MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

2024 Planning and Engineering Guidelines & Standards (PEGS) Manual

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

[Click here to learn how to use this manual]

Description

The purpose of the MDOT-MAA Planning and Engineering Guidelines & Standards (PEGS) Manual is to establish procedures, set standards, and achieve consistency for the design and construction of private and State-funded projects on the properties at both Baltimore/Washington International Thurgood Marshall (BWI Marshall) and Martin State (MTN) Airports.

These Guidelines & Standards are mandated regulations of MDOT-MAA with which all Designers and Architects/Engineers (A/E) and consultants must comply when performing work at MDOT-MAA owned and operated airports. In PEGS, the terms A/E, designer, and consultant are used interchangeably.

The intent of the PEGS manual is to supplement and complement established codes, regulations, and accepted industry practices, and to provide guidance and additional information regarding requirements unique to MDOT-MAA, Baltimore/Washington International Thurgood Marshall (BWI Marshall), and Martin State Airports.

The PEGS Manual is a living document that is continually updated to reflect the changing policies, procedures and design criteria of MDOT-MAA. If you know of a standard or guideline which needs updating, have identified any design standards or requirements contained herein that conflict with any codes or regulations, or have suggestions for improvement to the PEGS manual, please contact the Director, Office of Engineering and Construction, (410) 859-7093. Alternately, an email can be sent to maapegsstandards@bwiairport.com.

Updates and supplements

Modifications to the standards and guidelines herein will be made directly in the PEGS manual. Supplements will be issued as PDFS and will be linked from the PEGS manual, while the changes, additions, and deletions required by a supplement will be directly incorporated into the live PEGS manual, and will be formatted so as to allow the user to easily note any differences between previous and current requirements.

When a change is made to the PEGS manual, the text will be formatted according to the following convention:

- ~~Deleted passages will be left in place, but formatted with a gray, overstrike font~~
- Entirely new passages will be colored Green
- Changed passages will be colored Red

Supplements will be catalogued in the Introduction chapter.

Once each calendar year, a snapshot of the current PEGS manual will be taken, converted to PDF format, and added to the archives, along with any supplements issued during the calendar year (see Historical Editions) as the previous calendar year's archived edition. Afterward, the living PEGS manual will be 'flattened'; all changes made over the previous year will be incorporated into the base text by removing the red and green formatting, and the overstruck gray passages will be permanently deleted, forming a new edition of the PEGS manual for the next calendar year.

Administrative

The official name of the airport should read Baltimore/Washington International Thurgood Marshall Airport. An abbreviated version which can be used in correspondence, publications, and other communications is BWI Thurgood Marshall Airport.

The acronym “BWI Marshall” can be used in correspondence and other publications where necessary, for example, Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall).

How to use the PEGS manual

Interactive vs. Hard Copy

The PEGS manual is designed for use as an online, interactive, living electronic document. It is not designed to be printed, or extracted to a local file in formats such as Adobe PDF or Microsoft Word. The living electronic nature of the PEGS manual allows for updates and corrections to be made in only one place and instantly deployed, thus preventing the existence of out-of-date saved or printed copies. The PEGS manual, therefore, will always be the “latest and greatest” version of MDOT-MAA’s design standards.

Printing

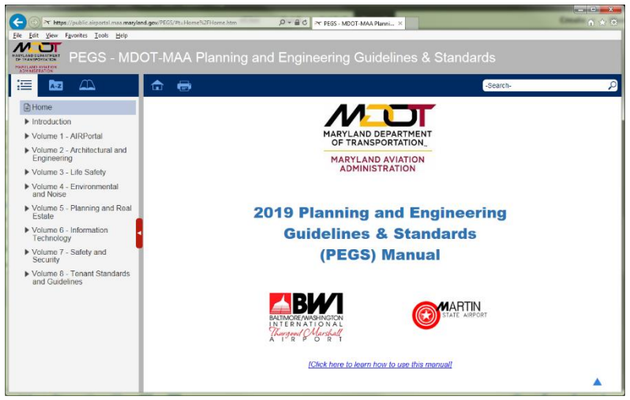
It is expected that there may be an occasional need to print individual pages of the PEGS manual for use in situations where online access is not available, such as field use in areas with no cellular or Wi-Fi coverage. To facilitate this occasional printing, a Print button has been included in the standard menu bar (see Print Button, below). ***The PEGS manual Print button must be used to print pages. Using a web browser’s Print button, Print Preview button, or pressing* Ctrl+P*, will result in incomplete pages.***

Screen layout

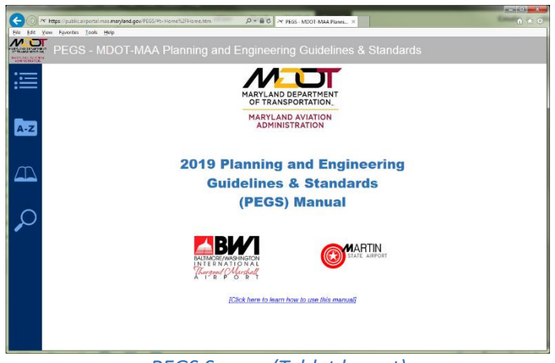
The PEGS manual’s screen consists of several main components: the button bar, the left pane, and the Content pane. These components can appear in one of three pre-configured layouts. The PEGS manual automatically selects one of the three layouts based on the size of the user’s browser window:

- PC Layout - A two-pane layout (shown above) with a button bar at the top, a Table of Contents/Index/Glossary pane on the left, and a Content pane on the right
- Tablet Layout - A single-pane layout with a button bar on the left and a Content pane on the right
- Phone Layout – A single-pane layout with a button bar at the bottom and a Content pane above

On devices with resizable browser windows, the PEGS manual will switch layouts automatically when the window reaches the minimum or maximum size for each layout.



PEGS Screen (PC Layout)



PEGS Screen (Tablet layout)

PEGS Screen (Phone layout)

Button Bar

The button bar contains the controls needed to navigate the PEGS manual and find content within it. Depending on the layout, the button bar will appear at either the top, left, or bottom edge of the screen.

Table of Contents (ToC) button

The ToC button causes the PEGS manual's Table of Contents to appear. In PC layout, the ToC will appear in the left-hand pane; in Tablet or Phone layout, the ToC will appear in the Content pane.

The Table of Contents is an expandable tree. Chapter titles expand when clicked to reveal all of the subsections contained within the chapter. Clicking a subsection title brings the subsection into the Content pane. After expanding multiple chapters, the user may find the length of the ToC to be cumbersome. In this event, chapters may be returned to their collapsed state by clicking their titles a second time.

Index button

The Index button causes the PEGS manual's Index to appear. In PC layout, the Index will appear in the left-hand pane; in Tablet or Phone layout, the Index will appear in the Content pane. Each of the common terms, acronyms, and abbreviations in the Index can be clicked to display a clickable menu of all locations where the term appears in the PEGS manual. Clicking one of these menu items will cause the corresponding chapter or section to appear in the Content pane. If no menu item is selected, the user may choose to return to the ToC by clicking the ToC button; switch to the Glossary by clicking the Glossary button; or use their web browser's Back button to return to the previous page.

Glossary button

The Glossary button causes the PEGS manual's Glossary to appear. In PC layout, the Glossary will appear in the left hand pane; in Tablet or Phone layout, the Glossary will appear in the Content pane. Each of the common terms, acronyms, and abbreviations in the Glossary can be clicked to display an expansion or definition of the term. The user may return to the ToC after a definition is checked by clicking the ToC button; switch to the Index by clicking the Index button; or use their web browser's Back button to return to the previous page.

Home button (PC Layout only)

The Home button causes the Content pane to return to the PEGS manual Home page, and the ToC to return to its top entry. The Home button is only visible in PC Layout; in the other layouts, the user may click the Home entry at the top of the ToC to return to the Home screen.

Print button (PC Layout only)

The Print button sends the page currently displayed in the Content pane to the user's default printer. Like the Home button, the Print button is visible only in the PC Layout. Printing is not available in Tablet or Phone layouts.

Search box (PC Layout only)

The PEGS manual includes a keyword Search capability, enabling the user to search for specified keywords and/or phrases. In PC Layout, the Search capability is accessed by entering user-specified keywords or phrases directly into the Search box. In Tablet and Phone layouts, the Search box is replaced by a Search button; clicking the Search button displays a Search box in the Content pane. Once keywords and/or phrases are entered into the Search box, the search is activated the search by pressing Enter on the keyboard, or by clicking the magnifying glass symbol on the right side of the Search box.

Search terms may include multiple individual words, such as ***pavement*** and ***markings***, or whole phrases, such as ***"pavement markings"***. Phrases must be surrounded by double quotes, or else the words which make up the phrase will be treated as separate individual words, and the search return will be less exact. In the preceding example, searching for ***pavement markings*** without the quotes will return any pages in the PEGS manual which contain both words, but not necessarily together, or in any specific order. Searching for the phrase ***"pavement markings"*** with the quotes included, however, only return those pages which include the entire phrase, in order. Search terms are automatically highlighted on the returned pages.

Navigating within the PEGS manual

The PEGS manual is composed in HTML format, much like any conventional web site. It is accessed through a web browser application, and can be accessed on most web-capable devices, such as PCs, laptops, tablets, and phones.

Navigating among the chapters and sections of the PEGS manual is accomplished by three primary methods:

- By clicking in the Table of Contents (see Table of Contents (ToC) button above)
- By clicking a link within the body of the document
- By clicking the Back and Forward navigation buttons on the user's web browser
- By saving the PEGS manual in a web browser's Favorites or Bookmarks

Within the body of the PEGS manual are numerous clickable hyperlinks. Hyperlinks fall into three categories:

- External links, which point to web sites outside of the PEGS manual containing information such as government or industry references, standards, and codes. An external link will open in a new browser tab or window when clicked, leaving the PEGS manual window on its current page.
- Internal links, which point to other locations within the PEGS manual itself, such as related chapters, or the various Appendices. An internal link will cause the referenced chapter or section to display in the Content pane.
- File links, which point to downloadable files such as forms, specifications, or example drawings. File links will cause the user's web browser to either automatically save a file to a pre-determined location, or open a dialog box asking the user to specify a save location for the downloaded file (this choice is set in the browser's preferences by the user).

Supplements

Any Supplements to the PEGS manual issued during the current calendar year are available for download in Adobe PDF format, using the following links.

Supplement No.	Issue Date	Section No.	Section Title
PEGS-24-001	2024-11-06	Vol 7, Appendix 7B	Standard Specifications

Historical editions

Historical editions of the MDOT-MAA Design Standards Manual and the PEGS manual are available for download in Adobe PDF format, for reference and comparison purposes, using the following links.

2023 Edition	2022 Edition
2023 Design Standards, Volumes 1-8 Supplement PEGS 23-001, 2023-05-15 Supplement PEGS 23-002, 2023-07-31	2022 Design Standards, Volumes 1-8 Supplement PEGS-22-001, 2021-03-07 Supplement PEGS-22-002, 2021-04-17 Supplement PEGS-22-003, 2021-05-27 Supplement PEGS-22-004, 2021-06-20 Supplement PEGS-22-005, 2021-07-01 Supplement PEGS-22-006, 2021-08-22

2021 Edition 2021 Design Standards, Volumes 1-8 Supplement PEGS-21-001, 2021-03-02 Supplement PEGS-21-002, 2021-04-14 Supplement PEGS-21-003, 2021-05-05 Supplement PEGS-21-004, 2021-06-15 Supplement PEGS-21-005, 2021-07-16 Supplement PEGS-21-006, 2021-08-18 Supplement PEGS-21-007, 2021-09-21 Supplement PEGS-21-008, 2021-11-16	2020 Edition 2020 Design Standards, Volumes 1-8 Supplement PEGS-20-003, 2020-02-07 Supplement PEGS-20-001, 2020-11-04 Supplement PEGS-20-002, 2020-12-01
2019 Edition 2019 Design Standards, Volumes 1-8 Supplement PEGS-19-001, 2019-06-02 Supplement PEGS-19-002, 2019-07-29 Supplement PEGS-19-003, 2019-11-06 Supplement PEGS-19-004, 2019-12-16 Supplement PEGS-19-005, 2019-12-20	2018 Edition 2018 Design Standards, Volumes 1-3 Supplement DST 18-001, 2018-07-02 Supplement DST 18-002, 2018-09-18 Supplement DST 18-003, 2018-09-18 Supplement DST-18-004, 2018-12-19 Supplement DST-18-005, 2018-12-19
2017 Edition 2017 Design Standards, Volumes 1-3 Supplement DST 2017-01, 2017-01-31 Supplement DST 2017-02, 2017-04-05 Supplement DST 2017-03, 2017-08-22 Supplement DST 2017-04, 2017-10-27 Supplement DST 2017-05, 2017-10-27	2016 Edition 2016 Design Standards, Volumes 1-3 Supplement DST 2016-01, 2016-08-19 Supplement DST 2016-02, 2016-08-19 Supplement DST 2016-03, 2016-11-23
2015 Edition 2015 Design Standards, Volume 1 2015 Design Standards, Volume 2 2015 Design Standards, Volume 3 Supplement DST 2015-01, 2015-04-06 Supplement DST 2015-02, 2015-07-30 Supplement DST 2015-03, 2015-08-07 Supplement DST 2015-04, 2015-11-04	2014 Edition 2014 Design Standards, Volume 1 2014 Design Standards, Volume 2 2014 Design Standards, Volume 3 Supplement DST 2014-01, 2014-05-07 Supplement DST 2014-02, 2014-05-09 Supplement DST 2014-03, 2014-09-09 Supplement DST 2014-04, 2014-10-17 Supplement DST 2014-05, 2014-11-14

2013 Edition	2011 Edition
2013 Design Standards, Volume 1 2013 Design Standards, Volume 2 2013 Design Standards, Volume 3 Supplement DST 2013-01, 2013-04-01 Supplement DST 2013-02, 2013-04-05 Supplement DST 2013-03, 2013-05-15 Supplement DST 2013-04, 2013-07-10 Supplement DST 2013-05, 2013-07-15 Supplement DST 2013-06, 2013-07-29 Supplement DST 2013-07, 2013-08-23 Supplement DST 2013-08, 2013-08-29 Supplement DST 2013-09, 2013-08-29 Supplement DST 2013-10, 2013-10-04 Supplement DST 2013-11, 2013-10-04	2011 Design Standards, Volume 1 2011 Design Standards, Volume 2 2011 Design Standards, Volume 3 Supplement DST 2011-11, 2016-02-04
2010 Edition	2009 Edition
2010 Design Standards, Volume 1 2010 Design Standards, Volume 2 2010 Design Standards, Volume 3	2009 Design Standards, Volume 1 2009 Design Standards, Volume 2 2009 Design Standards, Volume 3
2008 Edition	2006 Edition
2008 Design Standards, Volume 1 2008 Design Standards, Volume 2 2008 Design Standards, Volume 3	2006 Design Standards
2005 Edition	2004 Edition
2005 Interim Design Standards	2004 Design Standards Memoranda
2003 Edition	2002 Edition
2003 Design Standards Memoranda	2002 Design Standards Memoranda
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1999 Edition 1999 Design Standards Memoranda	1998 Edition 1998 Design Standards Memoranda
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1991 Edition 1991 Design Standards Memoranda	1990 Edition 1990 Design Standards Memoranda

MARYLAND DEPARTMENT OF TRANSPORTATION™

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Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 1

AIRPortal

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.0 Introduction to AIRPortal

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) is responsible for the Baltimore/Washington – Thurgood Marshall International (BWI) and Martin State (MTN) Airports located in Anne Arundel and Baltimore Counties, Maryland; respectively. AIRPortal is a secure web-based portal through which users can access data, documents, and applications that facilitate critical MDOT MAA business functions.

AIRPortal contains a comprehensive set of spatial data such as basemap layers, utilities, structures, and interior space layers, as well as engineering and construction documents for design projects, building permits, planning documents, and environmental documents. The information in AIRPortal can be distributed among offices within the MDOT MAA, Federal Aviation Administration (FAA), and with firms contracted to do business with the MDOT MAA.

AIRPortal was created to help reduce data redundancy, improve the accuracy and integrity of geospatial information, and make data usage and data sharing more efficient. It is MDOT MAA's single authoritative source for this type of information. The AIRPortal system is administered by the GIS and Engineering Technology Section (GETS) of the Division of Planning and Engineering of the MDOT MAA.

1.1 AIRPortal Purpose and Audience

The purpose of this document is to identify the means and methods that will be utilized to maintain AIRPortal and provide a consistent and uniform data management process for all data flowing into and out of MDOT MAA, regardless of the data format (i.e. documents, BIM, CAD, or GIS.)

The intended audience is anyone who interacts with AIRPortal to store or retrieve information.

1.2 Management of AIRPortal Data and Applications

The integrity of AIRPortal is directly related to the quality and consistency of the data it provides to end users, and data quality is a responsibility of all stakeholders working for MDOT MAA. Staff from the GIS and Engineering Technology Section (GETS) are involved with any MDOT MAA project that has a data deliverable. GETS has established highly coordinated and cooperative procedures for maintaining documents and spatial data on behalf of MDOT MAA. The success of AIRPortal and its ability to present reliable and up to date data to end users is predicated on the coordinated flow of information from MDOT MAA's consultants to GETS to be published in AIRPortal.

GETS has the following objectives:

A. Create a consistent and uniform data management process that effectively ensures compliance with MDOT MAA's BIM, CAD, GIS, and document management standards.
   Each design project will establish a plan of action based on these guidelines to ensure that all data-related activities will comply with MDOT MAA's standards. This will include methods to ensure compliance with existing feature class and layer definitions, geometry, and attribution; methods to establish new feature classes and layers when necessary; and a plan for submitting document deliverables that comply with naming conventions used within AIRPortal.

B. Establish and define roles and responsibilities of all participants, including MDOT MAA and its consultants.
   The execution of the data management process will require coordination and cooperation from all participants. Therefore, GETS will participate in scoping meetings for tasks that involve a data deliverable to establish roles and responsibilities for each participant.

C. Establish and define guidelines for editing and updating the data inventory that are based upon validated business rules.
   MDOT MAA's BIM, CAD, and GIS standards will be the driver behind all spatial data maintenance activities, establishing the definitions for each feature class that is used to model the real world within the database. All contributors will consistently and uniformly apply the standards, with no alternative interpretations being undertaken without the express consent of MDOT MAA, and only after assessing all potential impacts that the change or alternative interpretation may have.

D. Establish and define effective and workable procedures and tools for sharing and exchanging data among participants.
   Significant amounts of data will need to be exchanged between MDOT MAA and the design consultants, and steps will be taken to make this as fault-free as possible based on proven technologies. Several pre-conditions will be assumed:
   1. Contributing consultants will have the ability to edit data based on one of the predefined editing scenarios established by MDOT MAA. These scenarios will leverage MDOT MAA's current GIS and CAD architecture and represent proven practices within the geospatial industry.
   2. Design consultants will establish a data exchange schedule with GETS based on the length and scope of the task. The exchange schedule will build in time for quality control and acceptance by GETS.
   3. Contributing consultants will cooperate with database schema changes that may need to occur mid-task. It is reasonable to assume that at some point adjustments will be required to be made to the geodatabase schema as it matures and evolves operationally.

E. Establish a data review process for transparency.

Quality control procedures will be developed and provided to each consultant editing spatial data on behalf of MDOT MAA. These procedures will consist of automated and manual data checks to ensure data compliance with the MDOT MAA CAD and GIS Standards. Quality control of BIM data will be governed by BIM use cases within the MDOT MAA BIM Standard.

1.2.1 Roles & Responsibilities

A. GIS and Engineering Technology Section: Manage the flow of information in and out of AIRPortal. Responsibilities include:
   1. Overall management of spatial data, documents, and applications at MDOT MAA
   2. Fulfillment of any data requests that are not part of the self-service options available within AIRPortal
   3. Management of the versioning and check out structure of the enterprise database
   4. Updates to the baseline CAD templates and files available through AIRPortal
   5. Performing all manual and automated quality control checks prior to reconciling and posting updates to the geodatabase version being published through AIRPortal
   6. Manage editing projects to minimize or remove any overlap (minimize conflicts)
   7. Maintain space allocation drawings, airfield sign and markings plans, vector and raster basemaps, and other spatial data
   8. Perform quality control checks prior to accepting documents in AIRPortal for archiving purposes

B. MDOT MAA Project Managers: Oversee design and construction projects on behalf of MDOT MAA. Responsibilities include:
   1. Ensure AIRPortal requirements are identified early for each project assignment
   2. Coordination of data and documentation required under MDOT MAA's Standards
   3. Oversight of data deliverables to MDOT MAA from its consultants

C. Consultants: Perform work to MDOT MAA Standards and industry best practices. Responsibilities include:
   1. Identification of AIRPortal impacts
   2. Ensure project staff members have appropriate expertise for the subject matter and the technology being utilized
   3. Processing of all updates to spatial data generated during the execution of their respective projects, including those generated by inspections, maintenance
   4. activities, new construction, and any other instances as determined by MDOT MAA
   5. Performing all manual and automated quality control checks prior to returning a check out geodatabase to MDOT MAA

1.2.2 Project Communications

It is expected that MDOT MAA project managers and consultant project managers will bring the GETS staff into a project early in the scoping process to ensure data and document requirements are fully identified.

1.2.3 AIRPortal Access

AIRPortal can be accessed using a web browser from the following link: http://www.airportal.maa.maryland.gov.

New users shall request a login from the AIRPortal Administrator using the "Register" link on the appropriate login screen for either MAA Employee or MAA Consultant as appropriate – DO NOT REGISTER FOR BOTH. Logins are typically granted within 5 working days.

AIRPortal is currently compatible with the following browsers:
   A. Microsoft Internet Explorer version 9.0+
   B. Google Chrome
   C. Mozilla Firefox

User manuals associated with AIRPortal can be found in PEGS V1 Appendix 1A, PEGS V1 Appendix 1B, and PEGS V1 Appendix 1C.

If users have any questions or encounter any problems, they should contact the AIRPortal Administrator. This email account is monitored regularly.

1.2.3.1 Access to Sensitive Security Information on AIRPortal

Some of the document libraries contain Sensitive Security Information (SSI). The AIRPortal Administrator can grant users rights to view Sensitive Security Information. Refer to PEGS V7, Chapter 1.3 Sensitive Security Information for more information regarding Sensitive Security Information.

Access to SSI documents or spatial data containing SSI must be requested in writing by submitting the Digital Data Request form to the AIRPortal Administrator as described in PEGS V1, Chapter 1.2.5.2 Spatial Data Requests. The requestor must agree to follow the handling procedures outlined in the Digital Data Request form.

1.2.4 AIRPortal Data Holdings

Because of timing of projects and the potential for incomplete legacy records, all digital data carries the following disclaimer:

AIRPortal Digital Data Disclaimer

While every reasonable effort has been made to provide complete and accurate information, MDOT MAA grants access to this digital data with no guarantees of its accuracy, correctness, or completeness. The digital data provided is not survey quality, is not legally recorded, and is not intended to be used for surveying, engineering, or site-specific analysis. Any conclusions drawn from such digital data are done so at the sole risk and responsibility of the user. MDOT MAA disclaims all express and implied warranties relating to the material, including but not limited to warranties of merchantability, integration, title, and fitness for a particular purpose. ***All digital data is provided "as is." The data provided is exclusively for work associated with MDOT MAA projects ONLY and should not be distributed in any form outside MDOT MAA.***

As an AIRPortal user, one agrees to the fullest extent permitted by law, to indemnify and hold harmless MDOT MAA, its officers, directors, employees and consultants (collectively) against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising from any changes made by anyone or from reuse of the digital data files.

1.2.5 Data Requests

1.2.5.1 Self-Service Files

Many files within AIRPortal do not require a data request to access and are available for self-service. Non-SSI documents and drawings can be viewed within the application, downloaded directly, or shared with other users via AIRPortal's Shopping Cart functionality.

SSI documents are available upon request. Individual files are noted as SSI in their filenames and with the lock icon. They are listed for reference purposes.

Spatial data is available for viewing through AIRPortal applications. There is no direct download capability for this data; it is available upon request. Spatial data that is SSI is not available for viewing through AIRPortal applications and is only available upon request.

1.2.5.2 Spatial Data Requests

Access to spatial data (i.e. GIS, CAD, and BIM files) must be requested in writing by submitting the Digital Data Request form to the AIRPortal Administrator. The Digital Data Request form can be found in **AIRPortal > General > PEGS Reference Documents > PEGS V1-AIRPortal > Requesting Digital Data**. CAD, GIS, and BIM data are provided for planning and design purposes with the understanding that existing conditions must be field verified.

When the digital data request form is completed and submitted to the AIRPortal Administrator, an authorization process is initiated to fill the request.

1. The AIRPortal Administrator confirms the availability of the files that have been requested. Some project-based AutoCAD data may not be available if it was delivered prior to the MAA requirement for digital data.
2. The AIRPortal Administrator confirms the validity of the data request with the MAA Project Manager.
3. The AIRPortal Administrator contacts the data requestor to facilitate data transfer. Data will be transferred via FTP or a file sharing site at the requestor's direction.
4. The AIRPortal Administrator transfers the files to the requester.

1.3 AIRPortal Data Standards

1.3.1 CAD Standards

Refer to PEGS V1, Chapter 3 CAD Standards
Refer to PEGS V1, Appendix 1D.1 Layer Development
Refer to PEGS V1, Appendix 1D.2 Space Allocation Codes
Refer to PEGS V1, Appendix 1D.3 Glossary
Refer to PEGS V1, Appendix 1D.4 Crosswalk Relationships

1.3.2 GIS Standards

Refer to PEGS V1, Chapter 4 GIS Standards
Refer to PEGS V1, Appendix 1E.1 Feature Types
Refer to PEGS V1, Appendix 1E.2 Cross Reference of CAD and GIS

Refer to PEGS V1, Appendix 1E.3 Utilities Supplement

1.3.3 BIM Standards

Refer to PEGS V1, Chapter 5 Building Information Modeling (BIM) Standards
Refer to PEGS V1, Appendix 1F.1 Building Information Modeling (BIM) Execution Plan (BxP) Template, Version 1.0
Refer to PEGS V1, Appendix 1F.2 Building Information Modeling (BIM) Revit Template, Version 1.0
Refer to PEGS V1, Appendix 1F.3 Building Information Modeling (BIM) COBie Spreadsheet Template, Version 1.0
Refer to PEGS V1, Appendix 1F.4 Building Information Modeling Review Checklist
Refer to PEGS V1, Appendix 1G.1 Standard Specifications Section 010012X, Building Information Modeling (BIM) Use During Construction

1.3.4 Other Standards

1.3.4.1 Photographs for Use on AIRPortal

When required, photographs submitted for use in AIRPortal must meet the following requirements:

A. The aspect ratio must be 4:3
B. The largest resolution is 2 megapixels (approximately 1632 X 1224)

1.3.4.2 Geotechnical Boring & Core Data Requirement for AIRPortal

When a geotechnical investigation is included in the scope of work for projects at BWI Marshall or Martin State Airports, the consultant shall comply with the following requirements for preparation and delivery of geotechnical boring & core data:

A geotechnical boring/pavement core location plan shall be prepared in accordance with the requirements of the MDOT MAA CAD Standard contained in PEGS V1, Chapter 3 CAD Standards. Geotechnical boring/pavement core GIS data shall be prepared in accordance with the requirements of the GIS Data Standards contained in PEGS V1, Chapter 4 GIS Standards.

Within the CAD file, each boring/core shall be included at the location where the boring/core was obtained and shall be attributed and annotated with the following information:

A. Boring or Core Number (Boring/Core numbers shall be established as “MDOT MAA TASK NUMBER – BORING/CORE NUMBER”. For instance, the fifth boring taken for MDOT MAA Design Task Number 2750.1 shall be labeled B-2750.1-5 on the drawing and on the associated boring log. The fifth pavement core for the same project shall be labeled C-2750.1-5.)
B. Design Task Number
C. Date the Boring/Core was taken
D. Geotechnical Engineering firm responsible for the boring or core
E. Coordinates and existing ground elevation of the boring

1.3.4.3 Assignment of Building Identification Number

The GIS and Engineering Technology Section is responsible for administration of the Building Number Management Program and will determine and assign all building identification numbers at BWI Marshall and Martin State Airports.

The consultants of Capital and Building Permit projects shall contact the GIS and Engineering Technology Section to request a building identification number prior to 60% design process.

The GIS and Engineering Technology Section will coordinate the issuance of a new building identification number or the modification of any existing building identification number with the Office of Planning & Real Estate, the Office of the Fire Marshal, and the Office of Commercial Management prior to final issuance of an identification number.

1.3.4.4 Assignment of Door Numbers

MDOT MAA assigns a unique identifier to each entry or opening designated as a door, regardless of type, per PEGS V1, Chapter 2.4 Door Number Assignment. For additional information, refer to PEGS V1, Chapter 2 Building & Space Naming, Identification, Addressing, and Measurement.

1.3.4.5 Assignment of Space Numbers

MDOT MAA assigns a unique identifier to each interior space, both occupied and not occupied, per PEGS V1, Chapter 2.3 Interior Space Numbering. For additional information, refer to PEGS V1, Chapter 2 Building & Space Naming, Identification, Addressing, and Measurement.

1.4 AIRPortal Submissions

1.4.1 AIRPortal Document Manager (ADM)

AIRPortal submissions occur using the AIRPortal Document Manager application. ADM is a lightweight, downloadable, Windows based desktop application that allows MDOT MAA consultants to directly submit electronic deliverables to the MDOT MAA for archiving purposes. ADM streamlines the archiving process at MDOT MAA for document submittals to include design documents, environmental documents, and planning documents.

File naming standards and information on which files should be submitted to MDOT MAA via ADM can be found in the following locations:

- PEGS V1, Appendix 1A ADM User Guide for Design Consultants
- PEGS V1, Appendix 1B ADM User Guide for Environmental Consultants
- PEGS V1, Appendix 1C ADM User Guide for Planning Consultants

An AIRPortal login is required to utilize ADM. ADM is available at the following location: **AIRPortal > AIRPortal Document Manager (ADM).** The following are the system requirements to successfully install and run ADM:

A. Windows 7 SP1 or higher
B. .NET Framework 4.5
C. 1 GHz processor
D. 1 GB RAM
E. 100 MB of disk space
F. Internet connectivity

Only prime consultants on projects are authorized to submit electronic deliverables using ADM. Sub-consultants will not be able to submit electronic deliverables using ADM and therefore must transmit files to the prime for submission.

Email support can be obtained from the AIRPortal Administrator.

1.4.2 ADM Submissions for Design Consultants

ADM will be used for the submission of all CAD and non-CAD electronic deliverables for archiving purposes at each Design Phase as outlined in PEGS V2, Chapter 3.2 Deliverables by Design Phase. All electronic deliverables submitted using ADM must be uploaded by the prime consultant at the same time as submissions to MDOT MAA Project Manager for distribution and review.

ADM is configured to accept the following eligible submissions:

A. Exhibits and presentations – Presentations will be submitted in .pdf, .ppt or .pptx format. Photographs included in the presentations should be reduced in size to optimize the performance of the presentation.
B. 30/60/100 review documents (drawings and specifications)
C. Draft, draft-final, and final reports
D. Bid Documents (drawings, specifications, bid forms)
E. Addenda
F. Conformed documents
G. Record documents

Electronic deliverables outlined in PEGS V2, Chapter 2 Design Procedures that are not reports or specifications (i.e. meeting minutes, final task files, etc.) will be delivered to the MDOT MAA Project Manager as described in PEGS V2, Chapter 2 Design Procedures.

Required hard copy documents will be submitted to the MDOT MAA Archive as outlined in PEGS V2, Chapter 3.3 Standard File Naming Conventions. ADM does not eliminate the need for paper and electronic copies of documents for distribution to MDOT MAA for review. The MDOT MAA Project Manager will continue to direct these activities.

For availability, usage, limitations and system requirements, please refer to PEGS V1, Chapter 1.4.1 AIRPortal Document Manager (ADM).

Instructions on how to submit engineering records via ADM can be found in PEGS V1 Appendix 1A ADM User Guide for Design Consultants.

1.4.2.1 Passenger Boarding Bridges Data Requirements for AIRPortal

Refer to Specification 347713X_Apron Drive Passenger Boarding Bridges in PEGS V2, Appendix 2D Standard Specifications for AIRPortal submission requirements.

1.4.2.2 ADM Submission Requirements for Reports

A. Geotechnical Reports
   The consultant shall submit the final Geotechnical Report in electronic format described below, to the MDOT MAA Archive using MDOT MAA's Engineering AIRPortal Document Manager (ADM). The requirements for submission onto ADM are:
   1. Full Report, as one multipage PDF document. Geotechnical Report shall be submitted both in the Engineer's Report and as a separate PDF document from the Engineer's Report on ADM.
   2. Individual logs, as one PDF per log.
   3. Boring/Coring location plan in both PDF and DWG formats.

   Refer to PEGS V2, Chapter 3.3 Standard File Naming Conventions for file naming requirements.
   Refer to PEGS V2, Chapter 3.7.2 Geotechnical Reports for other requirements.

B. Stormwater Management Reports
   The consultant shall submit the draft and final Stormwater Management Report in electronic, Portable Document Format (PDF), to the MDOT MAA Archive using MDOT MAA's Engineering AIRPortal Document Manager (ADM). The requirements for submission using ADM are:
   1. Full Report as one multi-page PDF, as submitted to the MDE.

Refer to PEGS V2, Chapter 3.3 Standard File Naming Conventions for file naming requirements.

1.4.2.3 ADM Submission Requirements for Topographic Surveys

If topographic survey is performed for a project, the survey data shall be submitted to MAA in CAD (dwg) format. The topographic surveys shall be submitted to MAA via AIRPortal ADM at the time of the first scheduled deliverable to MAA.

A. For SUE tasks the topographic survey data submitted will be used to confirm that the consultant has successfully captured all utility features in the geodatabase checkout submissions. Topographic surveys that do not contain any "utilities," will still be used by MAA to update other surface features such as pavement markings.
B. For design projects, the topographic survey data will be used to confirm the existing GIS-related features in AIRPortal.

Topographic survey data CAD (dwg) files shall be eTransmitted and submitted via AIRPortal ADM by choosing the following options:

Submittal Group: Topographic Survey
Document Type: Topographic Survey

Standard naming of both dwg and eTransmit is as follows:
CX-TOPO-<AE Task Number>

Ex: "CX-TOPO-3901.dwg" and "CX-TOPO-3901.zip"

1.4.3 ADM Submissions for Environmental Consultants

As described in PEGS V4, Environmental and Noise, the MDOT MAA Office of Environmental Services requires consultants to submit final project documents via the ADM application. Refer to PEGS V1, Appendix 1B ADM User Guide for Environmental Consultants for how to submit environmental documents to MDOT MAA. Final documents must be uploaded in PDF format, although consultants may submit files in other file formats in addition to PDF. Once environmental files have been submitted and approved by the MDOT MAA archivist, they are stored in a database and are accessible by reference in one or more Environmental Services libraries found in AIRPortal.

1.4.4 ADM Submissions for Planning Consultants

As described in PEGS V5, Planning and Real Estate, the MDOT MAA Office of Planning requires consultants to submit final project documents via the ADM application. Refer to PEGS V1, Appendix 1C ADM User Guide for Planning Consultants for how to submit environmental documents to MDOT MAA. Final documents must be uploaded in PDF format, although consultants may submit files in other file formats in addition to PDF. Once planning files have been submitted and approved by the MDOT MAA archivist, they are stored in a database and are accessible by reference in one or more Planning libraries found in AIRPortal.

1.5 Subsurface Utility Engineering (SUE) Data Requirements for AIRPortal

Prior to submitting a fee proposal for a project at BWI Marshall and MTN Airports, consultants are required to coordinate with their MAA Project Manager and the GIS & Engineering Technology Section (GETS) to identify the requirements for Subsurface Utility Engineering (SUE). Projects that typically require SUE include, but are not limited to, projects that may require: excavation, installation of new utilities, relocation of existing utilities, and/or building a new structure/facility.

SUE is not limited to identification and disposition of existing underground utilities. Accordingly, existing aboveground utilities, such as storage tanks, pipes, overhead poles and power lines, electrical transformers, and other structures shall also be identified. Surface features which are associated with underground or aboveground utilities shall also be identified, including but are not limited to, lights, manholes, handholes, inlets, etc.

MAA has established a SUE grid for BWI Marshall and Martin State Airports. The SUE grid is available by visiting **AIRPortal > BWI > GIS Utilities >SUE Status** or **AIRportal > Martin State > GIS Utilities >SUE Status**.

Unless approved in writing, SUE work shall be conducted at the grid level, meaning that SUE shall be completed for all utilities above and below ground in the entire grid and for every grid that the project touches.

The following information shall be provided in the consultant's fee proposal as it relates to SUE:

A. A list or table of Grid IDs [(i.e. 33-30) – the unique identifier for the SUE grid(s)] that will be investigated. Grid IDs can be obtained by visiting **AIRPortal > BWI > GIS Utilities >SUE Status** or **AIRportal > Martin State > GIS Utilities >SUE Status**.
B. An image of the grids highlighting those that are included in the SUE investigation.
C. List of the consultant's and/or subconsultant's Engineer and GIS staff that will be involved with the SUE work. Qualification statements, resumes, and a QA/QC plan may be required for review and approval.

1.5.1 SUE Quality Levels

The consultant, MAA Project Manager, and GETS representative shall determine the appropriate quality level to be captured based on the last SUE survey performed, as well as, the type of work being performed within the affected grids. The consultant must involve an Engineer and a GIS Analyst in the project, regardless of the quality level being collected/submitted.

A. All SUE services shall be provided in accordance with applicable quality levels A through D of ASCE 38-02 Standard, latest edition.
B. Per ASCE 38-02 Standard, quality level designations A through D are cumulative, meaning that each quality level includes the activities performed for the quality levels below it in ranking. Levels are ranked from A (highest) to D (lowest). For example, if a project requires Quality Level C, the consultant must perform and deliver Quality Levels C and D.
C. Quality Levels are defined in its simplest form below. For full requirements refer to ASCE 38-02 Standard.
    1. Level D – Records research
    2. Level C – Identify ground surface features + Level D
    3. Level B – Topographic survey + Levels C and D
    4. Level A – Excavate and expose utility + Levels B, C, and D

D. If Quality Level A is required, the consultant is required to use minimally intrusive equipment such as vacuum excavation or hand excavation for test pits/test holes. Backhoe excavations are not permitted. Consultant must obtain an MAA Digging Authorization prior to any ground disturbance activities.

1.5.2 SUE Data Incorporating/Editing Process

Because SUE quality levels are cumulative, all SUE services will include Level D, records research. Using AIRPortal, the consultant may perform a review of all available drawings to identify existing utilities in the affected grid area(s). The BWI Projects Locator and MTN Projects Locator application in AIRPortal are also available to perform a spatial search for projects. Both Airports' Projects Locator viewers only contain a partial number of the projects that have been completed at BWI Marshall and Martin State Airports and should not be solely relied upon to identify all projects in the grid area(s).

When data has been collected to the Level required in the scope of work, the consultant is required to assemble all utilities' data and edit MAA's existing GIS data via geodatabase checkout. A checkout must be requested from GETS using a Digital Data Request Form, available for download in AIRPortal.

Data shall be separated by utility type into the appropriate feature classes in accordance with MAA's GIS Data Standards found in PEGS V1, Chapter 4 GIS Standards. The utility data shall be attributed with the following information:

A. Type of utility
B. Size
C. Material
D. Year built

E. Disposition
F. Data source
G. Quality level
H. Owner
I. Phase
J. Editor Name
K. Date of Last Update

Detailed information about each of the above listed attributes can be found in MAA's Utility Data Editing Guidelines. GETS maintains and frequently updates the Data Utility Editing Guideline. GETS will provide the most current guideline with every geodatabase checkout.

Utilities found on drawings shown as abandoned shall be captured and attributed in the same manner as in-service utilities, but with a disposition of "abandoned". Utilities are only deleted in cases of duplicate geometry; all other cases are handled by adjusting the disposition.

If a utility line exits the target grid(s), the consultant shall attempt to logically trace and connect the utility line to the existing utility feature in the adjacent grid. This could mean extending or adjusting the line to connect to the nearest physical feature (i.e. manhole, handhole, pole, etc.) if the utility records indicate a connection. In cases where the utility cannot be logically connected, the consultant shall place a notation in the description field to alert MAA GETS that there is a utility connecting into a feature of an adjacent grid.

Newly incorporated spatial data may not align exactly with the location of existing utility system features. When determining which geometry to use, the consultant must consider the quality level of the utility features in both the source and destination. The higher Quality Levels take precedence over the lower Quality Levels. Refer to PEGS V1, Chapter 1.5.1 SUE Quality Levels.

Attribute information identified during SUE projects may conflict with attribute information found in the existing utility system dataset. When that occurs, the consultant must determine which dataset contains more accurate information. The consultant shall consider the age of the data source and quality level in making the determination.

1.5.3 Electronic Deliverables for SUE

A. GIS Data
SUE data shall be submitted to MAA GETS in GIS format. The delivery of the GIS format shall be coordinated with GETS and delivered via a geodatabase checkout. Refer to PEGS V1, Chapter 4.6 MDOT MAA GIS Data Compliance Requirements.

The GIS deliverable must pass all ESRI Data Reviewer Quality Control Tests in accordance with PEGS V1, Chapter 4.8.1 Quality Assurance and Control of GIS Data, before being accepted. Tests will be provided by GETS to the consultant at the same time as the geodatabase checkout.

B. CAD Data – Refer to PEGS V1, Chapter 1.3.1 CAD Standards.

1.5.4 Data Exceptions

In cases where GIS features fail a Data Reviewer check but have a valid exception, the consultant will provide MAA with the file geodatabase used for the Data Reviewer session. This geodatabase shall have all corrected features removed from the reviewer table and only contain the exceptions. The consultant shall include a brief explanation for any feature exceptions.

1.5.5 Schedule

The consultant shall coordinate the schedule for delivery of SUE GIS data with their MAA Project Manager and GETS. All SUE work shall be initiated, completed, and delivered to MAA prior to the 30% submission of a task or in advance of the draft report submission, unless otherwise approved by the MDOT MAA Project Manager.

2.1 Introduction

2.1.1 Purpose

This Building and Space Naming, Identification, Addressing, and Measurement Standard provides guidance for identifying Maryland Aviation Administration (MDOT MAA) owned, occupied, and/or managed properties so they can be uniquely and consistently referenced by personnel and information systems alike. The personnel who will use these identifiers include MDOT MAA staff, consultants, contractors, and emergency responders. This Standard establishes a consistent method for assigning location attributes to MDOT MAA properties, including building number, address, and unique identifiers for interior spaces. In addition, this Standard defines the methods by which interior spaces at MDOT MAA properties shall be measured for the purposes of including these spaces in MDOT MAA databases and computing space square footage. Unless otherwise noted, the implementation and enforcement of these standards is by the MDOT MAA Division of Planning and Engineering GIS and Engineering Technology Section (GETS).

2.1.2 Definitions

This Standard is comprised of five hierarchical levels that define locations within MDOT MAA owned and/or occupied properties. Each level is a more detailed breakdown of its preceding level. The hierarchical levels follow:

A. Campus
B. Building
C. Section
D. Level
E. Unit

The first two levels, Campus and Building, define exterior locations. The Campus identifier is always either BWI or MTN, depending on whether the property is located at BWI Marshall or Martin State Airport. Buildings are assigned a building number and an address, as per Section 2.2 Addressing and Numbering Standard. The remaining levels define interior locations within a building. Standards for Section, Level, and Unit are all defined within Section 2.3 Interior Space Numbering. The Section level may refer to interior or exterior attributes depending upon the layout of the building. Level and Unit refer to interiors. Units include locations that are rooms (spaces with doors) and interior open spaces, such as concourses, holdrooms, or open stairwells.

For each of the five levels, this Standard defines identifiers to be assigned, along with any labeling and database considerations. This Standard covers the numbering and labeling of doors associated with spaces at MDOT MAA properties as well. This Standard also defines the procedures by which unique identifiers are to be assigned to MDOT MAA properties.

2.2 Building Addressing, Numbering, and Naming

Buildings on MDOT MAA property associated with publicly accessible roads will be assigned street addresses as needed. All MDOT MAA buildings will be assigned a unique identifier (building number) and name, whether the building is located on the airside or landside of airport operations. The building numbering conventions and procedures describe the process by which buildings are assigned numbers at BWI Marshall and Martin State Airports. GETS is responsible for assigning building numbers and addresses at BWI Marshall and Martin State Airports in coordination with the MDOT MAA Office of the Fire Marshall (OFM) as well as Anne Arundel and Baltimore counties, respectively.

For street addressing purposes, public roads are named by the surrounding county having jurisdiction over the road. Roads on MDOT MAA properties are named at the discretion of the MDOT MAA Executive Director, in coordination with GETS, Office of the Fire Marshal and the surrounding counties.

2.2.1 Building Addressing, Numbering, and Naming Coordination

Designers and consultants working with MDOT MAA will contact GETS to obtain building addresses, numbers, and names during the design and permitting process.

2.2.2 Assigning Building Addresses

2.2.2.1 Assigning Building Addresses at BWI Marshall

Street addresses at BWI Marshall shall be assigned with the closest accessible road that is used to access the building based on determination from GETS in coordination with Anne Arundel County and Office of the Fire Marshal.

A. BWI Marshall Building Addressing Process
    1. Requests for a building address are made to GETS by an MDOT MAA employee from the Division of Planning and Engineering, Office of the Fire Marshall, another relevant MDOT MAA office, or a consultant firm doing business with MDOT MAA.
    2. When requesting an address, the request must include information about the building including an existing building name and number if available. If building number is not available, GETS will follow the building numbering process as outlined in Section 2.2.3 Assigning Building Numbers.
    3. GETS will review the request, review current addressing data for the building (including nearby named streets and existing addresses), and coordinate with Anne Arundel County and OFM on the appropriate address. A building address consists of a street number and a street name (e.g., 7050 Friendship Rd). Determination of street number is based on nearby addresses and determination of street name is based on the closest accessible street to the building. GETS will confirm the new address with the requestor and notify relevant MDOT MAA offices.

2.2.2.2 Assigning Building Addresses at Martin State

Building addressing at Martin State is carried out by GETS in coordination with the Martin State Airport Manager, Baltimore County, and Office of the Fire Marshal following similar procedures as at BWI Marshall.

2.2.3 Assigning Building Numbers

2.2.3.1 Assigning Building Numbers at BWI Marshall

A. Types of Buildings that Receive Building Numbers
   Any permanent building that is intended for occupancy shall receive a building number. For the purposes of these Standards, a building is defined as any structure that is utilized or intended for supporting or sheltering any occupancy. Structures that are in place for less than 180 days are considered temporary and are not assigned a building number.
B. BWI Marshall Building Numbering Conventions
   All buildings are assigned a 3-digit number based on the ownership and operation status of the building. The BWI Marshall Main Terminal is building 100. Buildings constructed, owned and/or operated by the FAA are assigned a number in the 2XX range in coordination with GETS. All other buildings at BWI Marshall are assigned a number in the 1XX range. In cases where a building is a part of a group of buildings, a letter identifier may be added to an existing building number to show that the related buildings are nearby. For example, a new building is being built adjacent to building 160. The next available building number is 191, however for the purposes of planning and dispatch, it is may be appropriate to number the new building 160A so that the adjacent buildings maintain a logical consistency in numbering.
C. BWI Marshall Building Numbering Process
   1. GETS issues building numbers for new buildings during the Bid design phase of a capital project (i.e. while the Bid drawing set is being prepared), and after permit approval for a permitted project.
   2. Requests for a building number are made to GETS by an MDOT MAA employee from the Division of Planning and Engineering, Office of the Fire Marshall, another relevant MDOT MAA office, or a consultant firm doing business with MDOT MAA.
   3. When requesting a new or altered building number, the request must include information about the building including an existing building name and address, and information on building owner, and and information on building tenant(s) if available. If the building address is not known, GETS will follow the building addressing process as outlined in Section 2.2.2 Assigning Building Addresses.
   4. GETS will review the request and determine the appropriate number for the building based on the next available number and nearby buildings.
   5. GETS will confirm the new number with the requestor and notify relevant MDOT MAA offices.
D. Renumbering Buildings
   If a building must be renumbered, all renumbering will be coordinated by GETS since the change will influence several datasets including interior space numbers, airport layout plans, computer aided dispatch GIS datasets, and other GIS layers. GETS will follow the procedures above for assigning a new building number and in doing so update all relevant datasets. Since changing a building number will have impacts on many MDOT MAA offices and datasets, this process should only be carried out under extreme circumstances and after exhausting other options for changing the identification of a building. For example, changing a building name will be easier and is preferred over changing its number.
E. Demolishing Buildings
   When a building is removed, GETS will record its number and history in the MAA GIS database Numbers of removed buildings will become available for use for another building only after a minimum of five (5) years have passed since building removal.
F. Building numbers, once issued by GETS, shall be indicated on the Bid and subsequent drawing sets of capital projects with textual notes on the title sheet and any applicable Architectural floor plan sheets.
   a. A note shall be placed on the title sheet of the project stating, “This project will construct new building(s) at BWI/MTN numbered xxx by MAA.”
   b. Notes shall be placed on the Architectural floor plan sheet(s) of each new building stating, “Building numbered xxx by MAA.”

2.2.3.2 Assigning Building Numbers at Martin State

Building numbering at Martin State follows similar processes as Section 2.2.3.1 Assigning Building Numbers at BWI Marshall under the coordination of GETS staff and the Martin State Airport management.

A. Assigning numbers to T-Hangars
   T-hangars at Martin State are assigned a building number corresponding to a group of hangars installed near each other on the airfield. Individual T-hangars are assigned a unit number corresponding to the lease for that hangar. The unit number is posted on the outside face of the hangar.

2.2.3.3 Building Number Signage

Signs for building numbers shall be 12” x 12” with yellow honeycombed reflective background. Building number characters shall have black background. Character height shall be 4-1/2 inches with 5/8-inch stroke. Mounting location will be determined by Office of the Fire Marshal. A sign shall be placed on the public side and airfield side of the building as applicable.

2.2.4 Assigning Building Names

Designers of a new building at BWI Marshall and Martin State Airports may suggest a name for the new building. GETS will coordinate with all relevant MDOT MAA stakeholders to approve the name of the new building.

2.3 Interior Space Numbering

2.3.1 Introduction

Interior space numbers are unique codes that are used to identify individual interior spaces at BWI Marshall or Martin State Airports. These standards define space numbering conventions (i.e., how space numbers are formatted) and procedures (i.e., how spaces are assigned numbers) for BWI Marshall and Martin State Airports. The GETS office is responsible for maintaining and implementing the numbering standards at BWI Marshall and Martin State.

Each interior space is represented by a space polygon in the MDOT MAA GIS database. The attributes of these space polygons contain all components of the interior space number in separate fields, allowing interior space data to be queried, sorted, and analyzed according to any combination of those components, for example: querying the data for all spaces on a specific level of a specific building, or all spaces on all levels within a specific building section, etc.

2.3.2 Interior Space Numbering Coordination

The designers of Capital and Permitted projects shall contact GETS to request space number assignments during the design or construction process when one or more spaces are to be created, removed, or modified as part of the project. Designers shall contact GETS at the following times depending on the project type:

A. Capital Projects: Prior to each design submittal, beginning with the 30% design phase, and prior to any field changes or addenda, and prior to any temporary construction which may modify existing or create new spaces
B. Permitted Projects: As early as possible during design, prior to application for building permit.

GETS will assign space numbers for a project based on the following conventions and procedures described in Section 2.3.4 Space Number Assignment and will notify consultants via annotated plan and/or text document of the newly assigned space numbers.

Designers are required to coordinate with GETS to adjust space number assignments as a project evolves, to accommodate expected design changes which may add, remove, or modify interior spaces. Although such communication is mandated at each design phase, it is also encouraged in between design phases as well.

2.3.3 Interior Space Numbering Conventions

Interior space numbers are built from the components defined below. All components are required to form a completely unique space number. Components are joined by underscores to form the completed space number. By convention, space number components do not require leading zeros, e.g., 001, however those may be used at the discretion of GETS staff.

A. Airport Campus: A code denoting the airport campus where the space is located.
B. Building Number: The MDOT MAA-issued number of the building containing the space.
C. Section Identifier: A code denoting subdivision of a building where the space is located.
D. Level Number: A code denoting the level within a building where the space is located.
E. Unit Identifier: An individual code assigned to each interior space.
F. Function Designator (Optional): An optional single letter code denoting a specialty space's function.

2.3.3.1 Space Numbering Examples

Component	Component Name	Examples
A	Airport Campus	BWI, MTN
B	Building Number	100, 112, 991
C	Section Identifier	AT, NTE, A, 1, 0
D	Level Number	1, 1a, 3
E	Unit Identifier	1, 101, CST1, 203J, A111C
F	Function Designator (Optional)	P, K, U

Table 2.3.3.1-1 Space numbering component examples

Space Number	Space number component description
BWI_100_A_1_A111C	BWI Marshall Airport, Building 100 (Terminal), Section A (Concourse A), Level 1, Unit A111C
BWI_991_0_1_203J	BWI Marshall Airport, Building 991 (Hock Office Complex), Section 0 (default section), Level 1, Unit 203J
MTN_4-5-6_4_1_402B	Martin State Airport, Building 4-5-6 (Hangars), Section 4 (Hangar 4), Level 1, Unit 402B

Table 2.3.3.1-2 Space numbering examples

In Figure 2.3.3.1-3 below, several rooms in the BWI Marshall B Terminal are shown with space identifiers for the primary spaces (in green) and identifiers for sub-rooms (in purple). All of these spaces will share many components in the space number, BWI_100_BT_2, but have a unique space number when all components are combined: BWI_100_BT_2_BT254A, BWI_100_BT_2_BT254A1, BWI_100_BT_2_BT254B, BWI_100_BT_2_BT254B1, etc. The purpose of the full space number (e.g., BWI_100_BT_2_BT254A) is to provide a unique value to represent the space in digital databases that contain features for all spaces at BWI Marshall and Martin State Airports.

In day to day operations, and on digital or printed plans, it is common to represent space numbers by using only the Unit Identifier component (e.g., BT254A) as highlighted in Figure 2.3.3.1-3.

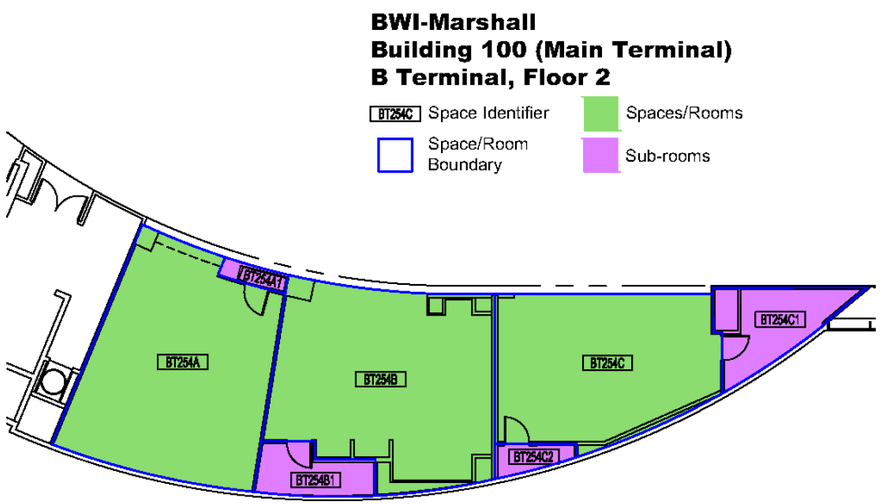


Figure 2.3.3.1-3 Space numbering at BWI Marshall showing different space identifiers for rooms and sub-rooms

Unit Identifiers and door numbers are closely related and are typically assigned at the same time. In general, a door number will match the Unit Identifier of the space into which it opens. Further description of how door numbers are assigned is found in Section 2.4 Door Number Assignment.

2.3.4 Space Number Assignment

This section describes the space numbering process for all MDOT MAA Marshall buildings for designating the campus, building, section, level, and space identifier components of space numbers.

2.3.4.1 Airport Campus

All interior spaces at BWI Marshall are assigned the campus code **BWI**. All interior spaces at Martin State Airport are assigned the Airport Campus code **MTN**.

2.3.4.2 Building Number

All interior spaces are assigned the building number of their building. Building numbers are assigned as defined in Section 2.2.3 Assigning Building Numbers and are maintained by GETS in coordination with the Office of Planning, the Office of the Fire Marshal, the Office of Maintenance, and other MDOT MAA offices. Interior spaces at the BWI Marshall Terminal are assigned the building number 100.

2.3.4.3 Section Identifier

For buildings with multiple sections (e.g., wings, concourses, zones) interior spaces are assigned a Section Identifier based on their location within the building. Section Identifiers in the BWI Marshall Terminal are based on the building's Terminals and Concourses (Table 2.3.4.3-1, Figure 2.3.4.3-2). Section Identifiers for buildings consisting of multiple hangars generally indicate the hangar number. Sections Identifiers in cargo buildings and warehouses are typically single letters. GETS will delineate building sections and assign Section Identifiers as needed. If a building has no delineated sections, all spaces within building shall be assigned the default Section Identifier "0" (the number zero).

AT	Terminal A-B, Concourse A side	**A**	Concourse A
BT	Terminal A-B, Concourse B side	**B**	Concourse B
ST	South Terminal	**C**	Concourse C
CT	Center Terminal	**D**	Concourse D
NT	North Terminal	**DX**	Concourse DX
NTE	North Terminal Extended	**DY**	Concourse DY
SKY	Skywalks and associated towers	**E**	Concourse E
CTT	Pedestrian Tunnel (to Hourly Garage)	**OBG**	Terminal Observation Gallery

Table 2.3.4.3-1 BWI Marshall Terminal Section Codes

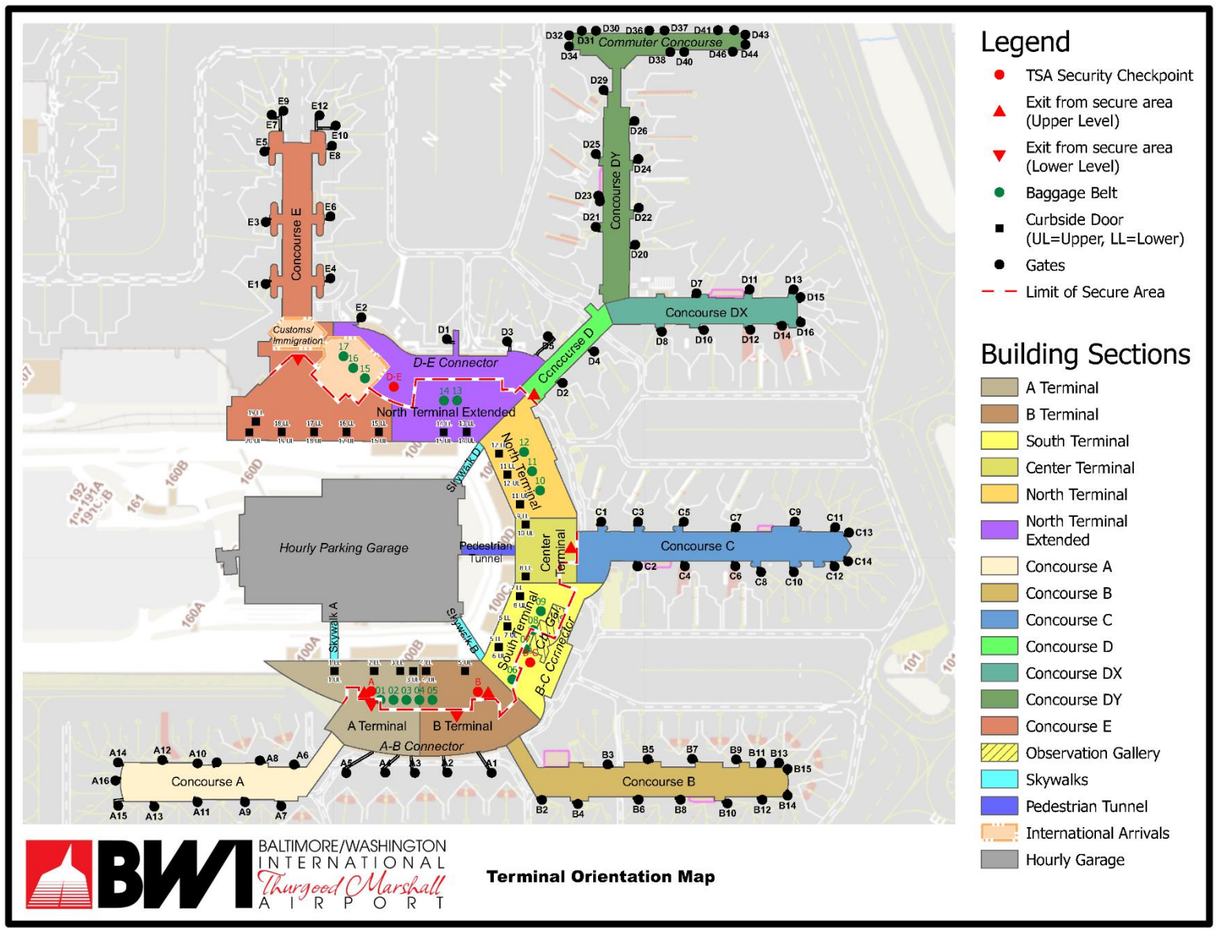


Figure 2.3.4.3-2 BWI Terminal Orientation Map

2.3.4.4 Level Number

All interior spaces are assigned the level number of the level where they are located. This can be a number (e.g., 1, 2, 3) or an alphanumeric value (e.g., 1a, 2i) depending upon the layout of the building.

A. BWI Marshall Terminal Level **Numbers and Names**

Terminal levels are divided by program at each level as defined in Table 2.3.4.4-1 below.

Level Number	Level Name	Terminal Programs on Level
0	Basement	A & B Terminal Baggage Tunnels
		Center Terminal Tunnel to Hourly Parking Garage
1a	A/B Ground Level	A & B Terminal Lower Level, Baggage Make-up, Airline Operations
		Concourses A & B Lower Level
1	Lower Level	Main Terminal Lower Level, Arrivals and Baggage Claim
2i	International Sterile Corridor	International Arrivals Sterile Corridor
2	Upper Level	Main Terminal Upper Level, Concourses Upper Level, Ticketing and all Gates
3	Third Floor	Skywalks to Hourly Parking Garage A & B Terminal Offices South Terminal Observation Gallery Center Terminal Offices Concourse DY Tower
4	Fourth Floor	Center Terminal Offices and MAA Operations
		Concourse DY Tower
5	Fifth Floor	Center Terminal Tower
6	Sixth Floor	Center Terminal Tower
7	Seventh Floor	Center Terminal Tower
8	Eighth Floor	Air Traffic Control Tower
9	Ninth Floor	Air Traffic Control Tower

Table 2.3.4.4-1 BWI Marshall Terminal Levels

B. Outbuildings

Buildings at BWI Marshall other than the Terminal, commonly referred to as Outbuildings, and all buildings at Martin State Airport, use a simplified numbering system for Level Numbers as defined in Table 2.3.4.4-2 below.

Level Number	Level Name
B	Basement
1	First Floor
2	Second Floor
M	Mezzanine
3	Third Floor
4	Fourth Floor
5	Fifth Floor
6	Sixth Floor
7	Seventh Floor
8	Eighth Floor
9	Ninth Floor

R	Roof

Table 2.3.4.4-2 Level Numbers in BWI Marshall Outbuildings and Martin State Buildings

2.3.4.5 Unit Identifier

Unit identifiers are the individualized code assigned to each interior space. They are typically two to eight characters in length, include the Section Identifier, an optional Function Designator, the Level Number, and may include alphanumeric suffixes in the case of sub-rooms. In buildings without delineated sections, the default Section Identifier "0" is omitted from the Unit Identifier and is only stored in the attributes of the building's space polygons.

A. Linear Buildings/Sections with a Central Corridor

For buildings or building sections whose rooms are arranged in a linear fashion along corridors, Unit Identifiers begin at the end or side closest to the main entrance and increment toward the opposite end or side, with spaces to the left of the corridor receiving sequential odd numbers, and spaces to the right of the corridor receiving sequential even numbers (e.g., 101, 103, 105 on the left and 102, 104, 106 on the right). If the corridor runs perpendicular to the face containing the main entrance, numbering shall begin at the end of the corridor to the left of the main entrance. Spaces along corridors are to be numbered sequentially whenever possible. Determination of the main entrance to a building or section for the purposes of assigning Unit Identifiers is by GETS staff.

B. Non-Linear Buildings/Sections without a Central Corridor

For non-linear buildings or sections without a central corridor, such as hangars and warehouses, Unit Identifiers begin at the main entrance and increment in a clockwise spiral from the exterior of the building towards the interior. When possible, spaces along corridors are numbered sequentially. Determination of the main entrance to a building or section for the purposes of assigning Unit Identifiers is by GETS staff.

C. Sub-rooms

Rooms may have one or more sub-rooms and on occasion there can be multiple levels of sub-rooms, such as in a suite containing open offices, private offices, and other rooms, or rooms wholly contained within another room, such as a closet. Sub-rooms are assigned Unit Identifiers that consist of the parent space's Unit Identifier plus an alphabetical suffix, always starting with the letter A, increasing by a letter suffix clockwise from the main entrance of the space. Occasionally, sub-rooms will also have sub-rooms. In those circumstances, an additional numeric suffix is added: room 201A1 is a sub-room of 201A, which is a sub-room of 201.

D. Ad Hoc Space Identifiers

GETS staff will assign Unit Identifiers that deviate from these procedures in cases where strictly following the procedures results in confusion in the field. For example, if the standard procedure would result in Unit Identifiers 124 and 146 being placed together, the second space may instead be assigned a Unit Identifier 124A to maintain a logical sequence along a corridor.

D. Curbside Entry Vestibules

Curbside entry vestibules along the BWI Marshall Terminal roadway are numbered 1-19 on the Lower Level and 1-20 on the Upper Level, starting on the Terminal A-B side. The vestibules are assigned a Unit Identifier based on a prefix of either LL indicating Lower Level (Level 1), or UL indicating Upper Level (Level 2), and the entry number. For example: curbside entry vestibule #2 on the Lower Level is assigned Unit Identifier LL2.

E. Holdrooms

Holdrooms are open public spaces at Gates where passengers wait to board their flights. Unit Identifiers for holdrooms include the prefix "HR" followed by the Gate number of the holdroom. For example, the Unit number HRE6 refers to the holdroom at Gate E6.

F. Restrooms, Nursing Rooms, and Adult Changing Rooms

All projects involving renovation or reconstruction of restrooms at BWI Marshall and Martin State Airport shall include numbering of each restroom, as well as numbering of each stall within the restrooms. The stall numbers should be affixed to the outside and inside door of each stall. The positioning and esthetics of the signs affixed on the stall doors shall be at the discretion of the Director of the MDOT MAA Office of Architecture.

Public Restrooms, Nursing Rooms, and Adult Changing Rooms at BWI Marshall are each assigned a unique MDOT MAA Identifier. The Unit Identifier for these rooms and their sub-rooms will match the room's MDOT MAA Identifier. The MDOT MAA Identifier includes the Section Identifier, a dash, the appropriate Function Designator (see 2.3.4.6 Function Designator for list), the Level Number, and an alphanumeric identifier assigned by GETS. For example: Family Assist Restroom C-F2A, Men's Restroom C-M2A, and Women's restroom C-W2A are located in the C Concourse on Level 2, resulting in Space Numbers BWI_100_C_2_C-F2A, BWI_100_C_2_C-M2A, BWI_100_C_2_C-W2A.

Non-public restrooms, such as those located within MDOT MAA occupied space or a tenants leased space, shall be issued standard Unit Identifiers.

Toilet stalls within a restroom are not represented in the MDOT MAA GIS by unique space polygons, but are incorporated as part of the parent restroom. However, each stall shall be assigned a sequential stall number, beginning with "1" at the first stall to the right of the entrance and counting up in a counter-clockwise direction, or beginning with the first stall to the left of the entrance and counting up in a clockwise direction.

G. Escalators, Elevators, Open Stairs, Stairwells, Moving Walkways

Escalators, Elevators, Open Stairs, and Stairwells are features with spaces that span multiple levels and thus may have duplicate Unit Identifiers from level to level. Additionally, the Maryland Department of Labor, Licensing and Regulation issues each Elevator, Escalator, and Moving Walkway a unique identifier consisting of two letters representing the Maryland county, and a four-digit number. The letters in state-owned facilities, such as BWI Marshall and Martin State Airports, are always “ST”. This identifier is recorded the MDOT MAA GIS database for reference, but is not part of the space number or MDOT MAA Identifier.

1. Escalators
   Escalators have a space polygon on each level through which they pass. Escalators at BWI Marshall are each assigned a unique MDOT MAA Identifier. The Unit Identifier for an escalator’s two space polygons will match its MDOT MAA Identifier. The MDOT MAA Identifier includes the Section Identifier, the Function Designator “L”, the Level Number of the unit’s bottom level, and an alphanumeric identifier assigned by GETS. For example: Escalator DYL1A is located in the DY Concourse, spanning levels 1 and 2, resulting in two space polygons with the Space Numbers BWI_100_DY_1_DYL1A and BWI_100_2_DYL1A.

2. Elevators
   Elevators have a space polygon on each level through which they pass. Elevators at BWI Marshall are each assigned a unique MDOT MAA Identifier. The Unit Identifier for an elevator’s multiple space polygons will match its MDOT MAA Identifier. The MDOT MAA Identifier includes the Section Identifier and an alphanumeric identifier assigned by GETS. (NOTE: Elevators lack a Function Designator). Alphanumeric identifiers in the Concourses will generally correspond to the number of the nearest Gate. For example: Elevator B7 is located on Concourse B, nearest Gate B7, spanning Levels 1a and 2, resulting in two space polygons with the Space Numbers BWI_100_B_1a_B7 and BWI_100_B_2_B7.

3. Enclosed Stairwells
   Stairwells have a space polygon on each level through which they pass. Stairwells are enclosed by walls, unlike open stairs, and are typically restricted from public use except in case of emergency. Stairwells at BWI Marshall are each assigned a unique MDOT MAA Identifier. The Unit Identifier for a stairwell’s multiple space polygons will match its MDOT MAA Identifier. The MDOT MAA Identifier includes the Section Identifier, the Function Designator “S”, and an alphanumeric identifier assigned by GETS. Alphanumeric identifiers in the Concourses will generally correspond to the number of the nearest Gate. For example: Stairwell DYS21 is located at Gate D21, spanning Levels 1 and 2, resulting in two space polygons with the Space Numbers: BWI_100_DY_1_DYS21 and BWI_100_DY_2_DYS21.

4. Open Stairs
   Open Stairs have a space polygon on each level through which they pass. Open stairs are not enclosed by walls and are considered public spaces. Open stairs are not assigned unique MDOT MAA Identifiers, and so their Unit Identifiers will correspond to the standard format for interior spaces and will not match from level to level. Open stairs are given a Function Designator of “P”, as they are considered public spaces. For example: a stair in Concourse DY spanning Levels 1 and 2, resulting in two space polygons with the Space Numbers BWI_100_DY_1_DYP101 and BWI_100_DY_1_DYP244.

5. Moving Walkways
   Moving walkways are pieces of equipment having a single space polygon. Moving Walkways are each assigned a unique MDOT MAA Identifier. The Unit Identifier for a moving walkway’s space polygon will match the MDOT MAA Identifier. The MDOT MAA Identifier includes the Section Identifier, the Function Designator “V”, the Level Number, and an alphanumeric identifier assigned by GETS. For example: Walkway BV2A is located in the B Concourse on Level 2, resulting in Space Number BWI_100_B_2_BV2A.

2.3.4.6 Function Designator

For certain spaces with dedicated functions, a Function Designator code is included in the Unit Identifier immediately following the Section Identifier. Function Designators are assigned by GETS staff as part of the Unit Identifier.

Designator	Description
F	Family Assist Restroom
G	Adult Changing Room
K	Kiosk
L	Escalator
M	Men’s Restroom
N	Nursing Room
P	Public Space
S	Stairwell
U	Unleasable Space
V	Moving Walkway
W	Women’s Restroom

Table 2.3.4.6-1 Function Designators

F. **Family Assist Restrooms**: Unisex facilities designed to be more accommodating to families with small children or those with special physical needs who might find it uncomfortable or impractical to use standard restrooms. One Family Assist Restroom is typically provided at or near each grouping of public restrooms. Family Assist Restrooms are assigned the Function Designator “F” in their Unit Identifier.

G. **Adult Changing Rooms:** Toilet and change facilities provided for those with high support needs and their caregivers, who may require more space, assistance, and specialized equipment than is available in a standard restroom. One Adult Changing Room is typically provided at or near each grouping of public restrooms. Adult Changing Rooms are assigned the Function Designator “G” in their Unit Identifier.

K. **Kiosks:** Found throughout BWI Marshall Terminal. Kiosks represent leasable area of open space, typically contained within a larger public space, which may include information, ticketing, queueing, or concession areas. Kiosks are assigned the Function Designator “K” in their Unit Identifier.

L. **Escalators:** Escalators may be found in public areas throughout the BWI Marshall Terminal. Escalators are assigned the Function Designator “L” in their Unit Identifier.

M. **Men’s Restrooms:** Public Men’s Restrooms in the BWI Marshall Terminal are assigned the Function Designator of “M” in their Unit Identifier.

N. **Nursing Rooms:** Facilities provided to allow mothers to nurse or pump in privacy and comfort. One Nursing Rooms is typically provided at or near each grouping of public restrooms. Nursing Rooms are assigned the Function Designator “N” in their Unit Identifier.

P. **Public Spaces:** Typically open spaces (spaces not enclosed by walls) accessible to airport patrons, located in either the secured or non-secured areas. Public spaces typically include concourses, walkways, Open Stairs, and other terminal areas delineated by GETS based on structural features, usage, or occupancy. Public Spaces are assigned the Function Designator “P” in their Unit Identifier.

S. **Stairwells:** Stairs enclosed by walls, typically not accessible to the public except in an emergency, when they provide emergency egress from the building. Stairwells are assigned the Function Indicator “S” in their Unit Identifier.

U. **Unleasable Spaces:** Those spaces in a building that are not normally human-accessible, such as dead spaces, shafts, or “open to below” spaces. Unleasable Spaces are assigned the Function Indicator “U” in their Unit Identifier.

V. **Moving Walkways:** Slow-moving conveyors within a public space, not enclosed by walls, that transport people across horizontal or inclined planes to shorten walking times. Moving Walkways are assigned the Function Indicator “V” in their Unit Identifier.

W. **Women’s Restrooms:** Public Women’s Restrooms in the BWI Marshall Terminal are assigned the Function Designator of “W” in their Unit Identifier.

2.3.4.7 Construction and Renovation

Designers for both Capital and Permitted projects shall coordinate with GETS staff for the assignment of space numbers, beginning at the earliest possible time and continuing throughout the design phase of a project (see Section 2.3.2 Interior Space Numbering Coordination). Spaces may receive a completely new space number or an existing space number if the space layout is being rearranged, depending upon the nature of construction and as outlined below.

A. Additions and New Spaces
When an addition is made to an existing building, GETS staff will assign numbers to the new spaces following these space numbering procedures. New numbers follow the sequence from the existing building, for example when an extension is added to the end of a concourse.

B. Splitting of Spaces
When a space is split, and new spaces are created, GETS staff will review all new spaces to ensure a proper number is assigned in accordance with these space numbering procedures. The first space closest to the main entrance of the area will retain the original space number. For subsequent spaces created from the split, new numbers will be assigned based on availability to maintain logical sequencing, including alphanumeric suffixes as need, as defined in Section 2.3.4.5.C Sub Rooms.

C. Combining or Merging of Spaces
When multiple spaces are combined or merged into a new single space, for example when several subdivisions in a suite are removed during construction, GETS staff will review current space numbers and reassign numbers so that the renovated space matches the numbering conventions. The space number of the new larger space is based on the primary space number prior to the merge or the lowest sequential space number. For example, an office is made up of three spaces: the main space from the entrance, AT200, and two subdivision offices, AT200A and AT200B. During a renovation, the subdivisions are removed, creating a single space, the new space has the number AT200 and the numbers AT200A and AT200B are no longer in use.

2.3.4.8 Updating Legacy Space Numbers

Many existing spaces in MDOT MAA buildings have legacy space numbers which do not comply with this standard. Un-numbered or non-compliant spaces will be numbered or re-numbered to comply with this standard when a space is to be modified by a Capital or Permitted project, or when a building is discovered to have been incorrectly or incompletely numbered and must be completely numbered to comply with this standard.

2.3.4.9 BWI Marshall Space Names and Additional Identifiers

Along with the above criteria for assigning space identifiers and space numbers, many spaces at BWI Marshall have additional identifying information including State of Maryland identifiers and common space names. For example, the mechanical room in Unit number NTE100 has the space number BWI_100_NTE_1_NTE100. This space is widely known by the name “MER #1”, which is displayed prominently on signs outside the room. Both the space number and the space name are recorded in the MDOT MAA GIS database.

2.3.4.10 Martin State Space Numbering

Space numbering at Martin State Airport follows the process outlined above, with the campus code **MTN**, and under the coordination of GETS staff and the Martin State Airport management.

2.4 Door Number Assignment

Numbers are assigned to all doors to facilitate wayfinding and dispatching. As a number is assigned to a space, door(s) associated with that space are numbered at the same time. The door number is derived from the Unit Identifier of the space into which the door leads. In general, this is based on the space into which a door swings, however GETS staff can override this determination as needed. Spaces may have more than one door or different door configurations, and specific door numbering conventions and procedures are outlined below.

2.4.1 Door Numbering Coordination

The designers of Capital and Permitted projects shall contact GETS to request door number assignments during the design process, when one or more doors are to be installed, removed, or relocated as part of the project. Designers shall contact GETS at the following times depending on the project type:

A. Capital Projects: Prior to each design submittal, beginning with the 30% design phase, and prior to any field changes or addenda
B. Permitted Projects: As early as possible during design, prior to application for building permit

GETS will assign door numbers for a project based on the following conventions and procedures and will notify consultants via annotated PDF and/or text document of the newly assigned door numbers.

Designers are required to coordinate with GETS to adjust door number assignments as a project evolves, to accommodate expected design changes which may add, remove, or modify doors. Although such communication is mandated at each design phase, it is also encouraged in between design phases as well.

For Capital and Permitted projects, contractors are responsible for installing door number plates as defined in PEGS V2, Chapter 14.2 Interior Signage. Contractors are required to replace any door number plates damaged, lost, or removed during construction per these standards. During day-to-day maintenance outside of a construction project, the MDOT MAA Office of the Fire Marshall (OFM) is responsible for installing missing door number plates, and replacing incorrect or non-compliant door number plates, after coordination with GETS.

2.4.2 Spaces with Multiple Doors

If a space has multiple doors opening into it, the primary door will be assigned a number based on the space number and succeeding doors will be assigned the space number with an alphabetical suffix (e.g., primary door into space 100 would be door number 100 and additional doors into space 100 would be 100a, 100b, etc.). However, curbside entry vestibules in the BWI Marshall terminal each have multiple doors opening into them which are not assigned additional identifiers; all doors associated with a curbside entry vestibule are considered a single entity, and assigned the same door number, consistent with the Unit Identifier of the vestibule.

2.4.3 Door Numbers for Space Subdivisions

As above, door numbers are assigned based on the Unit Identifier of the space the door leads into, including if the space is a subdivision of a larger space. If a subdivided space has multiple doors opening into it, the primary door will be assigned the space number including its alphabetical suffix and succeeding doors will be numbered with the space number and its alphabetical suffix, plus an additional numerical suffix.

2.4.4 Numbering Roll-up Doors

As with other doors, roll-up or overhead doors are assigned the space identifier of the room they are associated with along with suffix of “R” plus an increasing letter character, e.g., RA, RB, RC, etc. For example, for space CT100, there may be a standard door, CT100A, and two roll-up doors, CT100RA and CT100RB. For spaces with only one roll-up door, the suffix “RA” is used. Numeric suffixes may be used along with alphabetical suffixes at the discretion of GETS. For example, cargo buildings with multiple roll-up doors on both sides may use numeric on one side, and alphabetical on the other, such as C100R01 thru C100R12, and C100RA thru C100RL. Security grates at concession entrances are considered roll-ups for numbering purposes.

2.4.5 Doors at BWI Marshall Passenger Terminal Aircraft Boarding Gates

Doors at aircraft boarding gates are numbered corresponding with their Gate number, e.g., “Gate D4”.

2.4.6 Martin State Door Numbering

Doors are not numbered at Martin State Airport and instead only space numbers are assigned. Any signage for spaces may be on or adjacent to door portals at the discretion of the Martin State Airport management.

2.5 Space Measurement Procedures

Interior spaces are delineated by enclosed polygons that are maintained in the MDOT MAA GIS spatial database. These polygons are used for mapping purposes and for critical square footage calculations used for many aspects of design and interior space management. These polygons are defined not only by measurable physical boundaries such as walls and windows, but also by virtual boundaries such as corridor junctions, tenant lease area limits, and the divisions between building sections. The process of delineating such polygons is commonly known as “space measurement”. The following procedures shall be used for space measurement at BWI Marshall and Martin State Airports.

2.5.1 General Room Measurement Procedures

2.5.1.1 Room Measurement Procedures

A. Demising walls:
   1. Demising walls separate interior spaces between two tenants or separate a tenant and a common area (i.e. access corridor) or non-lease area (i.e. electrical room, mechanical room).
   2. Room polygons shall be delineated to the centerline of the demising wall separating two tenants or a tenant and a common area (i.e. access corridor) or non-lease area (i.e. electrical room, mechanical room, etc.).
   3. Wall coverings, wainscoting and other attachments to the wall shall not be included in determining the centerline of the demising wall. See Section 2.5.4 Figures, Figures 2.5.4-1 and 2.5.4-2.

B. Exterior walls:
   1. Exterior walls separate a tenant or a common area (i.e. access corridor) or non-lease area (i.e. electrical room, mechanical room) and the outside of the building.
   2. Room polygons shall be delineated to the interior face of the exterior wall. See Section 2.5.4 Figures, Figures 2.5.4-1.
   3. Where there are glass curtain walls or large expanses of glass that are generally not surrounded by other wall construction, room polygons shall be delineated to the interior face of the glass. See Section 2.5.3 Figures, Figures 2.5.4-2 and 2.5.4-3.
   4. Where windows are set within exterior walls and are generally surrounded on all sides by the wall construction, room delineations shall be measured as though the wall plane extends across the window. See Section 2.5.3 Figures, Figures 2.5.4-1 and 2.5.4-2.

C. Demising walls, exterior walls, or glass curtain walls not constructed at 90-degrees to the floor shall be calculated at a point measured 4’-0” above the floor. See Section 2.5.3 Figures, Figure 2.5.4-2.
   1. Room polygons must be topologically correct: Polygons must not overlap with adjoining polygons.
   2. Polygons must not have gaps with adjoining polygons.
   3. Polygons must not self-intersect.

Vertices of polygons must match vertices of adjoining polygons.

2.5.1.2 Space Measurement Procedures

Some interior spaces are contained within other spaces and are delineated by features other than walls. Such space polygons must be topologically correct, as defined in Section 2.5.1.1.C. Several other physical and virtual characteristics may be used to delineate a space:

A. Space polygons may be aligned to the program associated with a space: e.g., public walkways in a concourse, holdrooms, queueing areas, food courts, etc.
B. Space polygons may follow existing finishes or structural features such as carpet-tile transitions, or divisions between building sections.
C. Space polygons may be delineated without strict correspondence to physical features, which requires coordination with GETS.

2.5.2 Measurement of Lease Areas

Tenant lease areas are delineated by enclosed polygons in a manner identical to that used for delineating interior rooms/spaces. However, an individual lease area may consist of multiple rooms or spaces, or even partial spaces. The process of delineating such lease area polygons is commonly known as “lease measurement”.

The following procedures shall be used for measuring lease areas at BWI Marshall and Martin State Airports.

2.5.2.1 General Lease Area Procedures

A. Columns and other structural elements within the lease area or projecting into the lease area (e.g., columns or pilasters engaged in a wall) shall be included in lease area calculations and measurements.
B. Areas occupied by raised floors, furniture, appliances and/or equipment for a tenant's use shall be included in lease areas. See Section 2.5.4 Figures, Figures 2.5.4-1 and 2.5.4-2.

2.5.2.2 Tenant and Public/Common Use Spaces

A. Utility chases serving common use and airport systems that pass through a lease area shall not be included in lease area calculations and measurements.
B. Utility chases for a tenant's use shall be included in lease area calculations and measurements.
C. Elevators, stairways, fire stairs, emergency exits, hallways, corridors, locker rooms, restrooms, etc. for common and/or public use shall not be included in lease area calculations and measurements. See Section 2.5.4 Figures, Figures 2.5.4-1 and 2.5.4-2.
D. Elevators, stairways, fire stairs, emergency exits, hallways, corridors, locker rooms, restrooms, etc. for tenant's exclusive use shall be included in lease area calculations and measurements.

2.5.2.3 Accessory Spaces

A. Mezzanine areas approved for use by the MAA Office of the Fire Marshall (OFM) shall be included in lease area calculations and measurements.
    1. Mezzanine areas that are accessible from a tenant lease area but have not been approved for use by the OFM, shall not be permitted to be used by the tenant, may be physically sealed from access by the tenant, and shall not be included in the lease area calculations and measurements.
    2. If, after occupancy, a tenant constructs a mezzanine floor (complying with the Airport's permitting procedures), this additional space shall be included in the lease area calculation and shall be added to lease area.
B. Catwalks, defined as pathways to provide access for the maintenance of mechanical equipment, baggage handling systems or similar building systems, shall not generally be included in lease area calculations and measurements.

2.5.2.4 Calculating Lease Area

A. Delineation of lease areas follows the procedures for delineating rooms as outlined here: Lease areas are computed by adding the square footage of the spaces that make up the lease. Lease areas are delineated relative to demising walls, exterior walls, and glass curtain walls as described in Section 2.5.1.1 Room Measurement Procedures.
B. Walls separating two or more contiguous lease areas rented by one tenant shall be included in the lease area. See Section 2.5.4 Figures, Figures 2.5.4-1 and 2.5.4-2.

2.5.2.5 Lease Exhibits

A. Lease exhibits shall be prepared following the procedures herein for measuring and calculating tenant lease areas.
B. Lease exhibits shall indicate the total aggregate square footage for the entire lease area. See Section 2.5.4 Figures, Figures 2.5.4-1.
C. Tenant lease areas consisting of more than one room shall indicate the square footage of each room, space or component (such as a tenant's exclusive-use stair, utility chase, etc.) within the lease area. The sum of all such spaces within the lease area shall equal the total aggregate square footage for the entire lease area.

2.5.3 Measurement of Areas for Occupant Capacity

Procedures used for measuring spaces for occupant capacity differ from those used for measuring lease areas. Refer to PEGS V3, Chapter 2.8.5 Occupant Capacity Calculations for standards on measuring spaces for occupancy.

2.5.4 Figures

The following figures illustrate the appropriate room polygon delineation and lease line placement for various interior space conditions.

Figure 2.5.4-1 illustrates typical interior space conditions in plan view, including interior and exterior walls, windows, and doors.

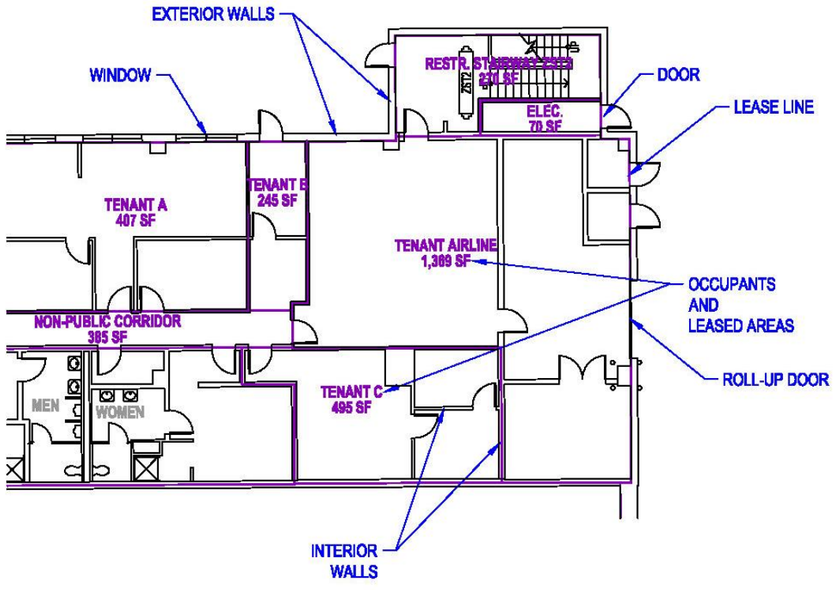


Figure 2.5.4-1: Typical Interior Space Conditions (Plan View)

Figure 2.5.4-2 illustrates typical holdroom conditions in plan view, including interior and exterior walls, exterior curtain walls, and non-wall lease boundaries such as carpet/floor treatment transitions.

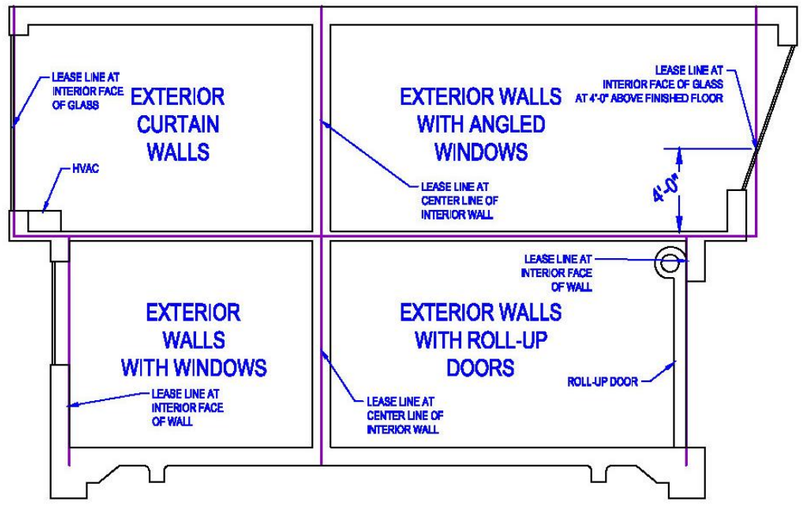


Figure 2.5.4-2: Typical Holdroom Conditions (Plan View)

Figure 2.5.4-3 illustrates typical interior space conditions in cross-section view, including interior and exterior walls, exterior curtain walls, overhead doors, windows, and angled windows.

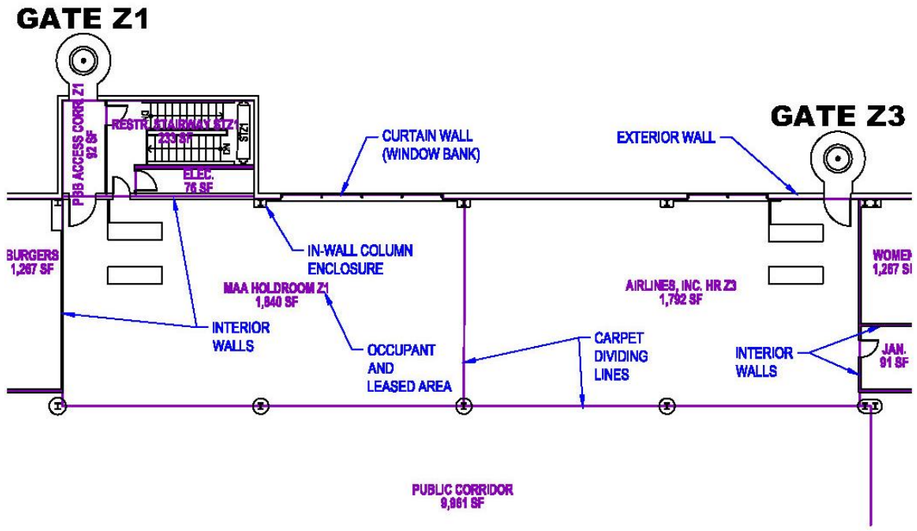


Figure 2.5.4-3: Typical Wall and Window Conditions (Section view)

3.0 Introduction to MDOT MAA CAD Standard

The CAD Standard is updated and maintained by the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA), Division of Planning and Engineering, GIS & Engineering Technology Section. It is based on the U. S. National CAD Standard with adjustments necessary to meet MDOT MAA needs. This standard is intended to assist in the production of uniform engineering documents, and provide efficient and effective means for management and technical data control.

This standard provides:

A. Drawing practices for the preparation of architectural, engineering and space allocation drawings.
B. Definitions and examples of the types of facility drawings to be prepared by and for the MDOT MAA.
C. Guidelines for the creation of title and index sheets for drawings.
D. Numbering, coding and identification procedures for drawings, associated lists and documents referenced.
E. Practices applicable to Computer Aided Design (CAD).

This standard is a living document and MDOT MAA will update it to incorporate future engineering drawing practices. The users of this standardstandard are encouraged to suggest revisions or additions to the standardstandard. All requests for enhancements and revisioins should be direct to:

Mr. Ali Logmanni
Manager, GIS & Engineering Technology Section
P.O. Box 8766
BWI Airport, MD 21240-0766
Or alogmanni@bwiairport.com

3.1 Scope

This standard outlines the requirements for the delivery of Computer Aided Design (CAD) files to the Maryland Aviation Administration (MDOT MAA) by its consultants. This standard establishes standard layers, title blocks, file names, line types and other conventions to be applied to all CAD files delivered to, used by, or developed by MDOT MAA. This standard does not define design and drafting procedures for consultants to follow when developing files that are compliant with this standard, but does provide requirements that must be met in the resulting product. This standard also covers standard naming, object properties, delivery format and plotting. Standard naming and delivery format will allow for efficient storage and retrieval of files. Standard layer naming facilitates sharing of information between drawings and better control of drawing objects. Standard object properties will help provide uniform appearance to CAD drawings. Standard plot settings will help overcome problems associated with producing similar looking plots from different plotters.

Consultants are required to follow these standards. MDOT MAA will utilize the CAD deliverables to extract valuable information to update MDOT MAA AIRPortal GIS database.

3.1.1 Standard Definition

MDOT MAA has implemented a series of standards, applications, policies, procedures and a spatial data repository. These serve as a central catalog and repository for engineering information used by MDOT MAA. This data is used within applications as well as other MDOT MAA systems that require this type of data. It also provides a structured workflow and a means of cataloging, archiving and retrieving project documents and information.

This standard prescribes general requirements for the preparation of and revision to architectural, engineering and space allocation drawings that are prepared by and for the MDOT MAA.

3.1.2 Document Classification

This standard shall apply, but not be limited, to the following drawing types regardless of source:

A. Construction drawings for new and existing facilities
B. Installation permit drawings
C. Building permit drawings
D. Space Allocation drawings
E. Design, planning and record drawings

3.1.3 Revisions to Standard

Where MDOT MAA CAD Standards do not contain the required detail for the work to be performed by the consultant or sub-consultant, additions or revisions to the standards shall be transmitted by the consultant or sub-consultant to the MDOT MAA Project Engineer for approval. All issued addenda will become part of the project-specific CAD standards. This standard will be subject to revision in response to changes in technology and by the incorporation of changes to support consultant requirements at MDOT MAA's discretion.

3.1.4 Software Requirements

The MDOT MAA requires that all CAD files be in AutoCAD DWG format, the version number to be specified by the MDOT MAA Project Engineer and selected from the Approved Software Lists provided in this section. The standards defined in this standard are specifically for AutoCAD environments. Consultants and sub-consultants that do not use AutoCAD are responsible for translating drawings into an AutoCAD DWG format prior to submittal. It is the consultant or sub-consultant's responsibility to ensure that there is no degradation of the accuracy or content of the data in this translation process.

3.1.4.1 Approved Software

The Administration **requires the submission of AutoCAD DWG files that are in DWG 2018 file format or later.** Consultants and subconsultants may choose to use one or more products that provide additional functionality for specific vertical markets, so long as the DWG drawings delivered:

A. Comply with the Autodesk file format referenced
B. Only contain standard AutoCAD entities such as lines, polylines, circles, arcs, blocks, text, and dimensions
C. Have all elements within the DWG files comply with the MDOT MAA CAD Standards

These include AutoCAD-based products (such as AutoCAD Architecture, AutoCAD Civil 3D, AutoCAD Map 3D, and AutoCAD MEP) and non-AutoCAD-based products (such as Autodesk Revit and Autodesk Inventor) that generate certified DWG compliant files. Custom objects in the DWG files that are specific to these products must be converted to standard AutoCAD entities before submitting.

3.2 Applicable Standards and Publications

When generating CAD documents the following standards and publications should be referenced for guidance.

3.2.1 MDOT MAA Standards Standards and Applications

This standard is to be used in conjunction with:

A. MDOT MAA's Planning and Engineering Guidelines & Standards (PEGS)
B. MDOT MAA's AIRPortal Standard
C. MDOT MAA's Design and Construction Standard
D. MDOT MAA Data Quality Standard
E. MDOT MAA Data Security Standard
F. MDOT MAA Naming, Identification & Addressing Standard
G. MDOT MAA Airport Information Retreival Portal (AIRPortal)
    1. AIRPortal provides access and reference to the most current MDOT MAA documentation.
    2. The most current Standard Borders, Title Blocks and Index Sheets can be found in AIRPortal under **General > PEGS Reference Documents > PEGS V2-Architecture and Engineering > PEGS Appendix 2C - Standard Contract Drawings**
    3. A user account is required to sign into AIRPortal
    4. A user account may be requested from the AIRPortal sign-in page

3.2.2 Government Documents

A. NAS-SS-1000 Vol. 6 Facility Requirements for the National Airspace System
B. FAA 7350.6 Location Identifiers
C. FAA FSEP Facilities, Services and Equipment Profile Orders
D. DOT Order 1360.6 Graphic Standards
E. FAA Order 1000.15 Glossary
F. FAA Order 7340.1 Contractions
G. FAA AC 150/5300-16A "General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey", Sept. 15, 2007
H. FAA AC 150/5300-17C "Standards for Using Remote Sensing Technologies in Airport Surveys", Sept. 30, 2011
I. FAA AC 150/5300-18B "General Guidance and Specifications for Aeronautical Surveys: Airport Survey Data Collection and Geographic Information System Standards", May 21, 2009

3.2.3 Commercial Documents

A. ANSI/AWS A2.4 Symbols for Welding & Nondestructive Testing
B. ANSI/AWS A3.0 Welding Terms and Definitions
C. ANSI B1.1 Unified Screw Threads
D. ANSI/1EEE 2.16 Reference Designations for Electrical and Electronics Parts and Equipment
E. ANSI/1EEE 91 Graphic Symbols for Logic Functions

F. ANSI Y1.1 Abbreviations for use on Drawings and Text
G. ANSI Y14.1 Drawing Sheet Size and Format
H. ANSI Y14.2 Line Conventions and Lettering
I. ANSI Y14.5 Dimensioning and Tolerance
J. ANSI Y14.6 Screw Thread Representation
K. ANSI Y14.7.1 Gear Drawing Standards - Part 1 for Spur, Helical, Double Helical and Rack
L. ANSI Y14.7.2 Gear and Spline Drawing Standards Part 2 - Bevel and Hypoid Gears
M. ANSI Y14.13 Mechanical Spring Representation
N. ANSI Y14.15 Electrical and Electronics Diagrams
O. ANSI Y14.15 Interconnection Diagrams
P. ANSI Y14.17 Fluid Power Diagrams
Q. ANSI Y14.26.3 Dictionary of Terms for Computer-Aided Preparation of Product Definition Data
R. ANSI Y32.2 Graphic Symbols for Electrical and Electronic Diagrams
S. ANSI Y32.4 Graphic Symbols for Plumbing Fixture for Diagram used in Architecture & Building Construction
T. ANSI Y 32.9 Graphic Symbols for Electrical Wiring and Layout Diagrams Used in Architecture and Building Construction United States National CAD Standard, Version 5
U. ASME-Y14.38M ASME Drawing & Terminology Standards

3.2.4 Order of Precedence

In the event of conflict between the documents referenced in Section 3.2.2 Government Documents and Section 3.2.3 Commercial Documents and the contents of this standard, the contents of this standard shall be considered the superseding requirement.

This CAD Standard takes precedence over any possible contradictory information in the PEGS Manual.

3.3 General

3.3.1 Drawing Definitions

The following sections define general A/E/C drawing types.

3.3.1.1 Engineering Drawings

Engineering drawings are formal representations used to convey the physical and functional end product design and/or installation requirements of an item. They may include pictorial, graphical, schematic or textual presentations.

3.3.1.2 Construction Drawings

Construction drawings are engineering drawings, which show the design of buildings, structures, or the related construction, and are normally associated with the architectural, construction and civil engineering operations. Construction drawings establish all the interrelated elements of the pertinent services, equipment, utilities, and other engineering skills.

3.3.1.3 Installation Drawings

Installation drawings are engineering drawings, which show the installation requirements of equipment in facilities.

3.3.1.4 Space Allocation Drawings

Space allocation drawings are used to provide an accurate record of existing space, identify tenants and square footages of occupancy.

3.3.2 MDOT MAA AIRPortal PEGS Reference Documents Library

As a consultant performing services for MDOT MAA, it is assumed that individuals providing engineering services for MDOT MAA have an account to AIRPortal, MDOT MAA's system of record. There are multiple applications and resources available through AIRPortal. One such resource is the PEGS Reference Documents library. Found in AIRPortal under **General > PEGS Reference Documents**, this library provides consultants and sub-consultants with access to the most current resources to prepare MDOT MAA-compliant products. Examples are:

A. Logos
B. Standard Borders
C. Standard Title Sheets
D. Layer Templates

3.3.3 Civil/SUE Confined Space Drawings

When a Civil or Subsurface Utility Engineering project includes either an inspection of existing confined space (CS) structures, or design of new CS structures, data regarding each structure shall be included in the contract drawings and associated digital data submissions. Consultants shall submit confined space CAD data at all design phases beginning with the 30% design phase (see PEGS V2, Chapter 3.2 Deliverables by Design Phase).

Before working with confined space data, consultants should be familiar with the MDOT MAA Confined Spaces guidelines in PEGS V7, Chapter 2 Confined Spaces, and the MDOT MAA GIS Standards in PEGS V1, Chapter 4 GIS Standards.

3.3.3.1 Submissions Format

Confined space data in CAD shall be entered in a dedicated AutoCAD .DWG file, attached to plan sheets as an external reference (xref) as needed. Each CS structure shall be represented by an AutoCAD block entity.

Two CS block definitions, named **conf-spac and conf-space-prmt**, have been pre-defined by MDOT MAA, and contain attribute definitions which must be populated by the consultant. **Conf-space** is to be used to represent unpermitted confined spaces, and **conf-spac-prmt** is to be used to represent permitted confined spaces.

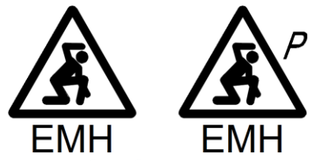


Figure 3.3.3.1 examples of conf-spac.dwg and conf-spac-prmt.dwg

Click here to download **conf-spac.dwg,** or here to download **conf-spac-prmt.dwg**, two AutoCAD DWG2013 files which may be inserted into any existing AutoCAD file to represent CS structures.

3.3.3.2 AutoCAD Drawing Composition

Instances of the blocks **conf-spac** and **conf-spac-prmt** should be inserted on the appropriate layer. Instances representing existing CS structures may be inserted on layer C-CONF-EXST, while those representing new work may be inserted on layer C-CONF-NEWW.

The blocks **conf-spac** and **conf-spac-prmt** are dynamic blocks with multiple visibility states, each corresponding to a type of CS structure. After an instance of the block is inserted, the visibility state must be changed to indicate the type of CS structure it represents. By default, the block's visibility state is set to EMH (electrical manhole).

The blocks also contain a set of AutoCAD Attributes, representing various types of data relating to CS structures. These attributes shall be populated by the consultant with all data known for each CS structure. See Section 3.3.3.4 Confined space attribute data for a list of these attributes.

3.3.3.3 Structure ID

Each CS structure shall be given a unique Structure ID by the consultant. This Structure ID will be confirmed by MDOT-MAA following submission at the Conformed design phase.

Structure IDs shall consist of five parts, separated by underscores or dashes, as illustrated in Figure 3.3.3.3.

Figure 3.3.3.3, Structure ID Format

- SUE Grid ID: The first part of the Structure ID shall be the Grid ID of the 500'x500' SUE grid name in which the structure is located (See PEGS V1, Chapter 1.5 Subsurface Utility Engineering (SUE) Data Requirements for AIRPortal).
- Structure Type Code: The second part of the Structure ID shall be the applicable Structure Type Code (see Table 33.3.3 below). The structure type codes coincide with SUE Aliases. NOTE: Consultants may request that MDOT-MAA create additional structure type codes, as needed.
- X Position: The third part of the Structure ID shall be the distance perpendicular to the west edge of the SUE grid containing the structure, to the center of the structure (i.e. the X-coordinate within the SUE grid), rounded to the nearest foot; should a structure's center fall directly on the boundary between two SUE grids, it shall be assumed to be located in the grid to the west at position 000
- NOTE: Parts three and four are separated by a dash rather than an underscore
- Y Position: The fourth part of the Structure ID shall be the distance perpendicular to the south edge of the SUE grid containing the structure, to the center of the structure (i.e. the Y-coordinate with the SUE grid), rounded to the nearest foot; should a structure's center fall directly on the boundary between two grids, it shall be assumed to be located in the grid to the north, at position 000

- Date of Installation: The fifth part of the Structure ID shall be the month and year of the structure's installation in MMYYYY format; this part shall not be added until the Record or As-Built design phase, following the structure's construction

Click here to download BWI_SUE_Grid.dwg, or here to download MTN_SUE_Grid.dwg, two AutoCAD DWG2013 files containing the SUE grids for both airports.

Example Structure ID's:

- 38-35_TMH_152-156_012003 - SUE grid 38-35, Telecommunications Manhole, position 152ft east by 156ft north, installed January 2003
- 38-33_EMH_069-219_122003 - SUE grid 38-33, Electrical Manhole, position 069ft east by 219ft north, installed December 2003
- 36-31_SWI_385-385_011988 - SUE grid 36-31, Stormwater Inlet, position 385ft east by 385ft north, installed January 1988

Confined Space Structure Types and Codes	
Structure Type	**Structure Type Code**
Electrical Manhole	EMH
Telecommunications Manhole	TMH
Sanitary Sewer Manhole	SSM
Sanitary Sewer Lift Station/Ejector	SSL
Storm Water Manhole	SWM
Storm Water Lift Station	SWL
Storm Water Inlet	SWI
Water Booster Pump Station	WPS
Glycol Diversion Vault	GDV
Glycol Force Main Vault	GFM
Glycol Lift Station	GLS
Glycol Storage Tank	GST
Oil Water Separator	OWS
Hydrant Fuel Manhole	HFM

Table 3.3.3.3, Confined Space Structure Types and Codes

3.3.3.4 Confined space attribute data

The block **conf-spac** contains AutoCAD attribute definitions which must be populated for each CS structure. There is no AutoCAD attribute definition for Structure Type, since this data is represented by the block's visibility state.

The attribute definitions within the block are all set to be invisible, to avoid creating visual clutter in the plan set. However, attribute values may be viewed and edited at any time by double-clicking an instance of the block, which will open AutoCAD's Enhanced Attribute Editor.

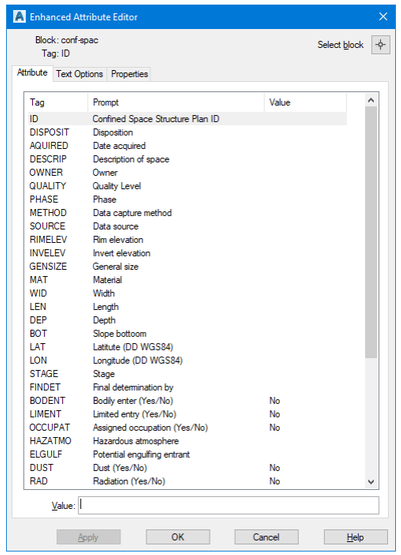


Figure 3.3.3.4 AutoCAD Enhanced Attribute Editor

Attributes defined in block conf-spac				
Category	**Attribute Name**	**Attribute Tag**	**Attribute Prompt**	**Example Value**
GENERAL INFORMATION	ID:	ID	Structure ID	*404-54-EMH-001*
	DISPOSITION:	DISPOSIT	Disposition	*IN SERVICE*
	DATE ACQUIRED:	ACQUIRED	Date Acquired	*20190405 (formatted YYYYMMDD)*
	DESCRIPTION OF SPACE:	DESCIP	Description of Space	*ELECTRICAL MANHOLE WEST OF EMPLOYEE PARKING LOT*
	OWNER:	OWNER	Owner	*MAA*
	QUALITY LEVEL:	QUALITY	Data quality level	*D*
	PHASE:	PHASE	Phase	*CONFORMED*
	CAPTURE METHOD:	METHOD	Data capture method	*CAD DIGITAL*
	DATASOURCE:	SOURCE	Data source	*MAA-CO-19-006_C2.02*
PHYSICAL PROPERTIES	RIM ELEVATION:	REMELEV	Rim elevation	*110.55*
	INVERT ELEVATION:	INVELEV	Invert elevation	*108.08*
	GENERAL SIZE:	GENSIZE	General size	*4’-2”*
	MATERIAL:	MAT	Material	*PRECAST*
	WIDTH:	WID	Width	*5’-6”*
	LENGTH:	LEN	Length	*3’-6”*
	DEPTH:	DEP	Depth	*3’-0”*
	SLOPE BOT:	BOT	Slope bottom	*999*
	LATITUDE (DD WGS84):	LAT	Latitude (DD WGS84):	*39.177579*
	LONGITUDE (DD WGS84):	LON	Longitude (DD WGS84):	*-76.668939*
ASSESSMENT VALUES	STAGE:	STAGE	Stage	*PERMIT REQUIRED CONFINED SPACE*
	FINAL DETERMINATION BY:	FINDET	Final determination by	*JOHN SMITH*
	BODILY ENTRY:	BODENT	Bodily entry (Yes/No)	*YES*
	LIMITED ENTRY:	LIMENT	Limited entry (Yes/No)	*YES*
	ASSIGNED OCCUPATION:	OCCUPAT	Assigned occupation (Yes/No)	*YES*
	HAZARDOUS ATMOSPHERE:	HAZATMO	Hazardous atmosphere	*CARBON MONOXIDE*
	POTENTIAL ENGULFING ENTRANT:	ENGULF	Potential engulfing entrant	*NONE*

	DUST:	DUST	Dust (Yes/No)	*NO*
	RADIATION:	RAD	Radiation (Yes/No)	*NO*
	NOISE:	NOISE	Noise (Yes/No)	*NO*
	HEAT / STEAM:	HEAT	Heat / steam (Yes/No)	*NO*
	MECHANICAL / MOVING PARTS:	MECHMOV	Mechanical / moving parts (Yes/No)	*NO*
	POTENTIAL ENERGY:	POTENG	Potential energy (Yes/No)	*NO*
	ELECTRICAL:	ELEC	Electrical (Yes/No)	*NO*
	BIOLOGICAL HAZARD:	BIOHAZ	Biological hazard (Yes/No)	*NO*
	LACK OF O2:	LACKO2	Lack of oxygen/O2 (Yes/No)	*NO*
	HAZARDOUS CHEMICAL:	HAZCHEM	Hazardous chemical (Yes/No)	*NO*
	NO HAZARD:	NOHAZ	No hazard (Yes/No)	*NO*
	OTHER HAZARD:	OTHHAZ	Other hazard (Yes/No)	*NO*
	HORIZONTAL ENTRY:	HORIZ	Horizontal entry (Yes/No)	*YES*
	VERTICAL ENTRY:	VERT	Vertical entry (Yes/No)	*NO*
	HORIZONTAL / VERTICAL ENTRY COMBINATION	HORZVER	Horizontal / vertical entry combination (Yes/No)	*NO*

Table 3.3.3.4 Attributes defined in block conf-spac

3.3.3.5 GIS Data

Electronic deliverables for design projects include GIS data (see PEGS V2, Chapter 3.2 Deliverables by Design Phase and PEGS V1, Chapter 4 GIS Standards for details). GIS data will include a field denoting whether a structure is a confined space, which must be populated with a Confined Space - No Permit Required or Confined Space - Permit Required value for each structure that is a confined space and with Non Confined Space value for each structure that is not a confined space; see PEGS V1, Chapter 4.3 Attributes & Domains for details.

3.4 Drawing Requirements

3.4.1 Drawing Production

MDOT MAA requires that all CAD files be provided in AutoCAD DWG format in compliant with Section 3.1.4.1 Approved Software. The standards defined in this standard are specifically for AutoCAD environments. For those consultants and sub-consultants who do not use AutoCAD, it is their responsibility to ensure that files translated to AutoCAD adhere to these standards and that the quality of the data is not degraded in the translation process before delivery.

3.4.1.1 Drawing File Format

Electronic drawings shall be created and maintained in native AutoCAD vector file format (DWG). All drawings shall be void of duplicate entities. The following should be avoided:

A. Translations between vector file formats (DWG and DGN).
B. Delivery of Drawing Exchange Format (DXF) files, unless mandated by special requirement in this standard.
C. Use of the following CAD entities:
    1. doughnuts
    2. segments
    3. solids and traces
    4. point entities
    5. custom fonts
D. Patterns or line types or styles
E. Special characters such as nested blocks, nested or circular Xrefs (reference files)
F. Infinite lines
G. Zero length lines

3.4.1.2 Creation of CAD Files

All CAD drawing files should be created at full-scale (1-to-1). Drawing borders are referenced into paper space with insertion point 0, 0 and a scale of 1. Refer to Table 3-1, Scale Factor and Text Height Conversion Chart for standard engineering, architectural and mapping scale factors and text heights to be used in model space for full size drawings.

Plotted Scale	Scale Factor	Plotted Text Height			
1/8”=1’-0”	96	9.6”	12”	18”	24”
3/16”= 1’-0”	64	6.4”	8”	12”	16”

1/4”=1’-0”	48	4.8”	6”	9”	12”
3/8”= 1’-0”	32	3.2”	4”	6”	8”
1/2”=1’-0”	24	2.4”	3”	4.5”	6”
3/4”=1’-0”	16	1.6”	2”	3”	4”
1”= 1’-0”	12	1.2”	1.5”	2.25”	3”
1 1/2”=1’-0”	8	.8”	1”	1.5”	2”
3”= 1’-0”	4	.4”	.5”	.75”	1”
6”= 1’-0”	2	.2”	.25”	.375”	.5”
12”= 1’-0”	1	.1”	.125”	.1875”	.25”
1”= 10’	120	1’	1.25’	1.875’	2.5625’
1”=20’-0”	240	2’	2.5’	3.75’	5’
1”=25’-0”	300	2.5’	3.125’	4.6875’	6.26’
1”=30’-0”	360	3’	3.75’	5.625’	7.5’
1”=50’-0”	600	5’	6.25’	9.375’	12.5’
1”=100’-0”	1200	10’	12.5’	18.75’	25.0’
1=10	10	1	1.25	1.875	2.5
1=20	20	2	2.5	3.75	5
1=30	30	3	3.75	5.625	7.5

Table 3-1, Scale Factor and Text Height Conversion Chart

A. Drawing Sheet Format

MDOT MAA-approved drawing formats include common drawing features such as boundary geometry, title block data, filename, pathname, and title block geometry.

The most current MDOT MAA-approved drawing formats, templates and seed files are stored in AIRPortal under General > PEGS Reference Documents. Consultants and sub-consultants have access to the most current resources to perform their services compliant with MDOT MAA’s current standards. Consultants are responsible to review the PEGS Reference Documents library to ensure they are using the most current versions.

B. Drawing Size

The MDOT MAA standard drawing size is ANSI D (22" X 34") full size and ANSI B (11” X 17") half size. Other sizes are allowed only as needed. Drawing sheet size and margins must follow the specifications shown in Table 3-2, Standard Drawing Sizes. These margins are configured in the Standard Borders. Apply ANSI Y14.1 for any information not provided in this standard, but required on drawing sheet size.

Size Designation	Vertical	Horizontal	Margin		
			Horizontal	Vertical	
				Left	Right
ANSI B	11"	17"	0.25"	0.75"	0.25"
ANSI D	22"	34"	0.50”	1.50"	0.50"

Table 3-2, Standard Drawing Sizes

C. Sizing Drawing Formats for Scaled Drawings

Each feature shall be drawn in the CAD model file at full size (1 : 1). The data should be scaled to fit the desired paper size at the correct scale through a view port in paper space. This can be done in AutoCAD using the zoom command and entering *nXP* where *n* is the scale factor required and *XP* remains constant. Table 5-3 provides the necessary scale factors needed to calculate each reduced plot size.

Plot Scale	Drawing Area Size (H x W) *		Scale Factor nXP	
	B (9.5” x 13.25”)	D (19” x 26.5”)		
1/8”=1’-0”	76’ x 106'	152’ x 212’	0.0104XP	Architectural Units
3/16”= 1’-0”	50.7’ x 70.7’	101.3’ x 141.3’	0.0156XP	
¼”=1’-0”	38’ x 53’	76’ x 106’	0.0208XP	
3/8”= 1’-0”	25’ x 35’	50.7’ x 70.7’	0.0312XP	

½”=1’-0”	19’ x 26.5’	38’ x 53’	0.0416XP	
¾”=1’-0”	12.7’ x 17.7’	25.3’ x 35.3’	0.0625XP	
1”= 1’-0”	9.5’ x 13’	19’ x 26.5’	0.0833XP	
1 ½”=1’-0”	6’ x 8.9’	12.7’ x 17.7’	0.125XP	
3”= 1’-0”	3’ x 4.4’	6.3’ x 8.8’	0.25XP	
6”=1’-0”	1.6’ x 2.2’	3.2’ x 4.4’	0.50XP	
12”=1’-0”	0.8’ x 1.1’	1.6’ x 2.2’	1XP	
1”= 10’-0”	95’ x 132.5’	190’ x 265’	10XP	Decimal Units
1”=20’-0”	190’ x 265’	380’ x 530’	20XP	
1”=25’-0”	237.5’ x 331’	475’ x 662.5’	25XP	
1”=30’-0”	285’ x 397.5’	570’ x 795’	30XP	
1”=50’-0”	475’ x 662.5’	950’ x 1325’	50XP	
1”=100’-0”	950’ x 1325’	1900’ x 2650’	100XP	

** NOTE: The area for the title block, notes, legend and key plan have been deducted from the sheet total area.*

Table 3-3, Sheet Sizes, Drawing Field, and Scale Factors Examples

3.4.1.3 Borders

Figure 2-1 shows the standard MDOT MAA border at the time of this publication. Figure 5-1 shows the title block portion of the MDOT MAA border. The bubble call-outs in Figure 2-2 refer to Table 2-4, where each item is described. Consultants should use the standard border sheet that is available in AIRPortal under **General > PEGS Reference Documents**.

The standard border includes the following features:

A. Border
B. Title Block
C. Consultant ID Block
D. Drawing Field
E. P.E. Stamp Box
F. Notes
G. Legend
H. Key Plan
I. Graphic Scales
J. North Arrow
K. Plot Stamp (Full path name, User name, Date, Time)
L. Key Plan is to match appropriate MDOT MAA Airport and Project Location showing drawing layout.
M. MDE SF # when provided by MDE.
N. Project Title.
O. Contract No.
P. Scale (if applicable).
Q. Date.
R. Sheet No.
S. Designed.
T. Drawn By.
U. Checked.
V. Any Revision No., Revision Dates and Revision Descriptions as necessary.
W. Professional Certification

The most current MDOT MAA-approved drawing formats, templates and seed files are stored in AIRPortal under General > PEGS Reference Documents. Consultants and sub-consultants have access to the most current resources to perform their services compliant with MDOT MAA’s current standards. Consultants are responsible to review the PEGS Reference Documents library to ensure they are using the most current versions.

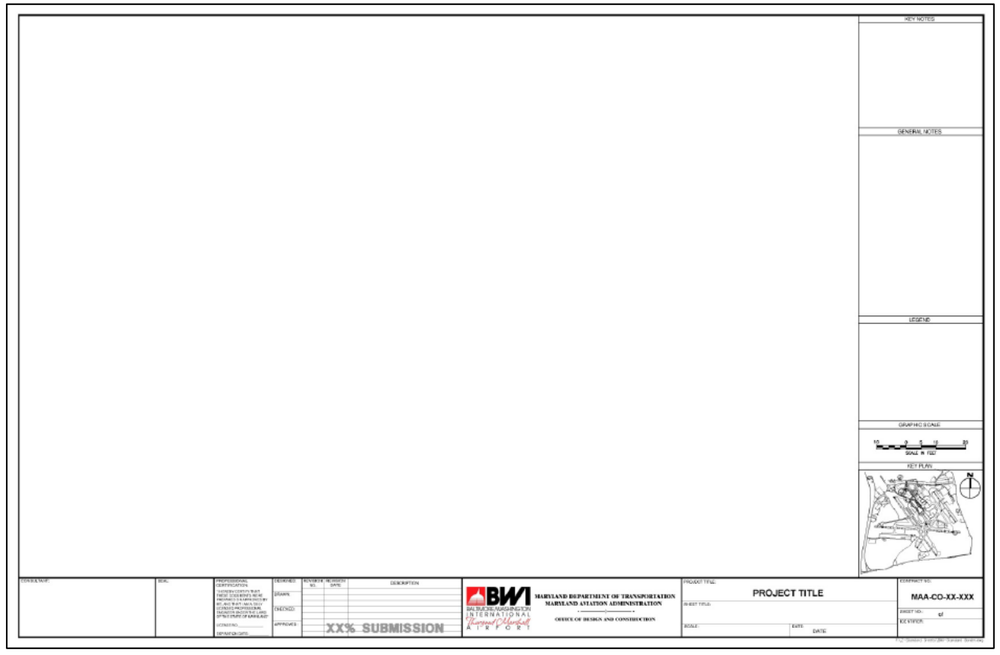


Figure 3-1, Standard Border

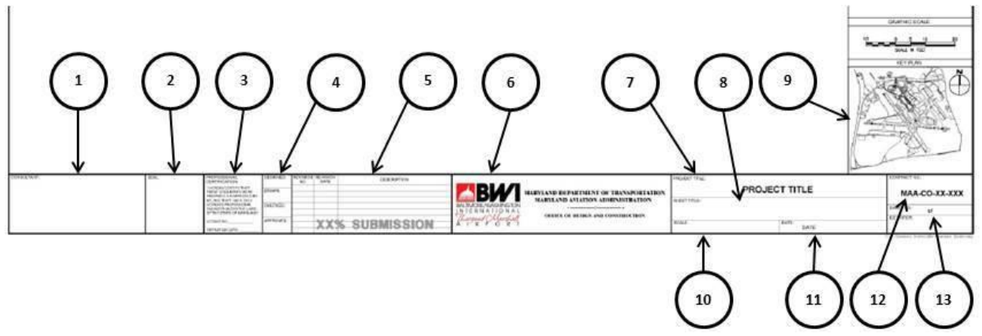


Figure 3-2, Title Block

All borders shall include the following information with the exception of the key plan, which applies to plan sheets only:

ITEM	BLOCK DESCRIPTION
1	Consultant Name, Address, Logo
2	Engineer's P.E. Stamp
3	Engineer's Certification
4	Initial Block
5	Revision Date and Description Block
6	Airport Logo and Name Block

7	Project Title
8	Sheet Title
9	Key Plan
10	Scale
11	Date
12	Contract Number
13	Sheet Number

Table 3-4, Drawing Title Block Descriptions

The following statement must be placed on all sheets that contain SSI as defined in the Code of Federal Regulations (49 CFR Part 1520). This statement should be placed in the area above the drawing title shown as item 6 in Figure 3-2 above. Individuals preparing or handling SSI, are required to read and abide by the terms and conditions in PEGS V2, Chapter 3.1.2 Electronic Deliverables Containing Sensitive Security Information (SSI), which define who can handle and how they should handle SSI.

Warning: This document contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 USC 552 and 49 CFR Part 15 and 49 CFR Part 1520.

3.4.1.4 Title Sheets

Figure 3-3 below, shows the standard title sheets for projects at both BWI and Martin State Airport (MTN). Consultants should use the standard title sheet that is available in AIRPortal under **General > PEGS Reference Documents**.

The most current MDOT MAA-approved drawing formats, templates and seed files are stored in AIRPortal under General > PEGS Reference Documents. Consultants and sub-consultants have access to the most current resources to perform their services compliant with MDOT MAA's current standards. Consultants are responsible to review the PEGS Reference Documents library to ensure they are using the most current versions.

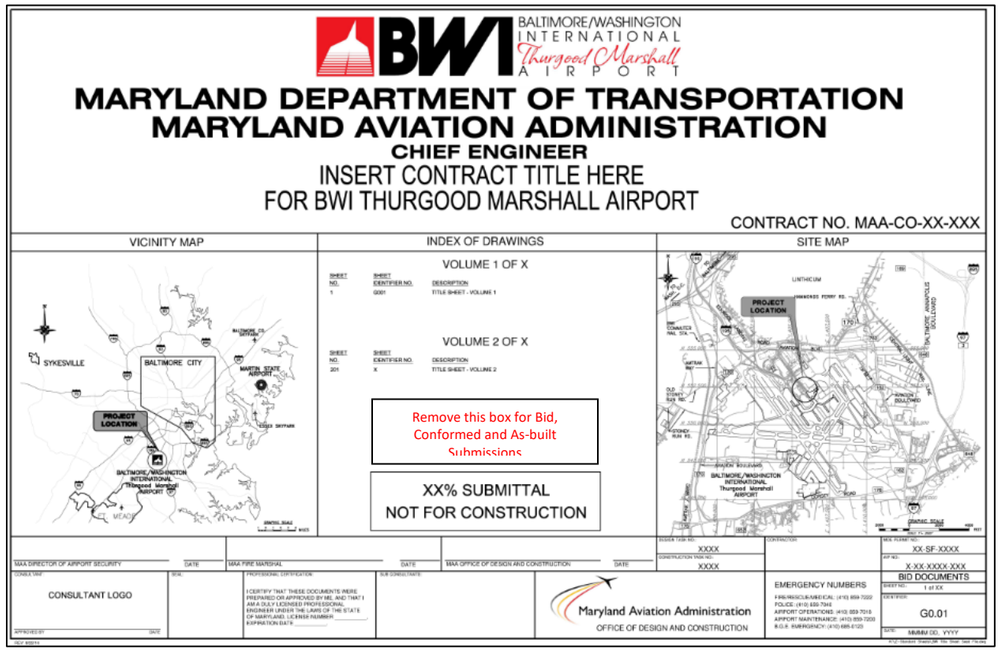
The following information will be included on all title/cover sheets:

A. Airport Logo and Name
B. Maryland Department of Transportation
C. Maryland Aviation Administration
D. Chief Engineer
E. ***MDOT MAA CONTRACT TITLE*** (assigned by MDOT MAA)
F. Contract No, MDOT MAA-CO-00-000 (assigned by MDOT MAA Office of Procurement)
G. AE Design Task Number
H. Construction Task Number (applicable to Comprehensive Construction Projects only)
I. Submission Name (e.g. 30% Design, Bid Documents, Conformed, Record, etc.) and date
J. Sensitive Security Information (SSI, as defined by 49 CFR Part 1520) statement as it appears below (applicable to document sets containing SSI).

   Warning: This document contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 USC 552 and 49 CFR Part 15 and 49 CFR Part 1520.

K. Vicinity Map and Site Map.
   1. The site map should include gridlines that conform to the grid layout defined in the MDOT MAA Naming and Addressing Standard.
   2. The combined extent of the area covered by all sheets provided should be clearly indicated on the site map.
L. Consultant Name Block and Stamp Block
M. Signature Blocks Including Signature Line and Date Line for:
   1. Airport Security
   2. Fire Marshal and
   3. MDOT MAA Division of Facilities Design
N. Drawing Index
   1. Should additional space be required provide separate index sheet immediately behind cover sheet.
   2. The comment '(contains SSI)' should be added after the title of any documents listed in the Index of Drawings that contain SSI.

3. Project Title
4. Construction Contract Number
5. AIP No. (if applicable) [AIP No. is provided for federally funded projects and shall be obtained from the MDOT MAA Director of Capital Programs]
6. Site and Vicinity Maps are to match appropriate MDOT MAA Airport and Project Location
7. Index of Drawings (if space is insufficient to list all drawings, use second sheet for Index of Drawings)
8. Design Task Number
9. Construction Task Number (if applicable - this number generally applies to on-call construction contracts)
10. MDE SF No. (if applicable)
11. Index of Drawings.
12. Submission Type (30%, 60%, 90%, Bid, Conformed, Record, etc.)
13. Professional Certification
14. Date



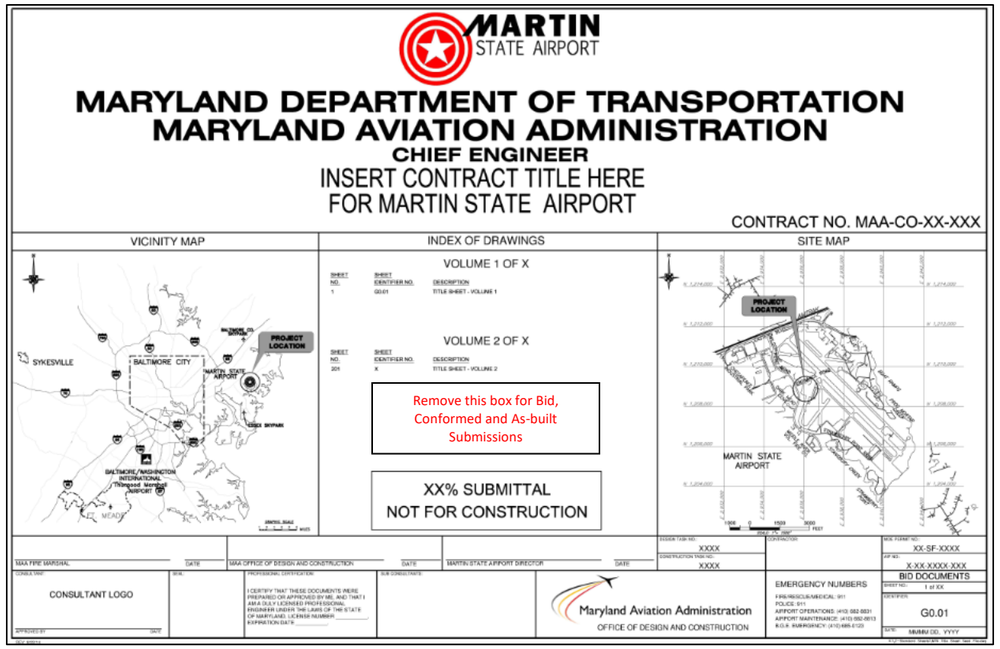


Figure 3-3, Title/Cover Sheet Layout Samples

Modifications to the standard cover sheet and border require prior approval of the Office of Engineering and Construction.

3.4.1.5 Drawing Numbering

The drawing sequence number for CAD drawing starts with an upper case letter specifying the discipline followed by a three digit sequential number, starting with 001 within each discipline code (i.e. C001, C002 …, C00n; A001, A002 … A00n). The discipline codes are listed in PEGS V1, Appendix 1D.1 Layer Development. Drawing numbering shall be consistent throughout the drawing set.

3.4.1.6 Arrangement of Drawings

The drawings in a construction drawing set are listed by discipline in Table 3-6, Construction Drawing Set.

A. Construction Drawing Sets

The drawings in Table 3-6 are commonly used in identifying a complete set of drawings for the construction of a new facility. Drawing sets for the construction of facility modifications must consist of a subset of the drawings listed in this table. Demolition drawings may be submitted under the Demolition discipline or under another discipline. Construction drawing sets shall be arranged by discipline in the following order, although the exact placement of demolition drawings can vary by project.

DISCIPLINE	DRAWING CODE	DESCRIPTION
General	G	Cover, Index, Abbreviations, Symbols, Staging & Safety Plans
General	G	Security Plan
Real Estate/Lease	R	Property Boundaries And Legal Descriptions
Civil	C	Demolition
Civil	C	Legend
Civil	C	Site
Civil	C	Boring Log
Civil	C	Under Slab Drainage
Civil	C	Building Site Plan
Civil	C	Grading Plan

Civil	C	Utility Plan
Civil	C	Details, Elevations And Sections
Civil	C	Site Improvements
Civil	C	Layout, Grading, Draining and Landscaping
Civil	C	Structural Details
Demolition	D	Removal of Existing Construction
Hazardous Materials	H	Hazardous Materials
Landscaping	L	Legend, Symbols and Abbreviations
Landscaping	L	Irrigation Plan
Landscaping	L	Planting
Landscaping	L	Irrigation and Planting Details
Architectural	A	Legend, Symbols and Abbreviations
Architectural	A	Floor Plan
Architectural	A	Reflected Ceiling Plan
Architectural	A	Roof Plan
Architectural	A	Elevations
Architectural	A	Sections
Architectural	A	Details
Architectural	A	Millwork
Architectural	A	Equipment
Architectural	A	Furniture
Interiors	I	Interior Building Elements
Structural	S	Legend, Symbols And Abbreviations
Structural	S	Structural Foundation Plan
Structural	S	Framing and Decking Plan
Structural	S	Roof Framing Plan
Structural	S	Structural Details
Structural	S	Structural Steel Grounding
Structural	S	Erection Drawings
Mechanical	M	Legend, Symbols And Abbreviations
Mechanical	M	Equipment Schedule
Mechanical	M	Elevations
Mechanical	M	Generator and Fan Room Plan
Mechanical	M	Chiller Room Plan
Mechanical	M	Mechanical Room Plan
Mechanical	M	Roof Plan
Mechanical	M	Sections and Details
Mechanical	M	Details
Mechanical	M	Hot and Cold Piping Diagrams
Mechanical	M	Miscellaneous
Mechanical	M	Steam Piping Systems
Mechanical - HVAC	M	Under Floor Plan
Mechanical - HVAC	M	Floor Plan (Room Area)
Mechanical - HVAC	M	Ceiling Plan
Baggage Handling System	Q	General Notes, Legend and Abbreviations
Baggage Handling System	Q	Floor Plans
Baggage Handling System	Q	Enlarged Floor Plans
Baggage Handling System	Q	Sections
Baggage Handling System	Q	Details

Baggage Handling System	Q	Controls
Plumbing	P	Legend, Symbols and Abbreviations
Plumbing	P	Foundation Plan
Plumbing	P	Piping Plan
Plumbing	P	Riser Diagram
Plumbing	P	Sanitary Riser Diagram
Plumbing	P	Storm Riser Diagram
Plumbing	P	Roof Drain System
Plumbing	P	Details
Electrical	E	Electrical Demolition
Electrical	E	Legend, Symbols and Abbreviations
Electrical	E	Single Line Diagrams
Electrical	E	First Floor Lighting Plan
Electrical	E	Power and Communications Plan
Electrical	E	Grounding Plan
Electrical	E	Security Plan
Electrical	E	Equipment
Electrical	E	Motor Control Schematics
Electrical	E	Miscellaneous
Electrical	E	Details
Electrical	E	Panel Schedules
Electrical	E	Airfield Electrical Duct Bank Plan and Profile
Telecommunications	T	Legend, Symbols And Abbreviations
Telecommunications	T	1st Floor Communications Plan
Telecommunications	T	Details
Telecommunications	T	Manhole and Cable Diagrams
Fire Protection	F	Legend, Symbols And Abbreviations
Fire Protection	F	Sprinkler System
Fire Protection	F	Fire Pump Location Plan
Fire Protection	F	Alarm Systems
Fire Protection	F	Fire Fighting Equipment
Fire Protection	F	Stand Pipe System
Z-Contractor	Z	Shop Drawings

Table 3-5, Construction Drawing Set

3.4.1.7 Typical Sheets and Layouts for Construction Drawing Sets

The following sections provide examples of drawing sheets that shall always be included in a drawing set.

A. Cover Sheet
See Figure 3-3, Title/Cover Sheet Layout Samples and AIRPortal under **General > PEGS Reference Documents** for downloads.

B. Index Sheet
The index sheet shows a continuation of the drawing list from the title sheet, if required, all abbreviations used in the document set and a legend depicting all existing and proposed symbols. Reference contracts pertaining to the active task document are to be included in the provided attributed block. The consultant or sub-consultant should contact MDOT MAA's Office of Engineering and Construction to assist in identifying this list of reference contracts and to obtain copies of the documents from the reference contracts. A sample of each standard Index Sheet is available in AIRPortal under **General > PEGS Reference Documents**.

The most current MDOT MAA-approved drawing formats, templates and seed files are stored in AIRPortal under General > PEGS Reference Documents. Consultants and sub-consultants have access to the most current resources to perform their services compliant with MDOT MAA's current standards. Consultants are responsible to review the PEGS Reference Documents library to ensure they are using the most current versions.

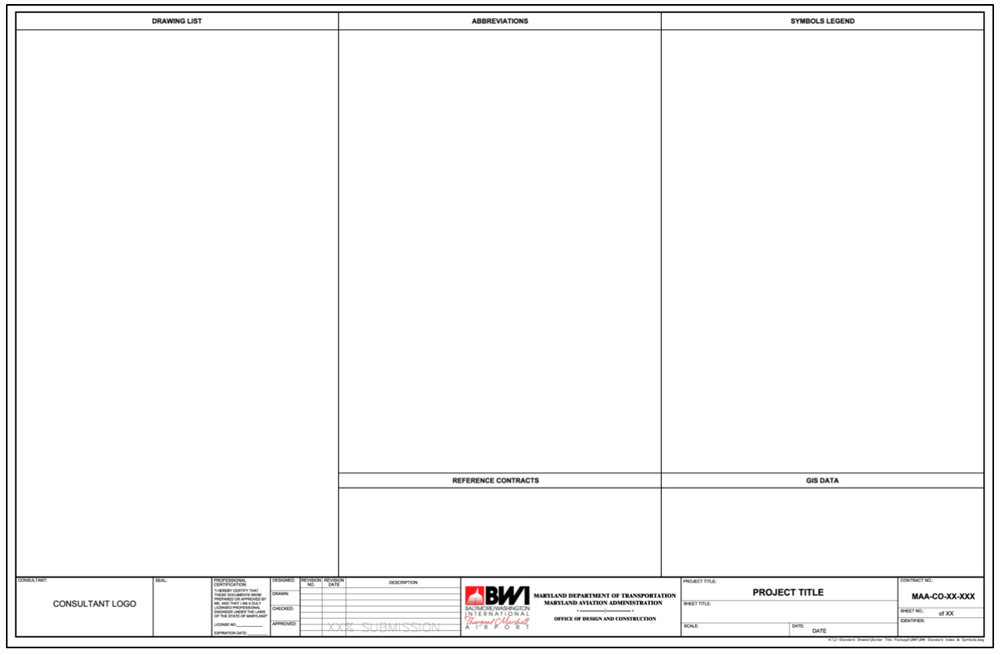


Figure 3-4, Index Sheet Example

An example index sheets is shown in Figure 3-4, Index Sheet. The columns shown are for illustration only and may be adjusted to accommodate more or less of one type of information.

C. Other Sheets
MDOT MAA has developed standard General Notes sheets for airside and landside construction projects. These are available through the MDOT MAA Design Standards publication. The remainder of the drawing sheets are discipline specific. To provide an example of all such sheets is beyond the intent of this standard. View and download files at AIRPortal under **General > PEGS Reference Documents**.

3.4.1.8 MDOT/MDOT MAA Logo Art

MDOT MAA provides the following logos in electronic format for use in CAD documents. The following .jpg image files contain the color MAA, BWI, and MTN logos referenced by the standard contract drawings. The appropriate image files must be placed in the same folder as the standard contract drawings in order to appear when the drawings are opened in AutoCAD. They are accessible through AIRPortal under **General > PEGS Reference Documents**.

Figure 3.4a, MDOT_MAA Logo_Color_Large_Long.jpg

Figure 3.4b, BWI-Thurgood_Logo_Color_Long.jpg

Figure 3.4c, BWI-Thurgood_Logo_Color_Stacked.jpg

Figure 3.4d, MTN Logo Color.jpg

3.4.1.9 Layers

For layer naming conventions, MDOT MAA has adopted the *CAD LAYER GUIDELINES* of the National CAD Standard (NCS), Version 5. Layers commonly used by MDOT MAA are listed in PEGS V1, Appendix 1D.1 Layer Development. Additional names as defined by the NCS shall be used as needed, in a manner that is consistent with their definitions. No other layers shall be used without prior written permission from MDOT MAA.

A. Sheet File (Paper Space) Layer Assignment
A sheet file is synonymous with a single sheet or page of a plotted CAD drawing file. A sheet file is a selected view or portion of referenced model files within a border sheet. The addition of sheet-specific information (e.g., text, dimensions, and symbols) completes the construction of the document. Table 3-7, Common Sheet File Layers, outlines layers that will be common in all sheet files in a set of construction drawings:

General Layers		
Name	**Description**	**Color No.**
G-ANNO-DIMS	Dimensions and Leaders	5
G-ANNO-IDEN	Identification Tags: Floor Id. #s; Room #s; Door #s; hardware group; Window #s; Equipment Id. #s; Furniture #s; Tenant Identification; Area calculations; Occupant or employee names; Elevation Id. #s; Component Id. #s	7
G-ANNO-KEYN	Key Notes	7
G-ANNO-LEGN	Legends	4
G-ANNO-NOTE	Notes	7
G-ANNO-NPLT	Construction Lines, non-plotting information	8
G-ANNO-PATT	Cross-hatching, patterns, poche	5
G-ANNO-REDL	Redline Annotations	10
G-ANNO-REFR	Reference Files	7
G-ANNO-REVS	Revisions	4
G-ANNO-SCHD	Schedules	7
G-ANNO-SYMB	Miscellaneous Symbols	4
G-ANNO-TEXT	Miscellaneous text and callouts with associated leaders	7
G-ANNO-TITL	Drawing Component Titles, Detail Titles, Section Titles, Elevations	3
G-ANNO-TTLB	Border and title block information	2

Table 3-6, Common Sheet File Layers

B. Model File (Model Space) Layer Assignment
A model file contains the physical components or features that make up a building, facility, or site (e.g., columns, walls, windows, ductwork, piping, etc.). Both MDOT MAA and NCS layer names consist of a discipline designator, a major category and minor categories. Once the discipline designator, major and minor categories have been determined, a final portion of the layer name indicating status may be added. This describes to the user what the disposition is of the entities on that layer, and helps to determine if that layer should or should not be shown on a particular drawing sheet. Refer to PEGS V1, Appendix 1D.1.3 Status Indicators for common status indicators.

3.4.1.10 Text Styles/Fonts

The MDOT MAA standard fonts include “out of the box” fonts that ship with every installment of *AutoCAD* as well as Windows true type fonts. Any font not meeting this criterion must be submitted to the MDOT MAA Project Engineer for approval and inclusion in the project specific standard *Font Library* (.shx or .ttf) file.

All ***Text Styles*** shall use the naming convention, (font name) (_) (text height in decimal equivalent of inches) e.g. *ROMANS_120*

3.4.1.11 Text Justification

All annotation text shall be left justified.

3.4.1.12 Text Heights

The following text heights must be used on all drawings to ensure uniformity in the contract documents.

ENTITY	PLOTTED TEXT HEIGHT (IN INCHES)
Titles	0.25
Subtitles	0.175
Normal Text	0.125 or 0.1
Notes, callouts etc.	0.125 or 0.1

Table 3-7, Text Heights

3.4.1.13 Line Widths and Colors

In AutoCAD, each color represents a different line width when plotted. Although other methods exist, this is the accepted MDOT MAA Standard. It is preferable to control the line widths in a drawing by assigning a specific color to the layer, instead of assigning a specific color to a single element/entity (line, polyline, arc, etc.). The color of a single element/entity should be set to “BYLAYER”, so the layer’s color setting can be used to globally change all elements/entities on that layer, both in the model files and sheet files.

Each "sheet file" submitted to the MDOT MAA, must be able to be plotted in monochrome and still be legible with distinctions between lines types and other symbology readily apparent. To achieve this, the MDOT MAA Standard Pen Settings in Table 3-9, MDOT MAA Standard Pen Settings, should be used. Pen widths are specified for only the AutoCAD index colors. Colors 1-9 plot as solid lines, and colors 250-254 plot as screened lines. There is a pen table for both full size (ANSI D) drawings and half-size (ANSI B) drawings:

AutoCAD Color No.	Plotted Pen Width in Inches	Plotted Color	Plotted Line Width	
1	0.010	Black		Solid Lineweights
2	0.012	Black		
3	0.014	Black		
4	0.020	Black		
5	0.024	Black		
6	0.031	Black		
7	0.007	Black		
8	0.005	Black		
9	0.047	Black		
250	0.010	Dark Grey		Screened Lineweights
251	0.010	Dark Grey		
252	0.010	Medium Grey		
253	0.010	Light Grey		
254	0.010	Light Grey		

Table 3-8, MDOT MAA Full Size.ctb

AutoCAD Color No.	Plotted Pen Width in Inches	Plotted Color	Plotted Line Width	
1	0.005	Black		Solid Lineweights
2	0.006	Black		
3	0.007	Black		
4	0.010	Black		
5	0.012	Black		
6	0.015	Black		
7	0.004	Black		
8	0.003	Black		
9	0.024	Black		
250	0.010	Dark Grey		Screened Lineweights
251	0.010	Dark Grey		
252	0.010	Medium Grey		
253	0.010	Light Grey		
254	0.010	Light Grey		

Table 3-5, MDOT MAA Half Size.ctb

3.4.1.14 Line Types

The MDOT MAA standard linetypes include “out of the box” linetypes (these are linetypes that ship with every installment of AutoCAD) and linetypes defined in the NCS.

The most current MDOT MAA-approved drawing formats, templates and seed files are stored in AIRPortal under General > PEGS Reference Documents. Consultants and sub-consultants have access to the most current resources to perform their services compliant with MDOT MAA’s current standards. Consultants are responsible to review the PEGS Reference Documents library to ensure they are using the most current versions.

Any new linetypes created by a consultant must be submitted to the MDOT MAA Project Engineer for approval and inclusion in the project specific standard linetype (.lin) file.

It is preferable to control the linetypes in a drawing by assigning a specific linetype to the layer, instead of assigning a specific linetype to a single element/entity (line, polyline, arc, etc.). The linetype of a single element/entity should be set to “BYLAYER”, so the layer’s linetype settings can be used to globally change all elements/entities on that layer, both in the model files and sheet files.

3.4.1.15 Drawing Units

The units for all A/E/C drawings shall be U.S. Survey Foot (1200/3937 meters), inches and fractions of an inch, with the smallest fraction normally being 1/8" or as decimals. Dimensions of less than a foot must be shown in inches or fractions of inches, or as decimals inches.

3.4.1.16 Working Units, Coordinate Systems and Drawing Origins

Units should be selected according to the discipline of the drawing, architectural (feet and inches), engineering (feet and tenths), or decimal. References to feet in this document are specifically to the U.S. Survey Foot (1200/3937 meters).

All topography and topography related design including structural and architectural building footprints shall be submitted to, maintained by, and provided by MDOT MAA in accordance with the ***Survey Control Standards***.

The lower left corner of all other drawings should be positioned at the Cartesian coordinate point of 0, 0, 0.

3.4.1.17 Externally Referenced Files

Externally referenced files are related DWGs that are referenced to the current (aka host) DWG to provide additional content. Referenced files can include title/borders, base map information, or other details not included but related to the primary drawing. Figure 3-5, Externally Referenced Files Example, illustrates the concept of how a sheet file drawing is composed using model/design and informational xref files.

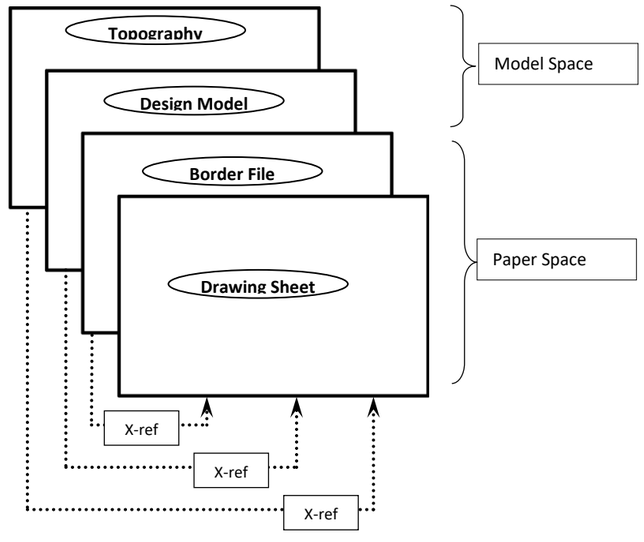


Figure 3-5, Externally Referenced Files Example

A. Specific Use of AutoCAD Reference Files
All files referenced in the host file shall be included in the final drawing package. Nested or circular xref files are not allowed.

Reference files shall be added to all drawings using relative paths only. These paths do not include the drive letter and reflect the location of the reference file as it relates to the active file.

3.4.1.18 Patterning

The patterns (hatching) to be used on MDOT MAA drawings include only “out of the box” hatch patterns; customized patterns must not be used.

3.4.1.19 Dimensioning

Refer to the ANSI Y14.5M for additional dimensioning information not provided in this standard.

The distance from the object for the first dimension is 1/2" (0.5”) and each additional dimension is 3/8" (0.375”) further apart. See Figure 3-6, Dimension Directions and Spacing Example, and Figure 3-7, Dimension and Extension Line Spacing Example for dimension examples.

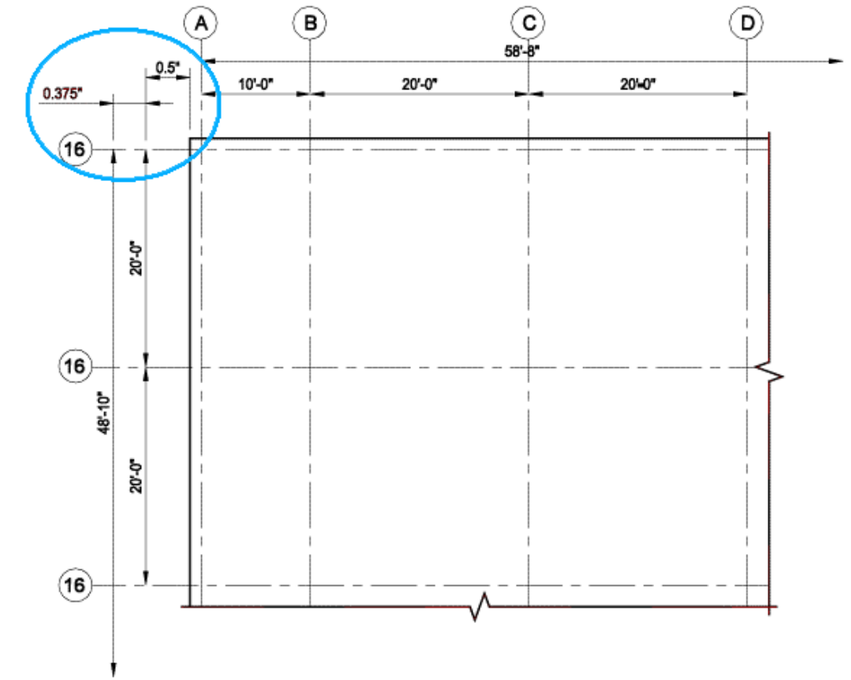


Figure 3-6, Dimension Directions and Spacing Example

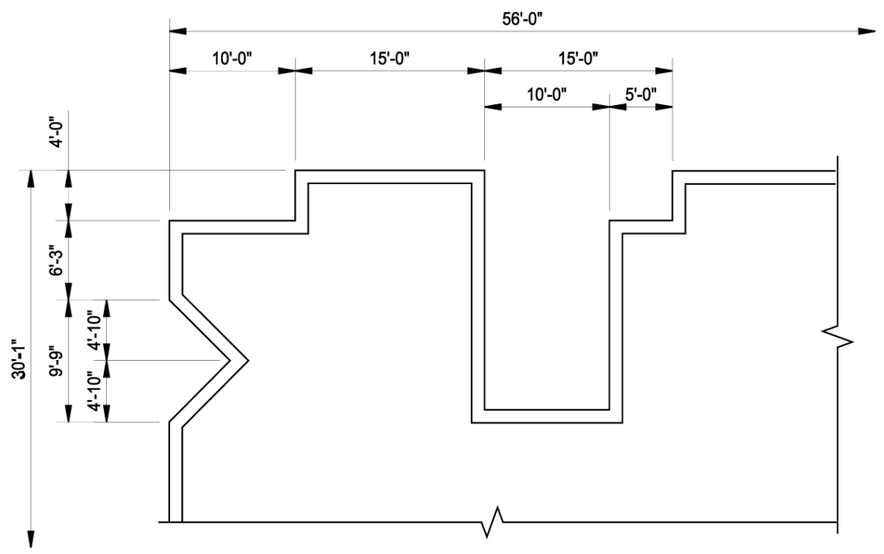


Figure 3-7, Dimension and Extension Line Spacing Example

A. The following dimension guidelines shall apply:

1. Avoid crossing dimension lines.
2. Centerlines may be extended and used as extension lines.
3. Place longer dimensions outside of shorter ones.
4. Do not cover dimensions with patterns in sectioned areas.
5. Whenever possible, arrange dimensions so they can be read easily on one continuous line.
6. Dimensions are always placed on the drawing so that the text may be read from the bottom or the right.
7. Locate dimension lines so that they do not cross extension lines. If it is necessary to dimension at an angle, that angle should be in quadrant between the horizontal and vertical so text may be read between 0 and 90 degrees.
8. All text must be located above or centered on the dimension lines.
9. The location of text on the dimension line shall be consistent throughout the drawing set.
10. Fractions must be located on one line with a space between the whole inch and fraction.
11. Make fractions with a slant bar with numbers the same height as text, for example, 1/4".
12. All dimension and extension lines shall be created using the “Color 1” line weight.
13. Arrowheads and dimension text shall be created using the “Color 1” line weight.
14. All text shall be left justified per standard drafting standards.

B. Leaders

When a note or dimension cannot be placed close to an object, a leader may be used. A leader consists of a short horizontal line, an angled line and a terminator. When placing a leader to the left side of a note the horizontal line must be place in line with the top of the note. If the leader is on the right side, the horizontal line is placed at the bottom of the note, see Figure 3-8, Placement of Leaders Example. When a leader points to an object, the angled line must terminate with an arrowhead at its first object line. When the information refers to (applies to, or points to) a surface of an object, use a small filled dot or tilde (~). When the information refers to a bundle or grouping of wires or cables, use a lasso. An example is shown in Figure 3-9, Typical Leaders Example.

All leader lines and arrowheads shall be created using the “Color 1” line weight.

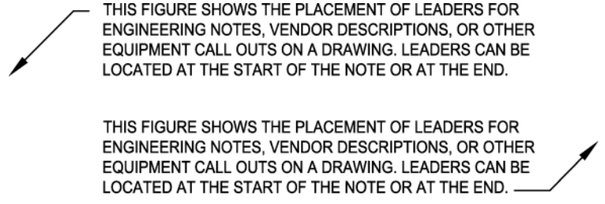


Figure 3-8, Placement of Leaders Example

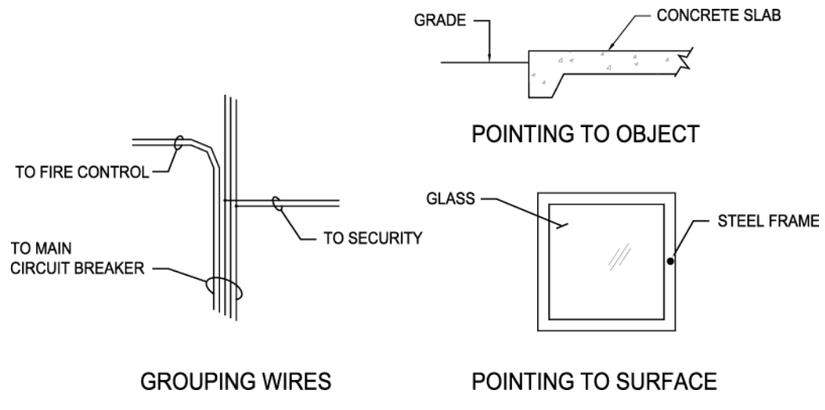


Figure 3-9, Typical Leaders Example

C. Arrowheads

Arrowheads denote termination of dimensions and leader lines and show direction. They must be filled, and must be the same size and style as the arrowheads used in other dimensions. Arrowhead size should be a 3:1 ratio for length to width, and in proportion to any associated text.

3.4.1.20 Symbols

Symbols used in drawings should comply with the NCS and all symbols used in a drawing must be indicated in a legend.

3.4.1.21 Drawing Subtitles

Subtitles must be used on drawings with more than one view or when sections or details are required for clarity and must also be used on drawings with a single view when title block information is inadequate and additional identification is required. Subtitles are always located below and centered on the view to which they apply, except for detail drawings where the title shall be located to the lower left.

Subtitles for plans, standard details, typical details, etc., which are not referenced in other views, consist of two lines. The first line shows the exact title of the view or detail and the second line indicates the scale of the view or detail, along with bar scale, see Figure 3-10, Standard Subtitle Annotation Example.

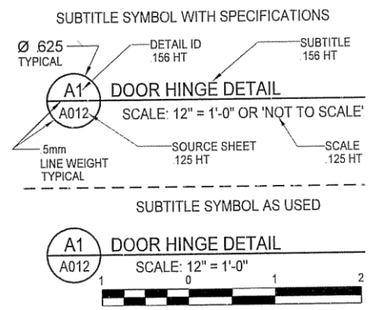


Figure 3-10, Standard Subtitle Annotation Example

3.4.1.22 Sections and Details

Sections must be drawn when additional clarification is warranted and details must be created whenever additional clarification is required and a section cannot readily be cut.

A. Sections

Sections must be drawn using the drafting standards shown in Figure 3-11, Standard Section Annotation Example. The three types of section indicators to be used are short sections, extended sections, and offset sections as shown in Figure 3-12, Section Types Example. All sections must be cut toward the top or left side of the drawing, except in unusual situations. In some cases, it may be necessary to cut a short section reading from the left, but this should be avoided if possible.

Sections must appear on the same drawing on which they are cut, if possible. If the section cannot be drawn on the same drawing, it must appear on a separate drawing reserved for sections. Under no circumstances are sections to be scattered indiscriminately throughout the set of drawings.

Section cuts shall be lettered in alphabetical order on each drawing. The letter in the top half of the circle marker must indicate the section letter. The alphanumeric number in the lower half of the circle marker must indicate the drawing on which the section is shown. Heavy dark lines located in the position where the section is cut must indicate the location of the cutting plane.

Offset sections may be used only when section clarity requires adjustment of a portion of the cutting plane. On all section cuts, the circle markers must be placed so they can be read from the direction of cut.

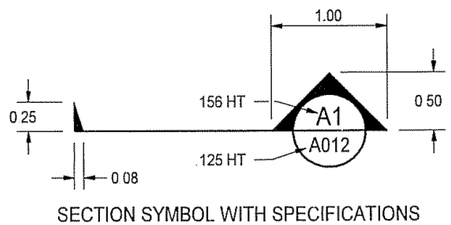


Figure 3-11, Standard Section Annotation Example

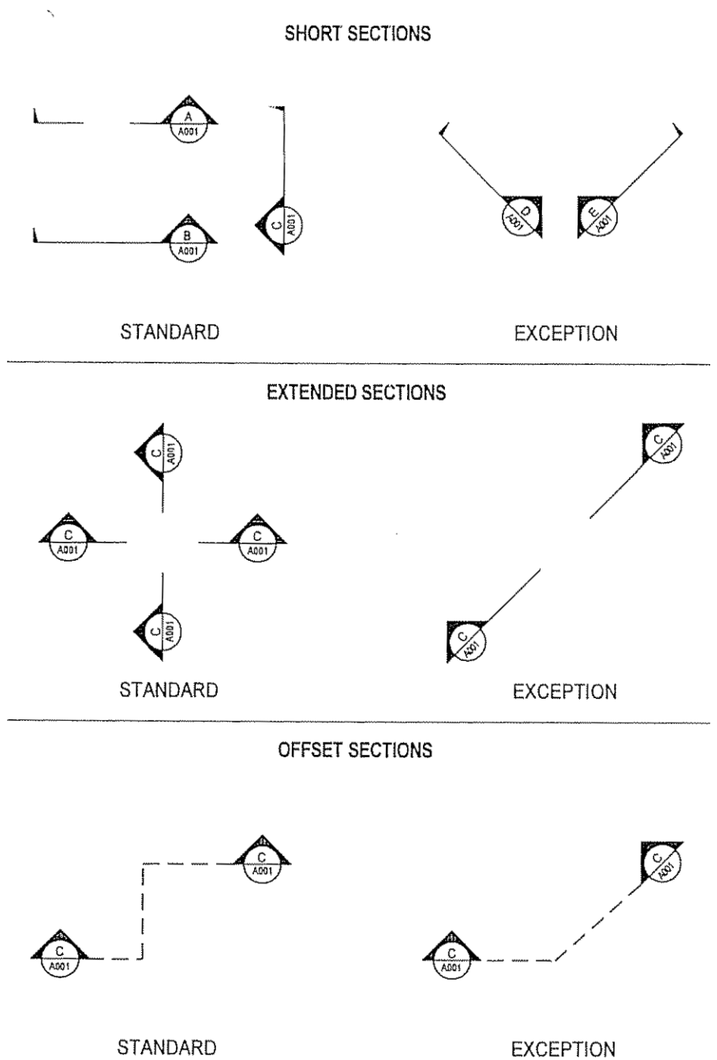
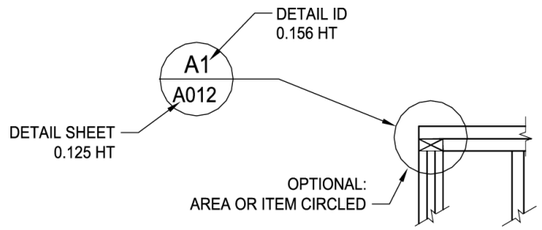


Figure 3-12, Section Types Example

B. Detail Drawings
The detail must be a section, a plan view, an elevation, or an enlargement. Details must have an alphanumeric (e.g. A1) designation in the upper half of the circle marker. When details are intermixed with sections and it would be difficult to locate a lettered detail on a drawing, the details must be numbered consecutively with the sections. The alphanumeric number in the lower half of the circle marker must indicate the sheet number on which the details reside (see Figure 3-13, Standard Detail Symbol Example).

When a detail appears more than once on the same drawing, extend a line off the detail, abbreviate the word typical (TYP), and indicate the quantity in parentheses.



DETAIL SYMBOL AS USED WITH SPECIFICATIONS

Figure 3-13, Standard Detail Symbol Example

3.4.1.23 Revision of Drawings

Changes to contract drawings must be clearly identified and tracked. The following sections outline the required methodologies for incorporating changes to the drawing set.

A. **Required Revisions** – Once a drawing has been approved and submitted as final, all subsequent changes shall be recorded as a revision.
B. **Revision Methods** – Revisions shall be made by the addition or deletion of information and the changes annotated on drawings.
C. **Drawing Practices** – When revising an existing drawing the most recently approved graphic symbols, abbreviations, layer naming requirements, and drawing practices, as documented in this standard, shall be used to incorporate changes or revisions.
D. **Identifying Revisions on Drawings** – All revisions shall be identified with a revision cloud and revision number within a triangle for addenda and a square for redline revisions. The revision number in the title block must correspond to the revision number in the drawing area where the change was made.
E. **Revision Locations** – The revision location is identified by the revision cloud and only additions or modifications are to be included within the revision cloud.
F. **Revision Numbers** – Revisions are to be identified by a sequential number starting at 1. Letters are not to be used for revision identification.
G. **Multiple Changes** – The same revision number shall identify all changes made to a drawing regardless of number of locations modified that are incorporated at the same time.
H. **Revision Block** – The revision block size and format shall conform to that in the standard border sheet provided. Only the five most current revisions shall be shown in the revision block and each revision shall be recorded in accordance with the following:
    1. The identifying number pertaining to the revision shall be entered in the “REV” column.
    2. The date the CAD file changes revision shall be entered in the “DATE” column.
    3. A brief description of the change shall be entered in the “DESCRIPTION” column.
I. **Redrawn or Replaced Drawings** – Drawings are redrawn when standard drawings are converted to CAD or when there are extensive changes to a CAD file. The new drawing shall contain a note referencing the superseded drawing. The note shall be located above the revision block on the new drawing stating:

    “THIS DRAWING SUPERSEDES DRAWING _____, REVISION___, DATED_____.” Subsequent revisions to the new drawing shall start with the number 1, regardless of the revision number of the drawing being superseded. A note shall also be located above the revision block on the superseded drawing stating: “THIS DRAWING SUPERSEDED BY DRAWING _____, DATED _____.” The statements shall be in letters not less than .125 inches high.

3.4.1.24 Feature Drawing Rules

Geometric features are objects in drawings that represent specific objects in the real world such as an airfield light, utility conduit, building outline, or property boundary.

A. Allowable Geometry Types

    There are three basic types of geometry (i.e., points, lines, and polygons) that are permissible in CAD drawings provided to MDOT MAA. Only one geometry type is allowed on layers that contain geometric features, as opposed to annotation or dimension layers. Only one type of geometry should be present on a single layer. The following geometry type definitions are used in accordance with ISO 19107 and in compliance with the Open GIS Consortium Level 0 Profile of GML Version 3.

    Point: a single location represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 3-14. Blocks can be used to symbolize point features so long as the block is placed on the appropriate layer for that type of feature. The insertion point of the block should be placed at the correct geographic location of the feature. If blocks are used, no additional point object should be placed at the features location.

Figure 3-14, Example of a Point Feature

    Line: straight line connections between two or more discrete locations represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 3-15. Note that line segments (i.e., a straight line connecting two points) and polylines (i.e., one or more connected line segments) are both included in this definition but that arcs (i.e., a curve joining two points) are not.

Figure 3-15, Example of Line Features

Polygons: A closed connection between three or more discrete locations represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 3-16. A closed polyline can also be used to represent a polygon.

Figure 3-16, Example of Polygon Features

Complex Geometry Types: Arcs, circles, and ellipses should not be used to represent geographic features. These complex geometry types can be used in details, building faces, and other drawing components that are not intended to be represented in geographic space. This is intended to facilitate data exchange between software that processes these complex data types differently. These shapes may however be represented by polylines or polygons as appropriate. For example, if arcs are used in a CAD drawing, they must first be broken into a line with vertices placed at intervals that are sufficient to maintain the feature's accuracy requirements.

B. Topology Rules

The placement of geometric features in juxtaposition to one another (i.e., next to, connected to, or on top of) is referred to as a topology. Topology rules establish requirements for the placement of features in relation to one another and in relation to features in other Feature Types. Unless stated otherwise, this standard requires the following topological rules:

Line Feature Types: Lines should contain one or more line segments with vertices placed at required intervals so the line feature does not stray from the actual feature by more than half the accuracy limit for that feature type, as shown below in Figure 3-17.

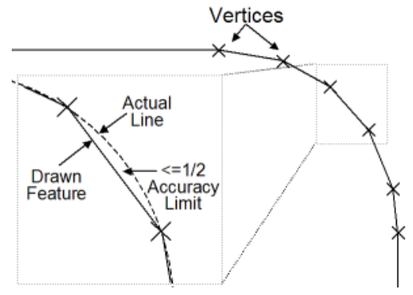


Figure 3-17, Placement of Vertices Along a Curve

Lines should begin and end at (snap to) vertices coincident (i.e., exactly at the same coordinate) with features (often point Feature Types) designed to join two or more linear features, as shown in Figure 3-18. An example is electrical conduit lines that are joined only at junction boxes and other similar point features. For lines not naturally joined by physical features (e.g., marking lines), beginning and ending nodes should be placed where an attribute or other property change occurs.

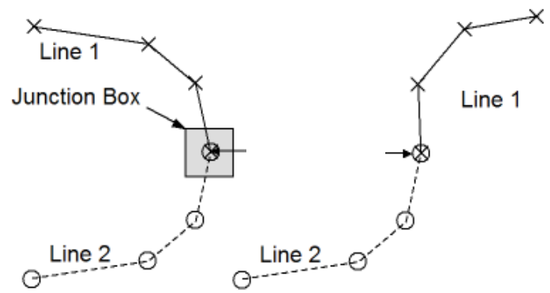


Figure 3-18, Coincident Line End Points

Lines should not fall short (i.e. have gaps) or extend beyond (i.e. have dangles) features they are intended to connect to. When lines are connected to features represented by blocks, the line should connect (snap) to the insertion point of the block and not to the outer edge of the block.

Polygon Feature Types: Polygons must always be closed, meaning all vertices must be shared by two adjacent line segments forming the edges of the polygon, as shown in Figure 3-19.

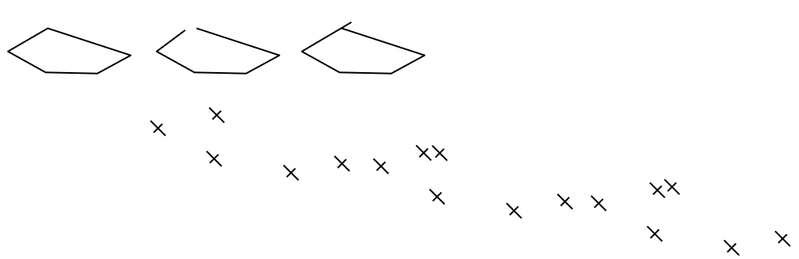


Figure 3-19, Example of Closed and Unclosed Polygons

Unless otherwise stated, polygons must not overlap other polygons on the same layer, as shown in Figure 3-20. This includes polygons placed on top of other polygons, as well as small overlapping splices because one or more vertices of adjacent sides are not matched. Polygons placed within (e.g., a 'doughnut hole') a larger polygon (e.g., the 'doughnut') which do not overlap are acceptable, because they describe a physically different space from the surrounding polygon.

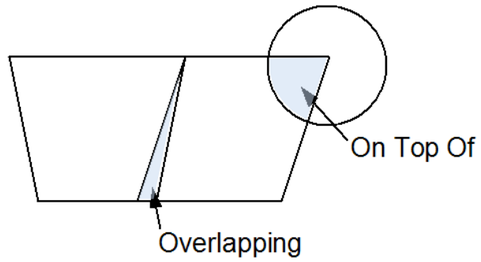


Figure 3-20, Examples of Overlapping Polygons

Polygons must share vertices with adjacent polygons where the real-world features they represent are adjacent, as shown below in Figure 3-21. This rule applies to polygons in the same Feature Type as well as polygons of different but related Feature Types.

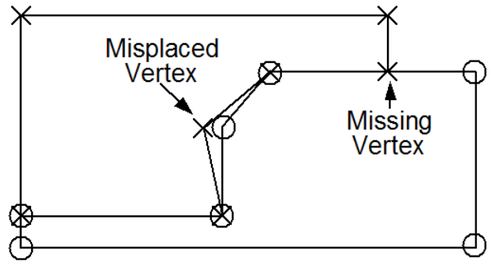


Figure 3-21, Placement of Vertices of Adjacent Polygons

C. Layering of Features
Features of the same type and geometry should be the only elements on any specific layer. Text and leaders relevant to feature on a layer should appear on a corresponding but different layer that complies with the layer naming conventions in this standard.

D. Relationship Between GIS & CAD Layers
MDOT MAA requires that CAD data be easily convertible into a GIS format to the extent feasible. To accommodate this exchange of data, a crosswalk between CAD and GIS layers has been developed and can be found in PEGS V1, Appendix 1D.4 Crosswalk Relationships.

3.4.1.25 Feature Attribution

In some cases, MDOT MAA requires that geometric features in CAD drawings include attributes such as size, material, and condition. These requirements will be defined in individual project statements of work. When MDOT MAA requires attributes, they should be attached to geometric objects in drawings via an object data table. If the same set of attributes are required for all features, a single object data table is preferred.

The attributes found in the object data table should align with attributes in MDOT MAA's GIS Data Standard for the corresponding GIS layer. For example, points or block symbols on the C-RUNW-ENDP layer, which corresponds to the RunwayEnd GIS layer per the CAD-GIS crosswalk, should include attributes for the runwayEndDesignator, thresholdType, and others. In some cases, the values that can be entered into these attributes will be bound to a domain list. For example, the attribute thresholdType is bound to domain called CodeThresholdType, which allows the values of Normal or Displaced.

Note that the ability to define, enter and edit object data is limited to AutoCAD Map 3D or AutoCAD Civil 3D products. This software will be required to enter such values into DWGs where required by MDOT MAA.

Attribution is not the same as annotation.

3.4.1.26 Coordinate Tick Marks

Coordinate Tick Marks, also called Coordinate Ticks or Grid Ticks, are notations on a drawing marking specific coordinate locations. Coordinate Ticks allow drawings to be aligned with other drawings, with GIS or CAD data, or with GPS coordinates in the field.

In any MDOT MAA capital or CMAR project, or permit application, each plan view shall have three or more Coordinate Ticks, spaced a minimum of one hundred feet apart, showing coordinates in the Maryland State Plane coordinate system (see PEGS Volume 1 Chapter 4.5 Coordinate System for details). Coordinate Ticks shall be placed on coordinates divisible by ten feet; single-digit or decimal values such as 603841 or 1477025.8 are unacceptable. For plans showing larger areas, Coordinate Ticks shall be placed on coordinates divisible by the largest even increment possible given the confines of the plan limits, such as one hundred feet, two-hundred and fifty feet, five hundred feet, or one thousand feet.

Coordinate ticks should be placed in the view forming either a triangle or rectangle, as far apart as is possible within the confines of the plan view limits.

Figure 3.4.1.26 shows a Coordinate Tick on a typical plan view.

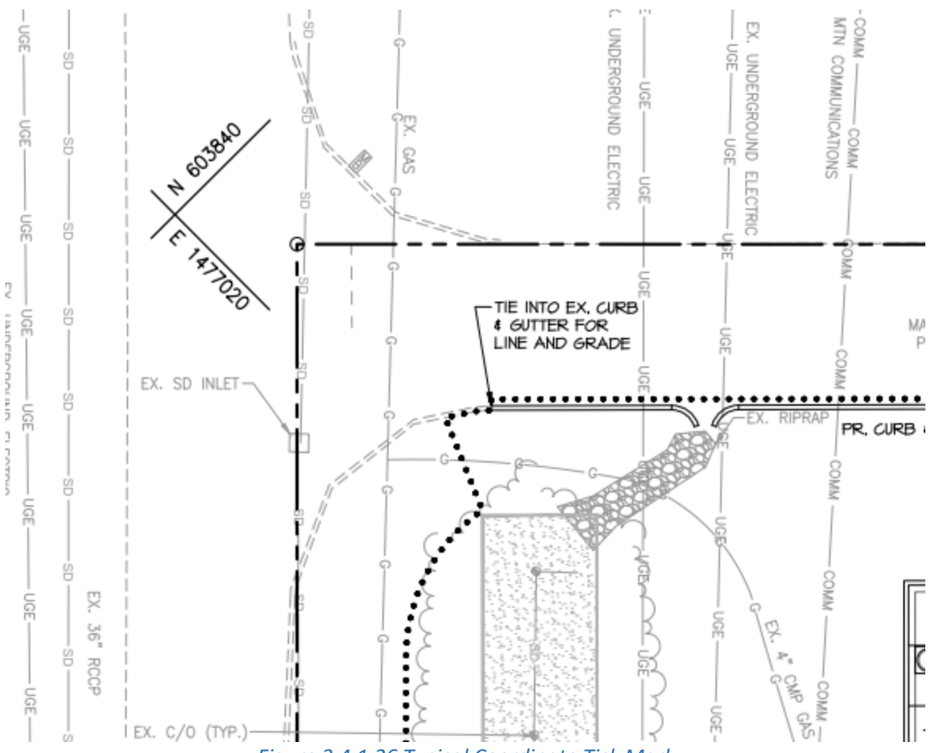


Figure 3.4.1.26 Typical Coordinate Tick Mark

3.5 Electronic Deliverables

3.5.1 General

MDOT MAA requires all submittals to be made electronically/digitally. Electronic deliverables shall be submitted in the same timeframe as hard copy deliverables.

All CAD drawing files MUST be delivered in AutoCAD DWG and PDF formats. The DWG files MUST be created with the approved software from the list provided in Section 3.1.4 Software Requirements of this standard. Additionally, all DWG submittals must be made utilizing the ***eTransmit*** function within Autodesk products. Instructions appear later in this chapter.

Project drawings produced using Autodesk Revit is optional, however, files must still comply with the standards described in this section. Drawings shall be submitted in their native revit format with the electronic deliverable in addition to the standard formats listed above.

All PDF files shall be created to allow printing but restrict editing by a third party. Each PDF should contain a single sheet drawing. Consultants will use the Standard Drawing File Naming Format shown in Section 3.5.1.2 Electronic File Preparation.

When submitting electronic contract documents to MDOT MAA, one sheet file representing each contract drawing shall be submitted in accordance with the MDOT MAA Design Standards. Each *sheet file* shall be ready to plot at full-size (1:1) in paper space. Layers must be controlled properly to reflect the document's intended appearance. Use of drawing files with multiple layouts is permitted only in the case of cross sections.

3.5.1.1 Delivery Media

DWGs and any related documents or files shall be submitted via MDOT MAA's AIRPortal Document Manager (ADM) application. Refer to Section 3.5.1.2.B, eTransmit Procedures. All electronic deliverables must be virus free.

3.5.1.2 Electronic File Preparation

Consultants shall deliver one eTransmit zip file containing all sheets, their unbound DWGs and their related files as gathered and presented by the eTransmit functionality. The eTransmit utility will be used to combine each AutoCAD file and its related support files such as raster images, external references, and fonts into a single zip file.

For the PDF version of contract drawings documentation submittals, each PDF file should contain only one contract drawing. The drawings should be organized and submitted in the proper sequence of the drawings set. Each file should follow the “Standard Drawing File Naming Format” as defined below.

A. Standard Drawing File Naming Format

Figure 3-22, Standard Drawing File Naming Format

Volume Identifier: 2 character field should contain “V1”, “V2”, etc. Used only when drawing set is divided in multiple packets or “volumes”. Omit field and underscore if all drawings are included in one volume.
Sheet Sequence: 4-digit number starting with “0001.” Leading zeros are required. The number counts all sheets in the drawing set. In cases where there is more than one volume in a set, sheet sequencing shall be continuous through all volumes. The sheet sequence number for the last drawing of the set is equal to the total number of drawings in all volumes. For example, Volume 1 has ten drawings and Volume 2 is twenty drawings making the total number of drawings thirty. Volume 1 will be numbered V1_0001 through V1_0010; then Volume 2 will be numbered V2_0011 through V2_0030 which continues the number sequence from Volume 1 and ends at the number equaling the total number of sheets in the set. All drawings, including SSI-marked sheets and repeated sheets such as the Index of Drawings sheet, must be included in the total sheet sequence count.
Insert Identifier: Single letter characters used for inserting added drawings into an existing sequence. “A” is the first insertion. “B” is the second and so on, through “Z”. Where there are no inserted sheets, this field is omitted.
Sheet Identifier: Sheet number as shown in drawing title block. Follows existing CAD standards (Example: G0.0, E1.1, C1.0, etc.).
Sheet Title: Sheet title as shown as shown in drawing title block. Special characters such as “/”, “\”, “&”, “*” etc. are not permitted.
SSI Identifier: Insert the letters “SSI” to identify drawings that contain Security Sensitive Information for special handling. Omit field and preceding underscore if no SSI data present.
Format Extension: Application defined code (Example: dwg, dwf, pdf, etc.).

B. eTransmit Procedures
1. With a drawing open, choose File > eTransmit
2. In the Create Transmittal dialog box, click Transmittal Setups…

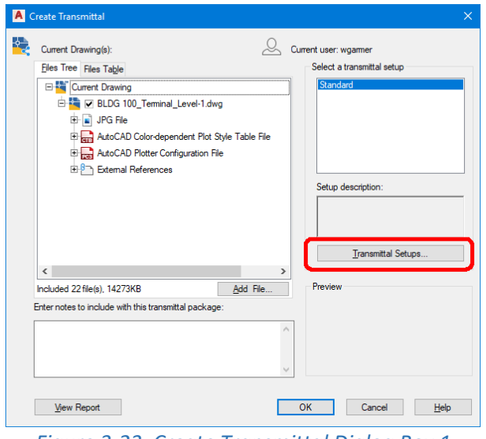


Figure 3-23, Create Transmittal Dialog Box 1

C. In the Transmittal Setups dialog box, click Modify… to modify the Standard setup

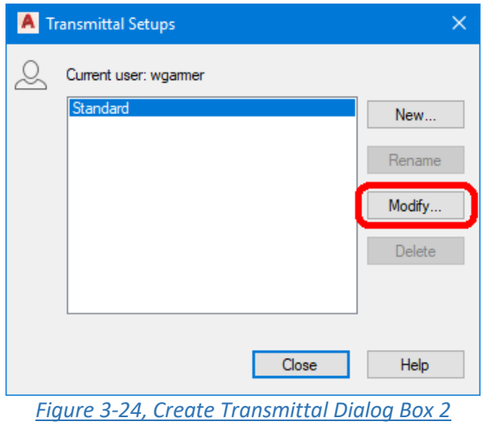


Figure 3-24, Create Transmittal Dialog Box 2

D. In the top section of the Modify Transmittal Setup dialog box, set the Transmittal Type and Location information.
   1. In the Modify Transmittal Setup dialog box, choose a transmittal package type of .zip.
   2. Under File Format, choose 'Keep existing drawing file formats'. If the MDOT MAA Project Manager requires the file in an older version of AutoCAD, you can change this setting.
   3. Under Transmittal file folder, choose the file folder where the transmittal file will be generated.
   4. Set the Transmittal file name text box to 'Prompt for a filename'

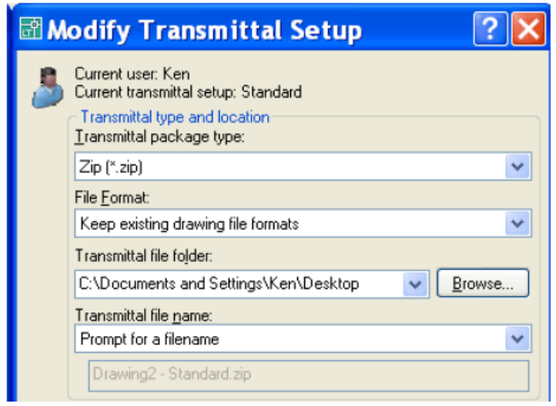


Figure 3-25, Modify Transmittal Dialog Box 1

E. In the bottom section of the Modify Transmittal Setup dialog box, set the Transmittal Options
   1. Under Transmittal Options, choose the 'Use organized folder structure' radio button and supply your Source root folder (location where the project root tree structure resides on your server).
   2. Click the radio button next to 'Place all files in one folder'
   3. Check the box next to 'Include fonts'
   4. Check the box next to 'Set default plotter to 'none''
   5. Name your transmittal setup for future use
   6. Click OK to accept changes and return to the "CREATE TRANSMITTAL" dialog box.

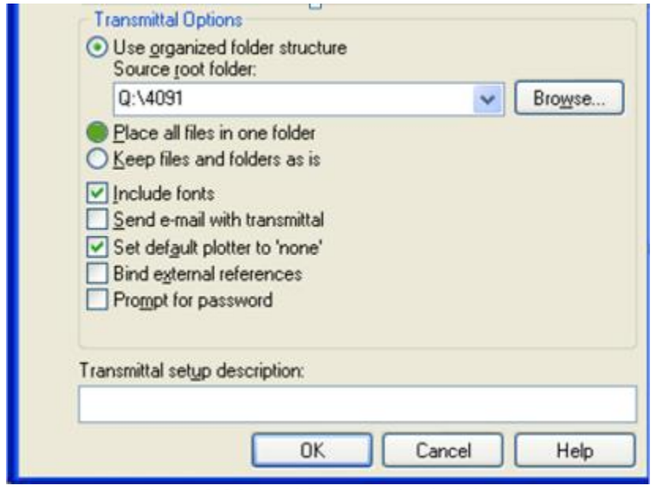


Figure 3-26, Modify Transmittal Dialog Box 2

F. In the Create Transmittal dialog box, ensure all necessary files are included in the Files Tree tab. This includes fonts, xref files, ASCII files, etc. Click Add File… to add additional files.
G. Click OK
H. When prompted for a file name, enter a file name that conforms to the naming convention defined in Section 3.5.1.2, Item A Standard Drawing File Naming Format.

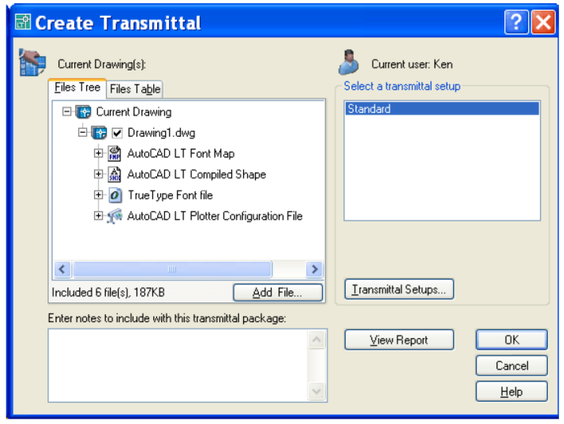


Figure 3-27, Create Transmittal Dialog Box 3

3.5.1.3 Documentation

All drawing packages submitted to the MDOT MAA shall include a transmittal letter containing the same information as on the external media label, and any special instructions for the restoring/transferring of files from the media.

3.5.1.4 Ownership

MDOT MAA shall have unlimited rights to all information and materials developed and furnished to the MDOT MAA and documentation thereof, reports and listings, and all other items pertaining to the work and services pursuant to this agreement including any copyright. Unlimited rights are rights to use, duplicate, or disclose data and information, in whole or part in any manner and for any purpose whatsoever without compensation or approval. The MDOT MAA will at all reasonable times have the right to inspect the work and will have access to and the rights to make copies of the above-mentioned items. All digital files and data, and other products generated shall become the property of the MDOT MAA.

3.5.2 Quality Assurance

This section lists the requirements for the inspection of drawings before they are submitted to MDOT MAA, and the engineering data quality assurance process that consultants and contractors must have in place.

3.5.2.1 Responsibility for Quality

The consultant is responsible for seeing that the electronic files are in compliance with MDOT MAA standards.

3.5.2.2 Quality Assurance Testing

Quality assurance testing carried out by consultants and contractors should include examining files for entities placed in the proper layer or level, proper drawing and plot parameters, title block is filled out and set correctly, and the drawing is free of unwanted entities. Where specific spatial accuracy is required, additional checking to ensure the accuracy of the data being submitted is required. Where attribution is required, attributes will be complete and will contain appropriate values. Procedures that MDOT MAA will use for acceptance testing and a recommended for consultant and contractor quality assurance are detailed in the MDOT MAA Data Quality Standard.

3.5.2.3 Engineering Data Quality Assurance Process

Unless otherwise specified in the contract or order, the contractor/supplier must have an effective quality assurance process for the detailed quality assurance and technical accuracy of all engineering drawings and associated lists to be supplied under the terms of the contract. The procedures of the quality assurance system shall assure the conformance of the engineering drawings and associated lists to the applicable contract provisions. The quality assurance system shall be documented, and subject to the approval of MDOT MAA's Project(Task) Manager.

4.1 Introduction to GIS Standards

4.1.1 Purpose

The GIS Data Standards provides guidance for developing geospatially-referenced data to be submitted to, maintained by, or provided by the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA). This includes geospatial vector data, related attributes, and metadata (i.e. information about the data). This standard is required so providers and receivers of MDOT MAA data have an understanding of the requirements for the GIS data they submit and use.

4.1.2 Scope

This document defines 125 of the 393 features covered by MDOT MAA's GIS Data Standards. The remaining 268 feature classes are covered in PEGS V1, Appendix 1E.3 – Utilities Supplement.

4.1.3 Organization of this Document

This document is a reference document that defines the requirements of GIS data submitted to, maintained for, or provided by MDOT MAA. The sections that make up the body of this document define the geometry, attributes, and metadata requirements at a general level that applies to all GIS data submitted to MDOT MAA. Specific definitions and requirements for each feature class and attribute are provided in PEGS V1, Appendix 1E.1 Feature Types. In this appendix, the geometry type, required accuracy, sensitivity levels, attribute definitions and any applicable attribute domain lists are defined. A list of acceptable domain values for each attribute domain list is also provided in PEGS V1, Appendix 1E.1 Feature Types.

This document also provides a basis to convert GIS to a CAD format and vice versa. Since GIS layering and CAD layering are traditionally different, a crosswalk is necessary to identify one or more CAD layers that correlate to each GIS layer. This crosswalk is provided in PEGS V1, Appendix 1E.2 – Cross Reference of CAD and GIS.

Other topics covered in this document include a definition of the Maryland State Plane coordinate system to be used for all MDOT MAA GIS and CAD data in Section 4.5 Coordinate System. Finally, Section 4.6 MDOT MAA Data Compliance Requirements describes the GIS data delivery formats acceptable to MDOT MAA.

4.1.4 Intended Audience

This standard is intended for Geographic Information Systems (GIS) data developers, database designers, and other providers and recipients of geospatial data that depict Baltimore/Washington Thurgood Marshall International (BWI Marshall) and Martin State (MTN) airports and their surrounds, as well as other facilities owned and operated by MDOT MAA. This standard assumes basic familiarity with GIS concepts and terminology.

4.1.5 Application of this Standard

All GIS data prepared for or used, maintained, and distributed by MDOT MAA should conform to this standard. This includes Esri shapefiles and file geodatabases prepared by MDOT MAA staff, consultants, or contractors. The extent and specifications for GIS data to be delivered will be further specified in contracts with consultants and contractors.

Some of the data submitted to MDOT MAA will also be submitted to the FAA in compliance with the FAA's Airports GIS Program requirements. This data must conform with the requirements defined by the latest versions of FAA AC 150/5300-16A, FAA AC 150/5300-17C, and FAA AC 150/5300-18B. The structure of the data required by these ACs is reflected in this document, although the FAA requirements take precedence for data that is to be submitted to the FAA.

To be in conformance with this standard, all geographic features such as runways, buildings, wetlands, obstruction and identification surfaces should be grouped into features classes (i.e. map layers) as defined in PEGS V1, Appendix 1E.1 Feature Types or in PEGS V1, Appendix 1E.3 Utilities Supplement. Features should be of the proper geometry type (i.e. point, line or polygon) as further defined in Section 4.2.1 Allowable Geometry Types, should meet or exceed the accuracy limits specified (unless otherwise stipulated in writing) and adhere to the topological constraints described in Section 4.2.2 Topology Rules. Attributes should be populated to the extent possible (or as otherwise stipulated in writing) and carry the names and be of the types specified in PEGS V1, Appendix 1E.1 Feature Types. Attributes that are bound to domains must contain values listed in PEGS V1, Appendix 1E.1 Feature Types. All data must be in the Maryland State Plane coordinate system as defined in Section 4.5 Coordinate System. This data is to be submitted along with the metadata specified in Section 4.4 Metadata in one of the formats specified.

4.1.6 Related Material

The following documents are related to this GIS Data Standard and must be followed to be compliant with this standard.

The primary normative references (i.e. references that must be complied with) are those related to the FAA's Airports GIS Program. MDOT MAA is required to submit GIS data in a format that complies with the FAA requirements on any project funded through federal grant monies and/or changes what the FAA defines as safety critical information. As a matter of policy, MDOT MAA follows the FAA's Airports GIS Requirements on all projects that develop GIS data regardless of whether data is to be submitted to the FAA or not. It is relevant to note that the feature class, attribute, and domain definitions in FAA AC 150/5300-18B have been incorporated into MDOT MAA's GIS Standards. If, however, there are any differences or clarifications necessary, the FAA advisory circulars shall prevail over this document.

A. FAA AC 150/5300-16A "General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey", latest edition

B. FAA AC 150/5300-17C “Standards for Using Remote Sensing Technologies in Airport Surveys”, latest edition
C. FAA AC 150/5300-18B “General Guidance and Specifications for Aeronautical Surveys: Airport Survey Data Collection and Geographic Information System Standards”, latest edition
D. Standard Provisions for Construction Contracts

4.2 Features & Attributes

The focus of this standard is on the definition of 353 geographic features required to depict an airport and its surrounding environment. These include features unique to airports, such as runways and taxiways, as well as more generic features, such as roads and buildings. Each of these 353 types of geographic features is referred to as a feature type. A specific instance of a feature type is referred to as a Feature. For example, Runways is a feature type, but Runway 10/28 at BWI is a specific Feature.

4.2.1 Allowable Geometry Types

There are three basic types of geometry (i.e., points, lines, and polygons). For simplicity in data development and transfer, this standard associates a single geometry type (i.e. point, line or polygon) with each feature type.

A. Point: a single location represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 4-1.

Figure 4-1. Example of Point Features

B. Line: straight line connections between two or more discrete locations represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 4-2. Note that line segments (i.e., a straight line connecting two points) and polylines (i.e., one or more connected line segments) are both included in this definition but that arcs (i.e., a curve joining two points) are not.

Figure 4-2. Example of Line Features

C. Polygon: A closed connection between three or more discrete locations represented by X and Y (and in some cases Z) coordinates on a reference coordinate system, as shown below in Figure 4-3. Polygons with interior portions excluded (i.e. doughnut holes) are acceptable, but multipart polygons (i.e. separate polygonal shapes represented by a common database record) are not.

Figure 4-3. Example of Polygon Features

D. Complex Geometry Types: Arcs, circles, and ellipses are not included in this standard. This is intended to facilitate data exchange between software that processes these complex data types differently. However, these shapes may be represented by polylines or polygons as appropriate. For example, if arcs are used in a CAD drawing, they must first be broken into a line with vertices placed at intervals that are sufficient to maintain the accuracy requirements described in PEGS V1, Appendix 1E.1 Feature Types.

4.2.2 Topology Rules

The placement of geometric features in juxtaposition to one another (i.e., next to, connected to, or on top of) is referred to as a topology. Topology rules establish requirements for the placement of features in relation to one another and in relation to features in other feature types. Unless stated otherwise, this standard requires the following topological rules:

A. Line Feature Types: Lines should contain one or more line segments with vertices placed at required intervals so the line feature does not stray from the actual feature by more than half the accuracy limit defined in PEGS V1, Appendix 1E.1 Feature Types for the feature type, as shown below in Figure 4-4.

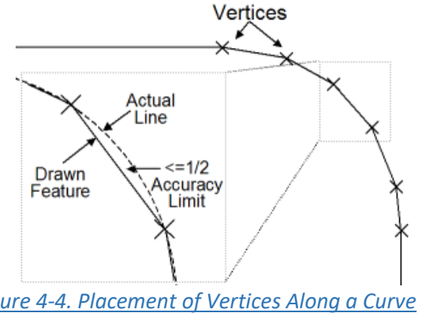


Figure 4-4. Placement of Vertices Along a Curve

Lines should begin and end at vertices collocated (i.e., exactly at the same coordinate) with features (often point feature types) designed to join two or more linear features, as shown in Figure 5. An example is electrical conduit lines that are joined only at junction boxes and other similar point features. For lines not naturally joined by physical features (e.g., marking lines), beginning and ending nodes should be placed where an attribute or other property change occurs.

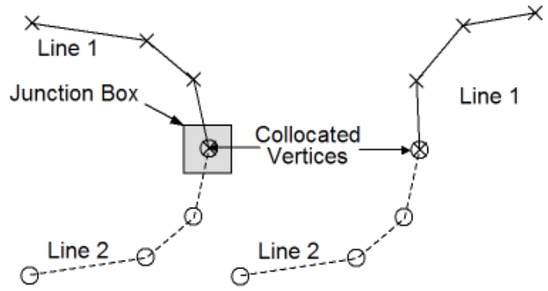


Figure 4-5. Collocation of Line End Points

B. Polygon **Feature Types:** Polygons must always be closed, meaning all vertices must be shared by two adjacent line segments forming the edges of the polygon, as shown in Figure 4-6.

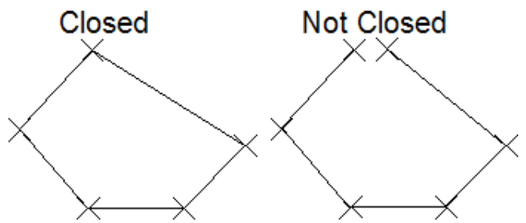


Figure 4-6. Examples of Closed and Unclosed Polygons

Unless otherwise stated, polygons must not overlap other polygons of the same feature type, as shown in Figure 4-7. This includes polygons placed on top of other polygons, as well as small overlapping splices because one or more vertices of adjacent sides are not matched. Polygons placed within (e.g., a 'doughnut hole') a larger polygon (e.g., the 'doughnut') which do not overlap are acceptable, because they describe a physically different space from the surrounding polygon.

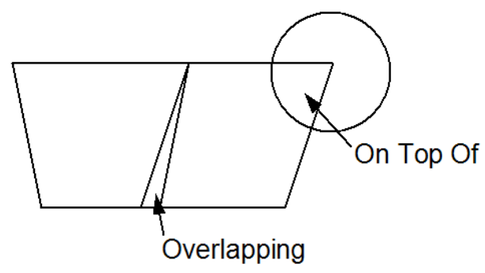


Figure 4-7. Overlapping Polygons

Polygons must share vertices with adjacent polygons where the real-world features they represent are adjacent, as shown below in Figure 4-8. This rule applies to polygons in the same feature type as well as polygons of different but related feature types.

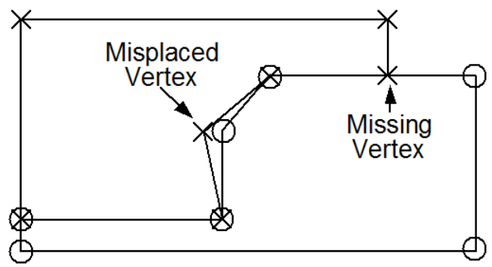


Figure 4-8. Placement of Vertices of Adjacent Polygons

4.2.3 Relationship of GIS & CAD Layers

Because many more CAD layers can be used to represent the same features represented on far fewer GIS layers, there is a natural many-to-one matching of CAD to GIS layers. The specific relationship of CAD layers that correspond to GIS layers is shown in PEGS V1, Appendix 1E.2 – Cross Reference of CAD and GIS.

4.3 Attributes & Domains

Attributes add descriptors to the geometry of a feature. Attributes can contain information such as the name, type, or condition of a feature. For example, the attributes of a runway include its designator (e.g., 15R/33L), material type (e.g., concrete), and length (e.g., 6,500 feet). Figure 4-9 below shows a typical list of attributes associated with a Feature type.

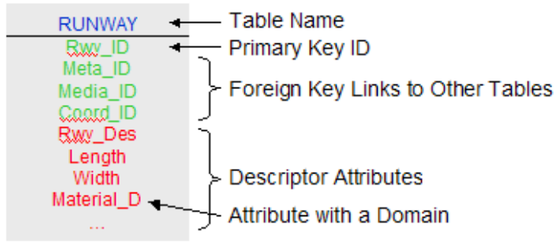


Figure 4-9. Sample Attribute Table for a Feature Type

4.3.1 Common Attributes

Several attributes are common to all feature classes in this standard. Some of these are used for naming and identification purposes. Others provide a reference to the project that installed or first recorded the location of the feature. Other attributes provide additional information about the data. Following is a list of these common attributes (with the exception of common metadata attributes that are described in the next section:

A. guid - A globally unique identifier (GUID) applied to each feature in the database for reference by GIS and other information systems. When GIS data are submitted to MDOT MAA and uploaded into the GIS Data Repository, each record will also be assigned a GUID, which means that no other records have the same identifier. Application modules will use this GUID to track features as they are modified. If users who download data encounter such GUIDs, they are required to retain the GUIDs and submit them, unaltered, with subsequent revisions, to the features they downloaded.

1. The format of the GUIDs to be used is described in Figure 4-10 below. A numeric ID is used that contains the FAA region, airport location ID, feature type, date, and a timestamp. Since FAA region, airport location, and feature type are text values, corresponding numeric values have been assigned in the domain tables found in PEGS V1, Appendix 1E.1 Feature Types.

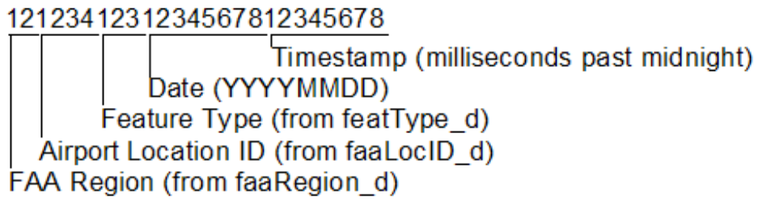


Figure 4-10. Format for Globally Unique Primary Keys

B. maaId - A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value). Refer to MDOT MAA's Naming, Identification and Addressing Standard for additional requirements that may apply to the assignment of identifiers. If a feature class contains Confined Space attribute, see PEGS V1, Chapter 3.3.3.3 Structure ID for details of the Confined Space Structure ID format.

C. maaAlias - An alternative or former name by which the feature is referred.

D. status - A temporal description of the operational status of the feature.

E. alternative - Discriminator used to tie features of a plan or proposal together into a version.

F. projectType - The type of project or work activity that installed or first recorded the location of this feature. At MDOT MAA, projects can be carried out under Contracts, Tasks, Subtasks, Building Permits, and Installation Permits.

G. projectId - A unique identifier associated with the project or work activity that installed or first recorded the location of this feature. These project IDs should conform to the following conventions.

1. Currently MDOT MAA contracts are assigned numbers formatted as ORG-TY-YY-NNN, where ORG is a three digit identifier for the originating organization. In most but not all cases, this is "MDOT MAA". TY is a two character indicator of the contract type. Key examples include "AE" for design contracts and "CO" for construction contracts. YY is a two digit representation of the year (e.g. 96 for 1996 and 02 for 2002). NNN is a unique sequential number that starts at 001 for the first contract of that type issues for a given fiscal year and is incremented by 1.
2. AE Contracts can have zero, one or more tasks, tasks can have zero, one or more Subtasks. CO contracts can have zero, one or more tasks but do not have subtasks.

3. Tasks under design contracts (referred to as design tasks) are assigned four digit task numbers that are unique to the design contract (e.g. 2412). Subtasks under design contracts carry the four digit task number and then a two digit sequential number after a decimal point (e.g. 2412.12). These task numbers were assigned sequentially starting at 1 in the early 1990s. Blocks of numbers are assigned to certain contracts, but not all may end up being used, so there is a possibility that task numbers have been skipped.
4. Tasks under construction contracts (referred to as construction tasks) are assigned a sequential number that starts with 1 for each contract and is therefore not unique. These are not widely used outside of construction at MDOT MAA.

H. **userFlag** – This attribute can be used for any purpose desired by the end user Often, this attribute is used to store relevant identifiers, notes or metadata that is accommodated elsewhere. The FAA's Airports GIS also accommodates this attribute, so values entered into this attribute will be retained upon upload of required feature classes to the FAA.

I. **Confined Space** – A field for specific Utility feature classes that may store features fitting the definition of a Confined Space. This field shall be assigned the domain Code Boolean as defined and provided in PEGS V1, Appendix 1E.1 Feature Types, which will limit potential values to Yes, No, or <null>.

4.2 Domain Values

The values assigned to an attribute are sometimes limited. The range of acceptable values is referred to as the domain for that attribute. Domains that limit attribute values to a range of numeric or date values are referred to as range domains. List domains limit values to a selection of choices. If users can add values to a list of acceptable values and still be compliant with the standard, the list is referred to as a code list. A list that users cannot add to is referred to as an enumeration. In this standard, all of the list domains are enumerations. To distinguish attributes that are limited to a domain, the name of each attribute ends with "_D". For each such attribute, there is an associated table in PEGS V1, Appendix 1E.1 Feature Types listing the acceptable values and their definitions.

4.3 Foreign Key Identifiers

Attributes containing primary key values of related records in other feature type tables are called foreign key identifiers. Foreign key identifiers provide a link between different types of features with logical relationships. For example, the data for a taxiway leading to a runway might contain a foreign key to the runway table that is populated with the primary key value for that runway.

4.4 Metadata

Metadata is information about the data, such as the data source, accuracy, and the dates during which the data are valid. As described below, metadata can be created at several different levels. Per this standard, metadata is required at the collection level when data are submitted. However, the standard accommodates metadata elements at the feature type and feature level. More detailed metadata increases the usefulness and longevity of the data provided. Accordingly, data providers are encouraged to submit metadata at the most detailed level possible.

4.4.1 Collection Level Metadata

Collection level metadata is used to describe a collection of data submitted at one time. A collection may comprise of one or more drawings that contain several layers such as those that make up an ALP, several individual shapefiles that each represent a layer, a single layer stored in a shapefile, or any other combination of allowable data sets.

4.4.2 Feature Type Metadata

Feature type metadata, also known as layer level metadata, is used to describe geometry and attributes for a single layer or feature type. This is the case with metadata that is compliant with the FGDC Content Standard for Digital Geospatial Metadata (CSDGM). This level of metadata applies if different layers within a collection have different metadata.

4.4.3 Feature Level Metadata

Feature level metadata is handled by storing metadata in attributes associated with specific features. All feature classes in the standard carry the following metadata elements (as attributes) for this purpose.

A. **metaId** - An identifier used to refer to a metadata record that provides additional information about the data in this record. This is a foreign key link to a database table that can be used to store additional metadata relevant to this feature.
B. **sourceStatement** - A statement providing additional details about the source of the data.
C. **editorName** - The name of the individual who last edited this data.
D. **lastUpdate** - The date upon which any data associated with this record was last updated.

4.4.4 ISO 19915

This standard uses metadata elements defined by the ISO Geographic Information – Metadata Standard (ISO 19115). Of the 409 elements defined in ISO 19115, only 25 are used by this standard, because many of the elements defined in ISO are classified as optional or conditional and do not apply to this standard. Furthermore, some of the mandatory elements in the ISO standard are redundant with the specifications of this standard and are therefore not necessary for data exchange. Table 4-11 lists each metadata element used in this standard along with the level of applicability and provides a description of the metadata elements required per this standard. These elements have been extracted from ISO 19115.

Metadata Elements Required by MDOT MAA				
Overview				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
abstract	Description of the contents of the data collection being submitted	✓	✓	✓
status	Status of the the data being submitted. Acceptable values are (completed, historical, archive, obsolete, onGoing, planned, required, under development)	✓	✓	✓
geometricObjectCount	Number of feature instances being transmitted	✓	✓	
Scope				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
dataset	List of feature classes to which the metadata pertains (separated by commas)	✓		
features	List of feature names to which the metadata pertains (separated by commas)	✓	✓	
attributes	List of attribute names to which the metadata pertains (separated by commas)			✓
Usage				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
specificUsage	Description of how the data should be used	✓	✓	✓
BegUsageDateTime	The first dateltime for which the data described by the scope is valid	✓	✓	✓
EndUSageDateTime	The last dateltime for which the data described by the scope is valid	✓	✓	✓
Source				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
statement	Description of the source of the data	✓		
individualName	Name of the person submitting the data	✓		
organizationName	Organization of the person submitting the data	✓		
positionName	Title of the person submitting the data	✓		
deliveryPoint	Street address of the person submitting the data	✓		
city	City of the location	✓		
administrativeArea	State	✓		
postalCode	Zip Code	✓		
electronicMailAddress	E-mail address	✓		
voicePhoneLine	Telephone number by which individuals can speak to the responsible organization or individual	✓		
Coordinate System				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
projection	Name of the projection used (SPCS, LL)	✓	✓	
horizontalDatum	Horizontal datum of submitted data	✓	✓	
verticalDatum	Vertical datum of submitted data	✓	✓	
code	Four digit code for the state place coordinate system used. A list of codes can be found in NOAA manual NOS NGS 5.	✓	✓	
Data Quality				
Metadata Element	**Definition**	**Collection**	**Set**	**Feature**
horizontalAccuracy	Horizontal accuracy of the dataset	✓	✓	✓

Metadata Elements Required by MDOT MAA				
verticalAccuracy	Vertical accuracy of the dataset	✓	✓	✓
evaluationMethodName	Name of the evaluation method used	✓	✓	✓
evaluationMethodDescription	Description of the evaluation method used	✓	✓	✓
pass	Indicatation of whether data described by the scope passed or failed in evaluation	✓	✓	✓
groundSampleDistance	The distance of the ground sample	✓	✓	✓

Table 4-11. Metadata Elements Required by MDOT MAA

4.4.5 Temporal Relevance

One of the most critical metadata elements to the aviation industry is time. The frequency with which airport infrastructure changes requires spatial data to possess an indication of the time period for which the data are valid. For example, the existence of a runway may be valid from the time it was authorized for use until further notice. This standard defines the beginning and ending date and time for which each feature instance is valid. All features must have a beginning date (i.e., data are valid until further notice), an ending date (i.e., the data expire at a specified time), or both (i.e., the data are valid only during the period specified). These values are held in the begUsageDateTime and endUsageDateTime metadata elements defined in Figure 4-11.

4.4.6 Accuracy

Accuracy is one metadata element that is particularly important to airport GIS applications. Accuracy is broadly defined as *the quality of nearness to the true value*. For the exchange of data as specified in this standard, it is important to be more specific. This standard, therefore, provides limits for the absolute horizontal positional accuracy of each feature type. These limits are described as a maximum number of feet between a feature's actual position and the position indicated in the data provided. The actual position is defined as the feature's true location on the specified geoid. Since the earth's surface has many variations, it is approximated by a geoid. The difference between a feature's true and recorded positions is required at a 95% confidence level. This means that statistically, 95% or more of the features provided fall within the required accuracy limit.

For some feature classes, particularly for FAA required feature classes, vertical accuracy limits are also provided. These accuracies are expressed as the maximum number of feet a feature's recorded elevation can differ from its actual elevation. Again, the actual elevation is measured from the geoid elevation at that location. Elevations are also to be provided at a 95% confidence level.

Accuracy requirements are driven by the way the data are to be used. The location of an airport on a map used for aircraft navigation must be much more accurate than its location on a national map of airports provided for general information purposes.

The accuracy guidelines provided in this standard have been derived from several sources, including FAA AC 150/5300-18B, RTCA User Requirements for Aerodrome Mapping Information, FGDC Geospatial Positioning Accuracy Standards-Part 4 (sources are indicated in order of precedence). Further information on accuracy definitions and methods to assess the accuracy of existing data can be found in the FGDC Geospatial Positioning Accuracy Standards-Part 3: National Standard for Spatial Data Accuracy (FGDC-STD-007.3-1998).

4.4.7 Security Sensitivity Levels

Sensitivity level is another important metadata element. Because spatial data can be used for nefarious purposes, the data must be protected from unauthorized users. The Code of Federal Regulations (49 CFR Part 1520) defines Sensitive Security Information (SSI) and methods for protecting the information. Protecting sensitive spatial data is therefore not just good practice, it is the law. However, overly protecting data limits the information's usefulness, in many cases needlessly. The challenge is to restrict data to users having an *operational need to know* and whose credentials the data provider has qualified. Relative to spatial data, this challenge is particularly complex because of the wide variety of data users and ways in which they need to use the data. An efficient way to restrict access to spatial data is to apply specific restrictions at the feature type level. This standard applies one of the following sensitivity levels to each feature type. The sensitivity levels are based on the MDOT MAA Spatial Data Security Standard and conform to the classifications listed in the MD_ClassificationCode list in ISO 19115.

A. **Unclassified** data are available for general disclosure.
B. **Restricted** data are not available for general disclosure.
C. **Confidential** data are available for users that can be trusted with the information.
D. **Secret** data are to be kept or intended to be kept private, unknown, or hidden from all but a select group of people.
E. **Top Secret** data are of the highest secrecy. At MDOT MAA, this classification is reserved for SSI. MDOT MAA defines SSI as data that depicts the location of Controlled Access Security System (CASS), Closed Circuit Television (CCTV), Flex Response System, and Computer Aided Dispatch (CAD) system and their components. Individuals who require or are provided with this type of information must abide by the requirements of the MDOT MAA PEGS Manual PEGS V2, Chapter 3.1.2 Electronic documents containing Sensitive Security Information (SSI).

Since sensitivity levels are established for each feature type by this standard (See PEGS V1, Appendix 1E.1 Feature Types), it is not necessary to include this information (i.e., a classification code in ISO terminology) in the metadata.

4.5 Coordinate System

Horizontal spatial data shall be submitted to, maintained by, and provided by MDOT MAA in the Maryland Coordinate System of 1983, also referred to as Maryland State Plane. Following are the parameters of the Maryland Coordinate System of 1987:

Map Projection:	Lambert conic conformal projection of the geodetic reference system of 1980
Horizontal Datum:	NAD83 (2001)
Latitude of Origin*:	37°40 North latitude
Central Meridian:	77°00' West longitude
Standard Parallel 1:	38°18' North latitude
Standard Parallel 2:	39°27' North latitude
False Easting*:	400,000 meters
False Northing*:	0 meters
Latitude:**	37°34' 38.14264" N
Longitude:**	81°31' 45.07877" W

** at the 77th meridian*
*** at artificial origin (0,0)*

Vertical spatial data shall be submitted to, maintained by, and provided by MDOT MAA based on the National Geodetic Vertical Datum of 1988 (NGVD88).

All units for both horizontal and vertical data will be the U.S. Survey Foot (1200/3937 meters).

Please note that the database coordinate system is not the same as that used by the Survey Control Manual.

4.6 MDOT MAA GIS Data Compliance Requirements

4.6.1 Electronic GIS Data Deliverables to MDOT MAA

Projects which contain GIS components are required to have GIS data electronically submitted to MDOT MAA's GIS and Engineering Technology Section (GETS). As such, consultants must include the applicability and the requirements of MDOT MAA's GIS data standards and deliverables in their fee proposal to MDOT MAA. GIS Data Standards apply to all offices within the Division of Planning and Engineering.

Refer to Section 4.6.4, MDOT MAA GIS Data Editing, for how to submit electronic GIS data to MDOT MAA.

4.6.2 Project GIS Staffing Requirements

For projects that require GIS deliverables, consultants must identify in their fee proposal qualified GIS staff who will be working on MDOT MAA GIS data. Proposed GIS staff must meet the following basic qualifications:

A. Technical skills and experience with ESRI ArcGIS software, ArcSDE Enterprise geodatabases and ESRI Data Reviewer extension.
B. Experience on past projects of similar nature and scope.
C. Certification as a GISP is preferred.

MDOT MAA reserves the right to request the resume(s) of the proposed GIS Staff included in the fee proposal for review and approval. Furthermore, MDOT MAA reserves the right to require the removal and replacement of the proposed GIS staff at any time.

4.6.3 Project GIS Data Requirements

MDOT MAA is requiring consultants to deliver GIS data for all projects at BWI Marshall and Martin State Airports involving assets identified in the table below. The table below is intended to help determine which projects require GIS deliverables, although it is not an all-encompassing list.

Asset Type	GIS Data Example	GIS Coordination[1]	GIS Required[2]
Airfield Markings	Permanent		X
	Temporary	X	
Airfield Signs	Surface Painted Signs, Runway and Taxiway Guidance Signs		X
Buildings	Exterior: Footprint, Building Numbers		X
	Interior: Door Numbers, Interior Floor Plan, Etc.	X	
Environmental	Ponds, Assessment Area, Contamination Areas, Investigation Areas		X
External Above Ground & Underground Utilities	Stormwater, Wastewater, Water, Gas, Electrical, Fueling Systems, Communications, Fire Hydrants, Light poles, Confined Space Structures, Etc.		X
Fire Protection Devices	Exterior and Interior	X	
Geotechnical Exploration	Boring and Coring Locations, Reports		X
IASS/CDC	Security Cameras, Card Readers, Etc.	X	
NAVAIDs	Shelters, Equipment, Instruments, Etc.		X
Pavement	Runways, Taxiway, Shoulder, Apron, Etc.	X	
Passenger Boarding Bridges	Type, Fleet Mix, Photos, Other attributes	X	
Structures	Fences		X
	Bridges, Parking Garages, Space Frames, Retaining Wall, Roadway Signs	X	
Subsurface Utility Engineering	Grids Impacted, GIS data, Etc.		X
Real Estate	Properties acquired, Properties sold		X
Topographic Surveys	Data of all surface features surveyed		See Note 3

[1] GIS Coordination = Project Manager should discuss the scope of their task with the GIS & Engineering Technology Section (GETS) staff to determine if the project requires GIS data.

[2] GIS Required = The project must produce GIS data per MDOT MAA standards. GIS Editors should discuss the procedure for editing GIS data with GIS & Engineering Technology Section (GETS) staff.

[3] Data Required = If survey is performed, a CAD ".dwg" file shall be provided to MDOT MAA via ADM submission. Refer to Section 1.4.2.3 – ADM Submission Requirements for Topographic Surveys.

Consultants are responsible for both spatial/geometry updates and data attributes. In a case where GIS geometry does not change spatially, consultants are still responsible for updating data attributes with current information.

4.6.3.1 ArcGIS Online

MDOT MAA utilizes ArcGIS Online to improve spatial collection of data for the State of Maryland. ArcGIS Online allows users to collaborate and share spatial data with ease and access maps and data from any device. Data can be updated in the field and viewed real-time online.

If a project requires the use of ArcGIS Online, consultants are required to contact GETS at airportal@bwiairport.com to aquire a State of Maryland ArcGIS Online account. After the account is created, the consultant must provide the username(s) to GETS. GETS will then invite the user(s) to join a group on MDOT MAA's ArcGIS Online Account for that specific project. MDOT MAA requires that all groups and data created for BWI Marshall and Martin State Airports be hosted on MDOT MAA's ArcGIS Online Account.

GETS can assist with user setup in ArcGIS Online.

4.6.4 MDOT MAA GIS Data Editing

Projects that require updating GIS data for MDOT MAA shall utilize ArcSDE Enterprise Database via checkout file geodatabase. The checkout will be given to the Consultant's GIS Editor for the duration of the editing session. During that time, no other entity will be permitted to edit data that is included in the checkout. Consultant's GIS Data Editor shall discuss the scope of each project with GETS staff to determine the best distribution method for editing the GIS data.

Following the discussion with GETS staff, consultants may request a checkout by submitting a completed Digital Data Request form to the AIRPortal Administrator as described in PEGS V1, Chapter 1.2.5.2, Spatial Data Requests.

Once the data request is approved, MDOT MAA will deliver the requested data to the consultant electronically via email or secure FTP site, on-line document repository, or other systems pre-approved by GETS staff.

Since the data that is included in the checkout is locked for the duration of the editing session, the checkout editing period will be limited to the minimum amount of time possible. GETS staff will determine the duration the data can be checked out.

4.7 FAA GIS Data Compliance Requirements

4.7.1 Electronic GIS Deliverables to FAA

Consultants must consider and address the applicability and the requirements of FAA Advisory Circular FAA AC 150/5300-18B, prior to submitting a fee proposal to MDOT MAA for planning and/or design of projects at BWI Marshall and Martin State Airports. If a project contains GIS components, GIS files must meet the requirements of FAA AC 150/5300-18B for submitting to the FAA Airports GIS (AGIS) System. This requirement must be clearly defined in the project scope and fee proposal. In order for the GIS files to be submitted to the FAA, consultants must follow the requirements below:

A. Must have first gone through the MDOT MAA GIS data update process.
B. Must be an exported shapefile of MDOT MAA data using ESRI's ArcGIS for Aviation extension.
C. Must be provided in a compressed ZIP file that is ready and error free for upload to the FAA AGIS web site.

4.7.2 Test Upload (Consultant Responsibility)

A. The consultant, submitting as an authorized FAA AGIS user, shall perform a test upload of the zip file to the FAA AGIS. All critical errors identified must be resolved. All non-critical errors must either be resolved or have a valid written explanation for each type of error (e.g. "out of scope"). Where required by the FAA, the consultant shall prepare a project final report and supporting data as defined in FAA AC 150/5300-18B, as well as, any supporting documentation published by the FAA and NGS.
B. The test upload process can be completed with CAD data, provided FAA continues to accept it.

4.7.2.1 Test Upload Procedure

The process for performing Test Upload is described below:

1. Log onto at https://airports-gis.faa.gov/
2. Click "Test Survey File".
3. Enter the Airport Code.
4. Specify that the feature schema is FAA AC 150/5300-18B compliant.
5. Point to the ZIP file stored on a local or network drive.
6. Specify that the file format is ESRI SHP.
7. Specify the coordinate system is MD83F.
8. Check the box indicating that the data meets FAA AC 150/5300-18B accuracy requirements or indicate alternative horizontal and vertical accuracies that were achieved at the 95% confidence level.
9. Click submit.
10. After the data is uploaded, which can take several minutes, translation and automated validation will commence.
11. After validation is compete, an error report will be provided. All errors identified must be addressed before providing to MDOT MAA for final upload. Critical errors must be resolved. Non-critical errors must either be resolved or have valid written explanation provided to MDOT MAA. If a final report is required, it must be provided by the consultant to MDOT MAA for final upload. Data is not retained by FAA for test uploads.
12. If applicable, after addressing errors, repeat this process until 95% confidence level achieved.
13. Submit to MDOT MAA for final upload.

4.7.3 Final Upload (MDOT MAA Responsibility)

A. GETS is the designated Airport Sponsor at MDOT MAA for FAA AGIS. GETS is responsible for and will perform the final upload of the data to the FAA AGIS site.

B. Consultants shall submit the zip, which has been tested to 95% confidence level, to MDOT MAA for final upload. If the file is rejected by FAA, MDOT MAA will return the file to the consultant to address the issues found. Consultant shall address and provide an updated file at no additional cost to MDOT MAA.

4.7.3.1 Final Upload Procedure

The process for performing Final Upload is described below:

1. Log onto at https://airports-gis.faa.gov/
2. Click “My Survey Projects”.
3. Select the desired project.
4. Click the “Survey” tab.
5. Specify that the feature schema is FAA AC 150/5300-18B compliant.
6. Point to the ZIP file stored on a local or network drive.
7. Specify that the file format is ESRI SHP.
8. Specify the coordinate system is MD83F.
9. Check the box indicating that the data meets FAA AC 150/5300-18B accuracy requirements or indicate alternative horizontal and vertical accuracies that were achieved at the 95% confidence level.
10. Add a relevant description that would help the FAA or NGS understand what data is being provided.
11. Click submit.
12. After the data is uploaded, which can take several minutes, translation, and automated validation will commence.
13. After validation is compete, an error report will be provided. If no critical errors are found, then the data can be submitted. If a final report is required, it must be uploaded as well before the data can be submitted.
14. After data is submitted, safety critical data will be verified by the FAA and/or NGS. If issues are found, the data submittal will be rejected and a detailed Quality Review Report (QRR) will be provided indicating the issues that must be resolved. MDOT MAA will return the file to the consultant to resolve issues.
15. Once resolved, the consultant will resubmit the data to MDOT MAA to repeat the process.
16. Once accepted, the data will be available for use in eALP and other FAA AGIS modules by authorized FAA personnel, as well as, airport staff and consultants that the Airport Sponsor has authorized.

4.7.4 MDOT MAA GIS Staffing Requirements for FAA Compliance

Refer to Section 4.6.2, Project GIS Staffic Requirements.

4.8 Quality Assurance and Control of GIS Data

GIS data editors should follow basic GIS editing best practices when editing MDOT MAA’s GIS data and before running ESRI Data Reviewer. Pre-checks should be performed to help spot errors. These pre-checks can be accomplished by querying the attribute tables and symbolizing data. Before running the Data Reviewer checks, verify that required attributes are populated, and topology rules have been followed. The Data Reviewer checks will then help the Data Editors catch errors that may be missed during editing.

4.8.1 ESRI Data Reviewer

MDOT MAA requires that all consultants preparing GIS data and related files for MDOT MAA must use Esri Data Reviewer to ensure data consistency and adherence to the MDOT MAA GIS database design as outlined in the GIS Standard and its appendices.

4.8.2 Availability & ESRI Support

Data Reviewer can be purchased directly from ESRI by visiting ESRI’s website at http://www.esri.com/software/arcgis/extensions/arcgis-data-reviewer/pricing. MDOT MAA will not reimburse the consultants for the purchase of this software.

Data Reviewer Support is available for registered users directly from ESRI’s website at http://resources.arcigis.com/en/communities/data-reviewer/

4.8.3 System Requirements

Because Data Reviewer runs only inside ArcMap and cannot be run as a stand-alone application, ArcMap must be installed on any computer before Data Reviewer can be installed. Computers running Data Reviewer must therefore meet ArcMap’s minimum system requirements, which can be found at http://desktop.arcgis/en/system-requirements/latest/arcgis-desktop-system-requirements.htm.

4.8.4 Automated Quality Control Software: Esri Data Reviewer and Custom ArcToolbox

MDOT MAA has an established set of automated quality control tests for file geodatabases that utilize ESRI's Desktop Data Reviewer extension. These batch files, known as ".rbj" files, will be shared with all Consultants to set expectations for data quality. The ".rbj" files will be provided at the same time as the geodatabase checkout or replica.

A custom ArcToolbox will also be provided at the same time as the geodatabase checkout or replica. This toolbox automatically creates two feature classes necessary for the Data Reviewer batch files to run. Consultant's Data Editors are expected to run the ArcToolbox and batch files on edited data prior to delivery to MDOT MAA. It is suggested that the tests be used early and frequently to ensure data integrity while establishing and executing editing processes, however the only requirement will be prior to delivery to ensure that the data passes the tests.

4.8.5 Usage

MDOT MAA will create all of the baseline tests to be performed on data during editing and make the tests available to the Consultant's Data Editors. The Data Editors will first run the custom ArcToolbox to generate two feature classes and then run the batch files until the data returns a clean report, meaning there are no errors. Both the ArcToolbox and batch files can be run multiple times as the data errors are cleaned up. The data will then be submitted to MDOT MAA, at which point the same set of tests will be re-run by MDOT MAA to ensure compliance. Any failure noted once data has been delivered to MDOT MAA will result in the entire dataset being rejected and returned to the Consultant for corrective action and resubmittal.

4.8.5.1 Required Tests

Automated quality control tests are developed for each feature class within a feature dataset and are self-documenting. The tests will share basic similarities across similar features, with customizations occurring on checks for logical consistency between attributes.

The following automated checks have been set up for each feature class:

A. Database Validation Checks – Validates coded value domains to ensure that all values meet domain constraints.
B. Default Checks – Invalid Geometry Check under Default Checks finds features whose geometry is empty, nothing, or not simple, as well as features with empty envelopes.
C. Advanced Checks – Custom checks for logical consistency between attributes that return values that do not conform to custom SQL statements.
D. Feature on Feature Checks – Evaluates the spatial relationship from the same or two different feature classes.
E. Duplicate Geometry Checks – Find features of the same geometry type that are collocated.

4.8.5.2 Data Acceptance

Data acceptance will be based on data performance using automated tests and visual inspections. Any single failure of edited data will constitute total failure of the data delivery and it will be returned to the Consultant for corrective action and resubmittal.

4.8.5.3 Exceptions

In cases where features fail a data reviewer check but have a valid exception, the Consultant shall provide MDOT MAA with the file geodatabase used for the Data Reviewer session. This geodatabase must have all corrected features removed from the reviewer table and should only contain the exceptions. The Consultant shall include a brief reason that the feature is exempt from the check.

4.8.6 Visual Quality Control Tests Using Sampling

While automated data review will catch systematic errors, the only way to evaluate data content is through a visual quality control process. Visual quality control processes will ensure that features are stored in correct feature classes, drawings are interpreted correctly, and attributes are correctly populated. Data Reviewer can be used to facilitate this process by selecting a random sampling of features for visual review.

Visual review will be based on the best practices and editing guidelines for a specific feature class.

5.1 Introduction to BIM

5.1.0 General

The MDOT MAA Building Information Modeling (BIM) Standards identify BIM-based modeling requirements for Baltimore/Washington International Thurgood Marshall (BWI Marshall) and Martin State (MTN) Airports projects. The model deliverable provides an "As Constructed" deliverable to MAA for configuration management, operations, and maintenance. The MDOT MAA recognizes the National BIM Standards definition for BIM:

"BIM is a digital representation of the physical and functional characteristics of a facility. BIM is a shared knowledge resource for information about a facility, forming a reliable basis for decisions during its lifecycle, and defined as existing from earliest conception to demolition." -National Institute of Building Sciences

This document is for design and construction service providers. MDOT MAA project consultants shall understand how the requirements affect their roles, project delivery, and deliverables. MDOT MAA assumes the reader has skills and knowledge of CAD and BIM project workflows, modeling methods, derived construction documentation, and the standard industry terms used in this document.

This standard, as part of the MDOT MAA Planning and Engineering Guidelines & Standards (PEGS), provides the basis for CAD, GIS, and BIM for MDOT MAA projects. Section 5.1.6 Referenced MDOT MAA Documents and National Standards contains other referenced standards.

TABLE 5.1-1: ACRONYMS in DOCUMENT	
3D	Geometry in BIM representing building elements or assemblies
4D	Time sequencing of construction
ASCE	American Society of Civil Engineers
ADM	AIRPortal Document Manager
A/E	The terms A/E (architect-engineer) designer and consultant are interchangeable.
BAS	Building Automation Systems
BIM	Building Information Model, Modeling, Management
BIM Uses	How the project team use the model during the project
BxP	BIM Execution Plan
CAD	Computer-Aided Design
CDE	Common Data Environment
CIM	Civil Information Modeling
CMAR	Construction Manager at Risk
CM	Configuration Management being MAA's activity to use the Record model of a facility or portion of for the Common Data Environment. May be provided by MAA to support the scope of work controlled by MAA
CMMS	Computer Maintenance Management System – Maximo at MDOT MAA
CO	Change Orders
COBie	Construction Operations Building information exchange
CSI	Construction Specifications Institute
Cx	Commissioning
DBB	Design Bid Build
DD	Design Development
EDI	Electronic Data Interchange
e-Transmit	Electronic exchange process tool
FAA	Federal Aviation Administration
Field	Mobile access to documentation
FFE	Furniture, Fixtures, Equipment

GC	General Contractor
GIS	Geographic Information System – ESRI at MDOT MAA
IFC	Industry Foundation Classes
LoD	Level of Development – the geometric and data accuracy of the model elements
NCS	National CAD Standard
Nora	Notice of Recommended Award
NTP	Notice to Proceed
NSF	Net Square Footage
MAA	Maryland Aviation Administration
MDOT	Maryland Department of Transportation
MEPFT	Mechanical, Electrical, Plumbing, Fire Protection & Telecom (The National CAD Standard “T” discipline includes security)
pegs	MDOT MAA Planning and Engineering Guidelines & Standards
RFI	Request for Information
SOW	Scope of Work
XREF	eXternally REFerenced file inserted in a current drawing using the AutoCAD “ATTACH” command.

5.1.1 MDOT MAA INFORMATION MANAGEMENT STRATEGY

BIM adoption is part of the MDOT MAA multi-year strategy to develop a Common Data Environment (CDE) integrating planning, design, construction, operations, and facilities management information. The CDE will integrate BIM project data and geometry as “ground truth” into other applications (CMMS and GIS technologies) used as part of its operational workflows.

Figure 5.1-1. MDOT MAA’s Common Data Environment (CDE)

- BIM - Building Information Modeling
- CIM - Civil Information Modeling
- GIS - Geographic Information Systems
- CMMS - Computer Maintenance & Management System
- BAS - Building Automation Systems (sensors)
- FIELD - Mobile access to documentation

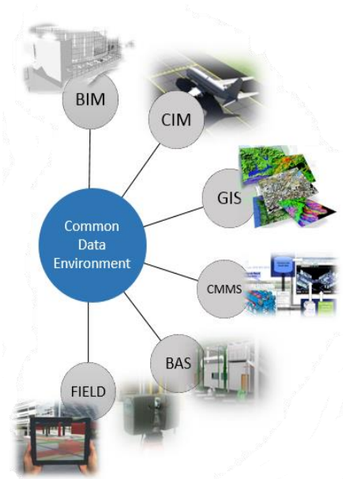


Figure 5.1-1- Common Data Environment

5.1.2 BIM Benefits and Goals

BIM is a process requiring standards, modeling strategy, and planning to maximize the benefits throughout the project lifecycle. It is necessary to *"Begin with the End in Mind*." Benefits accrue throughout the project lifecycle into asset management and operations. MDOT MAA's goal is to work with teams that maximize BIM benefits (see Figure 5.1-2) on projects and manage the demands of airport construction.

DESIGN BENEFITS	CONSTRUCTION BENEFITS	OPERATION BENEFITS
Improved Collaboration and Coordination • Model integration and coordination. identifies conflicts • Conflict resolution produces better design documentation. • Cloud-based collaboration improves design transparency. **Informed Design Decisions** • Visualization reduces ambiguity • Model analysis simulates performance **Reduced Documentation Errors** • BIM automates construction views • Less effort on drawing changes and document reviews. • BIM reduces RFIs and Change Orders	**Value Engineering** • Contractors problem solve and value-engineer using virtual prototypes • Quantity take-offs produce more accurate estimating. Schedules are animated to show construction phases. **Virtual Conflict Resolution** • "Clash Detection" identifies conflicts between trades before construction reducing change orders, delays and unexpected costs. **Pre-Fabrication and Site Logistics** • Off site pre-fabrication reduces installation time, logistics, and material waste. • Site planning and logistics are modeled for safety	**Asset Inventory** • COBie data integrates with Maximo saving resources populating facility management systems • Cloud-based collaboration improves design transparency. **Geospatial and AIRPortal Integration** • BIM and GIS integration supports visual business AIRPortal uses. • Model analysis simulates performance **Business Analysis** • BIM, GIS, and CMMS (Maximo) tools integrate analysis capability to asset information supporting reality-based planning and simulation.
INTEGRATED DATA and MOBILE ACCESS to INFORMATION		

Figure 5.1-2- BIM Benefits

5.1.3 When to Use BIM on MDOT MAA Projects

Not all design and construction projects will require BIM. However, all interiors and facility projects, regardless of size, shall use BIM, and the model shall be a deliverable.

Table 5.1.2 is used by MDOT MAA to determine when a project requires BIM, which depends upon the project type, complexity, size, and cost. The use of BIM on a project will be outlined within the project scope of work, RFP, and reflected in the project deliverables. If a design team chooses to use BIM as their preferred design process, then follow the MDOT MAA BIM Standard which specifies Revit as the BIM authoring tool

TABLE 5.1-2: MDOT MAA BIM PROJECT MATRIX

PROJECT TYPES	BIM USE	REQUIREMENTS			BIM DELIVERABLES
		DESCRIPTION	BxP	CLASH	
MDOT MAA Studies	Optional at discretion of MDOT MAA	Schematic model, design options, reports, visualization.	No	No	TBD by MDOT MAA based upon SOW. Any model developed becomes a deliverable
Architectural Design to 30%	Required	Some projects are ended at 15%-30%. If preliminary modeling is required follow the BIM Standards. LOD 200 – 300 and BIM Uses	Yes	Yes	BxP, 30% model, 30% documents
Small Projects - <500,000	Optional at discretion of MDOT MAA	Small area,single or few disciplines - BIM if specified in SOW process	Yes, if BIM	Yes, if BIM	60-100% model, documents, As-Built documents. Record model, DWGs
Projects > $500,000 construction cost	Required	BIM per MDOT MAA Standards	Yes, if BIM	Yes, if BIM	60-100% model deliverables, As-Built documents, Record model.
New Construction	Required modeling and BIM Uses per SOW	Major discipline models, construction documents, reports	Yes	Yes	30-60-100% Model and Documents (PDF) during Design Conformed models after BID Project close-out As-Built documents, Revit Record model LOD 300 - 450 Navisworks model including Shop models DWG Floor Plans for GIS MAA Asset Spreadsheet (COBie based)
Building Renovation					
Building Systems Replacement or Renovation		Primary equipment in building system, Architecture, MEP			
Building Permit Tenant Projects	As required by MAA	Per SOW	Yes	Recommended	

5.1.4 Model Terminology and Definitions

MDOT MAA uses the following modeling terms and modeling relationships throughout project execution (Figure 5.1-3).

5.1.4.1 Study Model – BIM Optional

MDOT MAA may require BIM (Revit) use for study reports. It may be necessary to analyze the design, document options, or illustrate study findings.

5.1.4.2 Existing Conditions Model – Revit

Not all projects have existing facility information. At the beginning of a project, MDOT MAA may provide a model as part of existing documentation. If not, then the consultant shall produce a model to support the project scope of work.

A. Creating a Model of Existing Conditions
The consultant will use the MDOT MAA Revit template for model creation. Define the Level of Development (LOD) of model elements in the BIM Execution Plan (BxP). Laser scanning may be used as a basis for the model.

B. Receiving an Existing Condition Model from MDOT MAA
MDOT MAA may provide a model of the project area. The model LOD and accuracy will be confirmed at the MDOT MAA BIM/GIS Kick-off meeting. Document further model development in the BxP.

5.1.4.3 Design Intent Model – Revit

The Design Intent model is developed throughout the design phases. It is the basis for project collaboration, coordination, analysis, stakeholder reviews, and decisions. Most elements are LOD 300, others LOD 350 - 400 based on project requirements. The LOD matrix, part of the BxP, identifies an item LOD. Teams resolve discipline model conflicts periodically, as stated in the BxP. MDOT MAA reviews all model submissions for standards compliance. The 100% Design Intent model and derived construction documentation shall be coordinated and free of significant element conflicts and errors.

MDOT MAA will review and provide written comments on the various model submissions (documented in the BxP) for standards compliance. Comments requiring model changes will be updated for the following model submission and be compliant for the Bid process. Models and construction documentation are project deliverables per Section 5.4, Table 5-4.1.

5.1.4.4 Bid Model – Revit

The Bid model, provided by MDOT MAA to bidders, is the revised 100% Design Intent model. Responses to Bidder's questions/comments submitted to MDOT MAA and design modifications or clarifications are issued as Addenda during the Bid process.

Bid models are created and submitted for DBB projects only. CMAR projects do not have a Bid phase.

5.1.4.5 Conformed Model – Revit

The Conformed model is the Bid model with all addenda incorporated by the design consultant. The winning contractor will receive the model after the initial NTP at a model handover meeting.

Conformed models are created and submitted for DBB projects. CMAR projects have an "Issued For Construction" model which is the final/100% Design Intent model with all addenda incorporated.

5.1.4.6 Construction Model – Revit and Navisworks

The Conformed model is a basis for additional construction modeling. This work provides detail and information for construction through shop modeling, constructability reviews, and product data. Construction BIM Uses will be documented in the BxP.

Navisworks is an approved tool for construction and shop model integration, constructability reviews, and clash detection. The Navisworks model is a final deliverable.

A. Construction Model – Revit
   The contractor will use the Revit Conformed model as a basis for construction modeling.
B. Construction Model – Navisworks
   The contractor will use Navisworks to integrate Revit modeling with shop models for clash detection and coordination. The Navisworks reports are provided to MDOT MAA, showing clash issues and resolution. The Navisworks model is updated with as-built information and is a deliverable as per Section 5.4, Table 5.4-1.

5.1.4.7 As-Built Drawings - Navisworks Model and.DWG Drawings

The contractor regularly provides as-built information to the design consultant to produce the Record model (Revit). Contractor supplied .dwg drawings may be required per the SOW. Dwg files shall conform to the layers defined in PEGS V1, Chapter 3 CAD Standards Layers within the MDOT MAA Revit template. Other layers may be added based upon project content. These layers shall be identified in the BxP. The Navisworks model deliverable contains the approved shop models, as-built data, and additional LOD detail.

5.1.4.8 Record Model – Revit and COBie Spreadsheet

The Record model is the Conformed model updated with as-built information supplied by the contractor. The Record model is LOD 300 or higher per element. Joint reviews of as-built conditions will facilitate knowledge transfer.
The COBie spreadsheet, per project SOW, is a model export providing asset data (building systems and equipment data) required by the MDOT MAA.

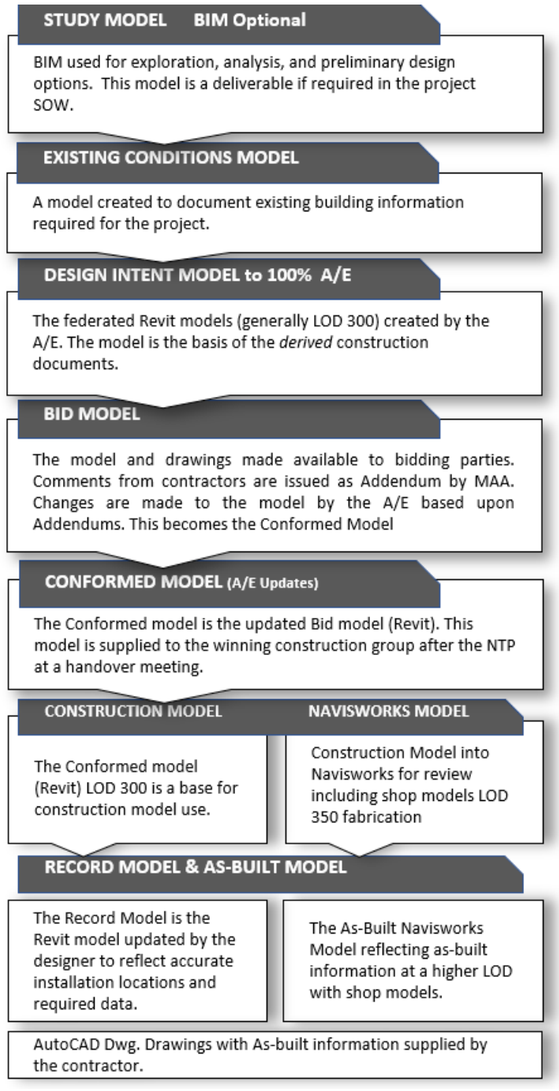


Figure 5.1-3 - MDOT MAA BIM Models

5.1.5 Model Progression by Contract Method

MDOT MAA uses Construction Manager at Risk (CMAR) and Design, Bid, Build (DBB) contracts on projects. These contracting methods must be determined at project inception as they alter model progression and handoff between parties.

5.1.5.1 Construction Manager at Risk (CMAR) BIM Model Progression

CMARs provide preconstruction services, collaboratively work with the design consultant, and maximize BIM, project cost, and schedule. A joint BxP created by the consultant and CMAR documents the services to be provided. The consultant updates model submissions with the CMAR and MDOT MAA comments during the project. These projects do not have a Bid model. The final/100% Design Intent model is developed collaboratively by the team with Addenda issued as necessary to support efficient construction procurement and delivery. The resulting documents are the Issued For Construction set and model.

Once construction begins, the CMAR serves as the project's general contractor, constructing the project with company crews or subcontracted trades. The CMAR retains the responsibility for monitoring design—coordinating any design changes, advising the owner on any design modifications, and coordinating approval of shop drawings with the consultant. During construction, the CMAR provides as-built updates and equipment data for Record model creation. The as-built Navisworks (350-400) model and .dwg drawings per SOW are deliverables. The design consultant creates the Record model using the submitted as-builts.

5.1.5.2 Design, Bid, Build (DBB) BIM Model Progression

The Design BIM Manager shall submit the Design Intent model for MDOT MAA review at each design phase. The reviewed and updated 100% Design Intent model becomes the Bid model set. Bid models and the derived construction documents are part of the DBB project Bid package. The bidding contractors are provided the Bid models during the Bid process. Comments and model issues are submitted to MDOT MAA. MDOT MAA will address comments via addenda. This updated model becomes the Conformed model, which is provided to the winning contractor (GC) after NTP at a model handover meeting.

The contractor shall supply as-built information to the consultant to update the Record model (Revit). The As-Built model (Navisworks LOD 350 - 400) and CADD (.dwg) files reflecting as-built information are deliverables. The CAD drawings (.dwg) shall conform to PEGS V1, Chapter 3 CAD Standards, reflecting as-built conditions.

5.1.6 Referenced MDOT MAA Documents and National Standards

The MDOT MAA Planning and Engineering Guidelines & Standards (PEGS) contain the current design, CAD, and GIS guidelines for projects. This BIM document references these standards to decrease redundancy and conflicts. Introducing BIM on projects does not negate the requirements identified in these standards. Additional referenced standards include:

TABLE 5.1-3: ADDITIONAL REFERENCED STANDARDS
MDOT MAA GIS Data Standards Utilities Supplement
MDOT MAA Data Quality Standards
MDOT MAA Data Security Standards
MDOT MAA Building & Space Naming, Identification, Addressing, and Measurement Standard
MDOT MAA Planning and Engineering Guidelines & Standards (PEGS)
MDOT MAA Asset Management Standard
BIM RELATED STANDARDS
MDOT MAA Revit template
National BIM Standards – National Institute of Building Sciences (NIBS)
COBie (Construction Owner Building Information Exchange) - NIBS
OmniClass - Construction Specification Institute (CSI)
BIMForum Level of Development (LOD) - Associated General Contractors (AGC)

5.1.7 Access to Documentation and Templates

The MDOT MAA provides consultants access to content through AIRPortal. https://www.airportal.maa.maryland.gov. Relevant content is available on the landing page and does not require a login. MAA MDOT will provide the information if it is not currently on AIRPortal.

TABLE 5.1-4: CONTENT AVAILABLE THROUGH AIRPortal
PEGS V1, Chapter 3 CAD Standards
Linetypes

Symbols
Logos
MDOT MAA Additional Topographic Symbols
Layer Template – X000-Geom.dwg
MDOT MAA Planning and Engineering Guidelines & Standards
MDOT MAA Signage Symbols
Plot Styles (ctb)
Standards Borders
Standards Title Block, Index Sheets
BIM Execution Plan Template
MDOT MAA Revit Template
MDOT MAA BIM Standard
MDOT MAA Asset Management System Data Delivery Standards

5.1.8 Approved BIM Software

TABLE 5.1-5: SOFTWARE USE	APPROVED APPLICATION NAME
BIM Authoring Tool	Autodesk Revit (Architecture, MEP, Structure)
CIM Authoring Tool	Autodesk Civil 3D
Model Checking Tool	Navisworks, Autodesk Model Checkers, Solibri, Revizto
Drawing Submissions	e-Transmit
Document Review	Bluebeam and Autodesk Design Review
Collaboration Tools	BIM 360 Design, Docs, Build

MDOT MAA uses Autodesk™ Revit software as its primary BIM authoring application. Other BIM authoring tools require MDOT MAA approval. Secondary tools for Revit, such as library management (UNIFY or others) or BIM 360 Design for collaboration, are part of the service providers' BIM environment documented in the project BIM Execution Plan (BxP).

5.1.9 BIM and Data Ownership

MDOT MAA shall have unlimited rights to all information and materials developed under a contract and furnished to the MDOT MAA, including all reports and listings, and all other items about the work and services according to its agreements, including any copyright. Unlimited rights under its contracts are rights to use, duplicate, or disclose data and information, in whole or part in any manner and for any purpose whatsoever without compensation to or approval from Contractor. The MDOT MAA will at all reasonable times have the right to inspect the work and will have access to and the right to make copies of the items mentioned above. All digital files and data, and other products generated under MDOT MAA contracts shall become the property of the MDOT MAA.

5.1.10 Waiver of BIM Standards Requirements

If a modification to a BIM requirement is in the best interest of the project, then a written waiver identifying the change, purpose, and alternative shall be submitted via email to the MDOT MAA for approval. Include the MDOT MAA PM on the email. After approval, document the changes in the BxP. E-mail address maapegsstandards@bwiairport.com.

5.1.11 Quality Assurance

The efficiency of the BIM process and the value of the construction documents depends upon model structure, level of development (LOD) accuracy, periodic model review and clash detection resolution, and quality control procedures. Plans, sections, elevations, essential details, schedules are ***derived*** from the model and have minimal 2D drafting. The consultant is responsible for seeing that all electronic files are compliant with all applicable MDOT MAA Standards and Guidelines.

The MDOT MAA Revit template is the base file for design. The Design BIM Manager shall periodically review the federated discipline models for conflicts using Navisworks, Autodesk Model Checker, or Solibri model checking tools. The clash/conflict reports are project deliverables. These reports will include the conflict type, number of specific conflicts, and the schedule for resolution by the design team.

Construction documentation is derived from conflict checked and resolved models with a minimum of 2D drafting on details. Schedules are reported from the model. The MDOT MAA BIM Manager will review model submissions for standards adherence, conflicts, and errors. The 100% model shall be free of reported errors and clashes before accepting the 100% model.

5.2 Model Management Standards

5.2.0 General

Several BIM management standards are part of the National BIM Standard. MDOT MAA uses several included in the MDOT MAA Revit Template.

5.2.1 Model Level of Development (LOD)

LOD defines the visual complexity and data reliability of a BIM object. Object LOD assignments are documented in the BIM Execution Plan (BxP). Objects carry the LOD, not the model; however, based upon most objects' LOD, a model is said to have general LOD. The Associated General Contractors (AGC) BIMForum and National Institute of Building Sciences (NBS) have jointly developed the Level of Development (LOD) Specification for BIM. A copy of the AGC LOD Specification is available on the AGC webpage http://bimforum.org/lod/.

5.2.1.1 Graphic Accuracy

MDOT MAA requires the design team to accurately model object size and location so that the contractor can use the model with a confident understanding of accuracy. Door offsets, outlet heights, walls on slabs, cut-throughs, and proper height, ceiling tiles with referenced lighting fixtures from Mechanical, Electrical, Plumbing (MEP) models are all part of LOD accuracy. These conditions should be reviewed by the design team as part of QA/QC and submit models with LOD accurate objects. The accuracy of placement can be more important than a highly detailed object.

5.2.1.2 Data Reliability

LOD also supports the reliability of data. At 100% documentation, elements should be at LOD 300 in terms of graphic accuracy and data reliability. The Record model is a minimum LOD 300 graphically with as-built and as-installed product data at LOD 350 – 400. Use the LOD matrix and the MDOT MAA Asset Management Requirements to determine the level of effort for data.

5.2.2 Level of Development Definitions

LOD 100 – Schematic representations of elements, not accurately placed or identified, or volumes for space reservation.
LOD 200 – Elements are generic but recognizable placeholders in approximate locations. Data is approximate.
LOD 300 – Elements are accurate. The type, quantity, size, shape, location, and orientation of the element as designed can be measured directly from the model without referring to non-modeled information such as notes or dimension callouts. All parts are accurately located to the project origin, nearby, and attached elements. Building systems components are connected. Data is accurate for design intent and performance.
LOD 350 – Shop model and fabrication installation accuracy.
LOD 400 – Represents modeling at a shop drawing level and data of the As-built condition. LOD 400 is ***graphically*** higher than is necessary for MDOT MAA Record models. LOD 300 graphics with accurate as-built location and data for MDOT MAA Maintenance and Operations. MDOT MAA requires the NavisWorks model as a deliverable that includes Shop model and as-installed components supporting MDOT MAA maintenance repairs or remodeling.
LOD 500 – Facilities management – MDOT-MAA does not use this designation for projects.

Examples of various LODs are shown in Figures 5.2-1, 5.2-2, and 5.2-3.

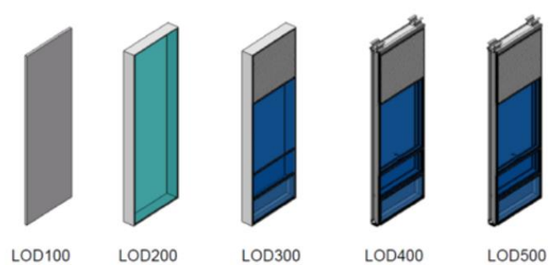
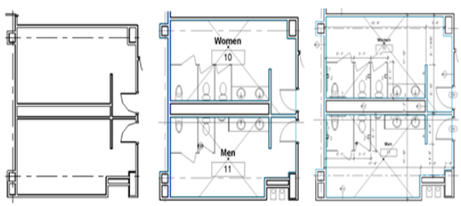


Figure 5.2-1 – LOD of Wall Assemblies

LOD 100 LOD 200 LOD 300 LOD 350 LOD 500

Figure 5.2-2 – HVAC LOD



LOD 100 LOD 200 LOD 300

Figure 5.2-3 – LOD of Plan Graphics

5.2.3 Data Management

MDOT MAA building, space, and equipment data are strategic assets that must be maintained to preserve value. Teams working on MDOT MAA projects must ensure that data standards, terminology, OmniClass, and COBie are maintained during project phases, submissions, and the transfer between software applications. MDOT MAA uses the following data standards:

A. MDOT MAA will use the National Institute of Building Sciences (NIBS) COBie template to transfer information from BIM to Maximo (MDOT MAA's asset management system)
B. Level of Development (LOD) – Associated General Contractors (AGC) and National Institute of Building Sciences (NIBS) standard for graphic detail and data reliability. Use the current version distributed by AGC. http://bimforum.org/lod/
C. BIM to GIS Handover
D. PEGS V1, Chapter 4 GIS Standards
E. The National CAD Standard (NCS), current version. Layers used in the MDOT MAA Revit template are listed in PEGS V1, Appendix 1D.1 Layer Development. Using new layers, not in the Revit template, requires written permission from the MDOT MAA BIM Manager.

5.2.3.1 OmniClass Building Classification Tables

Assign OmniClass to all spaces, building systems, and products. Spatial areas must maintain MDOT MAA naming, abbreviations, and codes. OmniClass is used to name model worksets to define the workset content.

TABLE 5.2-1: OMNICLASS TABLES	PURPOSE in BIM
Tables 13 and 14	Combined for project spaces
Table 23	Equipment
Table 21	Building systems
Table 22	Assets and products

5.2.3.2 Asset Management (COBie) Requirements

1. The consultant's fee proposal must take into account the asset information deliverable requirements (including extended attributes) during Phase II (Design) and Phase III (Construction Administration) of the project.

2. Methods for COBie data development and maintenance shall be defined in the BxP. COBIE data shall be included in each object's properties and used to generate the COBie schedules. It will be the responsibility of the consultant to create and maintain COBie schedules within the design model and be populated with the fields as defined in MDOT MAA's BIM Standards. These templates should be populated with the available data prior to submission to the

construction contractor. Population of COBie data is an iterative process that starts with the consultant developing the COBie spreadsheets (based on the COBie templates) during the design phase in close coordination with the MDOT MAA's Asset Management team. Once the construction contract is awarded, the consultant's COBie spreadsheets, partially populated with specified asset data, shall be turned over to the contractor to fill in the details of the as-installed/constructed assets.

3. The contractor is responsible for delivering the completed COBie spreadsheet to the designer and MDOT MAA for review as part of its final deliverables. In a BIM project, COBie spreadsheets shall be generated from design Revit model files including model and element ID information. After the contractor fully populates construction-related information and returns it to the consultant, information must be loaded into the Revit project for assessment and verification. The updated design model becomes the record model that is delivered to MDOT MAA along with an updated set of Revit-generated COBie spreadsheets.

4. Consultants will be required to participate in periodic meetings with the MDOT MAA's Asset Management Coordinator and separately with MDOT MAA's BIM Coordinator during the design and construction of the project.

5. When a project involves LIDAR data collection, the consultant must submit the LIDAR point cloud file. Depending on the contract scope and requirements, it may be necessary to update the record model using point cloud data to align model components with their real world position and orientation.

5.2.4 BIM Objects

BIM object refers to an individual building product or assembly in a model. All BIM objects must have an OmniClass product descriptors found in OmniClass Tables 21 and 22.

5.2.4.1 BIM Object Authoring

All new objects must use the provided tool, family, and type within the software. For example, a BIM software's *wall* tool must be used to create a wall. A drafted wall is not permitted.

5.2.4.2 New Object Criteria

Objects are named, typed, and classified for the real-world element it represents. All objects must accurately report from the software, rather than be unassigned, graphic primitives. Proper naming allows associated information to be correctly updated, published, and available for export. Generic, miscellaneous, or unspecified categories are not allowed.

Global Properties increase modeling value and performance. Attributes of any given object will reference global properties for its respective category. For example, a "Width" property for one piece of equipment must use the same global property for Width universally within the same category. Additional properties, meaning the same characteristic, are not allowed. (i.e., width1, Object Width, etc.)

BIM authoring software object libraries will be used when creating objects, whether they are actual 3D objects or 2D representations. Models must be populated with the software's objects for building products. Geometric lines, arcs, and vertices are not allowed. Objects are necessary to enable classification and reference keynoting (such as the Unified Facilities Guide Specification (UFGS) or MASTER SPEC numbering.)

5.2.5 GUID – Globally Unique Identifier

The Globally Unique Identifier (GUID) is a universally unique number assigned by the software to every element within the model. The GUID must be preserved during export in exchange formats such as IFC and COBie (Construction Operations Building Information Exchange).

5.2.6 Properties and Annotations

Object properties will be populated. The model(s) and objects must contain the appropriate non-graphical data to accurately support the automatic population of annotation tags and schedules from the BIM software.

All general annotations must comply with PEGS V1, Chapter 3 CAD Standards. Where the MDOT MAA Standard does not explicitly define an annotation standard, the latest version of the National CAD Standard applies.

The models must use the appropriate tool within the BIM software designed for that purpose.

1. All references, including but not limited to, elevations, sections, plan, and detail callouts or marks, must be created using the appropriate tools/commands and remain dynamically connected throughout the project. Do not use manual overrides.
2. The Title block identification values (e.g., sheet number and sheet name) must be associated and automatically populated and remain current throughout the project.
3. Annotation symbols such as tags are to read from and display information contained within the model properties.

5.3 BIM Management

5.3.0 General

The BIM teams shall maximize BIM capability to meet project goals. BIM managers will attend project kick-off meetings to understand MDOT MAA project goals and the scope of work. BIM Managers will then interpret these into BIM requirements and uses for the project to define the necessary members of the project BIM team. The BIM team will manage model development, submissions of the models, and documentation throughout the project phases. The Design BIM Manager has the responsibility for the design BIM Execution Plan (BxP).

5.3.1 BIM Roles, Responsibilities, and Expertise

The consultant and contractor shall designate a BIM Manager responsible for BIM execution per the project scope of work (SOW). Team member roles are shown visually in Figure 5.3-1 and described in Table 5.3-1. Additional team members shall be assigned accordingly per the SOW, BIM Uses, and project complexity.

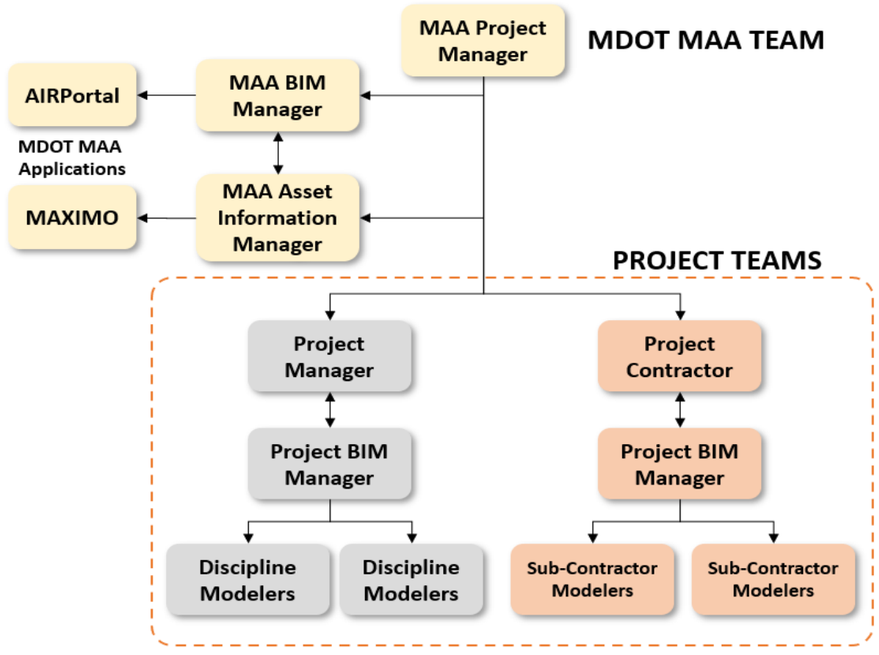


Figure 5.3-1 – BIM Teams

TABLE 5.3-1: BIM ROLES and RESPONSIBILITIES	
MDOT MAA PM	**MDOT MAA PROJECT MANAGER** – is the MDOT MAA representative with project management and oversight responsibilities on behalf of the MDOT MAA. The PM manages all aspects of the project to achieve the project goals. The PM works closely with the MDOT MAA BIM Manager on BIM schedule, deliverables, and data handovers.

MDOT MAA CMi	**CONSTRUCTION MANAGER/INSPECTION** – is the MDOT MAA representative during construction. This group will have oversight and review authority on BIM deliverables and the BxP per the SOW.
MDOT MAA BIM Manager	**MDOT MAA BIM MANAGER** – The MDOT MAA BIM Manager reviews and provides oversight on BIM requirements and deliverables.
MDOT MAA Cx	**COMMISSIONING TEAM** – A Commissioning team, if used, may request the model or model data for the commissioning process.

A/E - DESIGN BIM TEAM		**GC - CONSTRUCTION BIM TEAM**	
Design BIM Manager		**Construction BIM Manager**	
Manages the use of the MDOT MAA Revit Template; provides oversight of model structure, development, and integration of discipline models; determines model/s information; maintains construction documentation, quality, submissions, and team collaboration		Overall execution and use of BIM and construction documentation for the development of Shop models, constructability reviews, quantity take-off, and the As-Built information.	
Discipline Modelers	Major disciplines modeling teams with the expertise to develop these models and provide analysis as needed per the project SOW	**Fabrication Modelers**	Sub-contractors' BIM modelers managed by the Construction BIM Manager. Use the Design Intent model or other approved tools for fabrication.
BIM Use Modelers Rendering, Animation, Public Presentations Separate team members may be assigned as a visualization task coordinator, estimator, LEED analyst per the SOW. Reports to the Design BIM Managers		**BIM Use Modelers** Different teams may supply schedule (4D), estimating, (5D), and construction logistics visualizations tasks per the SOW. Teams report to Construction BIM Manager	
QA-QC – Model Management A separate team member may be designated as QA/QC task coordinator for model and data checking, model integration, and other multi-disciplinary activities. Reports to the Design BIM Manager.		**QA-QC – Model Management** A separate team member may be designated as QA/QC task coordinator supporting the As-built model, data checking, model integration, and other multi-disciplinary activities. Reports to the Construction BIM Manager.	

5.3.1.1 BIM Manager (Consultant or Contractor) Expertise and Responsibilities

The BIM Manager shall have an in-depth technical knowledge of Revit modeling and structure, project delivery, and BIM processes. They can manage teams and convey instructions to designers and other modelers. BIM Managers shall have experience interpreting what BIM uses to meet project goals for the BxP creation and updates for the project. BIM Managers:

A. Ensure compliance with MDOT MAA BIM standards and manage QC program
B. Develop, maintain, update, and provide clarifications to the BxP
C. Manage model creation and review across discipline teams or trades during construction
D. Participate in project meetings for BIM review.
E. Lead and facilitate BIM meetings
F. Manage and coordinate team modelers
G. Verify geo-references in all associated discipline models
H. Schedule periodic design coordination and construction coordination reviews
I. Manage submissions
J. Manage 2D Drawing, and BIM derived information production
K. Develop submission packages for design or construction handover to MDOT MAA and other parties

5.3.1.2 Discipline, BIM Users, and Fabrication Modelers

BIM teams require multiple areas of expertise. Discipline modelers are trained professionals in the discipline combined with BIM expertise. BIM Use modelers have additional software expertise that makes use of the Revit model.

A. Have professional expertise in the discipline to be modeled
B. Ability to review multiple discipline models for coordination and review
C. Object creation and best practice expertise for project use
D. Ability to derive and create documentation views and details from the model

E. Understand and adhere to standards
F. Fabrication modelers can utilize design intent models for fabrication through Revit or other fabrication software
G. BIM Use modelers use the model for analysis, rendering, animation, or other required uses beyond Revit capabilities

5.3.2 Project Kick-Off Meeting – BIM Participation

The MDOT MAA BIM Manager will work with the design team to define project BIM Uses and the model development strategy based upon MDOT MAA standards to achieve project goals. The BIM team must be aware of the downstream contractor, and MDOT MAA BIM uses to develop their model/s accordingly.

A. The MDOT MAA BIM Manager shall attend regular project review meetings and facilitate model uses to support MDOT MAA decision processes.
B. Regular BIM team meetings will be held to maintain the modeling schedule, model coordination, and quality control.

5.3.3 BIM Execution Plan (BxP) Development

Projects have different characteristics based upon scope, contract type, project type, assets, and type of construction, which illustrates why a common BIM package for all MDOT MAA projects is not possible. The BxP identifies and documents the model uses on the project, its structure, and responsible parties. It details the schedule for BIM development, LOD progression, model coordination activities, model structure, and required asset data. The BxP is a deliverable per Section 5.4, Table 5.4-1. The BxP provides the following information:

A. Project information
B. BIM goals & uses
C. Each project member's role, staffing, and competency, contact information
D. BIM process and strategy
E. BIM exchange protocol and submittal format
F. BIM data requirements including additions to the MDOT MAA data naming conventions for new instances
G. Collaboration and discipline model referencing procedures for shared models
H. Quality control plan
I. Technology infrastructure & software used

5.3.3.1 BIM Execution Plan (BxP) Templates

There are two templates available to use for the MDOT MAA BxP:

A. MDOT MAA BxP_Template 1 – can be used for all size projects; composed of 2 separate files as follows:
    1. MDOT_MAABxP_Template 1.docx
    2. MDOT_MAABxP_Part2 LODMatrix_Attributes Parameters.xlsx

B. MDOT MAA BxP_Template 2 – typically used for smaller, simple projects
    1. MDOT MAA BxP_Template 2.xlsx

Consultants shall confirm with the MDOT MAA BIM Manager, which template to use based on the complexity of the project.

5.3.3.2 BIM Execution Plan (BxP) Phases

The BxP documents the technical coordination of the model across teams. BxP development has two stages: the Design BxP and the Construction Phase BxP. Consultants and contractors must submit a BxP for their phase of the project for approval. The Design BxP is a contract deliverable as per Section 5.4, Table 5.4-1. As a contract deliverable, it provides documentation about the project BIM use and is a tool supporting post-project model use.

On DBB projects, the Design BxP is provided to the contractor. The contractor builds upon the Design BxP by adding additional information for the construction phase, which becomes the Construction Phase BxP.
On CMAR projects, the consultant and CM team jointly prepare the BxP. This combined plan is also called a Project Execution Plan (PxP).

5.3.4 BIM Uses

BIM Uses identify modeling tasks for the project, responsible parties, LOD, referenced standards, and the desired outcomes. BIM Uses are defined in the BxP for the design and construction phases. Below is a table of MDOT MAA recognized BIM Uses. Others may be added to the BxP.

TABLE 5.3-1: BIM USES for MDOT MAA			PARTICIPANTS				
No.	**BIM USES**	**GENERAL DESCRIPTION**	**A/E**	**GC CMAR**	**CMi**	**Cx**	**MAA**
BIM Uses 1-17 by MDOT MAA Document all BIM Uses in the project BxP							
1	**Existing Conditions Modeling**	The model developed from field measurements, existing docs, and laser scanning to produce an accurate existing conditions model. The A/E and the contractor (GC or CMAR) are individually responsible for implementing any process or technology required to field-verify existing conditions needed to perform their contractual obligations.	**X**	**X**			**X**
2	**A/E - Model Authoring**	Various discipline models developed for project design, analysis, and construction documentation	**X**		**X**		**X**
3	**Visualization Animations**	3D model views developed to more realism supporting stakeholder understanding, public reviews, and decision-making processes	**X**	**X**			
4	**Space Program Validation**	Quantify space in the model for variations from project space requirements and codes	**X**				**X**
5	**Fire Safety Review**	Model review of fire suppression system and alarm with the architectural model for interactive FM and Fire System reviews.	**X**		**X**		**X**
6	**Design Analysis**	Analysis of design per scope of work, required egress plan, vertical circulation coordination, energy, and others as required in the SOW	**X**		**X**		
7	**Coordination Reviews**	In-depth reviews of design for coordination. Use Navisworks, Revizto, or Solibri Model Checker for “Clash Detection” and data requirements	**X**	**X**			**X**
8	**Quantity Take-Off Reports**	Reporting on areas, volumes, square footages, objects, and material quantities supporting analysis, validation, procurement, estimating, and building system analysis	**X**	**X**			
9	**Phasing-Modeling (4D)**	Use model phasing tools to show design phases for design planning and scheduling		**X**			
10	**Logistics Modeling**	Modeling and representative views or animations supporting site planning, material and equipment handling, traffic patterns, etc.		**X**			
11	**Construction Sequencing**	4D or views showing construction phases and project development over time		**X**			
12	**3D Trade Coordination**	Use of model checking and “clash - conflict resolution” to verify model/s coordination – A Clash Resolution report is a deliverable		**X**			
13	**Facilities Data Turnover**	As-Built model LOD 300 with accurate data for FM. GC/CMAR will update the LOD 300 model with as-installed data	**X**	**X**	**X**		**X**
14	**Digital Layout**	Use of laser layout equipment for field layout of walls and other elements in the construction		**X**			
15	**Laser Scanning**	Use of laser scanning as a base to develop highly accurate existing models or to capture as-built conditions during construction		**X**			
16	**Digital Cx**	Commissioning (Cx) of the model for data integrity – Use of model in the field during commissioning to verify data	**X**	**X**	**X**	**X**	**X**
17	**Analysis Reporting**	All types of analysis including energy, daylighting, sun studies, LEED, as needed to meet project scope	**X**	**X**			
A/E= Architectural Engineer, GC – General Contractor or CMAR, CMi = Construction Manager inspection Cx= Commissioning Team							

5.4 BIM Project Submissions

5.4.1 BIM Project Deliverables

Table 5.4-1 shows the BIM project deliverables. Exact deliverables shall be discussed with the MDOT MAA BIM Manager. Deliverables must comply with Section 5.4.3 Electronic Submission and AIRPortal Document Manager. Additional project deliverable requirements are mentioned in PEGS V2, Chapter 3 Deliverables.

TABLE 5.4-1: MDOT MAA BIM SUBMISSIONS and DELIVERABLES					
DELIVERABLE		**FORMAT**	**DELIVERY METHOD**	**RESPONSIBLE PARTIES**	**TIMEFRAME**
1	BIM Project Execution Plan (BxP)	Excel or Docx template	As agreed upon in BxP	A/E	20 days after design NTP and at each design submittal, Bid and Conformed submittal (DB or DBB), Issued for Construction (CMAR)
				GC	30 days after NORA (GC) and at intervals requested by the Engineer or MDOT MAA BIM Manager
2	Site Survey Information and Utility Locations	Native, IFC formats, Digital 2D PDF	As agreed upon in BxP	A/E	Before design starts or at 30% submittal
3	Laser Scans (LIDAR)	Native files (Point Cloud) & Processed Digital Model	As agreed upon in BxP	A/E	30 days after scan
				GC	30 days after scan
4	Blocking & Stacking, Phasing Sequencing (Phasing project dependent)	AVI, MPEG, MOV	As agreed upon in BxP	A/E	Concept or 30% design submittal or as required by the MDOT MAA BIM Manager
				GC	Construction phasing submittal(s) or after each Construction Coordination meeting as required by the MDOT MAA BIM Manager
5	Design Coordination and Construction Coordination Reports	Navis and Excel	As agreed upon in BxP	A/E	Each design submittal
				GC	After each Construction Coordination meeting or as required by MDOT MAA BIM Manager
6	Design-Intent 2D Drawings (Building and Site)	DWG, Digital 2D PDF	As agreed upon in BxP	A/E	Each design submittal, Bid and Conformed submittal (DB or DBB), Issued for Construction (CMAR)
7	Design-Intent Model(s) (Building and Site)	Native format, NWD (or equal)	As agreed upon in BxP	A/E	Each design submittal, Bid and Conformed submittal (DB or DBB), Issued for Construction (CMAR)
8	Final Design-Intent Model(s) (Building and Site)	Native format, NWD, IFC, 3D PDF	As agreed upon in BxP	A/E	100% design
9	Bid Model (DB or DBB projects only)	Native format	As agreed upon in BxP	A/E	Bid submittal
10	Conformed Model (DB or DBB) or Issued for Construction (CMAR)	Native format	As agreed upon in BxP	A/E	Conformed submittal (DB or DBB) or Issued for Construction submittal (CMAR)
11	Construction Models, including Fire Protection	Native formats, NWD (or equal)	As agreed upon in BxP	GC	As agreed upon in BxP and at intervals required by the MDOT MAA BIM Manager
12	As-Built Model(s) and As-Built Drawings (Building and Site)	Native format, DWG, Digital 2D PDF	As agreed upon in BxP	GC	Within 60 days after final acceptance (construction completion) or as required by the MDOT MAA BIM Manager
13	Record Model(s) and Record Drawings (Building and Site)	Native format, NWD (or equal), IFC, 3D PDF	As agreed upon in BxP	A/E	Within 60 calendar days after receiving as-builts or as required by the MDOT MAA BIM Manager
14	FM Data (Asset Data)	COBie compliant excel spreadsheet	As agreed upon in BxP	A/E	Each design submittal, Bid and Conformed (DB or DBB), Issued for Construction (CMAR), and Record submittal
				GC	After each Construction Coordination meeting or as required by the MDOT MAA BIM Manager and when as-builts are submitted
15	BIM Submission Review Checklist	PDF	As agreed upon in BxP	A/E	Each design submittal, Bid and Conformed (DB or DBB), Issued for Construction (CMAR), and Record submittal
16	Record COBie Spreadsheet for Maximo	COBie compliant excel spreadsheet	As agreed upon in BxP	A/E	Within 30 calendar days after receiving as-builts

All models shall be submitted in native (.rvt) format for the project and in 2D and 3D PDF format as required. The submittals shall be compatible and editable within Revit or with markup capability in PDF or DWG in BlueBeam.

TABLE 5.4-2: SUBMISSION FILE TYPES	
Construction drawings new and existing	DWG and PDF
Installation permit drawings	PDF
Building permit drawings	DWG and PDF
Space Allocation drawings	DWG and PDF
Model files	.rvt model and associated files
Design, planning, and record drawings	DWG and PDF
Data files	COBie compliant excel spreadsheet

5.4.2 Folder Structure from Consultant Team to MDOT MAA

Models shall be e-Transmitted per Section 5.4.3 Electronic Submission and AIRPortal Document Manager (ADM) with the folder structure below. E-Transmitted versions are snapshots of the model at each submission level. Maintaining consistent file naming and use is critical for referenced (linked) files to function correctly across project teams and for MDOT MAA to retrieve data once the project is complete.
Folders should be supplied for each submission for Civil Drawings as required by the BxP.

FOLDER STRUCTURE for CONSULTANT SUBMISSIONS for BIM	
489 BWI	Campus BWI or Martin
XXX-XXX-XX	Project Folder (Project Number and name)
Concourse A	Building Number/ Name/Level (as required)
Presentations and Images	
2018-01-02 Renderings	Year/Month/Day Name
2018-02-02 Walk-thru - Animations	
2018-03-01 Slideshows	
Photographs	
Scanning	
Study	
Reports	
Model	
CADD	
Phase One – 30% Submission	
BIM	BIM review models during design (Navisworks)
BIM Submission	30% BIM Submission Model
Data Reports	
Phase Two 60% Submission	
BIM	BIM review models during design (Navisworks)
BIM Submission	60% BIM Submission Model
Data Reports	
Phase Three 100% CD	
BIM	BIM review models during design (Navisworks)
BIM Submission	100% BIM Submission Model
CADD	Collection of CAD Drawings Exported from Revit as well as produced in the CAD environment

				Submission Documentation	
				List of Drawings	
				Specifications	
				Cost Estimate	
				Drawings	PDF Format
				Full Size Set	Composite PDF with hyperlinks and bookmarks
				Half Size Set	Composite PDF with hyperlinks and bookmarks
				Individual Sheets	Individual PDFs 1:1 ratio corresponding to each sheet in the set
				Geotech Information	
				Design Report	
				Conformed Model Submission	Updated Model based upon Bid Process reviews and discrepancies
				Project Management	
				BIM Execution Plan	Dated files for additional Submissions
				Action Item Checklists	
				Bid Documents	
				Environmental Permitting	
				Sustainability	LEED or other sustainability documentation
				OFM Issues and Meetings	
				Construction Phase (Four)	
				Construction Schedule	
				BIM	
				Shop Models	
				Coordination Model	
				As-Built Model	
				As-Built Drawings	
				Commissioning	
				FM Data (COBie)	

5.4.3 Electronic Submission and AIRPortal Document Management (ADM)

The electronic submissions process is outlined in PEGS V2, Chapter 3.2 Deliverables by Design Phase. The prime consultant must upload all the submissions using ADM with hard copy submissions delivered to MDOT MAA for distribution and review.

5.4.3.1 e-Transmit for Revit Models

Revit model submissions shall use the e-Transmit for Autodesk Revit add-in. There is currently a 2GB limit on file size for ADM uploads. In the event a file is too large for upload, it will be delivered to MDOT MAA's GIS and Engineering Technology Section (GETS) via DVD or thumb drive to then be loaded into AIRPortal by the ADM Administrator.

The submitter shall provide a narrative on *delivered files connection*, and in what order the files shall be opened to reduce errors. Test the e-Transmit file and remove errors before submission.

Unacceptable Revit Errors:

A. “Error (must be addressed to continue)”
B. “Can’t obtain permission to edit the element. The Central model is inaccessible.
C. “Unresolved References. Revit could not find or read *n* references. What do you want to do?”
D. “Open Manage Links to correct the problem” does not allow the recipient to point to a file included in the *e-Transmit* package
E. “New shared parameters: id nnnn”
F. “The File could not be found.”

5.4.3.2 e-Transmit Revit files Best Practices

A. Include related dependent files such as linked models and DWF markups. Include supporting data such as documents or spreadsheets.
B. Disable Worksets
C. Remove unused families, materials, and other objects from the Revit models to reduce file size.
D. Delete unnecessary sheets and specific view types so that the models do not contain redundant data.
E. Include only the views placed on sheets.
F. Include dependent files. In some cases, not including these files can make the model unusable by the recipient.
G. Dependent files can be included automatically in the transmittal folder, reducing the possibility of error. Convert fully specified (absolute) paths of dependent files to relative paths or "no path" to ensure that the model can locate the dependent files.
H. Ensure model closure.

File types not automatically included in the transmittal folder during the e-Transmit process can be manually added to the transmittal directory after the e-Transmit process is complete.

A. Point clouds
B. Shared parameter file
C. Lookup tables
D. Material rendering images
E. XRefs linked to CAD models
F. External font files

5.5 Project Organization Requirements

5.5.0 General

Overall project organization and modeling conventions support the development of model and documentation deliverables in a BIM process. The required MDOT MAA Revit template supports this structure.

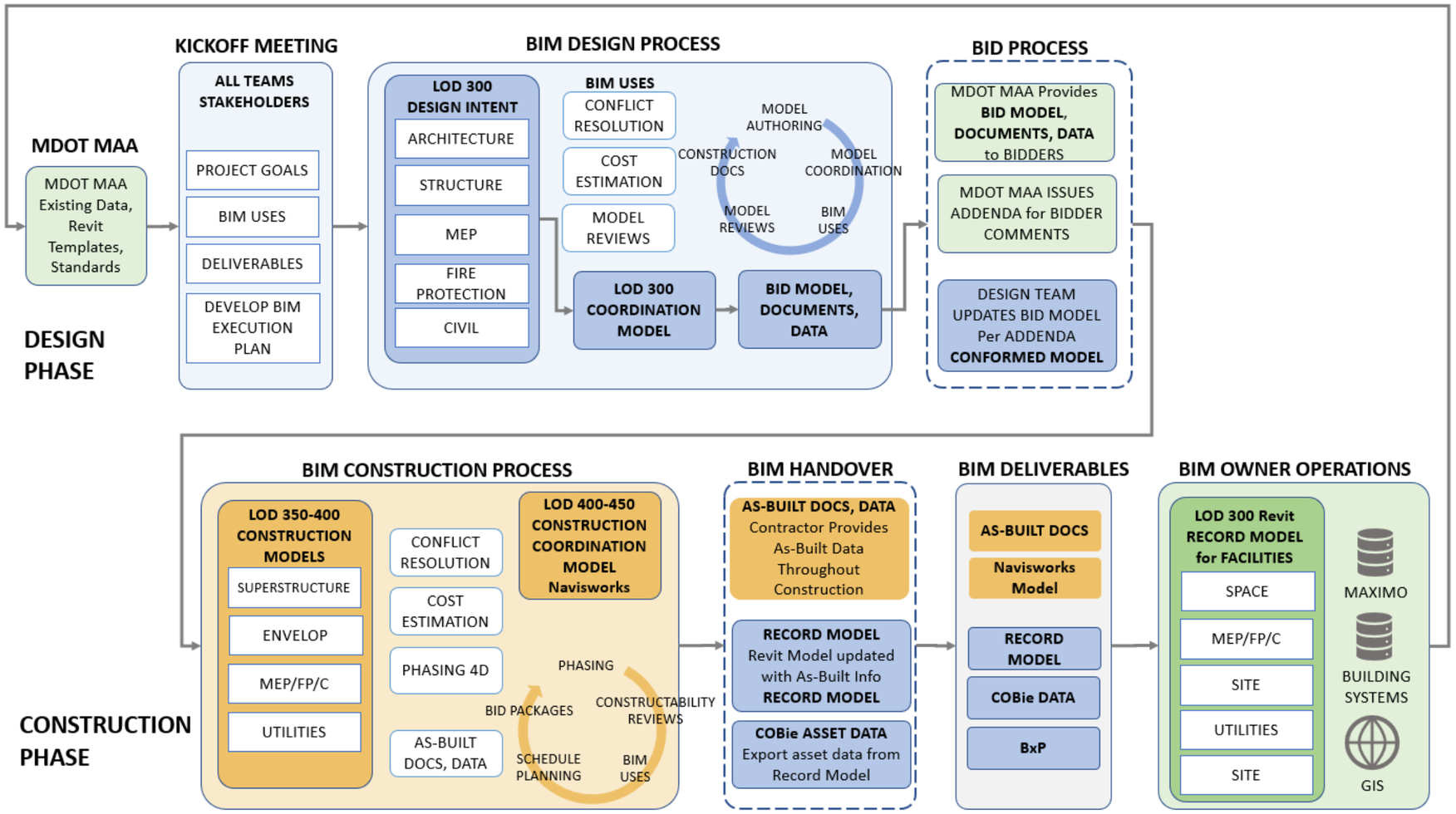


Figure 5.5-1 – Overall Project Organization

5.5.1 Revit Central File

All MDOT MAA projects shall use BIM work-sharing methodologies. A Revit Central file is created for each designated discipline team.

1. Worksets should be organized as described in Section 5.5.10 Workset Organization of this document.
2. Models should be opened **only** by going into "file -> Open" and selecting the "Create New Local" checkbox.

5.5.1.1 Central Model File Naming Convention

The model file naming convention includes the building or area name as designated by MDOT MAA. The GIS and Engineering Technology Section (GETS) is responsible for the administration of the Building Number Management Program. It will determine and assign all building identification numbers at BWI Marshall and Martin State Airports. The central model file naming convention includes:

Project Number	Space	Software Version	Space	Discipline Designation	Space	Building Name /Code Description	.rvt

Example: MDOT MAA-4604_R17_A.rvt

5.5.2 Discipline Designations, Codes

A/E design models must be subdivided by discipline and by non-building equipment as required in the MDOT MAA BIM Standards. All discipline model divisions are to be documented in the BIM Execution Plan (BxP). In general, each discipline model must contain the objects that relate to their discipline's design.

TABLE 5.5-1: DISCIPLINE DESIGNATIONS

DISCIPLINE CODE	DISCIPLINE
A	Architectural
B	Geotechnical
C	Civil
D	Demolition
E	Electrical
F	Fire Protection
G	General
H	Hazardous Materials
I	Interiors
L	Landscaping
M	Mechanical
P	Plumbing
Q	Equipment-Baggage
R	Real Estate/Lease
S	Structural
T	Telecommunication
V	Surveying/Mapping
Z	Contractor/Shop Drawing

5.5.3 Plot Sheets, Drawing Sheets, and Sets

Plot and sheet sets shall follow PEGS V1, Chapter 3 CAD Standards. The document types are named using the naming convention found in PEGS V1, Chapter 3 CAD Standards. Refer to PEGS V1, Chapter 3.4, Table 3-5 Construction Drawings Set. Drawings from BIM shall conform to these requirements.

5.5.4 Model and CAD Referencing

All discipline models must be referenced to each other with the process described in the BIM Execution Plan (BxP) to ensure proper coordination between disciplines (lighting to ceiling, utility hookups, structural support, etc.).

All CAD files referenced into Revit models should be Linked (not inserted) with Current View Option only as 2D elements. There should not be any CAD files directly inserted into Revit. No CAD files should be visible in any 3D view. The only CAD files temporarily added as 3D geometry are topography files on link CAD worksets.

5.5.5 Multiple Building Projects

There is only one building per file. Multiple buildings require a Composite model file. Duplicate the file structure for each building. The Composite model integrates individual building models into a Site/civil model for submission.

5.5.6 Modeling Tolerances and Dimensioning

Building objects are modeled in a location within industry standards tolerance of not more than 1/2”. All elements in the model use real-world dimensions (not nominal). The A/E and GC are responsible for designating stricter tolerances if needed for specific BIM Uses, fabrication, laser layout, or installation as outlined in the BxP.

If laser-guided layouts (such as Total Station), pre-fabrication, or modular assembly techniques are used, then the modeling teams, preferably with the GC, will review the tolerances required in those areas and for that building system component. Results, and any adjustments affecting current and future modeling, are documented in the BxP. MDOT MAA BIM Manager must approve exceptions.

Dimensions must comply with PEGS V1, Chapter 3 CAD Standards, be automated, associated, have an object reference, and not overridden. Dimensional values (i.e., the text appearing in dimension strings) will be in Imperial units (e.g., 10’-0”).

5.5.7 Model Navigation

Because MDOT MAA will receive numerous models from different A/E and construction teams, a standard view structure is critical for MDOT MAA to review and use federated models.

A. MDOT MAA is enforcing strict project browser organization mandatory for all Revit Files it receives from consultants.
B. The project browser organization shall meet the design, construction, and facility management requirements.

5.5.7.1 Project Browser

Others use BIM models after the design is complete. To facilitate this, MDOT MAA requires a uniform project browser organization for consistency between projects and files. Proper project browser organization streamlines model review and verification by the client.

A. The Default Project Browser organization for Views, Sheets, and Schedules are based on two Project Parameters: Category and Subcategory.
B. All View organization should sort the views by Associate Levels.
C. All Views, Schedules, and Sheets in the Revit file shall be categorized according to their purpose (function): Administration, Coordination, Documentation, Design Review, Design Authoring, Exports.
D. Additional Views, Schedules, and Sheets categories may be added if approved by MDOT MAA BIM Manager and documented in the BxP.
E. All Views, Schedules, and Sheets should use the naming conventions.

5.5.7.2 View Organization Requirements

Any Revit file should contain at least three mandatory categories of views in the Project Browser:

A. Administration
B. Coordination
C. Documentation

Additional categories for views must follow standards and best practices.

The category of Administration views should contain at least three main Subcategories for Levels, Worksets, and Categories.

The category of Coordination views shall contain building working floor plans, elevations, sections, and should be divided into the corresponding subcategories.

The category of Documentation views should be divided into Subcategories that represent the sheet index number of the corresponding construction documents: A01, A02, S01, etc.

When working with Phases in a project, a new mandatory project browser organization should be created: Phase / Category / Subcategory, sorting the views by their phase.

If several design disciplines are present in one model file, a new mandatory project browser organization shall be used: Discipline / Category / Subcategory, based on the discipline view parameter.

Each Revit File should contain mandatory views that help with model management, verification, and audit. Each model should include the following views:

A. Category Views: Views that include specific isolated individual Revit Categories (one per category.) There are a limited number defined by the owner.
B. Level Views: One view per level. Directly connected with corresponding levels and shared names.
C. System View: Views with isolated Mechanical, Electrical, Plumbing System types

D. Workset Views: Views that contain separate individual user-defined worksets (one per workset per view.)

5.5.7.2.1 Sheet Organization Requirements

There are two mandatory sheet categories in the Project Browser: Administrative and Documentation. The subcategories of the sheets under Documentation Category shall be divided based on the Construction Document Sheet Index: A01, A102, S01, etc.

5.5.7.3 Views

Revit projects consist of a variety of views: Floor Plans, Reflected Ceiling Plans, Sections, Elevations, Isometrics, Perspectives, Details. The number of views in the project does not affect the size of the Revit file. Each view contains only the specific set of Visibility and Graphic settings necessary to display the correct model components.

Annotation components: Lines, Dimensions, Text, Tags are in View Worksets and will contribute to the overall size of the model. If views with 2D elements are replicated, the file size will increase. Use the “duplicate with details” option as little as possible.

5.5.8 Geo-Reference Requirements

MDOT MAA requires all models to contain geospatial information referenced between a permanent, physical, USGS Survey Markers geographic survey point available in the Maryland State Plane Coordinate system, and the coordinate system within the project itself. The survey points are available in PEGS V2, Appendix 2E Survey Control Manuals. It is necessary to tie the model to an actual, physical point in space, appropriately referenced during construction, and for other purposes. All models must be correctly geo-referenced and fulfill the following requirements.

5.5.8.1 Project and Shared Coordinates

All Revit files in the Design model shall have project and shared coordinate systems.

A. Project Coordinate System Requirements:
   1. For each building, a Project Coordinate System should be established by placing Major Grid Line Intersection at Hardcoded Revit Origin.
   2. Each building in the project should be located orthogonality relative to Project North, independent of True North orientation. The example shown in Figure 5.5-2 below.

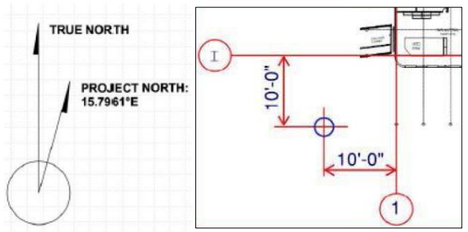


Figure 5.5-2 – Exterior Building Marker

   3. One of the building Levels should be aligned with Hardcoded Revit Origin and have Elevation equal to “0” relative to Project Base Point.
   4. All Revit Files related to the same building should be linked “Auto - Origin to Origin” only to share Project Coordinate System.
   5. The Revit template file should be used with the MDOT MAA supplied coordinates.

B. Shared Coordinate System Requirements
   1. Each project should contain the Revit Site Context model with an established shared coordinates system aligned with the Civil 3D files. This file should accurately position buildings in space relative to other buildings and structures located on-site.
   2. Shared coordinates are established within the Site Context model in a way that all model elements or linked files are located within a 2-mile radius from the hardcoded Revit origin in the Site Context model.
   3. Major Civil gridline intersections should align with hardcoded Revit origin, and site project base point coordinates should be populated based on the Civil grid line values.

4. Architecture Revit files establish the shared coordinate system by placing the Revit file into the Site Context model, aligning it to the proper position in space (True North Orientation, Building Elevation) and Publishing Shared Coordinates System back to the file.
5. All discipline Revit files should acquire the shared coordinate system from the linked Architecture model.

5.5.9 Model Levels

Each project should have a clearly defined list of Levels in the BIM Execution Plan (BxP). The MDOT MAA BIM Manager confirms these. All project Revit files should have the same number of levels and names. The naming conventions come from the MDOT MAA space allocation drawings and building floor plans.

If it is necessary to add additional levels, then the name of the levels and associated elevations (both project and shared) should be documented in BxP and approved by the MDOT MAA BIM Manager.

5.5.10 Workset Organization

Worksets are a primary method for model organization and collaboration. There are three Workset types defined in Table 5.5-2.

TABLE 5.5-2: WORKSET TYPES		
Worksets that contain building elements:	01 00 00 Substructure	Organization carried out by OmniClass (OmniClass Table 21)
Worksets that contain External Links:	Link CAD	Used for linking DWG documents.
	Link [name of the connection file]	Linking the .rvt file for each connection file separately.
Workspaces that contain elements related to the model:	Model Rooms	Including the room space, the line of room separation, and other connected features.
	Model Levels and Grids	Including levels and axis.
	Model Levels Primary (Model Levels Secondary)	Worksets used in many levels.
	Model Grids Primary (Model Grids Secondary) Scope Boxes	Worksets used in many axes.

5.5.10.1 Workset Naming Conventions

Workset naming conventions and content definition use OmniClass. Worksets will increase according to model progression and complexity. New Workset types include documentation. Worksets that are “workspaces” will be deleted before final submission. Worksets used for linking 3D DWG documents shall conform to the naming conventions.

Figure 5.5-3 is a preliminary Workset list for project launch. If a model is used for a study and not carried forward, then a reduced workset may be used; however, if there is a potential of the model moving forward, then OmniClass building worksets with more granularity should be applied.

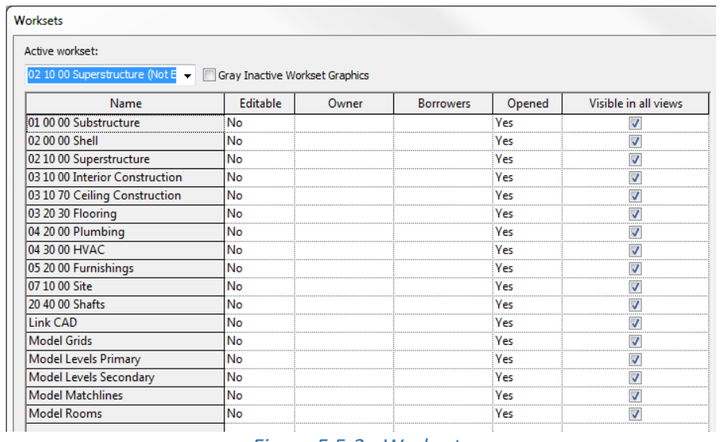


Figure 5.5-3 - Worksets

5.5.11 Model Phases in Revit

All renovation, additions, and fit-out projects should utilize at least two phases: Existing and New Construction.

There is no Demolition phase in the Revit file as demolished objects are marked as such using Phase filters in the New Construction Phase. If multiple phases are present in the project, they must be documented in BxP and approved by MDOT MAA. Only phase filters appearing in the template file are used in all project Revit files.

5.5.12 Schedules and Details Development

All schedules are exported from the properties of the model object, except for calculations (e.g., calculations for low voltage, structural, electrical, etc.). Schedules should not contain unconnected data.

Exceptions are calculations done outside of BIM. These are noted in the QA/QC reports identifying the technical reason for this exception. Designers and contractors submit reports per the BxP.

Both details and schedules are reported from the model with as little 2D drawing as possible. All construction details must be “Model Details” linked to the 3D view. No “Drafting Details” created in 2D software and added as 2D Drawings will be accepted unless they are approved MDOT MAA details for existing equipment installs.

5.5.13 Legends and Symbols

Legends and symbols in the 2D drawings may be 2D representations connected to an actual referenced BIM object. (i.e., any change to the BIM object will result in an immediate updated 2D image). BIM Objects must be 3D with attached or associated data and metadata as defined in the MDOT MAA BIM Standards.

5.6 General Content Requirements

5.6.1 Annotations

The model and objects shall have appropriate non-graphical properties to accurately automate annotation tags, generate schedules, and report Construction Operations Building Information Exchange (COBie) data from the model. All general annotations must comply with PEGS V1, Chapter 3 CAD Standards. Where the MDOT MAA Standards does not explicitly define a standard for an annotation, the latest version of the National CAD Standards applies. The models must use the appropriate tool within the BIM software designed for that purpose.

All references including, but not limited to, elevations (interior or exterior, partial, or whole), sections (building, wall, or object), plan, and detail callouts or marks must be created using the appropriate tools/commands from within the BIM software and remain dynamically connected throughout the project. Manual overrides are not permitted.

Title block identification values (e.g., sheet number and sheet name) must be associated and automatically populated and remain current throughout the project. Annotation symbols such as tags are to read and display information contained within the model properties. Fire rating fill patterns must be constructed within 3D wall types so that the partition's respective rating shows through all scales and views, including 2D drawings.

5.6.2 Common Parameters

Table 5.6-1 shows Revit Categories considered MDOT MAA assets. MDOT MAA Asset Management Standard identifies the assets MDOT MAA is tracking. Tracking is reported with COBie or an approved excel report.

TABLE 5.6-1: REVIT CATEGORIES - ASSETS			
Air Terminals	Lighting Fixtures	Communication Devices	Furniture
Duct Accessories	Mechanical Equipment	Data Devices	Telephone Devices
Electrical Equipment	Sprinklers	Fire Alarm Devices	Specialty Equipment
Electrical Fixtures	Pipe Accessories	Security Devices	Plumbing Fixtures
Lighting Devices			

Each Asset has parameters to be populated throughout the project. Some parameters are unique to product types; others are common for all types of assets. Common parameters are created as a shared project parameter.
Table 5.6-2 list Common Parameters:

TABLE 5.6-2: COMMON PARAMETERS

Asset Type	Instance Name	OmniClass Group	Serial Number	Type Description	Warranty Start Date
Category	Location	OmniClass Number	Space Name	Type Name	Warranty End Date
Design Basis	Manufacturer	Option Name	Space Number	UniFormat	
Documents	MasterFormat	Phase Created	Tag Number		

5.6.2.1 Properties

Construction assemblies and products represented as objects must include the properties of the object as described in the MDOT MAA Scope of Work (SOW) and the MDOT MAA Construction Operations Building Information Exchange (COBie) requirements. The consultant may use external BIM tools to manage the data during design. The final deliverable must provide the required information in a COBie format for import into Maximo.

5.6.3 System Families

System Family Categories such as Walls, Ceilings, Floors, Roofs, Pipes, Ducts, Rooms should be created per best practices and reside on proper worksets. All System Family Elements should accurately represent final construction assemblies, have no gaps, and correctly join intersecting elements.

5.6.3.1 Use of Generic Elements

If a material or type of assembly is not established at the early stages of the design, Generic Family types with Generic Materials should be used to represent undefined Geometry. New family types with proper layering, materials, and exact sizes should be created only after the appropriate Work Result category is selected for model elements. System families' naming conventions will vary based upon the Category of Elements.

5.6.4 Modeling Spaces

Spatial and room objects shall adhere to the MDOT MAA space standards in PEGS V1, Chapter 2 Building & Space Naming, Identification, Addressing, and Measurement Standard.

Define spatial and room objects as departments, areas, mechanical spaces, and zones, which are typically part of the Architectural, Mechanical, Electrical, Plumbing, Fire Protection, Security, and Communication Technology (MEPFT), or Interior Design models. Use the appropriate tool to generate spatial or room objects and associate them with bounding elements (walls, doors, windows, floors, columns, ceilings). All properties information related to spatial or room objects appearing in schedules, exports, tags, and diagrams must be generated from and connected to the model geometry, which defines its boundaries.

The Net Square Footage (NSF) must be modeled for each functional room and space. Rooms must be represented and broken down into functional areas even though they may be parts of a larger designed physical area. A physical area may contain several functional areas treated as individual "rooms" in the spatial program. If two rooms have different functional space classifications within the same physical area, they are modeled as two separate spaces. For example, a security checkpoint not enclosed by walls is defined as two different non-overlapping spaces. These spaces may be grouped into a Zone for visualization and analysis purposes (e.g., for thermal simulation calculations).

A. **Operational Areas, Airline Departments, Leased Spaces, Security:** The MDOT MAA will define the organizational arrangement for providing services. Group rooms into departments for space management and square footage analysis.
B. **Circulation, Egress Calculations:** Calculate values based on the spatial areas derived from the model floorplates.

5.6.4.1 Spatial Data

Spatial data includes the properties of the spatial object and applies to areas of four-square feet or higher. Model submissions at the end of the Study Phase and Design Development Phase must contain data to generate a tabular calculation from the model for comparison with the proposed project program space requirements. Spatial objects and data must be maintained throughout the project lifecycle.

5.6.4.2 Modeling Space Reservations for Maintenance

The consultant and the General Contractor (GC) must model space reservations for maintained equipment and systems. Managed systems include mechanical, electrical, plumbing, fire protection, security, and communication technologies (MEPFT). Grouped space objects shall be hidden as necessary. Space reservations are shown in design and construction coordination facility maintenance and asset management activities.

Space reservation zones are modeled as 3D transparent (volumetric) shapes, as shown in Figure 5.6-1. Transparency shall be between 65% and 85%, labeled by discipline, color-coded, and designated "Not in Contract" (when applicable) in the model and plans. Space reservations must accommodate:

A. Operations, adequate physical access, and tool/tool cart access (including unobstructed paths of travel) for repair, maintenance, and replacement.
B. Significant equipment removal, equipment replacement pathways, access hatches, knockout panels, doors, and elevators, and access to equipment, systems, and attachments located above ceilings.
C. Space accessibility reservations for code requirements, manufacturer's maintenance zones, equipment specifications, and any manufacturer specific design requirements.

Spaces for existing equipment are not required unless the new design elements impact the existing open space.

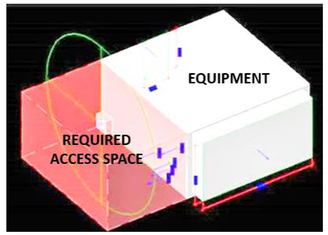


Figure 5.6-1 – Space Reservation Modeling

5.6.4.3 Construction Coordination

Space reservation settings represent the physical access requirements of the maintained system or equipment (e.g., Fire Protection) by the General Contractor (GC) for installation. The GC must confirm with MDOT MAA Maintenance the routing and sizes needed for business systems, etc., and assure that the space reservations are free spaces. MDOT MAA will approve the final routing and space reservations. The GC must install the building systems to the approved Construction Coordination locations. Examples must be modeled as space reservations and be included in Design and Construction Coordination. Each project must have these systems identified.

TABLE 5.6-3: SPACE RESERVATION MODELING	
Low-voltage systems	Radio/Wireless
IT system components	Video
Internet/WIFI	Security
Telephone	Wayfinding – Signage
Public Address	Television – Information Screens

5.6.5 Wall Naming Convention

Subdivide walls into groups: Structure, Exterior, Partitions, Finish, etc.

Structure Walls, Exterior, Partitions, and Finishes, should be modeled as separate elements. Wall finishes belong to a different Building system, Omniclass (21-03 20 00 Interior Finishes), and should be separate from (21-03 10 00 Interior Construction). It is a requirement for model verification and audit, cost estimation exercises, and other BIM Uses, during construction and facility management.

Furring walls placed next to the Structural Concrete walls or Masonry Shaft walls should be modeled as separate elements. Wall sweeps are allowed but as independent objects. They should not be built into the Wall Family structure.

Finish materials (tiles, wall coverings, floorings) should be modeled as separate elements and joined to partitions.

Structure, Exterior, Partitions, and Finish walls shall be assigned to their designated worksets.

Wall names should start with their group name, followed by a brief description. For example:

A. Structure - Concrete 0' 8"
B. Exterior - Brick on Studs 1' 2 1/2 "
C. Partition - M10
D. Finish - CT-2 Ceramic Tile

For partition wall types, include a Partition Type Mark in the Type Name of the wall.

For finishes, include a designated Material tag in-wall Type Name.

5.6.5.1 Partition Types

Interior Partitions, Fire-Rated Partitions, and Smoke Barriers must include fire resistance ratings in the wall object properties and be graphically depicted in 2D plan sets and 3D model views. A different partition name is created for each type of wall used in the models.

Fire rating fill patterns must be constructed within 3D wall types so that the partition's respective rating shows in all scales and types of views, including 2D drawings. An example of fire-rated walls is shown in Figure 14.

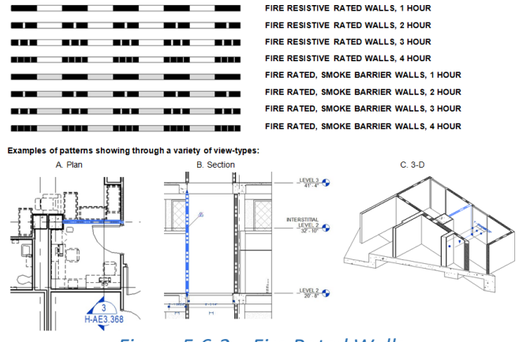


Figure 5.6-2 – Fire Rated Walls

5.6.6 Loadable Families

Loadable Families include numerous categories of objects edited outside of the Project file in a Family Editor and loaded back into the project for use. All loadable families must be created and optimized by the design team to satisfy MDOT MAA BIM guidelines. Any manufacturer or third-party content should be reviewed and optimized. They should fulfill but are not limited to, the requirements in Section 5.6.6.1 General Requirements of Loadable Families.

5.6.6.1 General Requirements of Loadable Families

A. Assign all loadable families a proper Revit Category. The generic category may be used if no appropriate category is available.
B. No surface-based families are used in the project.
C. No face-based, floor-based, or roof-based families should be used in any MDOT MAA Project
D. Families in the Architectural model such as doors, windows, casework, lighting, plumbing fixtures may be created as wall-based or ceiling-based families.
E. MEP families should be "free-floating," associated directly to model levels. There should be no surface-based, wall-based, ceiling-based families in the MEP model.
F. Geometry should relate to the material parameter, called Material. If multiple materials exist, multiple parameters should be created, starting with the word Maternal, then followed by a brief description.
G. For families with no established Material, a Generic material should be used.
H. Assign an OmniClass Number as a family parameter to all loadable families.
I. Families should contain all shared parameters per model requirements.
J. Purge unused materials, hatches, line types, and other items from the model.
K. Purge referenced CAD and image files used during family creation from all loadable families.
L. Test all loadable families by changing parameter values and family types in the Family Editor in the project environment.
M. Loadable Families should be free of warnings and exceptions.
N. Parameters within families that have the same meaning or use, but different names must be renamed before use so that the names match.
O. Parameter lists should be intuitive, clearly defined, and organized. Use standard industry abbreviations. Parameter naming shall:
    1. Capitalize Each Work Case, with spaces.
    2. Have no underscores.
    3. Example: Refrigerant Inlet Connector Diameter, Data Circuit Connection, Design Task Number

P. Loadable families should contain all necessary parameters used during design, construction, and facility management. Remove unnecessary parameters from the model. Parameters within families that have the same meaning or use, but different names must be renamed before use so that the names match.
Q. Complex families may contain nested families; however, nested families follow the same standards as the main family.
R. Loadable Families should contain the appropriate level of detail and visibility parameters appropriately managed, so families cleanly shown are various view scales.
S. Loadable Families should prioritize reference lines/planes.
T. Place Loadable Families under the appropriate categories. For example, a chair should not be a "generic model"– generic models may be allowed in some circumstances but must be documented in the BxP. Not everything gets placed in "specialty equipment" – the team should pay attention to non-cuttable families vs. cuttable family categories.
U. Loadable Families should never be "branded," meaning no product logos, or service provider company names. No links should appear within the Revit family.
V. Loadable Families should contain native Revit content, not imports from other programs (.dwg, .sat, .skp)
W. Loadable Families should be free of manufacturer data during the design process, nothing beyond the "basis of design." During construction, this data should be further populated in the As-built Model and aligned with MDOT MAA BIM Standards.
X. Keep Loadable Families under 2 Mb.
Y. Clean and purge Loadable Families of extraneous data, non-functioning parameters, and unnecessary items (images, linework, useless reference planes not used for parametric functionality).
Z. Loadable Families include numerous categories of objects edited outside of the project file in a Family Editor then reloaded into the project.
AA. Loadable families should contain all necessary parameters used during design, construction, and Facility Management Work. Remove unnecessary parameters before the content is used in the model.

5.6.6.2 Loadable Families Naming Conventions

All loadable families should be named using the following naming convention:

[OmniClass Table 23 (Singular)] + [Manufacturer Name] + [Model Number]

Ex 1. 23-21 43 15 25 Paper Towel Dispenser Bobrick B-3699
Ex 2. (Omniclass No.) Centrifugal Pump Armstrong 4030

For Generic models where manufacturer and model numbers are not determined, a Unique Description should be used to differentiate one Generic model from the other.

[OmniClass Table 23 (Singular)] + [Unique Description]

Ex 2. 23-21 43 15 25 Paper Towel Dispenser with Disposal Unit
Ex 2. (Omniclass No.) Centrifugal Pump Centerline Axial

No manufacture families should be used in the project. All Families should be generic with a proper generic material assigned until specific equipment is selected for the project. Even after a manufacturer and model number is selected, manufacture families need to be optimized to comply with the MDOT MAA Revit template.

5.6.7 Door Numbering

MDOT MAA assigns a unique identifier to each entry or opening designated as a door, regardless of type, per PEGS V1, Chapter 2.4 Door Number Assignment. For additional information, refer to PEGS V1, Chapter 2 Building & Space Naming, Identification, Addressing, and Measurement.

5.6.8 Space Numbering

MDOT MAA assigns a unique identifier to each interior space, both occupied and not occupied, per PEGS V1, Chapter 2.3 Interior Space Numbering. For additional information, refer to PEGS V1, Chapter 2 Building & Space Naming, Identification, Addressing, and Measurement.

5.7 Modeling Requirements

5.7.0 General

The model Level of Development (LOD) supports construction documentation and schedules from the model. Figure 5.7-7. shows a general BIM workflow.

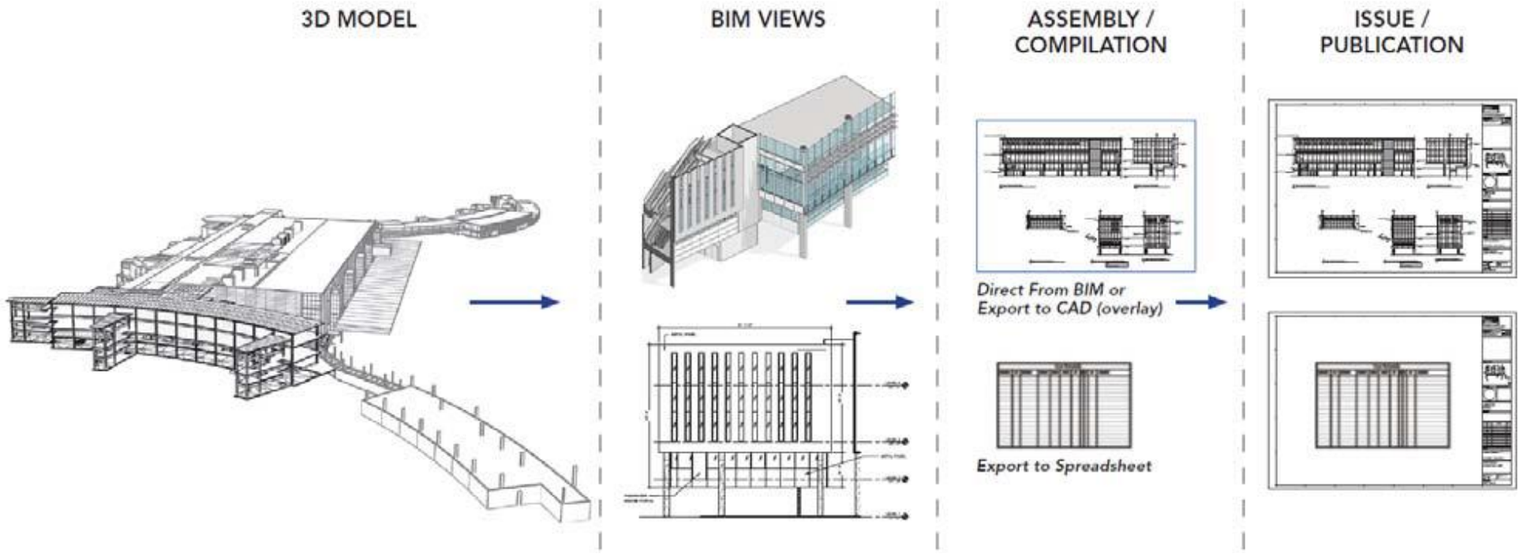


Figure 5.7-1 – General Model Workflow

Minimum Modeling Requirements

The following categories of a project are modeled.

A. Elements in the scope of work (SOW)
B. Items affected in the construction site
C. Building structures, equipment, and building systems
D. Utilities above or below ground inside and outside to service connections
E. Construction Details unless supplied by MDOT MAA
F. Preserved landscaping areas
G. Any protected areas during construction
H. Project site conditions affecting safety, logistics or public outreach
I. Equipment needed for facilities maintenance
J. Space reservation for maintenance
K. Existing conditions modeling

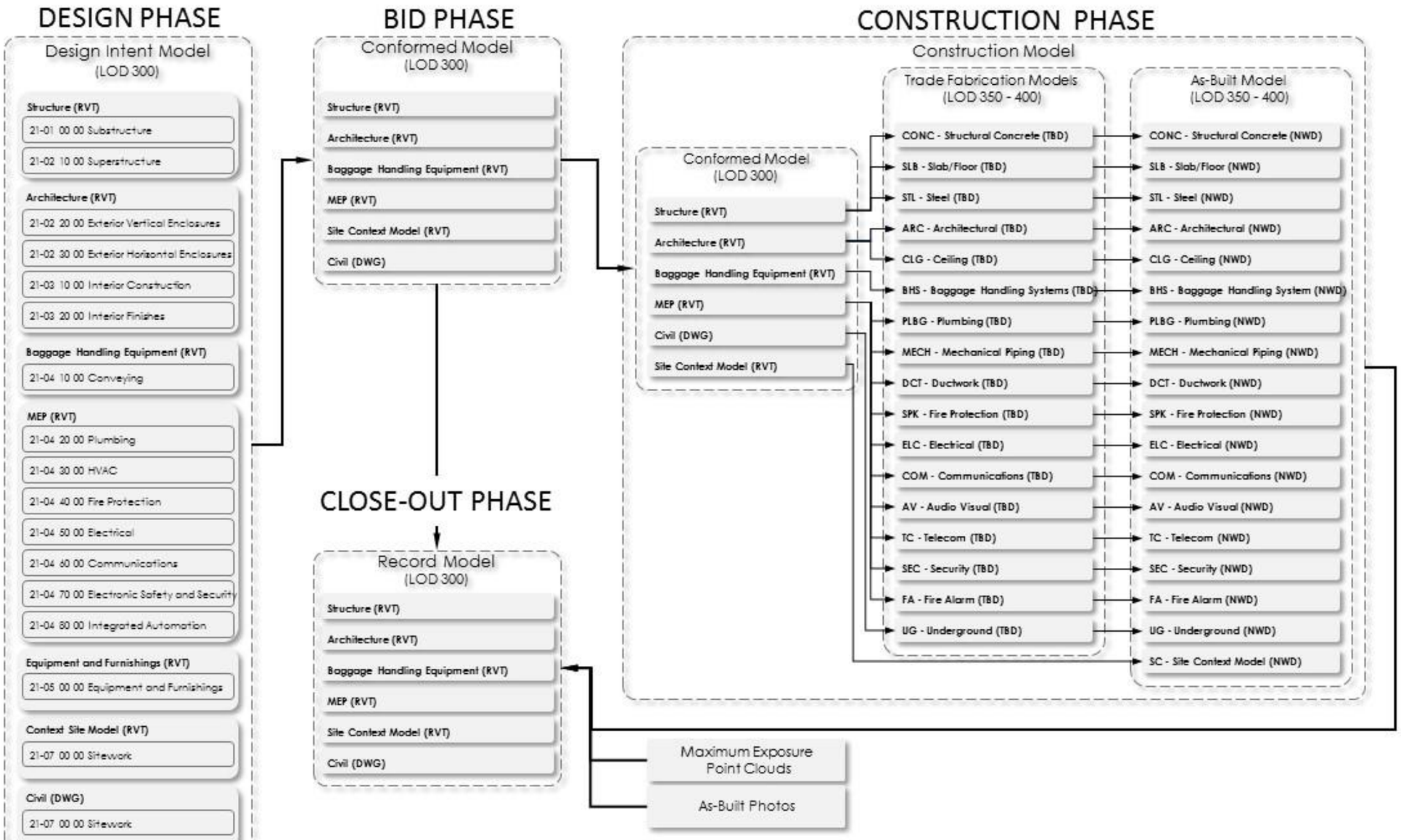


Figure 2F.7-2- Models by Phases

5.7.1 Architectural Model

Architectural models include the objects relative to floors, exterior and interior walls, partitions, roofs, vertical transportation, windows, doors, stairs, ramps, railings, ceilings, grilles & gates, interior specialties, etc. Required structural blocking (such as restrooms) must be modeled for quantities, size, shape, and location, etc. Reference major structural components from the Structural model including, but not limited to, structural walls, floors, roof structure, columns, and foundations. Reference the Interiors model, the Equipment models, appropriate building equipment and systems models, and others as needed to coordinate the work.

A. **Interior Partitions, Fire-Rated Partitions & Smoke Barriers:** Must be modeled to include fire resistance ratings in the wall object properties and must graphically be depicted in 2D plan sets and 3D model views. A different partition name is to be created for each type of wall used in the models.
B. **Electrical Outlets:** Model the location of electrical outlets required for equipment.
C. **Door Objects:** LOD 300 and attribute data. Properties of door objects must include finish information, door swing, vision panels, seals, acoustical properties, hardware, locks and keying, electrical requirements, and applicable fire resistance ratings. Door objects must have an accurate offset in the model.
D. **Ceilings:** Properties include fire ratings and sound transmission coefficients.
E. **Raised Floors:** LOD 300 - Model Access or Raised Floors. Exclude secondary supports in the Design Intent model.
F. **Casework:** All architectural casework, millwork, and features provided by the GC include finish information and collected in the room properties to be included in the overall room finish tag. Casework materials will consist of a horizontal and vertical element. Model casework and countertops with correct dimensions (length/width, depth, and height).

5.7.2 Discipline Models

Provide Mechanical, Electrical, Plumbing, Fire Protection, Security, and Communication Technology (MEPFT) systems discipline models, referenced to the Architectural model and other discipline models as needed.

5.7.2.1 Mechanical

Mechanical equipment and distribution systems are a vital part of operating a facility. Consequently, all components of the mechanical systems must be model accurately and include the necessary space reservations for appropriate access during operations.

A. All system models must include all equipment necessary for operations including, but not limited to:
    1. Boilers
    2. Chillers
    3. Geothermal and solar energy systems
    4. Pumps and piping distribution systems (including modeling for pipe slope and insulation)
    5. Water-side terminal units
    6. Fans
    7. Air handlers
    8. Air distribution and evacuation systems including modeling for duct and equipment insulation
    9. Air-side terminal units
    10. VAV boxes
    11. Electrical feed and distribution systems transformers
    12. Electrical panels and switchgear
    13. Lighting
    14. Emergency circuitry
    15. Emergency generators
    16. All public utility systems from a tap
    17. All control systems, data, and phone wiring and terminal devices, data switches, data rooms, etc.
B. Fire protection must include fire ratings, sprinkler medium, pressure, and flow volume. Use OmniClass Table 21 to identify the system each asset is a part of, OmniClass Table 22 to align with specification sections, and OmniClass Table 23 to determine the asset type. Include all utility properties. Modeling will extend five feet beyond the project construction boundaries and to the first connection point of the system.
C. Model system elements 1.0 inch in diameter and higher (e.g., general plumbing, fire protection, etc. and other elements (ducts, cable trays, etc.) with a dimension of 4 inches. Conduit consolidated into cable trays are modeled as the tray.

D. Existing systems should be modeled in the Existing Phase if they affect New Phase development. Existing MEP elements should have the appropriate information to analyze MEP systems without referencing construction drawings per BxP. All information shown on construction drawings should appear as tags and keynotes, extracting information from model elements. No independent text should be used for annotating floor plans.

The designer shall incorporate the manufacturer, model, serial number, refrigerant type, capacity (full charge), number of circuits, and the circuit charge for any new HVAC equipment.

5.7.2.2 Electrical

The architect cosmetically arranges ceilings diffusers, light fixtures, etc. but the electrical engineer designs the systems. The architectural and electrical models must reference each other and be coordinated to eliminate mismatches between the models.

5.7.2.3 Plumbing

Restrooms are modeled to meet MDOT MAA requirements and fixtures classified using OmniClass designations.

5.7.2.4 Fire Protection

A "Design-Build" procurement executed by the General Contractor (GC) is used for Fire Protection systems. *The GC must assure that the Fire Protection system is a part of the BIM construction coordination management.* It is the GC's responsibility to ensure that the installed fire protection system does not interfere with the location or maintenance access of other building systems or equipment. The GC must provide as-built documentation to the designer showing the final location of systems and equipment to update the Record model.

5.7.2.5 Communications

Business systems infrastructure must be in separate models. These systems, if not a part of the GC's contract, must be modeled as Space Reservations and included in the Design and Construction coordination activities.

5.7.3 Structural Models

Structural models are the basis for evaluating and analyzing the building structure and include all the objects, elements, and components of the system. All material and material properties are included in objects. The building structure and geometry must be accurately defined and labeled as foundations, subgrade enclosures, slab-on-grade, superstructure, and exterior vertical enclosures and roofs.

5.8 BIM Templates

5.8.0 Building Information Modeling (BIM) Templates Introduction

MDOT MAA uses National BIM Standard documents and templates as described throughout this standard. Download links for the materials and templates are provided in Section 5.8 of this standard.

5.8.1 Building Information Modeling (BIM) Execution Plan (BxP) Template, Version 1.0

MDOT MAA has two BIM Execution Plans templates for small and large projects:

A. MDOT MAA BxP Template 1, MDOT_MAABxP_Part2 LODMatrix_Attributes Parameters
B. MDOT MAA BxP Template 2

See Section 5.3.3.1 BIM Execution Plan (BxP) Templates for more information.

5.8.2 Building Information Modeling (BIM) Revit Template, Version 1.0

The MDOT MAA Revit template and supporting documentation align with the MDOT MAA BIM Standards. Files associated with the MDOT MAA Revit Template are for BWI and Martin State Airports. Files include:

File Name	Description
Baltimore City Vicinity Map.dwg	Reference map for BWI Thurgood Marshall Airport title block
BWI Site Map.dwg	Reference map for BWI Thurgood Marshall Airport title block
BWI-Thurgood Logo.jpg	BWI Airport logo to be used in Revit template
MAA Line Width Matrix.xlsx	Alignment of current CAD line weights to Revit template
MAA Origin.dwg	CAD file used to verify the true origin in the Revit file

MAA Revit Standards.xlsx	Listing of completed template standards
MAA Shared Parameters.txt	Shared parameters file for use in Revit
MAA Systems Naming Matrix.xlsx	Equipment and systems abbreviations in template
MAA Template.rvt	Revit template – BWI and MSA Title blocks included in the template
MTN Site Map.dwg	Reference map for Martin State Airport title block
MTN_LOGO.jpg	Martin State Airport logo to be used in Revit template

A. Use the MDOT MAA Revit template for BWI Marshall and MTN projects requiring BIM.
B. If a user changes any settings in the Revit template, they must record the changes in the and submit the worksheet to MDOT MAA for review before implementation. The project settings and the Revit template should always be in alignment.
C. Both the Project base point and Survey point can move in Revit. The only way to see the real file origin is to load the Origin.dwg using Origin to Origin settings. It is essential when establishing or verifying the building origin at the intersection of all major column grids. This file does not represent facility shared coordinates in any way.
D. Address any MDOT MAA Revit template questions and comments to the MDOT MAA BIM Manager.

5.8.3 COBie Spreadsheet Template, Version 1.0

The COBie spreadsheet is a report from the Record model providing the asset data required by MDOT MAA. The COBie spreadsheet template consists of the tables shown below. The required assets and asset information will vary by project and will be defined in the BxP. It may include things like location, asset type, model number, manufacturer, year manufactured, and date installed. The COBie data should be submitted ready to import into the MDOT MAA Maximo database.

	File Name
1.	Consumables-General
2.	Consumables-ProductTypes
3.	Files-Drawings
4.	Files-Photos
5.	InstalledProducts
6.	Plan-ProductTypes-Diagnostic
7.	Plan-ProductTypes-Maintenance
8.	Plan-Systems-Operations
9.	Schedule-Doors
10.	Schedule-RoomFinish
11.	Schedule-Signage
12.	Submittals-Hardware
13.	Submittals-Products
14.	Submittals-ProductTypes
15.	Submittals-System
16.	Warranties-ProductTags
17.	Warranties-ProductTypes
18.	InstalledEquipment-AirConditioner
19.	InstalledEquipment-AirHandler
20.	InstalledEquipment-Boiler
21.	InstalledEquipment-Burner
22.	InstalledEquipment-Compressor
23.	InstalledEquipment-Condenser
24.	InstalledEquipment-Controller
25.	InstalledEquipment-Evaporator
26.	InstalledEquipment-Fan
27.	InstalledEquipment-Furnace

28.	InstalledEquipment-HotWaterHeater
29.	InstalledEquipment-ValvesStrainers
30.	InstalledEquipment-Plumbing
31.	InstalledProducts-Electrical
32.	InstalledProducts-General
33.	InstalledProducts-ReadMeFirst.docx

5.8.4 Building Information Modeling (BIM) Submission Review Checklist

A BIM Submission Review Checklist is submitted with all model submissions to MDOT MAA as part of the review process. The submitting team provides answers and comments before submission.
At the end of the document, the submitter will supply any additional information relevant to understanding the model content and structure for MDOT MAA reviewers.

5.8.5 Building Information Modeling (BIM) Construction Technical Specification

The MDOT MAA has developed a standard specification 010012X, Building Information Modeling (BIM) Use During Construction, available in PEGS Manual, PEGS V1, Appendix 1G – Standard Specifications. This specification shall be used on all applicable projects. Consultants must coordinate with the MDOT MAA Task Manager and the GIS Engineering Technology Section (GETS) to determine appropriate projects.

6.0 Introduction to MDOT MAA's Asset Management Program

In 2018, the Maryland Department of Transportation began a strategic initiative to formalize an asset management program to guide transportation decision-making and investments for MDOT, its five transportation business units, and one authority. Per MDOT's Strategic Asset Management Plan, asset management is considered an integrated set of processes to minimize the lifecycle costs of infrastructure assets, at an acceptable level of risk, while continuously delivering established levels of service. Asset management is a holistic approach of balancing costs, opportunities, and risks against the desired performance of assets.

MDOT MAA has been actively participating in all aspects of MDOT's asset management initiative. MDOT MAA developed an asset management plan to assess its current practices and develop a strategy to normalize activities throughout the organization to establish a true asset management program. MDOT MAA is dedicated to developing an asset management process based upon quality information and a documented, structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions to help achieve and sustain a desired state of good repair (SGR) over the lifecycle of the assets at minimum practicable cost.

The MDOT Strategic Asset Management Plan's goals and strategies are centered around seven key assets: (1) facilities, (2) pavement, (3) structures, (4) tunnels, (5) rail, (6) vehicle fleet and equipment, and (7) major IT systems. One of those goals is to conduct inventories and assessments for all major assets.

6.1 Facility Assessments at MDOT MAA

MDOT developed guidance for the transportation business units to assess and report on the condition of facilities in the MDOT Facility Condition Assessment Manual and MDOT MAA began performing building inspections following this guidance in 2018. Work has continued since, and MDOT MAA has plans to inspect 25% of its facilities each year. MDOT MAA developed a field collection tool using Esri's Collector for ArcGIS to support facilities assessments as well as tools to calculate system scores and derive an overall building condition score. The calculations made by the tools come directly from the MDOT Facility Condition Assessment Manual and generate facility data required for annual reporting to MDOT. MDOT utilizes facility condition scores, along with criticality rankings, as part of its criterion for future funding decisions.

6.1.1 Facilities Condition Assessment Requirements

MDOT MAA relies on consultants to perform annual facility assessments. Consultants that are tasked with performing facility assessments must adhere to the guidance in the MDOT Facility Condition Assessment Manual. During project scoping, they must coordinate inspection and data collection activities with the GIS and Engineering Technology Section (GETS). Additionally, they must use MDOT MAA's Esri Collector for ArcGIS application that is configured to perform the facility condition assessments. Consultants unfamiliar with Esri Collector for ArcGIS application shall require staff to participate in MDOT MAA-provided training sessions. Information on using this application can be found in Section 6.1.2 Facility Assessment: Collector Application Guide.

Information for consultant GIS staff responsible for supporting the facility assessments can be found in Section 6.1.3 Facility Assessment Application - GIS Analyst Guide.

Prior to beginning field work, consultants should refer to the Appendix 1H.1 Facility Assessment Inspector Checklist to ensure a complete and successful facility assessment. Following each facility assessment, consultants shall perform quality control checks to ensure all required information was captured. The consultants shall run the MDOT MAA provided tools to generate system scores and an overall building condition score. As a project deliverable, consultants must submit facility data that complies with PEGS V1, Chapter 4 GIS Standards.

6.1.2 Facility Assessment: Collector Application Guide

The Collector for ArcGIS application was configured to facilitate the MDOT MAA facility assessment teams with data collection in the field. This application will allow MDOT MAA to fill in knowledge gaps and provide geospatial information for assets included in the facility assessments. This data will be utilized by MDOT MAA's GIS group and incorporated into Maximo, MDOT MAA's asset management system.

6.1.2.1 Working Online and Offline

Users should perform their work online, meaning that their tablet is connected to the internet via cellular network or WIFI. This ensures data is automatically uploaded to the cloud and reduces the potential for data loss.

If necessary, due to an inability to connect to the internet or lag time due to a slow connection, individuals may take copies of the facility assessment map offline. When working with offline maps, the user must sync data as soon as they are connected to the cellular network or WIFI. At a minimum, the user must sync data at lunch and at the completion of the field event day. Any data lost due to a failure to sync data in a timely manner will be the responsibility of the user. If the user receives a sync error, they should contact the GIS analyst providing technical support to the consultant team. Users should not delete any offline area, photo, or application until a successful data sync has been confirmed.

6.1.2.2 General Use

A. Opening the Map

   Users will open Collector for ArcGIS on their tablet and sign into their ArcGIS Online account. In the Map screen, the user will see the Facility Assessment Map for their assessment team. Tap on this map to open. (Offline maps should be pre-loaded on to the user's device. If for some reason the user does not see an offline map, please reference the section on Taking Maps Offline on page 3).

Once in the map, the user can select the three dots in the top right-hand corner. This will show a drop down for “Layers”, “Bookmarks”, “Basemap”, “Measure.”

1. When the user selects “Layers,” they will see the “Map Layers” screen by default. This is a list of all the layers in the map. These layers may be toggled on and off. In the Layers menu, the user can press “Legend” to open a list of all the symbols.
2. When the user selects “Bookmarks,” they will see bookmarks for each building. Selecting one of these bookmarks will zoom the Collector app to the building of interest.
3. When the user selects “Basemap,” they will see other basemap options. This is only available to online maps.
4. When the user selects “Measure”, they will be able to access the measuring tool.

B. Creating an Assessment Point

In the Collector application, assessment points represent the location of an asset, room, or building for which a user will complete an assessment. Prior to the field event, the user should be familiar with the Assessment Level Matrix, found on page 4, to ensure assessments are completed at the correct level of granularity: asset level, room level, or building level. Below are the steps for creating a new assessment point.

To create a new Assessment Point:

1. Click the + sign in the bottom right of the screen. A circle with a + sign will appear on the center of the screen over the users’ location.
2. On the left side of the screen, the user will see a window with the possible assessment point types—asset, room, or building. Tap the appropriate assessment point type. This will open the Assessment Point editing window.
3. On the map, the user will see the circle and + sign. Move the + sign to the appropriate location for the assessment point and tap “Add Point.” The user will now see the assessment point icon on the map.
4. On the left side of the screen, the user will see the assessment point editor window. The user will enter data for all fields where appropriate. Fields with an asterisk (*) are required. Required fields cannot be left blank; the Collector app will not allow the user to submit the point without the required information.
5. The user can take photos of the asset, room, or building to provide context. These photos are of the asset/room/building, and not for documenting damage or condition. Photos will be taken with a landscape orientation and the home button to the right of the screen. If the user takes photos of identification tags, make sure these identification tags are legible.
6. When complete, press “Submit.”

C. Completing an Assessment

In the Collector application, each of the eleven (11) systems has an assessment table. Per the MDOT Facility Assessment Manual, assessments are visual assessments of components or subsystems, depending on the system. Below are the stops for creating a link from an assessment point to a system assessment table and recording the assessment.

To create a new system assessment:

1. On the map, tap on the assessment point of interest. This will open the asset’s pop-up window.
2. Tap on the link icon. This will open the “Select Relationship” window.
3. Tap the appropriate System Assessment table. This will open a new window.
4. Tap add to create a new record in the System Assessment table. This will open the System Assessment table editor window.
5. The user will enter data for all fields where appropriate. Fields with marked with an asterisk (*) are required. Required fields cannot be left blank; the Collector app will not allow users to submit the point without the required information.
    a. Assessment values are required fields. Each asset ranking must be a percentage 0-100, and all score levels 1-5 must add up to 100%.
    b. Take photos if applicable. Photos are taken to document condition or damage to asset. Photos will be taken with a landscape orientation and the home button to the right of the screen.
6. When complete press “Submit.”
7. The left panel will show all the assessment information the user entered. Scroll through the entries and confirm accuracies of record information.
    a. Confirm the status fields says “Complete.” If the percentages add up to greater than 100%, the user will see the error message “Error Total Exceeds 100%.” If the percentage are less than 100%, the user will see “Incomplete.”

6.1.2.3 Taking Maps Offline

If necessary, maps can be taken offline. This means a copy of the map is downloaded onto a user’s device. Edits made to the map are made locally on the device and must be periodically synced to upload this data to the cloud.

The following steps outline the process of taking a map offline.

1. Open the Collector application and locate the map of interest.
2. Tap the three dots “…” next to the map name. This will open a window that allows users to select “Map” Details” or “Add Offline Area.”
3. Tap “Add Offline Area”. This will open the Add Offline Area Map.
4. Zoom to the area of interest and tap the “Download Area” Button. This will start the download process.
5. Once the download is complete, the user will be able to open the offline map and start recording data.

The following steps outline the process for syncing data from an offline map. The user can sync data two ways. The first option for syncing data is outside of the map.

1. Open the Collector application and locate the map of interest and tap. This will open a screen that shows users the areas that have been downloaded locally onto the device.
2. Locate the area of interest and tap the three dots ("…") next to the Area name. Three options will appear: "Sync", "Rename Area", or "Remove Area."
3. Select "Sync", a load icon will appear where the three dots ("…") once were. When the sync is complete, the load icon will revert to the three dots.
4. If there is a technical sync error, contact the GIS analyst providing technical support to the consultant team. Do not delete or remove any photos, downloaded areas or applications from the device.

The second option for syncing data is done directly in the download area map itself.

1. In the Downloaded Area Map, locate the sync button, two arrows pointing in opposite directions and tap this button. This will open the sync window.
2. Press the sync button to initiate the syncing process.
3. If there is a technical sync error, contact the GIS analyst providing technical support to the consultant team. Do not delete or remove any photos, downloaded areas or applications from the device.

6.1.2.4 Assessment Level Matrix

The Assessment Level Matrix identifies whether a subsystem or component should be assessed at the building, room, or asset level. An asterisk (*) indicates an MDOT MAA asset. Please note that some components are part of an asset. Components that make up an MDOT MAA asset do not need an individual assessment point. Their assessments should be attached to the MDOT MAA Asset point.

The final column, Inspector, indicates which inspector group is responsible for completing the assessment. In some instances, two inspector groups may be responsible for assessing the same subsystem or component.

Assessment			Level of Granularity				Inspector
System	Subsystem	Component	Building	Room	Asset	TBD	
Substructure	Foundation	All Components	√				STRUCT
	Basement	All Components	√				STRUCT
Shell	Superstructure /Structural Frame	All Components	√				STRUCT All, ARCH Walls
	Roof	All Components	√				ARCH
	Exterior	All Components	√				ARCH
	Shell Appurtenances	All Components	√				ARCH
Interiors	Partitions	-		√			ARCH
	Stairs	-		√			ARCH & STUCT
	Finishes	-		√			ARCH
Conveyance	Elevator*	-			√		ARCH & ELEC
	Escalator*	-			√		ARCH & ELEC
	Lift*	-			√		ARCH & ELEC
Plumbing	Fixtures	Appliances		√			MECH
		Sinks		√			MECH
		Toilets/Urinals		√			MECH
		Drinking Fountains		√			MECH
		Faucets/Supply Lines		√			MECH
		Drainage Pipes		√			MECH
	Water Distribution	Piping		√			MECH
		Water Heater*			√		MECH
		Booster Pump*			√		MECH
		Well*			√		MECH
		Well Pump*			√		MECH

Assessment			Level of Granularity				Inspector
System	Subsystem	Component	Building	Room	Asset	TBD	
	Sanitary Waste	Ejector/Grinder Pump*			√		MECH
		Wastewater Treatment Package Plant*			√		MECH
		Septic Tank*			√		MECH
		Septic Field*			√		MECH
		Piping		√			MECH
		Oil-Water Separator*			√		MECH
	Rain Water Drainage	-	√				MECH
HVAC	Energy Supply	Electrical Conduit				√	ELEC
		Fuel/Gas Line				√	MECH
	Heating/Cooling Generation and Distribution System	Boiler*			√		MECH
		Cooling Tower*			√		MECH
		Air Handler*			√		MECH
		Chiller*			√		MECH
		Piping		√			MECH
	Testing, Balancing, Controls, and Instrumentation	Valves				√	MECH
		Dampers				√	MECH
		Sensors				√	MECH
		Instruments				√	MECH
	Chimneys/Vents	Fans			√		MECH
		Ductwork		√			MECH
		Flues/Cleanout/Caps			√		MECH
Electrical (Non-Generator)	Electrical Service and Distribution	Incoming Service				√	ELEC
		Panels and Breakers*			√		ELEC
	Lighting and Branch Wiring	Wiring		√			ELEC
		Fixtures		√			ELEC
		Switches and Receptacles		√			ELEC
	Other Electrical System Related Elements	Lightning Protection	√				ELEC
		Emergency Lighting	√				ELEC
Fire Protection	Sprinklers	Piping		√			MECH
		Heads		√			MECH
	Standpipes*	Piping			√		MECH
		Hose Connection			√		MECH
	Hydrants and Other Fire Protection Specialties	Hydrants*			√		MECH
		Tank*			√		MECH
		Compressor*			√		MECH
		Valve*			√		MECH
		Controls*			√		MECH
		Annunciators*			√		MECH
Security	-	Sensor*			√		ELEC
		Camera*			√		ELEC

Assessment			Level of Granularity				Inspector
System	Subsystem	Component	Building	Room	Asset	TBD	
		Controls*			√		ELEC
		Annunciators*			√		ELEC
Equipment	Lifts*	-			√		ELEC & ARCH
	Cranes*	-			√		ELEC & ARCH
Generator	Generator*	-			√		ELEC
	Transfer Switch*	-			√		ELEC

6.1.3 Facility Assessment Application (ArcGIS Online/ArcGIS Pro) – GIS Analyst Guide

6.1.3.1 Purpose

This document is intended for a GIS analyst providing technical support for MDOT MAA facility assessments. It provides information on how the facility assessment application is architected in ArcGIS Online and it outlines the steps necessary to process data after field collection is complete for input into the MDOT Excel spreadsheet.

6.1.3.2 Getting Started

Below is a list of items that must be completed by the GIS analyst before field work can commence.

Item	Description/Action	References	
ArcGIS Online for Maryland account	The GIS analyst providing technical support must have an ArcGIS Online for Maryland account. Request an account by completing the MDOT-specific application. It requires the GIS analyst to have an MDOT or MAA email address.	https://survey123.arcgis.com/share/9f289ad6a8f4449d8622fe98a8dcb987	
MAA Facility Assessment group in ArcGIS Online	The GIS analyst must be added to the MAA Facility Assessment group in ArcGIS Online. To request access, contact the GIS & Engineering Technology Section (GETS) GIS Analyst at airportal@bwiairport.com.	https://maryland.maps.arcgis.com/home/group.html?id=91559c703c7640f6bed2c3a31644a136#overview	
Updated floor plans (lines and room polygons) for BWI and MTN	The GIS analyst must request updated floor plans for BWI and MTN via the Digital Data Request Form available in AIRPortal under General > PEGS Reference Documents > PEGS V1-AIRPortal > Requesting Digital Data. To the right is the complete list of BWI and MTN consolidated floorplans.	1	BWI_Campus_Floor_Number_0
		2	BWI_Campus_Floor_Number_1
		3	BWI_Campus_Floor_Number_1a
		4	BWI_Campus_Floor_Number_2
		5	BWI_Campus_Floor_Number_2i
		6	BWI_Campus_Floor_Number_3
		7	BWI_Campus_Floor_Number_4
		8	BWI_Campus_Floor_Number_5
		9	BWI_Campus_Floor_Number_6
		10	BWI_Campus_Floor_Number_7
		11	BWI_Campus_Floor_Number_8
		12	BWI_Campus_Floor_Number_9
		13	BWI_Campus_Floor_Number_B
		14	BWI_Campus_Floor_Number_M
		15	MTN_Campus_Floor_Number_1
		16	MTN_Campus_Floor_Number_2
		17	MTN_Campus_Floor_Number_3

Item	Description/Action	References	
		18	MTN_Campus_Floor_Number_4
		19	MTN_Campus_Floor_Number_5
		20	MTN_Campus_Floor_Number_M

Item	Description/Action		References
Web Maps to be used by field inspectors for collection via ArcGIS Collector. These are shared with the MAA Facility Assessment group in ArcGIS Online.	1	2019-2020_Facility_Assessment_New-ARCH (Web Map)	Linked tables: • ShellAssessment • InteriorsAssessment • EquipmentAssessment • ConveyanceAssessment
	2	2019-2020_Facility_Assessment_New-ELEC (Web Map)	Linked tables: • SecurityAssessment • HVACAssessment • GeneratorAssessment • EquipmentAssessment • ElectricalAssessment • ConveyanceAssessment
	3	2019-2020_Facility_Assessment_New-MECH (Web Map)	Linked tables: • PlumbingAssessment • HVACAssessment • FireProtectionAssessment
	4	2019-2020_Facility_Assessment_New-STRUCT (Web Map)	Linked tables: • SubstructureAssessment • ShellAssessment • InteriorsAssessment

6.1.3.3 Setting Up the ArcGIS Collector Application

1. In ArcGIS Pro, a single point feature class and related tables have been created for each system.
    a. **Point Feature Class** – this will be the geographic location of the “thing” that is being assessed. It will be either a room, asset, or building. This does not contain the inspection information, just location and brief description of the thing
        i. Level of Assessment – identifies the granularity of the assessment, it can either be at the asset, room, or building level, the symbology is based on the level of assessment
        ii. Preloaded points (if points are not present or need to be spatially adjusted to fit the updated floor plans, create per the following):
            1. Load a building point - for each building drop a point at the front door of the building and fill out all attribute information for the building
            2. Load room points – provide a point for each room. Where possible, include attribute information, suggest either door number or space unit centroid
        iii. Enable Attachments – photos will be of the “thing” rather than the condition

Assessment_Point Schema

Field Name	Alias	Type
MAXIMO_ID	Maximo ID	Text
FEATURE_NAME	Name	Text
FEATURE_DESCRIPTION	Description	Text
ASSESSMENT_LEVEL	Assessment Level	Text
BUILDINGID	Building ID	Text
FLOORNUMBER	Floor Number	Text
UNIT	Space Unit Number	Short
DOORNUBMER	Door Number	Text
GlobalID	GlobalID	GlobalID

b. **Assessment Tables** – Each system will have an assessment table (11 total) that will store all inspection information
   i. For System field – set the default value to the appropriate system name

Field Name	Alias	Type
OBJECTID	OBJECTID	ObjectID
SYSTEM	System	String
SUBSYSTEM	Subsystem	String
COMPOENT (if applicable)	Component	String
DESCRIPTION	Description	String
ASSET5	5 – Excellent	Small Integer
ASSET4	4 – Good	Small Integer
ASSET3	3 – Adequate	Small Integer
ASSET2	2 – Marginal	Small Integer
ASSET1	1 – Poor	Small Integer
CRITICALITY	Criticality to System	Small Integer
INSPECTOR_COMMENT	Inspector's Comment	String
PARENTGUID (relationship class)	ParentGUID	GUID
Score	Score	Double
Range	Range	Double
GlobalID (attachment)	GlobalID	GlobalID
CreationDate (automatic editor fields)	CreationDate	Date
Creator (automatic editor fields)	Creator	String
EditDate (automatic editor fields)	Editor	Date
DUPGUID (for preserving the ParentGUID)	DUPGUID	String

c. Domains are used for the following fields:
   i. Assessment Level: Asset, Building, Room
   ii. BuildingID: List all buildings numbers in the Code and Descriptive name in the description
   iii. Floor_Number: For Code: 1, 2, 3, 4, 5, M, NA, R - For description: 1st Floor...Mezzanine, Not Applicable, Roof
   iv. Component_XSystem: For each system write the "Subysystem-Component", use a shortened version in the code and longer version in the description
   v. Subsystem_XSystem: For each system, list all subsystems

vi. Range: 0-100 domain range
vii. Criticality: For Code: 1, 2, 3 For Description: 1 - Minor, Failure has minimal impacts, 2 - Major, Failure has moderate adverse impacts, 3 - Critical, Failure has significant adverse impacts
viii. YES_NO: Yes, No

2. The Point and Assessment tables exist in ArcGIS Online.

This has been published as Assessment Point_new

3. The Feature Layer (hosted, view) for each level of the buildings at BWI/MTN.
    a. These have been created for 1st, 2nd, Mezzanine, 3rd, 4th, 5th, and roof
    b. If the building has more levels, the GIS analyst will need to create another hosted view.
        i. To do that, click on the Assessment Point_new (hosted) in ArcGIS Online. On the Overview Page, press "Create View Layer"
            1. Give it a name and appropriate metadata. Then press OK.
            2. This will open the Hosted View Layer, go to the Visualization Window.

4. Create inspector web maps.
    a. Create bookmarks for buildings and airports.
    b. Add all hosted layer views for the appropriate buildings
    c. Remove tables that do not relate to that inspector's discipline to declutter map.
    d. Configure popups. Hide subsystem for component level assessments, use split function for post processing of the data to extract the subsystem from the component field

5. Share all hosted layers, layer views and maps with the appropriate group so that inspectors can access the maps via the Collector application.

6. There are two hosted feature layers in the web maps that can be used to collect information separately from the assessment points:
    a. Defect_Point: used to identify significant defects in an item
    b. Floor_Plan_Discrepancy: used to identify a discrepancy in a particular floorplan

6.1.3.4 Processing Data After a Field Event

A. Download a Copy of the Data from AGOL
    1. From ArcGIS Online, open the **Assessment Point_new** feature layer, press Export Data > Export to FGDB.

    2. URL: https://maryland.maps.arcgis.com/home/item.html?id=89e7819eefb64b6cb833f40d83d2437f

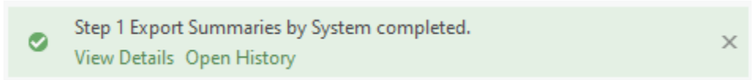
    3. From the GIS analyst's desktop, unzip folder and save file geodatabase to a project folder.

B. Process the Data to Create the MDOT Deliverable
    1. Open a new project in ArcGIS Pro.

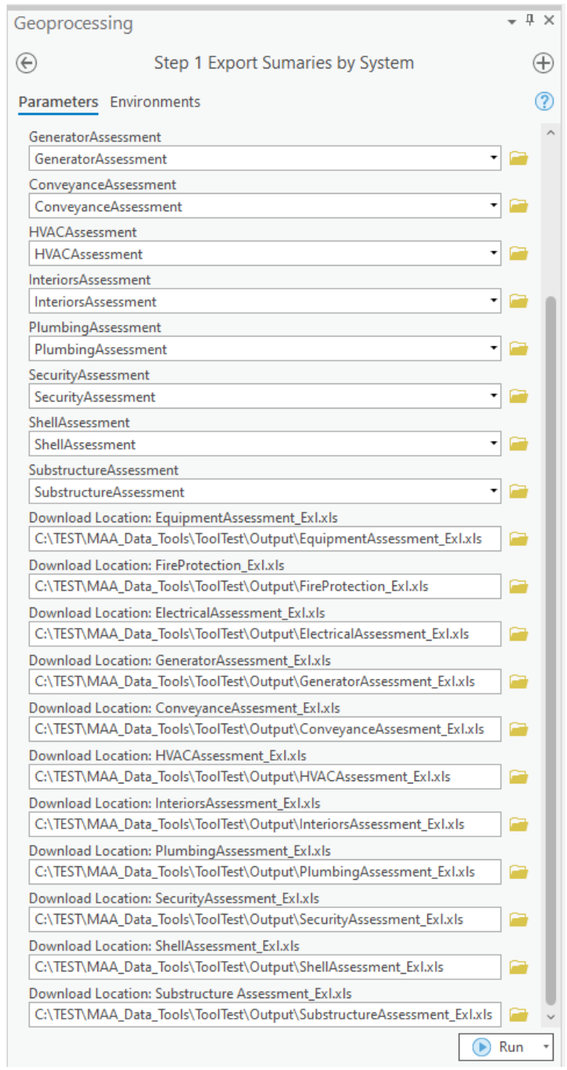
    2. Pull the feature class and all assessment tables into an empty map. The GIS analyst should label this map so they know they are working with an offline copy of data that needs to be cleaned up.
        a. Review the assessment data collected by inspectors.
        b. Use the ***CreationDate*** field to query only those inspection records created during the field work
        c. Confirm that ratings add up to 100 and that criticality, system/subsystem/component have been filled in (CRITICALITY IS NOT NULL, SYSTEM IS NOT NULL, SUBSYSTEM IS NOT NULL, COMPONENT IS NOT NULL). If these are missing, contact inspectors for the correct information.
            i. To see the location of assessment records with missing info, join these records to the assessment point feature class (ParentGUID → GlobalID)
            ii. Once the GIS analyst receives the corrected values, make changes to the Hosted Feature Layer in AGOL. (Inspectors can use the Collector app to fill in their own missing info as well)
            iii. Redownload a copy of the corrected FGDB.

    3. If data looks complete and accurate, open the toolbox (**MAA_step1.atbx**) and double click the **Step 1 Export Summaries by System** tool
        a. Parameters should auto populate per the screenshot below

b. Set the download location path for each system file to a local drive
c. Run tool – the following will appear if successfully completed



d. This will create Excel files for each system with average score for each asset rating and criticality broken out by component and the subsystem for each building.
e. In Excel, open the output file for the system of interest. Use control + A to select the entire data range, and click the filter button on the data tab. At the top of each column, there is now a filter option. On the BuildingID column, select the building of interest. This will filter the data to show only the subsystem and components related to the building of interest.
f. In another Excel window, open a copy of the MDOT Facility Assessment Form. Copy and paste the appropriate values form the export into the MDOT deliverable. Make sure to complete all fields in the MDOT deliverable per the instructions in the manual.
g. Repeat this process for every system output Excel file.



6.2 Asset Data Collection and Delivery (COBie Data) for Projects

This standard applies to all design and construction projects at BWI Marshall and Martin State Airports to include both Building Information Modeling (BIM) and non-BIM projects. *Note: Consultants preparing BIM deliverables must deliver asset data in accordance with PEGS Volume 1, Chapter 5 BIM Standards.*

The purpose of this standard is to be ensure that all design and construction projects include the delivery of asset data in conformance with the MDOT MAA's Strategic Asset Management Plan (SAMP). MDOT MAA relies on an IBM Maximo system to manage its asset inventory and maintenance operations. An important component of the SAMP is to collect and maintain quality asset information for:

- system preservation,
- safety and security,
- quality of service, and
- decision making

MDOT MAA requires that asset data be delivered using the Construction to Operations Building information exchange (COBie) data format. COBie is an international standard for building data exchange and is widely used for Facility Management (FM). The COBie process includes Design, Build, and Operate modules to help transform paper documents into electronic storage tools. For the purpose of this standard, COBie is used to capture building construction handover information via standardized spreadsheet templates that can be imported into MDOT MAA's asset management system (i.e., Maximo).

For any project involving the addition of assets required to be tracked within Maximo, consultants and contractors are required to collect accurate and complete asset data information as needed to modify/update the MDOT MAA's Maximo asset management system. The MDOT MAA-provided COBie templates shall be used for collecting such asset data. ***Note:*** *The provided COBie Templates and Examples are representative forms and may not address all required COBie data. As every project is unique, it is incumbent upon the consultants and contractors to adjust the MDOT MAA-provided templates for project-specific assets in coordination with and approved by MDOT MAA GIS & Engineering Technology Section's (GETS) Asset Management Manager (AMM).*

For both BIM and non-BIM projects, the population of COBie data is an iterative process that starts with the consultant developing the initial COBie spreadsheets (based on the PEGS COBie templates during the design phase and in close coordination with the MAA's GETS Asset Management Manager (AMM). On a routine basis (frequency to be based upon the complexity of the project and as directed by the AMM) the consultant shall meet with the AMM to coordinate the collection and assembly of COBie data. As a minimum, the asset management data must be submitted to AMM at the 60%, 100%, Bid, Conformed, and Record submissions. Each design submittal shall include all required fields (including data to be entered by the consultant and placeholders for data to be entered by both the Owner and the Contractor). Fields to be entered by the consultant shall be populated to the extent that can be determined at each stage of design and agreed to by the AMM. Upon approval of the Conformed submission, the COBie submittal shall be turned over to the contractor for further population.

Asset Management Coordination Process			
	Description	Teams	Project Phase
1	Meet with the MAA Asset Management Manager (include MAA BIM Manager if a BIM project) This meeting is to discuss project scope and schedule, and establish COBie template framework, expectations, and team meeting intervals as required by AMM	AMM + A/E	Upon Task NTP
2	Periodic meetings with the AMM (include MAA BIM Manager if a BIM project), at minimum at each submittal stage depending on the complexity of the project, as determined by AMM	AMM + A/E	As required by AMM
3	Submit populated Asset Data Cobie Spreadsheet to AMM	A/E	60%
4	Submit as designed populated Asset Data Cobie Spreadsheet to AMM and AIRPortal ADM	A/E	90% or 100%
5	Submit populated as-bid Asset Data COBie Spreadsheet to AMM and AIRPortal ADM	A/E	Bid
6	Submit populated conformed Asset Data COBie Spreadsheet to AMM and AIRPortal ADM	A/E	Conformed
7	Meet with the MAA Asset Management Manager (include MAA BIM Manager if a BIM project) This meeting is to discuss project scope and schedule, and establish COBie template framework, expectations, and team meeting intervals as required by AMM	AMM + A/E + CMI + Contractor	Upon Contract NTP
8	Periodic meetings with the AMM to review progress in populating the COBie spreadsheet (include MAA BIM Manager if a BIM project). Meeting interval will depend on the duration and complexity of the project, as determined by AMM	AMM + A/E + CMI + Contractor	As required by AMM
9	Submit populated as constructed Asset Data COBie Spreadsheet to AMM prior to final construction	Contractor + CMI	Final Walkthrough/Commissioning

	walkthrough/commissioning		
10	Submit final as-constructed Asset Data COBie Spreadsheet to the A/E and AMM for final review	Contractor + CMI	As-build
11	Submit final as-build Asset Data COBie Spreadsheet as part of Record set to AMM and AIRPortal ADM	A/E	Record

Project requirements shall dictate how COBie data is to be collected/entered/transferred:

1. For projects required to comply with MDOT MAA's BIM standard, complete asset management data shall be populated within the BIM model. Regardless of whether the information is available at the time of design, BIM elements shall be initially configured by the consultant with the full complement of attributes required and in the proper data format. After the Conformed BIM Model is transferred from the consultant to the contractor, the contractor shall be responsible for continued data population throughout the construction phase. At the end of the project, the asset data from the contractor's BIM model will be merged with the consultant's Record Model. Contractor-supplied asset data shall be checked for accuracy and completeness by the consultant and AMM prior to merging with the Record Model. Any needed corrections shall be addressed by the contractor prior to final walkthrough and commissioning. Once the contractor-supplied data is transferred to the Record Model, the consultant shall export the asset data to COBie spreadsheets and deliver to the AMM for import into the Maximo system.

2. For Non-BIM projects, COBie data shall be collected and manually entered in the COBie spreadsheets created for the project. Such spreadsheets shall be initially populated (with Owner-supplied data and details known at the end of the design) by the consultant and then transferred to the contractor for additional manual data entry. Contractor-supplied draft COBie spreadsheets shall be delivered at the end of the project and checked for accuracy and completeness by the consultant and AMM. Any needed corrections shall be addressed by the contractor prior to final walkthrough and commissioning. Once approved, the COBie spreadsheets shall be delivered to AMM as part of the close-out submittals for import into the Maximo system.

Consultants are required to include the MDOT MAA's Standard Technical Specifications for Asset Data Collection and Delivery (COBie Data) as provided in PEGS in all construction contracts. Such Technical Specifications shall be tailored for the specific project requirements. The construction documents shall also include the consultant's COBie spreadsheets, partially populated with the Owner/consultant-provided asset data, which shall accompany the Standard Technical Specifications so that bidders are made aware of the requirements and the extent of remaining data to be provided by the contractor.

COBie data population shall continue throughout the construction phase. Much of the data to be entered into the COBie spreadsheets can only be determined following the formal submittal and review process and, in some cases, only after the assets are delivered to site, e.g., serial numbers. Following award, the contractor shall be responsible to adjust the COBie documents as required to support the awarded solution. Throughout the project, the contractor shall populate the COBie documents with data from approved/installed equipment.

As dictated by the Standard Technical Specifications for Asset Data Collection and Delivery (COBie Data), the consultant shall participate in routine meetings with the AMM and the contractor to review the status of the COBie data population. The consultant shall review progress submissions for accuracy and completeness.

Upon final acceptance of a construction project, the contractor is responsible for delivering the completed COBie spreadsheets to the consultant and AMM for review. The consultant shall review the populated COBie spreadsheet for completeness and accuracy and submit the final COBie spreadsheets via AIRPortal Document Manager (ADM) to MDOT MAA along with as-built documents/models.

The quantities and types of COBie spreadsheets to be submitted shall be dictated by the nature and extent of the project. The examples and templates provided in PEGS Volume 1, Appendix 1F-3 are intended only to establish the organization of data and level of detail required. It shall be the consultant's responsibility to identify, develop, and initially populate all required COBie spreadsheets to be issued to the contractor for further population.

The required types of assets and the extent of data to be delivered are identified in MDOT_MAABxP_Part2 LODMatrix_Attributes Parameters. This document includes four tables:

1. Section 1 - MDOT-MAA BIM Execution Plan LOD Matrix: Relevant to this standard when the project utilizes BIM standards.
2. Section 1.1, Table 23 – Asset Attributes: provides a detailed matrix of required asset data to be provided for asset types currently being tracked within Maximo. Rows are sorted using the OmniClass Table 23 Construction Classification System to align with more traditional A/E organization.
3. Section 1.2: Omniclass Table 23 Asset Attribute Definitions: This table provides a data cross-walk between the Omniclass attributes/groups and COBie tabs/columns. The Table also provides recommendations concerning who is to provide the data (e.g., Owner, A/E, Contractor, etc.)
4. Section 2: Revit-Maximo Parameter List - Relevant to this standard when the project utilizes BIM standards.

The above tables provided under MDOT_MAABxP_Part2 LODMatrix_Attributes Parameters should be edited for the unique nature and complexity of each project. In the event that the project introduces new asset types that are not currently installed at BWI Marshall or MTN and, therefore, are not currently tracked within Maximo, the consultant shall consult with AMM to determine if such assets are to be added to the COBie deliverables. If it is agreed that such assets are to be added, the consultant will coordinate with the AMM to determine the specific attributes to be included in the COBie submission.

Section 1.1, Table 23 establishes a baseline of assets and data that MDOT MAA requires to be tracked within Maximo. Depending upon the specific asset type, this may include, but is not necessarily limited to, the following attributes:

- Asset ID (as noted in the field)
- Asset type
- Description
- Manufacturer
- Model number
- Serial number
- Year manufactured
- Installation date
- Purchase price/cost
- Expected service life
- Warranty number
- Warranty expiration

All assets to be demolished or relocated under a given project must be logged and reported as a separate close-out submittals, but are not required to be included in the COBie submission. Demolished/relocated assets shall be identified by existing/new locations, equipment type, asset tag number, make, model, etc., as required for MDOT MAA to uniquely identify the existing asset within its Maximo system.

The following spreadsheet templates shall be utilized to document demolished and relocated assets:

- Demolished/Abandoned-in-Place Assets
- Removed/Repurposed Assets

The above spreadsheets shall be initially populated by the consultant and then transferred to the contractor for additional data entry. At the end of the project, the spreadsheets shall be verified by the consultant and delivered to AMM concurrent with the close-out submittals. A final draft of the Contractor's Demolished Assets and Relocated Asset submittals shall be required prior to the final walkthrough and commissioning. MDOT MAA asset management staff shall utilize the spreadsheets to document changes within the Maximo system.

1A.1 AIRPortal Document Manager User Guide for Design Consultants

1A.1.1 Introduction

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) Office of Engineering & Construction requires consultants to submit design documents to MDOT MAA via the AIRPortal Document Manager (ADM) application.

ADM is a light weight, downloadable, Windows-based desktop application that allows consultants to directly submit electronic deliverables to MDOT MAA for archiving in AIRPortal prior to the closeout of a project. The purpose of ADM is to streamline the archiving process and to ensure those documents meet archiving standards.

Final documents must be uploaded in PDF format. Consultants may submit files in other file formats in addition to PDF. Once design documents have been submitted and approved by the MDOT MAA archivist, they are stored in a database and are accessible by reference in the Engineering Records document library found in AIRPortal.

1A.1.2 System Requirements

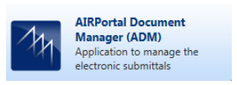
To use ADM on a Windows PC, users must have at least the following:

- Windows 7 SP1 or higher
- .NET Framework 4.5 (Install will download it from Microsoft if target PC does not already have it installed)
- 1 GHz processor
- 1 GB RAM
- 100 MB of disk space
- Internet connectivity

For users of Internet Explorer, ensure that compatibility mode is turned off. To do this, go to Tools > Compatibility View Settings. Uncheck the box next to Display intranet sites in Compatibility View.

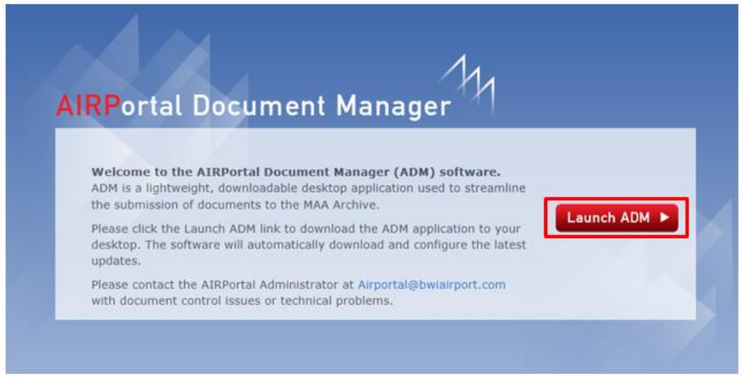
1A.1.3 Accessing AIRPortal Document Manager

ADM software is available at the following AIRPortal location: AIRPortal>AIRPortal Document Manager (ADM). An AIRPortal login is required to access the ADM software. Additional permissions are required to use the software. To request permission to use ADM, the consultant project manager should contact the AIRPortal Administrator (airportal@bwiairport.com).



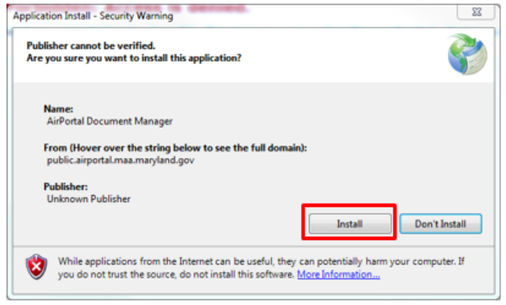
1A.1.3.1 Downloading AIRPortal Document Manager

When you click on the ADM module, you will be redirected to the download site. When you click the Launch ADM link, the software will download and install on the target PC. If the target PC does not have .NET framework 4.5, the framework will download with the ADM software.

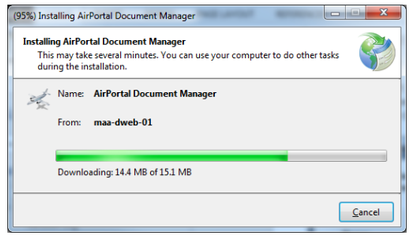


1A.1.3.2 Installing AIRPortal Document Manager

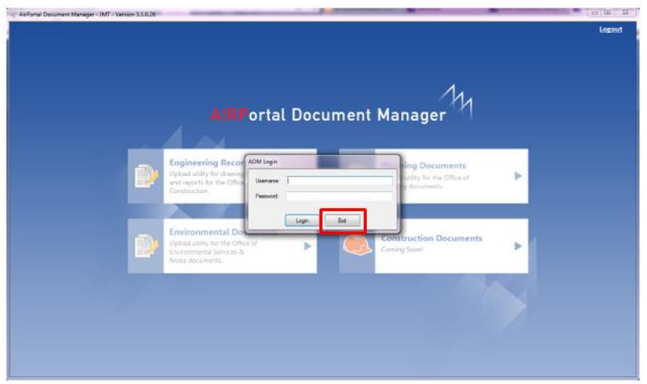
Once you have downloaded the AIRPortal Document Manager, click Install and follow the installation steps.



After you have clicked the Install button you will see the application being installed.

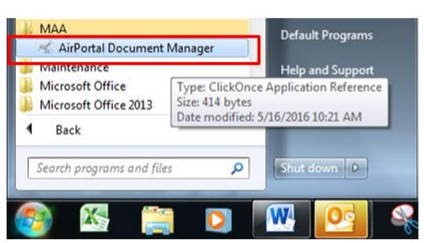


When the installation is complete, the AIRPortal Document Manager application will open. To close this window, click the Exit button at the bottom of the Login window.

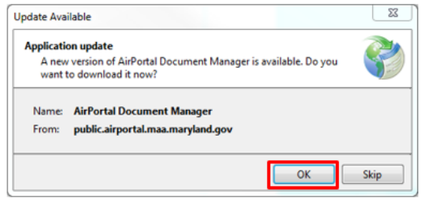


1A.1.3.3 Opening AIRPortal Document Manager

Once ADM is installed, the application will be available through Start Button > All Programs > MAA > AIRPortal Document Manager.

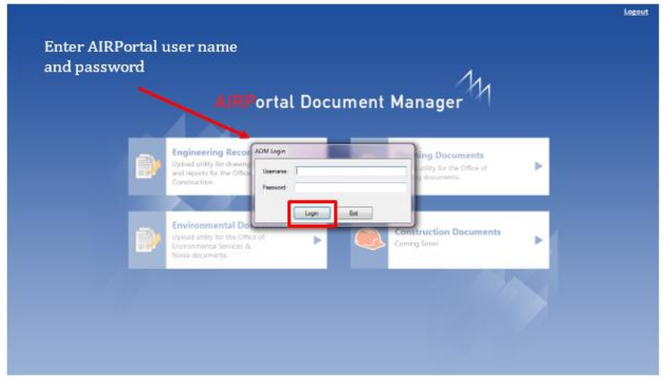


The application will automatically check for updates each time it is launched. Users are encouraged to install any updates to the software as they are available to ensure maximum functionality. To accept the application update, click OK.

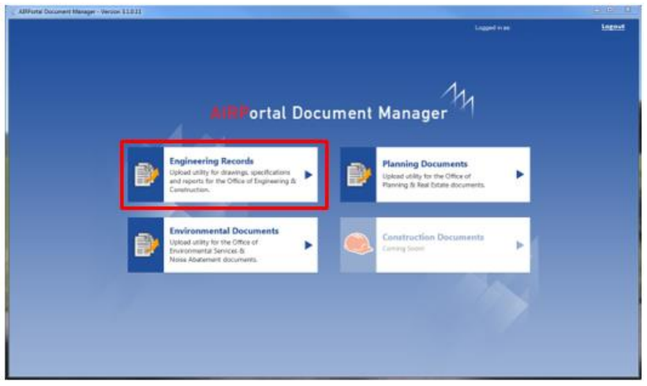


1A.1.3.4 Logging Into AIRPortal Document Manager

To log in to the AIRPortal Document Manager (ADM), enter your AIRPortal Username and Password in the ADM Login window. Click Login.

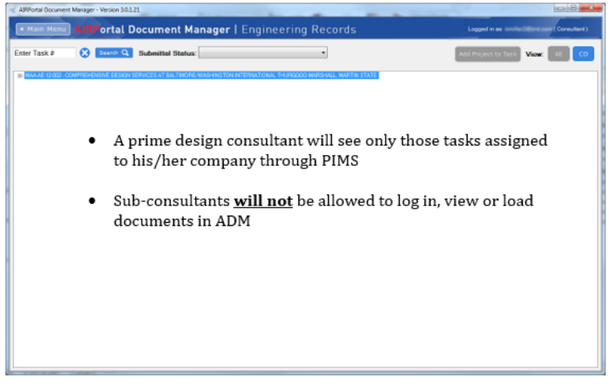


Once logged in, the user will come to a landing page where they can choose between Engineering Records, Planning Documents, and Environmental Documents. Permission to access these upload tools is dependent on the consultant. If a consultant does not have permissions to upload planning documents, the Engineering Records button will be grayed out. Click on the Engineering Records button.

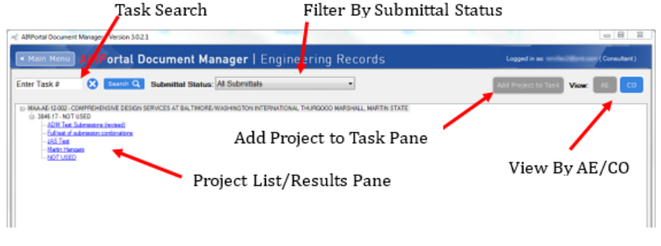


1A.1.4 Engineering Records

Once logged in to Engineering Records within ADM, the user will see the list of AE contracts available to his/her login on the ADM home window. Permissions to view contracts are based on PIMS assignments.



1A.1.5 Overview of ADM Home Window



The ADM interface allows the user to search for a project, add a project to a task if it doesn't already exist, and view the project list by AE number or by CO number.

Task Search Field: The Task Search Field allows the user can enter a specific Task number to search. Once the user enters a Task number, click the Search button to return results in the Project List/Results Pane.

Filter by Submittal Status: The user can also filter the Project List by selecting a specific Submittal Status out of the drop-down menu. The Project List/Results Pane will be updated to show only the projects that have submittals with that specific status.

Project List/Results Pane: The Project List/Results Pane is setup in a tree style. The user can navigate through a project by expanding the tree levels below the AE contract number. Projects will appear as hyperlinks in the tree.

Add Project to Task: *Add Project to Task* is greyed out unless a task is selected in the tree. The button is not available at the Contract level of the tree structure.

View By AE/CO: allows the user to toggle between the AE contract list and the CO contract list. The AE Contract list is filtered based on PIMS assignments for the design consultant or the MAA Task Manager. The CO contract list is a list of all COs and is not filtered.

1A.1.5.1 Overview of Document Submission Window

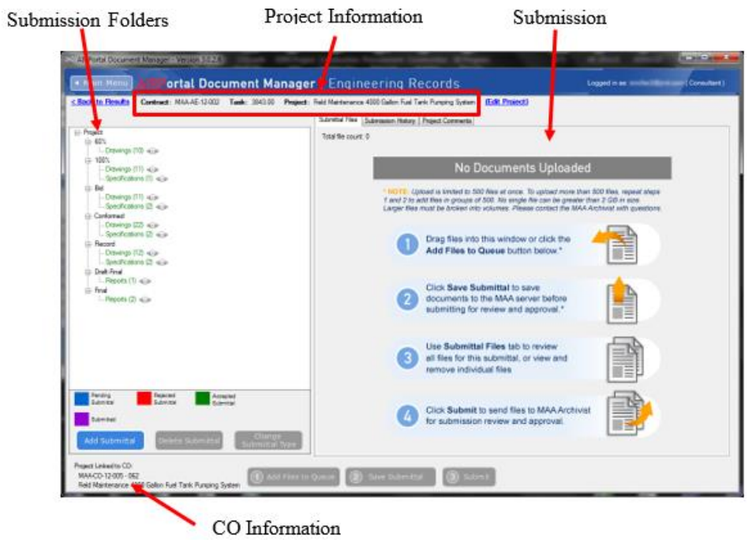
Once a project *hyperlink* has been clicked, the document submission window opens.

The information for the selected project is listed at the top of the window. This includes the AE Contract number, the AE Task number, and Project name.

The window is divided into two panes. The pane on the left is the folder structure for the submissions and the pane on the right is the submission area.

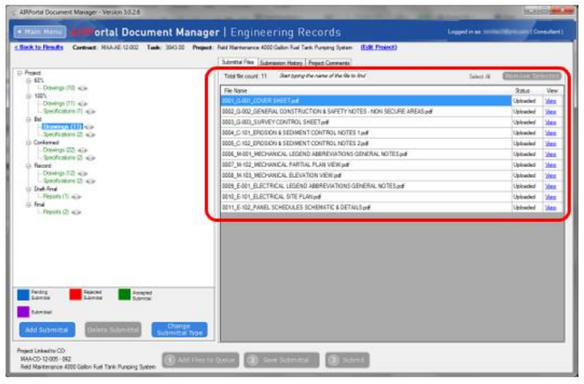
The information displayed in the submission area is controlled by tabs that allow the user to submit documents, review the submittal history and view any project comments entered by the MAA Archivist.

If a task has been linked to a CO number that information shows in the bottom left hand corner of the window.



1A.1.5.2 Submittal Files Tab

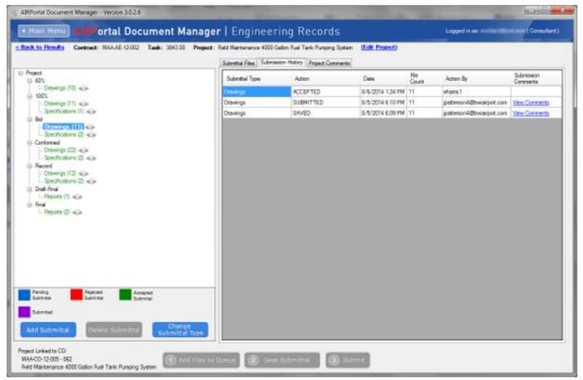
The Submittal Files tab allows the user to drag and drop files or navigate to files to build submission. Before any files have been loaded, instructions will appear in the Submittal Files tab.



Once files have been added to a submission, the listing and status of files will appear in the Submittal Files tab.

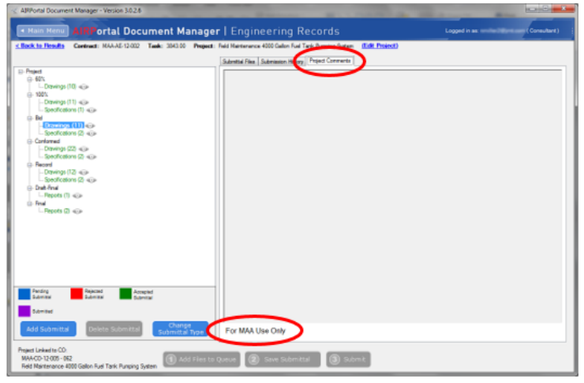
1A.1.5.3 Submission History Tab

The Submission History tab shows the database transaction log for documents and submissions that have been saved, submitted, removed, changed type, rejected, or accepted.



1A.1.5.4 Project Comments Tab

The Project Comments tab displays notes entered by the MAA Archivist related to the contract. This area is read only for every user except the MAA Archivist.



1A.1.6 Navigating to a Project

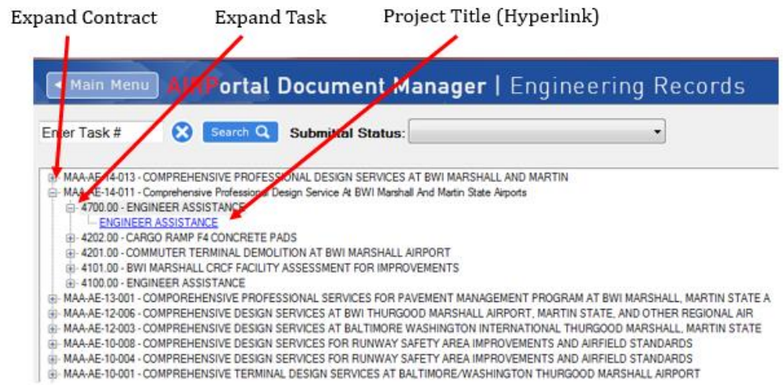
Before interacting with any submittal, the user must first navigate to a project. There are several ways to accomplish this.

1A.1.6.1 Browse to a Project

The user can browse to a project by expanding the tree levels below the AE contract number. The tree expands or closes by clicking the + and – signs next to each level.

Projects will appear as hyperlinks in the tree.

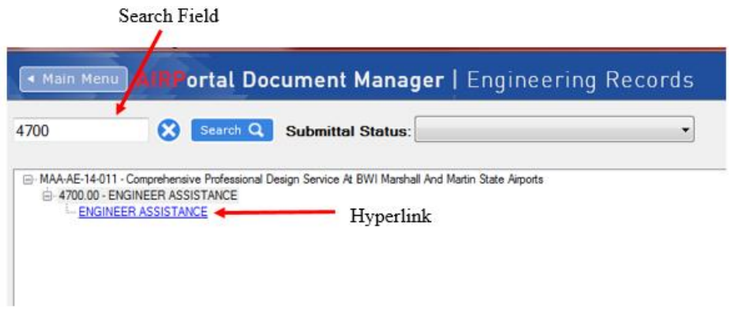
1. Expand a Contract (i.e. MAA-AE-14-011)
2. Expand a Task (i.e. 4700.00 ENGINEER ASSISTANCE)
3. Click the Project Title (i.e. ENGINEER ASSISTANCE). The Project Title is a hyperlink that when clicked, will open the submittal window.



1A.1.6.2 Search on a Task

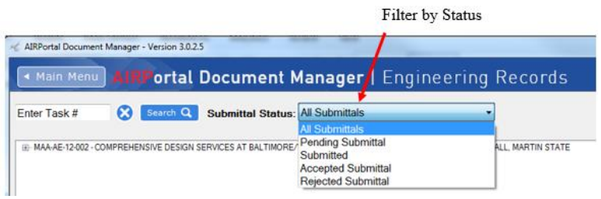
Alternately, users can search on a specific task number instead of browsing.

1. Enter a Task number in the Search field (i.e. 4700) and click Search.
2. The AE Contract the task is associated with will appear in the Project List/Results Pane.
3. Click the Project Title (i.e. ENGINEER ASSISTANCE). The Project Title is a hyperlink that when clicked, will open the submittal window.



1A.1.6.3 Filter by Submittal Status

If documents have already been submitted, or if a submission has been started and saved, the user can navigate using the *Submission Status* drop down.

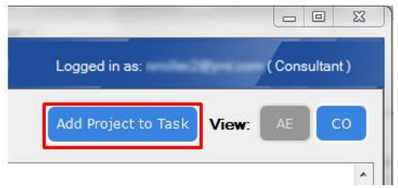


1. **All Submittals** – list of tasks and projects that has had or is in the process of having at least one (1) submittal.
2. **Pending Submittal** – lists only those tasks and project in process of building a submittal. Submittal has not been submitted to MAA.
3. **Submitted** – lists only projects that have been submitted to MAA but have not yet been reviewed by the Archivist.
4. **Accepted Submittal** – list of projects submitted and accepted by the MAA Archive. No additional work required.

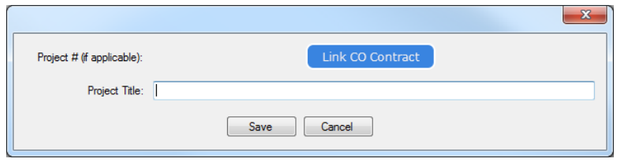
5. **Rejected Submittal** – list of projects that have been submitted to the Archive but were rejected for not meeting submittal requirements outlined in the MAA Design Standards. Consultant must correct and resubmit the documents identified in the return email provided by the Archivist.

1A.1.6.4 Add Project to Task

The *Add Project to Task* button is used when a project is not listed in the tree structure but is occurring under a specific task.



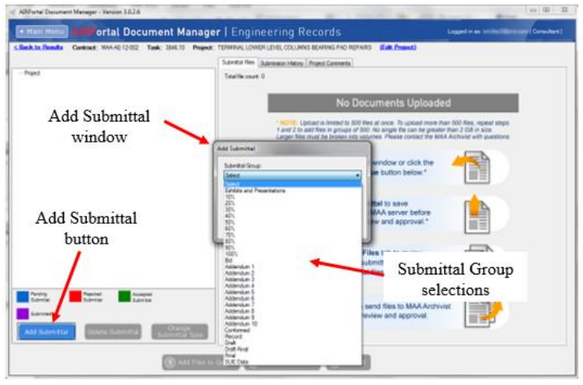
This usually occurs when a smaller, possibly unrelated assignment is added to an existing task (may have urgent/emergency need). This window allows the user to enter multiple Project Titles/descriptions under one (1) AE Task number and if appropriate, link the project to a CO Contract.



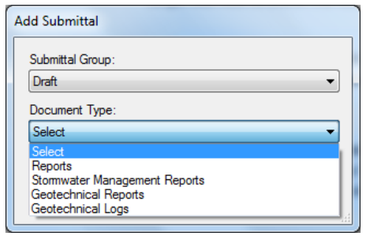
1A.1.6.5 Preparing a Submittal for Documents

Once the user has navigated to the specific project, documents can be uploaded for submission.

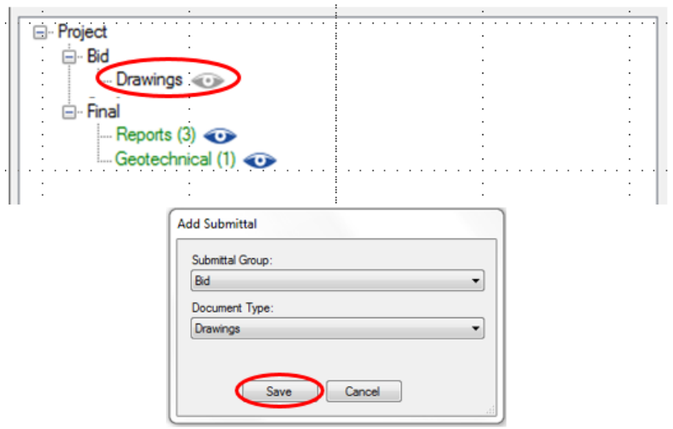
1. Select the Add Submittal button in the lower left-hand corner and the Add Submittal window will pop-up. This step will allow the user to build the folder structure for the submittal being made.



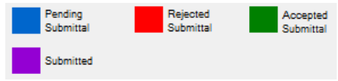
2. Select the following from the Add Submittal pop up:
   a) ***Submittal Group*** - creates a folder to store the submissions.
   b) ***Document Type*** - creates a folder based on the type of document to be submitted. The options presented will be dependent upon the *Submittal Group* that was chosen previously. For example, if Draft was selected for the *Submittal Group*, the follow *Document Types* are available:



3. Once the *Submittal Group* and *Document Type* have been selected, click *Save* and the folders for *Submittal Group* and *Document Type* will be added to the left-hand side of the ADM window.



Document Types are color coded based on the follow legend:



If the *Document Type* is black, that means no documents have been loaded into the folder.

1A.1.7 Uploading Documents for a Submittal

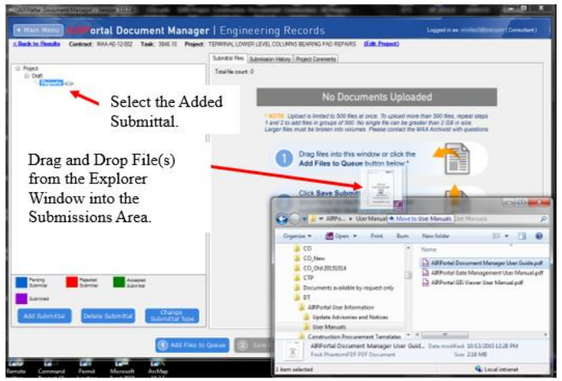
NOTE: There are limitations for file uploads.

- **No more than 500 files can be saved at one time.**
  - If your submittal contains more than 500 files, add and save files in groups of 500 until all your files are loaded.
- **Any one single file cannot be greater than 2 GB in size.**

At this point the user will see the submittal folder has been established on the left-hand side of the ADM window. The next step is to upload documents to the project. There are two ways a user can upload the document(s) either by the *drag and drop* method and/or by clicking the *Add File to Queue* button at the bottom of the window.

1A.1.7.1 Uploading Document(s) by Drag and Drop

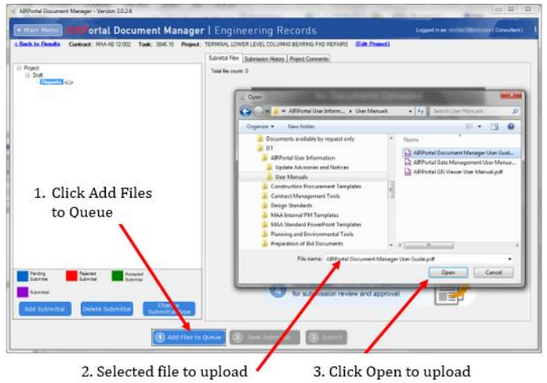
To add files by drag and drop, the user will have both the ADM and Explorer Windows open on the screen. The user will select the file(s) to be submitted in the Explorer window, then while holding down the left mouse button, will drag the selected file(s) to the submission area and release the left mouse button.



1A.1.7.2 Uploading Document(s) by Adding Files to Queue

The same thing can be accomplished by clicking the Add Files to Queue button at the bottom of the window.

1. Click the Add Files to Queue button and use the Explorer window to navigate to the files to be uploaded
2. Select the file(s) to upload

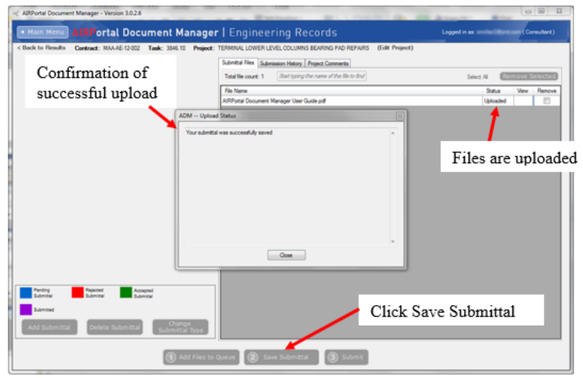


3. Click Open to upload selected file(s)

At this point the **Submittal Files** tab will be populated with the uploaded documents and the status will read **Queued**. You cannot View files through ADM that are only in the queue.

Once the files have been successfully queued, the user will click *Save Submittal*. This will move the files from the user's local PC to the MAA Server. The Status will change to Uploaded.

It is critical to click Save Submittal before moving to a different Document Type or Submittal Group. If you do not click Save Submittal, you will lose your queued documents when you click off of the current Submittal Group and Document Type.



Depending on the number and size of documents in the queue, the upload process may take a few moments to complete. BE PATIENT … do not move on to another step until the Upload Status window is displayed.

1A.1.7.3 Removing a File

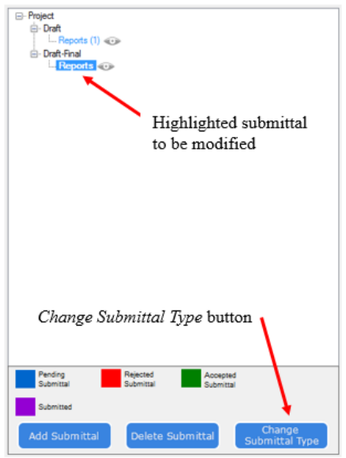
The user can remove a file by checking the *Remove* check box and clicking the *Remove Selected* button on the top right-hand side. These transactions are saved in the Submission History Tab.

The submittal is now saved and has been assigned ***Pending Submittal*** status.

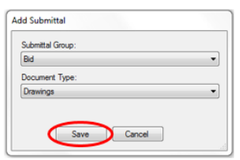
1A.1.7.4 Changing a Submittal Type

The submittal group or document type can be modified prior to the information being submitted to the MAA Archive.

1. Highlight the folder to be corrected in the folder structure pane.
2. Click on the Change Submittal Type button at the bottom of the folder structure pane. This will cause the Submittal Type window to open



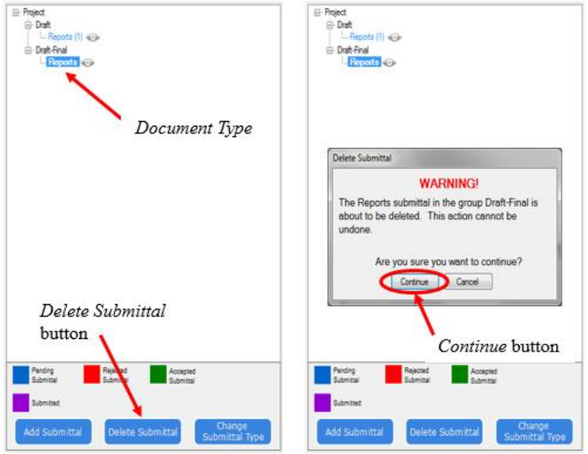
3. Correct the submittal information using the dropdown menus. When complete, click Save to record the change.



1A.1.7.5 Remove a Submission

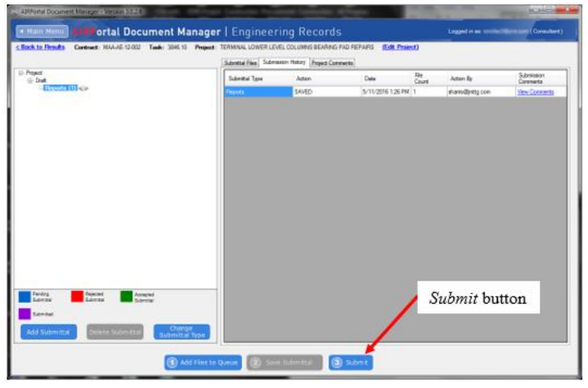
The submitter can delete a submittal while it is in Pending Status (colored blue). This status means that files have been uploaded to the MAA server, but that they have not been transmitted to the MAA Archivist.

1. Click the Document Type you will like to remove.
2. Select and remove all files associated with the submittal to be deleted. This will activate the Delete Submittal button.
3. Click the Delete Submittal button.
4. The user will see the Delete Submittal pop-up window, click Continue to finalize the deletion.

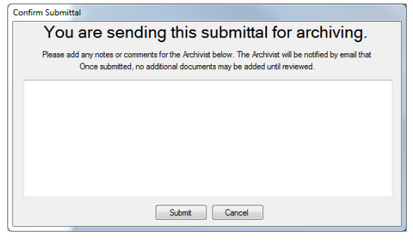


1A.1.8 Submittal Documents to the MAA Archive

Once the submittal has been built and all documents have all been queued and saved, *Submit* button at the bottom will activate. Click the button and the document(s) will be submitted to the MAA Archive.

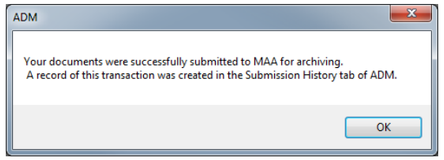


Click *Submit* and the Confirm Submittal pop up appears.



The submitter can make notes or comments in this pop up to accompany the submission. These notes will be viewed only by the MAA Archivist. The notes and comments are optional.

When *Submit* is clicked in the Confirm Submittal window, the MAA Archivist will be notified via email of the submission. A confirmation appears, and the submitter will see the submission turn purple in the Submission Area to indicate the documents have been submitted.



1A.1.8.1 Files Submitted to the MAA Archive

Once the Submittal has been sent to the MAA Archivist for review, the MAA Archivist will either Reject or Accept the submission.

If the submitted documents meet the criteria for acceptance as outlined in the MAA Design Standards, an automated email will be provided acknowledging the acceptance.

If the MAA Archivist **rejects** the submittal the user that submitted the documents will receive the following correspondence via email. The MAA Archivist will include comments that explain the reason for rejection.

From: airportal@bwiairport.com [mailto:airportal@bwiairport.com]
Sent: Wednesday, May 11, 2016 1:50 PM
To:
Subject: ADM - Submittal Rejected

Task: 3846.10

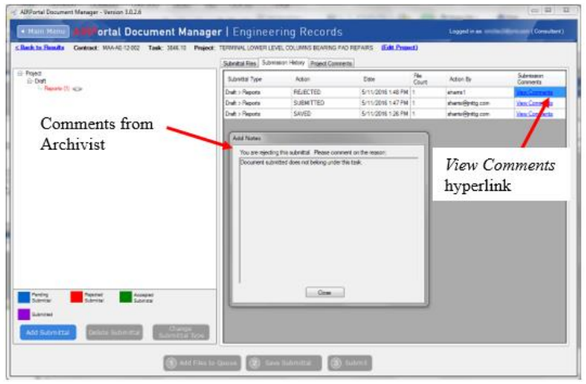
Submittal Type: Draft Reports

Comments: Document submitted does not belong under this task.

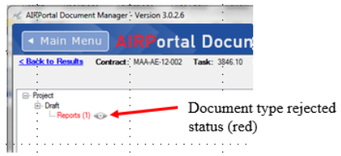
Document Count: 1

1A.1.8.2 Resubmittal After Rejection by the MAA Archivist

If a submittal is rejected, the user will have the ability to correct and resubmit the documents. The user can review the comments from the MAA Archivist by clicking the *View Comments* hyperlink on the Submission History tab. These comments are the same comments as shown in the rejection notice via email.



The user will see that the *Document Type* has turned red, indicating the rejection status.



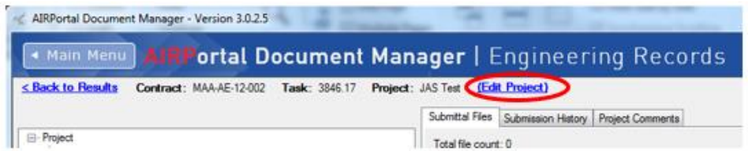
1A.1.8.3 Making Corrections and Resubmitting

To correct a submission that has been rejected by the MAA Archivist, the user will follow the steps to remove the document or documents that failed, make corrections, and follow the steps to make a submission.

1A.1.8.4 Link a CO to a Project (Edit Project)

When making a submission of BID set or better, **the project must be linked to a CO number**. The ADM Application will not allow the submission of any files BID or better without this assignment.

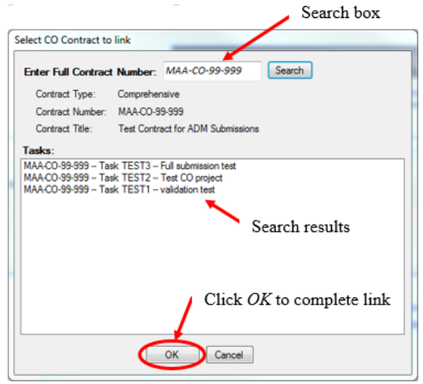
1. To link a CO to a project, click the *Edit Project* link at the top of the ADM window.



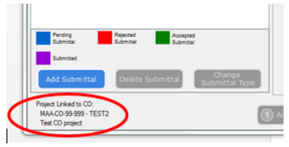
A window will open that allows the user to modify the Project Title as well as Link to a CO Contract.

2. Click the *Link CO* Contract button to open the Select CO Contract to Link window to search for a CO. This can be for regular contracts or project assigned to a comprehensive task.

3. To find your CO number fill-in the search box located at the top of the Select CO Contract to Link window and click search.
   a. If your contract has been entered in the database, the related information will be displayed beneath the search box.
   b. If you're looking for a comprehensive task assignment, they will be listed in the box at the bottom of the window. Click on the appropriate task listing to select.
   c. If your contract information is not listed, you'll need to add the contract info to the database. (Follow the direction provided under Creating and Managing CO Contracts)

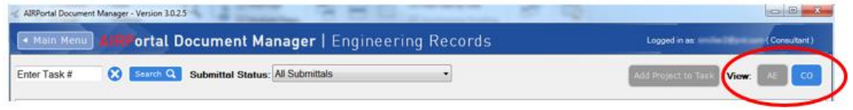


4. If your contract information is available, make sure it's selected and click OK to create the link between the AE Task Number and the CO Contract. This information will appear in the bottom left hand corner of the ADM window.



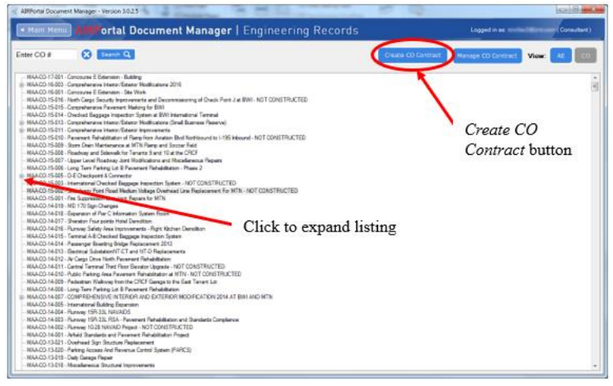
1A.1.8.5 Creating and Managing CO Contracts

To create a link to a CO contract or CO Task, the contract must exist in the contract list. To create a CO or add a CO Task, the user can click on the View By: CO button on the ADM home window.



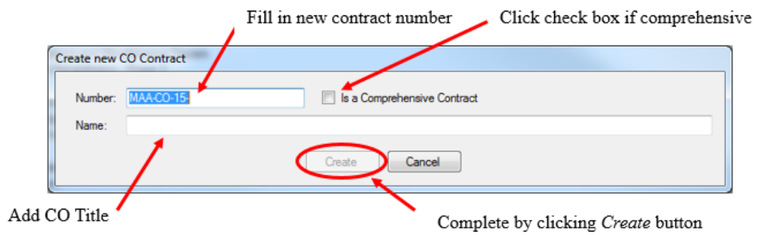
This will return a list of all available CO contracts. Clicking on the '+' symbol next to a contract number will expand the list to display CO Task numbers.

If a CO contract is not listed, the user can click the *Create CO Contract* button at the top of the window and the Create new CO Contract window will appear.

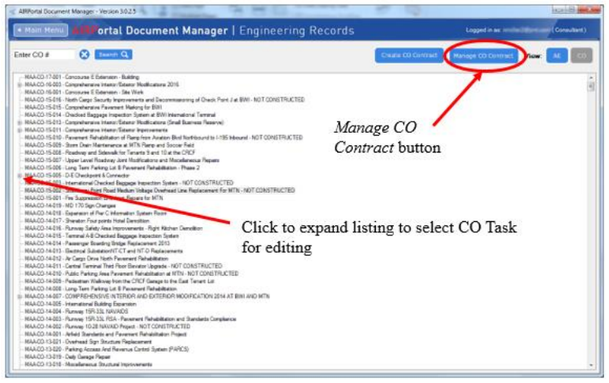


In the Create new CO Contract window, the user can:

- type in the CO Number
- type in the CO Name
- define the contract type (toggle between standard and comprehensive construction contract)
- click the Create button to complete the process

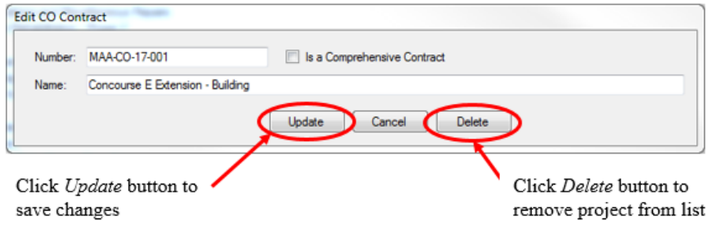


If the CO already exists, the information can be adjusted by clicking the *Manage CO Contract* button at the top of the window. The CO Number, Title and type can be altered in the Edit CO Contract window.

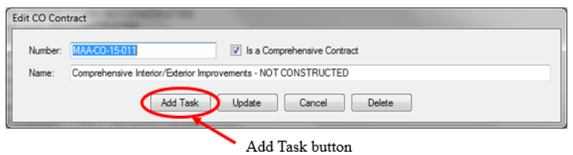


In the Edit CO Contract window, the user can:

- modify the CO Number
- modify the CO Name
- modify the contract type (toggle between standard and comprehensive construction contract)
- click the Update button to save modified information
- click the Delete button to remove the selected contract

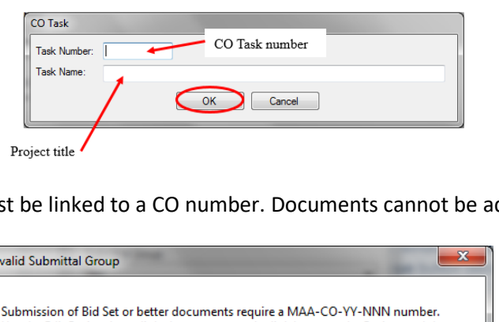


To add a CO Task reference, select a Comprehensive Contract from the list of contracts and click on the *Manage CO Contract* button as noted above. Since the project is already identified as a Comprehensive Contract, the Edit CO Contract window and additional button *Add Task* becomes active.

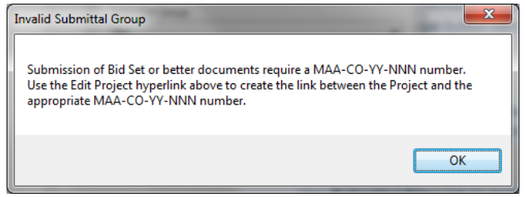


Click the *Add Task* button to access the CO Task window.

Fill in the CO Task number (three digits: 001, 002, 003, etc.) and the project title as noted on the Title page of the drawing set. To complete, click the *OK* button

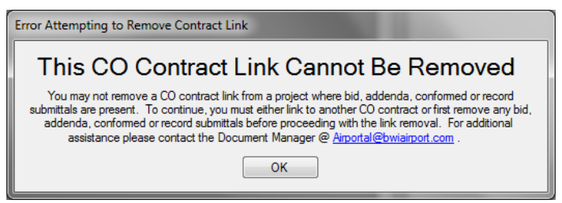


If documents are being prepared for a Submittal Group that is BID set of better, the AE Task must be linked to a CO number. Documents cannot be added to the submittal if there is no CO link.



To link a project to a CO, follow the steps found under Link a CO to a Project (Edit Project).

Conversely, if BID or better documents have been prepared for submission and have a CO link established, that link cannot be removed unless the documents are first removed. If the user attempted to remove the CO link prior to removing the documents from the submission, the following message will display:

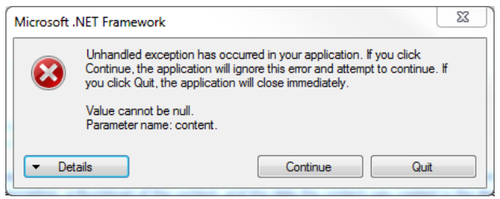


The steps to remove files from a submission are found in Removing a file.

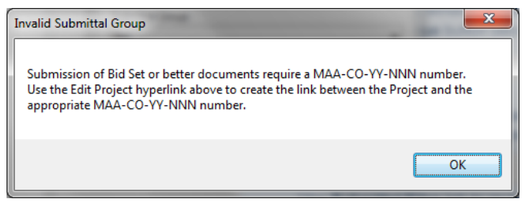
1A.1.8.6 Engineering Records ADM Best Practices

1. Allow ADM to install any updates to the software for maximum functionality.
   a. If you can't install the software on your PC, check with your IT group regarding software policies prior to contacting MAA AIRPortal Support.

2. ADM must maintain internet connectivity. If connectivity is lost, an error message will appear:

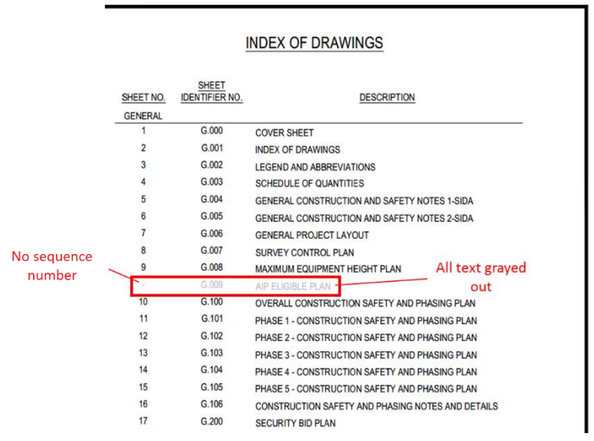


3. Save files to your local hard drive prior to upload. This will facilitate a faster file transfer with fewer upload issues.
4. Remember there are upload limitations:
   a. **No more than 500 files can be saved at one time.** If your submittal contains more than 500 files, add and save files in groups of 500 until all your files are loaded.
   b. Any one single file cannot be greater than 2 GB in size.
5. Saving the Submittal is the step that transfers the files from the user's PC to the MAA Server. This step is critical. Navigating off the submittal group or document type before saving will remove files from the queue.
6. Any documents being prepared for submission as BID set of better must have a CO link established prior to upload. If an upload of BID or better without establishing a link between the AE Task and a CO project a warning message is displayed:



   a. Conversely, any submittal containing BID set or better documents, cannot be unlinked from a CO. If BID or better documents exist for a project and an attempt to remove a link is made, a warning message is displayed:

7. Submittals that have been accepted cannot be removed. Only those that have either a *Rejected Submittal* or a *Pending Submittal* status can be removed.
8. Planning for future drawings in a submission set is permitted provided the following rules are applied"
   a. Submission of Review Drawing Sets (30/60/100% submittals) should be complete based on current available documents. If there are "planned" drawings identified in the Index of Drawings that are not submitted with the set, the consultants should gray out the index entry and that sheet should not be included in the sequence numbering of the set submitted.
   b. In the example below the consultant expects to submit sheet G.009 in a future submission, while showing the intent in the index is appropriate, accounting for in the sequence is not. In this case, 17 pdf files were submitted with the sequence numbers in order 0001 through 0017.



INDEX OF DRAWINGS

SHEET NO.	SHEET IDENTIFIER NO.	DESCRIPTION
GENERAL		
1	G.000	COVER SHEET
2	G.001	INDEX OF DRAWINGS
3	G.002	LEGEND AND ABBREVIATIONS
4	G.003	SCHEDULE OF QUANTITIES
5	G.004	GENERAL CONSTRUCTION AND SAFETY NOTES 1-SIDA
6	G.005	GENERAL CONSTRUCTION AND SAFETY NOTES 2-SIDA
7	G.006	GENERAL PROJECT LAYOUT
8	G.007	SURVEY CONTROL PLAN
9	G.008	MAXIMUM EQUIPMENT HEIGHT PLAN
	G.009	AIP ELIGIBLE PLAN
10	G.100	OVERALL CONSTRUCTION SAFETY AND PHASING PLAN
11	G.101	PHASE 1 - CONSTRUCTION SAFETY AND PHASING PLAN
12	G.102	PHASE 2 - CONSTRUCTION SAFETY AND PHASING PLAN
13	G.103	PHASE 3 - CONSTRUCTION SAFETY AND PHASING PLAN
14	G.104	PHASE 4 - CONSTRUCTION SAFETY AND PHASING PLAN
15	G.105	PHASE 5 - CONSTRUCTION SAFETY AND PHASING PLAN
16	G.106	CONSTRUCTION SAFETY AND PHASING NOTES AND DETAILS
17	G.200	SECURITY BID PLAN

No sequence number

All text grayed out

1B.1 ADM Standards for Office of Environmental Services Consultants

1B.1.1 Introduction

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) Office of Environmental Services requires consultants to submit final project documents to MDOT MAA via the AIRPortal Document Manager (ADM) application.

ADM is a light weight, downloadable, Windows-based desktop application that allows consultants to directly submit electronic deliverables to MDOT MAA for archiving in AIRPortal prior to the closeout of a project. The purpose of ADM is to streamline the archiving process and to ensure those documents meet archiving standards.

Final documents must be uploaded in PDF format. Consultants may submit files in other file formats in addition to PDF. Once environmental files have been submitted and approved by the MDOT MAA archivist, they are stored in a database and are accessible by reference in one or more Environmental Services libraries found in AIRPortal. A file is assigned a database reference for a library based on its attributes (i.e. library, category, and/or topic). Below is a chart of those attributes.

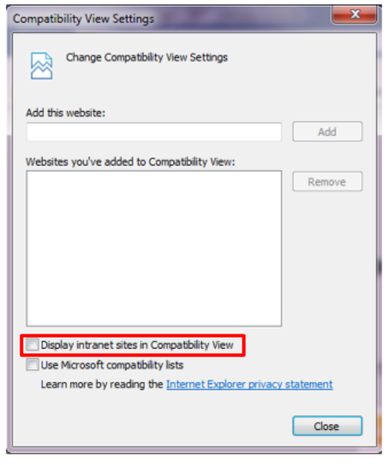
Office	Library Name in AIRPortal	Category	Topic
Environmental Services	Environmental Services Documents	Various	Various
	Stormwater Institutional Management	Various	Stormwater Institutional Management (IMP)
	Noise Documents	Noise	Various

1B.1.2 System Requirements

To use ADM on a Windows PC, users must have at least the following:

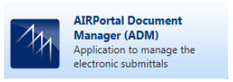
- Windows 7 SP1 or higher
- .NET Framework 4.5 (Install will download it from Microsoft if target PC does not already have it installed)
- 1 GHz processor
- 1 GB RAM
- 100 MB of disk space
- Internet connectivity

For users of Internet Explorer, ensure that compatibility mode is turned off. To do this, go to Tools > Compatibility View Settings. Uncheck the box next to Display intranet sites in Compatibility View.



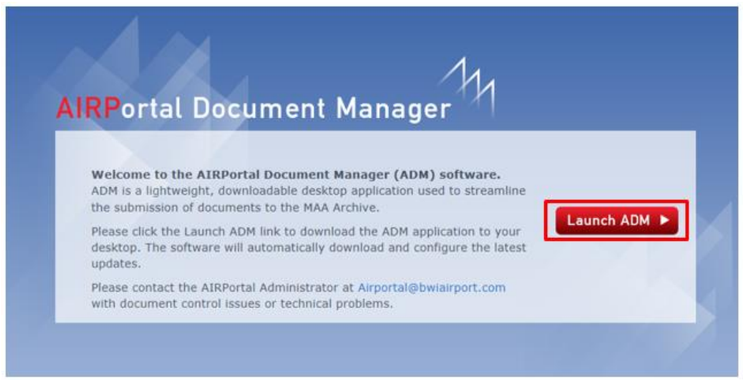
1B.1.3 Accessing AIRPortal Document Manager

ADM software is available at the following AIRPortal location: AIRPortal>AIRPortal Document Manager (ADM). An AIRPortal login is required to access the ADM software. Additional permissions are required to use the software. To request permission to use ADM, the consultant project manager should contact the AIRPortal Administrator (airportal@bwiairport.com).



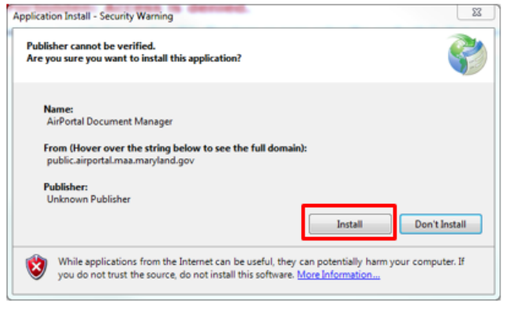
1B.1.3.1 Downloading AIRPortal Document Manager

When you click on the ADM module, you will be redirected to the download site. When you click the Launch ADM link, the software will download and install on the target PC. If the target PC does not have .NET framework 4.5, the framework will download with the ADM software.

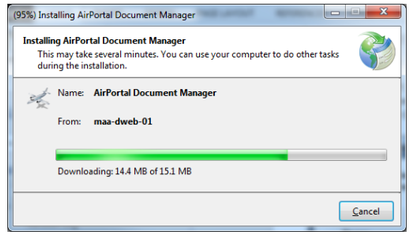


1B.1.3.2 Installing AIRPortal Document Manager

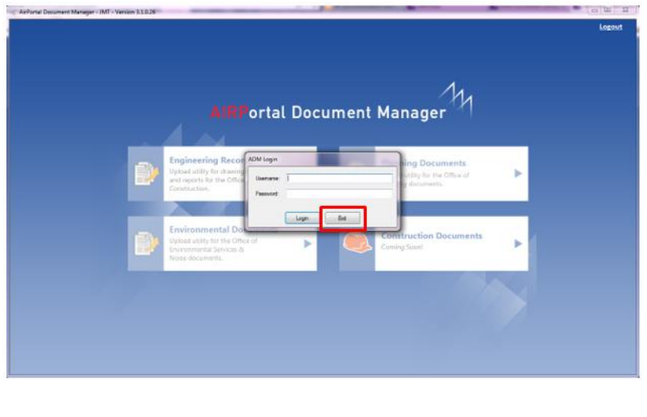
Once you have downloaded the AIRPortal Document Manager, click Install and follow the installation steps.



After you have clicked the Install button you will see the application being installed.

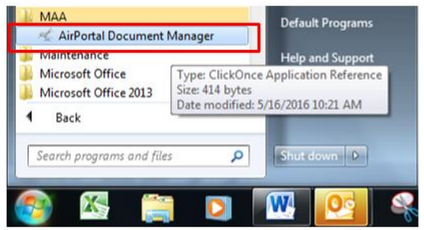


When the installation is complete, the AIRPortal Document Manager application will open. To close this window, click the Exit button at the bottom of the Login window.

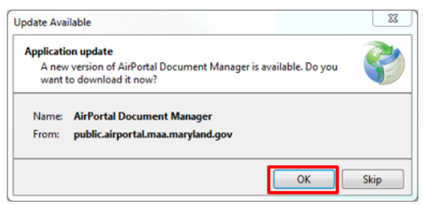


1B.1.3.3 Opening AIRPortal Document Manager

Once ADM is installed, the application will be available through Start Button > All Programs > MAA > AIRPortal Document Manager.

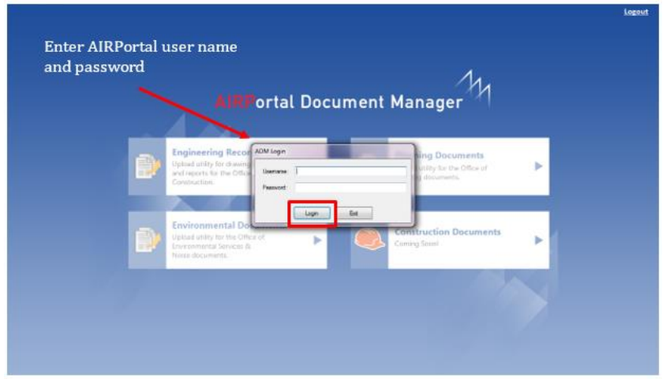


The application will automatically check for updates each time it is launched. Users are encouraged to install any updates to the software as they are available to ensure maximum functionality. To accept the application update, click OK.

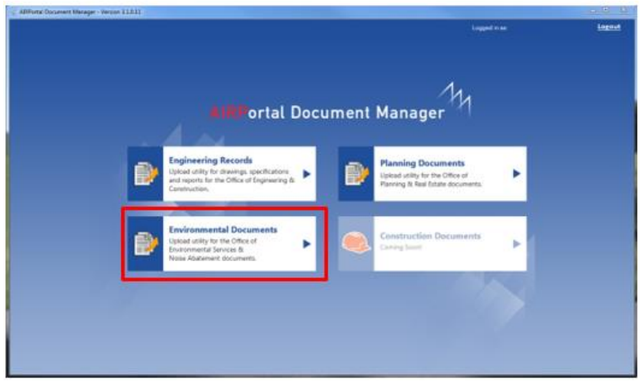


1B.1.3.4 Logging Into AIRPortal Document Manager

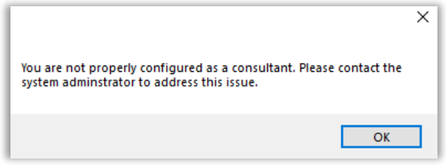
To log in to the AIRPortal Document Manager (ADM), enter your AIRPortal Username and Password in the ADM Login window. Click Login.



Once logged in, the user will come to a landing page where they can choose between Engineering Records, Planning Documents, and Environmental Documents. Permission to access these upload tools is dependent on the consultant. If a consultant does not have permissions to upload environmental documents, the Environmental Documents button will be grayed out. Click on the Environmental Documents button.



If an environmental consultant receives the error message below after clicking on the Environmental Documents button, they should send an email to Airportal@bwiairport.com.



1B.1.4 Environmental Services File Guidelines

1B.1.1 File Contents

Environmental files submitted to MDOT MAA via ADM are the final version of a file that has been reviewed and approved by the MDOT MAA Office of Environmental Services. Before uploading an environmental file in ADM, please make sure to check for the following:

- It is the final version of the file
- The first page of the file contains the title and publication date of the document (where applicable)
- No pages are missing
- No pages are duplicated
- If the file has been scanned, the scan is good enough quality for a user to be able to read it on screen and read a printed copy

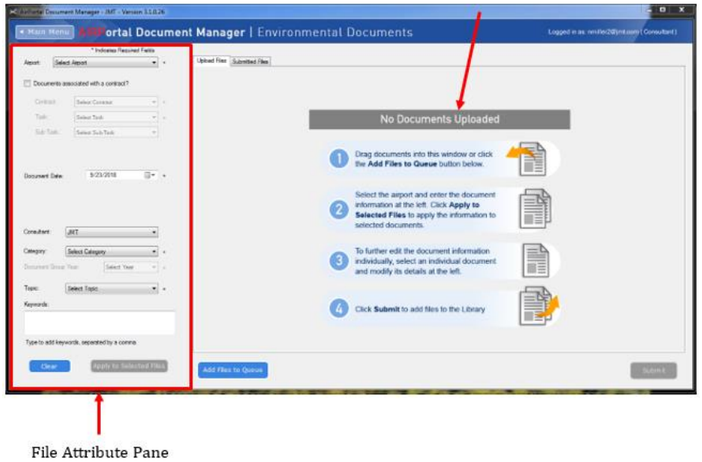
1B.1.2 File Naming

Environmental files that will be uploaded into AIRPortal via ADM must have a suitable name. The guidelines below should be followed when naming files:

- The file name should match the name of the document, with some minor exceptions
  - The file name must be less than 247 characters
  - If the airport name is included in the title, it does not have to be spelled out
- Since all documents are final documents, the word “Final” should not be included in the title
- If the file contains sensitive security information (SSI), it should have _SSI appended to the file name

1B.1.5 Overview of Environmental Documents Home Window

When the user first enters ADM for Environmental Documents, they see the following screen.



The Environmental Documents ADM interface allows the user to upload files or view submitted files that have not yet been approved. Once a user adds a file to the queue for uploading, the instructions are replaced with a data grid that lists the files in the queue.

1B.1.6 Add Files to Upload Queue and Define Attributes

All files to be uploaded must have attribute information. The file attributes can be set before or after adding files to the queue. Attributes include:

Airport: A required field, the user can choose from BWI Airport, Martin State Airport, Both, or Other.

Documents associated with a contract: Some environmental documents are not associated with a contract. If the document to be uploaded is associated with a contract, the user must check this box. Doing so will make the Contract, Task, and Sub-Task dropdowns active.

Contract: A required field, the user will choose the contract that the file(s) they are uploading are related to. The user will only be able to view contracts for which their firm is the prime.

Task: A required field, the user will choose the task that the file(s) they are uploading are related to. The user will only be able to view tasks for which their firm is the prime.

Sub-Task: The user can choose a sub-task that the file(s) they are uploading are related to. The user will only be able to view sub-tasks for which their firm is the prime. Not all tasks have a sub-task.

Document Date: A required field, the user will enter the effective date of the file(s) to be uploaded. This should be the date as it appears in the document being submitted.

Consultant: This field is populated by the system and is based on the credentials of the user uploading the file.

Category: A required field, the user can choose among a number of values including Administration, Airport Layout Plans, Airside, Landside, Master Plan, Other, Real Estate, Regional, and Terminal. Categories serve as keywords and facilitate searches in the AIRPortal document library for Environmental Documents.

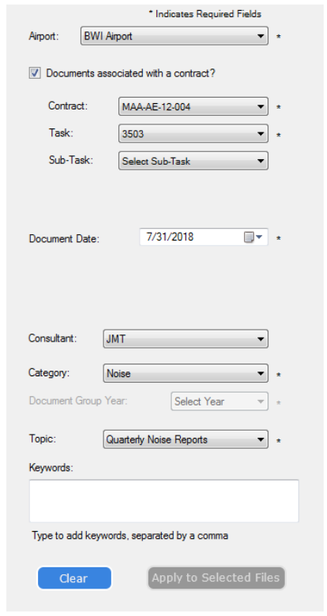
Document Group Year: This field is not required for any environmental documents and is therefore disabled.

Topic: A required field, the user can choose among a number of values. Users can start typing a topic name to jump down the list. Topics serve as keywords and facilitate searches in the AIRPortal document library for Environmental Services.

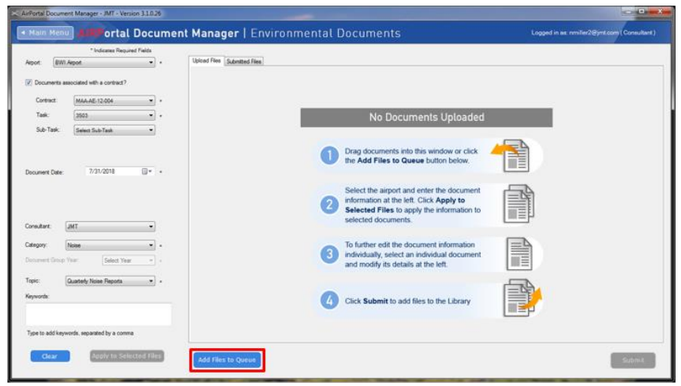
Keywords: The user can enter other keywords, separated by a comma, that will help users to find the file in the AIRPortal document library for Environmental Services. This field can be left blank. Users should not duplicate category or topic values.

1B.1.1 Define File Attributes Before Adding Files to the Queue

The user can begin the process by entering the required file attributes. Required fields are marked with an asterisk. In the example below, the document to be uploaded is associated with a contract.

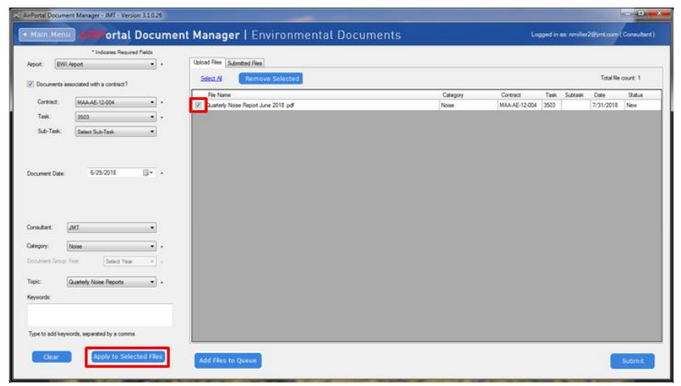


After entering the required file attributes, the user will click on Add Files to Queue or drag and drop one or more files from their desktop into the ADM Upload Files window.

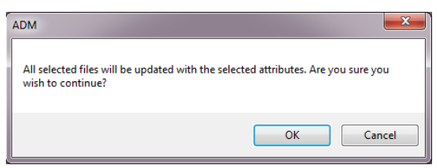


When the user adds a file to the queue, it is assigned the attributes that were entered beforehand.

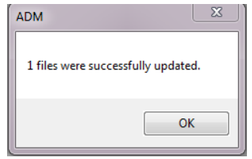
The user can modify the attribute information of the file by clicking the checkbox next to the file, updating the attribute information in the file attribute pane, and then clicking Apply to Selected Files at the bottom of the file attribute pane.



The user will be asked to confirm that they want to update the selected files with the new attribute information. The user can proceed with the update by clicking OK or canceling the update by clicking Cancel.

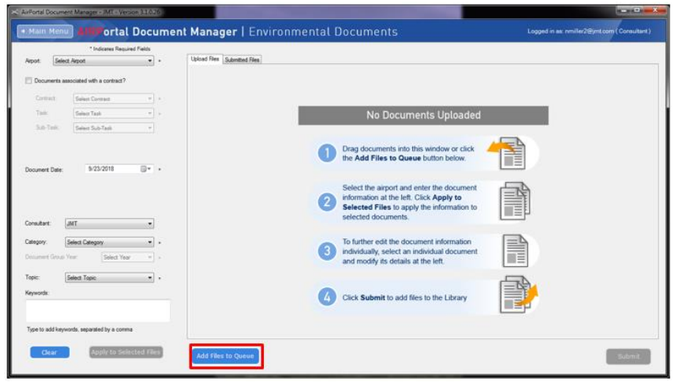


After the user clicks OK, they will receive a message that the update was successful.

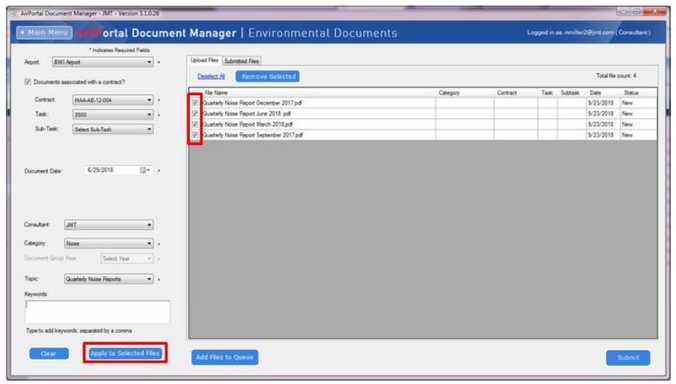


1B.1.2 Define File Attributes After Adding Files to the Queue

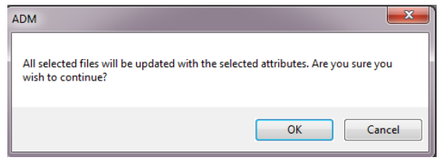
A user can add files to the queue for upload by clicking on Add Files to Queue or dragging and dropping files from their desktop into the ADM Upload Files window. Clicking Add Files to Queue will open a window where users can navigate to the location of the files on their desktop or on a shared drive.



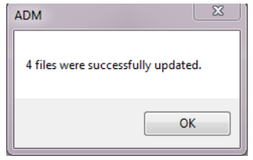
After the user has added one or more files to the queue, they will check the box next to the applicable files, define the file attributes, and click Apply to Selected Files.



The user will be asked to confirm that they want to update the selected files with the attribute information. The user can proceed with the update by clicking OK or canceling the update by clicking Cancel.

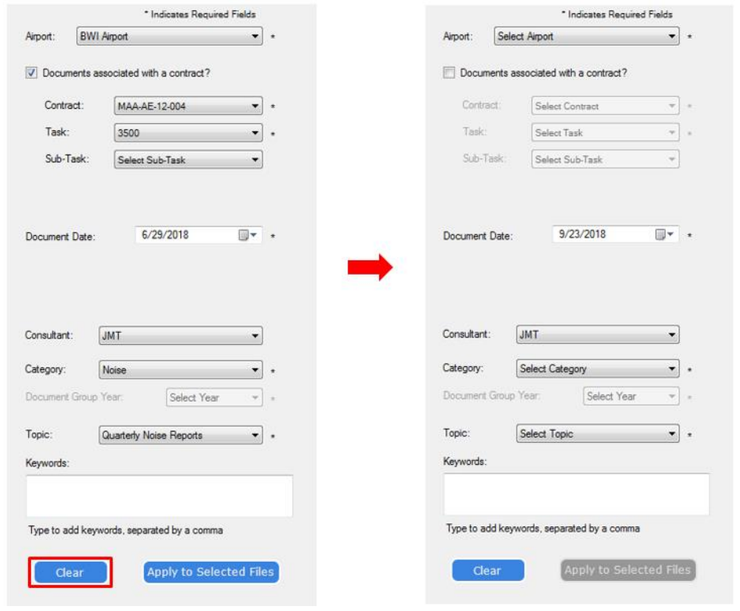


After the user clicks OK, they will receive a message that the update was successful, and the data grid will reflect the changes made.



1B.1.7 Clear Attribute Information

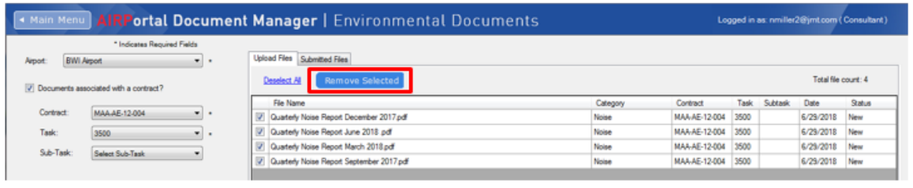
If at any time, the user wants to clear the attribute information that is visible in the file attribute pane, they can click on the Clear button.



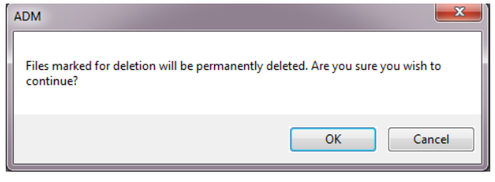
After clearing the file attribute pane, the user can enter new information and apply it to selected files in the data grid. The document date will default to today's date.

1B.1.8 Remove a File

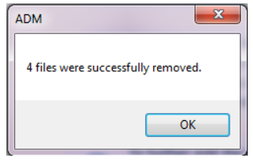
Files can be removed from the upload queue by checking the box next to the document and clicking Remove Selected.



The user will be prompted to confirm that they want to proceed and permanently delete the files marked for deletion. Clicking OK will delete the files. Clicking Cancel will cancel the action.



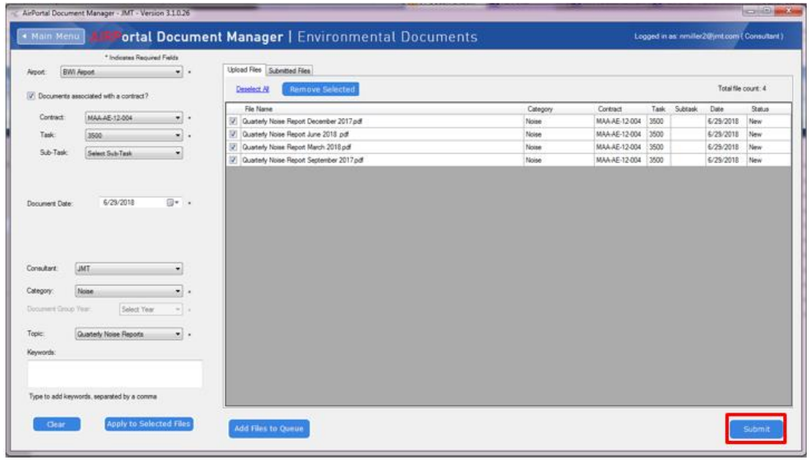
After clicking OK, the user will get a message notifying them of the successful removal of the files. The data grid will be emptied if all files have been selected for removal.



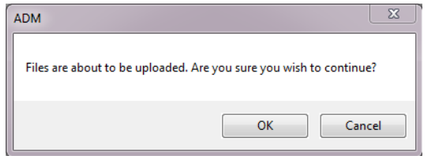
1B.1.9 Submit a File

Once the user has put all the files into the queue that they want to submit and defined the attributes for the files, they will submit the files by clicking Submit. If the user has not populated all the required fields, they will get an error message when they try to submit.

Note: If the user closes ADM before clicking on the Submit button, the files that have been queued will be removed. The user will have to reload the files into the queue the next time they launch ADM.

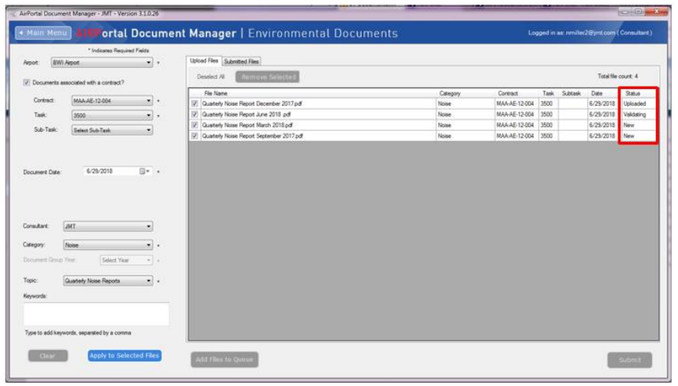


The user will be asked to confirm that they want to continue and upload all files in the data grid. They will click OK to continue or Cancel to cancel.



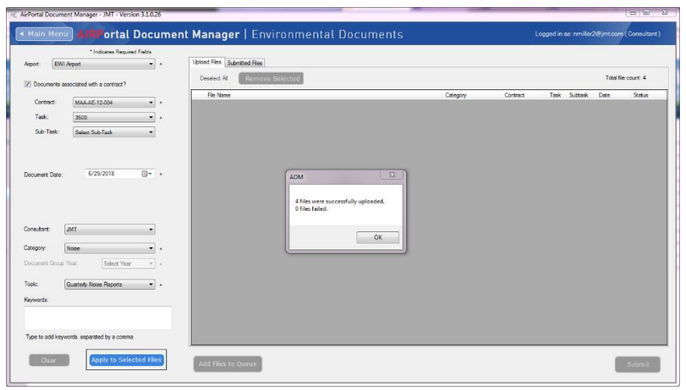
The Status field will show the current state of the file upload. Statuses include:

- New: Status of a file that has not yet been uploaded
- Validating: Status of a file that is in the process of being validated for upload
- Uploading: Status of a file whose upload is in progress
- Uploaded: Status of a file that has been successfully uploaded



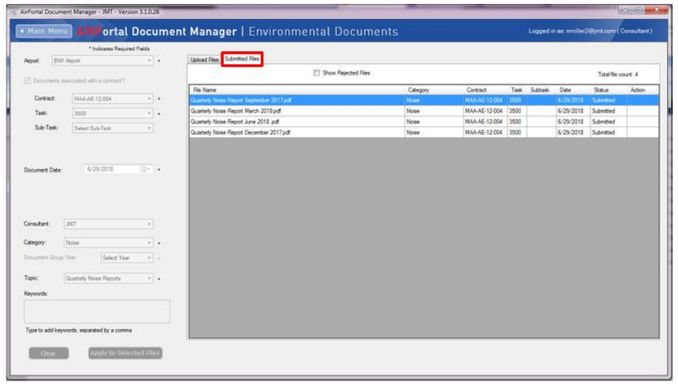
Once a file is submitted, it cannot be removed or edited by the consultant unless the file is rejected by the MDOT MAA Archivist.

When the upload process is complete, the user will get a pop-up message letting them know how many files were uploaded successfully and how many failed. If all the files uploaded successfully, the data grid will be empty.

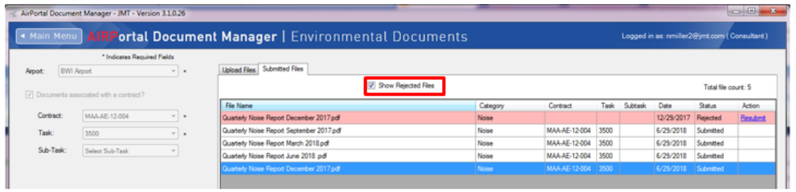


1B.1.10 Submitted Files Tab

Once a user submits one or more files and before those files are approved, they are visible to the consultant in the Submitted Files tab.



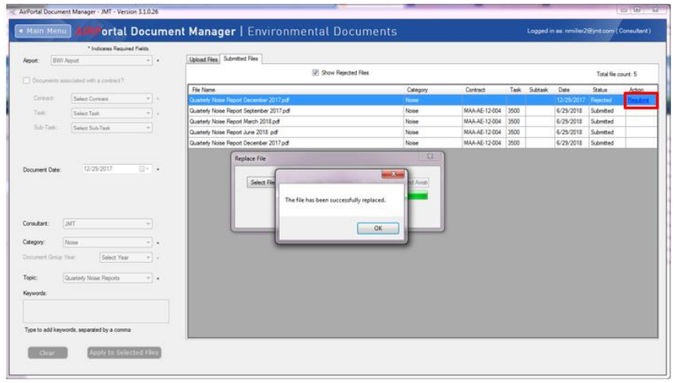
Users can see rejected files in this tab by checking the box next to Show Rejected Files. When a file is rejected by the MDOT MAA Archivist, an email is sent to the user from MAA-ADM-NoReply@bwiairport.comwith an explanation of why the file was rejected.



Approved files will be accessible to AIRPortal users in the appropriate Environmental Services library.

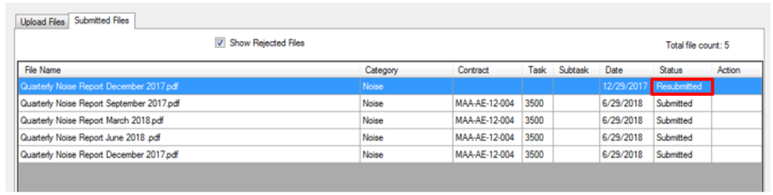
1B.1.11 Resubmit a Rejected File

It is possible that a file submitted to MDOT MAA via ADM could be rejected. If a file is rejected, an email will be sent to the consultant that submitted it from MAA-ADM-NoReply@bwiairport.com with a reason for why the file was rejected.

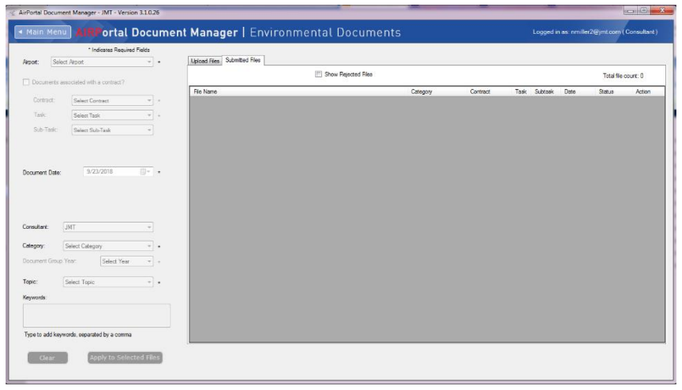


A user can resubmit a rejected file by logging into ADM for Environmental Documents, going to the Submitted Files tab, and clicking on the Resubmit link. This will launch a window where the user can navigate to the replacement file and upload it. When the file upload is successful, they will get a message saying that the file has been successfully replaced. The replacement file will be assigned the same attributes as the original file.

A resubmitted file will be given a status of Resubmitted in the data grid.



Once all files that a consultant has submitted have been approved, the Submitted Files tab will be empty. Approved files will be accessible to AIRPortal users in the appropriate Environmental Services library.



1C.1 ADM Standards for Office of Planning Consultants

1C.1.1 Introduction

The Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) Office of Planning requires consultants to submit final project documents to MDOT MAA via the AIRPortal Document Manager (ADM) application.

ADM is a light weight, downloadable, Windows-based desktop application that allows consultants to directly submit electronic deliverables to MDOT MAA for archiving in AIRPortal prior to the closeout of a project. The purpose of ADM is to streamline the archiving process and to ensure those documents meet archiving standards.

Final documents must be uploaded in PDF format. Consultants may submit files in other file formats in addition to PDF. Once Planning files have been submitted and approved by the MDOT MAA archivist, they are stored in a database and are accessible by reference in one or more Planning libraries found in AIRPortal. A file is assigned a database reference for a library based on its attributes (i.e. library, category, and/or topic). Below is a chart of those attributes.

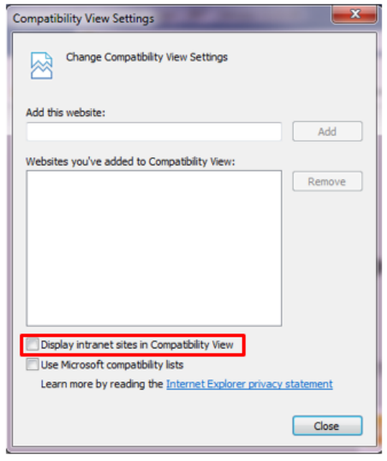
Office	Library Name in AIRPortal	Category	Topic
Planning	Planning Documents	Various	Various
	Airport Layout Plans	Airport Layout Plans	Airport Layout Plans
	Airport Master Plans	Master Plan	Various
	Real Estate	Real Estate	Various

1C.1.2 System Requirements

To use ADM on a Windows PC, users must have at least the following:

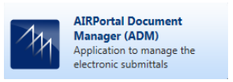
- Windows 7 SP1 or higher
- .NET Framework 4.5 (Install will download it from Microsoft if target PC does not already have it installed)
- 1 GHz processor
- 1 GB RAM
- 100 MB of disk space
- Internet connectivity

For users of Internet Explorer, ensure that compatibility mode is turned off. To do this, go to Tools > Compatibility View Settings. Uncheck the box next to Display intranet sites in Compatibility View.



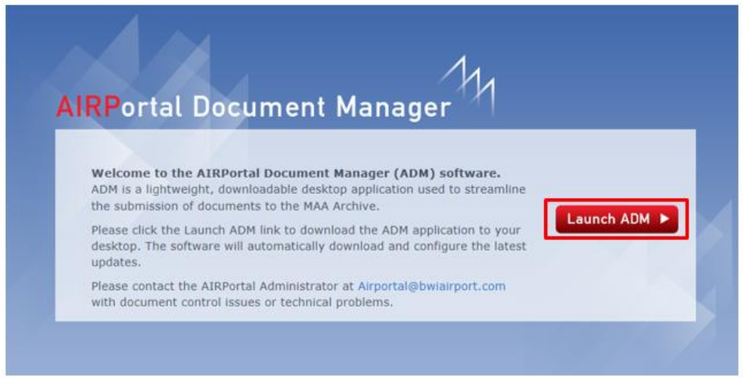
1C.1.3 Accessing AIRPortal Document Manager

ADM software is available at the following AIRPortal location: AIRPortal>AIRPortal Document Manager (ADM). An AIRPortal login is required to access the ADM software. Additional permissions are required to use the software. To request permission to use ADM, the consultant project manager should contact the AIRPortal Administrator (airportal@bwiairport.com).



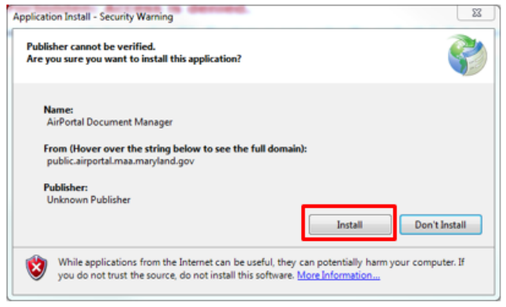
1C.1.3.1 Downloading AIRPortal Document Manager

When you click on the ADM module, you will be redirected to the download site. When you click the Launch ADM link, the software will download and install on the target PC. If the target PC does not have .NET framework 4.5, the framework will download with the ADM software.

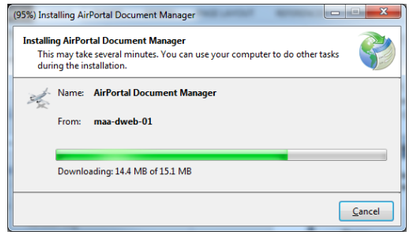


1C.1.3.2 Installing AIRPortal Document Manager

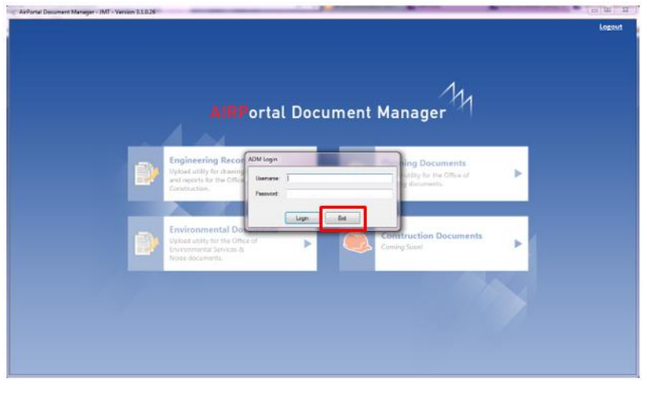
Once you have downloaded the AIRPortal Document Manager, click Install and follow the installation steps.



After you have clicked the Install button you will see the application being installed.

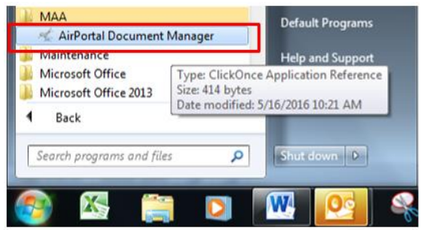


When the installation is complete, the AIRPortal Document Manager application will open. To close this window, click the Exit button at the bottom of the Login window.

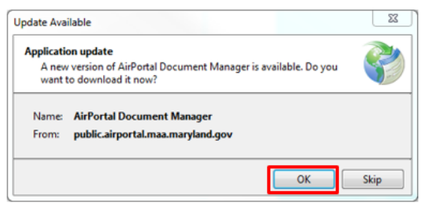


1C.1.3.3 Opening AIRPortal Document Manager

Once ADM is installed, the application will be available through Start Button > All Programs > MAA > AIRPortal Document Manager.

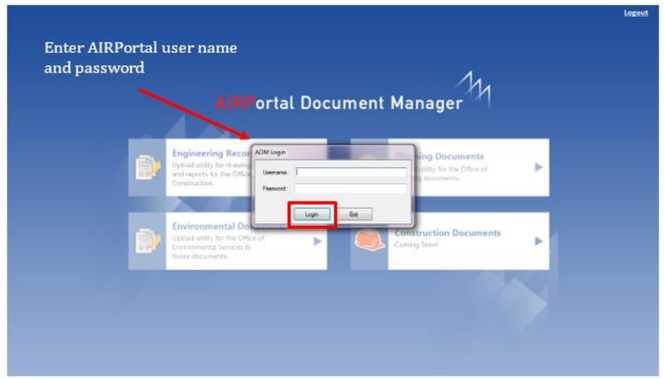


The application will automatically check for updates each time it is launched. Users are encouraged to install any updates to the software as they are available to ensure maximum functionality. To accept the application update, click OK.

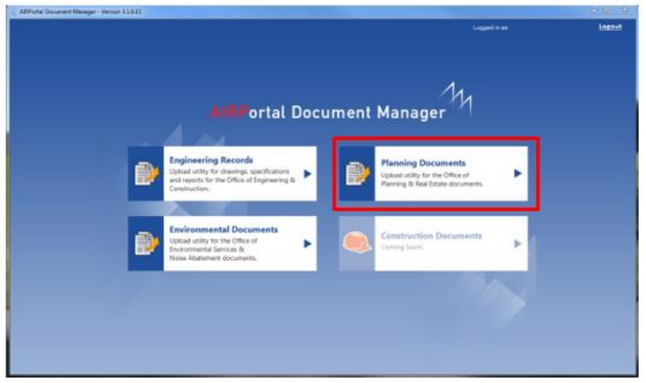


1C.1.3.4 Logging Into AIRPortal Document Manager

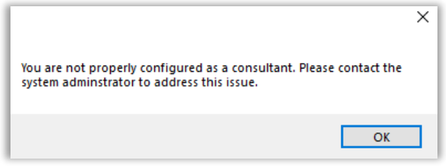
To log in to the AIRPortal Document Manager (ADM), enter your AIRPortal Username and Password in the ADM Login window. Click Login.



Once logged in, the user will come to a landing page where they can choose between Engineering Records, Planning Documents, and Environmental Documents. Permission to access these upload tools is dependent on the consultant. If a consultant does not have permissions to upload Planning documents, the Planning Documents button will be grayed out. Click on the Planning Documents button.



If a Planning consultant receives the error message below after clicking on the Planning Documents button, they should send an email to Airportal@bwiairport.com.



1C.1.4 Planning File Guidelines

1C.1.1 File Contents

Planning files submitted to MDOT MAA via ADM are the final version of a file that has been reviewed and approved by the MDOT MAA Office of Planning. Before uploading an Planning file in ADM, please make sure to check for the following:

- It is the final version of the file

- The first page of the file contains the title and publication date of the document (where applicable)
- No pages are missing
- No pages are duplicated
- If the file has been scanned, the scan is good enough quality for a user to be able to read it on screen and read a printed copy

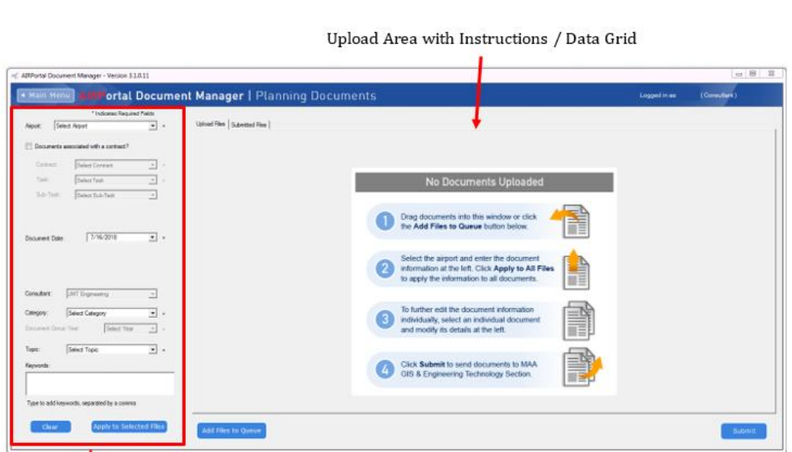
1C.1.2 File Naming

Planning files that will be uploaded into AIRPortal via ADM must have a suitable name. The guidelines below should be followed when naming files:

- The file name should match the name of the document, with some minor exceptions
  - The file name must be less than 247 characters
  - If the airport name is included in the title, it does not have to be spelled out
- Since all documents are final documents, the word “Final” should not be included in the title
- If the file contains sensitive security information (SSI), it should have _SSI appended to the file name
- Drawings such as Airport Layout Plans should have file names that define the drawing and how the files are to be displayed such as:
  - <Four-digit year> <Airport code> <sheet Sequence No.> “- “<*Sheet Identifier*> “- “< Document Title or Sheet Title>
  - Airport code: BWI or MTN
  - Sheet Sequence No. = 4-digit number starting with “0001”. Leading zeros are required. Must match the sheet number.
  - Sheet Identifier = Sheet number as shown, if the sheet sequence and sheet number are the same
  - Document title or sheet title = Sheet title as shown in drawing title box.

1C.1.5 Overview of Planning Documents Home Window

When the user first enters ADM for Planning Documents, they see the following screen.



The Planning Documents ADM interface allows the user to upload files or view submitted files that have not yet been approved. Once a user adds a file to the queue for uploading, the instructions are replaced with a data grid that lists the files in the queue.

1C.1.6 Add Files to Upload Queue and Define Attributes

All files to be uploaded must have attribute information. The file attributes can be set before or after adding files to the queue. Attributes include:

Airport: A required field, the user can choose from BWI Airport, Martin State Airport, Both, or Other.

Documents associated with a contract: Some planning documents are not associated with a contract. If the document to be uploaded is associated with a contract, the user must check this box. Doing so will make the Contract, Task, and Sub-Task dropdowns active.

Contract: A required field, the user will choose the contract that the file(s) they are uploading are related to. The user will only be able to view contracts for which their firm is the prime.

Task: A required field, the user will choose the task that the file(s) they are uploading are related to. The user will only be able to view tasks for which their firm is the prime.

Sub-Task: The user can choose a sub-task that the file(s) they are uploading are related to. The user will only be able to view sub-tasks for which their firm is the prime. Not all tasks have a sub-task.

Document Date: A required field, the user will enter the effective date of the file(s) to be uploaded. This should be the date as it appears in the document being submitted.

Consultant: This field is populated by the system and is based on the credentials of the user uploading the file.

Category: A required field, the user can choose among a number of values including Administration, Airport Layout Plans, Airside, Landside, Master Plan, Other, Real Estate, Regional, and Terminal. Categories serve as keywords and facilitate searches in the AIRPortal document library for Planning.

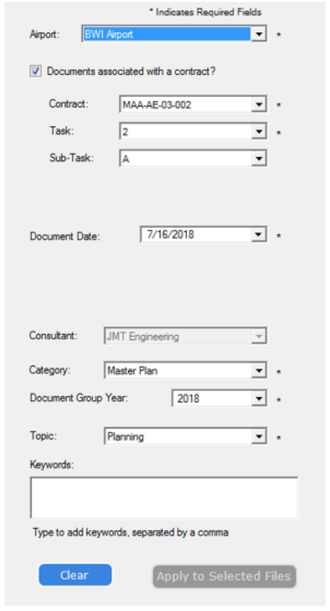
Document Group Year: A required field for files with a category of Master Plans or Airport Layout Plans, the user must choose a year from the list. This field will help group files by year which will aid users in finding files in the AIRPortal document library for Planning. If the selected category is other than Master Plans or Airport Layout Plans, this field is disabled.

Topic: A required field, the user can choose among a number of values. Users can start typing a topic name to jump down the list. Topics serve as keywords and facilitate searches in the AIRPortal document library for Planning.

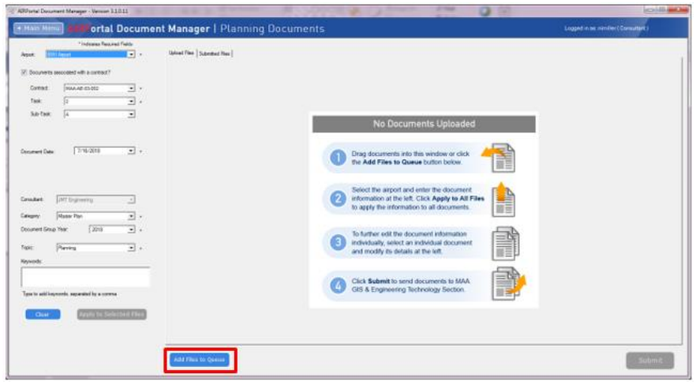
Keywords: The user can enter other keywords, separated by a comma, that will help users to find the file in the AIRPortal document library for Planning. This field can be left blank. Users should not duplicate category or topic values.

1C.1.1 Define File Attributes Before Adding Files to the Queue

The user can begin the process by entering the required file attributes. Required fields are marked with an asterisk. In the example below, the document to be uploaded is associated with a contract.

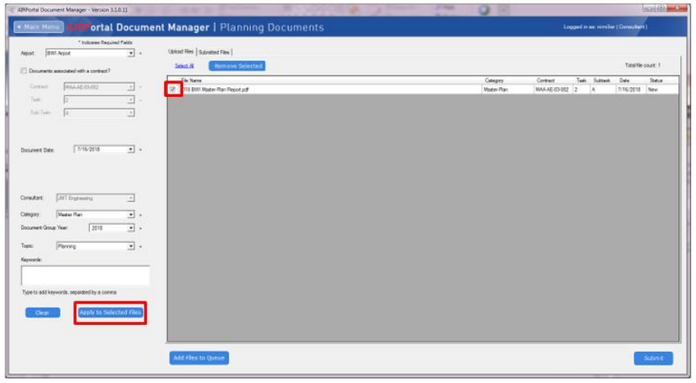


After entering the required file attributes, the user will click on Add Files to Queue or drag and drop one or more files from their desktop into the ADM Upload Files window.

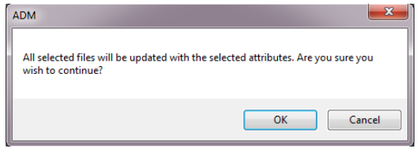


When the user adds a file to the queue, it is assigned the attributes that were entered beforehand.

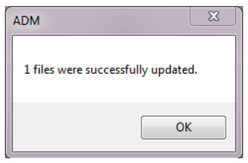
The user can modify the attribute information of the file by clicking the checkbox next to the file, updating the attribute information in the file attribute pane, and then clicking Apply to Selected Files at the bottom of the file attribute pane.



The user will be asked to confirm that they want to update the selected files with the new attribute information. The user can proceed with the update by clicking OK or canceling the update by clicking Cancel.

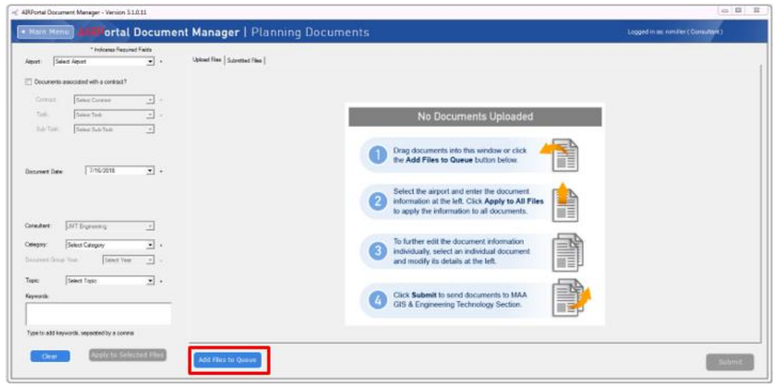


After the user clicks OK, they will receive a message that the update was successful.

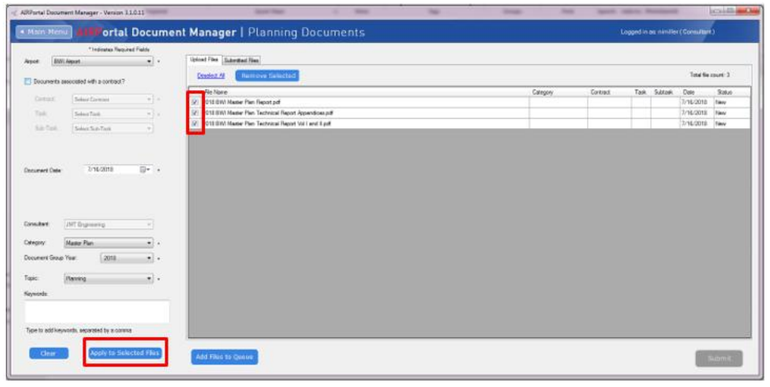


1C.1.2 Define File Attributes After Adding Files to the Queue

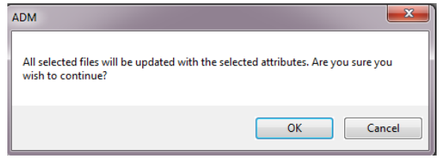
A user can add files to the queue for upload by clicking on Add Files to Queue or dragging and dropping files from their desktop into the ADM Upload Files window. Clicking Add Files to Queue will open a window where users can navigate to the location of the files on their desktop or on a shared drive.



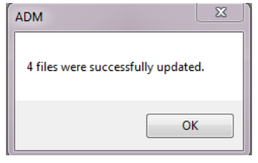
After the user has added one or more files to the queue, they will check the box next to the applicable files, define the file attributes, and click Apply to Selected Files.



The user will be asked to confirm that they want to update the selected files with the attribute information. The user can proceed with the update by clicking OK or canceling the update by clicking Cancel.

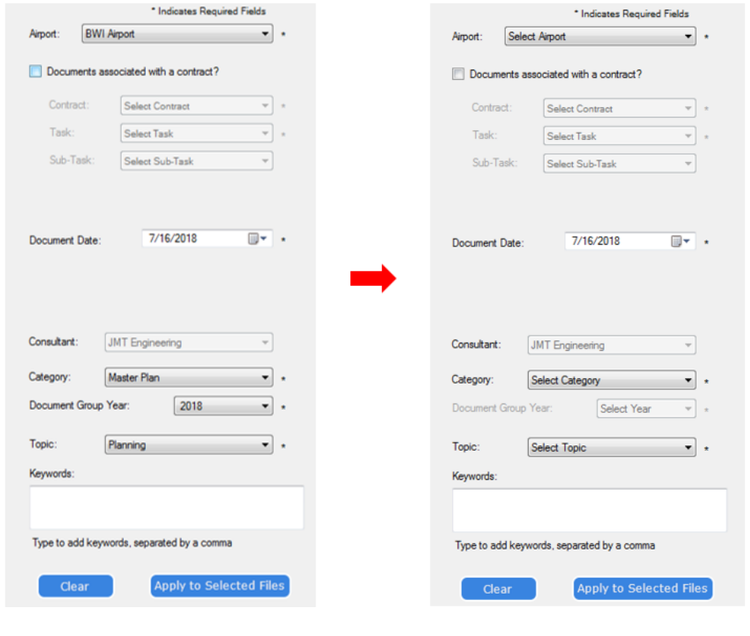


After the user clicks OK, they will receive a message that the update was successful, and the data grid will reflect the changes made.



1C.1.7 Clear Attribute Information

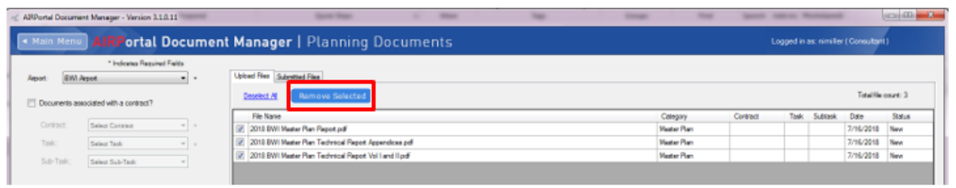
If at any time, the user wants to clear the attribute information that is visible in the file attribute pane, they can click on the Clear button.



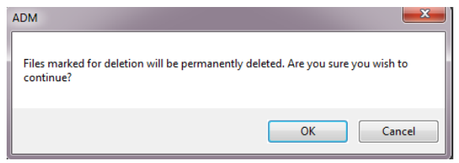
After clearing the file attribute pane, the user can enter new information and apply it to selected files in the data grid. The document date will default to today's date.

1C.1.8 Remove a File

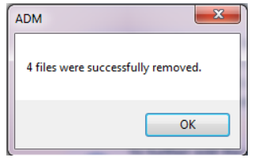
Files can be removed from the upload queue by checking the box next to the document and clicking Remove Selected.



The user will be prompted to confirm that they want to proceed and permanently delete the files marked for deletion. Clicking OK will delete the files. Clicking Cancel will cancel the action.



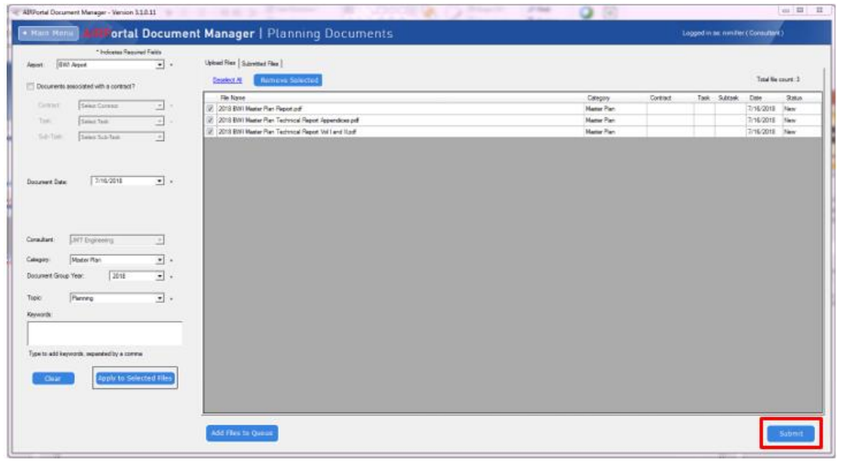
After clicking OK, the user will get a message notifying them of the successful removal of the files. The data grid will be emptied if all files have been selected for removal.



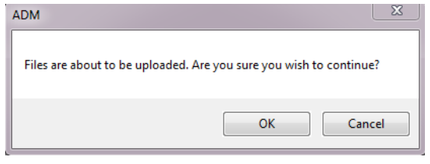
1C.1.9 Submit a File

Once the user has put all the files into the queue that they want to submit and defined the attributes for the files, they will submit the files by clicking Submit. If the user has not populated all the required fields, they will get an error message when they try to submit.

Note: If the user closes ADM before clicking on the Submit button, the files that have been queued will be removed. The user will have to reload the files into the queue the next time they launch ADM.

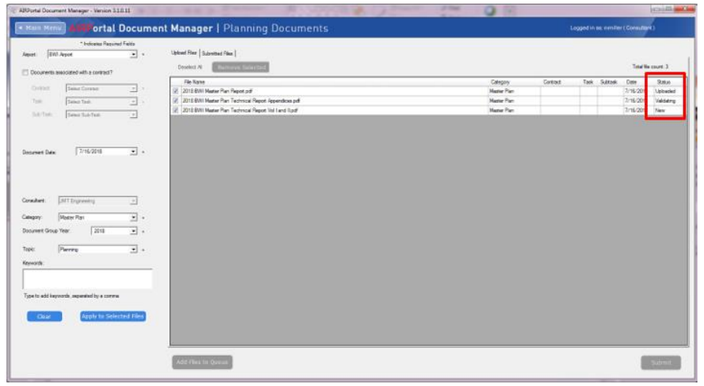


The user will be asked to confirm that they want to continue and upload all files in the data grid. They will click OK to continue or Cancel to cancel.



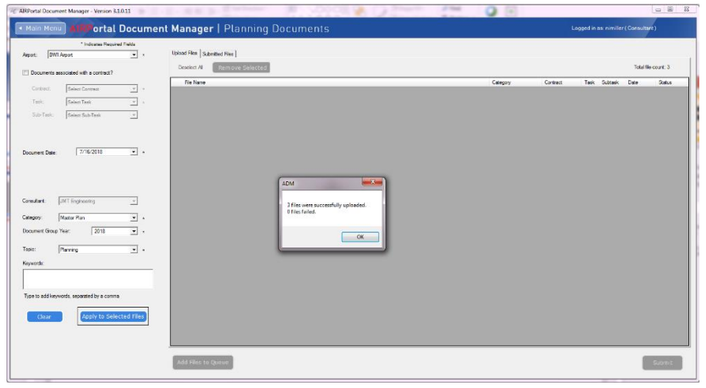
The Status field will show the current state of the file upload. Statuses include:

- New: Status of a file that has not yet been uploaded
- Validating: Status of a file that is in the process of being validated for upload
- Uploading: Status of a file whose upload is in progress
- Uploaded: Status of a file that has been successfully uploaded



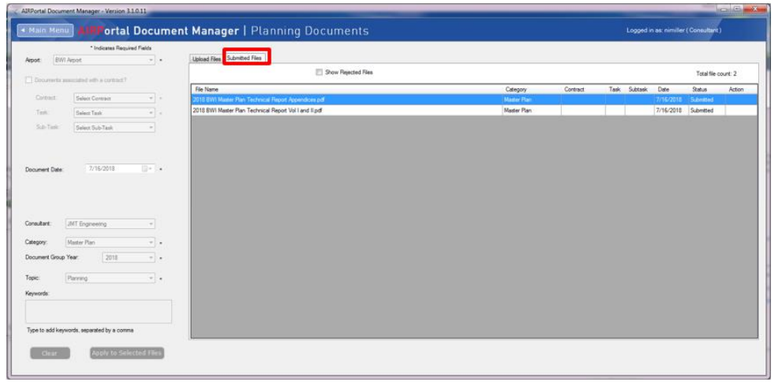
Once a file is submitted, it cannot be removed or edited by the consultant unless the file is rejected by the MDOT MAA Archivist.

When the upload process is complete, the user will get a pop-up message letting them know how many files were uploaded successfully and how many failed. If all the files uploaded successfully, the data grid will be empty.

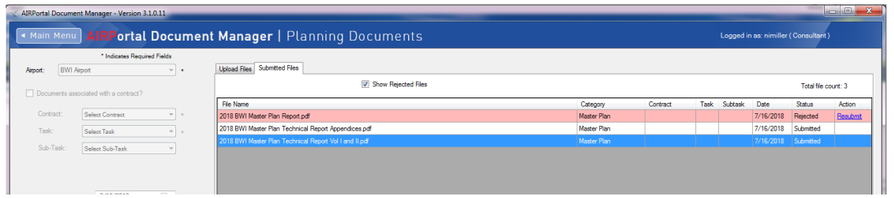


1C.1.10 Submitted Files Tab

Once a user submits one or more files and before those files are approved, they are visible to the consultant in the Submitted Files tab.



Users can see rejected files in this tab by checking the box next to Show Rejected Files. When a file is rejected by the MDOT MAA Archivist, an email is sent to the user from MAA-ADM-NoReply@bwiairport.comwith an explanation of why the file was rejected.

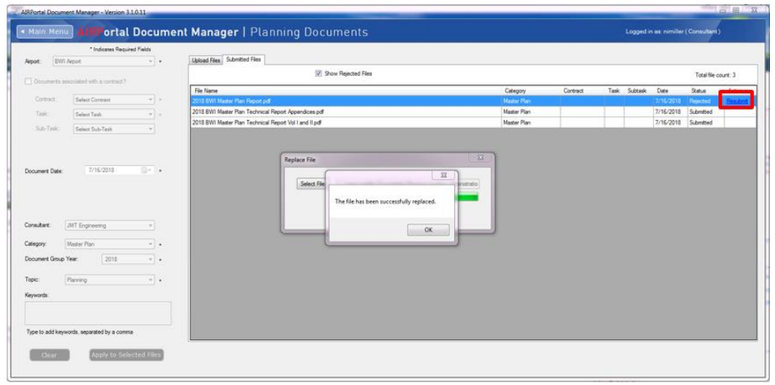


Approved files will be accessible to AIRPortal users in the appropriate Planning library.

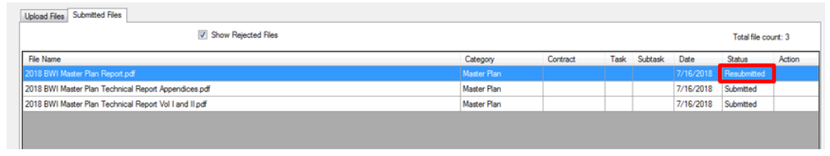
1C.1.11 Resubmit a Rejected File

It is possible that a file submitted to MDOT MAA via ADM could be rejected. If a file is rejected, an email will be sent to the consultant that submitted it from MAA-ADM-NoReply@bwiairport.com with a reason for why the file was rejected.

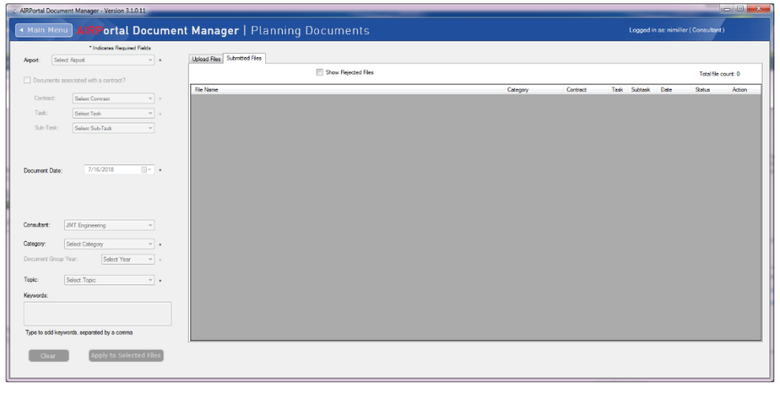
A user can resubmit a rejected file by logging into ADM for Planning Documents, going to the Submitted Files tab, and clicking on the Resubmit link. This will launch a window where the user can navigate to the replacement file and upload it. When the file upload is successful, they will get a message saying that the file has been successfully replaced. The replacement file will be assigned the same attributes as the original file.



A resubmitted file will be given a status of Resubmitted in the data grid.



Once all files that a consultant has submitted have been approved, the Submitted Files tab will be empty. Approved files will be accessible to AIRPortal users in the appropriate Planning library.



1D.1 Layer Development

1D.1.1 Discipline Indicators

The layer name format is organized as a hierarchy. This arrangement allows users to select from a number of options for naming layers according to the level of detailed information desired. Layer names consist of distinct data fields separated from one another by dashes. A detailed list of abbreviations, or field codes, is prescribed to define the content of layers. Most field codes are mnemonic English abbreviations of construction terminology that are easy to remember.

Layer naming generally follows the *CAD LAYER GUIDELINES*, NCS 6.0 Edition, published by the American Institute of Architects (AIA). There are five defined layer name data fields: Discipline Designator, Major Group, two Minor Groups, and Status. Each data field is separated from adjacent fields by a dash ("-") for clarity. Below are guidelines for compiling a layer name, followed by a table of common layer names.

Layer Discipline Designator	
Discipline Designator	**Discipline**
A	Architectural
B	Geotechnical
C	Civil
D	Demolition
E	Electrical
F	Fire Protection
G	General
H	Hazardous Materials
I	Interiors
L	Landscaping
M	Mechanical
P	Plumbing
Q	Equipment – Baggage
R	Real Estate/Lease
S	Structural
T	Telecommunications
V	Surveying/Mapping
Z	Contractor/Shop Drawing

Table 1D.1.1, Layer Discipline Designators

1D.1.2 Major and Minor Groups

A four-letter major group and either one or two four-letter minor groups follow the discipline designator in a layer name. Common major and minor groups are listed below:

A	
ACID	Industrial waste piping
AERI	Aerial
AFFF	Aqueous film forming foam
AFRZ	Anti-freeze
AFLD	Airfield
AIRS	Airspace, approach surface
ALGN	Alignment
ALRM	Alarm
ANNO	Annotation
APRN	Apron
AREA	Area
B	
BAGS	Baggage system information

BCNS	Beacons
BEAM	Beam
BELL	Bell systems
BLDG	Building
BORE	Bore
BORW	Borrow
BRAC	Brace
BRIN	Brine
C	
CABL	Cable
CATH	Cathode
CATV	Cable TV
CCTV	Closed Circuit TV
CHAN	Channel
CHEM	Chemical
CIRC	Circuit
CLNG	Ceiling
CLOK	Clock systems
CMPA	Compressed air
CNDW	Condenser water
CO2S	Carbon Dioxide system
COLS	Columns
COMM	Communications
CNDS	Condensate piping
CONF	Confined Space
CONT	Controls
CTRL	Control panels
CWTR	Chilled water
D	
DECK	Deck
DECN	Decontamination
DETL	Details
DIAG	Diagram
DICT	Central dictation
DISC	Discipline
DISP	Displaced
DOOR	Door
DOMW	Domestic Water
DRED	Dredge
DUAL	Dual
DUCT	Duct
DUST	Dust and fume collection
E	
ELEC	Electrical
ELEV	Elevation
EMER	Emergency Systems
EMCS	Emergency Monitoring Control System

EQPM	Equipment
EXHS	Exhaust
F	
FEAT	Feature
FIXT	Fixture
FLOR	Floor
FNDN	Foundation
FUEL	Fuel lines
FURN	Furnishing
G	
GLAZ	Glazed
GRAD	Grade
GRAT	Grating
GRDL	Ground/grade level
GRID	Grid
GRND	Ground
GTHP	Geothermal heat pump
H	
HALN	Halon
HELI	Heliport
HTCW	High temperature/chilled water
HVAC	Heating, ventilation and air conditioning
HWTR	Hot water
HYDR	Hydraulics
I	
IGAS	Inert gas
IW~~	Industrial waste
INSL	Insulation
INTC	Intercom/PA systems
IRRG	Irrigation
J	
JNTS	Joints
JOIS	Joists
JACK	Jacks
K	
L	
LGAS	Liquid gas
LITE	Lighting
LSFT	Life safety / egress requirements
LTNG	Lightning protection
LO~~	Lubrication
M	
MACH	Machinery
MATL	Materials
METL	Metal
MDGS	Medical/Dental gas

MNST	Monitoring stations
N	
NGAS	Natural gas
NURS	Nurse call/paging systems
O	
OPNG	Opening
OVRN	Overrun
P	
PADS	Pads
PATT	Pattern (hatching)
PENE	Penetrations
PIPE	Piping
PRKG	Parking
PLAN	Plan, blueprint
PLNT	Plants/vegetation
POLE	Utility pole
POLL	Pollution
POWR	Power
PRIM	Primary electrical cable
PROC	Process piping
PROF	Profile
PROP	Property
PROT	Protection
PVMT	Pavement
Q	
R	
RAIL	Railroad
RATE	Rating
RCOV	Recovery
REFG	Refrigeration
REIN	Reinforcement
ROAD	Roadway
ROOF	Roof
RUNW	Runway
RWTR	Raw water
S	
SFTY	Safety
SAMP	Sample
SEAP	Seaplane
SECD	Secondary electrical cable
SECT	Section
SERT	Security systems
SITE	Sitework
SLAB	Slab
SOUN	Sound systems
SPCL	Special

SPPT	Support
SPRN	Sprinkler
SSWR	Sanitary sewer
STAT	Status
STEM	Steam
STOR	Storage
STRC	Structures
STRM	Storm sewers/drain
STRS	Stairways
SURV	Survey
T	
TAXI	Taxiway
TOPO	Topography
TRAF	Traffic
TRUS	Trusses
TVAN	TV antenna systems
U	
UTIL	Utilities
V	
W	
WALL	Wall
WATR	Water
X	
Y	
Z	
ZONE	Zoning

Table 1D.1.2, Major and Minor Groups

1D.1.3 Status Indicators

Once the discipline designator, major and minor categories have been chosen, the final portion of the layer name is the status. This describes to the user what the disposition is of the entities on that layer, and helps to determine if that layer should or should not be shown on a particular drawing sheet. Note that AutoCAD uses a single letter abbreviation for its status categories. MDOT MAA prefers to use a four-letter abbreviation to stay consistent with the Major and Minor group names, and provide a more intuitive description for the status. Below is a list of common status categories:

Indicator	Status
PHS#	Phase of project (#=1-9)
D	Existing item to be demolished
E	Existing item to remain
F	Future work
M	Existing item to be moved
N	New work
T	Temporary work
X	Not in contract (not included in AutoCAD layer naming routine)
A	Abandoned item (not included in AutoCAD layer naming routine)

Table 1D.1.3, Layer Status Indicators

1D.1.4 Print File Layer Assignment

A sheet file is synonymous with a single sheet or page of a plotted CAD drawing file. A sheet file is a selected view or portion of referenced model files within a border sheet. The addition of sheet-specific information (e.g., text, dimensions, and symbols) completes the construction of the document. Table 1D.1-4, Common Sheet File Layers, outlines layers that will be common in all sheet files in a set of construction drawings:

General Layer Names	General Layer Descriptions	Color #
G-ANNO-DIMS	Dimensions and Leaders	5
G-ANNO-IDEN	Identification Tags: Floor Id. #s; Room #s; Door #s; hardware group; Window #s; Equipment Id. #s; Furniture #s; Tenant Identification; Area calculations; Occupant or employee names; Elevation Id. #s; Component Id. #s	7
G-ANNO-KEYN	Key Notes	7
G-ANNO-KEYP	Kay Plan	8
G-ANNO-LEGN	Legends	4
G-ANNO-NOTE	Notes	7
G-ANNO-NPLT	Construction Lines, non-plotting information	8
G-ANNO-PATT	Cross-hatching, patterns, poche	5
G-ANNO-REDL	Redline Annotations	10
G-ANNO-REFR	Reference Files	7
G-ANNO-REVS	Revisions	4
G-ANNO-SCHD	Schedules	7
G-ANNO-SYMB	Miscellaneous Symbols	4
G-ANNO-TEXT	Miscellaneous text and callouts with associated leaders	7
G-ANNO-TITL	Drawing Component Titles, Detail Titles, Section Titles, Elevations	3
G-ANNO-TTLB	Border and title block information	2

Table 1D.1.4, Common Sheet File Layers

1D.1.5 Model File Layer Assignment

A model file contains the physical components or features that make up a building, facility, or site (e.g., columns, walls, windows, ductwork, piping, etc.). Both MDOT MAA and NCS layer names consist of a discipline designator, a major category and minor categories. Once the discipline designator, major and minor categories have been determined, a final portion of the layer name indicating status may be added. This describes to the user what the disposition is of the entities on that layer, and helps to determine if that layer should or should not be shown on a particular drawing sheet.

MDOT MAA prefers to use a four-letter abbreviation for the status category to stay consistent with the Major and Minor group names, and provide a more intuitive description for the status. Below is a list of common status categories and their recommended properties:

STATUS	DESCRIPTION	COLOR	LINETYPE
A	Abandoned item	3	Hidden
D	Existing item to be demolished	Equal Color*	Hidden
E	Existing item to remain	252	Continuous
F	Future work	Equal Color + 1**	Continuous
M	Existing item to be relocated	Equal Color + 2**	Continuous
N	New work	Original Color	Continuous
T	Temporary work	174	Hidden2
X	Not in contract	7	Continuous
PHS#	Phase of project (#=1-9)	*Varies*	*Varies*

Table 1D.1.5, MDOT MAA Standard Pen Settings

*Equal Color = current color being used by the layer to which the status will be added

**Equal Color + (x) = add 1 or 2 to the current color number being used by the layer to which the status will be added

1D.1.5.1 (A) Architectural Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
A	ANNO	KEYN			Reference keynotes with associated leaders
A	ANNO	NOTE			General notes and general remarks
A	ANNO	NPLT			Non-plotting graphic information
A	ANNO	PATT			Miscellaneous patterning and hatching
A	ANNO	REFR			Reference files
A	ANNO	SYMB			Miscellaneous symbols
A	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
AREA INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	AREA	LINE			Architectural area calculation boundary lines
A	AREA	OCCP			Occupant or employee names
A	AREA	PATT			Area cross hatching
BAGGAGE SYSTEM INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	BAGS	CART			Cart/Tug
A	BAGS	CATW			Catwalk
A	BAGS	CLMD			Claim Device
A	BAGS	CONV			Baggage Conveyor
A	BAGS	CRBS			Curbside Baggage Conveyor
A	BAGS	CTRL			Control
A	BAGS	DIMS			Dimension
A	BAGS	DOOR			Doors
A	BAGS	ELEV			Elevation
A	BAGS	EQPM			Equipment
A	BAGS	ICNV			Inbound Baggage Conveyor
A	BAGS	IOSZ			Inbound Oversized Baggage Conveyor
A	BAGS	MATC			Match Lines
A	BAGS	MKUP			Make-Up Device
A	BAGS	NOTE			Notes
A	BAGS	OCNV			Outbound Baggage Conveyor
A	BAGS	OOSZ			Outbound Oversized Baggage Conveyor
A	BAGS	RAIL			Guardrail
A	BAGS	RWAY			Right-of-Way
A	BAGS	SCDR			Security Door
A	BAGS	SCNU			Screening Unit
A	BAGS	TCBC			Ticket Counter Baggage Conveyor
A	BAGS	TEMP			Temporary
A	BAGS	TTLB			Title Block
A	BAGS	TTRY			Tilt-Tray Baggage System
A	BAGS	VPRT			View Port Layer for Paper Space
A	BAGS	XFER			Transfer Baggage Conveyor
A	BAGS	XRAY			X-Ray Unit

CEILING INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	CLNG	ACCS			Access panels
A	CLNG	CTLJ			Ceiling control joints
A	CLNG	ENCL			Column enclosures/fire protection
A	CLNG	GRID			Ceiling grid
A	CLNG	LEVL			Level Changes
A	CLNG	OPNG			Openings, ceiling/roof penetrations (see also A-FLOR-OVHD in Model File Type: Floor Plan)
A	CLNG	PATT			Ceiling patterns
A	CLNG	REFL			Reflective Ceiling
A	CLNG	SUSP			Suspended elements, ceiling mounted specialties (e.g., clocks, fans, etc.)
A	CLNG	TEES			Main tees
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	DETL	GRPH			Graphics, gridlines, non-text items
A	DETL	INPD			Inch-pound-specific dimensions and notes
A	DETL	METR			Metric-specific dimensions and notes
A	DOOR	FULL			Full height (to ceiling) door: swing and leaf
A	DOOR	IDEN			Door number and symbol, hardware group, etc.
A	DOOR	PRHT			Partial height door: swing and leaf
A	DOOR	SERT			Security Door
A	DOOR	SYMB			Miscellaneous door symbols (e.g., overhead, bifold, pocket, etc.)
ELEVATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	ELEV	CSWK			Wall-mounted casework
A	ELEV	FIXT			Miscellaneous fixtures
A	ELEV	FNSH			Finishes, woodwork, trim
A	ELEV	IDEN			Component identification numbers
A	ELEV	OTLN			Building outlines
A	ELEV	PATT			Textures and hatch patterns
A	ELEV	PFIX			Plumbing fixtures
A	ELEV	SIGN			Signage
EQUIPMENT					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	EQPM	ACCS			Equipment access
A	EQPM	BELW			Equipment below Floor
A	EQPM	CLRN			Equipment clearance
A	EQPM	FIXD			Fixed equipment
A	EQPM	IDEN			Equipment identification numbers
A	EQPM	JETB			Aircraft Jet bridge
A	EQPM	MOVE			Moveable equipment
A	EQPM	NICN			Not in contract equipment
A	EQPM	OVHD			Overhead, ceiling mounted, or suspended equipment
FLOOR INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	FLOR	CSWK			Casework (manufactured cabinets)
A	FLOR	ESCL			Escalators
A	FLOR	EVTR			Elevator cars and equipment
A	FLOR	EXPJ			Expansion and Seismic Joints

A	FLOR	FIXT			Floor mounted/Free standing miscellaneous fixtures
A	FLOR	FURN			Furniture Layers
A	FLOR	HRAL			Stair and balcony handrails, guard rails
A	FLOR	IDEN			Room name, space identification text
A	FLOR	LADD			Ladders
A	FLOR	LEVL			Level changes, shafts, ramps, pits, breaks in construction, and depressions
A	FLOR	MOVS			Moving sidewalks
A	FLOR	NUMB			Room/space identification number and symbol
A	FLOR	OTLN			Floor outline/perimeter/building footprint
A	FLOR	OTLN	RPRM		Room perimeter shape (Interior walls)
A	FLOR	OVHD			Overhead items (skylights, overhangs etc.)
A	FLOR	PATT			Paving, tile, carpet patterns
A	FLOR	RAIS			Access (raised) flooring
A	FLOR	SIGN			Signage
A	FLOR	SPCE			Interior space not delineated by walls
A	FLOR	SPCL			Architectural specialties (e.g., toilet room accessories, display cases)
A	FLOR	STRS			Stair risers/treads
A	FLOR	TPTN			Toilet partitions
A	FLOR	WDWK			Architectural woodwork (field built cabinets and counters)
WINDOWS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	GLAZ	FULL			Full height glazed walls and partitions (see A-WALL-CWMG for curtain walls)
A	GLAZ	IDEN			Window number and symbol
A	GLAZ	PRHT			Windows and partial height glazed partitions
A	GLAZ	SILL			Window sills
LIGHTING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	LITE	CLNG			Specialty ceiling lights not shown on Electrical Lighting Plan
PROPERTY INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	PROP	LEAS			Lease line (interior)
ROOFING INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	ROOF	CRKT			Crickets flow arrows flow info
A	ROOF	EXPJ			Expansion joints
A	ROOF	GUTR			Roof internal gutters
A	ROOF	HRAL			Stair handrails, nosings, guard rails
A	ROOF	LEVL			Level changes
A	ROOF	OPNX			Roof Open Below ('X' line symbol)
A	ROOF	OTLN			Roof perimeter/edge, roof geometry
A	ROOF	PATT			Roof surface patterns, hatching
A	ROOF	RFDR			Roof drains
A	ROOF	SPCL			Roof specialties, accessories, access hatches, dormers
A	ROOF	STRS			Stair risers/treads, ladders
A	ROOF	WALK			Roof walkways
A	ROOF	WALL			Parapet walls and wall caps
SECTIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	SECT	IDEN			Component identification numbers

A	SECT	MBND			Material beyond section cut
A	SECT	MCUT			Material cut by section
A	SECT	PATT			Textures and hatch patterns
WALLS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
A	WALL	CAVI			Cavity wall lines
A	WALL	CNTR			Wall centerlines
A	WALL	CWMG			Curtain wall mullions and glass
A	WALL	FIRE			Fire wall designators (patterning)
A	WALL	FULL	EXTR		Exterior full height walls
A	WALL	FULL	INTR		Interior full height walls
A	WALL	HEAD			Door and window headers (appear on Reflected Ceiling Plan)
A	WALL	IDEN			Wall identification/type text or tags
A	WALL	JAMB			Door and window jambs (do not appear on Reflected Ceiling Plan)
A	WALL	MOVE			Moveable walls/partitions
A	WALL	PATT			Wall insulation, hatching, and fill
A	WALL	PRHT			Partial height walls (do not appear on Reflected Ceiling Plan)
A	WALL	SPCL			Wall-hung/attached specialties (e.g., fixtures, grab bars (incl. handicap), telephone booths)

1D.1.5.2 (B) Borings Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
B	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
B	ANNO	KEYN			Reference keynotes with associated leaders
B	ANNO	NOTE			General notes and general remarks
B	ANNO	NPLT			Non-plotting graphic information
B	ANNO	PATT			Miscellaneous patterning and hatching
B	ANNO	REFR			Reference files (AutoCAD users only, see Chapter 4)
B	ANNO	SYMB			Miscellaneous symbols
B	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
GEOPHYSICAL BORINGS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
B	BORE	ELEV			Boring elevations
B	BORE	FDTA			Field data
B	BORE	HOLE			Bore/perc hole number
B	BORE	IDEN			Component identification numbers
B	BORE	LDTA			Laboratory data
B	BORE	PATT			Soil/rock patterns

1D.1.5.3 (C) Civil Layers

AIRFIELD					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	AFLD	AHOA			Airfield: Air Operations Area
C	AFLD	AREA	O		Airfield: Air Operations Area
C	AFLD	ARWY			Airfield: Airway
C	AFLD	DSRF	BRLN		Airfield: Building Restriction Line

C	AFLD	DSRF	KEYH		Airfield: Key holes
C	AFLD	DSRF	NMOV		Airfield: Aircraft Non-Movement Area
C	AFLD	DSRF	OBFA		Airfield: Object Free Area
C	AFLD	DSRF	OBFA		Object Free Area
C	AFLD	DSRF	OFZ_		Object Free Zone
C	AFLD	DSRF	OFZN		Airfield: Object Free Zone
C	AFLD	DSRF	POFA		Airfield: Precision Object Free Area
C	AFLD	FAAR			Airfield: FAA Region
C	AFLD	FREQ			Airfield: Frequency Area
C	AFLD	GLYC	ANNO		Airfield: Glycol bubble callout
C	AFLD	GLYC	MHOL		Airfield: Glycol manholes
C	AFLD	GLYC	PIPE		Airfield: Glycol pipes
C	AFLD	LNDM			Airfield: Landmark segment
C	AFLD	NAID	COMM		Airfield: Communications airfield navigational aides
C	AFLD	NAID	CRIT		Airfield: Airfield Navigational Aid - Critical Area
C	AFLD	NAID	GPS_		Airfield: GPS airfield navigational aides
C	AFLD	NAID	ILS_		Airfield: Airfield Instrument Landing System
C	AFLD	NAID	MCWV		Airfield: Microwave airfield navigational aides
C	AFLD	NAID	OTHR		Airfield: Other airfield navigational aides
C	AFLD	NAID	RADI		Airfield: Radio airfield navigational aides
C	AFLD	NAID	RADR		Airfield: Radar airfield navigational aides
C	AFLD	NAID	RMTE		Airfield: Remote airfield navigational aides
C	AFLD	NAID	SITE		Airfield: Airfield Navigational Aid - Site
C	AFLD	NAID	SYST		Airfield: NAVAID system
C	AFLD	NAID	WTHR		Airfield: Weather airfield navigational aides
C	AFLD	OBST	LINE		Airfield: Airspace obstructions - Line
C	AFLD	OBST	NODE		Airfield: Airspace obstructions - Point
C	AFLD	OBST	POLY		Airfield: Airspace obstructions - Polygon
C	AFLD	OTHR			Airfield: Other airspace surfaces
C	AFLD	PART	APRC		Airfield: FAR Part 77 Approach Surface
C	AFLD	PART	CONL		Airfield: FAR Part 77 Conical Surface
C	AFLD	PART	HORZ		Airfield: FAR Part 77 Horizontal Surface
C	AFLD	PART	PRIM		Airfield: FAR Part 77 Primary Surface
C	AFLD	PART	TRNS		Airfield: FAR Part 77 Transitional Surface
C	AFLD	PROP			Airfield: Airport property
C	AFLD	PVMT			Airfield: Pavement section
C	AFLD	SECR	RSTR		Airfield: Military restricted access boundary
C	AFLD	SECR	SECA		Airfield: Airfield security area
C	AFLD	SECR	SIDA		Airfield: Security Identification Display Area
C	AFLD	SECR	STER		Airfield: Airfield sterile area
C	AFLD	SECT	AREA		Airfield Movement Security Area
C	AFLD	TERP			Airfield: TERPS surfaces
C	AFLD	TRAF	IDEN		Airfield Traffic Area: Annotation
C	AFLD	TRAF	TYPA		Airfield Traffic Area: Type A traffic area
C	AFLD	TRAF	TYPB		Airfield Traffic Area: Type B traffic area
C	AFLD	TRAF	TYPC		Airfield Traffic Area: Type C traffic area
C	AFLD	TRAK	LINE		Airfield: Flight Track Line
C	AFLD	TRAK	PNTS		Airfield: Flight Track Point
AIRSPACE					

Discipline	Major	Minor1	Minor2	Status	Description
C	AIRS	ISOC			Airfield: Approach surface isoclines
C	AIRS	LNDM			Airfield: Landmark segment
C	AIRS	OBST			Airfield: Airfield obstruction
C	AIRS	OBST	LINE		Airfield: Airspace obstructions - Line
C	AIRS	OBST	NODE		Airfield: Airspace obstructions - Point
C	AIRS	OBST	POLY		Airfield: Airspace obstructions - Polygon
C	AIRS	OTHR			Airfield: Other airspace surfaces
C	AIRS	PART	APRC		Airfield: FAR Part 77 Approach Surface
C	AIRS	PART	CONL		Airfield: FAR Part 77 Conical Surface
C	AIRS	PART	HORZ		Airfield: FAR Part 77 Horizontal Surface
C	AIRS	PART	PRIM		Airfield: FAR Part 77 Primary Surface
C	AIRS	PART	TRNS		Airfield: FAR Part 77 Transitional Surface
C	AIRS	TERP			Airfield: TERPS surfaces
ALIGNMENTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	ALGN	ANNO	AREA		Alignments: New Annotation Areas
C	ALGN	ASSM			Alignments: Civil 3D Assembly
C	ALGN	ASSM	BLIN		Alignments: Civil 3D Assembly Baseline
C	ALGN	ASSM	OFFS		Alignments: Civil 3D Assembly Offsets
C	ALGN	ASSM	TEXT		Alignments: Civil 3D Assembly Annotation
C	ALGN	BRNG			Alignments: Bearings
C	ALGN	CORR			Alignments: Civil 3D Corridor
C	ALGN	CORR	OTLN		Alignments: Civil 3D Corridor Boundary
C	ALGN	DATA			Alignments: Coordinates and Curve Data
C	ALGN	LINE			Alignments: Lines
C	ALGN	PROF			Alignments: Design profile
C	ALGN	PROF	LINE	EXTN	Alignments: Profile Extension Line
C	ALGN	PROF	TEXT		Alignments: Profile Text
C	ALGN	SECT	IDEN		Alignments: Section Sampling Station
C	ALGN	STAT			Alignments: Stationing and tick marks
C	ALGN	SYMB			Alignments: Alignment symbols
GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	ANNO	ANOD			General Annotation: Anode
C	ANNO	ANOD	TEXT		General Annotation: Anode Text
C	ANNO	DIMS			General Annotation: Witness/extension lines, dimension terminators, dimension text
C	ANNO	KEYN			General Annotation: Reference keynotes with associated leaders
C	ANNO	NOTE			General Annotation: General notes and remarks
C	ANNO	NPLT			General Annotation: Non-plotting graphic information
C	ANNO	PATT			General Annotation: Miscellaneous patterning and hatching
C	ANNO	REFR			General Annotation: Reference files (AutoCAD users only, see Chapter 4)
C	ANNO	SYMB			General Annotation: Miscellaneous symbols
C	ANNO	TABL			General Annotation: Tables
C	ANNO	TABL	IDEN		General Annotation: Table Identification
C	ANNO	TABL	PATT		General Annotation: Table Hatching
C	ANNO	TABL	TEXT		General Annotation: Table Annotation & Data
C	ANNO	TEXT			General Annotation: Miscellaneous text and callouts with associated leaders
APRONS					

Discipline	Major	Minor1	Minor2	Status	Description
C	APRN	ACPK			Aprons: Aircraft gate/stand parking area
C	APRN	CNTR			Aprons: Centerlines
C	APRN	CNTR	IDEN		Aprons: Centerline annotation
C	APRN	DEIC			Aprons: Aircraft Deicing Area
C	APRN	GRND			Aprons: Grounding points
C	APRN	HOLD			Aprons: Holding position markings
C	APRN	IDEN			Aprons: Annotation
C	APRN	JNTS			Aprons: Apron joints
C	APRN	MOOR			Aprons: Mooring points
C	APRN	MRKG			Aprons: Apron markings
C	APRN	NMOV			Aprons: Aircraft non-movement area
C	APRN	OTLN			Aprons: Airfield apron
C	APRN	SERT			Aprons: Security zone markings
C	APRN	SHLD	MRKG		Aprons: Shoulder markings
C	APRN	SIGN			Aprons: Airfield signs on the apron
C	AREA	CURB			Area: New Curb Areas
C	AREA	SIGN			Area: New Signage Area
BUILDINGS AND PRIMARY STRUCTURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	BLDG	IDEN			Buildings: Building and other structure annotation
C	BLDG	OTLN			Buildings: Buildings and other structures
C	BLDG	OVHD			Buildings: Building overhang
C	BLDG	PATT			Buildings: Building hatching and patterns
BORROW AREAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	BORW	IDEN			Borrow Areas: Borrow/Spoil area annotation
C	BORW	LINE			Borrow Areas: Borrow/Spoil area
CHANNELS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	CHAN	CNTR			Channels: Centerline and survey report lines
C	CHAN	CNTR	IDEN		Channels: Centerline and survey report lines - annotation
C	CHAN	DACL			Channels: De-authorized channel limits, anchorages, etc.
C	CHAN	DACL	IDEN		Channels: De-authorized channel limits, anchorages, etc. - annotation
C	CHAN	IDEN			Channels: Limits, anchorages, turning basins, disposal areas, etc. - annotation
C	CHAN	LIMT			Channels: Limits, anchorages, turning basins, disposal areas, etc.
C	CHAN	NAID			Channels: Navigation aids and text
C	CHAN	TURN			Channels: Turning points
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	DETL	ANNO	IDEN		Details: Identification Annotation
C	DETL	ANNO	TEXT		Details: Annotation
C	DETL	CONC			Details: Concrete Elements
C	DETL	COVR			Details: Covers and Fittings
C	DETL	ERTH			Details: Earth
C	DETL	FENC			Details: Fencing
C	DETL	FENC	SERT		Details: Security Fencing
C	DETL	FILL			Details: Fill and Hatching
C	DETL	FSTN			Details: Fasteners

C	DETL	GENF			Details: General features (miscellaneous items)
C	DETL	GRPH			Details: Graphics, gridlines, non-text items
C	DETL	INPD			Details: Inch-pound-specific dimensions and notes
C	DETL	METR			Details :Metric-specific dimensions and notes
C	DETL	PIPE			Details: Piping
C	DETL	PVMT			Details: Pavements
C	DETL	SPCL			Details: Special features
C	DETL	STRC			Details: Structural metal
C	DETL	TANK			Details: Tanks
C	DETL	VALV			Details: Valves and fittings
DOMESTIC WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	DOMW	DEVC	ANOD		Domestic Water: Anode
C	DOMW	DEVC	FIRE		Domestic Water: Fire connection pint other than hydrants
C	DOMW	DEVC	INTK		Domestic Water: Intake point
C	DOMW	DEVC	PIGL		Domestic Water: Pig launch point
C	DOMW	DEVC	PIGL		Water: Water Pig Launch Point
C	DOMW	DEVC	PUMP		Domestic Water: Pump
C	DOMW	DEVC	RECT		Domestic Water: Rectifier
C	DOMW	DEVC	REGL		Domestic Water: Regulator, reducer
C	DOMW	DEVC	SMPL		Domestic Water: Sample location
C	DOMW	DEVC	TEST		Domestic Water: Anode test station
C	DOMW	DEVC	TRET		Domestic Water: Treatment unit
C	DOMW	DEVC			Domestic Water: Connectors, faucets, reducers, regulators, vents, intake points, tanks, taps, backflow presenters, and valves
C	DOMW	FIRE			Domestic Water: Fire lines
C	DOMW	FTTG			Domestic Water: Caps, cleanouts, crosses, and tees
C	DOMW	HYDR			Domestic Water: Hydrants
C	DOMW	IDEN			Domestic Water: Identifier tags, symbol modifier, and text
C	DOMW	JBOX			Domestic Water: A below grade box or small vault (usually concrete, brick, or cast iron) with above grade access where pipes intersect. Manhole also houses associated fittings, valves, meters, etc.
C	DOMW	JBOX			Water: Water Junction box
C	DOMW	METR			Domestic Water: Meters
C	DOMW	NHYD			Domestic Water: Non-potable hydrants/flushing hydrants
C	DOMW	NPW~			Domestic Water: Non-potable water piping
C	DOMW	PIPE	A		Domestic Water: Abandoned piping
C	DOMW	PIPE	A		Water: Abandoned Water Line
C	DOMW	PIPE			Domestic Water: Main domestic water piping
C	DOMW	PITS	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
C	DOMW	PLNT			Domestic Water: A water treatment plant and all appurtenant equipment, buildings, and facilities relating to water treatment
C	DOMW	PUMP			Domestic Water: Booster pump stations
C	DOMW	REDC			Domestic Water: Pressure reducing stations
C	DOMW	REDC			Domestic Water: Water Pressure Reducing Station
C	DOMW	RSVR	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
C	DOMW	RSVR			Domestic Water: Reservoirs
C	DOMW	SERV			Domestic Water: Domestic water service piping
C	DOMW	SIGN			Domestic Water: Surface markers/signs
C	DOMW	SIGN			Surface markers/signs
C	DOMW	SITE			Domestic Water: A water utility company or organization’s certificated area of jurisdiction or responsibility as approved by a federal, state, or local utility regulatory authority

C	DOMW	SRCE			Domestic Water: The point from which water is supplied for processing and distribution
C	DOMW	SRCE			Domestic Water: Water Source Site
C	DOMW	STNS	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
C	DOMW	TANK			Domestic Water: Water storage tanks
C	DOMW	VALV			Domestic Water: Valve pits/vaults
C	DOMW	VENT			Domestic Water: Vent pits
C	DOMW	WELL			Domestic Water: Water well houses
DREDGING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	DRED	IDEN			Dredging: Dredging annotation
C	DRED	LIMT			Dredging: Dredge limit lines
C	DRED	OHWM			Dredging: Ordinary high water marks
DITCHES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	DTCH	BOTM			Ditches: Bottom of ditch
C	DTCH	CNTR			Ditches: Centerline of ditch
C	DTCH	EWAT			Ditches: Edge of water
C	DTCH	IDEN			Ditches: Ditch annotation
C	DTCH	TOP~			Ditches: Top of ditch
ELEVATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	ELEV	FIXT			Elevations: Miscellaneous fixtures
C	ELEV	IDEN			Elevations: Component identification numbers
C	ELEV	OTLN			Elevations: Building outlines
C	ELEV	PATT			Elevations: Textures and hatch patterns
C	ELEV	SIGN			Elevations: Signage
EROSION AND SEDIMENTATION CONTROL					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	EROS	CIPR			Erosion and Sedimentation Control: Culvert inlet protection
C	EROS	CNTE			Erosion and Sedimentation Control: Construction entrance
C	EROS	DDIV	IDEN		Erosion and Sedimentation Control: Drainage divide identification
C	EROS	DDIV			Erosion and Sedimentation Control: Drainage divides
C	EROS	DVDK			Erosion and Sedimentation Control: Diversion dike
C	EROS	IDEN			Erosion and Sedimentation Control: Annotation
C	EROS	INPR			Erosion and Sedimentation Control: Inlet protection
C	EROS	LIMI			Erosion and Sedimentation Control: Limit of Division
C	EROS	SILT	FENC		Erosion and Sedimentation Control: Silt fence
C	EROS	SILT	TRAP		Erosion and Sedimentation Control: Silt trap
C	EROS	SSLT	FENC		Erosion and Sedimentation Control: Super silt fence
C	EROS				Erosion and Sedimentation Control: General
LIQUID FUEL					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	FUEL	DEFL			Liquid Fuel: Defueling piping
C	FUEL	DEVC	AIRE		Liquid Fuel: Air eliminator
C	FUEL	DEVC	ANOD		Liquid Fuel: Anode
C	FUEL	DEVC	FILT		Liquid Fuel: Filter strainer point
C	FUEL	DEVC	OILW		Liquid Fuel: Oil water separator
C	FUEL	DEVC	PUMP		Liquid Fuel: Pump
C	FUEL	DEVC	RECT		Liquid Fuel: Rectifier

C	FUEL	DEVC	REDC		Liquid Fuel: Reducer
C	FUEL	DEVC	SRCE		Liquid Fuel: Source point
C	FUEL	DEVC	TEST		Liquid Fuel: Anode test station
C	FUEL	DEVC	VALV		Liquid Fuel: Valve
C	FUEL	DEVC			Liquid Fuel: Air eliminators, filter strainers, hydrant fill points, line vents, markers,
C	FUEL	FARM			Liquid Fuel: Fuel farm site
C	FUEL	FLOW			Liquid Fuel: Flow direction arrows
C	FUEL	FTTG			Liquid Fuel: Caps, crosses, and tees
C	FUEL	HYDR			Liquid Fuel: Hydrant control pits
C	FUEL	IDEN			Liquid Fuel: Identifier tags, symbol modifier, and text
C	FUEL	JBOX			Liquid Fuel: Junction boxes, manholes, handholes, test boxes
C	FUEL	METR			Liquid Fuel: Meters
C	FUEL	PIPE	A		Liquid Fuel: Abandoned piping
C	FUEL	PIPE	SEGM		Liquid Fuel: Pipeline segment line
C	FUEL	PIPE			Liquid Fuel: Main fuel piping
C	FUEL	PIPE			Liquid Fuel: Pipe line
C	FUEL	PITS	IDEN		Liquid Fuel: Identifier tags, symbol modifier, and text
C	FUEL	PUMP			Liquid Fuel: Booster pump stations
C	FUEL	REFN			Liquid Fuel: Refinery site
C	FUEL	SERV			Liquid Fuel: Service piping
C	FUEL	STNS	IDEN		Liquid Fuel: Identifier tags, symbol modifier, and text
C	FUEL	TANK			Liquid Fuel: Fuel tanks
C	FUEL	TRCH			Liquid Fuel: Fuel line trench
C	FUEL	VALV			Liquid Fuel: Valve pits
C	FUEL	VENT			Liquid Fuel: Vent pits
GLYCOL					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	GLYC	COUT			Glycol: Deicing Line Clean Out
C	GLYC	CULV	CEND		Glycol: Deicing Culvert End
C	GLYC	CULV	CNTR		Glycol: Deicing Culvert Centerline
C	GLYC	DBAS			Glycol: Deicing Drainage Basin
C	GLYC	DDIV			Glycol: Deicing Drainage Divide
C	GLYC	DISC			Glycol: Deicing Discharge Point
C	GLYC	FLOW			Glycol: Deicing Flow Control Point
C	GLYC	FTTG			Glycol: Deicing Fitting
C	GLYC	INLT			Glycol: Deicing Inlet
C	GLYC	JBOX			Glycol: Deicing Junction
C	GLYC	LIFT			Glycol: Deicing Lift Station
C	GLYC	LINE	RETN		Glycol: Deicing Return Line
C	GLYC	LINE	SPLY		Glycol: Deicing Supply Line
C	GLYC	LINE			Glycol: Deicing Line
C	GLYC	MARK			Glycol: Deicing Marker
C	GLYC	MHOL			Glycol: Deicing Manhole
C	GLYC	PUMP			Glycol: Deicing Pump
C	GLYC	RESV			Glycol: Deicing Reservoir
C	GLYC	STAT			Glycol: Deicing Pump Station
C	GLYC	TANK			Glycol: Deicing Tank
C	GLYC	VALT			Glycol: Deicing Vault
C	GLYC	VALV			Glycol: Deicing Valve

GRADE LINEWORK					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	GRAD	CUTS			Grade Linework: Cut Material
C	GRAD	E			Grade Linework: Existing grade, ground line
C	GRAD	FILL			Grade Linework: Fill Material
C	GRAD	FNSH			Grade Linework: Finished grade
C	GRAD	MASS	FREE		Grade Linework: Free Haul Area
C	GRAD	MASS	IDEN		Grade Linework: Mass Haul Identification
C	GRAD	MASS	LINE		Grade Linework: Mass Haul Linework
C	GRAD	MASS	MAJR		Grade Linework: Mass Haul Major Grids
C	GRAD	MASS	MINR		Grade Linework: Mass Haul Minor Grids
C	GRAD	MASS	OTLN		Grade Linework: Mass Haul Outline
C	GRAD	MASS	OVER		Grade Linework: Overhaul Area
C	GRAD	MASS	TEXT		Grade Linework: Mass Haul Annotation
C	GRAD	TEXT			Grade Linework: Annotation
C	GRAD				Grade Linework: Grading
GRID LINES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	GRID	FRAM			Grid Lines: Frame (bounding frame of an area referenced by a grid)
C	GRID	MAJR			Grid Lines: Major grid lines
C	GRID	MINR			Grid Lines: Minor grid lines
C	GRID	TEXT			Grid Lines: Border text, annotation
HELIPORTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	HELI	BLST			Heliports: Helipad blast pad and stopway markings
C	HELI	CNTR	MRKG		Heliports: Centerline markings
C	HELI	CNTR			Heliports: Centerline
C	HELI	DIST			Heliports: Fixed distance markings
C	HELI	DSPL			Heliports: Displaced threshold markings
C	HELI	DSRF			Heliports: Helipad design surface
C	HELI	FATO			Heliports: Helipad FATO - Final Approach and Takeoff
C	HELI	IDEN			Heliports: Heliport numbers and letters
C	HELI	SHLD			Heliports: Shoulder
C	HELI	SIDE			Heliports: Side stripes
C	HELI	TDZM			Heliports: Touchdown zone markers
C	HELI	THRS			Heliports: Threshold markers
C	HELI	TLOF			Heliports: Helipad take off and landing area
INDUSTRIAL WASTE WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	IW~~	DEVC	ANOD		Industrial Waste Water: Anode
C	IW~~	DEVC	DISC		Industrial Waste Water: Discharge point
C	IW~~	DEVC	FTTG		Industrial Waste Water: Waste fitting
C	IW~~	DEVC	GRIT		Industrial Waste Water: Grit chamber
C	IW~~	DEVC	INLT		Industrial Waste Water: Inlet
C	IW~~	DEVC	NEUT		Industrial Waste Water: Neutralizer
C	IW~~	DEVC	OILW		Industrial Waste Water: Oil water separator
C	IW~~	DEVC	PUMP		Industrial Waste Water: Pump
C	IW~~	DEVC	RECT		Industrial Waste Water: Rectifier
C	IW~~	DEVC	TEST		Industrial Waste Water: Anode test station

C	IW~~	DEVC			Industrial Waste Water: Grit chambers, meters, flumes, neutralizers, oil/water separators, ejectors, tanks, and valves
C	IW~~	FLOW			Industrial Waste Water: Flow direction arrows
C	IW~~	FTTG			Industrial Waste Water: Caps and cleanouts
C	IW~~	HEAD	LINE		Industrial Waste Water: Headwall line
C	IW~~	HEAD	NODE		Industrial Waste Water: Headwall point
C	IW~~	IDEN			Industrial Waste Water: Identifier tags, symbol modifier, and text
C	IW~~	JBOX			Industrial Waste Water: Junction boxes and manholes
C	IW~~	LAGN			Industrial Waste Water: Lagoons
C	IW~~	LIFT			Industrial Waste Water: Lift stations
C	IW~~	METR			Industrial Waste Water: Meters
C	IW~~	PIPE	A		Industrial Waste Water: Abandoned piping
C	IW~~	PIPE			Industrial Waste Water: Main industrial waste water piping
C	IW~~	PLNT			Industrial Waste Water: Treatment plants
C	IW~~	RSVR	IDEN		Industrial Waste Water: Identifier tags, symbol modifier, and text
C	IW~~	SERV			Industrial Waste Water: Industrial waste water service piping
C	IW~~	SIGN			Industrial Waste Water: Surface markers/signs
C	IW~~	STNS	IDEN		Industrial Waste Water: Identifier tags, symbol modifier, and text
JOINTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	JNTS	CNTJ	LONG		Joints: Construction joints - longitudinal
C	JNTS	CNTJ	TRAV		Joints: Construction joints - transverse
C	JNTS	CNTT	LONG		Joints: Contraction joints - longitudinal
C	JNTS	CNTT	TRAV		Joints: Contraction joints - transverse
C	JNTS	EDGE			Joints: Thickened edges
C	JNTS	EXPJ			Joints: Expansion joints
C	JNTS	IDEN			Joints: Joint annotation
MARKING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	MRKG	AREA			Marking: New Marking Area
MAINTENANCE OF TRAFFIC					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	MTRF	PHS1			Maintance of Traffic: Phase 1
C	MTRF	PHS2			Maintance of Traffic: Phase 2
C	MTRF	PHS3			Maintance of Traffic: Phase 3
C	MTRF	PHS4			Maintance of Traffic: Phase 4
C	MTRF	PHS5			Maintance of Traffic: Phase 5
NATURAL GAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	NGAS	DEVC	ANOD		Natural Gas: Anode
C	NGAS	DEVC	FILL		Natural Gas: Fill point
C	NGAS	DEVC	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
C	NGAS	DEVC	LITE		Natural Gas: Light
C	NGAS	DEVC	PUMP		Natural Gas: Pump
C	NGAS	DEVC	RECT		Natural Gas: Rectifier
C	NGAS	DEVC	SRCE		Natural Gas: Source point
C	NGAS	DEVC	TEST		Natural Gas: Anode test station
C	NGAS	DEVC			Natural Gas: Hydrant fill points, lights, vents, markers, rectifiers, reducers, regulators,
C	NGAS	FLOW			Natural Gas: Flow direction arrows
C	NGAS	FTTG			Natural Gas: Caps, crosses, and tees

C	NGAS	IDEN			Natural Gas: Identifier tags, symbol modifier, and text
C	NGAS	METR			Natural Gas: Meters
C	NGAS	PIPE	A		Natural Gas: Abandoned piping
C	NGAS	PIPE			Natural Gas: Main natural gas piping
C	NGAS	PITS	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
C	NGAS	PUMP			Natural Gas: Compressor stations
C	NGAS	REDC			Natural Gas: Reducing stations
C	NGAS	SERV			Natural Gas: Service piping
C	NGAS	SIGN			Natural Gas: Surface markers/signs
C	NGAS	STNS	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
C	NGAS	TANK			Natural Gas: Gas Tank
C	NGAS	VALV			Natural Gas: Valve pits/boxes
C	NGAS	VENT			Natural Gas: Vent pits
OVERRUN AREAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	OVRN	CNTR	IDEN		Overrun Areas: Centerline annotation
C	OVRN	CNTR			Overrun Areas: Centerlines
C	OVRN	IDEN			Overrun Areas: Airfield overrun area - annotation
C	OVRN	JNTS			Overrun Areas: Airfield overrun joints
C	OVRN	OTLN			Overrun Areas: Airfield overrun area - outlines
C	OVRN	SHLD			Overrun Areas: Shoulder markings
PADS (arm / disarm / calibration, etc.)					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	PADS	CNTR	IDEN		Pads: Centerline annotation
C	PADS	CNTR			Pads: Centerlines
C	PADS	IDEN			Pads: Annotation
C	PADS	OTLN			Pads: Outlines
C	PADS	SHLD			Pads: Shoulders with annotation
PARKING LOTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	PRKG	CARS			Parking Lots: Graphic illustration of cars
C	PRKG	CNTR	IDEN		Parking Lots: Centerline annotation
C	PRKG	CNTR			Parking Lots: Centerlines
C	PRKG	CURB			Parking Lots: Curbs and gutters
C	PRKG	DRAN			Parking Lots: Parking lot drainage slope indications
C	PRKG	EQPM			Parking Lots: Parking Equipment (I.e. booths, gates, etc.)
C	PRKG	FIXT			Parking Lots: Fixtures (e.g., wheel stops, parking meters)
C	PRKG	IDEN			Parking Lots: Minor road, and curb annotation
C	PRKG	ISLD			Parking Lots: Parking islands
C	PRKG	MRKG			Parking Lots: Striping, handicapped symbols, pavement markings
C	PRKG	OTLN			Parking Lots: Lot outline
C	PRKG	SBMP			Parking Lots: Speed bumps in parking areas
C	PRKG	SIGN			Parking Lots: Lot signage
PROFILES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	PROF	CUTS	IDEN		Profiles: Existing grade and grading cuts - annotation
C	PROF	DATA			Profiles: Alignment coordinates and curve data
C	PROF	E			Profiles: Existing Grade
C	PROF	FILL			Profiles: New work, grading fills

C	PROF	FNSH			Profiles: Finished Grade
C	PROF	GRID	GEOM		Profiles: Geometry Point Grid Lines
C	PROF	GRID	MAJR		Profiles: Major Grid Lines
C	PROF	GRID	MINR		Profiles: Minor Grid Lines
C	PROF	IDEN			Profiles: Identification Labels
C	PROF	INLT			Profiles: Curb and surface inlets, catch basins
C	PROF	LINE	EXTN	E	Profiles: Existing Grade Extension Lines
C	PROF	MHOL			Profiles: Manholes
C	PROF	OTLN			Profiles: Grid Outline
C	PROF	PIPE			Profiles: Piping
C	PROF	PROJ			Profiles: Projected Objects
C	PROF	ROAD			Profiles: Roads
C	PROF	SSWR			Profiles: Sanitary Sewer
C	PROF	STAT			Profiles: Stationing and tick marks
C	PROF	STRM			Profiles: Storm Sewer
C	PROF	TEXT	E		Profiles: Existing Grade Text
C	PROF	TEXT			Profiles: Text Annotation
PROPERTY					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	PROP	BRNG			Property: Bearings and distance labels
C	PROP	CONS			Property: Construction limits/controls, staging area
C	PROP	ESMT			Property: Easements
C	PROP	IDEN			Property: Identification Annotation
C	PROP	LEAS			Property: Lease line (exterior / ground lease)
C	PROP	LINE			Property: Line
C	PROP	PROP			Cadastral: Airport Boundary
C	PROP	RWAY			Property: Right of ways
C	PROP	TEXT			Property: General Annotation
PAVEMENTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	PVMT	AREA	E		Pavements: Existing Pavement Area
C	PVMT	AREA			Pavements: New Pavement Area
C	PVMT	ASPH			Pavements: Asphalt Pattern
C	PVMT	CONC			Pavements: Concrete Pattern
C	PVMT	GROV			Pavements: Pavement Grooving
C	PVMT	GRVL			Pavements: Gravel Pattern
C	PVMT	IDEN			Pavements: Road, parking lot, railroad, airfield pavement identification annotation
C	PVMT	MRKG	TEXT		Pavements: Road, parking lot, railroad, airfield pavement text annotation
C	PVMT	MRKG	WHIT		Pavements: Roadway markings (white)
C	PVMT	MRKG	YELO		Pavements: Roadway markings (yellow)
C	PVMT	MRKG			Pavements: Pavement markings
C	PVMT	PATT			Pavements: Joint patterns, text and dimensions
C	PVMT	REPR			Pavements: Pavement Repair
C	PVMT	ROAD			Pavements: Roads, parking lots, railroads, airfield pavements
C	PVMT	SBMP			Pavements: Speed bumps on roadways
C	PVMT	SIGN			Pavements: Other signs
C	PVMT	TEXT			Pavements: Annotation
RAILROADS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**

C	RAIL	BRDG	CNTR		Railroads: Bridge Centerline
C	RAIL	BRDG			Railroads: Bridge area
C	RAIL	CNTR	IDEN		Railroads: Centerline annotation
C	RAIL	CNTR			Railroads: Centerlines
C	RAIL	EQPM			Railroads: Equipment (e.g., gates, signals)
C	RAIL	IDEN			Railroads: Annotation
C	RAIL	TRAK			Railroads: Track
C	RAIL	YARD			Railroads: Yard
ROADS, STREETS, HIGHWAYS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	ROAD	ASPH			Roadways: Asphalt surface outline
C	ROAD	AUTO			Roadways: AutoTURN
C	ROAD	CHAN			Roadways: Channelizing Devices
C	ROAD	CNTR	IDEN		Roadways: Centerline annotation
C	ROAD	CNTR			Roadways: Centerlines
C	ROAD	CONC			Roadways: Concrete surface outline
C	ROAD	CORR	PATT		Roadways: Civil 3D Corridor Hatching
C	ROAD	CORR			Roadways: Civil 3D Corridors
C	ROAD	CURB			Roadways: Curbs
C	ROAD	DATA			Roadways: Alignment coordinates and curve data
C	ROAD	DRIV	CNTR		Roadways: Driveway centerline
C	ROAD	DRIV			Roadways: Driveway edge of pavement
C	ROAD	GRAL			Roadways: Guardrails
C	ROAD	GRVL			Roadways: Gravel surface outline
C	ROAD	IDEN			Roadways: Identification annotation
C	ROAD	INTS			Roadways: Intersections
C	ROAD	LINE	EXTN		Roadways: Alignment extension lines
C	ROAD	MRKG			Roadways: Pavement markings
C	ROAD	OTLN			Roads
C	ROAD	SHLD			Roadways: Roadway shoulder
C	ROAD	SIGN			Roadways: Roadway signs
C	ROAD	STAT			Roadways: Stationing and tick marks
C	ROAD	TABL			Roadways: Tables
C	ROAD	TEXT			Roadways: Annotation
C	ROAD	UPVD			Roadways: Unpaved surface outline
RUNWAYS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	RUNW	ARST			Runways: Runway arresting area
C	RUNW	ARST			Runways: Runway Arresting Gear Location
C	RUNW	ARST			Runway Arresting Gear Location
C	RUNW	BLST			Runways: Runway blast pad
C	RUNW	CLRW			Runways: Runway clearway
C	RUNW	CNTR	MRKG		Runways: Centerline markings
C	RUNW	CNTR			Runways: Runway Centerline
C	RUNW	DIST			Runways: Fixed distance markings
C	RUNW	DSPL			Runways: Displaced threshold
C	RUNW	DSRF	RPZN		Airfield: Runway Protection Zone
C	RUNW	DSRF	RPZN		Runway Protection Zone
C	RUNW	DSRF	SFTY		Airfield: Runway Safety Area

C	RUNW	EDGE			Runways: Airfield runway edges
C	RUNW	ENDP	MRKG		Runways: Runway label marking point
C	RUNW	ENDP			Runways: Runway endpoint
C	RUNW	IDEN			Runways: Runway numbers and letters
C	RUNW	INTS			Runways: Runway intersection
C	RUNW	LAHS			Runways: Runway land and hold short area
C	RUNW	LINE	EXTN		Runways: Runway alignment extension line
C	RUNW	OBFA			Runways: Object Free Area
C	RUNW	SEGM			Runways: Runway segment
C	RUNW	SFTY			Runways: Runway Safety Area
C	RUNW	SHLD			Runways: Runway Shoulder
C	RUNW	SHLD			Runways: Shoulder markings
C	RUNW	SIDE			Runways: Side stripes
C	RUNW	SIGN			Runways: Airfield signs on the runway such as distance remaining signs
C	RUNW	STWY			Runways: Runway stopway markings
C	RUNW	TDZM			Runways: Touchdown zone markers
C	RUNW	THRS			Runways: Threshold markers
SEAPLANES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	SEAP	BUOY			Seaplanes: Navigation buoy
C	SEAP	DOCK			Seaplanes: Dock
C	SEAP	LNDA			Seaplanes: Landing area
C	SEAP	RAMP	CNTR		Seaplanes: Ramp centerline
C	SEAP	RAMP			Seaplanes: Ramp site
SECTIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	SECT	GRID	GRAD		Sections: Geometry Gridlines
C	SECT	GRID	MAJR		Sections: Major Gridlines
C	SECT	GRID	MINR		Sections: Minor Gridlines
C	SECT	IDEN			Sections: Component identification numbers
C	SECT	MBND			Sections: Material beyond section cut
C	SECT	MCUT			Sections: Material cut by section
C	SECT	OTLN			Sections: Grid Outline
C	SECT	PATT			Sections: Textures and hatch patterns
C	SECT	PROJ			Sections: Projected Objects
C	SECT	ROAD			Sections: Roadways
C	SECT	SSWR			Sections: Sanitary Sewer
C	SECT	STAT			Sections: Stationing and Tick Marks
C	SECT	STRM			Sections: Storm Sewer
C	SECT	TABL	IDEN		Sections: Table Identification and Titles
C	SECT	TABL	PATT		Sections: Table Hatching
C	SECT	TABL	TEXT		Sections: Table Text and Data
C	SECT	TABL			Sections: Tables
C	SECT	TEXT			Sections: Annotation
C	SECT	VIEW			Sections: Civil 3D Section Views
SITE FEATURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	SITE	BARR			Site Features: Beam barricade
C	SITE	EROS	IDEN		Site Features: Riprap, revetment/stone protection, breakwater, dike, jetty, and drain annotation

C	SITE	EROS			Site Features: Riprap, revetments/stone protection, breakwaters, dikes, jetties, and drains
C	SITE	FENC	IDEN		Site Features: Fence, handrail, ramp, sign, and trail annotation
C	SITE	FENC	POST		Site Features: Fence Posts
C	SITE	FENC			Site Features: Fences and handrails
C	SITE	GATE			Site Features: Gates along fences or other barriers intended to restrict access
C	SITE	IDEN			Site Features: Identification annotation
C	SITE	IMPR			Site Features: Site improvements (channel or levee features)
C	SITE	LIMI			Site Features: Project Limits of Disturbance
C	SITE	SERT	CMRA		Site Features: Security camera locations outside of buildings
C	SITE	SIGN			Site Features: Signage
C	SITE	STRC			Site Features: Structures (bridges, sheds, foundation pads, footings, etc.)
C	SITE	STRS			Site Features: Stairs and ramps
C	SITE	SYMB			Site Features: Symbols
C	SITE	WALK			Site Features: Walks, trails and bicycle paths
SANITARY SEWER					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	SSWR	CNTR			Sanitary Sewer: Centerlines
C	SSWR	DEVC	ANOD		Sanitary Sewer: Anode
C	SSWR	DEVC	DISC		Sanitary Sewer: Discharge point
C	SSWR	DEVC	DNWS		Sanitary Sewer: Downspout point
C	SSWR	DEVC	GRIT		Sanitary Sewer: Grit chamber
C	SSWR	DEVC	GRSE		Sanitary Sewer: Grease trap
C	SSWR	DEVC	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	DEVC	INLT		Sanitary Sewer: Inlet Device
C	SSWR	DEVC	METR		Sanitary Sewer: Meters
C	SSWR	DEVC	NEUT		Sanitary Sewer: Neutralizer
C	SSWR	DEVC	OILW		Sanitary Sewer: Oil water separator
C	SSWR	DEVC	PUMP		Sanitary Sewer: Pump
C	SSWR	DEVC	RECT		Sanitary Sewer: Rectifier
C	SSWR	DEVC	TEST		Sanitary Sewer: Anode test station
C	SSWR	DEVC	TRET		Sanitary Sewer: Treatment unit
C	SSWR	DEVC	VALV		Sanitary Sewer: Valve
C	SSWR	DEVC			Sanitary Sewer: Grease traps, grit chambers, flumes, neutralizers, oil/water separators, ejectors, and valves
C	SSWR	FILT	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	FILT			Sanitary Sewer: Filtration beds
C	SSWR	FLOW			Sanitary Sewer: Flow direction arrows
C	SSWR	FTTG			Sanitary Sewer: Caps and cleanouts
C	SSWR	IDEN			Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	JBOX	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	JBOX	PATT		Sanitary Sewer: Junction boxes and manhole hatching
C	SSWR	JBOX			Sanitary Sewer: Junction boxes and manholes
C	SSWR	LAGN			Sanitary Sewer: Lagoons
C	SSWR	LEAC	LAGN		Sanitary Sewer: Leach Field Lagoon
C	SSWR	LEAC	SBED		Sanitary Sewer: Sludge bed
C	SSWR	LEAC			Sanitary Sewer: Leach field
C	SSWR	MHOL			Sanitary Sewer: Manholes
C	SSWR	NITF			Sanitary Sewer: Nitrification drain fields
C	SSWR	PIPE	A		Sanitary Sewer: Abandoned piping
C	SSWR	PIPE	PATT		Sanitary Sewer: New sanitary sewer piping hatching

C	SSWR	PIPE			Sanitary Sewer: Piping
C	SSWR	PLNT			Sanitary Sewer: Treatment plants
C	SSWR	PUMP			Sanitary Sewer: Booster pump stations
C	SSWR	RSVR	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	SERV			Sanitary Sewer: Service piping
C	SSWR	SIGN			Sanitary Sewer: Surface markers/signs
C	SSWR	SITE			Sanitary Sewer: A wastewater utility company or organization's certificated area of jurisdiction of responsibility as approved by a federal, state, or local utility regulatory authority
C	SSWR	STNS	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
C	SSWR	TANK	DISP		Sanitary Sewer: Disposal tanks
C	SSWR	TANK			Sanitary Sewer: Septic tanks
C	SSWR	TEXT			Sanitary Sewer: Annotation
C	SSWR	TRET			Sanitary Sewer: A wastewater treatment plant and all appurtenant equipment, buildings, and facilities relating to water treatment
STRUCTURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	STRC	IDEN			Structures: Bridges, piers, breakwaters, docks, floats, etc. - annotation
C	STRC	OTLN			Structures: Bridges, piers, breakwaters, docks, floats, etc. - outlines
C	STRC	TOWR			Structures: Tower
STORM SEWERS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	STRM	AFFF			Storm Sewer: AFFF lagoon/detention pond
C	STRM	CHUT			Storm Sewer: Chutes and concrete erosion control structures
C	STRM	CNTR			Storm Sewer: Centerlines
C	STRM	CULV	CNTR		Storm Sewer: Culvert centerline
C	STRM	CULV	LINE		Storm Sewer: Culvert line
C	STRM	CULV			Storm Sewer: Culverts
C	STRM	DEVC			Storm Sewer: Downspouts, flumes, oil/water separators, and flap gates
C	STRM	DRAN	DIVL		Storm Sewer: Drainage divide line
C	STRM	DRAN	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
C	STRM	DRAN	LINE		Storm Sewer: Open drainage line
C	STRM	EROS	SILT		Storm Sewer: Silt Fence
C	STRM	EROS	SSLT		Storm Sewer: Super Silt Fence
C	STRM	EROS	TANK		Storm Sewer: Portable Sediment Tank
C	STRM	EROS			Storm Sewer: Erosion control (riprap)
C	STRM	FLHA			Storm Sewer: Flood area
C	STRM	FLOW			Storm Sewer: Flow direction arrows
C	STRM	FMON			Storm Sewer: Flow monitoring station
C	STRM	FTTG			Storm Sewer: Caps and cleanouts
C	STRM	HWAL			Storm Sewer: Headwalls and endwalls
C	STRM	IDEN			Storm Sewer: Identifier tags, symbol modifier, and text
C	STRM	INLT			Storm Sewer: New Inlets (curb, surface, and catch basins)
C	STRM	INLT			Storm Sewer: Inlets (curb, surface, and catch basins)
C	STRM	JBOX			Storm Sewer: Junction
C	STRM	LAGN	BASN		Storm Sewer: Drainage basin
C	STRM	LAGN	OPEN		Storm Sewer: Open drainage area
C	STRM	LAGN	RESV	NODE	Storm Sewer: Reservoir point
C	STRM	LAGN	STIL		Storm Sewer: Stilling basin
C	STRM	LAGN			Storm Sewer: Lagoons, ponds, watersheds, and basins
C	STRM	MHOL			Storm Sewer: Manholes

C	STRM	PATT			Storm Sewer: Hatching
C	STRM	PIPE	A		Storm Sewer: Abandoned piping
C	STRM	PIPE	PATT		Storm Sewer: Storm Piping Hatching
C	STRM	PIPE	TEXT		Storm Sewer: Annotation
C	STRM	PIPE			Storm Sewer: Piping
C	STRM	PUMP			Storm Sewer: Pump stations
C	STRM	ROOF			Storm Sewer: Roof drain line
C	STRM	RSVR	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
C	STRM	SERV			Storm Sewer: Service piping
C	STRM	SIGN			Storm Sewer: Surface markers/signs
C	STRM	STAT	PUMP		Storm Sewer: Pump station
C	STRM	STNS	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
C	STRM	STRC	PATT		Storm Sewer: Structures Hatching
C	STRM	STRC			Storm Sewer: Storm drainage, headwalls, inlets, manholes, culverts, and drainage structures
C	STRM	SUBS			Storm Sewer: Subsurface drain piping
C	STRM	TABL			Storm Sewer: Tables
C	STRM	TEXT			Storm Sewer: Annotation
SURVEY					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	SURV	DATA			Survey: Survey data (benchmarks and horizontal control points or monuments)
C	SURV	IDEN			Survey: Baseline, and control line annotation
C	SURV	LINE			Survey: Baseline, and control lines
TAXIWAYS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	TAXI	ACCS			Taxiways: Contractor Access Route
C	TAXI	CNTR	IDEN		Taxiways: Centerline annotation
C	TAXI	CNTR	MRKG		Taxiways: Centerline markings
C	TAXI	CNTR			Taxiways: Centerline
C	TAXI	EDGE			Taxiways: Edge markings
C	TAXI	HOLD			Taxiways: Holding lines
C	TAXI	IDEN			Taxiways: Annotation
C	TAXI	INTS			Taxiways: Intersection
C	TAXI	JNTS			Taxiways: Joints
C	TAXI	OFA			Taxiways: Object Free Area
C	TAXI	OTLN			Taxiways: Outlines
C	TAXI	SFTY			Taxiways: Safety Area
C	TAXI	SHLD			Taxiways: Shoulder transverse stripes
C	TAXI	SIGN			Taxiways: Airfield signs on the taxiway such as taxiway designator, hold short and directional signs
TOPOGRAPHY					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	TOPO	AUCO			Topography: Noise Complaint
C	TOPO	AUST			Topography: Noise Monitoring Station
C	TOPO	AUZN			Topography: Noise Contour/Zone
C	TOPO	BORE			Topography: Boring locations
C	TOPO	BRKL			Topography: Breaklines
C	TOPO	FDPL			Topography: Flood Zone
C	TOPO	GRID	COOR		Topography: Coordinate grid ticks and text
C	TOPO	MAJR	IDEN		Topography: Major contours - annotation
C	TOPO	MAJR			Topography: Major contours

C	TOPO	MINR	IDEN		Topography: Minor contours - annotation
C	TOPO	MINR	ONEF		Topography: Minor contours - One Foot Intervals
C	TOPO	MINR	TWOF		Topography: Minor contours - Two Foot Intervals
C	TOPO	MINR			Topography: Minor contours
C	TOPO	NSCO			Topography: Noise Complaint
C	TOPO	NSST			Topography: Noise Monitoring Station
C	TOPO	NSZN			Topography: Noise Contour/Zone
C	TOPO	RTWL			Topography: Retaining wall
C	TOPO	RUNW	NODE		Topography: Runway centerline elevation point
C	TOPO	SHOR			Topography: Shorelines, land features, and references
C	TOPO	SLOP	CUTS		Topography: Cut slopes
C	TOPO	SLOP	FILL		Topography: Fill slopes
C	TOPO	SLOP	IDEN		Topography: Cut/fill slope, top/toe slope annotation
C	TOPO	SLOP	TOPT		Topography: Top/toe slopes
C	TOPO	SLOP			Topography: Cut/fill slopes
C	TOPO	SOUN			Topography: Soundings and overbanks
C	TOPO	SPOT	IDEN		Topography: Spot elevations - annotation
C	TOPO	SPOT			Topography: Spot elevations
C	TOPO	TEXT			Topography: Annotation
C	TOPO	TINN	BNDY		Topography: DTM Boundaries
C	TOPO	TINN	NODE		Topography: DTM points
C	TOPO	TINN			Topography: DTM triangles
C	TOPO	USER			Topography: User Specified Contour
C	TOPO	WATR			Topography: Water area
C	TOPO	WDRP			Topography: Water Drop
C	TOPO				Topography: DTM
UTILITIES GENERAL					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	UTIL	AREA			Utilities: Utility area
C	UTIL	CNDT			Utilities: Conduit centerline
C	UTIL	DIST			Utilities: Energy distribution control facility
C	UTIL	SOLR			Utilities: Solar panel
C	UTIL	TANK			Utilities: Tank
C	UTIL	TUNL			Utilities: Tunnel centerline
C	UTIL	UDOR			Utilities: Utility utilidor line
C	UTIL	UNID	LINE		Utilities: Undefined utility line
C	UTIL	UNID			Utilities: Undefined feature
WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
C	WATR	PIPE			Utilities: Water lines, hydrants, tanks
C	WATR	TEXT			Utilities: Water Annotation
C	WATR	VALV			Utilities: Water valves and fittings

1D.1.5.4 (E) Electrical Layers

AIRFIELD					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	AFLD	CIRC	CTRL		Control and monitoring circuits
E	AFLD	CIRC	MULT		Multiple circuits

E	AFLD	CIRC	SERS		Series circuits
E	AFLD	VALT			Airfield lighting vaults
ALARM SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	ALRM	EQPM			Alarm system equipment
E	ALRM	IDEN			Identifier tags, symbol modifier, and text
E	ALRM	SYMB			Miscellaneous alarm system symbols
GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
E	ANNO	KEYN			Reference keynotes with associated leaders
E	ANNO	NOTE			General notes and general remarks
E	ANNO	NPLT			Non-plotting graphic information
E	ANNO	PATT			Miscellaneous patterning and hatching
E	ANNO	REFR			Reference files
E	ANNO	SYMB			Miscellaneous symbols
E	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
BEACONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	BCNS	IDEN			Identifier tags, symbol modifier, and text
E	BCNS	MISC			Miscellaneous navaids - windcones and beacons
E	BCNS	STRB			Strobe beacons
BELL SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	BELL	EQPM			Bell system equipment
E	BELL	IDEN			Identifier tags, symbol modifier, and text
E	BELL	SYMB			Bell system symbols
CABLE SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	CABL	COAX			Coax cable
E	CABL	FIBR			Fiber optics cable
E	CABL	IDEN			Cable identifiers
E	CABL	MULT			Multi-conductor cable
E	CABL	TRAY			Cable trays and wireways
CATHODIC PROTECTION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	CATH	ANOD			Sacrificial anode system
E	CATH	CURR			Impress current system
E	CATH	IDEN			Identifier tags, symbol modifier, and text
E	CATH	TEST			Test stations
CLOSED-CIRCUIT TELEVISION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	CATV	IDEN			Identifier tags, symbol modifier, and text
E	CATV	SYMB			Cable television system symbols
E	CCTV	IDEN			Identifier tags, symbol modifier, and text
E	CCTV	SYMB			Closed-circuit television system symbols
CIRCUITS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	CIRC	CTRL			Control and monitoring circuits

E	CIRC	IDEN			Identifier tags, symbol modifier, and text
E	CIRC	MULT			Multiple circuits
E	CIRC	SERS			Series circuits
			CLOCK SYSTEMS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	CLOK	IDEN			Identifier tags, symbol modifier, and text
E	CLOK	SYMB			Clock system symbols
			COMMUNICATIONS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	COMM	ACCS			Access point
E	COMM	AIRP			Air pipe line
E	COMM	COVR			Access coverage area
E	COMM	DUCT			Duct line
E	COMM	EQPM			Other communications distribution equipment
E	COMM	EQPM	AIR~		Air pressure device
E	COMM	EQPM	AMPL		Amplifier
E	COMM	EQPM	ANTL		Antenna line
E	COMM	EQPM	ANTS		Antenna site
E	COMM	EQPM	ATTN		Attenuator
E	COMM	EQPM	BOTH		Telephone booth site
E	COMM	EQPM	CLAD		Cable ladder
E	COMM	EQPM	CRCK		Cable rack line
E	COMM	EQPM	DSPL		Dbsplice site
E	COMM	EQPM	GPLN		Ground plane
E	COMM	EQPM	GPNT		Ground point
E	COMM	EQPM	GWAV		Ground wave
E	COMM	EQPM	IMPD		Impedance matching point
E	COMM	EQPM	PHON		Telephone
E	COMM	EQPM	PULB		Pullbox site
E	COMM	EQPM	RELY		Relay station
E	COMM	EQPM	RISR		Riser
E	COMM	EQPM	RPTR		Repeater
E	COMM	EQPM	SATE		Satellite
E	COMM	EQPM	SENS		Sensor
E	COMM	EQPM	SPKR		Speaker
E	COMM	EQPM	SPLC		Splice
E	COMM	EQPM	SPLT		Splitter
E	COMM	EQPM	TMTR		Terminator
E	COMM	EQPM	TRML		Terminal
E	COMM	EQPM	TWIS		Twisted pair line
E	COMM	HAND			Handhole
E	COMM	INET	SITE		Internet center site
E	COMM	JBOX			Communication junction or pull boxes, man/handholes, pedestals, splices
E	COMM	LCAP			Load capacitor
E	COMM	LCOL			Load coil
E	COMM	LINE	CBRG		Cable bridge line
E	COMM	LINE	LOOP		Service loop
E	COMM	LINE	SEGL		Segmented cable line
E	COMM	LINE	SEGS		Segmented cable site

E	COMM	LOSL			Line of sight line
E	COMM	MCNV			Media converter
E	COMM	MHOL			Manhole site
E	COMM	MHOP			Multihop polygon area
E	COMM	NETS			Network systems site
E	COMM	OVHD			Overhead communications/telephone lines
E	COMM	OVHD	IDEN		Identifier tags, symbol modifier and text
E	COMM	PATH	SITE		Path node site
E	COMM	PATH	SLIN		Path segment line
E	COMM	PEDS			Pedestal site
E	COMM	RADI			Radio
E	COMM	RADI	RCVR		Radio receiver site
E	COMM	RADI	TSMR		Radio transmitter site
E	COMM	RADR			Radar site
E	COMM	SIGN			Marker
E	COMM	UGND			Underground communications/telephone lines
E	COMM	UGND	IDEN		Identifier tags, symbol modifier and text
E	COMM	VALT			Communications vault site
E	COMM	VIDS			Video site
E	COMM	VOIC			Voice switch site
E	COMM	VSIT			Vertical site
E	COMM	WAVG			Waveguide line
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	DETL	GRPH			Graphics, gridlines, non-text items
E	DETL	INPD			Inch-pound-specific dimensions and notes
E	DETL	METR			Metric-specific dimensions and notes
DIAGRAM INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	DIAG	GRPH			Graphics, gridlines, non-text items
E	DIAG	IDEN			Identifier tags, symbol modifier and text
E	DIAG	INPD			Inch-pound-specific dimensions and notes
E	DIAG	METR			Metric-specific dimensions and notes
CENTRAL DICTRATION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	DICT	IDEN			Identifier tags, symbol modifier, and text
E	DICT	INFO			Clearances and working space information (NEC code, etc.)
E	DICT	SYMB			Central dictation system symbols
UNDERGROUND DUCTBANKS (to be used when multiple systems are in one ductbank system)					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	DUCT	MULT			Ductbank
E	DUCT	MULT	IDEN		Identifier tags, symbol modifier and text
ELECTRIC					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	ELEC	DEVC			Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and markers
E	ELEC	JBOX			Junction boxes, pull boxes, manholes, handholes, pedestals, splices
E	ELEC	SUBS			Other substation equipment
E	ELEC	SWCH			Fuse cutouts, pole mounted switches, circuit breakers, gang operated disconnects, reclosers, cubicle switches
E	ELEC	VALT			Vaults

ENERGY MONITORING CONTROL SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	EMCS	EMER			Emergency systems equipment
E	EMCS	EQPM			Energy monitoring control system equipment
E	EMCS	EQPM	DUCT		Ductbank line
E	EMCS	EQPM	JBOX		Junction
E	EMCS	EQPM	SIGN		Marker
E	EMCS	IDEN			Identifier tags, symbol modifier, and text
E	EMCS	SYMB			Energy monitoring control system symbols
FLOOR INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	FLOR	IDEN			Room name, space identification text (copied from Architectural - Floor Plan model file)
E	FLOR	NUMB			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)
GROUND SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	GRND	CIRC			Circuits
E	GRND	DIAG			Ground system diagram
E	GRND	EQUI			Equipotential ground system
E	GRND	REFR			Reference ground system
INTERCOM SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	INTC	IDEN			Identifier tags, symbol modifier, and text
E	INTC	SYMB			Intercom/PA system symbols
LIGHTING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	LITE	APPR			Approach lights
E	LITE	APRN			Apron Lighting
E	LITE	CIRC			Lighting circuits (including crosslines and homeruns)
E	LITE	CIRC	NUMB		Lighting circuit numbers (e.g., panel/circuit number, wire/conduit size)
E	LITE	CLNG			Ceiling mounted (surface/pendant) fixtures
E	LITE	CONS			Constant Current Regulators
E	LITE	DIST			Distance and arresting gear markers and lights
E	LITE	EMER			Emergency fixtures (outline of light (if ceiling mounted) should go on E-LITE-CLNG)
E	LITE	EXIT			Exit fixtures (outline of light (if ceiling mounted) should go on E-LITE-CLNG)
E	LITE	EXTR			Exterior lights
E	LITE	EXTR	IDEN		Identifier tags, symbol modifier, and text
E	LITE	FLOR			Floor mounted fixtures (e.g., stage)
E	LITE	IDEN			Light fixture identifier tags
E	LITE	JBOX			Junction boxes
E	LITE	LANE			Hoverlane, taxilane, and helipad lights
E	LITE	OBST			Obstruction lights
E	LITE	PANL			Main distribution panels, switchboards, lighting panels
E	LITE	ROOF			Roof lighting
E	LITE	RUNW	CNTR		Runway Centerline lights
E	LITE	RUNW	DTGS		Runway Distance to go lights
E	LITE	RUNW	DTGS		Runway Distance to go lights
E	LITE	RUNW	EDGE		Runway edge lights
E	LITE	RUNW	EDGE		Runway edge lights
E	LITE	RUNW	GARD		Runway guard lights

E	LITE	RUNW	GARD		Runway guard lights
E	LITE	RUNW	TDZN		Runway Touchdown Zone lights
E	LITE	RUNW	TDZN		Runway Touchdown Zone lights
E	LITE	SIGN			Taxiway guidance signs
E	LITE	SIGN			Taxiway guidance signs
E	LITE	SPCL			Special fixtures
E	LITE	SWCH			Lighting contactors, photoelectric controls, low-voltage lighting controls, etc.
E	LITE	TAXI	CNTR		Taxiway centerline lights
E	LITE	TAXI	CNTR		Taxiway centerline lights
E	LITE	TAXI	EDGE		Taxiway edge lights
E	LITE	TAXI	EDGE		Taxiway edge lights
E	LITE	THRS			Threshold lights
E	LITE	THRS			Threshold lights
E	LITE	WALL			Wall mounted fixtures
LIGHTING PROTECTION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	LTNG	COND			Lightning protection conductors
E	LTNG	TRML			Lightning protection terminals
NURSE CALL / PAGING SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	NURS	IDEN			Identifier tags, symbol modifier, and text
E	NURS	SYMB			Nurse call/paging system symbols
POLES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	POLE	GUYP			Guying equipment
E	POLE	GUYP	IDEN		Guying equipment identifier tags, symbol modifiers, and text
E	POLE	IDEN			Utility pole identifier tags, symbol modifier, and text
E	POLE	UTIL			Utility poles
POWER					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	POWR	AUXL			Generators and auxiliary equipment
E	POWR	BUSW			Busways and wireways
E	POWR	CABL			Cable trays
E	POWR	CAPC			Capacitor
E	POWR	CIRC			Power circuits (including crosslines and homeruns)
E	POWR	CIRC	NUMB		Power circuit numbers (e.g., panel/circuit number, wire/conduit size)
E	POWR	CLNG			Ceiling outlets (receptacles and switches)
E	POWR	FEED			Feeders
E	POWR	GENR			Generators and auxiliary equipment
E	POWR	HBLT			Head bolt outlet
E	POWR	JBOX			Junction boxes
E	POWR	METR			Meter
E	POWR	MOTR			Motors and utilization equipment
E	POWR	PANL			Panelboards, switchboards, MCC, unit substations
E	POWR	PEDS			Pedestal
E	POWR	POLE	CNDT		Utility pole conduit
E	POWR	POLE	GUYP		Utility pole guy point
E	POWR	REGL			Regulator
E	POWR	RISR			Riser

E	POWR	SIGN			Marker
E	POWR	SITE			Utility electric utility site
E	POWR	SPLC			Splice
E	POWR	SUBS			Other substation equipment
E	POWR	SWCH			Fuse cutouts, motor starters, contactors, pole mounted switches, circuit breakers, gang operated disconnects, reclosers, cubicle switches
E	POWR	URAC			Underfloor raceways
E	POWR	WALL			Wall/floor outlets (receptacles and switches)
E	POWR	XFMR	PADM		Pad mounted transformers
E	POWR	XFMR	POLE		Pole mounted transformers
PRIMARY ELECTRICAL CABLES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	PRIM	OVHD			Overhead electrical utility lines
E	PRIM	OVHD	IDEN		Identifier tags, symbol modifier, and text
E	PRIM	UGND			Underground electrical utility lines
E	PRIM	UGND	IDEN		Identifier tags, symbol modifier, and text
SECONDARY ELECTRICAL CABLES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	SECD	OVHD			Overhead electrical utility lines
E	SECD	OVHD	IDEN		Identifier tags, symbol modifier, and text
E	SECD	UGND			Underground electrical utility lines
E	SECD	UGND	IDEN		Identifier tags, symbol modifier, and text
SECURITY SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	SERT	ACCS			Access control system symbols
E	SERT	BURD			Buried sensors
E	SERT	CLNG			Ceiling mounted sensors
E	SERT	FLOR			Floor mounted sensors
E	SERT	IDEN			Identifier tags, symbol modifier, and text
E	SERT	UGND			Buried sensors
E	SERT	WALL			Wall mounted sensors
SOUND / PA SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	SOUN	IDEN			Identifier tags, symbol modifier, and text
E	SOUN	SYMB			Sound system symbols
SPECIAL SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	SPCL	IDEN			Special systems (UMCS, EMCS, CATV, etc.) identifier tags, symbol modifier, and text
E	SPCL	JBOX			Junction boxes
E	SPCL	PANL			Panelboards, backing boards, patch panel racks
E	SPCL	SRFS			Surface Sensor System
E	SPCL	SYST			Special systems (UMCS, EMCS, CATV, etc.)
E	SPCL	TRAF			Traffic signal system
E	SPCL	TRAF	IDEN		Traffic signal identifier tags, symbol modifier, and text
TV ANTENNA SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
E	TVAN	IDEN			Identifier tags, symbol modifier, and text
E	TVAN	SYMB			TV antenna system symbols

1D.1.5.5 (F) Fire Protection Layers

AQUEOUS FILM FORMING FOAM SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	AFFF	EQPM			Equipment
F	AFFF	PIPE			Piping
ALARM SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	ALRM	DTCT			Smoke/heat/other detectors
F	ALRM	INDC			Indicating appliances
F	ALRM	MANL			Manual fire alarm pull stations
F	ALRM	PHON			Fire service or emergency telephone stations
GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
F	ANNO	KEYN			Reference keynotes with associated leaders
F	ANNO	NOTE			General notes and general remarks
F	ANNO	NPLT			Non-plotting graphic information
F	ANNO	PATT			Miscellaneous patterning and hatching
F	ANNO	REFR			Reference files (AutoCAD users only, see Chapter 4)
F	ANNO	SYMB			Miscellaneous symbols
F	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
CO2 SPRINKLER SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	CO2S	EQPM			Equipment
F	CO2S	PIPE			CO2 piping or CO2 discharge nozzle piping
CONTROL PANELS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	CTRL	PANL			Control panels
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	DETL	GRPH			Graphics, gridlines, non-text items
F	DETL	INPD			Inch-pound-specific dimensions and notes
F	DETL	METR			Metric-specific dimensions and notes
FLOOR INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	FLOR	IDEN			Room name, space identification text (copied from Architectural - Floor Plan model file)
F	FLOR	NUMB			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)
HALON SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	HALN	EQPM			Halon equipment
F	HALN	PIPE			Halon piping
INERT GAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	IGAS	EQPM			Inert gas equipment
F	IGAS	PIPE			Inert gas piping
LIGHTING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**

F	LITE	EMER			Emergency fixtures
F	LITE	EXIT			Exit fixtures
			EGRESS REQUIREMENTS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	LSFT	EGRE			Egress requirements designator
F	LSFT	OCCP			Occupant load for egress capacity
F	LSFT	TRVL			Maximum travel distances
			FIRE PROTECTION / SUPPRESSION / ALARM / DETECTION EQUIPMENT		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	PROT	CABN			Fire hose cabinets
F	PROT	EXTN			Fire extinguishers and fire extinguisher cabinets
F	PROT	HOSE			Fire hoses
			FIRE RATINGS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	RATE	DOOR			Door fire ratings
F	RATE	WALL			Wall fire ratings
			SMOKE / PRESSURIZATION CONTROL		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	SMOK	DAMP			Dampers
			SPRINKLER SYSTEM		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	SPRN	CLHD			Sprinkler - ceiling heads
F	SPRN	COMB			Combination system
F	SPRN	OTHD			Sprinkler - other heads
F	SPRN	OTHR			Sprinkler - other
F	SPRN	PEND			Sprinkler - pendant
F	SPRN	PIPE			Sprinkler piping
F	SPRN	STAN			Standpipe system
			WATER SUPPLY AND DISTRIBUTION		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
F	WATR	CONN			Fire department connections
F	WATR	HYDR			Hydrants
F	WATR	PIPE			Piping
F	WATR	PUMP			Fire pumps

1D.1.5.6 (G) General Layers

			GENERAL INFORMATION		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
G	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
G	ANNO	IDEN			Identification Tags: Floor Id. #s; Room #s; Door #s; hardware group; Window #s; Equipment Id. #s; Furniture #s; Tenant Identification; Area calculations; Occupant or employee names; Elevation Id. #s; Component Id. #s
G	ANNO	KEYN			Reference keynotes with associated leaders
G	ANNO	KEYP	ANNO		Key plan text, scale, north arrow
G	ANNO	KEYP	BKGN		Key plan background pattern
G	ANNO	KEYP	OTLN		Key plan sheet outlines
G	ANNO	KEYP	PATT		Key plan current sheet pattern
G	ANNO	KEYP	TOPO		Key plan topo

G	ANNO	LEGN			Legends
G	ANNO	MATC			Match Lines
G	ANNO	MATC	IDEN		Match Line Identification
G	ANNO	MATC	PATT		Match Line Hatching
G	ANNO	NOTE			Notes
G	ANNO	NPLT			Non-plotting graphic information
G	ANNO	PATT			Miscellaneous patterning and hatching
G	ANNO	REDL			Redline Annotations
G	ANNO	REFR			Reference files (AutoCAD users only, see Chapter 4)
G	ANNO	REVS			Revisions
G	ANNO	SCHD			Schedules
G	ANNO	SYMB			Miscellaneous symbols
G	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
G	ANNO	TITL			Drawing Component Titles, Detail Titles, Section Titles, Elevations
G	ANNO	TTLB			Border and title block linework
G	ANNO	VPRT			Viewport
GRIDS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
G	GRID	EXTR			Column grid outside building
G	GRID	IDEN			Column grid tags
PLAN / OUTLINE					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
G	PLAN	OTLN			Floor outline/perimeter/building footprint
SITE INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
G	SITE	OTLN			Site plan - key map

1D.1.5.7 (H) Hazardous Materials Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	ANNO	DIMS			Hazardous Annotation: Witness/extension lines, dimension terminators, dimension text
H	ANNO	KEYN			Hazardous Annotation: Reference keynotes with associated leaders
H	ANNO	NPLT			Hazardous Annotation: Non-plotting graphic information
H	ANNO	PATT			Hazardous Annotation: Miscellaneous patterning
H	ANNO	SYMB			Hazardous Annotation: Reference bubbles, matchlines and breaklines
H	ANNO	TEXT			Hazardous Annotation: Detail title text, text and associated leaders, notes
BUILDINGS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	BLDG	IDEN			Buildings: Annotation
H	BLDG	OTLN			Buildings: Command posts, information centers
DECONTAMINATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	DECN	EQPM			Decontamination: Equipment
H	DECN	IDEN			Decontamination: Annotation
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	DETL	GRPH			Details: Graphics, gridlines, non-text items

H	DETL	INPD			Details: Inch-pound-specific dimensions and notes
H	DETL	METR			Details: Metric-specific dimensions and notes
			DISPOSAL AREAS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	DISP	HAZW			Disposal Areas: Hazardous waste
H	DISP	IDEN			Disposal Areas: Annotation
H	DISP	MUNT			Disposal Areas: Munitions
H	DISP	TANK			Disposal Areas: Spill containment tanks
			FIXTURES		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	FIXT	EYEW			Fixtures: Emergency eyewashes
H	FIXT	SHOW			Fixtures: Emergency showers
			MONITORING SYSTEMS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	MNST	AIRQ			Monitoring Systems: Air quality
H	MNST	GNDW			Monitoring Systems: Ground water
H	MNST	IDEN			Monitoring Systems: Annotation
H	MNST	LAND			Monitoring Systems: Landfill gas
H	MNST	SOIL			Monitoring Systems: Soil gas
H	MNST	SWTR			Monitoring Systems: Surface water
			POLLUTION AREAS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	POLL	CNCR			Pollution Areas: Polluted area of concern
H	POLL	IDEN			Pollution Areas: Annotation
H	POLL	ORIG			Pollution Areas: Point of pollution origin
H	POLL	POTN			Pollution Areas: Potential spill, emission, or release source
			SAMPLE POINTS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	SAMP	AIRS			Sample Points: Air samples
H	SAMP	BIOL			Sample Points: Biological samples
H	SAMP	GNDW			Sample Points: Ground water samples
H	SAMP	IDEN			Sample Points: Annotation
H	SAMP	MAGN			Sample Points: Magnetometer location points
H	SAMP	SEDI			Sample Points: Sediment samples
H	SAMP	SOIL			Sample Points: Soil samples
H	SAMP	SOLI			Sample Points: Solid material samples
H	SAMP	SWTR			Sample Points: Surface water samples
H	SAMP	WAST			Sample Points: Waste samples
			SECTIONS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	SECT	IDEN			Sections: Component identification numbers
H	SECT	MBND			Sections: Material beyond section cut
H	SECT	MCUT			Sections: Material cut by section
H	SECT	PATT			Sections: Textures and hatch patterns
			STORAGE FACILITIES		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Layer Description**
H	STOR	HAZM			Storage Facilities: Hazardous materials
H	STOR	HAZW			Storage Facilities: Hazardous waste
H	STOR	IDEN			Storage Facilities: Annotation

1D.1.5.8 (I) Interiors Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
I	ANNO	KEYN			Reference keynotes with associated leaders
I	ANNO	NOTE			General notes and general remarks
I	ANNO	NPLT			Non-plotting graphic information
I	ANNO	PATT			Miscellaneous patterning
I	ANNO	SYMB			Reference bubbles, matchlines and breaklines
I	ANNO	TEXT			Detail title text, text and associated leaders, notes
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	DETL	GRPH			Graphics, gridlines, non-text items
I	DETL	INPD			Inch-pound-specific dimensions and notes
I	DETL	METR			Metric-specific dimensions and notes
ELEVATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	ELEV	CASE			Wall mounted casework
I	ELEV	FIXT			Miscellaneous fixtures
I	ELEV	FNSH			Finishes, woodwork and trim
I	ELEV	IDEN			Component identification numbers
I	ELEV	PATT			Textures and hatch patterns
I	ELEV	PFIX			Plumbing fixtures in elevation
I	ELEV	SIGN			Signage
EQUIPMENT					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	EQPM	ACCS			Equipment access
I	EQPM	CHLD			Child development (play toys, teaching rugs, play forms)
I	EQPM	COPY			Copiers, fax machines, office equipment
I	EQPM	FIXD			Fixed equipment
I	EQPM	IDEN			Equipment identification numbers
I	EQPM	MEDI			Medical (exam beds, dental chairs, etc.)
I	EQPM	MOVE			Moveable equipment
I	EQPM	NICN			Not in contract equipment
I	EQPM	OVHD			Overhead, ceiling mounted, and suspended equipment
I	EQPM	STOR			Storage equipment
FLOORING ITEMS AND MATERIALS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	FLOR	SIGN			Signage
FURNISHINGS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	FURN	ACCS			Accessories (vestibule matts, partitions, draperies, clocks, trashcans, lecturns, lamps, etc.)
I	FURN	ADPC			Automated Data Processing Components
I	FURN	ARTW			Artwork
I	FURN	CASE			Case goods (desks, credenzas, beds, dressers, nightstands, wardrobes, etc.)
I	FURN	FLOR			Flooring (carpet, rugs, etc.)

I	FURN	FREE			Free-standing furnishings (desks, beds, tables, dressers, credenzas, case goods)
I	FURN	GRID			Planning grid/modular outline
I	FURN	IDEN			Furniture code identification
I	FURN	MISC			Miscellaneous furniture
I	FURN	PLNT			Plants
I	FURN	SEAT			Chairs, sofas, etc.
I	FURN	STOR			File cabinets, high density storage, shelving, storage cabinets
SECURITY					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	SECT	CMRA			Security camera locations Inside of buildings
SYSTEM FURNITURE					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
I	SYST	BIDS			Baggage information display system equipment used in an airport terminal
I	SYST	CUTE			Common use terminal equipment in an airport terminal
I	SYST	FIDS			Flight information display system equipment used in an airport terminal
I	SYST	FURN			Furniture
I	SYST	IDEN			Code identification
I	SYST	LITE			Lighting components
I	SYST	PATT			Patterns
I	SYST	PNLS			Panels
I	SYST	POWR			Power, communication components
I	SYST	STOR			Storage components
I	SYST	WALL			Systems furniture partition walls
I	SYST	WKSF			Work surface components

1D.1.5.9 (L) Landscaping Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
L	ANNO	DIMS			Landscape Annotation: Witness/extension lines, dimension terminators, dimension text
L	ANNO	KEYN			Landscape Annotation: Reference keynotes with associated leaders
L	ANNO	NOTE			Landscape Annotation: General notes and general remarks
L	ANNO	NPLT			Landscape Annotation: Non-plotting graphic information
L	ANNO	PATT			Landscape Annotation: Miscellaneous patterning
L	ANNO	SYMB			Landscape Annotation: Reference bubbles, matchlines and breaklines
L	ANNO	TEXT			Landscape Annotation: Detail title text, text and associated leaders, notes
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
L	DETL	CABS			Details: Cabinets, enclosures
L	DETL	CONC			Details: Concrete
L	DETL	ERTH			Details: Earth
L	DETL	FENC			Details: Fencing
L	DETL	FILL			Details: Fill/cover material
L	DETL	FURN			Details: Furniture, furnishings
L	DETL	GATE			Details: Gate
L	DETL	GENF			Details: General features (miscellaneous items)
L	DETL	GRAS			Details: Grass, sod
L	DETL	GRPH			Details: Graphics, gridlines, non-text items

L	DETL	INPD			Details: Inch-pound-specific dimensions and notes
L	DETL	METR			Details: Metric-specific dimensions and notes
L	DETL	STRC			Details: Structural metal, supports
L	DETL	TANK			Details: Tank Site
L	DETL	VALV			Details: Valves, fittings
L	DETL	VEGE			Details: Planting details
L	DETL	WIRE			Details: Wiring
IRRIGATION SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
L	IRRG	COVR			Irrigation: Irrigation coverage, spray distribution patterns
L	IRRG	EQPM			Irrigation: Equipment (e.g., controllers, valves, RPBPs, etc.)
L	IRRG	HEAD			Irrigation: Irrigation heads, bubblers, and drip irrigation emitters
L	IRRG	IDEN			Irrigation: Annotation
L	IRRG	PIPE			Irrigation: Piping
L	IRRG	SPKL			Irrigation: Sprinklers
PLANT AND LANDSCAPING MATERIAL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
L	PLNT	BEDS			Planting: Planting beds
L	PLNT	BUSH			Planting: Bushes and shrubs (e.g., evergreen, deciduous)
L	PLNT	BUSH	LINE		Planting: Bush and shrub line
L	PLNT	CTNR			Planting: Containers or planters
L	PLNT	GRND			Planting: Groundcover and vines
L	PLNT	IDEN			Planting: Annotation
L	PLNT	MLCH			Planting: Mulches - organic and inorganic
L	PLNT	PLNT			Planting: Planting plants (e.g., ornamental annuals and perennials)
L	PLNT	PLTS			Planting: Planting plants (e.g., ornamental annuals and perennials)
L	PLNT	SHAD			Planting: Shadow areas
L	PLNT	SPRG			Planting: Sprigs
L	PLNT	TREE			Planting: Trees (e.g., evergreen, deciduous, etc.)
L	PLNT	TREE	LINE		Planting: Tree line
L	PLNT	TURF			Planting: Lawn areas (turfing limits)
SITE IMPROVEMENTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
L	SITE	BRDG			Site: Bridges
L	SITE	DECK			Site: Decks
L	SITE	FENC			Site: Fencing
L	SITE	FURN			Site: Furnishings
L	SITE	GATE			Site: Gate
L	SITE	IDEN			Site: Annotation
L	SITE	PLAY			Site: Play structures
L	SITE	POOL			Site: Pools and spas
L	SITE	ROCK			Site: Boulders and cobble
L	SITE	RTWL			Site: Retaining walls
L	SITE	SPRT			Site: Sports fields
L	SITE	SWLK			Site: Walks and steps
L	SITE	TUNL			Site: Tunnels
L	SITE	WALK			Site: Walks and steps

1D.1.5.10 (M) Mechanical Layers

INDUSTRIAL WASTE PIPING					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	ACID	EQPM			Acid, alkaline, and oil waste equipment
M	ACID	PIPE			Acid, alkaline, and oil waste piping
M	ACID	VENT			Acid, alkaline, and oil waste vent piping
ANTI-FREEZE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	AFRZ	PIPE			Anti-freeze piping
M	AFRZ	WAST			Waste anti-freeze piping
ALIGNMENTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	ALGN	DATA			Alignment coordinates and curve data
M	ALGN	LINE			Alignments
M	ALGN	STAT			Alignment stationing and tick marks
GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
M	ANNO	KEYN			Reference keynotes with associated leaders
M	ANNO	NOTE			General notes and general remarks
M	ANNO	NPLT			Non-plotting graphic information
M	ANNO	PATT			Miscellaneous patterning and hatching
M	ANNO	REFR			Reference files
M	ANNO	SYMB			Miscellaneous symbols
M	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
BRINE SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	BRIN	EQPM			Brine system equipment
M	BRIN	PIPE			Brine system piping
CHEMICAL TREATMENT SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	CHEM	EQPM			Equipment
M	CHEM	PIPE			Piping (includes fittings, valves)
COMPRESSED AIR					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	CMPA	EQPM	AIRD		Air drain separator point
M	CMPA	EQPM	VALV		Valve
M	CMPA	EQPM	VLVP		Valve point
M	CMPA	FTTG			Fitting
M	CMPA	TANK			Tank
CONDENSER WATER SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	CNDS	PIPE			Condensate piping (includes fittings, valves)
M	CNDW	EQPM			Condenser water equipment
M	CNDW	PIPE			Condenser water piping
M	CONT	THER			Thermostats, controls, instrumentation, and sensors
M	CONT	WIRE			Low voltage wiring
CHILLED WATER SYSTEM					

Discipline	Major	Minor1	Minor2	Minor3	Layer Description
M	CWTR	EQPM			Equipment
M	CWTR	PIPE			Piping (includes fittings, valves)
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	DETL	ACCS			Accessories
M	DETL	BOIL			Boilers
M	DETL	CABS			Cabinets
M	DETL	COIL			Coils and fin tubes
M	DETL	DUCT			Ducts
M	DETL	EQPM			Equipment and fixtures
M	DETL	FANS			Fans
M	DETL	GENF			General features (miscellaneous items)
M	DETL	GRIL			Grilles and louvers
M	DETL	GRPH			Graphics, gridlines, non-text items
M	DETL	INPD			Inch-pound-specific dimensions and notes
M	DETL	INSL			Insulation and coverings
M	DETL	METR			Metric-specific dimensions and notes
M	DETL	MOTR			Motors
M	DETL	PIPE			Piping
M	DETL	PUMP			Pumps and compressors
M	DETL	STRC			Structural support features
M	DETL	TANK			Tanks
M	DETL	TRAP			Traps and drains
M	DETL	VALV			Valves and fittings
M	DETL	VENT			Vents
M	DETL	WIRE			Electrical wiring
DIAGRAM INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	DIAG	GRPH			Graphics, gridlines, non-text items
M	DIAG	INPD			Inch-pound-specific dimensions and notes
M	DIAG	METR			Metric-specific dimensions and notes
OTHER DISCIPLINE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	DISC	INFO			Clearances and working space information
DUAL TEMPERATURE SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	DUAL	EQPM			Equipment
M	DUAL	PIPE			Piping (includes fittings, valves)
DUST AND FUME COLLECTION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	DUST	DUCT			Dust and fume ductwork
M	DUST	EQPM			Dust and fume collection equipment
ELEVATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	ELEV	FIXT			Miscellaneous fixtures
M	ELEV	IDEN			Component identification numbers
M	ELEV	OTLN			Building outlines
M	ELEV	PATT			Textures and hatch patterns

M	ELEV	PFIX			Plumbing fixtures
					EXHAUST AIR SYSTEM
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	EXHS	CDFF			Exhaust air ceiling registers and grilles
M	EXHS	DUCT			Exhaust ductwork
M	EXHS	EQPM			Equipment
					FLOOR INFORMATION
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	FLOR	IDEN			Room name, space identification text (copied from Architectural - Floor Plan model file)
M	FLOR	NUMB			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)
					GLYCOL SYSTEM
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	GLYC	CULV	LINE		Culvert line
M	GLYC	CULV	SITE		Culvert site
M	GLYC	DRAN	BASN		Deicing drainage basin
M	GLYC	DRAN	DDIV		Deicing drainage divide
M	GLYC	EQPM	COUT		Clean out
M	GLYC	EQPM	DISC		Discharge point
M	GLYC	EQPM	FLOW		Flow control point
M	GLYC	EQPM	INLT		inlet
M	GLYC	EQPM	LIFT		Lift station
M	GLYC	EQPM	PUMP		pump
M	GLYC	EQPM	VALV		Valve
M	GLYC	FTTG			Fitting
M	GLYC	JBOX			Junction
M	GLYC	RCOV			Recovery point
M	GLYC	RESV			Reservoir point
M	GLYC	SIGN			Marker
M	GLYC	STAT	PUMP		Pump station
M	GLYC	TANK			Tank
M	GLYC	VALT			Vault
					GEOTHERMAL HEAT PUMP SYSTEM
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	GTHP	EQPM			Equipment
M	GTHP	PIPE			Piping (includes fittings, valves)
					HIGH-TEMPERATURE / CHILLED WATER SYSTEM
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	HTCW	CHLP			Chilled water plant
M	HTCW	CHLS			Chilled water service piping
M	HTCW	DEVC			Rigid anchors, anchor guides, rectifiers, reducers, markers, meters, pumps, regulators, tanks, and valves
M	HTCW	FLOW			Flow direction arrows
M	HTCW	FTTG			Caps and flanges
M	HTCW	HTPL			Main high temperature piping
M	HTCW	HTPP			High temperature water plant
M	HTCW	HTPS			High temperature service piping
M	HTCW	IDEN			Identifier tags, symbol modifier, and text
M	HTCW	JBOX			Junction boxes, manholes, handholes, test boxes
M	HTCW	LTPL			Main low temperature piping
M	HTCW	LTPS			Low temperature service piping

M	HTCW	PIPE			Main chilled water piping
M	HTCW	PIPE			Main steam piping
M	HTCW	PIPE	A		Abandoned piping
M	HTCW	PITS			Valve pits/vaults, steam pits
M	HTCW	PLNT	IDEN		Identifier tags, symbol modifier, and text
M	HTCW	PUMP			Pump stations
M	HTCW	RETN			Return for all HTCW lines
M	HTCW	SERV			Steam service piping
M	HTCW	STNS	IDEN		Identifier tags, symbol modifier, and text
HVAC SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	HVAC	ACCS			Equipment access doors
M	HVAC	CDFF			Ceiling diffusers, registers, and grilles
M	HVAC	DMPR			Fire and smoke dampers
M	HVAC	EQPM			Air system equipment
M	HVAC	EQPM	ANCH		Anchor point
M	HVAC	EQPM	ANOD		Anode
M	HVAC	EQPM	PUMP		Pump
M	HVAC	EQPM	RECT		Rectifier
M	HVAC	EQPM	REGL		Regulator
M	HVAC	EQPM	TEST		Anode test station
M	HVAC	EQPM	VALV		Valve
M	HVAC	FDFF			Floor diffusers, registers, and grilles
M	HVAC	FTTG			Fitting
M	HVAC	IDEN			Duct sizes
M	HVAC	JBOX			Junction
M	HVAC	METR			Meters
M	HVAC	RETN			Return ductwork
M	HVAC	ROOF			Roof mounted HVAC equipment
M	HVAC	SIGN			Marker
M	HVAC	SPLY			Supply ductwork
M	HVAC	TAGS			Diffuser/register/grille tags and air flow arrows
M	HVAC	WDFF			Wall diffusers, registers, and grilles
HOT WATER HEATING SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	HWTR	EQPM			Equipment
M	HWTR	PIPE			Piping (includes fittings, valves)
HYDRAULIC SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	HYDR	EQPM			Hydraulic system equipment
M	HYDR	PIPE			Hydraulic system piping
INSULATING (TRANSFORMER) OIL SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	INSL	EQPM			Insulating oil equipment
M	INSL	PIPE			Insulating oil piping
LUBRICATION OIL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	LO~~	EQPM			Lubrication oil equipment
M	LO~~	PIPE			Lubrication oil piping

MACHINE DESIGN					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	MACH	BASE			Machinery bases
M	MACH	COMP			Miscellaneous machinery parts and components
M	MACH	CRAN			Bridge cranes, jib cranes, and monorails
M	MACH	CRAN			Bridge cranes, jib cranes, and monorails
M	MACH	E			Existing machinery
M	MACH	FSTN			Fasteners, nuts, and bolts
M	MACH	HOIS			Hoists and hooks
M	MACH	LIFT			Miscellaneous lifting equipment
M	MACH	LROT			Large rotating machinery (turbine and pump outlines)
M	MACH	MOTR			Machinery motors
PENETRATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	PENE	FLOR			Floor penetrations
M	PENE	ROOF			Roof penetrations
PROCESS PIPING					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	PROC	EQPM			Equipment
M	PROC	PIPE			Process piping
ENERGY RECOVERY SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	RCOV	EQPM			Equipment
M	RCOV	PIPE			Piping (includes fittings, valves)
REFRIGERATION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	REFG	EQPM			Equipment
M	REFG	PIPE			Piping (includes fittings, valves)
RAW WATER PIPING					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	RWTR	EQPM			Raw water equipment
M	RWTR	PIPE			Raw water piping
SECTIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	SECT	IDEN			Component identification numbers
M	SECT	MBND			Material beyond section cut
M	SECT	MCUT			Material cut by section
M	SECT	PATT			Textures and hatch patterns
STEAM SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
M	STEM	EQPM			Equipment
M	STEM	PIPE			Steam piping

1D.1.5.11 (P) Plumbing Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
P	ANNO	KEYN			Reference keynotes with associated leaders

P	ANNO	NOTE			General notes and general remarks
P	ANNO	NPLT			Non-plotting graphic information
P	ANNO	PATT			Miscellaneous patterning and hatching
P	ANNO	REFR			Reference files
P	ANNO	SYMB			Miscellaneous symbols
P	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
COMPRESSED AIR					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	CMPA	EQPM			Equipment
P	CMPA	PIPE			Piping
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	DETL	GRPH			Graphics, gridlines, non-text items
P	DETL	INPD			Inch-pound-specific dimensions and notes
P	DETL	METR			Metric-specific dimensions and notes
DIAGRAM INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	DIAG	GRPH			Graphics, gridlines, non-text items
P	DIAG	INPD			Inch-pound-specific dimensions and notes
P	DIAG	METR			Metric-specific dimensions and notes
OTHER DISCIPLINE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	DISC	INFO			Information and notes for other disciplines
DOMESTIC WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	DOMW	ACCS			Equipment access doors
P	DOMW	CPIP			Domestic cold water piping
P	DOMW	EQPM			Hot and cold water equipment
P	DOMW	FPIP			Domestic filtered water piping
P	DOMW	HPIP			Domestic hot water piping
P	DOMW	RISR			Domestic hot and cold water risers
P	DOMW	RPIP			Domestic hot water recirculation piping
FLOOR INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	FLOR	IDEN			Room name, space identification text (copied from Architectural - Floor Plan model file)
P	FLOR	NUMB			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)
LIQUID FUEL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	FUEL	EQPM			Equipment
P	FUEL	FGAS			Fuel gas piping
P	FUEL	FOIL			Fuel oil piping
P	FUEL	NGAS			Natural gas piping
LIQUID GAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	LGAS	EQPM			Equipment
P	LGAS	PIPE			Piping
MEDICAL / DENTAL GAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	MDGS	EQPM			Medical/Dental Gas Equipment

P	MDGS	PIPE			Medical/Dental Gas Piping
PENETRATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	PENE	FLOR			Floor penetrations
P	PENE	ROOF			Roof penetrations
SANITARY DRAINAGE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	SSWR	CNDS			Sanitary Condensate piping
P	SSWR	EQPM			Sanitary Equipment (e.g., sand/oil/water separators)
P	SSWR	FIXT			Sanitary Plumbing fixtures
P	SSWR	FLDR			Sanitary Floor drains, sinks, and cleanouts
P	SSWR	PIPE			Sanitary Piping
P	SSWR	RISR			Sanitary risers
P	SSWR	VENT			Sanitary Vent piping
STORM DRAINAGE SYSTEM					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
P	STRM	PIPE			Storm drain piping
P	STRM	RFDR			Roof drains
P	STRM	RISR			Storm drain risers

1D.1.5.12 (S) Structural Layers

GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text, welding symbols
S	ANNO	KEYN			Reference keynotes with associated leaders
S	ANNO	NOTE			General notes and general remarks
S	ANNO	NPLT			Non-plotting graphic information
S	ANNO	PATT			Miscellaneous patterning and hatching
S	ANNO	REFR			Reference files (AutoCAD users only, see Chapter 4)
S	ANNO	SYMB			Reference bubbles, matchlines and breaklines
S	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
BEAMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	BEAM	CNTR			Beam centerlines
S	BEAM	PRIM			Primary beams, girders
S	BEAM	SECD			Secondary beams, girders
BRACING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	BRAC	LATL			Lateral bracing
S	BRAC	SHEA			Shear walls
S	BRAC	VERT			Vertical bracing
COLUMNS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	COLS	CNTR			Column centerlines/working lines
S	COLS	MSC1			Miscellaneous columns (Type 1)
S	COLS	MSC2			Miscellaneous columns (Type 2)
S	COLS	MSC3			Miscellaneous columns (Type 3)

S	COLS	MSC4			Miscellaneous columns (Type 4)
S	COLS	PRIM			Primary columns
S	COLS	SCND			Secondary columns
DECKING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	DECK	FLOR			Floor deck
S	DECK	OPEN			Openings and penetrations
S	DECK	RBAR			Deck/slab reinforcing
S	DECK	ROOF			Roof deck
DETAIL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	DETL	GRPH			Graphics, gridlines, non-text items
S	DETL	INPD			Inch-pound-specific dimensions and notes
S	DETL	METR			Metric-specific dimensions and notes
FEATURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	FEAT	CMUW			CMU outline (no patterning)
S	FEAT	CNTR			Feature centerlines
S	FEAT	CONC			Concrete outline (no patterning)
S	FEAT	GENL			General features (miscellaneous items)
S	FEAT	WOOD			Wood outline (no patterning)
FOUNDATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	FNDN	CNTR			Beam centerlines
S	FNDN	FTNG			Footings
S	FNDN	GRBM			Grade beams
S	FNDN	PEDS			Column pedestals
S	FNDN	PILE			Piles (steel sheet, concrete, wood), piers, caisson piers, drilled piers
S	FNDN	RBAR			Foundation reinforcing
GRATING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	GRAT	ELEV			Elevated grating (catwalks)
S	GRAT	FLOR			Floor grating
S	GRAT	SUBS			Subsurface grating
GRADE LINES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	GRDL	EXGL			Existing ground
S	GRDL	FNGR			Finished grade
S	GRDL	WATR			Water surface
GRIDS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	GRID	HORZ			Primary grid lines (horizontal)
S	GRID	IDEN			Column I.D. tags
S	GRID	MSC_			Miscellaneous grid lines (Type 1)
S	GRID	MSC2			Miscellaneous grid lines (Type 2)
S	GRID	MSC3			Miscellaneous grid lines (Type 3)
S	GRID	MSC4			Miscellaneous grid lines (Type 4)
S	GRID	VERT			Primary grid lines (vertical)

S	GRID	WATR			Water surface
JOINTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	JOIN	CNST			Construction joints
S	JOIN	CTRL			Control/expansion joints
JOISTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	JOIS	BRDG			Bridging
S	JOIS	PRIM			Primary joists
S	JOIS	SECD			Secondary joists
METAL					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	METL	MISC			Miscellaneous metal
OPENINGS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	OPEN	MISC			Openings and penetrations
PADS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	PADS	EQPM			Equipment pads
PIPING					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	PIPE	GATE			Gates (flap gates, sluice gates, other)
S	PIPE	MISC			Miscellaneous piping/culverts
S	PIPE	TRSH			Trash racks
REINFORCEMENT					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	REIN	RBAR			Rebar, welded wire mesh
SAFETY FEATURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	SAFE	FENC			Fencing
S	SAFE	HRAL			Handrails
SECTIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	SECT	CMUW			CMU outline (no patterning)
S	SECT	CNTR			Centerlines
S	SECT	CONC			Concrete outline (no patterning)
S	SECT	FNGR			Finished grade
S	SECT	GENF			General features (miscellaneous items)
S	SECT	JOIN			Joint materials (e.g., felt), vapor barrier, other
S	SECT	MISC			Miscellaneous fasteners, anchor bolts, supports
S	SECT	PRIM			Primary beams/girders outlines
S	SECT	RBAR			Rebar, welded wire mesh
S	SECT	SHPS			Miscellaneous shapes, plates
S	SECT	STLS			Wide flange shapes, plates, open web joists, decking
S	SECT	WOOD			Wood outline (no patterning)
SLABS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	SLAB	EDGE			Edge of slab

S	SLAB	OPEN			Openings and penetrations
S	SLAB	RBAR			Slab reinforcing
			SUPPORTS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	SPPT	MISC			Miscellaneous fasteners, anchor bolts, supports
S	SPPT	SHPS			Miscellaneous shapes, plates
			STAIRWAYS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	STRS	FRAM			Stair/elevator framing
S	STRS	LADD			Ladders, ladder handrails, safety guard, grab bars
S	STRS	RBAR			Stair reinforcing
			TRUSSES		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	TRUS	PRIM			Primary trusses
S	TRUS	SECD			Secondary trusses
			WALLS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
S	WALL	CONC			Concrete walls
S	WALL	HBAR			Horizontal/secondary reinforcement
S	WALL	LOAD			Load bearing CMU walls
S	WALL	NONL			Non-load bearing CMU walls
S	WALL	OPEN			Openings and penetrations
S	WALL	OTLN			Wall outline
S	WALL	PCST			Precast walls
S	WALL	RBAR			Wall reinforcing
S	WALL	STUD			Stud walls
S	WALL	VBAR			Vertical/primary reinforcement

1D.1.5.13 (T) Telecommunications Layers

			ALARM SYSTEMS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	ALRM	EQPM	SERT		Security Alarm Equipment
T	ALRM	IDEN			Identifier tags, symbol modifier, and text
T	ALRM	SYST			Miscellaneous alarm system symbols
			GENERAL INFORMATION		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	ANNO	DIMS			Witness/extension lines, dimension terminators, dimension text
T	ANNO	KEYN			Reference keynotes with associated leaders
T	ANNO	NOTE			General notes and general remarks
T	ANNO	NPLT			Non-plotting graphic information
T	ANNO	PATT			Miscellaneous patterning and hatching
T	ANNO	REFR			Reference files (AutoCAD users only, see Chapter 4)
T	ANNO	SYMB			Miscellaneous symbols
T	ANNO	TEXT			Miscellaneous text and callouts with associated leaders
			CABLE SYSTEMS		
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	CABL	ANTN		`	Comm Antenna

T	CABL	COAX			Coax cable
T	CABL	FIBR			Fiber optics cable
T	CABL	IDEN			Cable identifiers
T	CABL	MULT			Multi-conductor cable
T	CABL	TRAY			Cable trays and wireways
CLOCK SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	CLOK	IDEN			Identifier tags, symbol modifier, and text
T	CLOK	SYST			Clock system symbols
COMMUNICATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	COMM	ANTN			Telecommunications antennae
T	COMM	APSY			Audio paging system
T	COMM	ATMS			Advanced traffic management system
T	COMM	AVID			Automatic vehicle identification system
T	COMM	BIDS			Baggage information display system
T	COMM	FIDS			Flight information display system
T	COMM	GIDS			Gate information display system
T	COMM	JBOX			Junction boxes
T	COMM	PMRC			Parking management and revenue control
T	COMM	VPSY			Visual paging system
DIAGRAM INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	DIAG	GRPH			Graphics, gridlines, non-text items
T	DIAG	IDEN			Identifier tags, symbol modifier and text
T	DIAG	INPD			Inch-pound-specific dimensions and notes
T	DIAG	METR			Metric-specific dimensions and notes
OTHER DISCIPLINE INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	DISC	INFO			Information and notes for other disciplines
EQUIPMENT					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	EQPM	COMB			Distribution equipment for both copper and fiber optics
T	EQPM	COPP			Distribution equipment for copper
T	EQPM	FIBR			Distribution equipment for fiber optic
T	EQPM	OTHR			Other telecommunications equipment
T	EQPM	RELA			Relays, resistors, capacitors, and inducers
FLOOR INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	FLOR	IDEN			Room name, space identification text (copied from Architectural - Floor Plan model file)
T	FLOR	NUMB			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)
JACKS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	JACK	COMB			Combination telephone and data/LAN jacks
T	JACK	DATA			Data/LAN jacks
T	JACK	IDEN			Identifier tags, symbol modifier, and text
T	JACK	PHON			Telephone jacks
NURSE CALL SYSTEMS					

Discipline	Major	Minor1	Minor2	Status	Description
T	NURS	IDEN			Identifier tags, symbol modifier, and text
T	NURS	SYST			Nurse call system symbols
SOUND SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Status**	**Description**
T	SOUN	IDEN			Identifier tags, symbol modifier, and text
T	SOUN	SYST			Sound system symbols

1D.1.5.14 (V) Survey Layers

AERIAL SURVEY					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	AERI	BNDY			Aerial Survey: Aerial photography boundaries
V	AERI	INDX			Aerial Survey: Aerial photo index
V	AERI	PATH			Aerial Survey: Aerial flight lines/paths
AIRFIELDS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	AFLD	BCNS	IDEN		Airfield: Identifier tags, symbol modifiers, and text
V	AFLD	BCNS	MISC		Airfield: Miscellaneous navaids-windcones and beacons
V	AFLD	BCNS	STRB		Airfield: Strobe beacons
V	AFLD	CIRC	CTRL		Airfield: Control and monitoring circuits
V	AFLD	CIRC	IDEN		Airfield: Circuit identifier tags, symbol modifier, and text
V	AFLD	CIRC	MULT		Airfield: Multiple circuits
V	AFLD	CIRC	SERS		Airfield: Series circuits
V	AFLD	DEVC			Airfield: Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and markers
V	AFLD	DUCT			Airfield: Ductbanks
V	AFLD	IDEN			Airfield: Airfield annotation
V	AFLD	JBOX			Airfield: Junction boxes, pull boxes, manholes, handholes, pedestals, splices
V	AFLD	LITE	APPR		Airfield: Approach lights
V	AFLD	LITE	DIST		Airfield: Distance and arresting gear markers
V	AFLD	LITE	LANE		Airfield: Hoverlane, taxilane and helipad lights
V	AFLD	LITE	OBST		Airfield: Obstruction lights
V	AFLD	LITE	RUNW		Airfield: Runway lights
V	AFLD	LITE	SIGN		Airfield: Taxiway guidance signs
V	AFLD	LITE	TAXI		Airfield: Taxiway lights
V	AFLD	LITE	THRS		Airfield: Threshold lights
V	AFLD	VALT			Airfield: Airfield lighting vaults
ALIGNMENTS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	ALGN	DATA			Alignments: Alignment coordinates and curve data
V	ALGN	LINE			Alignments: Alignments
V	ALGN	MRKG			Alignments: Markings
V	ALGN	PROF			Profiles: Existing Grade
V	ALGN	STAT			Alignments: Stationing and tick marks
GENERAL INFORMATION					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	ANNO	ANOD			Survey Annotation: Survey Annotation: Anode
V	ANNO	ANOD	TEXT		Survey Annotation: Anode Text

V	ANNO	DIMS			Survey Annotation: Witness/extension lines, dimension terminators, dimension text
V	ANNO	KEYN			Survey Annotation: Reference keynotes with associated leaders
V	ANNO	NOTE			Survey Annotation: General notes and general remarks
V	ANNO	NPLT			Survey Annotation: Non-plotting graphic information
V	ANNO	PATT			Survey Annotation: Miscellaneous patterning and hatching
V	ANNO	REFR			Survey Annotation: Reference files (AutoCAD users only, see Chapter 4)
V	ANNO	SYMB			Survey Annotation: Miscellaneous symbols
V	ANNO	TEXT			Survey Annotation: Miscellaneous text and callouts with associated leaders
BUILDINGS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	BLDG	IDEN			Buildings: Identification Annotation
V	BLDG	OTLN			Buildings: Buildings and other structures outline
V	BLDG	OVHD			Buildings: Overhangs
CATHODIC PROTECTION SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	CATH	ANOD			Cathodic Protection System: Sacrificial anode system
V	CATH	CURR			Cathodic Protection System: Impress current system
V	CATH	IDEN			Cathodic Protection System: Identifier tags, symbol modifier, and text
V	CATH	TEST			Cathodic Protection System: Test stations
CHANNELS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	CHAN	CNTR			Channels: Centerlines and survey report lines
V	CHAN	CNTR	IDEN		Channels: Centerline Annotation
V	CHAN	DACL			Channels: De-authorized channel limits, anchorages, etc.
V	CHAN	DACL	IDEN		Channels: De-authorized channel limit annotation
V	CHAN	IDEN			Channels: Identification Annotation
V	CHAN	LIMT			Channels: Channel limits, anchorages, turning basins, disposal areas, etc.
V	CHAN	NAID			Channels: Navigation aids and text
CIRCUITS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	CIRC	CTRL			Circuits: Control and monitoring circuits
V	CIRC	IDEN			Circuits: Identifier tags, symbol modifier, and text
V	CIRC	MULT			Circuits: Multiple circuits
V	CIRC	SERS			Circuits: Series circuits
COMMUNICATIONS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	COMM	EQPM			Communications: Other communications distribution equipment
V	COMM	JBOX			Communications: Junction boxes, pull boxes, manholes, handholes, pedestals, splices
V	COMM	OVHD			Communications: Overhead communications/telephone lines
V	COMM	OVHD	IDEN		Communications: Identifier tags, symbol modifier and text
V	COMM	UGND			Communications: Underground communications/telephone lines
V	COMM	UGND	IDEN		Communications: Identifier tags, symbol modifier and text
V	COMM	VALT			Communications: Vault
CONTROL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	CTRL	ANOD			Control: Anode
V	CTRL	ANOD	KNOW		Control: Known Anode
V	CTRL	ANOD	UNKN		Control: Unknown Anode
V	CTRL	BMRK			Control: Benchmarks

V	CTRL	GRID			Control: Grid
V	CTRL	HORZ			Control: Horizontal control points
V	CTRL	IDEN			Control: Control point annotation
V	CTRL	LINE	DIRC		Control: Traverse Lines
V	CTRL	LINE	NETW		Control: Traverse Network
V	CTRL	LINE	SHOT		Control: Traverse Sideshot
V	CTRL	TEXT			Control: Annotation
V	CTRL	TRAV			Control: Traverse points
V	CTRL	TRAV	ERRO		Control: Error Ellipses
V	CTRL	VERT			Control: Vertical control points
DOMESTIC WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	DOMW	ANOD			Domestic Water: Anode
V	DOMW	DEVC			Domestic Water: Connectors, faucets, reducers, regulators, vents, intake points, tanks, taps, backflow preventers, and valves
V	DOMW	FIRE			Domestic Water: Fire lines
V	DOMW	FTTG			Domestic Water: Caps, cleanouts, crosses, and tees
V	DOMW	HYDR			Domestic Water: Hydrants
V	DOMW	IDEN			Domestic Water: Identifier tags, symbol modifier, and text
V	DOMW	METR			Domestic Water: Meters
V	DOMW	NHYD			Domestic Water: Non-potable hydrants/flushing hydrants
V	DOMW	NPW~			Domestic Water: Non-potable water piping
V	DOMW	PIPE			Domestic Water: Main domestic water piping
V	DOMW	PIPE	A		Domestic Water: Abandoned piping
V	DOMW	PITS	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
V	DOMW	PUMP			Domestic Water: Booster pump stations
V	DOMW	REDC			Domestic Water: Pressure reducing stations
V	DOMW	RSVR			Domestic Water: Reservoirs
V	DOMW	RSVR	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
V	DOMW	SERV			Domestic Water: Service piping
V	DOMW	SIGN			Domestic Water: Surface markers/signs
V	DOMW	STNS	IDEN		Domestic Water: Identifier tags, symbol modifier, and text
V	DOMW	TANK			Domestic Water: Water storage tanks
V	DOMW	VALV			Domestic Water: Valve pits/vaults
V	DOMW	VENT			Domestic Water: Vent pits
V	DOMW	WELL			Domestic Water: Water well houses
DITCHES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	DTCH	BOTM			Ditches: Bottom of ditch
V	DTCH	CNTR			Ditches: Centerline of ditch
V	DTCH	EWAT			Ditches: Edge of water
V	DTCH	IDEN			Ditches: Ditch annotation
V	DTCH	TOP~			Ditches: Top of ditch
DUCTBANKS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	DUCT	MULT			Ductbanks: Ductbank
V	DUCT	MULT	IDEN		Ductbanks: Identifier tags, symbol modifier and text
ELECTRICAL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	ELEC				Utilities: Power lines, lights, telephone poles, communication lines

V	ELEC	DEVC			Electrical: Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and markers
V	ELEC	IDEN			Utilities: Power/communication annotation
V	ELEC	JBOX			Electrical: Junction boxes, pull boxes, manholes, handholes, pedestals, splices
V	ELEC	SUBS			Electrical: Other substation equipment
V	ELEC	SWCH			Electrical: Fuse cutouts, pole mounted switches, circuit breakers, gang operated disconnects, reclosers, cubicle switches
V	ELEC	VALT			Electrical: Vaults
LIQUID FUEL					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	FUEL	DEFL			Liquid Fuel: Defueling piping
V	FUEL	DEVC			Liquid Fuel: Air eliminators, filter strainers, hydrant fill points, line vents, markers, oil/water separators, reducers, regulators, and valves
V	FUEL	FLOW			Liquid Fuel: Flow direction arrows
V	FUEL	FTTG			Liquid Fuel: Caps, crosses, and tees
V	FUEL	HYDR			Liquid Fuel: Hydrant control pits
V	FUEL	IDEN			Liquid Fuel: Identifier tags, symbol modifier, and text
V	FUEL	JBOX			Liquid Fuel: Junction boxes, manholes, handholes, test boxes
V	FUEL	METR			Liquid Fuel: Meters
V	FUEL	PIPE			Liquid Fuel: Main fuel piping
V	FUEL	PIPE	A		Liquid Fuel: Abandoned piping
V	FUEL	PITS	IDEN		Liquid Fuel: Identifier tags, symbol modifier, and text
V	FUEL	PUMP			Liquid Fuel: Booster pump stations
V	FUEL	SERV			Liquid Fuel: Service piping
V	FUEL	STNS	IDEN		Liquid Fuel: Identifier tags, symbol modifier, and text
V	FUEL	TANK			Liquid Fuel: Fuel tanks
V	FUEL	TRCH			Liquid Fuel: Fuel line trench
V	FUEL	VALV			Liquid Fuel: Valve pits
V	FUEL	VENT			Liquid Fuel: Vent pits
GRADE LINEWORK					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	GRAD	E			Grade Linework: Existing grade, ground line
V	GRAD	FNSH			Grade Linework: Finished grade
V	GRAD	FRAM			Grade Linework: Frame
V	GRAD	GRID	MAJR		Grade Linework: Major grid lines
V	GRAD	GRID	MINR		Grade Linework: Minor grid lines
V	GRAD	TEXT			Grade Linework: Border text, annotation
GRID LINEWORK					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	GRID	FRAM			Grade Linework: Frame
V	GRID	MAJR			Grade Linework: Major grid lines
V	GRID	MINR			Grade Linework: Minor grid lines
V	GTHP	EQPM			Geothermal: Equipment
V	GTHP	PIPE			Geothermal: Piping (includes fittings, valves)
HIGH-TEMPERATURE / CHILLED WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	HTCW	CHLP			HTCW: Chilled water plant
V	HTCW	DEVC			HTCW: Rigid anchors, anchor guides, rectifiers, reducers, markers, meters, pumps, regulators, tanks, and valves
V	HTCW	FLOW			HTCW: Flow direction arrows
V	HTCW	FTTG			HTCW: Caps and flanges
V	HTCW	HTPL			HTCW: Main high temperature piping
V	HTCW	HTPP			HTCW: High temperature water plant

V	HTCW	HTPS			HTCW: High temperature service piping
V	HTCW	IDEN			HTCW: Identifier tags, symbol modifier, and text
V	HTCW	JBOX			HTCW: Junction boxes, manholes, handholes, test boxes
V	HTCW	LTPL			HTCW: Main low temperature piping
V	HTCW	LTPS			HTCW: Low temperature service piping
V	HTCW	PIPE			HTCW: Main chilled water piping
V	HTCW	PIPE	A		HTCW: Abandoned piping
V	HTCW	PITS			HTCW: Valve pits/vaults, steam pits
V	HTCW	PLNT	IDEN		HTCW: Identifier tags, symbol modifier, and text
V	HTCW	PUMP			HTCW: Pump stations
V	HTCW	RETN			HTCW: Return for all HTCW lines
V	HTCW	SERV			HTCW: Chilled water service piping
V	HTCW	STEM	PIPE		HTCW: Main steam piping
V	HTCW	STEM	SERV		HTCW: Steam service piping
V	HTCW	STNS	IDEN		HTCW: Identifier tags, symbol modifier, and text
INDUSTRIAL WASTE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	IW~~	DEVC			Industrial Waste: Grit chambers, meters, flumes, neutralizers, oil/water separators, ejectors, tanks, and valves
V	IW~~	FLOW			Industrial Waste: Flow direction arrows
V	IW~~	FTTG			Industrial Waste: Caps and cleanouts
V	IW~~	IDEN			Industrial Waste: Identifier tags, symbol modifier, and text
V	IW~~	JBOX			Industrial Waste: Junction boxes and manholes
V	IW~~	LAGN			Industrial Waste: Lagoons
V	IW~~	LIFT			Industrial Waste: Lift stations
V	IW~~	PIPE			Industrial Waste: Main industrial waste water piping
V	IW~~	PIPE	A		Industrial Waste: Abandoned piping
V	IW~~	PLNT			Industrial Waste: Treatment plants
V	IW~~	RSVR	IDEN		Industrial Waste: Identifier tags, symbol modifier, and text
V	IW~~	SERV			Industrial Waste: Industrial waste water service piping
V	IW~~	SIGN			Industrial Waste: Surface markers/signs
V	IW~~	STNS	IDEN		Industrial Waste: Identifier tags, symbol modifier, and text
LIGHTING					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	LITE	APPR			Lights: Approach lights
V	LITE	DIST			Lights: Distance and arresting gear markers
V	LITE	FIXT			Lights: Exterior Lights
V	LITE	FIXT	IDEN		Lights: Identifier tags, symbol modifier, and text
V	LITE	LANE			Lights: Hoverlane, taxilane, and helipad lights
V	LITE	OBST			Lights: Obstruction lights
V	LITE	RUNW			Lights: Runway lights
V	LITE	RUNW	CNTR		Lights: Runway Centerline lights
V	LITE	RUNW	TDZN		Lights: Runway Touchdown Zone lights
V	LITE	SIGN			Lights: Taxiway guidance signs
V	LITE	TAXI			Lights: Taxiway lights
V	LITE	THRS			Lights: Threshold lights
NATURAL GAS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	NGAS				Utilities: Gas lines, features, and valves
V	NGAS	ANOD			Natural Gas: Anode

V	NGAS	DEVC			Natural Gas: Hydrant fill points, lights, vents, markers, rectifiers, reducers, regulators, sources, tanks, drip pots, taps, and valves
V	NGAS	DEVC	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
V	NGAS	FLOW			Natural Gas: Flow direction arrows
V	NGAS	FTTG			Natural Gas: Caps, crosses, and tees
V	NGAS	IDEN			Natural Gas: Identifier tags, symbol modifier, and text
V	NGAS	METR			Natural Gas: Meters
V	NGAS	PIPE			Natural Gas: Main natural gas piping
V	NGAS	PIPE	A		Natural Gas: Abandoned piping
V	NGAS	PITS	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
V	NGAS	PUMP			Natural Gas: Compressor stations
V	NGAS	REDC			Natural Gas: Reducing stations
V	NGAS	SERV			Natural Gas: Service piping
V	NGAS	SIGN			Natural Gas: Surface markers/signs
V	NGAS	STNS	IDEN		Natural Gas: Identifier tags, symbol modifier, and text
V	NGAS	VALV			Natural Gas: Valve pits/boxes
V	NGAS	VENT			Natural Gas: Vent pits
POLES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	POLE	ANOD			Poles: Anode
V	POLE	GUYP			Poles: Guying equipment
V	POLE	GUYP	IDEN		Poles: Guying equipment identifier tags, symbol modifiers, and text
V	POLE	IDEN			Poles: Utility pole identifier tags, symbol modifier, and text
V	POLE	UTIL			Poles: Utility poles
POWER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	POWR	XFMR	PADM		Power: Pad mounted transformers
V	POWR	XFMR	POLM		Power: Pole mounted transformers
PRIMARY ELECTRICAL CABLES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	PRIM	OVHD			Primary Electrical Cables: Overhead electrical utility lines
V	PRIM	OVHD	IDEN		Primary Electrical Cables: Identifier tags, symbol modifier, and text
V	PRIM	UGND			Primary Electrical Cables: Underground electrical utility lines
V	PRIM	UGND	IDEN		Primary Electrical Cables: Identifier tags, symbol modifier, and text
PROFILES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	PROF	CUTS	IDEN		Profiles: Existing grade and grading cuts - annotation
V	PROF	FILL			Profiles: New work, grading fills
V	PROF	INLT			Profiles: Curb and surface inlets, catch basins
V	PROF	MHOL			Profiles: Manholes
V	PROF	PIPE			Profiles: Piping
V	PROF	ROAD			Profiles: Roads
PROPERTY					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	PROP	AFLD	LINE		Cadastral: Airport Parcel
V	PROP	ANOD			Property: Anode
V	PROP	BRNG			Property: Bearings and distance labels
V	PROP	CNTY			Property: County Boundary
V	PROP	ESMT			Property: Government easements/property lines
V	PROP	IDEN			Property: Identification Annotation

V	PROP	LEAS			Property: Lease line (surveyed)
V	PROP	LINE			Property: Property lines (Existing recorded plats)
V	PROP	LUSE			Property: Land Use Area
V	PROP	MUNI			Property: Municipal Boundary
V	PROP	QTRS			Property: Quarter lines
V	PROP	RWAY			Property: Right of ways
V	PROP	SECT			Property: Section lines
V	PROP	STAT			Property: State Boundary
V	PROP	SXTS			Property: Sixteenth lines (40 lines)
V	PROP	TEXT			Property: Annotation
V	PROP	ZONE			Property: Zoning Areas
PAVEMENT					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	PVMT	IDEN			Pavement: Road, parking lot, railroad, airfield pavement annotation
V	PVMT	MRKG			Pavement: Pavement markings
V	PVMT	PATT			Pavement: Joint patterns, text and dimensions
V	PVMT	ROAD			Pavement: Roads, parking lots, railroads, airfield pavements
ROADS, STREETS, HIGHWAYS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	ROAD	ASPH			Roadways: Road outlines-asphalt surface
V	ROAD	CNTR			Roadways: Road centerlines
V	ROAD	CONC			Roadways: Road outlines-concrete surface
V	ROAD	CURB			Roadways: Curbs and gutters
V	ROAD	GRAL			Roadways: Guard rails
V	ROAD	GRVL			Roadways: Road outlines-gravel surface
V	ROAD	IDEN			Roadways: Road, street, highway annotation
V	ROAD	MRKG			Roadways: Pavement markings
V	ROAD	OTLN			Roadways: Road outlines
V	ROAD	PATT			Roadways: Joint patterns, text and dimensions
V	ROAD	SHLD			Roadways: Roadway shoulders
V	ROAD	SIGN			Roadways: Signs
V	ROAD	UPVD			Roadways: Road outlines-unpaved surface
RUNWAYS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	RUNW	BLST	MRKG		Runways: Blast pad markings
V	RUNW	CNTR			Runways: Centerlines
V	RUNW	CNTR	MRKG		Runways: Centerline markings
V	RUNW	DIST	MRKG		Runways: Fixed distance markings
V	RUNW	DSPL	MRKG		Runways: Displaced threshold markings
V	RUNW	EDGE	MRKG		Runways: Edge markings
V	RUNW	IDEN	MRKG		Runways: Runway identifier markings
V	RUNW	SHLD	MRKG		Runways: Shoulder markings
V	RUNW	TDZM	MRKG		Runways: Touchdown zone markers
V	RUNW	THRS	MRKG		Runways: Threshold markers
SECONDARY ELECTRICAL CABLE					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SECD	OVHD			Secondary Electrical Cables: Overhead electrical utility lines
V	SECD	OVHD	IDEN		Secondary Electrical Cables: Identifier tags, symbol modifier, and text
V	SECD	UGND			Secondary Electrical Cables: Underground electrical utility lines

V	SECD	UGND	IDEN		Secondary Electrical Cables: Identifier tags, symbol modifier, and text
					SECTIONS
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SECT	IDEN			Sections: Component identification numbers
V	SECT	MBND			Sections: Material beyond section cut
V	SECT	MCUT			Sections: Material cut by section
V	SECT	PATT			Sections: Textures and hatch patterns
					SITE FEATURES
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SITE	EROS			Site: Riprap, revetments/stone protection, breakwaters, dikes, jetties, and drains
V	SITE	EWAT			Site: Water features
V	SITE	FENC			Site: Fences and handrails
V	SITE	FENC	IDEN		Site: Fence, handrail, ramp, and trail annotation
V	SITE	IDEN			Site: Existing site feature/structure annotation
V	SITE	OTLN			Site: Existing site features (play structures, bike racks, benches, recreational equipment)
V	SITE	SIGN			Site: Signage
V	SITE	STRC			Site: Structures (bridges, sheds, foundation pads, footings, etc.)
V	SITE	STRS			Site: Stairs and ramps
V	SITE	VEGE			Site: Existing treelines and vegetation
V	SITE	VEGE	ANOD		Site: Treelines and Vegetation Anode
V	SITE	WALK			Site: Walks, trails, and bicycle paths
V	SITE	WATR			Site: Water features
					SPECIAL SYSTEMS
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SPCL	IDEN			Special Systems: (UMCS, EMCS, CATV, etc.) identifier tags, symbol modifier, and text
V	SPCL	SYST			Special Systems: (UMCS, EMCS, CATV, etc.)
V	SPCL	TRAF			Special Systems: Traffic signal system
V	SPCL	TRAF	IDEN		Special Systems: Traffic signal identifier tags, symbol modifier, and text
					SANITARY SEWER
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SSWR				Utilities: Sanitary lines and manholes
V	SSWR	ANOD			Sanitary Sewer: Anode
V	SSWR	DEVC			Sanitary Sewer: Grease traps, grit chambers, flumes, neutralizers, oil/water separators, ejectors, and valves
V	SSWR	DEVC	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	FILT			Sanitary Sewer: Filtration beds
V	SSWR	FILT	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	FLOW			Sanitary Sewer: Flow direction arrows
V	SSWR	FTTG			Sanitary Sewer: Caps and cleanouts
V	SSWR	IDEN			Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	JBOX			Sanitary Sewer: Junction boxes
V	SSWR	JBOX	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	LAGN			Sanitary Sewer: Lagoons
V	SSWR	LEAC			Sanitary Sewer: Leach field
V	SSWR	MHOL			Sanitary Sewer: Manholes
V	SSWR	MHOL	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	NITF			Sanitary Sewer: Nitrification drain fields
V	SSWR	PIPE			Sanitary Sewer: Main Piping
V	SSWR	PIPE	A		Sanitary Sewer: Abandoned piping
V	SSWR	PLNT			Sanitary Sewer: Treatment plants

V	SSWR	PUMP			Sanitary Sewer: Booster pump stations
V	SSWR	RSVR	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	SERV			Sanitary Sewer: Service piping
V	SSWR	SIGN			Sanitary Sewer: Surface markers/signs
V	SSWR	STNS	IDEN		Sanitary Sewer: Identifier tags, symbol modifier, and text
V	SSWR	TANK			Sanitary Sewer: Septic tanks
STEAM SYSTEMS					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	STEM				Utilities: Steam lines
STRUCTURES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	STRC	IDEN			Structures: Bridges, piers, breakwaters, docks, floats, etc. - annotation
V	STRC	OTLN			Structures: Bridges, piers, breakwaters, docks, floats, etc. - outlines
V	STRC	TOWR			Structures: Tower
STORM SEWER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	STRM				Utilities: Storm sewer lines, culverts, manholes, and headwalls
V	STRM	AFFF			Storm Sewer: AFFF lagoon/detention pond
V	STRM	ANOD			Storm Sewer: Anode
V	STRM	CHUT			Storm Sewer: Chutes and concrete erosion control structures
V	STRM	CULV			Storm Sewer: Culverts
V	STRM	DEVC			Storm Sewer: Downspouts, flumes, oil/water separators, and flap gates
V	STRM	DRAN	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
V	STRM	EROS			Storm Sewer: Erosion control (riprap)
V	STRM	FLOW			Storm Sewer: Flow direction arrows
V	STRM	FMON			Storm Sewer: Flow monitoring station
V	STRM	FTTG			Storm Sewer: Caps and cleanouts
V	STRM	HWAL			Storm Sewer: Headwalls and endwalls
V	STRM	IDEN			Storm Sewer: Identifier tags, symbol modifier, and text
V	STRM	INLT			Storm Sewer: Inlets (curb, surface, and catch basins)
V	STRM	LAGN			Storm Sewer: Lagoons, ponds, watersheds, and basins
V	STRM	MHOL			Storm Sewer: Manholes
V	STRM	PIPE			Storm Sewer: Main Piping
V	STRM	PIPE	A		Storm Sewer: Abandoned piping
V	STRM	PUMP			Storm Sewer: Pump stations
V	STRM	ROOF			Storm Sewer: Roof drain line
V	STRM	RSVR	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
V	STRM	SERV			Storm Sewer: Service piping
V	STRM	SIGN			Storm Sewer: Surface markers/signs
V	STRM	STNS	IDEN		Storm Sewer: Identifier tags, symbol modifier, and text
V	STRM	SUBS			Storm Sewer: Subsurface drain piping
V	STRM	TEXT			Storm Sewer: Annotation
SURVEY					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	SURV	DATA			Survey: Data (benchmarks and horizontal control points or monuments)
V	SURV	IDEN			Survey: Survey, baseline, and control line annotation
V	SURV	LINE			Survey: Survey, baseline, and control line
V	SURV	SYMB			Survey: Survey line symbol
TAXIWAYS					

Discipline	Major	Minor1	Minor2	Minor3	Layer Description
V	TAXI	CNTR			Taxiways: Centerlines
V	TAXI	CNTR	IDEN		Taxiways: Centerline annotation
V	TAXI	CNTR	MRKG		Taxiways: Centerline markings
V	TAXI	EDGE			Taxiways: Edge markings
V	TAXI	HOLD			Taxiways: Hold lines
V	TAXI	IDEN			Taxiways: Identification Annotation
V	TAXI	OTLN			Taxiways: Outlines
V	TAXI	SHLD			Taxiways: Shoulder
TOPOGRAPHY					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	TOPO	BORE			Topography: Boring locations
V	TOPO	BRKL			Topography: Breaklines
V	TOPO	COOR			Topography: Coordinate grid ticks and text
V	TOPO	DTCH			Topography: Ditches and swales
V	TOPO	MAJR			Topography: Major contours
V	TOPO	MAJR	IDEN		Topography: Major contour annotation
V	TOPO	MINR			Topography: Minor contours
V	TOPO	MINR	IDEN		Topography: Minor contour annotation
V	TOPO	SHOR			Topography: Shorelines, land features, and references
V	TOPO	SLOP	TOPT		Topography: Top/toe slopes
V	TOPO	SOUN			Topography: Soundings
V	TOPO	SPEC			Topography: Species Site
V	TOPO	SPOT			Topography: Spot elevations
V	TOPO	TEXT			Topography: Annotation
V	TOPO	TINN			Topography: DTM triangles
V	TOPO	TINN	BNDY		Topography: DTM Boundaries
V	TOPO	TINN	NODE		Topography: DTM points
V	TOPO	TINN	SCAN		Topography: DTM Laser Scans
V	TOPO	WETL			Topography: Wetland
GENERAL UTILITIES					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	UTIL	UNID	IDEN		Utilities: Annotation
V	UTIL	UNID	LINE		Utilities: Lines
WATER					
Discipline	**Major**	**Minor1**	**Minor2**	**Minor3**	**Layer Description**
V	WATR				Utilities: Water lines, hydrants, tanks
V	WATR	IDEN			Utilities: Water annotation

1D.2 Space Allocation Codes

1D.2.1 Airline Name and Codes

3 Digit Code	2 Digit Code	Name	Ticketing Code
	6M	40-MILE AIR	
	VY	A.C.E.	
		A.S. NORVING	
		AARON AIRLINES PTY	
	SM	ABERDEEN AIRWAYS	731

3 Digit Code	2 Digit Code	Name	Ticketing Code
	GB	ABX AIR (CARGO)	832
	VX	ACES	137
	XQ	ACTION AIRLINES	410
	ZY	ADALBANAIR	121
	IN	ADIRONDACK AIRLINES	
	JP	ADRIA AIRWAYS	165
REA	RE	AER ARANN	684
EIN	EI	AER LINGUS	053
		AEREOS SERVICIOS DE TRANSPORTE	278
	DU	AERIAL TRANSIT COMPANY(CARGO)	892
	JR	AERO CALIFORNIA	078
	DF	AERO COACH AVIATION INT	868
	2G	AERO DYNAMICS (CARGO)	
		AERO EJECUTIVOS	681
	YP	AERO LLOYD	633
		AERO SERVICIOS	243
		AERO TRANSPORTES PANAMENOS	155
	QA	AEROCARIBE	723
		AEROCHAGO AIRLINES	198
	3Q	AEROCHASQUI	298
		AEROCOZUMEL	686
AFL	SU	AEROFLOT	555
	FP	AEROLEASING S.A.	
ARG	AR	AEROLINEAS ARGENTINAS	044
	YU	AEROLINEAS DOMINICANAS	
	VG	AEROLINEAS EL SALVADOR (CARGO)	680
		AEROLINEAS URUGUAYAS	966
	BQ	AEROMAR (CARGO)	926
	AM	AEROMEXICO	139
		AEROMONTERREY	722
	XX	AERONAVES DEL PERU (CARGO)	624
	RL	AERONICA	127
	PO	AEROPELICAN AIR SERVICES	
	WL	AEROPERLAS	
	PL	AEROPERU	210
	6P	AEROPUMA, S.A. (CARGO)	
	AW	AEROQUETZAL	291
	XU	AEROVIAS (CARGO)	316
		AEROVIAS COLOMBIANAS (CARGO)	158
		AFFRETAIR (PRIVATE) (CARGO)	292
		AFRICAN INTERNATIONAL AIRWAYS	648
	ZI	AIGLE AZUR	
AMM	DP	AIR 2000	
	RK	AIR AFRIQUE	092
DAH	AH	AIR ALGERIE	124
	3J	AIR ALLIANCE	188
	4L	AIR ALMA	248

3 Digit Code	2 Digit Code	Name	Ticketing Code
		AIR ALPHA	
		AIR AQUITAINE	
	FQ	AIR ARUBA	276
	9A	AIR ATLANTIC LTD.	
AAG	ES	AIR ATLANTIQUE	
	OU	AIR ATONABEE/CITY EXPRESS	253
	AX	AIR AURORA (CARGO)	386
	ZX	AIR B.C.	742
	AJ	AIR BELGIUM	
	KF	AIR BOTNIA	
	BP	AIR BOTSWANA	636
		AIR BRASIL	853
		AIR BRIDGE CARRIERS (CARGO)	912
	VH	AIR BURKINA	226
	PB	AIR BURUNDI	919
	TY	AIR CALEDONIE	190
	SB	AIR CALEDONIE INTERNATIONAL	063
ACA	AC	AIR CANADA	014
	XC	AIR CARIBBEAN	918
	SF	AIR CHARTER	
		AIR CHARTER (CHARTER)	
		AIR CHARTER SYSTEMS	272
CCA	CA	AIR CHINA	999
	CE	AIR CITY S.A.	
CNB		AIR COLUMBUS	
	OR	AIR COMORES	687
	YN	AIR CREEBEC	219
	DJ	AIR DJIBOUTI	611
	EN	AIR DOLOMITI	
	RQ	AIR ENGIADINA	834
		AIR ENTERPRISE INTERNATIONAL	
AEA	AE	AIR EUROPA	803
	UX	AIR EUROPA (AIR ESPANA S.A.)	
	BS	AIR EXCHANGE (CARGO)	595
	VJ	AIR EXEL	900
	DN	AIR EXEL (BELGIQUE)	
	NE	AIR EXEL (UK) LTD.	
	GS	AIR FOYLE	
AFR	AF	AIR FRANCE	057
FUA		AIR FUTURA	
	GN	AIR GABON	185
	IV	AIR GAMBIA	
	OG	AIR GUADELOUPE	937
	GI	AIR GUINEE	093
	ID	AIR GUYANE	694
		AIR HAITI (CARGO)	623
	GG	AIR HOLLAND B.V	

3 Digit Code	2 Digit Code	Name	Ticketing Code
AHK		AIR HONG KONG (CARGO)	152
	OX	AIR HUDIK	
AIC	AI	AIR INDIA	098
	9J	AIR INTEGRA	
	IT	AIR INTER	279
	3H	AIR INUIT	
	VU	AIR IVOIRE	084
	JM	AIR JAMAICA	
	YH	AIR JET	
	UV	AIR KANGAROO ISLAND	
	QP	AIR KENYA AVIATION	
		AIR KOREA CO. LTD.	
AIS	UE	AIR L.A.	396
ALK	UL	AIR LANKA	603
	VD	AIR LIBERTE	718
	FU	AIR LITTORAL	659
	MD	AIR MADAGASCAR	258
	QM	AIR MALAWI	167
KMC		AIR MALTA	
AMC	KM	AIR MALTA	643
	7N	AIR MANITOBA	268
	NN	AIR MARTINIQUE	606
	MR	AIR MAURITANIE	174
MAU	MK	AIR MAURITIUS	239
		AIR MERCURY INT (CARGO)	
	ZV	AIR MIDWEST	471
		AIR MOLOKAI	437
	OM	AIR MONGOL	289
	QE	AIR MOOREA	067
	SW	AIR NAMIBIA	186
		AIR NATIONAL	417
	ON	AIR NAURU	123
	LW	AIR NEVADA	568
	NZ	AIR NEW ZEALAND	086
	DB	AIR NIAGARA (CARGO)	296
	EL	AIR NIPPON	
	PX	AIR NIUGINI	656
	4N	AIR NORTH	287
	HS	AIR NORTH INTERNATIONAL LTD	935
	QK	AIR NOVA	983
	GX	AIR ONTARIO	368
	QN	AIR OUTRE MER	676
	FJ	AIR PACIFIC	260
	GZ	AIR RAROTONGA	755
	UZ	AIR RESORTS AIRLINES	
	UU	AIR REUNION	760
	ZJ	AIR ROUTING	

3 Digit Code	2 Digit Code	Name	Ticketing Code
	RY	AIR RWANDA	178
	5W	AIR SAN JUAN CHARTAIR	529
	7W	AIR SASK AVIATION	
	QR	AIR SATELLITE	
	9V	AIR SCHEFFERVILLE	
	UJ	AIR SEDONA	
	DS	AIR SENEGAL	223
SEY	HM	AIR SEYCHELLES	061
	4D	AIR SINAI	903
	WV	AIR SOUTH	399
	NY	AIR ST. VINCENT	
	OJ	AIR ST.BARTHELEMY	981
	PJ	AIR ST.PIERRE	638
		AIR STORD	
	YI	AIR SUNSHINE	806
	GK	AIR SWAZI (CARGO)	097
	VT	AIR TAHITI	135
ATC	TC	AIR TANZANIA CORPORATION	197
	HT	AIR TCHAD	095
	CS	AIR TORONTO	777
		AIR TRANSAT (CHARTER)	
	TF	AIR TRANSPORT PYRENEES	655
		AIR TRANSPORT SCHIPHOL	
	VK	AIR TUNGARU CORP	715
	QW	AIR TURKS & CAICOS	254
UKL	UK	AIR UK	130
LEI		AIR UK LEISURE	
	NF	AIR VANUATU	218
	6V	AIR VEGAS	
	VM	AIR VENDEE	982
		AIR VIA BULGARIAN AIRWAYS	699
	8K	AIR VITKOVICE	
	ZW	AIR WISCONSIN	303
AZR	QC	AIR ZAIRE	207
	UM	AIR ZIMBABWE CORPORATION	168
	ZF	AIRBORNE OF SWEDEN	
	4C	AIRES	
	XL	AIR-GLACIERS	
	FL	AIRLEC	
		AIR-LIFT INTERNATIONAL (CARGO)	
	CW	AIRLINE OF THE MARSHALL ISLAND	778
	IP	AIRLINES OF TASMANIA	
		AIRPAC AIRLINES (CARGO)	856
	5S	AIRSPEED AVIATION	
AIH		AIRTOURS INTERNATIONAL	
	3N	AIRVANTAGE (CARGO)	
	HO	AIRWAYS INTERNATIONAL	372

3 Digit Code	2 Digit Code	Name	Ticketing Code
AWD		AIRWORLD	
	6L	AKLAK AIR	709
		ALAS DE TRANSPORTES INT (CARGO)	791
	AS	ALASKA AIRLINES	027
	6D	ALASKA ISLAND AIR	
	2L	ALBERNI AIRWAYS	
		ALIADRIATICA	
	AZ	ALITALIA	055
	TO	ALKAN AIR	751
ANA	NH	ALL NIPPON AIRWAYS	205
		ALL SEASONS AIR PACIFIC	525
		ALLEGHENY COMMUTER AIRLINES	358
	3A	ALLIANCE AIRLINES	317
	QQ	ALLIED AIRLINES INC	446
	LM	ALM	119
	AQ	ALOHA AIRLINES	327
	WP	ALOHA ISLANDAIR	347
LPN		ALPENAIR (CHARTER)	
	7V	ALPHA AIR	895
	5A	ALPINE AVIATION	511
	AL	ALSAIR S.A	
	DY	ALYEMDA-DEMOCRATIC YEMEN AIR	607
AMY		AMBASSADOR	
AWA	HP	AMERICA WEST AIRLINES	401
AAL	AA	AMERICAN AIRLINES	001
AMT	TZ	AMERICAN TRANS AIR INC	366
		AMERIJET INTERNATIONAL (CARGO)	810
		AMTRAK	554
	OB	ANDALUCIA INTERNATIONAL AIRWAY	
	ED	ANDES AIRLINE (CARGO)	215
		ANGLO AIRLINES	
	VF	ANGLO ROMANIAN AIRLINE	
		ANSETT AIR FREIGHT	964
AAA	AN	ANSETT AUSTRALIA AIRLINES	090
	WX	ANSETT EXPRESS	187
	ZQ	ANSETT NEW ZEALAND	941
	MV	ANSETT W.A.	181
		ANSETT WORLDWIDE AVIATION	757
	7P	APA INTERNATIONAL AIR	917
	VZ	AQUATIC AIRWAYS	
	5F	ARCTIC CIRCLE AIR	
FGA	FG	ARIANA AFGHAN AIRLINES	255
	XA	ARINC	545
	OQ	ARIZONA PACIFIC AIRWAYS	503
	IZ	ARKIA ISRAEL AIRLINES	238
	JW	ARROW AIR (CARGO)	404
	UH	ARUBAIR N.V.	

3 Digit Code	2 Digit Code	Name	Ticketing Code
	OZ	ASIANA AIRLINES	988
	AP	ASPEN AIRWAYS	
		ASTRO AIR INTERNATIONAL	769
	9T	ATHABASKA AIRWAYS	909
	BM	ATI-AERO TRANSPORTI ITALIANI	
		ATLANTIC AIR TRANSPORT	
		ATLANTIC AIRLINES	336
	RC	ATLANTIC AIRWAYS, FAROE ISLES	767
		ATLANTIC ISLAND AIR	
	EV	ATLANTIC SOUTHEAST AIRLINES	862
	PT	ATLAS AIR SERVICE	
	BH	AUGUSTA AIRWAYS	
AUR	GR	AURIGNY AIR SERVICES	924
	NO	AUS-AIR	
	AU	AUSTRAL	143
	IM	AUSTRALIA-ASIA AIRLINES	
	TN	AUSTRALIAN AIRLINES	102
	SO	AUSTRIAN AIR SERVICES	
AVA	OS	AUSTRIAN AIRLINES	257
		AUSTRIAN AIRTRANSPORT	663
	CG	AVAIKI AIR	
	VE	AVENSA	128
	JZ	AVIA AB	752
	5T	AVIACION DEL NOROESTE	661
	AO	AVIACO	110
		AVIAEXPRESS AIRLINES	732
	5V	AVIAIR AVIATION	
	AV	AVIANCA COLOMBIA	134
	RD	AVIANOVA	
	GU	AVIATECA	240
		AVIOGENEX	
	2B	B. AIRWAYS (CARGO)	817
		B0-S-AIRE AIRLINES	871
BHS	UP	BAHAMASAIR	111
	8B	BAKER AVIATION	
		BALAIR	290
LAZ	LZ	BALKAN BULGARIAN AIRLINES	196
	BT	BALTIA AIR LINES	
	TI	BALTIC INTERNATIONAL AIRLINES	
	PG	BANGKOK AIRWAYS CO	829
		BANKAIR (CARGO)	
	QO	BAR HARBOR AIRLINES	473
	6Q	BARROW AIR	
	6B	BAXTER AVIATION	
BYU	DD	BAYU INDONESIA AIR	
	JV	BEARSKIN LAKE AIR SERVICE	632
		BELIZE AIR INT (CARGO)	986

3 Digit Code	2 Digit Code	Name	Ticketing Code
	LL	BELL AIR	
	5B	BELLAIR	
	CH	BEMIDJI AIRLINES	872
	8E	BERING AIR	
	WZ	BERLIN EUROPEAN U.K.	758
	GQ	BIG SKY AIRLINES	387
BBC	BG	BIMAN BANGLADESH AIRLINES	997
	NT	BINTER CANARIES	
		BIRGENAIR CHARTER GROUP	
	VB	BIRMINGHAM EUROPEAN AIRWAYS	702
		BLACKHAWK (CARGO)	536
	BV	BOPAIR	928
	3B	BORINQUEN AIR (CARGO)	433
	BO	BOURAQ INDONESIA AIRLINES	666
	BU	BRAATHENS S.A.F.E	154
		BRANIFF INTERNATIONAL A/L	577
	JJ	BRASIL CENTRAL LINHA AEREA REG	
DZH	DB	BRIT AIR	750
BAL	BY	BRITANNIA AIRWAYS	754
BAF		BRITISH AIR FERRIES LTD	
BAW	BA	BRITISH AIRWAYS	125
	RX	BRITISH INDEPENDENT AIRWAYS	
BIH	UR	BRITISH INT HELICOPTERS	
BMA	BD	BRITISH MIDLAND AIRWAYS	236
BWL	VF	BRITISH WORLD AIRLINES	762
		BRITT AIRWAYS	565
	BC	BRYMON AVIATION	657
	FR	BURLINGTON AIR EXPRESS	934
	II	BUSINESS AIR	
		BUSINESS AIR TRAVEL	664
	HQ	BUSINESS EXPRESS	357
	DR	BUSINESS FLIGHT OF SCANDINAVIA	244
	CT	C.A.V.E	
		CAICOS CARIBBEAN AIR. (CARGO)	
CKT	KT	CALEDONIAN AIRWAYS	
	MO	CALM AIR INT	622
	3C	CAMAI AIR	451
	UY	CAMEROON AIRLINES	604
CMM		CANADA 3000	
CDN		CANADIAN AIRLINES INT	018
	4A	CANADIAN EAGLE AIRLINES	
	KG	CANAFRICA TRANSPORTES AEREOS	
		CANAIR (CARGO)	
	9K	CAPE AIR	306
	6C	CAPE SMYTHE AIR SERVICE	879
		CARGO AIRLINES	700
	CV	CARGOLUX AIRLINES (CARGO)	172

3 Digit Code	2 Digit Code	Name	Ticketing Code
	OW	CARGOSUR (CARGO)	
		CARIBBEAN AIR CARGO (CARGO)	749
		CARIBBEAN AIRWAYS	
	KW	CARNIVAL AIR LINES	521
	CX	CATHAY PACIFIC AIRWAYS	160
	KX	CAYMAN AIRWAYS	378
		CAYUGA AIR (CARGO)	402
		CC AIR (US AIR COMMUTER)	354
CNA		CENTENIAL AIRLINES	
	GW	CENTRAL AMERICAN AIRLINES	712
	9M	CENTRAL MOUNTAIN AIR	634
	BK	CHALK'S/PARADISE ISLAND AIRWAY	522
		CHALLENGE AIR CARGO (CARGO)	307
		CHANNEL EXPRESS(AIR SER)(CARGO	
	NK	CHARTER ONE	487
		CHAUTAUQUA AIRLINES	363
		CHICAGO AIR TAXI	439
		CHILCOTIN-CARIBO AVIATION	116
CAL	CI	CHINA AIRLINES	297
	MU	CHINA EASTERN AIRLINES	781
		CHINA GENERAL AVIATION	
	CJ	CHINA NORTHERN AIRLINES	782
	WH	CHINA NORTHWEST AIRLINES	783
	CZ	CHINA SOUTHERN AIRLINES	784
	SZ	CHINA SOUTHWEST AIRLINES	785
	JS	CHOSONMINHANG KOREAN AIRWAYS	120
	SX	CHRISTMAN AIR SYSTEM	509
	QI	CIMBER AIR A/S	647
		CIRCLE AIR FREIGHT	
	CC	CISKEI INTERNATIONAL	222
	BX	COAST AIR	970
	DQ	COASTAL AIR TRANSPORT	457
		COASTAL AIRWAYS	819
	LQ	COHLMIA AVIATION (CARGO)	
	7C	COLUMBIA PACIFIC AIRLINES	
	OH	COMAIR	886
	MN	COMMERCIAL AIRWAYS	161
	XK	COMPAGNIE CORSE MEDITERRANEE	146
CFP	CF	COMPANIA DE AVIACION FAUCETT	163
MXA	MX	COMPANIA MEXICANA	132
	YM	COMPASS AIRLINES	612
		CONNECTAIR CHARTERS	
	4S	CONNER AIR LINES	575
	5C	CONQUEST AIRLINES	355
	DD	CONTI-FLUG	
COA	CO	CONTINENTAL AIRLINES	005
	KC	COOK ISLANDS INTERNATIONAL	

3 Digit Code	2 Digit Code	Name	Ticketing Code
	KO	COOK STRAIT SKYFERRY	
	CM	COPA-COMPANIA PANAMENA DE AVCN	230
		CORDOBA AIR CARGO	660
		CORPORATE AIR (CARGO)	
		CROATIA AIRLINES	
	LX	CROSSAIR	724
		CROWN AIRWAYS	501
	SC	CRUZEIRO DO SUL	049
CSA	OK	CSA CZECHOSLOVAK AIRLINES	064
	CU	CUBANA	136
CYP	CY	CYPRUS AIRWAYS	048
	YK	CYPRUS TURKISH AIRLINES	056
		DAIRO AIR SERVICES (CARGO)	761
	DX	DANAIR A/S	609
	DA	DAN-AIR SERVICES	062
	2D	DAWN AIR	551
	9D	DELTA AIR CHARTER	689
DAL	DL	DELTA AIR LINES	006
	DI	DELTA AIR REGIONAL FLUGVERKEHR	944
DLH	LH	DEUTSCHE LUFTHANSA AG.	220
	ER	DHL AIRWAYS	423
	UO	DIRECT AIR	418
	DH	DISCOVERY AIRWAYS	438
	DW	DLT DEUTSCHE LUFTVERK.	683
	YU	DOMINAIR	725
	DO	DOMINICANA	113
	DZ	DOUGLAS AIRWAYS	275
	KA	DRAGONAIR	043
	KB	DRUK AIR	787
	8D	DULLES EXPRESS	506
	QG	DYNAMIC AIR	
	EX	EAGLE AVIATION	
	XZ	EASTAIR (ICELAND)	
	UN	EASTERN AUSTRALIA AIRLINES	
	EW	EAST-WEST AIRLINES	088
	EU	ECUATORIANA	341
	3D	EDGARTOWN AIR	
	MS	EGYPTAIR	077
	LY	EL AL ISRAEL AIRLINES	114
	EB	EMERY WORLDWIDE (CARGO)	
	EK	EMIRATES	176
	EM	EMPIRE AIRLINES	464
	BE	ENTERPRISE AIRLINES	409
		ENVIROSALES CORPORATION	959
	3P	EQUATOR AIRLINES	
	GJ	EQUATORIAL INT AIR OF SAO TOME 980	
	7H	ERA AVIATION	808

3 Digit Code	2 Digit Code	Name	Ticketing Code
ETH	ET	ETHIOPIAN AIRLINES	071
	RN	EURALAIR INTERNATIONAL	836
	YQ	EURO AIR HELICOPTER SERVICE AB	
	EE	EURO BERLIN	770
ECA		EUROCYPRAIR	
EUC		EURO-CYPRIA (CHARTER)	
EEZ		EUROFLY	
		EUROFLY (CHARTER)	
	EY	EUROPE AERO SERVICE	546
		EUROPEAN EXPEDITE	256
		EUROWORLD	844
	BR	EVA AIR	
	OT	EVERGREEN HELICOPTERS ALASKA	
EXC	EQ	EXCALIBUR AIRWAYS	
	AD	EXEC EXPRESS	504
	NA	EXECUTIVE AIR CHARTER	
	FX	EXPRESS AIR	569
	9E	EXPRESS AIRLINES	430
		EXPRESS ONE INTERNATIONAL INC	
	IH	FALCON CARGO AB.	759
	EF	FAR EASTERN AIR TRANSPORT	265
	UD	FAST AIR CARRIER (CARGO)	726
FDX	FM	FEDERAL EXPRESS CORP. (CARGO)	023
	PC	FIJI AIR	677
FIN	AY	FINNAIR	105
	FA	FINNAVIATION	
	7F	FIRST AIR	245
	9R	FLAGSHIP EXPRESS SERV (CARGO)	359
	FK	FLAMENCO AIRWAYS	580
	IX	FLANDRE AIR	972
	VV	FLEXAIR	
	EC	FLIGHT LINE	452
	YC	FLIGHT WEST AIRLINES	060
	GM	FLITESTAR	805
		FLORIDA EXPRESS	456
	OP	FLYING BOAT	370
	FT	FLYING TIGER LINE (CARGO)	
	GE	FOSHING AIRLINES	
		FOUR STAR AIR CARGO (CARGO)	861
	ZU	FREEDOM AIR	221
	3F	FRESH AIR CORP. (CARGO)	815
	WR	FRIENDLY ISLANDS AIRWAYS	971
	SI	FRIESENFLUG	SI
	4F	FRONTIER AIR	233
	2F	FRONTIER FLYING SERVICE	517
	GO	GAMBIA AIR SHUTTLE	216
	CK	GAMBIA AIRWAYS	866

3 Digit Code	2 Digit Code	Name	Ticketing Code
GIA	GA	GARUDA INDONESIAN AIRWAYS	126
		GAS AIR CARGO	271
		GATEWAY PACE AVIATION	807
GBL	GT	GB AIRWAYS	171
	GP	GEMINI (CARGO)	625
GHA	GH	GHANA AIRWAYS CORPORATION	237
	9C	GILL AVIATION	786
	DC	GOLDEN AIR COMMUTER	
		GOLDEN STAR AIR CARGO	
	LK	GOLDFIELDS AIR SERVICES	
	8G	GP EXPRESS AIRLINES INC.	825
	QD	GRAND AIRWAYS	475
	YE	GRAND CANYON AIRLINES	374
		GREAT BARRIER AIRLINES	
		GREAT CHINA AIRLINES	
	ZK	GREAT LAKES AVIATION	846
GRN	WK	GREEN AIR (CHARTER)	
	GL	GREENLANDAIR (GRONLANDSFLY)	631
GFA	GF	GULF AIR	072
	XF	GULF FLITE CENTER	383
	3M	GULFSTREAM INTERNATIONAL A/L	449
	GY	GUYANA AIRWAYS CORPORATION	206
	7A	HAINES AIRWAYS	
		HAITI AIR FREIGHT INTERNAT.	671
		HAITI NATIONAL AIRLINES	284
	TV	HAITI TRANS AIR	362
	WD	HAITIAN AVIATION LINE	851
HAS	HX	HAMBURG AIRLINES	099
	VN	HANG KHONG VIETNAM	738
	4H	HANNA'S AIR SALTSPRING	
	8H	HARBOR AIR SERVICE	458
	HG	HARBOR AIRLINES	495
	HA	HAWAIIAN AIRLINES	173
	ZL	HAZELTON AIRLINES	
		HEAVYLIFT CARGO AIRL. (CARG0)	
	YO	HELI AIR MONACO	747
	OI	HELI TRANSPORT	764
	MY	HELIFRANCE	
	IU	HELIFRANS AIR SERVICE	860
	CN	HELIJET	
	JB	HELIJET AIRWAYS	613
		HENSON AVIATION	531
	2E	HERMANS/MARKAIR EXPRESS	325
		HEX'AIR	848
	ZS	HISPANIOLA AIRWAYS (CARGO)	263
	HJ	HOLMSTROEM AIR AB	
		HONDURAS INTERCARGO AIRLINE	669

3 Digit Code	2 Digit Code	Name	Ticketing Code
	QX	HORIZON AIRLINES	481
ABR	AK	HUNTING CARGO AIRLINES	
		HUTCHAIR	863
	HZ	HUTCHINSON AIR (CARGO)	
		I.L.P.O/ARUBA CARGO (CARGO)	564
IBE	IB	IBERIA	075
ICE	FI	ICELANDAIR FLUGLEIDIR	108
	LS	ILIAMNA AIR TAXI	
	IC	INDIAN AIRLINES	058
	ND	INTAIR	330
IEA		INTER EUROPEAN AIRWAYS	
		INTERAMERICANA DE AVIACION	601
	RS	INTERCONTINENTAL DE AVIACION	
	IF	INTERFLUG	107
		INTER-ISLAND AIR	882
		INTERNACIONAL DE AVIACION	420
	IQ	INTEROT AIR SERVICES	614
		IPEC AVIATION (CARGO)	717
IRA	IR	IRAN AIR	096
	IA	IRAQI AIRWAYS	073
	4M	ISLAND AIR	
	AK	ISLAND AIR, SA	
	IS	ISLAND AIRLINES	
	2S	ISLAND EXPRESS	
	2N	ISLANDER AIR/AIR NEWARK	
	WC	ISLENA AIRLINES	282
	FW	ISLES OF SCILLY SKYBUS	
	IL	ISTANBUL AIRLINES	
ITJ		ITALJET (CHARTER)	
	LN	JAMAHIRIYA LIBYAN ARAB AIRLINE	148
		JAMAICA AIR FREIGHTERS	605
		JANAIR (CARGO)	462
	JN	JAPAN AIR COMMUTER	
JAL	JL	JAPAN AIR LINES	131
	JD	JAPAN AIR SYSTEM	234
	EG	JAPAN ASIA AIRWAYS	688
	JT	JARO INTERNATIONAL	
JAT	JU	JAT YUGOSLAV AIRLINES	115
JEA	JY	JERSEY EUROPEAN AIRWAYS	267
	JX	JES AIR	691
		JET AIRWAYS	
	9W	JET AIRWAYS (INDIA) LTD	
		JET ALSACE	716
		JET EXECUTIVE INTERNATIONAL	310
	JI	JET EXPRESS	878
	8J	JETALL	662
	DK	KAMPUCHEA AIRLINES	

3 Digit Code	2 Digit Code	Name	Ticketing Code
	KR	KARAIR	261
	6K	KEEWATIN AIR	157
	KD	KENDELL AIRLINES	678
	5K	KENMORE AIR	
	4K	KENN BOREK AIR	652
	KQ	KENYA AIRWAYS	706
	6S	KETCHIKAN AIR SERVICE	469
	HE	KEYSTONE AIR SERVICE	921
		KING ISLAND AIRLINES	
	2K	KITTY HAWK AIRWAYS (CARGO)	352
	KL	KLM CITYHOPPER (KLM COMMUTER)	
KLM	KL	KLM ROYAL DUTCH AIRLINES	074
KAL	KE	KOREAN AIR	180
	2Y	KOYUKON AIR	
KAC	KU	KUWAIT AIRWAYS	229
	KH	KYRNAIR	
	JF	L.A.B. FLYING SERVICE	510
	7J	L.A.P.S.A	213
LAB		LAB AIRLINES	
	WJ	LABRADOR AIRWAYS	927
	LR	LACSA	133
	LD	LADE (LINEAS AER DEL ESTADO)	177
	UC	LADECO	145
		LAKE UNION AIR	461
	7L	LAKE UNION AIR SERVICE	461
	TM	LAM-LINHAS AEREAS MOCAMBIQUE	068
	LA	LAN-CHILE	045
	QV	LAO AVIATION	627
	PZ	LAP(LINEAS AEREAS PARAGUAYAS)	705
	MJ	LAPA	069
	TH	LAR TRANSREGIONAL	259
	7K	LARRY'S FLYING SERVICE	
	TQ	LAS VEGAS AIRWAYS	540
	NG	LAUDA AIR	231
	LV	LAV LINEA AERO VENEZOLANA	046
	QL	LESOTHO AIRWAYS	721
	4X	L'EXPRESS AIRLINES	534
	LI	LIAT	140
	QB	LIGNES AERIENNES INTER-QUEBEC	968
	GC	LINA CONGO	246
	RT	LINCOLN AIRLINES	
	LC	LINEAS AER DEL CARIBE (CARGO)	029
	LF	LINJEFLYG	247
	JK	LINK AIRWAYS	
	LE	LINK AIRWAYS (SOUTH AFRICA)	600
		LINK AMERICA (CARGO)	474
LAL	TE	LITHUANIAN AIRLINES	

3 Digit Code	2 Digit Code	Name	Ticketing Code
LLB	LB	LLOYD AEREO BOLIVIANO	051
LOG	LC	LOGANAIR	122
		LOKEN AVIATION INC	
	YL	LONG ISLAND AIRLINES LTD	443
LOT	LO	LOT POLISH AIRLINES	080
	L2	LOVE AIR	
	LT	LTU INTERNATIONAL AIRWAYS	266
LTE		LUFTANSA TRANS ESPANA	
	LG	LUXAIR LUXEMBOURG AIRLINES	149
	CD	M.K. AIRLINES	
	3R	MACAIR	812
	MT	MACKNIGHT AIRLINES	
DMA	DM	MAERSK AIR (DANISH AIRLINES)	349
	2J	MAJESTIC AIRLINES (CARGO)	
		MAKUNG AIRLINES	
MAS	MH	MALAYSIA AIRLINES	232
MAH	MA	MALEV HUNGARIAN AIRLINES	182
	FH	MALI AIRWAYS	
	HB	MALI-TINBOUCTOU AIR SERVICE	679
	6E	MALMO AVIATION	984
MXE	JE	MANX AIRLINES INC.	916
	BF	MARKAIR	478
	MP	MARTINAIR HOLLAND NV	
	MW	MAYA AIRWAYS	
	IG	MERIDIANA	191
	MZ	MERPATI NUSANTARA AIRLINES	621
	YV	MESA AIRLINES	533
	XJ	MESABA AIRLINES	582
		METAVIA AIRLINES	873
		METHOW AVIATION	519
	HY	METRO AIRLINES	380
		METRO AIRLINES NORTHEAST	450
		METRO EXPRESS	887
	FY	METROFLIGHT AIRLINES	
	MG	MGM GRAND AIR	558
		MICHIGAN PENINSULA AIRWAYS	574
MEA	ME	MIDDLE EAST AIRLINES	076
	ML	MIDWAY AIRLINES	557
	WV	MIDWEST AVIATION	896
	YX	MIDWEST EXPRESS AIRLINES	453
		MILLON AIR (CARGO)	034
	IW	MINERVE	646
		MISR. OVERSEAS AIRWAYS (CARGO)	931
	FS	MISSIONARY AVIATION FELLOWSHIP	
	ZO	MOHAWK AIRLINES	390
MON	ZB	MONARCH AIRLINES	974
		MONTAIR FLIGHT SERVICE	319

3 Digit Code	2 Digit Code	Name	Ticketing Code
MNT		MONTSERRAT AIRWAYS	
	NM	MOUNT COOK LINE OF NEW ZEALAND	445
	ZR	MUK AIR	796
	UB	MYANMA AIRWAYS CORPORATION	209
	JO	N.V LUCHTVAARTMAATSCHAPPIJ TWN	
	NJ	NAMAKWALAND LUGDIENS	
	DV	NANTUCKET AIRLINES	
		NASA SOYUZ AVIATION (CARGO)	
	8N	NASHVILLE EAGLE	
	HC	NASKE AIR	
NXA	NX	NATIONAIR CANADA	151
	YJ	NATIONAL AIRLINES	
	9L	NATIONAL CAPITAL AIRWAYS	426
	XV	NATURE ISLAND EXPRESS	
	EJ	NEW ENGLAND AIRLINES	367
	HD	NEW YORK HELICOPTER CORP	814
	WA	NEWAIR	797
		NEWFOUNDLAND/LABRADOR AIR TRAN	645
	NS	NFD LUFTVERKEHRS	104
NGA	WT	NIGERIA AIRWAYS	087
	KZ	NIPPON CARGO AIRLINES	933
	FN	NIUE AIRLINES	
	HN	NLM DUTCH AIRLINES	195
	HK	NOBLE AIR	
		NORCANAIR	
	JH	NORDESTA LINHAS AER REG	
	EO	NORDIC & SWEDEN AIRWAYS	650
	UI	NORLANDAIR (ICELAND)	
	NR	NORONTAIR	066
	NC	NORSKAIR	665
		NORTH CROSS AIRWAYS	
	5N	NORTHCOAST EXECUTIVE AIRLINES	497
	2V	NORTHEAST EXPRESS REGIONAL	463
		NORTHERN AIR CARGO (CARGO)	345
	RU	NORTHERN COMMUTER AIRLINES	
NWA	NW	NORTHWEST AIRLINES	012
	NV	NORTHWEST TERRITORIAL AIRWAYS	668
	3E	NORTHWESTERN AIR LEASE	
	HW	NORTH-WRIGHT AIR	
	JA	NORWAY AIRLINES	
	6N	NUNASI-NORTHLAND AIRLINES	
	LP	NYGE-AERO	
AAN		OASIS INTERNATIONAL AIRLINES	
	5H	ODIN AIR	
	4B	OLSON AIR SERVICE	
	OL	OLT OSTFRIESISCHE LUFTRANSPORT	704
OAL	OA	OLYMPIC AIRWAYS	050

3 Digit Code	2 Digit Code	Name	Ticketing Code
	WY	OMAN AVIATION SERVICES	910
	9X	ONTARIO EXPRESS	940
	VQ	OXLEY AIRLINES	
	RI	P.T MANDALA AIRLINES	
		PACIFIC AIRLINES	
	PQ	PACIFIC COAST AIRLINES	561
	8P	PACIFIC COASTAL AIRLINES	905
	2W	PACIFIC MIDLAND AIRLINES	763
PIA	PK	PAKISTAN INT AIRLINE	214
PAF		PANAF AIRWAYS (CHARTER)	
		PANAMA AIRWAYS	421
	PV	PANORAMA AIR	311
	HI	PAPILLON AIRWAYS	563
PGT		PEGASUS AIRLINES	
	9P	PELANGI AIR	
	PD	PEM AIR	329
	KS	PENINSULA AIRWAYS	339
		PENNSYLVANIA AIRLINES	395
	4P	PEOPLES AIR	906
	UW	PERIMETER AIRLINES	711
PAL	PR	PHILIPPINE AIRLINES	079
	NP	PICCOLO AIRLINES	
	PU	PLUNA URUGUAYIAN AIRLINES	286
	WO	POLARWING	
	PH	POLYNESIAN AIRLINES	162
	NI	PORTUGALIA	685
	2P	PRAIRIE FLYING SERVICE	094
	RP	PRECISION AIRLINES	544
		PREMIERE AIRLINES	350
		PRIME AIR	514
	FB	PROMAIR AUSTRALIA	
	YS	PROTEUS	
	AG	PROVINCIAL AIRWAYS	967
	PE	PROVINICIAL AIR SERVICES	
	5P	PTARMIGAN AIRWAYS	697
QFA	QF	QANTAS AIRWAYS	081
		QUEBEC AVIATION	911
	QJ	QUEENSLAND PACIFIC AIRLINES	
	QH	QWESTAIR	
		RACE CARGO AIRLINES	765
	4R	RAVEN AIR	
	7R	REDWING AIRWAYS	594
	RV	REEVE ALEUTIAN AIRWAYS	338
	7S	REGION AIR	
		RENTA-JET FLUGDIENST	
		RFG-REGIONALFLUG	637
	WE	RHEINTALFLUG SEEWALD	915

3 Digit Code	2 Digit Code	Name	Ticketing Code
	6R	RICHARDS AVIATION (CARGO)	552
	SL	RIO-SUL SERVICOS AEREOS REGION	293
	IK	ROADAIR FEEDER SERVICE	
	JC	ROCKY MOUNTAIN AIRWAYS	428
	ZD	ROSS AVIATION	
	WI	ROTTNEST AIRBUS	
	5R	ROVER AIRWAYS (CARGO)	376
	RR	ROYAL AIR FORCE	
	AT	ROYAL AIR MAROC	147
	BI	ROYAL BRUNEI AIRLINES	672
RJA	RJ	ROYAL JORDANIAN AIRLINE	512
RNA	RA	ROYAL NEPAL AIRLINES	285
	ZC	ROYAL SWAZI NATIONAL AIRWAYS	141
		RWL-LUFTFAHRT GMBH & CO	801
	XY	RYAN AIR (ALASKA)	251
RYR	FR	RYANAIR	224
		S.A.R. AVIONS TAXIS	
	ZG	SABAIR AIRLINES	
SAB	SN	SABENA WORLD AIRLINES	082
		SABER AVIATION (CARGO)	854
	9S	SABOURIN LAKE AIRWAYS	
	EH	SAETA	156
	KP	SAFAIR	103
	SH	SAHSA	274
	8S	SALAIR (CARGO)	477
	YD	SALAIR AB	947
	TS	SAMOA AVIATION	
	WB	SAN	739
	BB	SANSA	907
	UF	SARO AIRLINES	
	SP	SATA AIA ACORES	737
	ZT	SATENA	
SVA	SV	SAUDI ARABIAN	065
SAS	SK	SCANDINAVIAN AIRLINES	117
	SY	SCANJET	
	YR	SCENIC AIRLINES	398
	ZM	SCIBE AIRLIFT	939
	WW	SCOTTISH EUROPEAN AIRWAYS	626
		SEAGREEN AIR TRANSPORT	308
	RW	SEAIR PACIFIC	
	XT	SECTOR AIRLINES (CARGO)	987
		SERVICE AERIEN FRANCAIS	
	8L	SERVICIO AEREO LEO LOPEZ	
	2Z	SERVICIOS AEREOS LITORAL	642
		SERVICIOS DE CARGA AEREA	641
	VC	SERVIVENSA	985
	SS	SHABAIR	

3 Digit Code	2 Digit Code	Name	Ticketing Code
	NL	SHAHEEN AIR INTERNATIONAL	740
	3S	SHUSWAP FLIGHT CENTRE	
		SIERRA PACIFIC AIRLINES	
		SIGI AIR CARGO COMPANY	714
	MI	SILKAIR	
	MQ	SIMMONS AIRLINES	
	7B	SIMPSON AIR	166
	SQ	SINGAPORE AIRLINES	618
	5U	SKAGWAY AIR SERVICE	
	OO	SKY WEST AIRLINES	302
	9F	SKYCRAFT AIR TRANSPORT	973
	8M	SKYMASTER	581
	YT	SKYWEST AIRLINES	674
	HU	SLOV-AIR	
	MM	SOCIEDAD AERONAUTICA MEDELLIN	334
	IE	SOLOMON ISLANDS AIRLINES	193
	HH	SOMALI AIRLINES	089
SAA	SA	SOUTH AFRICAN AIRWAYS	083
	XE	SOUTH CENTRAL AIR	301
	SG	SOUTHEAST AIRLINES LIMITED	
		SOUTHERN AIR	
	SJ	SOUTHERN AIR TRANPORT (CARGO)	351
	NU	SOUTHWEST AIRLINES (JAPAN)	353
	WN	SOUTHWEST AIRLINES (U.S.A.)	526
SPP		SPAN AIR	
	YW	STATESWEST AIRLINES	454
	NB	STERLING AIRWAYS	194
SAY	CB	SUCKLING AIRWAYS	969
	SD	SUDAN AIRWAYS	200
		SULTAN AIR (CHARTER)	
		SUMO AIRLINES (CARGO)	541
	VL	SUN PACIFIC AIRLINES	
	EZ	SUN-AIR OF SCANDINAVIA	
SMB		SUNBEAM AIRLINE (CHARTER)	
	PI	SUNFLOWER AIRLINES	252
	OC	SUNSHINE AVIATION	938
	OF	SUNSTATE AIRLINES	620
	PY	SURINAM AIRWAYS	192
	JG	SWEDAIR	616
SWR	SR	SWISSAIR TRANSPORT COMPANY	085
	FD	SYDNEY AIRLINES	
	RB	SYRIAN ARAB AIRLINES	070
	EQ	T.A.M.E.	269
	DT	TAAG ANGOLA AIRLINES	118
	TA	TACA INTERNATIONAL AIRLINES	202
	CQ	TAHITI CONQUEST AIRLINES	
		TAIWAN AIRLINES COMPANY	710

3 Digit Code	2 Digit Code	Name	Ticketing Code
	GV	TALAIR	447
	KK	TAM	
	QT	TAMPA AIRLINES (CARGO)	729
	TX	TAN AIRLINES	208
	4E	TANANA AIR SERVICE	
TAP	TP	TAP AIR PORTUGAL	047
	9Q	TAQUAN AIR SERVICE	
	RO	TAROM ROMANIAN AIR TRANSPORT	281
	TJ	TAS AIRWAYS S.P.A	667
	3K	TATONDUK AIR SERVICE	
	QS	TATRA AIR	904
		TEDDY AIR	
	CL	TEMPLEHOF AIRWAYS U.S.A.	175
	KN	TEMSCO HELICOPTERS	876
	TG	THAI AIRWAYS INTERNATIONAL	217
	LU	THERON AIRWAYS	
TRS		TIA	
		TIKAL JETS (CARGO)	489
		TIME AIR SWEDEN	
		TNT SAVA S.A.	849
	AB	TORRES AIR	
TUR		TOUR EUROPE (CHARTER)	
TOW	NC	TOWER AIR	305
		TPI INTER. AIRWAYS (CARGO)	587
		TRANS AIR	499
		TRANS ARABIAN AIR TRANS(CARGO)	
	YB	TRANS CONTINENTAL A/L (CARGO)	837
	7T	TRANS COTE	
TEI		TRANS EUROPEAN AIR (CHARTER)	
		TRANS EUROPEAN AIRWAYS (CHART)	
	JQ	TRANS JAMAICAN AIRLINES	100
	TL	TRANS MEDITERRAREAN AIR(CARGO)	270
	4Q	TRANS NORTH AVIATION	
	9N	TRANS STATES AIRLINES	414
TWA	TW	TRANS WORLD AIRLINES	015
		TRANS-AIR-LINK (CARGO)	348
TRA	HV	TRANSAVIA AIRLINES	979
	TD	TRANSAVIO	
	TR	TRANSBRASIL S/A LINHAS AEREAS	653
		TRANSCARGO (CARGO)	978
	KV	TRANSKEI AIRWAYS	264
	IO	TRANSPORT AERIEN TRANS EXPORT	153
	IJ	TRANSPORT AERIEN TRANSREGIONAL	936
		TRANSPORT AIR CENTRE	203
	VR	TRANSPORTES AEREOS CABO VERDE	696
	GD	TRANSPORTES AEREOS EJECUTIVOS	838
	VW	TRANSPORTES AEROMAR	942

3 Digit Code	2 Digit Code	Name	Ticketing Code
	YZ	TRANSPORTES DE GUINE BISSAU	241
	8T	TRAVELAIR	
	BW	TRINIDAD & TOBAGO BWIA INT	106
	PM	TROPIC AIR	
	BN	TROPICAL SEA AIRLINES	922
	TB	TRUMP SHUTTLE	857
	UG	TUNINTER	
	TU	TUNIS AIR	199
	TT	TUNISAVIA	720
		TURK HAVA TASIMACILIGI	929
	TK	TURKISH AIRLINES	235
	KT	TURTLE AIRWAYS	
	6T	TYEE AIRWAYS	
	VO	TYROLEAN AIRWAYS	734
UGA	QU	UGANDA AIRLINES CORPORATION	673
	PS	UKRAINE INTERNATIONAL AIRLINES	
UAL	UA	UNITED AIRLINES	016
	5X	UNITED PARCEL SERVICE (CARGO)	406
	9U	UNIVERSAL AIRLINES (CARGO)	598
		US EXPRESS (CARGO)	
	US	USAIR	037
	UT	UTA	142
		VALLEY AIR SERVICES INC	482
	J7	Valuejet	
	5J	VALUJET	
BRG	RG	VARIG BRAZILIAN AIRLINES	042
	VP	VASP	343
	PF	VAYUDOOT	925
VIA	VA	VENEZUELAN INTL AIRWAYS	164
	VI	VIEQUES AIR LINK	381
	ZP	VIRGIN AIR	315
VIR	VS	VIRGIN ATLANTIC AIRWAYS	932
	FV	VIVA AIR	728
	4V	VOYAGEUR AIRWAYS	908
	3V	WAGLISLA AIR	
	XW	WALKERS CAY AIRLINE	360
		WALLISAIR	
	4W	WARBELOW'S AIR VENTURES	
	KY	WATERWINGS AIRWAYS (TE ANAU)	914
	KJ	WEST AIR EXECUTIVE	
	3L	WEST ISLE AIR	
	OE	WESTAIR COMMUTER AIRLINES	460
	WS	WESTATES AIRLINES	573
	MB	WESTERN AIRLINES	
	FO	WESTERN NEW SOUTH WALES AIR	
		WESTPAC AIRLINES (CARGO)	
	WF	WIDEROE'S FLYVESELSKAP	701

3 Digit Code	2 Digit Code	Name	Ticketing Code
	8F	WILBURS FLIGHT OPERATIONS	442
	6W	WILDERNESS AIRLINE (1975)	
	WM	WINDWARD ISLANDS AIRWAYS	295
	WQ	WINGS AIRWAYS	842
	SE	WINGS OF ALASKA	397
	RM	WINGS WEST AIRLINES	
		WORLD AIRWAYS (CHARTER)	
	WG	WORLDWAYS CANADA LTD	
	8R	WRA	393
		WRANGLER AVIATION (CARGO)	490
	8V	WRIGHT AIR SERVICE	
	MF	XIAMEN AIRLINES	
	XO	XINJIANG AIRLINES	
	ST	YANDA AIRLINES	
IYE	IY	YEMEN AIRWAYS	635
	9Y	YUTANA AIRLINES	
	4Y	YUTE AIR ALASKA	476
ZAC	QZ	ZAMBIA AIRWAYS	169
		ZANTOP INT AIRLINES (CARGO)	391
	ZA	ZAS AIRLINES OF EGYPT	708
	OD	ZULIANA DE AVIACION (CARGO)	822

1D.2.2 Occupant Codes for Airline Tenants

The $ symbol is used as a placeholder in order to conform to the aforementioned layering convention.

Airline	Y - designation
Air Ghana	$GH
Air Jamaica	$JM
Aer Lingus	$EI
Air Mobility Command	$MC
Air Ontario/Air Canada	$AC
American Airlines	$AA
America West	$HP
British Airways	$BA
Continental Airlines	$CO
Delta Airlines	$DL
Frontier Airlines	$F9
Icelandair	$FI
Northwest Airlines	$NW
Pro Air	$P9
Ryan Int'l Airlines	$XY
Trans World Airlines	$TW
United Airlines	$UA
US Airways	$US
MetroJet	USM
Southwest Airlines	L$WN

1D.2.3 Occupant Codes for Other Tenants

Baltimore/Washington International Airport lessees and their corresponding layer codes.

Y - designation	Company
AEX	A-1 Express
AGR	United States Department of Agriculture
ALA	Alamo Rent-a-Car
ARC	Arinc
AVS	Avis Car Rental
BUD	Budget Car Rental
CEX	Currency Exchange
CHM	Chimes
CMD	Celebrate Maryland
CUS	U.S. Customs
DEA	Drug Enforcement Agency
DOL	Dollar Car Rental
DUT	Duty Free
MAA	Federal Aviation Administration
GLO	Globe Airport Security
HNT	Huntleigh
HST	Host International, Inc.
HTZ	Herb Car Rental
INS	Immigration and Naturalization Service
ITS	International Total Services, Inc.
LHD	Lockheed
MAA	Maryland Aviation Administration
MAA	Millar Elevator (MAA)
MAS	Service Master
MTA	Maryland Transportation Authority Police
NAT	National Car Rental
PHS	Public Health Service
SIG	Signature Flight Support, Inc.
SKY	Sky Sites
SMT	SmarteCarte
SUS	Super Shuttle
TRX	Travelex
TRA	Travelers Aid Society
USM	U.S. Mail
USO	USO
VAC	Vacant
WAC	Wackenhut Security Services

1D.2.4 Usage Codes for Layering Convention

Z-Designation	Description	Hatch Pattern	Scale/Angle
DR	Directory	-none-	-
FB	Food and Beverages (retail)	CROSS	96/0°
FD	Flight Information Directory	- none -	-

Z-Designation	Description	Hatch Pattern	Scale/Angle
HR	Holdroom	DASH	00/45°
LS	Lighted Sign	- none -	-
MS	Merchandising Space (retail)	STARS	50/0°
ON	Office, No Public access	ANS136	100/0°
OP	Office, Public Access	ANS133	100/90°
PM	Public Meeting/Lounge	ACRD.IS014W100	3/315°
PS	Public Stairs	ANS134	50/90°
PL	Public Elevator	- none -	-
PE	Public Escalator	SACNCR	200/90°
PC	Public Corridor	- none -	-
PC	Restricted Corridor	ANGLE	60/45°
PT	PublicTelephones	- none -	-
RR	Restroom	AN S132	50/90°
SF	Special, Finished	- matches usage -	
SU	Special, Unfinished	ANS138	120/0°
SC	Security Checkpoint	ANS137	150/0°
SS	Special, Storage	ANS138	120/0°
TC	Ticket Counter	ANS131	100/0°
UM	Utility, Mechanical	SQUARE	100/0°
UE	Utility, Electrical	ZIGZAG	100/0°
UT	Utility, Telecommunications	TRIANG	100/90°
VP	Visual Paging	- none -	

1D.3 Glossary

1D.3.1 CAD Terminology

The following are definitions of CAD-related terminology used in this document:

2D	Two Dimensional – an entity having length and width, but no height
3D	Three Dimensional – an entity having length, width, and height
Acad	Shortened version of the word AutoCAD (see: AutoCAD)
A/E/C (AEC)	Architectural, Engineering and Construction
AIA	American Institute of Architects - a professional organization for architects in the United States, offering education, government advocacy, community redevelopment, and public outreach to support the architecture profession.
ANSI	American National Standards Institute - a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.
AutoCAD	A full-featured CAD software program, produced by Autodesk Inc., which is capable of producing both 2D and 3D CAD designs. Its native file format is DWG, though it directly reads and writes DXF files. (see: CAD, DWG)
Block	An AutoCAD object formed by grouping other objects together to form a named, repeatable symbol within a particular file.
CAD	Computer Aided Design. Computer software used by engineers and drafters to create and modify drawings in 2D and 3D. (see: AutoCAD, MicroStation)
CD / CD-R	Compact Disk / Recordable Compact Disk – an optical data storage medium used to store and transfer digital data between computer systems, with a maximum capacity of 700 megabytes (MB). (see: DVD-R)
DGN (.dgn) file	MicroStation's native CAD file format (see CAD, MicroStation)
Drawing Sheet Format	The sheet boundary lines, and title block geometry used to record administrative information about a CAD file.
Drawing Sheet Sizes	Standard size pieces of paper used for MAA projects. MAA uses standard sheet sizes defined by the American National Standards Institute (ANSI). ANSI sheet sizes are denoted by alphabetic designations such as ANSI-A, ANSI-B, ANSI-C, ANSI-D, and so on. MAA does not currently utilize either the International Organization for Standardization (ISO) standard sheet sizes or the commonly found Architectural (ARCH) sheet sizes.
DVD / DVD-R	Digital Versatile Disk / Recordable Digital Versatile Disk – an optical data storage medium used to store and transfer digital data between computer systems, with a maximum storage capacity of 4.7 gigabytes (GB). (see: CD-R)
DWG (.dwg) file	AutoCAD's native CAD file format (see CAD, AutoCAD)

DXF (.dxf) file	Drawing Interchange Format/Drawing Exchange Format – a CAD data file format developed by Autodesk to enable data interoperability between multiple CAD software programs. AutoCAD reads and writes DXF files directly.
External Reference (file)	See: Reference File
Georeference	To place CAD or Raster objects at the coordinates within a CAD file which correspond to their geographic coordinates in the real world. When georeferenced, data will also be properly scaled, so that a 9'x18' parking space will measure 9'x18' within the CAD file.
GIS	Geographical Information System - a system for creating, storing, analyzing and managing spatial data and associated attributes
Layer	Property of an object within a CAD file. Layers function as organizational tools, allowing drawing objects to be categorized and grouped. Layers can be turned on or off within the CAD file, functioning much like acetate overlays. Layers can be assigned properties such as color and line weight, which then apply to all objects on the layer (individual objects' properties can be configured to override the Layers property).
Linetype	A symbol comprised of patterns of dashes, spaces, text, and/or symbols, applied to any linear object
MicroStation	A full-featured CAD software program, produced by Bentley Systems Inc., which is capable of producing both 2D and 3D CAD designs. Its native file format is DGN, though it directly reads and writes DWG and DXF files. (see: CAD, AutoCAD, DWG)
Model File	Coordinately-correct CAD files which form the basis of a drawing set. Model Files are drawn at full size (1-to-1) and can contain 2D or 3D information. Model Files are typically used as Reference Files, attached to Print Files as underlays to assemble a completed, printable drawing. (see: Reference File, Print File)
Model Space	The main drawing area within an AutoCAD file. All drawing or 'modeling' done within an AutoCAD file is done within Model Space, with 2D and 3D objects drawn at full-size or 1-to-1. An AutoCAD file can contain only one Model Space, represented by a tab at the bottom edge of the screen, but can contain multiple Paper Spaces (see: Paper Space)
Nested Reference	Reference Files attached to other Reference files. If A is attached to B as a reference, and B is attached to C, A will be also appear in C because it is nested with A. In AutoCAD, it is necessary to use the Attach rather than the Overlay option in the Xref command, in order to insure that Reference Files will nest. Using the Overlay option will prevent Reference Files from nesting.
Paper Space	An area within an AutoCAD file used to create a finished drawing, analogous to a sheet of electronic paper. Items in a files Model Space area may be seen in the Paper Space area through the use of polygonal viewports. An AutoCAD sile can contain multiple Paper Spaces, represented by tabs at the bottom edge of the screen, but only one Model Space. (see: Model Space, Viewport)
Plot Stamp	A line or group of text in a printable CAD file, which typically includes the file name and path; date and time of the plot; and the name of the user who generated the plot. In AutoCAD, Text Fields are often used to create plot stamps which automatically update their contents.
Polygon	A complex object in a CAD file, composed of one or more straight or curved linear segments, forming a closed shape. In AutoCAD files, polygons can be one of several different AutoCAD-specific objects, such as circles, ellipses, or closed polyline objects.
Polyline	A complex object in a CAD file, composed of one or more straight or curved linear segments, forming a 2D path. In AutoCAD, there are two types of Polyline objects, the 2-dimensional LWPolyline object, and the 3-dimensional Polyline object.
Print File	Sometimes called Sheet Files. Print Files are CAD files configured to be a finished, printable sheet or drawing. Each Print File represents one plotted drawing. Within the Print File, elements such as References, text, title blocks and other elements are combined to create a finished, print-ready product. Print Files are generally drawn at the size of the printed output, i.e. an ANSI-D sheet is drawn 34"x24", and the contents of the sheet are scaled appropriately using Viewports. (see: Viewports)
Project Copy	A project copy drawing is part of the project copy process, which manages concurrent design updates to a single released drawing.
Raster	A digital image file consisting of rectangular picture elements (pixels) which form an image, similar to a tile mosaic. Raster files typically contain image information such as scanned documents, photographs, and aerial imagery. Examples of raster file formats are SID, TIFF, JPG, BMP, and GIF.
Reference File	Also called Xref or External Reference - A CAD file which is connected to another "child" CAD file, appearing as an overlay or underlay within the child file. Background mapping, borders, legends, and key plans are commonly used as Reference Files. A Reference File can be attached to multiple child files, eliminating the need to duplicate the contents of the reference. When a Reference File is altered, the alterations appear instantly in all child files to which it is attached. Date blocks in borders, for example, can be changed once, in the Reference File, and the change will appear in all plan sheets to which the border is attached.
Revised Drawing	A drawing that has been revised or modified after submission.
Sheet FIle	(see: Print File)
SID (.sid) File	A raster file in MrSid format. The MrSid format was developed and patented by LizardTech for encoding of georeferenced raster graphics, such as orthophotos. (see: Raster, Georeference)
SSI	Sensitive Security Information, as defined by the Code of Federal Regulations (49 CFR 1520).
TIFF (.tif) file	Tagged Image File Format, a raster graphics format. Often used to contain aerial orthophotos. (see: Raster)
Vector	Computer graphics comprised of mathematical representation of points, lines and other geometric entities.
Viewport	A polygonal viewing region in an AutoCAD file, in Paper Space. Viewports function as windows from Paper Space into Model Space, allowing objects in Model Space to appear in Paper Space, generally for the purpose of composing a completed Print File. (see: Paper Space, Model Space, Print File)
Workflow	Routing process for information or documentation to the users responsible for working on them.
Xref	AutoCAD-specific term for External Reference (see: Reference File)

1D.3.2 Airport Acronyms

-A-

A/C –Aircraft	ARINC -Aeronautical Radio, Inc.

A/H -Altitude/Height	A/G -Air to Ground
AAF -Army Air Field	AAC -Mike Monroney Aeronautical Center
AAP -Advanced Automation Program	AAI -Arrival Aircraft Interval
ABDIS -Automated Data Interchange System Service B	AAR -Airport Acceptance Rate
ACAS -Aircraft Collision Avoidance System	ACAIS -Air Carrier Activity Information System
ACCT -Accounting Records	ACC -Area Control Center
ACDO -Air Carrier District Office	ACD -Automatic Call Distributor
ACFO -Aircraft Certification Field Office	ACF -Area Control Facility
ACID -Aircraft Identification	ACFT -Aircraft
ACLT -Actual Landing Time Calculated	ACLS -Automatic Carrier Landing System
ADA -Air Defense Area	ACO -Aircraft Certification Office
ADAS -AWOS Data Acquisition System	ADAP -Airport Development Aid Program
ADDA -Administrative Data	ADCCP -Advanced Data Communications Control Procedure
ADI -Automatic De-Ice and Inhibitor	ADF -Automatic Direction Finding
ADIZ -Air Defense Identification Zone	ADIN -AUTODIN Service
ADLY -Arrival Delay	ADL -Aeronautical Data-Link
ADP -Automated Data Processing	ADO -Airline Dispatch Office
ADSIM -Airfield Delay Simulation Model	ADS -Automatic Dependent Surveillance
ADTN -Administrative Data Transmission Network	ADSY -Administrative Equipment Systems
ADVO -Administrative Voice	ADTN2000 -Administrative Data Transmission Network 2000
AEIS – Airport Engineering Information System-System replaced by AIRPortal	AEG -Aircraft Evaluation Group
AERA -Automated En-Route Air Traffic Control	AEX -Automated Execution
AF -Airway Facilities	AFB -Air Force Base
AFIS -Automated Flight Inspection System	AFP -Area Flight Plan
AFRES -Air Force Reserve Station	AFS -Airways Facilities Sector
AFSFO -AFS Field Office	AFSFU -AFS Field Unit
AFSOU -AFS Field Office Unit (Standard is AFSFOU)	AFSS -Automated Flight Service Station
AFTN -Automated Fixed Telecommunications Network	AGL -Above Ground Level
AID -Airport Information Desk	AIG -Airbus Industries Group
AIM -Airman's Information Manual	AIP -Airport Improvement Plan
AIRMET -Airmen's Meteorological Information	AIRNET -Airport Network Simulation Model
AIS -Aeronautical Information Service	AIT -Automated Information Transfer
ALP -Airport Layout Plan	ALS -Approach Lighting System
ALSF1 -ALS with Sequenced Flashers I	ALSF2 -ALS with Sequenced Flashers II
ALSIP -Approach Lighting System Improvement Plan	ALTRV -Altitude Reservation
AMASS -Airport Movement Area Safety System	AMCC -ACF/ARTCC Maintenance Control Center
AMOS -Automated Meteorological Observation Station	AMP -ARINC Message Processor (OR) Airport Master Plan
AMVER -Automated Mutual Assistance Vessel Rescue System	ANC -Alternate Network Connectivity
ANG -Air National Guard	ANGB -Air National Guard Base
ANMS -Automated Network Monitoring System	ANSI -American National Standards Group
AP -Acquisition Plan	APP -Approach
APS -Airport Planning Standard	AQAFO -Aeronautical Quality Assurance Field Office
ARAC -Army Radar Approach Control (AAF)	ARAC -Aviation Rulemaking Advisory Committee
ARCTR -FAA Aeronautical Center or Academy	ARF -Airport Reservation Function
ARLNO -Airline Office ARO -Airport Reservation Office	AWS -Air Weather Station
ARO -Airport Reservation Office	ARP -Airport Reference Point
ARSA -Airport Service Radar Area	ARSR -Air Route Surveillance Radar
ARTCC -Air Route Traffic Control Centre	ARTS -Automated Radar Terminal System
ASAS -Aviation Safety Analysis System	ASC -AUTODIN Switching Center

ASCP -Aviation System Capacity Plan	ASD -Aircraft Situation Display
ASDA -Accelerate - Stop Distance Available	ASLAR -Aircraft Surge Launch And Recovery
ASM -Available Seat Mile	ASP -Arrival Sequencing Program
ASOS -Automatic Surface Observation System	ASQP -Airline Service Quality Performance
ASR -Airport Surveillance Radar	ASTA -Airport Surface Traffic Automation
ASV -Airline Schedule Vendor	AT -Air Traffic
ATA -Air Transport Association of America	ATAS -Airspace and Traffic Advisory Service
ATCAA -Air Traffic Control Assigned Airspace	AT&T -American Telephone and Telegraph
AT&T ASDC -AT&T Agency Service Delivery Center	AT&T CSA -AT&T Customer Support Associate
ATC -Air Traffic Control	ATCBI -Air Traffic Control Beacon Indicator
ATCCC -Air Traffic Control Command Center	ATCO -Air Taxi Commercial Operator
ATCRB -Air Traffic Control Radar Beacon	ATCRBS -Air Traffic Control Radar Beacon System
ATCSCC -Air Traffic Control Systems Command Center	ATCT -Airport Traffic Control Tower
ATIS -Automated Terminal Information Service	ATISR -ATIS Recorder
ATM -Air Traffic Management	ATM -Asynchronous Transfer Mode
ATMS -Advanced Traffic Management System	ATN -Aeronautical Telecommunications Network
ATODN -AUTODIN Terminal (FUS)	ATOVN -AUOTVON (Facility)
ATOMS -Air Traffic Operations Management System	ATS -Air Traffic Service
ATSCCP -ATS Contingency Command Post	ATTIS -AT&T Information Systems
AUTODIN -DoD Automatic Digital Network	AUTOVON -DoD Automatic Voice Network
AVON -AUTOVON Service	AVN -Aviation Standards National Field Office, Oklahoma City
AWIS -Airport Weather Information	AWOS -Automated Weather Observation System
AWP -Aviation Weather Processor	AWPG -Aviation Weather Products Generator

-B-

BANS-BRITE Alphanumeric System	BART -Billing Analysis Reporting Tool (GSA software tool)
BASIC -Basic Contract Observing Station	BASOP -Military Base Operations
BCA -Benefit/Cost Analysis	BCR -Benefit/Cost Ratio
BDAT -Digitized Beacon Data	BMP -Best Management Practices
BOC -Bell Operating Company	bps -bits per second
BRI -Basic Rate Interface	BRITE -Bright Radar Indicator Terminal Equipment
BRL -Building Restriction Line	BUEC -Back-up Emergency Communications
BUECE -Back-up Emergency Communications Equipment	

-C-

CAA -Civil Aviation Authority	CAB -Civil Aeronautics Board
CARF -Central Altitude Reservation Facility	CASFO -Civil Aviation Security Office
CAT –Category	CAT -Clear - Air Turbulence
CAU -Crypto Ancillary Unit	CBI -Computer Based Instruction
CCC -Communications Command Center	CCCC -Staff Communications
CCCH -Central Computer Complex Host	CC&O -Customer Cost and Obligation
CCSD -Command Communications Service Designator	CCS7-NI -Communication Channel Signal-7 - Network Interconnect
CCU -Central Control Unit	CD -Common Digitizer
CDR -Cost Detail Report	CDT -Controlled Departure Time
CDTI -Cockpit Display of Traffic Information	CENTX -Central Telephone Exchange
CEQ -Council on Environmental Quality	CERAP -Central Radar Approach
CFC -Central Flow Control	CFCF -Central Flow Control Facility

CFCS -Central Flow Control Service	CFWP -Central Flow Weather Processor
CFWU -Central Flow Weather Unit	CGAS -Coast Guard Air Station
CLC -Course Line Computer	CLIN -Contract Line Item
CLT -Calculated Landing Time	CM -Commercial Service Airport
CNMPS -Canadian Minimum Navigation Performance Specification Airspace	CNS -Consolidated NOTAM System
CNSP -Consolidated NOTAM System Processor	CO -Central Office
COE -U.S. Army Corps of Engineers	COMCO -Command Communications Outlet
CONUS -Continental United States	CORP -Private Corporation other than ARINC or MITRE
CPE -Customer Premise Equipment	CPMIS -Consolidated Personnel Management Information System
CRA -Conflict Resolution Advisory	CRDA -Converging Runway Display Aid
CRT -Cathode Ray Tube	CSA -Communications Service Authorization
CSIS -Centralized Storm Information System	CSO -Customer Service Office
CSR -Communications Service Request	CSS -Central Site System
CTA -Controlled Time of Arrival	CTA -Control Area
CTA/FIR -Control Area/Flight Information Region	CTAF -Common Traffic Advisory Frequency
CTAS -Center - Tracon Automation System	CTMA -Center Traffic Management Advisor
CUPS -Consolidated Uniform Payroll System	CVFR -Controlled Visual Flight Rules
CVTS -Compressed Video Transmission Service	CW -Continuous Wave
CWSU -Central Weather Service Unit	CWY -Clearway

DA-Direct Access	DA -Decision Altitude/Decision Height
DA -Descent Advisor	DABBS -DITCO Automated Bulletin Board System
DAIR -Direct Altitude and Identity Readout	DAR -Designated Agency Representative
DARC -Direct Access Radar Channel	dBA -Decibels A-weighted
DBCRC -Defense Base Closure and Realignment Commission	DBMS -Data Base Management System
DBRITE -Digital Bright Radar Indicator Tower Equipment	DCA -Defense Communications Agency
DCAA -Dual Call, Automatic Answer Device	DCCU -Data Communications Control Unit
DCE -Data Communications Equipment	DDA -Dedicated Digital Access
DDD -Direct Distance Dialing	DDM -Difference in Depth of Modulation
DDS -Digital Data Service	DEA -Drug Enforcement Agency
DEDS -Data Entry and Display System	DEIS -Draft Environmental Impact Statement
DEP –Departure	DEWIZ -Distance Early Warning Identification Zone
DF -Direction Finder	DFAX -Digital Facsimile
DFI -Direction Finding Indicator	DGPS -Differential Global Positioning Satellite (System)
DH -Decision Height	DID -Direct Inward Dial
DIP -Drop and Insert Point	DIRF -Direction Finding
DITCO -Defense Information Technology Contracting Office Agency	DME -Distance Measuring Equipment
DME/P -Precision Distance Measuring Equipment	DMN -Data Multiplexing Network
DNL -Day-Night Equivalent Sound Level (Also called Ldn)	DOD -Direct Outward Dial
DoD -Department of Defense	DOI -Department of Interior
DOS -Department of State	DOT -Department of Transportation
DOTS -Dynamic Ocean Tracking System	DOTCC -Department of Transportation Computer Center
DSCS -Digital Satellite Compression Service	DSUA -Dynamic Special Use Airspace
DTS -Dedicated Transmission Service	DUAT -Direct User Access Terminal
DVFR -Defense Visual Flight Rules	DVFR -Day Visual Flight Rules
DVOR -Doppler Very High Frequency Omni-Directional Range	DYSIM -Dynamic Simulator

-E-

E-MSAW -En-Route Automated Minimum Safe Altitude Warning	EARTS -En Route Automated Radar Tracking System
ECOM -En Route Communications	ECVFP -Expanded Charted Visual Flight Procedures
EDCT -Expedite Departure Path	EFAS -En Route Flight Advisory Service
EFC -Expect Further Clearance	EFIS -Electronic Flight Information Systems
EIAF -Expanded Inward Access Features	EIS - Environmental Impact Statement
ELT -Emergency Locator Transmitter	ELWRT -Electrowriter
EMPS -En Route Maintenance Processor System	ENAV -En Route Navigational Aids
EPA -Environmental Protection Agency	EPS -Engineered Performance Standards
EOF -Emergency Operating Facility	EPSS -Enhanced Packet Switched Service
ERAD -En Route Broadband Radar	ESEC -En Route Broadband Secondary Radar
ESP -En Route Spacing Program	ESYS -En Route Equipment Systems
ESF -Extended Superframe Format	ETA -Estimated Time of Arrival
ETE -Estimated Time En Route	ETG -Enhanced Target Generator
ETMS -Enhanced Traffic Management System	ETN -Electronic Telecommunications Network
EVAS -Enhanced Vortex Advisory System	EVCS -Emergency Voice Communications System

-F-

FAA-Federal Aviation Administration	F&E -Facility and Equipment
FAAAC -FAA Aeronautical Center	FAACIS -FAA Communications Information System
FAATC -FAA Technical Center	FAC -Facility
FAF -Final Approach Fix	FAP -Final Approach Point
FAPM -FTS2000 Associate Program Manager	FAR -Federal Aviation Regulation
FAATSAT -FAA Telecommunications Satellite	FAST -Final Approach Spacing Tool
FAX -Facsimile Equipment	FBO -Fixed Base Operator
FBS -Fall Back Switch	FCC -Federal Communications Commission
FCLT -Freeze Calculated Landing Time	FCOM -FSS Radio Voice Communications
FCPU -Facility Central Processing Unit	FDAT -Flight Data Entry and Printout (FDEP) and Flight Data Service
FDE -Flight Data Entry	FDEP -Flight Data Entry and Printout
FDIO -Flight Data Input/Output	FDIOC -Flight Data Input/Output Center
FDIOR -Flight Data Input/Output Remote	FDM -Frequency Division Multiplexing
FDP -Flight Data Processing	FED -Federal
FEIS -Final Environmental Impact Statement	FEP -Front End Processor
FFAC -From Facility	FIFO -Flight Inspection Field Office
FIG -Flight Inspection Group	FINO -Flight Inspection National Field Office
FIPS -Federal Information Publication Standard	FIR -Flight Information Region
FIRE -Fire Station	FIRMR -Federal Information Resource Management Regulation
FL -Flight Level	FLOWSIM -Traffic Flow Planning Simulation
FMA -Final Monitor Aid	FMF -Facility Master File
FMIS -FTS2000 Management Information System	FMS -Flight management System
FNMS -FTS2000 Network Management System	FOIA -Freedom Of Information Act
FP -Flight Plan	FRC -Request Full Route Clearance
FSAS -Flight Service Automation System	FSDO -Flight Standards District Office
FSDPS -Flight Service Data Processing System	FSEP -Facility/Service/Equipment Profile
FSP -Flight Strip Printer	FSPD -Freeze Speed Parameter
FSS -Flight Service Station	FSSA -Flight Service Station Automated Service

FSTS -Federal Secure Telephone Service	FSYS -Flight Service Station Equipment Systems
FTS -Federal Telecommunications System	FTS2000 -Federal Telecommunications System 2000
FUS -Functional Units or Systems	FWCS -Flight Watch Control Station

-G-

GA-General Aviation	GAA -General Aviation Activity
GAAA -General Aviation Activity and Avionics	GADO -General Aviation District Office
GCA -Ground Control Approach	GNAS -General National Airspace System
GNSS -Global Navigation Satellite System	GOES -Geostationary Operational Environmental Satellite
GOESF -GOES Feed Point	GOEST -GOES Terminal Equipment
GPS -Global Positioning Satellite	GPWS -Ground Proximity Warning System
GRADE -Graphical Airspace Design Environment	GS -Glide Slope Indicator
GSA -General Services Administration	

-H-

H-Non-Directional Radio Homing Beacon (NDB)	HAA -Height Above Airport
HAL -Height Above Landing	HARS -High Altitude Route System
HAT -Height Above Touchdown	HAZMAT -Hazardous Materials
HCAP -High Capacity Carriers	HLDC -High Level Data Link Control
HDME -NDB with Distance Measuring Equipment	HDQ -FAA Headquarters
HELI –Heliport	HF -High Frequency
HH -NDB, 2kw or More	HI-EFAS -High Altitude EFAS
HOV -High Occupancy Vehicle	HSI -Horizontal Situation Indicators
HUD -Housing and Urban Development	HWAS -Hazardous In-Flight Weather Advisory
Hz –HERTZ	

-I-

IA-Indirect Access	IAF -Initial Approach Fix
I/AFSS -International AFSS	IAP -Instrument Approach Procedures
IAPA -Instrument Approach Procedures Automation	IBM -International Business Machines
IBP -International Boundary Point	IBR -Intermediate Bit Rate
ICAO -International Civil Aviation Organization	ICSS -International Communications Switching Systems
IDAT -Interfacility Data	IF -Intermediate Fix
IFCP -Interfacility Communications Processor	IFDS -Interfacility Data System
IFEA -In-Flight Emergency Assistance	IFO -International Field Office
IFR -Instrument Flight Rules	IFSS -International Flight Service Station
ILS -Instrument Landing System	IM -Inner Marker
IMC -Instrument Meteorological Conditions	INM -Integrated Noise Model
INS -Inertial Navigation System	IRMP -Information Resources Management Plan
ISDN -Integrated Services Digital Network	ISMLS -Interim Standard Microwave Landing System
ITI -Interactive Terminal Interface	IVRS -Interim Voice Response System
IW -Inside Wiring	

-J-

-K-

Kbps-Kilobits Per Second	KHz -Kilohertz
KVDT -Keyboard Video Display Terminal	

-L-

LAA-Local Airport Advisory	LAAS -Low Altitude Alert System
LABS -Leased A B Service	LABSC -LABS GS-200 Computer
LABSR -LABS Remote Equipment	LABSW -LABS Switch System
LAHSO -Land and Hold Short Operation	LAN -Local Area Network
LATA -Local Access and Transport Area	LAWRS -Limited Aviation Weather Reporting System
LCF -Local Control Facility	LCN -Local Communications Network
LDA -Localizer Directional Aid	LDA -Landing Directional Aid
LDIN -Lead-in Lights	LEC -Local Exchange Carrier
LF -Low Frequency	LINCS -Leased Interfacility NAS Communications System
LIS -Logistics and Inventory System	LLWAS -Low Level Wind Shear Alert System
LM/MS -Low/Medium Frequency	LMM -Locator Middle Marker
LMS -LORAN Monitor Site	LOC -Localizer
LOCID -Location Identifier	LOI -Letter of Intent
LOM -Compass Locator at Outer Marker	LORAN -Long Range Aid to Navigation
LRCO -Limited Remote Communications Outlet	LRNAV -Long Range Navigation
LRR -Long Range Radar	

-M-

FAA-Maximum Authorized Altitude	MALS -Medium Intensity Approach Lighting System
MALSF -MALS with Sequenced Flashers	MALSR -MALS with Runway Alignment Indicator Lights
MAP -Modified Access Pricing	MAP -Military Airport Program
MAP -Missed Approach Point	MAP -Maintenance Automation Program
Mbps -Megabits Per Second	MCA -Minimum Crossing Altitude
MCAS -Marine Corps Air Station	MCC -Maintenance Control Center
MCL -Middle Compass Locator	MCS -Maintenance and Control System
MDA -Minimum Descent Altitude	MDT -Maintenance Data Terminal
MEA -Minimum En Route Altitude	METI -Meteorological Information
MF -Middle Frequency	MFJ -Modified Final Judgement
MFT -Meter Fix Crossing Time/Slot Time	MHA -Minimum Holding Altitude
MHz –Megahertz	MIA -Minimum IFR Altitudes
MIDO -Manufacturing Inspection District Office	MIS -Meteorological Impact Statement
MISC –Miscellaneous	MISO -Manufacturing Inspection Satellite Office
MIT -Miles In Trail	MITRE -Mitre Corporation
MLS -Microwave Landing System	MM -Middle Marker
MMC -Maintenance Monitoring Console	MMS -Maintenance Monitoring System
MNPS -Minimum Navigation Performance Specification	MNPSA -Minimum Navigation Performance Specifications Airspace
MOA -Memorandum of Agreement	MOA -Military Operations Area
MOCA -Minimum Obstruction Clearance Altitude	MODE C -Altitude-Encoded Beacon Reply
MODE C -Altitude Reporting Mode of Secondary Radar	MODE S -Mode Select Beacon System
MOU -Memorandum of Understanding	MPO -Metropolitan Planning Organization

MPS -Maintenance Processor Subsystem (OR) Master Plan Supplement	MRA -Minimum Reception Altitude
MRC -Monthly Recurring Charge	MSA -Minimum Safe Altitude
MSAW -Minimum Safe Altitude Warning	MSL -Mean Sea Level
MSN -Message Switching Network	MTCS -Modular Terminal Communications System
MTI -Moving Target Indicator	MUX -Multiplexer
MVA -Minimum Vectoring Altitude	MVFR -Marginal Visual Flight Rules

-N-

NAAQS-National Ambient Air Quality Standards	NADA -NADIN Concentrator
NADIN -National Airspace Data Interchange Network	NADSW -NADIN Switches
NAILS -National Airspace Integrated Logistics Support	NAMS -NADIN IA
NAPRS -National Airspace Performance Reporting System	NAS -National Airspace System or Naval Air Station
NASDC -National Aviation Safety Data	NASP -National Airspace System Plan
NASPAC -National Airspace System Performance Analysis Capability	NATCO -National Communications Switching Center
NAVAID -Navigation Aid	NAVMN -Navigation Monitor and Control
NAWAU -National Aviation Weather Advisory Unit	NAWPF -National Aviation Weather Processing Facility
NCAR -National Center for Atmospheric Research; Boulder, CO	NCF -National Control Facility
NCIU -NEXRAD Communications Interface Unit	NCS -National Communications System
NDB -Non-Directional Radio Homing Beacon	NDNB -NADIN II
NEPA -National Environmental Policy Act	NEXRAD -Next Generation Weather Radar
NFAX -National Facsimile Service	NFDC -National Flight Data Center
NFIS -NAS Facilities Information System	NI -Network Interface
NICS -National Interfacility Communications System	NPIAS -National Plan of Integrated Airport Systems
NM -Nautical Mile	NMAC -Near Mid Air Collision
NMC -National Meteorological Center	NMCE -Network Monitoring and Control Equipment
NMCS -Network Monitoring and Control System	NOAA -National Oceanic and Atmospheric Administration
NOC -Notice Of Completion	NOTAM -Notice to Airmen
NPDES -National Pollutant Discharge Elimination System	NPIAS -National Plan of Integrated Airport Systems
NRC -Non-Recurring Charge	NRCS -National Radio Communications Systems
NSAP -National Service Assurance Plan	NSSFC -National Severe Storms Forecast Center
NSSL -National Severe Storms Laboratory; Norman, OK	NTAP -Notices To Airmen Publication
NTP -National Transportation Policy	NTSB -National Transportation Safety Board
NTZ -No Transgression Zone	NWS -National Weather Service
NWSR -NWS Weather Excluding NXRD	NSWRH -NWS Regional Headquarters
NXRD -Advanced Weather Radar System	

-O-

OAG-Official Airline Guide	OALT -Operational Acceptable Level of Traffic
OAW -Off-airway Weather Station	ODAL -Omni directional Approach Lighting System
ODAPS -Oceanic Display and Processing Station	OFA -Object Free Area
OFDPS -Offshore Flight Data Processing System	OFT -Outer Fix Time
OFZ -Obstacle Free Zone	OM -Outer Marker
OMB -Office of Management and Budget	ONER -Oceanic Navigational Error Report
OPLT -Operational Acceptable Level of Traffic	OPSW -Operational Switch
OPX -Off Premises Exchange	ORD -Operational Readiness Demonstration
OTR -Oceanic Transition Route	OTS -Organized Track System

-P-

PABX-Private Automated Branch Exchange	PAD -Packet Assembler/Disassembler
PAM -Peripheral Adapter Module	PAPI -Precision Approach Path Indicator
PAR -Precision Approach Radar	PAR -Preferential Arrival Route
PATWAS -Pilots Automatic Telephone Weather Answering Service	PBCT -Proposed Boundary Crossing Time
PBRF -Pilot Briefing	PBX -Private Branch Exchange
PCA -Positive Control Airspace	PCM -Pulse Code Modulation
PDAR -Preferential Arrival And Departure Route	PDC -Pre-Departure Clearance
PDC -Program Designator Code	PDR -Preferential Departure Route
PDN -Public Data Network	PFC -Passenger Facility Charge
PHONE –Telephone	PIC -Principal Interexchange Carrier
PIDP -Programmable Indicator Data Processor	PIREP -Pilot Weather Report
PMS -Program Management System	POLIC -Police Station
POP -Point Of Presence	POT -Point Of Termination
PPIMS -Personal Property Information Management System	PR -Primary Commercial Service Airport
PRI -Primary Rate Interface	PRM -Precision Runway Monitor
PSDN -Public Switched Data Network	PSN -Packet Switched Network
PSS -Packet Switched Service	PSTN -Public Switched Telephone Network
PUB –Publication	PUP -Principal User Processor
PVC -Permanent Virtual Circuit	PVD -Plan View Display

-Q-

RAIL-Runway Alignment Indicator Lights	RAPCO -Radar Approach Control (USAF)

-R-

RAIL-Runway Alignment Indicator Lights	RAPCO -Radar Approach Control (USAF)
RAPCON -Radar Approach Control	RATCC -Radar Air Traffic Control Center
RATCF -Radar Air Traffic Control Facility (USN)	RBC -Rotating Beam Ceilometer
RBDPE -Radar Beacon Data Processing Equipment	RBSS -Radar Bomb Scoring Squadron
RCAG -Remote Communications Air/Ground	RCC -Rescue Coordination Center
RCF -Remote Communication Facility	RCCC -Regional Communications Control Centers
RCIU -Remote Control Interface Unit	RCL -Radio Communications Link
RCLR -RCL Repeater	RCLT -RCL Terminal
RCO -Remote Communications Outlet	RCU -Remote Control Unit
RDAT -Digitized Radar Data	RDP -Radar Data Processing
RDSIM -Runway Delay Simulation Model	REIL -Runway End Identification Lights
RF -Radio Frequency	RL -General Aviation Reliever Airport
RMCC -Remote Monitor Control Center	RMCF -Remote Monitor Control Facility
RML -Radio Microwave Link	RMLR -RML Repeater
RMLT -RML Terminal	RMM -Remote Maintenance Monitoring
RMMS -Remote Maintenance Monitoring System	RMS -Remote Monitoring Subsystem
RMSC -Remote Monitoring Subsystem Concentrator	RNAV -Area Navigation
RNP -Required Navigation Performance	ROD -Record of Decision
ROSA -Report of Service Activity	ROT -Runway Occupancy Time
RP -Restoration Priority	RPC -Restoration Priority Code
RPG -Radar Processing Group	RPZ -Runway Protection Zone

RRH -Remote Reading Hygrothermometer	RRHS -Remote Reading Hydrometer
RRWDS -Remote Radar Weather Display	RRWSS -RWDS Sensor Site
RSS -Remote Speaking System	RT -Remote Transmitter
RT & BTL -Radar Tracking And Beacon Tracking Level	RTAD -Remote Tower Alphanumeric Display
RTCA -Radio Technical Commission for Aeronautics	RTR -Remote Transmitter/Receiver
RTRD -Remote Tower Radar Display	RVR -Runway Visual Range
RW –Runway	RWDS -Same as RRWDS
RWP -Realtime Weather Processor	

-S-

S/S - Sector Suite	SAC -Strategic Air Command
SAFI -Semi Automatic Flight Inspection	SALS -Short Approach Lighting System
SATCOM -Satellite Communications	SAWRS -Supplementary Aviation Weather Reporting System
SCC -System Command Center	SCVTS -Switched Compressed Video Telecommunications Service
SDF -Simplified Direction Finding	SDF -Software Defined Network
SDIS -Switched Digital Integrated Service	SDP -Service Delivery Point
SDS -Switched Data Service	SEL -Single Event Level
SELF -Simplified Short Approach Lighting System With Sequenced Flashing Lights	SFAR-38 -Special Federal Aviation Regulation 38
SHPO -State Historic Preservation Officer	SIC -Service Initiation Charge
SID -Station Identifier	SID -Standard Instrument Departure
SIGMET -Significant Meteorological Information	SIMMOD -Airport and Airspace Simulation Model
SIP -State Implementation Plan	SM -Statute Miles
SMGC -Surface Movement Guidance and Control	SMPS -Sector Maintenance Processor Subsystem
SMS -Simulation Modeling System	SNR -Signal-to-Noise Ratio, also: S/N
SOC -Service Oversight Center	SOIR -Simultaneous Operations On Intersecting Runways
SOIWR -Simultaneous Operations on Intersecting Wet Runways	SRAP -Sensor Receiver and Processor
SSALF -SSALS with Sequenced Flashers	SSALR -Simplified Short Approach Lighting System
SSB -Single Side Band	STAR -Standard Terminal Arrival Route
STD –Standard	STMUX -Statistical Data Multiplexer
STOL -Short Takeoff and Landing	SURPIC -Surface Picture
SVCA -Service A	SVCB -Service B
SVCC -Service C	SVCO -Service O
SVFO -Interphone Service F (A)	SVFB -Interphone Service F (B)
SVFC -Interphone Service F (C)	SVFD -Interphone Service F (D)
SVFR -Special Visual Flight Rules	

-T-

T1MUX-T1 Multiplexer	TAAS -Terminal Advance Automation System
TACAN -Tactical Aircraft Control and Navigation	TACR -TACAN at VOR, TACAN only
TAF -Terminal Area Forecast	TARS -Terminal Automated Radar Service
TAS -True Air Speed	TATCA -Terminal Air Traffic Control Automation
TAVT -Terminal Airspace Visualization Tool	TCA -Traffic Control Airport or Tower Control Airport
TCA -Terminal Control Area	TCACCIS -Transportation Coordinator Automated Command and Control Information System
TCAS -Traffic Alert And Collision Avoidance System	TCC -DOT Transportation Computer Center
TCCC -Tower Control Computer Complex	TCE -Tone Control Equipment
TCLT -Tentative Calculated Landing Time	TCO -Telecommunications Certification Officer
TCOM -Terminal Communications	TCS -Tower Communications System

TDLS -Tower Data-Link Services	TDMUX -Time Division Data Multiplexer
TDWR -Terminal Doppler Weather Radar	TELCO -Telephone Company
TELMS -Telecommunications Management System	TERPS -Terminal Instrument Procedures
TFAC -To Facility	TH -Threshold
TIMS -Telecommunications Information Management System	TIPS -Terminal Information Processing System
TL –Taxilane	TMA -Traffic Management Advisor
TMC -Traffic Management Coordinator	TMC/MC -Traffic Management Coordinator/Military Coordinator
TMCC -Terminal Information Processing System	TMCC -Traffic Management Computer Complex
TMF -Traffic Management Facility	TML -Television Microwave Link
TMLI -Television Microwave Link Indicator	TMLR -Television Microwave Link Repeater
TMLT -Television Microwave Link Terminal	TM&O -Telecommunications Management and Operations
TMP -Traffic Management Processor	TMS -Traffic Management System
TMSPS -Traffic Management Specialists	TMU -Traffic Management Unit
TODA -Takeoff Distance Available	TOF -Time Of Flight
TOFMS -Time of Flight Mass Spectrometer	TOPS -Telecommunications Ordering and Pricing System (GSA software tool)
TORA -Take-off Run Available	TNAV -Terminal Navigational Aids
TR -Telecommunications Request	TRACAB -Terminal Radar Approach Control in Tower Cab
TRACON -Terminal Radar Approach Control Facility	TRAD -Terminal Radar Service
TRNG –Training	TSA -Taxiway Safety Area
TSEC -Terminal Secondary Radar Service	TSP -Telecommunications Service Priority
TSR -Telecommunications Service Request	TSYS -Terminal Equipment Systems
TTMA -TRACON Traffic Management Advisor	TTY -Teletype
TVOR -Terminal VHF Omnidirectional Range	TW -Taxiway
TWEB -Transcribed WeatherBroadcastTWR-Tower (non-controlled)	TY -Type (FAACIS)

-U-

UAS -Uniform Accounting System	UHF -Ultra High Frequency
URA -Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970	USAF -United States Air Force
USOC -Uniform Service Order Code	

-V-

VASI-Visual Approach Slope Indicator	VDME -VOR with Distance Measuring Equipment
VF -Voice Frequency	VFR -Visual Flight Rules
VHF -Very High Frequency	VLF -Very Low Frequency
VMC -Visual Meteorological Conditions	VNAV -Visual Navigational Aids
VNTSC -Volpe National Transportation System Center	VON -Virtual On-net
VOR -VHF Omnidirectional Range	VOR/DME -VHF Omnidirectional Range/Distance Measuring Equipment
VORTAC -VOR collocated with TACAN	VOT -VOR Test Facility
VRS -Voice Recording System	VSCS -Voice Switching and Control System
VTA -Vertex Time of Arrival	VTAC -VOR collocated with TACAN
VTOL -Vertical Takeoff and Landing	VTS -Voice Telecommunications System

-W-

WAAS-Wide Area Augmentation System	WAN -Wide Area Network
WC -Work Center	WCP -Weather Communications Processor
WECO -Western Electric Company	WESCOM -Western Electric Satellite Communications

WMSC -Weather Message Switching Center	WMSCR -Weather Message Switching Center Replacement
WSCMO -Weather Service Contract Meteorological Observatory	WSFO -Weather Service Forecast Office
WSMO -Weather Service Meteorological Observatory	WSO -Weather Service Office
WTHR -"Weather"	WX -Weather

-X-

-Y-

-Z-

1D.4 Crosswalk Relationships

1D.4.1 CAD to GIS Crosswalk

This appendix lists CAD layers defined in MAA's CAD Standards Manual, their Data Category, their associated GIS feature class, and their Geometry type.

The CAD layers are ordered by category (i.e. Airfield, Airspace, Environmental, etc.) and then by CAD layer name. The first character of the CAD layer name, which indicates the discipline, has been replaced with an asterisk ('*') meaning that any discipline code applies.

CAD layers that are not relevant for GIS are excluded from this appendix.

1D.4.2 Base Map Data

The following categories contain base map data which can be used to create a comprehensive surface map of the airport or specific sites therein.

1D.4.2.1 Airfield Data

CAD Layer Name	Category	Feature Class	Geometry
*-AFLD-AHOA	Airfield	AirOperationsArea	Polygon
*-AFLD-DSRF-BLDR	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-KEYH	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-NMOV	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-OFA_	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-OFZ_	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-POFA	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-RPZ_	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-DSRF-RSA_	Airfield	RunwayHelipadDesignSurface	Polygon
*-AFLD-FREQ	Airfield	FrequencyArea	Polygon
*-AFLD-LITE-APPR	Airfield	AirfieldLight	Point
*-AFLD-LITE-DIST	Airfield	AirfieldLight	Point
*-AFLD-LITE-LANE	Airfield	AirfieldLight	Point
*-AFLD-LITE-OBST	Airfield	AirfieldLight	Point
*-AFLD-LITE-RUNW	Airfield	AirfieldLight	Point

CAD Layer Name	Category	Feature Class	Geometry
*-AFLD-LITE-SIGN	Airfield	AirfieldLight	Point
*-AFLD-LITE-TAXI	Airfield	AirfieldLight	Point
*-AFLD-LITE-THRS	Airfield	AirfieldLight	Point
*-AFLD-SECR-RSTR	Airfield	RestrictedAccessBoundary	Line
*-APRN-ACPK-BRDG	Airfield	PassengerLoadingBridge	Polygon
*-APRN-ANOM	Airfield	AircraftNonMovementArea	Line
*-APRN-CNTR	Airfield	MarkingLine	Line
*-APRN-DEIC	Airfield	DeicingArea	Polygon
*-APRN-GRND	Airfield	Apron	Polygon
*-APRN-HOLD	Airfield	MarkingLine	Line
*-APRN-MRKG	Airfield	MarkingLine	Line
*-APRN-OTLN	Airfield	Apron	Polygon
*-APRN-SECU	Airfield	MarkingLine	Line
*-APRN-SHLD	Airfield	MarkingLine	Line
*-APRN-SHLD-MRKG	Airfield	MarkingLine	Line
*-APRN-SIGN	Airfield	AirportSign	Point
*-ELEV-SIGN	Airfield	AirportSign	Point
*-EQPM-JETB	Airfield	PassengerLoadingBridge	Polygon
*-FLOR-SIGN	Airfield	AirportSign	Point
*-HELI-BLST	Airfield	MarkingLine	Line
*-HELI-CNTR-MARK	Airfield	MarkingLine	Line
*-HELI-DIST	Airfield	MarkingLine	Line
*-HELI-DSRF	Airfield	RunwayHelipadDesignSurface	Polygon
*-HELI-IDEN	Airfield	MarkingArea	Polygon
*-HELI-SHLD	Airfield	Shoulder	Polygon
*-HELI-SIDE	Airfield	MarkingLine	Line
*-HELI-TDZM	Airfield	MarkingArea	Polygon
*-HELI-TLOF	Airfield	TouchdownLiftOff	Polygon
*-LITE-DIST	Airfield	AirportSign	Point
*-LITE-SIGN	Airfield	AirportSign	Point
*-OVRN-CNTR	Airfield	MarkingLine	Line
*-OVRN-IDEN	Airfield	RunwayHelipadDesignSurface	Polygon
*-OVRN-OTLN	Airfield	RunwayHelipadDesignSurface	Polygon
*-OVRN-SHLD-MRKG	Airfield	MarkingLine	Line
*-PADS-CNTR	Airfield	MarkingLine	Line
*-PADS-OTLN	Airfield	MarkingLine	Line
*-PADS-SHLD	Airfield	Shoulder	Polygon
*-PRKG-SIGN	Airfield	AirportSign	Point
*-PVMT-MRKG	Airfield	MarkingLine	Line
*-PVMT-MRKG-WHIT	Airfield	MarkingLine	Line
*-PVMT-MRKG-YELO	Airfield	MarkingLine	Line
*-ROAD-SIGN	Airfield	AirportSign	Point
*-RUNW-ARST	Airfield	RunwayArrestingArea	Polygon

CAD Layer Name	Category	Feature Class	Geometry
*-RUNW-BLST	Airfield	RunwayBlastPad	Polygon
*-RUNW-CLRW	Airfield	RunwayHelipadDesignSurface	Polygon
*-RUNW-CNTR	Airfield	RunwayCenterline	Line
*-RUNW-CNTR-MARK	Airfield	MarkingLine	Line
*-RUNW-CNTR-MRKG	Airfield	MarkingArea	Polygon
*-RUNW-DISP	Airfield	MarkingArea	Polygon
*-RUNW-DIST	Airfield	MarkingArea	Polygon
*-RUNW-EDGE	Airfield	Runway	Polygon
*-RUNW-ENDP	Airfield	RunwayEnd	Point
*-RUNW-ENDP-MARK	Airfield	RunwayLabel	Point
*-RUNW-IDEN	Airfield	MarkingArea	Polygon
*-RUNW-LAHS	Airfield	RunwayLAHSO	Line
*-RUNW-SAFT	Airfield	RunwaySafetyAreaBoundary	Polygon
*-RUNW-SEGM	Airfield	RunwayElement	Polygon
*-RUNW-SHLD	Airfield	MarkingLine	Line
*-RUNW-SIDE	Airfield	MarkingArea	Polygon
*-RUNW-SIGN	Airfield	AirportSign	Point
*-RUNW-STWY	Airfield	Stopway	Polygon
*-RUNW-TDZM	Airfield	MarkingArea	Polygon
*-RUNW-THRS	Airfield	MarkingArea	Polygon
*-SIGN-EXTN	Airfield	AirportSign	Point
*-SIGN-FRMG	Airfield	AirportSign	Point
*-SIGN-GAGE	Airfield	AirportSign	Point
*-SIGN-PANL	Airfield	AirportSign	Point
*-SIGN-SPRT	Airfield	AirportSign	Point
*-SPCL-TRAF	Airfield	AirportSign	Point
*-TAXI-CNTR-MARK	Airfield	MarkingLine	Line
*-TAXI-CNTR-MRKG	Airfield	MarkingLine	Line
*-TAXI-EDGE	Airfield	MarkingLine	Line
*-TAXI-HOLD	Airfield	TaxiwayHoldingPosition	Line
*-TAXI-INTS	Airfield	TaxiwayIntersection	Polygon
*-TAXI-OTLN	Airfield	TaxiwayElement	Polygon
*-TAXI-SHLD	Airfield	MarkingLine	Line
*-TAXI-SIGN	Airfield	AirportSign	Point

1D.4.2.2 Airspace Data

CAD Layer Name	Category	Feature Class	Geometry
*-AIRS-LNDM	Airspace	LandmarkSegment	Line
*-AIRS-OBSC	Airspace	Obstacle	Point
*-AIRS-OBST-LINE	Airspace	ObstructionArea	Polygon
*-AIRS-OBST-POLY	Airspace	ObstructionArea	Polygon
*-AIRS-OBST-PPNT	Airspace	Obstacle	Point

CAD Layer Name	Category	Feature Class	Geometry
*-AIRS-OTHR	Airspace	ObstructionIdSurface	Polygon
*-AIRS-PART-APRC	Airspace	ObstructionIdSurface	Polygon
*-AIRS-PART-CONL	Airspace	ObstructionIdSurface	Polygon
*-AIRS-PART-HORZ	Airspace	ObstructionIdSurface	Polygon
*-AIRS-PART-PRIM	Airspace	ObstructionIdSurface	Polygon
*-AIRS-PART-TRNS	Airspace	ObstructionIdSurface	Polygon
*-AIRS-TERP	Airspace	ObstructionIdSurface	Polygon
*-OBST-AIRS	Airspace	Obstacle	Point

1D.4.2.3 Cadastral Data

CAD Layer Name	Category	Feature Class	Geometry
*-AFLD-FAAR	Cadastral	FaaRegionArea	Polygon
*-AFLD-PROP	Cadastral	AirportBoundary	Polygon
*-PROP-CNTY	Cadastral	County	Polygon
*-PROP-ESMT	Cadastral	EasementsAndRightsofWay	Polygon
*-PROP-LEAS	Cadastral	LeaseZone	Polygon
*-PROP-LINE	Cadastral	Parcel	Polygon
*-PROP-LUSE	Cadastral	LandUse	Polygon
*-PROP-LUSE-FUTR	Cadastral	LandUse	Polygon
*-PROP-MUNI	Cadastral	Municipality	Polygon
*-PROP-QTRS	Cadastral	Parcel	Polygon
*-PROP-RWAY	Cadastral	EasementsAndRightsofWay	Polygon
*-PROP-RWAY-ACQU	Cadastral	EasementsAndRightsofWay	Polygon
*-PROP-SECT	Cadastral	Parcel	Polygon
*-PROP-STAT	Cadastral	State	Polygon
*-PROP-SXTS	Cadastral	Parcel	Polygon
*-PROP-ZONG	Cadastral	Zoning	Polygon

1D.4.2.4 Environmental Data

CAD Layer Name	Category	Feature Class	Geometry
*-BORE-CONE	Environmental	SampleCollectionPoint	Point
*-BORE-GENL-LOCN	Environmental	SampleCollectionPoint	Point
*-BORE-GPRO-LOCN	Environmental	SampleCollectionPoint	Point
*-BORE-HOLE	Environmental	SampleCollectionPoint	Point
*-BORE-LINE	Environmental	SampleCollectionPoint	Point
*-BORE-PUSH	Environmental	SampleCollectionPoint	Point
*-BORE-STRK	Environmental	SampleCollectionPoint	Point
*-BORE-UNDS-LOCN	Environmental	SampleCollectionPoint	Point
*-BORE-VCOR-LOCN	Environmental	SampleCollectionPoint	Point
*-BORW-IDEN	Environmental	FaunaHazardArea	Polygon
*-BORW-LINE	Environmental	FaunaHazardArea	Polygon

CAD Layer Name	Category	Feature Class	Geometry
*-CHAN-BANK-TOP~	Environmental	Shoreline	Polygon
*-CHAN-DACL	Environmental	Shoreline	Polygon
*-CHAN-DACL-IDEN	Environmental	Shoreline	Polygon
*-CHAN-LIMT	Environmental	Shoreline	Polygon
*-CHAN-LIMT-IDEN	Environmental	Shoreline	Polygon
*-DRED-OHWM	Environmental	Shoreline	Polygon
*-ECCO-BURR	Environmental	FaunaHazardArea	Polygon
*-ECCO-DENS	Environmental	FaunaHazardArea	Polygon
*-ECCO-GATR	Environmental	FaunaHazardArea	Polygon
*-ECCO-HUMK	Environmental	FaunaHazardArea	Polygon
*-ECCO-NEST	Environmental	FaunaHazardArea	Polygon
*-ECCO-PRCH	Environmental	FaunaHazardArea	Polygon
*-FLHA-025Y	Environmental	FloodZone	Polygon
*-FLHA-050Y	Environmental	FloodZone	Polygon
*-FLHA-100Y	Environmental	FloodZone	Polygon
*-FLHA-200Y	Environmental	FloodZone	Polygon
*-FLHA-500Y	Environmental	FloodZone	Polygon
*-FLHA-IDEN	Environmental	FloodZone	Polygon
*-MNST-AIRQ	Environmental	SampleCollectionPoint	Point
*-MNST-GWTR	Environmental	Shoreline	Polygon
*-MNST-SWTR	Environmental	Shoreline	Polygon
*-PLNT-BEDS	Environmental	ForestStandArea	Polygon
*-PLNT-BUSH	Environmental	ForestStandArea	Polygon
*-PLNT-BUSH-LINE	Environmental	ForestStandArea	Polygon
*-PLNT-CTNR	Environmental	FloraSpeciesSite	Point
*-PLNT-GRND	Environmental	ForestStandArea	Polygon
*-PLNT-MLCH	Environmental	ForestStandArea	Polygon
*-PLNT-PLTS	Environmental	FloraSpeciesSite	Point
*-PLNT-SPRG	Environmental	ForestStandArea	Polygon
*-PLNT-TREE	Environmental	FloraSpeciesSite	Point
*-PLNT-TREE-LINE	Environmental	ForestStandArea	Polygon
*-PLNT-TURF	Environmental	ForestStandArea	Polygon
*-POLL-CONC	Environmental	EnvironmentalContaminationArea	Polygon
*-POLL-POTN	Environmental	EnvironmentalContaminationArea	Polygon
*-RIVR-BANK-TOP~	Environmental	Shoreline	Polygon
*-RIVR-EDGE	Environmental	Shoreline	Polygon
*-SAMP-AIRS	Environmental	SampleCollectionPoint	Point
*-SAMP-AUGR	Environmental	SampleCollectionPoint	Point
*-SAMP-BIOL	Environmental	SampleCollectionPoint	Point
*-SAMP-CORE	Environmental	SampleCollectionPoint	Point
*-SAMP-DRVE	Environmental	SampleCollectionPoint	Point
*-SAMP-GRAB	Environmental	SampleCollectionPoint	Point
*-SAMP-GWTR	Environmental	SampleCollectionPoint	Point

CAD Layer Name	Category	Feature Class	Geometry
*-SAMP-IDEN	Environmental	SampleCollectionPoint	Point
*-SAMP-MAGN	Environmental	SampleCollectionPoint	Point
*-SAMP-PERC	Environmental	SampleCollectionPoint	Point
*-SAMP-PITS	Environmental	SampleCollectionPoint	Point
*-SAMP-SEDI	Environmental	SampleCollectionPoint	Point
*-SAMP-SOIL	Environmental	SampleCollectionPoint	Point
*-SAMP-SOLI	Environmental	SampleCollectionPoint	Point
*-SAMP-SWTR	Environmental	SampleCollectionPoint	Point
*-SAMP-VERT	Environmental	SampleCollectionPoint	Point
*-SAMP-WASH	Environmental	SampleCollectionPoint	Point
*-SAMP-WAST	Environmental	SampleCollectionPoint	Point
*-SITE-EWAT	Environmental	Shoreline	Polygon
*-SITE-VEGE	Environmental	ForestStandArea	Polygon
*-SITE-VEGE-AREA	Environmental	ForestStandArea	Polygon
*-SITE-VEGE-HZRD	Environmental	FaunaHazardArea	Polygon
*-SITE-VEGE-PONT	Environmental	FloraSpeciesSite	Point
*-SITE-WATR	Environmental	Shoreline	Polygon
*-STOR-HAZM	Environmental	HazMatStorageSite	Point
*-TOPO-AUCO	Environmental	NoiseIncident	Point
*-TOPO-AUST	Environmental	NoiseMonitoringPoint	Point
*-TOPO-AUZN	Environmental	NoiseContour	Polygon
*-TOPO-BORE	Environmental	SampleCollectionPoint	Point
*-TOPO-FLZN	Environmental	FloodZone	Polygon
*-TOPO-SHOR	Environmental	Shoreline	Polygon
*-TOPO-SPEC	Environmental	FaunaHazardArea	Polygon
*-TOPO-WATR	Environmental	Shoreline	Polygon
*-TOPO-WETL	Environmental	Wetland	Polygon
*-WELL-ASR~	Environmental	SampleCollectionPoint	Point
*-WELL-MONT	Environmental	SampleCollectionPoint	Point
*-WELL-PIZO	Environmental	SampleCollectionPoint	Point
*-WETL-BOGS	Environmental	Wetland	Polygon
*-WETL-FENS	Environmental	Wetland	Polygon
*-WETL-MRSH	Environmental	Wetland	Polygon
*-WETL-MRSH-SALT	Environmental	Wetland	Polygon
*-WETL-MRSH-TIDL	Environmental	Wetland	Polygon
*-WETL-PCSN	Environmental	Wetland	Polygon
*-WETL-PHOL	Environmental	Wetland	Polygon
*-WETL-RPRN	Environmental	Wetland	Polygon
*-WETL-SLGH	Environmental	Wetland	Polygon
*-WETL-SWMP	Environmental	Wetland	Polygon

1D.4.2.5 Geodetic Data

CAD Layer Name	Category	Feature Class	Geometry
*-AERI-BNDY	Geodetic	ImageArea	Polygon
*-AERI-PHOT	Geodetic	ImageArea	Polygon
*-AERI-PNPT	Geodetic	ImageArea	Polygon
*-CTRL-BMRK	Geodetic	AirportControlPoint	Point
*-CTRL-GRID	Geodetic	CoordinateGridCell	Polygon
*-CTRL-HCPT	Geodetic	AirportControlPoint	Point
*-CTRL-HVPT	Geodetic	AirportControlPoint	Point
*-CTRL-TRAV	Geodetic	AirportControlPoint	Point
*-CTRL-VCPT	Geodetic	AirportControlPoint	Point
*-DETL-GRPH	Geodetic	CoordinateGridCell	Polygon
*-GRAD-AFTR	Geodetic	ElevationContour	Line
*-GRAD-EXST	Geodetic	ElevationContour	Line
*-GRAD-EXST-BASE	Geodetic	ElevationContour	Line
*-GRAD-EXST-SYR1	Geodetic	ElevationContour	Line
*-GRAD-EXST-SYR2	Geodetic	ElevationContour	Line
*-GRAD-EXST-SYR3	Geodetic	ElevationContour	Line
*-GRAD-EXST-SYR4	Geodetic	ElevationContour	Line
*-GRAD-FNSH	Geodetic	ElevationContour	Line
*-GRAD-PRED	Geodetic	ElevationContour	Line
*-GRAD-SCLN	Geodetic	ElevationContour	Line
*-GRID-COOR	Geodetic	CoordinateGridCell	Polygon
*-GRID-COOR-IDEN	Geodetic	CoordinateGridCell	Polygon
*-GRID-EXTR	Geodetic	CoordinateGridCell	Polygon
*-GRID-FRAM	Geodetic	CoordinateGridCell	Polygon
*-GRID-HORZ	Geodetic	CoordinateGridCell	Polygon
*-GRID-IDEN	Geodetic	CoordinateGridCell	Polygon
*-GRID-INTR	Geodetic	CoordinateGridCell	Polygon
*-GRID-MAJR	Geodetic	CoordinateGridCell	Polygon
*-GRID-MINR	Geodetic	CoordinateGridCell	Polygon
*-GRID-VERT	Geodetic	CoordinateGridCell	Polygon
*-IMAG-BDRY-QUAD	Geodetic	ImageArea	Polygon
*-PROJ-LALO-COOR	Geodetic	CoordinateGridCell	Polygon
*-PROJ-STAT-COOR	Geodetic	CoordinateGridCell	Polygon
*-SURV-DATA	Geodetic	AirportControlPoint	Point
*-TOPO-BKLN	Geodetic	ElevationContour	Line
*-TOPO-COOR	Geodetic	CoordinateGridCell	Polygon
*-TOPO-COOR-LALO	Geodetic	CoordinateGridCell	Polygon
*-TOPO-COOR-STAT	Geodetic	CoordinateGridCell	Polygon
*-TOPO-DTMP	Geodetic	ElevationContour	Line
*-TOPO-DTMT	Geodetic	ElevationContour	Line
*-TOPO-MAJR	Geodetic	ElevationContour	Line
*-TOPO-MAJR-IDEN	Geodetic	ElevationContour	Line
*-TOPO-MINR	Geodetic	ElevationContour	Line

CAD Layer Name	Category	Feature Class	Geometry
*-TOPO-MINR-IDEN	Geodetic	ElevationContour	Line
*-TOPO-MINR-ONEF	Geodetic	ElevationContour	Line
*-TOPO-MINR-TWOF	Geodetic	ElevationContour	Line
*-TOPO-RNYE	Geodetic	AirportControlPoint	Point
*-TOPO-SLOP-FILL	Geodetic	ElevationContour	Line
*-TOPO-SLOP-IDEN	Geodetic	ElevationContour	Line
*-TOPO-SLOP-TOPT	Geodetic	ElevationContour	Line
*-TOPO-SOUN	Geodetic	ElevationContour	Line
*-TOPO-SPOT	Geodetic	AirportControlPoint	Point
*-TOPO-SPOT-BLDG	Geodetic	AirportControlPoint	Point
*-WATR-SURF	Geodetic	ElevationContour	Line

1D.4.2.6 Interior Space Data

CAD Layer Name	Category	Feature Class	Geometry
*-ACCS-EVTR	Interior	Elevator	Polygon
*-ACCS-STRS	Interior	Stair	Polygon
*-ACCS-STRS-FRMG	Interior	Stair	Polygon
*-ALRM-EQPM-SECU	Interior	Door	Line
*-BAGS-CARR	Interior	BaggageCarousel	Polygon
*-BAGS-CVRI	Interior	BaggageConveyor	Polygon
*-BAGS-CVRO	Interior	BaggageConveyor	Polygon
*-COLS-CNTR	Interior	BuildingColumn	Polygon
*-COLS-ENCL	Interior	BuildingColumn	Polygon
*-COLS-POST	Interior	BuildingColumn	Polygon
*-COLS-PRIM	Interior	BuildingColumn	Polygon
*-COLS-RBAR	Interior	BuildingColumn	Polygon
*-COLS-SECD	Interior	BuildingColumn	Polygon
*-DOOR-FULL	Interior	Door	Line
*-DOOR-PRHT	Interior	Door	Line
*-DOOR-SECR	Interior	Door	Line
*-FLOR-ECSL	Interior	Escalator	Polygon
*-FLOR-EVTR	Interior	Elevator	Polygon
*-FLOR-HRAL	Interior	Stair	Polygon
*-FLOR-LEVL	Interior	Floor	Polygon
*-FLOR-MWLK	Interior	MovingSidewalk	Polygon
*-FLOR-OTLN	Interior	Floor	Polygon
*-FLOR-OTLN-RPRM	Interior	Room	Polygon
*-FLOR-SPCE	Interior	Space	Polygon
*-FLOR-STRS	Interior	Stair	Polygon
*-FNDN-ANCH	Interior	Wall	Line
*-FNDN-CNTR	Interior	Wall	Line
*-FNDN-FTNG	Interior	BuildingColumn	Polygon

CAD Layer Name	Category	Feature Class	Geometry
*-FNDN-GRBM	Interior	Wall	Line
*-FNDN-PEDS	Interior	BuildingColumn	Polygon
*-FNDN-PILE	Interior	BuildingColumn	Polygon
*-FURN-ACCS	Interior	Furnishing	Point
*-FURN-ADPC	Interior	Furnishing	Point
*-FURN-ARTW	Interior	Furnishing	Point
*-FURN-FLOR	Interior	Furnishing	Point
*-FURN-FREE	Interior	Furnishing	Point
*-FURN-GRID	Interior	Furnishing	Point
*-FURN-IDEN	Interior	Furnishing	Point
*-FURN-PLNT	Interior	Furnishing	Point
*-FURN-SEAT	Interior	Furnishing	Point
*-FURN-STOR	Interior	Furnishing	Point
*-GLAZ-FULL	Interior	Window	Line
*-GLAZ-PRHT	Interior	Window	Line
*-GLAZ-SILL	Interior	Window	Line
*-HVAC-ACCS	Interior	Door	Line
*-OTLN-FLOR	Interior	Floor	Polygon
*-OTLN-OPNG	Interior	Door	Line
*-OTLN-ROOF	Interior	Floor	Polygon
*-PENE-WALL	Interior	Wall	Line
*-SITE-STRS	Interior	Stair	Polygon
*-WALL-ABUT	Interior	Wall	Line
*-WALL-CAVI	Interior	Wall	Line
*-WALL-CELL	Interior	Wall	Line
*-WALL-CNTR	Interior	Wall	Line
*-WALL-COFF	Interior	Wall	Line
*-WALL-CURT	Interior	Wall	Line
*-WALL-CWMG	Interior	Wall	Line
*-WALL-FULL	Interior	Wall	Line
*-WALL-FULL-EXTR	Interior	Wall	Line
*-WALL-FULL-INTR	Interior	Wall	Line
*-WALL-GARD	Interior	Wall	Line
*-WALL-HEAD	Interior	Wall	Line
*-WALL-JAMB	Interior	Wall	Line
*-WALL-LOAD	Interior	Wall	Line
*-WALL-MONO	Interior	Wall	Line
*-WALL-MOVE	Interior	Wall	Line
*-WALL-MSE~	Interior	Wall	Line
*-WALL-NONL	Interior	Wall	Line
*-WALL-OPEN-LVRS	Interior	Wall	Line
*-WALL-PCST	Interior	Wall	Line
*-WALL-PRHT	Interior	Wall	Line

CAD Layer Name	Category	Feature Class	Geometry
*-WALL-RBAR	Interior	Wall	Line
*-WALL-RTWL	Interior	Wall	Line
*-WALL-SHEA	Interior	Wall	Line
*-WALL-SPCL	Interior	Wall	Line
*-WALL-STUD	Interior	Wall	Line

1D.4.2.7 Navigational Aids Data

CAD Layer Name	Category	Feature Class	Geometry
*-AFLD-AIDS-COMM	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-CRIT	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-GPS_	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-ILS_	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-MCWV	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-OTHR	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-RADI	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-RADR	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-RMTE	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-SITE	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-SYST	Navigational Aids	NavaidEquipment	Point
*-AFLD-AIDS-WTHR	Navigational Aids	NavaidEquipment	Point
*-AFLD-BCNS-IDEN	Navigational Aids	NavaidEquipment	Point
*-AFLD-BCNS-MISC	Navigational Aids	NavaidEquipment	Point
*-AFLD-BCNS-STRB	Navigational Aids	NavaidEquipment	Point

1D.4.2.8 SeaPlane Data

CAD Layer Name	Category	Feature Class	Geometry
*-SEAP-BUOY	SeaPlane	NavigationBuoy	Point
*-SEAP-RAMP	SeaPlane	SeaplaneRampSite	Polygon
*-SEAP-RAMP-CNTR	SeaPlane	SeaplaneRampCenterline	Line
*-SIGN-BUOY	SeaPlane	NavigationBuoy	Point

1D.4.2.9 Security Data

CAD Layer Name	Category	Feature Class	Geometry
*-AFLD-SECR-SECA	Security	SecurityArea	Polygon
*-AFLD-SECR-SIDA	Security	SecurityIdDisplayArea	Polygon
*-AFLD-SECR-STER	Security	SterileArea	Polygon
*-CCTV-EQPM	Security	SurveillanceCamera	Point

1D.4.2.10 Structures Data

CAD Layer Name	Category	Feature Class	Geometry
*-BLDG-DECK	Structures	Building	Polygon
*-BLDG-DOCK	Structures	Building	Polygon
*-BLDG-OTLN	Structures	Building	Polygon
*-BLDG-OVHD	Structures	Building	Polygon
*-BLDG-PRCH	Structures	Building	Polygon
*-DECK-FLOR	Structures	Building	Polygon
*-DECK-ROOF	Structures	Building	Polygon
*-DETL-FENC-SECU	Structures	Fence	Line
*-DETL-GATE	Structures	Gate	Line
*-ELEV-OTLN	Structures	Building	Polygon
*-EXST-BLDG	Structures	Building	Polygon
*-GATE-AXIS	Structures	Gate	Line
*-GATE-MISC	Structures	Gate	Line
*-OTLN-BLDG	Structures	Building	Polygon
*-OTLN-STRC	Structures	Building	Polygon
*-PLAN-OTLN	Structures	Building	Polygon
*-PROP-CONS	Structures	ConstructionArea	Polygon
*-SAFE-FENC	Structures	Fence	Line
*-SITE-FENC	Structures	Fence	Line
*-SITE-GATE	Structures	Gate	Line
*-SITE-OTLN	Structures	ConstructionArea	Polygon
*-STRC-TOWR	Structures	Tower	Point

1D.4.2.11 Surface Transportation Data

CAD Layer Name	Category	Feature Class	Geometry
*-ACCS-TUNL	Surface Transportation	Tunnel	Polygon
*-BRDG-BEAR	Surface Transportation	Bridge	Polygon
*-BRDG-CNTR	Surface Transportation	Bridge	Polygon
*-BRDG-CURB	Surface Transportation	Sidewalk	Polygon
*-BRDG-DECK	Surface Transportation	Bridge	Polygon
*-BRDG-OTLN	Surface Transportation	Bridge	Polygon
*-FNDN-TUNL	Surface Transportation	Tunnel	Polygon
*-GATE-WALK	Surface Transportation	Sidewalk	Polygon
*-MATL-CRAN	Surface Transportation	Bridge	Polygon
*-PRKG-OTLN	Surface Transportation	ParkingLot	Polygon
*-RAIL-BRDG	Surface Transportation	Bridge	Polygon
*-RAIL-BRDG-CNTR	Surface Transportation	RailroadCenterline	Line
*-RAIL-CNTR	Surface Transportation	RailroadCenterline	Line
*-RAIL-TRAK	Surface Transportation	RailroadCenterline	Line
*-RAIL-YARD	Surface Transportation	RailroadYard	Polygon
*-ROAD-ASPH	Surface Transportation	RoadSegment	Polygon
*-ROAD-CNTR	Surface Transportation	RoadCenterline	Line

CAD Layer Name	Category	Feature Class	Geometry
*-ROAD-CONC	Surface Transportation	RoadSegment	Polygon
*-ROAD-CURB	Surface Transportation	RoadSegment	Polygon
*-ROAD-DRIV	Surface Transportation	DrivewayArea	Polygon
*-ROAD-DRIV-CNTR	Surface Transportation	DrivewayCenterline	Line
*-ROAD-GRVL	Surface Transportation	RoadSegment	Polygon
*-ROAD-OTLN	Surface Transportation	RoadSegment	Polygon
*-ROAD-POIN	Surface Transportation	RoadPoint	Point
*-ROAD-SHLD	Surface Transportation	RoadSegment	Polygon
*-ROAD-UPVD	Surface Transportation	RoadSegment	Polygon
*-SITE-BRDG	Surface Transportation	Bridge	Polygon
*-SITE-STRC	Surface Transportation	Bridge	Polygon
*-SITE-TUNL	Surface Transportation	Tunnel	Polygon
*-SITE-WALK	Surface Transportation	Sidewalk	Polygon

1D.4.3 Utility Data

The following categories contain data on various on-site utility systems.

1D.4.3.1 Utilities - Air

CAD Layer Name	Category	Feature Class	Geometry
*-CMPA-AIRD	Utilities Air	CompressedAirDrainSeparator	Point
*-CMPA-FTTG	Utilities Air	CompressedAirFitting	Point
*-CMPA-PIPE	Utilities Air	CompressedAirPipeLine	Line
*-CMPA-VLVE	Utilities Air	CompressedAirValve	Point
*-CMPA-VLVP	Utilities Air	CompressedAirValvePit	Point

1D.4.3.2 Utilities - Communication

CAD Layer Name	Category	Feature Class	Geometry
*-COMM-ACCS	Utilities Communications	CommAccessPoint	Point
*-COMM-AIRP	Utilities Communications	CommAirLine	Line
*-COMM-AMPL	Utilities Communications	CommAmplifier	Point
*-COMM-ANTL	Utilities Communications	CommAntennaLine	Line
*-COMM-ANTS	Utilities Communications	CommAntenna	Point
*-COMM-APDP	Utilities Communications	CommAirPressureDevice	Point
*-COMM-ATTN	Utilities Communications	CommAttenuator	Point
*-COMM-BOTH	Utilities Communications	CommTelephoneBooth	Point
*-COMM-CABL-CBRL	Utilities Communications	CommCableBridgeLine	Line
*-COMM-CABL-CLAD	Utilities Communications	CommCableLadder	Point
*-COMM-CABL-COAX	Utilities Communications	CommCoaxialLine	Line
*-COMM-CABL-CRCK	Utilities Communications	CommCableRackLine	Line
*-COMM-CABL-TRAY	Utilities Communications	CommCableTrayLine	Line
*-COMM-CABL-TRGH	Utilities Communications	CommCableTroughLine	Line
*-COMM-COVR	Utilities Communications	CommAccessCoverageArea	Polygon

CAD Layer Name	Category	Feature Class	Geometry
*-COMM-DSPL	Utilities Communications	CommDbsplice	Point
*-COMM-DUCT	Utilities Communications	CommDuctbank	Line
*-COMM-DVPT	Utilities Communications	CommDevice	Point
*-COMM-EQPT	Utilities Communications	CommEquipment	Point
*-COMM-FIBR	Utilities Communications	CommFiberopticLine	Line
*-COMM-GPNT	Utilities Communications	CommGroundPoint	Point
*-COMM-GPPA	Utilities Communications	CommGroundplaneArea	Polygon
*-COMM-GWAV	Utilities Communications	CommGroundwaveArea	Polygon
*-COMM-IMPD	Utilities Communications	CommImpedanceMatchingPoint	Point
*-COMM-INET	Utilities Communications	CommInternetCenter	Point
*-COMM-HHOL	Utilities Communications	CommJunction	Point
*-COMM-LCAP	Utilities Communications	CommLoadCapacitor	Point
*-COMM-LCOL	Utilities Communications	CommLoadCoilPoint	Point
*-COMM-LOOP	Utilities Communications	CommServiceLoopPoint	Point
*-COMM-LOSL	Utilities Communications	CommLineOfSightLine	Line
*-COMM-MCNV	Utilities Communications	CommMediaConverter	Point
*-COMM-MHOL	Utilities Communications	CommJunction	Point
*-COMM-MHOP	Utilities Communications	CommMultihopArea	Polygon
*-COMM-NETS	Utilities Communications	CommNetworkSystemsSite	Point
*-COMM-OTCL	Utilities Communications	CommOtherCable	Line
*-COMM-PATH	Utilities Communications	CommPathNode	Point
*-COMM-PEDS	Utilities Communications	CommPedestal	Point
*-COMM-PULB	Utilities Communications	CommPullbox	Point
*-COMM-RADP	Utilities Communications	CommRadio	Point
*-COMM-RADR	Utilities Communications	CommRadarSite	Point
*-COMM-RDRS	Utilities Communications	CommRadioReceiver	Point
*-COMM-RDTS	Utilities Communications	CommRadioTransmitter	Point
*-COMM-RELY	Utilities Communications	CommRelayStation	Point
*-COMM-RISR	Utilities Communications	CommRiser	Point
*-COMM-RPTR	Utilities Communications	CommRepeater	Point
*-COMM-SATP	Utilities Communications	CommSatellitePoint	Point
*-COMM-SEGL	Utilities Communications	CommSegmentedCable	Line
*-COMM-SEGS	Utilities Communications	CommSegmentedCable	Line
*-COMM-SENS	Utilities Communications	CommSensor	Point
*-COMM-SIGN	Utilities Communications	CommElectronicMarker	Point
*-COMM-SLIN	Utilities Communications	CommPathSegmentLine	Line
*-COMM-SPKR	Utilities Communications	CommSpeaker	Point
*-COMM-SPLC	Utilities Communications	CommSplice	Point
*-COMM-SPLT	Utilities Communications	CommSplitter	Point
*-COMM-SWBX	Utilities Communications	CommJunction	Point
*-COMM-TELE	Utilities Communications	CommTelephone	Point
*-COMM-TERM	Utilities Communications	CommTerminator	Point
*-COMM-TRML	Utilities Communications	CommTerminal	Point

CAD Layer Name	Category	Feature Class	Geometry
*-COMM-TWIS	Utilities Communications	CommTwistedPairLine	Line
*-COMM-UNKN	Utilities Communications	CommJunction	Point
*-COMM-VALT	Utilities Communications	CommVaultSite	Point
*-COMM-VIDS	Utilities Communications	CommVideoSite	Point
*-COMM-VOIC	Utilities Communications	CommVoiceSwitch	Point
*-COMM-VSIT	Utilities Communications	CommVerticalSite	Point
*-COMM-WAVG	Utilities Communications	CommWaveguideLine	Line

1D.4.3.3 Utilities - Deicing

CAD Layer Name	Category	Feature Class	Geometry
*-GLYC-CLVL	Utilities Deicing	DeicingCulvertCenterline	Line
*-GLYC-CLVS	Utilities Deicing	DeicingCulvertEnd	Point
*-GLYC-COUT	Utilities Deicing	DeicingLineCleanOut	Point
*-GLYC-DBAS	Utilities Deicing	DeicingDrainageBasin	Polygon
*-GLYC-DDIV	Utilities Deicing	DeicingDrainageDivide	Line
*-GLYC-DSCH	Utilities Deicing	DeicingDischargePoint	Point
*-GLYC-FLOW	Utilities Deicing	DeicingFlowControlPoint	Point
*-GLYC-PLUG	Utilities Deicing	DeicingFitting	Point
*-GLYC-INLT	Utilities Deicing	DeicingInlet	Point
*-GLYC-HHOL	Utilities Deicing	DeicingJunction	Point
*-GLYC-LIFT	Utilities Deicing	DeicingLiftStation	Point
*-GLYC-LINE	Utilities Deicing	DeicingLine	Line
*-GLYC-MHOL	Utilities Deicing	DeicingJunction	Point
*-GLYC-SIGN	Utilities Deicing	DeicingMarker	Point
*-GLYC-PUMP	Utilities Deicing	DeicingPump	Point
*-GLYC-RESV	Utilities Deicing	DeicingReservoir	Point
*-GLYC-REVR	Utilities Deicing	DeicingGlycolRecoveryPit	Point
*-GLYC-STAT	Utilities Deicing	DeicingPumpStation	Point
*-GLYC-TANK	Utilities Deicing	DeicingTank	Point
*-GLYC-UNKN	Utilities Deicing	DeicingJunction	Point
*-GLYC-VALT	Utilities Deicing	DeicingVault	Point
*-GLYC-VLVE	Utilities Deicing	DeicingValve	Point

1D.4.3.4 Utilities - Electrical

CAD Layer Name	Category	Feature Class	Geometry
*-ELEC-BLIN	Utilities Electrical	ElectricalBusLine	Line
*-ELEC-CAPP	Utilities Electrical	ElectricalCapacitor	Point
*-ELEC-CLIN	Utilities Electrical	ElectricalCable	Line
*-ELEC-DUCT	Utilities Electrical	ElectricalDuctbank	Line
*-ELEC-GENP	Utilities Electrical	ElectricalGenerator	Point
*-ELEC-GRPT	Utilities Electrical	ElectricalGround	Point

CAD Layer Name	Category	Feature Class	Geometry
*-ELEC-BLIN	Utilities Electrical	ElectricalBusLine	Line
*-ELEC-HBLT	Utilities Electrical	ElectricalHeadBoltOutlet	Point
*-ELEC-HHOL	Utilities Electrical	ElectricalJunction	Point
*-ELEC-LITE	Utilities Electrical	ElectricalLight	Point
*-ELEC-METR	Utilities Electrical	ElectricalMeter	Point
*-ELEC-MHOL	Utilities Electrical	ElectricalJunction	Point
*-ELEC-MKPT	Utilities Electrical	ElectricalMarker	Point
*-ELEC-MTPT	Utilities Electrical	ElectricalMotor	Point
*-ELEC-PEDS	Utilities Electrical	ElectricalPedestal	Point
*-ELEC-REGP	Utilities Electrical	ElectricalRegulator	Point
*-ELEC-RISR	Utilities Electrical	ElectricalRiser	Point
*-ELEC-SITE	Utilities Electrical	ElectricalUtilitySite	Point
*-ELEC-SPLC	Utilities Electrical	ElectricalSplice	Point
*-ELEC-SWBX	Utilities Electrical	ElectricalJunction	Point
*-ELEC-SUBS	Utilities Electrical	ElectricalSubstation	Polygon
*-ELEC-SWCH	Utilities Electrical	ElectricalSwitch	Point
*-ELEC-TRBP	Utilities Electrical	ElectricalTransformerBank	Point
*-ELEC-UNKN	Utilities Electrical	ElectricalJunction	Point
*-ELEC-VALT	Utilities Electrical	ElectricalTransformerVault	Point
*-POLE-GUYL	Utilities Electrical	ElectricalPoleGuyLine	Line
*-POLE-GUYP	Utilities Electrical	ElectricalPoleGuyConnectionPoint	Point
*-POLE-TOWS	Utilities Electrical	ElectricalPoleTower	Point

1D.4.3.5 Utilities - Energy Monitoring and Control System

CAD Layer Name	Category	Feature Class	Geometry
*-EMCS-CABL	Utilities EMCS	EnergyCtrlMonCable	Line
*-EMCS-DUCT	Utilities EMCS	EnergyCtrlMonDuctbank	Line
*-EMCS-ECMD	Utilities EMCS	EnergyCtrlMonDevice	Point
*-EMCS-HHOL	Utilities EMCS	EnergyCtrlMonJunction	Point
*-EMCS-MHOL	Utilities EMCS	EnergyCtrlMonJunction	Point
*-EMCS-SIGN	Utilities EMCS	EnergyCtrlMonMarker	Point
*-EMCS-SWBX	Utilities EMCS	EnergyCtrlMonJunction	Point
*-EMCS-UNKN	Utilities EMCS	EnergyCtrlMonJunction	Point

1D.4.3.6 Utilities - Fuel

CAD Layer Name	Category	Feature Class	Geometry
*-FUEL-AEPT	Utilities Fuel	FuelAirEliminator	Point
*-FUEL-ANOD	Utilities Fuel	FuelAnode	Point
*-FUEL-ANOT	Utilities Fuel	FuelAnodeTestStation	Point
*-FUEL-COUT	Utilities Fuel	FuelFitting	Point
*-FUEL-FILT	Utilities Fuel	FuelFilterStrainer	Point

CAD Layer Name	Category	Feature Class	Geometry
*-FUEL-PLUG	Utilities Fuel	FuelFitting	Point
*-FUEL-HYDR	Utilities Fuel	FuelHydrant	Point
*-FUEL-HHOL	Utilities Fuel	FuelJunction	Point
*-FUEL-MAIN	Utilities Fuel	FuelLine	Line
*-FUEL-MHOL	Utilities Fuel	FuelJunction	Point
*-FUEL-METR	Utilities Fuel	FuelMeter	Point
*-FUEL-SIGN	Utilities Fuel	FuelMarker	Point
*-FUEL-OILW	Utilities Fuel	FuelOilWaterSeparator	Point
*-FUEL-PBSP	Utilities Fuel	FuelPumpBoosterStation	Point
*-FUEL-PIPL	Utilities Fuel	FuelTransPipeline	Line
*-FUEL-PIPS	Utilities Fuel	FuelTransPipelineSegmentLine	Line
*-FUEL-PUMP	Utilities Fuel	FuelPump	Point
*-FUEL-RECT	Utilities Fuel	FuelRectifier	Point
*-FUEL-REDC	Utilities Fuel	FuelRegulatorReducer	Point
*-FUEL-REFN	Utilities Fuel	FuelTransRefinery	Point
*-FUEL-SRCE	Utilities Fuel	FuelSource	Point
*-FUEL-SWBX	Utilities Fuel	FuelJunction	Point
*-FUEL-TANK	Utilities Fuel	FuelTank	Point
*-FUEL-UNKN	Utilities Fuel	FuelJunction	Point
*-FUEL-VLVE	Utilities Fuel	FuelValve	Point

1D.4.3.7 Utilities – Natural Gas

CAD Layer Name	Category	Feature Class	Geometry
*-NGAS-ANOD	Utilities Gas	GasAnode	Point
*-NGAS-ANOT	Utilities Gas	GasAnodeTestStation	Point
*-NGAS-COUT	Utilities Gas	GasFitting	Point
*-NGAS-FILL	Utilities Gas	GasFillPoint	Point
*-NGAS-PLUG	Utilities Gas	GasFitting	Point
*-NGAS-GASL	Utilities Gas	GasLine	Line
*-NGAS-HHOL	Utilities Gas	GasJunction	Point
*-NGAS-LITE	Utilities Gas	GasLight	Point
*-NGAS-MARK	Utilities Gas	GasMarker	Point
*-NGAS-METR	Utilities Gas	GasMeter	Point
*-NGAS-MHOL	Utilities Gas	GasJunction	Point
*-NGAS-PMPS	Utilities Gas	GasPumpStation	Point
*-NGAS-PUMP	Utilities Gas	GasPump	Point
*-NGAS-RECT	Utilities Gas	GasRectifier	Point
*-NGAS-REDC	Utilities Gas	GasReducer	Point
*-NGAS-SWBX	Utilities Gas	GasJunction	Point
*-NGAS-SRCE	Utilities Gas	GasSource	Point
*-NGAS-TANK	Utilities Gas	GasTank	Point
*-NGAS-UNKN	Utilities Gas	GasJunction	Point

CAD Layer Name	Category	Feature Class	Geometry
*-NGAS-ANOD	Utilities Gas	GasAnode	Point
*-NGAS-VLVE	Utilities Gas	GasValve	Point

1D.4.3.8 Utilities – Heating and Cooling System

CAD Layer Name	Category	Feature Class	Geometry
*-HVAC-ANCH	Utilities HCS	HeatCoolAnchorPoint	Point
*-HVAC-ANOD	Utilities HCS	HeatCoolAnode	Point
*-HVAC-ANOT	Utilities HCS	HeatCoolAnodeTestStation	Point
*-HVAC-COUT	Utilities HCS	HeatCoolFitting	Point
*-HVAC-PLUG	Utilities HCS	HeatCoolFitting	Point
*-HVAC-HCPA	Utilities HCS	HeatCoolPlantArea	Polygon
*-HVAC-HHOL	Utilities HCS	HeatCoolJunction	Point
*-HVAC-LINE	Utilities HCS	HeatCoolLine	Line
*-HVAC-METR	Utilities HCS	HeatCoolMeter	Point
*-HVAC-PUMP	Utilities HCS	HeatCoolPump	Point
*-HVAC-RECT	Utilities HCS	HeatCoolRectifier	Point
*-HVAC-REGL	Utilities HCS	HeatCoolRegulator	Point
*-HVAC-SIGN	Utilities HCS	HeatCoolMarker	Point
*-HVAC-VALT	Utilities HCS	HeatCoolVault	Polygon
*-HVAC-VLVE	Utilities HCS	HeatCoolValve	Point

1D.4.3.9 Utilities – Industrial Waste

CAD Layer Name	Category	Feature Class	Geometry
*-INDW-ANOD	Utilities Industrial Waste	IndustrialWasteAnode	Point
*-INDW-ANOT	Utilities Industrial Waste	IndustrialWasteAnodeTestSta	Point
*-INDW-DISC	Utilities Industrial Waste	IndustrialWasteDischargePoint	Point
*-INDW-EJEC	Utilities Industrial Waste	IndustrialWastePumpstnEjector	Point
*-INDW-FTTG	Utilities Industrial Waste	IndustrialWasteFitting	Point
*-INDW-GRIT	Utilities Industrial Waste	IndustrialWasteGritChamber	Point
*-INDW-HWLN	Utilities Industrial Waste	IndustrialWasteHeadwallLine	Line
*-INDW-HWPT	Utilities Industrial Waste	IndustrialWasteHeadwallPoint	Point
*-INDW-INLT	Utilities Industrial Waste	IndustrialWasteInlet	Point
*-INDW-JBOX	Utilities Industrial Waste	IndustrialWasteJunction	Point
*-INDW-LAGN	Utilities Industrial Waste	IndustrialWasteLagoon	Polygon
*-INDW-MAIN	Utilities Industrial Waste	IndustrialWasteLine	Line
*-INDW-METR	Utilities Industrial Waste	IndustrialWasteMeter	Point
*-INDW-NEUT	Utilities Industrial Waste	IndustrialWasteNeutralizer	Point
*-INDW-OILW	Utilities Industrial Waste	IndustrialWasteOilWatSep	Point
*-INDW-PLNT	Utilities Industrial Waste	IndustrialWasteTreatmentPlant	Polygon
*-INDW-PUMP	Utilities Industrial Waste	IndustrialWastePump	Point
*-INDW-RECT	Utilities Industrial Waste	IndustrialWasteRectPoint	Point

CAD Layer Name	Category	Feature Class	Geometry
*-INDW-SERV	Utilities Industrial Waste	IndustrialWasteLine	Line
*-INDW-SIGN	Utilities Industrial Waste	IndustrialWasteMarker	Point
*-INDW-STOR	Utilities Industrial Waste	IndustrialWasteStorageArea	Polygon
*-INDW-TANK	Utilities Industrial Waste	IndustrialWasteTank	Point
*-INDW-VLVE	Utilities Industrial Waste	IndustrialWasteValve	Point

1D.4.3.10 Utilities – Storm Drainage

CAD Layer Name	Category	Feature Class	Geometry
*-STRM-BASN	Utilities Storm	StormDrainageBasin	Polygon
*-STRM-COUT	Utilities Storm	StormFitting	Point
*-STRM-CPTR	Utilities Storm	StormCeptor	Point
*-STRM-DISC	Utilities Storm	StormDischargePoint	Point
*-STRM-DIVL	Utilities Storm	StormDrainageDivideLine	Line
*-STRM-DWNS	Utilities Storm	StormDownspout	Point
*-STRM-FLCD	Utilities Storm	StormFlowControlDevice	Point
*-STRM-FLTR	Utilities Storm	StormFilter	Point
*-STRM-PLUG	Utilities Storm	StormFitting	Point
*-STRM-GATE	Utilities Storm	StormGate	Point
*-STRM-HDWL	Utilities Storm	StormHeadwallLine	Line
*-STRM-HDWP	Utilities Storm	StormHeadwallPoint	Point
*-STRM-INLT	Utilities Storm	StormInlet	Point
*-STRM-HHOL	Utilities Storm	StormJunction	Point
*-STRM-LINE	Utilities Storm	StormLine	Line
*-STRM-SIGN	Utilities Storm	StormMarker	Point
*-STRM-MHOL	Utilities Storm	StormJunction	Point
*-STRM-OILW	Utilities Storm	StormOilWaterSeparator	Point
*-STRM-OPEN	Utilities Storm	StormOpenDrainageArea	Polygon
*-STRM-OWDV	Utilities Storm	StormOWSDiversionVault	Polygon
*-STRM-PSTA	Utilities Storm	StormPumpStation	Point
*-STRM-PUMP	Utilities Storm	StormPump	Point
*-STRM-RPNT	Utilities Storm	StormReservoir	Point
*-STRM-STIL	Utilities Storm	StormStillingBasin	Point
*-STRM-SWBX	Utilities Storm	StormJunction	Point
*-STRM-TRDL	Utilities Storm	StormTrenchDrainLine	Line
*-STRM-UNKN	Utilities Storm	StormJunction	Point
*-STRM-VLVE	Utilities Storm	StormValve	Point

1D.4.3.11 Utilities - Wastewater

CAD Layer Name	Category	Feature Class	Geometry
*-SSWR-ANOD	Utilities Wastewater	WastewaterAnode	Point
*-SSWR-ANOT	Utilities Wastewater	WastewaterAnodeTestStation	Point

CAD Layer Name	Category	Feature Class	Geometry
*-SSWR-COUT	Utilities Wastewater	WastewaterFitting	Point
*-SSWR-DFLD	Utilities Wastewater	WastewaterDrainField	Polygon
*-SSWR-DSCH	Utilities Wastewater	WastewaterDischargePoint	Point
*-SSWR-DWNS	Utilities Wastewater	WastewaterDownspout	Point
*-SSWR-EJEC	Utilities Wastewater	WastewaterPumpEjectorStation	Point
*-SSWR-FLTR	Utilities Wastewater	WastewaterFiltrationBed	Polygon
*-SSWR-PLUG	Utilities Wastewater	WastewaterFitting	Point
*-SSWR-GRIT	Utilities Wastewater	WastewaterGritChamber	Point
*-SSWR-GRSE	Utilities Wastewater	WastewaterGreaseTrap	Point
*-SSWR-INLT	Utilities Wastewater	WastewaterInlet	Point
*-SSWR-HHOL	Utilities Wastewater	WastewaterJunction	Point
*-SSWR-LAGN	Utilities Wastewater	WastewaterLagoon	Polygon
*-SSWR-METR	Utilities Wastewater	WastewaterMeter	Point
*-SSWR-MHOL	Utilities Wastewater	WastewaterJunction	Point
*-SSWR-NEUT	Utilities Wastewater	WastewaterNeutralizer	Point
*-SSWR-OILW	Utilities Wastewater	WastewaterOilWaterSeparator	Point
*-SSWR-PIPE	Utilities Wastewater	WastewaterLine	Line
*-SSWR-PLNT	Utilities Wastewater	WastewaterTreatmentPlant	Polygon
*-SSWR-PUMP	Utilities Wastewater	WastewaterPump	Point
*-SSWR-RECT	Utilities Wastewater	WastewaterRectifier	Point
*-SSWR-SBED	Utilities Wastewater	WastewaterSludgeBed	Polygon
*-SSWR-SERV	Utilities Wastewater	WastewaterLine	Line
*-SSWR-SIGN	Utilities Wastewater	WastewaterMarker	Point
*-SSWR-SWBX	Utilities Wastewater	WastewaterJunction	Point
*-SSWR-TANK	Utilities Wastewater	WastewaterDisposalTank	Point
*-SSWR-TRET	Utilities Wastewater	WastewaterTreatmentUnit	Point
*-SSWR-UNKN	Utilities Wastewater	WastewaterJunction	Point
*-SSWR-VLVE	Utilities Wastewater	WastewaterValve	Point

1D.4.3.12 Utilities - Water

CAD Layer Name	Category	Feature Class	Geometry
*-DOMW-ANOD	Utilities Water	WaterAnode	Point
*-DOMW-ANOT	Utilities Water	WaterAnodeTestStation	Point
*-DOMW-DWSP	Utilities Water	WaterDrinkingWaterSamplePoint	Point
*-DOMW-COUT	Utilities Water	WaterFitting	Point
*-DOMW-FCPT	Utilities Water	WaterFireConnectionPoint	Point
*-DOMW-PLUG	Utilities Water	WaterFitting	Point
*-DOMW-HYDR	Utilities Water	WaterHydrant	Point
*-DOMW-INTL	Utilities Water	WaterIntakeLine	Line
*-DOMW-INTP	Utilities Water	WaterIntake	Point
*-DOMW-HHOL	Utilities Water	WaterJunction	Point
*-DOMW-MAIN	Utilities Water	WaterLine	Line

CAD Layer Name	Category	Feature Class	Geometry
*-DOMW-METR	Utilities Water	WaterMeter	Point
*-DOMW-MHOL	Utilities Water	WaterJunction	Point
*-DOMW-PIGP	Utilities Water	WaterPigLaunchPoint	Point
*-DOMW-PLNT	Utilities Water	WaterTreatmentPlant	Polygon
*-DOMW-PSTA	Utilities Water	WaterPumpStation	Polygon
*-DOMW-PUMP	Utilities Water	WaterPump	Point
*-DOMW-RECT	Utilities Water	WaterRectifier	Point
*-DOMW-REDC	Utilities Water	WaterPressureReducingStation	Point
*-DOMW-RSVR	Utilities Water	WaterReservoirArea	Polygon
*-DOMW-SERV	Utilities Water	WaterLine	Line
*-DOMW-SIGN	Utilities Water	WaterMarker	Point
*-DOMW-SRCE	Utilities Water	WaterSourceSite	Point
*-DOMW-SWBX	Utilities Water	WaterJunction	Point
*-DOMW-TANK	Utilities Water	WaterTank	Point
*-DOMW-TRET	Utilities Water	WaterTreatmentUnit	Polygon
*-DOMW-UNKN	Utilities Water	WaterJunction	Point
*-DOMW-VENT	Utilities Water	WaterVent	Point
*-DOMW-VLVE	Utilities Water	WaterValve	Point

1E.1 - Feature Types

This appendix lists each of the 88 GIS feature types defined by this document. MAA's GIS Data Standard also includes 271 utility feature types, which are defined in Appendix 1E.3 – Utilities Supplement.

The feature types defined in this document are grouped into categories (i.e., Airfield, Airspace, Environmental, etc.) for ease of use. For each feature type, the class name, geometry type, sensitivity level, and a definition are provided. Suggested accuracies are also provided. Accuracies are indicated at a reasonable level that will meet a broad range of end user requirements. Individual project scopes, technical limitations and other factors may require data to be of a higher or lower level of accuracy. Attributes are also provided along with their type and definition. The following figure provides a key to the information provided within this Appendix.

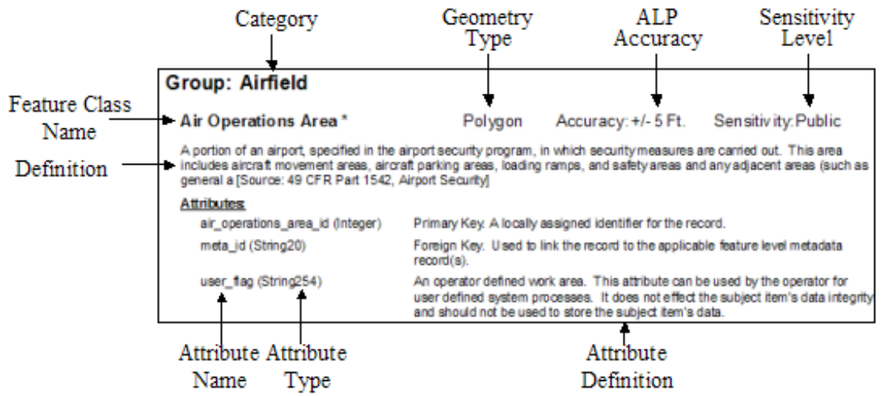


Figure 1. Appendix 1 Legend

Data Set: Airfield

Airfield : Aircraft Gate Stand

(Database Feature Class Name = AircraftGateStand; FAA=AircraftGateStand)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

Geographic position of painted stand positions on the stand guidance line usually marked by a yellow crossbar according to aircraft type (e.g., for B-747, A-340).

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
gateStandType (CodeGateStandType)	The type of aircraft gate/stand.
wingspan (Integer)	The quantity representing the maximum wingspan which can be accommodated at the aircraft gate stand.
length (Integer)	The overall length of the aircraft gate stand.
width (Integer)	The overall width of the aircraft gate stand.
pavementClassificationNumber (String10)	A number which expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load.[AC 150/5335-5A].
jetwayAvailability (CodeBoolean)	Indicates if a jetway or passenger loading bridge is available for use at the designated location.
towingAvailability (CodeBoolean)	Indicates if towing is available at the designated location.
dockingAvailability (CodeBoolean)	Indicates if docking light system is available at the designated location.
groundPowerAvailability (CodeBoolean)	Indicates the availability of ground power at the designated location.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Aircraft Non Movement Area

(Database Feature Class Name = AircraftNonMovementArea; FAA=AircraftNonMovementArea)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

Taxiways and apron (ramp) areas not under the control of air traffic.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Airfield Light

(Database Feature Class Name = AirfieldLight; FAA=AirfieldLight)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

Not used, use Electrical Light. Any lighting located within or near an airport boundary that provides guidance for airborne and ground maneuvering of aircraft. [AIM, AC 150/5340-24].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Use this attribute to identify the use of the light such as Runway Edge Light, Taxiway Edge Light, Taxiway Centerline Light, etc.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
lightingType (CodeLightingConfigurationType)	A description of the lighting system. Lighting system classifications are Approach; Airport; Runway; Taxiway; and Obstruction
color (CodeColor)	The color of the airfield light.
luminescence (Integer)	The luminescence of the airfield light specified in candellas (cd).
pilotControlFrequency (Real)	The radio frequency used by pilots to control various airport lighting systems

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Air Operations Area

(Database Feature Class Name = AirOperationsArea; FAA=AirOperationsArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Unclassified

Air Operations Area is where security measures are enforced as specified in the airport security program. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas and any adjacent areas (such as general aviation [49 CFR Part 1542, Airport Security*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Airport Sign

(Database Feature Class Name = AirportSign; FAA=AirportSign)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

Signs at an airport other than surface painted signs. [AC 150/5340-18].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the improvement feature.
signType (CodeSignTypeCode)	The type of sign.
height (Real)	The overall height of the feature.
message (String254)	The text message that appears on the sign.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Apron

(Database Feature Class Name = Apron; FAA=Apron)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A defined area on an airport or heliport, paved or unpaved, intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. [FAA].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
apronType (CodeApronType)	A classification of the typical use for the apron
numberOfTiedowns (Integer)	The approximate number of tiedowns in the surface.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
pavementClassificationNumber (String10)	A number that expresses the relative load-carrying capacity of a pavement in terms of a standard single wheel load[AC 150/5335-5A].
fuel (CodeFuel)	Code indicating the types of fuel available at the apron or deliverable to the apron.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Arresting Gear

(Database Feature Class Name = ArrestingGear; FAA=ArrestingGear)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

Location of the arresting gear cable across the runway. [RTCA DO-272].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature

airportFacilityType (CodeOperationsType)	Type of airfield.
owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Deicing Area

(Database Feature Class Name = DeicingArea; FAA=DeicingArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Unclassified

An aircraft deicing facility is a facility where: (1) frost, ice, or snow is removed (deicing) from the aircraft in order to provide clean surfaces and/or (2) clean surfaces of the aircraft receive protection (anti-icing) against the formation of frost or [AC 150/5300-13*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A brief description of the area and any special characteristics.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Frequency Area

(Database Feature Class Name = FrequencyArea; FAA=FrequencyArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Unclassified

Area specifying the designated part of the surface movement area where a specific frequency is required by ATC or ground control. If there is only one frequency area for the airport, the polygon must cover the total air operations area. [RTCA DO-272].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature

station (String30)	Service or Station assigned to primary frequency (e.g., ATC Tower, Ground Control)[RTCA DO-272].
frequency (Real)	Primary frequency used on frequency area (in MHZ).[RTCA DO-272].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Marking Area

(Database Feature Class Name = MarkingArea; FAA=MarkingArea)

Geometry Type: Polygon Accuracy: +/-2Ft. Sensitivity: Unclassified

Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. An element of marking whose geometry is a polygon. [AC 150/5340-1 and RTCA DO-272].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the feature.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
color (CodeColor)	The color of the marking

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Marking Line

(Database Feature Class Name = MarkingLine; FAA=MarkingLine)

Geometry Type: Line Accuracy: +/-2Ft. Sensitivity: Restricted

Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. An element of marking whose geometry is a line. [AC 150/5340-1, RTCA/DO-272].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the feature.

markingFeatureType (CodeMarkingFeatureType) The type of the marking
color (CodeColor) The color of the marking

Metadata:

projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20) A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus) A temporal description of the operational status of the feature.
Alternative (Integer) Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254) An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource) The source of the data in this record.
sourceStatement (String255) A statement providing additional details about the source of the data.
editorName (String50) The name of the individual who last edited this data.
lastUpdate (Date) The date upon which any data associated with this record was last updated.

System Keys:

guid (String60) A globally unique identifier applied to each feature in the database for reference.
metaId (Integer) An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Movement Area

(Database Feature Class Name = MovementArea; FAA=MovementArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

Runways, taxiways, and other areas of an airport used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas. [14 CFR Part 139].

Names and Identifiers:

id (String40) A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60) An alternative or former name by which the feature is referred.

Attributes:

name (String50) Name of the feature
description (String255) Description of the feature

Metadata:

projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20) A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus) A temporal description of the operational status of the feature.
Alternative (Integer) Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254) An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource) The source of the data in this record.
sourceStatement (String255) A statement providing additional details about the source of the data.
editorName (String50) The name of the individual who last edited this data.
lastUpdate (Date) The date upon which any data associated with this record was last updated.

System Keys:

guid (String60) A globally unique identifier applied to each feature in the database for reference.
metaId (Integer) An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Passenger Loading Bridge

(Database Feature Class Name = PassengerLoadingBridge; FAA=PassengerLoadingBridge)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A bridge for loading/unloading access to airplanes for passengers and crew.

Names and Identifiers:

id (String40) A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50) Name, code or identifier used to identify the loading bridge.
alias (String60) An alternative or former name by which the feature is referred.

Attributes:

description (String255) Description of the feature
loadingBridgeType (CodeLoadingBridgeType) Code indicating the type of loading bridge.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Restricted Access Boundary

(Database Feature Class Name = RestrictedAccessBoundary; FAA=RestrictedAccessBoundary)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Confidential

A restricted area boundary identifies areas strictly reserved for use by authorized personnel only. [NGS*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	A common name for the restricted area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the restricted area.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway

(Database Feature Class Name = Runway; FAA=Runway)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A rectangular area on a airport prepared for the landing and takeoff run of aircraft. [AC 150/5300-13*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
runwayDesignator (String7)	Designator of the runway based on the magnetic bearing and position in relation to parallel runways (e.g. 33R/15L)[AC 150/5340-1].

Attributes:

description (String255)	Description of the feature
width (Real)	A perpendicular line to the surface centerline, extending to the edge of the runway pavement on both sides of the runway, through a runway end-point. If the runway width is less than 100 feet, the width is rounded up to the nearest 5 feet. If the runway w[NGS].
length (Real)	The straight line distance between runway end points. This line does not account for surface undulations between points. Official runway lengths are normally computed from runway end coordinates and elevations.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].

pavementClassificationNumber (String10)	A number that expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load[AC 150/5335-5A].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Arresting Area

(Database Feature Class Name = RunwayArrestingArea; FAA=RunwayArrestingArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

Any FAA-approved high energy absorbing material of a specific strength that will reliably and predictably bring an aircraft to a stop without imposing loads that exceed the aircraft's design limits, cause major structural damage, or impose excessive force [AC 150/5220-22*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	A common name for the arresting area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the arresting area.
length (Real)	The overall length of the feature.
width (Real)	The overall width of the feature.
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
Setback (Integer)	The distance the EMAS begins beyond the end of the runway.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Blast Pad

(Database Feature Class Name = RunwayBlastPad; FAA=RunwayBlastPad)

Geometry Type: Polygon Accuracy: +/-2Ft. Sensitivity: Restricted

A specially prepared surface placed adjacent to the ends of runways to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their takeoff rolls. [AC 150/5300-13].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
length (Integer)	The length of clearway as measured. Compare the measure value to the value reported in the government flight information publications.
pavementClassificationNumber (String10)	A number that expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load[AC 150/5335-5A].
runwayEndDesignator (String3)	Specify runwayEnd designator to identify which runway end the Blast Pad is on.
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Centerline

(Database Feature Class Name = RunwayCenterline; FAA=RunwayCenterline)

Geometry Type: Line Accuracy: +/-1Ft. Sensitivity: Restricted

Continuous line along the painted centerline of a runway connecting the middle-points of the two outermost thresholds. Centerline is composed of many centerline points (see RunwayControlPoint). It is used to calculate grade and line-of-sight criteria. [AC 150/5300-13].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
runwayDesignator (String7)	Designator of the runway based on the magnetic bearing and position in relation to parallel runways (e.g. 33R/15L)[AC 150/5340-1].
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature

Metadata:

isDerived (CodeBoolean)	Indicates whether the centerline is derived or photo determined.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Element

(Database Feature Class Name = RunwayElement; FAA=RunwayElement)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A section of the runway surface. The runway surface can be defined by a set of non-overlapping RunwaySegment polygons for pavement management purposes. RunwayElements may overlap Runway and RunwayIntersection features. Use RunwayElement to model the physi [AC 150/5335-5, AC 150/5320-12, AC 150/5320-17, AC 150/5320-6].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
runwayDesignator (String7)	Specify runway designator.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
pavementClassificationNumber (String10)	A number which expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load.[AC 150/5335-5A].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway End

(Database Feature Class Name = RunwayEnd; FAA=RunwayEnd)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Restricted

The end of the runway surface suitable for landing or takeoff runs of aircraft. Runway Ends describe the approach and departure procedure characteristics of a runway threshold. The Runway End is the same as the runway threshold when the threshold is not [NGS*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
runwayEndDesignator (String3)	The designator for the runway end (i.e. 32L)

Attributes:

description (String255)	Description of the feature
ellipsoidHeight (Real)	The height above the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question. Also called the geodetic height.[NGS].
approachCategory (CodeApproachCategory)	A grouping of aircraft based on 1.3 times their stall speed in the landing configuration at the certificated maximum flap setting and maximum landing weight at standard atmospheric conditions[AC 150/5300-13].
approachGuidance (CodeApproachGuidance)	The type of approach guidance in use for the runway end.
accelerateStopDistanceAvail (Real)	The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.[AC 150/5300-13].
magneticBearing (Real)	Magnetic runway bearing corresponding to threshold location valid at the day of data generation[RTCA DO-272].
trueBearing (Real)	True bearing corresponding to the landing direction[ICAO Annex 14].
designGroup (CodeDesignGroup)	A grouping of airplanes based on wingspan and or tailheight, whichever is greatest.[AC 150/5300-13].
displacedDistance (Integer)	The distance from the runway end to the landing threshold. When the thresholdType is normal, displacedDist = 0.
landingDistanceAvailable (Real)	The runway length declared available and suitable for a landing airplane.[AC 150/5300-13].
runwaySlope (Real)	Runway slope corresponding to landing direction.[RTCA DO-272].

takeOffDistanceAvailable (Real)	The takeoff run available plus the length of any remaining runway clearway beyond the far end of the takeoff run available.[AC 150/5300-13].
takeOffRunwayAvailable (Real)	The runway length declared available and suitable for the ground run of an airplane taking off[AC 150/5300-13].
touchdownZoneSlope (Real)	The longitudinal slope of the first 3000 feet of the runway beginning at the threshold.[FAA Specification 405].
touchdownZoneElevation (Real)	The highest elevation in the Touchdown Zone. The Touchdown Zone is the first 3,000 feet of the runway beginning at the threshold.[FAA Specification 405].
thresholdType (CodeThresholdType)	An description of the landing threshold: either normal or displaced

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Helipad Design Surface

(Database Feature Class Name = RunwayHelipadDesignSurface; FAA=RunwayHelipadDesignSurface)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

A three-dimensional surface that is used in runway or heliport/helipad design. [AC 150/5300-13].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.[SDSFIE Feature Table].
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
designSurfaceType (CodeDesignSurfaceType)	A description of the design surface
zoneUse (String50)	A description of the use of the zone.
determination (String255)	A formal declaration of the runway/helipad/heliport safety area condition with respect to standards and any requirement improvements[FAA Order 5200.8 and AC 150/5390-2].
determinationDate (String8)	The date the safety area determination was approved[FAA Order 5200.8 and AC 150/5390-2B].
zoneInnerWidth (Real)	The width of the narrow end of a trapezoidal shaped DesignSurface feature. This is normally the end that is closest to the landing surface[AC 150/5300-13 and 150/5390-2B].
zoneOuterWidth (Real)	The width of the wide end of a trapezoidal shaped DesignSurface feature. This is normally the end that is furthest from the landing surface.
zoneLength (Real)	The length of a trapezoidal shaped DesignSurface feature.
slope (Real)	The low to high gradient within the airspace.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Intersection

(Database Feature Class Name = RunwayIntersection; FAA=RunwayIntersection)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Confidential

The area in which two or more runways intersect.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
runwayDesignator1 (String7)	Designator of the 1st intersecting runway based on the magnetic bearing and position in relation to parallel runways (e.g. 33R/15L).
runwayDesignator2 (String7)	Designator of the 2nd intersecting runway based on the magnetic bearing and position in relation to parallel runways (e.g. 33R/15L).
runwayDesignator3 (String7)	Designator of the 3rd intersecting runway based on the magnetic bearing and position in relation to parallel runways (e.g. 33R/15L).

Attributes:

description (String255)	Description of the feature
pavementClassificationNumber (String10)	A number which expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load.[AC 150/5335-5A].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Label

(Database Feature Class Name = RunwayLabel; FAA=RunwayLabel)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Secret

The bottom center position of the runway designation marking. [NGS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
runwayEndDesignator (String3)	The designator of the associated runway

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Land and Hold Short Line

(Database Feature Class Name = RunwayLAHSO; FAA=RunwayLAHSO)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

Markings installed on a runway where an aircraft is to stop when the runway is normally used as a taxiway or used for Land and Hold Short Operations (LAHSO) as identified in a letter of agreement with the Air Traffic Control Tower (ATCT). A runway should [Order 7110.118*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
protectedRunwayDesignator (String7)	Unique runway identifier for the airport of the runway, if any, being protected by the LAHSO (when the LAHSO precedes a runway intersection). Example 17L/35R.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
color (CodeColor)	The color of the marking

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Runway Safety Area Boundary

(Database Feature Class Name = RunwaySafetyAreaBoundary; FAA=RunwaySafetyAreaBoundary)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

The boundary of the Runway Safety Area (RSA). [AC 150/53XX-XX (Vol. C)].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
runwayEndDesignator (String3)	Specific runway end designator.[FAA AC150/5300-18b].
determinationDate (String8)	Date the RSA determination was approved[FAA Order 5200.8].
determination (String255)	A formal declaration of the runway safety area condition with respect to standards and any requirement improvements[FAA Order 5200.8].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Shoulder

(Database Feature Class Name = Shoulder; FAA=Shoulder)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhance drainage; and blast protection. [AC 150/5300-13].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.[AC 150/5300-18b].
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.[AC 150/5300-18b].
shoulderType (CodeShoulderType)	Code for whether this is a runway shoulder or taxiway shoulder[SDSFIE Attribute Table].
length (Real)	The overall length of the airfield surface.[SDSFIE Attribute Table].
width (Real)	The overall width of the airfield surface.[SDSFIE Feature Table].
restricted (CodeBoolean)	An indicator as to whether access to the feature is restricted.
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
sequence (String5)	Sequential number of the element.
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Stopway

(Database Feature Class Name = Stopway; FAA=Stopway)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff without causing structural damage to the airplane. It is designated by the airp

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
length (Real)	The length of the designated stopway from the end of the runway
width (Real)	The overall width of the feature
runwayEndDesignator (String3)	Specify runwayEnd designator to identify which runway end the Stopway is on.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].

surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Taxiway Element

(Database Feature Class Name = TaxiwayElement; FAA=TaxiwayElement)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

Defined paths on an airport established for the taxiing of aircraft (excluding apron taxilanes) and intended to provide a link between one part of the airport and another. [AC 150-5300-13].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
taxiwayId (String50)	Taxiway element name. The name should be identical to the corresponding taxiway name. Multiple taxiway elements can have the same name. If two or more taxiways intersect the taxiway element intersection will be named after the predominant taxiway. If two[FAA Airports GIS].
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.[FGDC].
taxiwayType (CodeTaxiwayType)	The type of taxiway.
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
pavementClassificationNumber (String10)	A number which expresses the relative load carrying capacity of a pavement in terms of a standard single wheel load.[AC 150/5335-5A].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
directionality (CodeDirectionality)	Code used to define the directionality of traffic on the element.
sequence (String5)	Sequential number of the taxiway element.
surfaceType (CodeSurfaceType)	Type of different materials used to construct the surface.[NGS].
designGroup (CodeDesignGroup)	Identifies the design group used in the design of the taxiway[AC 150/5300-13].
length (Real)	Provides the length of the taxiwayElement polygon as measured along the centerline.[SDSFIE Feature Table].
width (Real)	Width of the taxiway.[SDSFIE Feature Table].
maximumSpeed (Integer)	Identifies the maximum speed for the taxiwayElement.
wingspan (Real)	Identifies the maximum aircraft wingspan which can traverse the taxiwayElement.[SDSFIE Feature Table].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Taxiway Holding Position

(Database Feature Class Name = TaxiwayHoldingPosition; FAA=TaxiwayHoldingPosition)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

A designated position at which taxiing aircraft and vehicles shall stop and hold position, unless otherwise authorized by the aerodrome control tower. [RTCA DO-272].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
runwayDesignator (String7)	The designator for the approaching runway.
taxiwayDesignator (String4)	The designator for the taxiway.

Attributes:

description (String255)	A description of the feature.
lowVisibilityCategory (CodeLowVisibilityCategory)	Code describing the Low visibility operation category of the TaxiwayHoldingPosition.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Taxiway Intersection

(Database Feature Class Name = TaxiwayIntersection; FAA=TaxiwayIntersection)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A junction of two or more taxiways (Source: ICAO Annex 14, Volume 1, Aerodromes, Chapter 1, page 5). [ICAO Annex 14 (Aerodromes), Chapter 1, page 5].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String40)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airfield : Touchdown Lift Off

(Database Feature Class Name = TouchdownLiftOff; FAA=TouchDownLiftOff)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Unclassified

A load-bearing, generally paved area, normally centered in the Final Approach and Takeoff Area (FATO), on which a helicopter lands or takes off. The Touchdown and Lift-off Area (TLOF) is frequently called a helipad or helideck.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A brief description of the area and any special characteristics.
length (Real)	The overall length of the TLOF.
width (Real)	The overall width of the TLOF.
surfaceType (CodeSurfaceType)	A classification of airfield pavement surfaces for Airport Obstruction Charts[NGS].
surfaceMaterial (CodeSurfaceMaterial)	A code indicating the composition of the related surface[NFDC].
surfaceCondition (CodeSurfaceCondition)	A description of the serviceability of the pavement[NFDC].
designHelicopter (String20)	A generic helicopter that reflects the maximum weight, maximum contact load/minimum contact area, overall length, rotor diameter, etc. of all helicopters expected to operate at the heliport.[AC 150/5390-2].
gradient (Real)	The gradient of the TLOF surface designed to provide positive drainage.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Airspace

Airspace : Landmark Segment

(Database Feature Class Name = LandmarkSegment; FAA=LandmarkSegment)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Unclassified

Features providing geographic orientation near the airport vicinity. The features may or may not have obstruction value. Collect geographic features of landmark value aiding in geographic orientation as individual polyline objects. [NGS*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String40)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
landmarkType (CodeLandmarkType)	Type of landmark feature

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airspace : Obstacle

(Database Feature Class Name = Obstacle; FAA=Obstacle)

Geometry Type: Point Accuracy: +/-20Ft. Sensitivity: Restricted

All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft, penetrating an Obstruction Identification Surface (OIS), or selected as representative object. Use [NGS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
obstructionNumber (String30)	Provide the Aeronautical Study Number assigned by the FAA in the appropriate format (if known).

Attributes:

description (String255)	Description of the feature.
obstacleType (CodeObstacleType)	The type of object.
obstacleSource (CodeObstacleSource)	Identify how or where the object was identified.
aboveGroundLevel (Real)	The vertical distance from the ground to the highest point of the object.
distanceFromDisplacedThreshold (Real)	Distance measured along runway centerline or centerline extended from a Displaced Threshold to point abeam the object. A negative distance indicates that the object is on the touchdown side of the runway approach end. This data is not provided for objects
distanceFromRunwayCenterline (Real)	Shortest distance from the runway centerline or centerline extended to the object. L (LEFT) or R (RIGHT) is relative to an observer facing forward in a landing aircraft. This data is not provided for objects penetrating the horizontal, conical and runway
distanceFromRunwayEnd (Real)	Distance measured along runway centerline or centerline extended from the physical end to point abeam the object. A negative distance indicates that the object is on the touchdown side of the runway approach end. This data is not provided for objects pene
groupCode (String75)	A text code indicating that the object consists of a group of objects of the same type. For example, a group of trees, a group of buildings, a group of antennas, etc[AIXM].
heightAboveAirport (Integer)	Height above airport the official airport elevation point[NGS].
heightAboveRunway (Real)	Height above runway physical end for objects located underneath the approach surface.
heightAboveTouchdownZone (Real)	Height above touchdown zone elevation for objects located underneath the approach surface.
lightCode (CodeBoolean)	A code indicating that the obstacle is lighted[AIXM].
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
penValSpecified (Integer)	The elevation difference between the height of the object and the specified surface. Used to identify the amount of penetration of the main OIS.
penValSupplemental (Integer)	The elevation difference between the height of the object and the supplemental surface. Used to identify the amount of penetration to a secondary OIS.
ellipsoidHeight (Real)	The height above the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.
disposition (String16)	What was done to obstruction[Airport].
oisSurfaceCondition (CodeOisSurfaceCondition)	The Obstruction Identification Surface that Obstructing Area represents
frangible (CodeBoolean)	A Boolean indicating whether the object is frangible.
faaCoordinationCode (CodeBoolean)	A Boolean indicating whether the obstruction has received FAA coordination or review.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airspace : Obstruction Area

(Database Feature Class Name = ObstructionArea; FAA=ObstructionArea)

Geometry Type: Polygon Accuracy: +/-20Ft. Sensitivity: Restricted

Polygon features penetrating the plane of the obstruction identification surface (OIS) or selected as representative objects. Determine the type of obstructing area by the predominant feature within the grouped area. Penetrating groups of trees, ground, b

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
obstructionNumber (String30)	Provide the Aeronautical Study Number assigned by the FAA in the appropriate format (if known).

Attributes:

description (String255)	Description of the feature
obstacleType (CodeObstacleType)	The type of object.
obstacleSource (CodeObstacleSource)	Identify how or where the object was identified.
aboveGroundLevel (Real)	The vertical distance from the ground to the highest point of the object.
distanceFromDisplacedThreshold (Real)	Distance measured along runway centerline or centerline extended from a Displaced Threshold to point abeam the object. A negative distance indicates that the object is on the touchdown side of the runway approach end. This data is not provided for objects
distanceFromRunwayCenterline (Real)	Shortest distance from the runway centerline or centerline extended to the object. L (LEFT) or R (RIGHT) is relative to an observer facing forward in a landing aircraft. This data is not provided for objects penetrating the horizontal, conical and runway
distanceFromRunwayEnd (Real)	Distance measured along runway centerline or centerline extended from the physical end to point abeam the object. A negative distance indicates that the object is on the touchdown side of the runway approach end. This data is not provided for objects pene
groupCode (String75)	A text code indicating that the object consists of a group of objects of the same type. For example, a group of trees, a group of buildings, a group of antennas, etc[AIXM].
heightAboveAirport (Integer)	Height above airport the official airport elevation point[NGS].
heightAboveRunway (Real)	Height above runway physical end for objects located underneath the approach surface.
heightAboveTouchdownZone (Real)	Height above touchdown zone elevation for objects located underneath the approach surface[NGS].
lightCode (CodeBoolean)	A code indicating that the obstacle is lighted[AIXM].
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
penValSpecified (Integer)	The elevation difference between the height of the object and the specified surface. Used to identify the amount of penetration of the main OIS.
penValSupplemental (Integer)	The elevation difference between the height of the object and the supplemental surface. Used when to identify the amount of penetration to a secondary OIS.
obstructionAreaType (CodeObstructionAreaType)	Type of obstructing area.
disposition (String255)	The disposition of the airspace obstruction.
oisSurfaceCondition (CodeOisSurfaceCondition)	The Obstruction Identification Surface that Obstructing Area represents
length (Real)	The overall length of the obstruction.
width (Real)	The overall width of the obstruction.
frangible (CodeBoolean)	A Boolean indicating whether the object is frangible.
faaCoordinationCode (CodeBoolean)	A Boolean indicating whether the obstruction has received FAA coordination or review.
ellipsoidHeight (Real)	The height above the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airspace : Obstruction Identification Surface

(Database Feature Class Name = ObstructionIdSurface; FAA=ObstructionIdSurface)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

A derived imaginary Obstruction Identification Surface defined by the FAA. [NGS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

name (String50)	A commonly used name for the zone.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
runwayDesignator (String7)	Specify runway designator for the Vertically Guided Runway Primary Surface (VGRPS), for the Vertically Guided Primary Connection Surface (VGPCS), and for the Vertically Guided Approach Transitional Surface (VGATS).
runwayEndDesignator (String3)	Specify runwayEnd designator for the Vertically Guided Approach Surface (VGAS) and for the Vertically Guided Protection Surface (VGPS).[FAA AC150/5300-18b].
oisSurfaceType (CodeOisSurfaceType)	Surface Type refers to the general type of surface used to analyze features. Surfaces of the same type usually are similar in nature with respect to certain aspects of the surface definition or may merely be representative of different programs within the
oisZoneType (CodeOisZoneType)	Specifies zones within Obstruction Identification Surfaces (OIS)
oisSurfaceCondition (CodeOisSurfaceCondition)	The Obstruction Identification Surface that Obstructing Area represents
safetyRegulation (String20)	An identifier for the safety regulations in effect within the zone.
zoneUse (String50)	A description of the use of the zone.
approachGuidance (CodeApproachGuidance)	Defines the type of approach guidances the OIS is meant to protect.
slope (Real)	The low to high gradient within the airspace expressed as a ratio x:1, where X is the slope value. For example 40:1 for departures.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Airspace : Runway Protection Area

(Database Feature Class Name = RunwayProtectArea; FAA=RunwayProtectArea)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Confidential

An area beyond the takeoff runway under control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations, and the size and upward slope of the

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature
length (Real)	The length of clearway as reported by the FAA Airport/Facility Directory and the Aeronautical Information Publication (AIP) for international airports
type (CodeRunwayProtectionAreaType)	Code indicating the type of runway protection area being classified.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Cadastral

Cadastral : Airport Boundary

(Database Feature Class Name = AirportBoundary; FAA=AirportBoundary)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A polygon, or a set of polygons, that encompasses all property owned or controlled by the airport for aviation purposes. [AC 150/5300-13, Appendix 7, Order 5190.6A, Section 5].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
faaSiteNumber (String8)	This is a number that contains a one-letter suffix. The number is assigned to the airport in ascending order, depending on the state and the associated city. If you do not know or have access to the appropriate site number contact your airports district/r[FAA AC 150/5200-35].
alias (String60)	An alternative or former name by which the feature is referred.
faaLocationId (String4)	The location identifier assigned to the feature by FAA
iataCode (String4)	The location identifier assigned to the feature by International Air Transport Association (IATA)
icaoCode (String4)	The location identifier assigned to the airport by the ICAO

Attributes:

description (String255)	Description of the feature
airportFacilityType (CodeAirportFacilityType)	The type of airfield.
operationsType (CodeOperationsType)	The type of operations permitted on the airfield
owner (Enumeration60)	The type of owner of the airfield

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Airport Parcel

(Database Feature Class Name = AirportParcel; FAA=AirportParcel)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

A tract of land within the airport boundary acquired from surplus property, Federal funds, local funds, etc. Include easement interests in areas outside the fee property line as an airport parcel. [FAA Order 5190.6, Chapter 5].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
grantProjectNumber (String30)	The grant number if Federal funds were used to acquire the parcel
parcelNumber (String12)	Any locally used number to identify the parcel.

Attributes:

description (String255)	Description of the feature
authority (String75)	The owner of the airport parcel
acquisitionType (CodeAcquisitionType)	The type of acquisition used to acquire the parcel
costToAcquire (Real)	The amount paid to the owner in U.S. dollars for the parcel
dateAcquired (String8)	The date the parcel was acquired. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915).
howAcquired (CodeHowAcquired)	The manner in which the parcel was acquired
marketValue (Real)	The assessed market value of the parcel in U.S. dollars when it was acquired

yearAssessed (Integer)	The year in which the market value assessment was made
yearBuilt (Integer)	The year in which the most recent structure(s) were built on the parcel
useOfParcel (String16)	The current primary use of the airport parcel.
acquisitionPurpose (String50)	Acquisition purpose
area (Real)	The size of the area, zone, or polygon in square units.
assessedValue (Real)	The most recent assessed value of the airport parcel.
deedReference (String30)	Reference to where the deed to the airport parcel is recorded in such information as Plat Book and Page.
legalDescription (String240)	The complete legal description of the property as it appears in the deed.
passengerChargeNumber (String30)	Passenger Facility Charge Number
previousOwner (String75)	Previous owner of the airport parcel

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : County

(Database Feature Class Name = County; FAA=County)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

Boundary line of the land and water under the right, power, or authority of the county government. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
politicalName (String30)	The common name associated with the property area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	The description of the area.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Easements And Rights of Way

(Database Feature Class Name = EasementsAndRightsofWay; FAA=EasementsAndRightsofWay)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Confidential

A parcel of land for which formal or informal deed easement rights exist. [SDSFIE (modified)].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

status (CodeStatus)	The status of the parcel. (Active, inactive, terminated)
description (String255)	A brief description of the feature.
purpose (String30)	Project purpose for which the easement was acquired.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : FAA Region

(Database Feature Class Name = FaaRegionArea; FAA=FAARegionArea)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Unclassified

This feature depicts the FAA regions. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the FAA region.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the FAA region.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Land Use

(Database Feature Class Name = LandUse; FAA=LandUse)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Confidential

A description of the human use of land and water. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the land use area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the land use area.
useType (CodeLandUseType)	The way in which the land is being used.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Lease Area

(Database Feature Class Name = LeaseZone; FAA=LeaseZone)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Unclassified

A parcel of land or area within a building that is leased by an individual, agency, or organization for their use. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
tenantName (String75)	The current name of the tenant occupying the leased parcel.
alias (String60)	An alternative or former name by which the feature is referred.
cadPage (String10)	Reference to the hard copy page which this data has traditionally be plotted on.

Attributes:

lmsId (String10)	A foreign key link to the airports lease management system.
description (String255)	A brief description of the feature.
class (CodeSpaceClass)	The class of space utilization.
type (CodeSpaceType)	The type of space utilization.
permitUse (String20)	Permitted use of the leased parcel.
leasedArea (Real)	Area accounted for in the lease for a parcel.
actualArea (Real)	Actual measured area of the leased parcel.
expectedLeaseExpirationDate (String8)	The date the lease is expected to expire. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915).
legalDescription (String240)	The complete legal description of the property as it appears in the deed.
status (CodeStatus)	The status of the parcel. (Active, inactive, terminated)
subtenantName (String75)	The current name of the subtenant occupying the leased parcel or interior space.
tenantId (Integer)	A unique numeric ID assigned to the tenant occupying this space.
classId (Integer)	A unique numeric ID assigned to the space class.
typeId (Integer)	A unique numeric ID assigned to the space type.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Municipality

(Database Feature Class Name = Municipality; FAA=Municipality)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

Boundary line of the land and water under the right, power, or authority of the municipal government. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The common name associated with the property area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	The description of the area.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Parcel

(Database Feature Class Name = Parcel; FAA=Parcel)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

A single cadastral unit, which is the spatial extent of the past, present, and future rights and interests in real property and the geographic framework to support the description of the spatial extent. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
parcelNumber (String12)	Any locally used number to identify the parcel.
grantProjectNumber (String30)	The grant number if Federal funds were used to acquire the parcel

Attributes:

area (Real)	The size of the area, zone, or polygon in square units.
useOfParcel (String16)	The current primary use of the parcel.
name (String50)	The common name associated with the property area.
description (String255)	The description of the area.
legalDescription (String240)	The complete legal description of the property as it appears in the deed.
dateAcquired (String8)	The date the parcel was acquired by the current owner. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915).
assessedValue (Real)	The most recent assessed value of the parcel.
deedReference (String30)	Reference to where the deed to the parcel is recorded in such information as Plat Book and Page.
authority (String75)	The owner of the parcel
previousOwner (String75)	Previous owner of the parcel

acquisitionType (CodeAcquisitionType)	The type of acquisition used to acquire the parcel
acquisitionPurpose (String50)	Acquisition purpose
costToAcquire (Real)	The amount paid to the owner in U.S. dollars for the parcel
howAcquired (CodeHowAcquired)	The manner in which the parcel was acquired
marketValue (Real)	The assessed market value of the parcel in U.S. dollars when it was acquired
yearAssessed (Integer)	The year in which the market value assessment was made
yearBuilt (Integer)	The year in which the most recent structure(s) were built on the parcel

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : State

(Database Feature Class Name = State; FAA=State)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

Boundary line of the land and water under the right, power, or authority of the state government. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The common name associated with the property area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	The description of the area.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Cadastral : Zoning

(Database Feature Class Name = Zoning; FAA=Zoning)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Restricted

A parcel of land zoned specifically for real estate and land management purposes; more specifically for commercial, residential, or industrial use. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A brief description of the feature.
status (CodeStatus)	The status of the parcel. (Active, inactive, terminated)
landOwnerRestriction (String60)	Codes determining the land owner restriction for the parcel.[SDSFIE Feature Table].
zoningClassification (CodeZoningClass)	The zoning classification of the parcel.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Environmental

Environmental : Environmental Contamination Area

(Database Feature Class Name = EnvironmentalContaminationArea; FAA=EnvironmentalContaminationArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A facility or other locational entity, (as designated by the Environmental Protection Agency) that is regulated or monitored because of environmental concerns. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of a specific facility.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the source of the pollution.
environmentalHazardCategory (String16)	Indicates the broad category or type of the most prevalent or serious environmental hazard present at the site.
pollutantReleaseType (String16)	A descriptor for the type of pollutant release experienced.
severity (String16)	A descriptor for the severity of the pollution.
remediationUrgency (String16)	A code indicating the urgency for accomplishing a site remediation project.
toxicStatusOfPollutant (String16)	A descriptor for the toxic status of the pollution.
status (CodeStatus)	The code indicating whether the facility status is Active or Inactive.
dateFound (String8)	The date the pollution was discovered. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915)
cause (String16)	A code indicating the cause of the pollution.
pollutantSource (String16)	The actual or suspected source of the pollutant.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Fauna Hazard Area

(Database Feature Class Name = FaunaHazardArea; FAA=FaunaHazardArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

An area where there are hazards due to wildlife activities. This includes bird aircraft strike hazard (BASH) areas, and deer strike areas. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 240 characters.
hazardType (CodeHazardType)	A descriptor of the type of the hazard.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Flood Plain

(Database Feature Class Name = FloodZone; FAA=FloodZone)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Unclassified

Areas subject to 100-year, 500-year and minimal flooding. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
zoneType (CodeZoneType)	The zoning classification of the area

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Flora Species Site

(Database Feature Class Name = FloraSpeciesSite; FAA=FloraSpeciesSite)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Unclassified

The specific location where an individual flora species or an aggregate of flora species has been identified. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Any brief description of the feature.
plantType (String16)	A descriptor of the type of flora.
plantHeight (Real)	The average height of the flora species.
endangeredSpeciesActSite (CodeBoolean)	Defines if the habitat has been designated as a critical habitat under (C) the Endangered species Act or has not been so designated (N).

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Flora Habitat Area

(Database Feature Class Name = ForestStandArea; FAA=ForestStandArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A forest flora community with similar characteristics. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the flora species.
habitatCategory (String16)	Discriminator - The designation or type of the special wildlife habitat.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Hazardous Material Storage Site

(Database Feature Class Name = HazMatStorageSite; FAA=HazardousMaterialStorageSite)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Unclassified

A defined or bounded geographical area designated and used for the storage of contained hazardous materials. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 240 characters.
storeHazardousMaterialCategory (CodeHazardCategory)	The general type or category of contained hazardous material stored.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Noise Contour

(Database Feature Class Name = NoiseContour; FAA=NoiseContour)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Confidential

An area that describes the noise attributed to operations. For aircraft operations, the Day/Night average sound level (Ldn) descriptor is typically used to categorize noise levels. [14 CFR Part 150].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description for the noise zone.
contourValue (Real)	The decibel level of the contour line

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Noise Incident

(Database Feature Class Name = NoiseIncident; FAA=NoiseIncident)

Geometry Type: Point Accuracy: +/-50Ft. Sensitivity: Restricted

A formal complaint by an individual or group regarding excessive noise resulting from airport operations.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A general description of the complete incident, including any reference material.
reporter (String50)	The name of the individual or organization reporting the incident.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Noise Monitoring Point

(Database Feature Class Name = NoiseMonitoringPoint; FAA=NoiseMonitoringPoint)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Restricted

The location of noise sensing equipment or where a noise sample is taken. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Sample Collection Point

(Database Feature Class Name = SampleCollectionPoint; FAA=SampleCollectionPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Confidential

The physical location at which one or more environmental hazards field samples are collected. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
companyName (String60)	The name of the company that took the sample.

Attributes:

description (String255)	Descriptor providing any additional information to describe the sampling location in text format (e.g., monitoring well located 10 feet northeast of building 624 within spill area). IRPIMS.[SDSFIE Feature Table].
collectionPointLocation (CodeSamplePointLocation)	Code describing the type of location which is undergoing sampling (e.g., bh= borehole, wl=well).
coordX (Real)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Real)	The coordinate in the north-south plane, expressed in decimal degrees.
elevation (Real)	Elevation of the point relative to the selected vertical datum.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
dateSampleTaken (Date)	The date on which the sample was taken.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Shoreline

(Database Feature Class Name = Shoreline; FAA=Shoreline)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

The boundary where land meets the edge of a large body of fresh or salt water.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	A commonly used name for the shoreline.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A local description for the shoreline.
shorelineType (CodeShorelineType)	Discriminator - A value indicating the type or kind of shoreline.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Environmental : Wetland

(Database Feature Class Name = Wetland; FAA=Wetland)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

Transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. The soils are predominantly saturated with water and the plants and animals that live there are spe

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Any commonly used name for the wetland.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the wetland.
featureType (String16)	A descriptor of how the wetland is depicted graphically.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Geodetic

Geodetic : Airport Control Point

(Database Feature Class Name = AirportControlPoint; FAA=AirportControlPoint)

Geometry Type: Point Accuracy: +/-Ft. Sensitivity: Restricted

A control station established in the vicinity of, and usually on, an airport and tied to the National Spatial Reference System (NSRS). [NGS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
permanentId (String6)	Permanent point identifier assigned by NGS to PACS and SACS[NGS].
name (String50)	Any commonly used name for the control point.
alias (String60)	An alternative or former name by which the feature is referred.
stampedDesignation (String50)	The designation stamped onto the monument.

Attributes:

pointType (CodePointType)	Contains the allowable values of a point type used by the ControlPoint feature. The point types may be supplementally provided as subtypes of ControlPoints for ease of use and clarification.
runwayDesignator (String7)	Not applicable to this point type
runwayEndDesignator (String3)	Not applicable to this point type
monumentType (CodeMonumentType)	The type of monument as defined by the Corps of Engineers EM 110-1-1002.
description (String255)	The monument description.
ellipsoidHeight (Real)	The height above the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question. Also called the geodetic height.[NGS].
yearOfSurvey (Integer)	The year of the most recent runway end survey used to compute the ARP
dateRecovered (String8)	The date the monument was last field recovered. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915).
recoveredCondition (CodeRecoveredCondition)	The condition and type of the marker (witness post) used to identify the location of the monument.
fieldBook (String254)	The field book.
globalPositionSystemSuitable (CodeBoolean)	A Boolean indicating GPS suitability.

Metadata:

coordinateZone (CodeCoordinateZone)	The State Plane Coordinate System Code for where the airport is primarily located.
epoch (String10)	Survey epoch used to establish the control point.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Geodetic : Reference Grid Line

(Database Feature Class Name = CoordinateGridArea; FAA=CoordinateGridArea)

Geometry Type: Line Accuracy: +/-Ft. Sensitivity: Restricted

A regular pattern of horizontal and vertical lines used to represent regular coordinate intervals along the x and y axis. This grid line can be used to generate an arbitrary grid system which is common on locator maps.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name, code or identifier used to refer to an individual grid cell.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
gridType (CodeGridType)	Code indicating the type of grid.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Geodetic : Reference Grid Cell

(Database Feature Class Name = CoordinateGridCell)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Restricted

A regular pattern of horizontal and vertical lines used to represent regular coordinate intervals along the x and y axis. This grid line can be used to generate an arbitrary grid system which is common on locator maps. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Geodetic : Elevation Contour

(Database Feature Class Name = ElevationContour; FAA=ElevationContour)

Geometry Type: Line Accuracy: +/-Ft. Sensitivity: Restricted

Connecting points on the surface of the earth of equal vertical elevation representing some fixed elevation interval. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
length (Real)	The overall length of the feature.
contourValue (Real)	The elevation of the contour line.[SDSFIE Feature Table].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Geodetic : Image Area

(Database Feature Class Name = ImageArea; FAA=ImageArea)

Geometry Type: Polygon Accuracy: +/-Ft. Sensitivity: Confidential

The image foot print or coverage area. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
frameID (String20)	Image identification number of the covered area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.
photoDate (String8)	Date the aerial photography was flown. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915)

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Geodetic : Image Location

(Database Feature Class Name = ImageLocation)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Confidential

The location where an image was taken.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

caption (String255)	A textual title or short description used to define the primary subject of the image.
description (String255)	Textual details that provide further information about the primaery subject of the image.
heading (Real)	The heading (with 0 as true north) in which the camera was pointed when the image was taken
inclination (Real)	The degrees off he horizon (with 90 pointing straight up) at which the camera was pointed when the image was taken.
latitude (Real)	The latitude of the location of the camera when the image was taken.
longitude (Real)	The longitude of the location of the camera when the image was taken.
dateTaken (Date)	The date on which the image was taken.
timeTaken (Integer)	The time at which the image was taken.
fileDirectory (String255)	The local file directory in which the image file is located.
fileName (String40)	The name of the image file.
fileType (CodeImageType)	The type of image file format

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Interior

Interior : Baggage Carousel

(Database Feature Class Name = BaggageCarousel)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Baggage system carousels

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
carouselId (String60)	Common name associated with the feature.[Airport].
tenantName (CodeAirline)	The name of the current tenant using the baggage carousel.
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

direction (CodeDirection)	The direction of flow of baggage on the conveyor.

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Baggage Conveyor

(Database Feature Class Name = BaggageConveyor)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Baggage system conveyors

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
conveyorId (String60)	Common name associated with the feature.[Airport].
tenantName (CodeAirline)	The name of the current tenant using the baggage conveyor.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
direction (CodeDirection)	The direction of flow of baggage on the conveyor.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Column

(Database Feature Class Name = BuildingColumn)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Structural columns of a building

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
columnId (String10)	A unique identifier assigned to the Column.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

columnShape (CodeShape)	The shape of the horizontal cross section of the column.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
material (CodeMaterialType)	The type of material the column is made of.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Building Zone

(Database Feature Class Name = BuildingZone)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A subsection of a building used for reference purposes.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Any brief description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Ceiling Tile

(Database Feature Class Name = CeilingTile)

Geometry Type: Line Accuracy: +/-1Ft. Sensitivity: Confidential

The edge of tiles used to form a ceiling over an interior space.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	The name of the pumping station.[HSIP].
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

type (String40)	Type of feature[AC 150/5300-18b].
description (String255)	Textual description of the feature.[FGDC].
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Chase

(Database Feature Class Name = Chase)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Area of a building used for passing utilities from one floor to another.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
chaseId (String10)	A unique identifier assigned to the Chase.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Column Grid

(Database Feature Class Name = ColumnGrid)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Confidential

An area inside of a building between three or more building columns that is used for identification and referencing purposes.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Column Line

(Database Feature Class Name = ColumnLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Confidential

A line conncting two or more columns within a building that is used for reference purposes.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Display Case

(Database Feature Class Name = DisplayCase)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Restricted

Leasable items that are not represented in the InteriorExteriorSpace feature class. These items typically overlap with polygons in the InteriorExteriorSpace feature class, and represent other leasable assets as represented in the Authority's property/leas

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Door

(Database Feature Class Name = Door)

Geometry Type: Line Accuracy: +/-0.5Ft. Sensitivity: Restricted

Line where door is located within a wall

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String40)	The name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
roomId (String20)	An identifier assigned to the room to which this door leads
spaceId (String20)	An identifier that is uniquely assigned to this feature for identification purposes.

Attributes:

doorType (CodeDoorType)	The type of door.
fireRated (CodeBoolean)	Boolean to indicate whether door is a fire door or not[SDSFIE Attribute Table].

fireTime (Integer)	Time in hours for which a fire door is rated[SDSFIE Attribute Table].
isSecure (CodeBoolean)	Boolean for whether door provides access to a secure area[SDSFIE Attribute Table].
accessedArea (CodeAccess)	The area which is accessed to / from the door.
accessRestriction (CodeRestrictionType)	Type of equipment installed to restrict access[SDSFIE Attribute Table].
isAlarmed (CodeBoolean)	Boolean for whether door is connected to an alarm that will sound if it is openned without authorization.
description (String255)	Description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Elevator

(Database Feature Class Name = Elevator)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Area of a floor where an elevator shaft is located

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
elevatorId (String25)	A unique identifier assigned to the Elevator.
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

elevType (String20)	Code for the type of elevator[SDSFIE Attribute Table].
accessRestriction (CodeRestrictionType)	Type of equipment installed to restrict access.[SDSFIE Attribute Table].
fromLevel (CodeFloorLevel)	The lowest level of the building served by the elevator.
toLevel (CodeFloorLevel)	The highest level of the building served by the elevator.
fromLevelRestricted (CodeFloorLevel)	The lowest level of the building served by the elevator, where access is restricted.
toLevelRestricted (CodeFloorLevel)	The highest level of the building served by the elevator, where access is restricted.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
floors (Integer)	The number of floors served by the elevator.[SDSFIE Attribute Table].
secure (CodeBoolean)	Boolean for whether elevator provides access to a secure area[SDSFIE Attribute Table].
description (String255)	Description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Escalator

(Database Feature Class Name = Escalator)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Area of a floor occupied by escalators

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
escalatorId (String25)	A unique identifier assigned to the Escalator.
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
manufacturerName (String60)	The coomon name used to refer to the manufacturer.
modelNumber (String20)	The model number assigned by the manufacturer.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Floor

(Database Feature Class Name = Floor)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Floor outline of a building

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
floorName (String50)	Name of the building floor.[SDSFIE Feature Table].
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

usableArea (Real)	Usable or net area of the building floor. The sum of usable areas on the building floor (i.e., business and common) which can vary over the life of a building as corridors expand and contract as floors are remodeled.[SDSFIE Feature Table].

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Flooring Material

(Database Feature Class Name = FlooringMaterial)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

Are of floor with a common material type.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

type (String60)	Common name associated with the feature.[Airport].

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Furnishing

(Database Feature Class Name = Furnishing)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

The location of various interior furnishings

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.

buildingName (String60)	The name of the building associated with this feature.

Attributes:

type (String60)	Common name associated with the feature.[Airport].
modelNumber (String20)	The model number assigned by the manufacturer.
manufacturerName (String60)	The coomon name used to refer to the manufacturer.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Interior Sign

(Database Feature Class Name = InteriorSign)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

Signs located inside of a building.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
interiorSignId (String10)	A unique identifier assigned to the InteriorSign.
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
spaceId (String20)	An identifier that is uniquely assigned to this feature for identification purposes.

Attributes:

messageA (String255)	The primary text message which appears on the sign.
messageB (String255)	A secondary text message which appears on the sign.
modelNumber (String20)	The model number assigned by the manufacturer.
manufacturerName (String60)	The coomon name used to refer to the manufacturer.
dateInstalled (Date)	The date on which the feature was originally installed.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Ladder

(Database Feature Class Name = Ladder)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

The location of a ladder for accessing another floor or roof of a building.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
ladderId (String10)	A unique identifier assigned to the Ladder.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
spaceID (String20)	An identifier that is uniquely assigned to this feature for identification purposes.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Maintenance Responsibility Area

(Database Feature Class Name = MaintenanceResponsibilityArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An area on interior space assigned to a single enity to maintain.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

responsibleParty (String60)	A code representing the party who is responsible for performing maintenance in the designated area.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Moving Sidewalk

(Database Feature Class Name = MovingSidewalk)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Area of a floor occupied by a moving sidewalk

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
sidewalkId (String60)	Common name associated with the feature.[Airport].
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
modelNumber (String20)	The model number assigned by the manufacturer.
manufacturerName (String60)	The coomon name used to refer to the manufacturer.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Passenger Gate

(Database Feature Class Name = PassengerGate)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Unclassified

The location of a passenger boarding gate.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.

Attributes:

description (String255)	A description or other unique information concerning the subject item.
isCommonUse (CodeBoolean)	An indicator as to whether the passenger gate is common used or assigned to a signle airline.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Room

(Database Feature Class Name = Room)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Room outline within a building

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
roomName (String60)	Name of the building room.[SDSFIE Feature Table].
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

SaulaCode (String16)	The Successor Airport-Airline Use and Lease Agreement (SAULA) code assigned to spaces, rooms and lease areas at H-JAIA.
area (Real)	The size of the area, zone, or polygon in square units.[SDSFIE Feature Table].
height (Real)	Height dimension of the building room, measured from floor to ceiling.[SDSFIE Feature Table].
length (Real)	Length dimension of a building room, measured from inside of wall to inside of wall.[SDSFIE Feature Table].
width (Real)	Width dimension of a building room, measured from inside of wall to inside of wall.[SDSFIE Feature Table].

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Space

(Database Feature Class Name = Space)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

A space not elsewhere classified within a building

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
spaceId (String50)	Name of the building space.[SDSFIE Feature Table].
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

saulaCode (String16)	The Successor Airport-Airline Use and Lease Agreement (SAULA) code assigned to spaces, rooms and lease areas at H-JAIA.
area (Real)	The size of the area, zone, or polygon in square units.[SDSFIE Feature Table].
height (Real)	Height of building space, or distance from floor to ceiling.[SDSFIE Feature Table].
length (Real)	Length dimension of building space, from inside of wall or partition to inside of wall or partition.[SDSFIE Feature Table].
width (Real)	Width dimension of building space, from inside wall or partition to inside of wall or partition.[SDSFIE Feature Table].
description (String255)	Description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.
FkEcaiId (String7)	Foreign Key identifier used to link to Electrical Closet Asset Inventory

Interior : Stair

(Database Feature Class Name = Stair)

Geometry Type: Polygon Accuracy: +/-0.5Ft. Sensitivity: Restricted

Area of a floor where stairs are located

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

escRoute (CodeBoolean)	Boolean indicator for whether stairs are a part of an approved escape route[SDSFIE Attribute Table].
fromLevel (CodeFloorLevel)	The level of a building on which the feature starts.
toLevel (CodeFloorLevel)	The level of a building on which the feature ends.
elevRefLow (Integer)	A reference to the lowest floor elevation served by this feature.
elevRefHigh (Integer)	A reference to the highest floor elevation served by this feature.
description (String255)	Description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Wall

(Database Feature Class Name = Wall)

Geometry Type: Line Accuracy: +/-0.5Ft. Sensitivity: Restricted

Wall within a floor

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

description (String255)	Description of the feature.
isStructural (CodeBoolean)	Indicator for whether the wall is a structural wall or not[SDSFIE Attribute Table].
structuralMaterial (CodeMaterialType)	The material used for the structural or inner composition of the wall.
surfaceMaterial (CodeWallMaterial)	The material used for the surface or outer face of the wall.
thickness (Real)	Thickness in inches of the wall[SDSFIE Attribute Table].
isFire (CodeBoolean)	An indicator as to whether the feature is design to restrain fire[SDSFIE Attribute Table].

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Interior : Window

(Database Feature Class Name = Window)

Geometry Type: Line Accuracy: +/-0.5Ft. Sensitivity: Restricted

Line where window is located on an exterior wall

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.
floorLevel (CodeFloorLevel)	The level of a building on which the feature exists.
buildingNumber (String30)	An alphanumeric code indicating the number of the building.
buildingName (String60)	The name of the building associated with this feature.

Attributes:

glassType (String20)	Code for the type of glass installed in the window[SDSFIE Attribute Table].
description (String255)	Description of the feature.

Metadata:

metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
levelIdentifier (Integer)	A numeric identifier assigned to the building level.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Navigational_Aids

Navigational_Aids : Navigational Aid Critical Area

(Database Feature Class Name = NavaidCriticalArea; FAA=NavaidCriticalArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A zone encompassing a specific ground area in the vicinity of a radiating antenna array which must be protected from parking and unlimited movement of surface and air traffic. The drawings included in this table are representative, be sure to refer to the [FAA Order 6750.16C].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
dimensionX (Integer)	The linear dimension of the critical area in the X axis.
dimensionY (Integer)	The linear dimension of the critical area in the Y axis.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Navigational_Aids : Navigational Aid Equipment

(Database Feature Class Name = NavaidEquipment; FAA=NavaidEquipment)

Geometry Type: Point Accuracy: +/-Ft. Sensitivity: Unclassified

Any ground-based visual or electronic device that provides point to point guidance information or position to aircraft in flight. [FAA Specification 405].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature
faaFacilityId (String4)	Enter the identifier. When reporting on a glide slope, enter the identifier of the associated localizer. Do not enter the prefix I for ILS or M used with the MLS systems. Where more than one ASR is in operation at the same location or at an associated loc[FAA Order 8250-42].
alias (String60)	An alternative or former name by which the feature is referred.
runwayEndId (String3)	Identify the primary instrument runway served by the facility. When more than one runway is served by a precision approach aid (such as a PAR), provide a separate feature for each runway. This attribute is only required for ILS, MLS, TLS, and PAR.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.
navaidEquipmentType (CodeNavaidEquipmentType)	Specifies the type of NAVAID
navigationalAidSystemType (CodeNavaidSystemType)	Identifies the navigational aid equipment as part of an overall system. For example the localizer and glideslope together make up the Instrument landing system (ILS) or the MLS Azimuth and MLS Elevation make up a Microwave Landing System.
useCode (CodeUseCode)	The code that represents the airspace structure in which the aeronautical navigational aid is utilized.
antennaToThresholdDistance (Real)	The distance in feet that the antenna is from the runway threshold. Provide the distance to the nearest tenth of a foot.
centerlineDistance (Real)	Distance from the centerline perpendicular point to the physical runway end. This should be the same distance as the antenna to threshold distance unless the runway end the navigational aid serves has a displaced threshold. Provide this distance to the ne
stopEndDistance (Real)	Provide the distance the from the antenna along the centerline to the stop end of the runway.
offsetDistance (Real)	The distance in feet that the feature is offset from the runway centerline. Provide this distance to the nearest tenth of a foot.
offsetDirection (CodeOffsetDirection)	Enter the direction (right, left, or on centerline) the navigational aid is offset from the runway. Determine the appropriate direction from the approach threshold down the runway.
lightingType (CodeLightingConfigurationType)	The type of Visual navigational aid system (use only when CodeNavaidEquipmentType is set to visual)
owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
referencePointEllipsoidHeight (Real)	Provide the height above the ellipsoid (HAE) for the referencePoint.
referencePointThreshold (Real)	Distance from the runway reference point to the threshold. Provide this distance to the nearest tenth of a foot.[FAA AAS-100].
thresholdCrossingHeight (Real)	The designated crossing height of the flight path angle above the Landing Threshold Point (or Fictitious Threshold Point).
highAngle (Real)	Maximum approach light vertical angle[FAA AAS-100].
ellipsoidElevation (Real)	The Base Elevation for most NAVAIDs. For ILS DME, the elevation is the center of the antenna cover. For MLSAZ, MLSEL, and End Fire Type Glide Slope Antennas, the elevation is the phase center of the reference point.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Navigational_Aids : Navigational Aid Site

(Database Feature Class Name = NavaidSite; FAA=NavaidSite)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Unclassified

The parcel, lease, or right-of-way boundary for a navaid facility that is located off airport property.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature
faaFacilityId (String4)	The location identifier assigned to the feature by FAA
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A brief description of the facility and any special characteristics.

facilityType (String16)	The type of facility or feature related to airfield operations.
propertyCustodian (String50)	The regional property management office responsible for ownership of the site

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: SeaPlane

SeaPlane : AnchorageArea

(Database Feature Class Name = AnchorageArea; FAA=AnchorageArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

An area designated specifically for the parking of seaplanes.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

name (String50)	Name of the feature.
description (String255)	Description of the feature.
mooringLocations (Integer)	Specify the number of mooring locations provided in the AnchorageArea.
length (Integer)	Specify the overall length available for the AnchorageArea
width (Integer)	Specify the overall length available for the floating dock
depth (Integer)	Specify the depth of the turning basin with respect to mean lowest low tide to the nearest 0.5 foot.
bottomConditions (String240)	Specify the type of bottom conditions in the AnchorageArea.
restriction (String240)	Any restrictions or cautions associated with the AnchorageArea

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Dock

(Database Feature Class Name = DockArea; FAA=DockArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A defined area on a seaplane base either fixed or floating, intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
Pier (CodeBoolean)	Specify if a pier is available in the dockArea
PierLength (Integer)	Specify the overall length available for the pier
PierWidth (Integer)	Specify the overall length available for the pier
PierMaterial (CodeVerticalStructureMaterial)	Specify the materials used in the construction of the pier.
HoistingCapability (Integer)	Specify the hoisting capability in pounds
MarineRailwayPlatformLength (Integer)	Specify the length of the marine railway platform
MarineRailwayPlatformWidth (Integer)	Specify the width of the marine railway platform
MarineRailwayPlatformCapacity (Integer)	Specify the capacity of the marine railway platform in pounds
Gangway (CodeBoolean)	Specify if a gangway is available
GangwayLength (Integer)	Specify the overall length available for the gangway
GangwayWidth (Integer)	Specify the overall length available for the gangway
GangwayMaterial (CodeVerticalStructureMaterial)	Specify the material used to construct the gangway
FloatingDock (CodeBoolean)	Specify if a floating dock is available
FloatingDockLength (Integer)	Specify the overall length available for the floating dock
FloatingDockWidth (Integer)	Specify the overall length available for the floating dock
FloatingDockMaterial (CodeVerticalStructureMaterial)	Specify the material used in constructing the dockArea
FloatingBarge (CodeBoolean)	Specify if a floating barge is available
FloatingBargeLength (Integer)	Specify the overall length available for the floating barge
FloatingBargeWidth (Integer)	Specify the overall length available for the floating barge
FloatingBargeMaterial (CodeVerticalStructureMaterial)	Specify the material used in constructing the floatingBarge

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Navigation Buoy

(Database Feature Class Name = NavigationBuoy; FAA=NavigationBuoy)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Unclassified

A floating marker which is moored to the bottom at a specific known location, which is used as an aid to navigation or for other special purpose. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Any commonly used name associated with the buoy.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the buoy limited to 255 characters. Use this to describe navigational requirements or warnings.
designator (String20)	The official number of the buoy.
Type (CodeBuoyType)	Discriminator - The type of the buoy or marker.
lightingType (CodeLightingConfigurationType)	Type of lighting available at the location (if any)
color (CodeColor)	Code used to indicate the navigational color of the buoy.

owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Seaplane Ramp Centerline

(Database Feature Class Name = SeaplaneRampCenterline; FAA=SeaplaneRampCenterline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Restricted

The centerline of ramps specifically designed to transit seaplanesto or from land or water. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
Length (Integer)	Specify the length of the seaplane ramp centerline from the water to the shoreline

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Seaplane Ramp Site

(Database Feature Class Name = SeaplaneRampSite; FAA=SeaplaneRampSite)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

Ramps specifically designed to transit seaplanes from land to or from land to water. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
Width (Integer)	Identify the width of the seaplane ramp site
Slope (Integer)	The slope of the ramp specified as an integer value.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Taxi Channel

(Database Feature Class Name = TaxiChannel; FAA=TaxiChannel)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A water channel used for the movement of aircraft between shore facilities and the water lane. [AC 150/5395-1].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
Name (String50)	Any commonly used name associated with the taxi channel.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

Description (String255)	Description of the feature.
Restriction (String240)	Any restrictions or cautions associated with the taxi channel
Length (Integer)	Specify the overall length of the taxi channel
Width (Integer)	Specify the overall width of the taxi channel
Depth (Integer)	Specify the depth of the taxi channel with respect to mean lowest low tide

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Turning Basin

(Database Feature Class Name = TurningBasin; FAA=TurningBasin)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A water area used for the maneuvering of aircraft where the use of water surface is restricted. Turning basins should be located adjacent to shoreline facilities and at each end of the water operating area. [AC 150/5395-1].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
Name (String50)	A commonly used name for the turning basin
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

Restriction (String240)	Any restrictions or cautions associated with the turning basin

Length (Integer)	Specify the overall length of the turning basin to the nearest 5 feet.
Width (Integer)	Specify the overall width of the turning basin to the nearest 5 feet
Depth (Integer)	Specify the depth of the turning basin with respect to mean lowest low tide to the nearest 0.5 foot.
Diameter (Integer)	The diameter of the turning basin available for use by aircraft to the nearest 5 feet.
CompassLocation (CodeCompassLocation)	Code indicating the cardinal compass location of the turning basin from centroid of the WaterLaneEnd

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Water Lane End

(Database Feature Class Name = WaterLaneEnd; FAA=WaterLaneEnd)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Restricted

The end of the water land (typically located at the furthest end of a turning basin) suitable for landing or takeoff runs of aircraft. WaterLandEnds define the water lane and describe the approach/departure procedure characteristics of a water land.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
Name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

Description (String255)	Description of the feature.
MagneticBearing (Integer)	Compute and specify the magnetic bearing of the primary water lane to the nearest degree based on the location of the reciprocal WaterLaneEnd points. This is similar to the runway magnetic bearing for a land based airport.
CompassLocation (CodeCompassLocation)	Code indicating the cardinal compass location of the turning basin from centroid of the WaterLaneEnd. This feature is similar to the land based airport RunwayEnd.
Restriction (String240)	Any restrictions or cautions associated with the sea plane landing area.
AirMarker (CodeBoolean)	Code specifying if a standard air maker is used to indicate if a standard air marker is in use at the location.
Type (CodeBoolean)	Identifies the WaterLaneEnd as the primary or alternate. Primary = Y, alternate=N
Color (CodeColor)	The color of the air marker at the location (if any)
LightingType (CodeLightingConfigurationType)	Type of lighting available at the location (if any)
ApproachGuidance (CodeApproachGuidance)	Identifies the type of approach guidance in use or planned for the water operating area.
Length (Integer)	Specify the overall length of the primary water lane
Width (Integer)	Specify the overall width of the primary water lane
Depth (Integer)	Specify the depth of the primary water lane with respect to mean lowest low tide
Centroid (Integer)	The geographic location of the primary water centroid, used to determine the primary and alternate water lanes within the water operating area.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

SeaPlane : Water Operations Area

(Database Feature Class Name = WaterOperatingArea; FAA=WaterOperatingArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

An area designated and marked for the takeoff and landing of aircraft. This is equivalent to the Airport Operating Area of a land based airport.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
Name (String50)	Name of the feature water body (river/lake).
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

Description (String255)	Description of the feature.
SurfaceMaterial (CodeSurfaceMaterial)	Code used to indicate the type of water the water operating area is on or planned to use.
Length (Integer)	Specify the overall length of the WaterOperatingArea to the nearest 5 feet
Width (Integer)	Specify the overall width of the waterOperatingArea to the nearest 5 feet
CurrentFlowRate (Integer)	Measure and specify the rate of the current flow in the WaterOperatingArea in miles per hour
CompassLocation (CodeCompassLocation)	Specify the magnetic bearing of the current flow direction
TidalRange (Integer)	Specify (in feet) the height difference in height from mean low mean high tide
CoordinatedUseType (CodeCoordinatedUseType)	Specify the primary coordinated use of the waterway. If no single activity comprises the majority of the coordinated use then specify multiple.
CoordinatedUseActivityLevel (Integer)	Provide the amount of activity based on percentage of daily use of the primary coordinated use type. If coordinated use type is multiple provide the largest activity level of the single most expected activity.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Security

Security : Security Area

(Database Feature Class Name = SecurityArea; FAA=SecurityArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Secret

An area of the airport in which security measures required by 49CFR1542.201 must be carried out. [49CFR1542].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Security : Security Identification Display Area

(Database Feature Class Name = SecurityIdDisplayArea; FAA=SecurityIdDisplayArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Secret

Portions of an airport, specified in the airport security program, in which security measures required by regulation must be carried out. This area includes the security area and may include other areas of the airport. [DHS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Security : Security Perimeter Line

(Database Feature Class Name = SecurityPerimeterLine; FAA=SecurityPerimeterLine)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

Any type of perimeter, such as barbed wire, high fences, motion detectors and armed guards at gates, that ensure no unauthorized visitors can gain entry. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.[SDSFIE Attribute Table].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Security : Sterile Area

(Database Feature Class Name = SterileArea; FAA=SterileArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Secret

Portions of an airport defined in the airport security program that provide passengers access to boarding aircraft and to which the access is generally controlled by TSA, an aircraft operator, or a foreign air carrier. [DHS].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Security : Surveillance Camera

(Database Feature Class Name = SurveillanceCamera)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Top Secret

The location of a video camera used for surveillance purposes. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
alias (String60)	An alternative or former name by which the feature is referred.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Structures

Structures : Building

(Database Feature Class Name = Building; FAA=Building)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A three-dimensional structure (i.e. hangars, terminals, etc.) modeled with a bounding polygon.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
buildingNumber (String16)	The code indicating the number of the building.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.
structureType (CodeStructureType)	The type of structure.
numberOfCurrentOccupants (Integer)	Number of persons currently occupying the structure
areaInside (Real)	Total inside area of structure
structureHeight (Real)	Maximum height of structure; i.e. AGL height
areaFloor (Real)	Total inside floor area
lightingType (CodeLightingConfigurationType)	A description of the lighting system.
markingFeatureType (CodeMarkingFeatureType)	The color of the marking(s)
color (CodeColor)	The type of the marking(s)

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Structures : Project Area

(Database Feature Class Name = ConstructionArea; FAA=ConstructionArea)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

A defined area that is under construction, not intended for active use until authorized by the concerned authority. The area defines a boundary for personnel, material, and equipment engaged in the construction activity. [FAA].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
projectName (String60)	The name of the construction project
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.
projectStatus (CodeProjectStatus)	The status of the construction project
coordinationContact (String75)	Airport, emergency, airline, tenant, and contractor personnel who are responsible for coordinating on-airport construction work

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Structures : Fence

(Database Feature Class Name = Fence; FAA=Fence)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

Any fencing (chain-link, razor wire, PVC, etc.). [FAA].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 255 characters.
height (Real)	The overall distance from the surface of the ground to the top of the fence.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Structures : Gate

(Database Feature Class Name = Gate; FAA=Gate)

Geometry Type: Line Accuracy: +/-3Ft. Sensitivity: Restricted

A gate is an opening in a fence or other type of barrier between areas. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name, code or identifier used to identify the gate.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description or other unique information concerning the subject item, limited to 240 characters.
type (String50)	The gate material and method of construction.
length (Real)	The overall distance from one end of the gate to the other.
height (Real)	The overall distance from the surface of the top of the gate.
attended (CodeBoolean)	A Boolean indicating whether the gate is tended by a guard or other individual.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Structures : Roof

(Database Feature Class Name = Roof; FAA=Roof)

Geometry Type: Polygon Accuracy: +/-3Ft. Sensitivity: Restricted

Structure on top of buildings, garages and other similar structures.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.
buildingNumber (String16)	The code indicating the number of the building

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Structures : Tower

(Database Feature Class Name = Tower; FAA=Tower)

Geometry Type: Point Accuracy: +/-3Ft. Sensitivity: Restricted

A structure created, by man, to facilitate an activity at an elevated level above the ground.

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
verticalStructureMaterial (CodeVerticalStructureMaterial)	Classifies the predominant material of the vertical object
lightCode (CodeBoolean)	A code indicating that the tower is lighted[AIXM].
lightingType (CodeLightingConfigurationType)	A description of the lighting system. Lighting system classifications are Approach; Airport; Runway; Taxiway; and Obstruction
markingFeatureType (CodeMarkingFeatureType)	The type of the marking(s)
color (CodeColor)	The color of the marking(s)
structureHeight (Real)	Maximum height of structure; i.e. AGL height

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.

Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Surface_Transportation

Surface_Transportation : Bridge

(Database Feature Class Name = Bridge; FAA=Bridge)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A structure used by vehicles that allows passage over or under an obstacle such as a river, chasm, mountain, road or railroad. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
surfaceMaterial (CodeSurfaceMaterial)	The material used as a surface for the bridge.
bridgeType (CodeBridgeType)	The type of bridge.
verticalStructureMaterial (CodeVerticalStructureMaterial)	Classifies the predominant material of the vertical object
directionality (CodeDirectionality)	Code indicating the traffic flow of the bridge being classified.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Driveway

(Database Feature Class Name = DrivewayArea; FAA=DrivewayArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

An access to a residence or other vehicle parking lot or storage area. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
surfaceMaterial (CodeSurfaceMaterial)	The material used as a surface for the driveway.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.

projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Driveway Centerline

(Database Feature Class Name = DrivewayCenterline; FAA=DrivewayCenterline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Restricted

The center of the driveway as measured from the edge of the paved surface. The segments of a driveway centerline will coincide with the road segments in order to provide network connectivity. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Parking Lot

(Database Feature Class Name = ParkingLot; FAA=ParkingLot)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

An area of an airport used for parking of automobiles, buses, etc. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Any commonly used name for the parking area.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A description of the parking lot.
parkingLotUse (String16)	The primary use of the parking area.
totalNumberSpaces (Integer)	The total parking spaces available in the area including handicapped or reserved spaces.
numberHandicapSpaces (Integer)	The total number of spaces marked as being handicapped parking.
owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
surfaceType (CodeSurfaceType)	Type of different materials used to construct the surface.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Railroad Centerline

(Database Feature Class Name = RailroadCenterline; FAA=RailroadCenterline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Confidential

Represents the centerline of each pair of rails. [ANSI: Data Content Standards For Transportation Networks: Roads].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Any commonly used name for the railroad.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Any narrative remarks concerning the railroad.
numberOfTracks (Integer)	The number of tracks present
owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
isBridge (CodeBoolean)	Indicates given railroad segment is bridge (Y- a is bridge, N- is not a bridge).
isTunnel (CodeBoolean)	Indicates given railroad segment is tunnel (Y- is a tunnel, N- is not a tunnel).
directionality (CodeDirectionality)	Code indicating the traffic flow of the railroad segment being classified.
segmentType (CodeSegmentType)	Code indication the sequence or position of the segment being classified by the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Railroad Yard

(Database Feature Class Name = RailroadYard; FAA=RailroadYard)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

Represents a railroad yard. [ANSI: Data Content Standards For Transportation Networks: Roads].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	A name that represent the railroad yard.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Any brief description of the feature.
owner (Enumeration60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Road Centerline

(Database Feature Class Name = RoadCenterline; FAA=RoadCenterline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Confidential

The center of the roadway as measured from the edge of the paved surface. The segments of a road centerline will coincide with the road segments in order to have similar characteristics. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Any commonly used name for the road centerline.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
color (CodeColor)	The color of the centerline marking.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Road Point

(Database Feature Class Name = RoadPoint; FAA=RoadPoint)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Confidential

A point along the roadway which has some special significance either for starting or ending a road segment or for representing a significant position along the roadway system such as the start or center of a bridge or the center of an intersection. [ANSI: Data Content Standards For Transportation Networks: Roads*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Road Segment

(Database Feature Class Name = RoadSegment; FAA=RoadSegment)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

Represents a linear section of the physical road system designed for, or the result of, human or vehicular movement; must be continuous (no gaps) and cannot branch; no mandates are provided on how to segment the road system except that data providers adop [ANSI: Data Content Standards For Transportation Networks: Roads*].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	A common name or street name used to refer to the stretch of road.
alias (String60)	An alternative or former name by which the feature is referred.
alternateName (String30)	The alternate name or second name for the road.
route1Name (String30)	The route number or other identifier that is affiliated with the first route type
route2Name (String30)	The route number or other identifier that is affiliated with the second route type
route3Name (String30)	The number or other identifier that is affiliated with the third route type

Attributes:

description (String255)	A general description of the road.
route1Type (CodeRouteType)	The first route type for the road (Interstate, US, State, etc.)
route2Type (CodeRouteType)	The second route type for the road (Interstate, US, State, etc.)
route3Type (CodeRouteType)	The third route type for the road (Interstate, US, State, etc.)
numberOfLanes (Integer)	The total number of lanes of traffic, counting both directions, not including turning lanes.[SDSFIE Feature Table].
length (Real)	The length of the road segment measured at the centerline.[SDSFIE Feature Table].
width (Real)	The average width of the road segment.[SDSFIE Feature Table].
isBridge (CodeBoolean)	Indicates given road segment is bridge (Y- a is bridge, N- is not a bridge).[SDSFIE Feature Table].
isTunnel (CodeBoolean)	Indicates given road segment is tunnel (Y- is a tunnel, Nis not a tunnel).[SDSFIE Feature Table].
directionality (CodeDirectionality)	Code indicating the traffic flow on the road segment.
segmentType (CodeSegmentType)	Code indicating the type of segment being classified.
surfaceType (CodeSurfaceType)	Type of material used to construct the surface.
surfaceMaterial (CodeSurfaceMaterial)	Material used to construct the surface of the road.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Sidewalk Segment

(Database Feature Class Name = Sidewalk; FAA=Sidewalk)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

A paved or concrete pad used as a pedestrian walkway. Usually is composed of one or more SideWalkSegments. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	A brief description of any special characteristics of the sidewalk.
walkUse (String26)	A short description of the primary use of the sidewalk.
AmericanDisabilitiesAct (CodeBoolean)	Boolean indicating whether or not the walkway is in compliance with the American Disabilities Act.
length (Real)	The overall length of the sidewalk section.
width (Real)	The mean width of the sidewalk section.
surfaceMaterial (CodeSurfaceMaterial)	Primary material used in the sidewalk and/or trail.
segmentType (CodeSegmentType)	Code indicating the type of segment being classified.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Surface_Transportation : Tunnel

(Database Feature Class Name = Tunnel; FAA=Tunnel)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Restricted

The area of a transportation passage, open at both ends, used to provide access through or under a natural obstacle. [SDSFIE].

Names and Identifiers:

id (String40)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	Name of the feature.
alias (String60)	An alternative or former name by which the feature is referred.

Attributes:

description (String255)	Description of the feature.
type (String16)	The code that represents the type of tunnel
verticalClearance (Real)	Indicates the actual vertical clearance to the top of the tunnel imposed by any restrictions.
averageHeight (Real)	The average height of the tunnel.
averageWidth (Real)	The average width of the tunnel.
length (Real)	The length of the tunnel.
directionality (CodeDirectionality)	Code indicating the direction of traffic flow in the tunnel.
segmentType (CodeSegmentType)	Code indicating the type of segment being classified.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
dataSource (CodeDataSource)	The source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Domain Values

Below are acceptable domain values for each of the attributes bound by list domains. Each list of acceptable values is an enumeration, which means that one of the values must be selected in order to be compliant with the standard. For each value, a definition along with any applicable source information is provided.

CodeAccess

Used by Attributes: Door - Accessed Area

Value	Definition (Notes) [Source]
Public to Public	Public to Public
Public to Restricted	Public to Restricted
Public to SIDA	Public to SIDA
Public to Sterile	Public to Sterile
Ramp Call	Ramp Call
Restricted to Restricted	Restricted to Restricted
Restricted to SIDA	Restricted to SIDA
SIDA to Public	SIDA to Public
SIDA to Restricted	SIDA to Restricted
Sterile to Restricted	Sterile to Restricted
Sterile to SIDA	Sterile to SIDA
Sterile to Sterile	Sterile to Sterile

CodeAcquisitionType

Used by Attributes: Airport Parcel - Acquisition Type;Parcel - Acquisition Type

Value	Definition (Notes) [Source]
EASEMENT	Rights given to use land in a specific manner
FEE_SIMPLE	Purchased real property; absolute ownership
LEASED	Restricted use of land for a specific period of time

CodeAirline

Used by Attributes: Baggage Carousel - Tenant Name;Baggage Conveyor - Tenant Name

Value	Definition (Notes) [Source]
Air Canada	Air Canada
Air Canada Jazz	Air Canada Jazz
Air France	Air France
AirTran Airways	AirTran Airways
American Airlines	American Airlines
American Connection - American Eagle	American Connection - American Eagle
American Connection - Chautauqua Airlines	American Connection - Chautauqua Airlines
American Connection - Trans States Airlines	American Connection - Trans States Airlines
British Airways	British Airways
Continental Airlines	Continental Airlines
Delta Air Lines	Delta Air Lines
Delta Connection - Atlantic Southeast Airlines	Delta Connection - Atlantic Southeast Airlines
Delta Connection - Comair	Delta Connection - Comair
Delta Connection - Freedom Airlines	Delta Connection - Freedom Airlines
Delta Connection - Pinnacle Airlines	Delta Connection - Pinnacle Airlines
Delta Connection - Shuttle America	Delta Connection - Shuttle America
Delta Connection - SkyWest Airlines	Delta Connection - SkyWest Airlines
Delta Connection / Atlantic Southeast Airlines	Delta Connection / Atlantic Southeast Airlines
Delta Connection / Freedom Airlines	Delta Connection / Freedom Airlines
Delta Connection / Pinnacle Airlines	Delta Connection / Pinnacle Airlines
Delta Connection / SkyWest Airlines	Delta Connection / SkyWest Airlines
Frontier Airlines	Frontier Airlines

KLM Royal Dutch Airlines	KLM Royal Dutch Airlines
Korean Air	Korean Air
Lufthansa German Airlines	Lufthansa German Airlines
Midwest Airlines	Midwest Airlines
Multiple	Multiple
Northwest Airlines	Northwest Airlines
Omni Air International	Omni Air International
Other	Other
Ryan International	Ryan International
Spirit Airlines	Spirit Airlines
United Airlines	United Airlines
United Express - Mesa	United Express - Mesa
United Express - Shuttle America	United Express - Shuttle America
Unknown	Unknown
US Airways	US Airways
US Airways Express - Air Wisconsin	US Airways Express - Air Wisconsin
US Airways Express - Mesa	US Airways Express - Mesa
US Airways Express - PSA	US Airways Express - PSA
US Airways Express - Republic	US Airways Express - Republic
World Airways	World Airways

CodeAirportFacilityType

Used by Attributes: Airport Boundary - Airport Facility Type

Value	Definition (Notes) [Source]
AD	Airport only
AH	Airport with helicopter landing area
H	Helicopter (the stall speed method of calculating aircraft category does not apply)
HP	Heliport only
LS	Landing Site

CodeApproachCategory

Used by Attributes: Runway End - Approach Category

Value	Definition (Notes) [Source]
A	Speed less than 91 knots
B	Speed 91 knots or more but less than 121 knots
C	Speed 121 knots or more but less than 141 knots
D	Speed 141 knots or more but less than 166 knots
E	Speed 166 knots or more

CodeApproachGuidance

Used by Attributes: Obstruction Identification Surface - Approach Guidance;Runway End - Approach Guidance;Water Lane End - Approach Guidance

Value	Definition (Notes) [Source]
NON_VERTICAL	Runway is used for or planned use is for Non-Vertically Guided operations
PRECISION_CAT_I	Runway is used or or planned use is for Precision Category 1 operations
PRECISION_CAT_II	Runway is used for or planned use is for Precision Category II operations
PRECISION_CAT_IIIA	Runway is used for or planned use is for Precision Category IIIa operations.
PRECISION_CAT_IIIB	Runway is used for or planned use is for Precision Category IIIb operations
PRECISION_CAT_IIIC	Runway is used for or planned use is for Precision Category IIIc operations
VERTICAL	Runway is used for or planned use is for Vertically Guided (other than precision) operations
VISUAL	Runway is used for or planned use is for visual operations only

CodeApronType

Used by Attributes: Apron - Apron Type

Value	Definition (Notes) [Source]

CARGO	Cargo loading area used for the loading/unloading of cargo
DE_ICING	Area used for deicing of aircraft
FUEL	Area used for aircraft fueling
HARDSTAND	Area used for parking a single aircraft. More temporary than parking
LOADING	Passenger loading area used for the loading/unloading of passengers
MAINT	Area used for maintenance of aircraft
MILITARY	Apron used by military
NORMAL	Apron
OTHER	Other
PARKING	Area used to park aircraft
RAMP	Access pavement between maintenance hangars opening to the apron and the apron edge
STAIRS	Stairs
TAXILANE	Area where plane is still under terminal control (airline dispatched) as opposed to tower control.
TEMPORARY	Temporary
TURNAROUND	Area used for aircraft to turn around

CodeBoolean

Used by Attributes: Water Lane End - Air Marker;Door - Alarmed;Sidewalk Segment - American with Disabilities Act;Gate - Attended;Passenger Gate - Common Use;Aircraft Gate Stand - Docking Availability;Flora Species Site - Endangered Species Act Site;Stair - Esc Route;Obstacle - FAA Coordination Code;Obstruction Area - FAA Coordination Code;Wall - Fire;Door - Fire Rated;Dock - Floating Barge;Dock - Floating Dock;Obstacle - Frangible;Obstruction Area - Frangible;Dock - Gangway;Airport Control Point - GPS Suitable;Aircraft Gate Stand - Ground Power Availability;Railroad Centerline - Is Bridge;Road Segment - Is Bridge;Runway Centerline - Is Derived;Railroad Centerline - Is Tunnel;Road Segment - Is Tunnel;Aircraft Gate Stand - Jetway Availability;Obstacle - Light Code;Obstruction Area - Light Code;Tank Site - Light Code;Tower - Light Code;Dock - Pier;Shoulder - Restricted;Door - Secure;Elevator - Secure;Wall - Structural;Aircraft Gate Stand - Towing Availability;Water Lane End - Type

Value	Definition (Notes) [Source]
N	No
Y	Yes

CodeBridgeType

Used by Attributes: Bridge - Bridge Type

Value	Definition (Notes) [Source]
ROAD	Road or highway bridge
RR	Railroad or Monorail Bridge
RWY	Runway Bridge
TWY	Taxiway Bridge

CodeBuoyType

Used by Attributes: Navigation Buoy - Type

Value	Definition (Notes) [Source]
Bn	Beacon
C	Can Buoy
F	Fixed
J	Junction (S or T Dayboard)
K	Rectangular (Range Dayboard)
Lb	Lighted buoy
M	Octagonal Dayboard
N	Nun Buoy
O	Other marking
S	Square Dayboard
T	Triangle Dayboard

CodeColor

Used by Attributes: Airfield Light - Color;Building - Color;Land and Hold Short Line - Color;Marking Area - Color;Marking Line - Color;Navigation Buoy - Color;Road Centerline - Color;Tank Site - Color;Tower - Color;Water Lane End - Color

Value	Definition (Notes) [Source]
AMBER	Amber [U.S. CAD]
BLACK	Black [U.S. CAD]

BLUE	Blue [U.S. CAD]
BROWN	Brown [U.S. CAD]
GREEN	Green [U.S. CAD]
GREEN-GREEN	Bidirectional (Source AC 150/5345-46C)
GREEN-RED	Bidirectional (Source AC 150/5345-46C)
GREEN-YELLOW	Bidirectional (Source AC 150/5345-46C)
GREY	Grey [U.S. CAD]
LIGHTGREY	LightGrey [U.S. CAD]
MAGENTA	Magenta [U.S. CAD]
ORANGE	Orange [U.S. CAD]
OTHER	Other [U.S. CAD]
PINK	Pink [U.S. CAD]
PURPLE	Purple [AIXM]
RED	Red [U.S. CAD]
RED-GREEN	Bidirectional (Source AC 150/5345-46C)
RED-RED	Bidirectional (Source AC 150/5345-46C)
TBD	To be determined
VIOLET	Violet [U.S. CAD]
WHITE	White [U.S. CAD]
WHITE-RED	Bidirectional (Source AC 150/5345-46C)
WHITE-WHITE	Bidirectional (Source AC 150/5345-46C)
WHITE-YELLOW	Bidirectional (Source AC 150/5345-46C)
YELLOW	Yellow [U.S. CAD]
YELLOW-GREEN	Bidirectional (Source AC 150/5345-46C)
YELLOW-RED	Bidirectional (Source AC 150/5345-46C)
YELLOW-YELLOW	Bidirectional (Source AC 150/5345-46C)

CodeCompassLocation

Used by Attributes: Turning Basin - Compass Location;Water Lane End - Compass Location;Water Operations Area - Compass Location

Value	Definition (Notes) [Source]
E	East (076 to 105 degrees magnetic)
ESE	East Southeast (106 to 135 degrees magnetic)
N	North (346 to 015 degrees magnetic)
NE	Northeast (046 to 075 degrees magnetic)
NNE	North Northeast (016 to 045 degrees magnetic)
NW	Northwest (316 to 345 degrees magnetic)
S	South (166 to 195 degrees magnetic)
SE	Southeast (136 to 165 degrees magnetic)
SSW	South Southwest (196 to 225 degrees magnetic)
SW	Southwest (226 to 255 degrees magnetic)
W	West (256 to 285 degrees magnetic)
WNW	West NorthWest (286 to 315 degrees magnetic)

CodeCoordinatedUseType

Used by Attributes: Water Operations Area - Coordinated Use Type

Value	Definition (Notes) [Source]
A	Aeronautical
M	Multiple
R	Recreational boating/fishing
S	Commercial Shipping/Fishing

CodeCoordinateZone

Used by Attributes: Airport Control Point - Coordinate Zone

Value	Definition (Notes) [Source]
AK-1	NAD27 Alaska State Planes- Zone 1- US Foot (EPSG #26731)
AK-10	NAD27 Alaska State Planes- Zone 10- US Foot (EPSG #26740)
AK-2	NAD27 Alaska State Planes- Zone 2- US Foot (EPSG #26732)

AK-3	NAD27 Alaska State Planes- Zone 3- US Foot (EPSG #26733)
AK-4	NAD27 Alaska State Planes- Zone 4- US Foot (EPSG #26734)
AK-5	NAD27 Alaska State Planes- Zone 5- US Foot (EPSG #26735)
AK-6	NAD27 Alaska State Planes- Zone 6- US Foot (EPSG #26736)
AK-7	NAD27 Alaska State Planes- Zone 7- US Foot (EPSG #26737)
AK-8	NAD27 Alaska State Planes- Zone 8- US Foot (EPSG #26738)
AK83-1	NAD83 Alaska State Planes- Zone 1- Meter (EPSG #26931)
AK83-10	NAD83 Alaska State Planes- Zone 10- Meter (EPSG #26940)
AK83-10F	NAD83 Alaska State Planes- Zone 10- US Foot
AK83-1F	NAD83 Alaska State Planes- Zone 1- US Foot
AK83-2	NAD83 Alaska State Planes- Zone 2- Meter (EPSG #26932)
AK83-2F	NAD83 Alaska State Planes- Zone 2- US Foot
AK83-3	NAD83 Alaska State Planes- Zone 3- Meter (EPSG #26933)
AK83-3F	NAD83 Alaska State Planes- Zone 3- US Foot
AK83-4	NAD83 Alaska State Planes- Zone 4- Meter (EPSG #26934)
AK83-4F	NAD83 Alaska State Planes- Zone 4- US Foot
AK83-5	NAD83 Alaska State Planes- Zone 5- Meter (EPSG #26935)
AK83-5F	NAD83 Alaska State Planes- Zone 5- US Foot
AK83-6	NAD83 Alaska State Planes- Zone 6- Meter (EPSG #26936)
AK83-6F	NAD83 Alaska State Planes- Zone 6- US Foot
AK83-7	NAD83 Alaska State Planes- Zone 7- Meter (EPSG #26937)
AK83-7F	NAD83 Alaska State Planes- Zone 7- US Foot
AK83-8	NAD83 Alaska State Planes- Zone 8- Meter (EPSG #26938)
AK83-8F	NAD83 Alaska State Planes- Zone 8- US Foot
AK83-9	NAD83 Alaska State Planes- Zone 9- Meter (EPSG #26939)
AK83-9F	NAD83 Alaska State Planes- Zone 9- US Foot
AK-9	NAD27 Alaska State Planes- Zone 9- US Foot (EPSG #26739)
AL83-E	NAD83 Alabama State Planes- Eastern Zone- Meter (EPSG #26929)
AL83-EF	NAD83 Alabama State Planes- Eastern Zone- US Foot
AL83-W	NAD83 Alabama State Planes- Western Zone- Meter (EPSG #26930)
AL83-WF	NAD83 Alabama State Planes- Western Zone- US Foot
AL-E	NAD27 Alabama State Planes- Eastern Zone- US Foot (EPSG #26729)
ALHP-E	HPGN Alabama State Planes- Eastern Zone- Meter (EPSG #2759)
ALHP-EF	HPGN Alabama State Planes- Eastern Zone- US Foot
ALHP-W	HPGN Alabama State Planes- Western Zone- Meter (EPSG #2760)
ALHP-WF	HPGN Alabama State Planes- Western Zone- US Foot
AL-W	NAD27 Alabama State Planes- Western Zone- US Foot (EPSG #26730)
AR83-N	NAD83 Arkansas State Planes- Northern Zone- Meter (EPSG #26951)
AR83-NF	NAD83 Arkansas State Planes- Northern Zone- US Foot
AR83-S	NAD83 Arkansas State Planes- Southern Zone- Meter (EPSG #26952)
AR83-SF	NAD83 Arkansas State Planes- Southern Zone- US Foot
ARHP-N	HARN (HPGN) Arkansas State Planes- Northern Zone- Meter (EPSG #2764)
ARHP-NF	HARN (HPGN) Arkansas State Planes- Northern Zone- US Foot
ARHP-S	HARN (HPGN) Arkansas State Planes- Southern Zone- Meter (EPSG #2765)
ARHP-SF	HARN (HPGN) Arkansas State Planes- Southern Zone- US Foot
AR-N	NAD27 Arkansas State Planes- Northern Zone- US Foot (EPSG #26751)
AR-S	NAD27 Arkansas State Planes- Southern Zone- US Foot (EPSG #26752)
AZ83-C	NAD83 Arizona State Planes- Central Zone- Meter (EPSG #26949)
AZ83-CCM	NAD83 Arizona State Planes- Central Zone- Centimeter
AZ83-CF	NAD83 Arizona State Planes- Central Zone- US Foot
AZ83-CIF	NAD83 Arizona State Planes- Central Zone- Intnl Foot (EPSG #2223)
AZ83-E	NAD83 Arizona State Planes- East Zone- Meter (EPSG #26948)
AZ83-EF	NAD83 Arizona State Planes- East Zone- US Foot
AZ83-EIF	NAD83 Arizona State Planes- East Zone- Intnl Foot (EPSG #2222)
AZ83-W	NAD83 Arizona State Planes- West Zone- Meter (EPSG #26950)
AZ83-WF	NAD83 Arizona State Planes- West Zone- US Foot
AZ83-WIF	NAD83 Arizona State Planes- West Zone- Intnl Foot (EPSG #2224)
AZ-C	NAD27 Arizona State Planes- Central Zone- US Foot (EPSG #26749)
AZ-E	NAD27 Arizona State Planes- East Zone- US Foot (EPSG #26748)
AZHP-C	HPGN Arizona State Planes- Central Zone- Meter (EPSG #2762)
AZHP-CF	HPGN Arizona State Planes- Central Zone- US Foot
AZHP-CIF	HPGN Arizona State Planes- Central Zone- Intnl Foot (EPSG #2868)
AZHP-E	HPGN Arizona State Planes- East Zone- Meter (EPSG #2761)
AZHP-EF	HPGN Arizona State Planes- East Zone- US Foot
AZHP-EIF	HPGN Arizona State Planes- East Zone- Intnl Foot (EPSG #2867)
AZHP-W	HPGN Arizona State Planes- West Zone- Meter (EPSG #2763)

AZHP-WF	HPGN Arizona State Planes- West Zone- US Foot
AZHP-WIF	HPGN Arizona State Planes- West Zone- Intnl Foot (EPSG #2869)
AZ-W	NAD27 Arizona State Planes- West Zone- US Foot (EPSG #26750)
CA83-I	NAD83 California State Planes- Zone I- Meter (EPSG #26941)
CA83-IF	NAD83 California State Planes- Zone I- US Foot (EPSG #2225)
CA83-II	NAD83 California State Planes- Zone II- Meter (EPSG #26942)
CA83-IIF	NAD83 California State Planes- Zone II- US Foot (EPSG #2226)
CA83-III	NAD83 California State Planes- Zone III- Meter (EPSG #26943)
CA83IIIF	NAD83 California State Planes- Zone III- US Foot (EPSG #2227)
CA83-IV	NAD83 California State Planes- Zone IV- Meter (EPSG #26944)
CA83-IVF	NAD83 California State Planes- Zone IV- US Foot (EPSG #2228)
CA83-V	NAD83 California State Planes- Zone V- Meter (EPSG #26945)
CA83-VF	NAD83 California State Planes- Zone V- US Foot (EPSG #2229)
CA83-VI	NAD83 California State Planes- Zone VI- Meter (EPSG #26946)
CA83-VIF	NAD83 California State Planes- Zone VI- US Foot (EPSG #2230)
CAHP-I	HPGN California State Planes- Zone I- Meter (EPSG #2766)
CAHP-IF	HPGN California State Planes- Zone I- US Foot (EPSG #2870)
CAHP-II	HPGN California State Planes- Zone II- Meter (EPSG #2767)
CAHP-IIF	HPGN California State Planes- Zone II- US Foot (EPSG #2871)
CAHP-III	HPGN California State Planes- Zone III- Meter (EPSG #2768)
CAHPIIIF	HPGN California State Planes- Zone III- US Foot (EPSG #2872)
CAHP-IV	HPGN California State Planes- Zone IV- Meter (EPSG #2769)
CAHP-IVF	HPGN California State Planes- Zone IV- US Foot (EPSG #2873)
CAHP-V	HPGN California State Planes- Zone V- Meter (EPSG #2770)
CAHP-VF	HPGN California State Planes- Zone V- US Foot (EPSG #2874)
CAHP-VI	HPGN California State Planes- Zone VI- Meter (EPSG #2771)
CAHP-VIF	HPGN California State Planes- Zone VI- US Foot (EPSG #2875)
CA-I	NAD27 California State Planes- Zone I- US Foot (EPSG #26741)
CA-II	NAD27 California State Planes- Zone II- US Foot (EPSG #26742)
CA-III	NAD27 California State Planes- Zone III- US Foot (EPSG #26743)
CA-IV	NAD27 California State Planes- Zone IV- US Foot (EPSG #26744)
CA-V	NAD27 California State Planes- Zone V- US Foot (EPSG #26745)
CA-VI	NAD27 California State Planes- Zone VI- US Foot (EPSG #26746)
CA-VII	NAD27 California State Planes- Zone VII- US Foot (EPSG #26747)
CO83-C	NAD83 Colorado State Planes- Central Zone- Meter (EPSG #26954)
CO83-CF	NAD83 Colorado State Planes- Central Zone- US Foot (EPSG #2232)
CO83-N	NAD83 Colorado State Planes- Northern Zone- Meter (EPSG #26953)
CO83-NF	NAD83 Colorado State Planes- Northern Zone- US Foot (EPSG #2231)
CO83-S	NAD83 Colorado State Planes- Southern Zone- Meter (EPSG #26955)
CO83-SF	NAD83 Colorado State Planes- Southern Zone- US Foot (EPSG #2233)
CO-C	NAD27 Colorado State Planes- Central Zone- US Foot (EPSG #26754)
COHP-C	HPGN Colorado State Planes- Central Zone- Meter (EPSG #2773)
COHP-CF	HPGN Colorado State Planes- Central Zone- US Foot (EPSG #2877)
COHP-N	HPGN Colorado State Planes- Northern Zone- Meter (EPSG #2772)
COHP-NF	HPGN Colorado State Planes- Northern Zone- US Foot (EPSG #2876)
COHP-S	HPGN Colorado State Planes- Southern Zone- Meter (EPSG #2774)
COHP-SF	HPGN Colorado State Planes- Southern Zone- US Foot (EPSG #2878)
CO-N	NAD27 Colorado State Planes- Northern Zone- US Foot (EPSG #26753)
CO-S	NAD27 Colorado State Planes- Southern Zone- US Foot (EPSG #26755)
CT	NAD27 Connecticut State Plane Zone- US Foot (EPSG #26756)
CT83	NAD83 Connecticut State Plane Zone- Meter (EPSG #26956)
CT83F	NAD83 Connecticut State Plane Zone- US Foot (EPSG #2234)
CTHP	HPGN/HARN Connecticut State Plane Zone- Meter (EPSG #2775)
CTHPF	HPGN/HARN Connecticut State Plane Zone- US Foot (EPSG #2879)
DE	NAD27 Delaware State Planes- US Foot (EPSG #26757)
DE83	NAD83 Delaware State Planes- Meter (EPSG #26957)
DE83F	NAD83 Delaware State Planes- US Foot (EPSG #2235)
DEHP	HPGN Delaware State Planes- Meter (EPSG #2776)
DEHPF	HPGN Delaware State Planes- US Foot (EPSG #2880)
FL83-E	NAD83 Florida State Planes- Eastern Zone- Meter (EPSG #26958)
FL83-EF	NAD83 Florida State Planes- Eastern Zone- US Foot (EPSG #2236)
FL83-N	NAD83 Florida State Planes- Northern Zone- Meter (EPSG #26960)
FL83-NF	NAD83 Florida State Planes- Northern Zone- US Foot (EPSG #2238)
FL83-W	NAD83 Florida State Planes- Western Zone- Meter (EPSG #26959)
FL83-WF	NAD83 Florida State Planes- Western Zone- US Foot (EPSG #2237)
FL-E	NAD27 Florida State Planes- Eastern Zone- US Foot (EPSG #26758)

FLHP-E	HPGN Florida State Planes- Eastern Zone- Meter (EPSG #2777)
FLHP-EF	HPGN Florida State Planes- Eastern Zone- US Foot (EPSG #2881)
FLHP-N	HPGN Florida State Planes- Northern Zone- Meter (EPSG #2779)
FLHP-NF	HPGN Florida State Planes- Northern Zone- US Foot (EPSG #2883)
FLHP-W	HPGN Florida State Planes- Western Zone- Meter (EPSG #2778)
FLHP-WF	HPGN Florida State Planes- Western Zone- US Foot (EPSG #2882)
FL-N	NAD27 Florida State Planes- Northern Zone- US Foot (EPSG #26760)
FL-W	NAD27 Florida State Planes- Western Zone- US Foot (EPSG #26759)
GA83-E	NAD83 Georgia State Planes- Eastern Zone- Meter (EPSG #26966)
GA83-EF	NAD83 Georgia State Planes- Eastern Zone- US Foot (EPSG #2239)
GA83-W	NAD83 Georgia State Planes- Western Zone- Meter (EPSG #26967)
GA83-WF	NAD83 Georgia State Planes- Western Zone- US Foot (EPSG #2240)
GA-E	NAD27 Georgia State Planes- Eastern Zone- US Foot (EPSG #26766)
GAHP-E	HARN (HPGN) Georgia State Planes- Eastern Zone- Meter (EPSG #2780)
GAHP-EF	HARN (HPGN) Georgia State Planes- Eastern Zone- US Foot (EPSG #2884)
GAHP-W	HARN (HPGN) Georgia State Planes- Western Zone- Meter (EPSG #2781)
GAHP-WF	HARN (HPGN) Georgia State Planes- Western Zone- US Foot (EPSG #2885)
GA-W	NAD27 Georgia State Planes- Western Zone- US Foot (EPSG #26767)
HI-1	NAD27 Hawaii State Planes- Zone 1- US Foot
HI-2	NAD27 Hawaii State Planes- Zone 2- US Foot
HI-3	NAD27 Hawaii State Planes- Zone 3- US Foot
HI-4	NAD27 Hawaii State Planes- Zone 4- US Foot
HI-5	NAD27 Hawaii State Planes- Zone 5- US Foot
HI83-1	NAD83 Hawaii State Planes- Zone 1- Meter (EPSG #26961)
HI83-1F	NAD83 Hawaii State Planes- Zone 1- US Foot
HI83-2	NAD83 Hawaii State Planes- Zone 2- Meter (EPSG #26962)
HI83-2F	NAD83 Hawaii State Planes- Zone 2- US Foot
HI83-3	NAD83 Hawaii State Planes- Zone 3- Meter (EPSG #26963)
HI83-3F	NAD83 Hawaii State Planes- Zone 3- US Foot
HI83-4	NAD83 Hawaii State Planes- Zone 4- Meter (EPSG #26964)
HI83-4F	NAD83 Hawaii State Planes- Zone 4- US Foot
HI83-5	NAD83 Hawaii State Planes- Zone 5- Meter (EPSG #26965)
HI83-5F	NAD83 Hawaii State Planes- Zone 5- US Foot
HIHP-1	NAD83(HARN) / Hawaii zone 1 (EPSG #2782)
HIHP-2	NAD83(HARN) / Hawaii zone 2 (EPSG #2783)
HIHP-3	NAD83(HARN) / Hawaii zone 3 (EPSG #2784)
HIHP-4	NAD83(HARN) / Hawaii zone 4 (EPSG #2785)
HIHP-5	NAD83(HARN) / Hawaii zone 5 (EPSG #2786)
IA83-N	NAD83 Iowa State Planes- Northern Zone- Meter (EPSG #26975)
IA83-NF	NAD83 Iowa State Planes- Northern Zone- US Foot
IA83-S	NAD83 Iowa State Planes- Southern Zone- Meter (EPSG #26976)
IA83-SF	NAD83 Iowa State Planes- Southern Zone- US Foot
IAHP-N	HARN (HPGN) Iowa State Planes- Northern Zone- Meter (EPSG #2794)
IAHP-NF	HARN (HPGN) Iowa State Planes- Northern Zone- US Foot
IAHP-S	HARN (HPGN) Iowa State Planes- Southern Zone- Meter (EPSG #2795)
IAHP-SF	HARN (HPGN) Iowa State Planes- Southern Zone- US Foot
IA-N	NAD27 Iowa State Planes- Northern Zone- US Foot (EPSG #26775)
IA-S	NAD27 Iowa State Planes- Southern Zone- US Foot (EPSG #26776)
ID83-C	NAD83 Idaho State Planes- Central Zone- Meter (EPSG #26969)
ID83-CF	NAD83 Idaho State Planes- Central Zone- US Foot (EPSG #2242)
ID83-E	NAD83 Idaho State Planes- Eastern Zone- Meter (EPSG #26968)
ID83-EF	NAD83 Idaho State Planes- Eastern Zone- US Foot (EPSG #2241)
ID83-W	NAD83 Idaho State Planes- Western Zone- Meter (EPSG #26970)
ID83-WF	NAD83 Idaho State Planes- Western Zone- US Foot (EPSG #2243)
ID-C	NAD27 Idaho State Planes- Central Zone- US Foot (EPSG #26769)
ID-E	NAD27 Idaho State Planes- Eastern Zone- US Foot (EPSG #26768)
IDHP-C	HARN (HPGN) Idaho State Planes- Central Zone- Meter (EPSG #2788)
IDHP-CF	HARN (HPGN) Idaho State Planes- Central Zone- US Foot (EPSG #2887)
IDHP-E	HARN (HPGN) Idaho State Planes- Eastern Zone- Meter (EPSG #2787)
IDHP-EF	HARN (HPGN) Idaho State Planes- Eastern Zone- US Foot (EPSG #2886)
IDHP-W	HARN (HPGN) Idaho State Planes- Western Zone- Meter (EPSG #2789)
IDHP-WF	HARN (HPGN) Idaho State Planes- Western Zone- US Foot (EPSG #2888)
ID-W	NAD27 Idaho State Planes- Western Zone- US Foot (EPSG #26770)
IL83-E	NAD83 Illinois State Planes- Eastern Zone- Meter (EPSG #26971)
IL83-EF	NAD83 Illinois State Planes- Eastern Zone- US Foot
IL83-W	NAD83 Illinois State Planes- Western Zone- Meter (EPSG #26972)

IL83-WF	NAD83 Illinois State Planes- Western Zone- US Foot
IL-E	NAD27 Illinois State Planes- Eastern Zone- US Foot (EPSG #26771)
ILHP-E	HARN (HPGN) Illinois State Planes- Eastern Zone- Meter (EPSG #2790)
ILHP-EF	HARN (HPGN) Illinois State Planes- Eastern Zone- US Foot
ILHP-W	HARN (HPGN) Illinois State Planes- Western Zone- Meter (EPSG #2791)
ILHP-WF	HARN (HPGN) Illinois State Planes- Western Zone- US Foot
ILLIMAP	NAD27 Illinois Survey Mapping System- US Foot
IL-W	NAD27 Illinois State Planes- Western Zone- US Foot (EPSG #26772)
IN83-E	NAD83 Indiana State Planes- Eastern Zone- Meter (EPSG #26973)
IN83-EF	NAD83 Indiana State Planes- Eastern Zone- US Foot (EPSG #2244)
IN83-W	NAD83 Indiana State Planes- Western Zone- Meter (EPSG #26974)
IN83-WF	NAD83 Indiana State Planes- Western Zone- US Foot (EPSG #2245)
IN-E	NAD27 Indiana State Planes- Eastern Zone- US Foot (EPSG #26773)
INHP-E	HARN (HPGN) Indiana State Planes- Eastern Zone- Meter (EPSG #2792)
INHP-EF	HARN (HPGN) Indiana State Planes- Eastern Zone- US Foot (EPSG #2889)
INHP-W	HARN (HPGN) Indiana State Planes- Western Zone- Meter (EPSG #2793)
INHP-WF	HARN (HPGN) Indiana State Planes- Western Zone- US Foot (EPSG #2890)
IN-W	NAD27 Indiana State Planes- Western Zone- US Foot (EPSG #26774)
KS83-N	NAD83 Kansas State Planes- Northern Zone- Meter (EPSG #26977)
KS83-NF	NAD83 Kansas State Planes- Northern Zone- US Foot
KS83-S	NAD83 Kansas State Planes- Southern Zone- Meter (EPSG #26978)
KS83-SF	NAD83 Kansas State Planes- Southern Zone- US Foot
KSHP-N	HARN (HPGN) Kansas State Planes- Northern Zone- Meter (EPSG #2796)
KSHP-NF	HARN (HPGN) Kansas State Planes- Northern Zone- US Foot
KSHP-S	HARN (HPGN) Kansas State Planes- Southern Zone- Meter (EPSG #2797)
KSHP-SF	HARN (HPGN) Kansas State Planes- Southern Zone- US Foot
KS-N	NAD27 Kansas State Planes- Northern Zone- US Foot (EPSG #26777)
KS-S	NAD27 Kansas State Planes- Southern Zone- US Foot (EPSG #26778)
KY83-N	NAD83 Kentucky State Planes- Northern Zone- Meter (EPSG #26979)
KY83-NF	NAD83 Kentucky State Planes- Northern Zone- US Foot (EPSG #2246)
KY83-S	NAD83 Kentucky State Planes- Southern Zone- Meter (EPSG #26980)
KY83-SF	NAD83 Kentucky State Planes- Southern Zone- US Foot (EPSG #2247)
KYHP-N	HPGN Kentucky State Planes- Northern Zone- Meter (EPSG #2798)
KYHP-NF	HPGN Kentucky State Planes- Northern Zone- US Foot (EPSG #2891)
KYHP-S	HPGN Kentucky State Planes- Southern Zone- Meter (EPSG #2799)
KYHP-SF	HPGN Kentucky State Planes- Southern Zone- US Foot (EPSG #2892)
KY-N	NAD27 Kentucky State Planes- Northern Zone- US Foot (EPSG #26779)
KY-S	NAD27 Kentucky State Planes- Southern Zone- US Foot (EPSG #26780)
LA83-N	NAD83 Louisiana State Planes- Northern Zone- Meter (EPSG #26981)
LA83-NF	NAD83 Louisiana State Planes- Northern Zone- US Foot
LA83-O	NAD83 Louisiana State Planes- Offshore- Meter (EPSG #32199)
LA83-OF	NAD83 Louisiana State Planes- Offshore- US Foot
LA83-S	NAD83 Louisiana State Planes- Southern Zone- Meter (EPSG #26982)
LA83-SF	NAD83 Louisiana State Planes- Southern Zone- US Foot
LAHP-N	HPGN Louisiana State Planes- Northern Zone- Meter (EPSG #2800)
LAHP-NF	HPGN Louisiana State Planes- Northern Zone- US Foot
LAHP-O	HPGN Louisiana State Planes- Offshore- Meter
LAHP-OF	HPGN Louisiana State Planes- Offshore- US Foot
LAHP-S	HPGN Louisiana State Planes- Southern Zone- Meter (EPSG #2801)
LAHP-SF	HPGN Louisiana State Planes- Southern Zone- US Foot
LA-N	NAD27 Louisiana State Planes- Northern Zone- US Foot (EPSG #26781)
LA-O	NAD27 Louisiana State Planes- Offshore- US Foot (EPSG #32099)
LA-S	NAD27 Louisiana State Planes- Southern Zone- US Foot (EPSG #26782)
LL-83	NAD83 Latitude/Longitude- Degrees
LL84	WGS84 Lat/Long- Degrees- -180 through +180 (EPSG #4326)
MA	NAD27 Massachusetts State Planes- Mainland Zone- US Foot (EPSG #26786)
MA27-IS	NAD27 Massachusetts State Planes- Island Zone- US Foot (EPSG #26787)
MA83	NAD83 Massachusetts State Planes- Mainland Zone- Meter (EPSG #26986)
MA83F	NAD83 Massachusetts State Planes- Mainland Zone- US Foot (EPSG #2249)
MA83-IS	NAD83 Massachusetts State Planes- Island Zone- Meter (EPSG #26987)
MA83-ISF	NAD83 Massachusetts State Planes- Island Zone- US Foot (EPSG #2250)
MAHP	HPGN/HARN Massachusetts State Planes- Mainland Zone- Meter (EPSG #2805)
MAHPF	HPGN/HARN Massachusetts State Planes- Mainland Zone- US Foot (EPSG #2894)
MAHP-IS	HPGN/HARN Massachusetts State Planes- Island Zone- Meter (EPSG #2806)
MAHP-ISF	HPGN/HARN Massachusetts State Planes- Island Zone- US Foot (EPSG #2895)
MD	NAD27 Maryland State Plane Zone- US Foot (EPSG #26785)

MD83	NAD83 Maryland State Plane Zone- Meter (EPSG #26985)
MD83F	NAD83 Maryland State Plane Zone- US Foot (EPSG #2248)
MDHP	HPGN Maryland State Plane Zone- Meter (EPSG #2804)
MDHPF	HPGN Maryland State Plane Zone- US Foot (EPSG #2893)
ME83-E	NAD83 Maine State Planes- Eastern Zone- Meter (EPSG #26983)
ME83-EF	NAD83 Maine State Planes- Eastern Zone- US Foot
ME83-W	NAD83 Maine State Planes- Western Zone- Meter (EPSG #26984)
ME83-WF	NAD83 Maine State Planes- Western Zone- US Foot
ME-E	NAD27 Maine State Planes- Eastern Zone- US Foot (EPSG #26783)
MEHP-E	HPGN Maine State Planes- Eastern Zone- Meter (EPSG #2802)
MEHP-EF	HPGN Maine State Planes- Eastern Zone- US Foot
MEHP-W	HPGN Maine State Planes- Western Zone- Meter (EPSG #2803)
MEHP-WF	HPGN Maine State Planes- Western Zone- US Foot
ME-W	NAD27 Maine State Planes- Western Zone- US Foot (EPSG #26784)
MI27-C	NAD27 Michigan State Planes- Central Zone- US Foot (EPSG #26812)
MI27-N	NAD27 Michigan State Planes- Northern Zone- US Foot (EPSG #26811)
MI27-S	NAD27 Michigan State Planes- Southern Zone- US Foot (EPSG #26813)
MI83-C	NAD83 Michigan State Planes- Central Zone- Meter (EPSG #26989)
MI83-CF	NAD83 Michigan State Planes- Central Zone- US Foot
MI83-CIF	NAD83 Michigan State Planes- Central Zone- Intnl Foot (EPSG #2252)
MI83-N	NAD83 Michigan State Planes- Northern Zone- Meter (EPSG #26988)
MI83-NF	NAD83 Michigan State Planes- Northern Zone- US Foot
MI83-NIF	NAD83 Michigan State Planes- Northern Zone- Intnl Foot (EPSG #2251)
MI83-S	NAD83 Michigan State Planes- Southern Zone- Meter (EPSG #26990)
MI83-SF	NAD83 Michigan State Planes- Southern Zone- US Foot
MI83-SIF	NAD83 Michigan State Planes- Southern Zone- Intnl Foot (EPSG #2253)
MIHP-C	HARN (HPGN) Michigan State Planes- Central Zone- Meter (EPSG #2808)
MIHP-CF	HARN (HPGN) Michigan State Planes- Central Zone- US Foot
MIHP-CIF	HARN (HPGN) Michigan State Planes- Central Zone- Intnl Foot (EPSG #2897)
MIHP-N	HARN (HPGN) Michigan State Planes- Northern Zone- Meter (EPSG #2807)
MIHP-NF	HARN (HPGN) Michigan State Planes- Northern Zone- US Foot
MIHP-NIF	HARN (HPGN) Michigan State Planes- Northern Zone- Intnl Foot (EPSG #2896)
MIHP-S	HARN (HPGN) Michigan State Planes- Southern Zone- Meter (EPSG #2809)
MIHP-SF	HARN (HPGN) Michigan State Planes- Southern Zone- US Foot
MIHP-SIF	HARN (HPGN) Michigan State Planes- Southern Zone- Intnl Foot (EPSG #2898)
MN83-C	NAD83 Minnesota State Planes- Central Zone- Meter (EPSG #26992)
MN83-CF	NAD83 Minnesota State Planes- Central Zone- US Foot
MN83-N	NAD83 Minnesota State Planes- Northern Zone- Meter (EPSG #26991)
MN83-NF	NAD83 Minnesota State Planes- Northern Zone- US Foot
MN83-S	NAD83 Minnesota State Planes- South Zone- Meter (EPSG #26993)
MN83-SF	NAD83 Minnesota State Planes- South Zone- US Foot
MN-C	NAD27 Minnesota State Planes- Central Zone- US Foot (EPSG #26792)
MNHP-C	HARN (HPGN) Minnesota State Planes- Central Zone- Meter (EPSG #2811)
MNHP-CF	HARN (HPGN) Minnesota State Planes- Central Zone- US Foot
MNHP-N	HARN (HPGN) Minnesota State Planes- Northern Zone- Meter (EPSG #2810)
MNHP-NF	HARN (HPGN) Minnesota State Planes- Northern Zone- US Foot
MNHP-S	HARN (HPGN) Minnesota State Planes- South Zone- Meter (EPSG #2812)
MNHP-SF	HARN (HPGN) Minnesota State Planes- South Zone- US Foot
MN-N	NAD27 Minnesota State Planes- Northern Zone- US Foot (EPSG #26791)
MN-S	NAD27 Minnesota State Planes- South- US Foot (EPSG #26793)
MO83-C	NAD83 Missouri State Planes- Central Zone- Meter (EPSG #26997)
MO83-CF	NAD83 Missouri State Planes- Central Zone- US Foot
MO83-E	NAD83 Missouri State Planes- Eastern Zone- Meter (EPSG #26996)
MO83-EF	NAD83 Missouri State Planes- Eastern Zone- US Foot
MO83-W	NAD83 Missouri State Planes- Western Zone- Meter (EPSG #26998)
MO83-WF	NAD83 Missouri State Planes- Western Zone- US Foot
MO-C	NAD27 Missouri State Planes- Central Zone- US Foot (EPSG #26797)
MO-E	NAD27 Missouri State Planes- Eastern Zone- US Foot (EPSG #26796)
MOHP-C	HARN (HPGN) Missouri State Planes- Central Zone- Meter (EPSG #2816)
MOHP-CF	HARN (HPGN) Missouri State Planes- Central Zone- US Foot
MOHP-E	HARN (HPGN) Missouri State Planes- Eastern Zone- Meter (EPSG #2815)
MOHP-EF	HARN (HPGN) Missouri State Planes- Eastern Zone- US Foot
MOHP-W	HARN (HPGN) Missouri State Planes- Western Zone- Meter (EPSG #2817)
MOHP-WF	HARN (HPGN) Missouri State Planes- Western Zone- US Foot
MO-W	NAD27 Missouri State Planes- Western Zone- US Foot (EPSG #26798)
MS83-E	NAD83 Mississippi State Planes- Eastern Zone- Meter (EPSG #26994)

MS83-EF	NAD83 Mississippi State Planes- Eastern Zone- US Foot (EPSG #2254)
MS83-TM	NAD83 Mississippi Transverse Mercator Projection (meters)
MS83-W	NAD83 Mississippi State Planes- Western Zone- Meter (EPSG #26995)
MS83-WF	NAD83 Mississippi State Planes- Western Zone- US Foot (EPSG #2255)
MS-E	NAD27 Mississippi State Planes- Eastern Zone- US Foot (EPSG #26794)
MSHP-E	HPGN Mississippi State Planes- Eastern Zone- Meter (EPSG #2813)
MSHP-EF	HPGN Mississippi State Planes- Eastern Zone- US Foot (EPSG #2899)
MSHP-W	HPGN Mississippi State Planes- Western Zone- Meter (EPSG #2814)
MSHP-WF	HPGN Mississippi State Planes- Western Zone- US Foot (EPSG #2900)
MS-W	NAD27 Mississippi State Planes- Western Zone- US Foot (EPSG #26795)
MT83	NAD83 Montana State Plane Zone- Meter (EPSG #32100)
MT83F	NAD83 Montana State Plane Zone- US Foot
MT83IF	NAD83 Montana State Planes- Intnl Foot (EPSG #2256)
MT-C	NAD27 Montana State Planes- Central Zone- US Foot (EPSG #32002)
MTHP	HPGN Montana State Plane Zone- Meter (EPSG #2818)
MTHPF	HPGN Montana State Plane Zone- US Foot
MTHPIF	HPGN Montana State Planes- Intnl Foot (EPSG #2901)
MT-N	NAD27 Montana State Planes- Northern Zone- US Foot (EPSG #32001)
MT-S	NAD27 Montana State Planes- Southern Zone- US Foot (EPSG #32003)
NB83	NAD83 Nebraska State Planes- Meter (EPSG #32104)
NB83F	NAD83 Nebraska State Planes- US Foot
NBHP	HPGN/HARN Nebraska State Planes- Meter (EPSG #2819)
NBHPF	HPGN/HARN Nebraska State Planes- US Foot
NB-N	NAD27 Nebraska State Planes- Northern Zone- US Foot (EPSG #32005)
NB-S	NAD27 Nebraska State Planes- Southern Zone- US Foot (EPSG #32006)
NC	NAD27 North Carolina State Planes- US Foot (EPSG #32019)
NC83	NAD83 North Carolina State Planes- Meter (EPSG #32119)
NC83F	NAD83 North Carolina State Planes- US Foot (EPSG #2264)
NCHP	HARN (HPGN) North Carolina State Planes- Meter
NCHPF	HARN (HPGN) North Carolina State Planes- US Foot
ND83-N	NAD83 North Dakota State Planes- Northern Zone- Meter (EPSG #32120)
ND83-NF	NAD83 North Dakota State Planes- Northern Zone- US Foot
ND83-S	NAD83 North Dakota State Planes- Southern Zone- Meter (EPSG #32121)
ND83-SF	NAD83 North Dakota State Planes- Southern Zone- US Foot
NDHP-N	HARN (HPGN) North Dakota State Planes- Northern Zone- Meter (EPSG #2832)
NDHP-NF	HARN (HPGN) North Dakota State Planes- Northern Zone- US Foot
NDHP-S	HARN (HPGN) North Dakota State Planes- Southern Zone- Meter (EPSG #2833)
NDHP-SF	HARN (HPGN) North Dakota State Planes- Southern Zone- US Foot
ND-N	NAD27 North Dakota State Planes- Northern Zone- US Foot (EPSG #32020)
ND-S	NAD27 North Dakota State Planes- Southern Zone- US Foot (EPSG #32021)
NE83	NAD83 Nebraska State Planes- Meter
NE83F	NAD83 Nebraska State Planes- US Foot
NE-N	NAD27 Nebraska State Planes- Northern Zone- US Foot
NE-S	NAD27 Nebraska State Planes- Southern Zone- US Foot
NH	NAD27 New Hampshire State Planes- US Foot (EPSG #32010)
NH83	NAD83 New Hampshire State Planes- Meter (EPSG #32110)
NH83F	NAD83 New Hampshire State Planes- US Foot
NHHP	HPGN/HARN New Hampshire State Planes- Meter (EPSG #2823)
NHHPF	HPGN/HARN New Hampshire State Planes- US Foot
NJ	NAD27 New Jersey State Planes- US Foot (EPSG #32011)
NJ83	NAD83 New Jersey State Planes- Meter (EPSG #32111)
NJ83F	NAD83 New Jersey State Planes- US Foot
NJHP	HARN (HPGN) New Jersey State Planes- Meter (EPSG #2824)
NJHPF	HARN (HPGN) New Jersey State Planes- US Foot
NM83-C	NAD83 New Mexico State Planes- Central Zone- Meter (EPSG #32113)
NM83-CF	NAD83 New Mexico State Planes- Central Zone- US Foot (EPSG #2258)
NM83-E	NAD83 New Mexico State Planes- Eastern Zone- Meter (EPSG #32112)
NM83-EF	NAD83 New Mexico State Planes- Eastern Zone- US Foot (EPSG #2257)
NM83-W	NAD83 New Mexico State Planes- Western Zone- Meter (EPSG #32114)
NM83-WF	NAD83 New Mexico State Planes- Western Zone- US Foot (EPSG #2259)
NM-C	NAD27 New Mexico State Planes- Central Zone- US Foot (EPSG #32013)
NM-E	NAD27 New Mexico State Planes- Eastern Zone- US Foot (EPSG #32012)
NMHP-C	HPGN New Mexico State Planes- Central Zone- Meter (EPSG #2826)
NMHP-CF	HPGN New Mexico State Planes- Central Zone- US Foot (EPSG #2903)
NMHP-E	HPGN New Mexico State Planes- Eastern Zone- Meter (EPSG #2825)
NMHP-EF	HPGN New Mexico State Planes- Eastern Zone- US Foot (EPSG #2902)

NMHP-W	HPGN New Mexico State Planes- Western Zone- Meter (EPSG #2827)
NMHP-WF	HPGN New Mexico State Planes- Western Zone- US Foot (EPSG #2904)
NM-W	NAD27 New Mexico State Planes- Western Zone- US Foot (EPSG #32014)
NV83-C	NAD83 Nevada State Planes- Central Zone- Meter (EPSG #32108)
NV83-CF	NAD83 Nevada State Planes- Central Zone- US Foot
NV83-E	NAD83 Nevada State Planes- Eastern Zone- Meter (EPSG #32107)
NV83-EF	NAD83 Nevada State Planes- Eastern Zone- US Foot
NV83-W	NAD83 Nevada State Planes- Western Zone- Meter (EPSG #32109)
NV83-WF	NAD83 Nevada State Planes- Western Zone- US Foot
NV-C	NAD27 Nevada State Planes- Central Zone- US Foot (EPSG #32008)
NV-E	NAD27 Nevada State Planes- Eastern Zone- US Foot (EPSG #32007)
NVHP-C	HARN (HPGN) Nevada State Planes- Central Zone- Meter (EPSG #2821)
NVHP-CF	HARN (HPGN) Nevada State Planes- Central Zone- US Foot
NVHP-E	HARN (HPGN) Nevada State Planes- Eastern Zone- Meter (EPSG #2820)
NVHP-EF	HARN (HPGN) Nevada State Planes- Eastern Zone- US Foot
NVHP-W	HARN (HPGN) Nevada State Planes- Western Zone- Meter (EPSG #2822)
NVHP-WF	HARN (HPGN) Nevada State Planes- Western Zone- US Foot
NV-W	NAD27 Nevada State Planes- Western Zone- US Foot (EPSG #32009)
NY83-C	NAD83 New York State Planes- Central Zone- Meter (EPSG #32116)
NY83-CF	NAD83 New York State Planes- Central Zone- US Foot (EPSG #2261)
NY83-E	NAD83 New York State Planes- Eastern Zone- Meter (EPSG #32115)
NY83-EF	NAD83 New York State Planes- Eastern Zone- US Foot (EPSG #2260)
NY83-LI	NAD83 New York State Planes- Long Island- Meter (EPSG #32118)
NY83-LIF	NAD83 New York State Planes- Long Island- US Foot (EPSG #2263)
NY83-W	NAD83 New York State Planes- Western Zone- Meter (EPSG #32117)
NY83-WF	NAD83 New York State Planes- Western Zone- US Foot (EPSG #2262)
NY-C	NAD27 New York State Planes- Central Zone- US Foot (EPSG #32016)
NY-E	NAD27 New York State Planes- Eastern Zone- US Foot (EPSG #32015)
NYHP-C	HARN (HPGN) New York State Planes- Central Zone- Meter (EPSG #2829)
NYHP-CF	HARN (HPGN) New York State Planes- Central Zone- US Foot (EPSG #2906)
NYHP-E	HARN (HPGN) New York State Planes- Eastern Zone- Meter (EPSG #2828)
NYHP-EF	HARN (HPGN) New York State Planes- Eastern Zone- US Foot (EPSG #2905)
NYHP-LI	HARN (HPGN) New York State Planes- Long Island- Meter (EPSG #2831)
NYHP-LIF	HARN (HPGN) New York State Planes- Long Island- US Foot (EPSG #2908)
NYHP-W	HARN (HPGN) New York State Planes- Western Zone- Meter (EPSG #2830)
NYHP-WF	HARN (HPGN) New York State Planes- Western Zone- US Foot (EPSG #2907)
NY-LI	NAD27 New York State Planes- Long Island- US Foot (EPSG #32018)
NY-W	NAD27 New York State Planes- Western Zone- US Foot (EPSG #32017)
OH83-N	NAD83 Ohio State Planes- Northern Zone- Meter (EPSG #32122)
OH83-NF	NAD83 Ohio State Planes- Northern Zone- US Foot
OH83-S	NAD83 Ohio State Planes- Southern Zone- Meter (EPSG #32123)
OH83-SF	NAD83 Ohio State Planes- Southern Zone- US Foot
OHHP-N	HARN (HPGN) Ohio State Planes- Northern Zone- Meter (EPSG #2834)
OHHP-NF	HARN (HPGN) Ohio State Planes- Northern Zone- US Foot
OHHP-S	HARN (HPGN) Ohio State Planes- Southern Zone- Meter (EPSG #2835)
OHHP-SF	HARN (HPGN) Ohio State Planes- Southern Zone- US Foot
OH-N	NAD27 Ohio State Planes- Northern Zone- US Foot (EPSG #32022)
OH-S	NAD27 Ohio State Planes- Southern Zone- US Foot (EPSG #32023)
OK83-N	NAD83 Oklahoma State Planes- Northern Zone- Meter (EPSG #32124)
OK83-NF	NAD83 Oklahoma State Planes- Northern Zone- US Foot (EPSG #2267)
OK83-S	NAD83 Oklahoma State Planes- Southern Zone- Meter (EPSG #32125)
OK83-SF	NAD83 Oklahoma State Planes- Southern Zone- US Foot (EPSG #2268)
OKHP-N	HPGN Oklahoma State Planes- Northern Zone- Meter (EPSG #2836)
OKHP-NF	HPGN Oklahoma State Planes- Northern Zone- US Foot (EPSG #2911)
OKHP-S	HPGN Oklahoma State Planes- Southern Zone- Meter (EPSG #2837)
OKHP-SF	HPGN Oklahoma State Planes- Southern Zone- US Foot (EPSG #2912)
OK-N	NAD27 Oklahoma State Planes- Northern Zone- US Foot (EPSG #32024)
OK-S	NAD27 Oklahoma State Planes- Southern Zone- US Foot (EPSG #32025)
OR83-N	NAD83 Oregon State Planes- Northern Zone- Meter (EPSG #32126)
OR83-NF	NAD83 Oregon State Planes- Northern Zone- US Foot
OR83-NIF	NAD83 Oregon State Planes- Northern Zone- Intnl Foot (EPSG #2269)
OR83-S	NAD83 Oregon State Planes- Southern Zone- Meter (EPSG #32127)
OR83-SF	NAD83 Oregon State Planes- Southern Zone- US Foot
OR83-SIF	NAD83 Oregon State Planes- Southern Zone- Intnl Foot (EPSG #2270)
OR83-SSCGIS	NAD83 Oregon GIS- International Foot (EPSG #2992)
ORHP-N	HPGN Oregon State Planes- Northern Zone- Meter (EPSG #2838)

ORHP-NF	HPGN Oregon State Planes- Northern Zone- US Foot
ORHP-NIF	HPGN Oregon State Planes- Northern Zone- Intnl Foot (EPSG #2913)
ORHP-S	HPGN Oregon State Planes- Southern Zone- Meter (EPSG #2839)
ORHP-SF	HPGN Oregon State Planes- Southern Zone- US Foot
ORHP-SIF	HPGN Oregon State Planes- Southern Zone- Intnl Foot (EPSG #2914)
OR-N	NAD27 Oregon State Planes- Northern Zone- US Foot (EPSG #32026)
OR-S	NAD27 Oregon State Planes- Southern Zone- US Foot (EPSG #32027)
PA83-N	NAD83 Pennsylvania State Planes- Northern Zone- Meter (EPSG #32128)
PA83-NF	NAD83 Pennsylvania State Planes- Northern Zone- US Foot (EPSG #2271)
PA83-S	NAD83 Pennsylvania State Planes- Southern Zone- Meter (EPSG #32129)
PA83-SF	NAD83 Pennsylvania State Planes- Southern Zone- US Foot (EPSG #2272)
PAHP-N	HARN (HPGN) Pennsylvania State Planes- Northern Zone- Meter
PAHP-NF	HARN (HPGN) Pennsylvania State Planes- Northern Zone- US Foot
PAHP-S	HARN (HPGN) Pennsylvania State Planes- Southern Zone- Meter
PAHP-SF	HARN (HPGN) Pennsylvania State Planes- Southern Zone- US Foot
PA-N	NAD27 Pennsylvania State Planes- Northern Zone- US Foot (EPSG #32028)
PA-S	NAD27 Pennsylvania State Planes- Southern Zone- US Foot (EPSG #32029)
PR-1	NAD27 Puerto Rico and Virgin Islands- Zone 1- US Foot
PR-2	NAD27 Puerto Rico- St Croix Virgin Island- Zone 2- US Foot
PR83	NAD83 Puerto Rico and Virgin Islands- Meter (EPSG #32161)
PR83F	NAD83 Puerto Rico and Virgin Islands- US Foot
PRHP	HPGN Puerto Rico and Virgin Islands- Meter (EPSG #2866)
PRHPF	HPGN Puerto Rico and Virgin Islands- US Foot
RI	NAD27 Rhode Island State Planes- US Foot (EPSG #32030)
RI83	NAD83 Rhode Island State Planes- Meter (EPSG #32130)
RI83F	NAD83 Rhode Island State Planes- US Foot
RIHP	HPGN/HARN Rhode Island State Planes- Meter (EPSG #2840)
RIHPF	HPGN/HARN Rhode Island State Planes- US Foot
SC83	NAD83 South Carolina State Planes- Meter (EPSG #32133)
SC83F	NAD83 South Carolina State Planes- US Foot
SC83IF	NAD83 South Carolina State Planes- Intnl Foot (EPSG #2273)
SCHP	HARN (HPGN) South Carolina State Planes- Meter
SCHPF	HARN (HPGN) South Carolina State Planes- US Foot
SCHPIF	HARN (HPGN) South Carolina State Planes- Intnl Foot
SC-N	NAD27 South Carolina State Planes- Northern Zone- US Foot (EPSG #32031)
SC-S	NAD27 South Carolina State Planes- Southern Zone- US Foot (EPSG #32033)
SD83-N	NAD83 South Dakota State Planes- Northern Zone- Meter (EPSG #32134)
SD83-NF	NAD83 South Dakota State Planes- Northern Zone- US Foot
SD83-S	NAD83 South Dakota State Planes- Southern Zone- Meter (EPSG #32135)
SD83-SF	NAD83 South Dakota State Planes- Southern Zone- US Foot
SDHP-N	HARN (HPGN) South Dakota State Planes- Northern Zone- Meter (EPSG #2841)
SDHP-NF	HARN (HPGN) South Dakota State Planes- Northern Zone- US Foot
SDHP-S	HARN (HPGN) South Dakota State Planes- Southern Zone- Meter (EPSG #2842)
SDHP-SF	HARN (HPGN) South Dakota State Planes- Southern Zone- US Foot
SD-N	NAD27 South Dakota State Planes- Northern Zone- US Foot (EPSG #32034)
SD-S	NAD27 South Dakota State Planes- Southern Zone- US Foot (EPSG #32035)
TN	NAD27 Tennessee State Plane Zone- US Foot (EPSG #2204)
TN83	NAD83 Tennessee State Plane Zone- Meter (EPSG #32136)
TN83F	NAD83 Tennessee State Plane Zone- US Foot (EPSG #2274)
TNHP	HPGN Tennessee State Plane Zone- Meter (EPSG #2843)
TNHPF	HPGN Tennessee State Plane Zone- US Foot (EPSG #2915)
TX83-C	NAD83 Texas State Planes- Central Zone- Meter (EPSG #32139)
TX83-CF	NAD83 Texas State Planes- Central Zone- US Foot (EPSG #2277)
TX83-N	NAD83 Texas State Planes- Northern Zone- Meter (EPSG #32137)
TX83-NC	NAD83 Texas State Planes- North Central Zone- Meter (EPSG #32138)
TX83-NCF	NAD83 Texas State Planes- North Central Zone- US Foot (EPSG #2276)
TX83-NF	NAD83 Texas State Planes- Northern Zone- US Foot (EPSG #2275)
TX83-S	NAD83 Texas State Planes- Southern Zone- Meter (EPSG #32141)
TX83-SC	NAD83 Texas State Planes- South Central Zone- Meter (EPSG #32140)
TX83-SCF	NAD83 Texas State Planes- South Central Zone- US Foot (EPSG #2278)
TX83-SF	NAD83 Texas State Planes- Southern Zone- US Foot (EPSG #2279)
TX-C	NAD27 Texas State Planes- Central Zone- US Foot (EPSG #32039)
TXHP-C	HPGN/HARN Texas State Planes- Central Zone- Meter (EPSG #2846)
TXHP-CF	HPGN/HARN Texas State Planes- Central Zone- US Foot (EPSG #2918)
TXHP-N	HPGN/HARN Texas State Planes- Northern Zone- Meter (EPSG #2844)
TXHP-NC	HPGN/HARN Texas State Planes- North Central Zone- Meter (EPSG #2845)

TXHP-NCF	HPGN/HARN Texas State Planes- North Central Zone- US Foot (EPSG #2917)
TXHP-NF	HPGN/HARN Texas State Planes- Northern Zone- US Foot (EPSG #2916)
TXHP-S	HPGN/HARN Texas State Planes- Southern Zone- Meter (EPSG #2848)
TXHP-SC	HPGN/HARN Texas State Planes- South Central Zone- Meter (EPSG #2847)
TXHP-SCF	HPGN/HARN Texas State Planes- South Central Zone- US Foot (EPSG #2919)
TXHP-SF	HPGN/HARN Texas State Planes- Southern Zone- US Foot (EPSG #2920)
TX-N	NAD27 Texas State Planes- Northern Zone- US Foot (EPSG #32037)
TX-NC	NAD27 Texas State Planes- North Central Zone- US Foot (EPSG #32038)
TX-S	NAD27 Texas State Planes- Southern Zone- US Foot (EPSG #32041)
TX-SC	NAD27 Texas State Planes- South Central Zone- US Foot (EPSG #32040)
UT83-C	NAD83 Utah State Planes- Central Zone- Meter (EPSG #32143)
UT83-CF	NAD83 Utah State Planes- Central Zone- US Foot
UT83-CIF	NAD83 Utah State Planes- Central Zone- Intnl Foot (EPSG #2281)
UT83-N	NAD83 Utah State Planes- Northern Zone- Meter (EPSG #32142)
UT83-NF	NAD83 Utah State Planes- Northern Zone- US Foot
UT83-NIF	NAD83 Utah State Planes- Northern Zone- Intnl Foot (EPSG #2280)
UT83-S	NAD83 Utah State Planes- Southern Zone- Meter (EPSG #32144)
UT83-SF	NAD83 Utah State Planes- Southern Zone- US Foot
UT83-SIF	NAD83 Utah State Planes- Southern Zone- Intnl Foot (EPSG #2282)
UT-C	NAD27 Utah State Planes- Central Zone- US Foot (EPSG #32043)
UTHP-C	HARN (HPGN) Utah State Planes- Central Zone- Meter (EPSG #2850)
UTHP-CF	HARN (HPGN) Utah State Planes- Central Zone- US Foot
UTHP-CIF	HARN (HPGN) Utah State Planes- Central Zone- Intnl Foot (EPSG #2922)
UTHP-N	HARN (HPGN) Utah State Planes- Northern Zone- Meter (EPSG #2849)
UTHP-NF	HARN (HPGN) Utah State Planes- Northern Zone- US Foot
UTHP-NIF	HARN (HPGN) Utah State Planes- Northern Zone- Intnl Foot (EPSG #2921)
UTHP-S	HARN (HPGN) Utah State Planes- Southern Zone- Meter (EPSG #2851)
UTHP-SF	HARN (HPGN) Utah State Planes- Southern Zone- US Foot
UTHP-SIF	HARN (HPGN) Utah State Planes- Southern Zone- Intnl Foot (EPSG #2923)
UTM27-1	NAD27 UTM- Zone 1 North- Meter
UTM27-10	NAD27 UTM- Zone 10 North- Meter (EPSG #26710)
UTM27-10F	NAD27 UTM- Zone 10 North- US Foot
UTM27-10IF	NAD27 UTM- Zone 10 North- Intnl Foot
UTM27-11	NAD27 UTM- Zone 11 North- Meter (EPSG #26711)
UTM27-11F	NAD27 UTM- Zone 11 North- US Foot
UTM27-11JF	NAD27 UTM- Zone 11 North- Intnl Foot
UTM27-12	NAD27 UTM- Zone 12 North- Meter (EPSG #26712)
UTM27-12F	NAD27 UTM- Zone 12 North- US Foot
UTM27-12IF	NAD27 UTM- Zone 12 North- Intnl Foot
UTM27-13	NAD27 UTM- Zone 13 North- Meter (EPSG #26713)
UTM27-13F	NAD27 UTM- Zone 13 North- US Foot
UTM27-13IF	NAD27 UTM- Zone 13 North- Intnl Foot
UTM27-14	NAD27 UTM- Zone 14 North- Meter (EPSG #26714)
UTM27-14F	NAD27 UTM- Zone 14 North- US Foot
UTM27-14IF	NAD27 UTM- Zone 14 North- Intnl Foot
UTM27-15	NAD27 UTM- Zone 15 North- Meter (EPSG #26715)
UTM27-15F	NAD27 UTM- Zone 15 North- US Foot
UTM27-15IF	NAD27 UTM- Zone 15 North- Intnl Foot
UTM27-16	NAD27 UTM- Zone 16 North- Meter (EPSG #26716)
UTM27-16F	NAD27 UTM- Zone 16 North- US Foot
UTM27-16IF	NAD27 UTM- Zone 16 North- Intnl Foot
UTM27-17	NAD27 UTM- Zone 17 North- Meter (EPSG #26717)
UTM27-17F	NAD27 UTM- Zone 17 North- US Foot
UTM27-17IF	NAD27 UTM- Zone 17 North- Intnl Foot
UTM27-18	NAD27 UTM- Zone 18 North- Meter (EPSG #26718)
UTM27-18F	NAD27 UTM- Zone 18 North- US Foot
UTM27-18IF	NAD27 UTM- Zone 18 North- Intnl Foot
UTM27-19	NAD27 UTM- Zone 19 North- Meter (EPSG #26719)
UTM27-19F	NAD27 UTM- Zone 19 North- US Foot
UTM27-19IF	NAD27 UTM- Zone 19 North- Intnl Foot
UTM27-1N	NAD27 / UTM zone 1N (EPSG #26701)
UTM27-2	NAD27 UTM- Zone 2 North- Meter
UTM27-20	NAD27 UTM- Zone 20 North- Meter (EPSG #26720)
UTM27-20F	NAD27 UTM- Zone 20 North- US Foot
UTM27-20IF	NAD27 UTM- Zone 20 North- Intnl Foot
UTM27-21	NAD27 UTM- Zone 21 North- Meter (EPSG #26721)

UTM27-21F	NAD27 UTM- Zone 21 North- US Foot
UTM27-21JF	NAD27 UTM- Zone 21 North- Intnl Foot
UTM27-22	NAD27 UTM- Zone 22 North- Meter (EPSG #26722)
UTM27-22F	NAD27 UTM- Zone 22 North- US Foot
UTM27-22IF	NAD27 UTM- Zone 22 North- Intnl Foot
UTM27-23	NAD27 UTM- Zone 23 North- Meter
UTM27-23F	NAD27 UTM- Zone 23 North- US Foot
UTM27-23IF	NAD27 UTM- Zone 23 North- Intnl Foot
UTM27-2N	NAD27 / UTM zone 2N (EPSG #26702)
UTM27-3	NAD27 UTM- Zone 3 North- Meter (EPSG #26703)
UTM27-3F	NAD27 UTM- Zone 3 North- US Survey Foot
UTM27-3IF	NAD27 UTM- Zone 3 North- Intnl Foot
UTM27-4	NAD27 UTM- Zone 4 North- Meter (EPSG #26704)
UTM27-4F	NAD27 UTM- Zone 4 North- US Survey Foot
UTM27-4IF	NAD27 UTM- Zone 4 North- Intnl Foot
UTM27-5	NAD27 UTM- Zone 5 North- Meter (EPSG #26705)
UTM27-58	NAD27 UTM- Zone 58 North- Meter
UTM27-59	NAD27 UTM- Zone 59 North- Meter
UTM27-5F	NAD27 UTM- Zone 5 North- US Foot
UTM27-5IF	NAD27 UTM- Zone 5 North- Intnl Foot
UTM27-6	NAD27 UTM- Zone 6 North- Meter (EPSG #26706)
UTM27-60	NAD27 UTM- Zone 60 North- Meter
UTM27-6F	NAD27 UTM- Zone 6 North- US Foot
UTM27-6IF	NAD27 UTM- Zone 6 North- Intnl Foot
UTM27-7	NAD27 UTM- Zone 7 North- Meter (EPSG #26707)
UTM27-7F	NAD27 UTM- Zone 7 North- US Foot
UTM27-7IF	NAD27 UTM- Zone 7 North- Intnl Foot
UTM27-8	NAD27 UTM- Zone 8 North- Meter (EPSG #26708)
UTM27-8F	NAD27 UTM- Zone 8 North- US Foot
UTM27-8IF	NAD27 UTM- Zone 8 North- Intnl Foot
UTM27-9	NAD27 UTM- Zone 9 North- Meter (EPSG #26709)
UTM27-9F	NAD27 UTM- Zone 9 North- US Foot
UTM27-9IF	NAD27 UTM- Zone 9 North- Intnl Foot
UTM83-1	NAD83 UTM- Zone 1 North- Meter (EPSG #26901)
UTM83-10	NAD83 UTM- Zone 10 North- Meter (EPSG #26910)
UTM83-10F	NAD83 UTM- Zone 10 North- US Foot
UTM83-10IF	NAD83 UTM- Zone 10 North- Intnl Foot
UTM83-11	NAD83 UTM- Zone 11 North- Meter (EPSG #26911)
UTM83-11F	NAD83 UTM- Zone 11 North- US Foot
UTM83-11JF	NAD83 UTM- Zone 11 North- Intnl Foot
UTM83-12	NAD83 UTM- Zone 12 North- Meter (EPSG #26912)
UTM83-12F	NAD83 UTM- Zone 12 North- US Foot
UTM83-12IF	NAD83 UTM- Zone 12 North- Intnl Foot
UTM83-13	NAD83 UTM- Zone 13 North- Meter (EPSG #26913)
UTM83-13F	NAD83 UTM- Zone 13 North- US Foot
UTM83-13IF	NAD83 UTM- Zone 13 North- Intnl Foot
UTM83-14	NAD83 UTM- Zone 14 North- Meter (EPSG #26914)
UTM83-14F	NAD83 UTM- Zone 14 North- US Foot
UTM83-14IF	NAD83 UTM- Zone 14 North- Intnl Foot
UTM83-15	NAD83 UTM- Zone 15 North- Meter (EPSG #26915)
UTM83-15F	NAD83 UTM- Zone 15 North- US Foot
UTM83-15IF	NAD83 UTM- Zone 15 North- Intnl Foot
UTM83-16	NAD83 UTM- Zone 16 North- Meter (EPSG #26916)
UTM83-16F	NAD83 UTM- Zone 16 North- US Foot
UTM83-16IF	NAD83 UTM- Zone 16 North- Intnl Foot
UTM83-17	NAD83 UTM- Zone 17 North- Meter (EPSG #26917)
UTM83-17F	NAD83 UTM- Zone 17 North- US Foot
UTM83-17IF	NAD83 UTM- Zone 17 North- Intnl Foot
UTM83-18	NAD83 UTM- Zone 18 North- Meter (EPSG #26918)
UTM83-18F	NAD83 UTM- Zone 18 North- US Foot
UTM83-18IF	NAD83 UTM- Zone 18 North- Intnl Foot
UTM83-19	NAD83 UTM- Zone 19 North- Meter (EPSG #26919)
UTM83-19F	NAD83 UTM- Zone 19 North- US Foot
UTM83-19IF	NAD83 UTM- Zone 19 North- Intnl Foot
UTM83-2	NAD83 UTM- Zone 2 North- Meter (EPSG #26902)
UTM83-20	NAD83 UTM- Zone 20 North- Meter (EPSG #26920)

UTM83-20F	NAD83 UTM- Zone 20 North- US Foot
UTM83-20IF	NAD83 UTM- Zone 20 North- Intnl Foot
UTM83-21	NAD83 UTM- Zone 21 North- Meter (EPSG #26921)
UTM83-21F	NAD83 UTM- Zone 21 North- US Foot
UTM83-21JF	NAD83 UTM- Zone 21 North- Intnl Foot
UTM83-22	NAD83 UTM- Zone 22 North- Meter (EPSG #26922)
UTM83-22F	NAD83 UTM- Zone 22 North- US Foot
UTM83-22IF	NAD83 UTM- Zone 22 North- Intnl Foot
UTM83-23	NAD83 Universal Transverse Mercator- Zone 23 North- Meter
UTM83-3	NAD83 UTM- Zone 3 North- Meter (EPSG #26903)
UTM83-3F	NAD83 UTM- Zone 3 North- US Survey Foot
UTM83-4	NAD83 UTM- Zone 4 North- Meter (EPSG #26904)
UTM83-4F	NAD83 UTM- Zone 4 North- US Survey Foot
UTM83-5	NAD83 UTM- Zone 5 North- Meter (EPSG #26905)
UTM83-58	NAD83 UTM- Zone 58 North- Meter
UTM83-59	NAD83 UTM- Zone 59 North- Meter
UTM83-5F	NAD83 UTM- Zone 5 North- US Survey Foot
UTM83-5IF	NAD83 UTM- Zone 5 North- Intnl Foot
UTM83-6	NAD83 UTM- Zone 6 North- Meter (EPSG #26906)
UTM83-60	NAD83 UTM- Zone 60 North- Meter
UTM83-6F	NAD83 UTM- Zone 6 North- US Foot
UTM83-6IF	NAD83 UTM- Zone 6 North- Intnl Foot
UTM83-7	NAD83 UTM- Zone 7 North- Meter (EPSG #26907)
UTM83-7F	NAD83 UTM- Zone 7 North- US Foot
UTM83-7IF	NAD83 UTM- Zone 7 North- Intnl Foot
UTM83-8	NAD83 UTM- Zone 8 North- Meter (EPSG #26908)
UTM83-8F	NAD83 UTM- Zone 8 North- US Foot
UTM83-8IF	NAD83 UTM- Zone 8 North- Intnl Foot
UTM83-9	NAD83 UTM- Zone 9 North- Meter (EPSG #26909)
UTM83-9F	NAD83 UTM- Zone 9 North- US Foot
UTM83-9IF	NAD83 UTM- Zone 9 North- Intnl Foot
UTM84-10N	WGS 1984 UTM- Zone 10 North- Meter (EPSG #32610)
UTM84-10S	WGS 1984 UTM- Zone 10 South- Meter (EPSG #32710)
UTM84-11N	WGS 1984 UTM- Zone 11 North- Meter (EPSG #32611)
UTM84-11S	WGS 1984 UTM- Zone 11 South- Meter (EPSG #32711)
UTM84-12N	WGS 1984 UTM- Zone 12 North- Meter (EPSG #32612)
UTM84-12S	WGS 1984 UTM- Zone 12 South- Meter (EPSG #32712)
UTM84-13N	WGS 1984 UTM- Zone 13 North- Meter (EPSG #32613)
UTM84-13S	WGS 1984 UTM- Zone 13 South- Meter (EPSG #32713)
UTM84-14N	WGS 1984 UTM- Zone 14 North- Meter (EPSG #32614)
UTM84-14S	WGS 1984 UTM- Zone 14 South- Meter (EPSG #32714)
UTM84-15N	WGS 1984 UTM- Zone 15 North- Meter (EPSG #32615)
UTM84-15S	WGS 1984 UTM- Zone 15 South- Meter (EPSG #32715)
UTM84-16N	WGS 1984 UTM- Zone 16 North- Meter (EPSG #32616)
UTM84-16S	WGS 1984 UTM- Zone 16 South- Meter (EPSG #32716)
UTM84-17N	WGS 1984 UTM- Zone 17 North- Meter (EPSG #32617)
UTM84-17S	WGS 1984 UTM- Zone 17 South- Meter (EPSG #32717)
UTM84-18N	WGS 1984 UTM- Zone 18 North- Meter (EPSG #32618)
UTM84-18S	WGS 1984 UTM- Zone 18 South- Meter (EPSG #32718)
UTM84-19N	WGS 1984 UTM- Zone 19 North- Meter (EPSG #32619)
UTM84-19S	WGS 1984 UTM- Zone 19 South- Meter (EPSG #32719)
UTM84-1N	WGS 1984 UTM- Zone 1 North- Meter (EPSG #32601)
UTM84-1S	WGS 1984 UTM- Zone 1 South- Meter (EPSG #32701)
UTM84-20N	WGS 1984 UTM- Zone 20 North- Meter (EPSG #32620)
UTM84-20S	WGS 1984 UTM- Zone 20 South- Meter (EPSG #32720)
UTM84-21N	WGS 1984 UTM- Zone 21 North- Meter (EPSG #32621)
UTM84-21S	WGS 1984 UTM- Zone 21 South- Meter (EPSG #32721)
UTM84-22N	WGS 1984 UTM- Zone 22 North- Meter (EPSG #32622)
UTM84-22S	WGS 1984 UTM- Zone 22 South- Meter (EPSG #32722)
UTM84-23N	WGS 1984 UTM- Zone 23 North- Meter (EPSG #32623)
UTM84-23S	WGS 1984 UTM- Zone 23 South- Meter (EPSG #32723)
UTM84-24N	WGS 1984 UTM- Zone 24 North- Meter (EPSG #32624)
UTM84-24S	WGS 1984 UTM- Zone 24 South- Meter (EPSG #32724)
UTM84-25N	WGS 1984 UTM- Zone 25 North- Meter (EPSG #32625)
UTM84-25S	WGS 1984 UTM- Zone 25 South- Meter (EPSG #32725)
UTM84-26N	WGS 1984 UTM- Zone 26 North- Meter (EPSG #32626)

UTM84-26S	WGS 1984 UTM- Zone 26 South- Meter (EPSG #32726)
UTM84-27N	WGS 1984 UTM- Zone 27 North- Meter (EPSG #32627)
UTM84-27S	WGS 1984 UTM- Zone 27 South- Meter (EPSG #32727)
UTM84-28N	WGS 1984 UTM- Zone 28 North- Meter (EPSG #32628)
UTM84-28S	WGS 1984 UTM- Zone 28 South- Meter (EPSG #32728)
UTM84-29N	WGS 1984 UTM- Zone 29 North- Meter (EPSG #32629)
UTM84-29S	WGS 1984 UTM- Zone 29 South- Meter (EPSG #32729)
UTM84-2N	WGS 1984 UTM- Zone 2 North- Meter (EPSG #32602)
UTM84-2S	WGS 1984 UTM- Zone 2 South- Meter (EPSG #32702)
UTM84-30N	WGS 1984 UTM- Zone 30 North- Meter (EPSG #32630)
UTM84-30S	WGS 1984 UTM- Zone 30 South- Meter (EPSG #32730)
UTM84-31N	WGS 1984 UTM- Zone 31 North- Meter (EPSG #32631)
UTM84-31S	WGS 1984 UTM- Zone 31 South- Meter (EPSG #32731)
UTM84-32N	WGS 1984 UTM- Zone 32 North- Meter (EPSG #32632)
UTM84-32S	WGS 1984 UTM- Zone 32 South- Meter (EPSG #32732)
UTM84-33N	WGS 1984 UTM- Zone 33 North- Meter (EPSG #32633)
UTM84-33S	WGS 1984 UTM- Zone 33 South- Meter (EPSG #32733)
UTM84-34N	WGS 1984 UTM- Zone 34 North- Meter (EPSG #32634)
UTM84-34S	WGS 1984 UTM- Zone 34 South- Meter (EPSG #32734)
UTM84-35N	WGS 1984 UTM- Zone 35 North- Meter (EPSG #32635)
UTM84-35S	WGS 1984 UTM- Zone 35 South- Meter (EPSG #32735)
UTM84-36N	WGS 1984 UTM- Zone 36 North- Meter (EPSG #32636)
UTM84-36S	WGS 1984 UTM- Zone 36 South- Meter (EPSG #32736)
UTM84-37N	WGS 1984 UTM- Zone 37 North- Meter (EPSG #32637)
UTM84-37S	WGS 1984 UTM- Zone 37 South- Meter (EPSG #32737)
UTM84-38N	WGS 1984 UTM- Zone 38 North- Meter (EPSG #32638)
UTM84-38S	WGS 1984 UTM- Zone 38 South- Meter (EPSG #32738)
UTM84-39N	WGS 1984 UTM- Zone 39 North- Meter (EPSG #32639)
UTM84-39S	WGS 1984 UTM- Zone 39 South- Meter (EPSG #32739)
UTM84-3N	WGS 1984 UTM- Zone 3 North- Meter (EPSG #32603)
UTM84-3S	WGS 1984 UTM- Zone 3 South- Meter (EPSG #32703)
UTM84-40N	WGS 1984 UTM- Zone 40 North- Meter (EPSG #32640)
UTM84-40S	WGS 1984 UTM- Zone 40 South- Meter (EPSG #32740)
UTM84-41N	WGS 1984 UTM- Zone 41 North- Meter (EPSG #32641)
UTM84-41S	WGS 1984 UTM- Zone 41 South- Meter (EPSG #32741)
UTM84-42N	WGS 1984 UTM- Zone 42 North- Meter (EPSG #32642)
UTM84-42S	WGS 1984 UTM- Zone 42 South- Meter (EPSG #32742)
UTM84-43N	WGS 1984 UTM- Zone 43 North- Meter (EPSG #32643)
UTM84-43S	WGS 1984 UTM- Zone 43 South- Meter (EPSG #32743)
UTM84-44N	WGS 1984 UTM- Zone 44 North- Meter (EPSG #32644)
UTM84-44S	WGS 1984 UTM- Zone 44 South- Meter (EPSG #32744)
UTM84-45N	WGS 1984 UTM- Zone 45 North- Meter (EPSG #32645)
UTM84-45S	WGS 1984 UTM- Zone 45 South- Meter (EPSG #32745)
UTM84-46N	WGS 1984 UTM- Zone 46 North- Meter (EPSG #32646)
UTM84-46S	WGS 1984 UTM- Zone 46 South- Meter (EPSG #32746)
UTM84-47N	WGS 1984 UTM- Zone 47 North- Meter (EPSG #32647)
UTM84-47S	WGS 1984 UTM- Zone 47 South- Meter (EPSG #32747)
UTM84-48N	WGS 1984 UTM- Zone 48 North- Meter (EPSG #32648)
UTM84-48S	WGS 1984 UTM- Zone 48 South- Meter (EPSG #32748)
UTM84-49N	WGS 1984 UTM- Zone 49 North- Meter (EPSG #32649)
UTM84-49S	WGS 1984 UTM- Zone 49 South- Meter (EPSG #32749)
UTM84-4N	WGS 1984 UTM- Zone 4 North- Meter (EPSG #32604)
UTM84-4S	WGS 1984 UTM- Zone 4 South- Meter (EPSG #32704)
UTM84-50N	WGS 1984 UTM- Zone 50 North- Meter (EPSG #32650)
UTM84-50S	WGS 1984 UTM- Zone 50 South- Meter (EPSG #32750)
UTM84-51N	WGS 1984 UTM- Zone 51 North- Meter (EPSG #32651)
UTM84-51S	WGS 1984 UTM- Zone 51 South- Meter (EPSG #32751)
UTM84-52N	WGS 1984 UTM- Zone 52 North- Meter (EPSG #32652)
UTM84-52S	WGS 1984 UTM- Zone 52 South- Meter (EPSG #32752)
UTM84-53N	WGS 1984 UTM- Zone 53 North- Meter (EPSG #32653)
UTM84-53S	WGS 1984 UTM- Zone 53 South- Meter (EPSG #32753)
UTM84-54N	WGS 1984 UTM- Zone 54 North- Meter (EPSG #32654)
UTM84-54S	WGS 1984 UTM- Zone 54 South- Meter (EPSG #32754)
UTM84-55N	WGS 1984 UTM- Zone 55 North- Meter (EPSG #32655)
UTM84-55S	WGS 1984 UTM- Zone 55 South- Meter (EPSG #32755)
UTM84-56N	WGS 1984 UTM- Zone 56 North- Meter (EPSG #32656)

UTM84-56S	WGS 1984 UTM- Zone 56 South- Meter (EPSG #32756)
UTM84-57N	WGS 1984 UTM- Zone 57 North- Meter (EPSG #32657)
UTM84-57S	WGS 1984 UTM- Zone 57 South- Meter (EPSG #32757)
UTM84-58N	WGS 1984 UTM- Zone 58 North- Meter (EPSG #32658)
UTM84-58S	WGS 1984 UTM- Zone 58 South- Meter (EPSG #32758)
UTM84-59N	WGS 1984 UTM- Zone 59 North- Meter (EPSG #32659)
UTM84-59S	WGS 1984 UTM- Zone 59 South- Meter (EPSG #32759)
UTM84-5N	WGS 1984 UTM- Zone 5 North- Meter (EPSG #32605)
UTM84-5S	WGS 1984 UTM- Zone 5 South- Meter (EPSG #32705)
UTM84-60N	WGS 1984 UTM- Zone 60 North- Meter (EPSG #32660)
UTM84-60S	WGS 1984 UTM- Zone 60 South- Meter (EPSG #32760)
UTM84-6N	WGS 1984 UTM- Zone 6 North- Meter (EPSG #32606)
UTM84-6S	WGS 1984 UTM- Zone 6 South- Meter (EPSG #32706)
UTM84-7N	WGS 1984 UTM- Zone 7 North- Meter (EPSG #32607)
UTM84-7S	WGS 1984 UTM- Zone 7 South- Meter (EPSG #32707)
UTM84-8N	WGS 1984 UTM- Zone 8 North- Meter (EPSG #32608)
UTM84-8S	WGS 1984 UTM- Zone 8 South- Meter (EPSG #32708)
UTM84-9N	WGS 1984 UTM- Zone 9 North- Meter (EPSG #32609)
UTM84-9S	WGS 1984 UTM- Zone 9 South- Meter (EPSG #32709)
UTM89-30N	WGS 1984 UTM- Zone 30 North- Meter
UTMHP-10	HPGN UTM- Zone 10 North- Meter
UTMHP-10F	HPGN UTM- Zone 10 North- US Foot
UTMHP-10IF	HPGN UTM- Zone 10 North- Intnl Foot
UTMHP-11	HPGN UTM- Zone 11 North- Meter
UTMHP-11F	HPGN UTM- Zone 11 North- US Foot
UTMHP-11JF	HPGN UTM- Zone 11 North- Intnl Foot
UTMHP-12	HPGN UTM- Zone 12 North- Meter
UTMHP-12F	HPGN UTM- Zone 12 North- US Foot
UTMHP-12IF	HPGN UTM- Zone 12 North- Intnl Foot
UTMHP-13	HPGN UTM- Zone 13 North- Meter
UTMHP-13F	HPGN UTM- Zone 13 North- US Foot
UTMHP-13IF	HPGN UTM- Zone 13 North- Intnl Foot
UTMHP-14	HPGN UTM- Zone 14 North- Meter
UTMHP-14F	HPGN UTM- Zone 14 North- US Foot
UTMHP-14IF	HPGN UTM- Zone 14 North- Intnl Foot
UTMHP-15	HPGN UTM- Zone 15 North- Meter
UTMHP-15F	HPGN UTM- Zone 15 North- US Foot
UTMHP-15IF	HPGN UTM- Zone 15 North- Intnl Foot
UTMHP-16	HPGN UTM- Zone 16 North- Meter
UTMHP-16F	HPGN UTM- Zone 16 North- US Foot
UTMHP-16IF	HPGN UTM- Zone 16 North- Intnl Foot
UTMHP-17	HPGN UTM- Zone 17 North- Meter
UTMHP-17F	HPGN UTM- Zone 17 North- US Foot
UTMHP-17IF	HPGN UTM- Zone 17 North- Intnl Foot
UTMHP-18	HPGN UTM- Zone 18 North- Meter
UTMHP-18F	HPGN UTM- Zone 18 North- US Foot
UTMHP-18IF	HPGN UTM- Zone 18 North- Intnl Foot
UT-N	NAD27 Utah State Planes- Northern Zone- US Foot (EPSG #32042)
UT-S	NAD27 Utah State Planes- Southern Zone- US Foot (EPSG #32044)
VA83-N	NAD83 Virginia State Planes- Northern Zone- Meter (EPSG #32146)
VA83-NF	NAD83 Virginia State Planes- Northern Zone- US Foot (EPSG #2283)
VA83-S	NAD83 Virginia State Planes- Southern Zone- Meter (EPSG #32147)
VA83-SF	NAD83 Virginia State Planes- Southern Zone- US Foot (EPSG #2284)
VAHP-N	HPGN/HARN Virginia State Planes- Northern Zone- Meter (EPSG #2853)
VAHP-NF	HPGN/HARN Virginia State Planes- Northern Zone- US Foot (EPSG #2924)
VAHP-S	HPGN/HARN Virginia State Planes- Southern Zone- Meter (EPSG #2854)
VAHP-SF	HPGN/HARN Virginia State Planes- Southern Zone- US Foot (EPSG #2925)
VA-N	NAD27 Virginia State Planes- Northern Zone- US Foot (EPSG #32046)
VA-S	NAD27 Virginia State Planes- Southern Zone- US Foot (EPSG #32047)
VT	NAD27 Vermont State Planes- US Foot (EPSG #32045)
VT83	NAD83 Vermont State Planes- Meter (EPSG #32145)
VT83F	NAD83 Vermont State Planes- US Foot
VTHP	HPGN/HARN Vermont State Planes- Meter (EPSG #2852)
VTHPF	HPGN/HARN Vermont State Planes- US Foot
WA83-N	NAD83 Washington State Planes- Northern Zone- Meter (EPSG #32148)
WA83-NF	NAD83 Washington State Planes- Northern Zone- US Foot (EPSG #2285)

WA83-S	NAD83 Washington State Planes- Southern Zone- Meter (EPSG #32149)
WA83-SF	NAD83 Washington State Planes- Southern Zone- US Foot (EPSG #2286)
WAHP-N	HPGN Washington State Planes- Northern Zone- Meter (EPSG #2855)
WAHP-NF	HPGN Washington State Planes- Northern Zone- US Foot (EPSG #2926)
WAHP-S	HPGN Washington State Planes- Southern Zone- Meter (EPSG #2856)
WAHP-SF	HPGN Washington State Planes- Southern Zone- US Foot (EPSG #2927)
WA-N	NAD27 Washington State Planes- Northern Zone- US Foot (EPSG #32048)
WA-S	NAD27 Washington State Planes- Southern Zone- US Foot (EPSG #32049)
WI83-C	NAD83 Wisconsin State Planes- Central Zone- Meter (EPSG #32153)
WI83-CF	NAD83 Wisconsin State Planes- Central Zone- US Foot (EPSG #2288)
WI83-N	NAD83 Wisconsin State Planes- Northern Zone- Meter (EPSG #32152)
WI83-NF	NAD83 Wisconsin State Planes- Northern Zone- US Foot (EPSG #2287)
WI83-S	NAD83 Wisconsin State Planes- Southern Zone- Meter (EPSG #32154)
WI83-SF	NAD83 Wisconsin State Planes- Southern Zone- US Foot (EPSG #2289)
WI-C	NAD27 Wisconsin State Planes- Central Zone- US Foot (EPSG #32053)
WIHP-C	HPGN Wisconsin State Planes- Central Zone- Meter (EPSG #2860)
WIHP-CF	HPGN Wisconsin State Planes- Central Zone- US Foot (EPSG #2929)
WIHP-N	HPGN Wisconsin State Planes- Northern Zone- Meter (EPSG #2859)
WIHP-NF	HPGN Wisconsin State Planes- Northern Zone- US Foot (EPSG #2928)
WIHP-S	HPGN Wisconsin State Planes- Southern Zone- Meter (EPSG #2861)
WIHP-SF	HPGN Wisconsin State Planes- Southern Zone- US Foot (EPSG #2930)
WI-N	NAD27 Wisconsin State Planes- Northern Zone- US Foot (EPSG #32052)
WI-S	NAD27 Wisconsin State Planes- Southern Zone- US Foot (EPSG #32054)
WV83-N	NAD83 West Virginia State Planes- Northern Zone- Meter (EPSG #32150)
WV83-NF	NAD83 West Virginia State Planes- Northern Zone- US Foot
WV83-S	NAD83 West Virginia State Planes- Southern Zone- Meter (EPSG #32151)
WV83-SF	NAD83 West Virginia State Planes- Southern Zone- US Foot
WVHP-N	HARN (HPGN) West Virginia State Planes- Northern Zone- Meter (EPSG #2857)
WVHP-NF	HARN (HPGN) West Virginia State Planes- Northern Zone- US Foot
WVHP-S	HARN (HPGN) West Virginia State Planes- Southern Zone- Meter (EPSG #2858)
WVHP-SF	HARN (HPGN) West Virginia State Planes- Southern Zone- US Foot
WV-N	NAD27 West Virginia State Planes- Northern Zone- US Foot (EPSG #32050)
WV-S	NAD27 West Virginia State Planes- Southern Zone- US Foot (EPSG #32051)
WY83-E	NAD83 Wyoming State Planes- Eastern- Meter (EPSG #32155)
WY83-EC	NAD83 Wyoming State Planes- East Central Zone- Meter (EPSG #32156)
WY83-ECF	NAD83 Wyoming State Planes- East Central Zone- US Foot
WY83-EF	NAD83 Wyoming State Planes- Eastern- US Foot
WY83-W	NAD83 Wyoming State Planes- Western- Meter (EPSG #32158)
WY83-WC	NAD83 Wyoming State Planes- West Central Zone- Meter (EPSG #32157)
WY83-WCF	NAD83 Wyoming State Planes- West Central Zone- US Foot
WY83-WF	NAD83 Wyoming State Planes- Western- US Foot
WY-E	NAD27 Wyoming State Planes- Eastern Zone- US Foot (EPSG #32055)
WY-EC	NAD27 Wyoming State Planes- East Central Zone- US Foot (EPSG #32056)
WYHP-E	HPGN/HARN Wyoming State Planes- Eastern- Meter (EPSG #2862)
WYHP-EC	HPGN/HARN Wyoming State Planes- East Central Zone- Meter (EPSG #2863)
WYHP-ECF	HPGN/HARN Wyoming State Planes- East Central Zone- US Foot
WYHP-EF	HPGN/HARN Wyoming State Planes- Eastern- US Foot
WYHP-W	HPGN/HARN Wyoming State Planes- Western- Meter (EPSG #2865)
WYHP-WC	HPGN/HARN Wyoming State Planes- West Central Zone- Meter (EPSG #2864)
WYHP-WCF	HPGN/HARN Wyoming State Planes- West Central Zone- US Foot
WYHP-WF	HPGN/HARN Wyoming State Planes- Western- US Foot
WY-W	NAD27 Wyoming State Planes- Western Zone- US Foot (EPSG #32058)
WY-WC	NAD27 Wyoming State Planes- West Central Zone- US Foot (EPSG #32057)

CodeDataSource

Used by Attributes: Air Operations Area - DataSource;Aircraft Gate Stand - DataSource;Aircraft Non Movement Area - DataSource;Airfield Light - DataSource;Airport Boundary - DataSource;Airport Control Point - DataSource;Airport Parcel - DataSource;Airport Sign - DataSource;AnchorageArea - DataSource;Apron - DataSource;Arresting Gear - DataSource;Blast Pad - DataSource;Bridge - DataSource;Building - DataSource;County - DataSource;Deicing Area - DataSource;Dock - DataSource;Driveway - DataSource;Driveway Centerline - DataSource;Easements And Rights of Way - DataSource;Elevation Contour - DataSource;Environmental Contamination Area - DataSource;FAA Region - DataSource;Fauna Hazard Area - DataSource;Fence - DataSource;Flood Plain - DataSource;Flora Habitat Area - DataSource;Flora Species Site - DataSource;Frequency Area - DataSource;Gate - DataSource;Hazardous Material Storage Site - DataSource;Image Area - DataSource;Land and Hold Short Line - DataSource;Land Use - DataSource;Landmark Segment - DataSource;Lease Area - DataSource;Lease Area - DataSource;Lease Area - DataSource;Lease Area - DataSource;Marking Area - DataSource;Marking Line - DataSource;Movement Area - DataSource;Municipality - DataSource;Navigation Buoy - DataSource;Navigational Aid Critical Area - DataSource;Navigational Aid Equipment - DataSource;Navigational Aid Site - DataSource;Noise Contour - DataSource;Noise Incident - DataSource;Noise Monitoring Point - DataSource;Obstacle - DataSource;Obstruction Area - DataSource;Obstruction Identification Surface - DataSource;Parcel - DataSource;Parking Lot - DataSource;Passenger Loading Bridge - DataSource;Project Area - DataSource;Railroad Centerline - DataSource;Railroad Yard - DataSource;Reference Grid Line - DataSource;Restricted Access Boundary - DataSource;Road Centerline - DataSource;Road Point - DataSource;Road Segment - DataSource;Roof - DataSource;Runway - DataSource;Runway Arresting Area - DataSource;Runway Centerline - DataSource;Runway Element - DataSource;Runway End - DataSource;Runway Helipad Design Surface - DataSource;Runway Intersection - DataSource;Runway Label - DataSource;Runway Protection Area - DataSource;Runway Safety Area Boundary -

DataSource;Sample Collection Point - DataSource;Seaplane Ramp Centerline - DataSource;Seaplane Ramp Site - DataSource;Security Area - DataSource;Security Identification Display Area - DataSource;Security Perimeter Line - DataSource;Shoreline - DataSource;Shoulder - DataSource;Sidewalk Segment - DataSource;State - DataSource;Sterile Area - DataSource;Stopway - DataSource;Tank Site - DataSource;Taxi Channel - DataSource;Taxiway Element - DataSource;Taxiway Holding Position - DataSource;Taxiway Intersection - DataSource;Touchdown Lift Off - DataSource;Tower - DataSource;Tunnel - DataSource;Turning Basin - DataSource;Utility Line - DataSource;Utility Point - DataSource;Utility Polygon - DataSource;Water Lane End - DataSource;Water Operations Area - DataSource;Wetland - DataSource;Zoning - DataSource

Value	Definition (Notes) [Source]
AERIAL	2005/2007 Aerial Photography
CAD	Georeferenced CAD File/Scan
CAD_ASBUILT	CAD As-Built
CAD_DIGITAL	CAD Digital
CAD_PAPER	CAD Paper
CNTRLIMG	Controlled Image
COGO	COGO
CONSTRSURVEY	Construction Survey
CONVSURVEY	Conventional Survey
DIG_RTK	Dig Survey - RTK
DIGITAL_OTHER	Digital File (Other)
FIELD	Field Observatin
FIELDMEASURE	Field Measurement
GIS_DIGITAL	GIS Digital
GIS_PAPER	GIS Paper
GPS_COM	Commercial GPS
GPS_MAP	Mapping GPS
GPS_RTK	Trimble R8/5800 Receiver and TSC2 Data Collector
LEGACY	Existed in Legacy Database
LEGAL	Legal Description
NA	NA
NO_ACCESS	Cannot Access Feature
ORTHOGT6	Ortho (Greater than 6 Inch GSD)
ORTHOLT6	Ortho (Less than 6 Inch GSD)
OTHER	Other
PARSONS	Parsons Data
PLAT	Plat
RECOLLECTION	Personal Recollection
ROD_LEVEL	Laser Rangefinder and Survey Rod & Level
TOWSON	Towson Data
UNCNTRLIMG	Uncontrolled Image
UNKNOWN	Unknown
WRITTEN	Written Description

CodeDesignGroup

Used by Attributes: Runway End - Design Group;Taxiway Element - Design Group

Value	Definition (Notes) [Source]
I	Less than 20 foot tail height; and less than 49 foot wingspan
II	20 or more and less than 30 foot tail height; and 49 or more and less than 79 foot wingspan
III	30 or more and less than 45 foot tail height; and 79 or more and less than 118 foot wingspan
IV	45 or more and less than 60 foot tail height; and 118 or more and less than 171 foot wingspan
V	60 or more and less than 66 foot tail height; and 171 or more and less than 214 foot wingspan
VI	66 or more and less than 80 foot tail height; and 214 or more and less than 262 foot wingspan

CodeDesignSurfaceType

Used by Attributes: Runway Helipad Design Surface - Design Surface Type

Value	Definition (Notes) [Source]
BRL	Building restriction line (not a standard)
FATO	Final Approach and Takeoff Clearance Surface
HAS	Heliport Safety Area
HPZ	Heliport Protection Zone
IAOFZ	Inner Approach Obstacle Free Zone
ITOFZ	Inner Transitional Obstacle Free Zone
OFZ	Obstacle Free Zone
POFZ	Precision obstacle free zone (See AC 150/5300-13)
PRSIFR	Parallel Runway Separation Simultaneous IFR Operations

PRSVFR	Parallel Runway Separation Simultaneous VFR Operations
ROFA	Runway Object Free Area
RPZ	Runway protection zone (See AC 150/5300-13)
RSA	Runway safety area
RWYPTX	Runway to Parallel Taxiway and Taxiline Separation
TOFA	Taxiway and taxilane object free area (See AC 150/5300-13)
TSA	Threshold sighting area
TSS	Threshold Siting Surface (See AC 150/5300-13)
TXSA	Taxiway safety area (See AC 150/5300-13)

CodeDirection

Used by Attributes: Baggage Carousel - Direction;Baggage Conveyor - Direction

Value	Definition (Notes) [Source]
INBOUND	Baggage flow is from non-secure areas to secure areas of the airport.
OUTBOUND	Baggage flow is from secure areas to non-secure areas of the airport.
UNKNOWN	Baggage flow direction is unknown

CodeDirectionality

Used by Attributes: Bridge - Directionality;Railroad Centerline - Directionality;Road Segment - Directionality;Taxiway Element - Directionality;Tunnel - Directionality;Utility Line - Directionality

Value	Definition (Notes) [Source]
BI	Bidirectional
ES	One way from end-to-startpoint
SE	One way from start-to-endpoint

CodeDoorType

Used by Attributes: Door - Type

Value	Definition (Notes) [Source]
Access	Access
Alarm Point	Alarm Point
Chop	Chop
Comm/Electrical	Comm/Electrical
Elevator	Elevator
Emergency Exit	Emergency Exit
Interior	Interior
Jetway	Jetway
Roll Up	Roll Up
Turnstile	Turnstile
Baggage Handling System	Baggage Handling System
Roof Access	Roof Access

CodeFloorLevel

Used by Attributes: Baggage Carousel - Floor Level;Baggage Conveyor - Floor Level;Building Zone - Floor Level;Column - Floor Level;Column Grid - Floor Level;Column Line - Floor Level;Door - Floor Level;Floor - Floor Level;Flooring Material - Floor Level;Furnishing - Floor Level;Interior Sign - Floor Level;Lease Area - Floor Level;Lease Area - Floor Level;Maintenance Responsibility Area - Floor Level;Moving Sidewalk - Floor Level;Passenger Gate - Floor Level;Room - Floor Level;Space - Floor Level;Wall - Floor Level;Window - Floor Level;Baggage Carousel - From Level;Baggage Conveyor - From Level;Chase - From Level;Elevator - From Level;Escalator - From Level;Ladder - From Level;Moving Sidewalk - From Level;Stair - From Level;Baggage Carousel - To Level;Baggage Conveyor - To Level;Chase - To Level;Elevator - To Level;Escalator - To Level;Ladder - To Level;Moving Sidewalk - To Level;Stair - To Level

Value	Definition (Notes) [Source]
Level 1	Apron
Level 2	Boarding
Level 3	Level 3
Level 4	Level 4
Level 5	Level 5
Level 6	Level 6
Level 7	Level 7

Level 8	Level 8
Level 9	Level 9
Level G	Automated Ground Transportation
Level U	Utility Chase
Level Z	Mezzanine - Baggage Sort

CodeFuel

Used by Attributes: Apron - Fuel

Value	Definition (Notes) [Source]
100	100/130 octane gasoline, leaded, MIL-L-5572F (GREEN)
100LL	100/130 MIL Spec, low lead, aviation gasoline (BLUE)
115	115/145 octane gasoline, leaded, MIL-L-5572F (PURPLE)
7	JP-7, Jet Propellant type 7 (Glass Tank Fuel)
80	80/87 octane gasoline, leaded, MIL-L-5572F (RED)
A	Jet A, without icing inhibitor
A+	Jet A+, Kerosene fuel, Type A, Jet A or JP-1 With icing inhibitor.
A1	Jet A1, without icing inhibitor
A1+	Jet A1+, Jet A1 with icing inhibitor.
B	Jet B, Wide cut turbine fuel, Without icing inhibitor.
B+	Jet B+, wide cut turbine fuel with icing inhibitor.
C	91/96 octane gasoline, leaded, No MIL Spec.
F	80 octane gasoline, unleaded, No MIL Spec.
G	Aviation Gasoline (AVGAS), octane unknown
H	108/135 octane gasoline, leaded, No MIL Spec
J	Jet fuel available but type is unknown
J4	JP-4, Wide cut turbine fuel MIL Spec T-5624
J5	JP-5, Kerosene MIL Spec T-5624
J8	JP-8, Semi Kerosene MIL Spec T-83133, without icing inhibitor
K	73 octane gasoline, unleaded, No MIL Spec
X	Storage tanks available and fuel type unknown or the tanks were used at one time for aviation products but may now store other products
LqNaturalGas	Liguified Natural Gas

CodeGateStandType

Used by Attributes: Aircraft Gate Stand - Gate Stand Type

Value	Definition (Notes) [Source]
ANG-NI	Angled nose-in parking position
ANG-NO	Angled nose-out parking position
HS	Hard stand
ISO	Isolated parking position.
JB	Jet bridge
NI	Nose-in parking position.
OTHER	Other
PR	Portable ramp
RMT	Remote parking position.
SR	Stairs
TM	Temporary
UNK	unknown

CodeGridType

Used by Attributes: Reference Grid Line - Grid Type

Value	Definition (Notes) [Source]
ed50	European Datum 1950
gaussKruger	Gauss Kruger
GEOREF	World Geographic Reference System
ING	Irish National Grid Reference Survey
LCC	Lambert Conformal Conic
LL	Latitude, longitude
MIL	Military
OTHER	Other

RT90	Swedish Coordinate System
SPCS	State Plane Coordinate System
UPS	Universal Polar Stereographic
USNG	United States National Grid for Spatial Addressing
UTM	Universal Transverse Mercator

CodeHazardCategory

Used by Attributes: Hazardous Material Storage Site - Stored Hazmat Category

Value	Definition (Notes) [Source]
1	Explosives are any substance or article, including a device, which is designed to function by explosion or which, by chemical reaction within itself is able to function in a similar manner even if not designed to function by explosion (unless the article
1.1	Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously
1.2	Explosives that have a projection hazard but not a mass explosion hazard
1.3	Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or, both but not a mass explosion hazard.
1.4	Explosives that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of
1.5	Blasting agents consist of very insensitive explosives. This division comprises substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under norm
1.6	Consists of extremely insensitive articles which do not have a mass explosive hazard. This division comprises articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation o
2	HazMat Class 2 includes all gases which are compressed and stored for transportation. Class 2 has three divisions: Flammable (also called combustible), Non-Flammable/Non-Poisonous, and Poisonous.
2.1	Flammable Gas - 454 kg (1001 lb) of any material which is a gas at 20 degrees C (68 degrees F) or less and 101.3 kPa (14.7 psi) of pressure (a material which has a boiling point of 20 degrees C (68 degrees F) or less at 101.3 kPa (14.7 psi)) which-1. Is i
2.2	Non-Flammable, Non-Poisonus Gas - This division includes compressed gas, liquefied gas, pressurized cryogenic gas, compressed gas in solution, asphyxiant gas and oxidizing gas. A non-flammable, nonpoisonous compressed gas (Division 2.2) means any material
2.3	Poison Gas - Gas poisonous by inhalation means a material which is a gas at 20 degrees C or less and a pressure of 101.3 kPa (a material which has a boiling point of 20 degrees C or less at 101.3kPa (14.7 psi)) and which:1. Is known to be so toxic to huma
3	HazMat Class 3 are flammable liquids. They are liquids with flash point of not more than 60.5 degrees C (141 degrees F), or any material in a liquid phase with a flash point at or above 37.8 degrees C (100 degrees F).
4	HazMat Class 4 are Flammable solids. Flammable Solids are any materials in the solid phase of matter that can readily undergo combustion in the presence of a source of ignition under standard circumstances, i.e. without:Artificially changing variables suc
4.1	Flammable Solid
4.2	Spontaneously Combustible
4.3	Dangerous When Wet - Dangerous when wet material is material that, by contact with water, is liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 liter per kilogram of the material, per hour, when tested
5	HazMat Class 5 Oxidizing Agents and Organic Peroxides - An oxidizer is a chemical that readily yields oxygen in reactions, thereby causing or enhancing combustion
5.1	Oxidizers - An oxidizer is a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials
5.2	Organic Peroxides - An organic peroxide is any organic compound containing oxygen (O) in the bivalent -O-O- structure and which may be considered a derivative of hydrogen peroxide, where one or more of the hydrogen atoms have been replaced by organic radi
6	HazMat Class 6 is Toxic and Infectious Substances. Poisonous material is a material, other than a gas, known to be so toxic to humans that it presents a health hazard during transportation
6.1	Poisonous material is a material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation, or which, in the absence of adequate data on human toxicity:
6.2	Biohazards
7	HazMat Class 7 is Radioactive substances. Radioactive substances are materials that emit radiation.
8	Hazmat Class 8 is Corrosive Substances. A corrosive material is a liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time. A liquid that has a severe corrosion rate on steel or aluminum
9	HazMat Class 9 is Miscellaneous Substances. The miscellaneous hazardous materials category encompasses all hazardous materials that do not fit one of the definitions listed in Class 1 through Class 8.

CodeHazardType

Used by Attributes: Fauna Hazard Area - Hazard Type

Value	Definition (Notes) [Source]
BASH	Bird Aircraft Strike Hazard
DEER STRIKE	Deer Strike
TBD	Hazard yet to be determined
TORTOISE PITFALL	Tortoise Pitfall
UNKNOWN	Unknown

CodeHowAcquired

Used by Attributes: Airport Parcel - How Acquired;Parcel - How Acquired

Value	Definition (Notes) [Source]
AIP_APPROACH_PROTECTION	Land acquired using AIP funds for approach protection
AIP_DEVELOPMENT	Land acquired using AIP funds for airport development
AIP_NOISE	Land acquired using AIP funds for noise
DONATION	Land acquired by donation
PFC_APPROACH_PROTECTION	Land acquired using PFC funds for approach protection
PFC_DEVELOPMENT	Land acquired using PFC funds for airport development
PFC_NOISE	Land acquired using PFC funds for noise
SURPLUS_PROPERTY	Land acquired as surplus property

CodeImageType

Used by Attributes: Image Location - File Type

Value	Definition (Notes) [Source]
BMP	Bitmap
JPG	Jpeg
OTH	Other
TIF	Tiff
UNK	Unknown

CodeLandmarkType

Used by Attributes: Landmark Segment - Landmark Type

Value	Definition (Notes) [Source]
AERIAL CABLEWAY	Aerial Cableway
AGRICULTURE AREA	Agriculture Area
AIRPORT	Airport
ATHLETIC FIELD	Athletic Field
BOAT RAMP	Boat Ramp
BREAKWATER	Breakwater
CANAL	Canal
CEMETERY	Cemetery
CREEK	Creek
DAM	Dam
FENCE	Fence
GOLF COURSE	Golf Course
LEVEE	Levee
MILITARY AREA	Military Area
MOUNTAIN PASS	Mountain Pass
OTHER	Other
PIER	Pier
POWERPLANT	Powerplant
QUARRY	Quarry
QUAY	Quay
RACECOURSE OR TRACK	Racecourse Or Track
RAILROAD	Railroad
RIVER	River
ROAD	Road
SHORELINE	Shoreline
STADIUM	Stadium
STREAM	Stream
TANK TRAP	Tank Trap
TRENCH	Trench
URBAN AREA	Urban Area
UTILITY LINE	Utility Line
WALL	Wall
WHARF	Wharf

CodeLandUseType

Used by Attributes: Land Use - Use Type

Value	Definition (Notes) [Source]
1000	Residential activities (Source: APA LBCS)
1100	Household activities (Source: APA LBCS)
1200	Transient living (Source: APA LBCS)
1300	Institutional living (Source: APA LBCS)
2000	Shopping, business, or trade activities (Source: APA LBCS)
2100	Shopping (Source: APA LBCS)
2110	Goods-oriented shopping (Source: APA LBCS)
2120	Service-oriented shopping (Source: APA LBCS)
2200	Restaurant-type activity (Source: APA LBCS)

2210	Restaurant-type activity with drive-through (Source: APA LBCS)
2300	Office activities (Source: APA LBCS)
2310	Office activities with high turnover of people (Source: APA LBCS)
2320	Office activities with high turnover of automobiles (Source: APA LBCS)
3000	Industrial, manufacturing, and waste-related activities (Source: APA LBCS)
3100	Plant, factory, or heavy goods storage or handling activities (Source: APA LBCS)
3110	Primarily plant or factory-type activities (Source: APA LBCS)
3120	Primarily goods storage or handling activities (Source: APA LBCS)
3200	Solid waste management activities (Source: APA LBCS)
3210	Solid waste collection and storage (Source: APA LBCS)
3220	Landfilling or dumping (Source: APA LBCS)
3230	Waste processing or recycling (Source: APA LBCS)
3300	Construction activities (grading, digging, etc.) (Source: APA LBCS)
4000	Social, institutional, or infrastructure-related activities (Source: APA LBCS)
4100	School or library activities (Source: APA LBCS)
4110	Classroom-type activities (Source: APA LBCS)
4120	Training or instructional activities outside classrooms (Source: APA LBCS)
4130	Other instructional activities including those that occur in libraries (Source: APA LBCS)
4200	Emergency response or public-safety-related activities (Source: APA LBCS)
4210	Fire and rescue-related activities (Source: APA LBCS)
4220	Police, security, and protection-related activities (Source: APA LBCS)
4230	Emergency or disaster-response-related activities (Source: APA LBCS)
4300	Activities associated with utilities (water, sewer, power, etc.) (Source: APA LBCS)
4310	Water-supply-related activities (Source: APA LBCS)
4311	Water storing, pumping, or piping (Source: APA LBCS)
4312	Water purification and filtration activities (Source: APA LBCS)
4313	Irrigation water storage and distribution activities (Source: APA LBCS)
4314	Flood control, dams, and other large irrigation activities (Source: APA LBCS)
4320	Sewer-related control, monitor, or distribution activities (Source: APA LBCS)
4321	Sewage storing, pumping, or piping (Source: APA LBCS)
4322	Sewer treatment and processing (Source: APA LBCS)
4330	Power generation, control, monitor, or distribution activities (Source: APA LBCS)
4331	Power transmission lines or control activities (Source: APA LBCS)
4332	Power generation, storage, or processing activities (Source: APA LBCS)
4340	Telecommunications-related control, monitor, or distribution activities (Source: APA LBCS)
4350	Natural gas or fuels-related control, monitor, or distribution Activities (Source: APA LBCS)
4400	Mass storage, inactive (Source: APA LBCS)
4410	Water storage (Source: APA LBCS)
4420	Storage of natural gas, fuels, etc. (Source: APA LBCS)
4430	Storage of chemical, nuclear, or other materials (Source: APA LBCS)
4500	Health care, medical, or treatment activities (Source: APA LBCS)
4600	Interment, cremation, or grave digging activities (Source: APA LBCS)
4700	Military base activities (Source: APA LBCS)
4710	Ordnance storage (Source: APA LBCS)
4720	Range and test activities (Source: APA LBCS)
5000	Travel or movement activities (Source: APA LBCS)
5100	Pedestrian movement (Source: APA LBCS)
5200	Vehicular movement (Source: APA LBCS)
5210	Vehicular parking, storage, etc. (Source: APA LBCS)
5220	Drive-in, drive through, stop-n-go, etc. (Source: APA LBCS)
5400	Trains or other rail movement (Source: APA LBCS)
5410	Rail maintenance, storage, or related activities (Source: APA LBCS)
5500	Sailing, boating, and other port, marine and water-based Activities (Source: APA LBCS)
5510	Boat mooring, docking, or servicing (Source: APA LBCS)
5520	Port, ship-building, and related activities (Source: APA LBCS)
5600	Aircraft takeoff, landing, taxiing, and parking (Source: APA LBCS)
5700	Spacecraft launching and related activities (Source: APA LBCS)
6000	Mass assembly of people (Source: APA LBCS)
6100	Passenger assembly (Source: APA LBCS)
6200	Spectator sports assembly (Source: APA LBCS)
6300	Movies, concerts, or entertainment shows (Source: APA LBCS)
6400	Gatherings at fairs and exhibitions (Source: APA LBCS)
6500	Mass training, drills, etc. (Source: APA LBCS)
6600	Social, cultural, or religious assembly (Source: APA LBCS)
6700	Gatherings at galleries, museums, aquariums, zoological parks, etc. (Source: APA LBCS)
6800	Historical or cultural celebrations, parades, reenactments, etc. (Source: APA LBCS)

7000	Leisure activities (Source: APA LBCS)
7100	Active leisure sports and related activities (Source: APA LBCS)
7110	Running, jogging, bicycling, aerobics, exercising, etc. (Source: APA
7120	Equestrian sporting activities (Source: APA LBCS)
7130	Hockey, ice skating, etc. (Source: APA LBCS)
7140	Skiing, snowboarding, etc. (Source: APA LBCS)
7150	Automobile and motorbike racing (Source: APA LBCS)
7160	Golf (Source: APA LBCS)
7180	Tennis (Source: APA LBCS)
7190	Track and field, team sports (baseball, basketball, etc.), or other sports (Source: APA LBCS)
7200	Passive leisure activity (Source: APA LBCS)
7210	Camping (Source: APA LBCS)
7220	Gambling (Source: APA LBCS)
7230	Hunting (Source: APA LBCS)
7240	Promenading and other activities in parks (Source: APA LBCS)
7250	Shooting (Source: APA LBCS)
7260	Trapping (Source: APA LBCS)
7300	Flying or air-related sports (Source: APA LBCS)
7400	Water sports and related leisure activities (Source: APA LBCS)
7410	Boating, sailing, etc. (Source: APA LBCS)
7420	Canoeing, kayaking, etc. (Source: APA LBCS)
7430	Swimming, diving, etc. (Source: APA LBCS)
7440	Fishing, angling, etc. (Source: APA LBCS)
7450	Scuba diving, snorkeling, etc. (Source: APA LBCS)
7460	Water-skiing (Source: APA LBCS)
8000	Natural resources-related activities (Source: APA LBCS)
8100	Farming, tilling, plowing, harvesting, or related activities (Source: APA)
8200	Livestock related activities (Source: APA LBCS)
8300	Pasturing, grazing, etc. (Source: APA LBCS)
8400	Logging (Source: APA LBCS)

CodeLightingConfigurationType

Used by Attributes: Airfield Light - Lighting Type;Building - Lighting Type;Navigation Buoy - Lighting Type;Navigational Aid Equipment - Lighting Type;Tank Site - Lighting Type;Tower - Lighting Type;Water Lane End - Lighting Type

Value	Definition (Notes) [Source]
ALSF-1	High Intensity Approach Lighting System - Configuration 1
ALSF-2	High Intensity Approach Lighting System - Configuration 2
APAP	Alignment of Element Systems
APBN	Airport Rotating Beacon
CLRBAR	Taxiway Clearance Bar Lights
CODEBEACON	Code Beacon
COURSE	Course Lights
F	Fixed
FL	Flashing (Sea Plane Navigation Buoy use only)
FL (2)	Group Flashing (Sea Plane Navigation Buoy use only)
FL (2+1)	Composite Group-Flashing (Sea Plane Navigation Buoy use only)
HLL	Hover Lane Light
HLLL	Hover Lane Limit Light
HPIL	Helipad Perimeter Inset Light
HPPEL	Helipad Perimeter Light (Elevated)
HPPLSF	Helipad Perimeter Light (Semiflush)
ISO	Isophase (Sea Plane Navigation Buoy use only)
L-804	Unidirectional elevated runway guard lights
L-850A	Bi directional or unidirectional runway in pavement light used for runway centerline, Land and Hold Short Operations (LAHSO).
L-850B	Unidirectional runway in pavement light used for runway touchdown zone and medium intensity approach light system applications.
L-850C	Bi directional runway in pavement light used for runway edge lights and displaced threshold applications.
L-850D	Bi directional or unidirectional runway in pavement lights used for runway threshold or runway end light applications.
L-850E	Unidirectional runway in pavement light used for runway threshold light and Medium Intensity Approach Light System applications
L-850F	Unidirectional runway in pavement lights white flashing lights used for LAHSO
L-852A	Bi directional or unidirectional taxiway centerline in pavement lights used for the straight sections of taxiways where operations are permitted when the Runway Visual Range (RVR) is greater than or equal to 1200 feet.
L-852B	Bi directional or unidirectional taxiway centerline in pavement lights for curved sections of taxiways where operations are permitted when the Runway Visual Range (RVR) is greater than or equal to 1200 feet.
L-852C	bi directional or unidirectional taxiway centerline in pavement lights for straight portions of taxiways where operations are permitted when the Runway Visual Range (RVR) is less than 1200 feet.
L-852D	Bi directional or unidirectional taxiway centerline in pavement lights used for curved portions of taxiways where operations are permitted when the Runway Visual Range is less than 1200 feet.
L-852E	Omni directional taxiway intersection in pavement lights where operations are permitted when the Runway Visual Range is greater than or equal to 1200 feet.

L-852E/F	Runway Guard Light in-pavement
L-852F	Omni directional taxiway intersection in pavement lights where operations are permitted when the Runway Visual Range is less than 1200 feet.
L-852G	Unidirectional Runway Guard in pavement lights
L-852G/S	Combination Runway Guard/Stop bar light in-pavement
L-852J	Bi directional taxiway centerline in pavement lights for the curved portions of taxiways where operations are permitted when the Runway Visual Range is greater than or equal to 1200 feet.
L-852K	Bi directional taxiway centerline in pavement lights for the curved portions of taxiway where operation are permitted when the Runway Visual Ranger is less than 1200 feet.
L-852S	Unidirectional in pavement Stop Bar lights
L-852T	Omni directional in pavement taxiway edge and Apron edge lights
L-853	Reflective Marker
L-854	Radio Controller (Pilot Controlled Lights)
L-860	Omni directional elevated runway edge lights for Visual Flight Rules (VFR) operations.
L-860E	Bi directional or unidirectional elevated runway threshold or runway end lights for Visual Flight Rules operations.
L-861	Omni directional or bi directional elevated runway edge or displaced threshold lights for non-precision Instrument Flight Rules (IFR) operations.
L-861E	Bi directional or unidirectional elevated runway threshold or runway end lights for non-precision Instrument Flight Rule operations.
L-861SE	Bi directional and unidirectional elevated runway threshold, runway end, and displaced threshold lights for non-precision Instrument Flight Rule operations
L-861T	Omni directional elevated taxiway and apron edge lights.
L-862	Bi directional elevated runway edge, threshold, and displaced threshold lights for precision Instrument Flight Rule operations.
L-862E	Bi directional or unidirectional elevated runway threshold, runway end, and displaced threshold lights for precision Instrument Flight Rule operations.
L-862S	Unidirectional elevated stop bar lights
L-880/L881	Precision Approach Path Indicator
LDIN	Lead In Lighting System
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashing Lights
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (RAIL)
MO (A)	Morse Code (Sea Plane Navigation Buoy use only)
NONE	No lights
OBSCAT	Catenary Lighting
OBSDUAL	A combination of OBSRED and OBSWHT
OBSRED	Aviation red Obstruction Lights
OBSWHITE	Flashing White Obstruction Lights
OC	Occulting (Sea Plane Navigation Buoy use only)
ODALS	Omnidirectional Approach Lighting System
OTHER	Other
PAPI2	Precision Approach Path Indicator with 2 lights
PAPI4	Precision Approach Path Indicator with 4 lights
PORTABLE	Portable Lights
PVASI	Pulsating visual Approach Slope Indicator
Q	Quick (Flashing) (Sea Plane Navigation Buoy use only)
RAIL	Runway Alignment Indicator Lights
REIL	Runway End Identifier Lights
RWSL	Runway Status Lights
SALS	Short Approach lighting System
SMGCS	Surface Movement Guidance Control System
SSALF	Short Simplified Approach Light System with Sequenced Flashing Lights
SSALR	Simplified Short Approach Lighting System with Runway Alignment Indicator
TRCV	TriColor VASI
T-VASI	Visual Approach Slope Indicator
TWYON_OFFLGT	Taxiway Lead on/off lights
VASI-12	Visual Approach Slope Indicator with 2 bars and 12 boxes
VASI-16	Visual Approach Slope Indicator with 3 bars and 16 boxes
VASI-2	Visual Approach Slope Indicator with 2 bars
VASI-2-2	Visual Approach Slope Indicator with 2 bars and 2 boxes
VASI-3	Visual Approach Slope Indicator with 3 bars

CodeLoadingBridgeType

Used by Attributes: Passenger Loading Bridge - Loading Bridge Type

Value	Definition (Notes) [Source]
ARM	Moveable Arm
OTHER	Other
PORTABLE_RAMP	Portable Ramp
PORTABLE_STAIRS	Portable Stairs

CodeLowVisibilityCategory

Used by Attributes: Taxiway Holding Position - Low Visibility Category

Value	Definition (Notes) [Source]
0	No low visibility operation supported
1	Supports ILS CAT I low visibility operations
2	Supports ILS CAT II III low visibility operations

CodeMarkingFeatureType

Used by Attributes: Building - Marking Feature Type;Land and Hold Short Line - Marking Feature Type;Marking Area - Marking Feature Type;Marking Line - Marking Feature Type;Obstacle - Marking Feature Type;Obstruction Area - Marking Feature Type;Tank Site - Marking Feature Type;Tower - Marking Feature Type

Value	Definition (Notes) [Source]
AIMING_POINT	Runway Aiming Point (Geometry Type: Polygon) [Source: AC 150/5340-1]
ALTBAND	Iternating bands of aviation orange and white [Source AC 70/7640-1]
APRON_SIGN	Surface painted apron position/entrance sign (Geometry Type: Polygon) [Source: AC 150/5340-1]
ARROW	Arrows identify the displaced threshold area to provide centerline guidance for takeoffs and rollouts (Geometry Type: Line) [Source: AC 150/5340-1]
ARROW_HEAD	Arrow heads are used in conjunction with a threshold bar to further highlight the beginning of a runway (Geometry Type: Line) [Source: AC 150/5340-1]
CHECKERBOARD	Checkerboard obstruction marking pattern [Source AC 70/7640-1]
CHEVRON	A marking used to designate blast pads and other areas that are not suitable for aircraft (Geometry Type: Line) [Source: AC 150/5340-1]
DEMARCATION	Demarcation Bar (Geometry Type: Line) [Source: AC 150/5340-1]
DIR_SIGN	Surface painted taxiway direction signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
GATE_LINE	All painted taxilines covering a parking stand area are regarded as stand guidance lines and will be individual objects in the database. There may be several stand guidance taxilines leading to an aircraft stand to accommodate different aircraft types.
GATE_SIGN	Surface painted gate position signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
HOLD_SIGN	Surface painted holding position signs (Geometry Type: AC 150/5340-1]
ILS_HOLD	Holding position markings for Instrument Landing Systems (Geometry Type: Polygon) [Source: AC 150/5340-1]
INTERSECTION_HOLD	Holding position marking for taxiway/taxiway intersections (Geometry Type: Line) [Source: AC 150/5340-1]
LAHSO	Marking associated with a Land And Hold Short Operations (LAHSO)
LOCATION_SIGN	Surface painted taxiway location signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
NON_MOVE_AREA	Non-movement area marking (Geometry Type: Line) [Source: AC 150/5340-1]
NONE	No marking(s)
OTHER	Other markings not listed
OTHER_LINE	Other markings suitable for representation as a line
OTHER_POLYGON	Other markings suitable for representation as a polygon
PERM_CLOSED	Markings for permanently closed runways and taxiways (Geometry Type: Polygon) [Source: AC 150/5340-1]
POS_SIGN	Geographic position markings (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_CL	Runway Centerline (Geometry Type: Line) [Source: AC150/5340-1]
RWY_HOLD	Runway holding position markings on Runways (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_ID	Runway Designation Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_SHD	Runway shoulder markings (Geometry Type: Line) [Source: AC 150/5340-1]
RWY_THRSH	Runway Threshold Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
SIDE_STRP	Runway Side Stripe Marking (Geometry Type: Line) [Source: AC 150/5340-1]
SOLID	Solid pattern obstruction marking [Source AC 70/7640-1]
TDZ_MARK	Runway Touchdown Zone Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
TEMP_CLOSED	Markings for temporarily closed runways and taxiways (Geometry Type: Line) [Source: AC 150/5340-1]
THRSH_BAR	Runway Threshold Bar (Geometry Type: Polygon) [Source: AC 150/5340-1]
TIEDOWN	Aircraft tiedown
TWY_CL	Taxiway Centerline (Geometry Type: Line) [Source: AC 150/5340-1]
TWY_EDGE	Taxiway edge marking (Geometry Type: Line) [Source: AC 150/5340-1]
TWY_HOLD	Runway hold position markings on taxiways (Geometry Type: Polygon) [Source: AC 150/5340-1]
TWY_SHD	Taxiway shoulder marking (Geometry Type: Line) [Source: AC 150/5340-1]
VEHICLE	Vehicle roadway markings (Geometry Type: Line) [Source: AC 150/5340-1]

CodeMaterialType

Used by Attributes: Column - Material;Wall - Structural Material

Value	Definition (Notes) [Source]
Block	Block
Other	Other
Poured Concrete	Poured Concrete

Unknown	Unknown
Wood	Wood
Steel	Steel
Aluminum	Aluminum

CodeMonumentType

Used by Attributes: Airport Control Point - Monument Type

Value	Definition (Notes) [Source]
1ST_ORDER_CLASS_I	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
1ST_ORDER_CLASS_II	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
2ND_ORDER_CLASS_I	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
2ND_ORDER_CLASS_II	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
3RD_ORDER_NO_TABLET	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
3RD_ORDER_WITH_TABLET	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [NGS]
A_Order	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [FGCS]
B_Order	Meets the standards and specifications for geodetic control network accuracy according to the Federal Geodetic Control Subcommittee [FGCS]
BM	Benchmark is a location whose elevation and horizontal position has been surveyed as accurately as possible. Benchmarks are designed for use as reference points, and are usually marked by small brass plates
FOUND_CLOSING_CORNER	A found corner is a corner whose original or restored monument or mark is recovered, or whose position is definitely established by one or more witness corners or monuments
FOUND_SECTION_CORNER	A found corner is a corner whose original or restored monument or mark is recovered, or whose position is definitely established by one or more witness corners or monuments
MEANDER_CORNER	A corner established where a township line, section line, or other survey intersects the bank of a navigable stream or other meanderable body of water [USGS, 1996, Part 5: Public Land Survey System]
SPOT	A point with a measured vertical position of less than third order accuracy, measured relative to a reference datum [USGS, 2001, Part 7: Hypsography]
UNMONUMENTED	Indicates that no permanent marker has been placed
WEAK_CORNER	Corners established by the USDA Forest Service that have been found but their location has not been tied to their true ground position [USGS, 2003]
WITNESS_CORNER	A monumented station on a line of the survey that is used to perpetuate an important location more or less remote from and without special relation to any regular corner [USGS, 1996, Part 5: Public Land Survey System]

CodeNavaidEquipmentType

Used by Attributes: Navigational Aid Equipment - Navaid Equipment Type

Value	Definition (Notes) [Source]
ARSR	Air Route Surveillance Radar
ASR	Airport Surveillance Radar
DF	Direction Finding Equipment
DME	Distance Measuring Equipment
FM	Fan Marker
FMH	Fan Marker located with a radio beacon
GS CE	Glide Slope Capture Effect
GS EF	Glide Slope End Fire
GS NR	Glide Slope Null Reference
GS SB	Glide Slope Side Band
LOC	Localizer
MLSAZ	Microwave Landing System Azimuth Antenna
MLSDME	Microwave Landing System DME
MLSEL	Microwave Landing System Elevation Antenna
MSBLS-AZ	Microwave Scan Beam Landing System Azimuth
MSBLS-DME	Microwave Scan Beam Landing System Distance Measuring Equipment
MSBLS-EL	Microwave Scan Beam Landing System Elevation
MTI	Moving Target Indicator Reflector
NDB/C	Nondirectional Radio Beacon -- Compass Locator
NDB/H	Nondirectional Radio Beacon -- High Frequency
NDB/M	Nondirectional Radio Beacons/Medium HF
NDB/U	Nondirectional Radio Beacons/Ultra HF
PAR	Precision Approach Radar
SDF	Simplified Direction Finding Equipment
SECRA	Secondary Radar Antenna
TACAN	Tactical Air Navigation
TDR	Touchdown Reflector
TLS-APGS	Transponder Landing System Approach Glideslope
TLS-LOC	Transponder Landing System - Localizer
VISUAL	Used to identify the navaid as a visual system
VOR	VHF Omnidirectional Range
VORTAC	VOR and collocated TACAN

VOT	VOR Test Facility

CodeNavaidSystemType

Used by Attributes: Navigational Aid Equipment - Navaid System Type

Value	Definition (Notes) [Source]
DF	Direction Finder
ILS	Instrument Landing System
MLS	Microwave Landing System
MSBLS	Microwave Scan Beam Landing System
NDB/C	Nondirectional Radio Beacon -- Compas Locator
NDB/H	Nondirectional Radio Beacon -- High Frequency
NDB/M	Nondirectional Radio Beacons/Medium HF
NDB/U	Nondirectional Radio Beacons/Ultra HF
PAR	Precision Approach Radar
TLS	Transponder Landing System

CodeObstacleSource

Used by Attributes: Obstacle - Obstacle Source;Obstruction Area - Obstacle Source

Value	Definition (Notes) [Source]
AD	Airport Design and Planning
AF	FAA Tech Ops Field Survey
AO	Airports Field Office
DD	Digital Terrain Elevation Data
DI	U.S. Department of Interior Maps
DM	USGS Digital Elevation Model
EO	Estimated by Airport Owner
F77	Part 77 Analysis
FI	Flight Inspection
NV	Non-Vertically Guided Airport Airspace Analysis
OF	Digital Obstacle File (FAA)
OR	Other Source not named
RS	Remote Sensed
SE	Spot Elevations
SR	Shuttle Radar Terrain Model
ST	State Coded
SV	Field Survey
TE	TERPS Analysis
VG	Vertically Guided Airport Airspace Analysis
WW	Worldwide DoD

CodeObstacleType

Used by Attributes: Obstacle - Obstacle Type;Obstruction Area - Obstacle Type

Value	Definition (Notes) [Source]
AERIAL CABLEWAY	Aerial Cableway
AERIAL CABLEWAY PYLON	Aerial Cableway Pylon
AGRICULTURE EQUIPMENT	Generic for any agricultural equipment
AIRCRAFT	Generic for a parked or moving aircraft
AMUSEMENT PARK STRUCTURE	Amusement Park Structure
ANTENNA	Antenna
AQUEDUCT	Aqueduct
ARCH	Arch
ATHLETIC FIELD	Generic for any type of athletic field or stadium
BILLBOARD	Billboard
BLAST FURNACE	Blast Furnace
BLEACHERS	Bleachers
BRIDGE SUPERSTRUCTURE	Generic for larger bridges such as cable stayed bridges etc.
BRIDGE TOWER	Bridge Tower

BRIDGE/OVERPASS/VIADUCT	Generic for any type of bridge
BUILDING	Generic for any type of building
BUSH	Generic for bushes and other low growing vegetation
CABLE CAR/RAILWAY	Cable Car/Railway
CATALYTIC CRACKER	An oil refinery unit in which the cracking of petroleum takes place in the presence of a catalyst
CATENARY	The curve formed by a perfectly flexible, uniformly dense, and inextensible cable suspended from its endpoints.
CHIMMNEY/SMOKESTACK	Chimmney/Smokestack
CHURCH	Generic for houses of worship
COMMUNICATION BUILDING	Communication Building
COMMUNICATION TOWER	Communication Tower
CONTROL TOWER	Control Tower
CONVEYOR	Conveyor
COOLING TOWER	A large tower or similar structure typically attached to a power plant through which water is circulated to lower its temperature by partial evaporation
CRANE	Crane
DAM	Dam
DEBRIS/RUINS	Debris/Ruins
DIRT PILE	Dirt Pile
DOME	Dome
DREDGE/POWERSHOVEL /DRAG	Dredge/Powershovel /Drag
ELEVATOR	Elevator
FLAGPOLE	Flagpole
FLARE PIPE	Flare Pipe
FORTIFICATION OR FORT	Fortification Or Fort
GRAIN BIN/SILO	Grain Bin/Silo
GRAIN ELEVATOR	Grain Elevator
HOPPER	Hopper
HORIZONTAL POINT	Point of known horizontal position
INTERSTATE	Interstate highways with 17 foot vehicle allowance added to the features elevation
LAUNCHPAD	Launchpad
LIGHT RAILWAY	Generic for people mover systems serving airports
LIGHT SUPPORT STRUCTURE	Light Support Structure
LIGHT VESSEL/LIGHTSHIP	Light Vessel/Lightship
LIGHTHOUSE	Lighthouse
MONUMENT	Generic for historical or cultural monuments
NATURAL HIGH POINT	Generic for high terrain features
NAVAID	Used when defined as an obstacle
NUCLEAR REACTOR	Nuclear Reactor
OFF-SHORE PLATFORM	Off-Shore Platform
PARKING LOT	Parking Lot
PLANT	Generic for manufacturing facilities
POLE	Generic for utility or light poles providing local service
POWER PLANT	Power Plant
POWER TRANSMISSION LINE	Larger Tower high power Utility lines
POWER TRANSMISSION PYLON	Larger tower high power utility structures
PRIMARY ROAD	Non-Interstate roads with 15 foot vehicle allowance added to the features elevation
PROCESING/TREATMENT PLANT	Procesing/Treatment Plant
RAILROAD	Railroad track with 23 foot vehicle allowance added to the features elevation.
REFINERY	Refinery
RIG/SUPERSTRUCTURE	Rig/Superstructure
ROAD SIGN	Interstate highway overhead signs
SCRUB	Scrub
SECONDARY ROAD	Local city, county state roads with 10 foot vehicle allowance added to the features elevation
SHIP	Ship underway
SHIP STORAGE	Ship manufacturing or storage facilities
SIGN	Generic for any type of sign other than interstate or street signs
SKI JUMP	Ski Jump
SKI LIFT	Ski Lift
SKI PYLON	Ski Pylon
SKYSCRAPER	Skyscraper
SPIRE	Spire
STACK	Stack
STADIUM	Stadium
STEEPLE	Steeple
STORAGE DEPOT	Storage Depot
STREET SIGN	Signs used to control traffic or provide direction information other than interstate signs
SUBSTATION/TRANSFORMER	Substation/Transformer

TANK	Generic for other types of tanks
TELEPHONE LINE	Telephone Line
TELEPHONE PYLON/POLE	Telephone Pylon/Pole
TETHERED BALLOON	Tethered Balloon
TOWER (NON-COMMUNICATON TOWERS)	Tower (Non-Communicaton Towers)
TRAFFIC LIGHT/SIGNAL	Traffic Light/Signal
TRAMWAY	Tramway
TREE	Generic for a single or small group of trees
TREE OUTLINE	Dense area of trees
UTILITY LINE	Generic for local utility service
VEGETATION	Vegetation
VEHICLE	Generic for any type of vehicle
VERTICAL POINT	Point of known elevation
VERTICAL STRUCTURE	Generic for items not classified otherwise in this list
WALL	Wall
WATER TOWER	Generic for water towers
WIND MOTOR	Wind Motor
WINDMILL	Single windmill
WINDMILL FARMS	Multiple Windmills located close together

CodeObstructionAreaType

Used by Attributes: Obstruction Area - Obstruction Area Type

Value	Definition (Notes) [Source]
AG_EQUIP	Agricultural equipment
BUILDING	Building
GROUND	Ground
MOBILE_CRANE	Mobile_Crane
OTHER	Other
TREE	Tree
URBAN	Urban
VESSEL	Vessel

CodeOffsetDirection

Used by Attributes: Navigational Aid Equipment - Offset Direction

Value	Definition (Notes) [Source]
CL	On centerline
L	Offset to the left
R	Offset to the right

CodeOisSurfaceCondition

Used by Attributes: Obstacle - Ois Surface Condition;Obstruction Area - OIS Surface Condition;Obstruction Identification Surface - OIS Surface Condition

Value	Definition (Notes) [Source]
PRIMARY	Identifies an obstructing area solely within a single surface.
SUPPLEMENTARY	Used to identify when an obstructing area covers more than a single OIS.

CodeOisSurfaceType

Used by Attributes: Obstruction Identification Surface - OIS Surface Type

Value	Definition (Notes) [Source]
AAAA	Approach Surfaces
AAAC	Conical Surface
AAAH	Horizontal Surface
AAAP	Primary Surfaces
AAAT	Transitional Surfaces
AAAV	Vertical Guidance Protection Surface

APRC77	14 CFR Part 77 Approach Surfaces
CONL77	14 CFR Part 77 Conical Surface
DEPT	Departure Analysis
HORZ 77	14 CFR Part 77 Horizontal Surface
OEIA	One Engine Inoperative Analysis
PRIM77	14 CFR Part 77 Primary Surface
TERP	TERPS Surfaces
TRNS77	14 CFR Part 77 Transitional Surfaces

CodeOisZoneType

Used by Attributes: Obstruction Identification Surface - Ois Zone Type

Value	Definition (Notes) [Source]
APPROACH	Approach
CONICAL	Conical
HORIZONTAL	Horizontal
PRIMARY	Primary
TRANSITION	Transition

CodeOperationsType

Used by Attributes: Arresting Gear - Airport Facility Type;Airport Boundary - Operations Type

Value	Definition (Notes) [Source]
CIVIL	Civil operations only
JOINT	Joint military and civil operations
MIL	Military operations only

CodePointType

Used by Attributes: Airport Control Point - Point Type

Value	Definition (Notes) [Source]
AIRPORT_ELEVATION	Indicates the point of highest elevation on the landing surface of the airport.
ARP	Point identified is computed as the Airport reference point for the airport
ASOS	Location of the Automated Surface Observing System
AWOS	Location of the Aviation Weather Observing System
CENTERLINE_POINT	A point collected along the runway centerline whose location is variable based on collection method etc. Typically this point is used for runway profile points.
DISPLACED_THRESHOLD	Point provides the location of the displaced threshold for a runway
HELIPAD_REFERENCE_POINT	The point defined as the HelipadReferencePoint
IMAGERY	Imagery Control Point
OTHER	Other
PACS	Point referenced is the airport's Primary Airport Control Station
RUNWAY_CONTROL_POINT	Point provides the location and elevation of a specific point on the runway such as the point abeam an offset navaid or the intersection point of two runways defined in this standard as required information.
SACS	Point referenced is the airport's Secondary Airport Control Station
SAWS	Location of the Stand Alone Weather System
SEGMENTED_CIRCLE	Location of the airport segmented circle
SPOT_ELEVATION	Spot Elevation Point
STOPWAY_END	Point provides the end point for the stopway
TDZE	Touchdown Zone Elevation (TDZE) - Indicates the highest point along the runway centerline within the first 3000 feet from the threshold.
TEMPORARY_SURVEY_MARK	Temporary Survey Mark
VERTICAL_OBJECT	Point reference is a VerticalPointObject not classified by another feature but of possible significance
WIND_CONE	Location of the wind cone

CodeProjectStatus

Used by Attributes: Project Area - Project Status

Value	Definition (Notes) [Source]
IN_PROGRESS	In progress
PLAN_ON_FILE	Indicates a project that is part of a long term (11 + years) plan

PLANNED	Indicates a project that is a part of a short term (0 - 5 year) plan
PROPOSED	Indicates a project that is part of a midterm (6 - 10 year) plan

CodeProjectType

Used by Attributes: Air Operations Area - ProjectType;Aircraft Gate Stand - ProjectType;Aircraft Non Movement Area - ProjectType;Airfield Light - ProjectType;Airport Boundary - ProjectType;Airport Control Point - ProjectType;Airport Parcel - ProjectType;Airport Sign - ProjectType;AnchorageArea - ProjectType;Apron - ProjectType;Arresting Gear - ProjectType;Blast Pad - ProjectType;Bridge - ProjectType;Building - ProjectType;County - ProjectType;Deicing Area - ProjectType;Dock - ProjectType;Driveway - ProjectType;Driveway Centerline - ProjectType;Easements And Rights of Way - ProjectType;Elevation Contour - ProjectType;Environmental Contamination Area - ProjectType;FAA Region - ProjectType;Fauna Hazard Area - ProjectType;Fence - ProjectType;Flood Plain - ProjectType;Flora Habitat Area - ProjectType;Flora Species Site - ProjectType;Frequency Area - ProjectType;Gate - ProjectType;Hazardous Material Storage Site - ProjectType;Image Area - ProjectType;Land and Hold Short Line - ProjectType;Land Use - ProjectType;Landmark Segment - ProjectType;Lease Area - ProjectType;Lease Area - ProjectType;Lease Area - ProjectType;Lease Area - ProjectType;Marking Area - ProjectType;Marking Line - ProjectType;Movement Area - ProjectType;Municipality - ProjectType;Navigation Buoy - ProjectType;Navigational Aid Critical Area - ProjectType;Navigational Aid Equipment - ProjectType;Navigational Aid Site - ProjectType;Noise Contour - ProjectType;Noise Incident - ProjectType;Noise Monitoring Point - ProjectType;Obstacle - ProjectType;Obstruction Area - ProjectType;Obstruction Identification Surface - ProjectType;Parcel - ProjectType;Parking Lot - ProjectType;Passenger Loading Bridge - ProjectType;Project Area - ProjectType;Railroad Centerline - ProjectType;Railroad Yard - ProjectType;Reference Grid Line - ProjectType;Restricted Access Boundary - ProjectType;Road Centerline - ProjectType;Road Point - ProjectType;Road Segment - ProjectType;Roof - ProjectType;Runway - ProjectType;Runway Arresting Area - ProjectType;Runway Centerline - ProjectType;Runway Element - ProjectType;Runway End - ProjectType;Runway Helipad Design Surface - ProjectType;Runway Intersection - ProjectType;Runway Label - ProjectType;Runway Protection Area - ProjectType;Runway Safety Area Boundary - ProjectType;Sample Collection Point - ProjectType;Seaplane Ramp Centerline - ProjectType;Seaplane Ramp Site - ProjectType;Security Area - ProjectType;Security Identification Display Area - ProjectType;Security Perimeter Line - ProjectType;Shoreline - ProjectType;Shoulder - ProjectType;Sidewalk Segment - ProjectType;State - ProjectType;Sterile Area - ProjectType;Stopway - ProjectType;Tank Site - ProjectType;Taxi Channel - ProjectType;Taxiway Element - ProjectType;Taxiway Holding Position - ProjectType;Taxiway Intersection - ProjectType;Touchdown Lift Off - ProjectType;Tower - ProjectType;Tunnel - ProjectType;Turning Basin - ProjectType;Utility Line - ProjectType;Utility Point - ProjectType;Utility Polygon - ProjectType;Water Lane End - ProjectType;Water Operations Area - ProjectType;Wetland - ProjectType;Zoning - ProjectType

Value	Definition (Notes) [Source]

CodeRecoveredCondition

Used by Attributes: Airport Control Point - Recovered Condition

Value	Definition (Notes) [Source]
Disturbed but not missing	Surface mark destroyed (do not classify a mark as destroyed unless the actual disk is found and returned to the setting agency).
Good	Mark recovered in good condition
Other	Other
Poor	Mark recovered in poor condition and should be considered for replacement
Set now (for a first time description)	To identify a condition not available in the list.
Surface mark destroyed	Underground mark destroyed (do not classify a mark as destroyed unless the actual disk is found and returned to the setting agency).
Underground mark destroyed	Newly established mark

CodeRestrictionType

Used by Attributes: Door - Access Restriction Type;Elevator - Access Restriction Type

Value	Definition (Notes) [Source]
Biometric	Biometric
BMS	BMS
Card	Card Reader
CardKey	Card and Key
Cyper	Cyper Lock
Key	Key
None	None
Other	Other
Unknown	Unknown

CodeRouteType

Used by Attributes: Road Segment - Route 1 Type;Road Segment - Route 2 Type;Road Segment - Route 3 Type

Value	Definition (Notes) [Source]
ALLEY	Hard-surface or loose-surface narrow street or passageway primarily found between or behind buildings
CITY	City or subdivision streets
COUNTY	Hard-surface roads not included in a higher class and improved, loose-surface roads passable in all kinds of weather. These roads are adjuncts to the primary and secondary highway systems. These roads are under the jurisdiction and maintained by county au
FIFTHCLASS	Fifth Class Unimproved roads passable only with 4-wheel-drive vehicles [USGS, 2001, Part 3: Transportation]
FIRSTCLASS	First Class
FOURTHCLASS	Unimproved roads which are generally passable only in fair weather and used mostly for local traffic. Also included are driveways, regardless of construction [USGS, 2001, Part 3: Transportation]
INTERSTATE	Hard-surface highways including Interstate and U.S. numbered highways (including alternates), primary State routes, and all controlled access highways [USGS, 2001, Part 3: Transportation]
JEEPTRAIL	Unimproved roads passable only with 4-wheel-drive vehicles

LOCAL	Local jurisdiction roads
NATIONAL	First Class - Hard-surface highways including Interstate and U.S. numbered highways (including alternates), primary State routes, and all controlled access highways [USGS, 2001, Part 3: Transportation]. E.g. U.S. 66
OTHER	Other class of road
SECONDCLASS	Second Class Hard-surface highways including secondary State routes, primary county routes, and other highways that connect principal cities and towns, and link these places with primary highway system [USGS, 2001, Part 3: Transportation]
STATE	Hard-surface State routes under the control and jurisdiction of State authorities
THIRDCLASS	Hard-surface roads not included in a higher class and improved, loose-surface roads passable in all kinds of weather. These roads are adjuncts to the primary and secondary highway systems. Also included are important private roads such as main logging or
TRAIL	Unimproved roads passable only with 4-wheel-drive vehicles, snowmobiles, motocross bikes, and so forth

CodeRunwayProtectionAreaType

Used by Attributes: Runway Protection Area - Type

Value	Definition (Notes) [Source]
CWY	Clearway
ILS	ILS protection area. Protects ILS signal distortion by forbidding large objects in the area.
LIGHT	Light Plane Surface
OTHER	Other
SNOW	Area protected from snow accumulation
STOPWAY	A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.
VGSI	Visual Glide Slope Indicator (VGSI) protection area. Protects VGSI signal coverage by forbidding objects in the area.

CodeSamplePointLocation

Used by Attributes: Sample Collection Point - Collection Point Location

Value	Definition (Notes) [Source]
AS	Air sample
BH	Borehole
BIO	Biological sample
GWS	Ground water sample
OTHER	Other
SEDS	Sediment sample
SOIL	Soil sample
SOLM	Solid material sample
SURF	Surface water sample
WAS	Waste water sample
WL	Well
PC	Pavement core

CodeSegmentType

Used by Attributes: Railroad Centerline - Segment Type;Road Segment - Segment Type;Sidewalk Segment - Segment Type;Tunnel - Segment Type

Value	Definition (Notes) [Source]
BEGIN	Beginning section of the segment
CONNECTING	Intermediate segments connecting beginning and ending, beginning and intersection, or intersection and end.
END	Ending section of the segment
INTERSECTION	Defined intersection of multiple segments

CodeShape

Used by Attributes: Column - Column Shape

Value	Definition (Notes) [Source]
Circular	Circular
Ellipse	Ellipse
Other	Other
Rectangular	Rectangular
Square	Square
Unknown	Unknown
Wide Flange	Wide Flange

CodeShorelineType

Used by Attributes: Shoreline - Shoreline Type

Value	Definition (Notes) [Source]
APPARENT	Apparent edge of vegetation. Representation of the vegetative border is considered approximate because this line cannot be accurately identified on the ground, due to intricate growth patterns and change over time
INDEFINITE	Conditions prevent the feature from being confidently positioned. Horizontal data are confidently positioned within 0.02 Inches, at map scale, of the true ground position. Vertical data are confidently positioned within one-half contour interval of true g
MEAN_HIGH_LEVEL	The average limit of dry land during periods of highest water level (for example, high tide
MEAN_LOW_LEVEL	The average limit of dry land during periods of lowest water level (for example, low tide
MEAN_SEA_LEVEL	The arithmetic mean of hourly heights observed over some specified time

CodeShoulderType

Used by Attributes: Shoulder - Shoulder Type

Value	Definition (Notes) [Source]
O	Other airfield pavement with a shoulder
R	Runway
T	Taxiway

CodeSignTypeCode

Used by Attributes: Airport Sign - Sign Type

Value	Definition (Notes) [Source]
CARGO	Inbound Destination Sign - areas set aside for cargo handling
FBO	Inbound Destination Sign - fixed base operator
FUEL	Inbound Destination Sign - areas where aircraft are fueled or serviced
HOLD_INSTRUMENT_LANDING_SYSTEM	Holding Position Sign for ILS Critical Areas
HOLD_RUNWAY_APPROACH	Holding Position Sign for Runway Approach Areas
HOLD_RUNWAY_INTERSECTION	Holding Position Sign for Runway/Runway Intersections
INFO	Signs installed on the airside of an airport, other than taxiway guidance signs or runway distance remaining signs.
MIL	Inbound Destination Sign - areas set aside for military aircraft
NO_ENTRY	No Entry Sign
OUTBOUND_DESTINATION	Outbound Destination Sign
PAX	Inbound Destination Sign - areas set aside for passenger handling
ROAD_STOP	Stop sign in areas where vehicle roadways intersect runways or taxiways
ROAD_YIELD	Yield sign in areas where vehicle roadways intersect runways or taxiways
RSA_RUNWAY_APPROACH	Runway Safety Area/OFZ and Runway Approach Boundary Sign
RUNWAY_DISTANCE_REMAINING	Sign that designates the remaining runway distance to pilots during takeoff and landing operations
RUNWAY_EXIT	Runway Exit Sign
RUNWAY_LOCATION	Runway Location Sign
TAXIWAY_DIRECTION	Taxiway Direction Sign
TAXIWAY_END	Taxiway Ending Marker
TAXIWAY_LOCATION	Taxiway Location Sign
TERMINAL	Inbound Destination Sign - gate positions at which aircraft are loaded and unloaded

CodeSpaceClass

Used by Attributes: Lease Area - Class;Lease Area - Class

Value	Definition (Notes) [Source]
Airlines Common Use	Airlines Common Use
Airlines Leased	Airlines Leased
BAA Maryland	BAA Maryland
CUTE Joint Use	CUTE Joint Use
Federal SP Leased	Federal SP Leased
Federal SP Unleased	Federal SP Unleased
MAA Occupied	MAA Occupied
MAA Vacant	MAA Vacant
Misc. Tennants	Misc. Tennants

Other	Other
Public Circulation	Public Circulation
Restrooms	Restrooms
Unknown	Unknown
Utilities	Utilities

CodeSpaceType

Used by Attributes: Lease Area - Type;Lease Area - Type

Value	Definition (Notes) [Source]
Airline VIP Lounge	Airline VIP Lounge
BAA Food and Beverage	BAA Food and Beverage
BAA Retail	BAA Retail
Baggage Claim	Baggage Claim
Baggage Makeup	Baggage Makeup
Circulation	Circulation
Communication	Communication
Dead Space	Dead Space
EDS EDT	EDS EDT
Electrical	Electrical
FIS	FIS
Holdroom	Holdroom
Kiosk	Kiosk
Lounge or Meeting Rooms	Lounge or Meeting Rooms
Mechanical	Mechanical
Office Public	Office Public
Office Restricted	Office Restricted
Other	Other
Public Elevator	Public Elevator
Public Escalator	Public Escalator
Public Stairs	Public Stairs
Restricted	Restricted
Security Checkpoint	Security Checkpoint
Ticket Counter	Ticket Counter
Unfinished	Unfinished
Unknown	Unknown

CodeStatus

Used by Attributes: Air Operations Area - Status;Aircraft Gate Stand - Status;Aircraft Non Movement Area - Status;Airfield Light - Status;Airport Boundary - Status;Airport Control Point - Status;Airport Parcel - Status;Airport Sign - Status;AnchorageArea - Status;Apron - Status;Arresting Gear - Status;Blast Pad - Status;Bridge - Status;Building - Status;County - Status;Deicing Area - Status;Dock - Status;Driveway - Status;Driveway Centerline - Status;Easements And Rights of Way - Status;Elevation Contour - Status;Environmental Contamination Area - Status;FAA Region - Status;Fauna Hazard Area - Status;Fence - Status;Flood Plain - Status;Flora Habitat Area - Status;Flora Species Site - Status;Frequency Area - Status;Gate - Status;Hazardous Material Storage Site - Status;Image Area - Status;Land and Hold Short Line - Status;Land Use - Status;Landmark Segment - Status;Lease Area - Status;Lease Area - Status;Lease Area - Status;Lease Area - Status;Marking Area - Status;Marking Line - Status;Movement Area - Status;Municipality - Status;Navigation Buoy - Status;Navigational Aid Critical Area - Status;Navigational Aid Equipment - Status;Navigational Aid Site - Status;Noise Contour - Status;Noise Incident - Status;Noise Monitoring Point - Status;Obstacle - Status;Obstruction Area - Status;Obstruction Identification Surface - Status;Parcel - Status;Parking Lot - Status;Passenger Loading Bridge - Status;Project Area - Status;Railroad Centerline - Status;Railroad Yard - Status;Reference Grid Line - Status;Restricted Access Boundary - Status;Road Centerline - Status;Road Point - Status;Road Segment - Status;Roof - Status;Runway - Status;Runway Arresting Area - Status;Runway Centerline - Status;Runway Element - Status;Runway End - Status;Runway Helipad Design Surface - Status;Runway Intersection - Status;Runway Label - Status;Runway Protection Area - Status;Runway Safety Area Boundary - Status;Sample Collection Point - Status;Seaplane Ramp Centerline - Status;Seaplane Ramp Site - Status;Security Area - Status;Security Identification Display Area - Status;Security Perimeter Line - Status;Shoreline - Status;Shoulder - Status;Sidewalk Segment - Status;State - Status;Sterile Area - Status;Stopway - Status;Tank Site - Status;Taxi Channel - Status;Taxiway Element - Status;Taxiway Holding Position - Status;Taxiway Intersection - Status;Touchdown Lift Off - Status;Tower - Status;Tunnel - Status;Turning Basin - Status;Utility Line - Status;Utility Point - Status;Utility Polygon - Status;Water Lane End - Status;Water Operations Area - Status;Wetland - Status;Zoning - Status

Value	Definition (Notes) [Source]
ABANDONED	Abandoned
ACTIVE	Active surface
AIRSPACED	A favorable airspace determination has been issued
AS_BUILT	As-Built
BROKEN	Broken or rough surface
CLOSED	Closed surface
CONDEMNED	Condemned
DEMOLISHED	Demolished
ENV_CLEARED	All required environmental actions and documentation described in FAAO 5050.4 National Environmental Policy Act (NEPA) have been satisfied
FAILED_AID	Failure or irregular operation of visual aides
INACTIVE	Inactive
LIMITED	Limited operations]

LONG_TERM	Indicates the feature is part of a long term (11 + years) plan
MEDIUM_TERM	Indicates the feature is part of a midterm (6 - 10 year) plan
NON_OPERATIONAL	Non-operational
OCCUPIED	Occupied
OPERATIONAL	Operational (fully)
OTHER	Other
PARKED	Parked or disabled aircraft
PERMANENT	Permanent
PORTABLE	Portable
RELEASED	Used to track land released by the airport
S_POWER	Secondary power supply in operation
SEMI_PERMANENT	Semi_Permanent
SHORT_TERM	Indicates the feature is part of a short term (0 - 5 year) plan
TBD	To be determined
TEMPORARY	Temporary
TERMINATED	Terminated no longer used
UNDER_CONSTRUCTION	Planned or under construction
UNKNOWN	Unknown
UNOCCUPIED	Unoccupied
WORK_IN_PROGRESS	Construction or work in progress

CodeStructureType

Used by Attributes: Building - Structure Type

Value	Definition (Notes) [Source]
APARTMENT	Apartment building
APM_STATION	Automated People Mover station
APM_TRACK	Automated People Mover tracks
ARENA	Sports Arena or facility
ARFF_STATION	Aircraft Rescue and Firefighting station
ATC_FACILITY	Combined or Single (other than the airport control tower) Air Traffic Control Facility
ATC_TOWER	Air Traffic Control Tower
BANK	Bank
BARN	barn
CAPITOL	Capitol
CHURCH	church/temple
CITY_HALL	City Hall
COMMUNITY_CENTER	Community Center
CONCERT_HALL	Concert Hall
CONDO	condominium
COURT_HOUSE	Court House
DRY_STORAGE_DOCK	Dry Storage Dock
DUPLEX	house, duplex
DWELLING	dwelling
EARTHWORKS	Earthworks
FBO	Fixed Base operator
GARAGE	A structure used for the maintenance, storage, and display of motor vehicles
GRAIN_ELEVATOR	Grain Elevator
HANGAR	A structure used for the maintenance, storage, and display of aircraft
HIGHRISE	A multi-story structure with at least 12 floors or 35 meters (115 feet) in height
HOSPITAL	Hospital
HOUSE	house, single family
JAIL_OR_PRISON	Jail or Prison
MEDICAL_CENTER	Medical Center
MEMORIAL	Memorial
MOBILE_HOME	Mobile home or trailer
MUSEUM	Museum.
OFFICE	office building
OFFSHORE_PLATFORM	Offshore Platform
OTHER	Other
PARKING_GARAGE	Parking garage or facility
POLICE	Police Station
POST_OFFICE	Post Office
POWER_PLANT	A facility used in the production and distribution of electrical power

PUBLIC_TRANSPORTATION	Public transportation facility (buses, taxi, etc.)
RADIO_FACILITY	Radio Facility
RAILROAD_STATION	Railroad Station
RAIN_SHED	Rain Shed
RENTAL_FACILITY	Rental Car facility
SCHOOL	Any building or structure whose primary purpose is education
SECURITY	Security Office
SKYSCRAPER	Office or housing where the building clearly stands out above its surrounding built environment and significantly changes the overall skyline of that particular city
SNOW_SHED	A structure used for the storage, maintenance of Snow removal equipment
STORAGE_FACILITY	A structure used for any type of storage
TBD	to be determined
TERMINAL	Airport Terminal building
THEATER	Theater (any type)
TOWER	Tower
TOWN_HALL	Town Hall
TOWNHOUSE	townhouse
WATER_TANK	Water Tank

CodeSurfaceCondition

Used by Attributes: Aircraft Gate Stand - Surface Condition;Apron - Surface Condition;Blast Pad - Surface Condition;Runway - Surface Condition;Runway Arresting Area - Surface Condition;Runway Element - Surface Condition;Shoulder - Surface Condition;Stopway - Surface Condition;Taxiway Element - Surface Condition;Touchdown Lift Off - Surface Condition

Value	Definition (Notes) [Source]
FAIR	Fair condition
GOOD	Good condition
OTHER	Other
POOR	Poor condition
UNSAFE	Surface is deemed unsafe for operations

CodeSurfaceMaterial

Used by Attributes: Apron - Surface Material;Blast Pad - Surface Material;Bridge - Surface Material;Driveway - Surface Material;Road Segment - Surface Material;Runway - Surface Material;Runway Arresting Area - Surface Material;Runway Element - Surface Material;Shoulder - Surface Material;Sidewalk Segment - Surface Material;Stopway - Surface Material;Taxiway Element - Surface Material;Touchdown Lift Off - Surface Material;Water Operations Area - Surface Material

Value	Definition (Notes) [Source]
AG	Asphalt grooved
Ags	Asphalt and turf
ANG	Asphalt ungrooved
BE	Bare earth
CA	Concrete and asphalt
CG	Concrete grooved
CGS	Concrete and turf
CNG	Concrete ungrooved
DS	Desert/Sand
DT	Dirt
EMAS	Engineered Material Arresting System
FW	Fresh Water
GR	Gravel
GS	Turf
SI	Snow/Ice
SW	Salt Water
W	Water

CodeSurfaceType

Used by Attributes: Aircraft Gate Stand - Surface Type;Apron - Surface Type;Blast Pad - Surface Type;Parking Lot - Surface Type;Road Segment - Surface Type;Runway - Surface Type;Runway Element - Surface Type;Shoulder - Surface Type;Stopway - Surface Type;Taxiway Element - Surface Type;Touchdown Lift Off - Surface Type

Value	Definition (Notes) [Source]
P	Specially prepared hard surface Paved
S	Specially prepared hard surface Unpaved

U	Not a specially prepared hard surface

CodeTaxiwayType

Used by Attributes: Taxiway Element - Taxiway Type

Value	Definition (Notes) [Source]
AIR_TAXIWAY	Air taxiway
AIR_TLANE	Air taxilane
APRON	Apron taxiway
BYPASS	Bypass holding bay
CROSS_OVER	Crossover taxiway
EAT	End Around Taxiway
ENTER_EXIT_TAXIWAY	Entrance and Exit taxiway
EXIT	Exit/turnoff taxiway
FASTEXIT	Rapid exit/turnoff taxiway
GATE_TLANE	Gate/stand taxilane
GND	Ground taxiway
HOLDING	Holding bay
INLINE	Inline taxiway
OTHER	Those not listed here
PARALLEL	Parallel taxiway
STUB	Stub taxiway
TLANE	Taxilane
TURN_AROUND	Turn around taxiway

CodeThresholdType

Used by Attributes: Runway End - Threshold Type

Value	Definition (Notes) [Source]
Displaced	An indication that the landing threshold is located at a point other than the runway end
Normal	An indication that the landing threshold corresponds to the end of the runway

CodeUseCode

Used by Attributes: Navigational Aid Equipment - Use Code

Value	Definition (Notes) [Source]
C	Compass Locator
H	High Altitude for VOR/VORTAC/TACAN; All Altitudes for NDB at 50-90 watts
HH	All Altitudes for NDB; 2000 watts or more
L	Low Altitude
MH	All Altitudes for NDB; Under 50 watts
T	Terminal

CodeUtilityType

Used by Attributes: Utility Line - Utility Type;Utility Point - Utility Type;Utility Polygon - Utility Type

Value	Definition (Notes) [Source]
COMMUNICATION_SYSTEM	Telephone, telegraph, cable, video and voice transmission lines
COMPRESSED_AIR_SYSTEM	The components of a compressed air system.
CONTROL_MONITORING_SYSTEM	The components of an electronic monitoring and control system (EMCS) including cables, devices, etc.
ELECTRICAL_EXT_LIGHT	The components of an electrical exterior lighting system including cables, switches, devices, transformers, etc. Does not include airfield, NAVAID or approach lighting.
ELECTRICAL_SYSTEM	The components of an electrical distribution system including cables, switches, devices, motors, transformers, etc.
FUEL_SYSTEM	The components of a fuel distribution system consisting of pipes, fittings, fixtures, pumps, tanks, etc.
GENERAL_UTILITY	The components of utility system which are universal in use and purpose and do not belong to a specific utility.
HEAT_COOL_SYSTEM	The components of a heating and cooling distribution system consisting of pipes, fittings, fixtures, etc.
INDUSTRIAL_SYSTEM	The components of an industrial waste collection system including pipes, fittings, fixtures, tanks, lagoons, etc.
NATURAL_GAS_SYSTEM	The components of a natural gas distribution system consisting of pipes, fittings, fixtures, etc.
NUCLEAR_REACTOR	The components of a nuclear system such as nuclear fuel, Nuclear research, nuclear waste, and nuclear weapons.

POWER_SYSTEM	Power transmission lines
SALTWATER_SYSTEM	The components of a salt water collection system.
STORM_SYSTEM	The components of a storm drainage collection system including pipes, fittings, fixtures, etc.
TRANSMISSION_LINE	Objects related to the long distance transmission of gas, oil, or hazardous liquid.
WASTEWATER_SYSTEM	The components of a wastewater collection system including pipes, fittings, fixtures, treatment plants, collection locations, etc.
WATER_SYSTEM	The components of a water system including pipes, fittings, fixtures, treatment plants, etc.

CodeVerticalStructureMaterial

Used by Attributes: Dock - Floating Barge Material;Dock - Floating Dock Material;Dock - Gangway Material;Dock - Pier Material;Bridge - Vertical Structure Material;Tank Site - Vertical Structure Material;Tower - Vertical Structure Material

Value	Definition (Notes) [Source]
COMPOSITION	Composition
CONCRETE	Concrete
METAL	Metal
ROCK	Rock
STONE_BRICK	Stone/brick
WOOD	Wood

CodeWallMaterial

Used by Attributes: Wall - Surface Material

Value	Definition (Notes) [Source]
CMU	Concrete Masonry Unit
Composite	Composite
Glass Curtain	Glass Curtain
Metal Stud	Metal Stud
Other	Other
Unknown	Unknown
Aluminum	Aluminum
Block	Block
Brick	Brick
Concrete	Concrete
Partition	Partition
Railing	Railing
Steel	Steel
Wallboard	Wallboard
Wood	Wood
Other	Other

CodeZoneType

Used by Attributes: Flood Plain - Zone Type

Value	Definition (Notes) [Source]
10_YEAR	Areas subject to 10 year flooding.
100_YEAR	Areas subject to 100 year flooding.
15_YEAR	Areas subject to 15 year flooding.
25_YEAR	Areas subject to 25 year flooding.
5_YEAR	Areas subject to 5 year flooding.
50_YEAR	Areas subject to 50 year flooding.
500_YEAR	Areas subject to 500 year flooding.
GENERAL	Areas prone to flooding in general.
OTHER	Other
PROJECTED	Areas expected to be subject to flooding in the future.

CodeZoningClass

Used by Attributes: Zoning - Zoning Classification

Value	Definition (Notes) [Source]

COMMERCIAL	Areas which are zoned for merchandising, shopping, or other commercial development. (Source SDSFIE)
INDUSTRIAL	Areas which are zoned for factory, manufacturing, or other industrial development. (Source SDSFIE)
OTHER	Other Zoning
QUASI_PUBLIC	Areas which are zoned public although under private ownership or control. (Source SDSFIE)
RESIDENTIAL	Areas which are zoned for housing or residential development. (Source SDSFIE)

1E.2 Cross Reference of CAD and GIS

This appendix lists each of the CAD layers defined in Chapter 3 - CAD Standard that are associated with GIS layers defined in this document, as well as in Appendix 1E.3 – Utilities Supplement. The layers are ordered by category (i.e. Airfield, Airspace, Environmental, etc.) and then by Feature Type (i.e. Air Operations Area, Aircraft Deicing Area, etc.). Each feature type has one or more CAD layers associated with it. For each CAD layer, the layer name is provided. The first character of the CAD layer names, which indicates the discipline, has been replaced with an asterisk ('*') meaning that multiple discipline codes may apply. Applicable discipline codes for each CAD layers are listed in Appendix 1D.1 – Layer Development, but are omitted here. It is important to note that many CAD layers included in the CAD Standard are not relevant for GIS and are therefore excluded from this appendix.

1E.2.1 Discipline Indicators

Designator	Discipline	Designator	Discipline
A	Architectural	I	Interiors
B	Geotechnical	L	Landscaping
C	Civil	M	Mechanical
E	Electrical	P	Plumbing
F	Fire Protection	S	Structural
G	General	T	Telecommunications
H	Hazardous Materials	V	Surveying/Mapping

Table 1E.2.1, Discipline Designators that Can be Used as Permitted in the CAD Standard to Replace the '' in the GIS to CAD Layer Crosswalk*

1E.2.2 GIS to CAD Layer Crosswalk

1E.2.2.1 Airfield

Category	Feature Class	Geometry	CAD Layer Name
Airfield	AircraftNonMovementArea	Line	*-APRN-ANOM
Airfield	AirfieldLight	Point	*-AFLD-LITE-APPR
Airfield	AirfieldLight	Point	*-AFLD-LITE-DIST
Airfield	AirfieldLight	Point	*-AFLD-LITE-LANE
Airfield	AirfieldLight	Point	*-AFLD-LITE-OBST
Airfield	AirfieldLight	Point	*-AFLD-LITE-RUNW
Airfield	AirfieldLight	Point	*-AFLD-LITE-SIGN
Airfield	AirfieldLight	Point	*-AFLD-LITE-TAXI
Airfield	AirfieldLight	Point	*-AFLD-LITE-THRS
Airfield	AirOperationsArea	Polygon	*-AFLD-AHOA
Airfield	AirportSign	Point	*-APRN-SIGN
Airfield	AirportSign	Point	*-ELEV-SIGN
Airfield	AirportSign	Point	*-FLOR-SIGN
Airfield	AirportSign	Point	*-LITE-DIST
Airfield	AirportSign	Point	*-LITE-SIGN

Category	Feature Class	Geometry	CAD Layer Name
Airfield	AirportSign	Point	*-PRKG-SIGN
Airfield	AirportSign	Point	*-ROAD-SIGN
Airfield	AirportSign	Point	*-RUNW-SIGN
Airfield	AirportSign	Point	*-SIGN-EXTN
Airfield	AirportSign	Point	*-SIGN-FRMG
Airfield	AirportSign	Point	*-SIGN-GAGE
Airfield	AirportSign	Point	*-SIGN-PANL
Airfield	AirportSign	Point	*-SIGN-SPRT
Airfield	AirportSign	Point	*-SPCL-TRAF
Airfield	AirportSign	Point	*-TAXI-SIGN
Airfield	Apron	Polygon	*-APRN-GRND
Airfield	Apron	Polygon	*-APRN-OTLN
Airfield	DeicingArea	Polygon	*-APRN-DEIC
Airfield	FrequencyArea	Polygon	*-AFLD-FREQ
Airfield	MarkingArea	Polygon	*-HELI-IDEN
Airfield	MarkingArea	Polygon	*-HELI-TDZM
Airfield	MarkingArea	Polygon	*-RUNW-CNTR-MRKG
Airfield	MarkingArea	Polygon	*-RUNW-DISP
Airfield	MarkingArea	Polygon	*-RUNW-DIST
Airfield	MarkingArea	Polygon	*-RUNW-IDEN
Airfield	MarkingArea	Polygon	*-RUNW-SIDE
Airfield	MarkingArea	Polygon	*-RUNW-TDZM
Airfield	MarkingArea	Polygon	*-RUNW-THRS
Airfield	MarkingLine	Line	*-APRN-CNTR
Airfield	MarkingLine	Line	*-APRN-HOLD
Airfield	MarkingLine	Line	*-APRN-MRKG
Airfield	MarkingLine	Line	*-APRN-SECU
Airfield	MarkingLine	Line	*-APRN-SHLD
Airfield	MarkingLine	Line	*-APRN-SHLD-MRKG
Airfield	MarkingLine	Line	*-HELI-BLST
Airfield	MarkingLine	Line	*-HELI-CNTR-MARK
Airfield	MarkingLine	Line	*-HELI-DIST
Airfield	MarkingLine	Line	*-HELI-SIDE
Airfield	MarkingLine	Line	*-OVRN-CNTR
Airfield	MarkingLine	Line	*-OVRN-SHLD-MRKG
Airfield	MarkingLine	Line	*-PADS-CNTR
Airfield	MarkingLine	Line	*-PADS-OTLN
Airfield	MarkingLine	Line	*-PVMT-MRKG
Airfield	MarkingLine	Line	*-PVMT-MRKG-WHIT
Airfield	MarkingLine	Line	*-PVMT-MRKG-YELO

Category	Feature Class	Geometry	CAD Layer Name
Airfield	MarkingLine	Line	*-RUNW-CNTR-MARK
Airfield	MarkingLine	Line	*-RUNW-SHLD
Airfield	MarkingLine	Line	*-TAXI-CNTR-MARK
Airfield	MarkingLine	Line	*-TAXI-CNTR-MRKG
Airfield	MarkingLine	Line	*-TAXI-EDGE
Airfield	MarkingLine	Line	*-TAXI-SHLD
Airfield	PassengerLoadingBridge	Polygon	*-APRN-ACPK-BRDG
Airfield	PassengerLoadingBridge	Polygon	*-EQPM-JETB
Airfield	RestrictedAccessBoundary	Line	*-AFLD-SECR-RSTR
Airfield	Runway	Polygon	*-RUNW-EDGE
Airfield	RunwayArrestingArea	Polygon	*-RUNW-ARST
Airfield	RunwayBlastPad	Polygon	*-RUNW-BLST
Airfield	RunwayCenterline	Line	*-RUNW-CNTR
Airfield	RunwayElement	Polygon	*-RUNW-SEGM
Airfield	RunwayEnd	Point	*-RUNW-ENDP
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-BLDR
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-KEYH
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-NMOV
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-OFA_
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-OFZ_
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-POFA
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-RPZ_
Airfield	RunwayHelipadDesignSurface	Polygon	*-AFLD-DSRF-RSA_
Airfield	RunwayHelipadDesignSurface	Polygon	*-HELI-DSRF
Airfield	RunwayHelipadDesignSurface	Polygon	*-OVRN-IDEN
Airfield	RunwayHelipadDesignSurface	Polygon	*-OVRN-OTLN
Airfield	RunwayHelipadDesignSurface	Polygon	*-RUNW-CLRW
Airfield	RunwayLabel	Point	*-RUNW-ENDP-MARK
Airfield	RunwayLAHSO	Line	*-RUNW-LAHS
Airfield	RunwaySafetyAreaBoundary	Polygon	*-RUNW-SAFT
Airfield	Shoulder	Polygon	*-HELI-SHLD
Airfield	Shoulder	Polygon	*-PADS-SHLD
Airfield	Stopway	Polygon	*-RUNW-STWY
Airfield	TaxiwayElement	Polygon	*-TAXI-OTLN
Airfield	TaxiwayHoldingPosition	Line	*-TAXI-HOLD
Airfield	TaxiwayIntersection	Polygon	*-TAXI-INTS
Airfield	TouchdownLiftOff	Polygon	*-HELI-TLOF

1E.2.2.2 Airspace

Category	Feature Class	Geometry	CAD Layer Name

Airspace	LandmarkSegment	Line	*-AIRS-LNDM
Airspace	Obstacle	Point	*-AIRS-OBSC
Airspace	Obstacle	Point	*-AIRS-OBST-PPNT
Airspace	Obstacle	Point	*-OBST-AIRS
Airspace	ObstructionArea	Polygon	*-AIRS-OBST-LINE
Airspace	ObstructionArea	Polygon	*-AIRS-OBST-POLY
Airspace	ObstructionIdSurface	Polygon	*-AIRS-OTHR
Airspace	ObstructionIdSurface	Polygon	*-AIRS-PART-APRC
Airspace	ObstructionIdSurface	Polygon	*-AIRS-PART-CONL
Airspace	ObstructionIdSurface	Polygon	*-AIRS-PART-HORZ
Airspace	ObstructionIdSurface	Polygon	*-AIRS-PART-PRIM
Airspace	ObstructionIdSurface	Polygon	*-AIRS-PART-TRNS
Airspace	ObstructionIdSurface	Polygon	*-AIRS-TERP

1E.2.2.3 Cadastral

Category	**Feature Class**	**Geometry**	**CAD Layer Name**
Cadastral	AirportBoundary	Polygon	*-AFLD-PROP
Cadastral	County	Polygon	*-PROP-CNTY
Cadastral	EasementsAndRightsofWay	Polygon	*-PROP-ESMT
Cadastral	EasementsAndRightsofWay	Polygon	*-PROP-RWAY
Cadastral	EasementsAndRightsofWay	Polygon	*-PROP-RWAY-ACQU
Cadastral	FaaRegionArea	Polygon	*-AFLD-FAAR
Cadastral	LandUse	Polygon	*-PROP-LUSE
Cadastral	LandUse	Polygon	*-PROP-LUSE-FUTR
Cadastral	LeaseZone	Polygon	*-PROP-LEAS
Cadastral	Municipality	Polygon	*-PROP-MUNI
Cadastral	Parcel	Polygon	*-PROP-LINE
Cadastral	Parcel	Polygon	*-PROP-QTRS
Cadastral	Parcel	Polygon	*-PROP-SECT
Cadastral	Parcel	Polygon	*-PROP-SXTS
Cadastral	State	Polygon	*-PROP-STAT
Cadastral	Zoning	Polygon	*-PROP-ZONG

1E.2.2.4 Environmental

Category	**Feature Class**	**Geometry**	**CAD Layer Name**
Environmental	EnvironmentalContaminationArea	Polygon	*-POLL-CONC
Environmental	EnvironmentalContaminationArea	Polygon	*-POLL-POTN
Environmental	FaunaHazardArea	Polygon	*-BORW-IDEN
Environmental	FaunaHazardArea	Polygon	*-BORW-LINE
Environmental	FaunaHazardArea	Polygon	*-ECCO-BURR

Environmental	FaunaHazardArea	Polygon	*-ECCO-DENS
Environmental	FaunaHazardArea	Polygon	*-ECCO-GATR
Environmental	FaunaHazardArea	Polygon	*-ECCO-HUMK
Environmental	FaunaHazardArea	Polygon	*-ECCO-NEST
Environmental	FaunaHazardArea	Polygon	*-ECCO-PRCH
Environmental	FaunaHazardArea	Polygon	*-SITE-VEGE-HZRD
Environmental	FaunaHazardArea	Polygon	*-TOPO-SPEC
Environmental	FloodZone	Polygon	*-FLHA-025Y
Environmental	FloodZone	Polygon	*-FLHA-050Y
Environmental	FloodZone	Polygon	*-FLHA-100Y
Environmental	FloodZone	Polygon	*-FLHA-200Y
Environmental	FloodZone	Polygon	*-FLHA-500Y
Environmental	FloodZone	Polygon	*-FLHA-IDEN
Environmental	FloodZone	Polygon	*-TOPO-FLZN
Environmental	FloraSpeciesSite	Point	*-PLNT-CTNR
Environmental	FloraSpeciesSite	Point	*-PLNT-PLTS
Environmental	FloraSpeciesSite	Point	*-PLNT-TREE
Environmental	FloraSpeciesSite	Point	*-SITE-VEGE-PONT
Environmental	ForestStandArea	Polygon	*-PLNT-BEDS
Environmental	ForestStandArea	Polygon	*-PLNT-BUSH
Environmental	ForestStandArea	Polygon	*-PLNT-BUSH-LINE
Environmental	ForestStandArea	Polygon	*-PLNT-GRND
Environmental	ForestStandArea	Polygon	*-PLNT-MLCH
Environmental	ForestStandArea	Polygon	*-PLNT-SPRG
Environmental	ForestStandArea	Polygon	*-PLNT-TREE-LINE
Environmental	ForestStandArea	Polygon	*-PLNT-TURF
Environmental	ForestStandArea	Polygon	*-SITE-VEGE
Environmental	ForestStandArea	Polygon	*-SITE-VEGE-AREA
Environmental	HazMatStorageSite	Point	*-STOR-HAZM
Environmental	HazMatStorageSite	Point	*-STOR-HAZW
Environmental	NoiseContour	Polygon	*-TOPO-AUZN
Environmental	NoiseIncident	Point	*-TOPO-AUCO
Environmental	NoiseMonitoringPoint	Point	*-TOPO-AUST
Environmental	SampleCollectionPoint	Point	*-BORE-CONE
Environmental	SampleCollectionPoint	Point	*-BORE-GENL-LOCN
Environmental	SampleCollectionPoint	Point	*-BORE-GPRO-LOCN
Environmental	SampleCollectionPoint	Point	*-BORE-HOLE
Environmental	SampleCollectionPoint	Point	*-BORE-LINE
Environmental	SampleCollectionPoint	Point	*-BORE-PUSH
Environmental	SampleCollectionPoint	Point	*-BORE-STRK
Environmental	SampleCollectionPoint	Point	*-BORE-UNDS-LOCN

Environmental	SampleCollectionPoint	Point	*-BORE-VCOR-LOCN
Environmental	SampleCollectionPoint	Point	*-MNST-AIRQ
Environmental	SampleCollectionPoint	Point	*-SAMP-AIRS
Environmental	SampleCollectionPoint	Point	*-SAMP-AUGR
Environmental	SampleCollectionPoint	Point	*-SAMP-BIOL
Environmental	SampleCollectionPoint	Point	*-SAMP-CORE
Environmental	SampleCollectionPoint	Point	*-SAMP-DRVE
Environmental	SampleCollectionPoint	Point	*-SAMP-GRAB
Environmental	SampleCollectionPoint	Point	*-SAMP-GWTR
Environmental	SampleCollectionPoint	Point	*-SAMP-IDEN
Environmental	SampleCollectionPoint	Point	*-SAMP-MAGN
Environmental	SampleCollectionPoint	Point	*-SAMP-PERC
Environmental	SampleCollectionPoint	Point	*-SAMP-PITS
Environmental	SampleCollectionPoint	Point	*-SAMP-SEDI
Environmental	SampleCollectionPoint	Point	*-SAMP-SOIL
Environmental	SampleCollectionPoint	Point	*-SAMP-SOLI
Environmental	SampleCollectionPoint	Point	*-SAMP-SWTR
Environmental	SampleCollectionPoint	Point	*-SAMP-VERT
Environmental	SampleCollectionPoint	Point	*-SAMP-WASH
Environmental	SampleCollectionPoint	Point	*-SAMP-WAST
Environmental	SampleCollectionPoint	Point	*-TOPO-BORE
Environmental	SampleCollectionPoint	Point	*-WELL-ASR~
Environmental	SampleCollectionPoint	Point	*-WELL-MONT
Environmental	SampleCollectionPoint	Point	*-WELL-PIZO
Environmental	Shoreline	Polygon	*-CHAN-BANK-TOP~
Environmental	Shoreline	Polygon	*-CHAN-DACL
Environmental	Shoreline	Polygon	*-CHAN-DACL-IDEN
Environmental	Shoreline	Polygon	*-CHAN-LIMT
Environmental	Shoreline	Polygon	*-CHAN-LIMT-IDEN
Environmental	Shoreline	Polygon	*-DRED-OHWM
Environmental	Shoreline	Polygon	*-MNST-GWTR
Environmental	Shoreline	Polygon	*-MNST-SWTR
Environmental	Shoreline	Polygon	*-RIVR-BANK-TOP~
Environmental	Shoreline	Polygon	*-RIVR-EDGE
Environmental	Shoreline	Polygon	*-SITE-EWAT
Environmental	Shoreline	Polygon	*-SITE-WATR
Environmental	Shoreline	Polygon	*-TOPO-SHOR
Environmental	Shoreline	Polygon	*-TOPO-WATR
Environmental	Wetland	Polygon	*-TOPO-WETL
Environmental	Wetland	Polygon	*-WETL-BOGS
Environmental	Wetland	Polygon	*-WETL-FENS

Environmental	Wetland	Polygon	*-WETL-MRSH
Environmental	Wetland	Polygon	*-WETL-MRSH-SALT
Environmental	Wetland	Polygon	*-WETL-MRSH-TIDL
Environmental	Wetland	Polygon	*-WETL-PCSN
Environmental	Wetland	Polygon	*-WETL-PHOL
Environmental	Wetland	Polygon	*-WETL-RPRN
Environmental	Wetland	Polygon	*-WETL-SLGH
Environmental	Wetland	Polygon	*-WETL-SWMP

1E.2.2.5 Geodetic

Category	Feature Class	Geometry	CAD Layer Name
Geodetic	AirportControlPoint	Point	*-CTRL-BMRK
Geodetic	AirportControlPoint	Point	*-CTRL-HCPT
Geodetic	AirportControlPoint	Point	*-CTRL-HVPT
Geodetic	AirportControlPoint	Point	*-CTRL-TRAV
Geodetic	AirportControlPoint	Point	*-CTRL-VCPT
Geodetic	AirportControlPoint	Point	*-SURV-DATA
Geodetic	AirportControlPoint	Point	*-TOPO-RNYE
Geodetic	AirportControlPoint	Point	*-TOPO-SPOT
Geodetic	AirportControlPoint	Point	*-TOPO-SPOT-BLDG
Geodetic	CoordinateGridCell	Polygon	*-CTRL-GRID
Geodetic	CoordinateGridCell	Polygon	*-DETL-GRPH
Geodetic	CoordinateGridCell	Polygon	*-GRID-COOR
Geodetic	CoordinateGridCell	Polygon	*-GRID-COOR-IDEN
Geodetic	CoordinateGridCell	Polygon	*-GRID-EXTR
Geodetic	CoordinateGridCell	Polygon	*-GRID-FRAM
Geodetic	CoordinateGridCell	Polygon	*-GRID-HORZ
Geodetic	CoordinateGridCell	Polygon	*-GRID-IDEN
Geodetic	CoordinateGridCell	Polygon	*-GRID-INTR
Geodetic	CoordinateGridCell	Polygon	*-GRID-MAJR
Geodetic	CoordinateGridCell	Polygon	*-GRID-MINR
Geodetic	CoordinateGridCell	Polygon	*-GRID-VERT
Geodetic	CoordinateGridCell	Polygon	*-PROJ-LALO-COOR
Geodetic	CoordinateGridCell	Polygon	*-PROJ-STAT-COOR
Geodetic	CoordinateGridCell	Polygon	*-TOPO-COOR
Geodetic	CoordinateGridCell	Polygon	*-TOPO-COOR-LALO
Geodetic	CoordinateGridCell	Polygon	*-TOPO-COOR-STAT
Geodetic	ElevationContour	Line	*-GRAD-AFTR
Geodetic	ElevationContour	Line	*-GRAD-EXST
Geodetic	ElevationContour	Line	*-GRAD-EXST-BASE
Geodetic	ElevationContour	Line	*-GRAD-EXST-SYR1

Geodetic	ElevationContour	Line	*-GRAD-EXST-SYR2
Geodetic	ElevationContour	Line	*-GRAD-EXST-SYR3
Geodetic	ElevationContour	Line	*-GRAD-EXST-SYR4
Geodetic	ElevationContour	Line	*-GRAD-FNSH
Geodetic	ElevationContour	Line	*-GRAD-PRED
Geodetic	ElevationContour	Line	*-GRAD-SCLN
Geodetic	ElevationContour	Line	*-TOPO-BKLN
Geodetic	ElevationContour	Line	*-TOPO-DTMP
Geodetic	ElevationContour	Line	*-TOPO-DTMT
Geodetic	ElevationContour	Line	*-TOPO-MAJR
Geodetic	ElevationContour	Line	*-TOPO-MAJR-IDEN
Geodetic	ElevationContour	Line	*-TOPO-MINR
Geodetic	ElevationContour	Line	*-TOPO-MINR-IDEN
Geodetic	ElevationContour	Line	*-TOPO-MINR-ONEF
Geodetic	ElevationContour	Line	*-TOPO-MINR-TWOF
Geodetic	ElevationContour	Line	*-TOPO-SLOP-FILL
Geodetic	ElevationContour	Line	*-TOPO-SLOP-IDEN
Geodetic	ElevationContour	Line	*-TOPO-SLOP-TOPT
Geodetic	ElevationContour	Line	*-TOPO-SOUN
Geodetic	ElevationContour	Line	*-WATR-SURF
Geodetic	ImageArea	Polygon	*-AERI-BNDY
Geodetic	ImageArea	Polygon	*-AERI-PHOT
Geodetic	ImageArea	Polygon	*-AERI-PNPT
Geodetic	ImageArea	Polygon	*-IMAG-BDRY-QUAD

1E.2.2.6 Interior

Category	Feature Class	Geometry	CAD Layer Name
Interior	BaggageCarousel	Polygon	*-BAGS-CARR
Interior	BaggageConveyor	Polygon	*-BAGS-CVRI
Interior	BaggageConveyor	Polygon	*-BAGS-CVRO
Interior	BuildingColumn	Polygon	*-COLS-CNTR
Interior	BuildingColumn	Polygon	*-COLS-ENCL
Interior	BuildingColumn	Polygon	*-COLS-POST
Interior	BuildingColumn	Polygon	*-COLS-PRIM
Interior	BuildingColumn	Polygon	*-COLS-RBAR
Interior	BuildingColumn	Polygon	*-COLS-SECD
Interior	BuildingColumn	Polygon	*-FNDN-FTNG
Interior	BuildingColumn	Polygon	*-FNDN-PEDS
Interior	BuildingColumn	Polygon	*-FNDN-PILE
Interior	Door	Line	*-ALRM-EQPM-SECU
Interior	Door	Line	*-DOOR-FULL

Interior	Door	Line	*-DOOR-PRHT
Interior	Door	Line	*-DOOR-SECR
Interior	Door	Line	*-HVAC-ACCS
Interior	Door	Line	*-OTLN-OPNG
Interior	Elevator	Polygon	*-ACCS-EVTR
Interior	Elevator	Polygon	*-FLOR-EVTR
Interior	Escalator	Polygon	*-FLOR-ECSL
Interior	Floor	Polygon	*-FLOR-LEVL
Interior	Floor	Polygon	*-FLOR-OTLN
Interior	Floor	Polygon	*-OTLN-FLOR
Interior	Floor	Polygon	*-OTLN-ROOF
Interior	Furnishing	Point	*-FURN-ACCS
Interior	Furnishing	Point	*-FURN-ADPC
Interior	Furnishing	Point	*-FURN-ARTW
Interior	Furnishing	Point	*-FURN-FLOR
Interior	Furnishing	Point	*-FURN-FREE
Interior	Furnishing	Point	*-FURN-GRID
Interior	Furnishing	Point	*-FURN-IDEN
Interior	Furnishing	Point	*-FURN-PLNT
Interior	Furnishing	Point	*-FURN-SEAT
Interior	Furnishing	Point	*-FURN-STOR
Interior	MovingSidewalk	Polygon	*-FLOR-MWLK
Interior	Room	Polygon	*-FLOR-OTLN-RPRM
Interior	Space	Polygon	*-FLOR-SPCE
Interior	Stair	Polygon	*-ACCS-STRS
Interior	Stair	Polygon	*-ACCS-STRS-FRMG
Interior	Stair	Polygon	*-FLOR-HRAL
Interior	Stair	Polygon	*-FLOR-STRS
Interior	Stair	Polygon	*-SITE-STRS
Interior	Wall	Line	*-FNDN-ANCH
Interior	Wall	Line	*-FNDN-CNTR
Interior	Wall	Line	*-FNDN-GRBM
Interior	Wall	Line	*-PENE-WALL
Interior	Wall	Line	*-WALL-ABUT
Interior	Wall	Line	*-WALL-CAVI
Interior	Wall	Line	*-WALL-CELL
Interior	Wall	Line	*-WALL-CNTR
Interior	Wall	Line	*-WALL-COFF
Interior	Wall	Line	*-WALL-CURT
Interior	Wall	Line	*-WALL-CWMG
Interior	Wall	Line	*-WALL-FULL

Interior	Wall	Line	*-WALL-FULL-EXTR
Interior	Wall	Line	*-WALL-FULL-INTR
Interior	Wall	Line	*-WALL-GARD
Interior	Wall	Line	*-WALL-HEAD
Interior	Wall	Line	*-WALL-JAMB
Interior	Wall	Line	*-WALL-LOAD
Interior	Wall	Line	*-WALL-MONO
Interior	Wall	Line	*-WALL-MOVE
Interior	Wall	Line	*-WALL-MSE~
Interior	Wall	Line	*-WALL-NONL
Interior	Wall	Line	*-WALL-OPEN-LVRS
Interior	Wall	Line	*-WALL-PCST
Interior	Wall	Line	*-WALL-PRHT
Interior	Wall	Line	*-WALL-RBAR
Interior	Wall	Line	*-WALL-RTWL
Interior	Wall	Line	*-WALL-SHEA
Interior	Wall	Line	*-WALL-SPCL
Interior	Wall	Line	*-WALL-STUD
Interior	Window	Line	*-GLAZ-FULL
Interior	Window	Line	*-GLAZ-PRHT
Interior	Window	Line	*-GLAZ-SILL

1E.2.2.7 Navigational Aids

Category	Feature Class	Geometry	CAD Layer Name
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-COMM
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-CRIT
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-GPS_
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-ILS_
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-MCWV
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-OTHR
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-RADI
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-RADR
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-RMTE
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-SITE
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-SYST
Navigational Aids	NavaidEquipment	Point	*-AFLD-AIDS-WTHR
Navigational Aids	NavaidEquipment	Point	*-AFLD-BCNS-IDEN
Navigational Aids	NavaidEquipment	Point	*-AFLD-BCNS-MISC
Navigational Aids	NavaidEquipment	Point	*-AFLD-BCNS-STRB

1E.2.2.8 SeaPlane

Category	Feature Class	Geometry	CAD Layer Name
SeaPlane	NavigationBuoy	Point	*-SEAP-BUOY
SeaPlane	NavigationBuoy	Point	*-SIGN-BUOY
SeaPlane	SeaplaneRampCenterline	Line	*-SEAP-RAMP-CNTR
SeaPlane	SeaplaneRampSite	Polygon	*-SEAP-RAMP

1E.2.2.9 Security

Category	Feature Class	Geometry	CAD Layer Name
Security	SecurityArea	Polygon	*-AFLD-SECR-SECA
Security	SecurityIdDisplayArea	Polygon	*-AFLD-SECR-SIDA
Security	SterileArea	Polygon	*-AFLD-SECR-STER
Security	SurveillanceCamera	Point	*-CCTV-EQPM

1E.2.2.10 Structures

Category	Feature Class	Geometry	CAD Layer Name
Structures	Building	Polygon	*-BLDG-DECK
Structures	Building	Polygon	*-BLDG-DOCK
Structures	Building	Polygon	*-BLDG-OTLN
Structures	Building	Polygon	*-BLDG-OVHD
Structures	Building	Polygon	*-BLDG-PRCH
Structures	Building	Polygon	*-DECK-FLOR
Structures	Building	Polygon	*-DECK-ROOF
Structures	Building	Polygon	*-ELEV-OTLN
Structures	Building	Polygon	*-EXST-BLDG
Structures	Building	Polygon	*-OTLN-BLDG
Structures	Building	Polygon	*-OTLN-STRC
Structures	Building	Polygon	*-PLAN-OTLN
Structures	ConstructionArea	Polygon	*-PROP-CONS
Structures	ConstructionArea	Polygon	*-SITE-OTLN
Structures	Fence	Line	*-DETL-FENC-SECU
Structures	Fence	Line	*-SAFE-FENC
Structures	Fence	Line	*-SITE-FENC
Structures	Gate	Line	*-DETL-GATE
Structures	Gate	Line	*-GATE-AXIS
Structures	Gate	Line	*-GATE-MISC
Structures	Gate	Line	*-SITE-GATE
Structures	Tower	Point	*-STRC-TOWR

1E.2.2.11 Surface Transportation

Category	Feature Class	Geometry	CAD Layer Name
Surface Transportation	Bridge	Polygon	*-BRDG-BEAR
Surface Transportation	Bridge	Polygon	*-BRDG-CNTR
Surface Transportation	Bridge	Polygon	*-BRDG-DECK
Surface Transportation	Bridge	Polygon	*-BRDG-OTLN
Surface Transportation	Bridge	Polygon	*-MATL-CRAN
Surface Transportation	Bridge	Polygon	*-RAIL-BRDG
Surface Transportation	Bridge	Polygon	*-SITE-BRDG
Surface Transportation	Bridge	Polygon	*-SITE-STRC
Surface Transportation	DrivewayArea	Polygon	*-ROAD-DRIV
Surface Transportation	DrivewayCenterline	Line	*-ROAD-DRIV-CNTR
Surface Transportation	ParkingLot	Polygon	*-PRKG-OTLN
Surface Transportation	RailroadCenterline	Line	*-RAIL-BRDG-CNTR
Surface Transportation	RailroadCenterline	Line	*-RAIL-CNTR
Surface Transportation	RailroadCenterline	Line	*-RAIL-TRAK
Surface Transportation	RailroadYard	Polygon	*-RAIL-YARD
Surface Transportation	RoadCenterline	Line	*-ROAD-CNTR
Surface Transportation	RoadPoint	Point	*-ROAD-POIN
Surface Transportation	RoadSegment	Polygon	*-ROAD-ASPH
Surface Transportation	RoadSegment	Polygon	*-ROAD-CONC
Surface Transportation	RoadSegment	Polygon	*-ROAD-CURB
Surface Transportation	RoadSegment	Polygon	*-ROAD-GRVL
Surface Transportation	RoadSegment	Polygon	*-ROAD-OTLN

Surface Transportation	RoadSegment	Polygon	*-ROAD-SHLD
Surface Transportation	RoadSegment	Polygon	*-ROAD-UPVD
Surface Transportation	Sidewalk	Polygon	*-BRDG-CURB
Surface Transportation	Sidewalk	Polygon	*-GATE-WALK
Surface Transportation	Sidewalk	Polygon	*-SITE-WALK
Surface Transportation	Tunnel	Polygon	*-ACCS-TUNL
Surface Transportation	Tunnel	Polygon	*-FNDN-TUNL
Surface Transportation	Tunnel	Polygon	*-SITE-TUNL

1E.3 Utilities Supplement

This document defines communications and utilities feature classes that are included in MDOT MAA's Geographic Information System (GIS) Data Standard. This document is a supplement to the MDOT MAA Geographic Information System Data Standard and should be used by anyone developing or checking GIS data for MDOT MAA that includes communications or utility features. This document is related to the content included in the Geographic Information System Data Standard and should only be used in conjunction with that document.

This Utilities Supplement contains a list of 271 GIS Feature Types. The Feature Types are grouped into categories (i.e., General, Electrical, Communications, etc.) for ease of use. For each Feature Type, the class name, geometry type, sensitivity level, and a definition are provided. Suggested accuracies are also provided. Accuracies are indicated at a reasonable level that will meet a broad range of end user requirements. Individual project scopes, technical limitations and other factors may require data to be of a higher or lower level of accuracy. Attributes are also provided along with their type and definition. The following figure provides a key to the information provided in this supplement.

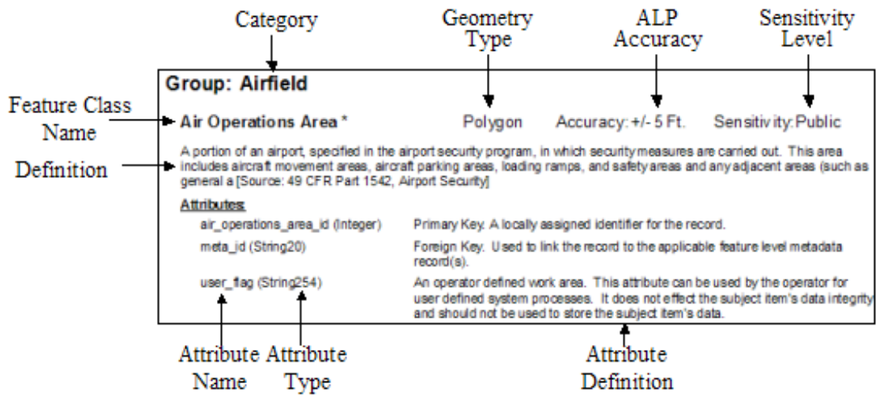


Figure 1 - Legend

At the end of this document is a list of acceptable domain values for each attribute domain list.

Data Set: Air

Air : Drain Separator

(Database Feature Class Name = CompressedAirDrainSeparator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

This table contains information about compressed air drain separators. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Air : Fitting

(Database Feature Class Name = CompressedAirFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying compressed air. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

fittyp (CodeCompAirFitting)	Discriminator. The type of fitting used for the compressed air unit.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Air : Pipe Line

(Database Feature Class Name = CompressedAirPipeLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry compressed air from location to location [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

length (Double)	The overall length of the feature.[Center].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground air line pipe.[Air Force].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
cblMaterial (CodeElectricCable)	Cable material.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
size (CodePipeDiameter)	The size of the pipe
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Air : Tank Area

(Database Feature Class Name = CompressedAirTankArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An area of physical boundary encompassing one or more tanks.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

color (CodeColor)	The color of the compressed air tank.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
tankCapacity (Integer)	The capacity of the tank.
tankSt (CodeStyleTank)	This value differentiates similar entities by use or type.
tankUse (CodeTankUse)	The particular kind or use of the industrial waste water tank.
topElevation (Double)	The top elevation of the tank.
verticalStructureMaterial (String16)	The vertical structure material.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Air : Valve

(Database Feature Class Name = CompressedAirValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device to control flow through a compressed air line. [SDSFIE REEGIS].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.

size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Air : Valve Pit

(Database Feature Class Name = CompressedAirValvePit)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A below grade chamber, too small to enter, containing one or more valves that control the flow of compressed air. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Communications

Communications : Access Coverage Area

(Database Feature Class Name = CommAccessCoverageArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

The nominal coverage area for a wireless local area network (WLAN) access point. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

avgss (Double)	Average Signal Strength for coverage area.[AIR FORCE].
maxsnr (Double)	Maximum Signal to Noise Ratio (dbm) for coverage area.[AIR FORCE].
minsnr (Double)	Minimum Signal to Noise Ratio (dbm) for coverage area.[AIR FORCE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
maxdr (Double)	Maximum Data Rate for the coverage area.[AIR FORCE].
mindr (Double)	Minimum Data Rate for the coverage area.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Access Point

(Database Feature Class Name = CommAccessPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An access point is a station that transmits and receives data in a wireless local area network (WLAN). [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	The local name of the Access Point.[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

encProt (CodeCryptographyProtocol)	Protocol used to provide encryption for the access point (WEP, WPA, etc.).[AIR FORCE].
antType (CodeCommAntenna)	The type of communications antenna used.[AIR FORCE].
pomx (String16)	The Access Point designator as defined in the POMX Site Survey Report.[AIR FORCE].
ids (CodeBoolean)	A boolean indicating whether the WLAN AP has an Intrusion Detection System (IDS).[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
antennaLocation (CodeBoolean)	A boolean indicating whether the antenna is located inside a building.[AIR FORCE].
ssid (String50)	The service set identification of the device.[AIR FORCE].
mac (String20)	The MAC address of the device.[AIR FORCE].
numSens (Integer)	The number of sensors used for the Intrusion Detection System (IDS).[AIR FORCE].
standard (String16)	IEEE wireless standard used (i.e. 802.11a, b, g, etc.).[AIR FORCE].
channel (Integer)	Channel number utilized.[AIR FORCE].
gain (Double)	The measure of signal amplification.[AIR FORCE].
height (Double)	Antenna height above ground level.[AIR FORCE].
elevation (Double)	The height of the antenna as measured from a reference point or from sea level.[AIR FORCE].
radiationPattern (CodeAntRadPattern)	The radiation pattern of the antenna.[AIR FORCE].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Air Pipe

(Database Feature Class Name = CommAirLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe which conveys pressurized air to a pressurized telephone cable system [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

pipeLength (Double)	A measurement of the longer of two linear axes.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
groundElevation1 (Double)	The elevation of the ground surface at node_id_1, in feet (English units) or meters (SI units) above some datum.
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
groundElevation2 (Double)	The elevation of the ground surface at node_id_2, in feet (English units) or meters (SI units) above some datum.
pressMax (Double)	The manufacturers or industry standards maximum pressure rating of the subject item.
pressNorm (Double)	The manufacturers or industry standards normal pressure rating of the subject item.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Air Pressure Device

(Database Feature Class Name = CommAirPressureDevice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any device which supports a cable pressurization system, for example valves, compressors, pressure transducers, air dryers, and pressure mete. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String16)	The manufacturers serial, or unique identification number of the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

airpType (CodeAirPressureDeviceType)	The type of air pressure device.[Austin and Pitts].
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from list or entered from field inspections.
featureUse (CodeValveType)	The site specific use of the valve.
devSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
devSize (Double)	The manufacturers nominal size designation.
deviceElevation (Double)	The elevation measured at centerline of the valve, in feet (English Units) or meters (SI Units) above some datum.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
placement (CodePlacementOfAirPreType)	Indicates the placement of the device.[AIR FORCE].
description (String255)	A description of the feature.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Amplifier

(Database Feature Class Name = CommAmplifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any electronic device intended to boost the power or amplify the signal associated with a communications system. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

gain (Double)	The measure of signal amplification.[Tinker Air Force Base].
bandwidth (Double)	The difference between the highest and lowest frequencies that an amplifier can pass.[Tinker Air Force Base].
power (Double)	The amplifier power.[Tinker Air Force Base].
ampType (CodeAmplifierType)	Discriminator - Amplifier type[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
inSigLvl (Double)	The amount of the input signal to the amplifier.[Tinker Air Force Base].
outsigLvl (Double)	The output level of the signal.[Tinker Air Force Base].
impedIn (Double)	The input impedance of the amplifier[Tinker Air Force Base].
impedOut (Double)	The output impedance of the amplifier.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Antenna Site

(Database Feature Class Name = CommAntenna)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of a communications antenna. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
corpName (String80)	Name of station corporation.[HSIP].

Attributes:

length (Double)	A measurement of the longer of two linear axes.
diameter (Double)	The width of a cylindrical or circular antenna.[Tinker Air Force Base].
antType (CodeCommAntenna)	Discriminator. The type of communications antenna.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
azimuth (Double)	The angle of horizontal deviation.
bandwidth (Double)	The difference between the highest and lowest frequencies that an antenna can pass.[Tinker Air Force Base].
elevation (Double)	The height of the antenna as measured from a reference point or from sea level.[Tinker Air Force Base].
gain (Double)	The measure of signal amplification.[Tinker Air Force Base].
txPower (Double)	The transmission power rating of the antenna.[Tinker Air Force Base].
txFreq (Double)	The transmission frequency of the antenna.[Tinker Air Force Base].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
antUse (CodeCommAntennaUsageType)	The usage of communications antenna.[AIR FORCE].
beamwdthE (Integer)	The measurement of vertical beamwidth at half power.[Tinker Air Force Base].
beamwdthH (Integer)	The measurement of horizontal beamwidth at half power.[Tinker Air Force Base].
eqFpArea (Double)	The surface area used for calculating wind loading for tower design.[Tinker Air Force Base].
freqRngH (Double)	The highest frequency antenna is designed to pass.[Tinker Air Force Base].
rxFreq (Double)	The receiving frequency of the antenna.[Tinker Air Force Base].
freqRngL (Double)	The lowest frequency antenna is designed to pass.[Tinker Air Force Base].
ftbRatio (Integer)	The isolation provided by directional antennas away from the beam.[HSIP].
height (Double)	The overall height of an antenna unit - base to top.[HSIP].
maxWind (Integer)	The maximum wind speed antenna is designed to withstand.[HSIP].
polarizatn (Integer)	The rf polarization provided by antenna (as installed).[Tinker Air Force Base].
rdomeDiameter (Double)	The radome diameter.[Tinker Air Force Base].
vswr (Integer)	The maximum voltage that the Standing Wave Ratio antenna will operate at over range.[Tinker Air Force Base].
weight (Integer)	The weight of the antenna unit for use in tower loading calculations.[Tinker Air Force Base].
polrType (CodeAntennaPolarization)	Polarization type.[AIR FORCE].
aboveGroundLevel (Double)	Antenna height above ground level.[AIR FORCE].
tilt (Double)	Antenna tilt angle for dish and parabolic antennas.[AIR FORCE].
peakpower (Double)	The peak amount of power the antenna can withstand.[AIR FORCE].
avgpwr (Double)	Average power rating for this antenna.[AIR FORCE].
radiationPattern (CodeAntRadPattern)	The radiation pattern of the antenna.[AIR FORCE].
connType (CodeCableConnectorType)	The type of RF connector presented on the antenna.[AIR FORCE].
description (String255)	A description of the feature.
size (Integer)	The size of the subject item
impedance (Double)	The impedance of antenna for cable matching (in Ohms) apparent opposition in an electrical circuit to the flow of an alternating current. Analogous to the actual electrical resistance to a direct current. It is the ratio of effective electromotive force t[HSIP].
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Antenna Line

(Database Feature Class Name = CommAntennaLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Any device or wire which is intended to transmit or receive electromagnetic impulses to or from air or space. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cblMaterial (CodeElectricCable)	The material of the cable.
cblSize (CodeCableDimension)	The size of the cable.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Attenuator

(Database Feature Class Name = CommAttenuator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device for reducing the amplitude of an electrical signal without appreciable distortion [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

attnType (CodeAmplifierType)	The type of attenuator.[Tinker Air Force Base].
loss (Double)	The amount of signal loss of the attenuator.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
bandwidth (Double)	The difference between the highest and lowest frequencies that an attenuator can pass.[Tinker Air Force Base].
inSigLvl (Double)	The amplitude of the input signal.[Tinker Air Force Base].
outsigLvl (Double)	The amplitude of the output signal.[Tinker Air Force Base].
impedIn (Double)	The input impedance of the attenuator.[Tinker Air Force Base].
impedOut (Double)	The output impedance of the attenuator.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Cable Bridge Line

(Database Feature Class Name = CommCableBridgeLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A structure used for the horizontal conveyance of A communications cable that allows passage over or under an obstacle such as a river, chasm, mountain, road or railroad. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (CodeEnclosureMaterials)	The material of the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
description (String255)	A description or other unique information concerning the subject item.

size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Cable Ladder

(Database Feature Class Name = CommCableLadder)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A ladder type structure used to support the vertical conveyance of communications cable. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

height (Double)	The height of the cable ladder measured from the ground surface to the top.[Tinker Air Force Base].
width (Double)	A measurement of the shorter of two linear axes.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Cable Rack Line

(Database Feature Class Name = CommCableRackLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A ladder type structure used to support the horizontal conveyance of communications cable. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (CodeEnclosureMaterials)	The material composition of the cable way.[AIR FORCE].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Cable Tray Line

(Database Feature Class Name = CommCableTrayLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

An elevated structure enclosed on the bottom and sides usually fabricated from sheet metal which is used to support the horizontal conveyance of communications cable. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

width (Double)	A measurement of the shorter of two linear axes.[Tinker Air Force Base].
cawType (CodeCableWayType)	The type of cable way.[Tinker Air Force Base].
material (CodeEnclosureMaterials)	The material composition of the cable way.[AIR FORCE].
height (Double)	The height of the cable way measured from the ground surface to the top.[Tinker Air Force Base].

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
length (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Cable Trough Line

(Database Feature Class Name = CommCableTroughLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A trench along the ground used for the horizontal conveyance of communications cables. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

material (CodeSurfaceComposition)	The material composition of the cable trough line.[Tinker Air Force Base].
width (Double)	A measurement of the shorter of the two linear axes of the cable trough line.[Tinker Air Force Base].
length (Double)	A measurement of the longer of the two linear axes.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Coaxial Line

(Database Feature Class Name = CommCoaxialLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

a transmission line that consists of a tube of electrically conducting material surrounding a central conductor held in place by insulators that is used to transmit telegraph, telephone, and television signals of high frequency [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	Any commonly used name for the cable.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

noConduct (Integer)	The number of conductors within the coaxial cable.[Tinker Air Force Base].
cabUse (CodeCableUse)	Discriminator - The overall use of the coaxial cable.
cabNo (String16)	The alphanumeric string assigned to the cable.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cabElev (CodeCableElevation)	The vertical location of the cable.[Tinker Air Force Base].
cblMaterial (CodeElectricCable)	The material composition of the cable.[Tinker Air Force Base].
riverMile (Double)	The reference of the river mile associated with the cable.[REEGIS].
verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[Tinker Air Force Base].
frequency (Double)	The number of cycles per unit time of the current in the coaxial cable.[Tinker Air Force Base].
cabOffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
installType (CodeCableInstallationType)	The installation type code for cables.[Austin and Pitts].
chlSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
cblLength (Double)	The length dimension of the cable.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
description (String255)	Any brief description of the feature.[Tinker Air Force Base].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to alternating current within an electrical circuit.[Tinker Air Force Base].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : DbSplice

(Database Feature Class Name = CommDbsplice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A enclosed structure that represents a splice case (aerial or buried). [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	The standard identifier name (i.e. MH-19).[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
dateInstalled (Date)	The date on which the feature was originally installed.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
ecsType (CodeSpliceCaseEncapsulate)	The type of encapsulate used.[AIR FORCE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.[AIR FORCE].
casType (CodeSpliceCaseTyp)	Used to describe the type of splice case.[AIR FORCE].
casMaterial (CodeSpliceCaseMat)	Used to describe the material composition of the splice case.[AIR FORCE].
size (Integer)	The size of the subject item
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Device

(Database Feature Class Name = CommDevice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A communications system component that lies within the signal transmission path and modifies the transmission characteristics of the media. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
devName (String30)	Any commonly used name for the device.[Tinker Air Force Base].
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

dgtlIn (Integer)	The total number of digital-in ports on the device.
dgtlOt (Integer)	The total number of digital-out ports on the device.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noPairlnk (Integer)	The number of cables attached to the device.
readout (CodeDisplayType)	The type of display or readout for the device.
anlgIn (Integer)	The total number of analog-in ports on the device.
anlgOt (Integer)	The total number of analog-out ports on the device.
description (String255)	A description of the feature[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
impedance (Double)	The apparent opposition in an electrical circuit to the flow of an alternating current. Analogous to the actual electrical resistance to a direct current. It is the ratio of effective electromotive force to the effective current.[Tinker Air Force Base].

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Ductbank

(Database Feature Class Name = CommDuctbank)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

One or more duct routed in parallel between two nodes [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

noDucts (Integer)	The total number of ducts in the ductbank.
noDuHigh (Integer)	The number of ducts in the y-direction
noDuWide (Integer)	The number of ducts in the x-direction
noSpares (Integer)	The total number of ducts not used in the ductbank.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
dbkSize (Double)	A two dimensional description of the physical size of the ductbank including units of measure (e.g., 2 ft x 2 ft, 3 m x 3 m).
dblLength (Double)	The total length of the ductbank from source to load. Manholes and pullboxes should not break the measurement.
concEnc (CodeBoolean)	A Boolean indicating whether the ductbank is encased in concrete.[Tinker Air Force Base].
diameter (Double)	Diameter (if round).[AIR FORCE].
width (Double)	Width of horizontal cross section.[AIR FORCE].
height (Double)	Height.[AIR FORCE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.

ductMat (CodePipeMaterial)	The material of the duct.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Marker

(Database Feature Class Name = CommElectronicMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Device that aids location of buried communications equipment or pathways. [SDSFIE NGA/NIMA].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

passve (CodeBoolean)	Is it a passive device? (Y/N).[AIR FORCE].
elmpur (CodeElectronicMarkerPurpose)	Purpose of this marker.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
type (String16)	Discriminator - The type of marker.[AIR FORCE].
meterType (CodeDisplayType)	The meter type.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Equipment

(Database Feature Class Name = CommEquipment)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A generic piece of communications equipment, that has not otherwise been defined with the communications equipment entity class. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
eqpName (String60)	The name or type of the equipment.[Tinker Air Force Base].
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].
stdsyName (String50)	The standard system name.[Air Force].
bLanName (String50)	The domain name.[Air Force].
runwayDesignator (String50)	The name of the runway.[Air Force].

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
portNum (String50)	The port identifier corresponding to port's location on the device(slot/card/port).[Air Force].
portVlan (String50)	The VLAN(s) port is assigned to.[Air Force].
ncc (CodeBoolean)	A boolean indicating whether it is under The Network Control Center control (Y = YES or N = NO)?[Air Force].
coeqpinid (String20)	The identifying number of the input equipment.[Air Force].
installDate (Date)	The date of the Installation. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[Air Force].
secFac (String50)	The secondary facility name.[Air Force].
priFacNa (String30)	The primary facility name.[Air Force].
platform (String50)	The processor class.[Air Force].
priFacNo (String20)	The primary facility number.[Air Force].
contrid (Integer)	The access control system for this portal.[Air Force].
equipmentType (CodeEquipmentType)	The different types of equipment.[Air Force].
barCode (String50)	The IPMS Bar Code.[Air Force].
bandwidth (Double)	The bandwidth of network adapter.[Air Force].
mediaType (CodeMediaType)	The different types of media.[Air Force].
antUse (CodeCommAntennaUsageType)	The different usages of communications antenna.[Air Force].
autoSys (String20)	The Automation System.[Air Force].
cardPorts (Integer)	The total ports used/available on card.[Air Force].
porDuplex (String50)	The transmission duplex of the port.[Air Force].
portLoc (String50)	The location of the portal.[Air Force].
cardType (String50)	The model/version of card.[Air Force].
crdNoUse (Integer)	The total number of expansion slots in chassis in use.[Air Force].
ifMac (String50)	The MAC Address of interface.[Air Force].
probDescription (String255)	The identifier of processor.[Air Force].
devClass (String50)	The class of device.[Air Force].
devMac (String50)	The MAC Address of device.[Air Force].
devIp (String50)	The IP Address of device.[Air Force].
osVer (String50)	The software version/I.O.S. of device.[Air Force].
dateInstalled (Date)	The date on which the feature was originally installed.
cameraNo (Integer)	The number of cameras on the switch.[Air Force].
monitorNumber (Integer)	The number of monitors on the switch.[Air Force].
keybordNo (Integer)	The number of keyboards on the switch.[Air Force].
maxCamNo (Integer)	The maximum number of cameras switch can have.[Air Force].

maxMonNo (Integer)	The maximum of monitors switch can have.[Air Force].
maxKeyNo (Integer)	The maximum number of keyboards a switch can have.[Air Force].
numSens (Integer)	The number of sensors on an annunciator.[Air Force].
maxSenNo (Integer)	The maximum number of sensors annunciator you can have.[Air Force].
intVid (CodeBoolean)	A boolean indicating of it is integrated w/a video switch (Y = YES and N = NO)?[Air Force].
cblType (CodeCableType)	The type of cable.[Air Force].
onlncmptos (String25)	The name of the operating system.[Air Force].
softVer (String50)	The version of the software being used.[Air Force].
cntrType (CodeElectricControlType)	The list of control type codes.[Air Force].
portalNo (Integer)	The number of controlled portals.[Air Force].
dnsName (String50)	The Domain Name Server name of device if applicable.[Air Force].
netVerNo (String50)	The version number of network device.[Air Force].
physDimension (Double)	The physical dimensions of network device (HxWxD).[Air Force].
pwrInType (String50)	The required input power type.[Air Force].
pwrSupply (Integer)	The number of power supplies network device was designed for.[Air Force].
pwrSupNo (Integer)	The number of power supplies network device has installed.[Air Force].
totalIf (Integer)	The total number of network interfaces/ports network device has.[Air Force].
cardSlots (Integer)	The total number of expansion slots in chassis.[Air Force].
contrlLvl (String50)	The level of control at the portal.[Air Force].
radioCap (Double)	The radio circuit capacity system.[Air Force].
ifIp (String50)	The IP Address of interface.[Air Force].
ifProtocl (String50)	The protocol by which interface communicates.[Air Force].
ifSpeed (String50)	The interface bit rate.[Air Force].
ifMtu (String50)	The maximum transmission unit of interface.[Air Force].
ifApp (String50)	The application for interface.[Air Force].
ifAppDes (String50)	The destination interface/port number.[Air Force].
prtModNo (String50)	The physical module number.[Air Force].
fanTray (String50)	The description of the number of fans that are operational.[Air Force].
maxPorNo (Integer)	The maximum number of controlled portals.[Air Force].
portIndex (String50)	The physical port number.[Air Force].
voltage (CodeVoltage)	The voltage requirements.[Air Force].
monitorType (String50)	The primary or remote annunciator.[Air Force].
ifTyp (String50)	The physical/electrical type of interface.[Air Force].
rackDescription (String255)	The identifier of rack chassis is located in.[Air Force].
cardIp (String50)	The IP Address of device.[Air Force].
intrfDesc (String255)	A unique Identifier of interface that port corresponds to.[Air Force].
cardMac (String50)	The MAC Address of device.[Air Force].
coeqpoutid (String20)	The identifying number of the output equipment.[Air Force].
remInd (String50)	The type of remote indicators.[Air Force].
crypto (CodeBoolean)	A boolean indicating whether the data is classified or unclassified (Y = YES and N = NO)?[Air Force].
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
lineCap (Double)	The landline circuit capacity system.[Air Force].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
numOpPos (Integer)	The number of operator positions.[Air Force].
numautscop (Integer)	The number of automation scopes or positions.[Air Force].
flCkDate (Integer)	The date of the flight check. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[Air Force].
reflcLoc (String50)	The name of the reflector location.[Air Force].
remindloc (String50)	The location position of the remote indicator.[Air Force].
secFacNo (Integer)	The secondary facility number.[Air Force].
description (String255)	A description of the feature.[Tinker Air Force Base].
remarks (String255)	Additional information about the camera switch.[Air Force].

Metadata:

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.

projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Fiberoptic Line

(Database Feature Class Name = CommFiberopticLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Thin transparent fibers of glass or plastic that are enclosed by material of a lower index of refraction and that transmit light throughout their length by internal reflections [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	The name of the feature.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
stationName (String12)	Commercial identifier.[HSIP].
corpName (String80)	Name of station corporation.[HSIP].

Attributes:

verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[REEGIS].
cabElev (CodeCableElevation)	The vertical location of the cable.[Tinker Air Force Base].
riverMile (Double)	The river mile marker.[REEGIS].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cabUse (CodeCableUse)	Discriminator - The overall use of the fiberoptic cable.
installType (CodeCableInstallationType)	The installation type code for cables.[Tinker Air Force Base].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
length (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
cabOffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
fcSm (Integer)	The number of single-mode fibers[Tinker Air Force Base].
fcMm (Integer)	The number of multi-mode fibers in the cable.[Tinker Air Force Base].
fcDs (Integer)	The number of dispersion-shifted fibers in the cable.[Tinker Air Force Base].
fcTotal (Integer)	The total number of fibers in the cable.[Tinker Air Force Base].
cblMaterial (CodeElectricCable)	Types of communication cable.[HSIP].
netAffil (String32)	Network affiliation.[HSIP].
description (String255)	A description of the feature.[Tinker Air Force Base].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Groundplane Area

(Database Feature Class Name = CommGroundplaneArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A series of ground points electrically connected in a mesh formation necessary to minimize ground resistance and electromagnetic radiation, for example lightening strikes, in support of critical communications systems. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Ground Point

(Database Feature Class Name = CommGroundPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where the communication configuration is grounded. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
resistance (Double)	The measured resistance of the cable.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Groundwave Area

(Database Feature Class Name = CommGroundwaveArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An emanation pattern of Low Frequency Electromagnetic transmissions which use a ground path for transmission. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Impedance Matching Point

(Database Feature Class Name = CommImpedanceMatchingPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that matches the impedance between two transmissions in order to minimize signal attenuation and distortion [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

impType (CodeAmplifierType)	The impedance matching device type.[Tinker Air Force Base].
loss (Double)	The signal amplitude loss of matching device.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
bandwidth (Double)	The difference between the highest and lowest frequencies.[Tinker Air Force Base].
inSigLvl (Double)	The amplitude of the input signal.[Tinker Air Force Base].
outsigLvl (Double)	The amplitude of the output signal.[Tinker Air Force Base].
impedIn (Double)	The input impedance.[Tinker Air Force Base].
impedOut (Double)	The output impedance.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Internet Center

(Database Feature Class Name = CommInternetCenter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A site that contains information about the internet center. [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
area (Double)	The size of the area, zone, or polygon in square units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Junction

(Database Feature Class Name = CommJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The communications junction node represents a transition node of cable path. For example, it can represent terminal, splice, or cross connection points. It can also indicate the transition of the cable into a duct opening. [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

conectedTo (String30)	Table name of Child Equipment that links to this node.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
juncType (CodeJuncType)	The type of junction (e.g. manhole, handhole, other)

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Line Of Sight Line

(Database Feature Class Name = CommLineOfSightLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

An electromagnetic transmission signal path requiring line of sight such as microwave or laser transmission [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the signal path.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

frequency (Double)	The frequency of the signal in the LOS transmission path.
power (Double)	The power of the signal in the LOS transmission path.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
txLength (Double)	The length of the LOS transmission path.
verticalClearance (Double)	The clearance in feet MHW between the lowest point under the transmission path.[REEGIS].
riverMile (Double)	The river mile marker.
description (String255)	A description of the feature.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Load Capacitor

(Database Feature Class Name = CommLoadCapacitor)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Device used to eliminate problems with high-frequencies on long telephone lines using capacitance. Spliced into the line. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

capacity (Double)	Capacitance of each capacitor.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
coDist (Double)	Distance from the build-out unit to the Central Office.[AIR FORCE].
ldcnum (CodeCountsInAssembly)	Number of capacitors making up the build-out unit.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Load Coil

(Database Feature Class Name = CommLoadCoilPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Device used to eliminate problems with high-frequencies on long telephone lines using inductance. Spliced into the line. [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

ldccas (CodeLoadsCoilCaseType)	Type of case in which the load coil(s) are assembled.[AIR FORCE].
ldcType (CodeNumberLoadsCoilType)	Type of loading coils.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
loadPtNo (Integer)	Load point number.[AIR FORCE].
coDist (Double)	Distance from the load coil assembly to the Central Office.[AIR FORCE].
ldcnum (CodeCountsInAssembly)	Number of coils making up the load coil assembly.[AIR FORCE].
ldcsym (CodeLoadCoilSystem)	Type of load coil system used.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.

size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Media Converter

(Database Feature Class Name = CommMediaConverter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Device used to convert from one type of signal transmission media to another. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

connt2 (CodeCableConnectorType)	The connector type at port two.[AIR FORCE].
maxcellt (CodeMaxcellType)	For flexible MaxCell inner ducts, this indicates the type used.[AIR FORCE].
mtimzone (CodeMaritimeMgmtType)	Typical Maritime Zones.[NAVFAC].
netbw (CodeNetworkBandwidth)	The data transmission rate through the repeater.[AIR FORCE].
cbltyp1 (CodeCableType)	The type of cable accommodated by port one.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cbltyp2 (CodeCableType)	The type of cable accommodated by port two.[AIR FORCE].
netprc (CodeNetworkProtocol)	The network protocol accommodated by the media converter.[AIR FORCE].
vehtype (CodeTransVehicleType)	The type of vehicles located in the parking area.[AIR FORCE].
connt1 (CodeCableConnectorType)	The connector type at port one.[AIR FORCE].
voltReq (CodeVoltageRequirements)	Voltage Requirements.[AIR FORCE].
mcnvty (CodeMediaConverter)	Converter Type.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Multihop Area

(Database Feature Class Name = CommMultihopArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A radio broadcast transmission which consist of a larger network such as cellular telephone, polygon represents coverage area. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	any commonly used name for the feature.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

riverMile (Double)	The river mile marker.[REEGIS].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
frequency (Double)	The frequency of the signal.[Tinker Air Force Base].
power (Double)	The amount power of the transmission signal.[Tinker Air Force Base].
description (String255)	A description of the feature.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Network Systems Site

(Database Feature Class Name = CommNetworkSystemsSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The Network Standard System name, architecture (i.e. protocol), number of facilities where installed and number of users of system. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	The name for the standard system.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

netAff (CodeNetworkAffiliationType)	The broadcasting network to which the facility is associated.[HSIP].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
convType (String50)	A type of media converter.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
protocol (String60)	The Protocol Description.[Tinker Air Force Base].
numUsers (Integer)	The number of users of standard system.[Tinker Air Force Base].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Other Cable

(Database Feature Class Name = CommOtherCable)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Any type of communications cable transmission not otherwise specified. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	Any commonly used name for the cable.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

cabUse (CodeCableUse)	Discriminator - The overall use of the cable.
installType (CodeCableInstallationType)	The installation type code for cables.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cabElev (CodeCableElevation)	The vertical location of the cable.[Tinker Air Force Base].
riverMile (Double)	The river mile marker.[REEGIS].
cblMaterial (CodeElectricCable)	The material composition of the cable.[Tinker Air Force Base].

verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[REEGIS].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
cblLength (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
coffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
icefacClr (Double)	The clearance in feet between the lowest point under the cable line and the ice facility surface.[S-57].
description (String255)	A description of the feature.[Tinker Air Force Base].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Path Node Site

(Database Feature Class Name = CommPathNode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Node that represents a transition of different communications path segment types (i.e. duct to aerial) or attributes (i.e. duct material type from PVC to PE). [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
nodeType (CodeCommNodeType)	Discriminator. The type of node this represents.[AIR FORCE].
ductFlap (String20)	The flap on which this duct opening is located (i.e. N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, and NNW).[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
ductTag (String8)	The location of the duct within the flap (i.e. A3).[AIR FORCE].
inDiameter (Double)	The inside diameter measurement of the duct, stub out, or hole.[AIR FORCE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Path Segment Line

(Database Feature Class Name = CommPathSegmentLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Link that represents an enclosure path of communications items outside of a building, manhole, pedestal, or other enclosed structures. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

pathType (CodePathType)	A field that describes what type of thing this segment is representing.[AIR FORCE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.[AIR FORCE].
pathCnt (CodePathCont)	A field that indicates what the path contains.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cabins (CodeCableInstallationType)	A field to describe the type of installation.[AIR FORCE].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground communications path.[AIR FORCE].
dateInstalled (Date)	The date on which the feature was originally installed.
percent (CodePercentModifier)	How continuous the enclosure path is.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
description (String255)	A description or other unique information concerning the subject item.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Pedestal Site

(Database Feature Class Name = CommPedestal)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above-ground enclosure providing access to buried plant. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	The standard identifier name (i.e. PED-19).[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

type (String16)	The type of communications pedestal.[Austin and Pitts].
terminal (CodeBoolean)	A Boolean indicating the presence of a terminal[Tinker Air Force Base].
bonded (CodeBoolean)	A Boolean indicating whether the pedestal is bonded.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
costrm (CodeEnclosureMaterials)	The material composition of the pedestal.[AIR FORCE].
diameter (Double)	Diameter.[AIR FORCE].
width (Double)	Width of horizontal cross section.[AIR FORCE].
height (Double)	Height.[AIR FORCE].
depth (Double)	Depth of horizontal cross-section.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Pullbox Site

(Database Feature Class Name = CommPullbox)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box with cover used as an aid for pulling cable. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Radar Site

(Database Feature Class Name = CommRadarSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of equipment used for determining the presence and position of an object by measure the direction and timing of electromagnetic waves. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
radType (CodeRadio)	The operating spectrum of the radar.[Tinker Air Force Base].
power (Double)	The amount of power the radar emits.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Radio

(Database Feature Class Name = CommRadio)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of equipment used to transmit and receive communications signals via electromagnetic waves. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Radio Receiver

(Database Feature Class Name = CommRadioReceiver)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location to store individual radio receiver sections that may be in one piece of radio equipment. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
rfAsnFrq (String50)	The frequencies assigned to this unit.[Tinker Air Force Base].
rfHigh (Integer)	The highest capable operating frequency unit.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
rfLow (Integer)	The lowest capable operating frequency unit.[Tinker Air Force Base].
rfBndwdth (Double)	The bandwidth of signal (LMR is 25k wide, 12.5k narrow).[Tinker Air Force Base].
modPos (Integer)	From the left of unit, module number for multiple transmitters in one radio.[Tinker Air Force Base].
rfP25t (CodeBoolean)	Is the unit capable of operating P25 Trunking (Y/N)?[Tinker Air Force Base].
rfP25c (CodeBoolean)	Is the unit capable of operation P25 Conventional (Y/N)?[Tinker Air Force Base].
description (String255)	A description or other unique information concerning the subject item.[Tinker Air Force Base].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Radio Transmitter

(Database Feature Class Name = CommRadioTransmitter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location to store individual radio transmitter sections that may be in one piece of radio equipment. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
rfLow (Integer)	The lowest capable operating frequency unit.[Tinker Air Force Base].
rfP25t (CodeBoolean)	Is the unit capable of operating P25 Trunking (Y/N)?[Tinker Air Force Base].
rfP25c (CodeBoolean)	Is the unit capable of operation P25 Conventional (Y/N)?[Tinker Air Force Base].
modPos (Integer)	From the left of unit, module number for multiple transmitters in one radio.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
rfAsnFrq (String50)	The frequencies assigned to this unit.[Tinker Air Force Base].

rfFccid (String50)	FCC emission designators.[Tinker Air Force Base].
rfBndwdth (Double)	The bandwidth of signal (LMR is 25k wide, 12.5k narrow).[Tinker Air Force Base].
rfMaxwats (Integer)	The maximum output power of this unit in watts.[Tinker Air Force Base].
rfHigh (Integer)	The highest capable operating frequency unit.[Tinker Air Force Base].
description (String255)	A description or other unique information concerning the subject item.[Tinker Air Force Base].
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Relay Station

(Database Feature Class Name = CommRelayStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A piece of equipment used to relay communications signals. [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	Any commonly used name of the feature.[HSIP].
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
stationName (String20)	Indicates the Commercial Identifier.[HSIP].

Attributes:

facilityType (String16)	The type of broadcast facility located at this location.[Tinker Air Force Base].
netAff (CodeNetworkAffiliationType)	The broadcasting network to which the facility is associated.[Tinker Air Force Base].
radioType (CodeRadioType)	Types of radio points[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
radType (CodeRadio)	Discriminator - Radio type[Tinker Air Force Base].
accountCode (String20)	The owners account code.[Tinker Air Force Base].
baseIlc (String20)	ILC code of the installation where this equipment is located.[Tinker Air Force Base].
deployab (CodeBoolean)	Is unit flagged as deployable (Y/N)?[Tinker Air Force Base].
encLvl (String20)	The level of encryption unit supports (TRS is not standard on this).[Tinker Air Force Base].
encMax (CodeEncryptionLevelType)	The highest level of encryption unit can operate .[Tinker Air Force Base].
encProt (String16)	Type of protocol used to provide encryption.[Tinker Air Force Base].
lmrNet (String20)	The network is this unit assigned to (LMR or Conventional).[Tinker Air Force Base].
narrowbn (CodeBoolean)	Narrowband operation 12.5kHz capable (Y/N)?[Tinker Air Force Base].
power (CodePowerUseType)	Alternating Current or Direct Current (AC/DC).[Tinker Air Force Base].

pwrPhase (Integer)	The phase requirement if AC.[Tinker Air Force Base].
pwrVolt (Integer)	The voltage required in Volts.[Tinker Air Force Base].
pwrWatts (Integer)	The maximum power draw.[Tinker Air Force Base].
rackNo (String20)	The rack identifier the unit is in.[Tinker Air Force Base].
rackPos (String20)	The position in the rack if applicable.[Tinker Air Force Base].
rfLmrwd (CodeBoolean)	Is the unit wideband operation capable (Y/N)?[Tinker Air Force Base].
suppSys (String20)	The system that does this asset support (LMR, Giant Voice, Milstar).[Tinker Air Force Base].
thermLoad (Integer)	Thermal loading of unit for HVAC calculations.[Tinker Air Force Base].
trnkP25 (CodeBoolean)	Is the unit capable of operating trunking P25 (Y/N)?[Tinker Air Force Base].
trunkNum (Integer)	Trunking site ID (LMR).[Tinker Air Force Base].
txAnalg (CodeBoolean)	Analog transmission capable (Y/N)?[Tinker Air Force Base].
txDigl (CodeBoolean)	Digital transmission capable (Y/N)?[Tinker Air Force Base].
vehicleNo (String20)	For mobile units assigned to vehicles (LMR).[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
verified (String255)	Whether or not the feature has been verified.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Repeater

(Database Feature Class Name = CommRepeater)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Device used to receive, clean up a signal, and then retransmit it. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

netbw (CodeNetworkBandwidth)	The data transmission rate through the repeater.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Riser

(Database Feature Class Name = CommRiser)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pipe-like structure used for the vertical conveyance of cable [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

duct (CodeBoolean)	A Boolean indicating the presence of a duct.[Tinker Air Force Base].
height (Double)	The height of the riser duct measured from the ground surface to the top.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular riser as measured from the ground surface to the top.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The code used to determine the type of material the riser is made of.
dateInstalled (Date)	The date on which the feature was originally installed.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Satellite

(Database Feature Class Name = CommSatellitePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Communications Satellite. Used to retransmit signals from space. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
comnName (String30)	Common Name.[AIR FORCE].
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
noradNo (String5)	NORAD Designation Number.[AIR FORCE].

Attributes:

origin (String50)	Country of Origin.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
lvehicle (String25)	Launch vehicle used.[AIR FORCE].
launchDate (Date)	Launch date. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Segmented Cable

(Database Feature Class Name = CommSegmentedCable)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Used to represent a portion of the entire cable sheath as it is shown in an enclosed structure (building, manhole, vault, etc.) so that the cable sheath does not have to be drawn between enclosed structures. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cblMaterial (CodeElectricCable)	

cblSize (CodeCableDimension)	
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Segmented Cable Point

(Database Feature Class Name = CommSegmentedCablePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location all communication cable types. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	Any commonly used name for the cable.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coreType (CodeCoreType)	Attributes for Core Types.[Air Force].
bufferType (CodeShoreBufferType)	The types of buffers.[Tinker Air Force Base].
cabUse (CodeCableUse)	The overall use of the cable.[Tinker Air Force Base].
installType (CodeCableInstallationType)	The installation type code for cables.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
cblLength (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.[AIR FORCE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
segNum (Integer)	The segment in which the cable section is located.[Tinker Air Force Base].
cabType (CodeCableType)	The type of cable.[Tinker Air Force Base].
cabNo (String16)	Cable name or number.[Tinker Air Force Base].
begincount (Integer)	Starting count of pairs or strands.[Tinker Air Force Base].
endCount (Integer)	Ending count of pairs or strands.[Tinker Air Force Base].
totalCount (Integer)	Total number of pairs or strands associated with a particular cable.[Tinker Air Force Base].
sheathDia (Double)	Overall Diameter of sheath.[Tinker Air Force Base].
mediaDiam (Double)	Diameter of gauge of individual media.[Tinker Air Force Base].
mediaType (CodeMediaType)	The types of media.[Tinker Air Force Base].
dateInstalled (Date)	The date on which the feature was originally installed.

description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Sensor

(Database Feature Class Name = CommSensor)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of equipment used to detect and measure various environmental conditions (e.g. Temperature, Fire, Intrusion, etc.) [SDSFIE Austin and Pitts].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].
busName (String80)	Name of the Weather Forecast Office.

Attributes:

sensorType (String16)	The type of sensor.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
officeType (String30)	National Hurricane Center, Nat. Severe Storm Forecast Center.[HSIP].
sensLoc (String50)	The sensor location (Interior or exterior).[Tinker Air Force Base].
cblType (CodeElectricCable)	Sensor cable connectivity type.[Tinker Air Force Base].
sensZone (String50)	The Detection zone.[Tinker Air Force Base].
annunNum (String50)	The Annunciator in which the sensor is connected.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Service Loop Point

(Database Feature Class Name = CommServiceLoopPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Service loops contain extra cable that may be required in the future. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

length (Double)	The length of cable contained in the service loop.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Speaker

(Database Feature Class Name = CommSpeaker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that converts an electrical signal into sound. Generally used as part of a public address, giant voice, or mass notification system. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	The local name of the Speaker.[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.

modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[AIR FORCE].

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.[AIR FORCE].
weather (CodeBoolean)	Indicates a weather proof speaker case.[AIR FORCE].
multp25 (CodeBoolean)	Indicates a 25 Volt multi-tap transformer.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
multp70 (CodeBoolean)	Indicates a 70 Volt multi-tap transformer.[AIR FORCE].
rmsWatage (Integer)	Average power handling capability over time, in watts AKA average power or mean power.[AIR FORCE].
diameter (Double)	Diameter, if round or cylindrical.[AIR FORCE].
width (Double)	Width.[AIR FORCE].
height (Double)	Height.[AIR FORCE].
depth (Double)	Depth.[AIR FORCE].
freqRngH (Double)	Highest effective frequency speaker emits in Hz.[AIR FORCE].
freqRngL (Double)	Lowest effective frequency speaker emits in Hz.[AIR FORCE].
weight (Double)	Weight of speaker.[AIR FORCE].
dispertnH (Integer)	Angle of horizontal sound dispersion in degrees.[AIR FORCE].
dispertnV (Integer)	Angle of vertical sound dispersion in degrees.[AIR FORCE].
sensitivty (String50)	Speaker sensitivity or efficiency measured as dB/W/m - decibels output for an input of one nominal watt measured at on meter from the speaker.[AIR FORCE].
spkimp (CodeSpeakerImpedance)	Input impedance.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.[AIR FORCE].
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Splice

(Database Feature Class Name = CommSplice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A joining of two or more communications cables, each cable contributing one end of itself to the splice. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

loss (Double)	The signal loss introduced by the splice
splType (CodeSplice)	Discriminator. The type of splice.[Austin and Pitts].
casMaterial (CodeSpliceCaseMat)	The material composition of the splice case.[Austin and Pitts].

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
method (CodeSpliceMethod)	The method of spicing used.[Austin and Pitts].
length (Double)	Length of the splice case.[AIR FORCE].
insideDiameter (Double)	The inside diameter of the splice case.[AIR FORCE].
casType (CodeSpliceCaseTyp)	Used to describe the type of splice case.[AIR FORCE].
ecsType (CodeSpliceCaseEncapsulate)	The type of encapsulate used.[AIR FORCE].
description (String255)	Any description of the feature.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Splitter

(Database Feature Class Name = CommSplitter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device to split a signal transmission into two or more signal paths while minimizing attenuation and distortion, generally used in broadband cable systems. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

inSigLvl (Double)	The input signal amplitude.[Tinker Air Force Base].
outsigLvl (Double)	The amplitude of the output signal.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
spltType (CodeSplitterType)	Discriminator - Splitter Type.[Tinker Air Force Base].
loss (Double)	The signal amplitude loss of splitter.[Tinker Air Force Base].
bandwidth (Double)	The difference between the highest and lowest frequencies that a splitter can pass.[Tinker Air Force Base].
impedIn (Double)	The input impedance of the amplifier[Tinker Air Force Base].
impedOut (Double)	The output impedance of the amplifier[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Telephone

(Database Feature Class Name = CommTelephone)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of an end user telephone set used for voice communications. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	Indicates the name of the feature.[HSIP].
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

color (CodeColor)	The color of the emergency telephone.[FGDC].
appearance (String50)	A description of the appearance of phone.[FGDC].
status (CodeStatus)	A description of the status of the emergency telephone.[FGDC].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.[FGDC].
phoneType (CodePhoneType)	The type of phone.[Tinker Air Force Base].
phoneNumber (String16)	The phone number of the location.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Telephone Booth

(Database Feature Class Name = CommTelephoneBooth)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of one or more outdoor telephones either in an open air bank or enclosed within a booth or other enclosure. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
area (Double)	The size of the area, zone, or polygon in square units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description of the feature.[Tinker Air Force Base].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Terminal

(Database Feature Class Name = CommTerminal)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

a device attached to the end of a wire or cable or to an electrical apparatus for convenience in making connections [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

caseType (CodeTerminalCaseType)	The type of terminal case.[Austin and Pitts].

termType (CodeTerminalType)	The type of terminal[Austin and Pitts].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description of the feature.[Tinker Air Force Base].
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Terminator

(Database Feature Class Name = CommTerminator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that terminates an electrical or optical transmission media. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

termType (String16)	The type of terminator.[AIR FORCE].
connt (CodeCableConnectorType)	The type of connector used for the terminator.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cbldim3 (CodeCableGaDimensions)	Tertiary. Wire Gauge (AWG) or Core Size (in um).[AIR FORCE].
description (String255)	A description of the feature.[Tinker Air Force Base].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
impedance (Double)	A measure of the apparent opposition in an electrical circuit to the flow of an alternating current that is analogous to the actual electrical resistance to a direct current and that is the ratio of effective electromotive force to the effective current.[Tinker Air Force Base].

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.

dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Twisted Pair Line

(Database Feature Class Name = CommTwistedPairLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Multi-conductor Communications cable generally consisting of copper wire, with each pair being twisted in order to minimize signal loss due to electromagnetic radiation. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	The name of the feature.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[REEGIS].
cabUse (CodeCableUse)	Discriminator - The overall use of the cable.
noPairs (Integer)	The number of wire pairs in the cable
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
installType (CodeCableInstallationType)	The installation type code for cables.[Tinker Air Force Base].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
riverMile (Double)	The reference of the river mile associated with the cable.[REEGIS].
cblSize (CodeCableDimension)	The wire gauge of the cable.[Austin and Pitts].
resistance (Double)	The degree of tendency of the cable to oppose the flow of current.
numprLow (Integer)	The lowest numbered pair within the cable[Tinker Air Force Base].
numprHigh (Integer)	The highest numbered pair within the cable[Tinker Air Force Base].
coreType (CodeCoreType)	The type of core in the cable.[Tinker Air Force Base].
cabOffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
length (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
cabElev (CodeCableElevation)	The vertical location of the cable.
cblMaterial (CodeElectricCable)	The material composition of the cable.[Tinker Air Force Base].
description (String255)	A description of the feature.[Tinker Air Force Base].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Vault

(Database Feature Class Name = CommVaultSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A special structure for transitioning the outside cable plant from horizontal orientation to vertical orientation in preparation for termination on the distribution frame. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	The standard identifier name (i.e. MH-19).[AIR FORCE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
serialNumber (String16)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
noCircuit (Integer)	The number of circuits housed in the vault.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
vltMaterial (CodeEnclosureMaterials)	Used to describe the material composition of the vault.[AIR FORCE].
dateInstalled (Date)	The date on which the feature was originally installed.
diameter (Double)	Diameter.[AIR FORCE].
depth (Double)	Depth of horizontal cross-section.[AIR FORCE].
width (Double)	Width of horizontal cross section.[AIR FORCE].
height (Double)	Height.[AIR FORCE].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Vertical Site

(Database Feature Class Name = CommVerticalSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A vertical is part of a mainframe where the outside cable plant terminates. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

covtbk (CodeVerticalConnectingBlock)	The type of the connector block.[AIR FORCE].
covtht (CodeVerticalHeight)	The height of this vertical in the frame.[AIR FORCE].
covtma (CodeVerticalMountingArea)	The spacing between mounting brackets for mounting MDF connector blocks.[AIR FORCE].
covtmb (CodeVerticalMountBlock)	The type of mounting bar.[AIR FORCE].
covtsw (CodeVerticalShelfWidth)	The width of the mounting shelf for connector blocks.[AIR FORCE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
covtty (CodeVerticalType)	The type of vertical.[AIR FORCE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
grndbar (CodeBoolean)	Indicates the presences of a grounding bar.[AIR FORCE].
grdrails (CodeBoolean)	Indicates the presences of a guardrail.[AIR FORCE].
endguard (CodeBoolean)	Indicates the presences of an end guard.[AIR FORCE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Video Site

(Database Feature Class Name = CommVideoSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of equipment used to receive or transmit the visual portion of a communications signal. [SDSFIE Tinker Air Force Base].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Name of the recreation feature.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String16)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].

Attributes:

convType (String60)	A type of media converter.[Tinker Air Force Base].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

sysDescription (String255)	The system description.[Tinker Air Force Base].
transType (String50)	The transmission type protocol.[Tinker Air Force Base].
bandwidth (Double)	The data rate.[Tinker Air Force Base].
crypto (CodeBoolean)	Classified or Unclassified (Y/N)?[Tinker Air Force Base].
description (String255)	The name or type of the equipment.[Tinker Air Force Base].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Voice Switch

(Database Feature Class Name = CommVoiceSwitch)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location of equipment used to receive or transmit the voice portion of a communications signal. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.[Tinker Air Force Base].
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.[Tinker Air Force Base].

Attributes:

voipTrk (String50)	Number of Trunks Voice IP switch -to- DCO PBX.[Tinker Air Force Base].
numUsers (Integer)	The number of users capability in Voice Mail system.[Tinker Air Force Base].
trkUsed (String50)	The total number of trunk lines being used.[Tinker Air Force Base].
linCapNo (String50)	The number of lines capability.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
numLused (Integer)	The number of lines used.[Tinker Air Force Base].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
swType (String20)	The code for the different switch types.[Tinker Air Force Base].
softVer (String50)	The software version release number.[Tinker Air Force Base].
swCap (Double)	The number of lines that the software is capable of running.[Tinker Air Force Base].
hwCap (Double)	The total hardware line capacity.[Tinker Air Force Base].
anlgLused (Integer)	The number of analog lines being used.[Tinker Air Force Base].
digtLused (Integer)	The number of digital lines being used.[Tinker Air Force Base].
isdnLused (Integer)	The number of ISDN lines being used.[Tinker Air Force Base].
trkCap (Double)	The total number of trunk lines capacity.[Tinker Air Force Base].

description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Communications : Waveguide Line

(Database Feature Class Name = CommWaveguideLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A cable designed to confine and direct the propagation of electromagnetic waves. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	The name of the feature.[Tinker Air Force Base].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeCableInstallationType)	The installation type code for cables.[Tinker Air Force Base].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
length (Double)	A measurement of the longer of two linear axes.[Tinker Air Force Base].
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
cabElev (CodeCableElevation)	The vertical location of the cable.[Tinker Air Force Base].
cblMaterial (CodeElectricCable)	The material composition of the cable.[Tinker Air Force Base].
riverMile (Double)	The river mile marker.[REEGIS].
verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[REEGIS].
cabType (CodeCableType)	The type of cable.[Tinker Air Force Base].
frequency (Double)	The number of cycles per unit time of the energy in the waveguide..[Tinker Air Force Base].
cabOffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
cabUse (CodeCableUse)	Discriminator - The overall use of the cable.
description (String255)	A description of the feature.[Tinker Air Force Base].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line’s geometry.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.

projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Deicing

Deicing : Culvert Center Line

(Database Feature Class Name = DeicingCulvertCenterline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

The centerline of a pipe or structure, the purpose of which is for the interception and conveyance of deicing fluid. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name of the culvert.[Derived from SDSFIE].
maaAlias (String60)	An alternative or former name by which the feature is refered.
canalName (String30)	The canal name that the structure is located on.[Derived from USACE].

Attributes:

angle (Double)	The angle that the structure symbol should appear on a map.[Derived from USACE].
control (String30)	The means in which the water being controlled; i.e., by gate, weir, flashboard, pump, lock or uncontrolled?[Derived from USACE].
peakFlow (Double)	Q10 runoff (cubic feet per second of the 10 year peak flow associated with a ten year storm).[Derived from ARMY].
purpose (String30)	A summary of the intentions with which the data set was developed.[Derived from USACE].
estuary (String25)	The name of the Estuary, if applicable.[Derived from USACE].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
gateType (CodeCulvert)	Discriminator. The type of gate.[Derived from SDSFIE].
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the culvert.[Derived from SDSFIE].
drainageZone (CodeDrainageZone)	The local name of assigned the hydrographic drainage zone.[Derived from SDSFIE].
materialTexture (CodeDrainageDensity)	The texture of the material surrounding the culvert.[Derived from SDSFIE].
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.[Derived from SDSFIE].
invElv2 (Double)	The dimension indicating the elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
culvLength (Double)	The length of culvert, measured from node to node along the culvert centerline .[Derived from SDSFIE].
lined (CodeBoolean)	A boolean indicating whether the culvert is lined or not (Y = YES and N = NO)?[Derived from SDSFIE].
flowType (String15)	The type of flow such as culvert, lock, pump, spillway or weir.[Derived from USACE].
material (CodePipeMaterial)	The material composition of the subject item, such as concrete or corrugated metal, etc.[Derived from USACE].
source (String20)	The event's source of information.[Derived from USACE].
critical (CodeBoolean)	A boolean indicating whether this is a 'critical' structure (Y = YES or N = NO).[Derived from USACE].
voltReq (CodeVoltageRequirements)	Voltage Requirements.[Derived from AIR FORCE].
size (CodePipeDiameter)	The size of the diameter of the pipe opening in inches.[Derived from ARMY].
description (String255)	A description or other unique information concerning the subject item.[Derived from ARMY].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
verified (CodeBoolean)	A boolean indicating whether that a structure has been repositioned and with good source (Y = YES or N = NO).[Derived from USACE].
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Culvert End

(Database Feature Class Name = DeicingCulvertEnd)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

A pipe or structure, the purpose of which is for the interception and conveyance of surface water transported in open drainage lines and ditches [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Discharge Point

(Database Feature Class Name = DeicingDischargePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any location where deicing pipes directly discharge effluent. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
effluentDischargeType (String16)	A field indicating the kind, class, or group of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
sysType (String16)	The type of deicing fluid discharge system.[Derived from USACE OPERATIONS].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Drainage Basin

(Database Feature Class Name = DeicingDrainageBasin)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An area in which surface runoff collects and from which it is carried by a drainage system. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
gradeMean (Double)	The average grade in the drainage basin.
gradeMin (Double)	The minimum or shallowest grade in the drainage basin.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
maxGrade (Double)	The maximum or steepest grade in the drainage basin.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.

material (String16)	The material of the subject item.
valveDrain(String50)	The name of the valve through which the drainage area flows.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Drainage Divide

(Database Feature Class Name = DeicingDrainageDivide)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

The border of a drainage basin where one side directs runoff to one basin and the other side directs runoff to a different basin. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Fitting

(Database Feature Class Name = DeicingFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe deicing fluid [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

fitDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
fitLength (Double)	The overall length of the fitting.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	Discriminator. The kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground deicing system line fitting.[Derived from Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Flow Control Device

(Database Feature Class Name = DeicingFlowControlPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Devices for a storm water system to control the pressure in and out of the open channel. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

cntrlElv (Double)	The elevation at the centerline of the flow control device, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
depth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
length (Double)	The overall length of the flow control.
width (Double)	The width dimension of the subject item, measured from opposite inside faces.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
source (String255)	The source of the deicing flow.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Glycol Recovery Pit

(Database Feature Class Name = DeicingGlycolRecoveryPit)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

Designated places for glycol recovery vehicles to dump the recovered glycol

Names and Identifiers:	
maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
Attributes:	
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Inlet

(Database Feature Class Name = DeicingInlet)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where deicing fluid is collected and received into the utility system. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityDgn (Double)	The design flow capacity of the subject item.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
inletSt (CodeInlets)	Discriminator. The step domain code for an inlet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
weirElevation (Double)	Elevation of the weir invert.
description (String255)	A description or other unique information concerning the subject item.
pierCode (String7)	The one-letter code for the terminal pier where the inlet is located
gateNumber (String20)	The number of the terminal gate where the inlet is located.
trenchDrain (String10)	The identifying name or tag of the Trench drain associated with the inlet
diversionVault (String10)	The identifying name or tag of the Div. Vault associated with the inlet
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Junction

(Database Feature Class Name = DeicingJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in deicing systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
juncType (CodeJuncType)	The type of junction (e.g. manhole, handhole, other)

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Lift Station

(Database Feature Class Name = DeicingLiftStation)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

Equipment used to pump deicing fluid to a higher level to enable gravity flow in pipes.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.

coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
MAA requirementvaultLength (Double)	Length of diversion vault, in feet
vaultWidth (Double)	Width of diversion vault, in feet
vaultDepth (Double)	Depth of diversion vault, in feet
inletLength (Double)	Length of inlet pipe into diversion vault, in feet
inletDiameter (Double)	Diameter of inlet pipe into diversion vault, in inches
inletMaterial (String20)	Material of the inlet pipe into the vault
outletLength (Double)	Length of outlet pipe from diversion vault, in feet
outletDiameter (Double)	Diameter of out;et pipe from diversion vault, in inches
outletMaterial (String20)	Material of the outlet pipe from the vault
description (String255)	A description or other unique information concerning the subject item.
MAA requirementmaterial (String16)	
size (Integer)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Line

(Database Feature Class Name = DeicingLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry deicing fluid from location to location (main line, service line, vent line, etc). [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name of the culvert.[Derived from REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainageZone (CodeDrainageZone)	Local name of assigned hydrographic drainage zones.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the pipe.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the pipe.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
pipeWidth (Double)	The width dimension of the subject item, measured from opposite inside faces.
lined (CodeBoolean)	An indicator as to whether the pipe is lined or not (yes/no).

invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
scrnType (CodeCulvertScreenType)	The type of screen used to cover the end of the culvert.
type (String16)	A field indicating the kind, class, or group of the subject item.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
featureUse (String16)	Discriminator. The use code for deicing line.
pressNorm (Double)	The normal operating pressure of the deicing system pipe.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground deicing line pipe.[Derived from Air Force].
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Line Clean Out

(Database Feature Class Name = DeicingLineCleanOut)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

Glycol force main cleanouts, which are mechanism used to clear out the pipe line

Names and Identifiers:	
maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
Attributes:	
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Marker

(Database Feature Class Name = DeicingMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of nearby deicing system component. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Pump

(Database Feature Class Name = DeicingPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for deicing system that draws material into itself through an entrance port and forces the material out through an exhaust port. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

outflwAct (Double)	The actual measured pump flow output.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
type (String16)	A field indicating the kind, class, or group of the subject item.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Pump Station

(Database Feature Class Name = DeicingPumpStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to supply material flowing at adequate pressure to or from a deicing fluid system. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the deicing pump station.[Derived from REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

alrmlvlelv (Double)	The elevation in the wet well that triggers an alarm indicating no additional storage capacity.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
hiWaterElevation (Double)	The high water or overflow elevation of the storage tank at the pumping station, in feet (English units) or meters (SI units) above some datum.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the deicing distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
width (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.

length (Double)	The overall length of the pump station plant area.
wetwlCapacity (Double)	The wet well capacity.
area (Double)	The size of the area, zone, or polygon in square units.
type (String16)	A field indicating the kind, class, or group of the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
noPumps (Integer)	The total number of pumps located at the subject item.
riverMile (Double)	River mile marker.[Derived from REEGIS].
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
mxDsgnHd (Double)	The water elevation of the maximum design head of the pump in feet NGVD.[Derived from REEGIS].
dateEnd (Date)	The date the project was actually completed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)[Derived from REEGIS].
capacity (Double)	The pumping capacity at the maximum design head in cfs.[Derived from REEGIS].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Reservoir

(Database Feature Class Name = DeicingReservoirLocation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where deicing fluid is collected. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of containment measured from normal operating pool.
invElvAv (Double)	The average elevation of the bottom of the reservoir.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
xDikes (CodeBoolean)	An indicator whether cross dikes exists in the subject item or not (yes or no).
outCntr (String12)	The outlet control.
featureUse (String16)	The particular application, or use the subject item.
resLength (Double)	The overall length of the reservoir.
resType (CodeReservoirType)	The type or classification of the reservoir.
resWidth (Double)	The average width dimension of the reservoir, measured from top of opposite side slopes.

description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Tank

(Database Feature Class Name = DeicingTank)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

A tank which holds deicing fluid [Entity MAA requirement database merge, attributes from IndustrialWasteTankPoint].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
headNorm (Double)	The normal operating head for the subject item.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankSt (CodeStyleTank)	This value differentiates similar entities by use or type.
tankUse (CodeTankUse)	The particular kind or use of the industrial waste water tank.
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.
description (String255)	A description or other unique information concerning the subject item.
mapGrid (String5)	Placeholder for ETL process to hold column 'grid' in MES DI_Tanks feature
color (CodeColor)	The color of the deicing tank.

lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Valve

(Database Feature Class Name = DeicingValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a decing fluid line. [Adapted from SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
dVaultId (String50)	

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	The particular application, or use the subject item.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground deicing fluid line valve.[Derived from Air Force].
description (String255)	A description or other unique information concerning the subject item.
pierCode (String10)	The one-letter code for the terminal pier where the valve is located
divVaultValve (CodeBoolean)	Indicates if the valve is a diversion vault valve or not.
mapGrid (String5)	Placeholder for ETL process to hold column 'grid' in MES DI_Tanks feature
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Deicing : Vault

(Database Feature Class Name = DeicingVault)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Secret

Reservoirs for used deicing fluid and stormwater [Entity MAA requirement database merge, attributes from IndustrialWasteTankPoint].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String60)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of the vault.
vaultLength (Double)	The overall length of the vault.
vaultType (String20)	The type or classification of the vault.
vaultWidth (Double)	The average width dimension of the vault measured from top of opposite side slopes.
description (String255)	A description or other unique information concerning the subject item.
pipeWidth (Double)	Size of inlet pipe
pipeMaterial (CodePipeMaterial)	Material of which inlet pipe is made
airReleasePresent (CodeBoolean)	Indicates whether or not an air release valve is present
pumpOutPresent (CodeBoolean)	Indicates whether or not a pump out conection is present
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
mapGrid (String5)	Target column for ETL process to hold column 'grid' in MES database
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
pierCode (String10)	The one-letter code for the terminal pier where the valve is located
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
metadata (Integer)	Foreign Key. Used to link the record to the applicable feature level metadata record(s).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Electrical

Electrical : Bus Line

(Database Feature Class Name = ElectricalBusLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A rigid metallic conductor (copper or aluminum), typically in the form of a flat bar, angle stock, or square tubing. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

bilRat (CodeBilKv)	The insulators basic insulation level rating.
busMat (CodeElectricBus)	The material composition of the electrical bus group.
cblUse (CodeElectricCableUse)	The use or purpose of the cable group.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
frameType (String20)	The substation structural frame configuration.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
voltage (CodeVoltage)	The voltage of the bus group.
noConduct (Integer)	The total number of ungrounded conductors in the cable.
noNeutral (Integer)	The number of neutral conductors.
reactance (Double)	The reactance of the bus provided by the manufacturer.
sizeNeut (CodeCableDimension)	The size of the neutral conductors.
resistance (Double)	The resistance of the bus provided by the manufacturer.
length (Double)	The overall length of the feature.[Center].
description (String255)	A description or other unique information concerning the subject item.
cblMaterial (CodeElectricCable)	The material of the cable.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Cable

(Database Feature Class Name = ElectricalCable)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A group of conductors used to carry electrical energy from point to point. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the feature.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

condSize (CodeCableDimension)	The size of a single ungrounded conductor in the cable group in American Wire Gauge (AWG) units.
cblType (CodeElectricCable)	This value differentiates similar entities by use or type.[REEGIS].
catnav (CodeNavigationLineType)	Category of navigation line[S-57].
cblLength (Double)	The length of the cable between nodes.
cblMaterial (CodeElectricCable)	The material composition of the cable.
cfgType (CodeElectricConfigType)	The cable mounting configuration on the pole or tower.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
voltage (CodeVoltage)	The system voltage applied to the cable group.
installType (CodeElectricCable)	Discriminator. The installation type code.
insulMaterial (CodeSheathInsulateType)	The type of material with which the conductors are insulated from each other and from their surroundings.
neutSize (CodeCableDimension)	The size of a single neutral conductor in American Wire Gauge (AWG) units.
noConduct (Integer)	The total number of ungrounded conductors in the cable.
noNeutral (Integer)	The total number of grounded conductors in a ductbank.
noPhases (Integer)	The number of phases routed by this cable group.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
riverMile (Double)	River mile marker.[REEGIS].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Capacitor

(Database Feature Class Name = ElectricalCapacitor)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An electrical device placed in a circuit to correct power factor by adding reactive power to the circuit. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

cntrType (CodeElectricControlType)	The method of adjusting the kilovar output of the capacitor.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
cpctrKv (CodeElectricKvar)	The rating of the capacitor's ability to provide reactive power to a circuit.
voltage (CodeVoltage)	The system voltage across the capacitor.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
installType (CodePumpSta)	The type installation of the subject item.
noPhases (Integer)	The number of phases to which this device provides reactive power.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
switch (CodeBoolean)	This indicates whether the capacitor is presently in the circuit or is not presently in the circuit.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Ductbank

(Database Feature Class Name = ElectricalDuctbank)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A tubular structure that provides protection for underground cables contained in conduit. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Name of the electrical underground conduit.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

ductMat (CodePipeMaterial)	An indication of the type of material of which the duct is composed.

dbkLength (Double)	The total length of the ductbank from source to load. Manholes and pullboxes should not break the measurement.
dbkSize (Double)	A two dimensional description of the physical size of the ductbank including units of measure (e.g., 2 ft x 2 ft, 3 m x 3 m).
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
voltage (CodeVoltage)	The maximum voltage in the ductbank.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noDucts (Integer)	An indicator of the number of conduits or wireways found in the ductbank.
noSpares (Integer)	The number of spare ducts enclosed in the ductbank for future use.
riverMile (Double)	River mile marker.[REEGIS].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Generator

(Database Feature Class Name = ElectricalGenerator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A machine which converts mechanical energy into electrical energy. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
facilityName (String65)	A commonly used name for the facility.[HSIP].

Attributes:

coolType (CodeEquipmentCooling)	The type of cooling for the generator engine.
autotran (CodeBoolean)	An indicator as to whether or not an automatic transfer switch exist. (yes or no) An automatic transfer switch is an electromechanical device used to automatically change states in the event of a power failure on the primary electrical service to use an
genType (CodeGeneratorType)	This value differentiates similar entities by use or type.
engModel (String20)	The engine Model, Product, Catalog, or Item Number.
engSerNo (String20)	The engine serial number.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
engineHp (Integer)	The power rating of the prime mover of the generator in horsepower.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
powerFact (Double)	The cosine of the phase angle between the voltage and the current that the generator creates.
fuelType (CodeFuel)	The type of fuel required to operate the prime mover of the generator.
hertz (Double)	The frequency of the electrical signal that the generator creates.

oilCapacity (Double)	The manufacturer recommended amount of oil that the generator engine requires to operate properly.
voltage (CodeVoltage)	The potential of the electrical energy that the generator creates.
kvaRate (Integer)	The rating of the complex power that the generator creates.
kwRate (Integer)	The rating of the Double power that the generator creates.
noPhases (Integer)	The number of phases to which this device provides reactive power.
sound (CodeBoolean)	An indicator as to whether or not Insulation was added to dampen the transmission of noise. (yes or no)
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
numPipes (Integer)	The number of powerlines entering the power plant.[HSIP].
pwrsource (String65)	The source of the power used by the plant to generate electricity.[HSIP].
fuelDel (CodeFuelDeliveryMethodType)	The delivery method of the fuel used at the power plant.[HSIP].
numLines (Integer)	The total number of powerlines exiting the power plant.[HSIP].
numStat (Integer)	The total number of substations associated with the power plant.[HSIP].
genCapacity (Double)	The total generating capacity of the power plant.[HSIP].
comAff (String80)	The name of the company that operates the power plant.[HSIP].
numGen (Integer)	The total number of generators at the power plant.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Ground Point

(Database Feature Class Name = ElectricalGround)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where the electrical configuration is grounded. [SDSFIE Air Force].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Head Bolt Outlet

(Database Feature Class Name = ElectricalHeadBoltOutlet)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device which supplies electric current in cold weather climates for vehicle heating. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

type (String16)	The type of head bold outlet.[Air Force].
voltage (CodeVoltage)	The type of voltage used.[Air Force].
noPlugs (Integer)	The number of plug-ins available.[Air Force].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.[Air Force].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Junction

(Database Feature Class Name = ElectricalJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or metal) typically located below grade with above grade access in which cables intersect, connect, or pass through. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
drainType (CodeDrainType)	The type of subject item drain.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
floorElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
Material (String16)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
noCables (Integer)	The number of the cables entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
juncType (CodeJuncType)	The type of junction (e.g. manhole, handhole, other)

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Light

(Database Feature Class Name = ElectricalLight)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Locations of point sources of general external lighting. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

sensor (CodeBoolean)	A Boolean code indicating whether or not the light has a night sensor.[USACE OPERATIONS].
watts (CodeLightWatts)	The light fixture wattage specification.
voltage (CodeVoltage)	The system voltage applied to the light fixture.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noLamps (Integer)	The total number of lamps in fixture.
fixtureHt (Double)	The height above the ground/base surface of the light fixture.
mountHeight (Double)	The fixture mounting height.
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
litType (CodeExternalLight)	The type of the light.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Marker

(Database Feature Class Name = ElectricalMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc., identifying the location of the electrical equipment. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Meter

(Database Feature Class Name = ElectricalMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the electrical power supplied to a facility or through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

ampRate (Integer)	The maximum continuous current rating of the meter.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityKva (Double)	The limit of the complex power which the demand meter can record.
meterType (String20)	A label describing the features of the electrical system that the meter is measuring.
hertz (Double)	The frequency of the electrical system on which the meter should be used.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
voltage (CodeVoltage)	The potential of the electrical system on which the meter may be used.
kwRate (Integer)	The power rating on the meter based on the current and potential transformer ratios.
mtrConst (Integer)	The multiplication factor by which one must multiply the difference in present and previous meter readings to determine actual power consumed.
mtrUse (CodeElectricDeviceUse)	An indication of the type of service the meter is monitoring.
noPhases (Integer)	The number of phases that the meter monitors.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
drgvesty (CodeVesselType)	The types of dredging vessels.[USACE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.

dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Motor

(Database Feature Class Name = ElectricalMotor)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A machine that converts electrical energy into mechanical energy. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

enclty (CodeElectricMotorEnclType)	The type enclosure the motor has to protect it from outside elements like the weather.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
powerFact (Double)	The nameplate power factor at which the motor operates at full load. The power factor is the cosine of the phase angle between the voltage and the current.
voltage (CodeVoltage)	The nameplate voltage rating of the motor.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
insulCl (CodeElectricMotorInsulType)	The classification of the motor's insulation.
startType (CodeElectricMotorStartType)	The startup configuration for the motor.
motorHp (Double)	The output power rating of the motor in units of horsepower.
motorType (String20)	A label representing the name of a certain category of motors in which the motor fits based on common features of construction with other motors in the same category.
noPhases (Integer)	The number of phases at which the motor was designed to operate.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
windType (CodeWindingConnectionType)	A label representing the configuration of the stator winding connections.
description (String255)	A description or other unique information concerning the subject item.
hertz (CodeHertz)	The frequency of the electrical signal that the motor creates.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Pedestal

(Database Feature Class Name = ElectricalPedestal)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above ground enclosure which provides access to underground cables. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Utility Pole Guy

(Database Feature Class Name = ElectricalPoleGuyConnectionPoi)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A support configuration, which generally includes connecting hardware, cables, and anchor components, used to stabilize structures (poles, towers, etc.). Down guys typically connect to the structures at key stress points and extend to an anchor at the gro [SDSFIE Anteon].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anchorAtt (String15)	The type of anchor attachment to the pole or tower.
anchorType (String15)	The type of anchor used with this guy.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
design (String16)	Discriminator. The design code for a utility guy.

cblDia (Double)	The nominal diameter of the cable.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
guyLength (Double)	The length of the guy cable from pole connection to anchor.
cblMaterial (CodeElectricCable)	The material composition of the cable.
cblSht (CodeSheathInsulateType)	The type sheath attached to the guy cable.
cblTen (Double)	The tensile force applied to the guy cable.
cblType (String16)	The type of cable use for the guy.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
guyType (CodeUtilityGuyType)	A code indicating the configuration of the guy construction.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Utility Pole Guy Line

(Database Feature Class Name = ElectricalPoleGuyLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A support configuration that spans between two structures, which generally includes connecting hardware, cables, and anchor components. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Utility Pole Tower Site

(Database Feature Class Name = ElectricalPoleTower)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A structure used to elevate wires, cables, or other lines above the ground surface. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
design (String16)	Discriminator. The design code for types of poles.
capped (CodeBoolean)	Indicates whether or not the pole is capped (yes/no).
dateTreat (Date)	The date that the pole was last treated. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915).
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
grounded (CodeBoolean)	An indicator as to whether or not the pole is grounded. (yes or no)
poleLength (Double)	The overall length of the pole from tip to tip.
poleHeight (Double)	The height of the pole measured from the ground surface to the top.
material (String16)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
pClass (CodePoleClassificationType)	A classification of the pole diameter, and consequently the breaking strength, of wooden poles.
treatType (CodePoleTreatmentType)	Defines any treatment applied to the pole to improve its life.
type (String16)	A field indicating the kind, class, or group of the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Regulator

(Database Feature Class Name = ElectricalRegulator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An electrical device that maintains its output voltage at a certain level even though its input voltage varies in a certain range over time. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

dateManufactured (Date)	The date of manufacturer for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
coolType (CodeEquipmentCooling)	The method of controlling the temperature of the regulator.
installType (CodePumpSta)	The type installation of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
fuseRate (Integer)	The current rating of the fuse protecting the regulator. This will be on the primary side.
fuseType (CodeElectricSwitchType)	A label chosen from a standard list of labels describing the characteristics of the fuse.
oilCapacity (Double)	The manufacturer suggested volume of oil that should be maintained inside the regulator to assure safe and efficient operation.
prcntTap (Double)	The percentage of the voltage that will be changed by moving the connection up or down one tap.
kvaRate (Integer)	The maximum continuous complex power rating of the regulator.
secVolt (CodeVoltage)	The voltage on the load side of the regulator with the associated units given.
noPhases (Integer)	The number of phases regulated by this device.
noTaps (Integer)	The number of available points of connection on the regulator which may be used to change the voltage.
priVolt (CodeVoltage)	The voltage on the source side of the regulator with the associated units given.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
regType (CodeElectricVoltRegulType)	The type of voltage regulator.
regUse (CodeElectricDeviceUse)	An indication of whether the regulator is on a line or in a substation.
regWeight (Integer)	The force of the regulator toward the center of the earth due to the regulator's mass.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item..
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Riser

(Database Feature Class Name = ElectricalRiser)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where underground cable transitions to overhead. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

material (String16)	The material composition of the pole riser.
installDate (Date)	The date the riser was installed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Splice

(Database Feature Class Name = ElectricalSplice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The connection of two separate cables at their ends or the tapping of a conductor along the path of another conductor. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Substation

(Database Feature Class Name = ElectricalSubstation)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Secret

A facility in an electrical system where the voltage is reduced from transmission levels to distribution levels. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the substation.[USGS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
facilityName (String65)	A commonly used name for the facility.[HSIP].

Attributes:

voltOut (CodeVoltage)	The line-to-line output voltage of the substation.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityOper (Double)	The normal continuous amount of complex power that the substation provides.
capacityRate (Double)	The maximum continuous amount of complex power that the substation can provide.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noTrans (Integer)	The total number of transformers presently in use at the substation.
noCircuit (Integer)	The total number of circuits that are being fed by the substation.
sstType (CodeSubstationType)	A label indicating the type of service that the substation performs (e.g. distribution substation, facility substation).
noSpares (Integer)	The number of spare bays for possible substation expansion.
voltIn (CodeVoltage)	The line-to-line voltage of the transmission line that is the source for the substation.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Switch

(Database Feature Class Name = ElectricalSwitch)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device which closes and opens (connects and disconnects) an electrical circuit. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

installType (String16)	Discriminator. The installation type code.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
voltage (CodeVoltage)	The system voltage of the electrical line at the point in which the switch is inserted.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noPhases (Integer)	The number of phases opened by the switch
noSwitch (Integer)	The number of switches at this installation. Each switch has its own record.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
swCubNo (String20)	A locally assigned switching cubicle number or designator.
switchDim (String20)	A three dimensional description of the amount of space which a switch occupies (e.g., 2 x 1 x 4).
switchRat (Integer)	The maximum continuous amount of current to which the switch should be subjected.
swtSta (CodeStatusElectricSwitch)	The positional condition of a switch during normal circuit conditions (e.g., normally-open, normally closed).
swtType (CodeElectricSwitchType)	A label chosen from a standard list of labels indicating the characteristics of a switch.
swtWeight (Integer)	The force of the switch toward the center of the earth due to the switch's mass.
fuseSize (Double)	The size of the fuse associated with the switch.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
size (Integer)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.

dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Transformr Bank

(Database Feature Class Name = ElectricalTransformerBank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A location containing one or more transformers. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
noTrans (Integer)	The number of transformers in the transformer bank.
secVolt (CodeVoltage)	The line-to-line voltage of the electrical system that the transformer bank serves.
tranCap1 (Double)	The capacity of the first transformer contained in the transformer bank. Used exclusively for displaying the capacities in the bank.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
tranCap2 (Double)	The capacity of the second transformer contained in the transformer bank. Used exclusively for displaying the capacities in the bank.
tranCap3 (Double)	The capacity of the third transformer contained in the transformer bank. Used exclusively for displaying the capacities in the bank.
mount (CodeElectricTranbnk)	Discriminator. The type of mounting for the transformer bank.
totalKva (Double)	The total kva rate for all transformers attached to the transformer bank.
feederNo (String20)	An operator generated identifier locally used to identify the feeder to the transformer bank.
priVolt (CodeVoltage)	The line-to-line voltage of the electrical system that serves as the source for the transformer bank.
dateInstalled (Date)	The date on which the feature was originally installed.
dateLastInspected (Date)	The last inspection date of the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
condition (CodePoleCondition)	The condition of the subject item when last inspected.
phase1 (CodeElectricPhase)	The phase number for the first transformer group.
kva1 (CodeElectricKvar)	The capacity of each transformer in a group. (i.e. 2-50kva / 1-25kva, 50 is the capacity of each transformer in the first group - 25 is the capacity of each transformer in the second group.) There can be no more than two groups in a bank.
noTfrs1 (Integer)	The number of transformers in the first group.
phase2 (CodeElectricPhase)	The phase number for the second transformer group.
noTfrs2 (Integer)	The number of transformers in the second group.
kva2 (CodeElectricKvar)	The capacity of each transformer in a group. (i.e. 2-50kva / 1-25kva, 50 is the capacity of each transformer in the first group - 25 is the capacity of each transformer in the second group.) There can be no more than two groups in a bank.
pcb (CodeBoolean)	A boolean indicating whether the transformer contains PCB's and can be classified as wet or not (YES = Y and NO = N)?[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Transformer Vault

(Database Feature Class Name = ElectricalTransformerVault)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An enclosure housing one or more transformers. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
noTrans (Integer)	The number of transformers housed inside the transformer vault.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Electrical : Utility Electric Utility Site

(Database Feature Class Name = ElectricalUtilitySite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An electrical power utility company or organization's certificated area of jurisdiction or responsibility as approved by a federal, state, or local utility regulatory authority. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
elutname (String50)	Name of electrical power utility or system.

Attributes:

numPipes (Integer)	Number of pipelines entering facility.[HSIP].
numLines (Integer)	Number of powerlines existing on a facility.[HSIP].
numGen (Integer)	Total number of power generators at the plant.[HSIP].
numStat (Integer)	Number of substations at the facility.[HSIP].
area (Double)	The size of the area, zone, or polygon in square units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
reConnect (Integer)	Total number of residential type service connections.
coConnect (Integer)	Total number of commercial (i.e., businesses, industrial) type service connections.
populationServed (Integer)	Population served by electrical power utility or system.
elecutmaaID (String30)	Identifier assigned to the electrical power utility or system by the appropriate federal, state, or local regulatory authority.
elecutcap (Double)	Total design capacity of the electrical power utility or system (e.g. megawatts per day).
utilown (CodeUtilityOwnershipType)	General category or type of electric utility or system owner.
elecsource (String50)	Source of electrical power distributed by electric utility (e.g., electrical power plants owned by utility, electrical power purchased from other utilities).
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: EMCS

EMCS : Cable

(Database Feature Class Name = EnergyCtrlMonCable)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Data transmission media, typically fiber optics or shielded twisted-pair. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

cblDim (CodeCableDimension)	The cable dimension.
cblLength (Double)	The overall cable length.
cblMaterial (CodeElectricCable)	The material composition of the cable.
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.
cblType (String16)	The type of cable connecting the devices.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

loosbuf (CodeBoolean)	An indicator as to whether or not the cable is loose buffered (yes/no).
dbLoss (Double)	Loss of a signal over a conductor expressed in decibels.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (String16)	Discriminator. The installation type code.
noLinks (Integer)	Number of links in the cable.
noPairs (Integer)	The number of pairs in a twisted pair cable.
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

EMCS : Device

(Database Feature Class Name = EnergyCtrlMonDevice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Devices used in an energy monitoring/control system to collect, process or transmit data signals. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

anlgIn (Integer)	The total number of analog-in ports on the device.
anlgInSp (Integer)	The number of spare analog-in ports.
anlgOt (Integer)	The total number of analog-out ports on the device.
anlgOtSp (Integer)	The number of spare analog-out ports.
dateManufactured (Date)	The date of manufacturer for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
devType (CodeEcmDevice)	Discriminator: This value differentiates similar entities by use or type.
installType (CodePumpSta)	The type installation of the subject item.
dgtlIn (Integer)	The total number of digital-in ports on the device.
dgtlInSp (Integer)	The number of spare digital-in ports.
dgtlOt (Integer)	The total number of digital-out ports on the device.
dgtlOtSp (Integer)	The number of spare digital-out ports.
readout (CodeDisplayType)	The type of display or readout for the device.

noPairlnk (Integer)	The number of twisted pair linked to the device.
description (String255)	A description or other unique information concerning the subject item.
locationDesc (String50)	Text description of location of item
manufacturerName (String60)	Manufacturer's name
sensorNumber (Integer)	Sensor number associated with item
inspectionFormNo (String50)	Form number used by inspectorswhen inspecting the item,
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
impedance (Double)	The overall device resistance measured in ohms.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

EMCS : Ductbank

(Database Feature Class Name = EnergyCtrlMonDuctbank)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A structure containing multiple conduits used to protect underground cables. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

ductMat (CodePipeMaterial)	The material composition of the ductbank.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dbkLength (Double)	The total length of the ductbank from source to load. Manholes and pullboxes should not break the measurement.
dbkSize (Double)	A two dimensional description of the physical size of the ductbank including units of measure (e.g., 2 ft x 2 ft, 3 m x 3 m).
voltage (CodeVoltage)	The voltage of the electrical control monitoring ductbank.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noDucts (Integer)	The total number of ducts in the ductbank.
noSpares (Integer)	The total number of ducts not used in the ductbank.
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

EMCS : Junction

(Database Feature Class Name = EnergyCtrlMonJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault located below grade with above grade access where cables intersect, connect, or pass through. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
type (String16)	Discriminator. The code that represents the type of Junction.
description (String255)	A description or other unique information concerning the subject item.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (Integer)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

EMCS : Marker

(Database Feature Class Name = EnergyCtrlMonMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of an energy control monitoring station. [SDSFIE NGA/NIMA].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: FAA

FAA : Cable

(Database Feature Class Name = CableLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Not used, use Communication Other Cable or Electrical Cable where owner equals FAA. A group of conductors used to carry electrical energy or transmit communications from point to point.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the feature.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

condSize (CodeCableDimension)	The size of a single ungrounded conductor in the cable group in American Wire Gauge (AWG) units.
cblType (CodeElectricCable)	This value differentiates similar entities by use or type.[REEGIS].
catnav (CodeNavigationLineType)	Category of navigation line[S-57].
cblLength (Double)	The length of the cable between nodes.
cblMaterial (CodeElectricCable)	The material composition of the cable.
cfgType (CodeElectricConfigType)	The cable mounting configuration on the pole or tower.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

voltage (CodeVoltage)	The system voltage applied to the cable group.
installType (CodeElectricCable)	Discriminator. The installation type code.
insulMaterial (CodeSheathInsulateType)	The type of material with which the conductors are insulated from each other and from their surroundings.
neutSize (CodeCableDimension)	The size of a single neutral conductor in American Wire Gauge (AWG) units.
noConduct (Integer)	The total number of ungrounded conductors in the cable.
noNeutral (Integer)	The total number of grounded conductors in a ductbank.
noPhases (Integer)	The number of phases routed by this cable group.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
cabUse (CodeCableUse)	Discriminator - The overall use of the cable.
diameter (Double)	The width of a cylindrical or circular cable.[Tinker Air Force Base].
cabElev (CodeCableElevation)	The vertical location of the cable.[Tinker Air Force Base].
verticalClearance (Double)	The clearance in feet between the lowest point under the cable line and the water's surface at Mean High Water (MHW) referenced to a reading on the appropriate gage.[REEGIS].
cblSht (CodeSheathInsulateType)	The type of cable sheathing or insulation.[Tinker Air Force Base].
coffset (Double)	The distance to the cable as measured from the edge of a paved surface.[Tinker Air Force Base].
icefacClr (Double)	The clearance in feet between the lowest point under the cable line and the ice facility surface.[S-57].

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

FAA : Ductbank

(Database Feature Class Name = Ductbank)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Not used, use Communication Ductbank or Electrical Ductbank where owner equals FAA. A tubular structure that provides protection for underground cables contained in conduit.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Name of the electrical underground conduit.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

ductMat (CodePipeMaterial)	An indication of the type of material of which the duct is composed.
dbkLength (Double)	The total length of the ductbank from source to load. Manholes and pullboxes should not break the measurement.
dbkSize (Double)	A two dimensional description of the physical size of the ductbank including units of measure (e.g., 2 ft x 2 ft, 3 m x 3 m).
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
voltage (CodeVoltage)	The maximum voltage in the ductbank.

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noDucts (Integer)	An indicator of the number of conduits or wireways found in the ductbank.
noSpares (Integer)	The number of spare ducts enclosed in the ductbank for future use.
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
noDucts (Integer)	The total number of ducts in the ductbank.
noDuHigh (Integer)	The number of ducts in the y-direction
noDuWide (Integer)	The number of ducts in the x-direction
noSpares (Integer)	The total number of ducts not used in the ductbank.
concEnc (CodeBoolean)	A Boolean indicating whether the ductbank is encased in concrete.[Tinker Air Force Base].
diameter (Double)	Diameter (if round).[AIR FORCE].
width (Double)	Width of horizontal cross section.[AIR FORCE].
height (Double)	Height.[AIR FORCE].

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

FAA : Junction

(Database Feature Class Name = ElectricalJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Not used, use Communication Junction or Electrical Junction where owner equals FAA. A box or small vault (usually concrete, brick, or metal) typically located below grade with above grade access in which cables intersect, connect, or pass through. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
drainType (CodeDrainType)	The type of subject item drain.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
floorElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
Material (String16)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
noCables (Integer)	The number of the cables entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.

description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
juncType (CodeJuncType)	The type of junction (e.g. manhole, handhole, other)

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Fuel

Fuel : Air Eliminator

(Database Feature Class Name = FuelAirEliminator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device or structure placed in the fuel distribution system to separate air from petroleum products. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Anode

(Database Feature Class Name = FuelAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A material used for fuel distribution systems that is electrically connected to a less electrolytically active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.
material (CodeAnodes)	The type of material composition of the anode or anode packet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Anode Test Station

(Database Feature Class Name = FuelAnodeTestStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in fuel systems. [SDSFIE HSIP].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

noTerm (Integer)	The total number of terminal connections at the test station.
type (String16)	The type of anode test station configuration use.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.

wireType (String16)	The conductor configuration, typically solid or stranded.
description (String255)	A description or other unique information concerning the subject item.
installType (CodeSheathInsulateType)	The type of insulate installed.
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Farm Site

(Database Feature Class Name = FuelFarmLocation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An area designated for the storage of POL products which normally includes multiple tanks (above or below ground), berms, and monitoring wells. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	A commonly used name for the feature.[HSIP].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
numPipes (Integer)	The quantity of pipes that access the fuel farm.[HSIP].
jetCapacity (Double)	The quantity of jet fuel that can be stored in the facility.[HSIP].
lubCapacity (Double)	The total storage capacity of lubricants at the fuel farm.[HSIP].
gasCapacity (Double)	The total gas storage capacity for the fuel farm.[HSIP].
numTanks (Integer)	The total number of tanks in the fuel farm.[HSIP].
oilCapacity (Double)	The quantity of oil that can be stored in the facility.[HSIP].
strgpet (CodeBoolean)	A boolean indicating whether the farm is a part of the Strategic Petroleum Reserve (Y - is a part of the reserve, N - is not a part of the reserve)?[HSIP].
material (String16)	
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Filter Strainer

(Database Feature Class Name = FuelFilterStrainer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device through which fuel is passed to remove impurities to the fuel. Usually placed in fuel lines near fill points. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Fitting

(Database Feature Class Name = FuelFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying fuel. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
fitLength (Double)	The overall length of the fitting.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1 gas hydrant, 2 meter, 6 pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
coverDepth (Double)	Depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line fitting.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Hydrant

(Database Feature Class Name = FuelHydrant)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Location where fuel is control discharged to users. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.
nozzleNr (Integer)	The number of fuel system hydrant cart nozzles.[Air Force].

Attributes:

hydrantType (CodeHydrantType)	The particular kind, class, or group of hydrant.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
outcon1dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of the largest hydrant outlet.
outcon2dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of the second largest hydrant outlet.
outcon3dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of the smallest hydrant outlet.

pressResd (Double)	The measured pressure at a hydrant or connection during a flow test conducted at the subject hydrant or connection.
pressStat (Double)	The numeric pressure head on the subject item under static (i.e., no flow or demand) conditions in the utility system.
valveSt (CodeStyleValve)	The style of the valve.
noHydrnts (Integer)	The number of Refill for the hydrants.[Air Force].
nozzlType (CodeNozzleType)	Fuel System Hydrant Cart Nozzle Type Code.[Air Force].
truckNr (Integer)	The number of the cart truck.[Air Force].
truckType (CodeTruckType)	The different code types of the cart truck.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
remarks (String255)	Any narrative remarks about the fuel hydrant .[Air Force].
hydrantElvevation (Integer)	The elevation of the hydrant.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Junction

(Database Feature Class Name = FuelJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in fuel systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

airrfValve (CodeBoolean)	Indicates whether or not there is an air relief valve installed on subject item? (yes/no)
drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
noValves (Integer)	The number of valves inside the subject item.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.

invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
status (CodeStatus)	The status of the manhole indicating its' usability.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Line

(Database Feature Class Name = FuelLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry fuel from location to location (main line, service line, vent line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
catProt (CodeBoolean)	Indicates whether or not the pipe has been provided with cathodic protection? (yes or no).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
fuelType (CodeFuel)	The type of fuel transported in this pipe.
pressNorm (Double)	The normal operating pressure of the fuel pipe.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	Discriminator. The use code for a fuel line.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1 gas hydrant, 2 meter, 6 pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.

piplty (CodePipelineLocationType)	The location of the pipeline in relevance to the earth's surface.[USGS].
coverDepth (Double)	Depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line pipe.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Marker

(Database Feature Class Name = FuelMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of fuel lines. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Meter

(Database Feature Class Name = FuelMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of fuel to a facility or through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
meterCustomer (String20)	The name of the individual, company, or government agency served by the subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation at the centerline of the meter, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1 gas hydrant, 2 meter, 6 pipe).
srvcMtr (CodeBoolean)	An indicator as to whether or not the meter is installed on a service line? (yes or no)
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Oil Water Separator

(Database Feature Class Name = FuelOilWaterSeparator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A filtering device placed in the fuel stream specifically to remove oil and water from the fuel. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

maaAlias (String60)	An alternative or former name by which the feature is refered.
sepName (String12)	The site specific identification name or number assigned to the subject item.

Attributes:

datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
disposal (String30)	Brief description of how the waste is disposed.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber. (yes or no)
flowCapacity (Double)	The flow capacity of the subject item.
oilCapacity (Double)	The retention capacity of the oil-water separator.
sepCode (String2)	The oil-water separator code. Usually defined as OW.
sepContnt (String20)	Separator contents
tempOptim (Double)	The optimum operating temperature for the subject item.
separationProcess (String30)	The specific type of separation process.
sepVolume (Double)	The volume of the oil-water separator.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Pump

(Database Feature Class Name = FuelPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for a fuel system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

outflwAct (Double)	The actual measured pump flow output.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
primeMethod (String15)	The method by which the pump is primed.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
type (String16)	A field indicating the kind, class, or group of the subject item.
bank (CodeBankSide)	The bankside of the river that the feature is located on.[USACE].
riverMile (Double)	River mile marker.[USACE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Pump Booster Station

(Database Feature Class Name = FuelPumpBoosterStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to supply material flowing at adequate pressure to or from a fuel distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the fuel pump booster station point.[USGS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
design (CodePumpSta)	Discriminator. The design of the pump/booster station.
capacityAlrm (Double)	Capacity alarm level.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
fuelSrc (CodeSourceListFuelGas)	The source of fuel for the pumps.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
staCapacity (Double)	The pump station's output capacity (e.g., gpm) rating (with all pumps operating) at a specific total dynamic head (TDH), which correlates to normal system pressure head or design pressure head.
staLength (Double)	The length dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.

staType (CodePumpSta)	The type of station.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
noPumps (Integer)	The total number of pumps located at the subject item.
prodct (CodePipelineProduct)	The product being pumped or carried by the pipeline.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Rectifier

(Database Feature Class Name = FuelRectifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system on an element of the fuel distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.
voltIn (CodeVoltage)	The input AC voltage to the rectifier.
currntOut (Double)	The output direct current from the rectifier to the anode system.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.
noPhases (Integer)	The number of phases to which this device provides reactive power.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Regulator Reducer

(Database Feature Class Name = FuelRegulatorReducer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pressure regulator located in the fuel line automatically reduces the pressure on the downstream side of the valve to a preset magnitude. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
pressIn (Double)	The design fuel system pressure in the line on inlet side of the pressure regulator.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressOut (Double)	The design or maximum system pressure in the line on outlet side of the pressure reducing station.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1 gas hydrant, 2 meter, 6 pipe).
pressReqd (Double)	The required maximum outlet pressure setting for the regulator.
type (String16)	Discriminator. The kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Source

(Database Feature Class Name = FuelSource)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The point from which the fuel is supplied a product for processing and distribution. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (CodeFuelSource)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Tank

(Database Feature Class Name = FuelTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above or below grade receptacle or chamber for holding fuels on a temporary basis prior to transfer or use. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
headNorm (Double)	The normal operating head for the subject item.
fuelType (CodeFuel)	The type fuel stored in the tank.
pressNorm (Double)	The normal operating pressure of the fuel tank.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
tankSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g., elevated, hydropneumatic, etc.).
tankUse (CodeTankUse)	The particular kind or use of the tank.
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
strgpet (CodeBoolean)	A boolean indicating whether there is a Strategic Petroleum Reserve (Y = YES or N = NO).[HSIP].
numTanks (Integer)	Maximum number of storage tanks, all POL.[HSIP].
numPipes (Integer)	Number of pipelines entering/exiting facility.[HSIP].
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
fllstandrt (Integer)	The Rate of the Fillstand.[Air Force].
resplyCap (Double)	The Resupply Capacity.[Air Force].
secCont (CodeBoolean)	A boolean indicating whether or not the secondary containment that is present (Y = YES or N = NO).[AIR FORCE].
secContam (String255)	A description of the secondary containment that is present.[Army].
description (String255)	A description or other unique information concerning the subject item.
remarks (String255)	The narrative remarks about the fuel tank.[Air Force].
color (CodeColor)	The color of the fuel tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Transmission Pipeline

(Database Feature Class Name = FuelTransPipeline)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

An interstate or intrastate transmission line through which gas, oil, or hazardous liquid is transported for the purpose of supplying a local utility. [SDSFIE DOT - NPMS].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the pipeline.[USGS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
sysName (String40)	The name of a single pipeline system.[DOT - NPMS].

Attributes:

operNm (String40)	The name of the company or organization that physically operates the pipeline system.[DOT - NPMS].
catPipe (CodePipeCategory)	Category of pipe[S-57].
verticalClearance (Double)	Vertical Clearance of pipeline[S-57].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
piprod (CodePipelineProduct)	Discriminator. The type of product carried by pipeline.[HSIP].
diameter (Double)	The diameter of the pipeline in either mm or cm.[HSIP].
tankSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g. elevated, on ground, below ground, floating, on water body bottom.).[HSIP].
capacity (Double)	The capacity of the pipeline.[HSIP].
intersta (CodeBoolean)	Indication whether or not (yes or no) pipeline is an interstate pipeline. Yes = interstate, No = Intrastate.[DOT - NPMS].
cmdtyDesc (String255)	Comma separated list of the names of commodities carried by the pipeline system.[DOT - NPMS].
commody1 (CodePipelineProduct)	Code designation for the primary commodity carried by the pipeline system.[DOT - NPMS].
commody2 (CodePipelineProduct)	Code designation for a secondary commodity carried by the pipeline system (if applicable). Empty (EMT) is not valid.[DOT - NPMS].
commody3 (CodePipelineProduct)	Code designation for an additional secondary commodity carried by the pipeline system (if applicable). Empty (EMT) is not valid.[DOT - NPMS].
prodct (String255)	A description of the product that is being carried in pipeline.[S-57].
length (Double)	The overall length of the feature.[Center].
vertLoc (CodeVerticalLocation)	The vertical location for the pipeline relative to the surface.[USGS].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
impedance (Double)	The number representing the total opposition to flow.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Transmission Pipeline Segment Line

(Database Feature Class Name = FuelTransPipelineSegmentLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A linear feature representing part or all of a pipeline system. A pipeline segment must have only two ends. No branches are allowed. A pipeline segment may be a straight line or may have any number of vertices. Each pipeline segment must be uniquely i [SDSFIE CGDII].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).[DOT - NPMS].
posAcc (CodePosAccuracyQuality)	Estimated positional accuracy of the feature.[DOT - NPMS].
length (Double)	The length of pipe, measured from node to node along the pipeline segment centerline.[DOT - NPMS].
subsysNm (String40)	Name for the pipeline segment, or smaller sub-section of the pipeline system.[DOT - NPMS].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Refinery Site

(Database Feature Class Name = FuelTransRefinery)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An establishment where fossil fuels are refined. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
refName (String50)	The name of the refinery.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
cogenCap (Double)	The co-generation capacity of the refinery in Kw.[HSIP].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
heProd (Double)	The total production capacity of helium for the refinery.[HSIP].
prodCap (Double)	The total production capacity for the refinery.[HSIP].
sProd (Integer)	The total sulpher production produced at the refinery.[HSIP].
h2Prod (Double)	The total production capacity of hydrogen for the refinery.[HSIP].
cokeProd (Double)	The total coke production capacity of the refinery.[HSIP].
co2Prod (Integer)	The total carbon dioxide production capacity of the refinery.[HSIP].

chrgCap (Double)	The total charge capacity of the refinery.[HSIP].
distillateProduction (Double)	The total distillate production capacity of the refinery.[HSIP].
asphProd (Double)	The production capacity of asphalt for the refinery.[HSIP].
capacity (Double)	The Plant capacity.[HSIP].
sprAccess (String32)	Access to Strategic Petroleum Reserve: none, water, pipeline.[HSIP].
distillateType (CodeDistallateProductioType)	The different Distillate Production Types.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Fuel : Valve

(Database Feature Class Name = FuelValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a fuel line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the fuel valve point.[USGS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	The site specific use of the valve.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
valveDiameter (CodePipeDiameter)	The manufacturer's nominal diameter.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Gas

Gas : Anode

(Database Feature Class Name = GasAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A material used for natural gas distribution systems that is electrically connected to a less electrolytically active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.
material (CodeAnodes)	The type of material composition of the anode or anode packet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Anode Test Station

(Database Feature Class Name = GasAnodeTestStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in natural gas systems. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeSheathInsulateType)	The type of insulation covering the conductor.
noTerm (Integer)	The total number of terminal connections at the test station.
type (String16)	The type of anode test station configuration use.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.
wireType (String16)	The conductor configuration, typically solid or stranded.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Fill Point

(Database Feature Class Name = GasFillPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Location where gas is control discharged to users. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
hydrantType (CodeHydrantType)	The particular kind, class, or group of hydrant.
outcon1dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
outcon2dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.

outcon3dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
gasType (CodeFuel)	The type of fuel or gas dispensed, carried, used or otherwise handled by the subject item.
hydrantElvevation (Double)	The elevation of the hydrant, measured at the hydrant outlet, in feet (English units) or meters (SI units) above some datum.
source (CodeSourceListFuelGas)	The source of fuel for the subject item.
pressResd (Double)	The measured pressure at a hydrant or connection during a flow test conducted at the subject hydrant or connection.
pressStat (Double)	The numeric pressure head on the subject item under static (i.e., no flow or demand) conditions in the utility system.
valveSt (CodeStyleValve)	The style of the valve.
capacity (Double)	The storage capacity of the hydrant.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Fitting

(Database Feature Class Name = GasFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Hardware used to cap, plug, or join pieces of pipe. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fittinLength (Double)	The overall length of the fitting.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1 gas hydrant, 2 meter, 6 pipe).
type (String16)	Discriminator. The kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Junction

(Database Feature Class Name = GasJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in natural gas systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

airrfValve (CodeBoolean)	Indicates whether or not there is an air relief valve installed on subject item? (yes/no)
drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
noValves (Integer)	The number of valves inside the subject item.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Light

(Database Feature Class Name = GasLight)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A point graphic representing the location of a gas light fixture. A gas light fixture utilizes gas as it's energy source and contains a flame used for illumination of an area. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fixHeight (Double)	The height of the fixture above a given reference, usually the grounds surface.
fixType (String20)	The type of fixture.
fixUse (CodeGasFixtureUse)	The use or purpose of the gas fixture.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
gasType (CodeFuel)	The type of fuel or gas dispensed, carried, used or otherwise handled by the subject item.
useRate (Integer)	The fuel/gas usage rate for the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Line

(Database Feature Class Name = GasLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry natural gas from location to location (main line, service line, vent line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
catProt (CodeBoolean)	Indicates whether or not the pipe has been provided with cathodic protection? (yes or no).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
gasType (CodeFuel)	The type of fuel or gas dispensed, carried, used or otherwise handled by the subject item.
pressNorm (Double)	The normal operating pressure of the gas pipe.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	Discriminator. The use code for natural gas pipes.
source (CodeSourceListFuelGas)	The source of fuel for the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
piplty (CodePipelineLocationType)	The location of the pipeline in relevance to the earth's surface.[USGS].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
mapLevel (Integer)	From the MES database, it denotes the numeric Level that the feature is associated with; i.e., 6 for Level 6, etc.
mapColor (CodeColor)	From the MES database, it denotes the numeric Level that the feature is associated with; i.e., 6 for Level 6, etc.
mapLayerNo (Integer)	From the MES database, it denotes the textual (label) Level that the feature is associated with; i.e., Level 6 for 6, etc.)
entityType (String16)	From the MES database,
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Marker

(Database Feature Class Name = GasMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate natural gas. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Meter

(Database Feature Class Name = GasMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of gas to a facility or through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
meterCustomer (String20)	The name of the individual, company, or government agency served by the subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation of the meter above a specific datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
source (CodeSourceListFuelGas)	The source of fuel for the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
srvcMtr (CodeBoolean)	An indicator as to whether or not the meter is installed on a service line? (yes or no)
type (String16)	A field indicating the kind, class, or group of the subject item.
pressMax (Double)	Maximum working pressure.
capacity (Double)	Capacity of the gas meter.
description (String255)	A description or other unique information concerning the subject item.

material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Pump

(Database Feature Class Name = GasPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for natural gas system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

outflwAct (Double)	The actual measured pump flow output.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Pump Station

(Database Feature Class Name = GasPumpStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to maintain flow at adequate pressure within a natural gas distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
capacityAlrm (Double)	Capacity alarm level.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
staCapacity (Double)	The pump station's output capacity (e.g., gpm) rating (with all pumps operating) at a specific total dynamic head (TDH), which correlates to normal system pressure head or design pressure head.
staLength (Double)	The length dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
staType (String16)	Discriminator. The type of station.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
noPumps (Integer)	The total number of pumps located at the subject item.
pressOper (Double)	The normal operating gas system pressure in the gas line on the inline side of the station.
pressOut (Double)	The design or maximum system pressure in the line on outlet side of the pumping station.
source (CodeSourceListFuelGas)	The source of fuel for the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Rectifier

(Database Feature Class Name = GasRectifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system on an element of the natural gas distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.
voltIn (CodeVoltage)	The input AC voltage to the rectifier.
voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
currntOut (Double)	The output direct current from the rectifier to the anode system.
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.
noPhases (Integer)	The number of phases to which this device provides reactive power.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Reducer

(Database Feature Class Name = GasReducer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pressure regulator automatically reduces the pressure on the downstream side of the valve to a preset magnitude. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
pressIn (Double)	The design gas system pressure in the line on inlet side of the pressure regulator.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressOut (Double)	The design or maximum system pressure in the line on outlet side of the pressure reducing station.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
pressReqd (Double)	The required maximum outlet pressure setting for the regulator.
type (String16)	Discriminator. The kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Source

(Database Feature Class Name = GasSource)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The point from which natural gas is supplied for processing and distribution. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
type (CodeFuel)	A field indicating the kind, class, or group of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item
size (Integer)	The size of the subject item
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	The material of the subject item
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Tank

(Database Feature Class Name = GasTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above or below grade receptacle or chamber used for holding natural gas on a temporary basis prior to transfer or use. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
headNorm (Double)	The normal operating head for the subject item.
pressNorm (Double)	The manufacturer's (as rated by American Society of Mechanical Engineers (ASME) testing procedures) maximum pressure rating of the gas tank.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g., elevated, hydropneumatic, etc.).
tankUse (CodeTankUse)	The particular kind or use of the tank.
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.
numStruct (Integer)	The total number of gas storage structures that exist on the plant.[HSIP].
featureUse (String16)	The Descriptive Shape Code.[Army].
lngFac (CodeBoolean)	LNG facility (Y or N).[HSIP].
description (String255)	A description or other unique information concerning the subject item.
ustSensor (CodeBoolean)	Whether or not a sensor exists on the tank.
color (CodeColor)	The color of the gas tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.

markingFeatureType (CodeMarkingFeatureType) The type of the marking
verticalStructureMaterial (String16) The vertical structure material.
junctionType (CodeJunctionType) An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress) The progress of the data collection.
dateAcquired (Date) The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255) The material of the subject item
source (String255) The source of the feature.
projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20) A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus) A temporal description of the operational status of the feature.
Alternative (Integer) Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254) An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel) The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource) The primary source of the data in this record.
dataSource2 (CodeDataSource) The secondary source of the data in this record.
sourceStatement (String255) A statement providing additional details about the source of the data.
editorName (String50) The name of the individual who last edited this data.
lastUpdate (Date) The date upon which any data associated with this record was last updated.

System Keys:

guid (String60) A globally unique identifier applied to each feature in the database for reference.
metaId (Integer) An identifier used to refer to a metadata record that provide additional information about the data in this record.

Gas : Valve

(Database Feature Class Name = GasValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a natural gas line. [SDSFIE NGA/NIMA].

Names and Identifiers:

maaID (String30) A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60) An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject) The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
valveElv (Double) The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
featureUse (String16) Discriminator. The site specific use of the valve.
owner (String60) A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
valveDiameter (CodePipeDiameter) The manufacturer's nominal diameter.
valveSt (CodeStyleValve) The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double) The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line valve.[CENTER].
endDate (Date) The date the evacuation route ended. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[NGA/NIMA].
branchSys (String12) An operator generated identifier that is a unique site specific name or number designation of a branch or isolated area of a natural gas distribution system.
description (String255) A description or other unique information concerning the subject item.
coordX (Double) The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double) The coordinate in the north-south plane, expressed in decimal degrees.
material (String16) The material of the subject item.
junctionType (CodeJunctionType) An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen) The direction a valve must be turned to open
operatingStatus (CodeValveStatus) The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress) The progress of the data collection
dateAcquired (Date) The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255) The material of the subject item
projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.

projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: HCS

HCS : Anchor

(Database Feature Class Name = HeatCoolAnchorPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A structure, typically concrete, used to either guide the expansion of pipes or used to fix the movement of some part of the expansion section. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anchType (CodeHcsAnchor)	Discriminator. This value differentiates similar entities by use or type.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
size (Integer)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Anode

(Database Feature Class Name = HeatCoolAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device used in utility distribution systems that is electrically connected to a less electrolytically active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.
material (CodeAnodes)	The type of material composition of the anode or anode packet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Anode Test Station

(Database Feature Class Name = HeatCoolAnodeTestStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in heating/cooling systems. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeSheathInsulateType)	The type of insulation covering the conductor.
noTerm (Integer)	The total number of terminal connections at the test station.
type (String16)	The type of anode test station configuration use.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.
wireType (String16)	The conductor configuration, typically solid or stranded.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Fitting

(Database Feature Class Name = HeatCoolFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise attach to a heating and cooling system pipe. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fitElv (Double)	The elevation measured at centerline of the fitting, in feet (English units) or meters (SI units) above some datum.
diaIn (Double)	The inside, or interior, diameter of the fitting.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
fitLength (Double)	The overall length of the fitting.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	Discriminator. The kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground heating and cooling system line fitting.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.

sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Junction

(Database Feature Class Name = HeatCoolJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in heating/cooling systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

airrfValve (CodeBoolean)	Indicates whether or not there is an air relief valve installed on subject item? (yes/no)
drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
noValves (Integer)	The number of valves inside the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
area (Double)	The size of the area, zone, or polygon in square units.[Cherry Point].
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.[Cherry Point].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Line

(Database Feature Class Name = HeatCoolLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry a heating/cooling substances from location to location (main line, service line, vent line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
catProt (CodeBoolean)	Indicates whether or not the pipe has been provided with cathodic protection? (yes or no).
expLoop (CodeBoolean)	The expansion loop of the heating and cooling system.
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
groundElevation1 (Double)	The elevation of the ground surface at node_id_1, in feet (English units) or meters (SI units) above some datum.
groundElevation2 (Double)	The elevation of the ground surface at node_id_2, in feet (English units) or meters (SI units) above some datum.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
tape (CodeBoolean)	Location marker tape or wire is installed above underground pipe to facilitate locating with a magnetometer? (yes or no).
featureUse (String16)	Discriminator. The use code for heating and cooling pipes.
pressNorm (Double)	The normal operating pressure of the heating and cooling system pipe.
tempNorm (Double)	The normal operating temperature of the subject item.
tempMax (Double)	The manufacturer's or industry standard's maximum temperature rating of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground heating and cooling system line pipe.[Air Force].
description (String255)	Narrative text providing a brief description of the feature.[Cherry Point].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line’s geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Marker

(Database Feature Class Name = HeatCoolMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc., installed either directly above or immediately adjacent heating/cooling equipment marking its location. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Meter

(Database Feature Class Name = HeatCoolMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of water to a facility or through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
meterCustomer (String20)	The name of the individual, company, or government agency served by the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation at the centerline of the meter, in feet (English units) or meters (SI units) above some datum.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

srvcMtr (CodeBoolean)	An indicator as to whether or not the meter is installed on a service line? (yes or no)
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Plant Area

(Database Feature Class Name = HeatCoolPlantArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A building or structure containing boilers, furnaces, chillers, pumps and appurtenant equipment to produce the water temperature/pressure combinations which are distributed to other buildings and facilities. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

capacCool (Double)	The plant's rated capacity (e.g., tons), which signifies the peak constant cooling ability of the plant.
capacHeat (Double)	The plant's rated capacity (e.g. boiler_hp), which signifies the peak constant heating ability of the plant.
area (Double)	The size of the area, zone, or polygon in square units.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
pressCool (Double)	The nominal chilled water pressure leaving the plant.
pressHeat (Double)	The nominal hot water or steam pressure leaving the plant.
prodType (CodeHeating-CoolingType)	The type of product (chilled water, high temp, etc) produced at this plant.
tempCool (Double)	The nominal chilled water temperature leaving the plant.
tempHeat (Double)	The nominal hot water temperature leaving the plant.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
plantElv (Double)	The finished floor elevation of the energy plant, in feet (English units) or meters (SI units) above some datum.
plantLength (Double)	The overall length dimension of the energy plant.
plantwidth (Double)	The overall width dimension of the energy plant.
type (String16)	Discriminator. The kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Pump

(Database Feature Class Name = HeatCoolPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for heating and cooling system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
capacityAct (Double)	The measured capacity of the pump operating under actual normal head and flow conditions.
capacityRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
pwrReq (CodeVoltage)	The voltage of the electrical power required by the subject item.
primeMethod (String15)	The method by which the pump is primed.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
tdhRated (Double)	The total dynamic head upon which the capacity_rated is based.
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.

Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Rectifier

(Database Feature Class Name = HeatCoolRectifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.
voltIn (CodeVoltage)	The input AC voltage to the rectifier.
voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
currntOut (Double)	The output direct current from the rectifier to the anode system.
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.
noPhases (Integer)	The number of phases to which this device provides reactive power.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
size (Integer)	
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Regulator

(Database Feature Class Name = HeatCoolRegulator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A regulator located in the heating/cooling line that automatically reduces the pressure on the downstream side of the valve to a preset magnitude. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressIn (Double)	The design water system pressure in the waterline on inlet side of the pressure regulator.
pressOut (Double)	The design water system pressure in the waterline on outlet side of the pressure regulator.
pressReqd (Double)	The required maximum outlet pressure setting for the regulator.
regElevation (Double)	The elevation of the pressure regulator, measured at the regulator centerline.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	The kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Valve

(Database Feature Class Name = HeatCoolValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a heating and cooling line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	The site specific use of the valve.
valveSize (Double)	The manufacturer's nominal size designation.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground heating and cooling system line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

HCS : Vault

(Database Feature Class Name = HeatCoolVault)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

Names and Identifiers:	
maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
Attributes:	
airrfValve (CodeBoolean)	
area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	
drainType (CodeDrainType)	
groundElevation (Integer)	
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
junctionType (CodeJunctionType)	
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
mhDia (Double)	
mhLength (Double)	
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.

modelNumber (String20)	The model number of the feature.
description (String255)	A description or other unique information concerning the subject item.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
noValves (Integer)	The number of the valves.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
perimeter (Integer)	
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
size (Integer)	The size of the subject item
type (String16)	
use (String50)	Use of the feature.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Industrial_Waste

Industrial_Waste : Anode

(Database Feature Class Name = IndustrialWasteAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A material used in industrial waste distribution systems that is electrically connected to a less electrolytically active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.[FGDC Utilities Classification].
material (CodeAnodes)	The type of material composition of the anode or anode packet.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
dateInstalled (Date)	The date on which the feature was originally installed.
dateLastInspected (Date)	The date the anode was last inspected or checked. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Anode Test Station

(Database Feature Class Name = IndustrialWasteAnodeTestSta)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in industrial waste system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeSheathInsulateType)	The type of insulation covering the conductor.[FGDC Utilities Classification].
noTerm (Integer)	The total number of terminal connections at the test station.[FGDC Utilities Classification].
type (String16)	The type of anode test station configuration use.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.[FGDC Utilities Classification].
wireType (String16)	The conductor configuration, typically solid or stranded.[FGDC Utilities Classification].
description (String255)	A description or other unique information concerning the subject item.[FGDC Utilities Classification].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Discharge Point

(Database Feature Class Name = IndustrialWasteDischargePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any location where industrial waste water pipes directly discharge effluent. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
type (String16)	A field indicating the kind, class, or group of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Fitting

(Database Feature Class Name = IndustrialWasteFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying industrial waste. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

fitDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fitLength (Double)	The overall length of the fitting.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	Discriminator. The kind, class, or group of the subject item.
fitloc (CodeWasteFittingLocation)	A coded value designating the location of the fitting.[Cherry Point].
estimatedDischarge (Integer)	Estimated discharge through, or from, fitting.[Cherry Point].
dischargedMaterial (String20)	Material being discharged, or potentially discharged.[Cherry Point].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground heating and cooling system line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Grit Chamber

(Database Feature Class Name = IndustrialWasteGritChamber)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A chamber designed to remove sand, gravel, or other heavy solids that have subsiding velocities or specific gravities substantially greater that those of the organic solids in the waste water in the industrial waste system. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
oWSep (CodeBoolean)	An indicator as to whether or not grit chamber has an integrated oil-water separator. (yes or no)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowCapacity (Double)	The flow capacity of the subject item.
gritType (String12)	The predominate type of grit collected in the grit chamber.
storCapacity (Double)	The grit chamber overall storage capacity.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Headwall Line

(Database Feature Class Name = IndustrialWasteHeadwallLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A wall (of any material) depicted as a line at the end of a culvert or drain to serve one or more of the following purposes: protect fill from scour or undermining; increase hydraulic efficiency, divert direction of flow, and serve as a retaining wall. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Headwall

(Database Feature Class Name = IndustrialWasteHeadwallPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A wall (of any material) depicted as a point at the end of a culvert or drain to serve one or more of the following purposes: protect fill from scour or undermining; increase hydraulic efficiency, divert direction of flow, and serve as a retaining wall. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

topElevation (Double)	The elevation of the top of wall above the pipe.
length (Double)	The overall length of the feature.[Center].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Inlet

(Database Feature Class Name = IndustrialWasteInlet)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where water is collected and received into the utility system. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityDgn (Double)	The design flow capacity of the subject item.
inletSt (CodeInlets)	The step domain code for an inlet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
weirElevation (Double)	Elevation of the weir invert.
estimatedDischarge (Integer)	Estimated quantity of discharge to inlet.[Cherry Point].
dischargedMaterial (String20)	Material being discharged, or potentially discharged.[Cherry Point].

description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Junction

(Database Feature Class Name = IndustrialWasteJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in industrial waste systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
linerType (CodeManholeLinerType)	The type of liner used if the pit/manhole is used for neutralizing chemicals.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
reactant (String30)	The chemical in the incoming waste stream being neutralized.
neutAgent (String30)	The chemical agent in the pit which chemically neutralizes the in stream reactant.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
estimatedDischarge (Integer)	Estimated quantity of discharge from subject feature.[Cherry Point].
dischargedMaterial (String20)	Material being discharged, or potentially discharged.[Cherry Point].
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.[USMC].
azimuth (Double)	A direction clockwise in degrees from magnetic north indicating location of pipe opening in manhole.[USMC].

description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Lagoon

(Database Feature Class Name = IndustrialWasteLagoon)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A shallow man made pool or pond for the purpose of holding industrial waste. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.
labName (CodeLaboratory)	The name of the laboratory primarily responsible for completing the required tests for the subject item.
monAgency (String15)	The regulator agency that monitors inflow, containment, and discharge for the subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

aerator (CodeBoolean)	Indicates whether or not the lagoon has aerators. (yes/no)
aeratorPow (Double)	The power rating for the aerator, usually in terms of horse power (hp).
area (Double)	The size of the area, zone, or polygon in square units.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
dateAnl (Date)	Date on which water quality analyses were performed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of containment measured from normal operating pool.
lgnLength (Double)	The average length of the lagoon.
lgnWidth (Double)	The average width dimension of the lagoon, measured from top of opposite side slopes.
manageOff (String12)	The managing office/organization.
testType (CodeSewageTestType)	The type of test used to evaluate the contained material.
invElvAv (Double)	The average elevation of the bottom of the lagoon.
labType (CodeLaboratoryType)	The type of the laboratory primarily responsible for completing the required tests for the subject item.
userInd (CodeBoolean)	An indicator as to whether or not the lagoon is used for industrial wastewater. (yes or no)
userSan (CodeBoolean)	An indicator as to whether or not the lagoon is used for wastewater. (yes or no)
smplFreq (Integer)	The frequency at which material sampling is conducted.
soilCdn (CodeSoilConsistency)	The consistency of the soil indicating soil condition and strength.

werOutl (CodeBoolean)	An indicator as to whether or not the subject item has weir outlets. (yes or no)
xDikes (CodeBoolean)	An indicator whether cross dikes exists in the subject item or not (yes or no).
outCntr (String12)	The outlet control.
noPipesI (Integer)	The number of pipes discharging into the subject item.
noPipesO (Integer)	The number of pipes carrying material/fluid out of the subject item.
noPumps (Integer)	The total number of pumps located at the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
soilEro (CodeSoilsErosionK)	The erosion potential of the soil.
soilFam (CodeSoilsFamily)	The soil family.
soilTex (CodeSoilsTexture)	The soil texture.
pipOutl (CodeBoolean)	An indicator as to whether or not the lagoon has pipe outlets. (yes or no)
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (CodePipeMaterial)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Line

(Database Feature Class Name = IndustrialWasteLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry industrial waste material from location to location (main line, service line, force main line, etc). [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the pipe.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the pipe.
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
lined (CodeBoolean)	An indicator as to whether the pipe is lined or not (yes/no).
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].

invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
featureUse (String16)	Discriminator. The use code for wastewater lines.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
pressNorm (Double)	The normal operating pressure of the industrial waste water pipe.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground industrial waste line pipe.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Marker

(Database Feature Class Name = IndustrialWasteMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate industrial waste. [SDSFIE].

Names and Identifiers:	
maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
Attributes:	
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Meter

(Database Feature Class Name = IndustrialWasteMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of waste through a section of line. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

design (String16)	Discriminator: The design of the water meter.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation of the meter above a specific datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The ground elevation at the subject item.
meterDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
meterLength (Double)	The overall length of the meter.
meterWidth (Double)	The overall width dimension of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Neutralizer

(Database Feature Class Name = IndustrialWasteNeutralizer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A receptacle or chamber, which by chemical reactions with reactant materials in the receptacle, makes liquid waste passing through the receptacle chemically neutral for industrial waste systems. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
linerType (CodeManholeLinerType)	The type of liner used if the pit/manhole is used for neutralizing chemicals.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
neutDiameter (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
neutLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
neutWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
reactant (String30)	The chemical in the incoming waste stream being neutralized.
neutAgent (String30)	The chemical agent in the pit which chemically neutralizes the in stream reactant.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole/pit for the subject utility.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Oil Water Separator

(Database Feature Class Name = IndustrialWasteOilWatSep)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device or structure placed in the industrial waste stream to separate water from oil products. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
sepName (String12)	The site specific identification name or number assigned to the subject item.

Attributes:

datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
disposal (String30)	Brief description of how the waste is disposed.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber. (yes or no)
flowCapacity (Double)	The flow capacity of the subject item.
oilCapacity (Double)	The retention capacity of the oil-water separator.
sepCode (String2)	The oil-water separator code. Usually defined as OW.
sepContnt (String20)	Separator contents
tempOptim (Double)	The optimum operating temperature for the subject item.
separationProcess (String30)	The specific type of separation process.
sepVolume (Double)	The volume of the oil-water separator.
type (String16)	A field indicating the kind, class, or group of the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
probDescription (String255)	Text describing a problem with the oil and water separator[Cherry Point].
datePumpd (Date)	The date the oil and water separator was last pumped out. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[Cherry Point].
estimatedDischarge (Integer)	Estimated quantity of discharge from subject feature.[Cherry Point].
shopNo (String20)	Current shop number for subject item.[Cherry Point].
dischargedMaterial (String20)	Material being discharged, or potentially discharged.[Cherry Point].
disType (String20)	Type of discharge point.[Cherry Point].
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Pump

(Database Feature Class Name = IndustrialWastePump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device that draws for industrial waste system material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityAct (Double)	The measured capacity of the pump operating under actual normal head and flow conditions.
capacityRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
featureUse (String16)	The particular application, or use of the subject item.
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Pumpstation Ejector

(Database Feature Class Name = IndustrialWastePumpstnEjector)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to supply industrial waste flowing at adequate pressure to or from a distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

alrmlvlelv (Double)	The elevation in the wet well that triggers an alarm indicating no additional storage capacity.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
design (String16)	Discriminator. The design of the pump station.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
hiWaterElevation (Double)	The high water or overflow elevation of the storage tank at the pumping station, in feet (English units) or meters (SI units) above some datum.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
staLength (Double)	The overall length of the pump station plant area.
wetwlCapacity (Double)	The wet well capacity.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
noPumps (Integer)	The total number of pumps located at the subject item.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Rect Point

(Database Feature Class Name = IndustrialWasteRectPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system on an element of the industrial waste distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.[FGDC Utilities Classification].
currntOut (Double)	The output direct current from the rectifier to the anode system.[FGDC Utilities Classification].
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.[FGDC Utilities Classification].
noPhases (Integer)	The number of phases to which this device provides reactive power.[FGDC Utilities Classification].
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.[FGDC Utilities Classification].
voltIn (CodeVoltage)	The input AC voltage to the rectifier.[FGDC Utilities Classification].

voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.[FGDC Utilities Classification].
description (String255)	A description or other unique information concerning the subject item.[FGDC Utilities Classification].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Storage Area

(Database Feature Class Name = IndustrialWasteStorageArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A structure used to contain and hold industrial waste. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
facilityNumber (String20)	The organization specific identification code from Army's IFS-M, Air Force's WIMS, or Navy's Property Record Code Number.
labName (CodeLaboratory)	The name of the laboratory primarily responsible for completing the required tests for the subject item.
monAgency (String15)	The regulator agency that monitors inflow, containment, and discharge for the subject item.

Attributes:

dateInstalled (Date)	The date on which the feature was originally installed.
dateLastInspected (Date)	The last inspection date of the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
condition (CodePoleCondition)	The condition of the subject item when last inspected.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
userInd (CodeBoolean)	An indicator as to whether or not the vault is used for industrial wastewater. (yes or no)
userSan (CodeBoolean)	An indicator as to whether or not the vault is used for wastewater. (yes or no)
depthAvg (Double)	The average depth of containment.
vltLength (Double)	The average length of the vault.
vltWidth (Double)	The average width dimension of the vault, measured from top of opposite side slopes.
invElv (Double)	The elevation of the bottom of the vault.
aerator (CodeBoolean)	Indicates whether or not the vault has aerators. (yes/no)
aeratorPow (Double)	The power rating for the aerator, usually in terms of horse power (hp).
noPumps (Integer)	The total number of pumps located at the subject item.
noPipesI (Integer)	The number of pipes discharging into the subject item.
noPipesO (Integer)	The number of pipes carrying material/fluid out of the subject item.
outCntr (String12)	The outlet control.

pipOutl (CodeBoolean)	An indicator as to whether or not the vault has pipe outlets. (yes or no)
werOutl (CodeBoolean)	An indicator as to whether or not the subject item has weir outlets. (yes or no)
smplFreq (Integer)	The frequency at which material sampling is conducted.
testType (CodeSewageTestType)	The type of test used to evaluate the contained material.
dateAnl (Date)	Date on which water quality analyses were performed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
labType (CodeLaboratoryType)	The type of the laboratory primarily responsible for completing the required tests for the subject item.
manageOff (String12)	The managing office/organization.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Tank

(Database Feature Class Name = IndustrialWasteTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above or below grade receptacle or chamber used for holding industrial waste on a temporary basis prior to disposal. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
headNorm (Double)	The normal operating head for the subject item.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.

tankSt (CodeStyleTank)	This value differentiates similar entities by use or type.
tankUse (CodeTankUse)	The particular kind or use of the industrial waste water tank.
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.
description (String255)	A description or other unique information concerning the subject item.
color (CodeColor)	The color of the industrial waste tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Treatment Plant

(Database Feature Class Name = IndustrialWasteTreatmentPlant)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A structure containing equipment used to treat and remove unwanted constituents from industrial waste.. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
bypass (CodeBoolean)	Indicates whether or not the treatment plant has a bypass line? (yes or no).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowAct (Double)	The measured peak treatment capacity of the water treatment plant when installation has been completed and it is operating under normal inflow and demand conditions.
flowRated (Double)	The plant manufacturer's rated treatment plant capacity (e.g., gpm), which signifies the peak constant or daily flow of raw water that the plant can treat and transform to the specified water quality requirements.
type (String16)	A field indicating the kind, class, or group of the subject item.
noPumps (Integer)	The total number of pumps located at the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
plantElv (Double)	The finished floor elevation of the treatment plant, in feet (English units) or meters (SI units) above some datum.

plantLength (Double)	The overall length dimension of the treatment plant.
plantwidth (Double)	The overall width dimension of the water treatment plant.
description (String255)	A description or other unique information concerning the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Industrial_Waste : Valve

(Database Feature Class Name = IndustrialWasteValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a industrial waste line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	The particular application, or use the subject item.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground industrial waste line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Storm

Storm : Storm Ceptor

(Database Feature Class Name = StormCeptor)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Confidential

A patented water quality structure that takes the place of a conventional manhole with in a storm drain system.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
sepName (String50)	The name of the storm captor.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
disposal (String50)	Brief description of how the waste is disposed.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
flowCapacity (Integer)	The flow capacity of the subject item.
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber.
inspectionPhase (String16)	The phase of the inspection.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
oilCapacity (Integer)	The capacity of the storm captor for storing oil.
oldMAAAlias (String50)	The old MAA alias.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
perimeter (Integer)	The distance around the boundary of the area, zone, or subject item in linear units.
separationProcess (String50)	The specific type of separation process.
sepCode (String2)	The oil-water separator code. Usually defined as OW.
sepContnt (String20)	Separator contents
sepVolume (Integer)	The volume of the oil-water separator.
tempOptim (Integer)	The optimum operating temperature for the subject item.
type (String16)	Discriminator. The kind, class, or group of the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Discharge Point

(Database Feature Class Name = StormDischargePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any location where storm sewer pipes directly discharge effluent. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String40)	Descriptive text of the item
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
type (String16)	A field indicating the kind, class, or group of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
sysType (String16)	The type of stormwater discharge system.[USACE OPERATIONS].
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
coordZ (Double)	The coordinate in the vertical plane.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
iDDE (String10)	
inspectionPhase (String16)	The phase of the inspection.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Downspout

(Database Feature Class Name = StormDownspout)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pipe normally attached to the side of a building or structure which conveys rainfall runoff from the roof area to the ground surface or the storm sewer system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

dnsptLength (Double)	The length of the downspout, measured from highest point to its discharge point.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
baseElevation (Double)	The elevation of the discharge point of the downspout in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The elevation of the ground surface at the discharge point, in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Drainage Basin

(Database Feature Class Name = StormDrainageBasin)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An area in which surface runoff collects and from which it is carried by a drainage system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
gradeMean (Double)	The average grade in the drainage basin.
gradeMin (Double)	The minimum or shallowest grade in the drainage basin.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
gradeMax (Double)	The maximum or steepest grade in the drainage basin.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
acres (Double)	The size of the drainage basin in acres.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Drainage Divide Line

(Database Feature Class Name = StormDrainageDivideLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

The border of a drainage basin where one side directs runoff to one basin and the other side directs runoff to a different basin. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Storm Filter

(Database Feature Class Name = StormFilter)

Geometry Type: Point Accuracy: +/-5Ft. Sensitivity: Confidential

A filter to remove target pollutants using a variety of sustainable media designed to meet regulatory requirements.

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
sepName (String50)	

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
disposal (String50)	Brief description of how the waste is disposed.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
flowCapacity (Integer)	The flow capacity of the subject item.
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber.
inspectionPhase (String16)	The phase of the inspection.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
numFilters (Integer)	The number of filters in place.
oilCapacity (Integer)	The capacity of the storm filter for capturing oil.
oldMAAAlias (String50)	The old MAA alias.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
perimeter (Integer)	The distance around the boundary of the area, zone, or subject item in linear units.
separationProcess (String50)	The specific type of separation process.
sepCode (String2)	The oil-water separator code. Usually defined as OW.
sepContnt (String20)	Separator contents
sepVolume (Integer)	The volume of the oil-water separator.
tempOptim (Integer)	The optimum operating temperature for the subject item.
type (String16)	Discriminator. The kind, class, or group of the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.

projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Fitting

(Database Feature Class Name = StormFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying storm sewage. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

fitDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
fitLength (Double)	The overall length of the fitting.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	Discriminator. The kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground storm water line fitting.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
oldMaaAlias (String50)	The old MAA alias.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Flow Control Device

(Database Feature Class Name = StormFlowControlDevice)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Devices for a storm water system to control the pressure in and out of the open channel. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

cntrlElv (Double)	The elevation at the centerline of the flow control device, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
fctDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
fctLength (Double)	The overall length of the flow control.
fctWidth (Double)	The width dimension of the subject item, measured from opposite inside faces.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String100)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Gate

(Database Feature Class Name = StormGate)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A movable barrier used in an open channel. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

gateSt (CodeStyleGates)	The particular kind, class, or group of gate.
gateWidth (Double)	The width dimension of the subject item, measured from opposite inside faces.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
gateLength (Double)	The overall length of the storm gate.
gateCapacity (Double)	The flow capacity of the storm gate.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Headwall Line

(Database Feature Class Name = StormHeadwallLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A wall (of any material) depicted as a line at the end of a culvert or drain to serve one or more of the following purposes: protect fill from scour or undermining; increase hydraulic efficiency, divert direction of flow, and serve as a retaining wall. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Headwall

(Database Feature Class Name = StormHeadwallPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A wall (of any material) depicted as a point at the end of a culvert or drain to serve one or more of the following purposes: protect fill from scour or undermining; increase hydraulic efficiency, divert direction of flow, and serve as a retaining wall. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the storm sewer headwall.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

riverMile (Double)	River mile marker.[REEGIS].
pollType (String16)	Pollution type.[REEGIS].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
topElevation (Double)	The elevation of the top of wall above the pipe.
length (Double)	The overall length of the feature.[Center].
description (String255)	Any brief description of the feature.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.

editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Inlet

(Database Feature Class Name = StormInlet)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where water is collected and received into the utility system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityDgn (Double)	The design flow capacity of the subject item.
inletSt (CodeInlets)	Discriminator. The step domain code for an inlet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
weirElevation (Double)	Elevation of the weir invert.
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
garageInlet (CodeBoolean)	Indicator as to whether the inlet is located within a garage or not. This is important to the MES database.
coordZ (Double)	The coordinate in the vertical plane.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
inspectionPhase (String16)	The phase of the inspection.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Junction

(Database Feature Class Name = StormJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in storm sewer systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

type (String100)	A field indicating the kind, class, or group of manhole for the subject utility.
drainType (CodeDrainType)	The type of subject item drain.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
description (String255)	A description or other unique information concerning the subject item.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
inspectionPhase (String16)	The phase of the inspection.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
mhDia (Integer)	The diameter of the manhole.
oldMaaAlias (String50)	The old MAA alias.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Line

(Database Feature Class Name = StormLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry storm sewer water from location to location (main line, service line, vent line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name of the culvert.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
idDwnStrmFeat (String50)	The ID of the downstream storm feature.
idDwnStrmStruct (String50)	The ID of the downstream storm structure.
idUpStrmFeat (String50)	The ID of the upstream storm feature.
idUpStrmStruct (String50)	The ID of the upstream storm structure.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainageZone (CodeDrainageZone)	Local name of assigned hydrographic drainage zones.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the pipe.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the pipe.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
pipeWidth (Double)	The width dimension of the subject item, measured from opposite inside faces.
lined (CodeBoolean)	An indicator as to whether the pipe is lined or not (yes/no).
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
scrnType (CodeCulvertScreenType)	The type of screen used to cover the end of the culvert.
type (String16)	A field indicating the kind, class, or group of the subject item.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
featureUse (String16)	Discriminator. The use code for storm sewer line.
pressNorm (Double)	The normal operating pressure of the storm system pipe.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground storm water line pipe.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
fromCoordX (Double)	The from, or downstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
fromCoordY (Double)	The from, or downstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
fromCoordZ (Double)	The from, or downstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
toCoordX (Double)	The to, or upstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
toCoordY (Double)	The to or upstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
toCoordZ (Double)	The to, or upstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
dwnStrmStructType (String10)	The type of the downstream structure, if any
upStrmStructType (String10)	The type of the downstream structure, if any
immediateOutFall (String20)	Identifying tag of the immediate outfall to which the pipe leads.
finalOutFall (String20)	Identifying tag of the final outfall to which the pipe leads.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
inspectionPhase (String16)	The phase of the inspection.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line’s geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Marker

(Database Feature Class Name = StormMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of nearby storm sewer. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Oil Water Separator

(Database Feature Class Name = StormOilWaterSeparator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device or structure placed in the storm sewer stream to separate water from oil products. [SDSFIE USMC].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
sepName (String12)	The site specific identification name or number assigned to the subject item.

Attributes:

datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
disposal (String30)	Brief description of how the waste is disposed.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber. (yes or no)
flowCapacity (Double)	The flow capacity of the subject item.
oilCapacity (Double)	The retention capacity of the oil-water separator.
sepCode (String2)	The oil-water separator code. Usually defined as OW.
type (String16)	A field indicating the kind, class, or group of the subject item.
tempOptim (Double)	The optimum operating temperature for the subject item.
sepContnt (String20)	Separator contents
separationProcess (String30)	The specific type of separation process.
sepVolume (Double)	The volume of the oil-water separator.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
inspectionPhase (String16)	The phase of the inspection.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
invertFeet (Double)	Measurement from the top of the manhole to the bottom
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Open Drainage Area

(Database Feature Class Name = StormOpenDrainageArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

Interception and removal area of ground water or surface water. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
vegMaintID (String16)	The vegetation maintenance ID.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
acreage (Integer)	The size of the open draining area in acres.
inspectionPhase (String16)	The phase of the inspection.
maintRequirements (String255)	Maintenance requirements of the open drainage area.
oldMaaAlias (String50)	The old MAA alias.
structureType (String16)	The type of structure.
material (String16)	The material of the subject item
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Open Drainage Line

(Database Feature Class Name = StormOpenDrainageLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

Interception and removal of ground water or surface water by natural means. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
reachName (String20)	An operator generated identifier for the reach of an open channel.
idDwnStrmFeat (String50)	The ID of the downstream storm feature.
idUpStrmFeat (String50)	The ID of the upstream storm feature.

Attributes:

chanLength (Double)	The overall length of the open channel.
chanSt (CodeStyleOpenChannel)	The style or geometric configuration of the channel
bedMaterial (CodeBedMaterial)	The type of bedding material beneath the channel armor.
bankArm (CodeBankArmorLining)	The type of channel armor used.
design (String16)	Discriminator. The design code for open channel.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainageZone (CodeDrainageZone)	Local name of assigned hydrographic drainage zones.
bottomWidth (Double)	The bottom width of the open channel measured from the base of opposite side slopes.
fldZon (CodeDrainageZone)	Local name of assigned hydrographic drainage zones.
flmeanElv (Double)	The elevation of the mean flow above a specific datum.
flmeanTop (Double)	The average top width of the mean flow.
flmeanXar (Double)	The cross section area of the mean flow for the open channel.
flooddepth (Double)	The average depth of the specific flood.
flowMean (Double)	The mean or average flow rate for the open channel.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of channel at node_id_2 in feet (English units) or meters (SI units) above some datum.
noFloods (Integer)	The total number of floods recorded for this channel.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
slopeLeft (Double)	The slope of the left channel side expressed as a percentage.
slopeRght (Double)	The slope of the right channel side expressed as a percentage.
topWidth (Double)	The top width of the open channel measured from the top of opposite side slopes.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.[USMC].
area (Double)	The size of the area, zone, or polygon in square units.[USMC].
photoFileName (String30)	File location of photo (if applicable)
wellDiameter (Double)	MAA requirement The diameter of the monitoring well in the infiltration trench.
description (String255)	A description or other unique information concerning the subject item.
wellDepth (Double)	MAA requirement The depth of the monitoring well in the infiltration trench.
MAA requirementlocationDesc (String255)	MAA requirement, text description of location of trench
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
fromCoordX (Double)	The from, or downstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
fromCoordY (Double)	The from, or downstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
fromCoordZ (Double)	The from, or downstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
inspectionPhase (String16)	The phase of the inspection.
oldMaaAlias (String50)	The old MAA alias.
structureType (String16)	The type of structure.
toCoordX (Double)	The to, or upstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
toCoordY (Double)	The to or upstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
toCoordZ (Double)	The to, or upstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.

dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Oil Water Separator Diversion Vault

(Database Feature Class Name = StormOWSDiversionVault)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
maaAlias (String60)	An alternative or former name by which the feature is refered.
mapGrid (String20)	The map grid that the feature resides within.
pipeWidth (Integer)	The width of the pipe.
vaultWidth (Integer)	The widget of the vault.

Attributes:

airReleasePresent (CodeBoolean)	Indicates whether or not an air release valve is present
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Integer)	Average depth of the feature.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
description (String255)	A description or other unique information concerning the subject item.
pierCode (String20)	The code of the pier associated with the feature.
pipeMaterial (CodePipeMaterial)	Material of which inlet pipe is made
pumpOutPresent (CodeBoolean)	Indicates whether or not a pump out conection is present
size (Integer)	The size of the subject item.
vaultLength (Integer)	The length of the vault.
vaultType (CodeVaultType)	The type of the vault.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.

metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Pump

(Database Feature Class Name = StormPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for storm sewer system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

outflwAct (Double)	The actual measured pump flow output.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
type (String16)	A field indicating the kind, class, or group of the subject item.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
description (String255)	A description or other unique information concerning the subject item.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
inspectionPhase (String16)	The phase of the inspection.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Pump Station

(Database Feature Class Name = StormPumpStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to supply material flowing at adequate pressure to or from a storm sewer distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the storm sewer pump station.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

alrmlvlelv (Double)	The elevation in the wet well that triggers an alarm indicating no additional storage capacity.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
hiWaterElevation (Double)	The high water or overflow elevation of the storage tank at the pumping station, in feet (English units) or meters (SI units) above some datum.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
staLength (Double)	The overall length of the pump station plant area.
wetwlCapacity (Double)	The wet well capacity.
area (Double)	The size of the area, zone, or polygon in square units.
type (String16)	A field indicating the kind, class, or group of the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
noPumps (Integer)	The total number of pumps located at the subject item.
riverMile (Double)	River mile marker.[REEGIS].
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
mxDsgnHd (Double)	The water elevation of the maximum design head of the pump in feet NGVD.[REEGIS].
dateEnd (Date)	The date the project was actually completed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)[REEGIS].
capacity (Double)	The pumping capacity at the maximum design head in cfs.[REEGIS].
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Reservoir

(Database Feature Class Name = StormReservoirLocation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where storm sewer water is collected. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of containment measured from normal operating pool.
invElvAv (Double)	The average elevation of the bottom of the reservoir.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
xDikes (CodeBoolean)	An indicator whether cross dikes exists in the subject item or not (yes or no).
outCntr (String12)	The outlet control.
featureUse (String16)	The particular application, or use the subject item.
resLength (Double)	The overall length of the reservoir.
resType (CodeReservoirType)	The type or classification of the reservoir.
resWidth (Double)	The average width dimension of the reservoir, measured from top of opposite side slopes.
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Stilling Basin

(Database Feature Class Name = StormStillingBasin)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where the energy from turbulent water flow is reduced. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of containment measured from normal operating pool.

outCntr (String12)	The outlet control.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
invElvAv (Double)	The average elevation of the bottom of the stilling basin.
sbnLength (Double)	The overall length of the stilling basin.
sbnWidth (Double)	The average width dimension of the stilling basin, measured from top of opposite side slopes.
type (String16)	A field indicating the kind, class, or group of the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
xDikes (CodeBoolean)	An indicator whether cross dikes exists in the subject item or not (yes or no).
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Storm Trench Drain Line

(Database Feature Class Name = StormTrenchDrainLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Confidential

Names and Identifiers:	
maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String50)	The name of the feature.
maaAlias (String60)	An alternative or former name by which the feature is refered.
idDwnStrmFeat (String50)	The ID of the downstream storm feature.
idDwnStrmStruct (String50)	The ID of the downstream storm structure.
idUpStrmFeat (String50)	The ID of the upstream storm feature.
idUpStrmStruct (String50)	The ID of the upstream storm structure.
trenchWidth (Integer)	The width of the trench.
Attributes:	
coverDepth (Double)	Depth of cover. The depth measured from top of ground's surface (or grade) to top of underground fuel line pipe.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line’s geometry.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the culvert.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the grease trap.
drainageZone (CodeDrainageZone)	The local name of assigned the hydrographic drainage zone.

dwnStrmStructType (String20)	The type of the downstream structure, if any.
enabled (CodeBoolean)	Flag used for networking functionality in MES application.
finalOutFall (String50)	Final outfall.
fromCoordX (Double)	The from, or downstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
fromCoordY (Double)	The from, or downstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
fromCoordZ (Double)	The from, or downstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
immediateOutFall (String50)	Immediate outfall.
impedance (Integer)	The number representing the total opposition to flow.
inspectionPhase (String16)	The phase of the inspection.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Integer)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
lined (CodeBoolean)	An indicator as to whether the pipe is lined or not (yes/no).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
modelNumber (String20)	The model number of the feature.
description (String255)	A description or other unique information concerning the subject item.
oldMAAAlias (String50)	The old MAA alias.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressMax (Integer)	The maximum pressure.
pressNorm (Integer)	The normal pressure.
scrnType (CodeCulvertScreenType)	The type of screen used to cover the end of the culvert.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
slopeBot (Integer)	The bottom slope of the feature.
toCoordX (Double)	The to, or upstream,coordinate of the pipe in the east-west plane in as measured by GPS equipment.
toCoordY (Double)	The to or upstream, coordinate of the pipe in the north-south plane in as measured by GPS equipment.
toCoordZ (Double)	The to, or upstream, coordinate of the pipe in the vertical plane in as measured by GPS equipment.
trenchLength (Integer)	The length of the trench.
type (String16)	A field indicating the kind, class, or group of the subject item.
upStrmStructType (String16)	Upstream storm structure type.
use (String50)	Use of the feature.
Metadata:	
collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.
System Keys:	
guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Storm : Valve

(Database Feature Class Name = StormValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a storm sewer line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
featureUse (String16)	The particular application, or use the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground storm water line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
oldMaaAlias (String50)	The old MAA alias.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
verified (String255)	Whether or not the feature has been verified.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Wastewater

Wastewater : Anode

(Database Feature Class Name = WastewaterAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A material used in waste water distribution systems that is electrically connected to a less electrolytically-active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.[FGDC Utilities Classification].
dateInstalled (Date)	The date on which the feature was originally installed.
dateLastInspected (Date)	The date the anode was last inspected or checked. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).[FGDC Utilities Classification].
material (CodeAnodes)	The type of material composition of the anode or anode packet.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.[FGDC Utilities Classification].
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Anode Test Station

(Database Feature Class Name = WastewaterAnodeTestStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in wastewater systems. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeSheathInsulateType)	The type of insulation covering the conductor.[FGDC Utilities Classification].
noTerm (Integer)	The total number of terminal connections at the test station.[FGDC Utilities Classification].
type (String16)	The type of anode test station configuration use.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.[FGDC Utilities Classification].
wireType (String16)	The conductor configuration, typically solid or stranded.[FGDC Utilities Classification].
description (String255)	A description or other unique information concerning the subject item.[FGDC Utilities Classification].
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Discharge Point

(Database Feature Class Name = WastewaterDischargePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Any location where wastewater pipes directly discharge effluent. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
type (String16)	A field indicating the kind, class, or group of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
sysType (String16)	The type of wastewater system.[USACE OPERATIONS].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Disposal Tank

(Database Feature Class Name = WastewaterDisposalTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above or below grade receptacle or chamber for holding waste water on a temporary basis prior to transfer or use. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
headNorm (Double)	The normal operating head for the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankUse (CodeTankUse)	The particular kind or use of the waste water tank.
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
pressNorm (Double)	The manufacturer's (as rated by American Society of Mechanical Engineers (ASME) testing procedures) maximum pressure rating of the waste water tank.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
tankDes (CodeWastewaterTankType)	This value differentiates similar entities by use or type.
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.
description (String255)	A description or other unique information concerning the subject item.
tankSt (CodeStyleTank)	This value differentiates similar entities by use or type.
color (CodeColor)	The color of the disposal tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Downspout

(Database Feature Class Name = WastewaterDownspout)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pipe normally attached to the side of a building or structure which conveys rainfall runoff from the roof area to the ground surface or an underground collection system for wastewater. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

dnsptLength (Double)	The length of the downspout, measured from highest point to its discharge point.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
baseElevation (Double)	The elevation of the discharge point of the downspout in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The elevation of the ground surface at the discharge point, in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Drain Field

(Database Feature Class Name = WastewaterDrainField)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

The area of influence where perforated pipe placed in gravel trenches carries effluent from a waste storage containment for percolation into the earth. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Filtration Bed

(Database Feature Class Name = WastewaterFiltrationBed)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A below grade system consisting of perforated piping installed in sand or gravel beds or trenches designed to permit the uniform distribution and absorption of effluent from a septic tank or aerobic unit into the soil. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Fitting

(Database Feature Class Name = WastewaterFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying wastewater. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)

maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

fitDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
fitLength (Double)	The overall length of the fitting.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String100)	Discriminator. The kind, class, or group of the subject item.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground wastewater line fitting.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Grease Trap

(Database Feature Class Name = WastewaterGreaseTrap)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A tank which separates grease from water, collects the grease for removal, and allows the water to exit. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

dstbx (CodeBoolean)	Indicates whether or not a distribution box exists for the subject item. (yes or no)
dstbxIEl (Double)	The invert elevation of the inside bottom of the distribution box.
drnflSt (CodeStyleDrainField)	The style of field drain system indicating the configuration and layout of the drain lines.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the grease trap.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the grease trap.

manhole (CodeBoolean)	An indication as to whether or not is part of a manhole or has access via a manhole (yes/no).
gtpWidth (Double)	The width dimension of the subject item, measured from opposite inside faces.
latDiTot (Double)	The total diameter of all drainage laterals
latdimean (Double)	The average diameter of all drainage laterals
laterlSlp (Double)	The average slope of all drainage laterals.
laterlTot (Double)	The total (sum) length of all drainage laterals.
laterlmean (Double)	The mean or average length of the drainage laterals.
flowRate (Double)	The flow rate of the feature.
gtpCapacity (Double)	The grease trap's storage capacity (e.g., gallons, ft3, etc).
gtpDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
gtpLength (Double)	The overall length of the grease trap.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
noLateral (Integer)	The total number of laterals.
trapSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g., elevated, hydropneumatic, etc.).
trenchWid (Double)	The trench width excavated for the field drains.
soilPerc (Double)	The percolation rate of the soil in which the drain field lines are placed.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Grit Chamber

(Database Feature Class Name = WastewaterGritChamber)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A chamber designed to remove sand, gravel, or other heavy solids that have subsiding velocities or specific gravities substantially greater than those of the organic solids in the waste water system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
oWSep (CodeBoolean)	An indicator as to whether or not grit chamber has an integrated oil-water separator. (yes or no)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowCapacity (Double)	The flow capacity of the subject item.

gritType (String12)	The predominate type of grit collected in the grit chamber.
storCapacity (Double)	The grit chamber overall storage capacity.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Inlet

(Database Feature Class Name = WastewaterInlet)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where waste water is collected and received into the utility system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityDgn (Double)	The design flow capacity of the subject item.
inletSt (String16)	Discriminator: This value differentiates similar entities by use or type.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
weirElevation (Double)	Elevation of the weir invert.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].

qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Junction

(Database Feature Class Name = WastewaterJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in wastewater systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
highLevelAlarmId (String50)	The high level alarm ID.
idDestMH (String50)	The ID of the destination manhole.

Attributes:

drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
linerType (CodeManholeLinerType)	The type of liner used if the pit/manhole is used for neutralizing chemicals.
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
reactant (String30)	The chemical in the incoming waste stream being neutralized.
neutAgent (String30)	The chemical agent in the pit which chemically neutralizes the in stream reactant.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
noSteps (Integer)	Number of manhole steps.[Cherry Point].
illict (CodeBoolean)	Indication whether or not (yes/no) illicit flow was detected in manhole or box.[Cherry Point].
description (String255)	The text describing a wastewater manhole.[Cherry Point].
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
coordZ (Double)	The coordinate in the vertical plane in as measured by GPS equipment.
highLevelAlarmFlag (CodeBoolean)	Indicator whether manhole is (or has?) a high level alarm
apronTroughMaterial (CodeManholeMaterial)	The material of the apron trough.
corbelWallsMaterial (CodeManholeMaterial)	The material of the corbel walls.
coverMaterial (CodeManholeCoverType)	The cover material.
effluentPipeDestination (String50)	The effulent pipe destination.
effluentPipeDiameter (CodePipeDiameter)	The effulent pipe diameter.
effluentPipeInvert (Double)	The effluent pipe invert.
effluentPipeMaterial (CodePipeMaterial)	Material of which the pipe is made.

influentPipe1Diameter (CodePipeDiameter)	The influent pipe diameter.
influentPipe1Invert (Double)	The influent pipe invert.
influentPipe1Material (CodePipeMaterial)	The influent pipe material.
influentPipe1Origin (String50)	The influent pipe origin.
influentPipe2Diameter (CodePipeDiameter)	The second influent pipe diameter.
influentPipe2Invert (Double)	The second influent pipe invert.
influentPipe2Material (CodePipeMaterial)	The second influent pipe material.
influentPipe2Origin (String50)	The second influent pipe origin.
influentPipe3Diameter (CodePipeDiameter)	The third influent pipe origin.
influentPipe3Invert (Double)	The third influent pipe invert.
influentPipe3Material (CodePipeMaterial)	The third influent pipe material.
influentPipe3Origin (String50)	The third influent pipe origin.
influentPipe4Diameter (CodePipeDiameter)	The fourth influent pipe diameter.
influentPipe4Invert (Double)	The fourth influent pipe invert.
influentPipe4Material (CodePipeMaterial)	The fourth influent pipe material.
influentPipe4Origin (String50)	The fourth influent pipe origin.
influentPipe5Diameter (CodePipeDiameter)	The fourth influent pipe diameter.
influentPipe5Invert (Double)	The fifth influent pipe invert.
influentPipe5Material (CodePipeMaterial)	The fifth influent pipe material.
influentPipe5Origin (String50)	The fifth influent pipe origin.
manholeSteps (String50)	The number of steps in the manhole.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Lagoon

(Database Feature Class Name = WastewaterLagoon)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A shallow man made pool or pond for the purpose of providing treatment of domestic wastewater. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.
labName (CodeLaboratory)	The name of the laboratory primarily responsible for completing the required tests for the subject item.
monAgency (String15)	The regulator agency that monitors inflow, containment, and discharge for the subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

aerator (CodeBoolean)	Indicates whether or not the lagoon has aerators. (yes/no)
aeratorPow (Double)	The power rating for the aerator, usually in terms of horse power (hp).
area (Double)	The size of the area, zone, or polygon in square units.
dateAnl (Date)	Date on which water quality analyses were performed. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
depthAvg (Double)	The average depth of containment measured from normal operating pool.
lgnLength (Double)	The average length of the lagoon.
lgnWidth (Double)	The average width dimension of the lagoon, measured from top of opposite side slopes.
outCntr (String12)	The outlet control.
manageOff (String12)	The office/organization responsible for managing the lagoon.
testType (CodeSewageTestType)	The type of test used to evaluate the contained material.
invElvAv (Double)	The average elevation of the bottom of the lagoon.
labType (CodeLaboratoryType)	The type of the laboratory primarily responsible for completing the required tests for the subject item.
userInd (CodeBoolean)	An indicator as to whether or not the lagoon is used for industrial wastewater. (yes or no)
userSan (CodeBoolean)	An indicator as to whether or not the lagoon is used for wastewater. (yes or no)
smplFreq (Integer)	The frequency at which material sampling is conducted.
soilCdn (CodeSoilConsistency)	The consistency of the soil indicating soil condition and strength.
werOutl (CodeBoolean)	An indicator as to whether or not the subject item has weir outlets. (yes or no)
xDikes (CodeBoolean)	An indicator whether cross dikes exists in the subject item or not (yes or no).
noPumps (Integer)	The total number of pumps located at the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
soilEro (CodeSoilsErosionK)	The erosion potential of the soil.
soilFam (CodeSoilsFamily)	The soil family.
soilTex (CodeSoilsTexture)	The soil texture.
type (String16)	A field indicating the kind, class, or group of the subject item.
pipOutl (CodeBoolean)	An indicator as to whether or not the lagoon has pipe outlets. (yes or no)
description (String255)	A description or other unique information concerning the subject item.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Line

(Database Feature Class Name = WastewaterLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry waste water from location to location (main line, service line, force main line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
idDwnStrmMH (String50)	The ID of the downstream manhole.
idUpStrmMH (String50)	The ID of the upstream manhole.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the pipe.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the pipe.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
lined (CodeBoolean)	An indicator as to whether the pipe is lined or not (yes/no).
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
featureUse (String16)	Discriminator. The use code for wastewater lines.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
pressNorm (Double)	The normal operating pressure of the waste water system pipe.
type (CodeWastewaterLineType)	A field indicating the kind, class, or group of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
piplty (CodePipelineLocationType)	The location of the pipeline in relevance to the earth's surface.[USGS].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground wastewater line pipe.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line’s geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Marker

(Database Feature Class Name = WastewaterMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of waste water. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Meter

(Database Feature Class Name = WastewaterMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of water through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

design (String16)	Discriminator: The design of the water meter.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation at the centerline of the meter, in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
meterDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
meterLength (Double)	The overall length of the meter.
meterWidth (Double)	The overall width dimension of the subject item.

type (String16)	A field indicating the kind, class, or group of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Neutralizer

(Database Feature Class Name = WastewaterNeutralizer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A receptacle or chamber where chemicals react with reactant materials, resulting in making liquid waste passing through chemically neutral for wastewater systems. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
linerType (CodeManholeLinerType)	The type of liner used if the pit/manhole is used for neutralizing chemicals.
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
neutDiameter (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
neutLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
neutWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
reactant (String30)	The chemical in the incoming waste stream being neutralized.
neutAgent (String30)	The chemical agent in the pit which chemically neutralizes the in stream reactant.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of manhole/pit for the subject utility.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Oil Water Separator

(Database Feature Class Name = WastewaterOilWaterSeparator)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device or structure placed in the waste water stream to separate water from oil products. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
sepName (String12)	The site specific identification name or number assigned to the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
datePerX (Date)	The date the current permit expires for the subject item. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
oilCapacity (Double)	The retention capacity of the oil-water separator.
disposal (String30)	Brief description of how the waste is disposed.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
grtchbr (CodeBoolean)	An indicator as to whether or not the subject item has a grit chamber. (yes or no)
flowCapacity (Double)	The flow capacity of the subject item.
separatorCode (String2)	The oil-water separator code. Usually defined as OW.
tempOptim (Double)	The optimum operating temperature for the subject item.
sepContnt (String20)	Separator contents
separationProcess (String30)	The specific type of separation process.
sepVolume (Double)	The volume of the oil-water separator.
type (String16)	A field indicating the kind, class, or group of the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
size (Double)	The manufacturer's designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 6 inches).[Cherry Point].
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.[Cherry Point].
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Pump

(Database Feature Class Name = WastewaterPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for wastewater system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the pump/lift station.[REEGIS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
outflwAct (Double)	The actual measured pump flow output.
outflwRat (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
featureUse (String16)	The particular application, or use the subject item.
type (String16)	A field indicating the kind, class, or group of the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
pumpHp (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
riverMile (Double)	River mile marker.[REEGIS].
noPumps (Integer)	The number of pumps located at the station.[REEGIS].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.

status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Pump Ejector Station

(Database Feature Class Name = WastewaterPumpEjectorStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to pump wastewater flowing at adequate pressure to or from a distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

alrmlvlelv (Double)	The elevation in the wet well that triggers an alarm indicating no additional storage capacity.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
design (String16)	Discriminator. The design of the pump station.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
hiWaterElevation (Double)	The high water or overflow elevation of the storage tank at the pumping station, in feet (English units) or meters (SI units) above some datum.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
wetwlCapacity (Double)	The wet well capacity.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
noPumps (Integer)	The total number of pumps located at the subject item.
staLength (Double)	The overall length of the pump station plant area.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
type (String16)	A field indicating the kind, class, or group of the subject item.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.

dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Rectifier

(Database Feature Class Name = WastewaterRectifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system on an element of the wastewater distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.[FGDC Utilities Classification].
coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.[FGDC Utilities Classification].
currntOut (Double)	The output direct current from the rectifier to the anode system.[FGDC Utilities Classification].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.[FGDC Utilities Classification].
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.[FGDC Utilities Classification].
noPhases (Integer)	The number of phases to which this device provides reactive power.[FGDC Utilities Classification].
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.[FGDC Utilities Classification].
voltIn (CodeVoltage)	The input AC voltage to the rectifier.[FGDC Utilities Classification].
description (String255)	A description or other unique information concerning the subject item.[FGDC Utilities Classification].
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Septic Tank

(Database Feature Class Name = WastewaterSepticTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Typically, a below grade receptacle or chamber in which solid organic waste is decomposed and purified by anaerobic bacteria. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
dstbx (CodeBoolean)	Indicates whether or not a distribution box exists for the subject item. (yes or no)
dstbxIEl (Double)	The invert elevation of the inside bottom of the distribution box.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
drainageTexture (CodeDrainageDensity)	The texture of the material surrounding the tank.
drnflSt (CodeStyleDrainField)	The style of field drain system indicating the configuration and layout of the drain lines.
drainagePattern (CodeDrainagePattern)	The drainage pattern of the material surrounding the tank.
manhole (CodeBoolean)	An indication as to whether or not is part of a manhole or has access via a manhole (yes/no).
laterlSlp (Double)	The average slope of all drainage laterals.
laterlTot (Double)	The total (sum) length of all drainage laterals.
laterlmean (Double)	The mean or average length of the drainage laterals.
flowRate (Double)	The rate of flow through the device or pipe.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
noLateral (Integer)	The total number of laterals.
trenchWid (Double)	The trench width excavated for the field drains.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g., elevated, hydropneumatic, etc.).
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
featureUse (CodeWastewaterTankType)	This value differentiates similar entities by use or type.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
soilPerc (Double)	The percolation rate of the soil in which the drain field lines are placed.
tankCapacity (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankDepth (Double)	The depth below the ground surface or cover measured from the top of the subject item.
description (String255)	A description or other unique information concerning the subject item.
color (CodeColor)	The color of the septic tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.

dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Service Area

(Database Feature Class Name = WastewaterServiceArea)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Secret

A wastewater utility company or organization's certificated area of jurisdiction or responsibility as approved by a federal, state, or local utility regulatory authority. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
wwutilname (String50)	Name of the wastewater utility or system.[EPA].

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
wwutilmaaID (String30)	Identifier assigned to the water utility by the appropriate federal, state, or local regulatory authority.[EPA].
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
city (String40)	The name of the incorporated municipality (city, township, or other local government, excluding counties) in which the address is physically located.[FGDC Street Address Data Standard].
state (String2)	Name of state where wastewater utility or system provides service.[EPA].
populationServed (Integer)	Population served by wastewater system or utility.[EPA].
wwPlant (Integer)	Total number of wastewater treatment plants serving wastewater utility or system.
dtreatcap (Double)	Total design capacity of wastewater treatment plants serving wastewater utility or system. Usually expressed in mgd.
reConnect (Integer)	Total number of residential type service connections.
coConnect (Integer)	Total number of commercial (i.e., businesses, industrial) type service connections.
wwsystem (CodeWastewaterSystemType)	General type or category of a wastewater system or utility.[EPA].
utilown (CodeUtilityOwnershipType)	General category of type of utility owner.
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Sludge Bed

(Database Feature Class Name = WastewaterSludgeBed)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

An area used for spreading and drying waste sludge. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String30)	Any commonly used name for the wastewater sludge bed area.[USGS].
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

bedWidth (Double)	The exterior width dimension of the sludge bed, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
bedLength (Double)	The length dimension of the sludge bed, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
bedDia (Double)	The inside diameter of the sludge bed, measured from the interior wall surface to the opposite interior wall surface.
bedDepth (Double)	The depth measured from the top of the subject item.
invertElv (Double)	The elevation measured at bottom of the sludge bed, in feet (English units) or meters (SI units) above some datum. mean sea level.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
bedCapacity (Double)	The sludge bed's storage capacity (e.g., gallons, ft3, etc).
area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Treatment Plant

(Database Feature Class Name = WastewaterTreatmentPlant)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Secret

A structure containing equipment used to treat and remove unwanted constituents from wastewater. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Treatment Unit

(Database Feature Class Name = WastewaterTreatmentUnit)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A waste water treatment plant and all appurtenant equipment, buildings, and facilities relating to water treatment. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	Indicates the name for the sewage treatment plant.[HSIP].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
bypass (CodeBoolean)	Indicates whether or not the treatment plant has a bypass line? (yes or no).
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowRated (Double)	The plant manufacturer's rated treatment plant capacity (e.g., gpm), which signifies the peak constant or daily flow of raw water that the plant can treat and transform to the specified water quality requirements.
flowAct (Double)	The measured peak treatment capacity of the water treatment plant when installation has been completed and it is operating under normal inflow and demand conditions.
noPumps (Integer)	The total number of pumps located at the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
plantElv (Double)	The finished floor elevation of the treatment plant, in feet (English units) or meters (SI units) above some datum.
plantLength (Double)	The overall length dimension of the treatment plant.
plantwidth (Double)	The overall width dimension of the water treatment plant.
type (String16)	A field indicating the kind, class, or group of the subject item.
remMth (String32)	The method used to remove solids from the wastewater during processing.[HSIP].
trtLev (CodeWaterTreatmentLevel)	The overall level of treatment for the wastewater process.[HSIP].
comAff (String80)	The name of the company that operates the wastewater treatment facility.[HSIP].
chlorint (CodeBoolean)	Chlorination (Y/N)?[HSIP].
maxCapacity (Double)	Capacity rate of the plant.[HSIP].

capacityRate (Double)	Maximum waste water treatment capacity.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Wastewater : Valve

(Database Feature Class Name = WastewaterValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a wastewater line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	The particular application, or use the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground wastewater line valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open
operatingStatus (CodeValveStatus)	The normal operating status of the valve

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.

userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Data Set: Water

Water : Anode

(Database Feature Class Name = WaterAnode)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A material used for water distribution systems that is electrically connected to a less electrolytically active material so that it will oxidize in the place of the less active material. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

anodeWeight (Double)	The initial weight of the anode or anode packet.
material (CodeAnodes)	The type of material composition of the anode or anode packet.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Anode Test Station

(Database Feature Class Name = WaterAnodeTestStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A central location where anodes are tested for performance in water systems. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

installType (CodeSheathInsulateType)	The type of insulation covering the conductor.
noTerm (Integer)	The total number of terminal connections at the test station.
type (String16)	The type of anode test station configuration use.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
wireSize (CodeCableDimension)	The AWG size designation for the wire connecting the anode/anode packet to the anode test station.
wireType (String16)	The conductor configuration, typically solid or stranded.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Drinking Water Sample Point

(Database Feature Class Name = WaterDrinkingWaterSamplePoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A point location where one or more water samples are collected from a water utility or system. [SDSFIE].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
dwslocname (String50)	Commonly used name for the location where a drinking water sample was collected.[EPA].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

dwslocty (CodeDrinkingWaterSamLoc)	Code designating the type of location where a drinking water sample was collected.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.

projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Fire Connection Point

(Database Feature Class Name = WaterFireConnectionPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An apparatus which dispenses fluids for use in fire management. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
roadName (String30)	A common name or street name used to refer to the stretch of road that the hydrant is facing.[FGDC].

Attributes:

fireFlow (Double)	The code or regulation required fire flow rate from a fire hydrant or fire flow connection.
hydrantType (CodeHydrantType)	The particular kind, class, or group of hydrant.
location (String255)	A textual description of the location of this feature.
hydclass (CodeHydrantClass)	The hydrant classification according to their rated capacity according to the National Fire Protection Association.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
inletDiameter (Double)	The diameter of the hydrant inlet connection.
conType (CodeFireConnection)	Discriminator. This value differentiates fire connections by use or type.
measType (CodeDiameterMeasureType)	This attribute provides information concerning the basis for the subject item's inlet and outlet dimensions (e.g., inside diameter, outside diameter, nominal).
outcon1dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
outcon2dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
outcon3dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
flowTest (Integer)	The date of the last fire flow test conducted at the subject fire hydrant or fire department connection. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
hydrantElvevation (Double)	The elevation of the hydrant, measured at the hydrant outlet, in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
pressResd (Double)	The measured pressure at a hydrant or connection during a flow test conducted at the subject hydrant or connection.
pressStat (Double)	The numeric pressure head on the subject item under static (i.e., no flow or demand) conditions in the utility system.
valveSt (CodeStyleValve)	The style of the valve.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.[FGDC].
verify (CodeBoolean)	A boolean indicating whether the blue reflectors was placed correctly in the street (Y = YES and N = NO).[FGDC].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Fitting

(Database Feature Class Name = WaterFitting)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting is an item used to connect, cap, plug or otherwise alter a pipe carrying water. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

fitElv (Double)	The elevation measured at centerline of the fitting, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
diaIn (Double)	The inside, or interior, diameter of the fitting.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
fitLength (Double)	The overall length of the fitting.
fitWidth (Double)	The width dimension of the subject item measured at its' widest point.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	Discriminator. The kind, class, or group of the subject item.
drawingNo (Integer)	The drawing number of the Pig Drawing. This is a separate field from media_id.
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground waterline fitting.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
mapGrid (String5)	Number of grid on map on which item is shown on
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.

dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Hydrant

(Database Feature Class Name = WaterHydrant)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An apparatus which dispenses fluids. [SDSFIE IENC].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

fireFlow (Double)	The code or regulation required fire flow rate from a fire hydrant or fire flow connection.
flowStandard (CodeFireFlow)	National Fire Protection Association classification for flow rate of a fire hydrant or fire flow connection.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
measType (CodeDiameterMeasureType)	This attribute provides information concerning the basis for the subject item's inlet and outlet dimensions (e.g., inside diameter, outside diameter, nominal).
design (String16)	Discriminator. The design code for a water hydrant.
hydrantType (CodeHydrantType)	The particular kind, class, or group of hydrant.
owner (CodeHydrantOrg)	The agency that owns the hydrant.
hydrantElvevation (Double)	The elevation of the hydrant, measured at the hydrant outlet, in feet (English units) or meters (SI units) above some datum.
sourceDiameter (Double)	Diameter of source main in inches.
outcon1dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
outcon2dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
outcon3dia (Double)	The diameter of the hydrant outlet, or for hydrants with more than one outlet, the diameter of one of the hydrant outlets.
flowTest (Integer)	The date of the last fire flow test conducted at the subject fire hydrant or fire department connection. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
connectSize (CodeConnectSize)	The size of the hydrant connection
pressResd (Double)	The residual pressure of the hydrant in psi format.
pressStat (Double)	The static pressure of the hydrant in psi format.
valveSt (CodeStyleValve)	The style of the valve.
bldgLevel (CodeBldgLevel)	Level of the building where the hydrant is located.
maintAgency (CodeHydrantOrg)	The agency that is responsible for maintenance of the hydrant.
Manufacturer (String255)	The manufacturer of the hydrant.
firePumpArea (CodePumpArea)	The fire pump coverage area at BWI.
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
mapGrid (String5)	Number of grid on map on which item is shown on
locationDesc (String255)	MAA requirement, text description of location of trench
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
physicalStatus (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Intake

(Database Feature Class Name = WaterIntake)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The location where water is allowed into the water distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Intake Line

(Database Feature Class Name = WaterIntakeLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

The location where water is allowed into the water distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
material (String16)	The material of the subject item.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Junction

(Database Feature Class Name = WaterJunction)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A box or small vault (usually concrete, brick, or cast iron) in water systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

airrfValve (CodeBoolean)	Indicates whether or not there is an air relief valve installed on subject item? (yes/no)
drainType (CodeDrainType)	The type of subject item drain.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
noValves (Integer)	The number of valves inside the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
mhDia (Double)	The diameter dimension of the subject item, measured from inside face of wall to inside face of opposite wall.
mhLength (Double)	The length dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.
mhWidth (Double)	The width dimension of the subject item, from outside face of exterior wall/side to outside face of opposite exterior wall/side.

invertElv (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	A field indicating the kind, class, or group of manhole for the subject utility.
featureUse (String16)	Discriminator. An attribute that differentiates the use of the subject item.
noPipes (Integer)	The number of the pipes entering and exiting the subject item.
rimElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
description (String255)	A description or other unique information concerning the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Line

(Database Feature Class Name = WaterLine)

Geometry Type: Line Accuracy: +/-5Ft. Sensitivity: Secret

A pipe used to carry water from location to location (main line, service line, vent line, etc). [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
catProt (CodeBoolean)	Indicates whether or not the pipe has been provided with cathodic protection? (yes or no).
pipeLength (Double)	The length of pipe, measured from node to node along the pipe centerline .
pressMax (Double)	The manufacturer's or industry standard's maximum pressure rating of the subject item.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation1 (Double)	The elevation of the ground surface at node_id_1, in feet (English units) or meters (SI units) above some datum.
groundElevation2 (Double)	The elevation of the ground surface at node_id_2, in feet (English units) or meters (SI units) above some datum.
invElv1 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_1 in feet (English units) or meters (SI units) above some datum.[Derived from SDSFIE].
invElv2 (Double)	The elevation of the bottom of pipe (i.e., pipe invert) at node_id_2 in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
type (String16)	The kind, class, or group of the subject item.
slopeBot (Double)	The slope of the bottom of the subject item expressed as a percentage.
tape (CodeBoolean)	This attribute indicates whether or not location marker tape or wire been installed above the waterline pipe to facilitate it's location with a magnetometer? (yes or no).
featureUse (String16)	Discriminator. The use code for water pipes.
pressNorm (Double)	The normal operating pressure of the water system pipe.

piplty (CodePipelineLocationType)	The location of the pipeline in relevance to the earth's surface.[USGS].
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground waterline pipe.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
dateInstalled (Date)	The date on which the feature was originally installed.
lineType (String16)	The type of water line.
directionality (CodeDirectionality)	The directionality of flow with repsect to the line's geometry.
impedance (Double)	The number representing the total opposition to flow.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Marker

(Database Feature Class Name = WaterMarker)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A sign, concrete monument, etc. installed either directly above or immediately adjacent to underground lines, bends, fittings, etc to indicate the presence of water. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
poleMat (String16)	The material composition of the pole.
poleDepth (Double)	The depth the pole is buried in the foundation (usually the ground surface).
poleHeight (Double)	The distance the pole extends above the foundation (usually the ground surface).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
signHeight (Double)	The height dimension of the sign.
signMaterial (String16)	The material composition of the sign.
signText (String30)	The text on the sign.
signWidth (Double)	The width dimension of the sign.
soilCnd (CodeSoilConsistency)	The soil condition indicating the soil's strength and integrity.
rockCnd (CodeRockStrength)	The condition of the rock relative to the rocks strength and integrity.
type (String16)	A field indicating the kind, class, or group of the subject item.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.

dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Meter

(Database Feature Class Name = WaterMeter)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device installed in a line for measuring the quantity and or rate of water flowing to a facility or through a section of line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
meterCustomer (String20)	The name of the individual, company, or government agency served by the subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
installType (CodePumpSta)	The type installation of the subject item.
meterElv (Double)	The elevation at the centerline of the meter, in feet (English units) or meters (SI units) above some datum.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
type (String16)	A field indicating the kind, class, or group of the subject item.
srvcMtr (CodeBoolean)	An indicator as to whether or not the meter is installed on a service line? (yes or no)
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Pig Launch Point

(Database Feature Class Name = WaterPigLaunchPoint)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

Fittings where a pigging device is inserted in order to clean or maintain a pipe. [SDSFIE DOT - NPMS].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
material (String16)	The material of the subject item.
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Pressure Reducing Station

(Database Feature Class Name = WaterPressureReducingStation)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A station consists of a box/pit containing one or more pressure regulators and appurtenant shutoff valves and fittings. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.

Attributes:

condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
dateConstructed (Date)	The date on which the subject item construction was complete and user occupancy provided. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915)
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].

staElevation (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
pressIn (Double)	The design or maximum water system pressure in the waterline on inlet side of the pressure reducing station.
pressOper (Double)	The normal operating water system pressure in the waterline on inlet side of the pressure reducing station.
source (String16)	The point of origin of a water system's water supply.
pressOut (Double)	The design or maximum water system pressure in the waterline on outlet side of the pressure reducing station.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Pump

(Database Feature Class Name = WaterPump)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A mechanical device for water system that draws material into itself through an entrance port and forces the material out through an exhaust port. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the pump is cooled.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
capacityAct (Double)	The measured capacity of the pump operating under actual normal head and flow conditions.
capacityRate (Double)	The manufacturer's pump capacity (e.g., gpm) rating at a specific design total dynamic head (TDH), usually depicted by a pump curve.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
pwrGen (Double)	The power generated by the pump, equal in the U.S. to 746 watts and nearly equivalent to the English gravitational unit of the same name that equals 550 foot-pounds of work per second.
pwrReq (CodeVoltage)	The voltage of the electrical power required by the subject item.
type (String16)	A field indicating the kind, class, or group of the subject item.
primRqd (CodeBoolean)	An indicator as to whether or not the pump has to be primed? (yes or no).
primeMethod (String15)	The method by which the pump is primed.
tdhRated (Double)	The total dynamic head upon which the capacity_rated is based.
featureUse (String16)	The particular application, or use the subject item.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
description (String255)	A description or other unique information concerning the subject item.

material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Pump Station

(Database Feature Class Name = WaterPumpStation)

Geometry Type: Polygon Accuracy: +/-1Ft. Sensitivity: Secret

A building in which one or more pumps operate to maintain flow at adequate pressure within a water distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	The name of the pumping station.[HSIP].
maaAlias (String60)	An alternative or former name by which the feature is refered.
tributaryId (String20)	An operator generated identifier used locally to identify a tributary subsystem of the main utility system.
srcName (String16)	The name of the water source (e.g., Mississippi River, Bayou LaFouche, etc.).

Attributes:

condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
hiWaterElevation (Double)	The high water or overflow elevation of the elevated water storage tank downstream of the pumping station, in feet (English units) or meters (SI units) above some datum.
nodalElv (Double)	The elevation of subject node, which is used in performing computer analyses of the water distribution system. The node elevation is usually the ground elevation at the subject node, or the elevation of the subject item located at the subject node (e.g.,
wetwlCapacity (Double)	The wet well capacity.
staWidth (Double)	The width dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
staCapacity (Double)	The pump station's output capacity (e.g., gpm) rating (with all pumps operating) at a specific total dynamic head (TDH), which correlates to normal system pressure head or design pressure head.
staElevation (Double)	The top surface elevation of the subject item's interior floor/bottom in feet (English units) or meters (SI units) above some datum.
staType (CodePumpSta)	Discriminator. The type of station.
noPumps (Integer)	The total number of pumps located at the subject item.
source (String16)	The point of origin of a water system's water supply.
staLength (Double)	The length dimension of the station, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
pumpElevation (Double)	The elevation measured at centerline of the pump, in feet (English units) or meters (SI units) above some datum.
tnkalrmelv (Double)	Elevation of water in upstream ground water storage tank(s) which represents a low level which activates a low water/pressure alarm.
area (Double)	The size of the area, zone, or polygon in square units.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
description (String255)	A description or other unique information concerning the subject item.
mapGrid (String5)	Number of grid on map on which item is shown on
material (String16)	The material of the subject item.

junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Rectifier

(Database Feature Class Name = WaterRectifier)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A device that changes alternating current to direct current for an impressed current cathodic protection system on an element of the water distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

coolMethod (CodeEquipmentCooling)	The method by which the rectifier is cooled, typically air or oil.
enclType (CodeElectricMotorEnclType)	The type of enclosure used to protect the rectifier.
voltOut (CodeVoltage)	The output DC voltage from the rectifier to the anode system.
currntOut (Double)	The output direct current from the rectifier to the anode system.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
internalMeter (CodeBoolean)	An indicator as to whether or not the rectifier has an internal meter, yes/no.
noPhases (Integer)	The number of phases to which this device provides reactive power.
phaseLeter (CodeElectricPhaseType)	The letter(s) of the phase(s) for the subject item.
voltIn (CodeVoltage)	The input AC voltage to the rectifier.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.

dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Regulator Reducer

(Database Feature Class Name = WaterRegulatorReducer)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A pressure regulator located in the water line that automatically reduces the pressure on the downstream side of the valve to a preset magnitude. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
size (CodePipeDiameter)	The manufacturers designated size, or nominal (i.e., rounded to the nearest unit) diameter for the subject item (e.g., 1in gas hydrant, 2in meter, 6in pipe).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
pressIn (Double)	The design water system pressure in the waterline on inlet side of the pressure regulator.
type (String16)	Discriminator. The kind, class, or group of the subject item.
pressOut (Double)	The design water system pressure in the waterline on outlet side of the pressure regulator.
pressReqd (Double)	The required maximum outlet pressure setting for the regulator.
regElevation (Double)	The elevation of the pressure regulator, measured at the regulator centerline.
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Reservoir

(Database Feature Class Name = WaterReservoirArea)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A body of water which supplies water to a water distribution system. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Source Site

(Database Feature Class Name = WaterSourceSite)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

The point from which water is supplied for processing and distribution. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	The name of the water intake.[HSIP].
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
type (String16)	A field indicating the kind, class, or group of the subject item.
sysType (String16)	The type of water system.[USACE OPERATIONS].
catPipe (CodePipeCategory)	Category of pipe[S-57].
length (Double)	The overall length of the feature.[Center].
maxFlow (Double)	The intake capacity of the pipe.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).

verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Tank

(Database Feature Class Name = WaterTank)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

An above or below grade receptacle or chamber used for holding water on a temporary basis prior to transfer or use. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String80)	Indicates the name as given for the water system control facility.[HSIP].
maaAlias (String60)	An alternative or former name by which the feature is refered.
modelNumber (String12)	The Model, Product, Catalog, or Item Number of subject item.
serialNumber (String15)	The manufacturer's serial, or unique identification number of the subject item.

Attributes:

alarmLevel (Double)	The elevation of the preset level in a tank which activates a low water level alarm, in feet (English units) or meters (SI units) above mean sea level. Mean sea level is universally considered as the elevation reference surface although local surveys may
altValve (CodeBoolean)	Indicates whether or not the tank has an altitude valve which controls the flow into the tank? (yes or no).
area (Double)	The size of the area, zone, or polygon in square units.
level1On (Double)	The elevation of the preset level in a tank which activates one pump or one control valve which supplies water to the tank, in feet (English units) or meters (SI units) above some datum.
level2On (Double)	The elevation of the preset level in a tank which activates a second pump, or control valve, which operates in conjunction with the first activated pump, or control valve, to supply water to the tank, in feet or meters above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
levelOff (Double)	The elevation of the preset level in a tank which turns off the pump(s) or control valve(s) which supply water to the tank, in feet (English units) or meters (SI units) above some datum.
levelShut (Double)	The elevation of the preset level in a tank (ground storage or supply tank) which indicates a dangerously low water level in the tank and turns off all pumps which draw water from the tank, in feet (English units) or meters (SI units) above some datum.
ovrflwElevation (Double)	The elevation measured at the point of overflow, or entrance, into the tank overflow pipe,, in feet (English units) or meters (SI units) above some datum.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
headNorm (Double)	The normal operating head for the subject item.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
pressAlrm (Double)	The preset pressure setting of a tank which activates a low tank pressure alarm.
pressHigh (Double)	The preset high, or maximum, operating pressure setting of a tank. For a hydropneumatic (i.e., pressure) type tank this is the setting at which all pumps supplying water to the tank, and all air compressors supplying compressed air to the tank, are off.
invertElv (Double)	The elevation measured at bottom of the tank, in feet (English units) or meters (SI units) above some datum. mean sea level.
material (CodePipeMaterial)	The material composition of the subject item, such as wood, concrete, steel, cast iron, plastic, etc.
topElevation (Double)	The elevation of exterior top surface of the subject item's lid, hatch, rim, or roof in feet (English units) or meters (SI units) above some datum.
tankLength (Double)	The length dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
tankSt (CodeStyleTank)	The particular kind, class, or group of tank (e.g., elevated, hydropneumatic, etc.).
tankUse (CodeTankUse)	The particular kind or use of the tank (e.g., raw water, potable, etc.).
tankVol (Double)	The tank's storage capacity (e.g., gallons, ft3, etc).
tankWidth (Double)	The exterior width dimension of the tank, measured from outside face of the exterior wall/side to outside face of the opposite exterior wall/side.
pressLow (Double)	The preset low, or minimum, operating pressure setting of a tank. For a hydropneumatic (i.e., pressure) type tank this is the setting which activates the pump(s) supplying water to the tank. For an elevated type tank, this is the setting which activates
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
pressNorm (Double)	The manufacturer's (as rated by American Society of Mechanical Engineers (ASME) testing procedures) maximum pressure rating of the water tank.
tankDiameter (Double)	The inside diameter of the tank, measured from the interior wall surface to the opposite interior wall surface.

description (String255)	A description or other unique information concerning the subject item.
color (CodeColor)	The color of the water tank.
lightCode (String1)	The light code of the tank.
lightingType (CodeLightingConfigurationType)	Thetype of lighting configuration.
markingFeatureType (CodeMarkingFeatureType)	The type of the marking
verticalStructureMaterial (String16)	The vertical structure material.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Treatment Plant

(Database Feature Class Name = WaterTreatmentPlant)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A water treatment plant and all appurtenant equipment, buildings, and facilities relating to water treatment. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	A description or other unique information concerning the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.
source (String255)	The source of the feature.
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.

lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Treatment Unit

(Database Feature Class Name = WaterTreatmentUnit)

Geometry Type: Polygon Accuracy: +/-5Ft. Sensitivity: Confidential

A water separation pond or other pool designed to allow solid material decomposition. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String16)	The site specific identification name or number assigned to the subject item.
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

area (Double)	The size of the area, zone, or polygon in square units.
condition (CodePoleCondition)	Indicates a state of being, or readiness for use of the subject item (e.g., good, fair, poor), from lists or field inspections.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
bypass (CodeBoolean)	Indicates whether or not the treatment plant has a bypass line? (yes or no).
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
flowRated (Double)	The plant manufacturer's rated treatment plant capacity (e.g., gpm), which signifies the peak constant or daily flow of raw water that the plant can treat and transform to the specified water quality requirements.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
flowAct (Double)	The measured peak treatment capacity of the water treatment plant when installation has been completed and it is operating under normal inflow and demand conditions.
noPumps (Integer)	The total number of pumps located at the subject item.
perimeter (Double)	The distance around the boundary of the area, zone, or subject item in linear units.
source (String16)	The point of origin of a water system's water supply.
type (String16)	A field indicating the kind, class, or group of the subject item.
plantElv (Double)	The finished floor elevation of the treatment plant, in feet (English units) or meters (SI units) above some datum.
plantLength (Double)	The overall length dimension of the treatment plant.
plantwidth (Double)	The overall width dimension of the water treatment plant.
numCust (Integer)	The number of customers being served by the treatment facility.[HSIP].
description (String255)	A description or other unique information concerning the subject item.
material (String16)	The material of the subject item.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Valve

(Database Feature Class Name = WaterValve)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A fitting or device used for shutting or throttling flow through a water line. [SDSFIE FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
name (String20)	Descriptive identifying text
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
branchSys (String12)	An operator generated identifier that is a unique site specific name or number designation of a branch or isolated area of a water distribution system.
groundElevation (Double)	The elevation of the ground surface in feet (English units) or meters (SI units) above some datum.
owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
valveElv (Double)	The elevation measured at centerline of the valve, in feet (English units) or meters (SI units) above some datum.
featureUse (String16)	Discriminator. The site specific use of the valve.
valveSize (CodePipeDiameter)	A code indicating the manufacturer's nominal size designation.
valveSt (CodeStyleValve)	The particular kind, class, or group of valve (e.g., gate, check, etc.).
coverDepth (Double)	The depth of cover. The depth measured from top of ground's surface (or grade) to top of underground waterline valve.[Air Force].
description (String255)	A description or other unique information concerning the subject item.
coordX (Double)	The coordinate in the east-west plane, expressed in decimal degrees.
coordY (Double)	The coordinate in the north-south plane, expressed in decimal degrees.
MAA requirementmapGrid (String5)	Number of grid on map on which item is shown on
locationNotes (String255)	Notes on the location of the feature.
valveDesc (CodeValveType)	The valve type.
valveUse (String25)	A description of the valve's use.
material (String16)	The material of the subject item.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.
valveOpen (CodeValveOpen)	The direction a valve must be turned to open.
operatingStatus (CodeValveStatus)	The normal operating status of the valve.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.projectType (CodeProjectType) The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Water : Vent

(Database Feature Class Name = WaterVent)

Geometry Type: Point Accuracy: +/-1Ft. Sensitivity: Secret

A valve installed in a line to either release air trapped in the line, and/or allow air into a line to relieve a vacuum condition. [FGDC Utilities Classification].

Names and Identifiers:

maaID (String30)	A unique identifier used by people to refer to this feature (note: this is not a system primary or foreign key value)
maaAlias (String60)	An alternative or former name by which the feature is refered.

Attributes:

owner (String60)	A person, organization, or agency with legal control or management responsibility of the utility asset.[Adopted from SDSFIE].
description (String255)	Any brief description of the feature.
material (String16)	The material of the subject item.
size (Integer)	The size of the subject item.
disposition (CodeDispositionObject)	The status of the subject item (e.g., permanent, temporary, proposed, abandoned, etc.), from lists or entered from field inspections.
junctionType (CodeJunctionType)	An indicator as to whether the feature serves as a source, sink or neither in the network.

Metadata:

collectionProgress (CodeProgress)	The progress of the data collection.
dateAcquired (Date)	The date on which the subject item was originally acquired or purchased. Format for date is YYYYMMDD (i.e., September 15, 1994 = 19940915).
verified (String255)	Whether or not the feature has been verified.source (String255)
projectType (CodeProjectType)	The type of project or work activity that installed or first recorded the location of this feature.
projectId (String20)	A unique identifier associated with the project or work activity that installed or first recorded the location of this feature.
status (CodeStatus)	A temporal description of the operational status of the feature.
Alternative (Integer)	Discriminator used to tie features of a plan or proposal together into a version.
userFlag (String254)	An operator defined work area. This attribute can be used by the operator for user defined system processes. It does not affect the subject items data integrity and should not be used to store the subject items data.[SDSFIE].
qualityLevel (CodeSueQualityLevel)	The subsurface utility engineering quality level assigned to utilities features as defined in ASCE38-02.
dataSource (CodeDataSource)	The primary source of the data in this record.
dataSource2 (CodeDataSource)	The secondary source of the data in this record.
sourceStatement (String255)	A statement providing additional details about the source of the data.
editorName (String50)	The name of the individual who last edited this data.
lastUpdate (Date)	The date upon which any data associated with this record was last updated.

System Keys:

guid (String60)	A globally unique identifier applied to each feature in the database for reference.
metaId (Integer)	An identifier used to refer to a metadata record that provide additional information about the data in this record.

Domain Values

This section lists the acceptable domain values for each of the attributes bound by list domains. Each list of acceptable values is an enumeration, which means that one of the values must be selected in order to be compliant with the standard. For each value there is a definition, notes, and a source. Notes are captured in parentheses and the source is provided in brackets.

CodeAirPressureDeviceType

Used by Attributes: Air Pressure Device - Airp Type

Value	Definition (Notes) [Source]
A	Transducer [SDSFIE V2 Austin and Pitts]
AIRFLOW_B	Meter Panel Component [SDSFIE V2 Austin and Pitts]
ALARM_PIPE	Meter Panel Component [SDSFIE V2 Austin and Pitts]
AV	Automatic Shut-Off Valve [SDSFIE V2 Austin and Pitts]
B	By-Pass [SDSFIE V2 Austin and Pitts]
BV	By-Pass Valve [SDSFIE V2 Austin and Pitts]
C	Pressure Contactor [SDSFIE V2 Austin and Pitts]
CA_3131	Gas Feeder Pipe [SDSFIE V2 Austin and Pitts]
CD	Compressed Dry Air Source [SDSFIE V2 Austin and Pitts]
CO	Central Office [SDSFIE V2 Austin and Pitts]
CT	Pressure Contactor Terminal [SDSFIE V2 Austin and Pitts]
DBV	Dual (Shutoff) Valve. [SDSFIE V2.5 AIR FORCE]

E	Pressure Contactor [SDSFIE V2 Austin and Pitts]
GT	Gas-Tight Cable Terminal [SDSFIE V2 Austin and Pitts]
GT_500CFD	Air Dryer (greater than 500 Cfd) [SDSFIE V2 Austin and Pitts]
LT_500CFD	Air Dryer (less than 500 Cfd) [SDSFIE V2 Austin and Pitts]
M	Flow Meter [SDSFIE V2 Austin and Pitts]
M_262	Manifold [SDSFIE V2 Austin and Pitts]
MF	Pipe Manifold [SDSFIE V2 Austin and Pitts]
MODEL_3000	Compressor Dehydrator [SDSFIE V2 Austin and Pitts]
MP	Meter Panel [SDSFIE V2 Austin and Pitts]
P	Pressure Plug [SDSFIE V2 Austin and Pitts]
PRESS_C	Transducer [SDSFIE V2 Austin and Pitts]
R	Pressure Regulator [SDSFIE V2 Austin and Pitts]
RV	Excessive Pressure Relief Valve [SDSFIE V2 Austin and Pitts]
T	Gas-Tight Cable Terminal [SDSFIE V2 Austin and Pitts]
TD	Pressure Transducer [SDSFIE V2 Austin and Pitts]
V	Pressure Testing Valve [SDSFIE V2 Austin and Pitts]
VALVE_750	Transducer [SDSFIE V2 Austin and Pitts]
VALVE_BLK	Pressure [SDSFIE V2 Austin and Pitts]
VALVE_C	Pressure [SDSFIE V2 Austin and Pitts]
VT	Cable Vent [SDSFIE V2 Austin and Pitts]

CodeAmplifierType

Used by Attributes: Amplifier - Amp Type;Attenuator - Attn Type;Impedance Matching Point - Imp Type

Value	Definition (Notes) [Source]
CATV	Cable Television Amplifier [SDSFIE V2 Tinker Air Force Base]
OTHER	Other [SDSFIE V2]
PHONE_LINE_AMP	Telephone Line Amplifier [SDSFIE V2 Tinker Air Force Base]
RADIO	Radio [SDSFIE V2 Tinker Air Force Base]
TBD	To Be Determined [SDSFIE V2 Tinker Air Force Base]
UNKNOWN	Unknown [SDSFIE V2]
VIDEO	Video Amplifier [SDSFIE V2 Tinker Air Force Base]

CodeAnodes

Used by Attributes: Anode - Material;Anode - Material;Anode - Material;Anode - Material;Anode - Material;Anode - Material

Value	Definition (Notes) [Source]
AL	aluminum [SDSFIE V1.4]
CI	cast iron [SDSFIE V1.4]
GR	graphite [SDSFIE V1.4]
MG	magnesium [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
ZN	zinc [SDSFIE V1.4]

CodeAntennaPolarization

Used by Attributes: Antenna Site - Polr Type

Value	Definition (Notes) [Source]
CLOCKWISE	Installed with the plane of polarization rotating right-hand circular. [SDSFIE V2.5 Air Force]
COUNT_CLOCKWISE	Installed with the plane of polarization rotating left-hand circular. [SDSFIE V2.5 Air Force]
HORIZONTAL	Installed with the plane of polarization parallel to earth's surface. [SDSFIE V2.5 Air Force]
OTHER	Other
TBD	To be Determined
UNKNOWN	Unknown
VERTICAL	Installed with the plane of polarization perpendicular to the earth's surface. [SDSFIE V2.5 Air Force]

CodeAntRadPattern

Used by Attributes: Access Point - Radiation Pattern;Antenna Site - Radiation Pattern

Value	Definition (Notes) [Source]
DIRECTIONAL	Directional Antenna. [SDSFIE V2.5 AIR FORCE]
LOS	Line of Sight. [SDSFIE V2.5 AIR FORCE]
OMNI	Omnidirectional Antenna. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeBankArmorLining

Used by Attributes: Open Drainage Line - Bank Arm

Value	Definition (Notes) [Source]
ASPHALT	asphalt [SDSFIE V1.4]
CEMENTD_STONE	cemented stones [SDSFIE V1.4]
CONCRETE_LINED	concrete lined [SDSFIE V1.4]
DUMP_BRICK_CONC	dumped brick and concrete [SDSFIE V1.4]
DUMPED_ROCK	dumped rocks [SDSFIE V1.4]
FORMEDLINING	formed channel lining [SDSFIE V1.4]
GABIONS	gabions [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PILEDIKE	pile dike [SDSFIE V1.4]
PLACED_STONE	placed stone [SDSFIE V1.4]
SAND_CEMNBGRR	sand cement/bag riprap [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WILLOW_MAT	willow mat [SDSFIE V1.4]

CodeBankSide

Used by Attributes: Pump - Bank

Value	Definition (Notes) [Source]
L_DESCENDING	Left descending bank [SDSFIE V1.8 REEGIS]
LEFT	left [SDSFIE V1.8 REEGIS]
NON_RIVERINE	non riverine [SDSFIE V2.6 LEVEE DATABASE]
R_DESCENDING	Right descending bank [SDSFIE V1.8 REEGIS]
RIGHT	right [SDSFIE V1.8 REEGIS]

CodeBedMaterial

Used by Attributes: Open Drainage Line - Bed Material

Value	Definition (Notes) [Source]
AQUATCWEED	aquatic weed [SDSFIE V1.4]
CEMENTED_STONE	cemented stones [SDSFIE V1.4]
CLAY	clay [SDSFIE V1.4]
CONCRETE_LINED	concrete lined [SDSFIE V1.4]
CRSAND_GRAVEL	coarse sand and gravel [SDSFIE V1.4]
EXPOSED_ROCK	exposed rock [SDSFIE V1.4]
FINE_SAND	fine sand [SDSFIE V1.4]
GRASSED	grassed [SDSFIE V1.4]
GRAVEL_STONE	gravel to larger stone [SDSFIE V1.4]
ORGANIC_MUD	organic mud [SDSFIE V1.4]

OTHER	other [SDSFIE V1.4]
PLACED_STONE	placed stone [SDSFIE V1.4]
SAND	Sand. [SDSFIE V2.5 USACE]
SILT_SAND	Silty sand. [SDSFIE V2.5 USACE]
TBD	to be determined [SDSFIE V1.4]
UNDERBRUSH	underbrush [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeBilKv

Used by Attributes: Bus Line - Bil Rat

Value	Definition (Notes) [Source]
15KV	15kv basic insulation level [SDSFIE V1.4]
25KV	25kv basic insulation level [SDSFIE V1.4]
5KV	5kv basic insulation level [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]

CodeBldgLevel

Used by Attributes: Hydrant – Building Level

Value	Definition (Notes) [Source]
LOWER_LEVEL_TERMINAL	Lower level BWI terminal
UPPER_LEVEL_TERMINAL	Upper level BWI terminal

CodeBoolean

Used by Attributes: Lagoon - Aerator;Lagoon - Aerator;Storage Area - Aerator;Vault - Air Release Present;Junction - Air Relief Valve Code;Oil Water Separator Diversion Vault - airReleasePresent;Junction - Airrf Valve;Junction - Airrf Valve;Junction - Airrf Valve;Vault - airrfValve;Disposal Tank - Alt Valve;Tank - Alt Valve;Tank - Alt Valve;Tank - Alt Valve;Tank - Altitude Valve;Tank - Altitude Valve;Access Point - Antenna Location;Generator - Automatic Transfer Switch Code;Pedestal Site - Bonded;Treatment Plant - Bypass;Treatment Unit - Bypass;Treatment Unit - Bypass;Utility Pole Tower Site - Capped;Line - Cat Prot;Line - Cat Prot;Line - Cat Prot;Line - Cathodic Protection;Treatment Unit - Chlorint;Ductbank - Conc Enc;Culvert Center Line - Critical;Equipment - Crypto;Video Site - Crypto;Relay Station - Deployab;Grease Trap - Dist Box Id;Valve - Diversion Vault Valve;Septic Tank - Dstbx;Riser - Duct;Discharge Point - Enabled;Drainage Divide Line - Enabled;Fitting - Enabled;Inlet - Enabled;Junction - Enabled;Line - Enabled;Oil Water Separator - Enabled;Oil Water Separator Diversion Vault - enabled;Open Drainage Line - Enabled;Pump - Enabled;Storm Ceptor - enabled;Storm Filter - enabled;Storm Trench Drain Line - enabled;Vault - Enabled;Vertical Site - Endguard;Line - Exp Loop;Inlet - Garage Inlet;Vertical Site - Grdrails;Vertical Site - Grndbar;Utility Pole Tower Site - Grounded;Oil Water Separator - Grtchbr;Oil Water Separator - Grtchbr;Oil Water Separator - Grtchbr;Oil Water Separator - Grtchbr;Storm Ceptor - grtchbr;Storm Filter - grtchbr;Junction - High Level Alarm Flag;Access Point - Ids;Junction - Illict;Equipment - Int Vid;Rect Point - Internal Meter;Rectifier - Internal Meter;Rectifier - Internal Meter;Rectifier - Internal Meter;Rectifier - Internal Meter;Rectifier - Internal Meter;Transmission Pipeline - Interstate;Culvert Center Line - Lined;Line - Lined;Line - Lined;Line - Lined;Line - Lined;Storm Trench Drain Line - lined;Tank - Lng Fac;Cable - Loosbuf;Grease Trap - Manhole;Septic Tank - Manhole;Speaker - Multp 2 5;Speaker - Multp 7 0;Relay Station - Narrowbn;Equipment - Ncc;Grit Chamber - O W Sep;Grit Chamber - O W Sep;Marker - Passve;Transformr Bank - Pcb;Lagoon - Pip Outl;Lagoon - Pip Outl;Storage Area - Pip Outl;Pump - Prim Required;Pump - Prim Rqd;Pump - Prim Rqd;Pump - Prim Rqd;Pump - Prim Rqd;Pump - Prim Rqd;Pump - Prim Rqd;Pump - Priming Required;Vault - Pump Out Present;Oil Water Separator Diversion Vault - pumpOutPresent;Relay Station - Rf Lmrwd;Radio Receiver - Rf P 2 5C;Radio Transmitter - Rf P 2 5C;Radio Receiver - Rf P 2 5T;Radio Transmitter - Rf P 2 5T;Tank - Secondary Containment;Light - Sensor;Meter - Service Meter;Meter - Service Meter;Meter - Service Meter;Meter - Service Meter;Generator - Sound;Farm Site - Strategic Petroleum Reserve Code;Tank - Strategic Petroleum Reserve Code;Capacitor - Switch;Line - Tape;Line - Tape;Pedestal Site - Terminal;Relay Station - Trnk P 2 5;Relay Station - Tx Analg;Relay Station - Tx Digl;Lagoon - User Ind;Lagoon - User Ind;Storage Area - User Ind;Lagoon - User San;Lagoon - User San;Storage Area - User San;Tank - ustSensor;Culvert Center Line - Verified;Fire Connection Point - Verify;Speaker - Weather;Lagoon - Wer Outl;Lagoon - Wer Outl;Storage Area - Wer Outl;Lagoon - X Dikes;Lagoon - X Dikes;Reservoir - X Dikes;Reservoir - X Dikes;Stilling Basin - X Dikes

Value	Definition (Notes) [Source]
N	No
Y	Yes

CodeCableConnectorType

Used by Attributes: Antenna Site - Conn Type;Terminator - Connt;Media Converter - Connt 1;Media Converter - Connt 2

Value	Definition (Notes) [Source]

1_0_2_3_F	1.0/2.3, Female. [SDSFIE V2.5 AIR FORCE]
1_0_2_3_M	1.0/2.3, Male. [SDSFIE V2.5 AIR FORCE]
1_6_5_6_F	1.6/5.6, Female. [SDSFIE V2.5 AIR FORCE]
1_6_5_6_M	1.6/5.6, Male. [SDSFIE V2.5 AIR FORCE]
7_16_DIN_F	7-16 Deutsh Industries Norm (DIN), Female. [SDSFIE V2.5 AIR FORCE]
7_16_DIN_M	7-16 Deutsh Industries Norm (DIN), Male. [SDSFIE V2.5 AIR FORCE]
AMC_F	Amphenol Micro Coaxial (AMC), Male. [SDSFIE V2.5 AIR FORCE]
AMC_M	Amphenol Micro Coaxial (AMC), Female. [SDSFIE V2.5 AIR FORCE]
BI_F	Bionic, Female. [SDSFIE V2.5 AIR FORCE]
BI_M	Bionic, Male. [SDSFIE V2.5 AIR FORCE]
BNC_F	Bayonet Neill Concelman (BMC), Female. [SDSFIE V2.5 AIR FORCE]
BNC_M	Bayonet Neill Concelman (BMC), Male. [SDSFIE V2.5 AIR FORCE]
C_F	C Connector, Female. [SDSFIE V2.5 AIR FORCE]
C_M	C Connector, Male. [SDSFIE V2.5 AIR FORCE]
D4_F	D4, Female. [SDSFIE V2.5 AIR FORCE]
D4_M	D4, Male. [SDSFIE V2.5 AIR FORCE]
DB_25_F	25-pin D-type connector, Female. [SDSFIE V2.5 AIR FORCE]
DB_25_M	25-pin D-type connector, Male. [SDSFIE V2.5 AIR FORCE]
DB_9_F	9-pin D-type connector, Female. [SDSFIE V2.5 AIR FORCE]
DB_9_M	9-pin D-type connector, Male. [SDSFIE V2.5 AIR FORCE]
DE_9_F	9-pin D-type connector, Female AKA DB-10. [SDSFIE V2.5 AIR FORCE]
DE_9_M	9-pin D-type connector, Male AKA DB-10. [SDSFIE V2.5 AIR FORCE]
F_TYPE_F	F TYPE, Female. [SDSFIE V2.5 AIR FORCE]
F_TYPE_M	F-M - F TYPE, Male. [SDSFIE V2.5 AIR FORCE]
FC_F	MIL-C-39012 category D type, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
FC_M	MIL-C-39012 category D type, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
FDDI_F	Fiber Distributed Data Interface, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
FDDI_M	Fiber Distributed Data Interface, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
FIREWIRE_4F	IEEE 1394 Fire wire connector, 4-pin, Female. [SDSFIE V2.5 AIR FORCE]
FIREWIRE_4M	IEEE 1394 Fire wire connector, 4-pin, Male. [SDSFIE V2.5 AIR FORCE]
FIREWIRE_6F	IEEE 1394 Fire wire connector, 6-pin, Female. [SDSFIE V2.5 AIR FORCE]
FIREWIRE_6M	IEEE 1394 Fire wire connector, 6-pin, Male. [SDSFIE V2.5 AIR FORCE]
FME_F	FME, Female. [SDSFIE V2.5 AIR FORCE]
FME_M	FME, Male. [SDSFIE V2.5 AIR FORCE]
G_TYPE_F	G-F - Type G, Female. [SDSFIE V2.5 AIR FORCE]
G_TYPE_M	G-M - Type G, Male. [SDSFIE V2.5 AIR FORCE]
HM_F	HN, weatherproof, RF connector, Female. [SDSFIE V2.5 AIR FORCE]
HN_M	HN, weatherproof, RF connector, Male. [SDSFIE V2.5 AIR FORCE]
LC_F	Limited Co-ordination Specification (LC Spec.), Female. [SDSFIE V2.5 AIR FORCE]
LC_M	Limited Co-ordination Specification (LC Spec.), Male. [SDSFIE V2.5 AIR FORCE]
MINI_UHF_F	MINI UHF, Female. [SDSFIE V2.5 AIR FORCE]
MINI_UHF_M	MINI UHF, Male. [SDSFIE V2.5 AIR FORCE]
MT_RJ_F	MT-RJ, FO, RJ45 footprint connector, Female. [SDSFIE V2.5 AIR FORCE]
MT_RJ_M	MT-RJ, FO, RJ45 footprint connector, Male. [SDSFIE V2.5 AIR FORCE]
N_TYPE_F	N TYPE, Female. [SDSFIE V2.5 AIR FORCE]
N_TYPE_M	N TYPE, Male. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
RJ21_F	RJ21, RJ21 AKA Telco 50-pin connector, Female. [SDSFIE V2.5 AIR FORCE]
RJ21_M	RJ21 AKA Telco 50-pin connector, Male. [SDSFIE V2.5 AIR FORCE]
RJ45_F	RJ45, Female. [SDSFIE V2.5 AIR FORCE]
RJ45_M	RJ45, Male. [SDSFIE V2.5 AIR FORCE]
SC_F	Plug and socket, push-pull latch, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
SC_M	Plug and socket, push-pull latch, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
SMA_F	SubMiniature Version A, Female. [SDSFIE V2.5 AIR FORCE]
SMA_M	Subminiature Version A, Male. [SDSFIE V2.5 AIR FORCE]
SMC_F	Subminiature Version C, Female. [SDSFIE V2.5 AIR FORCE]
SMC_M	Subminiature Version C, Male. [SDSFIE V2.5 AIR FORCE]
ST_F	ST, Female. [SDSFIE V2.5 AIR FORCE]
ST_M	ST, Male. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
TNC_F	TNC Female. [SDSFIE V2.5 AIR FORCE]
TNC_M	TNC Male. [SDSFIE V2.5 AIR FORCE]
UHF_F	UHF, Female. [SDSFIE V2.5 AIR FORCE]
UHF_M	UHF, Male. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
USB_F	Universal Serial Bus, Female. [SDSFIE V2.5 AIR FORCE]

USB_M	Universal Serial Bus, Male. [SDSFIE V2.5 AIR FORCE]

CodeCableDimension

Used by Attributes: Cable - Cbl Dim;Twisted Pair Line - Cbl Size;Cable - Cond Size;Cable - Neut Size;Antenna Line - Size;Segmented Cable - Size;Bus Line - Size Neut;Anode Test Station - Wire Size;Anode Test Station - Wire Size;Anode Test Station - Wire Size;Anode Test Station - Wire Size;Anode Test Station - Wire Size;Anode Test Station - Wire Size

Value	Definition (Notes) [Source]
#1/0	#1/0 [SDSFIE V2.1 FGDC Utilities Classification]
#10	#10 [SDSFIE V2.1 FGDC Utilities Classification]
#14	#14 [SDSFIE V2.1 FGDC Utilities Classification]
#16	#16 [SDSFIE V2.1 FGDC Utilities Classification]
#18	#18 [SDSFIE V2.1 FGDC Utilities Classification]
#19	#19 [SDSFIE V2.1 FGDC Utilities Classification]
#2/0	#2/0 [SDSFIE V2.1 FGDC Utilities Classification]
#20	#20 [SDSFIE V2.1 FGDC Utilities Classification]
#22	#22 [SDSFIE V2.1 FGDC Utilities Classification]
#24	#24 [SDSFIE V2.1 FGDC Utilities Classification]
#26	#26 [SDSFIE V2.1 FGDC Utilities Classification]
#28	#28 [SDSFIE V2.1 FGDC Utilities Classification]
#3/0	#3/0 [SDSFIE V2.1 FGDC Utilities Classification]
#30	#30 [SDSFIE V2.1 FGDC Utilities Classification]
#32	#32 [SDSFIE V2.1 FGDC Utilities Classification]
#34	#34 [SDSFIE V2.1 FGDC Utilities Classification]
#36	#36 [SDSFIE V2.1 FGDC Utilities Classification]
#4/0	#4/0 [SDSFIE V2.1 FGDC Utilities Classification]
0.375	3/8 inch [SDSFIE V2.1 FGDC Utilities Classification]
0.5	0.5 inch [SDSFIE V2.1 FGDC Utilities Classification]
0.75	0.75 inch [SDSFIE V2.1 FGDC Utilities Classification]
0_375	3/8 inch [SDSFIE V2.1 FGDC Utilities Classification]
0_5	0.5 inch [SDSFIE V2.1 FGDC Utilities Classification]
0_75	0.75 inch [SDSFIE V2.1 FGDC Utilities Classification]
1	1 inch [SDSFIE V2.1 FGDC Utilities Classification]
1.25	1.25 inches [SDSFIE V2.1 FGDC Utilities Classification]
1.5	1.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
1_25	1.25 inches [SDSFIE V2.1 FGDC Utilities Classification]
1_5	1.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
1000_MCM	1000 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
1033.5_MCM	1033.5 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
1113_MCM	1113 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
12	12 inches [SDSFIE V2.1 FGDC Utilities Classification]
1272_MCM	1272 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
1431_MCM	1431 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
1590_MCM	1590 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
2	2 inches [SDSFIE V2.1 FGDC Utilities Classification]
2.5	2.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
2_5	2.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
2156_MCM	2156 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
250_MCM	250 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
266.8_MCM	266.8 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
3	3 inches [SDSFIE V2.1 FGDC Utilities Classification]
3.5	3.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
3_5	3.5 inches [SDSFIE V2.1 FGDC Utilities Classification]
300_MCM	300 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
336.4_MCM	336.4 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
336_MCM	336 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
350_MCM	350 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
397.5_MCM	397.5 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
4	4 inches [SDSFIE V2.1 FGDC Utilities Classification]
400_MCM	400 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
477_MCM	477 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
477_MCM_A	477 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
5	5 inches [SDSFIE V2.1 FGDC Utilities Classification]
500_MCM	500 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]

556.5_MCM	556.5 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
556_5_MCM_A	556.5 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
6	6 inches [SDSFIE V2.1 FGDC Utilities Classification]
600_MCM	600 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
636_MCM	636 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
636_MCM_A	636 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
7	7 inches [SDSFIE V2.1 FGDC Utilities Classification]
700_MCM	700 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
750_MCM	750 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
795_MCM_A	795 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
8	8 inches [SDSFIE V2.1 FGDC Utilities Classification]
800_MCM	800 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
9	9 inches [SDSFIE V2.1 FGDC Utilities Classification]
900_MCM	900 K circular mils [SDSFIE V2.1 FGDC Utilities Classification]
954_MCM_A	954 K circular mils, ACSR [SDSFIE V2.1 FGDC Utilities Classification]
BITTERN	1272 K circular mils, ACSR,45/7 [SDSFIE V2.1 FGDC Utilities Classification]
BLUEBIRD	2156 K circular mils, ACSR,84/19 [SDSFIE V2.1 FGDC Utilities Classification]
BLUEJAY	1113 K circular mils, ACSR,45/7 [SDSFIE V2.1 FGDC Utilities Classification]
BOBOLINK	1431 K circular mils, ACSR,45/7 [SDSFIE V2.1 FGDC Utilities Classification]
CARDINAL	954 K circular mils, ACSR,54/7 [SDSFIE V2.1 FGDC Utilities Classification]
CHICKADEE	397.5 K circular mils, ACSR,18/1 [SDSFIE V2.1 FGDC Utilities Classification]
DOVE	556.5 K circular mils, ACSR,26/7 [SDSFIE V2.1 FGDC Utilities Classification]
DRAKE	795 K circular mils, ACSR,26/7 [SDSFIE V2.1 FGDC Utilities Classification]
FALCON	1590 K circular mils, ACSR,54/19 [SDSFIE V2.1 FGDC Utilities Classification]
FINCH	1113 K circular mils, ACSR,54/19 [SDSFIE V2.1 FGDC Utilities Classification]
FLICKER	477 K circular mils, ACSR,24/7 [SDSFIE V2.1 FGDC Utilities Classification]
GROSBEAK	636 K circular mils, ACSR,24/7 [SDSFIE V2.1 FGDC Utilities Classification]
HAWK	477 K circular mils, ACSR,26/7 [SDSFIE V2.1 FGDC Utilities Classification]
HEN	477 K circular mils, ACSR,30/7 [SDSFIE V2.1 FGDC Utilities Classification]
IBIS	397.5 K circular mils, ACSR,26/7 [SDSFIE V2.1 FGDC Utilities Classification]
LAPWING	1590 K circular mils, ACSR,45/7 [SDSFIE V2.1 FGDC Utilities Classification]
LINNET	336.4 K circular mils, ACSR,26/7 [SDSFIE V2.1 FGDC Utilities Classification]
MERLIN	336.4 K circular mils, ACSR,18/1 [SDSFIE V2.1 FGDC Utilities Classification]
N1	#1 [SDSFIE V2.1 FGDC Utilities Classification]
N1_0	#1/0 [SDSFIE V1.4]
N10	#10 [SDSFIE V1.4]
N12	#12 [SDSFIE V1.4]
N14	#14 [SDSFIE V1.4]
N16	#16 [SDSFIE V1.4]
N18	#18 [SDSFIE V1.4]
N19	#19 [SDSFIE V1.4]
N2	#2 [SDSFIE V1.4]
N2_0	#2/0 [SDSFIE V1.4]
N20	#20 [SDSFIE V1.4]
N22	#22 [SDSFIE V1.4]
N24	#24 [SDSFIE V1.4]
N26	#26 [SDSFIE V1.4]
N28	#28 [SDSFIE V1.4]
N3	#3 [SDSFIE V1.4]
N3_0	#3/0 [SDSFIE V1.4]
N30	#30 [SDSFIE V1.4]
N32	#32 [SDSFIE V1.4]
N34	#34 [SDSFIE V1.4]
N36	#36 [SDSFIE V1.4]
N4	#4 [SDSFIE V1.4]
N4_0	#4/0 [SDSFIE V1.4]
N5	#5 [SDSFIE V1.4]
N6	#6 [SDSFIE V1.4]
N8	#8 [SDSFIE V1.4]
ORIOLE	336.4 K circular mils, ACSR,30/7 [SDSFIE V1.7]
ORTOLAN	1033.5 K circular mils,45/7 [SDSFIE V1.7]
OSPREY	556.5 K circular mils, ACSR,18/1 [SDSFIE V1.7]
OSTRICH	300 K circular mils, ACSR,26/7 [SDSFIE V1.7]
OTHER	other [SDSFIE V1.4]
PARAKEET	556.5 K circular mils, ACSR,24/7 [SDSFIE V1.7]
PARTRIDGE	556.5 K circular mils, ACSR,26/7 [SDSFIE V1.7]

PELICAN	266.8 K circular mils, ACSR,18/1 [SDSFIE V1.7]
PHEASANT	477 K circular mils, ACSR,54/19 [SDSFIE V1.7]
PLOVER	1272 K circular mils, ACSR,54/19 [SDSFIE V1.7]
RAIL	1431 K circular mils, ACSR,45/7 [SDSFIE V1.7]
ROOK	954 K circular mils, ACSR,24/7 [SDSFIE V1.7]
TBD	to be determined [SDSFIE V1.4]
TERN	795 K circular mils, ACSR,45/7 [SDSFIE V1.7]
UNKNOWN	unknown [SDSFIE V1.4]
WAXWING	266.8 K circular mils, ACSR,18/1 [SDSFIE V1.7]

CodeCableElevation

Used by Attributes: Coaxial Line - Cab Elev;Fiberoptic Line - Cab Elev;Other Cable - Cab Elev;Twisted Pair Line - Cab Elev;Waveguide Line - Cab Elev

Value	Definition (Notes) [Source]
MAIN_BURIED	Underground main communications cables [SDSFIE V1.6]
MAIN_OHEAD	Overhead communications cables, normally suspended from or between poles. [SDSFIE V1.6]
MAIN_SUBMERGE	Submerged communications cables, either on the bottom or buried in the bottom of a water body or water course. [SDSFIE V1.6]
SERV_BURIED	The cable is a secondary service line which has been buried below ground. [SDSFIE V1.6]
SERV_OHEAD	A secondary service line which is suspended overhead, normally between poles. [SDSFIE V1.6]
SERV_SUBMERGE	A secondary service line which lies on the bottom of a watercourse or water body or which has been buried in the bottom. [SDSFIE V1.6]

CodeCableGaDimensions

Used by Attributes: Terminator - Cbldim 3

Value	Definition (Notes) [Source]
100_UM	101 micron core (obsolete). [SDSFIE V2.5 AIR FORCE]
1000_UM	2 mm (Plastic Optical Fiber). [SDSFIE V2.5 AIR FORCE]
125_UM	126 micron cladding. [SDSFIE V2.5 AIR FORCE]
140_UM	141 micron cladding (obsolete). [SDSFIE V2.5 AIR FORCE]
200_UM	201 micron core. [SDSFIE V2.5 AIR FORCE]
240_UM	241 micron cladding. [SDSFIE V2.5 AIR FORCE]
50_UM	51 micron core. [SDSFIE V2.5 AIR FORCE]
62_5_UM	62.5 micron core. [SDSFIE V2.5 AIR FORCE]
8_3_UM	8.3 micron core. [SDSFIE V2.5 AIR FORCE]
N14	#14 or 14 Gage. [SDSFIE V2.5 AIR FORCE]
N16	#16 or 16 Gage. [SDSFIE V2.5 AIR FORCE]
N18	#18 or 18 Gage. [SDSFIE V2.5 AIR FORCE]
N19	#19 or 19 Gage. [SDSFIE V2.5 AIR FORCE]
N20	#20 or 20 Gage. [SDSFIE V2.5 AIR FORCE]
N22	#22 or 22 Gage. [SDSFIE V2.5 AIR FORCE]
N24	#24 or 24 Gage. [SDSFIE V2.5 AIR FORCE]
N26	#26 or 26 Gage. [SDSFIE V2.5 AIR FORCE]
N28	#28 or 28 Gage. [SDSFIE V2.5 AIR FORCE]
N30	#30 or 30 Gage. [SDSFIE V2.5 AIR FORCE]
N32	#32 or 33 Gage. [SDSFIE V2.5 AIR FORCE]
N34	#34 or 34 Gage. [SDSFIE V2.5 AIR FORCE]
N36	#36 or 36 Gage. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeCableInstallationType

Used by Attributes: Path Segment Line - Cabins;Coaxial Line - Install Type;Fiberoptic Line - Install Type;Other Cable - Install Type;Segmented Cable Point - Install Type;Twisted Pair Line - Install Type;Waveguide Line - Install Type

Value	Definition (Notes) [Source]
ABANDONED	abandoned [SDSFIE V1.6]
ABOVEGROUND	above ground [SDSFIE V1.6]
AER	aerial attachment [SDSFIE V2 Austin and Pitts]

BORE	jack and bore, pull cable [SDSFIE V2 Austin and Pitts]
BURY	direct bury cable [SDSFIE V2 Austin and Pitts]
DB	directional bore conduit, pull cable [SDSFIE V2 Austin and Pitts]
INSIDE	inside [SDSFIE V1.6]
JSC	jet submarine cable [SDSFIE V2 Austin and Pitts]
OUTSIDE	outside [SDSFIE V1.6]
OVERHEAD	overhead [SDSFIE V1.6]
TR	trench and place conduit, pull cable [SDSFIE V2 Austin and Pitts]
TUNNEL	tunnel [SDSFIE V1.6]
UNDERGROUND	underground [SDSFIE V1.6]

CodeCableType

Used by Attributes: Segmented Cable Point - Cab Type;Waveguide Line - Cab Type;Equipment - Cbl Type;Media Converter - Cbltyp 1;Media Converter - Cbltyp 2

Value	Definition (Notes) [Source]
1_WIRE	1-wire, single conductor [SDSFIE V1.4]
18_7_FC	18x7 FC [SDSFIE V1.4]
19_7	19x7 [SDSFIE V1.4]
3_19_FLUSHER	3x19 slusher [SDSFIE V1.4]
3_7_GRD_RAIL	3x7 guard rail [SDSFIE V1.4]
3_WIRE_PRKWY	3-wire parkway [SDSFIE V1.4]
3_WIRE_ROUND	3-wire, round [SDSFIE V1.4]
3_WIRE_SGMNT	3-wire, segmental [SDSFIE V1.4]
4_WIRE_ROUND	4-wire, quad conductor [SDSFIE V1.4]
5_19_CLAD	5x19 marlin clad FC [SDSFIE V1.4]
6_12_FILLER_FC	6x12 filler wire FC [SDSFIE V1.4]
6_12_GALV_FC	6x12 galvanized running rope FC [SDSFIE V1.4]
6_19_CLAD	6x19 marlin clad [SDSFIE V1.4]
6_19_SEALE_IWRC	6x19 Seale IWRC [SDSFIE V1.4]
6_24_HAWSER	6x24 hawser [SDSFIE V1.4]
6_25_FILL_IWRC	6x25 filler wire IWRC [SDSFIE V1.4]
6_25B_FLAT_FC	6x25B flattened strand FC [SDSFIE V1.4]
6_26_WARR_IWRC	6x26 Warrington Seale IWRC [SDSFIE V1.4]
6_27H_FLAT_FC	6x27H flattened strand FC [SDSFIE V1.4]
6_3_19_SPRING	6x3x19 spring lay [SDSFIE V1.4]
6_30_HAWSER	6x30 hawser [SDSFIE V1.4]
6_30G_FLAG_FC	6x30G flattened strand FC [SDSFIE V1.4]
6_31_FILL_IWRC	6x31 filler wire IWRC [SDSFIE V1.4]
6_31_WARR_IWRC	6x31 Warrington Seale IWRC [SDSFIE V1.4]
6_36_SEALE_IWRC	6x36 Seale filler wire IWRC [SDSFIE V1.4]
6_36_WARR_IWRC	6x36 Warrington Seale IWRC [SDSFIE V1.4]
6_41_SEALE_IWRC	6x41 Seale filler wire IWRC [SDSFIE V1.4]
6_41_WARR_IWRC	6x41 Warrington Seale IWRC [SDSFIE V1.4]
6_42_TILLER_FC	6x42 tiller rope FC [SDSFIE V1.4]
6_46_SEALE_IWRC	6x46 Seale filler wire IWRC [SDSFIE V1.4]
6_49_FILL_FC	6x49 filler wire Seale FC [SDSFIE V1.4]
6_6_7_TILLER	6x6x7 tiller rope [SDSFIE V1.4]
6_7_FC	6x7 FC [SDSFIE V1.4]
8_19_SEALE_FC	8x19 Seale FC [SDSFIE V1.4]
8_25_FILLER_IWR	8x25 filler wire IWRC [SDSFIE V1.4]
8_9_SEALE_IWRC	8x9 Seale IWRC [SDSFIE V1.4]
BARE	bare [SDSFIE V1.4]
COAX	coaxial [SDSFIE V1.4]
DUPLEX	2-wire, dual conductor [SDSFIE V1.4]
EHS	Extra High Strength Steel [SDSFIE V1.4]
EIP	Extra Improved Plow Steel [SDSFIE V1.4]
FC	FiberCore [SDSFIE V1.4]
FE	Iron [SDSFIE V1.4]
FIBER_OPTICS	Fiber Optics Cable. [SDSFIE V2.3 Tinker Air Force Base]
HSS	High Strength Steel [SDSFIE V1.4]
IPS	Improved Plow Steel [SDSFIE V1.4]
IWRC	Independent Wire Rope Core [SDSFIE V1.4]
MPS	Mild Plow Steel [SDSFIE V1.4]

OTHER	other [SDSFIE V1.4]
PORTAL	Portal. [SDSFIE V2.31 Air Force]
PRIMARY	primary [SDSFIE V1.4]
PS	Plow Steel [SDSFIE V1.4]
RECEIVE	Receive. [SDSFIE V2.31 Air Force]
REMOTE	Remote. [SDSFIE V2.31 Air Force]
SECONDARY	secondary [SDSFIE V1.4]
SENSOR	Sensor. [SDSFIE V2.31 Air Force]
SOLIDCORE	solid core [SDSFIE V1.4]
SOLIDCORETB	solid core-twisted bundle around [SDSFIE V1.4]
SOLIDCORETS	solid core-twisted strand around [SDSFIE V1.4]
SOLIDIELEC	solid dielectric [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TRANSMIT	Transmit. [SDSFIE V2.31 Air Force]
TRIPLEX	triplex [SDSFIE V1.4]
TS	twisted strands [SDSFIE V1.4]
TSCORE	twisted strands core [SDSFIE V1.4]
TWINAX	Twin Coaxial Cable [SDSFIE V2.31]
TWISTED_PAIR	Twisted Pair Cable. [SDSFIE V2.3 Tinker Air Force Base]
UNKNOWN	Unknown [SDSFIE V2.31 ATT]
WAVEGUIDE	Waveguide [SDSFIE V2.31 ATT]
WEATHRPROFCU	weatherproofed-Copper [SDSFIE V1.4]
WSC	Wire-Strand Core [SDSFIE V1.4]

CodeCableUse

Used by Attributes: Coaxial Line - Cab Use;Fiberoptic Line - Cab Use;Other Cable - Cab Use;Segmented Cable Point - Cab Use;Twisted Pair Line - Cab Use;Waveguide Line - Cab Use

Value	Definition (Notes) [Source]
OTHER	other cable [SDSFIE V2]
TBD	to be determined [SDSFIE V2]
TELEGRAPH	Telegraph [SDSFIE V2.2]
TELEPHONE	telephone cable [SDSFIE V2]
TELEVISION	television cable [SDSFIE V2]
UNKNOWN	unknown use [SDSFIE V2]

CodeCableWayType

Used by Attributes: Cable Tray Line - Caw Type

Value	Definition (Notes) [Source]
BRIDGE	Cable Bridge [SDSFIE V2 Tinker Air Force Base]
RACK	Cable Rack [SDSFIE V2]
TRAY	Cable Tray [SDSFIE V2 Tinker Air Force Base]

CodeColor

Used by Attributes: Disposal Tank - Color;Septic Tank - Color;Tank - Color;Tank - Color;Tank - Color;Tank - Color;Tank - Color;Tank Area - Color;Telephone - Color;Line - Map Color

Value	Definition (Notes) [Source]
AMBER	Amber [U.S. CAD]
BLACK	Black [U.S. CAD]
BLUE	Blue [U.S. CAD]
BROWN	Brown [U.S. CAD]
GREEN	Green [U.S. CAD]
GREEN-GREEN	Bidirectional (Source AC 150/5345-46C)
GREEN-RED	Bidirectional (Source AC 150/5345-46C)
GREEN-YELLOW	Bidirectional (Source AC 150/5345-46C)
GREY	Grey [U.S. CAD]
LIGHTGREY	LightGrey [U.S. CAD]
MAGENTA	Magenta [U.S. CAD]

ORANGE	Orange [U.S. CAD]
OTHER	Other [U.S. CAD]
PINK	Pink [U.S. CAD]
PURPLE	Purple [AIXM]
RED	Red [U.S. CAD]
RED-GREEN	Bidirectional (Source AC 150/5345-46C)
RED-RED	Bidirectional (Source AC 150/5345-46C)
TBD	To be determined
VIOLET	Violet [U.S. CAD]
WHITE	White [U.S. CAD]
WHITE-RED	Bidirectional (Source AC 150/5345-46C)
WHITE-WHITE	Bidirectional (Source AC 150/5345-46C)
WHITE-YELLOW	Bidirectional (Source AC 150/5345-46C)
YELLOW	Yellow [U.S. CAD]
YELLOW-GREEN	Bidirectional (Source AC 150/5345-46C)
YELLOW-RED	Bidirectional (Source AC 150/5345-46C)
YELLOW-YELLOW	Bidirectional (Source AC 150/5345-46C)

CodeCommAntenna

Used by Attributes: Access Point - Ant Type;Antenna Site - Ant Type

Value	Definition (Notes) [Source]
DIPOLE	dipole antenna [SDSFIE V2 Tinker Air Force Base]
FIELD	field antenna [SDSFIE V2 Tinker Air Force Base]
PARABOLIC	parabolic antenna [SDSFIE V2 Tinker Air Force Base]
PATCH	Directional Patch Antenna. [SDSFIE V2.5 AIR FORCE]
YAGI	Directional Yagi Antenna. [SDSFIE V2.5 AIR FORCE]

CodeCommAntennaUsageType

Used by Attributes: Antenna Site - Ant Use;Equipment - Ant Use

Value	Definition (Notes) [Source]
14_DF	14 element dual frequency. [SDSFIE V2.31 Air Force]
14_SF	14 element single frequency. [SDSFIE V2.31 Air Force]
8_DF	8 element dual frequency. [SDSFIE V2.31 Air Force]
8_SF	8 element single frequency. [SDSFIE V2.31 Air Force]
CAPTURE	Capture. [SDSFIE V2.31 Air Force]
NULL	Null. [SDSFIE V2.31 Air Force]
RANTEC	Rantec. [SDSFIE V2.31 Air Force]
ROTATING	Rotating. [SDSFIE V2.31 Air Force]
SIDEBAND	Sideband. [SDSFIE V2.31 Air Force]

CodeCommNodeType

Used by Attributes: Path Node Site - Node Type

Value	Definition (Notes) [Source]
DBGROUP	Virtual Ductbank Group (not drawn). [SDSFIE V2.5 AIR FORCE]
DUCT_OPENING	Duct or Inner duct Opening. [SDSFIE V2.5 AIR FORCE]
DUCT2DIRECT	Duct to/from a Direct-Buried Path. [SDSFIE V2.5 AIR FORCE]
GENERAL	General Transition (i.e. PVC to PE duct). [SDSFIE V2.5 AIR FORCE]
HOLE	Vault Vertical Hole. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
RISER	Vertical pipe or covering. [SDSFIE V2.5 AIR FORCE]

CodeCompAirFitting

Used by Attributes: Fitting - Fittyp

Value	Definition (Notes) [Source]
CAP	Pipe Cap [SDSFIE V1.75]
CROSS	Pipe Cross [SDSFIE V1.75]
FLANGE	Pipe Flange [SDSFIE V1.75]
TEE	Pipe Tee [SDSFIE V1.75]

CodeConnectSize

Used by Attributes: Hydrant – Connection Size

Value	Definition (Notes) [Source]
1X4.5IN_BC_PLUS_2X2.5IN_NST	1 x 4.5" Baltimore City + 2 x 2.5" NST
2X2.5IN_NST	2 x 2.5" NST
1X5IN_STORZ_PLUS_2x2.5IN_NST	1 x 5" Storz + 2 x 2.5" NST
OTHER	Other
UNKNOWN	Unknown

CodeCoreType

Used by Attributes: Segmented Cable Point - Core Type;Twisted Pair Line - Core Type

Value	Definition (Notes) [Source]
AIR_CORE	Air core [SDSFIE V2 Tinker Air Force Base]
FILLED	Filled Core by unknown substance. [SDSFIE V2.5 AIR FORCE]
INSULATION	Insulation core [SDSFIE V2 Tinker Air Force Base]
PAPER	Paper Core [SDSFIE V2 Tinker Air Force Base]
PRESSURIZED	Pressurized core [SDSFIE V2 Tinker Air Force Base]

CodeCountsInAssembly

Used by Attributes: Load Capacitor - Ldcnum;Load Coil - Ldcnum

Value	Definition (Notes) [Source]
0001	1. [SDSFIE V2.5 AIR FORCE]
0002	2. [SDSFIE V2.5 AIR FORCE]
0003	3. [SDSFIE V2.5 AIR FORCE]
0004	4. [SDSFIE V2.5 AIR FORCE]
0005	5. [SDSFIE V2.5 AIR FORCE]
0006	6. [SDSFIE V2.5 AIR FORCE]
0010	10. [SDSFIE V2.5 AIR FORCE]
0011	11. [SDSFIE V2.5 AIR FORCE]
0012	12. [SDSFIE V2.5 AIR FORCE]
0015	15. [SDSFIE V2.5 AIR FORCE]
0016	16. [SDSFIE V2.5 AIR FORCE]
0018	18. [SDSFIE V2.5 AIR FORCE]
0020	20. [SDSFIE V2.5 AIR FORCE]
0024	24. [SDSFIE V2.5 AIR FORCE]
0025	25. [SDSFIE V2.5 AIR FORCE]
0050	50. [SDSFIE V2.5 AIR FORCE]
0100	100. [SDSFIE V2.5 AIR FORCE]
0200	200. [SDSFIE V2.5 AIR FORCE]
0300	300. [SDSFIE V2.5 AIR FORCE]
0400	400. [SDSFIE V2.5 AIR FORCE]
0600	600. [SDSFIE V2.5 AIR FORCE]
0900	900. [SDSFIE V2.5 AIR FORCE]
1200	1200. [SDSFIE V2.5 AIR FORCE]
1500	1500. [SDSFIE V2.5 AIR FORCE]
1800	1800. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]

UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeCryptographyProtocol

Used by Attributes: Access Point - Enc Prot

Value	Definition (Notes) [Source]
3DES	Triple DES encryption (will be replaced by AES). [SDSFIE V2.3 Tinker Air Force Base]
A_NEEDH_SCHR_SK	Amended Needham Schroeder Symmetric Key. [SDSFIE V2.5 AIR FORCE]
AES	Advanced Encryption Standard, a Type I capable encryption module. [SDSFIE V2.3 Tinker Air Force Base]
AS_RPC	Andrew Secure RPC. [SDSFIE V2.5 AIR FORCE]
BAN_CON_AS_RPC	BAN concrete Andrew Secure RPC. [SDSFIE V2.5 AIR FORCE]
BAN_MOD_AS_RPC	BAN modified Andrew Secure RPC. [SDSFIE V2.5 AIR FORCE]
BAN_MOD_CCITT_3	BAN modified version of CCITT X.509 (3). [SDSFIE V2.5 AIR FORCE]
BAN_YAHALOM	BAN simplified version of Yahalom. [SDSFIE V2.5 AIR FORCE]
CAM	CAM. [SDSFIE V2.5 AIR FORCE]
CCITT_X_509_1	CCITT X.509 (1). [SDSFIE V2.5 AIR FORCE]
CCITT_X_509_1C	CCITT X.509 (1c). [SDSFIE V2.5 AIR FORCE]
CCITT_X_509_3	CCITT X.509 (3). [SDSFIE V2.5 AIR FORCE]
CJ_HC_SPLICE_AS	Clark and Jacob modified Hwang and Chen modified Splice/As. [SDSFIE V2.5 AIR FORCE]
DENNING_SACCO_SK	Denning-Sacco shared key. [SDSFIE V2.5 AIR FORCE]
DES	Digital Encryption Standard [SDSFIE V2.3 Tinker Air Force Base]
DES-OFB	Digital Encryption Standard - Output Feedback [SDSFIE V2.3 Tinker Air Force Base]
DIFFIE_HELMAN	Diffie Helman. [SDSFIE V2.5 AIR FORCE]
DNSSEC	Domain Name Server Security. [SDSFIE V2.5 AIR FORCE]
DSS	DSS. [SDSFIE V2.5 AIR FORCE]
FASCINATOR	Fascinator is a series of Type I capable encryption module. [SDSFIE V2.31 Tinker Air Force Base]
GJM	GJM. [SDSFIE V2.5 AIR FORCE]
GNUPG_PGP	GnuPG/PGP. [SDSFIE V2.5 AIR FORCE]
GONG	Gong. [SDSFIE V2.5 AIR FORCE]
GSSAPI	Generic Security Services API. [SDSFIE V2.5 AIR FORCE]
HC_SPLICE_AS	Hwang and Chen modified Splice/As. [SDSFIE V2.5 AIR FORCE]
HWANG_NEUM_STUB	Hwang modified version of Neumann Stubblebine. [SDSFIE V2.5 AIR FORCE]
IDEA	IDEA. [SDSFIE V2.5 AIR FORCE]
IEEE_P1363	IEEE P1364. [SDSFIE V2.5 AIR FORCE]
IPSEC	IP Secure Protocol. [SDSFIE V2.5 AIR FORCE]
KAO_CHOW_AUTH_1	Kao Chow Authentication v.1. [SDSFIE V2.5 AIR FORCE]
KAO_CHOW_AUTH_2	Kao Chow Authentication v.2. [SDSFIE V2.5 AIR FORCE]
KAO_CHOW_AUTH_3	Kao Chow Authentication v.3. [SDSFIE V2.5 AIR FORCE]
KERBEROS_V5	Kerberos V6. [SDSFIE V2.5 AIR FORCE]
KSL	KSL. [SDSFIE V2.5 AIR FORCE]
L_BAN_CON_AS_RPC	Lowe modified BAN concrete Andrew Secure RPC. [SDSFIE V2.5 AIR FORCE]
L_DENNING_SAC_DK	Lowe modified Denning-Sacco shared key. [SDSFIE V2.5 AIR FORCE]
L_NEEDH_SCHR_PK	Lowes fixed version of Needham-Schroder Public Key. [SDSFIE V2.5 AIR FORCE]
LOWE_MOD_KSL	Lowe modified KSL. [SDSFIE V2.5 AIR FORCE]
LOWE_WMF	Lowe modified Wide Mouthed Frog. [SDSFIE V2.5 AIR FORCE]
LOWES_YAHALOM	Lowes modified version of Yahalom. [SDSFIE V2.5 AIR FORCE]
MARS	MARS. [SDSFIE V2.5 AIR FORCE]
NEEDHAM_SCHR_PK	Needham-Schroeder Public Key. [SDSFIE V2.5 AIR FORCE]
NEEDHAM_SCHR_SK	Needham Schroeder Symmetric Key. [SDSFIE V2.5 AIR FORCE]
NEUMANN_STUBBLE	Neumann Stubblebine. [SDSFIE V2.5 AIR FORCE]
OPENPGP	OpenPGP. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
OTWAY_REES	Otway Rees. [SDSFIE V2.5 AIR FORCE]
PAULSONS_YAHALOM	Paulsons strengthened version of Yahalom. [SDSFIE V2.5 AIR FORCE]
PKCS	Public Key Encryption Standards. [SDSFIE V2.5 AIR FORCE]
RC4	RC5. [SDSFIE V2.5 AIR FORCE]
ROT	ROT. [SDSFIE V2.5 AIR FORCE]
RSA	RSA. [SDSFIE V2.5 AIR FORCE]
SEAL	SEAL. [SDSFIE V2.5 AIR FORCE]
SERPENT	Serpent. [SDSFIE V2.5 AIR FORCE]
SHTTP	Secure Hypertext Transfer Protocol. [SDSFIE V2.5 AIR FORCE]
SK3	SK3. [SDSFIE V2.5 AIR FORCE]
SMARTRIGHT_VO	SmartRight view-only. [SDSFIE V2.5 AIR FORCE]

SOBER	SOBER. [SDSFIE V2.5 AIR FORCE]
SPLIC_AS	SPLICE/AS. [SDSFIE V2.5 AIR FORCE]
SSH1	Secure Shell v2. [SDSFIE V2.5 AIR FORCE]
SSH2	Secure Shell v3. [SDSFIE V2.5 AIR FORCE]
SSL	Secure Socket Layer. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
TLS	TLS. [SDSFIE V2.5 AIR FORCE]
TMN	TMN. [SDSFIE V2.5 AIR FORCE]
TWOFISH	Twofish. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
WAKE	WAKE. [SDSFIE V2.5 AIR FORCE]
WEP	Wired Equivalent Privacy. [SDSFIE V2.5 AIR FORCE]
WMF	Wide Mouthed Frog. [SDSFIE V2.5 AIR FORCE]
WOO_AND_LAM_P_3	Woo and Lam Pi 3. [SDSFIE V2.5 AIR FORCE]
WOO_AND_LAM_PI	Woo and Lam Pi. [SDSFIE V2.5 AIR FORCE]
WOO_AND_LAM_PI_1	Woo and Lam Pi 1. [SDSFIE V2.5 AIR FORCE]
WOO_AND_LAM_PI_2	Woo and Lam Pi 2. [SDSFIE V2.5 AIR FORCE]
WOO_LAM_MA	Woo and Lam Mutual Authentication. [SDSFIE V2.5 AIR FORCE]
WOO_LAM_PI_F	Woo and Lam Pi f. [SDSFIE V2.5 AIR FORCE]
WPA	Wi-Fi Protected Access. [SDSFIE V2.5 AIR FORCE]
XOR	XOR. [SDSFIE V2.5 AIR FORCE]
YAHALOM	Yahalom. [SDSFIE V2.5 AIR FORCE]

CodeCulvert

Used by Attributes: Culvert Center Line - Gate Type

Value	Definition (Notes) [Source]
GATED	The culvert is equipped with gates to block or divert water flow. [SDSFIE V1.8 REEGIS]
NONGATED	The culvert contains no provision to block or divert water flow. [SDSFIE V1.8 REEGIS]

CodeCulvertScreenType

Used by Attributes: Line - Screen Type;Line - Scrn Type;Storm Trench Drain Line - scrnType

Value	Definition (Notes) [Source]
HORZBAR	horizontal bar/pipe [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VERTBAR	vertical bar/pipe [SDSFIE V1.4]

CodeDataSource

Used by Attributes: Access Coverage Area - collectionProgress;Access Point - collectionProgress;Air Pipe - collectionProgress;Air Pressure Device - collectionProgress;Amplifier - collectionProgress;Anchor - collectionProgress;Anode - collectionProgress;Anode - collectionProgress;Anode - collectionProgress;Anode Test Station - collectionProgress;Anode Test Station - collectionProgress;Anode Test Station - collectionProgress;Antenna Line - collectionProgress;Antenna Site - collectionProgress;Attenuator - collectionProgress;Bus Line - collectionProgress;Cable - collectionProgress;Cable Bridge Line - collectionProgress;Cable Ladder - collectionProgress;Cable Rack Line - collectionProgress;Cable Tray Line - collectionProgress;Cable Trough Line - collectionProgress;Capacitor - collectionProgress;Coaxial Line - collectionProgress;DbSplice - collectionProgress;Device - collectionProgress;Device - collectionProgress;Discharge Point - collectionProgress;Drain Separator - collectionProgress;Ductbank - collectionProgress;Ductbank - collectionProgress;Equipment - collectionProgress;Fiberoptic Line - collectionProgress;Fill Point - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Generator - collectionProgress;Grit Chamber - collectionProgress;Ground Point - collectionProgress;Ground Point - collectionProgress;Groundplane Area - collectionProgress;Groundwave Area - collectionProgress;Head Bolt Outlet - collectionProgress;Headwall - collectionProgress;Headwall Line - collectionProgress;Impedance Matching Point - collectionProgress;Inlet - collectionProgress;Internet Center - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Lagoon - collectionProgress;Light - collectionProgress;Line - collectionProgress;Line Of Sight Line - collectionProgress;Load Capacitor - collectionProgress;Load Coil - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Media Converter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Motor - collectionProgress;Multihop Area - collectionProgress;Network Systems Site - collectionProgress;Neutralizer - collectionProgress;Oil Water Separator - collectionProgress;Other Cable - collectionProgress;Path Node Site - collectionProgress;Path Segment Line - collectionProgress;Pedestal - collectionProgress;Pedestal Site - collectionProgress;Pipe Line - collectionProgress;Pullbox Site - collectionProgress;Pump - collectionProgress;Pump - collectionProgress;Pump - collectionProgress;Pump Station - collectionProgress;Pumpstation Ejector - collectionProgress;Radar Site - collectionProgress;Radio - collectionProgress;Radio Receiver - collectionProgress;Radio Transmitter -

collectionProgress;Rect Point - collectionProgress;Rectifier - collectionProgress;Rectifier - collectionProgress;Reducer - collectionProgress;Refinery Site - collectionProgress;Regulator - collectionProgress;Regulator - collectionProgress;Relay Station - collectionProgress;Repeater - collectionProgress;Riser - collectionProgress;Riser - collectionProgress;Satellite - collectionProgress;Segmented Cable - collectionProgress;Segmented Cable Point - collectionProgress;Sensor - collectionProgress;Service Loop Point - collectionProgress;Source - collectionProgress;Speaker - collectionProgress;Splice - collectionProgress;Splice - collectionProgress;Splitter - collectionProgress;Storage Area - collectionProgress;Substation - collectionProgress;Switch - collectionProgress;Tank - collectionProgress;Tank Area - collectionProgress;Telephone - collectionProgress;Telephone Booth - collectionProgress;Terminal - collectionProgress;Terminator - collectionProgress;Transformer Vault - collectionProgress;Transformr Bank - collectionProgress;Transmission Pipeline - collectionProgress;Transmission Pipeline Segment Line - collectionProgress;Treatment Plant - collectionProgress;Twisted Pair Line - collectionProgress;Utility Electric Utility Site - collectionProgress;Utility Pole Guy - collectionProgress;Utility Pole Guy Line - collectionProgress;Utility Pole Tower Site - collectionProgress;Valve - collectionProgress;Valve - collectionProgress;Valve - collectionProgress;Valve Pit - collectionProgress;Vertical Site - collectionProgress;Video Site - collectionProgress;Voice Switch - collectionProgress;Waveguide Line - collectionProgress

Value	Definition (Notes) [Source]
AERIAL	2005/2007 Aerial Photography
CAD	Georeferenced CAD File/Scan
CAD_ASBUILT	CAD As-Built
CAD_DIGITAL	CAD Digital
CAD_PAPER	CAD Paper
CNTRLIMG	Controlled Image
COGO	COGO
CONSTRSURVEY	Construction Survey
CONVSURVEY	Conventional Survey
DIG_RTK	Dig Survey - RTK
DIGITAL_OTHER	Digital File (Other)
FIELD	Field Observatin
FIELDMEASURE	Field Measurement
GIS_DIGITAL	GIS Digital
GIS_PAPER	GIS Paper
GPS_COM	Commercial GPS
GPS_MAP	Mapping GPS
GPS_RTK	Trimble R8/5800 Receiver and TSC2 Data Collector
LEGACY	Existed in Legacy Database
LEGAL	Legal Description
NA	NA
NO_ACCESS	Cannot Access Feature
ORTHOGT6	Ortho (Greater than 6 Inch GSD)
ORTHOLT6	Ortho (Less than 6 Inch GSD)
OTHER	Other
PARSONS	Parsons Data
PLAT	Plat
RECOLLECTION	Personal Recollection
ROD_LEVEL	Laser Rangefinder and Survey Rod & Level
TOWSON	Towson Data
UNCNTRLIMG	Uncontrolled Image
UNKNOWN	Unknown
WRITTEN	Written Description

CodeDiameterMeasureType

Used by Attributes: Hydrant - Meas Type;Fire Connection Point - Measurement Type

Value	Definition (Notes) [Source]
INSIDE	inside diameter [SDSFIE V1.4]
NOMINAL	nominal or average diameter [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
OUTSIDE	outside diameter [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeDirectionality

Used by Attributes: Air Pipe - Directionality;Antenna Line - Directionality;Bus Line - Directionality;Cable - Directionality;Cable - Directionality;Cable Bridge Line - Directionality;Cable Rack Line - Directionality;Cable Tray Line - Directionality;Cable Trough Line - Directionality;Coaxial Line - Directionality;Culvert Center Line - Directionality;Drainage Divide - Directionality;Drainage Divide Line - Directionality;Ductbank - Directionality;Ductbank - Directionality;Ductbank -

Directionality;Fiberoptic Line - Directionality;Headwall Line - Directionality;Headwall Line - Directionality;Intake Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line - Directionality;Line Of Sight Line - Directionality;Open Drainage Line - Directionality;Other Cable - Directionality;Path Segment Line - Directionality;Pipe Line - Directionality;Segmented Cable - Directionality;Storm Trench Drain Line - Directionality;Transmission Pipeline - Directionality;Transmission Pipeline Segment Line - Directionality;Twisted Pair Line - Directionality;Utility Pole Guy Line - Directionality;Waveguide Line - Directionality

Value	Definition (Notes) [Source]
BI	Bidirectional
ES	One way from end-to-startpoint
SE	One way from start-to-endpoint

CodeDisplayType

Used by Attributes: Marker - meterType;Device - Readout;Device - Readout

Value	Definition (Notes) [Source]
ANALOG	analog (dial) display [SDSFIE V1.4]
DIGITAL	digital display [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeDispositionObject

Used by Attributes: Access Coverage Area - Disposition;Access Point - Disposition;Air Eliminator - Disposition;Air Pipe - Disposition;Air Pressure Device - Disposition;Amplifier - Disposition;Anchor - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Antenna Line - Disposition;Antenna Site - Disposition;Attenuator - Disposition;Bus Line - Disposition;Cable - Disposition;Cable - Disposition;Cable Bridge Line - Disposition;Cable Ladder - Disposition;Cable Rack Line - Disposition;Cable Tray Line - Disposition;Cable Trough Line - Disposition;Capacitor - Disposition;Coaxial Line - Disposition;Culvert Center Line - Disposition;Culvert End - Disposition;DbSplice - Disposition;Device - Disposition;Device - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Disposal Tank - Disposition;Downspout - Disposition;Downspout - Disposition;Drain Field - Disposition;Drain Separator - Disposition;Drainage Basin - Disposition;Drainage Basin - Disposition;Drainage Divide - Disposition;Drainage Divide Line - Disposition;Drinking Water Sample Point - Disposition;Ductbank - Disposition;Ductbank - Disposition;Ductbank - Disposition;Equipment - Disposition;Farm Site - Disposition;Fiberoptic Line - Disposition;Fill Point - Disposition;Filter Strainer - Disposition;Filtration Bed - Disposition;Fire Connection Point - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Flow Control Device - Disposition;Flow Control Device - Disposition;Gate - Disposition;Generator - Disposition;Glycol Recovery Pit - Disposition;Grease Trap - Disposition;Grit Chamber - Disposition;Grit Chamber - Disposition;Ground Point - Disposition;Ground Point - Disposition;Groundplane Area - Disposition;Groundwave Area - Disposition;Head Bolt Outlet - Disposition;Headwall - Disposition;Headwall - Disposition;Headwall Line - Disposition;Headwall Line - Disposition;Hydrant - Disposition;Hydrant - Disposition;Impedance Matching Point - Disposition;Inlet - Disposition;Inlet - Disposition;Inlet - Disposition;Inlet - Disposition;Intake - Disposition;Intake Line - Disposition;Internet Center - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Lagoon - Disposition;Lagoon - Disposition;Lift Station - Disposition;Light - Disposition;Light - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line Clean Out - Disposition;Line Of Sight Line - Disposition;Load Capacitor - Disposition;Load Coil - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Media Converter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Motor - Disposition;Multihop Area - Disposition;Network Systems Site - Disposition;Neutralizer - Disposition;Neutralizer - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator Diversion Vault - disposition;Open Drainage Area - Disposition;Open Drainage Line - Disposition;Other Cable - Disposition;Path Node Site - Disposition;Path Segment Line - Disposition;Pedestal - Disposition;Pedestal Site - Disposition;Pig Launch Point - Disposition;Pipe Line - Disposition;Plant Area - Disposition;Pressure Reducing Station - Disposition;Pullbox Site - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump Booster Station - Disposition;Pump Ejector Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pumpstation Ejector - Disposition;Radar Site - Disposition;Radio - Disposition;Radio Receiver - Disposition;Radio Transmitter - Disposition;Rect Point - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Reducer - Disposition;Refinery Site - Disposition;Regulator - Disposition;Regulator - Disposition;Regulator Reducer - Disposition;Regulator Reducer - Disposition;Relay Station - Disposition;Repeater - Disposition;Reservoir - Disposition;Reservoir - Disposition;Reservoir - Disposition;Riser - Disposition;Riser - Disposition;Satellite - Disposition;Segmented Cable - Disposition;Segmented Cable Point - Disposition;Sensor - Disposition;Septic Tank - Disposition;Service Area - Disposition;Service Loop Point - Disposition;Sludge Bed - Disposition;Source - Disposition;Source - Disposition;Source Site - Disposition;Speaker - Disposition;Splice - Disposition;Splice - Disposition;Splitter - Disposition;Stilling Basin - Disposition;Storage Area - Disposition;Storm Ceptor - disposition;Storm Filter - disposition;Storm Trench Drain Line - disposition;Substation - Disposition;Switch - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank Area - disposition;Telephone - Disposition;Telephone Booth - Disposition;Terminal - Disposition;Terminator - Disposition;Transformer Vault - Disposition;Transformr Bank - Disposition;Transmission Pipeline - Disposition;Transmission Pipeline Segment Line - Disposition;Treatment Plant - Disposition;Treatment Plant - Disposition;Treatment Plant - Disposition;Treatment Unit - Disposition;Treatment Unit - Disposition;Twisted Pair Line - Disposition;Utility Electric Utility Site - Disposition;Utility Pole Guy - Disposition;Utility Pole Guy Line - Disposition;Utility Pole Tower Site - Disposition;Valve - Disposition;Valve -

Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve Pit - Disposition;Vault - Disposition;Vault - Disposition;Vault - disposition;Vent - Disposition;Vertical Site - Disposition;Video Site - Disposition;Voice Switch - Disposition;Waveguide Line - Disposition

Value	Definition (Notes) [Source]
ABANDONED	abandoned in place (not in use) [SDSFIE V1.4]
IN_SERVICE	In service and being used. [SDSFIE V2.1 DOT - NPMS]
IN_SERVICE_REPAIRS	In service but requires maintenance
INCOMPLETE	incomplete or unfinished [SDSFIE V1.4]
OUT_OF_SERVICE	Out of service
OTHER	other [SDSFIE V1.4]
PROPOSED	proposed [SDSFIE V1.4]
SERV_NOT_USED	Servicable Not Used
TBD	to be determined [SDSFIE V1.4]
TEMPORARY	temporary [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
UNSERVICEABLE	Unservicable
BURIED	Burried
NATURAL	Natural
PERMANENT	Permanent
RETIRED	Retired
REMOVED	Removed

CodeDistallateProductioType

Used by Attributes: Refinery Site - Distillate Type

Value	Definition (Notes) [Source]
ASPHALT	Asphalt Production. [SDSFIE V2.3 HSIP]
CO2	CO2 Production. [SDSFIE V2.3 HSIP]
DISTALLATES	Distallates Production. [SDSFIE V2.3 HSIP]
H2	H2 Production. [SDSFIE V2.3 HSIP]
HE	He Production. [SDSFIE V2.3 HSIP]
S	S Production. [SDSFIE V2.3 HSIP]

CodeDrainageDensity

Used by Attributes: Grease Trap - Drainage Texture;Line - Drainage Texture;Line - Drainage Texture;Line - Drainage Texture;Line - Drainage Texture;Septic Tank - Drainage Texture;Storm Trench Drain Line - drainageTexture;Culvert Center Line - Material Texture

Value	Definition (Notes) [Source]
COARSE	coarse [SDSFIE V1.4]
FINE	fine [SDSFIE V1.4]
MEDIUM	medium [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeDrainagePattern

Used by Attributes: Culvert Center Line - Drainage Pattern;Grease Trap - Drainage Pattern;Line - Drainage Pattern;Line - Drainage Pattern;Line - Drainage Pattern;Line - Drainage Pattern;Septic Tank - Drainage Pattern;Storm Trench Drain Line - drainagePattern

Value	Definition (Notes) [Source]
ANGULATE	Angulate. [SDSFIE V1.4]
ANNULAR	Annular. [SDSFIE V1.4]
ARTIFICIAL	Artificial. [SDSFIE V1.4]
BARBED	Barbed. [SDSFIE V1.4]
BRAIDED	Braided. [SDSFIE V1.4]
CENTRIPETAL	Centripetal. [SDSFIE V1.4]

COMPLEX	Complex. [SDSFIE V1.4]
COMPOUND	Compound. [SDSFIE V1.4]
CONTORTED	Contorted. [SDSFIE V1.4]
DENDRITANAST	Dendritic Anastomotic. [SDSFIE V1.4]
DENDRITDISTR	Dendritic Distributary (dichotomic). [SDSFIE V1.4]
DENDRITPINNT	Dendritic Pinnate. [SDSFIE V1.4]
DENDRITSUBDN	Dendritic Subdendritic. [SDSFIE V1.4]
DERANGED	Deranged. [SDSFIE V1.4]
INTERNAL	Internal. [SDSFIE V1.4]
MULTIBSKARST	Multibasinal Karst. [SDSFIE V1.4]
MULTIBSTHERM	Multibasinal Thermokarst. [SDSFIE V1.4]
MULTIELNGBAY	Multibasinal Elongate Bay. [SDSFIE V1.4]
MULTIGLACLDS	Multibasinal Glacially Disturbed. [SDSFIE V1.4]
NODEVLSYSTEM	No developed system. [SDSFIE V1.4]
OTHER	Other. [SDSFIE V1.4]
PALIMPSEST	Palimpsest. [SDSFIE V1.4]
PARLLCOLINER	Parallel Collinear. [SDSFIE V1.4]
PARLLSUBPARL	Parallel Subparallel. [SDSFIE V1.4]
PINNATE	Pinnate. [SDSFIE V1.4]
RADILCENTRIP	Radial Centripetal. [SDSFIE V1.4]
RECTANGLARAN	Rectangular Angulate. [SDSFIE V1.4]
TBD	To be determined. [SDSFIE V1.4]
TRELISUBTREL	Trellis Subtrellis. [SDSFIE V1.4]
TRELSDIRECTN	Trellis Directional. [SDSFIE V1.4]
TRELSFAULT	Trellis Fault. [SDSFIE V1.4]
TRELSJOINT	Trellis Joint. [SDSFIE V1.4]
TRELSRECURVE	Trellis Recurved. [SDSFIE V1.4]
UNKNOWN	Unknown. [SDSFIE V1.4]

CodeDrainageZone

Used by Attributes: Culvert Center Line - Drainage Zone;Line - Drainage Zone;Line - Drainage Zone;Open Drainage Line - Drainage Zone;Storm Trench Drain Line - drainageZone;Open Drainage Line - Fld Zon

Value	Definition (Notes) [Source]
MERLIN	Merlin Drainage District [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
ZONE_1	zone 1 [SDSFIE V1.4]

CodeDrainType

Used by Attributes: Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Junction - Drain Type;Neutralizer - Drain Type;Neutralizer - Drain Type;Vault - drainType

Value	Definition (Notes) [Source]
FAN	fan [SDSFIE V1.4]
NETWORK	network [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SEALED	sealed [SDSFIE V1.4]
SEEPAGEPIT	seepage pit [SDSFIE V1.4]
STORMCONNECT	connected to storm system [SDSFIE V1.4]
SUBDRAIN	sub drain (French drain) [SDSFIE V1.4]
SUMPPUMP	sump pump [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TILEFIELD	tile field [SDSFIE V1.4]

CodeDrinkingWaterSamLoc

Used by Attributes: Drinking Water Sample Point - Dwslocty

Value	Definition (Notes) [Source]
DISTRIBUTION_SYS	Distribution System [SDSFIE V2 Mississippi Dept. of Health]
PLANT_TREATED	Finished water from a water treatment plant. [SDSFIE V2 Mississippi Dept. of Health]
SOURCE_RAW	Raw water from the water source (i.e., well or surface water) prior to treatment. [SDSFIE V2 Mississippi Dept. of Health]
WELL	Chlorinated well water. [SDSFIE V2 Mississippi Dept. of Health]

CodeEcmDevice

Used by Attributes: Device - Dev Type

Value	Definition (Notes) [Source]
FIELD_INTERFC	field interface [SDSFIE V1.8]
MULTIPLEX	multiplexer [SDSFIE V1.8]
Emergency Generator Panel	Emergency Generator Panel

CodeElectricBus

Used by Attributes: Bus Line - Bus Mat

Value	Definition (Notes) [Source]
ALUMINUM	aluminum metal [SDSFIE V1.4]
COPPER	copper metal [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricCable

Used by Attributes: Cable - Cable Material;Cable - Cable Type;Cable - Cbl Material;Coaxial Line - Cbl Material;Fiberoptic Line - Cbl Material;Other Cable - Cbl Material;Twisted Pair Line - Cbl Material;Utility Pole Guy - Cbl Material;Waveguide Line - Cbl Material;Sensor - Cbl Type;Cable - Install Type;Antenna Line - Material;Bus Line - Material;Pipe Line - Material;Segmented Cable - Material

Value	Definition (Notes) [Source]
ABANDONED	abandoned/inactive
AIRFIELD_UG	Underground Airfield Cable.
OTHER	Other
PRIMARY_OH	primary overhead
PRIMARY_UG	primary underground
PRIMARY_UG_DIRECT_BURIAL	Underground primary electrical cable installed direct burial (i.e., without conduit).
PRIMARY_UG_ENCASED	Underground primary electrical cable installed in conduit.
SECONDARY_OH	secondary overhead
SECONDARY_UG	secondary underground
SECONDARY_UG_DIRECT_BURIAL	Underground secondary electrical cable installed direct burial (i.e., without conduit).
SECONDARY_UG_ENCASED	Underground secondary electrical cable installed in conduit.
SENSOR	Sensor Type Cable.
SERVICE_OH	service overhead
SERVICE_UG	service underground
SERVICE_UG_DIRECT_BURIAL	Underground service electrical cable installed direct burial (i.e., without conduit).
SERVICE_UG_ENCASED	Underground service electrical cable installed in conduit.
UNKNOWN	Unknown

CodeElectricCableUse

Used by Attributes: Bus Line - Cbl Use

Value	Definition (Notes) [Source]
ABANDONED	abandoned/inactive cable [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PRIMARY_OH	primary overhead cable [SDSFIE V1.4]
PRIMARY_UG	primary underground cable [SDSFIE V1.4]

SECONDARY_OH	secondary overhead cable [SDSFIE V1.4]
SECONDARY_UG	secondary underground cable [SDSFIE V1.4]
SERVICE_OH	service, overhead cable [SDSFIE V1.4]
SERVICE_UG	service, underground cable [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricConfigType

Used by Attributes: Cable - Config Type

Value	Definition (Notes) [Source]
ARMLESS	The cable group is mounted in a cluster at the top of the pole. [SDSFIE V1.4]
CROSSARM_EQL	The individual line mounts in a cable group are equally spaced on a standard length crossarm. [SDSFIE V1.4]
CROSSARM_UNEQL	The individual line mounts in a cable group are not equally spaced on a standard crossarm. [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SHORTARM	The individual line in a cable group are mounted on a cross arm less than 24-inches long. [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VERTICAL	The individual line mounts in a cable group are vertically spaced down the pole. [SDSFIE V1.4]

CodeElectricControlType

Used by Attributes: Capacitor - Cntr Type;Equipment - Cntr Type

Value	Definition (Notes) [Source]
OTHER	other [SDSFIE V1.4]
PRIMARY	Primary. [SDSFIE V2.31 Air Force]
REMOTE	Remote. [SDSFIE V2.31 Air Force]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricDeviceUse

Used by Attributes: Regulator - Reg Use;Meter - Use

Value	Definition (Notes) [Source]
ACPOWERPANEL	ac power panel [SDSFIE V1.4]
ALARMPULLBOX	alarm pullbox [SDSFIE V1.4]
BATTERY	battery [SDSFIE V1.4]
CAPACITOR	capacitor [SDSFIE V1.4]
CIRCUITBREAK	circuit breaker [SDSFIE V1.4]
COMMERCIAL	commercial service [SDSFIE V1.4]
DCPOWERPANEL	dc power panel [SDSFIE V1.4]
DISTRIBFRAME	distribution frame [SDSFIE V1.4]
DISTRIBPANEL	distribution panel [SDSFIE V1.4]
ELEC_METER	electric meter [SDSFIE V1.4]
ELEC_MOTOR	electric motor [SDSFIE V1.4]
FIELDINTERFC	field interface [SDSFIE V1.4]
GENERATOR	generator [SDSFIE V1.4]
GROUND	ground [SDSFIE V1.4]
INTDISTRFRAM	intermediate distribution frame [SDSFIE V1.4]
JUNCTIONBOX	junction box [SDSFIE V1.4]
LIGHT	light [SDSFIE V1.4]
LOAD_POINT	load point [SDSFIE V1.4]
MAINDISTFRAM	main distribution frame [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PEDESTAL	pedestal [SDSFIE V1.4]
RECTIFIER	rectifier [SDSFIE V1.4]
RESIDENTIAL	residential service [SDSFIE V1.4]
SPLICE	splice [SDSFIE V1.4]

SWITCH	switch [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TRAFFICSIGNL	traffic signal [SDSFIE V1.4]
TRANSFORMER	transformer [SDSFIE V1.4]
TRFSIGCONBOX	traffic signal control box [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VOLTREGULATE	voltage regulator [SDSFIE V1.4]

CodeElectricKvar

Used by Attributes: Capacitor - Cpctr Kv;Transformr Bank - Kva 1;Transformr Bank - Kva 2

Value	Definition (Notes) [Source]
10	10 kvar [SDSFIE V1.4]
100	100 kvar [SDSFIE V1.4]
1000	1000 kvar [SDSFIE V1.4]
10000	10000 kvar [SDSFIE V1.4]
112.5	112.5 kvar [SDSFIE V1.7]
112_5	112.5 kvar [SDSFIE V1.4]
1250	1250 kvar [SDSFIE V1.4]
14K20K	14000 20000 kvar [SDSFIE V1.4]
15	15 kvar [SDSFIE V1.4]
150	150 kvar [SDSFIE V1.4]
1500	1500 kvar [SDSFIE V1.4]
167	167 kvar [SDSFIE V1.4]
16K22K	16000 22000 kvar [SDSFIE V1.4]
225	225 kvar [SDSFIE V1.4]
25	25 kvar [SDSFIE V1.4]
250	250 kvar [SDSFIE V1.4]
300	300 kvar [SDSFIE V1.4]
333	333 kvar [SDSFIE V1.4]
37.5	37.5 kvar [SDSFIE V1.7]
37_5	37.5 kvar [SDSFIE V1.4]
3750	3750 kvar [SDSFIE V1.4]
45	45 kvar [SDSFIE V1.4]
50	50 kvar [SDSFIE V1.4]
500	500 kvar [SDSFIE V1.4]
5000	5000 kvar [SDSFIE V1.4]
55	55 kvar [SDSFIE V1.4]
7.5	7.5 kvar [SDSFIE V1.7]
7_5	7.5 kvar [SDSFIE V1.4]
75	75 kvar [SDSFIE V1.4]
750	750 kvar [SDSFIE V1.4]
775	775 kvar [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricMotorEnclType

Used by Attributes: Rect Point - Encl Type;Rectifier - Encl Type;Rectifier - Encl Type;Rectifier - Encl Type;Rectifier - Encl Type;Rectifier - Enclosure Type;Motor - Enclty

Value	Definition (Notes) [Source]
AIR/AIR	totally enclosed, air-to-air cooled [SDSFIE V1.4]
AIR_OVER	totally enclosed, air-over [SDSFIE V1.4]
DUST_PROOF	totally enclosed, dust-ignition proof [SDSFIE V1.4]
ENCL_FAN	totally enclosed, fan cooled [SDSFIE V1.4]
ENCL_FANG	totally enclosed, fan cooled, guarded [SDSFIE V1.4]
ENCL_NON	totally enclosed, nonventilated [SDSFIE V1.4]
ENCL_WAC	totally enclosed, water/air cooled [SDSFIE V1.4]
ENCL_WATER	totally enclosed, water cooled [SDSFIE V1.4]
EXPL_PROOF	totally enclosed, explosion proof [SDSFIE V1.4]
OPEN	open [SDSFIE V1.4]

OPEN_DGUARD	open, drip-proof guarded [SDSFIE V1.4]
OPEN_DP	open, drip-proof [SDSFIE V1.4]
OPEN_EV	open, externally ventilated [SDSFIE V1.4]
OPEN_GUARD	open, guarded [SDSFIE V1.4]
OPEN_PVENT	open, pipe ventilated [SDSFIE V1.4]
OPEN_SG	open, semiguarded [SDSFIE V1.4]
OPEN_SP	open, splash-proof [SDSFIE V1.4]
OPEN_WEATI	open, weather protected - Type I [SDSFIE V1.4]
OPEN_WEATII	open, weather protected - Type II [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PIPE_VENT	totally enclosed, pipe ventilated [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WATER_PROOF	totally enclosed, water-proof [SDSFIE V1.4]

CodeElectricMotorInsulType

Used by Attributes: Motor - Insul Cl

Value	Definition (Notes) [Source]
A	IEEE Std 1, 60- 70 deg C. [SDSFIE V1.4]
B	IEEE Std 1, 80- 90 deg C. [SDSFIE V1.4]
F	IEEE Std 1, 105- 115 deg C. [SDSFIE V1.4]
H	IEEE Std 1, 125- 135 deg C. [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricMotorStartType

Used by Attributes: Motor - Start Type

Value	Definition (Notes) [Source]
AUTOTRN_STRT	autotransformer start [SDSFIE V1.4]
CAPCTR_RUN	capacitor run [SDSFIE V1.4]
CAPCTR_STRT	capacitor start [SDSFIE V1.4]
LINE_STRT	line start [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
REACTR_REDUV	reactor type, reduced voltage [SDSFIE V1.4]
RESIST_REDUV	resistor type, reduced voltage [SDSFIE V1.4]
SHADED_POLE	shaded pole [SDSFIE V1.4]
SOLDSTATSTRT	solid state start [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
Y_STRT_D_RUN	Y start delta run [SDSFIE V1.4]

CodeElectricPhase

Used by Attributes: Transformr Bank - Phase 1;Transformr Bank - Phase 2

Value	Definition (Notes) [Source]
A	1 [SDSFIE V1.9]
B	2 [SDSFIE V1.9]
C	3 [SDSFIE V1.9]

CodeElectricPhaseType

Used by Attributes: Cable - Phase Leter;Capacitor - Phase Leter;Generator - Phase Leter;Meter - Phase Leter;Motor - Phase Leter;Rect Point - Phase Leter;Rectifier - Phase Leter;Rectifier - Phase Leter;Rectifier - Phase Leter;Rectifier - Phase Leter;Regulator - Phase Leter;Switch - Phase Leter;Rectifier - Phase Letter

Value	Definition (Notes) [Source]
A	A phase [SDSFIE V1.4]
AB	AB phase [SDSFIE V1.4]
ABC	ABC phase [SDSFIE V1.4]
AC	AC phase [SDSFIE V1.4]
B	B phase [SDSFIE V1.4]
BC	BC phase [SDSFIE V1.4]
C	C phase [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeElectricSwitchType

Used by Attributes: Regulator - Fuse Type;Switch - Swt Type

Value	Definition (Notes) [Source]
DISCONNECT	disconnect [SDSFIE V1.4]
ISO	ISO switch [SDSFIE V1.4]
OIL	oil switch [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
RAC6WOIL	RAC 6way oil switch [SDSFIE V1.4]
RACOIL	RAC oil switch [SDSFIE V1.4]
RAMOIL	RAM oil switch [SDSFIE V1.4]
SOLIDBLADISC	solid blade disconnect [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VACUUM	vacuum [SDSFIE V1.4]

CodeElectricTranbnk

Used by Attributes: Transformr Bank - Mount

Value	Definition (Notes) [Source]
CEILING_MOUNTED	Ceiling mounted. [SDSFIE V2.3 Tinker Air Force Base]
PAD_MOUNTED	pad mounted transformer bank [SDSFIE V2.1 FGDC Utilities Classification]
POLE_MOUNTED	pole mounted transformer bank [SDSFIE V2.1 FGDC Utilities Classification]
WALL_MOUNTED	Wall mounted [SDSFIE V2.3 Tinker Air Force Base]

CodeElectricVoltRegulType

Used by Attributes: Regulator - Reg Type

Value	Definition (Notes) [Source]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VOLTREG_1	1-phase, 7.5-19.9 Kvs, 50-418 amps, 7.6-19.9 Kva, metered or digital parameters, multiple microprocessor controlled step-voltage regulator. [SDSFIE V1.4]
VOLTREG_3	3-phase, 13-34 Kvs, 220-445 amps, 500-2670 Kva, metered or digital parameters, multiple microprocessor controlled step-voltage regulator. [SDSFIE V1.4]

CodeElectronicMarkerPurpose

Used by Attributes: Marker - Elmpur

Value	Definition (Notes) [Source]
BUILDING_ENTER	Conduit Entrance to Building. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
ROAD_CROSSING	Road Crossing. [SDSFIE V2.5 AIR FORCE]
ROUTE	Cable or Duct Route. [SDSFIE V2.5 AIR FORCE]

ROUTE_CHANGE	Change in Direction of Cable or Duct Route. [SDSFIE V2.5 AIR FORCE]
SPLICE	Cable Splice Location. [SDSFIE V2.5 AIR FORCE]
STUBOUT	Manhole Stubout. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeEnclosureMaterials

Used by Attributes: Pedestal Site - Costrm;Cable Bridge Line - material;Cable Rack Line - material;Cable Tray Line - Material;Vault - Vlt Material

Value	Definition (Notes) [Source]
AL	Aluminum. [SDSFIE V2.5 AIR FORCE]
CIS	Concrete Cast inSitu/Cast in Place. [SDSFIE V2.5 AIR FORCE]
COMBINATION	Combination of materials. [SDSFIE V2.5 AIR FORCE]
FIBERGLASS	Fiberglass. [SDSFIE V2.5 AIR FORCE]
IRON	Iron (Cast or Forged). [SDSFIE V2.5 AIR FORCE]
MASONRY	Masonry (Brick or Block). [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
PLASTIC	Plastic. [SDSFIE V2.5 AIR FORCE]
PRECAST	Pre-Cast Concrete. [SDSFIE V2.5 AIR FORCE]
STEEL	Steel. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeEncryptionLevelType

Used by Attributes: Relay Station - Enc Max

Value	Definition (Notes) [Source]
I	First [SDSFIE V2.3 Tinker Air Force Base]
II	Second [SDSFIE V2.3 Tinker Air Force Base]
III	Third [SDSFIE V2.3 Tinker Air Force Base]
IV	Fourth [SDSFIE V2.3 Tinker Air Force Base]
V	Fifth [SDSFIE V2.3 Tinker Air Force Base]

CodeEquipmentCooling

Used by Attributes: Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Pump - Cool Method;Rect Point - Cool Method;Rectifier - Cool Method;Rectifier - Cool Method;Rectifier - Cool Method;Rectifier - Cool Method;Generator - Cool Type;Regulator - Cool Type;Rectifier - Cooling Method

Value	Definition (Notes) [Source]
AIR	air [SDSFIE V1.4]
FAN	fan [SDSFIE V1.4]
OIL	oil [SDSFIE V1.4]
OILAIR	oil and air (OA) [SDSFIE V1.4]
OILAIRFAN	oil, air, and fan (FA) [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
REFRIGERATE	refrigeration units [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]

CodeEquipmentType

Used by Attributes: Equipment - Equipment Type

Value	Definition (Notes) [Source]
AN/FPN-62	AN/FPN-62. [SDSFIE V2.31 Air Force]
AN/GPN-11	AN/GPN-11. [SDSFIE V2.31 Air Force]
AN/GPN-12	AN/GPN-12. [SDSFIE V2.31 Air Force]
AN/GPN-20	AN/GPN-20. [SDSFIE V2.31 Air Force]

AN/GPN-22	AN/GPN-22. [SDSFIE V2.31 Air Force]
ARSR-4	ARSR-4. [SDSFIE V2.31 Air Force]
ASR-11	ASR-11. [SDSFIE V2.31 Air Force]
ASR-5	ASR-5. [SDSFIE V2.31 Air Force]
ASR-7	ASR-7. [SDSFIE V2.31 Air Force]
ASR-8	ASR-8. [SDSFIE V2.31 Air Force]
ASR-9	ASR-9. [SDSFIE V2.31 Air Force]
MACS	MACS. [SDSFIE V2.31 Air Force]
WSR-88D	WSR-88D. [SDSFIE V2.31 Air Force]

CodeExternalLight

Used by Attributes: Light - litType

Value	Definition (Notes) [Source]
OTHER	Other
SAFETY	Lights used for safety.
SECURITY	Security Light [SDSFIE V1.9 REEGIS]
STREET	Lights specifically designed to illuminate the street below. [SDSFIE V1.6]
UNKNOWN	Unknown
WALKWAY	Normally a low mounted light designed to illuminate a walkway or beside a driveway. [SDSFIE V2.1 FGDC Utilities Classification]
WORKSITE	Lights ysed to illuminate a work site.

CodeFireConnection

Used by Attributes: Fire Connection Point - Connection Type

Value	Definition (Notes) [Source]
FIRE_CONNECT	fire department connection [SDSFIE V2.1 FGDC Utilities Classification]
FIRE_HYDRANT	fire hydrant [SDSFIE V2.1 FGDC Utilities Classification]

CodeFireFlow

Used by Attributes: Hydrant – Flow Standard

Value	Definition (Notes) [Source]
C	Less than 500 gal/min, red hydrant cap
B	500-999 gal/min, orange hydrant cap
A	1000-1499 gal/min, green hydrant cap
AA	1500 gal/min or higher, light blue hydrant cap
TBD	To be determined
UNKNOWN	Unknown

CodeFuel

Used by Attributes: Generator - Fuel Type;Line - Fuel Type;Tank - Fuel Type;Fill Point - Gas Type;Light - Gas Type;Line - Gas Type;Source - Type

Value	Definition (Notes) [Source]
100	100/130 octane gasoline, leaded, MIL-L-5572F (GREEN)
100LL	100/130 MIL Spec, low lead, aviation gasoline (BLUE)
115	115/145 octane gasoline, leaded, MIL-L-5572F (PURPLE)
7	JP-7, Jet Propellant type 7 (Glass Tank Fuel)
80	80/87 octane gasoline, leaded, MIL-L-5572F (RED)
A	Jet A, without icing inhibitor
A+	Jet A+, Kerosene fuel, Type A, Jet A or JP-1 With icing inhibitor.
A1	Jet A1, without icing inhibitor
A1+	Jet A1+, Jet A1 with icing inhibitor.
B	Jet B, Wide cut turbine fuel, Without icing inhibitor.
B+	Jet B+, wide cut turbine fuel with icing inhibitor.
C	91/96 octane gasoline, leaded, No MIL Spec.

F	80 octane gasoline, unleaded, No MIL Spec.
G	Aviation Gasoline (AVGAS), octane unknown
H	108/135 octane gasoline, leaded, No MIL Spec
J	Jet fuel available but type is unknown
J4	JP-4, Wide cut turbine fuel MIL Spec T-5624
J5	JP-5, Kerosene MIL Spec T-5624
J8	JP-8, Semi Kerosene MIL Spec T-83133, without icing inhibitor
K	73 octane gasoline, unleaded, No MIL Spec
X	Storage tanks available and fuel type unknown or the tanks were used at one time for aviation products but may now store other products
LqNaturalGas	Liguified Natural Gas

CodeFuelDeliveryMethodType

Used by Attributes: Generator - Fuel Delivery Method

Value	Definition (Notes) [Source]
CONVEYOR	Conveyor. [SDSFIE V2.31 HSIP]
OTHER	Other. [SDSFIE V2.31 HSIP]
PIPELINE	Pipeline. [SDSFIE V2.31 HSIP]
RAIL	Railroad. [SDSFIE V2.31 HSIP]
SHIP_BARGE	Ship or Fuel Barge. [SDSFIE V2.31 HSIP]
TRUCK	Truck/Vehicle. [SDSFIE V2.31 HSIP]

CodeFuelSource

Used by Attributes: Source - Name

Value	Definition (Notes) [Source]
5	lagoon #5 [SDSFIE V1.4]
ART_WELL_7	Artisan Well #7 [SDSFIE V1.6]
FEDERALES	Arroyo Federales [SDSFIE V1.6]
LAFOUCHE	Bayou LaFouche [SDSFIE V1.6]
MAGEES_CREEK	Magees Creek [SDSFIE V1.6]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TYLERTOWN	Tylertown Wellfield [SDSFIE V1.6]
UNKNOWN	unknown [SDSFIE V1.4]

CodeGasFixtureUse

Used by Attributes: Light - Fix Use

Value	Definition (Notes) [Source]
EX_LIGHT	exterior light [SDSFIE V1.4]
IN_LIGHT	interior light [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SEC_LIGHT	security light [SDSFIE V1.4]
ST_LIGHT	street light [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeGeneratorType

Used by Attributes: Generator - Type

Value	Definition (Notes) [Source]
BACKUP	Backup generator. [SDSFIE V2 Cherry Point]
EMERGENCY	Emergency generator. [SDSFIE V2 Cherry Point]
OTHER	other [SDSFIE V1.4]
PRIMARY	Primary generator. [SDSFIE V2 Cherry Point]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeHcsAnchor

Used by Attributes: Anchor - Anch Type

Value	Definition (Notes) [Source]
GUIDE_ANCHOR	guide anchor [SDSFIE V2.1 FGDC Utilities Classification]
RIGID_ANCHOR	rigid anchor [SDSFIE V2.1 FGDC Utilities Classification]

CodeHeating-CoolingType

Used by Attributes: Plant Area - Prod Type

Value	Definition (Notes) [Source]
CHW	chilled water: water less than 45 deg. F. [SDSFIE V1.4]
HTW_CHW	high temp - chilled water [SDSFIE V1.4]
LTW	low temperature water: water less than 250 deg. F. [SDSFIE V1.4]
LTW_CHW	low temp - chilled water [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
S	steam [SDSFIE V1.4]
S_CHW	steam - chilled water [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeHertz

Used by Attributes: Motor - hertz

Value	Definition (Notes) [Source]
temp	temp

CodeHydrantClass

Used by Attributes: Fire Connection Point - Hydrant Class

Value	Definition (Notes) [Source]
GREEN	green - Class A - rated capacity of 1000-1499 gpm (3785-5675 L/min). [SDSFIE V1.8]
LT_BLUE	light blue - Class AA - rated capacity of 1500 gpm or greater (5680 L/min). [SDSFIE V1.8]
ORANGE	orange - Class B - rated capacity of 500-999 gpm (1900-3780 L/min). [SDSFIE V1.8]
RED	red - Class C - rated capacity less than 500 gpm (1900 L/min). [SDSFIE V1.8]

CodeHydrantOrg

Used by Attributes: Hydrant – Owner;Hydrant – Maintenance Agency

Value	Definition (Notes) [Source]
AA_COUNTY	Anne Arundel County
BALTIMORE_CITY	Baltimore City
FAA	Federal Aviation Administration
MAA	Maryland Aviation Administration
OTHER	Other
PRIVATE	Private
SHA	Maryland State Highway Administration
UNKNOWN	Unknown

CodeHydrantType

Used by Attributes: Fill Point - Hydrant Type;Fire Connection Point - Hydrant Type;Hydrant - Hydrant Type;Hydrant - Hydrant Type

Value	Definition (Notes) [Source]
AIRPORT	airport hydrant [SDSFIE V1.4]
BUILDING	building hydrant [SDSFIE V1.4]
DRINKFOUNT	drinking fountain [SDSFIE V1.4]
DRYBARREL	dry barrel [SDSFIE V1.4]
FREEZEPROOF	freeze proof [SDSFIE V1.4]
FUEL	fuel hydrant [SDSFIE V1.4]
NATGAS	natural gas hydrant [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
STREETWASH	street washer [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WASHRACK	wash rack hydrant [SDSFIE V1.4]
WATER	water hydrant [SDSFIE V1.4]
WETBARREL	wet barrel [SDSFIE V1.4]
YARD	yard hydrant [SDSFIE V1.4]
ELEVATED	connection on elevated roadway with valve on lower level
UNDERGROUND	hydrant contained in underground vault
WALL	hydrant is wall-mounted connection inside building

CodeInlets

Used by Attributes: Inlet - Inlet St;Inlet - Inlet St;Inlet - Inlet Step

Value	Definition (Notes) [Source]
AC_CONDENSATE	air conditioner condensate [SDSFIE V2.3 Cherry Point]
BWV_DRAIN	backwater valve drain [SDSFIE V2.3 Cherry Point]
CATCH_BASIN	catch basin [SDSFIE V2.3 Cherry Point]
CONDENSATE_DRAIN	condensate drain [SDSFIE V2.3 Cherry Point]
CURB_INLET	curb opening inlet [SDSFIE V2.1 FGDC Utilities Classification]
DRAIN	drain [SDSFIE V2.3 Cherry Point]
DROP_INLET	drop inlet [SDSFIE V2.1 FGDC Utilities Classification]
GRATECRBOPEN	combined grate and curb opening inlet [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
ROOF_DRAIN	roof drain [SDSFIE V2.3 Cherry Point]
STANDARDA	inlet standard type A inlet [SDSFIE V1.4]
STANDARDB	inlet standard type B inlet [SDSFIE V1.4]
STANDARDC	inlet standard type C inlet [SDSFIE V1.4]
STANDARDD	inlet standard type D inlet [SDSFIE V1.4]
SURFACE_LINEAR	surface linear [SDSFIE V2.1 FGDC Utilities Classification]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WASTE_DRAIN	waste drain [SDSFIE V2.3 Cherry Point]
WEIRINLET	weir inlet [SDSFIE V1.4]

CodeJunctionType

Used by Attributes: Access Point - Junction Type;Air Eliminator - Junction Type;Air Pressure Device - Junction Type;Amplifier - Junction Type;Anchor - Junction Type;Anode - Junction Type;Anode - Junction Type;Anode - Junction Type;Anode - Junction Type;Anode - Junction Type;Anode - Junction Type;Anode Test Station - Junction Type;Anode Test Station - Junction Type;Anode Test Station - Junction Type;Anode Test Station - Junction Type;Anode Test Station - Junction Type;Anode Test Station - Junction Type;Antenna Site - Junction Type;Attenuator - Junction Type;Cable Ladder - Junction Type;Capacitor - Junction Type;Culvert End - Junction Type;DbSplice - Junction Type;Device - Junction Type;Device - Junction Type;Discharge Point - Junction Type;Discharge Point - Junction Type;Discharge Point - Junction Type;Discharge Point - Junction Type;Disposal Tank - Junction Type;Downspout - Junction Type;Downspout - Junction Type;Drain Separator - Junction Type;Drinking Water Sample Point - Junction Type;Equipment - Junction Type;Farm Site - Junction Type;Fill Point - Junction Type;Filter Strainer - Junction Type;Fire Connection Point - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Fitting - Junction Type;Flow Control Device - Junction Type;Flow Control Device - Junction Type;Gate - Junction Type;Generator - Junction Type;Grease Trap - Junction Type;Grit Chamber - Junction Type;Grit Chamber - Junction Type;Ground Point - Junction Type;Ground Point - Junction Type;Head Bolt Outlet - Junction Type;Headwall - Junction Type;Headwall - Junction Type;Hydrant - Junction Type;Hydrant - Junction Type;Impedance Matching Point - Junction Type;Inlet - Junction Type;Inlet - Junction Type;Inlet - Junction Type;Inlet - Junction Type;Intake - Junction Type;Internet Center - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Junction - Junction Type;Light - Junction Type;Light - Junction Type;Load Capacitor - Junction Type;Load Coil - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Marker - Junction Type;Media Converter - Junction Type;Meter - Junction Type;Meter

- Junction Type;Meter - Junction Type;Meter - Junction Type;Meter - Junction Type;Meter - Junction Type;Meter - Junction Type;Motor - Junction Type;Network Systems Site - Junction Type;Neutralizer - Junction Type;Neutralizer - Junction Type;Oil Water Separator - Junction Type;Oil Water Separator - Junction Type;Oil Water Separator - Junction Type;Oil Water Separator - Junction Type;Path Node Site - Junction Type;Pedestal - Junction Type;Pedestal Site - Junction Type;Pig Launch Point - Junction Type;Pressure Reducing Station - Junction Type;Pullbox Site - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump - Junction Type;Pump Booster Station - Junction Type;Pump Ejector Station - Junction Type;Pump Station - Junction Type;Pump Station - Junction Type;Pump Station - Junction Type;Pump Station - Junction Type;Pumpstation Ejector - Junction Type;Radar Site - Junction Type;Radio - Junction Type;Radio Receiver - Junction Type;Radio Transmitter - Junction Type;Rect Point - Junction Type;Rectifier - Junction Type;Rectifier - Junction Type;Rectifier - Junction Type;Rectifier - Junction Type;Rectifier - Junction Type;Reducer - Junction Type;Refinery Site - Junction Type;Regulator - Junction Type;Regulator - Junction Type;Regulator Reducer - Junction Type;Regulator Reducer - Junction Type;Relay Station - Junction Type;Repeater - Junction Type;Reservoir - Junction Type;Reservoir - Junction Type;Riser - Junction Type;Riser - Junction Type;Satellite - Junction Type;Segmented Cable Point - Junction Type;Sensor - Junction Type;Septic Tank - Junction Type;Service Area - Junction Type;Service Loop Point - Junction Type;Source - Junction Type;Source - Junction Type;Source Site - Junction Type;Speaker - Junction Type;Splice - Junction Type;Splice - Junction Type;Splitter - Junction Type;Stilling Basin - Junction Type;Storm Ceptor - Junction Type;Storm Filter - Junction Type;Substation - Junction Type;Switch - Junction Type;Tank - Junction Type;Tank - Junction Type;Tank - Junction Type;Tank - Junction Type;Tank - Junction Type;Tank Area - Junction Type;Telephone - Junction Type;Telephone Booth - Junction Type;Terminal - Junction Type;Terminator - Junction Type;Transformer Vault - Junction Type;Transformr Bank - Junction Type;Treatment Plant - Junction Type;Treatment Unit - Junction Type;Utility Electric Utility Site - Junction Type;Utility Pole Guy - Junction Type;Utility Pole Tower Site - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve - Junction Type;Valve Pit - Junction Type;Vault - Junction Type;Vault - Junction Type;Vent - Junction Type;Vertical Site - Junction Type;Video Site - Junction Type;Voice Switch - Junction Type

Value	Definition (Notes) [Source]
NEITHER	A junction feature that neither pushes or pulls flow away or towards itself.
SINK	A junction feature that pulls flow toward itself through the edges of a geometric network [ESRI]
SOURCE	A junction feature that pushes flow away from itself through the edges of a geometric network [ESRI]

CodeJuncType

Used by Attributes: Comm Junction – JuncType; Deicing Junction – JuncType; Electrical Junction - JuncType

Value	Definition (Notes) [Source]
UNKNOWN	UNKNOWN
MANHOLE	MANHOLE
HANDHOLE	HANDHOLE
SWITCHBOX	SWITCHBOX

CodeLaboratory

Used by Attributes: Lagoon - Lab Name;Lagoon - Lab Name;Storage Area - Lab Name

Value	Definition (Notes) [Source]
LAW_ENG	Law Engineering [SDSFIE V1.4]
LAW_ENV	Law Environmental [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WES	Waterways Experiment Station [SDSFIE V1.4]

CodeLaboratoryType

Used by Attributes: Lagoon - Lab Type;Lagoon - Lab Type;Storage Area - Lab Type

Value	Definition (Notes) [Source]
CHEMICAL	chemical testing laboratory [SDSFIE V1.4]
ENVIRONMENTAL	environmental testing laboratory [SDSFIE V1.4]
GEOTECHNICAL	geotechnical (soils and rock) testing laboratory [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
STRUCTURAL	structural testing laboratory [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeLightingConfigurationType

Used by Attributes: Disposal Tank - Lighting Type;Septic Tank - Lighting Type;Tank - Lighting Type;Tank - Lighting Type;Tank - Lighting Type;Tank - Lighting Type;Tank - Lighting Type;Tank Area - Lighting Type

Value	Definition (Notes) [Source]
ALSF-1	High Intensity Approach Lighting System - Configuration 1
ALSF-2	High Intensity Approach Lighting System - Configuration 2
APAP	Alignment of Element Systems
APBN	Airport Rotating Beacon
CLRBAR	Taxiway Clearance Bar Lights
CODEBEACON	Code Beacon
COURSE	Course Lights
F	Fixed
FL	Flashing (Sea Plane Navigation Buoy use only)
FL (2)	Group Flashing (Sea Plane Navigation Buoy use only)
FL (2+1)	Composite Group-Flashing (Sea Plane Navigation Buoy use only)
HLL	Hover Lane Light
HLLL	Hover Lane Limit Light
HPIL	Helipad Perimeter Inset Light
HPPEL	Helipad Perimeter Light (Elevated)
HPPLSF	Helipad Perimeter Light (Semiflush)
ISO	Isophase (Sea Plane Navigation Buoy use only)
L-804	Unidirectional elevated runway guard lights
L-850A	Bi directional or unidirectional runway in pavement light used for runway centerline, Land and Hold Short Operations (LAHSO).
L-850B	Unidirectional runway in pavement light used for runway touchdown zone and medium intensity approach light system applications.
L-850C	Bi directional runway in pavement light used for runway edge lights and displaced threshold applications.
L-850D	Bi directional or unidirectional runway in pavement lights used for runway threshold or runway end light applications.
L-850E	Unidirectional runway in pavement light used for runway threshold light and Medium Intensity Approach Light System applications
L-850F	Unidirectional runway in pavement lights white flashing lights used for LAHSO
L-852A	Bi directional or unidirectional taxiway centerline in pavement lights used for the straight sections of taxiways where operations are permitted when the Runway Visual Range (RVR) is greater than or equal to 1200 feet.
L-852B	Bi directional or unidirectional taxiway centerline in pavement lights for curved sections of taxiways where operations are permitted when the Runway Visual Range (RVR) is greater than or equal to 1200 feet.
L-852C	bi directional or unidirectional taxiway centerline in pavement lights for straight portions of taxiways where operations are permitted when the Runway Visual Range (RVR) is less than 1200 feet.
L-852D	Bi directional or unidirectional taxiway centerline in pavement lights used for curved portions of taxiways where operations are permitted when the Runway Visual Range is less than 1200 feet.
L-852E	Omni directional taxiway intersection in pavement lights where operations are permitted when the Runway Visual Range is greater than or equal to 1200 feet.
L-852E/F	Runway Guard Light in-pavement
L-852F	Omni directional taxiway intersection in pavement lights where operations are permitted when the Runway Visual Range is less than 1200 feet.
L-852G	Unidirectional Runway Guard in pavement lights
L-852G/S	Combination Runway Guard/Stop bar light in-pavement
L-852J	Bi directional taxiway centerline in pavement lights for the curved portions of taxiways where operations are permitted when the Runway Visual Range is greater than or equal to 1200 feet.
L-852K	Bi directional taxiway centerline in pavement lights for the curved portions of taxiway where operation are permitted when the Runway Visual Ranger is less than 1200 feet.
L-852S	Unidirectional in pavement Stop Bar lights
L-852T	Omni directional in pavement taxiway edge and Apron edge lights
L-853	Reflective Marker
L-854	Radio Controller (Pilot Controlled Lights)
L-860	Omni directional elevated runway edge lights for Visual Flight Rules (VFR) operations.
L-860E	Bi directional or unidirectional elevated runway threshold or runway end lights for Visual Flight Rules operations.
L-861	Omni directional or bi directional elevated runway edge or displaced threshold lights for non-precision Instrument Flight Rules (IFR) operations.
L-861E	Bi directional or unidirectional elevated runway threshold or runway end lights for non-precision Instrument Flight Rule operations.
L-861SE	Bi directional and unidirectional elevated runway threshold, runway end, and displaced threshold lights for non-precision Instrument Flight Rule operations
L-861T	Omni directional elevated taxiway and apron edge lights.
L-862	Bi directional elevated runway edge, threshold, and displaced threshold lights for precision Instrument Flight Rule operations.
L-862E	Bi directional or unidirectional elevated runway threshold, runway end, and displaced threshold lights for precision Instrument Flight Rule operations.
L-862S	Unidirectional elevated stop bar lights
L-880/L881	Precision Approach Path Indicator
LDIN	Lead In Lighting System
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashing Lights
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (RAIL)
MO (A)	Morse Code (Sea Plane Navigation Buoy use only)
NONE	No lights
OBSCAT	Catenary Lighting
OBSDUAL	A combination of OBSRED and OBSWHT
OBSRED	Aviation red Obstruction Lights
OBSWHITE	Flashing White Obstruction Lights
OC	Occulting (Sea Plane Navigation Buoy use only)
ODALS	Omnidirectional Approach Lighting System

OTHER	Other
PAPI2	Precision Approach Path Indicator with 2 lights
PAPI4	Precision Approach Path Indicator with 4 lights
PORTABLE	Portable Lights
PVASI	Pulsating visual Approach Slope Indicator
Q	Quick (Flashing) (Sea Plane Navigation Buoy use only)
RAIL	Runway Alignment Indicator Lights
REIL	Runway End Identifier Lights
RWSL	Runway Status Lights
SALS	Short Approach lighting System
SMGCS	Surface Movement Guidance Control System
SSALF	Short Simplified Approach Light System with Sequenced Flashing Lights
SSALR	Simplified Short Approach Lighting System with Runway Alignment Indicator
TRCV	TriColor VASI
T-VASI	Visual Approach Slope Indicator
TWYON_OFFLGT	Taxiway Lead on/off lights
VASI-12	Visual Approach Slope Indicator with 2 bars and 12 boxes
VASI-16	Visual Approach Slope Indicator with 3 bars and 16 boxes
VASI-2	Visual Approach Slope Indicator with 2 bars
VASI-2-2	Visual Approach Slope Indicator with 2 bars and 2 boxes
VASI-3	Visual Approach Slope Indicator with 3 bars

CodeLightWatts

Used by Attributes: Light - Watts

Value	Definition (Notes) [Source]
100	100w. [SDSFIE V2.4 USMC]
1000	1000w. [SDSFIE V2.4 USMC]
150	150w. [SDSFIE V2.4 USMC]
175	175w. [SDSFIE V2.4 USMC]
200	200w. [SDSFIE V2.4 USMC]
250	250w. [SDSFIE V2.4 USMC]
400	400w. [SDSFIE V2.4 USMC]
7	7w [SDSFIE V1.9]
70	70w [SDSFIE V1.9]

CodeLoadCoilSystem

Used by Attributes: Load Coil - Ldcsym

Value	Definition (Notes) [Source]
B88	B88 - 88 Mh Coil Spaced Every 3,000 Feet. [SDSFIE V2.5 AIR FORCE]
D66	D66 - 66 Mh Coil Spaced Every 4,500 Feet. [SDSFIE V2.5 AIR FORCE]
D66DSL	D66DSL - 66 Mh Coil Spaced Every 4,500 Feet. Permits ADSL Services. [SDSFIE V2.5 AIR FORCE]
D88	D88 - 88 Mh Coil Spaced Every 4,500 Feet. [SDSFIE V2.5 AIR FORCE]
H88	H88 - 88 Mh Coil Spaced Every 6,000 Feet. [SDSFIE V2.5 AIR FORCE]
H88DSL	H88DSL - 88 Mh Coil Spaced Every 6,000 Feet. Permits ADSL Services. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeLoadsCoilCaseType

Used by Attributes: Load Coil - Ldccas

Value	Definition (Notes) [Source]
124C	124C Case. [SDSFIE V2.5 AIR FORCE]
235A	235A Case. [SDSFIE V2.5 AIR FORCE]
236C	236C Case. [SDSFIE V2.5 AIR FORCE]
723	723 Aerial Load Coil Case. [SDSFIE V2.5 AIR FORCE]

724	724 Aerial Load Coil Case. [SDSFIE V2.5 AIR FORCE]
772	772 Aerial Load Coil Case. [SDSFIE V2.5 AIR FORCE]
NREC	Non-reenterable factory sealed case designed to be placed within an enclosure. [SDSFIE V2.5 AIR FORCE]
NREX	Non-reenterable factory sealed case designed to be direct buried or exposed to weather. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
REC	Coils are assembled in a case that can be opened for maintenance, designed to be placed in an enclosure. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeManholeCoverType

Used by Attributes: Junction - Cover Material

Value	Definition (Notes) [Source]
MRND25	Round (25 centimeter diameter). [SDSFIE V2.5 AIR FORCE]
MRND40	Round (40 centimeter diameter). [SDSFIE V2.5 AIR FORCE]
MRND45	Round (45 centimeter diameter). [SDSFIE V2.5 AIR FORCE]
REC	Rectangular (24 inch by 36 inch) [SDSFIE V2 Austin and Pitts]
RND24	Round (24 inch diameter) [SDSFIE V2 Austin and Pitts]
RND27	Round (27 inch diameter) [SDSFIE V2 Austin and Pitts]
RND28	Round (28 inch diameter) [SDSFIE V2 Austin and Pitts]
RND30	Round (30 inch diameter) [SDSFIE V2 Austin and Pitts]
RND36	Round (36 inch diameter) [SDSFIE V2 Austin and Pitts]
RND38	Round (38 inch diameter) [SDSFIE V2 Austin and Pitts]
RND42	Round (42 inch diameter) [SDSFIE V2 Austin and Pitts]
RND48	Round (48 inch diameter) [SDSFIE V2 Austin and Pitts]

CodeManholeLinerType

Used by Attributes: Junction - Liner Type;Junction - Liner Type;Neutralizer - Liner Type;Neutralizer - Liner Type

Value	Definition (Notes) [Source]
GLASS	glass liner [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PLASTIC	plastic liner [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeManholeMaterial

Used by Attributes: Junction - Apron Trough Material;Junction - Corbel Walls Material

Value	Definition (Notes) [Source]
temp	temp

CodeMaritimeMgmtType

Used by Attributes: Media Converter - Mtimzone

Value	Definition (Notes) [Source]
CZ	The Contiguous Zone is a U.S. maritime boundary extending to 24 nautical miles from the baseline. [SDSFIE V2.5 NAVFAC]
EEX	The Exclusive Economic Zone is an area beyond and adjacent to the territorial sea. [SDSFIE V2.5 NAVFAC]
FZ	The Fishing Zone area as defined in the Fisheries Management Act 1991 (FMA). [SDSFIE V2.5 NAVFAC]
HS	High Seas, International Waters, meaning the open seas of the world outside the territorial waters of any nation. [SDSFIE V2.5 NAVFAC]
IW	Internal Waters. [SDSFIE V2.5 NAVFAC]
JDZ	Joint Development Zones. [SDSFIE V2.5 NAVFAC]
MZ	Military Zones. [SDSFIE V2.5 NAVFAC]
SZ	Special Zones. [SDSFIE V2.5 NAVFAC]
TS	The Territorial Sea is U.S. maritime boundary extending to 12 nautical miles as measured from the baseline. [SDSFIE V2.5 NAVFAC]

CodeMarkingFeatureType

Used by Attributes: Disposal Tank - markingFeatureType;Septic Tank - markingFeatureType;Tank - markingFeatureType;Tank - markingFeatureType;Tank - markingFeatureType;Tank - markingFeatureType;Tank - markingFeatureType;Tank Area - markingFeatureType

Value	Definition (Notes) [Source]
AIMING_POINT	Runway Aiming Point (Geometry Type: Polygon) [Source: AC 150/5340-1]
ALTBAND	lternating bands of aviation orange and white [Source AC 70/7640-1]
APRON_SIGN	Surface painted apron position/entrance sign (Geometry Type: Polygon) [Source: AC 150/5340-1]
ARROW	Arrows identify the displaced threshold area to provide centerline guidance for takeoffs and rollouts (Geometry Type: Line) [Source: AC 150/5340-1]
ARROW_HEAD	Arrow heads are used in conjunction with a threshold bar to further highlight the beginning of a runway (Geometry Type: Line) [Source: AC 150/5340-1]
CHECKERBOARD	Checkerboard obstruction marking pattern [Source AC 70/7640-1]
CHEVRON	A marking used to designate blast pads and other areas that are not suitable for aircraft (Geometry Type: Line) [Source: AC 150/5340-1]
DEMARCATION	Demarcation Bar (Geometry Type: Line) [Source: AC 150/5340-1]
DIR_SIGN	Surface painted taxiway direction signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
GATE_LINE	All painted taxilines covering a parking stand area are regarded as stand guidance lines and will be individual objects in the database. There may be several stand guidance taxilines leading to an aircraft stand to accommodate different aircraft types.
GATE_SIGN	Surface painted gate position signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
HOLD_SIGN	Surface painted holding position signs (Geometry Type: AC 150/5340-1]
ILS_HOLD	Holding position markings for Instrument Landing Systems (Geometry Type: Polygon) [Source: AC 150/5340-1]
INTERSECTION_HOLD	Holding position marking for taxiway/taxiway intersections (Geometry Type: Line) [Source: AC 150/5340-1]
LAHSO	Marking associated with a Land And Hold Short Operations (LAHSO)
LOCATION_SIGN	Surface painted taxiway location signs (Geometry Type: Polygon) [Source: AC 150/5340-1]
NON_MOVE_AREA	Non-movement area marking (Geometry Type: Line) [Source: AC 150/5340-1]
NONE	No marking(s)
OTHER	Other markings not listed
OTHER_LINE	Other markings suitable for representation as a line
OTHER_POLYGON	Other markings suitable for representation as a polygon
PERM_CLOSED	Markings for permanently closed runways and taxiways (Geometry Type: Polygon) [Source: AC 150/5340-1]
POS_SIGN	Geographic position markings (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_CL	Runway Centerline (Geometry Type: Line) [Source: AC150/5340-1]
RWY_HOLD	Runway holding position markings on Runways (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_ID	Runway Designation Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
RWY_SHD	Runway shoulder markings (Geometry Type: Line) [Source: AC 150/5340-1]
RWY_THRSH	Runway Threshold Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
SIDE_STRP	Runway Side Stripe Marking (Geometry Type: Line) [Source: AC 150/5340-1]
SOLID	Solid pattern obstruction marking [Source AC 70/7640-1]
TDZ_MARK	Runway Touchdown Zone Marking (Geometry Type: Polygon) [Source: AC 150/5340-1]
TEMP_CLOSED	Markings for temporarily closed runways and taxiways (Geometry Type: Line) [Source: AC 150/5340-1]
THRSH_BAR	Runway Threshold Bar (Geometry Type: Polygon) [Source: AC 150/5340-1]
TIEDOWN	Aircraft tiedown
TWY_CL	Taxiway Centerline (Geometry Type: Line) [Source: AC 150/5340-1]
TWY_EDGE	Taxiway edge marking (Geometry Type: Line) [Source: AC 150/5340-1]
TWY_HOLD	Runway hold position markings on taxiways (Geometry Type: Polygon) [Source: AC 150/5340-1]
TWY_SHD	Taxiway shoulder marking (Geometry Type: Line) [Source: AC 150/5340-1]
VEHICLE	Vehicle roadway markings (Geometry Type: Line) [Source: AC 150/5340-1]

CodeMaxcellType

Used by Attributes: Media Converter - Maxcellt

Value	Definition (Notes) [Source]
MXC_1_25_1	Standard 1.25 Inch 1 Cell (White - Teardrop) - 1.25 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXC_2_2	Standard 2 Inch 2 Cell (Purple) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXC_2_3	Standard 2 Inch 3 Cell (Yellow) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXC_3_3	Standard 3 Inch 3 Cell (Black, Red, or Blue) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXC_4_3	Standard 4 Inch 3 Cell (Green) - 1.25 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXD_1_25_1	Detachable 1.25 Inch 1 Cell (White - Teardrop) - 1.25 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXD_2_2	Detachable 2 Inch 2 Cell (Purple) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXD_2_3	Detachable 2 Inch 3 Cell (Yellow) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXD_3_3	Detachable 3 Inch 3 Cell (Black, Red, or Blue) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXD_4_3	Detachable 4 Inch 3 Cell (Green) - 1.25 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]

MXP_1_25_1	Plenum 1.25 Inch 1 Cell (White - Teardrop) - 1.25 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXP_2_2	Plenum 2 Inch 2 Cell (Purple) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXP_2_3	Plenum 2 Inch 3 Cell (Yellow) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
MXP_3_3	Plenum 3 Inch 3 Cell (Black, Red, or Blue) - 1 Inch Cable OD Max. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeMediaConverter

Used by Attributes: Media Converter - Mcnvty

Value	Definition (Notes) [Source]
COAX_TO_MM	Coaxial Cable to Multi Mode Fiber. [SDSFIE V2.5 AIR FORCE]
COAX_TO_SM	Coaxial Cable to Single Mode Fiber. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
SM_TO_MM	Single Mode Fiber to Multi Mode Fiber. [SDSFIE V2.5 AIR FORCE]
STP_TO_MM	Shielded Twisted Pair to Multi Mode Fiber. [SDSFIE V2.5 AIR FORCE]
STP_TO_SM	Shielded Twisted Pair to Single Mode Fiber. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
UTP_TO_MM	Unshielded Twisted Pair to Multi Mode Fiber. [SDSFIE V2.5 AIR FORCE]
UTP_TO_SM	Unshielded Twisted Pair to Single Mode Fiber. [SDSFIE V2.5 AIR FORCE]

CodeMediaType

Used by Attributes: Equipment - Media Type;Segmented Cable Point - Media Type

Value	Definition (Notes) [Source]
COPPER	Copper. [SDSFIE V2.3 Tinker Air Force Base]
FIBER_OPTIC	Fiber Optics. [SDSFIE V2.31 Air Force]
MICROWAVE	Microwave. [SDSFIE V2.31 Air Force]
MULTI_MODE_FIBER	Multi-Mode Fiber [SDSFIE V2.3 Tinker Air Force Base]
SINGLE_MODE_FIBE	Single Mode Fiber. [SDSFIE V2.3 Tinker Air Force Base]

CodeNavigationLineType

Used by Attributes: Cable - Cable Category

Value	Definition (Notes) [Source]
CLEARING_LINE	Clearing Line [SDSFIE V2.2 S-57]
LD_LN_BEAR_A_TRA	Leading Line Bearing A Recommended Track [SDSFIE V2.2 S-57]
TRANSIT_LINE	Transit Line [SDSFIE V2.2 S-57]

CodeNetworkAffiliationType

Used by Attributes: Network Systems Site - Net Aff;Relay Station - Net Aff

Value	Definition (Notes) [Source]
ABC	ABC Network. [SDSFIE V2.31 HSIP]
CBL	CBL Network. [SDSFIE V2.31 HSIP]
CBS	CBS Network. [SDSFIE V2.31 HSIP]
FOX	FOX Network. [SDSFIE V2.31 HSIP]
NBC	NBC Network. [SDSFIE V2.31 HSIP]
PBS	PBS Network. [SDSFIE V2.31 HSIP]

CodeNetworkBandwidth

Used by Attributes: Media Converter - Netbw;Repeater - Netbw

Value	Definition (Notes) [Source]
0_3	300 bps - 300 Bits Per Second (Bell 103, ITU-T V.21). [SDSFIE V2.5 AIR FORCE]
1_1_2	1200 bps - 1200 Bits Per Second (Bell 212A, ITU-T V.22). [SDSFIE V2.5 AIR FORCE]
1_14_4	14.4K bps - 14.4K Bits Per Second (ITU-T V.32bis, V.33). [SDSFIE V2.5 AIR FORCE]
1_19_2	19.2K bps - 19.2K Bits Per Second (ITU-T V.34, V.32terbo) [SDSFIE V2.5 AIR FORCE]
1_2_4	2400 bps - 2400 Bits Per Second (ITU-T V.22bis). [SDSFIE V2.5 AIR FORCE]
1_28_8	28.8K bps - 28.8K Bits Per Second (ITU-T V.34). [SDSFIE V2.5 AIR FORCE]
1_33_6	33.6K bps - 33.6K Bits Per Second (ITU-T V.34). [SDSFIE V2.5 AIR FORCE]
1_38_4	38.4K bps - 38.4K Bits Per Second. [SDSFIE V2.5 AIR FORCE]
1_4_8	4800 bps - 4800 Bits Per Second (Bell 208 A/B, ITU-T V.29). [SDSFIE V2.5 AIR FORCE]
1_48_0	48K bps - 48K Bits Per Second. [SDSFIE V2.5 AIR FORCE]
1_56_0	56K bps - 56K Bits Per Second (ITU-T V.9x). [SDSFIE V2.5 AIR FORCE]
1_57_6	57.6K bps - 57.6K Bits Per Second. [SDSFIE V2.5 AIR FORCE]
1_64_0	64K bps - 64K Bits Per Second. [SDSFIE V2.5 AIR FORCE]
1_7_2	7200 bps - 7200 Bits Per Second (ITU-T V.29). [SDSFIE V2.5 AIR FORCE]
1_9_6	9600 bps - 9600 Bits Per Second (ITU-T V.29, V.32, V.22bis). [SDSFIE V2.5 AIR FORCE]
1115_2	115.2K bps - 115.2K Bits Per Second. [SDSFIE V2.5 AIR FORCE]
2_1_544_T_1	1.544 Mbps (T-1, DS-1). [SDSFIE V2.5 AIR FORCE]
2_10_BT	10 Mbps (10 BaseT Copper). [SDSFIE V2.5 AIR FORCE]
2_2_048_E_1	2.048 Mbps (E-1). [SDSFIE V2.5 AIR FORCE]
2_44_736_T_3	44.736 Mbps (T-3, DS-3). [SDSFIE V2.5 AIR FORCE]
2_51_84_OC1	51.84 Mbps (OC1). [SDSFIE V2.5 AIR FORCE]
2100_BTF	100 Mbps (100 BaseT Copper, 100 BaseF Fiber). [SDSFIE V2.5 AIR FORCE]
2155_52_OC3	155.52 Mbps (OC3c, OC3/STM-1). [SDSFIE V2.5 AIR FORCE]
2622_08_OC12	622.08 Mbps (OC12c, OC12/STM-4). [SDSFIE V2.5 AIR FORCE]
3_1_BTF	1 Gbps (1000 BaseT Copper, 1000 BaseF Fiber). [SDSFIE V2.5 AIR FORCE]
3_10_BF	10 Gbps (10000 BaseF Fiber). [SDSFIE V2.5 AIR FORCE]
3_2_488_OC48	2.488 Gbps (OC48c, OC48/STM-16). [SDSFIE V2.5 AIR FORCE]
3_39_81_OC768	39.81 Gbps (OC-768c, OC-768/STM-256). [SDSFIE V2.5 AIR FORCE]
3_40_OC48WDM	40 Gbps (OC48 WDM). [SDSFIE V2.5 AIR FORCE]
3_9_952_OC192	9.952 Gbps (OC192c, OC192/STM-64). [SDSFIE V2.5 AIR FORCE]
3160_OC3072	160 Gbps (OC-3072). [SDSFIE V2.5 AIR FORCE]
4_6_4_OC768DWDM	6.4 Tbps (OC-768 DWDM). [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeNetworkProtocol

Used by Attributes: Media Converter - Netprc

Value	Definition (Notes) [Source]
ADSL	Asymmetric Digital Subscriber Loop. [SDSFIE V2.5 AIR FORCE]
ATM	Asynchronous Transfer Mode. [SDSFIE V2.5 AIR FORCE]
DSL	Digital Subscriber Loop. [SDSFIE V2.5 AIR FORCE]
ETHERNET	Ethernet. [SDSFIE V2.5 AIR FORCE]
FDDI	Fiber Distributed Data Interface. [SDSFIE V2.5 AIR FORCE]
FIBERCHANNEL	Fiber Channel. [SDSFIE V2.5 AIR FORCE]
FRAMERELAY	Frame Relay. [SDSFIE V2.5 AIR FORCE]
ISDN	Integrated Services Digital Network. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
SONET	Synchronous Optical Network. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
TOKENRING	Token Ring. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeNozzleType

Used by Attributes: Hydrant - Nozzle Type

Value	Definition (Notes) [Source]
OVERWING	Jumbo VASI with a TCH to accommodate long-bodied or jumbo aircraft. [SDSFIE V2.4 Air Force]
SINGLE_PT	None. [SDSFIE V2.4 Air Force]
SINGLEPT_OVRWING	Not Applicable. [SDSFIE V2.4 Air Force]
UNKNOWN	PVASI (Pulsating VASI). [SDSFIE V2.4 Air Force]

CodeNumberLoadsCoilType

Used by Attributes: Load Coil - Ldc Type

Value	Definition (Notes) [Source]
632	633 Type 88 Mh Load Coil. [SDSFIE V2.5 AIR FORCE]
656	657 Type 66 Mh Load Coil. [SDSFIE V2.5 AIR FORCE]
662	663 Type 88 Mh Load Coil. [SDSFIE V2.5 AIR FORCE]
666	667 Type 66 Mh Load Coil. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodePathCont

Used by Attributes: Path Segment Line - Path Cnt

Value	Definition (Notes) [Source]
3	Fiber and Copper (twisted-pair). [SDSFIE V2.5 AIR FORCE]
4	Coax. [SDSFIE V2.5 AIR FORCE]
5	Coax and Fiber. [SDSFIE V2.5 AIR FORCE]
6	Coax and Copper (twisted-pair). [SDSFIE V2.5 AIR FORCE]
7	Coax, Copper (twisted-pair), Fiber. [SDSFIE V2.5 AIR FORCE]

CodePathType

Used by Attributes: Path Segment Line - Path Type

Value	Definition (Notes) [Source]
AERIAL	Above ground path between, poles, towers or buildings. [SDSFIE V2.5 AIR FORCE]
CABLE_BRIDGE	Bridge only used for cables. [SDSFIE V2.5 AIR FORCE]
CABLE_TROUGH	Pathway on top of ground for cables. [SDSFIE V2.5 AIR FORCE]
DIRECT_BURIED	Below ground path where soil has direct contact with cable. [SDSFIE V2.5 AIR FORCE]
DUCT	Single communications duct. [SDSFIE V2.5 AIR FORCE]
DUCTBANK	A container for multiple ducts. [SDSFIE V2.5 AIR FORCE]
ROAD_CROSSING	A duct for cables, usually under a road. [SDSFIE V2.5 AIR FORCE]
STUB_OUT	Short duct used with manholes and vaults. [SDSFIE V2.5 AIR FORCE]

CodePercentModifier

Used by Attributes: Path Segment Line - percent

Value	Definition (Notes) [Source]
0	Unknown. [SDSFIE V2.5 NAVFAC]
1	Bare. [SDSFIE V2.5 NAVFAC]
2	Sparse. [SDSFIE V2.5 NAVFAC]
3	Patchy. [SDSFIE V2.5 NAVFAC]
4	Continuous. [SDSFIE V2.5 NAVFAC]

CodePhoneType

Used by Attributes: Telephone - Phone Type

Value	Definition (Notes) [Source]
COURTESY	Courtesy [SDSFIE V2 Tinker Air Force Base]
EMERGENCY	Emergency [SDSFIE V2]
EXTENSION	Extension [SDSFIE V2 Tinker Air Force Base]
HOTLINE	Hotline [SDSFIE V2 Tinker Air Force Base]
OTHER	Other [SDSFIE V2]
PAYPHONE	Payphone [SDSFIE V2 Tinker Air Force Base]
TBD	To Be Determined [SDSFIE V2]
UNKNOWN	Unknown [SDSFIE V2]

CodePipeCategory

Used by Attributes: Source Site - Cat Pipe;Transmission Pipeline - Pipe Category

Value	Definition (Notes) [Source]
BUBBLER_SYSTEM	Bubbler System [SDSFIE V2.2 S-57]
INTAKE_PIPE	Intake Pipe [SDSFIE V2.2 S-57]
OUTFALL_PIPE	Outfall Pipe [SDSFIE V2.2 S-57]
SEWER	Sewer [SDSFIE V2.2 S-57]
SUPPLY_PIPE	Supply Pipe [SDSFIE V2.2 S-57]

CodePipeDiameter

Used by Attributes: Junction - effluentPipeDiameter;Junction - influentPipe1Diameter;Junction - influentPipe2Diameter;Junction - influentPipe3Diameter;Junction - influentPipe4Diameter;Junction - influentPipe5Diameter;Culvert Center Line - Openning Diameter;Air Pipe - Size;Downspout - Size;Downspout - Size;Fire Connection Point - Size;Fitting - Size;Fitting - Size;Fitting - Size;Fitting - Size;Fitting - Size;Fitting - Size;Fitting - Size;Fitting - Size;Flow Control Device - Size;Flow Control Device - Size;Gate - Size;Hydrant - Size;Intake Line - Size;Line - Size;Line - Size;Line - Size;Line - Size;Line - Size;Line - Size;Meter - Size;Meter - Size;Meter - Size;Meter - Size;Meter - Size;Meter - Size;Pipe Line - Size;Reducer - Size;Regulator - Size;Regulator Reducer - Size;Regulator Reducer - Size;Storm Trench Drain Line - Size;Transmission Pipeline Segment Line - Size;Valve - Size;Valve - Size;Valve - Size;Valve - Size;Valve - Valve Diameter;Valve - Valve Diameter;Valve - Valve Size

Value	Definition (Notes) [Source]
0.25	1/4 inch (0.25 inch) [SDSFIE V2]
0.5	1/2 inch (0.5 inch) [SDSFIE V2]
0.75	3/4 inch (0.75 inch) [SDSFIE V2]
1	1inch (1.0 inch) [SDSFIE V2]
1.25	1 1/4 inch (1.25 inches) [SDSFIE V2]
1.5	1 1/2 inch (1.5 inches) [SDSFIE V2]
1.75	1 3/4 inch (1.75 inches) [SDSFIE V2]
10	10 inch (10.0 inches) [SDSFIE V2]
12	12 Inch (12.0 inches) [SDSFIE V2]
14	14 Inch (14.0 inches) [SDSFIE V2 Cherry Point]
15	15 Inch (15.0 inches) [SDSFIE V2 Cherry Point]
16	16 Inch (16.0 inches) [SDSFIE V2 Cherry Point]
18	18 Inch (18.0 inches) [SDSFIE V2 Cherry Point]
2	2 inch (2.0 inches) [SDSFIE V2]
2.5	2 1/2 inch (2.5 inches) [SDSFIE V2]
20	20 Inch (20.0 inches) [SDSFIE V2]
21	21 Inch (21.0 inches) [SDSFIE V2 Cherry Point]
22	22 Inch (22.0 inches) [SDSFIE V2]
24	24 Inch (24.0 inches) [SDSFIE V2 Cherry Point]
28	28 Inch (28.0 inches) [SDSFIE V2]
3	3 inch (3.0 inches) [SDSFIE V2]
30	30 Inch (30.0 inches) [SDSFIE V2 Cherry Point]
32	32 Inch (32.0 inches) [SDSFIE V2]
36	36 Inch (36.0 inches) [SDSFIE V2]
4	4 inch (4.0 inches) [SDSFIE V2]
42	42 Inch (42.0 inches) [SDSFIE V2]
48	48 Inch (48.0 inches) [SDSFIE V2]

5	5 Inch (5.0 inches) [SDSFIE V2 Cherry Point]
6	6 inch (6.0 inches) [SDSFIE V2]
60	60 Inch (60.0 inches) [SDSFIE V2]
64_INCH	64 Inch (64.0 inches). [SDSFIE V2.5 AIR FORCE]
65_INCH	65 Inch (65.0 inches). [SDSFIE V2.5 AIR FORCE]
66_INCH	66 Inch (66.0 inches). [SDSFIE V2.5 AIR FORCE]
67_INCH	67 Inch (67.0 inches). [SDSFIE V2.5 AIR FORCE]
72	72 Inch (72.0 inches) [SDSFIE V2]
8	8 inch (8.0 inches) [SDSFIE V2]
84_INCH	84 Inch (84.0 inches). [SDSFIE V2.5 AIR FORCE]
85_INCH	85 Inch (84.0 inches). [SDSFIE V2.5 AIR FORCE]
OTHER	other [SDSFIE V1.4]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodePipelineLocationType

Used by Attributes: Line - Location Type;Line - Piplty;Line - Piplty;Line - Piplty

Value	Definition (Notes) [Source]
ABOVE_GROUND	above ground [SDSFIE V1.8 USGS]
ELEVATED	elevated [SDSFIE V1.8 USGS]
SUBMERGED	submerged [SDSFIE V1.8 USGS]
TBD	to be determined [SDSFIE V1.8 USGS]
UNDERGROUND	underground [SDSFIE V1.8 USGS]
UNKNOWN	unknown [SDSFIE V1.8 USGS]

CodePipelineProduct

Used by Attributes: Transmission Pipeline - Commodity 1;Transmission Pipeline - Commodity 2;Transmission Pipeline - Commodity 3;Pump Booster Station - Prodct;Transmission Pipeline - Product Descriminator

Value	Definition (Notes) [Source]
AA	Anhydrous Ammonia [SDSFIE V2.1 DOT - NPMS]
BAUXITE	BAUXITE [SDSFIE V2.2 S-57]
CEMENT	CEMENT [SDSFIE V2.2 S-57]
CHEMICALS	Chemicals - type unspecified [SDSFIE V2.2 S-57]
CO2	Carbon Dioxide [SDSFIE V2.1 DOT - NPMS]
COAL	COAL [SDSFIE V2.2 S-57]
COKE	COKE [SDSFIE V2.2 S-57]
CRD	Crude or unprocessed oil. [SDSFIE V2.3 DOT - NPMS]
DRINKING_WATER	DRINKING_WATER [SDSFIE V2.2 S-57]
EMP	empty [SDSFIE V2.1 DOT - NPMS]
GAS	Gas - type not specified [SDSFIE V2.2 S-57]
GRAIN	GRAIN [SDSFIE V2.2 S-57]
HG	Hydrogen Gas [SDSFIE V2.1 DOT - NPMS]
HVL	Highly Volatile Liquid [SDSFIE V2.1 DOT - NPMS]
IRON_INGOTS	IRON_INGOTS [SDSFIE V2.5 S-57CENTER]
LIQUIF_PETROGAS	LIQUIFIED_PETROLEUM_GAS [SDSFIE V2.2 S-57]
LIQUIFIED_NATGAS	LIQUIFIED_NATURAL_GAS [SDSFIE V2.2 S-57]
LPG	Liquefied Petroleum Gas [SDSFIE V2.1 DOT - NPMS]
MILK	MILK [SDSFIE V2.2 S-57]
NG	Natural Gas [SDSFIE V2.1 DOT - NPMS]
NGL	Natural Gas Liquids [SDSFIE V2.1 DOT - NPMS]
OIL	OIL [SDSFIE V2.2 S-57]
ORE	ORE [SDSFIE V2.2 S-57]
PRD	Product is not known. [SDSFIE V2.1 DOT - NPMS]
SALT	SALT [SDSFIE V2.2 S-57]
SAND	SAND [SDSFIE V2.2 S-57]
SAWDUST_WOODCHIP	SAWDUST_WOODCHIPS [SDSFIE V2.2 S-57]
SCRAP_METAL	SCRAP_METAL [SDSFIE V2.2 S-57]
STONE	STONE [SDSFIE V2.2 S-57]
TIMBER	TIMBER [SDSFIE V2.2 S-57]
WATER	Water - potable or otherwise. [SDSFIE V2.2 S-57]

WINE	WINE [SDSFIE V2.2 S-57]

CodePipeMaterial

Used by Attributes: Ductbank - Duct Material;Ductbank - ductMat;Junction - effluentPipeMaterial;Junction - influentPipe1Material;Junction - influentPipe2Material;Junction - influentPipe3Material;Junction - influentPipe4Material;Junction - influentPipe5Material;Air Pipe - Material;Culvert Center Line - Material;Disposal Tank - Material;Downspout - Material;Downspout - Material;Ductbank - Material;Filtration Bed - Material;Fitting - Material;Fitting - Material;Fitting - Material;Fitting - Material;Fitting - Material;Fitting - Material;Fitting - Material;Gate - Material;Grease Trap - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Junction - Material;Lagoon - Material;Lagoon - Material;Line - Material;Line - Material;Line - Material;Line - Material;Line - Material;Line - Material;Line - Material;Line - Material;Neutralizer - Material;Neutralizer - Material;Septic Tank - Material;Sludge Bed - Material;Storm Trench Drain Line - Material;Tank - Material;Tank - Material;Tank - Material;Tank - Material;Tank - Material;Vault - Material;Vault - Pipe Material;Oil Water Separator Diversion Vault - pipeMaterial

Value	Definition (Notes) [Source]
ABS	acrylonitrile butadiene styrene [SDSFIE V1.4]
ALUMINUM	Aluminum [SDSFIE V1.4]
ARMORED_GLASS	Armored-glass. [SDSFIE V2]
ASBESTCEMENT	asbestos cement [SDSFIE V1.4]
BLACK_FE	black iron [SDSFIE V1.4]
BRICK	brick [SDSFIE V1.4]
BUILTUP	builtup [SDSFIE V1.4]
CANVAS	canvas [SDSFIE V1.4]
CARDBOARD	cardboard [SDSFIE V1.4]
CASTIRON	cast iron [SDSFIE V1.4]
CEMENT	cement [SDSFIE V1.4]
CEMENTBLOCK	cement block [SDSFIE V1.4]
CINDERBLOCK	cinder block [SDSFIE V1.4]
CIS	Concrete Cast inSitu/Cast in Place [SDSFIE V2 Tinker Air Force Base]
COATWRAPSTEL	coated and wrapped steel [SDSFIE V1.4]
COMBINATION	combination of materials [SDSFIE V1.4]
COMPO	Composolite [SDSFIE V2 Tinker Air Force Base]
COMPOSOLITE	Composolite [SDSFIE V2 Tinker Air Force Base]
CONCRETBLOCK	concrete block [SDSFIE V1.4]
CONCRETE	concrete [SDSFIE V1.4]
CONCRETEPILE	concrete pile [SDSFIE V1.4]
CONCRT_AND_STEEL	Concrete and Steel. [SDSFIE V2.31 Air Force]
CONCRT_AND_WOOD	Concrete and Wood. [SDSFIE V2.31 Air Force]
COPPER	Copper [SDSFIE V1.4]
CORR_METAL	corrugated metal [SDSFIE V1.4]
CORR_STEEL	corrugated steel [SDSFIE V1.4]
CORRALBITMEN	corrugated Aluminum with bituminous coating [SDSFIE V1.4]
CORRALPAVINV	corrugated Aluminum with paved invert [SDSFIE V1.4]
CORRMETLBITM	corrugated metal with bituminous coating [SDSFIE V1.4]
CORRMETPAVIN	corrugated metal with paved invert [SDSFIE V1.4]
CORRSTELBITM	corrugated steel with bituminous coating [SDSFIE V1.4]
CORRSTELPAVI	corrugated steel with paved invert [SDSFIE V1.4]
CORRUGATEDAL	corrugated Aluminum [SDSFIE V1.4]
CRESOTEDWOOD	creosoted wood [SDSFIE V1.4]
DUCTILEFE	ductile iron [SDSFIE V1.4]
EARTHEN	earthen, dirt [SDSFIE V1.4]
FEPT_STEEL	FEP Teflon-lined steel. [SDSFIE V2]
FIBER	fiber [SDSFIE V1.4]
FIBERGLASS	fiberglass [SDSFIE V1.4]
FRP	Fiberglass reinforced polyester. [SDSFIE V2]
FRV	Fiberglass Reinforced Vinylester. [SDSFIE V2]
GALVANIZEDFE	galvanized iron [SDSFIE V1.4]
GALVNIZSTEEL	galvanized steel [SDSFIE V1.4]
GLASS	glass [SDSFIE V1.4]
GLASS_LINED	Glass-lined [SDSFIE V2]
GLASS_REIN_PLAS	Glass Reinforced Plastic [SDSFIE V2.2 S-57]
GLASSBLOCK	glass block [SDSFIE V1.4]
GRASS	grass [SDSFIE V1.4]
HARD_SURFACED	Hard Surfaced [SDSFIE V2.2 S-57]
HASTELLOY	Hastelloy [SDSFIE V2]

HDPE	High Density Polyethylene (HDPE) [SDSFIE V2]
HELIWOUND	helically wound [SDSFIE V1.4]
HIDES	hides [SDSFIE V1.4]
INCONEL	Inconel [SDSFIE V2]
INSULATCONCR	insulating concrete [SDSFIE V1.4]
KYN_STEEL	Kynar-lined steel. [SDSFIE V2]
LOGS	logs [SDSFIE V1.4]
LOOSE_BOULDERS	Loose Boulders [SDSFIE V2.2 S-57]
MASNRY_AND_STEEL	Masonry and Steel. [SDSFIE V2.31 Air Force]
MASONRY	MASONRY [SDSFIE V2.2 S-57]
MASONRY_AND_WOOD	Masonry and Wood. [SDSFIE V2.31 Air Force]
METAL	metal conduit [SDSFIE V1.4]
MONEL	Monel [SDSFIE V2]
MULTIPLECLAY	multiple clay [SDSFIE V1.4]
MULTIPLETILE	multiple tile [SDSFIE V1.4]
NICKEL	Nickel [SDSFIE V2]
OTHER	other [SDSFIE V1.4]
OTHERMASONRY	other [SDSFIE V1.4]
PAINTED	Painted [SDSFIE V2.2 S-57]
PFA	PFA Teflon-lined. [SDSFIE V2]
PLASTIC	plastic [SDSFIE V1.4]
POLYETHYLENE	polyethylene [SDSFIE V1.4]
POLYSTYRENE	polystyrene [SDSFIE V1.4]
PPE_STEEL	Polypropylene-lined steel. [SDSFIE V2]
PRECAST	precast [SDSFIE V1.4]
PRESTRESSED	prestressed [SDSFIE V1.4]
PTFE	PTFE Teflon-lined. [SDSFIE V2]
PVC	polyvinyl chloride [SDSFIE V1.4]
REINFORCONCR	reinforced concrete [SDSFIE V1.4]
REINFPLASMOR	reinforced plastic mortar [SDSFIE V1.4]
RUB_STEEL	Rubber-lined steel. [SDSFIE V2]
SARAN_LINED	Saran lined [SDSFIE V2]
SHEETMETAL	sheet metal [SDSFIE V1.4]
SINGLE_CLAY	single clay [SDSFIE V1.4]
SINGLE_TILE	single tile [SDSFIE V1.4]
SNOW	snow [SDSFIE V1.4]
STAINLESS_STEEL	Stainless steel [SDSFIE V2]
STEEL	steel [SDSFIE V1.4]
STEEL_AND_WOOD	Steel and Wood. [SDSFIE V2.31 Air Force]
STEEL_WRAPED	steel wrapped [SDSFIE V1.4]
STEELPILE	steel pile [SDSFIE V1.4]
STONE	stone [SDSFIE V1.4]
STYROFOAM	Styrofoam [SDSFIE V1.4]
TAN_STEEL	Tantalum-lined steel [SDSFIE V2]
TBD	to be determined [SDSFIE V1.4]
TERRACOTTA	terra cotta [SDSFIE V1.4]
TILE	tile [SDSFIE V1.4]
TILE_RESIN	tile resin [SDSFIE V1.4]
TITANIUM	Titanium [SDSFIE V2]
UNEARTHEN	Unearthen. [SDSFIE V2.4 USGS]
UNKNOWN	unknown [SDSFIE V1.4]
UNSURFACED	Unsurfaced [SDSFIE V2.2 S-57]
VITRIFIDCLAY	vitrified clay [SDSFIE V1.4]
WOOD	wood [SDSFIE V1.4]
WOODENPILE	wooden pile [SDSFIE V1.4]
WROUGHT_FE	wrought iron [SDSFIE V1.4]
ZIRCONIUM	Zirconium [SDSFIE V2]

CodePlacementOfAirPreType

Used by Attributes: Air Pressure Device - Placement

Value	Definition (Notes) [Source]
EXTENDED	Extended and not in or on cable sheath. [SDSFIE V2.5 AIR FORCE]

ON_BYPASS	On the bypass. [SDSFIE V2.5 AIR FORCE]
ON_CASE	On the case. [SDSFIE V2.5 AIR FORCE]
ON_SHEATH	On or in sheath. [SDSFIE V2.5 AIR FORCE]
ON_SLEEVE	On the lead sleeve. [SDSFIE V2.5 AIR FORCE]
ON_STUB	Located on a stub and not in or on the cable sheath. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodePoleClassificationType

Used by Attributes: Utility Pole Tower Site - P Class

Value	Definition (Notes) [Source]
CLASS_1	Class 1, MHBL 4500, Minimum Top Circumference 27 [SDSFIE V1.75]
CLASS_2	Class 2, MHBL 3700, Minimum Top Circumference 25 [SDSFIE V1.75]
CLASS_3	Class 3, MHBL 3000, Minimum Top Circumference 23 [SDSFIE V1.75]
CLASS_4	Class 4, MHBL 2400, Minimum Top Circumference 21 [SDSFIE V1.75]
CLASS_5	Class 5, MHBL 1900, Minimum Top Circumference 19 [SDSFIE V1.75]
CLASS_6	Class 6, MHBL 1500, Minimum Top Circumference 17 [SDSFIE V1.75]
CLASS_7	Class 7, MHBL 1200, Minimum Top Circumference 15 [SDSFIE V1.75]

CodePoleCondition

Used by Attributes: Fire Connection Point - Condition;Gate - Condition;Grease Trap - Condition;Junction - Condition;Pressure Reducing Station - Condition;Pump Booster Station - Condition;Pump Ejector Station - Condition;Pump Station - Condition;Pump Station - Condition;Pump Station - Condition;Pump Station - Condition;Pumpstation Ejector - Condition;Septic Tank - Condition;Storage Area - Condition;Telephone - Condition;Transformr Bank - Condition;Treatment Plant - Condition;Treatment Unit - Condition;Treatment Unit - Condition;Utility Pole Tower Site - Condition

Value	Definition (Notes) [Source]
BOARDEDUP	boarded up [SDSFIE V1.4]
BROKENNOUSE	broken and unusable [SDSFIE V1.4]
BURNTNOUSE	burnt and not useable [SDSFIE V1.4]
BURNTUSEABLE	burnt but useable [SDSFIE V1.4]
CONDEMNED	condemned [SDSFIE V1.4]
CRACKED	cracked but useable [SDSFIE V2.1 FGDC Utilities Classification]
DAMAGED	damaged [SDSFIE V1.4]
DAMAGEHEVUSE	heavily damage, but useable [SDSFIE V1.4]
DAMAGELITUSE	light damage, but useable [SDSFIE V1.4]
DAMAGEMODUSE	moderate damage, but useable [SDSFIE V1.4]
DAMAGHEVNO	heavy damage, and unusable [SDSFIE V1.4]
DAMAGLITNO	light damage, and unusable [SDSFIE V1.4]
DAMAGMODNO	moderate damage, and unusable [SDSFIE V1.4]
DANGEROUS	dangerous to use [SDSFIE V1.4]
FAIR	fair or medium condition [SDSFIE V1.4]
FAIRESTIMATED	Estimated in fair condition. [SDSFIE V2.31 Air Force]
GOOD	good condition [SDSFIE V1.4]
GOODESTIMATED	Estimated in good condition. [SDSFIE V2.31 Air Force]
GOODNOTNEW	good, but not new [SDSFIE V1.4]
HABITABLE	habitable [SDSFIE V1.4]
HABITABLENO	not habitable [SDSFIE V1.4]
MINORUSE	minor use [SDSFIE V1.4]
NEWLYBUILT	newly built [SDSFIE V1.4]
NEWUNFINISH	newly built, but not yet finished [SDSFIE V1.4]
NOTRESPASSNG	no trespassing [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
POOR	poor or unsuitable condition [SDSFIE V1.4]
POORESTIMATED	Estimated in poor condition. [SDSFIE V2.31 Air Force]
QUARANTINED	quarantined [SDSFIE V1.4]
RADIOACTIVE	radioactive [SDSFIE V1.4]
SERVICEABLE	Servicable
SPLINTER	splintered but useable [SDSFIE V2.1 FGDC Utilities Classification]
TBD	to be determined [SDSFIE V1.4]

UNDERCONSTRUCT	Planned or under construction. [SDSFIE V2.31 Air Force]
UNKNOWN	unknown [SDSFIE V1.4]
UNSERVICEABLE	Unserviceable or not a weight bearing surface. [SDSFIE V2.31 Air Force]
UNUSEABLE	unusable [SDSFIE V2.1 FGDC Utilities Classification]
USEABLE	useable [SDSFIE V1.4]
USEABLENO	not useable [SDSFIE V1.4]

CodePoleTreatmentType

Used by Attributes: Utility Pole Tower Site - Treat Type

Value	Definition (Notes) [Source]
CREOSOTE	The pole has been treated with creosote. [SDSFIE V1.6]
OTHER	Other, Not otherwise listed [SDSFIE V1.6]
PAINT	The pole has been painted to prevent corrosion. [SDSFIE V1.6]
TBD	To be determined [SDSFIE V1.6]
UNKNOWN	Unknown [SDSFIE V1.6]

CodePosAccuracyQuality

Used by Attributes: Transmission Pipeline Segment Line - Pos Acc

Value	Definition (Notes) [Source]
EXCELLENT	Excellent (0 to 50 feet). [SDSFIE V2.1 DOT - NPMS]
GOOD	Good (301 to 500 feet). [SDSFIE V2.1 DOT - NPMS]
POOR	Poor (501 to 1000 feet). [SDSFIE V2.1 DOT - NPMS]
UNKNOWN	Unknown [SDSFIE V2.1 DOT - NPMS]
VERY_GOOD	Very Good (51 to 300 feet). [SDSFIE V2.1 DOT - NPMS]

CodePowerUseType

Used by Attributes: Relay Station - Power

Value	Definition (Notes) [Source]
AC	Alternating Current [SDSFIE V2.3 Tinker Air Force Base]
DC	Direct Current [SDSFIE V2.3 Tinker Air Force Base]

CodeProgress

Used by Attributes: Access Coverage Area - collectionProgress;Access Point - collectionProgress;Air Pipe - collectionProgress;Air Pressure Device - collectionProgress;Amplifier - collectionProgress;Anchor - collectionProgress;Anode - collectionProgress;Anode - collectionProgress;Anode - collectionProgress;Anode Test Station - collectionProgress;Anode Test Station - collectionProgress;Anode Test Station - collectionProgress;Antenna Line - collectionProgress;Antenna Site - collectionProgress;Attenuator - collectionProgress;Bus Line - collectionProgress;Cable - collectionProgress;Cable Bridge Line - collectionProgress;Cable Ladder - collectionProgress;Cable Rack Line - collectionProgress;Cable Tray Line - collectionProgress;Cable Trough Line - collectionProgress;Capacitor - collectionProgress;Coaxial Line - collectionProgress;DbSplice - collectionProgress;Device - collectionProgress;Device - collectionProgress;Discharge Point - collectionProgress;Drain Separator - collectionProgress;Ductbank - collectionProgress;Ductbank - collectionProgress;Equipment - collectionProgress;Fiberoptic Line - collectionProgress;Fill Point - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Fitting - collectionProgress;Generator - collectionProgress;Grit Chamber - collectionProgress;Ground Point - collectionProgress;Ground Point - collectionProgress;Groundplane Area - collectionProgress;Groundwave Area - collectionProgress;Head Bolt Outlet - collectionProgress;Headwall - collectionProgress;Headwall Line - collectionProgress;Impedance Matching Point - collectionProgress;Inlet - collectionProgress;Internet Center - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Junction - collectionProgress;Lagoon - collectionProgress;Light - collectionProgress;Line - collectionProgress;Line Of Sight Line - collectionProgress;Load Capacitor - collectionProgress;Load Coil - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Marker - collectionProgress;Media Converter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Meter - collectionProgress;Motor - collectionProgress;Multihop Area - collectionProgress;Network Systems Site - collectionProgress;Neutralizer - collectionProgress;Oil Water Separator - collectionProgress;Other Cable - collectionProgress;Path Node Site - collectionProgress;Path Segment Line - collectionProgress;Pedestal - collectionProgress;Pedestal Site - collectionProgress;Pipe Line - collectionProgress;Pullbox Site - collectionProgress;Pump - collectionProgress;Pump - collectionProgress;Pump - collectionProgress;Pump Station - collectionProgress;Pumpstation Ejector - collectionProgress;Radar Site - collectionProgress;Radio - collectionProgress;Radio Receiver - collectionProgress;Radio Transmitter - collectionProgress;Rect Point - collectionProgress;Rectifier - collectionProgress;Rectifier - collectionProgress;Reducer - collectionProgress;Refinery Site - collectionProgress;Regulator - collectionProgress;Regulator - collectionProgress;Relay Station - collectionProgress;Repeater - collectionProgress;Riser - collectionProgress;Riser - collectionProgress;Satellite - collectionProgress;Segmented Cable - collectionProgress;Segmented Cable Point - collectionProgress;Sensor -

collectionProgress;Service Loop Point - collectionProgress;Source - collectionProgress;Speaker - collectionProgress;Splice - collectionProgress;Splice - collectionProgress;Splitter - collectionProgress;Storage Area - collectionProgress;Substation - collectionProgress;Switch - collectionProgress;Tank - collectionProgress;Tank Area - collectionProgress;Telephone - collectionProgress;Telephone Booth - collectionProgress;Terminal - collectionProgress;Terminator - collectionProgress;Transformer Vault - collectionProgress;Transformr Bank - collectionProgress;Transmission Pipeline - collectionProgress;Transmission Pipeline Segment Line - collectionProgress;Treatment Plant - collectionProgress;Twisted Pair Line - collectionProgress;Utility Electric Utility Site - collectionProgress;Utility Pole Guy - collectionProgress;Utility Pole Guy Line - collectionProgress;Utility Pole Tower Site - collectionProgress;Valve - collectionProgress;Valve - collectionProgress;Valve - collectionProgress;Valve Pit - collectionProgress;Vertical Site - collectionProgress;Video Site - collectionProgress;Voice Switch - collectionProgress;Waveguide Line - collectionProgress

Value	Definition (Notes) [Source]
temp	temp

CodeProjectType

Used by Attributes: Access Coverage Area - Disposition;Access Point - Disposition;Air Eliminator - Disposition;Air Pipe - Disposition;Air Pressure Device - Disposition;Amplifier - Disposition;Anchor - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Anode Test Station - Disposition;Antenna Line - Disposition;Antenna Site - Disposition;Attenuator - Disposition;Bus Line - Disposition;Cable - Disposition;Cable - Disposition;Cable Bridge Line - Disposition;Cable Ladder - Disposition;Cable Rack Line - Disposition;Cable Tray Line - Disposition;Cable Trough Line - Disposition;Capacitor - Disposition;Coaxial Line - Disposition;Culvert Center Line - Disposition;Culvert End - Disposition;DbSplice - Disposition;Device - Disposition;Device - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Discharge Point - Disposition;Disposal Tank - Disposition;Downspout - Disposition;Downspout - Disposition;Drain Field - Disposition;Drain Separator - Disposition;Drainage Basin - Disposition;Drainage Basin - Disposition;Drainage Divide - Disposition;Drainage Divide Line - Disposition;Drinking Water Sample Point - Disposition;Ductbank - Disposition;Ductbank - Disposition;Ductbank - Disposition;Equipment - Disposition;Farm Site - Disposition;Fiberoptic Line - Disposition;Fill Point - Disposition;Filter Strainer - Disposition;Filtration Bed - Disposition;Fire Connection Point - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Fitting - Disposition;Flow Control Device - Disposition;Flow Control Device - Disposition;Gate - Disposition;Generator - Disposition;Glycol Recovery Pit - Disposition;Grease Trap - Disposition;Grit Chamber - Disposition;Grit Chamber - Disposition;Ground Point - Disposition;Ground Point - Disposition;Groundplane Area - Disposition;Groundwave Area - Disposition;Head Bolt Outlet - Disposition;Headwall - Disposition;Headwall - Disposition;Headwall Line - Disposition;Headwall Line - Disposition;Hydrant - Disposition;Hydrant - Disposition;Impedance Matching Point - Disposition;Inlet - Disposition;Inlet - Disposition;Inlet - Disposition;Inlet - Disposition;Intake - Disposition;Intake Line - Disposition;Internet Center - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Junction - Disposition;Lagoon - Disposition;Lagoon - Disposition;Lift Station - Disposition;Light - Disposition;Light - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line - Disposition;Line Clean Out - Disposition;Line Of Sight Line - Disposition;Load Capacitor - Disposition;Load Coil - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Marker - Disposition;Media Converter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Meter - Disposition;Motor - Disposition;Multihop Area - Disposition;Network Systems Site - Disposition;Neutralizer - Disposition;Neutralizer - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator - Disposition;Oil Water Separator Diversion Vault - disposition;Open Drainage Area - Disposition;Open Drainage Line - Disposition;Other Cable - Disposition;Path Node Site - Disposition;Path Segment Line - Disposition;Pedestal - Disposition;Pedestal Site - Disposition;Pig Launch Point - Disposition;Pipe Line - Disposition;Plant Area - Disposition;Pressure Reducing Station - Disposition;Pullbox Site - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump - Disposition;Pump Booster Station - Disposition;Pump Ejector Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pump Station - Disposition;Pumpstation Ejector - Disposition;Radar Site - Disposition;Radio - Disposition;Radio Receiver - Disposition;Radio Transmitter - Disposition;Rect Point - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Rectifier - Disposition;Reducer - Disposition;Refinery Site - Disposition;Regulator - Disposition;Regulator - Disposition;Regulator Reducer - Disposition;Regulator Reducer - Disposition;Relay Station - Disposition;Repeater - Disposition;Reservoir - Disposition;Reservoir - Disposition;Reservoir - Disposition;Riser - Disposition;Riser - Disposition;Satellite - Disposition;Segmented Cable - Disposition;Segmented Cable Point - Disposition;Sensor - Disposition;Septic Tank - Disposition;Service Area - Disposition;Service Loop Point - Disposition;Sludge Bed - Disposition;Source - Disposition;Source - Disposition;Source Site - Disposition;Speaker - Disposition;Splice - Disposition;Splice - Disposition;Splitter - Disposition;Stilling Basin - Disposition;Storage Area - Disposition;Storm Ceptor - disposition;Storm Filter - disposition;Storm Trench Drain Line - disposition;Substation - Disposition;Switch - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank - Disposition;Tank Area - disposition;Telephone - Disposition;Telephone Booth - Disposition;Terminal - Disposition;Terminator - Disposition;Transformer Vault - Disposition;Transformr Bank - Disposition;Transmission Pipeline - Disposition;Transmission Pipeline Segment Line - Disposition;Treatment Plant - Disposition;Treatment Plant - Disposition;Treatment Plant - Disposition;Treatment Unit - Disposition;Treatment Unit - Disposition;Twisted Pair Line - Disposition;Utility Electric Utility Site - Disposition;Utility Pole Guy - Disposition;Utility Pole Guy Line - Disposition;Utility Pole Tower Site - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve - Disposition;Valve Pit - Disposition;Vault - Disposition;Vault - Disposition;Vault - disposition;Vent - Disposition;Vertical Site - Disposition;Video Site - Disposition;Voice Switch - Disposition;Waveguide Line - Disposition

Value	Definition (Notes) [Source]

CodePumpArea

Used by Attributes: Hydrant – Fire Pump Area

Value	Definition (Notes) [Source]
WHITE_AREA_MER_2	White Area MER 2 Fire Pump
RED_AREA_A_PIER	Red Area A Pier Fire Pump
YELLOW_AREA_B_PIER	Yellow Area B Pier Fire Pump

GREEN_AREA_E_PIER	Green Area E Pier Fire Pump
BLUE_AREA_HRLY_GARAGE	Blue Area Hourly Garage Pump
NA	Not applicable
UNKNOWN	Unknown

CodePumpSta

Used by Attributes: Pump Booster Station - Design;Capacitor - Install Type;Device - Install Type;Flow Control Device - Install Type;Meter - Install Type;Meter - Install Type;Meter - Install Type;Meter - Install Type;Meter - Install Type;Meter - Install Type;Regulator - Install Type;Flow Control Device - Installation Type;Pump Station - Sta Type;Pump Booster Station - Station Type

Value	Definition (Notes) [Source]
BOOSTER	booster station [SDSFIE V2.1 FGDC Utilities Classification]
DOUBLE_POLE	double pole [SDSFIE V2.1 FGDC Utilities Classification]
DOWN_GUY	A wire guy running from the top of a pole to an anchor in the ground. [SDSFIE V2.1 FGDC Utilities Classification]
EJECTOR	ejector system [SDSFIE V1.6]
FAUCET	faucet [SDSFIE V2.1 FGDC Utilities Classification]
HYDRANT	hydrant [SDSFIE V2.1 FGDC Utilities Classification]
METER	meter [SDSFIE V1.4]
OPEN_DRAINAGE	The channel is part of an unaltered drainage system [SDSFIE V2.1 FGDC Utilities Classification]
PARSHALL_FLUME	parshall flume meter [SDSFIE V1.4]
PAVED_DITCH	The channel has a concrete or other paved surface [SDSFIE V2.1 FGDC Utilities Classification]
POLE	pole [SDSFIE V2.1 FGDC Utilities Classification]
PRESS_REDUCE	pressure reducer station [SDSFIE V2.1 FGDC Utilities Classification]
PUMP	pump station [SDSFIE V2.1 FGDC Utilities Classification]
RISER_POLE	riser pole [SDSFIE V2.1 FGDC Utilities Classification]
SPAN_GUY	A wire guy running from the top of a pole to the top of the adjacent pole [SDSFIE V2.1 FGDC Utilities Classification]
SPRINKLER	sprinkler head [SDSFIE V2.1 FGDC Utilities Classification]
TBD	To Be Determined [SDSFIE V2.1]
TOWER	tower [SDSFIE V2.1 FGDC Utilities Classification]
UNKNOWN	Unknown [SDSFIE V2.1]
UNPAVED_DITCH	The channel has no constructed or prepared surface [SDSFIE V2.1 FGDC Utilities Classification]

CodeRadio

Used by Attributes: Radar Site - Rad Type;Relay Station - Rad Type

Value	Definition (Notes) [Source]
HF	High Frequency. [SDSFIE V2.3 Tinker Air Force Base]
LF	Low Frequency. [SDSFIE V2.3 Tinker Air Force Base]
UHF	Ultra High Frequency. [SDSFIE V2.3 Tinker Air Force Base]
VHF	Very High Frequency. [SDSFIE V2.3 Tinker Air Force Base]

CodeRadioType

Used by Attributes: Relay Station - Radio Type

Value	Definition (Notes) [Source]
BASE_STATION	Base Station Type. [SDSFIE V2.3 Tinker Air Force Base]
MOBILE	Mobile Type. [SDSFIE V2.3 Tinker Air Force Base]
PORTABLE	Portable Type. [SDSFIE V2.3 Tinker Air Force Base]
REPEATOR	Repeator Type. [SDSFIE V2.3 Tinker Air Force Base]

CodeReservoirType

Used by Attributes: Reservoir - Res Type;Reservoir - Res Type

Value	Definition (Notes) [Source]
CONSERVATION	The reservoir is used primarily for water conservation and storage. [SDSFIE V1.6]
FLOOD_CONTROL	The reservoir is used primarily for control of excessive rain fall to temporarily store excessive water. [SDSFIE V1.6]
LAGOON	lagoon [SDSFIE V1.4]

LAKE	lake [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
POND	pond [SDSFIE V1.4]
RECREATION	Recreation [SDSFIE V1.9 REEGIS]
TANK	tank [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeRockStrength

Used by Attributes: Marker - Rock Cnd

Value	Definition (Notes) [Source]
HIGH	high dry strength/toughness [SDSFIE V1.4]
LOW	low dry strength/toughness [SDSFIE V1.4]
MEDIUM	medium dry strength/toughness [SDSFIE V1.4]
NONE	very weak, no strength, probably should class as soil [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VERYHIGH	very high dry strength/toughness [SDSFIE V1.4]

CodeSewageTestType

Used by Attributes: Lagoon - Test Type;Lagoon - Test Type;Storage Area - Test Type

Value	Definition (Notes) [Source]
BOD	biological O2 dissolved [SDSFIE V1.4]
COD	chemical O2 dissolved [SDSFIE V1.4]
DO	dissolved O2 [SDSFIE V1.4]
FC	fecal coliform [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SS	suspended solids [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TC	total coliform bacteria [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeSheathInsulateType

Used by Attributes: Cable - Cbl Sht;Fiberoptic Line - Cbl Sht;Other Cable - Cbl Sht;Segmented Cable Point - Cbl Sht;Twisted Pair Line - Cbl Sht;Utility Pole Guy - Cbl Sht;Waveguide Line - Cbl Sht;Coaxial Line - Chl Sht;Anode Test Station - Install Type;Anode Test Station - Install Type;Anode Test Station - Install Type;Anode Test Station - Install Type;Anode Test Station - Install Type;Anode Test Station - installType;Cable - Insul Material

Value	Definition (Notes) [Source]
ALPETH	Aluminum Polyethylene [SDSFIE V2 Austin and Pitts]
ARP	Aluminum Rodent Protected Polyethylene [SDSFIE V2 Austin and Pitts]
ASBEST_SIL	asbestos-silicone bond [SDSFIE V1.4]
ASBESTOS	asbestos [SDSFIE V1.4]
AT	Aerial Tape Armor [SDSFIE V2 Austin and Pitts]
BT	Buried Tape Armor [SDSFIE V2 Austin and Pitts]
CAMBRIC_PB_COV	varnished cambric, Pb covered [SDSFIE V1.4]
CELLULOSE	cellulose-acetate fiber [SDSFIE V1.4]
COTTON_YARN	cotton yarn [SDSFIE V1.4]
CP	Corrosion Protection [SDSFIE V2 Austin and Pitts]
CPNM	Cross Ply Non Metallic [SDSFIE V2 Austin and Pitts]
DA	Double Wire Armor [SDSFIE V2 Austin and Pitts]
DJ	Jacketed Double Wire Armor [SDSFIE V2 Austin and Pitts]
DOUBLE_TAPE	double tape armored [SDSFIE V1.4]
F_FILLED	Foam Filled. [SDSFIE V2.5 AIR FORCE]
FIBER_PAPER	polyimide fiber paper [SDSFIE V1.4]
GLASS_FIBER	glass fiber-organic bond [SDSFIE V1.4]
GLASS_ORGANIC	glass/polyesterfib-organic bond [SDSFIE V1.4]

GLASS_SILICONE	glass/polyesterfib-silicone bond [SDSFIE V1.4]
GT	Gopher Tape Armor [SDSFIE V2 Austin and Pitts]
JP	Jute Protection [SDSFIE V2 Austin and Pitts]
JUTE	jute protected [SDSFIE V1.4]
KP	Kevlar Polyethylene [SDSFIE V2 Austin and Pitts]
KPSP	Kevlar Polyethylene Corrugated Steel [SDSFIE V2 Austin and Pitts]
LA	Light Armor [SDSFIE V2 Austin and Pitts]
LJ	Jacketed Light Wire Armor [SDSFIE V2 Austin and Pitts]
MG	Modified Gopher Tape Armor [SDSFIE V2 Austin and Pitts]
MP	Mechanical Protection [SDSFIE V2 Austin and Pitts]
NEOPRENE	neoprene [SDSFIE V1.4]
NONE	No outer sheath protection [SDSFIE V2 Austin and Pitts]
OPEN_WIRE	open wire [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PAP	Polyethylene Fused Aluminum [SDSFIE V2 Austin and Pitts]
PAPER	paper [SDSFIE V1.4]
PAPER_PB_COV	paper insulated Pb covered [SDSFIE V1.4]
PB_ARMOR	Pb armored [SDSFIE V1.4]
PB_COVER	Pb covered [SDSFIE V1.4]
PLASTIC_CLAD	plastic clad [SDSFIE V1.4]
PLASTIC_FOAM	Plastic, Foam Filled. [SDSFIE V2.5 AIR FORCE]
PLASTIC_GEL	plastic, gel-filled [SDSFIE V1.4]
POLY_CROSS	polyethylene (XLPE), cross-linked [SDSFIE V1.4]
POLY_FOAM	polyethylene (PE), foamed [SDSFIE V1.4]
PPP	polypropylene (PPP) [SDSFIE V1.4]
PVC	polyvinyl chloride [SDSFIE V1.4]
QUAD_TAPE	quad tape, armored [SDSFIE V1.4]
RPS	Rodent Protection Shield Polyethylene [SDSFIE V2 Austin and Pitts]
RUBBER_BUT	rubber-butyl [SDSFIE V1.4]
RUBBER_EPT	rubber-EPT [SDSFIE V1.4]
RUBBER_NBR	rubber-NBR [SDSFIE V1.4]
SA	Single Wire Armor [SDSFIE V2 Austin and Pitts]
SHIELDED	shielded [SDSFIE V1.4]
SJ	Jacketed Single Wire Armor [SDSFIE V2 Austin and Pitts]
SUBDA	Submarine Double Wire Armor [SDSFIE V2 Austin and Pitts]
SUBDJ	Submarine Jacketed Double Wire Armor [SDSFIE V2 Austin and Pitts]
TAPE_ARMOR	tape armored [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TFE	polytetrafluroethylene (TFE) [SDSFIE V1.4]
UM	Unsoldered Mechanical Protection [SDSFIE V2 Austin and Pitts]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
WEATHERPROOF	weatherproofed [SDSFIE V1.4]
WIRE_ARMOR	single wire, armored [SDSFIE V1.4]

CodeShoreBufferType

Used by Attributes: Segmented Cable Point - Buffer Type

Value	Definition (Notes) [Source]
CRITICAL_AREA	The area that is 1000 feet landward of the mean high tide coastline and any tidal waterways. [SDSFIE V1.75]
NO_BUILD_ZONE	The area that is 100 feet landward of the mean high tide coastline and any tidal waterways. [SDSFIE V1.75]

CodeSoilConsistency

Used by Attributes: Lagoon - Soil Cdn;Lagoon - Soil Cdn;Marker - Soil Cnd

Value	Definition (Notes) [Source]
FIRM	firm [SDSFIE V1.4]
HARD	hard [SDSFIE V1.4]
MEDIUMFIRM	medium firm [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SOFT	soft [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]

UNKNOWN	unknown [SDSFIE V1.4]
VERYHARD	very hard [SDSFIE V1.4]
VERYSOFT	very soft [SDSFIE V1.4]

CodeSoilsErosionK

Used by Attributes: Lagoon - Soil Ero;Lagoon - Soil Ero

Value	Definition (Notes) [Source]
0.02	0.02 [SDSFIE V1.7 FGDC Soils Classification]
0.05	0.05 [SDSFIE V1.7 FGDC Soils Classification]
0.10	0.10 [SDSFIE V1.7 FGDC Soils Classification]
0.17	0.17 [SDSFIE V1.7 FGDC Soils Classification]
0.20	0.20 [SDSFIE V1.7 FGDC Soils Classification]
0.24	0.24 [SDSFIE V1.7 FGDC Soils Classification]
0.28	0.28 [SDSFIE V1.7 FGDC Soils Classification]
0.32	0.32 [SDSFIE V1.7 FGDC Soils Classification]
0.37	0.37 [SDSFIE V1.7 FGDC Soils Classification]
0.43	0.43 [SDSFIE V1.7 FGDC Soils Classification]
0.49	0.49 [SDSFIE V1.7 FGDC Soils Classification]
0.55	0.55 [SDSFIE V1.7 FGDC Soils Classification]
0.64_OR_MORE	0.64 or more [SDSFIE V1.7 FGDC Soils Classification]
0_02	0.02 [SDSFIE V1.4 FGDC Soils Classification]
0_05	0.05 [SDSFIE V1.4 FGDC Soils Classification]
0_10	0.10 [SDSFIE V1.4 FGDC Soils Classification]
0_15	0.15 [SDSFIE V1.8 FGDC Soils Classification]
0_17	0.17 [SDSFIE V1.4 FGDC Soils Classification]
0_20	0.20 [SDSFIE V1.4 FGDC Soils Classification]
0_24	0.24 [SDSFIE V1.4 FGDC Soils Classification]
0_28	0.28 [SDSFIE V1.4 FGDC Soils Classification]
0_32	0.32 [SDSFIE V1.4 FGDC Soils Classification]
0_37	0.37 [SDSFIE V1.4 FGDC Soils Classification]
0_43	0.43 [SDSFIE V1.4 FGDC Soils Classification]
0_49	0.49 [SDSFIE V1.4 FGDC Soils Classification]
0_55	0.55 [SDSFIE V1.4 FGDC Soils Classification]
0_64_OR_MORE	0.64 or more [SDSFIE V1.4 FGDC Soils Classification]
TBD	to be determined [SDSFIE V1.4 FGDC Soils Classification]
UNKNOWN	unknown [SDSFIE V1.4 FGDC Soils Classification]

CodeSoilsFamily

Used by Attributes: Lagoon - Soil Fam;Lagoon - Soil Fam

Value	Definition (Notes) [Source]
ALTAVISTA	fine-loamy, mixed, thermic Aquic Hapludults [SDSFIE V1.4]
AUTRYVILLE	loamy, siliceous, thermic Arenic Paleudults [SDSFIE V1.4]
AYCOCK	fine-silty, siliceous, thermic Typic Paleudults [SDSFIE V1.4]
BLANEY	loamy, siliceous, thermic Arenic Hapludults [SDSFIE V1.4]
BRAGG	fine-loamy, siliceous, acid, thermic Typic Udorthents [SDSFIE V1.4]
BUTTERS	coarse-loamy, siliceous, thermic Typic Paleudults [SDSFIE V1.4]
BYARS	clayey, kaolinitic, thermic Umbric Paleaquults [SDSFIE V1.4]
CANDOR	sandy, siliceous, thermic Arenic Paleudults [SDSFIE V1.4]
CAPEFEAR	clayey, mixed, thermic Typic Umbraquults [SDSFIE V1.4]
CHEWACLA	fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts [SDSFIE V1.4]
COXVILLE	clayey, kaolinitic, thermic Typic Paleaquults [SDSFIE V1.4]
CRAVEN	clayey, mixed, thermic Aquic Hapludults [SDSFIE V1.4]
CROATAN	loamy, siliceous, dysic, thermic Terric Medisaprists [SDSFIE V1.4]
DELOSS	fine-loamy, mixed, thermic Typic Umbraquults [SDSFIE V1.4]
DOGUE	clayey, mixed, thermic Aquic Hapludults [SDSFIE V1.4]
DOTHAN	fine-loamy, siliceous, thermic Plinthic Paleudults [SDSFIE V1.4]
DUNBAR	clayey, kaolinitic, thermic Aeric Paleaquults [SDSFIE V1.4]
DUPLIN	clayey, kaolinitic, thermic Aquic Paleudults [SDSFIE V1.4]
DYSTROCHREPT	loamy, thermic Dystrochrepts [SDSFIE V1.4]

EXUM	fine-silty, siliceous, thermic Aquic Paleudults [SDSFIE V1.4]
FACEVILLE	clayey, kaolinitic, thermic Typic Paleudults [SDSFIE V1.4]
FUQUAY	loamy, siliceous, thermic Arenic Plinthic Paleudults [SDSFIE V1.4]
GILEAD	clayey, kaolinitic, thermic Aquic Hapludults [SDSFIE V1.4]
GOLDSBORO	fine-loamy, siliceous, thermic Aquic Paleudults [SDSFIE V1.4]
GRANTHAM	fine-silty, siliceous, thermic Typic Paleaquults [SDSFIE V1.4]
JOHNSTON	coarse-loamy, siliceous, acid, thermic Cumulic Humaquepts [SDSFIE V1.4]
KALMIA	fine-loamy over sandy or sandy skeletal, siliceous, thermic Typic Hapludults [SDSFIE V1.4]
KENANSVILLE	loamy, siliceous, thermic Arenic Hapludults [SDSFIE V1.4]
KUREB	thermic, uncoated Spodic Quartzipsamments [SDSFIE V1.4]
LAKELAND	thermic, coated Typic Quartzipsamments [SDSFIE V1.4]
LENOIR	clayey, mixed, thermic Aeric Paleaquults [SDSFIE V1.4]
LEON	sandy, siliceous, thermic Aeric Haplaquods [SDSFIE V1.4]
LYNCHBURG	fine-loamy, siliceous, thermic Aeric Paleaquults [SDSFIE V1.4]
LYNNHAVEN	sandy, siliceous, thermic Typic Haplaquods [SDSFIE V1.4]
MCCOLL	clayey, kaolinitic, thermic Typic Fragiaquults [SDSFIE V1.4]
NAHUNTA	fine-silty, siliceous, thermic Aeric Paleaquults [SDSFIE V1.4]
NORFOLK	fine-loamy, siliceous, thermic Typic Paleudults [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PACTOLUS	thermic, coated Aquic Quartzipsamments [SDSFIE V1.4]
PANTEGO	fine-loamy, siliceous, thermic Umbric Paleaquults [SDSFIE V1.4]
RAINS	fine-loamy, siliceous, thermic Typic Paleaquults [SDSFIE V1.4]
ROANOKE	clayey, mixed, thermic Typic Ochraquults [SDSFIE V1.4]
STALLINGS	coarse-loamy, siliceous, thermic Aeric Paleaquults [SDSFIE V1.4]
TARBORO	mixed, thermic Typic Udipsamments [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TORHUNTA	coarse-loamy, siliceous, acid, thermic Typic Humaquepts [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VAUCLUSE	fine-loamy, siliceous, thermic Typic Hapludults [SDSFIE V1.4]
WAGRAM	loamy, siliceous, thermic Arenic Paleudults [SDSFIE V1.4]
WAHEE	clayey, mixed, thermic Aeric Ochraquults [SDSFIE V1.4]
WICKHAM	fine-loamy, mixed, thermic Typic Hapludults [SDSFIE V1.4]
WOODINGTON	coarse-loamy, siliceous, thermic Typic Paleaqults [SDSFIE V1.4]

CodeSoilsTexture

Used by Attributes: Lagoon - Soil Tex;Lagoon - Soil Tex

Value	Definition (Notes) [Source]
ASHY	Ashy [SDSFIE V1.8 FGDC Soils Classification]
BOLDGRAVEL	boulder gravel [SDSFIE V1.4]
BY	Bouldery [SDSFIE V1.8 FGDC Soils Classification]
BYV	Very bouldery [SDSFIE V1.8 FGDC Soils Classification]
BYX	Extremely bouldery [SDSFIE V1.8 FGDC Soils Classification]
C/SS	Clay/Sand with Stone. [SDSFIE V2.4 Army]
CB	Cobbly [SDSFIE V1.8 FGDC Soils Classification]
CBV	Very cobbly [SDSFIE V1.8 FGDC Soils Classification]
CBX	Extremely cobbly [SDSFIE V1.8 FGDC Soils Classification]
CLAY	clay [SDSFIE V1.4 FGDC Soils Classification]
CLAYLOAM	clay loam [SDSFIE V1.4 FGDC Soils Classification]
CN	Channery [SDSFIE V1.8 FGDC Soils Classification]
CNV	Very channery [SDSFIE V1.8 FGDC Soils Classification]
CNX	Extremely channery [SDSFIE V1.8 FGDC Soils Classification]
COARSANDYLOM	course sandy loam [SDSFIE V1.4 FGDC Soils Classification]
COARSESAND	coarse sand [SDSFIE V1.4 FGDC Soils Classification]
COARSESILT	coarse silt [SDSFIE V1.4]
COP	Coprogenous [SDSFIE V1.8 FGDC Soils Classification]
CORSCOBLGRAV	coarse cobble gravel [SDSFIE V1.4]
CORSPBLGRAVL	coarse pebble gravel [SDSFIE V1.4]
CS/CS	Clay-Sand/Clay-Silt. [SDSFIE V2.4 Army]
DIA	Diatomaceous [SDSFIE V1.8 FGDC Soils Classification]
FINCOBLGRAV	fine cobble gravel [SDSFIE V1.4]
FINEPBLGRAVL	fine pebble gravel [SDSFIE V1.4]
FINESAND	fine sand [SDSFIE V1.4 FGDC Soils Classification]

FINESANDYLOM	fine sandy loam [SDSFIE V1.4 FGDC Soils Classification]
FINESILT	fine silt [SDSFIE V1.4]
FL	Flaggy [SDSFIE V1.8 FGDC Soils Classification]
FLV	Very flaggy [SDSFIE V1.8 FGDC Soils Classification]
FLX	Extremely flaggy [SDSFIE V1.8 FGDC Soils Classification]
G/GS	Gravel/Gravel-Sand. [SDSFIE V2.4 Army]
GR	Gravelly [SDSFIE V1.8 FGDC Soils Classification]
GRAVEL	gravel [SDSFIE V1.4]
GRC	Coarse gravelly [SDSFIE V1.8 FGDC Soils Classification]
GRF	Fine gravelly [SDSFIE V1.8 FGDC Soils Classification]
GRM	Medium gravelly [SDSFIE V1.8 FGDC Soils Classification]
GRV	Very gravelly [SDSFIE V1.8 FGDC Soils Classification]
GRX	Extremely gravelly [SDSFIE V1.8 FGDC Soils Classification]
GS	Grassy [SDSFIE V1.8 FGDC Soils Classification]
GYP	Gypsiferous [SDSFIE V1.8 FGDC Soils Classification]
HB	Herbaceous [SDSFIE V1.8 FGDC Soils Classification]
HYDR	Hydrous [SDSFIE V1.8 FGDC Soils Classification]
LOAM	loam [SDSFIE V1.4 FGDC Soils Classification]
LOAMCOARSAND	loamy course sand [SDSFIE V1.4 FGDC Soils Classification]
LOAMFINESAND	loamy fine sand [SDSFIE V1.4 FGDC Soils Classification]
LS	loamy sand [SDSFIE V1.8 FGDC Soils Classification]
LVFS	loamy very fine sand [SDSFIE V1.8 FGDC Soils Classification]
MEDCOBLGRAVL	medium cobble gravel [SDSFIE V1.4]
MEDIUMSAND	medium sand [SDSFIE V1.4]
MEDIUMSILT	medium silt [SDSFIE V1.4]
MEDL	Medial [SDSFIE V1.8 FGDC Soils Classification]
MEDPEBLGRAVL	medium pebble gravel [SDSFIE V1.4]
MK	Mucky [SDSFIE V1.8 FGDC Soils Classification]
MR	Marly [SDSFIE V1.8 FGDC Soils Classification]
MS	Mossy [SDSFIE V1.8 FGDC Soils Classification]
OTHER	other [SDSFIE V1.4]
PBY	Paraboulder [SDSFIE V1.8 FGDC Soils Classification]
PBYV	Very paraboulder [SDSFIE V1.8 FGDC Soils Classification]
PBYX	Extremely paraboulder [SDSFIE V1.8 FGDC Soils Classification]
PCB	Paracobbly [SDSFIE V1.8 FGDC Soils Classification]
PCBV	Very paracobbly [SDSFIE V1.8 FGDC Soils Classification]
PCBX	Extremely paracobbly [SDSFIE V1.8 FGDC Soils Classification]
PCN	Parachannery [SDSFIE V1.8 FGDC Soils Classification]
PCNV	Very parachannery [SDSFIE V1.8 FGDC Soils Classification]
PCNX	Extremely parachannery [SDSFIE V1.8 FGDC Soils Classification]
PERMAFROST	permafrost [SDSFIE V1.4]
PF	Permanently frozen [SDSFIE V1.8 FGDC Soils Classification]
PFL	Paraflaggy [SDSFIE V1.8 FGDC Soils Classification]
PFLV	Very paraflaggy [SDSFIE V1.8 FGDC Soils Classification]
PFLX	Extremely paraflaggy [SDSFIE V1.8 FGDC Soils Classification]
PGR	Paragravelly [SDSFIE V1.8 FGDC Soils Classification]
PGRV	Very paragravelly [SDSFIE V1.8 FGDC Soils Classification]
PGRX	Extremely paragravelly [SDSFIE V1.8 FGDC Soils Classification]
PST	Parastony [SDSFIE V1.8 FGDC Soils Classification]
PSTV	Very parastony [SDSFIE V1.8 FGDC Soils Classification]
PSTX	Extremely parastony [SDSFIE V1.8 FGDC Soils Classification]
PT	Peaty [SDSFIE V1.8 FGDC Soils Classification]
ROCK	Rock. [SDSFIE V2.4 Army]
S	sand [SDSFIE V1.8 FGDC Soils Classification]
S/GS	Sand/Gravel Sand. [SDSFIE V2.4 Army]
S/SC	Silt/Silty-Clay. [SDSFIE V2.4 Army]
SANDYCLAY	sandy clay [SDSFIE V1.4 FGDC Soils Classification]
SANDYCLAYLOM	sandy clay loam [SDSFIE V1.4 FGDC Soils Classification]
SANDYLOAM	sandy loam [SDSFIE V1.4 FGDC Soils Classification]
SI	silt [SDSFIE V1.8 FGDC Soils Classification]
SILTYCLAY	silty clay [SDSFIE V1.4 FGDC Soils Classification]
SILTYLOAM	silty loam [SDSFIE V1.4 FGDC Soils Classification]
SLITYCLAYLOM	silty clay loam [SDSFIE V1.4 FGDC Soils Classification]
SR	Stratified [SDSFIE V1.8 FGDC Soils Classification]
SS/SC	Sand-Silt/Sand-Clay. [SDSFIE V2.4 Army]
ST	Stony [SDSFIE V1.8 FGDC Soils Classification]

STONES	stones [SDSFIE V1.4]
STV	Very stony [SDSFIE V1.8 FGDC Soils Classification]
STX	Extremely stony [SDSFIE V1.8 FGDC Soils Classification]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
VERYCOARSAND	very coarse sand [SDSFIE V1.4]
VERYFINESAND	very fine sand [SDSFIE V1.4 FGDC Soils Classification]
VERYFINESILT	very fine silt [SDSFIE V1.4]
VRYCRSPBGRVL	very coarse pebble gravel [SDSFIE V1.4]
VRYFINPBLGRV	very fine pebble gravel [SDSFIE V1.4]
VRYFINSANLOM	very fine sandy loam [SDSFIE V1.4 FGDC Soils Classification]
WD	Woody [SDSFIE V1.8 FGDC Soils Classification]

CodeSourceListFuelGas

Used by Attributes: Pump Booster Station - Fuel Source;Fill Point - Source;Line - Source;Meter - Source;Pump Station - Source

Value	Definition (Notes) [Source]
ARROYO	arroyo/draw/wash [SDSFIE V1.4]
ARTISAN_WELL	artisan well [SDSFIE V1.4]
BAYOU	bayou [SDSFIE V1.4]
CREEK	creek [SDSFIE V1.4]
DEEPWELL	deep well [SDSFIE V1.4]
DRY_PLAYA	dry playa [SDSFIE V1.4]
FUMAROLE	fumarole [SDSFIE V1.8 USGS]
GEOTHERMAL	geothermal well [SDSFIE V1.8 USGS]
GEYSER	geyser [SDSFIE V1.4]
GLACIER	glacier [SDSFIE V1.4]
GULF	gulf [SDSFIE V1.4]
HAIL	hail [SDSFIE V1.4]
ICEBERG	iceberg [SDSFIE V1.4]
LAKE	lake [SDSFIE V1.4]
MUD_POT	mud pot [SDSFIE V1.8 USGS]
OCEAN	ocean [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
POND	pond [SDSFIE V1.4]
RAINFALL	rainfall [SDSFIE V1.4]
RESERVOIR	reservoir [SDSFIE V1.4]
RIME	hoarfrost, dew, condensed fog [SDSFIE V1.4]
RIVER	river [SDSFIE V1.4]
RUNOFF	runoff [SDSFIE V1.4]
SLEET	sleet [SDSFIE V1.4]
SLOUGH	slough [SDSFIE V1.4]
SNOWFALL	snowfall [SDSFIE V1.4]
SPRING	spring [SDSFIE V1.4]
STREAM	stream [SDSFIE V1.4]
SWAMP	swamp [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
WET_PLAYA	wet playa [SDSFIE V1.4]

CodeSpeakerImpedance

Used by Attributes: Speaker - Spkimp

Value	Definition (Notes) [Source]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
VARIABLE	Variable (selectable). [SDSFIE V2.5 AIR FORCE]

CodeSplice

Used by Attributes: Splice - Spl Type

Value	Definition (Notes) [Source]
DROP_INSERT	DROP INSERT SPLICE [SDSFIE V2 Air Force]
HALFTAP_FOLDBACK	Halftap fold back splice. [SDSFIE V2 AIR FORCE]
HALFTAP_INLINE	halftap inline splice [SDSFIE V2]
JUNCTION_FOLDBAC	Junction fold back splice. [SDSFIE V2.5 AIR FORCE]
JUNCTION_INLINE	junction inline splice [SDSFIE V2]
LOAD_FOLDBACK	Load fold back splice. [SDSFIE V2.5 AIR FORCE]
LOAD_INLINE	load inline splice [SDSFIE V2]
MULTIPLE_INLINE	Multiple inline splice. [SDSFIE V2.5 AIR FORCE]
MULTIPLEFOLDBACK	Multiple fold back splice. [SDSFIE V2.5 AIR FORCE]
STRAIGHT_INLINE	straight inline splice [SDSFIE V2]
STRAIGHTFOLDBACK	Straight inline splice. [SDSFIE V2.5 AIR FORCE]

CodeSpliceCaseEncapsulate

Used by Attributes: DbSplice - Ecs Type;Splice - Ecs Type

Value	Definition (Notes) [Source]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
RE	Reenterable compound. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeSpliceCaseMat

Used by Attributes: DbSplice - Cas Material;Splice - Cas Material

Value	Definition (Notes) [Source]
AL	Aluminum [SDSFIE V2 Austin and Pitts]
EVA	Ethylene Vinyl Acetate (Heat Shrinkable Tubing). [SDSFIE V2.5 AIR FORCE]
FIBER	Fiberglass [SDSFIE V2 Austin and Pitts]
IRON	Cast Iron [SDSFIE V2 Austin and Pitts]
LEAD	Lead [SDSFIE V2 Austin and Pitts]
OTHER	Other [SDSFIE V2]
PE	Polyethylene. [SDSFIE V2.5 AIR FORCE]
PP	Polypropylene. [SDSFIE V2.5 AIR FORCE]
PVC	Polyvinyl Chloride [SDSFIE V2 Austin and Pitts]
SS	Stainless Steel [SDSFIE V2 Austin and Pitts]
TBD	To Be Determined [SDSFIE V2 Austin and Pitts]
UNKNOWN	Unknown [SDSFIE V2]

CodeSpliceCaseTyp

Used by Attributes: DbSplice - Cas Type;Splice - Cas Type

Value	Definition (Notes) [Source]
12_5SS	12.5 Inch Stainless Steel. [SDSFIE V2.5 AIR FORCE]
2_TYPE	3 Type. [SDSFIE V2.5 AIR FORCE]
3BB	4 Inch Better Buried. [SDSFIE V2.5 AIR FORCE]
3RS	4 Inch ReddiSeal. [SDSFIE V2.5 AIR FORCE]
3SS	4 Inch Stainless Steel. [SDSFIE V2.5 AIR FORCE]
4BB	5 Inch Better Buried. [SDSFIE V2.5 AIR FORCE]
4RS	5 Inch ReddiSeal. [SDSFIE V2.5 AIR FORCE]
4SS	5 Inch Stainless Steel. [SDSFIE V2.5 AIR FORCE]
6_5BB	6.5 Inch Better Buried. [SDSFIE V2.5 AIR FORCE]
6_5RE	6.5 Inch ReddiSeal. [SDSFIE V2.5 AIR FORCE]
6_5SS	6.5 Inch Stainless Steel. [SDSFIE V2.5 AIR FORCE]

9_5BB	9.5 Inch Better Buried. [SDSFIE V2.5 AIR FORCE]
9_5RS	9.5 Inch ReddiSeal. [SDSFIE V2.5 AIR FORCE]
9_5SS	9.5 Inch Stainless Steel. [SDSFIE V2.5 AIR FORCE]
FOSC_100_B_H	Raychem FOSC-100 B/H [SDSFIE V2 Austin and Pitts]
HS	Heat Shrinkable. [SDSFIE V2.5 AIR FORCE]
KBV	K and B Vault. [SDSFIE V2.5 AIR FORCE]
LEAD	Lead Tube. [SDSFIE V2.5 AIR FORCE]
OTHER	Other [SDSFIE V2]
READY_ACCESS	Ready Access Aerial Terminal. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined [SDSFIE V2]
UC_6_9	Siemens UC 6-9 [SDSFIE V2 Austin and Pitts]
UCN_7_10	Siemens UCN 7-10 [SDSFIE V2 Austin and Pitts]
UNKNOWN	Unknown [SDSFIE V2]

CodeSpliceMethod

Used by Attributes: Splice - Method

Value	Definition (Notes) [Source]
AMP	Amp [SDSFIE V2 Austin and Pitts]
B	B-connectors [SDSFIE V2 Austin and Pitts]
ELAST	Elastomeric Fiber Splice [SDSFIE V2 Austin and Pitts]
FACTORY	Factory Splice [SDSFIE V2 Austin and Pitts]
FUSION	Fusion Fiber Splice [SDSFIE V2 Austin and Pitts]
M	Modular [SDSFIE V2 Austin and Pitts]
MECH	Other Mechanical [SDSFIE V2 Austin and Pitts]
OTHER	Other [SDSFIE V2 Austin and Pitts]
ROTARY	Rotary Fiber Splice [SDSFIE V2 Austin and Pitts]
SL	Scotch Locks (Copper) [SDSFIE V2 Austin and Pitts]
TBD	To Be Determined [SDSFIE V2]
TS	Twist and Solder or Sleeve [SDSFIE V2 Austin and Pitts]
UNKNOWN	Unknown [SDSFIE V2]

CodeSplitterType

Used by Attributes: Splitter - Splt Type

Value	Definition (Notes) [Source]
2_WAY	2 Way Splitter [SDSFIE V2 Tinker Air Force Base]
3_WAY	3 Way Splitter [SDSFIE V2 Tinker Air Force Base]
4_WAY	4 Way Splitter [SDSFIE V2 Tinker Air Force Base]
5_WAY	5 Way Splitter [SDSFIE V2 Tinker Air Force Base]
6_WAY	6 Way Splitter [SDSFIE V2 Tinker Air Force Base]

CodeStatus

Used by Attributes: Junction - Status;Telephone - Status

Value	Definition (Notes) [Source]
ABANDONED	Abandoned
ACTIVE	Active surface
AIRSPACED	A favorable airspace determination has been issued
AS_BUILT	As-Built
BROKEN	Broken or rough surface
CLOSED	Closed surface
CONDEMNED	Condemned
DEMOLISHED	Demolished
ENV_CLEARED	All required environmental actions and documentation described in FAAO 5050.4 National Environmental Policy Act (NEPA) have been satisfied
FAILED_AID	Failure or irregular operation of visual aides
INACTIVE	Inactive
LIMITED	Limited operations]

LONG_TERM	Indicates the feature is part of a long term (11 + years) plan
MEDIUM_TERM	Indicates the feature is part of a midterm (6 - 10 year) plan
NON_OPERATIONAL	Non-operational
OCCUPIED	Occupied
OPERATIONAL	Operational (fully)
OTHER	Other
PARKED	Parked or disabled aircraft
PERMANENT	Permanent
PORTABLE	Portable
RELEASED	Used to track land released by the airport
S_POWER	Secondary power supply in operation
SEMI_PERMANENT	Semi_Permanent
SHORT_TERM	Indicates the feature is part of a short term (0 - 5 year) plan
TBD	To be determined
TEMPORARY	Temporary
TERMINATED	Terminated no longer used
UNDER_CONSTRUCTION	Planned or under construction
UNKNOWN	Unknown
UNOCCUPIED	Unoccupied
WORK_IN_PROGRESS	Construction or work in progress
PROPOSED	Planned to be installed
REMOVED	Removed from location, though pipes may still be present
BURIED	Partially or completely covered by soil
INCOMPLETE	Partially disassembled

CodeStatusElectricSwitch

Used by Attributes: Switch - Swt Sta

Value	Definition (Notes) [Source]
CLOSED	closed [SDSFIE V1.4]
CLOSEDCLOSED	closed - normally closed [SDSFIE V1.4]
CLOSEDOPEN	closed - normally open [SDSFIE V1.4]
OPEN	open [SDSFIE V1.4]
OPENCLOSED	open - normally closed [SDSFIE V1.4]
OPENOPEN	open - normally open [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeStyleDrainField

Used by Attributes: Septic Tank - Drnfl St;Grease Trap - Field Drain Style

Value	Definition (Notes) [Source]
FAN	fan drain field [SDSFIE V1.4]
NETWORK	network drain field [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
SEEP_PIT	seepage pit [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TILE	tile field [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeStyleGates

Used by Attributes: Gate - Gate St

Value	Definition (Notes) [Source]
FLAP	flap gate [SDSFIE V1.4]
LIFT	lift gate [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]

UNKNOWN	unknown [SDSFIE V1.4]

CodeStyleOpenChannel

Used by Attributes: Open Drainage Line - Chan St

Value	Definition (Notes) [Source]
CANALCMPLSEC	canal complex section [SDSFIE V1.4]
CANALTRPZSEC	canal trapezoidal section [SDSFIE V1.4]
LAKE	lake [SDSFIE V1.4]
OPENDRAINAGE	open drainage [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
PAVEDDITCH	paved ditch [SDSFIE V1.4]
PAVEDINVRTDR	paved invert drain [SDSFIE V1.4]
POND	pond [SDSFIE V1.4]
RIVER	river [SDSFIE V1.4]
STORMWATER	storm water retention reservoir [SDSFIE V1.4]
SWALE	swale [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
UNPAVEDITCH	unpaved ditch [SDSFIE V1.4]

CodeStyleTank

Used by Attributes: Septic Tank - Tank St;Tank - Tank St;Tank - Tank St;Tank - Tank St;Tank - Tank St;Tank - Tank Style;Transmission Pipeline - Tank Style;Disposal Tank - tankSt;Tank Area - tankSt;Grease Trap - Trap Style

Value	Definition (Notes) [Source]
ABOVEGROUND	A receptacle or chamber of which 90 percent or more is located above the surface of the ground. [SDSFIE V1.4]
ABVGRND_UNDRGRND	Aboveground and underground. [SDSFIE V2.31 Air Force]
ALODINE_TANK	alodine tank [SDSFIE V2.3 Edwards Air Force Base]
BARRELS	Barrels, drums or cans. [SDSFIE V2.31 Air Force]
DRAINSUMP	drain sump tank [SDSFIE V1.4]
ELEVATED	elevated [SDSFIE V1.4]
HOT_WATER_TANK	hot water rinse tank [SDSFIE V2.3 Edwards Air Force Base]
HYDROPNEU	hydropneumatic [SDSFIE V1.4]
IND_WASTE_TANK	industrial waste tank [SDSFIE V2.3 Edwards Air Force Base]
OTHER	other [SDSFIE V1.4]
RAILROAD_TANKCAR	Railroad Tank Car. [SDSFIE V2.31 Air Force]
SCP	self contained propane gas tank [SDSFIE V1.4]
SEMIBRD_UNDRGRND	Semi-buried and Underground. [SDSFIE V2.31 Air Force]
SEMIBURIED	Semi-buried. [SDSFIE V2.31 Air Force]
STANDPIPE	standpipe [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TRUCK	Truck. [SDSFIE V2.31 Air Force]
UNCONFNDRESV	unconfined reservoir [SDSFIE V1.4]
UNDERGROUND	A receptacle or chamber of which 10 percent or more is located beneath the surface of the ground. [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
TEMP	temp

CodeStyleValve

Used by Attributes: Air Pressure Device - Dev St;Fill Point - Valve St;Hydrant - Valve St;Valve - Valve St;Valve - Valve St;Valve - Valve St;Valve - Valve St;Valve - Valve St;Valve - Valve St;Fire Connection Point - Valve Style;Hydrant - Valve Style;Valve - Valve Style;Valve - valveSt

Value	Definition (Notes) [Source]
ANGLE	angle [SDSFIE V1.4]
BALL	ball [SDSFIE V1.4]
BUTTERFLY	butterfly [SDSFIE V1.4]
CHECK	check [SDSFIE V1.4]
DRYPIPE	dry pipe [SDSFIE V1.4]
GATE	gate [SDSFIE V1.4]

GLOBE	globe [SDSFIE V1.4]
NEEDLE	needle [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
OTHERPOSTIND	other post indicator [SDSFIE V1.4]
PLUG	plug [SDSFIE V1.4]
PRESSREDUCNG	pressure reducing [SDSFIE V1.4]
PRESSRELIEF	pressure relief [SDSFIE V1.4]
QUAD	quad [SDSFIE V1.4]
REGULATING	regulating [SDSFIE V1.4]
STOP_WASTE	stop and waste [SDSFIE V1.4]
SWINGCHECK	swing check [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
TRIPLEDUTY	triple duty [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeSubstationType

Used by Attributes: Substation - Sst Type

Value	Definition (Notes) [Source]
DISTRIBUTION	Substations located in the middle of a load area. [SDSFIE V1.6]
OTHER	other [SDSFIE V1.4]
SUBTRANSMISSION	Electric substations with equipment used to switch circuits operating at voltages in the range of 34.5 to 161kV. [SDSFIE V1.6]
TBD	to be determined [SDSFIE V1.4]
TRANSMISSION	A substation which uses alternating current which contains equipment used to sectionalize the system when a fault or circuit develops. [SDSFIE V1.6]
UNKNOWN	unknown [SDSFIE V1.4]

CodeSueQualityLevel

Used by Attributes:

Value	Definition (Notes) [Source]
A	Potholing
B	Subsurface Detection
C	Field Survey of Apurtenances
D	Records
UNKNOWN	Unknown

CodeSurfaceComposition

Used by Attributes: Cable Trough Line - Material

Value	Definition (Notes) [Source]
AGS	Asphalt and turf
ASPH	Asphalt
BE	Bare earth
BITUM	Bitumen
BRICK	Brick
CA	Concrete and asphalt
CG	Concrete grooved
CGS	Concrete and turf
CLAY	Clay
CONC	Concrete
CORAL	Coral
DS	Desert/Sand
GRADE	Graded surface
GRAVEL	Gravel
GS	Turf
ICE	ice
LATERITE	Laterite
MACADAM	Macadam

MATS	MATS
MEMBRANE	MEMBRANE
METAL	METAL
OTHER	Other type of surface composition
PSP	PSP
SAND	SAND
SI	Snow/Ice
SNOW	Snow
STONE	Stone
WATER	Water
WOOD	Wood

CodeTankUse

Used by Attributes: Disposal Tank - Tank Use;Tank - Tank Use;Tank - Tank Use;Tank - Tank Use;Tank - Tank Use;Tank - Tank Use;Tank Area - tankUse

Value	Definition (Notes) [Source]
CHEMICAL	chemical [SDSFIE V1.4]
DISPOSAL	disposal tank [SDSFIE V1.4]
EWS	Reserve water source used by emergency firefighting services. [SDSFIE V2.21 Lakenheath AFB]
FUEL	fuel [SDSFIE V1.4]
NATGAS	natural gas [SDSFIE V1.4]
OIL	oil [SDSFIE V1.75]
OTHER	other [SDSFIE V1.4]
POL	Petroleum, Oil, and Lubricants. [SDSFIE V2.31 Air Force]
POTWATER	potable water [SDSFIE V1.4]
PROPGAS	propane gas [SDSFIE V1.4]
RAWWATER	raw water [SDSFIE V1.4]
SEPTIC_TANK	septic tank [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeTerminalCaseType

Used by Attributes: Terminal - Case Type

Value	Definition (Notes) [Source]
OTHER	Other [SDSFIE V2]
PED12	12 Inch Pedestal [SDSFIE V2 Austin and Pitts]
PED4	4 Inch Pedestal [SDSFIE V2 Austin and Pitts]
PED6	6 Inch Pedestal [SDSFIE V2 Austin and Pitts]
PED8	8 Inch Pedestal [SDSFIE V2 Austin and Pitts]
TBD	To Be Determined [SDSFIE V2]
TRANS	Transducer [SDSFIE V2 Austin and Pitts]
UNKNOWN	Unknown [SDSFIE V2]

CodeTerminalType

Used by Attributes: Terminal - Term Type

Value	Definition (Notes) [Source]
BNC_F	BNC-F - Bayonet Neill Concelman (BMC), Female. [SDSFIE V2.5 AIR FORCE]
BNC_M	BNC-M - Bayonet Neill Concelman (BMC), Male. [SDSFIE V2.5 AIR FORCE]
ENC	Enclosure [SDSFIE V2 Austin and Pitts]
ENCAP	Encapsulated [SDSFIE V2 Austin and Pitts]
F_TYPE_F	F-F - F TYPE, Female. [SDSFIE V2.5 AIR FORCE]
F_TYPE_M	F-M - F TYPE, Male. [SDSFIE V2.5 AIR FORCE]
FC	Fixed Count [SDSFIE V2 Austin and Pitts]
FC_F	FC-F - MIL-C-39012 category D type, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
FC_M	FC-M - MIL-C-39012 category D type, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
FCCP	Fixed Count Control Point [SDSFIE V2 Austin and Pitts]

FCTP	Fixed Count Taper Point [SDSFIE V2 Austin and Pitts]
FDDI_F	FDDI-F - Fiber Distributed Data Interface, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
FIDDI_M	FDDI-M - Fiber Distributed Data Interface, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
LC_F	LC-F - Limited Co-ordination Specification (LC Spec.), Female. [SDSFIE V2.5 AIR FORCE]
LC_M	LC-M - Limited Co-ordination Specification (LC Spec.), Male. [SDSFIE V2.5 AIR FORCE]
N_TYPE_F	N-F - N TYPE, Female. [SDSFIE V2.5 AIR FORCE]
N_TYPE_M	N-M - N TYPE, Male [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
RA	Ready Access [SDSFIE V2 Austin and Pitts]
RACP	Ready Access Control Point [SDSFIE V2 Austin and Pitts]
RATP	Ready Access Taper Point [SDSFIE V2 Austin and Pitts]
RE	Reenterable [SDSFIE V2 Austin and Pitts]
SC_F	SC-F - Plug and socket, push-pull latch, FO connector, Female. [SDSFIE V2.5 AIR FORCE]
SC_M	SC-M - Plug and socket, push-pull latch, FO connector, Male. [SDSFIE V2.5 AIR FORCE]
SMA_AF	SMA-AF - Subminiature Version A, Female. [SDSFIE V2.5 AIR FORCE]
SMA_AM	SMA-AM - Subminiature Version A, Male. [SDSFIE V2.5 AIR FORCE]
SMC_CF	SMC-CF - Subminiature Version C, Female. [SDSFIE V2.5 AIR FORCE]
SMC_CM	SMC-CM - Subminiature Version C, Male. [SDSFIE V2.5 AIR FORCE]
ST_F	ST-F - ST, Female. [SDSFIE V2.5 AIR FORCE]
ST_M	ST-M - ST, Male. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
TNC_F	TNC-F - TNC Female. [SDSFIE V2.5 AIR FORCE]
TNC_M	TNC-M - TNC Male. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeTransVehicleType

Used by Attributes: Media Converter - Vehtype

Value	Definition (Notes) [Source]
GOV	Areas that contain government owned vehicles only. [SDSFIE V2.5]
POV	Areas that contain privately owned vehicles. [SDSFIE V2.5]

CodeTruckType

Used by Attributes: Hydrant - Truck Type

Value	Definition (Notes) [Source]
FUEL_SVC_UNIT	Trailer-mounted Fuel Servicing Unit [SDSFIE V2.31 Air Force]
HOSE_CART	Hose cart - truck only [SDSFIE V2.31 Air Force]
UNKNOWN	Unknown [SDSFIE V2.31 Air Force]
WATER_SEPARATOR	Filter - Water separator [SDSFIE V2.31 Air Force]

CodeUtilityGuyType

Used by Attributes: Utility Pole Guy - Guy Type

Value	Definition (Notes) [Source]
ANCHOR_GUY	anchor guy [SDSFIE V1.4]
BUILDING_GUY	building guy [SDSFIE V1.4]
COMPRESS_GUY	compressive guy [SDSFIE V1.4]
DOWN_GUY	A wire guy running from the top of a pole to an anchor in the ground. [SDSFIE V1.75]
OTHER	other [SDSFIE V1.4]
SPAN_GUY	A wire guy running from the top of a pole to the top of the adjacent pole [SDSFIE V1.75]
STUB_GUY	stub guy [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeUtilityOwnershipType

Used by Attributes: Utility Electric Utility Site - Utility Owner Type;Service Area - Utilown

Value	Definition (Notes) [Source]
PRIVATE	Private entity (e.g., individual, corporation, etc.). [SDSFIE V2 AWWA]
PUBLIC	Public entity (e.g., federal, state, or local government). [SDSFIE V2 AWWA]

CodeValveOpen

Used by Attributes:

Value	Definition (Notes) [Source]
CLOCKWISE	CLOCKWISE
COUNTER_CLOCKWISE	COUNTER_CLOCKWISE
UNKNOWN	UNKNOWN

CodeValveType

Used by Attributes: Air Pressure Device - Use;Valve - valveDesc

Value	Definition (Notes) [Source]
BACKFLOW	BACKFLOW [FGDC Utilities Classification]
BLOW_OFF	BLOW_OFF [FGDC Utilities Classification]
CHECK	CHECK [AWWA]
GATE	GATE [AWWA]
GLOBE	GLOBE [AWWA]
OTH	Other
POSTINDICATOR	POSTINDICATOR [AWWA]
PRV	PRV [FGDC Utilities Classification]
TAP	TAP [FGDC Utilities Classification]
UNK	Unknown

CodeValveStatus

Used by Attributes:

Value	Definition (Notes) [Source]
OPEN	OPEN
CLOSED	CLOSED
UNKNOWN	UNKNOWN

CodeVerticalConnectingBlock

Used by Attributes: Vertical Site - Covtbk

Value	Definition (Notes) [Source]
303	303. [SDSFIE V2.5 AIR FORCE]
305	305. [SDSFIE V2.5 AIR FORCE]
355	355. [SDSFIE V2.5 AIR FORCE]
399	399. [SDSFIE V2.5 AIR FORCE]
700	700. [SDSFIE V2.5 AIR FORCE]
713	713. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeVerticalHeight

Used by Attributes: Vertical Site - Covtht

Value	Definition (Notes) [Source]
11_FT_6_IN	11 Foot 6 Inch. [SDSFIE V2.5 AIR FORCE]
7_FT	7 Foot. [SDSFIE V2.5 AIR FORCE]
8_FT	8 Foot. [SDSFIE V2.5 AIR FORCE]

9_FT	9 Foot. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeVerticalLocation

Used by Attributes: Transmission Pipeline - Vertical Location

Value	Definition (Notes) [Source]
ELEVATED	Elevated. [SDSFIE V2.4 USGS]
NEAR	Near. [SDSFIE V2.4 USGS]
UNDERGROUND	Underground. [SDSFIE V2.4 USGS]
UNSPECIFIED	Unspecified. [SDSFIE V2.4 USGS]

CodeVerticalMountBlock

Used by Attributes: Vertical Site - Covtmb

Value	Definition (Notes) [Source]
8_IN	8 Inch. [SDSFIE V2.5 AIR FORCE]
NONE	None. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To be determined. [SDSFIE V2.5 AIR FORCE]
UNIVERSAL	Universal. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeVerticalMountingArea

Used by Attributes: Vertical Site - Covtma

Value	Definition (Notes) [Source]
126_IN	126 Inch. [SDSFIE V2.5 AIR FORCE]
76_IN	76 Inch. [SDSFIE V2.5 AIR FORCE]
84_IN	84 Inch. [SDSFIE V2.5 AIR FORCE]
92_IN	92 Inch. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeVerticalShelfWidth

Used by Attributes: Vertical Site - Covtsw

Value	Definition (Notes) [Source]
14_IN	14 Inch. [SDSFIE V2.5 AIR FORCE]
20_5_IN	20.5 Inch. [SDSFIE V2.5 AIR FORCE]
26_5_IN	26.5 Inch. [SDSFIE V2.5 AIR FORCE]
32_5_IN	32.5 Inch. [SDSFIE V2.5 AIR FORCE]
5_5_IN	5.5 Inch. [SDSFIE V2.5 AIR FORCE]
8_5_IN	8.5 Inch. [SDSFIE V2.5 AIR FORCE]
9_IN	9 Inch. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]

CodeVerticalType

Used by Attributes: Vertical Site - Covtty

Value	Definition (Notes) [Source]
DOUBLE_SIDED	Double sided. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
SINGLE_SIDED	Single sided. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]
UNKNOWN	Unknown. [SDSFIE V2.5 AIR FORCE]
WALL_MOUNT	Wall Mount. [SDSFIE V2.5 AIR FORCE]

CodeVesselType

Used by Attributes: Meter - Dredge Vessel Type

Value	Definition (Notes) [Source]
BACKHOE	A dredge with a single bucket on an arm which moves towards the vessel as the bucket excavates the soil. [SDSFIE V2.2 COE Dredging]
CLAMSHELL	Type of mechanical cable excavator dredge that uses a single bucket attached to the dredge crane with cables. [SDSFIE V2.2 COE Dredging]
CUTTERHEAD	A hydraulic dredge that uses a cutterhead at the suction entrance to dislodge bottom material. [SDSFIE V2.2 COE Dredging]
DIPPER	A power shovel operated from a barge. [SDSFIE V2.2 COE Dredging]
DRAGLINE	An excavating machine with a bucket that is dropped by a boom and then dragged toward the machine by a cable. [SDSFIE V2.2 COE Dredging]
HOPPER	A self-propelled floating plant capable of dredging material, storing it, transporting it to the disposal area, and placing the material at a designated site. [SDSFIE V2.2 COE Dredging]
OTHER	Dredges using non-conventional means or a combination of hydraulic and mechanical processes, e.g., pneumatic, agitation, etc. [SDSFIE V2.2 COE Dredging]
PLAIN_SUCTION	Hydraulic dredge with no mechanical device at suction mouth, a cutter for dislodging bottom material [SDSFIE V2.2 COE Dredging]
TUGBOAT	Used for agitation dredging [SDSFIE V2.2 COE Dredging]
WATER_INJECTION	A type of dredge that injects water at high velocity and/or volume, into the shoaled material to move it to deeper area. [SDSFIE V2.2 COE Dredging]

CodeVoltage

Used by Attributes: Regulator - Pri Volt;Transformr Bank - Pri Volt;Pump - Pwr Req;Pump - Pwr Req;Regulator - Sec Volt;Transformr Bank - Sec Volt;Rect Point - Volt In;Rectifier - Volt In;Rectifier - Volt In;Rectifier - Volt In;Rectifier - Volt In;Substation - Volt In;Rect Point - Volt Out;Rectifier - Volt Out;Rectifier - Volt Out;Rectifier - Volt Out;Rectifier - Volt Out;Substation - Volt Out;Bus Line - Voltage;Cable - Voltage;Capacitor - Voltage;Ductbank - Voltage;Ductbank - Voltage;Equipment - Voltage;Generator - Voltage;Head Bolt Outlet - Voltage;Light - Voltage;Meter - Voltage;Motor - Voltage;Switch - Voltage;Rectifier - Voltage Input;Rectifier - Voltage Output

Value	Definition (Notes) [Source]
110V	110 volts [SDSFIE V1.4]
115000V	115,000 volts [SDSFIE V1.4]
115V	115 volts [SDSFIE V1.4]
120_240V	120/240 volts [SDSFIE V1.4]
12000V	12,000 volts [SDSFIE V1.4]
12000Y_6930V	12,000Y/6,930 volts [SDSFIE V1.4]
120V	120 volts [SDSFIE V1.4]
12470V	12,470 volts [SDSFIE V1.4]
12470Y_7200V	12,470Y/7,200 volts [SDSFIE V1.4]
12V	12 volts [SDSFIE V1.4]
13200V	13,200 volts [SDSFIE V1.4]
13200Y_7620V	13,200Y/7,620 volts [SDSFIE V1.4]
138000V	138,000 volts [SDSFIE V1.4]
15000V	15,000 volts [SDSFIE V1.4]
15930V	15,930 volts [SDSFIE V1.4]
19920V	19,920 volts [SDSFIE V1.4]
20780V	20,780 volts [SDSFIE V1.4]
20780Y_12000V	20,780Y/12,000 volts [SDSFIE V1.4]
208V	208 volts [SDSFIE V1.4]
208Y_120V	208Y/120 volts [SDSFIE V1.4]
220V	220 volts [SDSFIE V1.4]
22860V	22,860 volts [SDSFIE V1.4]
22860Y_13200V	22,860Y/13,200 volts [SDSFIE V1.4]
230000V	230,000 volts [SDSFIE V1.4]
230V	230 volts [SDSFIE V1.4]
2400V	2,400 volts [SDSFIE V1.4]
240V	240 volts [SDSFIE V1.4]

24940V	24,940 volts [SDSFIE V1.4]
24940Y_14400V	24,940Y/14,400 volts [SDSFIE V1.4]
24V	24 volts [SDSFIE V1.4]
27600V	27,600 volts [SDSFIE V1.4]
27600Y_15930V	27,600Y/15,930 volts [SDSFIE V1.4]
277V	277 volts [SDSFIE V1.4]
345000V	345,000 volts [SDSFIE V1.4]
34500V	34,500 volts [SDSFIE V1.4]
34500Y_19920V	34,500Y/19,920 volts [SDSFIE V1.4]
400V	400 volts [SDSFIE V1.4]
4160V	4,160 volts [SDSFIE V1.4]
4160Y_2400V	4,160Y/2400 volts [SDSFIE V1.4]
43800V	43,800 volts [SDSFIE V1.4]
460V	460 volts [SDSFIE V1.4]
4800V	4,800 volts [SDSFIE V1.4]
480V	480 volts [SDSFIE V1.4]
480Y_277V	480Y/277 volts [SDSFIE V1.4]
48V	48 volts [SDSFIE V1.4]
500000V	500,000 volts [SDSFIE V1.4]
5000V	5,000 volts [SDSFIE V1.4]
52V	52 volts [SDSFIE V1.4]
600V	600 volts [SDSFIE V1.4]
69000V	69,000 volts [SDSFIE V1.4]
7200V	7,200 volts [SDSFIE V1.4]
7620V	7,620 volts [SDSFIE V1.4]
765000V	765,000 volts [SDSFIE V1.4]
7970V	7,970 volts [SDSFIE V1.4]
8320V	8,320 volts [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]

CodeVoltageRequirements

Used by Attributes: Media Converter - Volt Req;Culvert Center Line - Voltage Requirements

Value	Definition (Notes) [Source]
AC_+120V	+120 Volt AC. [SDSFIE V2.5 AIR FORCE]
DC_+5V	+5 Volt DC. [SDSFIE V2.5 AIR FORCE]
DC_+5V_+12V	+5 and +12 Volt DC. [SDSFIE V2.5 AIR FORCE]
DC_+9V	+9 Volt DC. [SDSFIE V2.5 AIR FORCE]
DC_12V	-12 Volt DC. [SDSFIE V2.5 AIR FORCE]
DC_24V	-24 Volt DC. [SDSFIE V2.5 AIR FORCE]
OTHER	Other. [SDSFIE V2.5 AIR FORCE]
TBD	To Be Determined. [SDSFIE V2.5 AIR FORCE]

CodeWasteFittingLocation

Used by Attributes: Fitting - Fitloc

Value	Definition (Notes) [Source]
CHILLWATER_TANK	chilled water tank [SDSFIE V2.3 Cherry Point]
CLEANING_BOOTH	Cleaning Booth. [SDSFIE V2.3 Cherry Point]
CONDENSATE_TANK	condensate tank [SDSFIE V2.3 Cherry Point]
COOKER	cooker [SDSFIE V2.3 Cherry Point]
COOLING_TOWER	cooling tower [SDSFIE V2.3 Cherry Point]
COOLING_WATER	cooling water [SDSFIE V2.3 Cherry Point]
CORROSION_REMOVE	corrosion remover [SDSFIE V2.3 Cherry Point]
DESCALER	descaler [SDSFIE V2.3 Cherry Point]
DISHWASHER	dishwasher [SDSFIE V2.3 Cherry Point]
DRINK_FOUNTAIN	drinking fountain [SDSFIE V2.3 Cherry Point]
EYEWASH_STATION	eyewash station [SDSFIE V2.3 Cherry Point]
HOT_WATER_RINSE	hot water rinse [SDSFIE V2.3 Cherry Point]

HUMIDIFIER	humidifier [SDSFIE V2.3 Cherry Point]
ICE_DISPENER	ice dispenser [SDSFIE V2.3 Cherry Point]
PAINT_BOOTH	paint booth [SDSFIE V2.3 Cherry Point]
PARTS_WASHER	parts washer [SDSFIE V2.3 Cherry Point]
PHOTO_TRAY	photo tray [SDSFIE V2.3 Cherry Point]
PIT	pit [SDSFIE V2.3 Cherry Point]
RESPIRATOR_WASH	respirator washer [SDSFIE V2.3 Cherry Point]
SINK	sink [SDSFIE V2.3 Cherry Point]
STACK	stack [SDSFIE V2.3 Cherry Point]
STEAM_CONDEN	steam condensate [SDSFIE V2.3 Cherry Point]
STRIPPER_VAT	stripper vat [SDSFIE V2.3 Cherry Point]
TEST_TEE	test tee [SDSFIE V2.3 Cherry Point]
TOILET	toilet [SDSFIE V2.3 Cherry Point]
URINAL	urinal [SDSFIE V2.3 Cherry Point]
VENT_PIPE	vent pipe [SDSFIE V2.3 Cherry Point]
WASTE_OIL_DISC	waste oil discharge [SDSFIE V2.3 Cherry Point]

CodeWastewaterLineType

Used by Attributes: Line - Type

Value	Definition (Notes) [Source]
FORCE	Force
MAIN	Main
OTHER	Other
SERVICE	Service
UNKNOWN	Unknown

CodeWastewaterSystemType

Used by Attributes: Service Area - Wwsystem

Value	Definition (Notes) [Source]
COMMERCIAL	Commercial type wastewater system (i.e., serves residential areas, businesses, industry, etc. outside the boundaries of a municipality). [SDSFIE V2 EPA]
MUNICIPAL	Municipal type of wastewater treatment system or utility (i.e., serves residential areas, businesses, and industry located within a municipality. [SDSFIE V2 EPA]

CodeWastewaterTankType

Used by Attributes: Disposal Tank - Tank Des;Septic Tank - Use

Value	Definition (Notes) [Source]
DISPOSAL	disposal tank [SDSFIE V1.8]
SEPTIC_TANK	septic tank [SDSFIE V1.8]

CodeWaterTreatmentLevel

Used by Attributes: Treatment Unit - Trt Lev

Value	Definition (Notes) [Source]
OTHER	Other. [SDSFIE V2.31 HSIP]
PRIMARY	Primary. [SDSFIE V2.31 HSIP]
QUATERNARY	Quaternary. [SDSFIE V2.31 HSIP]
SECONDARY	Secondary. [SDSFIE V2.31 HSIP]
TERTIARY	Tertiary. [SDSFIE V2.31 HSIP]

CodeWindingConnectionType

Used by Attributes: Motor - Wind Type

Value	Definition (Notes) [Source]
DELTA	delta [SDSFIE V1.4]
GROUNDED_Y	grounded wye [SDSFIE V1.4]
HIGHLEG_DELTA	high-leg delta [SDSFIE V1.4]
OPEN_DELTA	open delta [SDSFIE V1.4]
OTHER	other [SDSFIE V1.4]
TBD	to be determined [SDSFIE V1.4]
UNKNOWN	unknown [SDSFIE V1.4]
Y	wye [SDSFIE V1.4]

1F.1 BIM Execution Plan

Template 1 (.docx, 10 pages)

Click the image to download the document in Microsoft Word format.

Template 1, Part 2 LOD Matrix_Attributes Parameters (.xlsx)

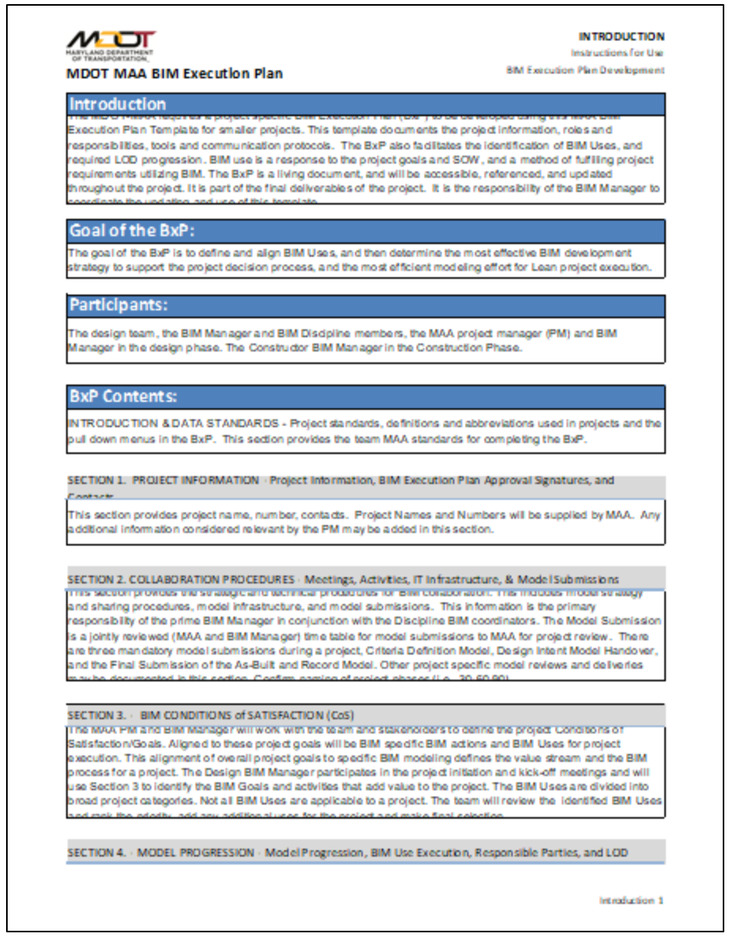
Click the image to download the document in Microsoft Excel format.

Level	Element ID	OmniClass Table 21	OmniClass Table 23- See Asset Attributes Tab	UniFormat	Included in Scope of Work	MDOT-MAA LOD Project Requirements Record Model	Asset Data (See instructions above)		Design Package Breakdown				
							MDOT-MAA Requirments per SOW	Responsible Party (select from pull-down)	Instructions: Provide Drawing Package Abbreviation and Content Designation Ex. Project - (A02 - for Concourse A and Foundations and number for package) columns as needed. Provide LOD of the elements to be reviewed in the specific pa				
					Provide Yes or No with Pull-down		If Yes -provide from pull down actual element		Drawing Package & Content Name	Drawing Package & Content Name	Drawing Package & Content Name	Drawing Package & Content Name	Dra
Level 1	SUBSTRUCTURE	21-01 00 00		A		•							
Level 2	FOUNDATIONS	21-01 10		A10		•	No	•					
Level 3	Standard Foundations	21-01 10		A1010		•	No	•					
Level 4	Wall Foundations	21-01 10 10		A1010.10		300		•					
Level 4	Column Foundations	21-01 10 10 10		A1010.30		300		•					
Level 4	Standard Foundation Supplementary Components	21-01 10 10 30		A1010.90		200		•					
Level 4	Perimeter Drainage & Insulation	21-01 10 10 30		A1013.00		200		•					
Level 3	Special Foundations	21-01 10 20		A1020		•	No	•					
Level 4	Driven Piles	21-01 10 20 10		A1020.10		300		•					
Level 4	Bored Piles	21-01 10 20 15		A1020.15		300		•					
Level 4	Caissons	21-01 10 20 20		A1020.20		300		•					
Level 4	Special Foundation Walls	21-01 10 20 30		A1020.30		300		•					
Level 4	Foundation Anchors	21-01 10 20 40		A1020.40		100		•					
Level 4	Underpinning	21-01 10 20 50		A1020.50		100		•					
Level 4	Raft Foundations	21-01 10 20 60		A1020.60		300		•					

Sec 1 Element LOD Matrix | Table 23 Asset Attributes | Table 23 Asset Sttribute Def | Sec 2 Revit P ...

Template 2 (.xlsx)

Click the image to download the document in Microsoft Excel format.



MDOT MAA BIM Execution Plan

INTRODUCTION
Instructions for Use
BIM Execution Plan Development

Introduction

This MAA BIM Project Specific BIM Execution Plan (BxP) should be completed using this MAA BIM Execution Plan Template for smaller projects. This template documents the project information, roles and responsibilities, tools and communication protocols. The BxP also facilitates the identification of BIM Uses, and required LOD progression. BIM use is a response to the project goals and SOW, and a method of fulfilling project requirements utilizing BIM. The BxP is a living document, and will be accessible, referenced, and updated throughout the project. It is part of the final deliverables of the project. It is the responsibility of the BIM Manager to coordinate the updating and use of this template.

Goal of the BxP:

The goal of the BxP is to define and align BIM Uses, and then determine the most effective BIM development strategy to support the project decision process, and the most efficient modeling effort for Lean project execution.

Participants:

The design team, the BIM Manager and BIM Discipline members, the MAA project manager (PM) and BIM Manager in the design phase. The Constructor BIM Manager in the Construction Phase.

BxP Contents:

INTRODUCTION & DATA STANDARDS - Project standards, definitions and abbreviations used in projects and the pull down menus in the BxP. This section provides the team MAA standards for completing the BxP.

SECTION 1. PROJECT INFORMATION - Project Information, BIM Execution Plan Approval Signatures, and Contacts

This section provides project name, number, contacts. Project Names and Numbers will be supplied by MAA. Any additional information considered relevant by the PM may be added in this section.

SECTION 2. COLLABORATION PROCEDURES - Meetings, Activities, IT Infrastructure, & Model Submissions

This section provides the strategic and technical protocols for BIM collaboration. This includes model strategy and sharing procedures, model infrastructure, and model submissions. This information is the primary responsibility of the prime BIM Manager in conjunction with the Discipline BIM coordinators. The Model Submission is a jointly reviewed (MAA and BIM Manager) time table for model submissions to MAA for project review. There are three mandatory model submissions during a project, Criteria Definition Model, Design Intent Model Handover, and the Final Submission of the As-Built and Record Model. Other project specific model reviews and deliveries may be documented in this section. Confirm naming of project phases (i.e., 30-60-90).

SECTION 3. - BIM CONDITIONS of SATISFACTION (CoS)

The MAA PM and BIM Manager will work with the team and stakeholders to define the project Conditions of Satisfaction/Goals. Aligned to these project goals will be BIM specific BIM actions and BIM Uses for project execution. This alignment of overall project goals to specific BIM modeling defines the value stream and the BIM process for a project. The Design BIM Manager participates in the project initiation and kick-off meetings and will use Section 3 to identify the BIM Goals and activities that add value to the project. The BIM Uses are divided into broad project categories. Not all BIM Uses are applicable to a project. The team will review the identified BIM Uses and rank the priority, add any additional uses for the project and make final selection.

SECTION 4. - MODEL PROGRESSION - Model Progression, BIM Use Execution, Responsible Parties, and LOD

1F.2 Revit Template

Revit Template (.zip)

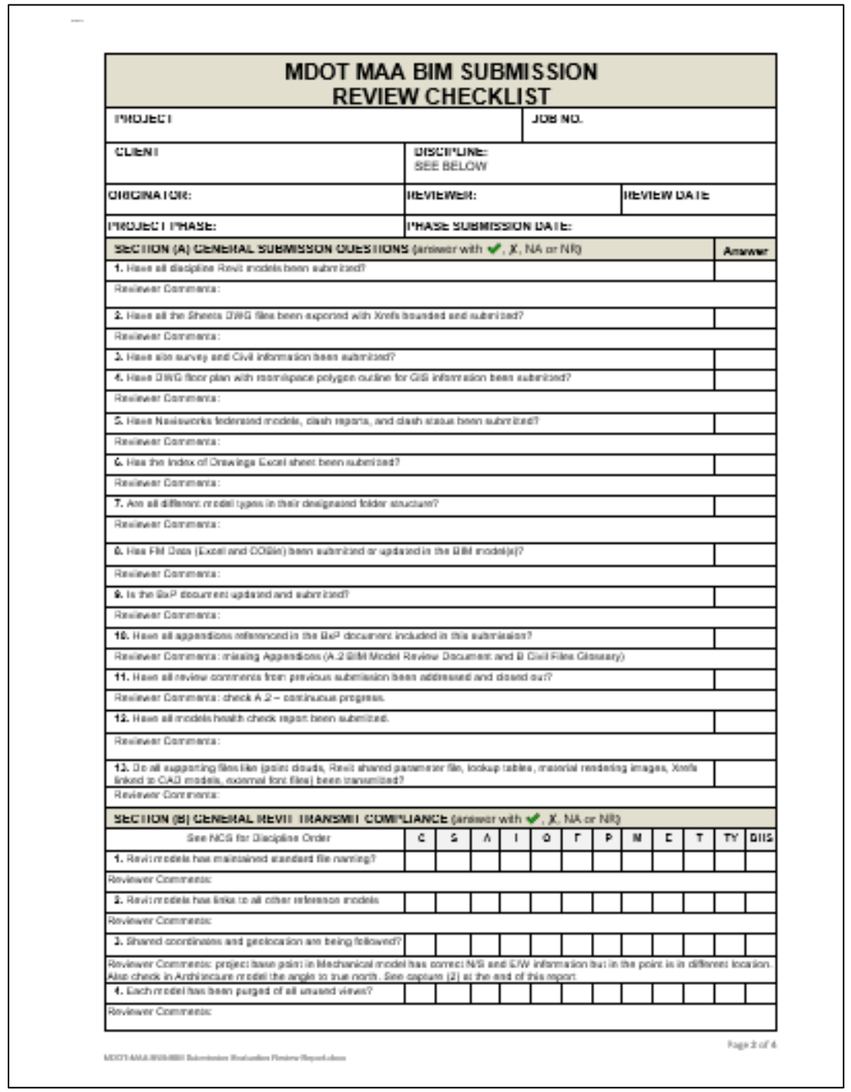
1F.3 COBie Spreadsheet Template

COBie Spreadsheet Template (.zip)

1F.4 BIM Submission Review Checklist

BIM Submission Review Checklist (.docx, 1 page)

Click the image to download the document in Microsoft Word format.



MDOT MAA BIM SUBMISSION REVIEW CHECKLIST

PROJECT		JOB NO.
CLIENT	DISCIPLINE: SEE BELOW	
ORIGINATOR:	REVIEWER:	REVIEW DATE
PROJECT PHASE:	PHASE SUBMISSION DATE:	

SECTION (A) GENERAL SUBMISSION QUESTIONS (answer with ✔, X, NA or NR)	Answer
1. Have all discipline Revit models been submitted?	
Reviewer Comments:	
2. Have all the Sheets DWG files been exported with Xrefs bounded and submitted?	
Reviewer Comments:	
3. Have site survey and Civil information been submitted?	
4. Have DWG floor plan with room/space polygon outline for GIS information been submitted?	
Reviewer Comments:	
5. Have Navisworks federated models, clash reports, and clash status been submitted?	
Reviewer Comments:	
6. Has the Index of Drawings Excel sheet been submitted?	
Reviewer Comments:	
7. Are all different model types in their designated folder structure?	
Reviewer Comments:	
8. Has FM Data (Excel and COBie) been submitted or updated in the BIM model(s)?	
Reviewer Comments:	
9. Is the BxP document updated and submitted?	
Reviewer Comments:	
10. Have all appendices referenced in the BxP document included in this submission?	
Reviewer Comments: missing Appendices (A.2 BIM Model Review Document and B Civil Files Glossary)	
11. Have all review comments from previous submission been addressed and closed out?	
Reviewer Comments: check A.2 – continuous progress.	
12. Have all models health check report been submitted.	
Reviewer Comments:	
13. Do all supporting files like (point clouds, Revit shared parameter file, lookup tables, material rendering images, Xrefs linked to CAD models, external font files) been transmitted?	
Reviewer Comments:	

SECTION (B) GENERAL REVIT TRANSMIT COMPLIANCE (answer with ✔, X, NA or NR)												
See NCS for Discipline Order	C	S	A	I	Q	T	P	M	E	T	TY	DIS
1. Revit models has maintained standard file naming?												
Reviewer Comments:												
2. Revit models has links to all other reference models												
Reviewer Comments:												
3. Shared coordinates and geolocation are being followed?												
Reviewer Comments: project base point in Mechanical model has correct N/S and E/W information but the point is in different location. Also check in Architecture model the angle to true north. See capture (2) at the end of this report												
4. Each model has been purged of all unused views?												
Reviewer Comments:												

1G.01 Division 01 - MAA Standard Procedures

Click the following links to download the individual specifications in Microsoft Word format.

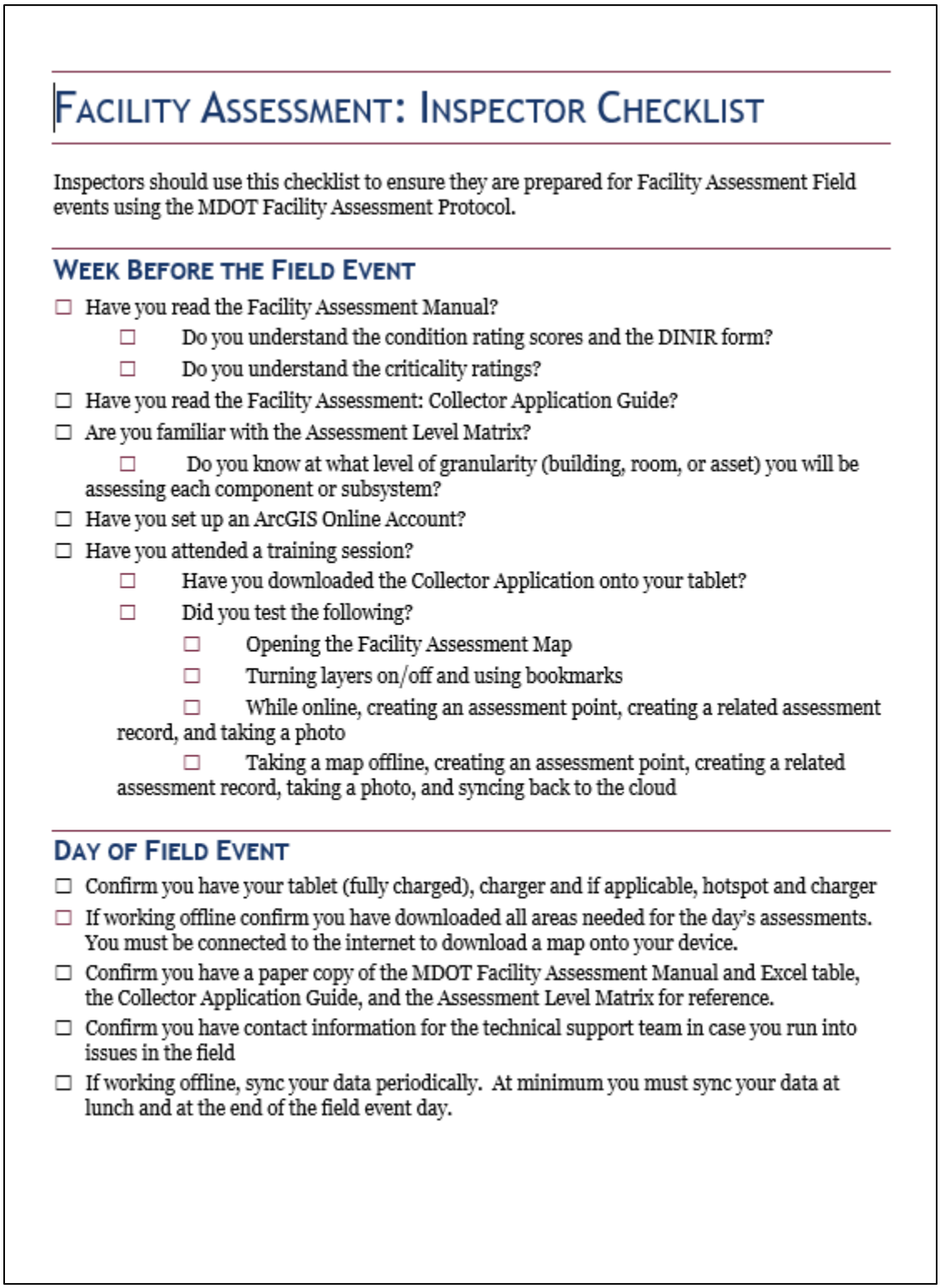
Specification 010012X Building Information Modeling (BIM) Use During Construction

Specification 010013X Asset Management Requirements for Non BIM Projects

1H.1 Facility Assessment Inspector Checklist

Facility Assessment Inspector Checklist (.docx, 1 page)

Click the image to download the document in Microsoft Word format.



FACILITY ASSESSMENT: INSPECTOR CHECKLIST

Inspectors should use this checklist to ensure they are prepared for Facility Assessment Field events using the MDOT Facility Assessment Protocol.

WEEK BEFORE THE FIELD EVENT

- ☐ Have you read the Facility Assessment Manual?
  - ☐ Do you understand the condition rating scores and the DINIR form?
  - ☐ Do you understand the criticality ratings?
- ☐ Have you read the Facility Assessment: Collector Application Guide?
- ☐ Are you familiar with the Assessment Level Matrix?
  - ☐ Do you know at what level of granularity (building, room, or asset) you will be assessing each component or subsystem?
- ☐ Have you set up an ArcGIS Online Account?
- ☐ Have you attended a training session?
  - ☐ Have you downloaded the Collector Application onto your tablet?
  - ☐ Did you test the following?
    - ☐ Opening the Facility Assessment Map
    - ☐ Turning layers on/off and using bookmarks
    - ☐ While online, creating an assessment point, creating a related assessment record, and taking a photo
    - ☐ Taking a map offline, creating an assessment point, creating a related assessment record, taking a photo, and syncing back to the cloud

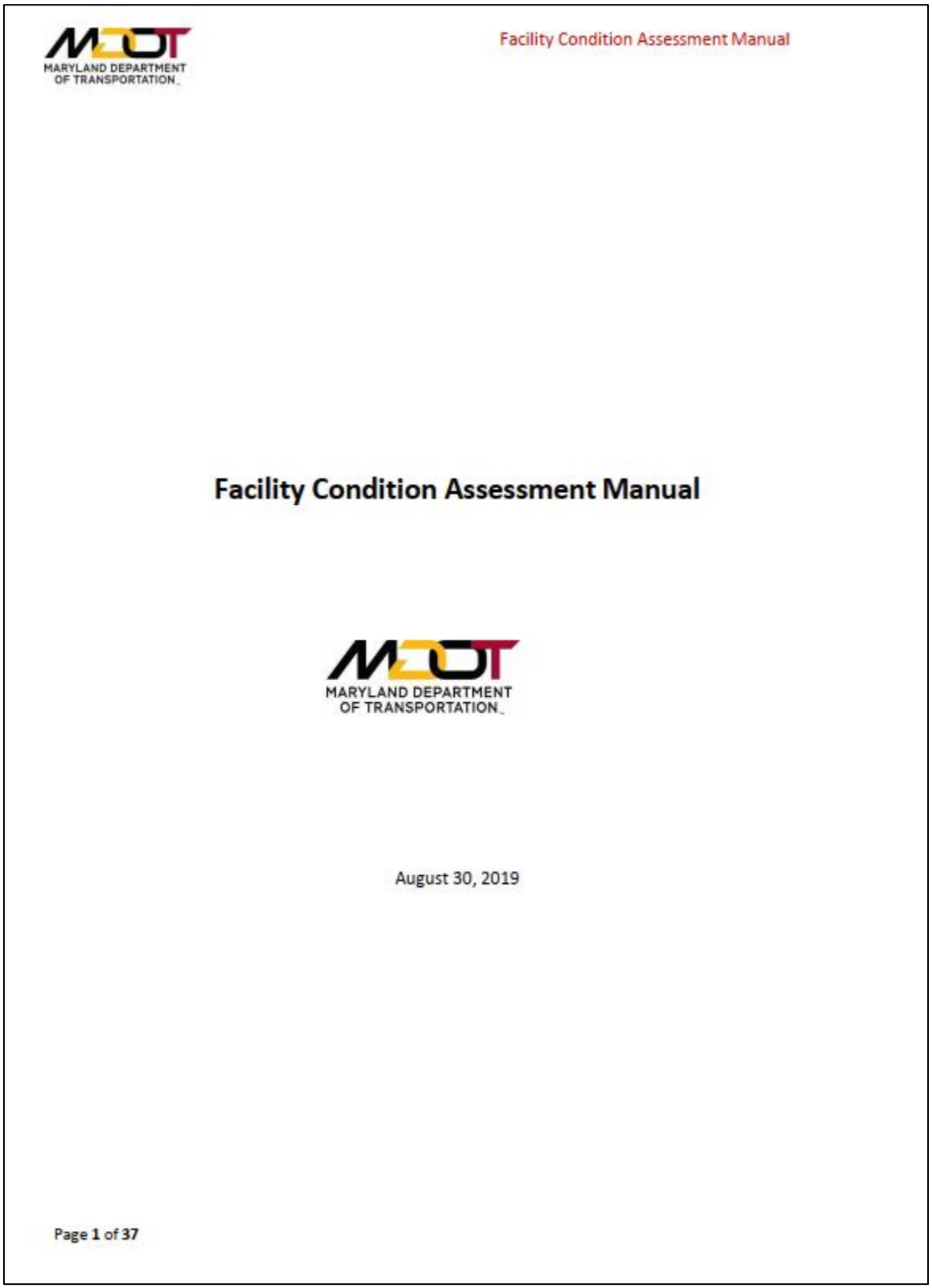
DAY OF FIELD EVENT

- ☐ Confirm you have your tablet (fully charged), charger and if applicable, hotspot and charger
- ☐ If working offline confirm you have downloaded all areas needed for the day's assessments. You must be connected to the internet to download a map onto your device.
- ☐ Confirm you have a paper copy of the MDOT Facility Assessment Manual and Excel table, the Collector Application Guide, and the Assessment Level Matrix for reference.
- ☐ Confirm you have contact information for the technical support team in case you run into issues in the field
- ☐ If working offline, sync your data periodically. At minimum you must sync your data at lunch and at the end of the field event day.

1H.2 Facility Condition Assessment Manual

Facility Condition Assessment Manual (.pdf, 110 pages)

Click the image to download the document in PDF format.



MARYLAND DEPARTMENT OF TRANSPORTATION

Facility Condition Assessment Manual

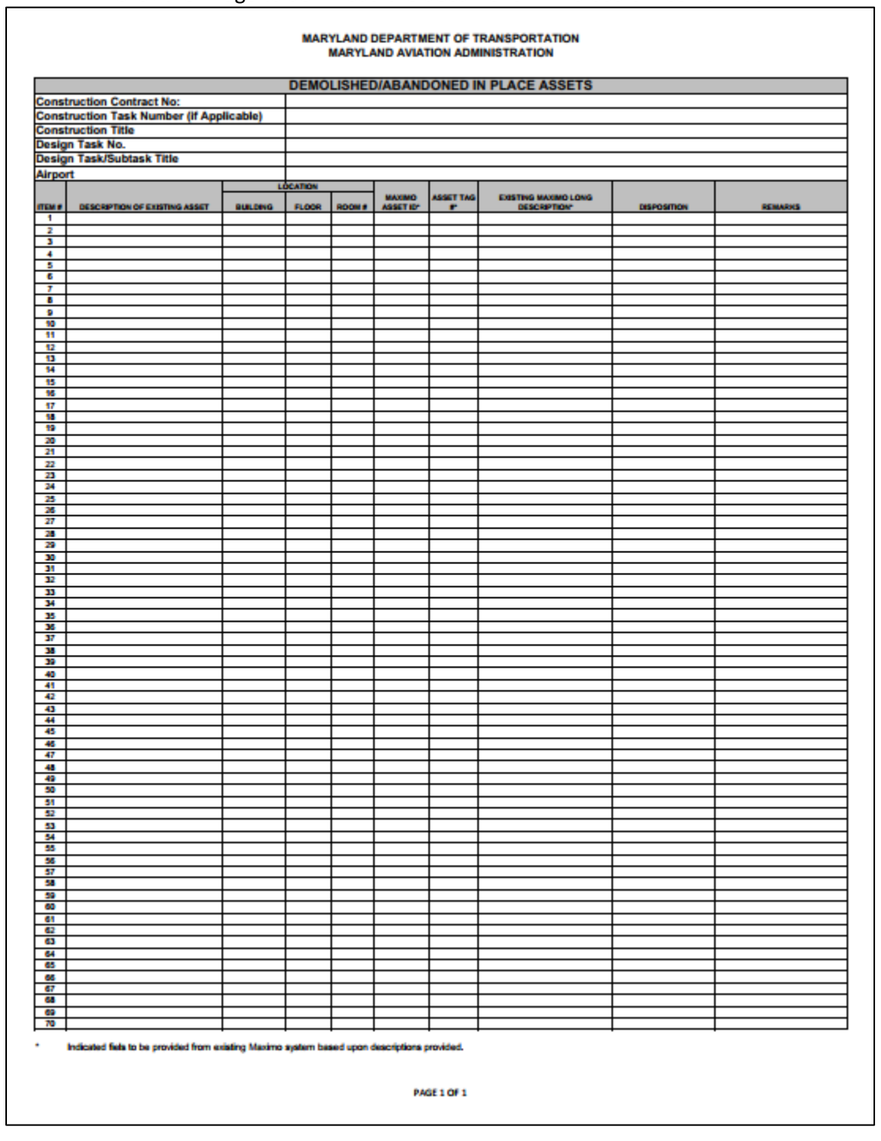
MARYLAND DEPARTMENT OF TRANSPORTATION

August 30, 2019

1I.01 Forms

Demolished-Abandoned in Place Assets

Click the image to download the document in Microsoft Excel format.



MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

DEMOLISHED/ABANDONED IN PLACE ASSETS

Construction Contract No:	
Construction Task Number (if Applicable)	
Construction Title	
Design Task No.	
Design Task/Subtask Title	
Airport	

ITEM #	DESCRIPTION OF EXISTING ASSET	LOCATION			MAXIMO ASSET ID*	ASSET TAG #*	EXISTING MAXIMO LONG DESCRIPTION*	DISPOSITION	REMARKS
		BUILDING	FLOOR	ROOM #					
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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* Indicated fields to be provided from existing Maximo system based upon descriptions provided.

PAGE 1 OF 1

Relocated-Repurposed Assets

Click the image to download the document in Microsoft Excel format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

RELOCATED/RE-PURPOSED ASSETS

Construction Contract No:		**Design Task No.**	
Construction Task Number (if Applicable)		**Design Task/Subtask Title**	
Construction Title		**Airport**	

	EXISTING ASSET/LOCATION								NEW ASSET/LOCATION				
		LOCATION							LOCATION				
ITEM #	DESCRIPTION OF EXISTING ASSET	BUILDING	FLOOR	ROOM #	MAXIMO ASSET ID*	ASSET TAG #*	EXISTING MAXIMO LONG DESCRIPTION*	REASON FOR MOVE	BUILDING	FLOOR	ROOM #	NEW MAXIMO DESCRIPTION*	REMARKS
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
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39													

* Indicated fiels to be provided from existing Maximo system based upon descriptions provided.

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 2

Architectural and Engineering

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.1 Proposal Preparation / Scoping Meeting / Scope of Services

For all MDOT MAA Office of Engineering & Construction projects, the MDOT MAA Project Manager, Consultant, and end-users shall meet to review the capital program request; develop the scope, budget, and schedule for the project; identify the procurement method; and identify permit requirements. Based on the meeting, the Consultant shall prepare a proposal for MDOT MAA's review and approval.

In addition to the contractual requirements and specific requirements for each task, consultants shall submit all proposals, unless directed otherwise, in accordance with and to include the information below. Order of activities listed may vary from task to task. Scope of each project should determine the applicability of activities listed. Prior to submitting a proposal, the Consultant and MDOT MAA Task Manager shall meet with the client to develop the project scope. Consultant should obtain an approved CTP request form, Capital Program budget, and any preliminary cost estimates performed to date.

GENERAL

Consultant shall:

1. Develop a Description of the project.
2. Identify Scope of Services (Phases I, II, and III, as defined in subsequent sections): List types and purpose of specific activities to be performed or considered under each phase.
3. List items specifically not covered in the scope of services, and list of assumptions.
4. Provide requested compensation (must be identified separately):
    i. Cost for proposal preparation
    MDOT MAA will not approve and reimburse the consultants for charges associated with preparing and submitting the following types of design fee proposals:
        1. Short Form fee proposals.
        2. Supplemental fee proposals.
        3. Fee proposals prepared by subconsultants.
        4. Fee proposals for design projects that are based on an investigation and/or a study previously prepared by the same consultant.
    ii. Cost for Phase I (Pre-Design Services, Investigation, Surveying, Geotechnical, Subsurface Utility Engineering ([SUE]), etc.)
        1. If the fee proposal does not include topographic surveying, geotechnical exploration, and/or SUE provide reason(s) why these services are not included.
        2. When preparing fee proposals for geotechnical investigation, Consultants shall note the following regarding their and/or subconsultant fees:
            a. Contingency Percentage: Contingency fee is not acceptable and is not approvable. If extra work is requested/required, a fee supplement must be submitted to MDOT MAA for review and approval prior to conducting any additional work outside of the agreed upon scope.
            b. Delay/Cancellation/Non-productive time: Fees associated with possible delays, cancellations, and /or non-productive time is not pre-approvable. A fee supplement with justification should be submitted to MDOT MAA for review and approval if the subconsultant experiences any unforeseen cancellations and/or delays explicitly caused by others.
            c. Fees associated with administrative efforts such as obtaining security badge cannot be invoiced by the consultant/subconsultant.
            d. 3rd Tier Subconsultant: MBE subconsultants cannot hire other subconsultants/vendors to perform work related to their scope of work. Charges associated with using 3rd tier subconsultants will not be compensated by MDOT MAA. See Chapter 1.4.8, Adding New Subconsultants/Vendors Post Award.
    iii. Cost for Phase II (Design Services)
    iv. Cost for Phase III (Construction Administration/Shop Drawing Review/Record Drawing Preparation, Cost for Record Drawing Preparation should be shown separately). For projects with construction estimates over $10,000,000, include fees associated with Partnering. See Chapter 1.5, Partnering Requirements During Construction.
5. Provide required time of completion for each Phase.
6. Provide Man-Hour Breakdown
7. Identify Out of Pocket/Direct Cost Breakdown (no markups are permitted on ODCs or subconsultant fees)
8. Provide estimated quantity and title of construction drawings with associated man-hours.
9. MDOT MAA Task Manager and the Consultant shall complete the attached form (List of Deliverables), which constitute major deliverables for the task.
10. List all subconsultants to be utilized under the task. Subconsultants shall submit their proposal in the format required herein.
11. Identify MBE/DBE Subconsultant to be utilized under the task and state the percentage of the total fee request that will be performed by the MBE/DBE subconsultant. Include a summary of best faith efforts made to secure MBE/DBE participation on the task.
    i. All fee proposals must include contract MBE goal; contract MBE goal obligated to-date; contract MBE goal achieved to-date; total MBE participation proposed under the task.
    ii. If the proposed MBE participation is zero, or small relative to the contract total MBE goal, provide reasonable justification and explanation for lack of MBE subconsultant participation.
12. Coordinate with the MDOT MAA's GIS Coordinator regarding GIS Applicability and identify the extent of compliance with the AIRPortal GIS Design Standards.
13. Submit a detailed design schedule within one week following approval of the proposal and notice to proceed.
14. Consultants shall identify on every fee proposal, by name, the Project Manager, Task Manager, subject matter expert, and all individuals working on the proposed project. Individuals not charging to the task (i.e. administrative staff) need not be listed.

15. Provide a completed Design Checklist.

On federally funded projects, reports, plans, and specifications must be prepared in accordance with FAA guidelines and requirements.

PHASE I – PRE-DESIGN SERVICES & ENGINEERING REPORTS:

Phase I services shall include the following and any additional items requested at the scoping meeting.

1. Data collection and review of existing reports, record drawings, and other available information.
2. Conduct topographic field surveys.
3. Conduct Geotechnical Investigation.
4. Conduct field inspection, investigation, and testing
5. Evaluate environmental considerations, and identify permit requirements. Develop permit schedule.
6. Determine availability of and evaluate existing resources (power, water, gas, sewer, drainage, etc.) and future requirements.
7. Attendance at scoping and fact finding meetings with Maryland Aviation Administration, airport tenants and other agencies involved and prepare meeting minutes.
8. Provide GIS Applicability Statement. This shall include the identification of the types of features to be built, moved, reconfigured or demolished during the construction as listed in MDOT MAA's AIRPortal GIS Data Standard. Provide GIS data deliverable identification as per GIS Standards, when applicable.
9. Prepare and submit preliminary construction cost estimate.
10. Provide Recommendations and Concept Plans.
11. Prepare and submit the required number of Conceptual Plans, Cost Estimate and Report with recommendations for review, prepared in accordance with FAA standards, if applicable, including all tests and data and coordinate documents with other agencies.
12. Attend preliminary design review meeting(s).
13. Prepare and submit the required number of preliminary plans, preliminary construction cost estimates and report and incorporate MDOT MAA's, tenants' and other agencies' comments.

PHASE II SERVICES (DESIGN AND PREPARATION OF CONSTRUCTION DOCUMENTS):

1. Conduct additional research, data collection, site investigations, testing, and topographic survey if necessary.
2. Prepare agenda and necessary presentation material for attending and conducting pre-design conference. Prepare draft and final minutes of the meetings and distribute.
3. Develop, coordinate, and prepare final construction phasing plan with input from MDOT MAA, FAA, tenants and other affected agencies.
4. Prepare and submit construction cost estimate and the required number of 30%, 60% and 100% construction drawings and specifications in appropriate format for review.
5. Incorporate MDOT MAA, FAA and other agencies' comments and recommendations into 30%, 60% and 100% contract documents and prepare written responses to comments.
6. Apply for and obtain all required permits and approvals. Include the required correspondence, meetings, and follow-up with agencies concerned.
7. Attend coordination and review meetings with MDOT MAA, FAA, Fire Marshal, MDE, DNR, BG&E, Verizon, tenants, and other agencies. Prepare minutes of meetings and follow-up. Attend the Procurement Advisory Group to establish MBE goal for the construction contract.
8. Obtain the required approvals and signatures on the contract drawings from various MDOT MAA offices, as noted on the drawings.
9. Prepare and submit the required number of Bid documents suitable for bidding in accordance with MDOT MAA/FAA format.
10. Prepare and submit final construction cost estimate and construction duration.
11. Attend pre-bid conference. Respond to the contractor's questions and prepare minutes of the meeting for incorporation into an addendum or addenda.
12. Prepare and submit addenda for distribution (equal to the number of Bid documents produced).
13. Respond to contractors' questions prior to bidding and confirm in writing.
14. Prepare bid tabulation forms in MDOT MAA/FAA format to include all bidders and recommend award.
15. Furnish conformed documents in accordance with the MDOT MAA Design Standards. Incorporate all revisions made by addendum or addenda.

PHASE III SERVICES (CONSTRUCTION ADMINISTRATION):

1. Justification must be prepared for Engineer's Estimates that are above or below 10% of the apparent low bidder. Prepare Notice of Recommended Award to MDOT MAA.
2. Review all submittals by the Contractor for compliance with the drawings and specifications and sign and date.

   Consultants may receive either hard copy or electronic submittals from the Contractor.

   Electronic Submittals/Shop Drawings

Consultants shall review electronic submittals the same as hard copy submittals. The submittal shall be reviewed for compliance with the contract documents and, if commenting, the Consultant shall mark on a hard copy print in red ink. The Consultant shall also initial the submittal as compliant or require resubmission. The hard copy print shall be scanned and returned electronically to the Contractor within the time specified in Section SP-8.06 of the Standard Provisions for Construction Contracts, latest edition.

3. Provide consultation and advice to Construction Management group during construction.
4. Attend meetings with MDOT MAA, Construction Management Group or other agencies during construction as required. The Project Engineer or other qualified personnel should be available, as requested by MDOT MAA, to meet with MDOT MAA, the Resident Engineer or the Contractor on issues related to the shop drawing submittals, field conditions and construction phasing coordination.
5. Prepare written responses to the Contractor's questions (RFI) regarding the plans and specifications.
6. Conduct site visits as requested by MDOT MAA and report findings.
7. Prepare Field Revisions, as required, to address field changes and modifications to the design.
8. Prepare Record Drawings and GIS data (if applicable) in accordance with the MDOT MAA Design Standards.
9. Submit Record Drawings and calculations for storm water management facilities to MDE, when applicable.
10. Conduct an as-built survey of SWM facilities in accordance with MDE requirements. Documentation must be submitted to MDE certifying that constructed facilities meet functionality as designed.

TASK MANAGER REQUESTED ITEMS:

The Consultant shall inquire from the Task Manager the need for the following items and if applicable include the cost in the design fee proposal:

1. Conducting Value Engineering/Peer Review.
2. Conducting Constructability Review/Ready Check.
3. Design for mitigation of asbestos and lead paint within the proposed construction area.
4. Independent construction cost estimate coordination and analysis
5. Presentation(s) to the Executive Management Team.
6. Procurement method for construction. Consult with the Task Manager regarding the requirements for preparing construction documents for Building Permit and On-Call Construction Contractors.

NOTES TO THE CONSULTANT:

Minutes of meeting must be submitted using the MDOT MAA's standard Meeting Minutes Template (Appendix 2B - Standard Forms).

1. Construction cost estimates must be submitted using the MDOT MAA's standard Construction Cost Estimate Template. Any increases to the construction estimate must be documented and justified in writing to the MDOT MAA Task Manager.
2. Obtain concurrence from the Task Manager regarding the proposed list of assumptions and exclusions, if any, prior to submitting the proposal.
3. Engineer's Reports must be submitted in Draft, Draft Final, and Final.
4. Any out of scope work performed under the task must be with prior approval of the Task Manager. The Consultant must submit a supplemental fee proposal for out of scope work prior to proceeding with the out of scope work. In circumstances where design must start before the proposal can be submitted, the supplemental proposal must be submitted within two weeks following the Task Manager's approval to proceed with the out of scope work.

1.2 Design Reviews

All written comments will be responded to in writing by the Consultant within two weeks after receipt. All comments that cannot be fully addressed in the two-week period will be responded to in writing when resolved, and prior to the final addendum being issued. This applies to all written comments received by the Consultant and the MDOT MAA Project Manager.

At the beginning of each project, the MDOT MAA project managers will determine who the "client" is within MDOT MAA. The client should be invited to all scoping, design, phasing, and review meetings. Project Managers and Consultants should use their judgment to additional invitees as needed.

1.3 Design Meeting Minutes

All meeting minutes prepared for MDOT MAA Office of Engineering & Construction projects shall be distributed to all attendees and persons invited to the meeting. Meeting minutes shall be developed and distributed within five (5) business days of the meeting date. The Meeting Notice shall also be attached to the meeting minutes. Refer to Appendix 2B - Standard Forms for the standard Meeting Minutes form.

1.4 Invoicing

The following guidelines are for invoices submitted for A/E contracts with the Architecture and Engineering Sections of the Office of Engineering & Construction.

1.4.1 Electronic Submittal

1. All invoices for Architecture and Engineering Sections of the Office of Engineering & Construction shall be submitted electronically in PDF format as outlined below. MDOT MAA also reserves the right to request an original hard copy of the consultant's invoices.
2. All invoices shall be emailed to MAADesignInvoices@bwiairport.com. Additionally, send a copy of the email to the Manager of Contracts Administration and his point of contact for invoices.
3. All emails must contain "Invoice #XX, MDOT MAA-AE-XX-XXX" in the email subject line.
4. Electronically submitted invoices must be prepared in two (2) separate bookmarked files:
    a. File #1 shall be labeled "Invoice #XX, MDOT MAA-AE-XX-XXX, Summary." This file shall contain and be bookmarked with the following pages in the order listed:
        i. Invoice Submittal Signature Sheet Cover Letter/Transmittal Letter
        ii. Comment Form (if applicable)
        iii. Contract Summary Sheet
        iv. Task Billing Summary Sheet
        v. Subconsultant Utilization Report (Prime Consultant Recap, MBE Subconsultant Detail)
        vi. Subconsultant Utilization Report (Non-MBE Subconsultant Detail)
        vii. Task/Subtask Summary Sheets in ascending order, excluding backups and roster
    b. File #2 shall be labeled "Invoice #XX, MDOT MAA-AE-XX-XXX." This file shall include the entire invoice containing the following documents and bookmarked in the order listed:
        i. Invoice Submittal Signature Sheet Cover Letter/Transmittal Letter
        ii. Comment Form (if applicable)
        iii. Contract Summary Sheet
        iv. Task Billing Summary Sheet
        v. Subconsultant Utilization Report (Prime Consultant Recap, MBE Subconsultant Detail)
        vi. Subconsultant Utilization Report (Non-MBE Subconsultant Detail)
        vii. Task/Subtask Summary Sheets including backup documentation (timesheets, labor reports, direct expenses, subconsultant invoices) behind their respective Task Summary Sheet. Charges associated with each specific task must be highlighted on the backup documents.
        viii. Certified Payroll Roster
5. File #1 must be bookmarked by the Summary pages as one bookmark and each individual task/subtask separately bookmarked. Alternatively, each task/subtask and its respective backup documents could be submitted as an individual file under File #1 in ascending order.
6. If each task and its respective backup documents are submitted as an individual file under File #1, each task/subtask file must be labeled "Task/Subtask #XXXX.XX" in ascending order.
7. If the email attachments exceed 7 megabytes (Mb), the invoice may be submitted in two or more volumes via separate emails. Accordingly, the email subject line shall include the volume number and labeled "Invoice #XX, MDOT MAA-AE-XX-XXX, Vol 1" and "Invoice #XX, MDOT MAA-AE-XX-XXX, Vol 2" for the second email, etc.
8. All PDF files must be in 200 dots per inch (DPI).
9. "***Invoice Submittal Signature Sheet***" must be included with submittal invoice. Invoices cannot be processed for payment without the Invoice Submittal Signature Sheet. The Invoice Submittal Signature sheet does not need to be submitted on consultant letterhead. Invoice Submittal Signature sheet will be placed at the front of the invoice.
10. All invoices shall be directed to the Manager of Contracts Administration on the Invoice Cover Letter and Summary Sheets.

1.4.2 Invoice Submission

1. In accordance with the Contract Agreements with MDOT MAA, invoices are required to be submitted on a monthly basis.
2. For failure by a consultant to submit approvable invoices on a monthly basis or comply with MDOT MAA's invoicing requirements, MDOT MAA reserves the right to require no new assignment to be authorized to the firm(s) in violation until such time that they are up-to-date on the invoice submittals and are in compliance with all applicable invoicing requirements.
3. If the invoices are not being submitted monthly, there must be a written explanation on the cover letter of such invoice(s) providing reasonable explanation for noncompliance.
4. All prime consultants and subconsultants must submit their invoices within one hundred eighty (180) days of providing services to the MDOT MAA. The MDOT MAA reserves the right to accept or reject any charge(s) submitted after one hundred eighty (180) days of providing services to the MDOT MAA. MDOT MAA will require written documentation/justification in order to consider reviewing such charges submitted beyond one hundred eighty (180) days of the current invoice date.
5. The MDOT MAA must receive invoices from consultants no later than two (2) business days of the invoice date; otherwise the invoice will not be accepted. Invoices must contain the current invoice date on the cover/transmittal letter and on all summary forms.
6. For any particular contract, no invoice shall be submitted to MDOT MAA until the previous invoice has been approved. Do not submit the next invoice unless an email is sent by MDOT MAA advising the approval of the current invoice.
7. All invoices must comply with the latest invoicing template provided by MDOT MAA.
8. All invoices for a contract must be numbered consecutively, starting with Invoice #1.
9. All invoices must have a current EFT and paper check "Remit to Address" on the cover letter of the invoice.

10. Resubmitted invoices must contain the MDOT MAA's Invoice Comment For on the first part of the invoice with complete responses to each MDOT MAA comment.
11. No additional charges may be added to a resubmitted invoice unless it is as a result of the MDOT MAA's review comment. The Response Column of the Invoice Comment form must contain itemized and specific explanation for any changes to the original invoice amount.
12. Once a task has been closed by MDOT MAA, no further charges will be accepted under that task.
13. Invoice billing periods should be discrete with specific beginning and ending dates.
14. If there is a charge outside of the current billing period on an invoice, there must be a detailed explanation for the overlap on the invoice cover letter.
15. If there is no activity during a time period, note on the cover letter of the next submitted invoice, no activity during the time period of [INSERT DATE] to [INSERT DATE].
16. Invoices must be prepared using a minimum font size 10.
17. Invoices shall be submitted on paper size 8.5" x 11" only.

1.4.3 Certified Payrolls

1. A certified payroll roster must be submitted by the prime consultant and subconsultant(s) with each invoice.
2. An acceptable payroll roster must include the following:
    a. The legal name of every employee billed in the current invoice.
    b. The classification of each employee billed in the current invoice (indicate merit raises and/or promotions as well as the effective date).
    c. The billed rate(s) of each employee charged under the current invoice. Billed rates are subject to the maximum allowable for the contract, if applicable.
    d. The effective date(s) of the billed rate(s) of each employee billed on the current invoice.
    e. The name and signature of an appropriate company officer, certifying that the information submitted in the payroll roaster is true and accurate.
    f. A certified payroll roaster must reflect the actual hourly rate paid to the employees.
3. Administrative services are considered as part of overhead by the MDOT MAA. The MDOT MAA will reject any billed administrative labor costs.
4. All hours billed must be within the invoice billing period. The invoice must show the start and end dates for the invoice period being billed.
5. MDOT MAA will not pay for any overtime charges performed without prior written approval of the MDOT MAA's Task Manager. Include a copy of MDOT MAA's overtime approval letter with the invoice backup for the task.

1.4.4 Timesheets

1. Every task must contain Labor Summary Sheet with a line at the bottom reading; "*I hereby certify that the information contained hereafter is true and correct*." The name and signature of a company officer must accompany this statement.
2. A labor summary sheet must be submitted for each task billed with all invoices submitted for payment.
3. Employee pay increases are capped at 6% in a twelve (12) month period. Annual (annual is referenced from the day of the signed contract agreement) and/or other pay increases of more than 6% will not be paid for by MDOT MAA. The 6% cap applies only to the unburdened hourly rate.
4. Prime consultants and subconsultants must provide backup for all labor in at least one of the following forms:
    a. Manually-generated timesheets – Timesheets must be signed by both the employee and his/her supervisor. Additionally, timesheets must contain legal name of the employee and his/her supervisor.
    b. Detailed Time Summary (Payroll Detail) – Payroll detail must contain the name and signature/approval of a company officer.
5. If timesheets are submitted with hours charged to multiple projects and tasks, the hours specific to the submitted invoice and task must be highlighted. All timesheets for a task must be submitted behind their respective Task/Subtask Summary Sheet.
6. All Prime Consultants' and subconsultants' paystubs for employees billed under an MDOT MAA contract are subject to inspection and review by MDOT MAA.
7. All-inclusive rates are fixed for the life of the contract. All-inclusive rates billed must be as originally approved by the MDOT MAA's Office of Procurement. All-inclusive rate changes must be approved in advance by the MDOT MAA Office of Procurement in the form of a contract amendment in advance.

1.4.5 Overhead Rates

1. Overhead and profit charges for premium labor over forty (40) hours will not be paid by the MDOT MAA.
2. Prime consultants and subconsultants must provide an annual audited overhead rate prior to July 1st to the MDOT MAA for review and approval.
3. Consultants must identify all defaulted and all-inclusive subconsultant on the Progress Reports.
4. Audited overhead rates are to be applied for services provided as of the effective date approved by MDOT MAA and are not retroactive.
5. If a firm has not submitted its annual audited overhead report and is defaulted, no new work shall be assigned to such firm. The defaulted firm may continue to invoice MDOT MAA for previously approved work at the defaulted rate of 100% or the firm's original rate, whichever is lower.
6. If a defaulted firm later resolves its annual audited overhead rate, the approved audited overhead rates shall be applied for services provided as of the effective date approved by MDOT MAA and is not retroactive.

1.4.6 Direct Expenses

1. All direct expense reimbursements must follow the current State of Maryland guidelines. Please visit the following links for further details:
   http://dbm.maryland.gov/Pages/TravelManagementServices.aspx
   http://dbm.maryland.gov/Pages/FleetManagementServices.aspx
2. Per Diem expenses must be in accordance with MDOT policies and must involve overnight stay in order to qualify for reimbursement. Legible receipts are required for reimbursement.
3. Out of town travel must be explicitly included in the task fee proposal and sufficient detail must be provided regarding destination and person(s) traveling.
4. Airfare must be economy class. If economy class is not identified on the ticket, prior written approval must be received from the MDOT MAA Task Manager and a copy of the written approval must be included in the invoice task expense backup. If "Frequent Flyer" mileage is being used for an upgrade, the consultant must provide documents showing that the charge is for economy class.
5. The rate of mileage reimbursement is in accordance with the MDOT's approved rate at the time mileage expense was incurred.
6. The MDOT MAA only reimburses mileage for work directly related to the contract/task.
7. Prime consultants and subconsultants must submit a mileage log for all mileage charges, indicating start and end destinations and purpose of travel.
8. Mileage is to be calculated based on the shortest possible distance from the prime consultant's contract home office to the project site.
9. Prime consultants and subconsultants must provide legible receipts for all direct expenses. Expense receipts should contain the name of the business/vendor, the date the expense was incurred, and the amount of the expense. Write the respective task number on each receipt.
10. The MDOT MAA will disallow all mileage expenses incurred on days without corresponding labor hours.
11. Books/Publication, software, hardware, and other purchases charged to the "Out of Pocket" expenses must be approved by the MDOT MAA's Task Manager and must be turned over to the MDOT MAA upon completion of the task.

1.4.7 Contract and Task Upset Limits

1. Prime consultants and subconsultants must comply with the approved contract and task upset limits, including the limits of their respective contract budget and task budget breakdown by phase.
2. In cases where a line item under a contract/task budget breakdown exceeds the maximum allocated funds, the prime consultants must submit a detailed explanation for all reallocation of the funds for each line item within the contract/task budget in a reallocation letter. The MDOT MAA reserves the right to accept or reject submissions for contract/task budget reallocations. The MDOT MAA will not allow any increases in fixed fees from contract/task budget reallocation(s).
3. The MDOT MAA will not accept invoices related to a submitted contract/task budget reallocation letter without prior approval of the submitted reallocation letter.
4. All funds allocated to MBE's must remain with the respective MBE firm for the life of the contract, unless approved by the Office of Fair Practices in writing.

1.4.8 Adding New Subconsultants/Vendors Post Award

1. MDOT MAA will reject any invoice(s) that include any subconsultant and/or vendor that has not been approved in advance by MDOT MAA Engineering Manager and added to the contract through a contract amendment issued by the Office of Procurement.
2. Charges incurred by a subconsultant or a vendor not formally added to the contract are not reimbursable and such charges are not retroactive.
3. A consultant cannot obtain credit for an MBE subconsultant added to the contract post award until approval is obtained by the Office of Fair Practices.
4. Consultants, subconsultants, and/or vendors are not allowed to utilize the services of a third tier firm. Such charges will not be reimbursed by MDOT MAA.

1.4.9 Points of Contact

1. All consultants must identify a primary and alternate point of contact for MDOT MAA to communicate with regarding invoice matters. These points of contact's name, email address, and phone numbers shall be shown on the invoice cover letter.
2. Consultants shall only communicate with the MDOT MAA's point of contact regarding their invoices. Contact the Manager of Contracts Administration for the MDOT MAA's point of contact information.

1.5 Partnering Requirements During Construction

All projects with a construction cost estimate of $10,000,000 or more shall require "Partnering" during construction. The Partnering shall involve representatives from the design consultants, the program manager, the construction manager, the contractor, and the MDOT MAA.

The intent of this program is to initiate project culture change by developing team goals, assess overall project tasks and manage conflict resolution expeditiously. The Consultants must identify and incorporate the fee associated with participating in partnering during construction in their design fee proposal under their Phase III services.

The Consultants shall also incorporate the appropriate specifications and requirements in all construction contract specifications which have a construction cost estimate of $10,000,000 or more, requiring the contractor to engage in "Partnering" sessions and activities as required and scheduled by MDOT MAA or its representative.

2.1 Phase I Studies/Programming and Schematic Design

MDOT MAA requests studies be performed by a Consultant in order to determine if the corresponding project should be pursued. Factors such as funding, design recommendations, and construction schedules are considered. Studies shall be provided in draft, draft final, and final submissions or as directed by the MDOT MAA Task Manager.

Study content shall contain, but not limited to, a brief overview of the task, establish a scope of work, elaborate on current conditions described in the overview, any discussion items or options, consultant's recommendation to resolve or correct the issue being studied, and a cost estimate appropriate to the level of the submittal. Consultant may also include concept drawings or renderings for easy visualization of current conditions and/or resolutions.

At each submission, as the scope of work is further refined, the consultant shall include, but not limited to, documentation in the form of Meeting Minutes, Review Comments, etc. as appendices to the study. The body of the study shall be modified to reflect and discuss any scope of work adjustments.

2.1.1 Assignment of Building Identification Number

Refer to PEGS V1, Chapter 2.2 Building Addressing, Numbering, and Naming.

2.1.2 Assignment of Door Numbers

Refer to PEGS V1, Chapter 2.4 Door Number Assignment.

2.1.3 Assignment of Space Numbers

Refer to PEGS V1, Chapter 2.3 Interior Space Numbering.

2.2 Phase II Design

Quantities of deliverables described in the following Sections shall be as outlined in PEGS V2, Chapter 3 Deliverables.

2.2.1 Design Development (30% Review) Submittal

At the 30% level, submissions shall include, but are not limited to, drawings, a table of contents of the anticipated technical specifications required, cost estimate, and design report.

Design reports shall be designated as "Draft" and contain similar content described in Section 2.1 Phase I Studies Programming and Schematic Design. Preliminary phasing and security concerns shall also be discussed. If the project is anticipated to contain Sole Source Items, it shall be discussed in the body of the report.

2.2.2 Construction Documents (60% Review) Submittal

At the 60% level, submissions shall include drawings, specifications including general information and technical specifications, cost estimate, and design report.

Design reports shall be designated as "Draft Final." The report shall be a modified version of the Draft report. Revisions to the report shall be based on, but not limited to, a refined scope of work, review comments, and continued coordination with MDOT MAA Stakeholders.

At this level, Consultants shall initiate coordination with the Office of Facilities Maintenance for extra materials (MROI) following the procedure described in PEGS V2, Chapter 4.5 Maintenance Repair and Operating Items MROI.

2.2.3 Construction Documents (100% Review) Submittal

At the 100% level, submissions shall include drawings, specifications including general information and technical specifications, cost estimate, and design report. Consultants should prepare the content of this submittal as if bid ready. There should not be major design revisions or omissions associated with the project at this level.

Design reports shall be designated as "Final." The report shall be the final version modified from the Draft Final report. Revisions to the report shall be based on, but not limited to, a refined scope of work, review comments, and continued coordination with MDOT MAA Stakeholders and shall reflect the final design decisions.

Design calculations shall be completed and submitted.

If the Office of Facilities Maintenance requires MROI, Consultants shall obtain final signatures as required by PEGS V2, Chapter 4.5 Maintenance Repair and Operating Items MROI.

2.2.4 Bid Documents

Bid documents shall include final drawings and specifications. Specifications shall include general information, technical specifications, and wage rates.

Hard copies of bid documents are to be submitted directly to MDOT MAA Procurement. If requested, Consultant shall submit a hard copy of the bid documents to the MDOT MAA Task Manager as well.

The final cost estimate as a separate loose document to the MDOT MAA Task Manager. Consultants shall also submit with the final cost estimate, a cost estimate certification prepared as described in PEGS V2, Chapter 3.5 Cost Estimating.

2.2.5 Procurement

2.2.5.1 Pre-Bid Conference and Site Inspection

A. The Office of Procurement will schedule the pre-bid conference and the site inspection. The date(s) and time(s) of the pre-bid conference and site inspection will be included in the Technical Provisions.
B. The Consultant shall attend the pre-bid conference and site inspection and prepare the meeting minutes for incorporation into Addendum No. 1.

2.2.5.2 Addenda

A. The Consultant shall prepare Addendum No. 1 using the MDOT MAA Standard Addendum Template. Addendum No. 1 shall be issued within seven (7) days of the deadline for receipt of the Contractor's questions and shall include, at a minimum, the following:
    1. Pre-Bid Meeting Minutes.
    2. Pre-Bid Meeting Attendance Sheet.
    3. Minority Business Enterprise Goals and Requirements for Construction Contracts, Good Faith Efforts, and Trucking Requirements.
    4. Responses to Contractor's Questions.
    5. Plan holders list.
    6. Any additions, modifications or new specifications.
    7. Any additions, modifications or new drawings.
    8. Any revised bid tabulations (if applicable.)
B. Additional addenda shall be prepared by the Consultant as required.
C. All addenda shall include an Acknowledgement of Receipt.
D. The last addendum shall be issued to the Contractors by the Office of Procurement a minimum of seven (7) days prior to the bid opening.

2.2.5.3 Bid Tabulation and Notice of Recommended Award (NORA)

A. After the bid opening, the Consultant shall prepare a bid tabulation including all bids that were received and the Engineer's estimate. On Federally funded projects, the bid tabulation shall include eligible and non-eligible items.
B. Based on the bid tabulation, the Consultant shall prepare a Notice of Recommended Award and forward it to the Office of Procurement and a copy to the attention of the MDOT MAA Project Manager. For the projects that are procured through the on-call construction contracts, the Notice of Recommended Award will be forwarded to the Office of Engineering & Construction, Construction Section and a copy to the MDOT MAA Project Manager.
C. Justification must be prepared by the Consultant if the Engineer's estimate is more than 10% above or below the apparent low bid.
D. If advertisement was allowed prior to receipt of all permits, the Office of Procurement and the Office of Engineering & Construction, Construction Section, shall be notified accordingly. The Office of Procurement and the Office of Engineering & Construction, Construction Section shall coordinate approvals with the MDOT MAA Project Manager prior to issuing the Notice to Proceed.

2.2.5.4 Conformed Construction Documents

Unless otherwise directed by MDOT MAA's Project Manager, the consultant shall provide Conformed Documents incorporating all changes to the drawings and specifications that have been developed during the solicitation.

Deliverables shall be as described in PEGS V2, Chapter 3 Deliverables. Documents shall be submitted to MDOT MAA's Document Manager for distribution.

The electronic documents will follow the standard described for submittal of electronic documents as per PEGS V2, Chapter 3.1 Electronic Deliverable Requirements in the MDOT MAA PEGS Manual as well as the requirements as outlined inPEGS V1, Chapter 3 CAD Standards.

A. All Conformed Documents shall be delivered to the Document Manager in the MDOT MAA Office of Engineering & Construction.
B. No one but the Document Manager is authorized to receive Conformed Documents for MDOT MAA.
C. Coordinate with the Document Manager for the delivery of Conformed Documents. Request the Document Manager's email from the MDOT MAA Task Manager.
D. DO NOT leave Conformed Documents at the Document Manager's desk or with anyone else if he or she is not at their desk.

E. Only full/complete set(s) of Conformed Documents will be accepted. Do not deliver partial sets unless specifically requested by MDOT MAA.
F. All documents shall be prepared in accordance with the latest MDOT MAA PEGS Manual. Documents not conforming to the PEGS Manual will be returned for correction.
G. All documents are to be submitted with a Letter of Transmittal addressed to the Document Manager. The Letter of Transmittal shall include relevant information such as Contract Number, Title, A/E Task Number, and a complete list of documents included in the set of Conformed Documents being delivered.
H. Copy the MDOT MAA Task Manager on the Letter of Transmittal.
I. Have the Document Manager sign the Letter of Transmittal. Consultants shall keep a copy of the signed Letter of Transmittal for future reference.
J. The Document Manager will distribute the Conformed Documents to the appropriate individuals at MDOT MAA.

2.3 Phase III Construction Administration

2.3.1 Shop Drawing/Submittal Review

Note that some material submittals may require review by the MDOT MAA Office of the Fire Marshal (OFM). Refer to PEGS V3, Chapter 1.2 OFM Shop Drawing/Submittal Review.

Consultants shall review shop drawings, product submittals, mix designs, etc. for conformance to the drawings and specifications issued to the successful bidder.

Consultants shall NOT use the shop drawing/submittal review process to implement revisions to the original design and construction documents. Revisions to the design should be implemented by Field Revisions.

2.3.2 Requests for Information

The consultant shall review and respond to all Request for Information (RFIs) within the time frames specified in the Construction Documents.

2.3.3 Design Changes/Field Revisions

During construction, the contractor, CMI, or MDOT MAA stakeholder may request a change to the original design. Design changes occur for different reasons such as alternate construction methods to expedite the schedule, requests from MDOT MAA stakeholders to include a new portion of work that is easily included in the work already being performed, design resolution to a conflict found in the field, etc.

To prepare a Field Revision, the Consultant shall revise existing drawings or create new drawings to show the work being modified. Only applicable sheets need re-issuing. Any content on the drawings which has been revised, modified, or deleted shall be enclosed in a revision bubble. Content in the specifications which has been revised, modified or deleted shall be shown via track changes.

A brief narrative shall be issued with the drawings and/or specifications of each Field Revision. A general overview of what the Field Revision addresses as well as a point by point description of what has been revised, added, deleted on each drawing and/or specification shall be included in the narrative.

A cost estimate to complete the Field Revision shall be prepared by the Consultant and submitted as a loose document to the CM only along with the Field Revision package. The cost estimate is for the purpose of cost comparison with contractor pricing and should not be included in the package issued to the contractor with the Field Revision.

2.4 Phase IV Record Drawings & Project Close Out

2.4.1 Record Drawing Preparation

At the close of every project, the MDOT MAA will provide the Consultant with the as-built markups from the contractor. The following requirements should be followed when preparing Record Drawings.

Deliverables shall be as described in PEGS V2, Chapter 3 Deliverables.

Drawings shall include:
A. Revision block labeled “Record” with date of issue.
B. The disclaimer Record Drawing Stamp (on the following page) placed on each sheet (including the title sheet) and applicable boxes should be checked.
C. Every drawing with file name clearly located within the sheet border.

Electronic Files shall include:
AutoCAD DWG as well as PDF drawings prepared per the Electronic Deliverables Section in PEGS V1, Chapter 3 CAD Standards.

2.4.2 Procedure for Delivery of Record Documents

Record documents shall be submitted to MDOT MAA through the Engineering AIRPortal Document Manager (ADM). Refer to Electronic Deliverables Section in PEGS V1, Chapter 3 CAD Standards.

Paper and mylar hard copies are not required.

SUBMISSION NOTE:

"THESE RECORD DRAWINGS DATED... AND TITLED "RECORD" HAVE BEEN DEVELOPED FROM

☐ RFI/FIELD CHANGES

☐ CONFORMED DRAWINGS

☐ AS-BUILT MARKUPS

AND MAY NOT REPRESENT THE FINAL PROJECT, AS CONSTRUCTED, IN EVERY DETAIL. THE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUPPLIED BY OTHERS AND THE ENGINEER HAS NOT VERIFIED THE ACCURACY OR COMPLETENESS OF THE INFORMATION."

SUBMISSION NOTE:

"THESE RECORD DRAWINGS DATED... AND TITLED "RECORD" HAVE BEEN DEVELOPED FROM

☐ RFI/FIELD CHANGES

☐ CONFORMED DRAWINGS

☐ AS-BUILT MARKUPS

AND MAY NOT REPRESENT THE FINAL PROJECT, AS CONSTRUCTED, IN EVERY DETAIL. THE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUPPLIED BY OTHERS AND THE ENGINEER HAS NOT VERIFIED THE ACCURACY OR COMPLETENESS OF THE INFORMATION."

SHEET TITLE: RECORD DRAWING STAMP	DATE: SEPT 2007

2.4.3 Procedure for SWM As-Built Certification

Refer to PEGS V4, Chapter 3.1.2.2 Procedure for SWM As-Built Certification.

2.5 Special Design and Procurement Procedures

2.5.1 Comprehensive Paving and Comprehensive Interior/Exterior Modifications Contract Design Procedure

Comprehensive Paving Contracts (Comp Paving) and Comprehensive Interior/Exterior Modifications Contracts (Vertical Comp) at BWI Marshall and Martin State (MTN) Airports are on-call construction contracts for which MDOT MAA makes multiple awards under one contract. Each successful bidder is issued the Technical Provisions for the overall Contract which include General Information, Technical Specifications (Comp Paving only), Wage Rates, and Bid Forms. After award, competitive bids are solicited from the selected contractors as "Tasks" are advertised.

Comp Paving tasks involve airside and landside paving projects and typically do not include terminal/building work. Tasks under a Comp Paving contract range from small to large, usually involving paving, pavement patching, crack sealing, pavement marking, structure adjustments, sign installation, and other construction flatwork.

Vertical Comp projects are for work on buildings, utilities, and other airport facilities and typically do not include flatwork such as paving. Tasks under a Vertical Comp contract usually involve construction and/or repair services including electrical, mechanical, architectural, demolition, roofing, painting and finishes.

Designs of Comp Paving and Vertical Comp tasks shall comply with all applicable sections of this Manual. The following sections describe the design procedure for a Task to be bid under Comp Paving and Vertical Comp Contracts at BWI Marshall and MTN. Text which does not specify either Comp Paving or Vertical Comp is applicable to both.

2.5.1.1 Technical Provisions

Procurement templates have been developed for Comp Paving and Vertical Comp Tasks and shall be used to create the Technical Provisions specific to each Task. The information to be provided in the template is discussed below. The populated template shall be bound in one (1) complete volume. The templates are available for download on AIRPortal, or click the following links to download the templates directly:
Comp Paving_Tech Specs and Bid Forms
Comp Interior-Exterior_Tech Specs and Bid Forms

A. Part I – General Information
   Consultants shall develop the General Information in the format provided in the template and submit this at each submittal phase. Refer to PEGS V2, Chapter 3 Deliverables.

   General Information shall be a narrative of the Task, summarizing major items for contractor consideration and awareness for bid. The items shall include at minimum:
   1. Contract Summary – table with information fields to be filled in by Consultant
   2. Referenced Documents – for Comp Paving tasks, reference overall contract technical specifications
   3. Description of project
   4. Special Construction Requirements – include information such as Project Duration, Liquidated Damages, Phasing Requirements (if applicable), Security Requirements (if applicable)
   5. List of Drawings

   The information included in the Special Construction Requirements is not limited to the items listed above. The Consultant shall determine if there are other specific items that should be brought to the contractor's attention and include them with the narrative.

B. Part II – Technical Specifications
   1. Comp Paving
      Each Contractor awarded a Comp Paving contract is issued the Technical Specifications that apply to all Tasks, airside and/or landside, constructed under the contract. The technical specifications are also available on AIRPortal, or click the following link to download the specifications directly:
      Comp Paving Tech Specs and Bid Forms

      Additional supplemental specifications may be required and should be issued with each individual Task as described below.

      Consultants shall review and evaluate the Comp Paving Technical Specifications to determine if the Task being designed requires language/specifications above and beyond those given. If a Comp Paving Technical Specification is determined to be applicable but needs supplemental information, the Consultant may include this information as additional notes on the Task drawings. If additional technical specifications are deemed necessary for the Task, the Consultant shall develop the appropriate specifications and submit them to MDOT MAA in Part II of the Technical Provisions.

In general, the Comp Paving technical specifications are more suitable for landside tasks than for airside tasks. Each specification shall be reviewed by the Consultant to ensure compatibility with each task. Several airside specifications have been included in the contract; however, additional specifications may be required.

In the event that additional specifications are required, Consultants shall note that MDOT MAA has developed certain Standard Specifications which are included in PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures. These specifications shall be used if applicable when additional specifications are needed for the Task. Refer to PEGS V2, Chapter 3.6 Construction Specifications.

If the Comp Paving Specifications are deemed adequate and no supplementary specifications are required, the Design shall not in Part II "Not Applicable."

2. Vertical Comp
   There are no Technical Specifications issued to Contractors that apply to all Vertical Comp Tasks. Each individual Task shall have the appropriate specifications developed, tailored to the Task's specific scope of work.

   In addition to the applicable technical specifications tailored to the scope of work, Consultants shall also include MDOT MAA Standard Specification items for each Task where relevant. See PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures.

   Consultant shall prepare remaining Technical Specifications following the most current listing of sections included in Construction Specifications Institute (CSI) MasterFormat Division Numbers (6-digits) and Titles, and Section Format organization. Note that MasterFormat 95 and Section numbering (5-digits) is not acceptable.

3. Method of Measurement and Basis of Payment
   Technical Specifications shall be developed in accordance with PEGS V2, Chapter 3.6 Construction Specifications, and shall include sections for Method of Measurement and Basis of Payment sections.

   The Comp Paving Technical Specifications do not include sections for Method of Measurement or Basis of Payment. Consultants shall include additional notes on the Task drawings to indicate if work and/or materials are incidental to a specific Item. This shall be a requirement for all pay items, regardless of whether they are from the Comp Paving Technical Specifications or from supplemental specifications prepared by the Consultant.

C. Part III – Wage Rates
   Wage rates are provided in the Technical Provisions issued to the Contractor upon award of a Comp Paving or Vertical Comp contract. The wage rats do not need to be provided again if the Task specific Technical Provisions.

D. Part IV – Bid Forms
   Bid Forms are provided in the overall Technical Provisions of both contracts and do not need to be provided again for each Task.

   However, a Bid Tabulation form is required for each Task. Consultants shall develop the Bid Tabulation form with which the contractors will use to submit Unit or Lump Sum prices to MDOT MAA. Consultants shall determine each item of work and the quantity of each item necessary to complete the Task.

   A blank Bid Tabulation Form in Microsoft Word format for Comp Paving and for Vertical Comp is provided in the template found on AIRPortal, or click the following link to download the form directly:
   Comp Paving_Tech Specs and Bid Forms
   Comp Interior-Exterior_Tech Specs and Bid Forms

   Rows can be added or deleted for items depending on the complexity of the work.

2.5.1.2 Construction Contract and Task Number

All Tasks shall be identified by the Comp Paving or Vertical Comp contract number, in the format MAA-CO-XX-XXX, as well as its unique Task number, on the drawings and in the template for the Technical Provisions in the designated spaces. Consultants shall obtain the Task numbers from the MDOT MAA Task Manager during the 100% design stage at the latest, prior to submitting 100% documents.

2.5.1.3 MBE Goal Establishment

MBE goals shall be obtained by the Consultant for all Comp Paving and Vertical Comp tasks issued under the 2016 and future on-call construction contracts. MBE goals will be determined on an individual task basis.

The Consultant shall contact the Compliance Officer, Office of Fair Practice, at the time of the 100% design submission, to initiate the process.

The following items shall be provided by the Consultant, as part of the 100% design submission, to the Compliance Officer, Office of Fair Practice:

A. Part I – General Information Section.
B. Scope of Work and purpose of the task.
C. Engineer's Estimate.
D. Subcontractable items.
E. Contractor Self-Performance Goal.
F. A description of the work that will be the responsibility of the prime contractor.

If a task is deemed to be an "emergency" task by MDOT MAA, the Consultant shall contact Lisa Grant as soon as possible and indicate that said task is an "emergency" task.

Once the MBE goals have been established by the Office of Fair Practice, the Consultant shall include the MBE goals in Part I – General Information Section of the Technical Provisions.

2.5.1.4 Task Durations and Submittal Review

Task durations shall be established during design and documented in the contract documents. In instances when duration is less than 30 days, the Consultant shall be aware that the product submittal review period as defined in the Standard Provisions GP-8.06 is reduced from 21 calendar days to 10 calendar days. For projects requiring materials with a lengthy procurement time, utility relocations, a large number of product submittals or other similar situations, Consultant shall consider specifying a "Phase 0" to account for the duration of these activities prior to the start of construction in the field.

2.5.1.5 Liquidated Damages

The amount of liquidated damages shall be evaluated for each task to be completed under a Comp Paving or Vertical Comp contract. The Consultant shall state the liquidated damages amount(s) in Part I – General Information section of the Technical Provisions for Comp Paving or Technical Provisions for Vertical Comp (see Section 2.5.1.1 Technical Provisions to download). Consultants shall note whether liquidated damages are being assessed per phase, for the overall project duration, or both.

2.5.1.6 Deliverables

Consultants shall deliver each design submittal to the MDOT MAA Task Manager. Pre-bid submittals such as 60%, 100%, etc. will be distributed by the MDOT MAA Task Manager to the Fire Marshal, Construction Manager, and other MDOT MAA stakeholders for review. Bid documents are also delivered to the MDOT MAA Task Manager for their review and delivery to the MDOT MAA Manager, Construction Section.

The following items shall be submitted to the MDOT MAA Task Manager at each submittal level:

1. Task Drawings
2. Engineer's Estimate of Construction Costs
3. Technical Provisions
4. Engineer's Design Report, if required

The number of hard copies and CDs to be distributed for review shall be coordinated with and determined by the MDOT MAA Task Manager prior to the first design submission. This count shall be maintained for the remaining pre-bid design submissions (i.e., 60%, 100%, etc.) unless otherwise directed by the MDOT MAA Task Manager.

CDs shall be formatted in accordance with the design standard for electronic document preparation; however, folders 01_Instructions to Bidders and 02_Standard Provisions need not be included on the CD. Utilize the Comp Paving or Vertical Comp procurement template for the 03_Technical Provisions folder.

The number of hard copies and CDs to be submitted for Bid solicitation shall vary for each contract depending on the number of contractors bidding. Confirm the number of hard copies and CDs with the MDOT MAA Task Manager prior to bid submission.

CDs for Bid solicitation shall contain PDFs of the drawings, Technical Provisions, and Certified Engineer's Estimate. PDFs of the Bid Documents shall display all applicable signatures required in PEGS V2, Chapter 3.4 Drawing Requirements.

2.5.1.7 Pre-Bid Meetings

The Construction Manager will schedule Pre-Bid meetings for each Task. Consultants shall attend the Pre-Bid meetings unless instructed otherwise by the MDOT MAA Task Manager.

2.5.1.8 Conformed Documents

At the direction of the MDOT MAA Task Manager, Consultants shall provide Conformed Documents for Comp Paving/Vertical Comp Tasks in accordance with Section 2.2.5.4 Conformed Construction Documents, and in accordance with the design standard for electronic document preparation. Conformed documents shall be submitted to the MDOT MAA Document Manager in accordance with Section 2.2.5.4 Conformed Construction Documents.

2.5.1.9 Record Documents

Consultants shall provide Record Documents for all Tasks to the MDOT MAA Document Manager in accordance with Section 2.4 Phase IV Record Drawings Project Close Out.

2.5.2 Construction Manager at Risk (CMAR) Contract Design Procedures

Construction Manager at Risk (CMAR) is a project delivery method in which the CMAR commits to delivering a project within a Guaranteed Maximum Price (GMP) which is based on the construction documents and specifications at the time of the GMP plus any reasonably inferred items. This standard is intended for use on vertical building projects only and shall only be used on projects that are over $10,000,000 in construction cost (COMAR 21.05.10.02). All procedures contained herein shall follow COMAR 21.05.10, Construction Management at Risk.

The CMAR shall be procured by a Competitive Sealed Proposals procedure (COMAR 21.05.10.03) which considers qualifications and pre-construction services fee to determine the best value to the State of Maryland. The CMAR project delivery method is most beneficial when the CMAR is procured early in the Design Phase of a project. Unlike a General Contractor, the CMAR provides professional services during both the design phase (Pre-Construction Services) and the construction phase (Construction Services).

Designs produced by the A/E of Record (Consultant) under the CMAR project delivery method shall comply with all sections of this Manual, unless otherwise noted. The following sections describe modifications to the design procedure to be followed by the Consultant for the CMAR project delivery method and anticipated Pre-construction and Construction services to be provided by the CMAR for reference.

2.5.2.1 Phase II Design

While the Design submittals are similar, there are several key differences from PEGS V2, Chapter 2.2 Phase II Design regarding the Consultant's effort during a CMAR project delivery. The Consultant will have to remain flexible during Phase II Design while the CMAR performs Pre-construction Services specified in PEGS V2, Chapter 2.5.2.5 Pre-construction Services Provided by the CMAR. It is anticipated this will be an iterative process – it will not utilize the typical review process described in PEGS V2, Chapter 1.2 Design Reviews – the Consultant will address comments as the design progresses, in addition to each Submittal. The goal of Phase II Design is to produce Issued for Construction (IFC) documents that incorporate feedback received from the Stakeholders, the CMAR, and the agreed upon CMAR GMP defined contract scope.

A. Design Development (30% Review) Submittal
   It is advantageous to procure the CMAR and have them to be actively engaged no later than the end of the Design Development Submittal. All provisions of PEGS V2, Chapter 2.2.1 Design Development (30% Review) Submittal apply to the CMAR project delivery.

B. Construction Documents (60% Review) Submittal
   All provisions of PEGS V2, Chapter 2.2.2 Construction Documents (60% Review) Submittal apply to the CMAR project delivery with one notable exception – the CMAR will utilize the 60% documents to begin construction procurement activities. As such, in addition to providing traditional 60% level of completion drawings, the Consultant shall provide a full set of draft specifications as part of this Submittal – a specification outline is not acceptable. While the term "60% Review" is noted in this section, the actual submittal completion may be between 50% and 90% depending on project conditions. (Note that, per COMAR 21.05.10.04, 50% construction documents are the minimum completion level that the CMAR can utilize for procurement purposes). Actual "60% Review" level of completion will be directed by MDOT MAA prior to commencement of design.

C. Construction Documents (100% Review) Submittal
   All provisions of PEGS V2, Chapter 2.2.3 Construction Documents (100% Review) Submittal apply to the CMAR project delivery. In addition, concurrent with the Consultant's progression of the documents from 60% to 100%, the CMAR will package the 60% documents into trade packages, solicit bids for each trade package, conduct scope review meetings, etc. to determine the best value to the State of Maryland for each trade package. During this procurement, the bidders will be given an opportunity to ask questions and request clarifications. These questions and clarifications will be compiled by the CMAR and submitted to the Consultant as Requests for Information (RFI). The Consultant shall participate in meetings as required to resolve RFI responses and will be required to expeditiously respond to all RFI. All required drawing and/or specification changes during the RFI process shall be issued to the CMAR as Addenda. In addition, Consultant participation in scope review meetings may also be necessary if requested by the CMAR. The Consultant shall perform these services as requested by MAA concurrent with the progression of the construction documents.

D. Bid Documents
   Since the procurement phase of the project is coincidental with the progression of the construction documents from 60% to 100%, a separate Bid Documents Submittal as described in PEGS V2, Chapter 2.2.4 Bid Documents is not required in a CMAR project delivery.

E. Procurement

Since the procurement phase of the project is coincidental with the progression of the construction documents from 60% to 100% and since the CMAR is responsible for development and procurement of trade packaged, full procurement services as described in PEGS V2, Chapter 2.2.5 Procurement are generally not required in a CMAR project delivery. However, there are several exceptions where Procurement services provided by the Consultant will be required. These services are discussed in other subsections of these CMAR Design Procedures.

F. Conformed Construction Documents
When utilizing the CMAR project delivery, Conformed Construction Documents are referred to as "Issued for Construction (IFC)." These documents are prepared after Construction Documents (100% Submittal) Review and incorporate all valid comments from review of the 100% Submittal and all questions and addenda from the procurement. All other requirements of PEGS V2, Chapter 2.2.5.4 Conformed Construction Documents remain in effect.

2.5.2.2 Phase III Construction Administration

All provisions of Volume 2, Section 2.3 apply to the CMAR project delivery.

2.5.2.3 Phase IV Record Drawings & Project Close-Out

In a CMAR project delivery, the CMAR will record all deviations from the IFC documents, RFI responses, Field Revisions, etc. in the documents. At the completion of the work, the CMAR will submit the "as-built" BIM Model to the Consultant. The Consultant shall perform a Quality Assurance review and validation of known deviations of the BIM Model and provide comments to the CMAR. The CMAR will prepare the final Record BIM Model/Drawings and submit to MDOT MAA according to the provisions in PEGS V1, Chapter 5 Building Information Modeling (BIM) Standards and Section 2.4 Phase IV Record Drawings & Project Close Out.

Projects impacting MAA's GIS data according to PEGS V1, Chapter 4.6 GIS Data Compliance Requirements must coordinate with MDOT MAA's GIS and Engineering Technology Section (GETS). The CMAR will be responsible for updating MDOT MAA's GIS data to reflect record conditions.

2.5.2.4 Use of Building Information Modeling (BIM) Software

The Consultant shall utilize BIM Software for the development of all design elements. At each submittal, the Consultant shall provide the BIM Model to the CMAR. The Consultant shall be responsible for the BIM Model through the IFC Submittal. When the IFC Submittal is complete, the Consultant shall transfer responsibility for the BIM Model to the CMAR for the remainder of the project. The BIM Model is to be considered a collaborative tool throughout the design/construction CMAR process and is the property of MDOT MAA.

Refer to PEGS V1, Chapter 5 Building Information Modeling (BIM) Standards.

2.5.2.5 Pre-construction Services Provided by the CMAR

In addition to the development of the GMP, the CMAR typically provides the following services during the Design Phase of a project.

A. Project Administration
The CMAR will establish a presence in the Program Management Office and will become an integral part of the overall project Team. The CMAR will develop construction phase project procedures specific to the Project. They will attend all meetings and presentations during the design phase of the project. They will develop a tracking spreadsheet for all changes to the design proposed by the CMAR. Partnering is an important part of successful projects. For any project that meets the minimum requirements for Partnering set forth by MDOT MAA per PEGS V2, Section 1.5 Partnering Requirements During Construction, the CMAR will participate in and administer the Partnering sessions. Typically, formal partnering will start at the beginning of the construction phase; however, in CMAR project delivery, formal partnering will commence at the beginning of the design phase.

B. Site Survey and Utility Investigations
An advantage of CMAR project delivery is that the CMAR will participate in and witness investigations of existing conditions. The initial site survey shall be performed by the Consultant and reviewed for completeness by the CMAR. Any future site surveys during the Construction Phase will be the responsibility of the CMAR. The CMAR will witness, review, and evaluate all subsurface utility exploration (SUE) performed by the Consultant. The Consultant shall work closely with the CMAR to identify areas where selective demolition may be required (or beneficial) to verify existing building or field conditions. Any agreed upon selective demolition will be the responsibility of the CMAR. SUE work may require an update to MDOT MAA's GIS data. Coordinate with the MDOT MAA Project Manager and GETS to identify the requirements of the SUE project, per PEGS V1, Chapter 1.5 Subsurface Utility Engineering SUE Data Requirements for AIRPortal.

C. Value Engineering
At Submittals as specified by MDOT MAA, the CMAR shall perform Value Engineering Studies. The Consultant shall participate in all activities related to the Value Engineering Studies. It is anticipated that the CMAR will hold multiple brainstorming sessions to develop value engineering concepts for consideration. The CMAR will produce a written report detailing the concepts proposed, including cost savings and a pro/con evaluation of each concept. The Consultant shall participate in the reconciliation of these concepts and provide a recommendation to MDOT MAA regarding which elements should be incorporated into the Design.

D. Schedule
The CMAR shall work with the Consultant to develop an overall program schedule.

E. Constructability Review
The CMAR will review the drawings and specifications, starting with the 30% Submittal, for any constructability issues. The CMAR will develop a list of items which appear ambiguous, confusing, conflicting, or erroneous. The Consultant shall work with the CMAR to address these items and incorporate into the Design as required.

F. Construction Cost Estimates
The CMAR and the Consultant will each develop an independent construction cost estimate that will be updated at each Submittal. The detailed construction cost estimate shall be submitted no later than two weeks after the Submittal date. Both parties will work together to develop a format that is agreeable to both parties for ease of MDOT MAA review and use in obtaining Maryland State procurement approvals. MDOT MAA Standard Provisions for Construction Contracts, Volume 3 – Special Provisions for Construction Manager at Risk Contracts dated June 2018 require a CMAR Contingency and Owner Contingency be included in construction cost estimates. The Consultant shall include these contingencies in the designer-provided cost estimate. After development and updates of the estimates, the CMAR and Consultant shall meet as required to reconcile differences in the construction cost estimate.

G. BIM Clash Detection and Quality Assurance
Throughout design and construction process, the CMAR and the Consultant will work closely to identify and resolve conflicts, clashes, discrepancies, or non-conformance to the MDOT MAA BIM Standards.

H. Commissioning Authority
A Commissioning Authority may be required as part of the CMAR Pre-Construction Services or included in procurement of trade packages as a separate package. As the Commissioning scope may vary, reference the scope in the Request for Proposal for a specific project for all requirements. It is not the intent for the Consultant to act as the Commissioning Authority.

3.1 Electronic Deliverable Requirements

Each project submission will include delivery of electronic files of the project documents for use by the MDOT MAA and incorporation into the AIRPortal database. The database structure mandates that the format of delivered electronic media shall be strictly adhered to. This section serves to outline the requirements and the formats for delivery of Architectural, Engineering, and Construction documents, as well as any document, which is submitted electronically to MDOT MAA's Office of Engineering & Construction for archiving purposes.

Refer to PEGS V1, AIRPortal.

3.1.1 General Electronic Deliverable Requirements

PDF documents submitted to MDOT MAA shall have pages rotated for on-screen readability regardless of page orientation in the hard copy submission.

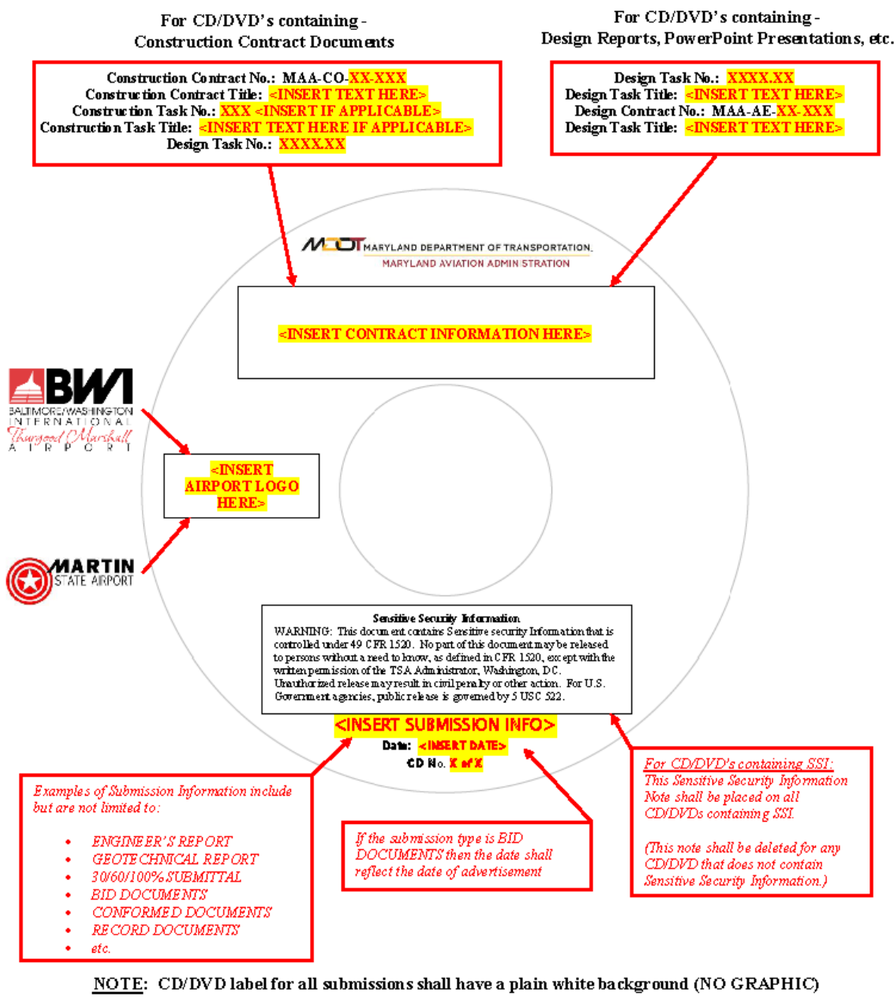
Electronic deliverables outlined in PEGS V2, Chapter 2 Design Procedures that are not reports or specifications (i.e. meeting minutes, Final Task Files, etc.) will be delivered to the MDOT MAA Project Manager as described in PEGS V2, Chapter 2.1 Phase I Studies Programming and Schematic Design.

Documents identified as SSI will be submitted via ADM and will follow the standard MDOT MAA naming conventions outlined in Section 3.3 Standard File Naming Conventions.

3.1.1.1 Deliverables via CDs/DVDs

A. Electronic copies of documents provided to MDOT MAA on CD or DVD shall be with the session closed to ensure maximum cross platform readability.
B. Documents shall be provided in Adobe pdf format, noting the following guidelines:
    1. Resolution of scanned documents shall not be less than 200 dpi and must enable reproduction of the original document without loss of clarity and definition.
    2. Color pages and large size inserts must be scanned to enable the reproduction of the document in its original form, as part of the main document.
    3. PDF Portfolios are not acceptable.
C. Submitted electronic files should not be compressed. (i.e. ZIP) unless otherwise noted.
D. Each CD will include a CD label with the information in the Sample CD/DVD Disk Label below. Word files for the standard CD label are provided on AIRPortal, or click the following link to download the label directly: Standard CD Label.

Sample CD/DVD Disk Label:

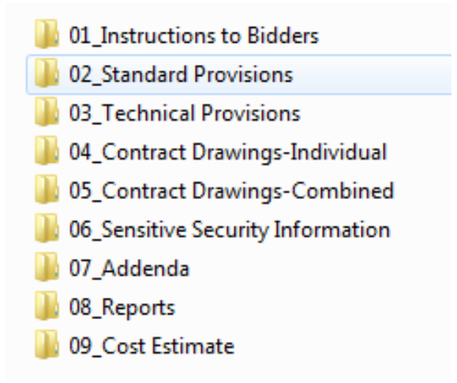


NOTE: CD/DVD label for all submissions shall have a plain white background (NO GRAPHIC)

Sample CD/DVD Disk Label

3.1.1.2 Folder Structure on CDs/DVDs

Files shall be organized into the following folder and file structure for submittal to MDOT MAA. This folder and file structure shall be considered standard and the Consultant shall not alter the folder names or add/delete folders without the written permission of the MDOT MAA Archivist. Document file names within the folder structure shall also be considered a standard with the exception of the individual drawing names, which shall be developed in accordance with the drawing file naming convention contained in Chapter 3.3 Standard File Naming Conventions.



SUBMISSION							STANDARD FOLDER STRUCTURE FOR DIGITAL SUBMISSIONS
30%	60%	100%	BID	ADDENDA	CONFORMED	RECORD	
		●	●				01_Instruction to Bidders
	●	●	●				02_Standard Provisions
	●	●	●		●	●	03_Technical Provisions
●	●	●	●		●	●	04_Contract Drawings - Individual
●	●	●	●		●		05_Contract Drawings – Combined
●	●	●	●		●	●	06_Sensitive Security Information
				●	●		07_Addenda
●	●	●				●	08_Reports
●	●	●					09_Cost Estimate

Standard Project Folder Structure

01_Instructions to Bidders

Consultants shall copy the Link to Adobe Reader and Terms and Conditions from AIRPortal. The Consultant shall not make modifications to these documents.

02_Standard Provisions

Consultants shall copy the latest version of the General Provisions and Special Provisions from the MDOT-MAA Standard Provisions for Construction Contracts. The Consultant shall not make modifications to these documents.

03_Technical Provisions

This folder will contain one (1) pdf file for each volume of the Technical Provisions provided by the Consultant.

i. Volume 1 – Technical Provisions contains the following:
   PART I. General Information
   PART II. Technical Specifications
   PART III. Wage Rates
ii. Volume 2 - Technical Provisions contains:
   PART IV. Bid Forms (documents to be water-marked “NOT FOR BIDDING PURPOSES” on 60%, 100% submissions)

04_Contract Drawings – Individual

This folder will contain individual project drawings in pdf format. See Section 3.3 Standard File Naming Conventions for file naming requirements.

05_Contract Drawings – Combined

This folder will contain a combined set of drawings (one single file). See Section 3.3 Standard File Naming Conventions for file naming requirements.

06_Sensitive Security Information

This folder will contain any drawings or specifications containing SSI. See Section 3.1.2 Electronic documents containing Sensitive Security Information (SSI) for more detail on how to prepare documents in this section.

07_Addenda

This folder for Conformed CD shall contain a copy of each addendum issued during the project’s procurement phase.

08_Reports

This folder shall contain all reports prepared during the life of the project, such as the Design Report, Stormwater Management Report, Geotechnical Report, Environmental Assessment, Hazardous Material Report, etc. See Section 3.3 Standard File Naming Conventions for file naming requirements.

09_Cost Estimate
This folder will contain the Engineer's Estimate of construction and program costs for the project at each design submission. Consultant shall use the Construction Cost Estimating Template described in PEGS V1, Chapter 3.5 Cost Estimating. This folder is omitted on the Bid, Conformed, and Record CDs.

Note: Bid Document requirements may vary slightly for each method of procurement. Refer to the Procurement Templates posted in AIRPortal under General > **PEGS Reference Documents** for more information on the requirements for each procurement type.

3.1.2 Electronic Deliverables Containing Sensitive Security Information (SSI)

On projects containing SSI, the Consultant shall develop the drawings and specifications in accordance with PEGS V7, Chapter 1.3 Management of Sensitive Security Information (SSI) with the following additional requirements for the preparation of the electronic SSI documents:

A. The Consultant shall prepare two distinct CD/DVD's for any project containing SSI: one containing only non-SSI content and one containing only SSI content. Both CD/DVD's shall follow the format described in Section 3.1.1.2 Folder Structure on CDs/DVDs.
B. Non-SSI CD/DVD: This disk shall contain all non-SSI information only. The following "SSI Notice" shall be included on the non-SSI disk as a substitute for each SSI document. The intent of the SSI Notice is to direct the user to the disk containing SSI. This requirement shall apply to CAD and non-CAD deliverables. Because there is no SSI content on this disk, the SSI identification statement shown on the sample CD/DVD label in Section 3.1.1.1 Deliverables via CDs/DVDs shall be deleted.
C. SSI CD/DVD: This disk shall contain all SSI information only. The files and folder structure shall be compressed in a ".zip" file. The ".zip" file shall be password protected. The SSI CD/DVD shall contain this password protected ".zip" file. See PEGS V7, Chapter 1.3.3.7 Transmission of SSI for password requirements. The CD/DVD label for this disk must contain the required SSI identification statement in accordance with Section 3.2 Deliverables by Design Phase. See sample CD/DVD label in Section 3.1.1.1 Deliverables via CDs/DVDs.
D. SSI CD/DVD: Reports/Studies containing SSI shall be password protected even if the report also contains non-SSI information.
E. When submitting files through the AIRPortal Document Manager (ADM) application, SSI files shall not be password protected. ADM will automatically detect and mark files as SSI based on the file names. See Section 3.3 Standard File Naming Conventions for file naming requirements.

Revise Text as appropriate for content

Drawing No. XXXX or Specification Section No. XXXXXX

NOTICE: THIS DRAWING CONTAINS SENSITIVE SECURITY INFORMATION (SSI) THAT IS CONTROLLED UNDER 49 CFR 1520

Requirements for viewing and handling SSI are contained in the Notice to Contractors that is provided in Volume 1 of the Technical Specifications that are provided on this CD.

All SSI information associated with this project, **including this drawing**, is provided on a separate CD that is clearly marked "Sensitive Security Information". No part of this document may be released to persons without a need to know, as defined in CFR 1520, except with the written permission of the TSA Administrator, Washington, DC. Unauthorized release may result in civil penalty or other action. For U.S. Government agencies, public release is governed by 5 USC 522.

SSI Notice

3.2 Deliverables by Design Phase

The table below illustrates the type and quantity of deliverables during each phase of design.

Item	Letter Size (8 1/2"x11") PAPER	Half Size (11"x17") PAPER	Full Size (22"x34") PAPER	PDF [1,2] *CD/DVD*	DWG (e-Transmit) / RVT [1]	PDF [1]	GIS Data File GeoDatabase Check-out [4]
	Quantity of Hard Copies				*AIRPortal*		
CTP Cost Estimates				~~(1)~~			
Technical Memorandum				~~(1)~~			
Draft Study Report	~~(5)~~			~~(5)~~		ADM	
Draft Final Study Report	~~(5)~~			~~(5)~~		ADM	
Final Study Report	~~(5)~~			~~(5)~~		ADM	
Concept Plans		~~(5)~~		~~(10)~~		ADM	
Renderings		~~(5)~~		~~(5)~~		ADM	
PowerPoint Presentations [5]	~~(2)~~			~~(5)~~		ADM	
Preliminary Design-Build Drawings		~~(5)~~	~~(5)~~	~~(10)~~	ADM	ADM	
Preliminary Design-Build Specifications	~~(5)~~					ADM	
Final Design-Build Drawings		~~(5)~~	~~(5)~~	~~(10)~~	ADM	ADM	
Final Design-Build Specifications	~~(5)~~					ADM	
30% Drawings		~~(5)~~		~~(6)~~	ADM	ADM	
30% Outline Specifications	~~(5)~~					ADM	
30% Engineer's Report	~~(5)~~					ADM	
30% Cost Estimate	~~(1)~~						
60% Drawings		~~(5)~~		~~(6)~~	ADM	ADM	
60% Specifications/Bid Forms	~~(5)~~					ADM	
60% Engineer's Report	~~(5)~~					ADM	
60% Cost Estimate	~~(1)~~						
100% Drawings		~~(5)~~		~~(6)~~	ADM	ADM	
100% Specifications/Bid Forms	~~(5)~~					ADM	
Final Engineer's Report	~~(5)~~					ADM	
100% Cost Estimate	~~(1)~~						
Geotechnical Report	~~(4)~~			~~(5)~~		ADM	
Geotechnical Boring/Coring Locations					ADM	ADM	
Geotechnical Logs						ADM	
Bid Drawings (Comprehensives)		~~(3)~~		~~(2)~~	ADM	ADM	
Bid Specifications/Bid Forms (Comprehensives)	~~(2)~~					ADM	
Cost Estimate to Match Bid Forms (Comprehensives)	~~(1)~~			~~(1)~~		ADM	
Bid Drawings				(15) Drawings Only	ADM	ADM	
Bid Specifications/Bid Forms	(5) Volume 1 (1) Volume 2			(1) All documents (1) Copy complete V1 and V2 in .pdf format emailed (1) Copy GI Section V1 in .docx format emailed		ADM	
Cost Estimate to Match Bid Forms	(1)			(1)		ADM	

Addendum Drawings				See bid		ADM	
Addendum Specifications/Bid Forms	See Bid					ADM	
Conformed Drawings		(2)	(2)	(2)	ADM	ADM	
Conformed Specifications/Bid Forms	(2)					ADM	
Conformed GIS Data [4]						ADM	(See Note 4 below)
Record Drawings				(1) - (if AIP)	ADM	ADM	
Record Specifications						ADM	
Record GIS Data [4]						ADM	(See Note 4 below)
Photographs [5]				~~(1)~~			
Final Stormwater Management Report	~~(2)~~			~~(3)~~		ADM	

1. *All electronic documents (pdf, dwg, rvt, etc.) must comply with MDOT MAA's standard naming convention.*
2. *PDF for review distribution to be delivered to MDOT MAA Task Manager as directed.*
3. *ADM is the AIRPortal Document Manager used for direct submission to MDOT MAA for archiving purposes.*
4. *For project requiring GIS Deliverables, please contact the AIRPortal Administrator prior to initiating design activities to obtain a File GeoDatabase Check-out and to coordinate procedures for data submissions.*
5. *For presentations and photographs, reduce file size as appropriate.*

3.3 Standard File Naming Conventions

STANDARD NAMING CONVENTIONS - SUMMARY TABLE				
Document Type	**File Format**	**Naming Convention * KEY: <RED> required, *<BLUE italics>* as needed**	**Example**	**Submission Notes**
Design Reports/Studies (Draft, Draft-Final)	PDF	<DOCUMENT TITLE><*_V#*><*_REVISED*>_<date using the format yyyymmdd><*_SSI*>.pdf	B-C Security Checkpoint and Connector_V2_20120501.pdf	
Design Reports/Studies (Final and CTP Estimates **)	PDF	<DOCUMENT TITLE><*_V#*><*_REVISED*>_<date using the format yyyymmdd><*_SSI*>.pdf	B-C Security Checkpoint and Connector_V2_20120501.pdf	CTP Estimates should include "CTP Estimate" as part of the document title.
Geotechnical Reports	PDF	<DOCUMENT TITLE><*_V#*>.pdf	Runway 15R-33L Safety Area Improvements.pdf	Full Geotechnical Report.
Geotechnical Borings/Corings	PDF	<B (Boring) or C (Coring)> - <AE Task No.> - <Location Number>.pdf	B-2616.00-AJK-67.pdf	One PDF per log
Exhibits/Concept Plans/Renderings	PDF	<DOCUMENT TITLE><*_REVISED*>_<date using the format yyyymmdd><*_SSI*>.pdf	MTN Rehabilitation of Helipad Taxiways_20120214.pdf	
PowerPoint Presentation	PDF	<DOCUMENT TITLE><*_REVISED*>_<date using the format yyyymmdd><*_SSI*>. pdf	International Terminal Presentation_20040209_SSI.pdf	
	PPTX	<DOCUMENT TITLE><*_REVISED*>_<date using the format yyyymmdd><*_SSI*>.pptx	International Terminal Presentation_20040209_SSI.pptx	
Plans/Drawings • 30%, 60%, 100% • Bid • Conformed • Record	PDF	<*V#_*><sequence#>_<sheet #>_<sheet title><*_SSI*>.pdf	V2_0201_ES202_PORTAL DETAILS.pdf	Submitted as individual files, 1 per sheet in set. ALL CAPS acceptable.
	eTransmit	<*V#_*><Project Title><*_SSI*>.zip	V2_B-C Security Checkpoint and Connector.zip	Submitted as a single file or as volumes as required. SSI should be provided as separate volumes.
Technical Specification/Bid Forms • 30%, 60%, 100% • Bid	PDF	<Project Title><*_V#*><*_SSI*>.pdf	B-C Security Checkpoint and Connector_V1.pdf	SSI should be provided as separate volumes.

• Conformed • Record				
Addenda	PDF	*<V#_>*<Project Title>_Addendum <number>*<_SSI>*.pdf	Concourse E Extension - Site Work_Addendum 3.pdf	Combine entire Addenda into one multi-page PDF.
Photographs	JPG	<date using the format yyyymmdd>_*<photo sequence #>*_<Photo subject>	20161001_02_VSR Stop sign 43.jpg	

** - Special characters("/", "\", "&", "*", etc) are not permitted in file names.*
*** - "Final" CTP Estimates are to be submitted as Reports. All other cost estimates are to be submitted to the MDOT MAA Project manager.*
SSI documents should follow established protocols for distribution except for submissions using AIRPortal Document Manager (ADM)
Filenames will use a combination of upper and lowercase letters to improve readability.
Filenames that are excessively long may require truncating using acceptable MDOT MAA abbreviations.
Digital documents submitted to the MDOT MAA Project Manager, Procurement or Construction are to be made on CD/DVD ROM

3.4 Drawing Requirements

All drawing submissions to MDOT MAA shall meet the requirements described in this section as well as PEGS V1, Chapter 3 CAD Standards.

3.4.1 Standard Drawings

MDOT MAA has established standard drawings that shall be included in the plan sets for all contract documents. They are found in PEGS V2, Appendix 2C Standard Contract Drawings.

3.4.1.1 Standard Title Sheet

Each project shall utilize the standard title sheet provided for either BWI Marshall or Martin State Airport which are found in PEGS V2, Appendix 2C Standard Contract Drawings.

3.4.1.2 Standard Border

All sheets following the Title Sheet shall utilize the MDOT MAA standard border provided for either BWI Marshall or Martin State Airport which are found in PEGS V2, Appendix 2C Standard Contract Drawings.

3.4.1.3 General Construction and Safety Notes

To ensure accurate and consistent information is included with each plan set, all consultants shall use the standard General Construction and Safety Notes Sheets found in PEGS V2, Appendix 2C Standard Contract Drawings. There are four versions of the General Construction and Safety Notes to be selected based on the location of the project, as described below:

A. Projects that impact the Security Identification Display Area (SIDA) at BWI Marshall Airport. Any project that requires access into the SIDA shall include this version of the notes in the construction documents.
B. Projects that impact the Sterile Area of the Terminal Building. The Sterile Area is considered those areas that a person has to pass through security to access, but does not include work on the SIDA, outside of the Terminal Building at BWI Marshall Airport.
C. Projects not within the secure area of BWI Marshall Airport. Note that non-secure areas within the Airport's main Terminal Building and extending 300 feet from the non-secure (public-side) face of the main Terminal Building, as well as public areas within ten feet of the security perimeter fence are considered restricted public areas and have specific security requirements as identified in Specification 010005X_Security Requirements During Construction at BWI. Note that the Hourly Garage is exempt from the restrictions for areas within 300 feet of the terminal building.
D. All projects at Martin State Airport.

Each version of the notes has highlighted sections within it. These highlighted sections are to be reviewed and edited as appropriate for each project.

Any proposed changes to the notes shall be submitted to the MDOT MAA's Project Manager for approval.

3.4.2 Project-Specific Drawings

The following drawings shall be included in plan sets as applicable.

3.4.2.1 Standard Survey Sheet

The MDOT MAA has established standard survey control for both BWI Marshall and Martin State Airports (please refer to PEGS V2, Chapter 6.1.1 Survey Control). All drawing sets involving survey work/grading are required to include the appropriate BWI Marshall or Martin State Airports Standard Survey Control Drawing contained in PEGS V2, Appendix 2E Survey Control Manuals.

3.4.2.2 MDE Standard Erosion and Sediment Control Notes and Details

Refer to PEGS V4, Chapter 3.1.1 MDE Standard Erosion and Sediment Control Notes and Details.

3.4.2.3 Stormwater Management Plans

Refer to PEGS V4, Chapter 3.1.2 Stormwater Management Plans.

3.4.2.4 Quantity Sheet for FAA Projects

A Quantities Sheet is required for all federally funded projects. The Quantities Sheet shall identify federally and non-federally funded quantities.

3.4.2.5 Construction Staging and Stockpiling Areas

Construction Staging and Stockpile Areas shall be shown on all drawings and be coordinated with the MDOT MAA Project Manager and the MDOT MAA Office of Engineering & Construction, Construction Section.

3.4.2.6 Geotechnical Boring & Core Data

Refer to PEGS V1, Chapter 1.3.4.2 Geotechnical Boring & Core Data Requirement for AIRPortal.

3.4.2.7 Construction Phasing Plans

Construction Phasing Plans shall be developed according to PEGS V2, Chapter 5.3 Construction Duration and Phasing.

3.4.2.8 Maintenance of Traffic (MOT) Plans

Maintenance of Traffic Plans shall be developed according to PEGS V2, Chapter 5.4 Maintenance of Traffic.

3.4.3 Signature Requirements for Bid Set Construction Drawings

3.4.3.1 Designer of Record Signature Requirements

The construction project's bid set drawing cover sheet shall be signed and sealed by a Maryland Licensed Design Professional (registered Professional Engineer or Architect as appropriate) as the Designer of Record in the designated space.

All bid set plan sheets in the plan set are to be signed and sealed by a Maryland Licensed Design Professional in the designated space within the title block. The Professional Certification block shall be completed with the professional's license number and expiration date in the designated space. Design Professionals shall only sign and seal plan sheets for which they are responsible for the design.

3.4.3.2 Office of Engineering & Construction Signature Requirements

All bid set construction project's drawings shall be signed by the Office of Engineering & Construction, Engineering or Architectural Section Managers or their designated person. Signatures from the Office of Engineering & Construction are only required on the drawing Cover sheet in the space provided.

3.4.3.3 Office of the Fire Marshal (OFM) Signature Requirements

The Fire Marshal must sign the bid set construction project's drawing Cover sheet in the space provided for all Tasks.

Additionally, Life Safety plans are required to be signed by the Fire Marshal on the signature block provided on the drawing. If there are multiple Life Safety sheets, a signature is required on each individual sheet.

3.4.3.4 MTN Signature Requirements

For all construction projects at Martin State Airport, the bid set Cover sheet must be signed by the Martin State Airport Director in the space provided.

3.4.3.5 Additional Signature Requirements

Additional signatures may be required on plans in the plan set. Refer to the following DST sections for detailed requirements.

Security Bid Plan	PEGS V7, Chapter 1.1.1 Security Plan
Construction Safety and Phasing Plan (CSPP)	PEGS V2, Chapter 5.5 Construction Safety and Phasing Plans

Erosion & Sediment Control Notes (Owner/Developer Certification)	PEGS V4, Chapter 3.1.1 MDE Standard Erosion and Sediment Control Notes and Details

3.4.4 Signature Requirements for Conformed Construction Drawings

All conformed drawings shall be signed and sealed by a Maryland Licensed Professional (registered Professional Engineer or Architect) as the Designer of Record in the designated space.

3.5 Construction Cost Estimating

3.5.1 Development of Construction Cost Estimates

Since the MDOT MAA utilizes various funding sources for construction projects, the following procedure outlines the requirements for development of construction cost estimates, and supplemental requirements for preparation of quantity plan sheets, tabulation of bids and bid forms.

A. "Design Contingencies" should be included in all construction cost estimates. The percentages should be determined by the design consultant for the individual project components and should be higher for early budget estimates and decreased as the design progresses. The final Engineer's Estimate should not have any design contingency.
B. In addition to the design contingencies discussed above, all estimates should have a "Miscellaneous Work Allowance" added after the subtotal to account for change orders. The amount of Miscellaneous Work Allowance has generally ranged between five (5) and ten (10) percent but should be coordinated with the MDOT MAA Project Manager.
C. All estimates shall include line items as described in the Security Requirements During Construction specification relating to the project (i.e., airside, terminal, MTN, etc.). Refer to the applicable Security Requirements During Construction specification in PEGS V2, Appendix 2D Standard Specifications for the basis of payment and method of measurement of specific line items when determining costs for the estimate.
D. Design contingencies and construction contingencies should be listed as separate line items.
E. Once a project component has been identified in the budget or subsequent estimates, it must be carried forward as a line item in all future estimates. When work is added to the project scope, an additional line item should be included in the estimate to cover that work. Back-up for each line item should be attached.
F. For projects with Federal (AIP) or PFC funding, eligible and non-eligible costs should be separated. For estimates with these costs, a narrative should be attached, briefly outlining which costs are non-eligible and why.
G. For unit price contracts, the quantities for the various line items with different funding sources should be calculated and shown separately in the Quantity plan sheets and Tabulation of Bids.
H. For lump sum contracts, language should be added in the bid forms requiring the Contractor to furnish MDOT MAA with a breakdown of the total bid into the project components as necessary to allow the determination of eligible and non-eligible costs under different funding sources.
I. All cost estimates shall be program costs which shall include both construction costs and soft (design and construction management) costs.

The MDOT MAA standard format for cost estimates should be used for preparing all estimates. It is found in PEGS V2, Appendix 2B Standard Forms. Percentages shown in the cost estimate form for contingencies, overhead and profit, etc. are samples. It is the consultant's responsibility to select the correct percentage and apply the correct formulas within the spreadsheet.

3.5.2 Bid Tabulation Format Cost Estimates

When final contract documents or addendum documents are submitted for bidding, the A/E Consultant shall be responsible for delivering a final complete construction cost estimate prepared as described below to the MDOT MAA Project Manager, as well as, the Office of Procurement. For the on-call construction contracts, the A/E Consultant shall be responsible for delivering a final complete construction cost estimate prepared as described below to the MDOT MAA Project Manager, as well as, the Office of Engineering and Construction, Construction Section.

The A/E Consultants are required to submit a completed set of **Bid Tabulation Format Cost Estimate** wherein the A/E Consultant has filled in the same **Unit Prices** and **Total Prices** on the Bid Forms as those presented in the A/E Consultant's cost estimate in the same manner as a prospective bidder would. The A/E Consultant's Bid Tabulation Format Cost Estimate shall have identical bid **Item Numbers**, **Description**, **Units** and **Approximate Quantities**. For lump sum bid items, the A/E Consultant cost estimate shall also include separate lump sum breakdowns for each lump sum item used. Lump sum breakdowns can be prepared using any industry accepted cost estimating program, and the breakdown information shall be included as an Appendix to the cost estimate.

The A/E Consultant shall be responsible for the review of each line item to ensure that the **Item Numbers**, **Description**, **Units** and **Approximate Quantities** of the Bid Tabulation Format Cost Estimate and the Bid Tabulation Forms correspond to each specification section's "Method of Measurement" and "Basis of Payment" descriptions.

3.5.3 Bid Tabulation Format Cost Estimate Certification

The A/E Consultant shall also provide a cover letter on their company's letterhead for the completed set of Bid Tabulation Format Cost Estimate containing the following statement:

"I hereby certify that I have personally checked the bid tabulation forms, cost estimate and specifications for consistency and completeness and certify that there are no missing or incomplete pay items, units, or other discrepancies".

Project Manager: *Insert Signature of Project Manager*
Project Manager's Typed Name "

3.5.4 Liquidated Damages

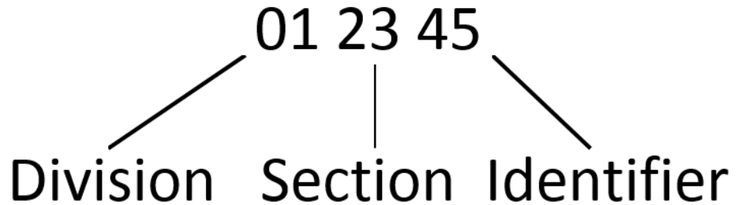
The Consultant shall provide to the MDOT MAA written documentation outlining the basis for liquidated damages. The documentation shall be provided to the MDOT MAA Project Manager at 100% submittal.

3.6 Construction Specifications

Technical Specifications shall be included in all construction contract documents prepared for the MDOT MAA. The Consultant should identify in writing to the MDOT MAA Project Manager inclusion of any special technical requirements in the contract specifications (i.e. pre-qualification for minimum years of experience, dollar value of past work, certifications, warranties, proprietary procurement, value engineering; etc.). MDOT MAA will approve the special requirements on a case-by-case basis.

3.6.1 Specification Format and Numbering

The MDOT MAA has adopted the American Institute of Architects (AIA) "MasterSpec®" building construction specifications system (MasterSpec), which incorporates the Construction Specifications Institute (CSI) MasterFormat™ Numbers and Titles. All specifications shall follow the MasterSpec standard six-digit numbering system:



MasterSpec Numbering System

A Table of Contents of MasterSpec divisions is included in PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D MAA Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures. Where no existing MasterSpec division or section exists, Consultants shall use their best judgment to select a number to appropriately describe the item specified. All building contract specifications shall be developed using the current edition of MasterSpec.

Specifications shall generally implement the following format convention:

PART 1 – GENERAL
PART 2 –PRODUCTS
PART 3 – EXECUTION
PART 4 – METHOD OF MEASUREMENT
PART 5 – BASIS OF PAYMENT

Sections not used shall note "Not Used" in the body of the section.

3.6.2 MDOT MAA Standard Specifications

MDOT MAA has developed several Standard Specifications to be utilized on relevant contracts, which are included in PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D MAA Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures. MDOT MAA Standard Specifications include an "X" following its specification number. These specifications contain "Notes to the Consultant" shown in shaded boxes, instructing the Consultant to modify sections of the specification as necessary to suit the individual project. These notes and boxes shall be deleted once the note is addressed.

MDOT MAA standard procedural specifications are included as part of Division 01. Other MasterSpec Division 01 requirements must be closely coordinated with the MDOT MAA "Standard Provisions for Construction" and individual construction management requirements. Do not duplicate items in a Division 01 spec that are included in an MDOT MAA standard spec (i.e. Mobilization). MDOT MAA's "Standard Provisions for Construction" address many of the MasterSpec Division 01 requirements and will take precedence. Additional Division 01 items shall only be used to supplement and enhance the MDOT MAA "Standard Provisions for Construction Contracts."

A. MDOT MAA Division 01 specifications include the following which must be used on all MDOT MAA projects:
010001X Mobilization/Demobilization
010002X Construction Quality Control (CQC)
010004X Temporary Construction Items
010011X Miscellaneous Construction Allowance
010013X Asset Management Requirements for Non-BIM Projects
017419X Construction Debris Management and Disposal

B. MDOT MAA Division 01 specification include the following which shall be used based on the project requirements:
010003X Maintenance, Repair and Operating Items (MROI) – Refer to PEGS V2, Chapter 4.5 Maintenance Repair and Operating Items (MROI).
010005X Security Requirements During Construction at BWI – Refer to PEGS V7, Chapter 1.1 Security at BWI Marshall Airport.
010006X Security Requirements During Construction at MTN – Refer to PEGS V7, Chapter 1.2 Security at Martin State Airport.
010007X Sensitive Security Information (SSI) System Requirements During Construction – Refer to PEGS V7, Chapter 1.3 Sensitive Security Information.
010008X Management of Universal Wastes – Refer to PEGS V4, Chapter 2.5.1.4 Management of Universal Wastes.
010009X Management of Radioactive Wastes – Refer to PEGS V4, Chapter 2.5.1.3 Management of Radioactive Wastes.
010010X Survey Requirements During Construction (AGIS)
010012X Building Information Modeling (BIM) Use During Construction – Refer to PEGS V1, Chapter 5 BIM Standards
017823X Operation and Maintenance Data

3.6.3 MDOT MAA Special Product/Sole Source Requirements

The MDOT MAA has developed specifications for several construction products for which special requirements and/or sole source procurement are required. On projects utilizing one or more of these products, the Consultant shall include the referenced specification(s) from PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D MAA Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures in the Contract documents. For certain products, MDOT MAA has provided only a partial spec (i.e. Part 2 – Products only). Consultant shall insert the provided specification language into the referenced specifications section and complete the specification with information applicable to the project.

A list of products with MDOT MAA special requirements and their referenced specifications sections are included in the list below. Note that additional product requirements may exist for each project, and the Consultant shall coordinate with the MDOT MAA Project Manager to obtain those requirements to include in the project's Technical Specifications.

MDOT MAA Special Product Requirements

1. Door Hardware (Section 087100)
2. Building Automation Systems (BAS) (Section 230900)
3. Air Flow Monitoring System (in Meters and Gauges, Section 230519)
4. Flow Meters (in Meters and Gauges, Section 230519)
5. Power Monitors for Low Voltage Switchgear (Section 262300)
6. Panelboards (Section 262416)
7. Variable Frequency Drives (Section 262923)
8. Closed-Circuit Television (CCTV) System (Section 282300)
9. Controlled Access Security System (CASS) (Section 280708)
10. Fire Alarm System (Section 283111)
11. ~~Flexible Response System (Section 283200)~~
12. Landscaping (Section 329000X)
13. Topsoil (Section 329115X)
14. Plant Installation (Section 329300X)
15. Seeding (Section 329201X)
16. Sodding (Section 329202X)
17. Mulching (Section 329203X)
18. Natural Gas Distribution (Section 335103X)

19. Passenger Boarding Bridges (Section 347713X)
20. Underground Storage Tanks (UST) (Section 231313)
21. Above Ground Storage Tanks (Section 231323)

3.6.4 FAA Specifications for Airfield

The Consultant shall use the applicable FAA specifications for items located on the airfield which are subject to FAA review. These specifications can be found in the FAA AC 150/5370-10G – Standards for Specifying Construction of Airports. Note that several FAA specifications have been modified for MDOT MAA use, and are contained in the MDOT MAA Standard Specifications in PEGS V2, Appendix 2D Standard Specifications.

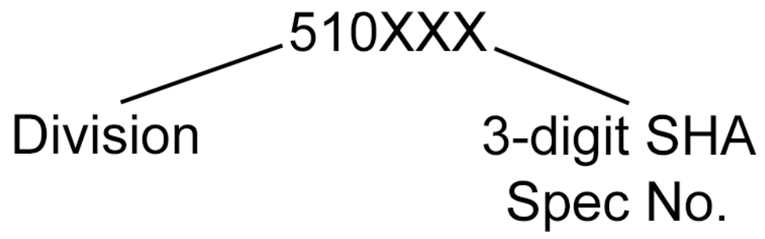
FAA Specifications shall be listed under "Division 50: FAA Specifications" in the Specifications Table of Contents. Each specification shall retain its FAA specification number for ease of FAA project review.

Example:
Division 50: FAA Specifications
L-109 Modifications and Additions to Airfield Lighting System
P-401 Plant Mix Bituminous Pavements

3.6.5 Landside Site Work Specifications

MDOT MAA has adopted the Maryland State Highway Administration (SHA) Standard Specifications for Construction and Materials for non-airfield roadway and landside site construction. The applicable SHA specification number may be referenced in "Part 3 – Execution" of the technical specifications for landside site work items, noting any modifications to the specifications necessary for the specific project. SHA specifications used on a contract shall be numbered using the six-digit convention below for continuity with the remaining project specifications using MasterSpec format.

Division 51: SHA Specifications



Example: 510508 for SHA Specification 508, Milling Hot Mix Asphalt Pavement

The current SHA Standard Specifications for Construction and Materials can be found on the SHA website, (http://www.roads.maryland.gov), or hard copies may be purchased by contacting:

Maryland State Highway Administration, Cashier Office
211 E. Madison Street
Baltimore, Maryland 21202
Telephone: 410-545-8490

MDOT MAA Standard Provisions (SP) will be used in lieu of the SHA's General Provisions (GP) and Terms and Conditions (TC) provided in this document.

SHA Section 700 – Landscaping and Section 920 – Landscaping Materials are not to be used. Landscaping and Landscaping Materials for MDOT MAA construction projects are included in Volume 4, Appendix 4B - Standard Specifications under Division 23, Exterior Improvements.

3.6.6 Miscellaneous Specification Requirements

A. All contract milestones shall be specified in calendar days from NTP. If specifying specific dates it must be approved by the MDOT MAA Project Manager in advance.
B. All incentives must be approved by the MDOT MAA Project Manager in advance.

C. Sole source and proprietary items, other than those specified by the MDOT MAA standard specifications and special product requirements contained in PEGS V1, Appendix 1G Standard Specifications, PEGS V2, Appendix 2D MAA Standard Specifications, PEGS V4, Appendix 4B MAA Standard Procedures, PEGS V6, Appendix 6B Standard Specifications, and PEGS V7, Appendix 7B MAA Standard Procedures, must be approved by the MDOT MAA Project Manager in advance.
D. Performance specifications which require the contractor to design/build shall be identified and brought to the attention of the MDOT MAA Project Manager in advance. The consultant should provide justification for using this method.
E. Specifications which require pre-qualification of contractors and suppliers (i.e. the number of years providing specific products or services, previous project experience etc.), should be identified and brought to the attention of the MDOT MAA Project Manager in advance. The consultant should provide justification for pre-qualification requirements.
F. Specifications which have specific warranty/maintenance requirements beyond the MDOT MAA standard of one year shall be identified. The consultant should provide justification for extended/additional warranty maintenance requirements and brought to the attention of the MDOT MAA Project Manager in advance.

3.7 Reports

3.7.1 Design Reports and Studies

A draft, draft-final, and final Engineer's report is required for all FAA reviewed and funded projects. For all non-FAA projects, verify with the MDOT MAA Project Manager during the proposal preparation phase if an Engineer's report is required for the project. All Engineer's reports shall be marked as "draft" until approved by the MDOT MAA Project Manager. Once approved by the MDOT MAA Project Manager, the final report shall be issued.

All design reports and studies shall follow the format shown in the standard template available in AIRPortal under **General > PEGS Reference Documents**. Template is available in 8.5x11 and 11x17 format and includes:

A. Cover page
B. Table of Contents
C. Section I. Executive Summary
D. Section II. Design/Study Report
E. Section III. Appendices – Appendices include, but not limited to, meeting minutes, review comments and responses, cost estimate, exhibits, geotechnical report.
F. Section IV. Design Report General Information

3.7.2 Geotechnical Reports

When a geotechnical study is included in the scope of work for projects at BWI Marshall or Martin State Airports, the consultant shall submit the final geotechnical report as outlined below. Geotechnical investigations shall be performed in accordance with PEGS V2, Chapter 6.1.3 Geotechnical Investigations.

3.7.2.1 Hardcopy Submission

The final Geotechnical Report shall be submitted to the MDOT MAA Project Manager as an appendix to the Engineer's Report.

3.7.2.2 Digital Submission

Refer to PEGS V1, Chapter 1.4.2.2.A, Geotechnical Reports.

3.7.3 Stormwater Management Reports

Refer to PEGS V1, Chapter 1.4.2.2.B, Stormwater Management Reports.

4.1 ALP Coordination

Refer to Volume 5, Section 2.1.

4.2 FAA Requirements for Proposed Development

Refer to Volume 5, Section 2.2.

4.3 Internal MDOT MAA Coordination

4.3.1 Office of the Fire Marshal (OFM) Coordination

Refer to Volume 3, Section 1.1.

4.3.2 Zoning Permits

Refer to Volume 5, Section 2.3.

4.3.3 Tenant Information Advisories

All Consultants performing field inspections are required to coordinate with the Office of Airport Operations to determine if a Tenant Information Advisory is required prior to conducting inspections. The Office of Airport Operations requires a ten (10) day advance notice for Tenant Information Advisories.

4.4 Designated Sub-Contractors for Specific Airport Systems

The Maryland Aviation Administration maintains several vendors under contract to provide design and installation services on specific systems at the airport. If a construction project requires participation of such a "Designated Sub-Contractor" on a project at BWI Marshall and Martin State Airports, it shall be the designer's responsibility to coordinate and ensure the following:

A. Determine what existing airport systems are within the scope of the design and may require alteration. Coordinate with MDOT MAA to determine which systems have vendors under contract to provide alteration, maintenance, or similar services that would be required to be performed under the proposed design. A partial list of sample systems is provided below:
    1. Fire Alarm System
    2. Controlled Access Security System (CASS)
    3. Closed Circuit Television System (CCTV)
    4. Multi-User Flight Information Display System (MUFIDS) and Baggage Information Display System (BIDS)
    5. Building Automation and Control (METASYS)
    6. Distributed Antenna System (DAS)
    7. Public Address System
    8. Automated External Defibrillators (AED)
    9. Flexible Response System
    10. Wall Mounted Advertisement
    11. Public Telephones
    12. Parking Access and Revenue Control Systems (PARCS)
    13. Air Navigation Systems (NAVAIDS)
    14. Utilities (Gas, Power, and Communication)
    15. Airfield Lighting Control System
    16. Airlines (Equipment and Wiring Systems Owned by Airlines)
    17. FAA (Equipment and Facilities Owned and Operated by FAA)
    18. TSA (Equipment and Facilities Owned and Operated by TSA)
    19. Master Clock System
    20. Noise Monitoring and Analysis System
    21. Artificial Turf

In addition, the designer shall add a section to the Engineer's Report titled "Designated Sub-Contractors" and state whether the construction project requires participation of Designated Sub-Contractors. If so, the consultant shall identify and list the vendor(s) and the respective system(s) that are impacted under the project. The consultant shall include a summary of the scope of services and fee estimates received from vendor(s) in the referenced section of the Engineer's Report.

B. Coordinate, as necessary, the requirements of the design, the preparation of a scope of services to clearly define the work proposed, and the responsibilities of the owner, designer, contractor, and designated sub-contractor.
C. Verify with the Office of Procurement that Sole Source documentation is/is not required.
D. Reflect the scope and responsibilities in the contract documents.
E. Secure written final scope and cost proposal from the designated sub-contractor.
F. It shall be a requirement to have all final scope and cost proposals submitted to MDOT MAA from every vendor required for a given project prior to proceeding with advertisement. This requirement may be waived on a case by case basis with prior written approval of the MDOT MAA Task Manager.

4.5 Maintenance, Repair, and Operating Items (MROI)

Maintenance, Repair and Operating Items (MROI) were formerly known as "attic supplies" or "attic stock." During the design phase of a project, Designers shall coordinate with MDOT MAA to determine if MROI is required, and if so, the type and quantity items needed. Designers shall not specify MROI unless requested in writing by the MDOT MAA. MROI shall be included as an agenda item for discussion in the project's design review meetings. All projects requiring MROI shall include in the construction documents standard Specification 010003X_Maintenance, Repair and Operating Items (MROI)_with forms. Specification 010003X is included in Appendix 2D - Standard Specifications.

4.5.1 MROI Approval Form

Designers are required to fill out the MROI Approval form in Appendix 2B.3 – MROI Forms if the project includes MROI to be turned over to MDOT MAA. Items that are anticipated to be salvaged must be listed on the form and noted that it is a salvaged item. This list shall include:

A. Applicable specification section of the item – this is not the Specification 010003X that specifies MROI.
B. Material/Product description – similar materials shall be listed together, e.g., carpet, ceiling tiles, ceramic tiles.
C. Quantity – a specific quantity and measurable unit is required. A percentage of materials is not acceptable.
D. Unit – SY, CY, Each, etc.
E. Person Requesting – MDOT MAA employee or representative who requested the item.

All equipment turned over to MDOT MAA shall be accompanied by any and all operating/ service/maintenance manuals, equipment specifications, and vendor information such as where obtained, spare part sources, etc.

The designer shall obtain necessary signatures on the MROI Approval form prior to advertisement. This form shall be included in the project's final design report. If no Design Report is prepared for the project, a scanned copy of the signed MROI Approval form shall be emailed to the MDOT MAA Task Manager for inclusion in the task file.

4.5.2 Signature Requirements for MROI

A signature from the following MDOT MAA Offices shall be obtained for all MROI Approval forms:

A. Office of Engineering & Construction – signed by MDOT MAA Task Manager
B. Office of Capital Programs – signed by Director
C. Office of Procurement – signed by Procurement Officer

If the MROI specified includes items requested by the Office of Facilities Maintenance, then a signature from the Director/Deputy Director of Facilities Maintenance is required. If there are no items requested by the Office of Facilities Maintenance, then the Designer shall write "N/A" and initial the signature line for the Office of Facilities Maintenance confirming that the MROI listed on the form are not applicable to the Office of Facilities Maintenance.

If the MROI specified includes items requested by the Office of Information Technology (OT), then a signature from a Director of OT is required. If there are no items requested by OT, then the Designer shall write "N/A" and initial the signature line for OT confirming that the MROI listed on the form are not applicable to OT.

4.5.3 MROI List Form

After all parties have agreed to the type and quantity of MROI required for the project and signatures on the MROI Approval form are obtained, the Designer shall fill out the MROI List form in Specification 010003X to include in the contract specifications. The items included in the MROI List form shall be identical to the items listed in the MROI Approval form. If during the approval process, items were not approved, the Designer shall not include those items on the MROI List form for bid.

The purpose of the MROI List form is to clearly identify in one place items to be turned over to MDOT MAA as required throughout the contract specifications. The completed MROI List form shall be placed in the contract specifications directly behind Specification 010003X. Blank lines shall be provided to allow for any MROI generated during construction. A blank MROI Record of Delivery form shall be placed behind the MROI List form in the specifications. The MROI Record of Delivery form is to be filled out by the contractor for each item delivered to the MDOT MAA as MROI, and includes information such as product description, contract requirement, quantity, price, and date delivered. The completed MROI Record of Delivery forms will be submitted to the MDOT MAA Construction Section Manager on the date of MROI delivery. See Specification 010003X for additional details.

4.6 Environmental Coordination and Permitting

Refer to Volume 4, Environmental and Noise.

5.1 Security

Refer to Volume 7, Chapter 1.

5.2 Construction Safety

5.2.1 Vehicle Access on BWI Airport Movement Area

Access to the movement area (taxiways and runways) is restricted to vehicles with an essential function. An essential function is defined as having a need to be on the movement area, e.g., working on runway edge lights. The intent of this action is to eliminate all convenience crossings. Using the movement area to get to other portions of the airport that can be accessed by alternative routing is not permitted. Any questions regarding accessing the movement area can be directed to the MDOT MAA Operations Center Manager at 410-859-7024.

5.2.2 Use of Lifts Within the Terminal Building

The following information shall be added to construction documents for any construction that may require the use of lifts on the terminal floor tiles at BWI Marshall:

All man-lifts to be used on or transported across the ceramic, porcelain, and/or terrazzo floor tile in the terminal shall conform to the following requirements:

A. All lifts shall be equipped with pneumatic tires.
B. All lifts shall be transported and parked on ¾" plywood protection panels at all times.

5.3 Construction Duration and Phasing

5.3.1 Construction Durations and Blackout Dates

Construction durations shall be estimated during the design phase and documented in the Contract Documents. The Consultant shall coordinate with MDOT MAA Operations to determine the appropriate work hours and dates of work permitted for the project. Annual construction blackout dates occur when airport traffic is expected to be higher than usual and therefore no construction activity is to take place. Blackout dates for consideration and discussion are listed below.

A. BWI Marshall:
   1. President's Day weekend (Sat – M)
   2. Spring Break/Easter (full week prior to Easter)
   3. Memorial Day weekend (Sat – M)
   4. Fourth of July and adjacent weekend
   5. Labor Day weekend (Sat – M)
   6. Thanksgiving (M – Su)
   7. Christmas & New Year's (weekend prior to Christmas – weekend after New Year's)

B. Martin State:
   1. All dates listed above
   2. Weekends

Consultants shall determine the applicable construction blackout dates for each project on a case-by-case basis with the Project Manager and the MDOT MAA office with operational responsibility (i.e. Airport Operations, Ground Transportation, etc.) based on the type of work, location of the project, as well as the year's calendar.

5.3.2 Construction Phasing Plans

Construction Phasing Plans shall be included for all landside tasks involving multiple phases of construction. Phasing plans shall include the following information, at minimum:

A. Project Work Area (shaded/hatched) [phased work areas on the same plan sheet shall have different, distinguishable hatches, if applicable]
B. Contractor access/haul routes
C. Description of work
D. Phase Durations and/or Total Task Duration
E. Closures for roads or lanes of roads – this note shall also refer to the Maintenance of Traffic plan

F. Work hours (if applicable)
G. Liquidated damages if determined to be different than specified in the Comp Paving Technical Specifications

5.3.3 Construction Staging and Stockpile Areas

Construction Staging areas are defined as, “the locations in which the general contractor stores construction equipment and materials for the needs of the contract.” The Consultant shall identify these areas within the contract documents and on the general site plan or make a note that areas will be determined once the contract has received a “notice to proceed.”

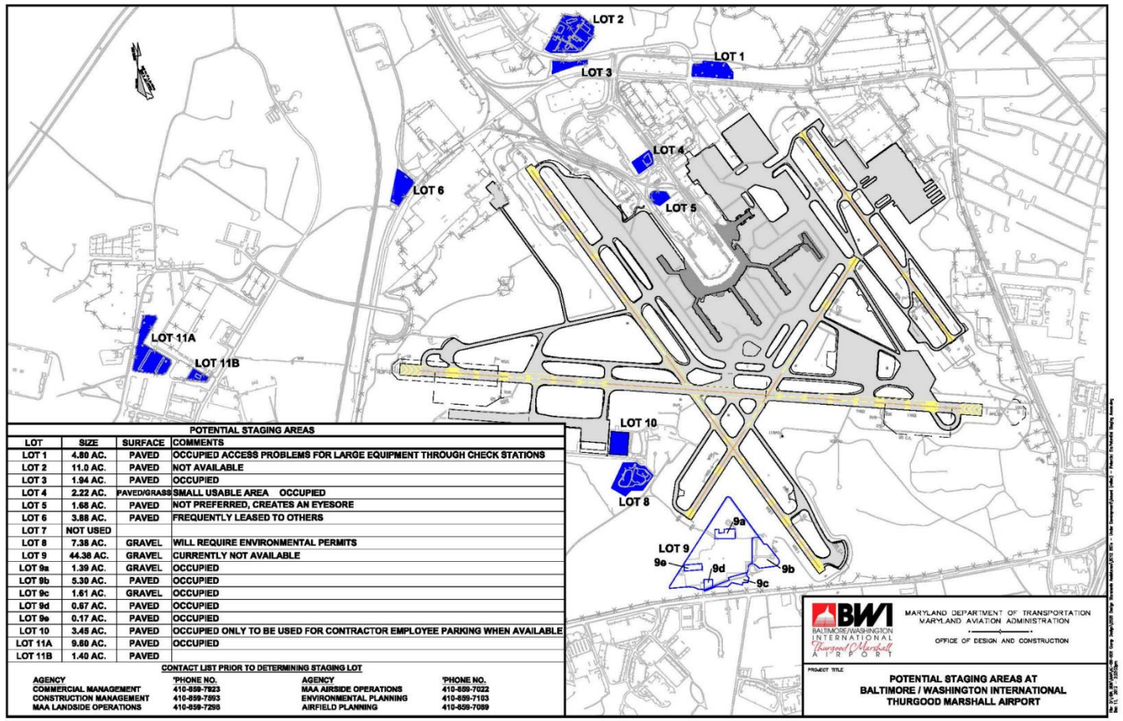
Stockpile Areas are to be defined as, “a mound or pile of soil protected by appropriately designed erosion and sediment control measures.” For projects involving site work/earth disturbance, the Consultant shall provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns. Stockpile areas are designated to store soil and other erodible materials, such as sand, millings, and fine aggregate. The Consultant may identify separate construction stockpiling areas within the contract documents on the general site plan and on the erosion and sediment control drawings. MDE erosion and sediment control measure **B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA** shall be referenced for these areas and the areas shall be located within the Limits of Disturbance (LOD).

Below is a graphic map depicting available areas for use as off-site staging areas. The graphic includes available lot size, an indication as to whether the lot is paved and brief comments about the site. The consultant shall determine which lot to use as a staging area based upon the type of construction being proposed and the locality of the work. The consultant shall coordinate on-site and off-site staging areas with the MDOT MAA Project Manager and consult each agency identified on the map to confirm the availability and applicability of the proposed on-site and off-site staging area(s).

If there is a requirement to modify or change the construction staging area after the contract documents are issued, the consultant shall follow the same procedures to identify, coordinate, and design additional construction staging areas. Any off-site stockpiles outside of the approved project’s LOD will be required to have either a separate ESC approval (State, federal, or local) or a permit modification obtained for the MDE permit associated with the MDOT MAA project. All MDE coordination shall be through the MDOT MAA Environmental Planning Section.

The consultant shall identify construction staging areas within the contract documents. The consultant shall coordinate on-site and off-site staging areas with the MDOT MAA Project Manager and consult each agency identified on the map to confirm the availability and applicability of the proposed on-site and off-site staging area(s). On the following page is a graphic map depicting available areas for use as off-site staging areas. The graphic includes available lot size, an indication as to whether the lot is paved and brief comments about the site. The consultant shall determine which lot to use as a staging area based upon the type of construction being proposed and the locality of the work.

If there is a requirement to modify or change the construction staging area after the contract documents are issued, the consultant shall follow the same procedures to identify, coordinate, and design additional construction staging areas.



Construction Staging Areas

5.3.4 Runway 10-28 and 15R-33L Intersection Closure

Construction of utilities within the safety areas of the intersection of Runways 10-28 and 15R-33L, which will require simultaneous closure of both major runways, will not be permitted. Alternate routes or methods, such as crossing one runway point at a time and remaining clear of the adjacent runway safety area, should be used. The Director of the Office of Engineering & Construction must approve any project that requires closure of both runways.

This allows BWI Marshall to maintain airport capacity during utility construction by keeping at least one major runway open. It provides additional periods of time for accessing work areas for utility installation, which would be limited if both runways required closing. It also alleviates closures of both major runways for subsequent maintenance, emergency repairs, periodic inspections, tie-ins, etc. These types of occurrences are even more problematic, as they may be unscheduled and occur at peak times.

5.4 Maintenance of Traffic

5.4.1 Maintenance of Traffic (MOT) Plans

Maintenance of Traffic (MOT) Plans are required when work requires road/lane closures. Road/Lane closures or roads otherwise impacted by the Task require approval by the agency having jurisdiction over said road; in most cases this is Maryland State Highway Administration (SHA) or the County (Anne Arundel County for BWI Marshall tasks, Baltimore County for MTN tasks.) All Tasks impacting roads, whether or not owned/maintained by the MDOT MAA, shall be coordinated with and approved by the Office of Ground Transportation.

For projects impacting SHA roads, the following SHA groups, at minimum, shall be coordinated with:

A. Office of Traffic Safety (OOTS), for traffic signaling
B. Office of Materials Technology (OMT), for materials testing
C. District 5 Utility Permits, for any digging of utilities in Anne Arundel County

D. District 4, for any digging of utilities in Baltimore County (MTN)

If MOT impacts SHA, Consultants shall submit the plans and a "District Office Permit" application to the District Utility Engineer at SHA for approval. Upon approval, SHA will issue a District Office Permit. SHA does not return signed drawings upon approval.

5.4.2 Traffic Cones

Twelve inch (12") traffic controlling cones shall not be used for projects at BWI Marshall and Martin State Airports. State Highway Administration (SHA) studies have found that larger cones decrease accident rates. For slower traffic, 18" cones shall be used. For highway and nighttime traffic, 28" cones shall be used. In addition, during nighttime work, 28" cones must have reflective collars. This information may be obtained from SHA's Traffic Control Booklet #6.

5.5 Construction Safety and Phasing Plans

Projects receiving funding from the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) program must prepare a Construction Safety and Phasing Plan (CSPP). All CSPP shall be prepared in accordance with the latest FAA AC 150/5370-2 and approved and signed by the Director of Airport Operations for BWI Marshall Projects and the Chief of Airport Operations at Martin State Airport for all MTN projects. The document shall be prepared based on a joint effort between MDOT MAA Operations, the ATCT, MDOT MAA Office of Engineering & Construction and the Consultant.

5.5.1 CSPP Review Checklist

Refer to Volume 5, Section 2.4.1.

5.5.2 Design Progress Milestones

Refer to Volume 5, Section 2.4.2.

5.5.3 Sample CSPP

Refer to Volume 5, Section 2.4.3.

5.5.4 Specific Design Requirements

5.5.4.1 Placement of Construction Barricades

CSPP shall require that no spaces be permitted between adjacent barricades.

6.1 Site Exploration

6.1.1 Survey Control

6.1.1.1 BWI Marshall Airport Surveying Monuments

Please refer to Appendix 2E - Survey Control Manuals.

NGS monumentation that has been damaged or destroyed should be reported to the National Geodetic Survey web page. In the event that the actual marker is separated from its setting, you can report the point as destroyed. To do so, please send the report on the destroyed mark to the NOAA. In addition, please submit proof of the mark's destruction via actual disk, rubbing, photo, or digital picture (preferred) to:

NOAA, National Geodetic Survey, N/NGS143
1315 East West Highway
Silver Spring, MD 20910

If you did not find the actual marker, then you should enter notes concerning evidence of its possible destruction as text records and select "Not recovered, not found" as the condition of mark.

Also, please immediately notify the Director of the Office of Engineering & Construction, Maryland Aviation Administration, to report damaged or destroyed monumentation.

6.1.1.2 Martin State Airport Surveying Monuments

A network of 9 survey control points, including 3 points established by NGS, have been established at Martin State Airport to provide a reliable and accessible system of control for all surveys performed on the airport. Please refer to Appendix 2E - Survey Control Manuals.

Consultants shall use the Martin State Airport Survey Control for all design and construction projects. All project surveys must be tied to the Martin State Airport Survey Control Network shown on the Survey Control Drawing and described in the Survey Control Manual. All contract drawing sets must contain the Martin State Airport Survey Control Plan Sheet and a 2nd geometric layout sheet containing the specific geometric layout and coordinate data for the project. This drawing shall also include any and all points set by the contractor for the specific project stating traverse closures and which Martin State Airport control points were used.

The survey control for Martin State Airport is based horizontally on the Maryland State Plane Coordinate System which is tied to the North American Datum of 1983 (NAD 83), and vertically on the North American Vertical Datum 1988 (NAVD 88). Data supplied in the manual meets or exceeds 1st order horizontal survey control accuracies and is equal to or less than 3rd order vertical accuracies as indicated on the individual monument recovery sheet. All monuments are cast in place concrete, 48” deep with aluminum disks stamped “Martin State Airport – Survey Control”, and with a point ID.

All monuments are described on monument recovery sheets. Each monument recovery sheet contains “How to reach” descriptions for each control point, coordinates, elevations, and pictures of each monument as well as reference sketches. The scale factor given on the recovery sheet is the measure of the linear distortion that has been mathematically imposed on ellipsoid distances so they may be projected onto a plane. These monuments were set in the fall of 2005 and have a stability rating of “C” points subject to surface motion.

Elevations of monuments are based on the North American Vertical Datum of 1988 (NAVD88). Elevations are derived from GPS observations of NGS benchmark stations MARTAIR AZ (a third order vertical monument), CLOVER (a second order vertical monument), GIS58 (a third order vertical monument), and GIS70 (a third order vertical monument). Elevations are in U.S. Survey Feet.

The consultant is responsible for quality control checking of all new and existing monumentation prior to using the monuments in accordance with standard survey practices. Please notify the Airport Operations Manager of Martin State Airport (410-682-8826) and the Director of MDOT MAA’s Office of Engineering & Construction of damaged and destroyed monumentation immediately.

6.1.2 Subsurface Utility Engineering (SUE)

Refer to Volume 1, Section 1.5.

6.1.3 Geotechnical Investigations

The Consultant shall develop a program to perform subsurface exploration and laboratory testing in the area of any proposed construction. The Consultant shall describe the geotechnical exploration and testing methodology as part of the cost proposal required for the project. The explanation shall include technical issues to be resolved, field and laboratory methods to be used, estimated number and depths of borings/corings, and other field methods, estimated laboratory testing, and reporting methods.

Before performing any field work, the Consultant shall prepare a detailed work plan including coordination with stakeholders such as Airport Operations and the preparation of Tenant Information Advisories. The work plan shall include proposed boring/coring locations, details of investigation methods, coordination issues, and reporting schedule and the Consultant shall be responsible for identifying, field locating and avoiding all utilities in the vicinity of any proposed

borings prior to drilling. Any utility discrepancies found shall be reported to the MDOT MAA Task Manager. Repair of any utility damaged by the Consultant shall be the Consultant's responsibility. The work plan shall be submitted to the MDOT MAA Project Manager for review and approval before any field work is performed.

The Consultant shall stipulate in their work plan that approximately 50% of proposed cores be performed specifically in areas displaying pavement distress. Full-depth cores are to be extracted unless directed otherwise. All cores taken will be used to evaluate the appropriate depth of milling and repairs, where applicable. The core results shall include location, thickness, and condition (crack depth, debonding, stripping, partial/full disintegration etc.) of the extracted cores along with the underlying material(s). The core pictures shall depict clear and actual in-situ conditions.

When only pavement coring is to be performed, a "grab sample" of the unbound material directly beneath the pavement core is to be collected and stored in a container such as a zip lock bag or a sample jar. The material/soil type shall be reported based on visual classification.

All core/bore holes shall be backfilled/grouted with cementitious in-situ or borrow or patch material and compacted in multiple lifts, as appropriate. A minimum 12 in. depth from the existing pavement surface shall be patched with a fast setting concrete mix. Proper cleaning, patching, and compacting procedures shall be followed throughout to ensure a durable and satisfactory patch. Any improper or deficient patches shall be promptly repaired or replaced at no cost to MDOT MAA.

See Chapter 3.2 Deliverables by Design Phase for details on Geotechnical report deliverable requirements. See Chapter 3.7.2 Geotechnical Reports for details on Geotechnical report submission requirements.

6.2 Utilities

6.2.1 Underground Utility Markings

The design and construction of all projects at BWI Marshall and Martin State Airports shall include the requirement to mark all temporary (regardless of duration) and permanent underground utilities with detectable utility warning devices in accordance with the following requirements:

In paved areas (asphalt or concrete) mark the underground utility with 6" wide detectable tape positioned at a maximum 3"- 6" deep below the bottom of asphalt or concrete.

In unpaved areas mark the underground utility with 6" wide detectable tape positioned at a maximum 8"- 12" deep below top of ground.

6.2.1.1 Underground Utility Marking Requirements

A. Buried Underground **Non-metallic** Utilities:
   1. All temporary and permanent buried underground non-metallic utilities shall be marked with appropriately colored detectable utility warning tape placed over the utility at the depth indicated above.
   2. Additionally, all temporary and permanent buried underground non-metallic utilities shall also be marked with a steel reinforced copper clad tracer wire placed with and at the same depth as the utility. The tracer wire shall be continuous (thru) and shall be brought into and be accessible at all valves, handholes, manholes, and other access points along the length of the utility. Should the tracer wire be terminated at these locations, 5 or more feet of spare wire shall remain and be coiled.

B. Buried Underground **Metallic** Utilities:
   1. All temporary and permanent buried underground metallic utilities shall be marked with appropriately colored detectable utility warning tape placed over the utility at the depth indicated above.

C. Underground **Non-metallic** Utilities installed by directional drilling or other trenchless technologies:
   1. All temporary and permanent underground non-metallic utilities installed by trenchless technologies such as directional drilling, jack and bore, etc, shall include the placement of an appropriately colored steel reinforced copper clad tracer wire placed with and at the same depth as the utility. The tracer wire shall be continuous (thru) and shall be extended beyond the limits of the trenchless installation and be brought into and be accessible at all valves, handholes, manholes and other access points along the length of the utility. Should the tracer wire be terminated at these locations, 5 or more feet of spare wire shall remain and be coiled.

D. Underground **Metallic** Utilities installed by directional drilling or other trenchless technologies:
   1. Metallic utilities installed by trenchless technology shall not be marked for the extent of the trenchless installation, but they shall be marked in accordance with the requirements of Paragraph 2, Buried Underground **Metallic** Utilities, for all portions of the utility installed by conventional trenching.

E. Utility Marking Materials shall conform to the following requirements:
   1. Detectable Utility Warning Tape:
      The detectable tape shall be 6" wide and 5.0 mil thick, continuously inscribed with a description of the utility (Gas, Water, Electric, etc.), color coded to meet the American Public Works Association (APWA) uniform color code system as listed below and shall include a metallic foil coating that is detectable by utility locating equipment.

RED	Electric Power Lines, Cables, Conduit and Lighting Cables
YELLOW	Gas, Oil, Steam, Petroleum or Gaseous Materials
ORANGE	Communication, Alarm or Signal Lines, Cables or Conduit

BLUE	Potable Water
GREEN	Sewers and Drain Lines
PURPLE	Reclaimed Water, Irrigation and Slurry Lines
PINK	Temporary Survey Marking
WHITE	Proposed Excavation

2. Steel Reinforced Copper Clad Tracer Wire: Tracer wire shall be a 12 AWG, Extra-High-Strength Copper-Clad Steel conductor (EHS-CCS), insulated with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation, and rated for direct burial use at 30 volts. EHS-CCS conductor must be a 21% conductivity for locatability purposes. Break load shall be a minimum of 1,150 pounds. HDPE insulation shall be Restriction of Hazardous Substances (RoHS) compliant and utilize virgin grade material. Insulation color shall meet the APWA uniform color code system, as listed above, for identification of buried utilities.

   Tracer wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to ensure that the wire remains adjacent to the pipe. The tracer wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all trace wire access points. The contract shall require the tracer wire to be tested for continuity prior to acceptance of the utility.

F. Recommended product Manufacturers
   1. Acceptable tracer wire products for buried installations include the following products or an approved equal:
      a. Copperhead conventional tracer wire produced by Copperhead Industries, LLC (www.copperheadwire.com), or DURAtraceTM Produced by Duratrace (www.duratracewire.com)
      b. Acceptable tracer wire products for trenchless technology installations include the following products or an approved equal:
      c. SoloShotTM EHS produced by Copperhead Industries, LLC (www.copperheadwire.com), or DURAtraceTM DD Produced by Duratrace (www.duratracewire.com).
   2. Acceptable detectable utility warning tape products for underground utility markings installations include the following products or an approved equal:
      a. 6” wide and 5.0 mil thick, continuously inscribed with a description of the utility (Gas, Water, Electric, etc.), color coded to meet the American Public Works Association (APWA) uniform color code system and shall include a metallic foil coating that is detectable by utility locating equipment produced by Stranco, Inc. (www.strancoinc.com) or Rhino Marking and Protection Systems (www.rhinomarkers.com).

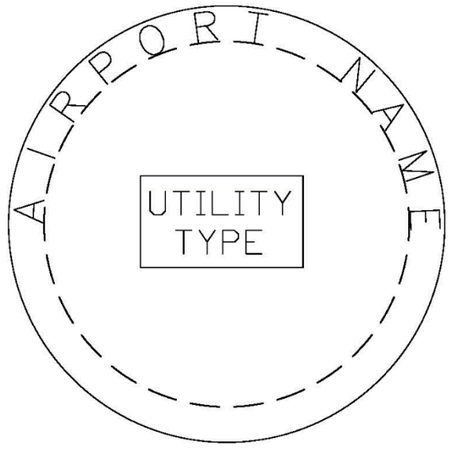
G. Recording of Marking Technique Used: CAD and GIS data that records the location of utilities should provide an indication where one of the marking techniques described above was installed and, if so, which type and manufacturer’s product was used.
   1. As-built or record CAD should include a superscript number on any annotations used to label utility features in the drawing where a marking technique was used (i.e. 6” PVC Drainage Line). A schedule of corresponding notes on the same or a separate sheet, should list all such notes indicating the method of marking used, the manufacturer name, and product name or model number.
   2. As a requirement of the As-Built submittal, GIS data submitted with subsurface utilities should record the use of, manufacturer name, and product or model in the description attribute (e.g. “Marked with Copperhead Industries’ SoloShotTM EHS tracer wire).

6.2.2 Manhole/Handhole Covers/LIDS

All new and replacement manhole/handhole covers/lids shall include customized cover/lid surface lettering as follows:

All Airport manhole/handhole covers/lids shall include the name “BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT” or “MARTIN STATE AIRPORT” and the type of utility: “ELECTRIC”, “STORMWATER”, “SANITARY SEWER”, “WATER”, “GAS”, “TELEPHONE.” Lettering shall be Helvetica, medium, capitalized, and 1 ½ inches in height.

"ELECTRIC"
"STORMWATER"
"SANITARY SEWER"
"WATER"
"GAS"
"TELEPHONE"



NOTE: LETTERING SHALL BE HELVETICA, MEDIUM, CAPITALIZED AND 1-1/2 INCHES IN HEIGHT.

SHEET TITLE: MANHOLE/HANDHOLE COVER LIDS	DATE: APRIL 2005

6.2.3 Water Mains

6.2.3.1 Backflow Prevention

Refer to Chapter 10 Plumbing for Backflow Prevention requirements.

6.2.3.2 Corrosion Protection for Water Valve Repair (New and Replacement Valves)

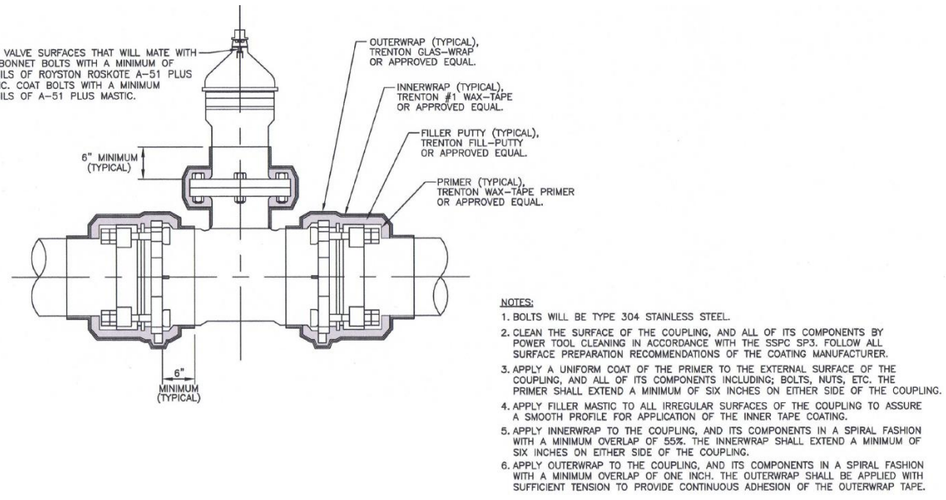
Valves and bolt assemblies for all new and replacement water valves shall be required to be protected from corrosion in accordance with the following specification and details.

A. Water Valve Notes and Specifications for New and Replacement Valves

New valves shall be non-rising stem, high pressure, resilient-seated gate valves sized to match existing, AWWA C509, ductile-iron body and bonnet with bronze or ductile iron gate, resilient seats, bronze stem and stem nut, 250-PSIG minimum working pressure, 400 PSIF test pressure, interior coating according to AWWA C550, and mechanical joint ends. All valves shall be standardized to close when turned in the clockwise direction “Right Handed”. The basis of design is Mueller Valve Model A2360 Series Resilient Wedge Gate Valve or approved equal.

1. Valves shall be gates valves conforming to the American Waterworks Association.
2. Epoxy coated inside and out.
3. Fasteners exposed to backfill must be T304 stainless steel.
4. O-ring seals.
5. Solid sleeves shall be ductile iron 250-PSIG minimum working pressure design.

Coat mechanical coupling and valve bolts in accordance with specifications and details below.



COATING OF MECHANICAL COUPLING AND VALVE BOLTS

N.T.S.

B. Specifications for Coating of Bolts and Mechanical Joints-Gate Valve Assemblies for New and Replacement Valves

1. External Coating System for Mechanical Couplings
   a. Mechanical joints/flanges shall receive an exterior tape wrapping in the field as indicated in detail below. The coating applicator shall abide by and follow all manufacturer’s application specifications for the coating system. All components of the coating system shall be manufactured by a single supplier to assure compatibility of individual components. The coating system shall be manufactured by Trento Corporation or an approved equal.
   b. Materials
      I. Primer: A blend of microcrystalline wax, plasticizer, and corrosion inhibitors having a paste-like consistency, designed to displace moisture, penetrate rust and wet the surface, ensuring adhesion of the tape. The primer shall be Trenton Wax-Tape Primer or approved equal.
      II. Filler Putty: A cold applied anti-corrosive moldable filler material used to even the contours of irregular fittings and surfaces. The filler putty shall have the following properties:

a. Specific gravity: 1.15
b. Density: 24 cu in/lb
c. The filler putty shall be Trenton Fill-Putty or approved equal. Filler putty shall be used at all irregular surfaces to provide a smooth surface for the application of the innerwrap and outerwrap.

III. Innerwrap: A non-woven, non-stitch bonded synthetic fabrix saturated with a blend of microcrystalline wax, plasticizer, and corrosion inhibitor (no clay fillers). The inner tape shall have the following properties:
   a. Thickness: 70 to 90 mils
   b. Dielectric strength: 170 volt/mil
   c. The innerwrap shall be Trenton #1 Wax-Tape or approved equal.

IV. Outerwrap: A white, resin-coated, woven figerglass fabric. The outerwrap shall be the following properties:
   a. Thickness: 0.005 inch
   b. Tensile strength (per one inch width): 85 lb min
   c. Tape width: 6 inches
   d. The outerwrap shall be Trenton Glas-Wrap or approved equal

C. Application of Coating Materials
1. The mechanical couplings either side of the vale, including all components shall be fully coated for a minimum of 6 inches on either side of the coupling.
   a. Clean the surface of the coupling, and all of its components by power tool cleaning in accordance with SSPC-SP3. Follow all surface preparation recommendations of the coating manufacturer.
   b. Apply a uniform coat of the primer to the external surface of the coupling, and all of its components including; bolts, nuts, etc. The primer shall extend a minimum of six inches on either side of the coupling.
   c. Apply filler mastic to all irregular surfaces of the coupling, with special attention to the bolts, to assure a smooth profile for application of the inner tape coating.
   d. Apply innerwrap to the coupling, and its components in a spiral fashion with a minimum overlap of 55%. The innerwrap shall extend a minimum of six inches on either side of the coupling.
   e. Apply outerwrap to the coupling and its components in a spiral fashion with a minimum overlap of one inch. The outerwrap shall be applied with sufficient tension to provide continuous adhesion of the outerwrap tape.

6.2.4 Sanitary Sewers

If existing conditions prohibit gravity flow then lift station/ejector pits are to be included in the design. Lift stations and ejector pits should be located outside the footprint of the building structure the restroom is within. In addition, secondary containment of the lift station and ejector pit should be considered to limit overflow into adjacent areas during system failure.

If a lift station or ejector pit is required, this MUST be brought to the attention of the MDOT MAA Office of Engineering & Construction during the design process. The exact requirements of the design will then be provided for inclusion in the project construction documents.

SEWAGE EJECTOR PIT DESIGN: All projects with sewage ejector pits should be designed with the ejector motors, pumps, impellers and related equipment outside the actual “sewage pit.” One acceptable method is to construct a wetside/dryside pit. All motors, pumps, impellers, and equipment would be installed on the dryside with pipe connections to the wetside (sewage pit side). The dryside of the pit would be sealed tight to prevent water and sewer gases infiltration. Other concepts will require the approval of the MDOT MAA Office of Engineering & Construction project manager and the Office of Facilities Maintenance. Refer to Chapter 7.6 Restroom Standards for further information on sewage ejection pit design.

6.2.5 Electric/Phone/Telecommunications

Parking facilities shall be equipped with public telephones. The Contractor should install the concrete pad and necessary conduits at the phone location. The telephone company (currently Verizon) should pull wiring and install housing and telephone.

6.2.5.1 Electrical Structure Drains

An Electrical Structure Drain (ESD) shall be provided as a drainage design alternative for electrical manhole (MH) and handhole (HH) structures where other preferred alternate drainage measures may not be possible to facilitate drainage away from the Electrical and Communications (E/C) Infrastructure Systems.

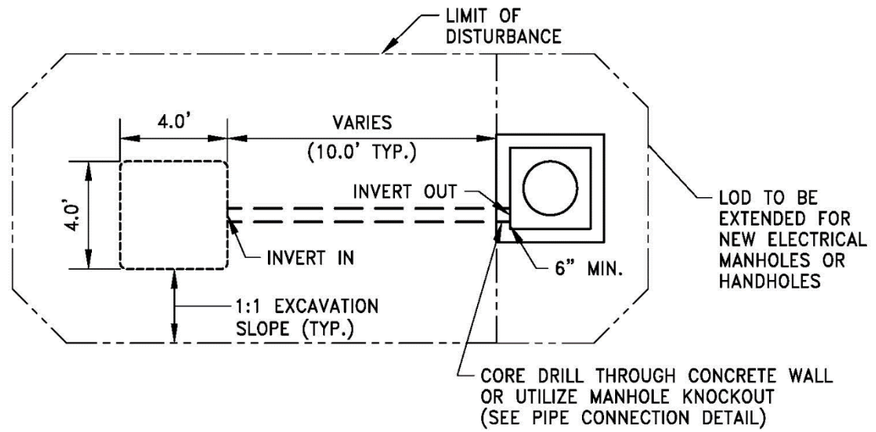
Qualifying Preferred Alternate Drainage Measures are the following:

A. Install 6” Polyvinylchloride (PVC) drainage pipe from E/C MH or HH directly into a drainage MH in close proximity provided inverts permit positive drainage.
B. Install 6” PVC drainage pipe from E/C MH or HH directly into drainage pipe in close proximity provided inverts permit positive drainage.

ESD(s) shall be installed in locations where space is available and where other preferred drainage measures cannot be provided in grass areas. For proposed E/C ductbank installations the design consultant shall provide either adequate space for ESD installations at an E/C structure or design the ductbank plan and profile to allow for the E/C ductbank infrastructure to drain to a low point at a MH or HH where an ESD can be installed.

Many design measures have been taken in the past to prevent water from entering the E/C infrastructure at lighting conduits, manholes, handholes, etc., however water has entered the E/C infrastructure despite those efforts, and design measures need to be taken to remove the water that has both entered in the past and will continue to enter in the future. For existing E/C ductbank runs, ESD(s) need to be installed at ductbank profile low points at E/C MH(s) and HH(s) where space is provided.

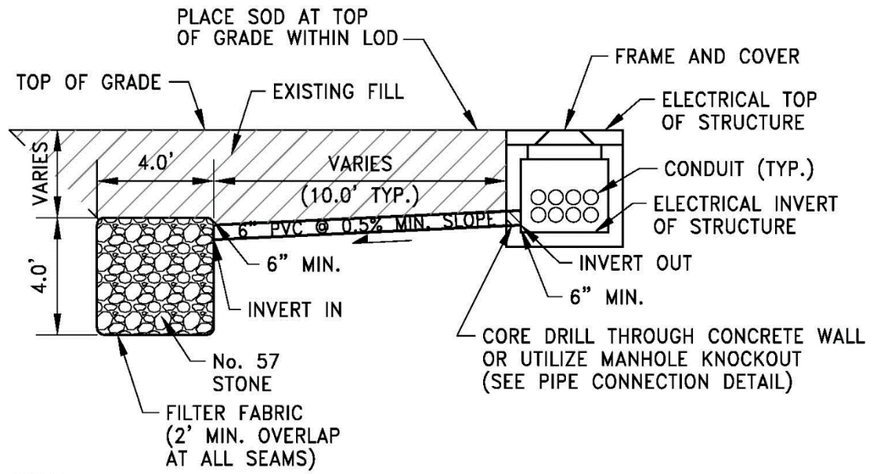
The following details depict the plan and section view of a typical ESD, section view of a typical pipe connection detail, and the plan view of a typical rodent screen detail.



ELECTRICAL STRUCTURE DRAIN DETAIL (PLAN)

N.T.S.

SHEET TITLE: ELECTRICAL STRUCTURE DRAIN DETAIL (PLAN)



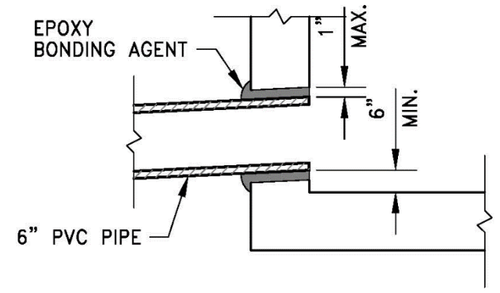
NOTE:

DEPTH OF DRAIN WILL VARY DEPENDING ON STUCTURE – 8' TO 9' FOR MANHOLES, AND 4' TO 5' FOR HANDHOLES.

ELECTRICAL STRUCTURE DRAIN DETAIL (SECTION)

N.T.S.

SHEET TITLE: ELECTRICAL STRUCTURE DRAIN DETAIL (SECTION)



PIPE CONNECTION DETAIL

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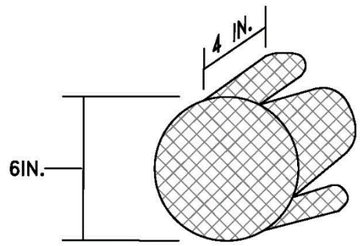
SHEET TITLE: PIPE CONNECTION DETAIL



RODENT SCREEN

A REMOVABLE RODENT SCREEN SHALL BE CONSTRUCTED AT THE END OF ALL ELECTRICAL STRUCTURE DRAINS AS SHOWN. COMMERCIALLY AVAILABLE GALVANIZED HARDWARE SCREEN IS TO BE SNUGLY FITTED INSIDE EACH OUTLET PIPE. THE SCREEN IS TO HAVE THE CAPABILITY OF BEING REMOVED AND REINSTALLED FOR MAINTENANCE OPERATIONS. THE SCREEN WIRES SHALL BE WELDED AT A SPACING IN EACH DIRECTION OF 3/8– TO 1/2–INCHES. THE COST OF THE SCREEN IS TO BE INCLUDED IN THE COST OF THE DRAIN.

SHEET TITLE: RODENT SCREEN

6.2.6 Use of HDPE Pipe

A. HDPE Pipe is acceptable for underground use at BWI Marshall and MTN Airports for Sanitary Force Main, Natural Gas Distribution, communications conduit, and for electrical system directional bore. HDPE Pipe is prohibited for use with potable water and Fire Protection Water Systems or with glycol recovery drain/force main piping. HDPE Pipe is also prohibited for use inside railroad right-of-way.

B. Material Requirements:

1. High Density Polyethylene (HDPE) Pipe and Heat Fusion Fittings shall conform to AWWA C906, PE 3408. Pipe and fittings shall have a minimum standard dimension ratio (SDR) of eleven (11) rated for 160 psi and have a nominal ductile iron pipe size. Butt Fusion Fittings shall meet the requirements of ASTM D-2153 and ASTM D-3261.
2. Use Butt Fusion Joining Technique for joining pipe segments and pipe fittings in accordance with the pipe manufacturer's written specifications. Mechanical couplings are not permitted for joining segments of HDPE pipe underground. Flange or other pipe adapters for connection to valves or dissimilar pipe materials inside vaults or underground shall be as recommended by HDPE Pipe Manufacturer.
3. Contractor shall certify that all joining operations are conducted by personnel trained by the joining equipment manufacturer. Certification shall be provided to the Resident Engineer prior to construction.

C. High Density Polyethylene Pipe (SDR 11) is furnished with inside diameters less than nominal pipe size which needs to be considered when determining pipe flow and velocity capabilities.

D. All underground natural gas and sanitary force main installations must be buried with at least 36-inches of cover from top of pipe to finished grade. Pipe bedding shall consist of a minimum of 4" depth of compacted sand, peagravel, or small diameter clean aggregate placed all around HDPE Pipe with select backfill above to bottom of pavement subgrade. Tape continuous length of No.12 AWG Copper insulated tracer wire to top of pipe and install 6-inch wide by 5 mils thick detectable warning and identification tape centered directly above pipe.

E. Testing:

1. Sanitary Force Main: Conduct piping tests before joints are covered. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Perform Hydraulic Test with pressure at 150 PSI for two hours. There should be no leakage. Remake leaking joints with new materials and repeat test until leakage is stopped.
2. Natural Gas Distribution: Conduct air pressure test per NFPA 54 on the gas system piping for at least 24 hours. Test pressure shall be 100 PSI. During the test, the entire system shall be completely isolated from all compressors and other sources of air pressure. Locate and repair leaks found and retest line until pressure holds for 24 hour test period.

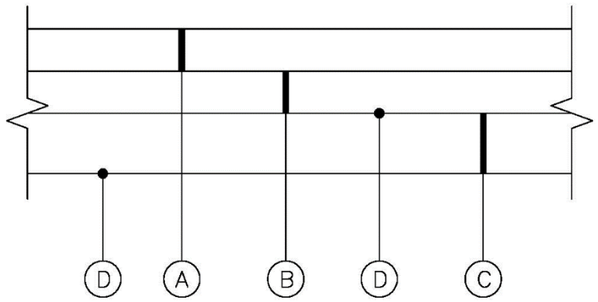
6.3 Pavement Design

6.3.1 Airfield Pavement Design

A. The preferred pavement mixes used on the airside shall be the following:

Airside (P-401) Pavement Lift Thicknesses	
Maximum Aggregate Size	**Lift Thickness**
1/2"	1.0 to 2.0"
3/4"	1.5 to 3.0"
1"	2.0 to 4.0"
1-1/4"	3.0 to 5.0"

B. The design and construction of all Martin State (MTN) Airport projects shall include the requirement of placing an additional layer of AASHTO #3 Stone under the design pavement section. The AASHTO #3 stone shall not be considered part of the structural pavement. Due to the excessive amount of unsuitable material located at MTN, MDOT MAA requires the consultant place a minimum of 12" of AASHTO #3 Stone and filter fabric over the entire paved area. The unsuitable material shall be removed and backfilled as determined by the engineer. AASHTO #3 Stone shall then be placed at a depth determined by the engineer prior to the placement of the subbase material. In addition, the engineer shall require filter fabric to be placed below and above the section of AASHTO #3. Refer to exhibit on the following page titled "*MARTIN STATE AIRPORT SECTION*" dated April 2005.



TYPICAL SECTION
NOT TO SCALE

LEGEND

(A) PORTLAND CEMENT CONCRETE / BITUMINOUS ASPHALT PAVEMENT *

(B) CRUSHED AGGREGATE BASE COURSE *

(C) NO. 2 STONE *

(D) FILTER FABRIC

* DEPTH TO BE DETERMINED BY THE ENGINEER

SHEET TITLE: MARTIN STATE AIRPORT SECTION	DATE: APRIL 2005

C. Subbase and Base Course: Cement Treated Base Course materials shall not be used in the design and construction of flexible pavements in projects at BWI Marshall or Martin State Airports.

6.3.1.1 Federal Aviation Administration (FAA) Specification Incentives

There are no incentive payments for either Specification P-401 or Specification P-501.

6.3.2 Landside Pavement Design

The preferred pavement mixes used on the landside shall be from this list:

- 9.5 mm PG 64-22 Level 2
- 9.5 mm PG 64-22 Level 2 HPV
- 9.5 mm PG 64-22 Level 4
- 9.5 mm PG 64-22 Level 4 HPV
- 9.5 mm PG 76-22 Level 4
- 9.5 mm PG 76-22 Level 4 HPV
- 9.5 mm PG 76-22 Level 4 GAP
- 12.5 mm PG 64-22 Level 2
- 12.5 mm PG 64-22 Level 2 HPV
- 12.5 mm PG 64-22 Level 4
- 12.5 mm PG 64-22 Level 4 HPV
- 12.5 mm PG 76-22 Level 4
- 12.5 mm PG 76-22 Level 4 HPV
- 12.5 mm PG 76-22 Level 4 GAP
- 19.0 mm PG 64-22 level 2
- 19.0 mm PG 64-22 Level 4
- 25.0 mm PG 64-22 Level 2
- 25.0 mm PG 64-22 level 4

Landside (Superpave) Pavement Lift Thicknesses	
Nominal Aggregate Size	**Lift Thickness**
9.5 mm	1.0 to 2.0”
12.5 mm	1.5 to 3.0”
19.0 mm	2.0 to 4.0”
25.0 mm	3.0 to 5.0”

6.4 Pavement Markings

6.4.1 Airfield Pavement Markings

Airfield pavement markings shall be according to the following table:

Airfield Pavement Markings		
Location	**Type**	**FAA Reference**
Runways Aircraft Parking Envelope – Passenger Gates	Waterborne paint with glass beads	TT-P-1952E, TT-B-1325D Type I beads
Taxiway centerline and edge lines Hold position markings All other areas approved for use by FAA AC 150/5340-1 and the MDOT MAA Project Manager	Preformed Thermoplastic (FAA Approved)	AC 150/5340-1 P-620 specification in AC 150/5370-10
Aircraft Parking Envelope – Cargo Areas Vehicle Service Road (VSR)	Preformed Thermoplastic (MDSHA or FAA Approved)	N/A MD SHA (section 559)*

Other non-movement areas.		or FAA (P-620)* *As approved by MDOT MAA Project Manager

6.4.1.1 Waterborne Paint

All permanent pavement markings on the runways at both BWI Marshall and Martin State Airport, with the exception of black markings, shall be waterborne paint containing glass beads. Aircraft parking envelopes at passenger gates at BWI Marshall shall also be marked in waterborne paint and contain glass beads (Type I in the colored paint). Black outlines shall not contain glass beads.

Paint shall be waterborne in accordance with Federal Specification TT-P-1952E, Type I or Type II depending on usage [Type I has a standard drying time (no pick-up when tested in accordance with ASTM D 711), Type II may be used for striping where faster curing is desirable]. Paint shall be furnished in [white (37925), yellow (33538 or 33655), red (31136), black (37038), and pink (one part red – 31136 to two parts white – 37925)] in accordance with Federal Standard Number 595. Black paint should be used to outline a border at least six inches wide around markings on all pavements. Black and red paints shall contain glass beads.

Glass beads shall meet the requirements for Federal Specification TT-B-1325D, Type III where required by FAA (hold lines, or where red paint is used, etc.) For runway markings at BWI Marshall and MTN, glass beads shall be Type I. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment. Consultants shall include in the construction documents the requirement for glass beads to be installed in the first application of paint.

6.4.1.2 Heat Applied Preformed Thermoplastic Markings

All permanent pavement markings on the airfield at BWI Marshall shall receive permanent heat applied preformed thermoplastic markings where permitted by the latest edition of Federal Aviation Administration Advisory Circular AC 150/5340-1, Standards for Airport Markings and Federal Specification 150/5370-10, Item P-620, Runway and Taxiway Painting.

Permanent pavement markings on the airfield at Martin State Airport shall receive permanent heat applied preformed thermoplastic or waterborne markings as directed by the Project Manager. Thermoplastic markings, when requested, shall be where permitted in accordance with the latest edition of Federal Aviation Administration Advisory Circular AC 150/5340-1, Standards for Airport Markings and Federal Specification 150/5370-10, Item P-620, Runway and Taxiway Painting. These include but are not limited to hold position markings, surface hold position signs, and taxiway centerline and edge lines. The material shall meet the requirements from the latest edition of Federal Specification 150/5370-10, Item P-620 Runway and Taxiway Painting.

The Consultant shall specify in the contract documents that only trained and installers certified by the paint manufacturer apply these markings.

6.4.1.3 Surface Painted Stop Markings

All surface painted stop markings shall have a red background in accordance with the head-knocker details included in the PEGS Manual.

6.4.1.4 Aircraft Parking Marking

To provide safety and uniformity on the ramps and aprons at BWI Marshall Airport, all aircraft gate and RON markings shall adhere to the following standards. If a Tenant requires a gate marking in addition to or different than those specified in this standard, they shall submit a building permit/installation permit for the intended change or modification (such as envelope shape, line widths, and colors). Upon BWI Marshall Airport Operations' approval and receipt of an installation permit for the intended modification, Airlines may install their specific standard gate marking.

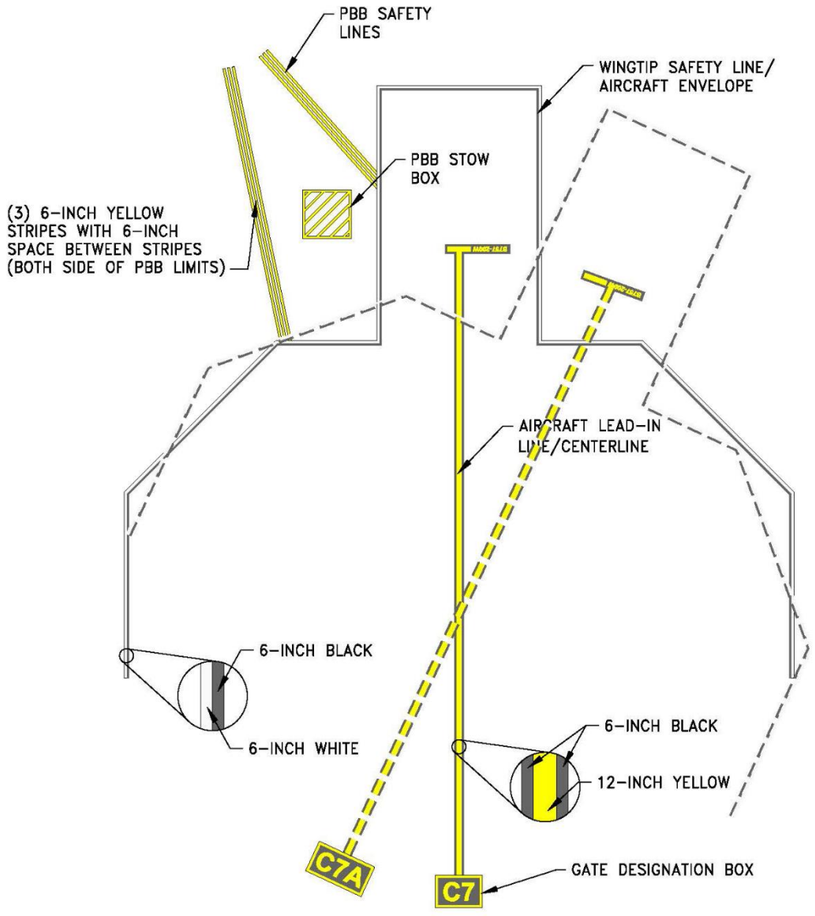
A. Loading Bridge Gates
   It is required that all Loading Bridge Gates comply, at minimum, with the following marking standards.
   1. Wingtip Safety Line or Aircraft Envelope shall be 6-inch white with 6-inch black highlight on the inside or aircraft side of the stripe.
   2. Aircraft Lead-in Lines or Centerline Marking shall be 12-inch yellow with 6-inch black outline on both sides (See Aircraft Parking Marking I exhibit).
   3. Nose Wheel Stop Bars shall be 12-inch think, 5-foot wide yellow with 6-inch black outline on all sides.
   4. Text defining the aircraft type at a given Nose Wheel Stop Bar shall be 12-inch tall yellow letters with black background. Text shall be justified to the left when located on the right side of the stop bar and justified to the right when located on the left side of the stop bar.
   5. The Gate Designation Box at the end of the lead-in line shall include the pier designation and gated number with 4-foot tall yellow letters, black background, and 4-inch minimum width stroke. The black background shall extend a minimum of 12-inches beyond the extremities of the letters. It shall be encompassed with 6-inch yellow and 6-inch black outlines. (See Aircraft Parking Marking II exhibit)
   6. Passenger Boarding Bridge (PBB) safety lines shall include three (3) 6-inch yellow stripes with 6-inch spacing between stripes. No black outlines are required on either side of the PBB Safety Line.

7. PBB Stow Box shall be 6-inch yellow, 10-foot by 10-foot square, with 6-inch yellow stripes at a 45 degree angle (no black outline).
8. An alternate centerline and envelope may be required when a gate or RON position can accommodate different aircraft groups or sizes under different scenarios. The secondary, or less used set of marking, shall then be dashed. The widths and colors for the lead-in lines and aircraft envelope remain constant; however the marking shall be altered to 10-foot long stripes with 10-foot long spaces. (See Aircraft Parking Marking II Exhibit).

B. Remain Overnight (RON) Marking

It is required that all Non-Loading Bridge Gates and RON only parking positions comply, at minimum, with the following marking standards.

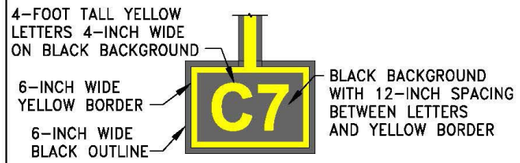
1. Wingtip Safety Line or Aircraft Envelope shall be 6-inch white with 6-inch black highlight on the inside or aircraft side of the stripe.
2. Aircraft Lead-in Lines or Centerline Marking shall be 12-inch yellow with 6-inch black outline on both sides (See Aircraft Parking Marking I Exhibit).
3. Nose Wheel Stop Bars shall be 12-inch think, 5-foot wide yellow with 6-inch black outline on all sides.
4. Text defining the aircraft type at a given Nose Wheel Stop Bar shall be 12-inch tall yellow letters with black background. Text shall be justified to the left when located on the right side of the stop bar and justified to the right when located on the left side of the stop bar.
5. The Gate Designation Box, if applicable, at the end of the lead-in line shall include the pier or RON pad designation and position number with 4-foot tall yellow letters, black background, and 4-inch minimum width stroke. The black background shall extend a minimum of 12-inches beyond the extremities of the letters. It shall be encompassed with 6-inch yellow and 6-inch black outlines. (See Aircraft Parking Marking II Exhibit)
6. An alternate centerline and envelope may be required when a gate or RON position can accommodate different aircraft groups or sizes under different scenarios. The secondary, or less used set of marking, shall then be dashed. The widths and colors for the lead-in lines and aircraft envelope remain constant; however the marking shall be altered to 10-foot long stripes with 10-foot long spaces. (See Aircraft Parking Marking II Exhibit).



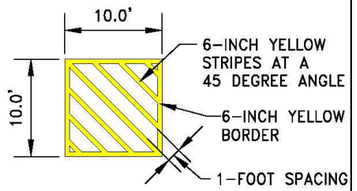
MAA TYPICAL AIRCRAFT ENVELOPE

AS SHOWN

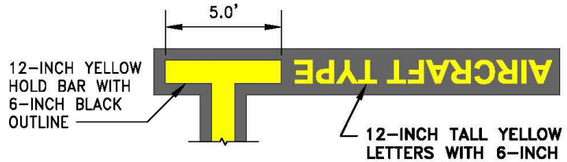
SHEET TITLE: AIRCRAFT PARKING MARKING I	DATE: MAY 2012



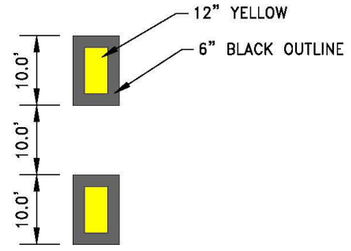
GATE DESIGNATION
BOX DETAIL
N.T.S.



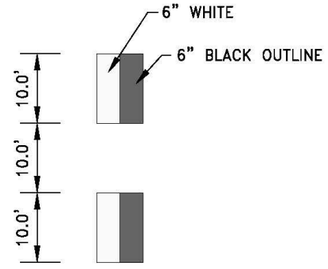
PASSENGER BOARDING
BRIDGE STOW BOX
N.T.S.



HOLD BAR DETAIL
N.T.S.



DASHED LEAD–IN LINE/
CENTERLINE MARKING
N.T.S.



DASHED AIRCRAFT
ENVELOPE MARKING
N.T.S.

SHEET TITLE: AIRCRAFT PARKING MARKING II	DATE: MAY 2012

6.4.2 Landside Pavement Markings

Pavement markings on all landside pavements shall conform to the latest version of the applicable Maryland State Highway Administration (MDSHA) specification as outlined below. These specifications can be found on MDSHA's Standard and Supplemental Specifications for Construction and Materials Book web page.

The specifications, when applicable, shall be inserted in the contract documents.

6.4.2.1 Landside Asphalt Pavements

Landside asphalt pavements shall receive thermoplastic pavement markings conforming to MDSHA Standard Specifications for Construction and Materials Section 553 – Lead Free Reflective Thermoplastic Pavement Markings or Section 556 – Preformed Thermoplastic Pavement Markings. The manufacturer's recommendations shall be followed for the duration between installation of the asphalt pavement and application of the thermoplastic pavement markings.

Alternatively, inlaid permanent preformed pattern reflective pavement marking materials conforming to MDSHA Standard Specifications for Construction and Materials Section 559 – Permanent Preformed Patterned Reflective Pavement Markings, may be used.

Thermoplastic pavement markings shall not be placed over existing pavement marking tape on existing asphalt pavement. The existing tape shall be removed prior to placement of the thermoplastic pavement markings.

6.4.2.2 Landside Concrete Pavements

Landside concrete pavements shall receive permanent preformed contrast pattern reflective pavement markings materials conforming to MDSHA Standard Specifications for Construction and Materials Section 559 – Permanent Preformed Patterned Reflective Pavement Markings.

Existing contrast pavement markings shall be removed per MDSHA standard specifications for Construction Materials Section 565 – Removal Of Existing Pavement Markings, with high pressure water blasting or other manual removal methods as specified.

6.4.2.3 Landside Crosswalks, Legends and Symbols

Landside crosswalks, legends and symbols shall receive heat applied permanent preformed thermoplastic pavement markings meeting MDSHA Standard Specifications for Construction and Materials Section 556 Preformed Thermoplastic Pavement Markings.

6.4.2.4 Parking Garages

A. Lane, stall, and numbering markings shall use solvent based Low VOC Acrylic Traffic Marking Paint which is a conventional dry (non-heat applied) acetone-based paint for use on concrete and asphalt pavements.
B. Crosswalks, messaging, and symbols shall be heat applied permanent preformed thermoplastic pavement markings conforming to MDSHA Standard Specifications for Construction and Materials Section 556 – Preformed Thermoplastic Pavement Markings.
C. Consolidated Rental Car Facility (CRCF) Garage – The CRCF Garage is an exception and shall use solvent based Low VOC Acrylic Traffic Marking Paint which is a conventional dry (non-heat applied) acetone-based paint for use on concrete and asphalt pavements for all markings including lane, stall, numbering, crosswalks, messaging, and symbols.

6.4.3 Emergency Vehicle Access/Fire Lanes/Fire Hydrants and Fire Department Connections

Refer to Volume 3, Chapter 3.

6.5 Miscellaneous Site Elements

6.5.1 Curb and Gutter

Only Combination Curb and Gutter shall be used as per MDSHA Standard 620.02. Straight Curb shall not be used under any circumstances.

6.5.2 Bollards

All bollards installed at BWI Marshall and Martin State Airports shall be concrete filled galvanized schedule 40 pipe not less than six (6) inches in diameter, painted yellow.
Bollards shall be covered with a yellow, 1/8" thick HDPE bollard post cover, securely fastened to the bollard in accordance with the manufacturer's recommendations. Sleeve height shall be from the top of the surrounding pavement to the top of the exposed pipe. Two red, reflective, 1-inch thick recessed bands shall be located within the top 18" of the bollard cover. Bollard cover manufacturer shall provide at least five (5) year warranty against warping, cracking, and fading.

Bollard placement shall be designed to protect buildings and other valuable assets from vehicular and mobile equipment impact without impeding access to the protected asset. Assets to be protected included, but are not limited to, above ground tanks, platforms, loading bridge foundations, generators, guard booths, baggage handling systems, etc. In the instance of fire hydrants and standpipes, the provision of, and location of, bollards will be subject to approval by the MDOT MAA Fire Marshal and bollards shall not be located in front of, or within three (3) feet of a fire hydrant steamer connection.

6.5.3 Power Gate Loops

The installation of the gate loop wire inside a plastic conduit pipe shall be mandatory when new concrete pad is poured.

7.1 Architectural Design Coordination

The Consultant shall coordinate their design approach with MDOT MAA's Resident Architect prior to and during the concept and schematic design phases for all projects. In addition, the Resident Architect shall review and approve all architectural materials. Prior to the proposal preparation, the Consultant, MDOT MAA's Project Manager, and Resident Architect shall identify any specialty architectural sub-consultants required for interior design, graphics, furnishings, etc.

The GIS and Engineering Technology Section (GETS) is responsible for the numbered identification of all doors, elevators, stairwells, and buildings. Designs/construction requiring new or re-numbering of any of the mentioned shall be obtained from GETS. See PEGS Volume 1, Chapter 02 Building and Space Naming, Identification, Addressing and Measurement Standards.

7.1.1 Domestic Terminal Baggage Claim Areas

The Consultant shall match the standard wall covering, solid surface wainscot and terrazzo floor finish. The red wall covering used on the back wall is "Tretford 570" manufactured by Eurotex. Signage shall match the Airport's standard.

7.1.2 Domestic Terminal Ticketing Concourse

The present design of the ticket counter facing the public shall be maintained. All plastic laminate visible to the public shall match the existing black plastic laminate. The ticket counter module and baggage well size shall match the existing unless approved in advance by the MDOT MAA. The provider of the inserts shall be identified during the concept design phase. The design of the back wall, including airline signage and graphics, must be approved by the MDOT MAA. Signage required by the Federal Aviation Administration (FAA) must be maintained. The MDOT MAA must approve any objects placed by tenants in the public space. Ticket counters shall be designed to have an accessible counter level for the disabled per ADA Accessibility Guidelines, current regulations.

Queuing areas may be a maximum of twenty feet (20') from the face of the ticket counters on the upper level of the terminal. Temporary exceptions to these limits may be allowed when needed to accommodate a large number of patrons; however, a minimum of twelve feet (12') of clear corridor must be maintained at all times. Stanchions shall be manufactured by Lavi Industries, Model #60-50-3000CL with plastisol coating on the base and a nylon webbed belt that will extend 6 feet. The logo and color of the tenant/consultant's choice shall be silk-screened on the belt. LED and Blade signs shall match existing.

7.1.3 Domestic Terminal Security Checkpoints

Terminal Security Checkpoints shall comply with all regulations issued by the Transportation Security Administration (TSA) for security checkpoint equipment, signage, screens, search rooms, etc. Wall covering and solid surfacing wainscot shall match the Airport's standard. Column covers shall be stainless steel. The checkpoint area shall be separated from the egress corridor with full height clear butt-glazed partition. Consultants must provide a private search room for dignitaries and an office for the security personnel. In addition, convenient storage for personal items belonging to security personnel shall be provided. This may be a closet or a cupboard in the casework. Lockers, which are visible to the public, are not acceptable.

7.1.4 Domestic Terminal and International Terminal Concourse Holdrooms

The furnishings and finishes in the preferential use Domestic Terminal Holdrooms are the responsibility of the airlines, if required by the lease agreements. Changes in the finishes must be submitted to the MDOT MAA for approval. The furnishings and finishes in the International Terminal and common use Domestic Terminal Holdrooms are the responsibility of the MDOT MAA. Ticket and lift and gate podium design shall match existing unless approved by MDOT MAA.

7.1.5 Commercial Storefronts and Signage

Some latitude is allowed in the design of storefronts and signage in the Domestic Terminal. The preliminary design must be approved by the MDOT MAA Resident Architect prior to commencement of Construction Documents (CDs). The roll down grilles shall be aluminum and approved by the MDOT MAA Resident Architect. Storefronts and signage in the International Terminal shall conform to the current design. Roll-down grilles shall be clear aluminum and approved by the MDOT MAA Resident Architect.

For all Terminal buildings, except A, B, A/B and E Concourses, storefront security grills must be "smoke barrier" grills. Lexan, or Class A rated thermal polycarbonate filler strips, are permitted by the Office of the Fire Marshal to be used for smoke barrier grill designs.

7.1.6 Service Areas

Back-of-house corridor walls should be constructed of painted gypsum board, painted concrete block, or glazed concrete block. When using gypsum board, vinyl bumpers and corner guards shall be provided to protect walls from impact damage. Consider using a wainscoting material such as Kydex or approved equal at the elevator entrances and/or other areas especially subject to damage.

7.1.7 Offices

The design of office space shall be coordinated with the MDOT MAA Resident Architect.

7.1.8 FIDS/BIDS Enclosures

The design of FIDS/BIDS enclosures and displays shall be coordinated with the MDOT MAA Resident Architect.

7.2 Tenant Improvements

7.2.1 International Terminal and Concourse Millwork

MDOT MAA would like to maintain the architectural standard and structural integrity of the International Terminal and Concourse millwork. Accordingly, modifications to the ticket counter and holdroom millwork should be designed, reviewed, and constructed using the following general guidelines. Deviations from the following will require approval on a case by case basis by the MDOT MAA Resident Architect.

A. Cabinet Work or Shell
   1. Top, front, and sides of counters that are visible to the public should not be altered. The continuity of design that is presented to the public should be maintained.
   2. Modifications for inserts should be done in a manner which insures that support is provided for all parts of the shell independent of the inserts.
   3. The rear counter work surface can be modified, provided that supports are added so that the work surface can support itself without the use of inserts.
   4. When modifications such as cut outs are made, all visible edges should be finished by qualified case work specialist with plastic laminate, or solid surfacing material to match original design.

B. Baggage Scales
   1. Stainless steel surrounding the scales and the scales should not be modified in any manner. The continuity of design that is presented to the public should be maintained.
   2. Readouts should not be modified or relocated. The continuity of design that is presented to the public should be maintained.

C. Hardware
   1. Hinges for the flip-up counter top work surface in front of the monitors should be concealed or located in such a manner so that clothing cannot be damaged.
   2. Visible hardware, such as locks and hinges, should be the same as or compatible with the original design.
   3. All hardware should be commercial grade.

D. Inserts and Equipment
   1. New inserts should match original design with respect to colors, finish, plastic laminate, solid surface material, etc.
   2. Monitors should have a mental angle or wood stops to prevent them from resting on the back of the front counter wall.
   3. Scale readouts should remain on the side panels as originally designed. They should not be placed in the counter top work surface.
   4. Telephones, outlets, etc. shall not be placed in areas that are visible to the public.

E. Plastic Laminate
   1. Plastic laminate shall be Nevamar; MR-6-7-CR, PHANTOM GRAY MATRIX.

F. Solid Surface
   1. Solid surface material shall be Wilsonart; Surfacing veneer Steel Grey Tempest – 9194TM at 13 mm thickness.

7.3 Roof Systems

All projects at BWI Marshall and Martin State Airports shall comply with the Department of General Services (DGS) Statewide Roofing Policy and specifications, as well as the following criteria:

A. Design shall include a 60-year life cycle cost analysis for all new construction projects. Reroofing rehabilitation projects are exempt from this requirement. Any method of analysis is acceptable as long as assumptions include: 1) 20-year life for built-up and modified bitumen roofs, 2) biannual maintenance performed.

B. If the proposed roofing system has not been previously approved by DGS, consultants shall submit the system to Chief, Project Management Design, DGS Engineering, for review and approval. DGS review time is approximately 14 days.

C. Based on project specifics, DGS may waive the requirement to install vapor retarders for roof installation and/or replacement projects. DGS shall evaluate the need for vapor retarders on a case-by-case basis. Requests for waivers shall be submitted to Chief, Project Management Design.

D. All projects shall be specified to insure qualified contractors perform the work. Qualified contractors shall be approved by the manufacturer, have a minimum of 5 years of experience in the installation of roof systems, and meet the following guarantee and warranty requirements:
   1. Provide Manufacturer's roof warranty, including the following minimum criteria:
      a. Complete coverage of the cost of the labor and materials for repair of leaks due to poor workmanship or materials failure.
      b. Complete systems warranty must include each and every component of the roofing system.
      c. Non-prorated, non-penal sum (no dollar limit), twenty (20) year warranty period.

      Note: The use of polyisocyanurate (Iso) insulation, to make up the two layers of insulation (base and tapered layer) needed to achieve a 20-year no dollar limit roof, is no longer allowed unless a ½" cover board is applied. Roof systems in which felts are attached directly to the Iso boards shall be rejected and must be remedied.

d. Coverage of the cost of removal and replacement of damaged or wet insulation, which is a result of leaks from poor workmanship or failed materials.
e. No exclusion from coverage for damage to the roof system as a result of wind gusts less than 55 mph.

2. Submit and provide components required by the roofing system manufacturer for the specific warranty.
3. At the completion of the work, the contractor shall guarantee in writing to the Maryland Aviation Administration (MDOT MAA) representative that the roofing system, flashing, sheet metal work and all associate components as installed are of the highest quality, weathertight, waterproof and free from defects due to improper or defective materials, and/or workmanship developing under normal wear and tear for a period of five (5) years from the date of final acceptance of all work under this contract. The contractor shall be notified by the MDOT MAA representative of any defective work and shall correct water leaks into the building within forty-eight (48) hours after notification and within ten (10) days for all other defects. Failure of the contractor to correct any defects in the time allowed shall allow the MDOT MAA to contract for repairs and charge the contractor for all costs incurred. All repairs/replacement shall be at no cost to the MDOT MAA.
4. Evidence shall be submitted to MDOT MAA which verifies that all new or replacement roofing materials conform with applicable Underwriter's Laboratories listed fire rated roof-ceiling assemblies, where listed assemblies are specified as components of A/E designs for the subject building or are otherwise required by the adopted building or fire codes. Additionally, MDOT MAA will not accept any roofing material that is not a Class "A" roof, listed by Underwriter's Laboratories or Factory Mutual.

E. All roofs at BWI Marshall and Martin State Airports shall be color white. Consultant shall coordinate with Resident Architect for exact color requirements.

7.3.1 Rooftop Equipment Installation

Equipment installation such as satellite dishes is prohibited. Only HVAC equipment shall be permitted on rooftops. All rooftop equipment installation shall undergo a Line of Sight study and shall be reviewed and coordinated with MDOT MAA Operations and FAA-ATCT at BWI Marshall.

7.4 Floor and Wall Coverings

7.4.1 Restrooms

Refer to Restroom Standards in Chapter 7.6 Restroom Standards for Restroom floor and wall coverings.

7.4.2 Tile

A. Red Ceramic Tile Column Finish: Summitville Tile, Inc., Summitville, Ohio 43962, manufacturers the red tile which clads the columns in front of the Passenger Terminal. The custom color number is 4865-1.
B. No asbestos containing materials are to be used, including mastic.

7.4.3 Carpet Tile

A. Terminal E Carpet Tile: Carpet tile used in Concourse E Holdrooms is manufactured by Shaw Industries, Inc. The product is Networx Hemisphere No. SC-32, color 4295B-11. The field is 3 ply Dupont Antron Lumina, 2 end No. C145A and 1 end No. C151A. The border is 2 ply Dupont Antron Lumina, 1 end No. C127A and 1 end No. C247A.
B. Domestic Terminal Carpet Tile: The Consultant shall coordinate selection of carpet with the MDOT MAA Resident Architect.

7.4.4 Painting

Architects shall specify "white" paint colors that are standard with the MDOT MAA Office of Facilities Maintenance in order to minimize the paint colors they have to keep on hand.

7.4.5 Wall Covering

The wall covering used in the public areas of the Domestic Terminal shall be the MDOT MAA standard.

7.4.6 Solid Surfacing Material

A. Domestic Terminal's Public Area: The solid surfacing material for the Domestic Terminal's public area wainscot shall be coordinated with the MDOT MAA Resident Engineer.
B. Terminal E Casework: The solid surfacing material for Terminal E casework is Wilsonart Steel Grey Tempest – 9194TM at 13 mm thickness.

7.4.7 Plastic Laminate

Terminal E Casework: The Plastic Laminate used for Terminal E casework shall be Nevamar "Phantom Grey Matrix Crystal" MR-6-7CR, and "Storm Grey Matrix Crystal" MR-6-4CR.

7.4.8 Waterproofing

A. Waterproofing of suspended composite and reinforced concrete floors in janitors' closets, toilet rooms, kitchens, food preparation areas and any other spaces where the use of the space, potentially or consequently, results in the wetting of the floor. These spaces are referred to as "wet areas" in this Standard.
B. Prevention of water damage from hot water heaters and sprinkler drains.

SPECIAL NOTE:
Consultants shall not place wet pipes over electrical rooms (such as electrical substations, communications rooms and other spaces where water damage would have significant impact on life safety or the airport's operations or that of its tenants). For special conditions that prohibit this, it should be brought to the attention of the Building Permit Committee or the MDOT MAA Project Manager. This may result in additional provisions being required beyond those contained in this Standard.

7.4.8.1 Waterproofing of Floors

A. Waterproofing of floors in wet areas is intended to prevent water damage to spaces below or adjacent to the wet area.
B. Waterproofing of floors in wet areas shall be continuous. The waterproofing may be a membrane material or a liquid-applied material and must have acceptable waterproofing and crack-suppression qualities. The material must be laid in full compliance with the manufacturer's instructions.
C. Acceptable membrane materials are "Schluter-Ditra" membrane and underlayment as manufactured by Schluter Systems, or equal materials approved by MDOT MAA.
D. Acceptable liquid-applied materials are "Redgard" waterproofing and crack prevention membrane, as manufactured by Custom Building Products, or equal materials as approved by MDOT MAA.
E. At perimeter walls of wet areas and at pipe and other projections above the floor slab, turn up floor waterproofing minimum 2" onto the vertical surface, so that the wet area is surrounded by a continuous waterproof barrier to prevent water penetration into surrounding spaces. Refer to Standard detail for Floor Penetration on the following pages.

7.4.8.2 Floor Drains, Floor Sinks and Floor Cleanouts

A. Refer to the standard details for floor drains and floor sinks on the following pages.
B. Floor drains, floor sinks, and floor cleanouts in food preparation spaces must comply with the requirements of Anne Arundel County Health Department.
C. Floor sinks, floor drains, and floor cleanouts in wet areas generally must comply with the following requirements:
    1. Floor sinks, drains, and cleanouts must be provided with flanges to allow the floor waterproofing to be flashed around the flange and secured with continuous flashing clamps. Where necessary to allow for smooth transition of floor waterproofing onto flange, cut back the topping of the slab as illustrated.
    2. Floor sinks and drain must have seepage openings to allow moisture penetrating the floor covering to discharge into the body of the sink/drain. Provide loose gravel at seepage openings.
D. Size of floor drains and sinks.
    1. Grids of drains and sinks shall be not less than 8 inches in diameter, or 8" X 8" square. Rectangular grids shall not be less than 50 square inches in area.
    2. Floor drains and sinks must have outlets not less than 4 inches diameter to discharge into drain piping not less than 4 inches in diameter.
E. Cleanouts
    1. Cleanouts below the slab shall only be located above service areas or other unoccupied spaces, where access to them will not inconvenience other Tenants or the Public.
    2. Where cleanouts below slab level are not permissible, provide side-accessible cleanouts in walls above the slab, such as walls of mechanical chases or other walls in Tenant's premises.
    3. Cleanouts shall not be permitted in electrical substations, communications rooms and other similar spaces.

7.4.8.3 Penetrations Through Floors of Wet Areas

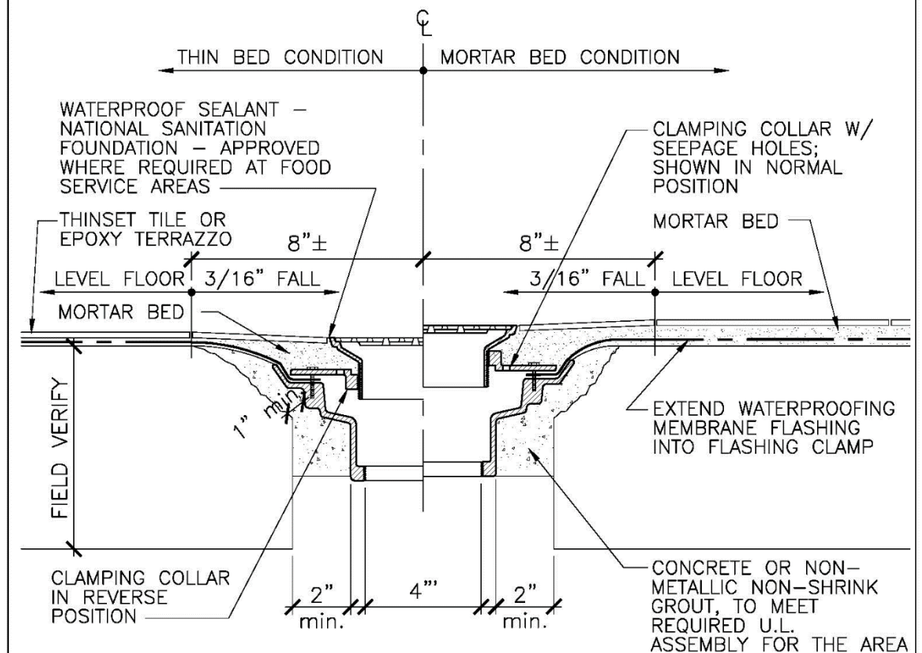
A. Refer to the standard details on the following pages.
B. Penetrations through slabs for new sinks, drains and pipes must not impair the structural stability of the slabs. Existing suspended slabs at the Airport are generally of the following types (Consultant must verify this information in the field):
    1. Composite concrete, generally 4-1/2 inches thick, with 2-1/2 inch concrete topping on 2 inch metal deck.
    2. Reinforced concrete. Thickness varies, from approximately 6 inches to 8 inches.
C. General Requirements for Floor Penetrations
    1. Submit drawings and documents signed and sealed by a structural engineer registered in the State of Maryland.
    2. Locate penetrations through slabs so that they are clear of below-slab beams.
    3. For reinforced concrete slabs, locate penetrations so as to avoid the slab reinforcement. Slab reinforcement is likely to be heavy in the areas surrounding columns. Where penetrations through reinforced concrete slabs are so located or of such a size that cutting of slab reinforcement bars is unavoidable, provide specific details signed and sealed by a structural engineer.
    4. For composite slabs, for any penetrations larger than 10" X 10" through the slab, provide specific details signed and sealed by a structural engineer.

7.4.8.4 Floor Coverings

A. Impervious tile or epoxy terrazzo is required in wet areas. Portland-cement based terrazzo is not permitted. An epoxy-type grout is recommended for tiled floors. At junction of floor finish and floor sinks/drains/cleanouts, provide flexible sealant. (National Sanitation Foundation approved where required at food service areas.)
B. At perimeter walls, etc., turn floor covering up as a wall base and to protect turned-up vertical waterproofing.

7.4.8.5 Preventative measures to avoid water damage to floors from water heaters, sprinkler drains, etc.

A. Install hot water heaters (high level) over a curbed galvanized metal or other catchment tray, with a discharge pipe to discharge at a floor sink, mop sink or floor drain with a funnel.
B. Install hot water heaters (floor mounted) on a curbed waterproof tray raised sufficiently above the floor so that the tray discharge pipe can fall to discharge at a floor sink or floor drain.
C. Sprinkler drains must discharge over an adequately sized floor drain or floor sink.

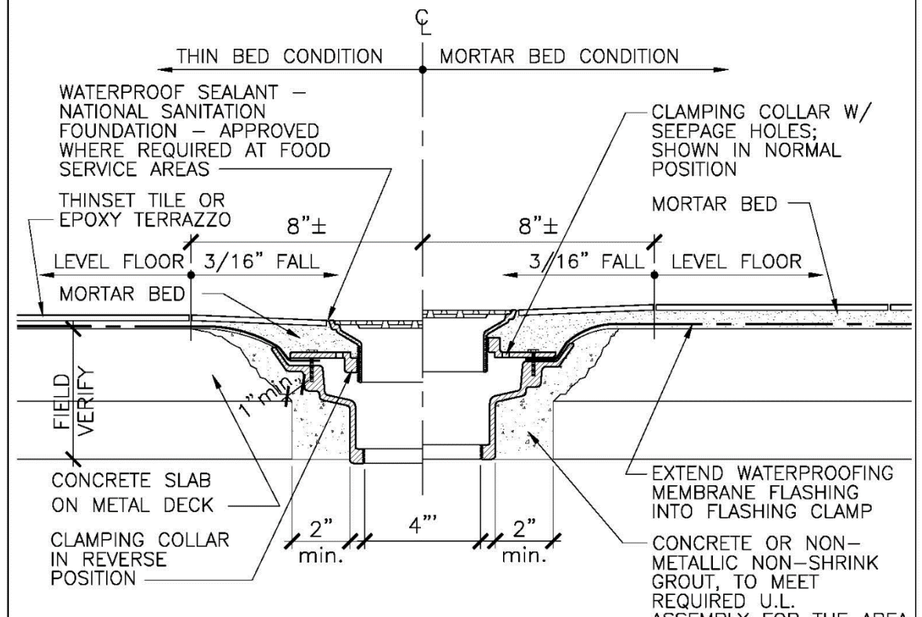


NOTE:
CORE DRILL OR SAW CUT AS NECESSARY TO REMOVE SLAB.
SLAB REINFORCEMENT CAN ONLY BE CUT WITH STRUCTURAL ENGINEER'S APPROVAL.

1 / SK-2 FLOOR DRAIN — SUSPENDED REINFORCED CONCRETE SLAB CONDITION
SCALE: 3" = 1'–0"

DRAIN AS SHOWN – J.R. SMITH FLOOR DRAIN # 2005–A
EQUIVALENT DRAINS ACCEPTABLE FROM JOSAM OR ZURN

SHEET TITLE: FLOOR DRAIN IN SUSPENDED REINFORCED CONCRETE SLAB LOCATION	DATE: SEPT 2006

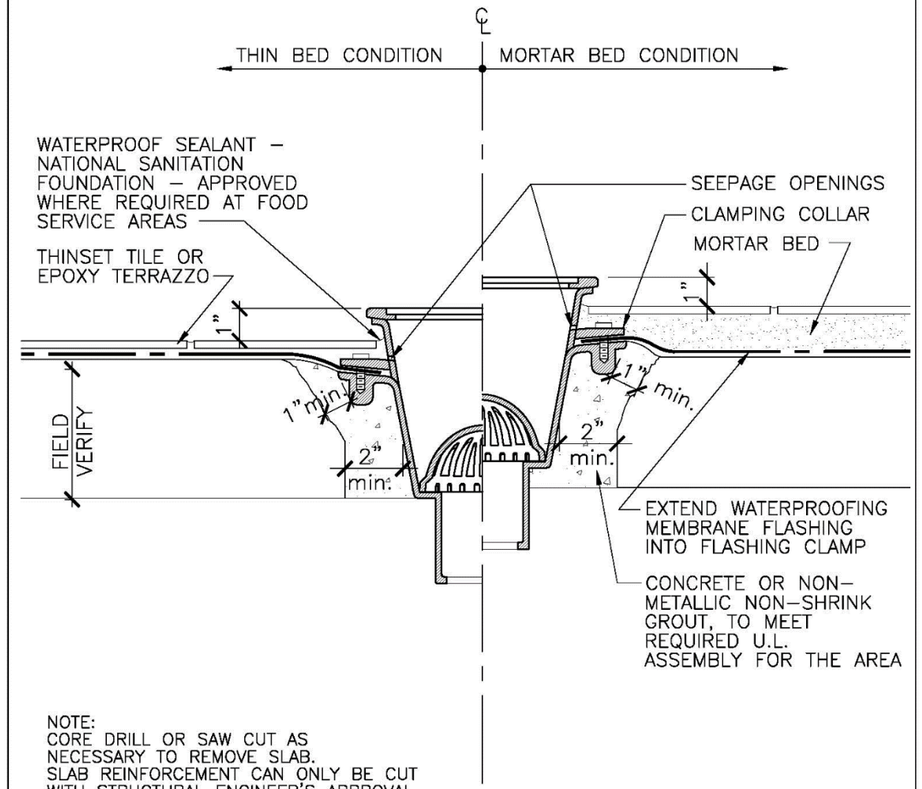


NOTE:
CORE DRILL OR SAW CUT AS NECESSARY TO REMOVE SLAB.
OPENINGS LARGER THAN 10"x10" REQUIRE STRUCTURAL ENGINEERS APPROVAL.

1 / SK-1 **FLOOR DRAIN** — COMPOSITE SLAB CONDITION
SCALE: 3" = 1'–0"

DRAIN AS SHOWN – J.R. SMITH FLOOR DRAIN # 2005–A
EQUIVALENT DRAINS ACCEPTABLE FROM JOSAM OR ZURN

SHEET TITLE: FLOOR DRAIN IN COMPOSITE SLAB LOCATION	DATE: SEPT 2006



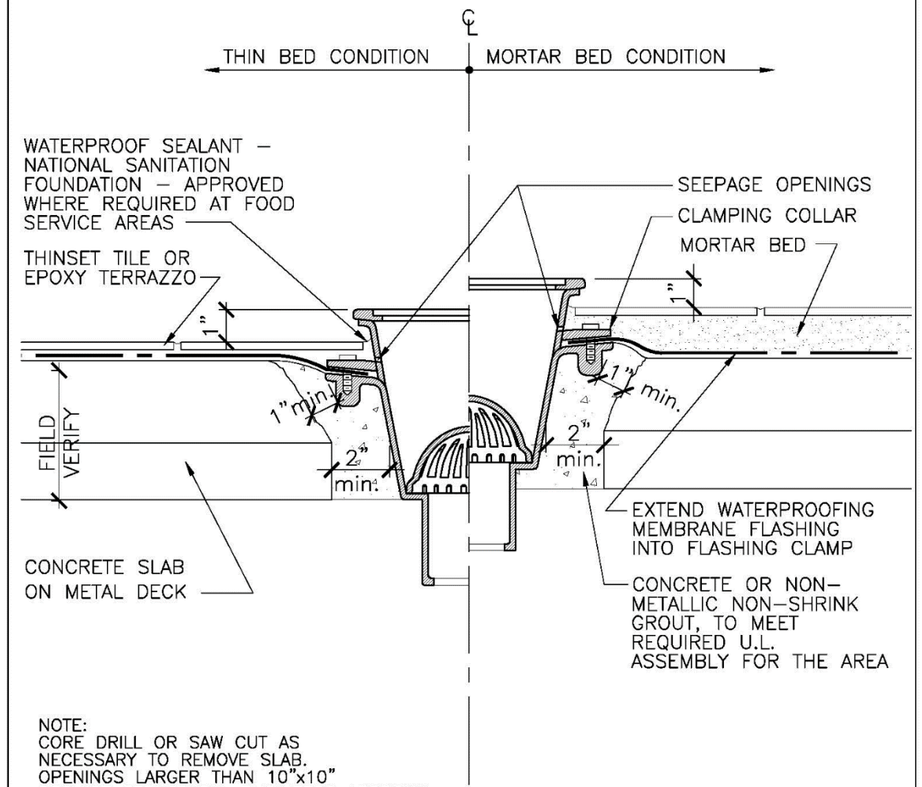
NOTE:
CORE DRILL OR SAW CUT AS NECESSARY TO REMOVE SLAB.
SLAB REINFORCEMENT CAN ONLY BE CUT WITH STRUCTURAL ENGINEER'S APPROVAL.

LOCATE FLOOR SINK UNDER EQUIPMENT/ ETC. TO AVOID TRIPPING HAZARD.

1 / SK-4 FLOOR SINK – SUSPENDED REINFORCED CONCRETE SLAB CONDITION
SCALE: 3" = 1'–0"

SINK AS SHOWN – J.R. SMITH SANI–CEPTOR # 3100
EQUIVALENT SINKS ACCEPTABLE FROM JOSAM OR ZURN

SHEET TITLE: FLOOR SINK IN SUSPENDED REINFORCED CONCRETE SLAB LOCATION	DATE: SEPT 2006



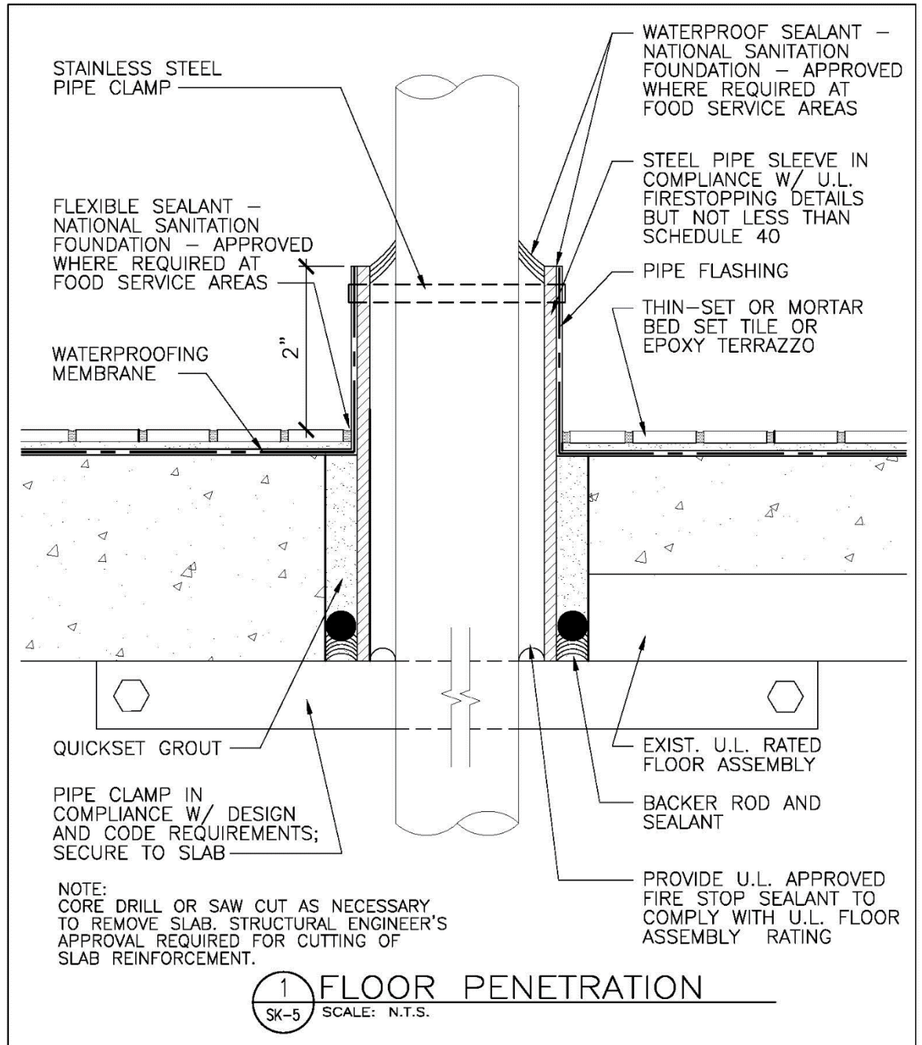
NOTE:
CORE DRILL OR SAW CUT AS NECESSARY TO REMOVE SLAB.
OPENINGS LARGER THAN 10"x10" REQUIRE STRUCTURAL ENGINEERS APPROVAL.

LOCATE FLOOR SINK UNDER EQUIPMENT/ ETC. TO AVOID TRIPPING HAZARD.

1 / SK-3 FLOOR SINK – COMPOSITE SLAB CONDITION
SCALE: 3" = 1'–0"

SINK AS SHOWN – J.R. SMITH SANI–CEPTOR # 3100
EQUIVALENT SINKS ACCEPTABLE FROM JOSAM OR ZURN

SHEET TITLE: FLOOR SINK IN COMPOSITE SLAB LOCATION	DATE: SEPT 2006



1 SK–5 FLOOR PENETRATION
SCALE: N.T.S.

SHEET TITLE: PIPE FLOOR PENETRATION DETAIL	DATE: SEPT 2006

7.4.8.6 Test for Waterproofing of Floors

A. Test of all wet areas as defined and required to be waterproofed should be tested to ensure that the requirements and recommendations in the standards have been successfully applied and that all spaces below and adjacent to the wet areas are protected from water penetration and moisture damage**.**
B. Items to be Tested:
    1. Waterproofing of Floors:
        a. Continuity of membrane and/or liquid-applied material.
        b. Perimeter walls to a min.1-1/2 inches height above the contributory area.
        c. Projections of pipe and other material above the floor.
    2. Floor Drains, Floor Sinks and Floor Cleanouts:
        a. Prevention of migration of water to occupied spaces below any wet area to be waterproofed in conformance with Chapter 7.4.8 Waterproofing water proofing standards.
C. Cost of the flood test shall be borne by the tenant, not the Airport.
D. The flood test shall include testing of:
    1. Each wet area to be waterproofed in conformance with Chapter 7.4.8 Waterproofing standards.
    2. All floor drains, floor sink drains, and clean outs in and serving each wet area.
    3. Ensure that all corners and door threshold are thoroughly tested.
E. Test Procedure: The flood test shall be performed in conformance with the following:
    1. Ensure that all new sanitary pipe drains are pre-tested for leaks and proper drainage prior to the wet area flood test.
    2. Allow for manufacturer's recommended dry and cure time for the installed water proof membrane before conducting testing.
    3. Notify the MDOT MAA Office of Commercial Management ten calendar days prior to testing to obtain access and an access schedule for the spaces being tested and the spaces located below and adjacent to the areas to be tested.
    4. Prior to testing, remove acoustic ceiling panels in spaces located beneath test area.
    5. Prior to testing, provide access into the ceiling/under slab space, in any areas with drywall ceiling that are located beneath the test area.
    6. Prior to testing, provide protective plastic sheet covering to all equipment, and furniture in any occupied areas located immediately below or adjacent to the wet floor being tested.
    7. Prior to testing, provide protection of doors into and out of the space being tested.
    8. Provide a seal at the sill (threshold) of each door into and out of the space being tested.
    9. Provide observers in the areas located immediately below the wet area being tested.
    10. Equip the testing team with devices that will permit communication between the wet floor area being tested and the areas immediately below and adjacent to the wet area being tested.
    11. Provide each of the observers with a reporting form that when filled out will locate any leaks for use during subsequent resealing operations.
    12. Install plugs in the floor drains in the wet floor being tested.
    13. Flood each area to a depth of 1-1/2 inches above the highest finish level of the contributory area. (That is to ½ inch below the two-inch height of the turned up membrane located at the edges of the contributory area).
    14. Maintain 1-1/2 inches of water in the wet area for a minimum of 2 hours.
    15. Observe and report any leaks using the forms and communication devices called for above.
    16. Identify source of leak on top side of slab.
    17. After two hours of testing, unplug floor drains and allow water to drain out of the wet area.
    18. After one hour, observe again, the conditions in areas below and adjacent to the test area.
    19. Upon completion of the test replace all removed acoustic ceiling panels and repair any drywall ceiling modified to provide testing access. Remove all protective plastic sheathing and return the space to its original condition.
F. Report: Compile a report summarizing the test and specifically locating and describing any leaks that occur. Include the observers filled out forms as well as a diagram showing where the sources of the leaks are located. Provide two copies of the report to:

    MDOT MAA Inspector and/or the Resident Engineer,
    991 Corporate Boulevard
    Linthicum, Maryland 21090

G. Re-test: After sealing leaks, re-test the wet area as specified above. Continue sealing leaks and testing until all leaking has been eliminated.
H. Repair: The contractor will be responsible for all damage, caused by the test, in areas which are located adjacent to and below the test area.

7.4.9 Floor Structure Recessed Expansion Joint Covers

The consultant of new or renovated facilities shall specify floor structure expansion joints with recessed/flush metal covers when and wherever possible. The intent of the required covers is to reduce potential tripping hazards and, secondarily, to protect the expansion joints. This standard addresses both floor to floor and floor to wall expansion joints.

The need for, location of, performance requirements and type of expansion joints will be determined by the consultant as required by the type of floor construction, floor finishes and current design code requirements.

A. General Requirements – All expansion joint covers shall be:
   1. Recessed and flush with adjacent finishes or slab surface.
   2. ADA Accessibility Guidelines-compliant.
   3. Heavy duty, as appropriate, for the anticipated traffic over the joint.
   4. UL fire-rating, as appropriate, where installed in a fire-rated assembly.
   5. Weatherproof when exposed to the weather with occupied spaces below (including parking garages). Covers subject to snowplowing should be designed to withstand this activity.
   6. Stainless steel or aluminum, as appropriate, with finishes to be determined by Consultant. Ensure proper isolation barriers are specified for aluminum on concrete installations.
   7. The Consultant shall consider the coefficient of friction of adjacent floor/slab surfaces when selecting the cover plate and its finish. Plate texturing or applied non-skid treatment may be applicable with certain adjacent finishes.
   8. Joint covers over bellow type expansion joints should be removable to allow cleaning.
   9. The cover should span all components of the expansion joint.
B. New Construction Guidelines – For new construction in the Terminal, and other buildings with applied floor finishes, the expansion joint covers shall accommodate and be appropriate for the floor finishes on each side of the joint. These finishes typically include: carpet, vinyl composition tile, ceramic tile and terrazzo. Where the recessed expansion joint cover also acts as a transition between two types of floor finishes, the consultant shall specify a cover that is designed for such transitions.
C. Existing Construction Guidelines – Consultants of building renovations that include existing floor structure expansion joints within the limits of work must provide the MDOT MAA with an evaluation of the structural feasibility and probable costs to modify or replace existing expansion joints to allow for a recessed flush cover plate installation. Based on the evaluation, the MDOT MAA will decide on whether to modify the existing joints to comply with the requirements of this standard.

NOTE: Floor structures in the Hourly, Daily and Consolidated Rental Car Facility Garages are post-tensioned concrete slabs. The Consultant should take particular care in attempting to modify existing expansion joint configurations in this type of structure.

D. Interior Floor Expansion Joint Covers and Assemblies
   1. General: Floor expansion joint covers required to bridge building structure expansion joints must be of a type recommended by manufacturers for installation in airports, and capable of withstanding the loads imposed by airport pedestrian traffic; wheeled carts of various capacities and wheel types; pallet trucks; trolleys; and commercial ride-on floor cleaning equipment. Covers must be all-metal design, flush with adjacent floor finishes such as tile and terrazzo to avoid tripping hazards, and textured or striated for slip resistance. Set expansion joint covers adjacent to carpeted floors slightly below the finished height of carpet to compensate for carpet crushing and wear.
   2. Expansion joint assemblies consist of an approved expansion joint cover and fire barrier.
E. Expansion Joint Covers
   1. Solid cast or extruded aluminum, or combination, no-bump type expansion joint covers are required. Minimum product design characteristics and performance requirements include the following:
      a. Material: Heavy-duty interlocking aluminum extrusions.
      b. Movement: Three-way.
      c. Load Capacity: Minimum 1450 psi for solid rubber tires.
      d. Capable of spanning width of expansion joint.
      e. Designed to reduce noise, and resist passage of liquid spills and accumulation of dirt in movement joints.
      f. Americans with Disabilities Act Accessibility Guidelines (ADAAG) compliant.
   2. Installation Accessories: Factory-fabricated closure materials, intersections, and similar accessories required for a continuous expansion joint system. Isolate aluminum components from concrete and dissimilar metals following expansion joint cover manufacturers' recommendations and details.
   3. Expansion joint covers incorporating elastomeric materials in the design of the wearing surface, including santoprene, have not been capable of withstanding the conditions at the airport. Aluminum extrusions of this type of cover are generally thin-walled and susceptible to damage. Additionally, elastomeric extrusions tear easily and are often of a unique design. Obtaining matching replacements of the correct design has proven to be difficult for airport maintenance. Expansion joint covers of this type are not permitted.
F. Fire-Resistance-Rated Expansion Joint Assemblies
   1. General: Floor fire-resistance-rated expansion joint assemblies must be of a type that is an approved fire-resistant joint system, designed to resist the passage of fire for a time period not less than the required fire resistance rating of the airport terminal floor, or other horizontal fire separation assembly. Where expansion joint covers are a part of fire-resistance-rated horizontal construction, expansion joint covers do not contribute to the overall fire-resistance rating of the floor assembly. Details must provide for the installation of the expansion joint covers, and not less than the minimum thicknesses of floor materials required to install the fire-resistant joint material in compliance with assemblies tested by laboratories recognized by the MDOT MAA Office of the Fire Marshal. For example, if the tested assembly requires a minimum four-inch depth of concrete either side of the fire-resistant joint material, the overall concrete depth at the expansion joint must be increased by the depth required for flush installation of the joint cover. Generally, the overall required thickness of concrete at the expansion joint will be greater than the thickness required for a fire-resistance-rated composite slab.
   2. Fire Barrier Joint Material: Manufactured product consisting of a combination of traffic-bearing silicone top layer applied to a fire-retardant-impregnated foam core and intumescent bottom layer. Joint material is adhered to the edges of concrete floor slabs. Factory pre-formed transitions to reduce or eliminate field cutting are required wherever possible. Completed installation must be designed to produce a fire-resistance-rated watertight joint.

Bellows type fire barriers are not permitted, unless otherwise accepted by MDOT MAA. These types of joints have become travel paths for various pests and should be avoided.

3. Fire-Resistant Joint Design: Joint designs cannot include permanent metal concrete pour stops without greatly reducing the required fire-resistance rating of the horizontal assembly. Metal acts as a thermal bridge, resulting in premature failure of the joint when tested. Expansion joint details should indicate removal of the pour stops, or alternative methods of controlling concrete pours during construction.

   Note that many existing structural expansion joints utilized metal pour stops that were left in place. In order to comply with fire-resistance-rated horizontal separation requirements, these pour stops may have to be removed. Additionally, concrete slab thicknesses may not comply with tested assembly details. In existing construction, extraordinary measures may be required to sawcut pour stops and thicken slab at expansion joints.

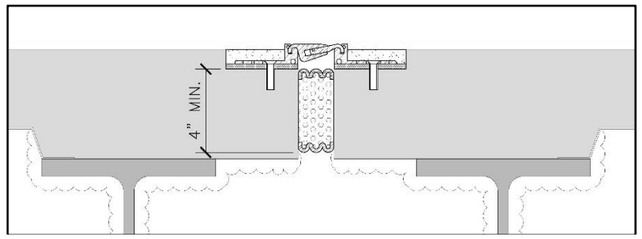


Figure 1 Representative expansion joint cover and fire barrier.

4. Non-Conforming Joint Designs: Although not recommended or encouraged, Consultants, in consultation with MDOT MAA Office of the Fire Marshal and the expansion joint manufacturer's technical support, may seek to obtain an engineering judgment, prepared by a registered fire protection engineer (FPE), for joint designs not in full compliance with laboratory-tested assemblies. The FPE need not be registered in the State of Maryland but must be certifying design on behalf of the expansion joint manufacturer.

7.5 Lock System

7.5.1 Finish Hardware

All projects shall specify MDOT MAA standard hardware and locksets unless otherwise approved by the Office of Facilities Maintenance.

7.5.2 Cipher Locks

Refer to Volume 3, Section 4.1.

7.6 Restroom Standards

Any toilet room renovated or newly constructed in public space on the departures or arrivals level of the terminal or concourses shall comply with this section. Toilet rooms constructed in Airline operation areas and tenant space shall comply with the hardware, fixtures, urinals, etc. and other requirements as outlined in this section to the full extent possible.

7.6.1 Design and Layout

A. **Code Requirements:** The design of the toilet room shall be in accordance with the most current edition of the applicable codes. The International Building and Plumbing Codes, the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and COMAR are applicable, and shall be used for the toilet room designs at BWI Marshall.

B. **Fixture Quantity Calculations:** The consultant should consider the proposed services being offered in the immediate vicinity of the toilet room for the basis of fixture quantity calculations. Fixture quantities in renovated toilet rooms shall be in accordance with the current local, state and federal plumbing codes.

   When Male and Female toilet rooms are designed immediately adjacent to each other, parity between fixtures shall be in accordance with current building codes and MDOT MAA requirements. Currently no requirement exists for parity. Women's toilet rooms shall be provided with as many fixtures as possible.

C. **Toilet Room Configuration:** The configuration and geometry of toilet rooms will vary depending on the physical constraints in the existing facility for renovated or new toilet room construction. All Toilet rooms shall be designed in accordance with the following guidelines:

1. The entry into high volume toilet rooms should be through a “maze” configuration. The maze should be configured to prevent direct line of sight into the toilet room from the entry corridor. The minimum functional clearance should permit two-way traffic through the maze and be considerate of travelers with baggage. The minimum allowable clear width is five (5) feet. The maze geometry should consider the traffic volumes expected for the toilet room.
2. Family Assist, single-use, and tenant toilet rooms shall be equipped with a lockable door.
3. The toilet room geometry should consider the daily maintenance required.
    a. Designs should permit half of the toilet room to be closed and cleaned while the other half remains open.
    b. A 3-foot chase is required behind all toilet walls for ease of maintenance. Accessible chases are not required behind lavatories and urinals, although a non-accessible “wet wall” may be required for plumbing line clearance and installation.
    c. Waste receptacles should be shown on the plans to verify adequate space is available.

D. Janitorial Closets:
1. A janitorial closet shall be located immediately adjacent to the toilet room(s). Only one closet is needed per pair of male/female restrooms. One closet is required adjacent to a single stall restroom.
2. The janitorial closet shall be a minimum of 20 square feet with a minimum width of 3 feet in any direction.
3. Closets shall be equipped with:
    a. Floor mounted mop basin constructed of terrazzo or molded stone.
    b. One fluorescent lighting fixture operated by a wall switch.
    c. Single gang electrical outlet installed in accordance with code (i.e. GFCI).
    d. A mop strip over the basin with multiple clips for hanging equipment.
    e. Threaded hose connection with an anti-siphon backflow preventer.
4. Hot water heaters are NOT to be installed in the Janitorial Closets.
5. Minimal storage is required in the janitorial closet. The consultant should verify the location of the nearest bulk storage location to verify if additional storage should be provided at the designed location.
6. Access to the closet shall be from the common public corridor. Locks for the door should be in accordance with the requirements of this document.
7. Waterproofing of floor shall be designed per Section 7.4.8.1 Waterproofing of Floors.

7.6.2 Facility Construction Requirements

A. The facility construction requirements provided below should be followed for all public toilet rooms. Private toilet rooms that are maintained and used by tenant personnel only should follow the requirements for the hardware, fixtures, urinals, etc. and other requirements as outlined in this standard to the full extent possible.

B. **Floors:** The floors can be either ceramic tile or terrazzo. The material shall match the existing corridor material. If the existing corridor does not consist of ceramic tile or terrazzo, then ceramic tile is preferred. The tile should be 12” x 12” with a non-slip finish. The grout should be non-absorbent and dark. The floors should be sloped to the extent possible to promote drainage. Floor drains are required for each bank of fixtures. The floor drains should be located in non-walking areas. The castings and grates for the drains should be stainless steel. Drains are to be installed per the current Plumbing Code. No check valve type drains are to be provided.

C. **Walls:** The walls should be constructed of concrete masonry units (CMU) when costs and structural integrity allow. CMU walls offer greater durability and impact resistance, and better anchorage for fixtures, stalls and accessories. Other approved wall construction would consist of 20-gauge metal studs with 5/8” marine grade plywood and cement board. Use of the stud wall construction should be reviewed and approved by the MDOT MAA. The wall finish should be ceramic tile from floor to ceiling. The cove base should be extended as high as possible off the floor. The tile size should match the floor. The grout for the walls should be light colored. The grout lines of the wall shall match the grout lines of the floor.

D. **Crash Protection**: Crash rails should be provided along the entrance hall walls. The material should be a high impact resistant extruded rigid plastic. The corners should have full-height corner guards from the floor to the ceiling. All guards should be mechanically fastened for ease of replacement when needed.

E. **Ceiling:** The height of the ceiling should be nine feet (9’-0”) above finish floor, unless constrained by existing conditions. The ceiling material is preferred to be gypsum wallboard with access panels. The access panels should be 16” x 16”, minimum and key-lockable. The keys shall have best key core to match airport standards. The finish on the gypsum ceiling is to be painted semi-gloss enamel. If an excessive number of access panels are required, an acoustic tile ceiling is permitted. Tile ceilings should consist of 2’ x 2’ moisture resistant panels, aluminum pre-painted suspension grid and tiles with anti-micro bacterial coatings. A restroom with both gypsum and acoustic panel ceiling is acceptable.

F. **Doors:** Doors are required for the Family Assist, single use, and tenant restrooms. The janitorial closets and the chase entry locations should also have doors. The doors should be hollow metal seamless with welded frames. The hardware should be in accordance with the details found in Chapter 7.7 Doors/Windows and restroom design cut sheets in Appendix 2F - Restroom Design Cut Sheets.
1. Hinges should be stainless steel ball bearing type.
2. Door Lever should be type required by ADAAG. The lever should of a type that returns to door face, to avoid possibility of catching fire hoses in an emergency situation.
3. Locks should be keyed to MDOT MAA master key system. The locks should be equipped with Best Lock Company interchangeable cores.
4. Closers should be delayed action closing type.

G. **Casework:** At multi-user locations, the countertops should be solid surface material with drop-in self-rimming lavatories, integral back and end splashes. The countertops should be linear and set at a constant height. The height should be in accordance with current ADAAG requirements. Under lavatory guards should be provided at each lavatory to prevent the potential scalding to users due to hot piping. Refer to Finishes cut sheets in Appendix 2F - Restroom Design Cut Sheets.

H. **Partitions:** Stalls are required at multi-user toilet rooms with water closets. Do not install urinals screens. The stall partition should be stainless steel with honeycomb cores. Additional reinforcement should be provided for grab bars, toilet paper holders and other accessories. The partitions should be floor supported unless otherwise approved.

Stall doors shall be attached to partitions with continuous stainless steel piano hinges - top and bottom pivot hinges are not acceptable.

The locking mechanism should be the latch type. No piston in hole type latch. Doors are required to have automatic returns. Typical stall doors should swing in towards the toilet. For the ADA toilets, the doors need to swing out. (Refer to Partitions cut sheets in Appendix 2F - Restroom Design Cut Sheets.

The wall-mounted side of the partition should be a continuous connection rather than a point-mounting bracket.

No coat hooks are to be placed on the partitions or the door. Locate hooks on rear wall. The coat hook attachment should be reinforced to the extent possible. Hooks should be located so the automatic flusher sensor is not blocked.

I. **Accessories:** The toilet accessories apply to public toilet rooms only.
   1. **Mirrors** should be located above the vanity running the full length in multi-user toilet rooms. In single use or Family Assist restrooms, only a wall mounted individual mirror is required. Mirrors can be tilted if required by the ADAAG. A minimum of one independent full height mirror is required in each multi-use toilet room. All mirrors should be placed away from the main entrance and in a location that would permit reflective view into the room. Mirrors should be constructed of tempered glass.
   2. **Soap dispensers** should be liquid soap dispensing type. They are required to be wall mounted with adhesive material. One dispenser is required between each sink. Coordinate with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract.
   3. **Paper towel dispensers** shall be coordinated with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract. Do not specify electric hand dryers.
   4. **Toilet paper holders** shall be coordinated with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract. Provide one at each water closet.
   5. **Waste receptacles** are to be 32 gallon, round freestanding unit with large top opening and grey in color. Wastes receptacles should be located immediately adjacent to the towel dispensers and of sufficient quantities. Where possible, provide a recessed nook to permit the receptacles space without taking away any traffic floor area. Waste receptacles are to be located on the plan view of the restroom in the construction documents.
   6. **Sanitary napkin disposal** receptacles should be provided in each stall of the women's toilet room. Receptacles should be free standing and not attached to the partitions. Coordinate with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract.
   7. **Sanitary napkin dispensers** should be located in the women's and Family Assist restrooms. Coordinate with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract.
   8. **Toilet seat cover dispensers** are required in the toilet rooms. They are not required in each stall and should be wall-mounted type. The automatic toilet seat cover dispenser is not to be specified. Coordinate with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract.
   9. **Air Fresheners** shall be located in all restrooms. A minimum of one should be provided for the Family Assist restroom. The location and number of fresheners in the multiple-user restrooms is at the discretion of the consultant. Coordinate with MDOT MAA Building maintenance for acceptable manufacturer per vendor contract.
   10. **Grab bars** are required in the ADA toilet stall. Grab bars should have slip resistant gripping surface.
   11. **Handbag shelves** are not to be provided in multiple-user toilet rooms.
   12. **Baby changing stations** and related countertops and sinks are to be provided in each male and female multi-use toilet room and Family Assist restroom. The changing table should be within 4 feet of the countertop and sink. Baby changing equipment shall be Koala Bear Care or approved equal. A sign is required within each multiple-user restroom indicating the location of the baby changing station.

J. **Signage:** The toilet room signage should be in accordance with the terminal standards. Icons are to be used to designate male and female toilet rooms. Directional signs are required in public toilet room areas. Signs shall be installed at the toilet room entrance including blade-type signage. ADAAG compliant wall mounted signage is to be provided at each toilet room.

K. **Lighting:** Lighting design and illumination levels should be in accordance with current lighting standards and codes. Lighting fixtures consistent with Chapter 12 Lighting, and should be 2 x 2 with parabolic lens and respective luminaire type. Alcove lighting above sinks and urinals shall have an egg-crate type parabolic diffuser. Flat translucent sheet diffusers are not acceptable.

L. **Ventilation:** The ventilation should exceed published mechanical standards by ten percent. The toilet room should be designed to have lower pressure than the public corridor to prevent fumes from escaping.

M. **Acoustics:** All toilet rooms should be sound proof. This is to be performed by constructing walls from the floor to roof deck/floor above.

N. **Fire Alarm and Emergency Lighting**: All public rooms need to comply with current building codes for fire alarm notification and emergency lighting requirements.

O. **Plumbing Fixtures**: The plumbing fixtures shall have the following requirements for all toilet rooms constructed. Refer to Fixtures cut sheets in Appendix 2F - Restroom Design Cut Sheets.
   1. Lavatories for Family Assist and single use restrooms are to be wall mounted with trim and controls. Lavatories for multi-use toilet rooms are to be countertop mounted drop-in self-rimming with trim and controls. All sinks are to be cast iron. The mixing valves should be located in the walls (not the ceiling). The maximum temperature setting should be in accordance with applicable code. Automatic presence sensors are required at each lavatory.
   2. Urinals are to be wall mounted with trim and controls on the flushometer. Wing-walls are required on the urinals. Automatic presence sensors are required at each urinal. The sensor shall be equipped with the ability to manual flush in the event the sensor is malfunctioning.
   3. Water closets are to be wall mounted with trim and controls. Automatic presence sensors are required at each water closet. Comply with current ADAAG requirements for accessible toilet stalls. The sensor shall be equipped with the ability to manual flush in the event the sensor is malfunctioning.
   4. Mop basins are to be floor mounted with trim, controls and plumbing accessories.

5. Floor drains should be self-priming and properly flashed for leak prevention (pertains to Janitorial closet as well).
6. General control requirements for all toilet rooms:
    a. All controls are to be automatic and hard wired.
    b. Limit the number of fixtures on a single transformer to reduce multiple fixture outages.
    c. Provide scald protection at all lavatories.

P. **Shower Compartments**: Shower compartments are not to be placed in multi-use, Family Assist, or single-use public toilet rooms. When shower compartments are required, they shall meet the following standards (Refer to Fixtures cut sheets in Appendix 2F - Restroom Design Cut Sheets):
1. Designed in accordance with current ADAAG requirements.
2. The compartment should be a prefabricated solid surface material.
3. Each compartment should have grab bars, soap dish or dispenser, a shower seat, and a heavy-duty curtain rod.
4. The mixing valve should be in the wall.
5. The showerhead should be slide type (up and down). Head is not to be placed on the back wall.
6. A floor drain is to be installed in front of the shower when installing an ADA accessible shower stall.

Q. **Lockers**: Lockers are not to be placed in multi-use, Family Assist, or single use public toilet rooms. The type, size, and material are at the discretion of the consultant. All lockers shall have removable legs with base filler (no concrete bases for ease of renovation). Attaching lockers to the wall or to the floor is to be approved by MDOT MAA. The lockers and locks will not be provided by MDOT MAA. ADAAG requirements must be maintained in locker areas.

R. **Sanitary Lines:** All restroom fixtures should drain by gravity to the sanitary piping system. If existing conditions prohibit gravity flow then lift station/ejector pits are to be included in the design. Lift stations and ejector pits should be located outside the footprint of the building structure the restroom is within. In addition, secondary containment of the lift station and ejector pit should be considered to limit overflow into adjacent areas during system failure.

7.6.3 Adult Change Rooms

7.6.3.1 General

The Maryland Aviation Administration has recognized a need to provide restroom facilities with greater accommodation than required by current accessibility codes and guidelines. Current MDOT MAA practice has been to provide family assist restrooms offering privacy for families with young children and individuals with special needs. The purpose of this Standard is to expand on those provisions, space permitting, and exceed the minimum requirements included in ADA Accessibility Guidelines and ICC ANSI A117.1.

7.6.3.2 Entrance Door

Comply with Chapter 7.7.5 Adult Change Room Door requirements.

7.6.3.3 Changing Table

Refer to Photo 2 and Drawings at end of this Section. Provide a floor-supported changing table, sized for use by adults, which can support individuals weighing a minimum of 400 pounds (180 kilograms). Table surfaces must be easily cleanable using steam or power-spray equipment. Do not permanently attach table to wall or floor to permit cleaning of spills on and around wall and floor surfaces behind and under table. Design table with the following characteristics:

A. Removable top.
B. Adjustable leveling feet.
C. Rounded edges and corners on open sides of table.
D. Located against an inside corner of the room.
E. Minimum 6-inch high back- and end-splash, integral with top. Loose splashes are not permitted.
F. Medical examining table paper roller at end of table.
G. Duplex convenience outlet (GFCI), and emergency call switch with pull cord within reach of individuals using changing table and assistant. Call switch is to signal the Consolidated Dispatch Center and illuminate a flexible response blue strobe signal light outside the Adult Change Room, above the entrance door.

Wood framing and panel products used in the design of the table are to be fire-retardant-treated. Refer to Volume 3, Section 2.2 General Fire Protection Design Information, regarding architectural woodwork fire protection requirements.

Metals, including fasteners, are to be corrosion-resistant or otherwise protected from corrosion, including the effects of cleaning chemicals. Fasteners securing removable top are to be tamper-resistant.

Grab Bars are to be installed along the full length and width of changing tables. Provide at least one intermediate support for grab bars installed along the length of changing tables. Comply with ICC ANSI A117.1 requirements for grab bars, except increase structural strength requirements to 400 pounds (1770 N). Peened grip for grab bars is optional.

Assistant's Chair: Subject to program requirements, provide area adjacent changing table (end opposite paper roll preferred) for one assistant's chair. Chair may also be used by nursing mothers in addition to those assisting individuals with decreased mobility. Chair must be easily cleanable, water-resistant, and capable of supporting a minimum weight of 300 pounds (135 kilograms). A fixed seating location is preferred. Optional features may include adjustable chair armrests and seat height, folding armrests and seat. Refer to Photo 1 at end of this Article for sample product available.

7.6.3.4 Changing Room Design

At a minimum, design Adult Change Rooms to comply with applicable requirements of ICC ANSI A117.1 Accessible and Usable Buildings and Facilities, and the Code of Maryland Regulations (COMAR). Consultants are encouraged to provide enhanced accommodation for these spaces, exceeding the minimum requirements contained in this Standard. For example, motorized wheelchairs, scooters, and wheelchairs and scooters with additional back and head support, often require greater floor space to maneuver and access plumbing fixtures. Additional space adjacent the water closet for assistant's use in aiding transfer may also be provided.

A. Room Finishes: Select finishes that can be cleaned easily, are mold and mildew resistant, and contain antimicrobial agents, when available by product manufacturers. Avoid finishes that are easily stained. Waterproof floors in accordance with Chapter 7.4.8 Waterproofing. Grout joints of ceramic, porcelain, and quarry tile are to be sealed. If epoxy grout is used for tile, note that some types of epoxy grout cannot withstand certain cleaning methods that may be used, including steam-cleaning. Provide ceilings consisting of framed monolithic gypsum board, suspended gypsum board system, or suspended exposed grid system and gypsum panels. Comply with Chapter 7.6.2 Facility Construction Requirements.
B. Water Closet: Wall-mounted type, conditions permitting.
C. Lavatories: Wheel-chair type with lavatory guards.
D. Vanities: Vanities are optional. If provided, ensure weight of an individual who may sit or stand on vanity can be supported.
E. Toilet Accessories: Coordinate with the Office of Ground Transportation for toilet accessories provided by MDOT MAA vendor(s), which may include soap dispensers, paper towel cabinets, toilet tissue dispensers, and sanitary napkin disposals. In addition to typical restroom accessories, include the following:
    1. Diaper changing station for infants.
    2. At least one large wall-mounted trash receptacle (recessed or semi-recessed preferred) for disposable diapers.
    3. Wall-mounted hook(s) for diaper bags and coats.
    4. Room deodorizer.
    5. Full-height angle-framed mirror with tempered glass.

7.6.3.5 Changing Room Design Scope

At the discretion of the Office of Architecture, elements of accommodation included in the Adult Change Room may be increased or decreased, but in no case less than what is required by referenced codes and regulations.

7.6.3.6 References

A. Assistance Chair: Pressalit Care www.pressalit.com.
B. Changing Table Paper Holder: Ritter 95 Treatment Table Accessories, Midmark Corporation www.midmark.com.

Photo 1: Assistance Chair

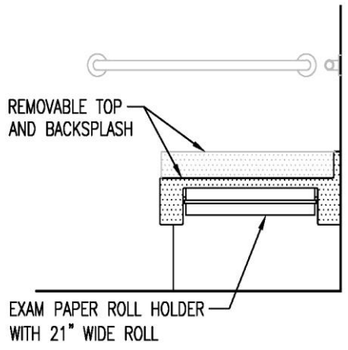
Chair, in this example, is attached to rail system, allowing horizontal adjustment. Height of seat and arms are adjustable and can be folded. Rail system is available in varying lengths.

Photo 2: Changing Room

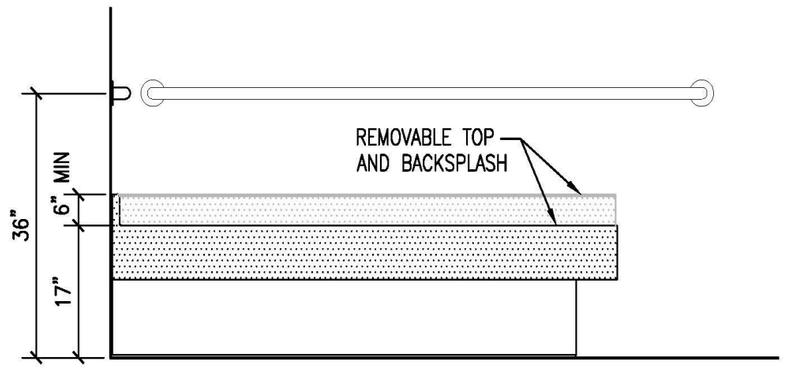
Changing table to right of view with examining table paper roll at end of table, housed within removable top. Duplex convenience outlet and emergency pull cord on wall at opposite end. Careful planning is required when locating plastic accessories supplied by vendors, to avoid encroaching upon required clearances.

Drawings: Changing Table

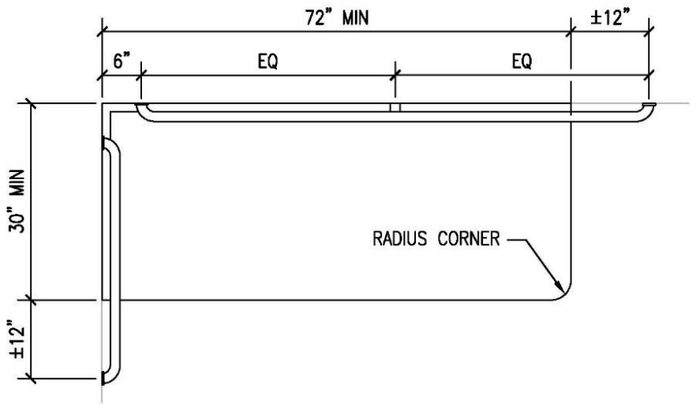
Locate table at inside corner of room. Design table as furniture, which can be moved for cleaning, and provide a removable top. Include grab bars mounted on wall along length and width of table. Extend room finishes behind and below table. Preferred location of Assistant's Chair in this layout is to left of plan, and within reach of convenience outlet.



Front Elevation



End Elevation



Plan

7.6.4 Restroom Exhibits and Standard Details

Standard exhibits and details to be utilized for restroom designs can be found in Appendix 2F - Restroom Design Cut Sheets.

7.7 Doors/Windows

7.7.1 Roll-up Doors

Fabric roll-up doors at “high hazard” locations are not permitted. Fabric roll-up doors do not provide a fire rating, and therefore provide a hazard when used at improper locations. “High hazard” applications include, but are not limited to, mechanical, switch gear, and electrical substation rooms. When fire rated doors are required, metal roll-up doors shall be specified.

7.7.2 Door Numbers

Refer to PEGS Volume 1, Section 2.4 Door Number Assignment.

7.7.3 Sterile Area Access Doors

In accordance with TSA mandate 5142-04-10A2, any proposal to increase the number of sterile area access doors (e.g. new construction) must be approved by TSA's Federal Security Director.

7.7.4 Window Opaque

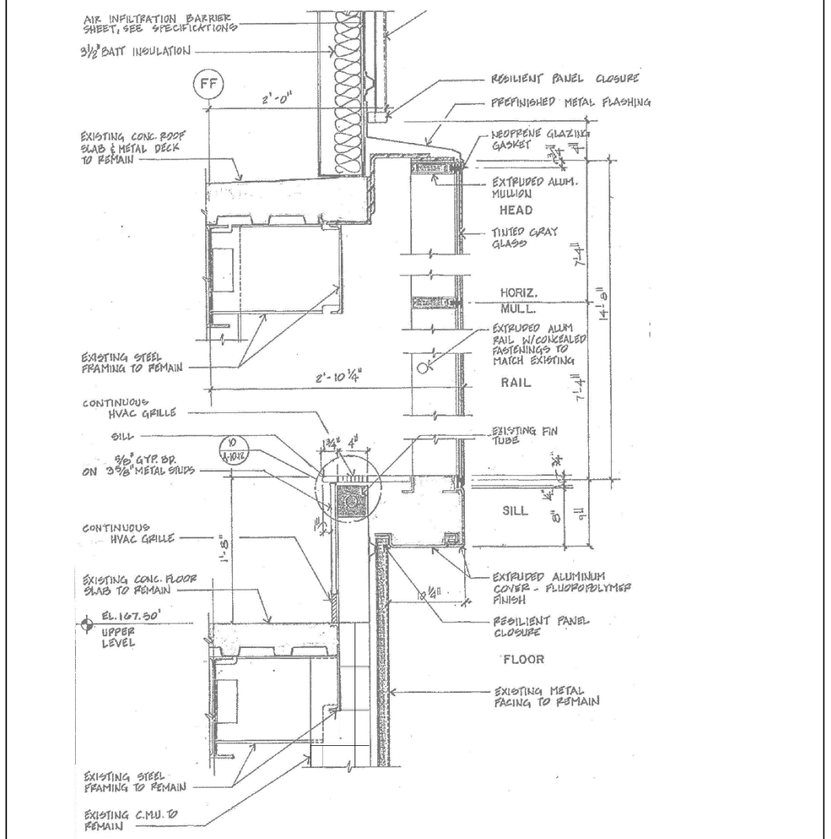
All projects at BWI Marshall shall be designed and specified per the following requirements wherever the work requires the obscuring or covering of existing exterior windows in the terminal facility:

A. Terminal A/B (Where Exterior Wall Panel or Spandrel Glass is WHITE)
   1. Provide tinting of windows where required to opaque existing vision glass windows. Provide product as follows or an approved equal:
   2. Lumar – Window Film – NRM W PS3
   3. 3M – Fasara –San Marino
   4. Product color is to closely match installed white spandrel glass.
   5. Prior to installation, review glass surface and verify submitted film is compatible with surface.
   6. Warranty – provide minimum ten year installation and material warranty.
   7. Install window film as recommended by manufacturer and published guidelines from the International Window Film Association.

B. Terminal A/B and Concourses A and B (Where Exterior Wall Panel or Spandrel Glass is BLACK)
   1. Provide infill panels where required to opaque existing vision glass windows. Provide hardboard panel (HBD) product as follows or approved equal.
      a. Omega Foam - Ply HBD by Laminators Inc.
         i. 0.013 "Stucco" aluminum face on window side with polyester paint finish; color black.
         ii. 1/8" Tempered Hardboard Stabilizers.
         iii. Polyisocyanurate Foam Core.
         iv. Manufacturer's standard white smooth finish on interior side of panels.
   2. Install infill panels as detailed to interior of window frames wherever windows are required to be covered by tenant space requirements. See exhibits Horizontal Hardboard Panel, Concourse A & B, and A/B; and Vertical Hardboard Panel, Concourse B.
   3. Provide manufacturer's standard panel product warranty.

C. Terminals C and D
   1. Prior to installing panels specified below, remove all reheat coils, fin tube radiation, covers, and other devices, and abandon piping back to the main line. Demolition must provide for continuation of existing downstream service. Temporary outages may be required by demolition, but the piping loop must be retained to service existing downstream units which remain.
   2. Provide infill panels where required to opaque existing vision glass windows. Provide hardboard panel (HBD) product as follows, or approved equal.
      a. Omega Foam - Ply HBD by Laminators Inc.
         i. 0.013 "Stucco" aluminum face on window side with polyester paint finish; color black.
         ii. 1/8" Tempered Hardboard Stabilizers.
         iii. Polyisocyanurate Foam Core.
         iv. Manufacturer's standard white smooth finish on interior side of panels.
            1. Install infill panels as detailed to interior of window jambs wherever windows are required to be covered by tenant space requirements. See exhibits for Wall Section – Standard Detain @ Domestic Terminal and Details @ Hardboard Panel.
            2. Provide interior gypsum wallboard assembly of 3-5/8" 20 gauge steel studs with 5/8" Type X gypsum wallboard and un-faced batt insulation to interior of space as illustrated in the Wall Section – Standard Detail @ Domestic Terminal.
            3. Provide panel manufacturer's standard product warranty.

Consultant should refer to the following 5 exhibits.

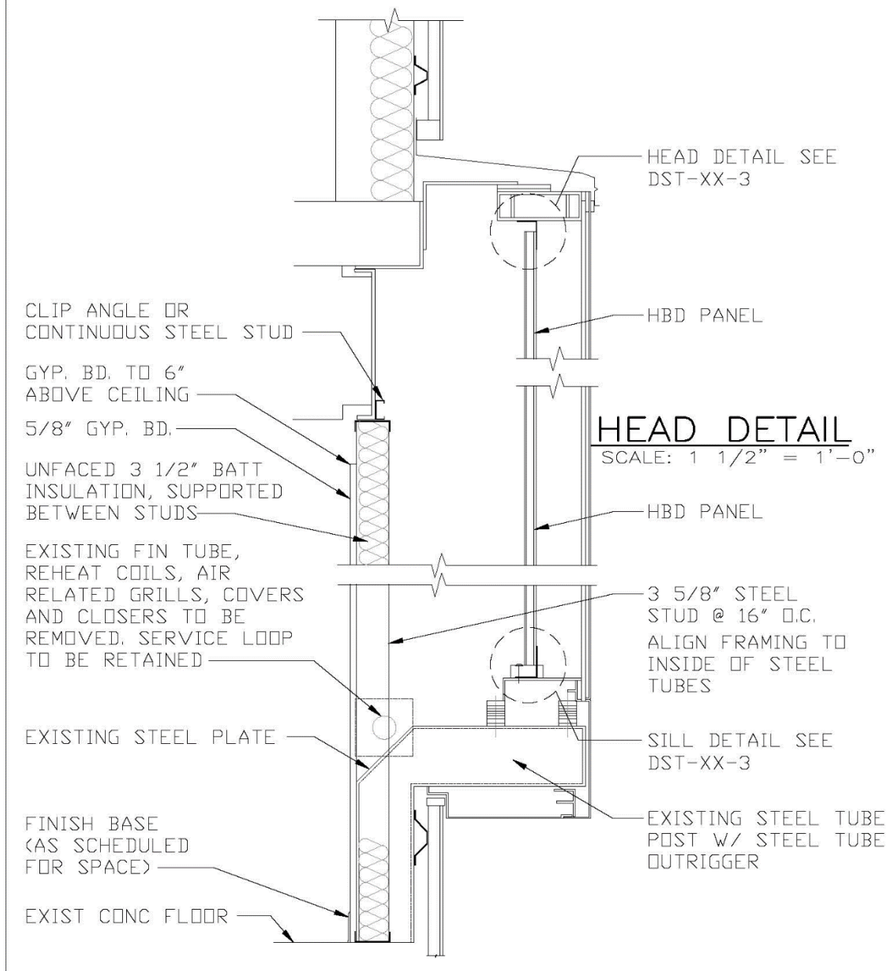


EXISTING WALL SECTION

SCALE: N.T.S.

NOTE:
THIS DETAIL IS TAKEN FROM ARCHIVED CONSTRUCTION DOCUMENTS AND IS PROVIDED FOR REFERENCE. ALL INFORMATION MUST BE VERIFIED IN THE FIELD.

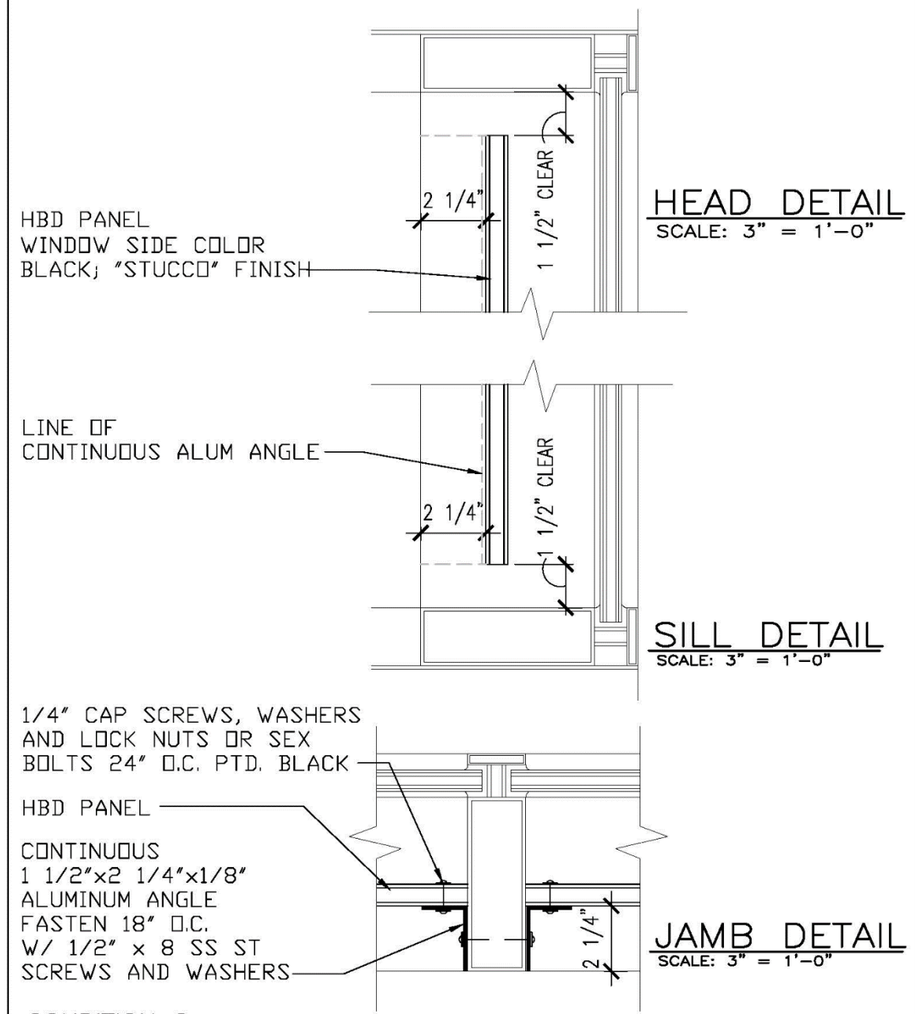
SHEET TITLE: EXISTING WALL SECTION @ DOMESTIC TERMINAL



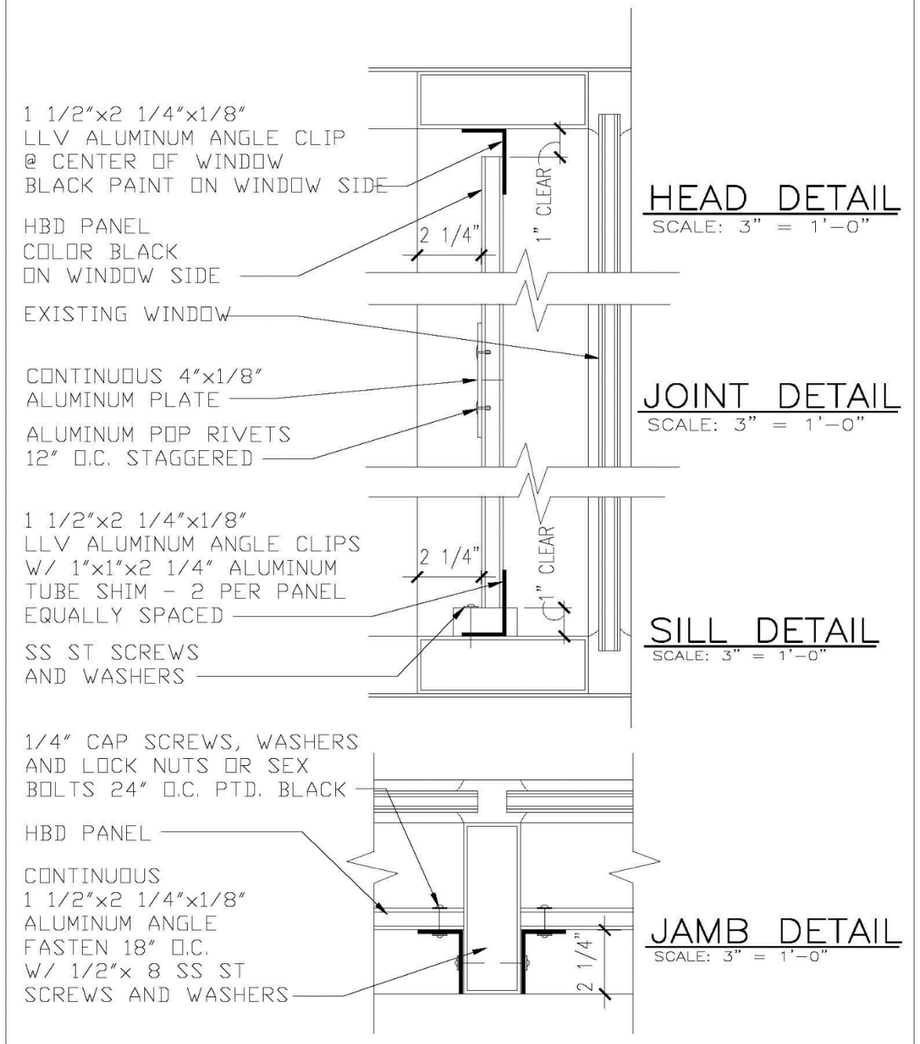
HEAD DETAIL
SCALE: 1 1/2" = 1'-0"

SILL DETAIL
SCALE: 1 1/2" = 1'-0"

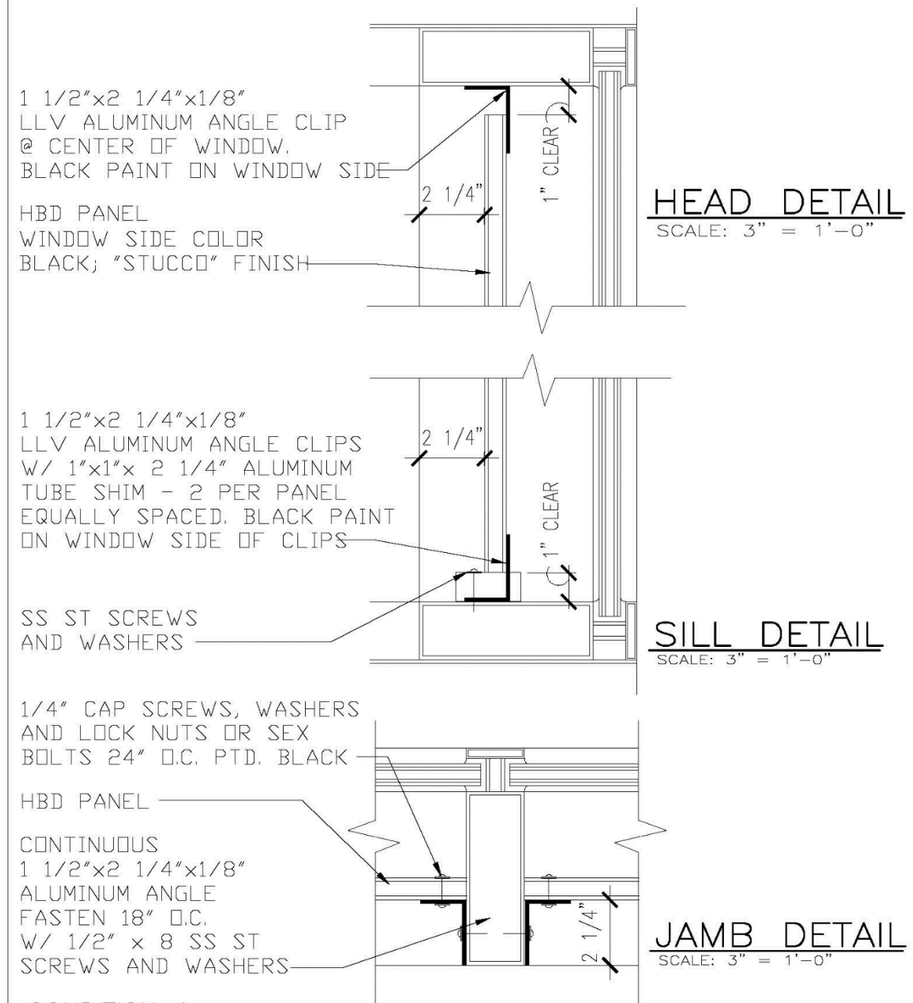
SHEET TITLE: WALL SECTION - STANDARD DETAIL @ DOMESTIC TERMINAL



SHEET TITLE: DETAILS @ VERTICAL HARDBOARD PANEL, CONCOURSE B



SHEET TITLE: DETAILS @ HARDBOARD PANEL



SHEET TITLE: DETAILS @ HORIZONTAL HARDBOARD PANEL, CONCOURSE A & B, AND A/B

7.7.5 Adult Change Room Doors

7.7.5.1 General

Comply with the minimum requirements included herein for entrance doors to Adult Change Rooms. Entrance doors are to provide user privacy, and enhanced accommodation, which exceeds accessibility requirements included in ADA Accessibility Guidelines and ICC ANSI A117.1. In-swinging type doors are preferred.

7.7.5.2 Automatic Door Operator:

Provide low-voltage electro-hydraulic type automatic door operator. Door operation included in this Standard requires that automatic door operator comply with manual door closer reduced opening force.

A. Door Operator Characteristics:
   The electro-hydraulic door operator, in simplest terms, is a motorized manual hydraulic door closer. Since it contains a manual closer, it can be adjusted to fully comply with the accessibility requirements for reduced opening force of a manual closer. Other features of the operator are to include the following
   1. Obstruction detection on opening and closing cycles.
   2. Adjustable door opening and closing force.
   3. Adjustable hydraulic backcheck valve to cushion door speed if opened violently.
   4. Three-position switch, ON/OFF/HOLD-OPEN, with cover plate to prevent tampering, if available from manufacturer specified.
   5. Rigid type closer arm and slide track.
   6. Tested to UL standards for automatic closing door, UL 10B and UL 10C; ADAAG-compliant; certified by BHMA to meet ANSI A117.1 and A156.19.

B. Door Operator Installation:
   Door operators and track arms are to be through-bolted to hollow metal door frame heads and doors (wood or metal) with sex bolts. Heights of frame heads are to be designed to provide a minimum 4-bolt attachment of operator to frame. Refer to door and frame requirements 11.9.5.8 below.

C. Quality Control:
   Installer must be trained and approved by automatic door operator manufacturer for installation and maintenance of product. Include testing and inspection of installation by an inspector certified by the American Association of Automatic Door Manufacturers.

D. Electric Strike:
   An electric strike is necessary to permit the lockset latch to pass through the door frame when the automatic door operator is used, and the lockset lever is not turned. Door sequence of operation must be set to release the strike prior to activation of the door operator to protect the operator motor. Provide fail safe type strike.

E. Mortise Lockset:
   Privacy mortise lockset with tubular lever of type that returns to door face; Best Access Systems interchangeable core lock cylinder (Ref: Chapter 7.5 Lock System) with thumbturn; indicator (Vacant/Occupied outside, Secure/Unsecure inside). Standard mechanical lockset is to be custom pre-wired at the factory with a switch, operated by turning the thumbturn or key. Lockset functions include the following:
   1. Latchbolt by grip either side, unless outside grip is locked.
   2. Outside grip locked or unlocked, and outside door operator press wall switch deactivated or activated, by key (outside) or thumbturn (inside).
   3. Operating inside grip, closing the door, or using key unlocks outside grip, and activates outside press wall switch.
   4. Inside grip always free, and inside press wall switch always activated.
   5. Auxiliary latch deadlocks latch.

   Lockset manufacturer will likely require that modification to mechanical lockset be reviewed and approved by their engineering department prior to release for fabrication. Coordinate with specified manufacturer(s) for procedure, and information to include in door hardware specifications.

F. Continuous Hinge:
   Provide geared aluminum, edge-mount (mortise), continuous hinges for adult change room doors equipped with automatic door operators. Hinge may be electrically modified or prepared for power transfer hinge required for electrified mortise lockset.

G. Miscellaneous Door Hardware:
   Provide miscellaneous door hardware required for project, including boxed power supply, kickplates, saddles, wall stops, and similar items.

H. Hardware Finishes:
   Provide standard MDOT MAA-approved door hardware finishes and base metals.

I. Doors and Frames:
   Hollow metal doors and frames to receive automatic door operators are to be fully welded, and internally reinforced to receive surface-applied door hardware. Reinforce frame heads with channel type reinforcing for full height of frame head and depth of frame. Reinforce frame hinge jamb and door hinge edge full height for continuous hinges. Where wood doors are used, coordinate door blocking requirements with door manufacturer(s) to ensure adequate reinforcing (blocking) is specified for door hardware.

J. Hardware Set:
The following is a sample door hardware set and sequence of operation. *Note: This is NOT a standard specification. Consultant shall tailor the hardware set(s) to suit individual project requirements.*

Sample Door Hardware Set and Sequence of Operation

1. Basis of Design Manufacturers: Names of the following basis of design manufacturers are abbreviated in the Schedule as indicated:
   a. Best Access Systems; Div. of Stanley Security Solutions, Inc. (BAS).
   b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
   c. HES, Inc.; an ASSA ABLOY Group company (HES).
   d. McKinney Products Company; an ASSA ABLOY Group company (MCK).
   e. Norton Door Controls; an ASSA ABLOY Group company (NOR).
   f. Pemko Manufacturing Co.; an ASSA ABLOY Group company (PMC).
   g. Rockwood Manufacturing Company (RMC).
   h. Securitron Magnalock Corporation; an ASSA ABLOY Group company (SMC).
2. POWER-OPERATED OPENINGS
   HW-01 M x M
   Door Nos. AT213, Dx201

Item	Description	Mfr	BHMA
1 continuous hinge	MCK-25HD x 83"	MCK	628
1 power transfer hinge	EL-CEPT	SMC	630
1 wiring harness	ElectroLynx QC-C1500P (power xfer-junction box)	MCK	---
1 electrified lockset (privacy)	ML2068 x M92 x M105 x M19VN x LWA 24VDC	CR	630
-- indicator (vacant-occupied)			---
1 wiring harness	ElectroLynx QC-CXXX x lgth. (pwr xfer to lockset)	MCK	630
1 mortise cylinder	1E74	BAS	626
1 electric strike (fail safe)	1006 x 1000-KM x 2004 x 2005 x 24VDC	HES	
1 wiring harness	ElectroLynx QC-C1500P (strike-junction box)	MCK	---
1 door operator	6010 x 120VAC x 668S	NOR	689
2 press wall plate switches	505	NOR	630
1 kickplate	10" x 2" LDW x 0.050" 4BE CSK	RMC	630
1 mop plate	4" x 1" LDW x 0.050" 4BE CSK	RMC	630
1 wall stop	409 (gray)	RMC	630
1 threshold (AT213 only)	190 drilled for countersunk fasteners	PMC	Alum
1 set seals	S88 BL x DOWxDOH	PMC	---
1 power supply (above ceiling)	BPS-24-1	SMC	---

3. <u>Sequence of Operation</u>
   a. Entry to the restroom by rotating the corridor side lever or by use of the corridor side press wall switch.
   b. Corridor side press wall switch to activate the electric strike and then the automatic door operator.
   c. Person entering the restroom rotates the indicator turn piece locking the corridor side lever and deactivating the corridor press wall switch.
   d. Rotating the restroom side lever unlocks the corridor side lever and reactivates the corridor side press wall switch via the request for exit (RX) switch.
   e. Use of the restroom side press wall switch activates the electric strike and then the automatic door operator.
   f. Use of the restroom side press wall switch reactivates the corridor side press wall switch and with the closing of the door unlocks the corridor side lever.

K. Maintenance and Occupancy Adjustment:
Prior to including in project specifications, review with MDOT MAA any requirements for the Installer to return to perform post Substantial Completion maintenance and occupancy adjustment for the automatic door operator.

L. Demonstration and Training:

Include in project specifications for MDOT MAA Maintenance personnel.

7.8 Furnishings

7.8.1 Holdroom Tandem Seating

A. Domestic Terminal: Seating in most holdrooms is provided and installed by the designated airlines. Seating in MDOT MAA holdrooms is provided and installed by the MDOT MAA.
B. International Terminal: Seating is provided by the MDOT MAA. It is the “Eames Tandem Sling Seating” manufactured by Herman Miller, Inc., Zeeland, Michigan.

7.8.2 Exterior Benches and Bike Racks

A. Exterior Benches: Benches are manufactured by Landscape Forms, Inc. of Kalamazoo, MI. They are “Petroskey Group” with metal rod seat inserts. The color and finish are “Hollyberry” powdercoat.
B. Bike Racks: Bike racks are manufactured by Landscape Forms, Inc. of Kalamazoo, MI. They are “Pi Rack”. The color and finish are “Grotto” powdercoat.

7.8.3 Trash Receptacles

Office of Facilities Maintenance must approve trash receptacles.

7.8.4 Master Clock System

All electronic clocks shall operate on the Simplex Master Clock System. Cut sheets for electronic clocks with analog faces are available by contacting the MDOT MAA Resident Architect. Digital clocks shall be designed with red characters.

7.9 Passenger Conveyance

7.9.1 Elevators

7.9.1.1 Elevator Pre-Inspection

Pre-inspection requirements are found in Public Safety Article, Title 12, Subtitle 8, Annotated Code of Maryland. The contract documents shall require the contractor to procure and conduct the pre-inspection and submit the required written certifications.

§12-801. Final acceptance inspection.

A. Required- The Commissioner shall conduct a final acceptance inspection on completion of the installation, modification, or alteration of an elevator unit before it is placed in service.
B. Inspection checklist- The Commissioner shall provide an inspection checklist that specifies the requirements for compliance with the Safety Code and other regulations adopted by the Commissioner.
C. Duties of contractor- At least 15 days before a scheduled final acceptance inspection for an elevator unit being installed, modified, or altered in the State, the contractor, owner, or lessee shall submit to the Commissioner a written certification that:
    1. the elevator plans and construction documents have been reviewed by a qualified elevator inspector;
    2. the qualified elevator inspector has certified that the elevator unit as constructed and installed complies with this subtitle, its regulations, and the safety code; and
    3. the elements indicated on the inspection checklist are operational, have been tested, and are functional.
D. Failure to meet criteria- If an inspector arrives to inspect an elevator unit at the designated time and the elevator unit does not meet the criteria established in subsection (c) of this section, the inspector may cancel the inspection and charge the contractor a fee in accordance with § 12-809 of this subtitle.

7.9.1.2 Elevator Doors

Elevator doors shall be made of the following materials:

A. Service/Freight Elevators – Diamond-plated/textured
B. Passenger Elevators – Stainless Steel #14

7.9.2 LIFT-Net Monitoring System

All passenger conveyance equipment being installed or refurbished, including elevators, lifts, escalators, and moving walks shall be compatible with the Airport’s LIFT-Net system as provided by Integrated Display Systems, Inc. and shall be connected to the LIFT-Net system as part of the contract to install the conveyance. The work shall include any hardware and programming required for connection to the system.

LIFT-Net installations shall be tested and working properly upon beneficial occupancy. Lift-Net Terminals monitoring equipment shall be available at the time of beneficial occupancy. The new/refurbished unit(s) must be visible and operating on the Airport’s existing Lift-Net system on the MDOT MAA’s computer terminals.

7.10 Terminal Stair Tower Ramp Access

7.10.1 General Design Considerations for Terminal Stair Tower Ramp Access

A. Reference Standards: Comply with Volume 3, Appendix 3B - Codes and Standards. Particular attention should be given to COMAR 05.02.02 Maryland State Accessibility Code, Americans with Disabilities Act Accessibility Standards, International Building Code, and NFPA 101 Life Safety Code.
B. Hand/Guardrails: All BWI Marshall exterior gate ramps will have handrails and guard railings as shown on the following exhibits. These rails will meet or exceed the code requirements. The rails are intended to direct pedestrians to the ramp and entry door.
C. Door Landing: The exterior landing will be at the same elevation as the interior of the building. Provide a guardrail on each side of the landing to indicate the elevation difference between the landing and the adjacent sidewalk.
D. Doors: Provide new door, frame, and hardware as required to comply with ADAAG standards and changed exterior building conditions modified to comply with this standard.
E. Threshold: Provide ADAAG compliant extruded aluminum thresholds with integral weather seal.
F. Bollards: Provide as required to protect the ramp from vehicular traffic in accordance with Section 6.5.2 Bollards.
G. Pavement Walkways: Provide a walkway path, delineated by pavement paint, extending 5’-0” toward the aircraft parking area from the end of the access ramp.

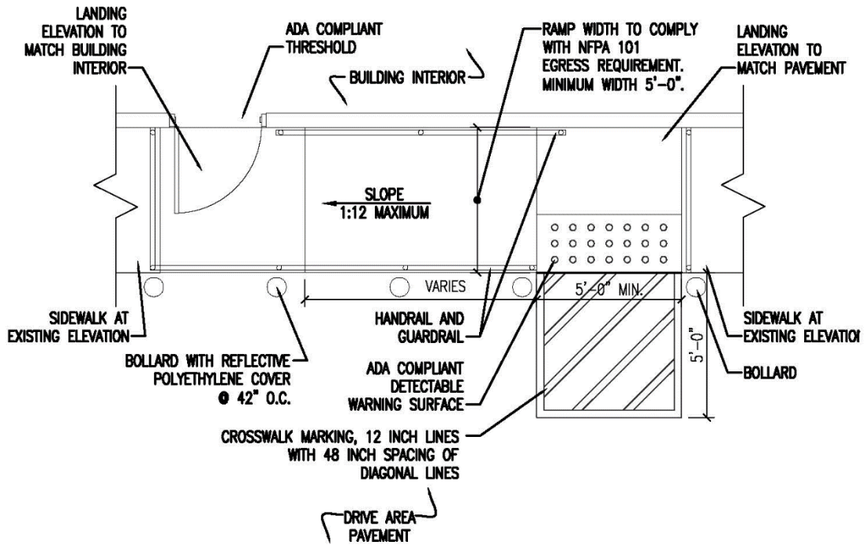
7.10.2 Ramp Configuration

Each location identified for a new ramp should be studied during the initial design process to ensure the location does not impact:

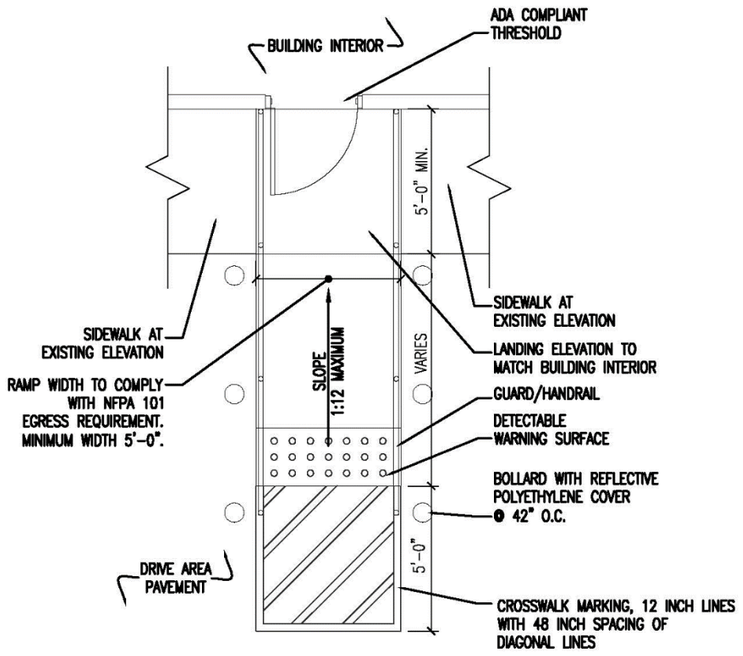
A. Vehicular traffic and parking spaces
B. Apron vehicle traffic and parking
C. Aircraft traffic and parking
D. Ground Service Equipment (GSE) locations

The configuration and geometry of ramps may vary depending on physical constraints surrounding the exterior doors. It is expected that most ramps can be configured in a manner similar to the following exhibits. The actual configuration of doors and curbs will vary around the perimeter of the concourses. It is the design professional’s responsibility to modify the designs to suit each field condition while maintaining the intent of the standard.

Design ramps in accordance with the following Exhibits. The first exhibit is applicable where the ramp will be located parallel with the building and integrated into the existing sidewalk. The second exhibit is applicable where the ramp will be located perpendicular to the building.



SHEET TITLE: EXTERIOR GATE ACCESS RAMP 1	DATE: JULY 2009



SHEET TITLE: EXTERIOR GATE ACCESS RAMP 2	DATE: JULY 2009

7.10.3 Ramp Construction Requirements

A. Ramp Pavement:
   1. Concrete: 3000 psi @ 28 days, complying with ACI 301.
   2. Finish: Light Broom.
   3. Detectable Warning Surface: ADAAG compliant 1-3/8 inch thick precast concrete core, reinforced epoxy tiles.
B. Pavement Markings: Provide pavement paint to comply with Chapter 6.4 Pavement Markings.
C. Handrails and Guardrails:
   1. Galvanized steel pipe or tube. 1-½ inch outside diameter.
   2. Capable of withstanding following; concentrated load of 890 N (200 pounds) applied at any point in any direction and uniform load of 730 N/m (50 PLF) applied in any direction. Concentrated and uniform loads above need not be applied simultaneously.
   3. Paint: In accordance with MPI EXT 5.3B, Alkyd System.
D. Vehicular Traffic Protection: Bollards in accordance with Section 6.5.2 Bollards.
E. Doors, Frames, and Hardware:
   1. Doors and frames: Provide galvanized seamless hollow metal doors with welded frames. Comply with SDI-100, Level 3, Model 2.
   2. Hinges: Stainless steel ball bearing type.
   3. Locksets: Lever type complying with ADAAG standards. Provide lever that returns to door face to avoid possibility of catching fire hoses in an emergency situation.
   4. Cores: Provide in accordance with MDOT MAA PEGS Manual Appendix 2D - Standard Specifications.
F. Lighting:
   1. Purpose: Provide pedestrian lighting for ramps.
   2. Lighting Level: Minimum of 5 footcandles with an average_uniformity of 3 to 1of lighting on the ramp.
   3. Comply with Chapter 12 Lighting.
   4. Light Fixture: Wall pack type fixture, 250w/120v with metal halide lamp with top visor and side shields. UL/CUL Listed for wet locations at 40C. UL Listed Marine Outdoor. Class I, Division 2 Class II, Div 1 & 2 Class III, Div 1 & 2. Provide Holophane Predator or similar.

7.11 Architectural Woodwork

7.11.1 General Requirements for Architectural Woodwork

Architectural Woodwork for MDOT MAA projects are to be designed, constructed, and installed in compliance with the recommendations and appropriate quality grade(s) as defined in the latest edition of the Architectural Woodwork Standards (AWS), published jointly by the Architectural Woodwork Institute (AWI), the Architectural Woodwork Manufacturers Association of Canada (AWMAC), and the Woodwork Institute (WI).

7.11.1.1 Types of Woodwork

Types of woodwork covered by this Standard are listed by Section in the AWS, including casework, doors, countertops, and trim.

7.11.1.2 Fire Protection Requirements for Woodwork

Refer to Volume 3, Section 2.2 General Fire Protection Design Information.

7.11.2 Architectural Woodwork Standards (AWS) Quality Grades

AWS includes three levels of quality, ranging from lowest to highest: Economy, Custom, and Premium. Each quality level addresses such items as permitted materials, appearance, detailing, finishes, and fabrication and installation tolerances for woodwork. Architectural woodwork quality grade for manufacture and installation shall be “Custom” for MDOT MAA projects, unless otherwise specified by the consultant and approved by MDOT MAA’s Project Manager.

7.11.2.1 Modifications to Woodwork

Certain improvements to the specified quality grade, for example, Premium grade wood veneer faces for Custom grade wood doors, may be specified.

7.11.2.2 Options for Woodwork

Economy grade may be considered for certain types and locations of woodwork, subject to approval by the MDOT MAA’s Project Manager.

7.11.3 Architectural Woodwork Institute Quality Certification Program (AWI QCP)

Specifications for architectural woodwork for MDOT MAA projects shall include the requirement(s) that the project be registered with AWI's Quality Certification Program, which shall include manufacture and installation by AWI-Certified woodworking firms, certified for the applicable categories of the work. Project registration with AWI QCP by the woodworker is required immediately following construction contract award. Prior to Substantial Completion, each project is to be issued a Certificate of Compliance by the woodworker indicating the project has been completed under the auspices of the AWI QCP.

7.11.3.1 Submittal Requirements for QCP Projects

Action and Informational Submittals are to include the following requirements:

A. Shop Drawings
   Action Submittals for QCP projects are to bear AWI QCP labels indicating the project's registration number. Shop Drawings not bearing labels may be reviewed and marked for resubmittal but are not to be marked as approved (or approved as noted) by the Consultant until shop drawings indicate compliance with requirements and labels are attached.

B. Compliance Certificates
   Informational Submittals of AWI Quality Certification Program Certificates of Compliance. Certificates of Compliance are to be delivered to MDOT MAA Office of Architecture, prior to Project Closeout.

7.11.3.2 Inspection of Woodwork

Fabrication and installation of registered projects shall be inspected by an AWI QCP inspector for compliance with the AWS quality level specified, and a Project Compliance Inspection Report will be filed with the Engineer. The Report shall indicate any deficiencies that require correction prior to recommendation that a certificate be issued. A follow up site inspection shall be performed to verify that corrections have been satisfactorily completed, and an updated Report shall be filed with the Engineer. Project Specifications may include requirement for Informational Submittals of Reports.

A. Labels
   AWI QCP labels are to be affixed to woodwork receiving Certificates of Compliance by the woodworker in an inconspicuous location determined by the MDOT MAA Office of Architecture.

7.11.3.3 Selection of Qualified Woodworkers

A list of qualified woodworkers may be included in each section of the specifications requiring AWI certification. Information regarding the QCP and AWI-Certified woodworkers is available from the AWI QCP web site. Check boxes for certified sections may be selected to narrow the search for qualified woodworkers. A complete list of certified sections applicable to each contractor is displayed following selection of the listed contractors from the search results.

A. Recommendation
   It is recommended that one section at a time be selected. Selection of multiple sections may yield inaccurate results, which may inadvertently disqualify otherwise qualified woodworkers.

7.11.3.4 Economy Grade Woodwork

Certification for Economy grade woodwork is not required.

7.11.3.5 Wood Doors

Flush wood doors produced by reputable manufacturers generally will not require certification. Certification may be specified for flush wood doors integral with wall paneling, stile and rail doors, sketchface doors, and similar special doors and applications. Compliance with Architectural Woodwork Standards is, nevertheless, required for quality grade specified.

7.11.3.6 Enforcement of AWI QCP

Any or all AWI QCP requirements may be waived at the discretion of MDOT MAA Office of Architecture; however, compliance with requirements of Chapter 7.11.1 General Requirements for Architectural Woodwork and Chapter 7.11.2 Architectural Woodwork Standards (AWS) Quality Grades is still required.

A. Modifications to Woodwork
   Proposed future work involving modifications to woodwork that has received a Certificate of Compliance is to be reviewed and approved in writing by the MDOT MAA Office of Architecture, prior to proceeding with any proposed modification.

8.1 Materials for Structural Systems

8.1.1 Reinforced Concrete (With Subcategories)

All projects shall be designed based on cast-in place concrete principles. However, the contract specifications should allow for the submission of pre-cast concrete alternatives. The specifications should require the Contractor to submit the required design documentation and calculations to support the substitution of pre-cast concrete. MDOT MAA approval is required prior to proceeding with pre-cast applications.

8.2 Bomb Mitigation Design

Criteria exist for the design of terminal and building facilities to mitigate a potential vehicle bomb attack at the terminal curbside. These criteria can be obtained by contacting the MDOT MAA Manager of Office of Engineering & Construction.

8.3 Trash Compactor Fall Protection Systems

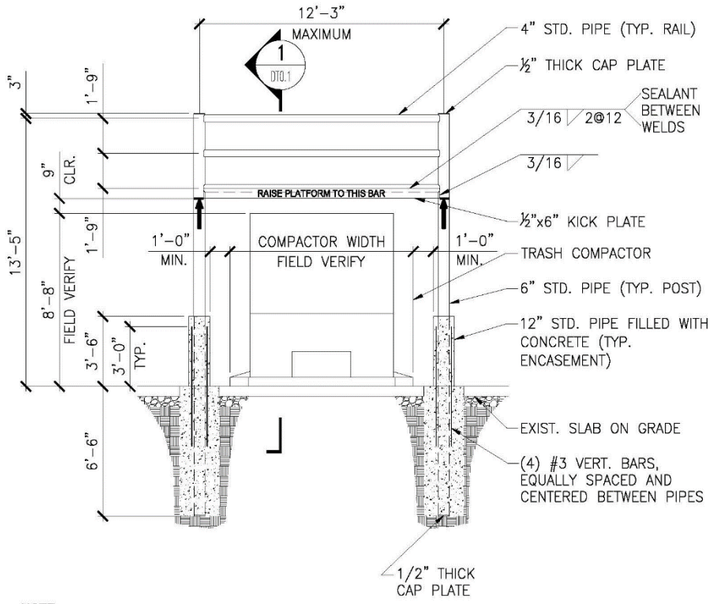
The fall protection system consists of vertical and horizontal safety posts (details are on the following pages) and must adhere to the regulations listed below:

All design loads shall be as per the current MDOT MAA adopted edition of the International Building Code (IBC).

All Construction shall be compliant with the following OSHA standards:

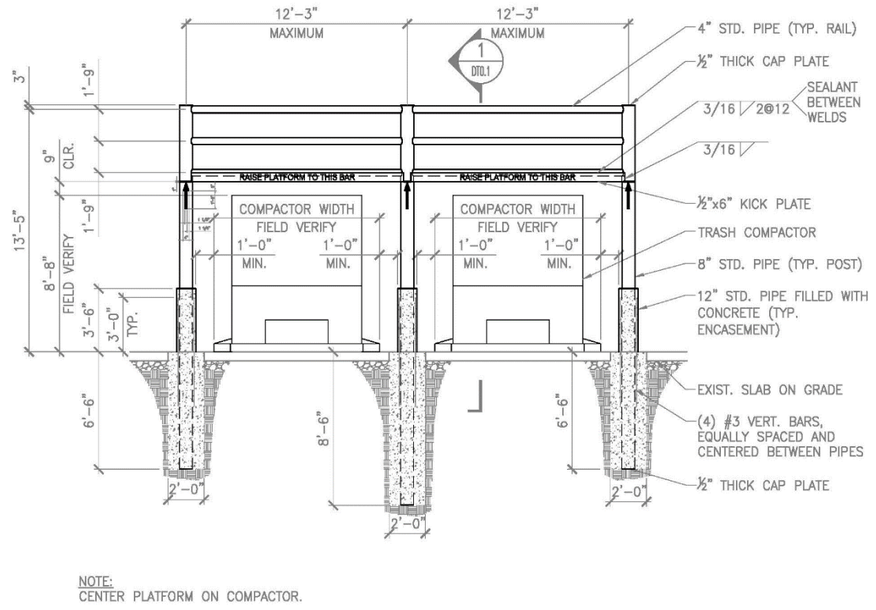
A. 1910.23(e)(1)
   A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal from upper surface to top rail. The top rail shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be approximately 21 inches below the top rail. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.
B. 1910.23(c)(1)
   Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing (or the equivalent as specified in paragraph (e)(3) of this section) on all open sides except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toe board wherever, beneath the open sides.
C. 1910.23(e)(3)(iv)
   The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail.
D. 1910.23(e)(3)(v)(b)
   A strength to withstand at least the minimum requirement of 200 pounds top pressure.

   Because of the various dimensions of the trash compactors at the airport, dimensions for the safety posts will vary. Dimensions of the trash compactor requiring protection should be field verified before the design is to be submitted for construction. Any changes to these details should be submitted to the MDOT MAA Office of Engineering & Construction so that the changes can be incorporated into a revised notes standard.



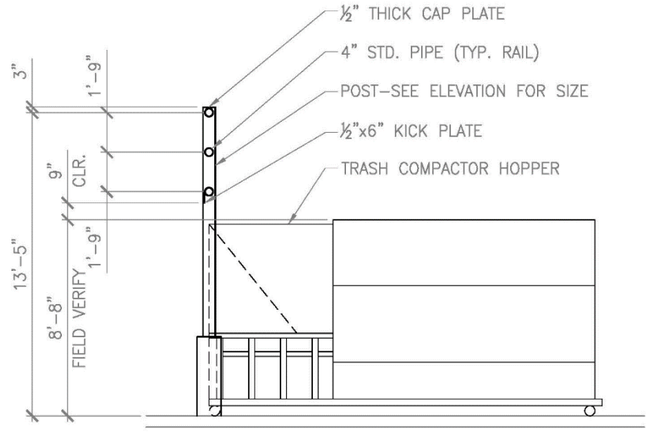
NOTE:
CENTER PLATFORM ON COMPACTOR.

SHEET TITLE: TYPICAL SINGLE TRASH COMPACTOR	DATE: JULY 2009



NOTE:
CENTER PLATFORM ON COMPACTOR.

SHEET TITLE: TYPICAL DOUBLE TRASH COMPACTOR	DATE: JULY 2009



SECTION 1

SCALE: 1/4"=1'–0"

NOTE:
CENTERLINE OF RAILING POSTS SHALL BE ALIGNED WITH EDGE OF TRASH COMPACTOR HOPPER.

SHEET TITLE: TYPICAL TRASH COMPACTOR SECTION	DATE: JULY 2009

8.4 Core Drilling of Concrete Floors

The decision to core drill or not to core drill should be made by a qualified engineer (consultant or resident engineer) based on the evidence from the documentation and nondestructive testing. Existing documentation of the structure should be reviewed to determine preliminary information on size and spacing of embedded objects.

Core drilling of concrete floors (on-grade, elevated, and post-tensioned) must be preceded by nondestructive testing (NDT) to show that no embedded conduits or structural reinforcing will be cut in the proposed location.

Nondestructive testing methods to determine the presence of reinforcing steel in concrete include electromagnetic sensor metal locators, x-rays or ground penetrating radar (GPR). The testing method used must be approved in advance by the resident engineer as being suitable for the application.

Safety precautions must be taken when utilizing x-ray techniques. For use of x-rays, access must be available to the both surfaces of the structure for placement of the x-ray source and the receptor (film).

Concrete dust, chips, water, etc. should be contained during core drilling. Safety should be practiced to assure that no one is directly below the core drilling location during the drilling.

8.5 Terminal Building Head Knockers

Terminal building head knocker structures shall be provided at each end of each at-grade through traffic vehicle passageway (tunnel) that traverses beneath an elevated portion of the terminal building. The free-standing head knockers shall protect the face of the building by preventing oversized vehicles from passing and making contact with the at the tunnel entrance.

8.5.1 Head Knocker Location

Head knockers shall be located at each end of each through vehicle passageway to protect the overhead portion of the building above the passageway. The head knockers shall clear span the full width of the passage and neither the head knocker frame nor any of its components or supports shall impede vehicle travel below the posted clear height or within the full width of the travel lanes.

The centerline of head knocker structures shall be located a minimum of 5’-0” from the face of the building and shall not be positioned any further from the face of the building then would allow passage of vehicles between the head knocker and the building. If conditions, such as adjacent existing building elements or equipment, require the head knocker to be closer to the building than 5’-0”, coordinate location with BWI Airport Operations and verify clearances with existing building foundations.

Head knockers shall provide 7’-10” clearance. If a lower clearance is required to protect building elements, coordinate with BWI Airport Operations for approval.

Head knockers must be positioned clear of existing and anticipated airfield and building infrastructure elements, such as sidewalks, below grade-utilities and high-mast light poles. Clearance must be maintained around high-mast light poles for lowering of the fixtures for maintenance. Head knockers must not reduce the width of Vehicle Service Road (VSR) lanes or other vehicle pathways.

Head knocker locations shall not impede fire truck access, including roof access, or access to or from egress doors or walkways. Head knocker supports shall not be positioned within in the path of sidewalks or protection curbs, unless there is no other acceptable location, and only with the approval of the BWI Fire Marshal. Head knockers shall not impede, block or otherwise obstruct any fire suppression systems to include, but not limited to, fire hydrants (free standing or wall hydrants), fire department automatic sprinkler or sprinkler/standpipe connections, fire pump connections or test headers, and should not impact established fire lane markings as required in the Annotated Code of Maryland, Title 21, Subtitle 10, Section 21-1003(m) as well as stipulated in NFPA 1, Fire Code, Chapter 18.

Final location of head knockers must be approved by the BWI Fire Marshal.

8.5.2 Head Knocker Civil Design Requirements

Head knockers shall be installed to clear span existing drive aisles. Existing lane pavement markings shall remain. A painted STOP line marking, including a painted stop bar shall be installed in the direction of travel in each lane at each head knocker.

Field investigation of existing utilities, either as part of the design or mandated for the contractor, shall be performed to aid in locating the head knockers clear of existing foundations and to prevent damaging utilities during construction.

Pavement repairs shall be included for the areas at the head knocker foundations and for trenching required for installation of electrical conduits.

8.5.3 Head Knocker Structural System

Head knockers shall be designed to resist a horizontal 10,000 pound concentrated load applied at any location along the length of the head knocker frame. The frame shall also resist other code applicable structural loads.

The head knocker structure shall be a welded steel frame composed of hollow structural sections. A top and bottom horizontal section of equal size shall be provided to support attached signage and resist applied loads. Intermediate, equally spaced vertical hollow structural sections shall also be provided to connect the top and bottom sections and provide signage support. Spacing of the intermediate sections shall not exceed 5’-0”. The base of the steel frame shall be elevated above grade a minimum of 4’-0” on concrete pedestals. The reinforced concrete pedestals shall be 2’-6” in diameter.

Foundations shall be provided to resist the applied and self-weight loads on the frame, signage and attachments. Foundation placement must be clear of existing foundations and utilities. Foundations shall be reinforced concrete drilled piers, or reinforced concrete spread footings if below grade obstructions make drilled piers impractical. Offset foundations to accommodate head knocker placement must be structurally adequate. Foundation design soil and subgrade parameters are site specific and shall be determined by the consultant.

The steel frame shall have a multi-coat, high-performance epoxy coating. Color shall be Safety Yellow.

8.5.4 Head Knocker Signage

The head knocker frame shall include Caution, Clearance and Stop signs mounted over the clear drive aisle. Each head knocker shall include Pedestrian Warning signs attached to the vertical columns, reflective stripes on the concrete pedestals and an MDOT MAA User Authorization sign mounted to the face of the building. The Caution/Clearance/Stop sign shall accommodate surface mounting of signal lights. Signage lettering and colors are as indicated. Signs shall be fabricated from sheet aluminum, with joints as indicated and mounted to the head knocker frame with banding strap and universal channel clamps attached to sign with rivets. Do not screw the signage directly to the head knocker frame. Wall mounted signage shall be screwed directly to the metal panel or masonry exterior wall of the building.

Signage shall be governed by the standards and requirements of the current versions of the following publications:

FHWA "Manual on Uniform Traffic Control Devices" (M.U.T.C.D.)

MDSHA "Maryland Manual on Uniform Traffic Control Devices" (MdMUTCD)

AASHTO "Highway Safety Design and Operations Guide"

AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals"
(Category II for all Overhead and Cantilever Sign Structures)

The disposition of existing signage shall be coordinated with BWI Airport Operations.

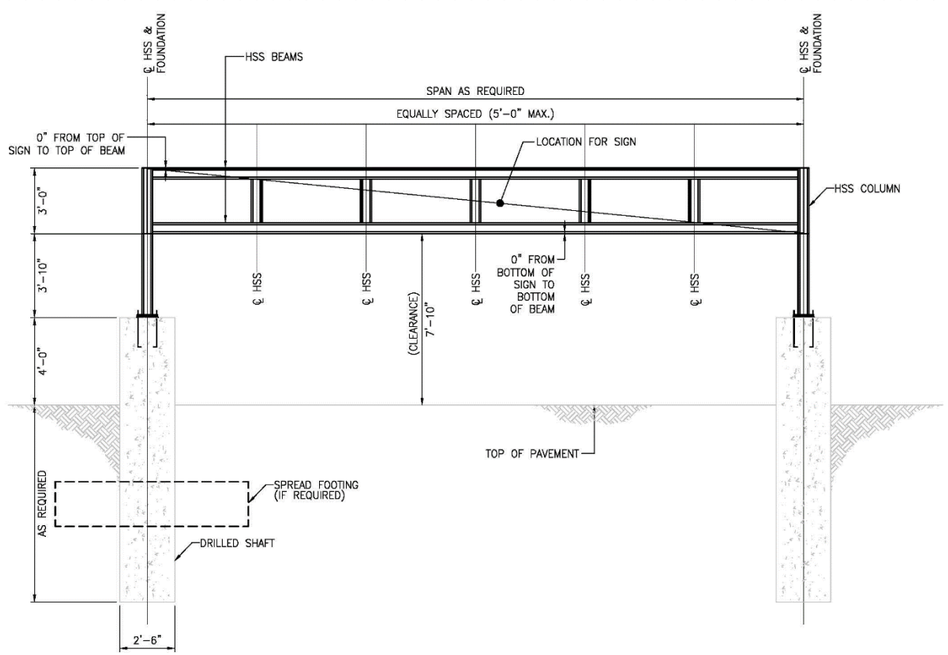
8.5.5 Head Knocker Electrical Requirements

Each head knocker shall be equipped with two 120V red LED flashing 12-inch diameter signal light fixtures with glass lens and aluminum enclosures. The fixtures shall be surface mounted to the signage. Power for the lights shall be provided from the existing signal light circuit or from a nearby panel as required. Wiring shall be copper. All exterior conduits (exposed and underground) shall be rigid galvanized steel and a minimum of 1-inch. Junction boxes shall be cast metal weatherproof type FS. Conduit from the sign frame to the face of the terminal building shall be installed below grade. Do not mount conduit overhead. Conduit shall be surface mounted to the head knocker frame and embedded within the concrete pedestal.

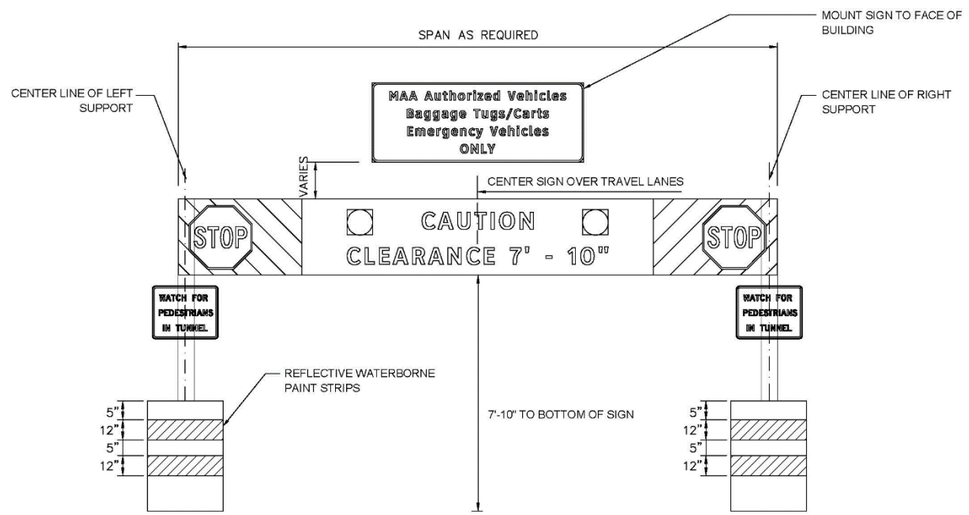
Each head knocker frame shall be grounded with a #8 bare copper conductor and ¾" x 10ft. copper ground rod.

8.5.6 Head Knocker Exhibits and Standard Details

The following pages include standard head knocker elevations and signage details to be utilized for head knocker designs.

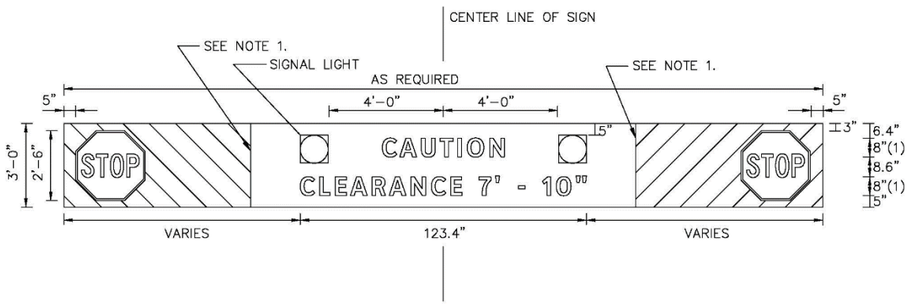


SHEET TITLE: TYPICAL HEAD KNOCKER ELEVATION	DETAIL 1



NOTE: SIGN ATTACHMENT TO THE STRUCTURE SHALL COMPLY WITH MDSHA STANDARD FOR SIGN SUPPORT ATTACHMENT. SEE STANDARD NO. MD813.08-01 FOR FURTHER DETAILS.

SHEET TITLE: TYPICAL HEAD KNOCKER SIGNAGE ELEVATION	DETAIL 2



MATERIAL: EXTRUDED ALUMINUM
THICKNESS: 0.125"

NOTE:
1. CONSTRUCT SIGN IN THREE PANELS, PROVIDE JOINT AT TRANSITION FROM CAUTION/CLEARANCE TO STRIPED.
2. CENTER CAUTION/CLEARANCE PORTION OF SIGN OVER TRAVEL LANES.

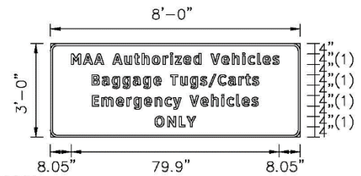
FONT:
(1) CLEARVIEWHWY-4-B
PANEL STYLE: WARNING_RECTANGULAR.SSI
M.U.T.C.D.: 2009 EDITION

COLORS:
LEGEND - BLACK

BACKGROUND - YELLOW (RETROREFLECTIVE)

STRIPE - BLACK (WIDTH = 4" SPACE=4" @ 45 DEGS)

SHEET TITLE: TYPICAL HEAD KNOCKER SIGNAGE	DETAIL 3



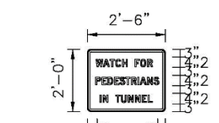
BORDER:
R 2.75"
TH 0.75"

FONT:
(1) CLEARVIEW HWY-4-B
PANEL STYLE: GUIDE_CON_DESTINATION.SSI
M.U.T.C.D.: 2009 EDITION

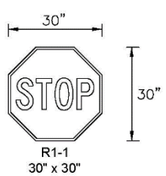
MATERIAL: SHEET ALUMINUM
THICKNESS: 0.125"

COLORS:
LEGEND - BLACK

BACKGROUND - YELLOW (RETROREFLECTIVE)



BORDER
R=1.13"
TH=0.63"
IN=0.38"



R1-1
30" x 30"

MATERIAL: SHEET ALUMINUM
THICKNESS: 0..080"

FONT:
(2) CLEARVIEW HWY-1B

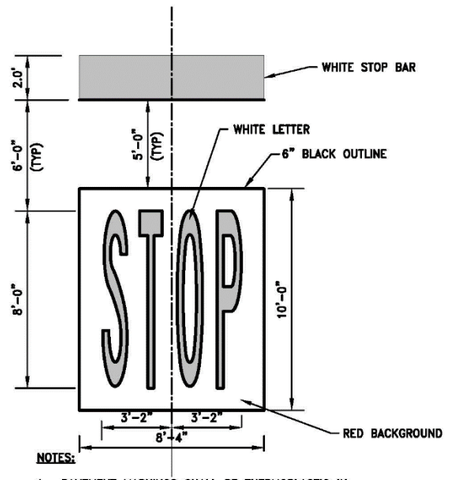
PANEL STYLE: REGULATORY.SSI
M.U.T.C.D.: 2009 EDITION

COLORS:
LEGEND - WHITE

BACKGROUND - RED
(RETROREFLECTIVE)

MATERIAL: SHEET ALUMINUM
THICKNESS: 0..080"

SHEET TITLE: TYPICAL HEAD KNOCKER SIGNAGE	DETAIL 4



NOTES:

1. PAVEMENT MARKINGS SHALL BE THERMOPLASTIC IN ACCORDANCE WITH MDSHA SPECIFICATION MD-553. THE WORD "STOP" SHALL BE INSTALLED WITH GLASS BEADS.
2. CENTER MARKINGS WITHIN LANE.

HEAD KNOCKER PAVEMENT MARKING

NOT TO SCALE

SHEET TITLE: HEAD KNOCKER PAVEMENT MARKING	DETAIL 5

9.0 HVAC Design Introduction

The Chief, HVAC Systems and the DOM must approve the design of proposed mechanical systems. The HVAC system shall be designed in accordance with the Maryland Department of General Services (DGS). The HVAC systems shall be tied to the Facility Management System (FMS) (BWI Marshall only).

9.1 Ductwork

9.1.1 Duct Liner

Unless otherwise approved by MDOT MAA, duct liners on supply ducts shall not be used. Where sound acoustics are a concern in public spaces, all insulation shall be installed on the exterior of the ductwork.

For critical non-public spaces where noise control is required, duct silencers shall be utilized, where space allows. If space for duct silencers is not available, then only the low velocity ducts shall be lined. No duct liner shall be provided in high velocity ducts, especially in ductwork on the supply to variable air volume terminals.

Return ducts to air handling units from return ceiling plenum spaces may have duct liners if the consultant feels they are necessary.

When utilized duct liner shall be installed with anti-microbial products. In addition, reinforcing shall be provided for the liner material to guarantee that the liner will not peel away from the duct wall. All duct liners shall comply with building code and fire code requirements for smoke development and flame spread limits and shall be listed by UL or FM.

9.2 Particulate Air Filtration

Design documents shall require the contractor to install filters to prevent passage of unfiltered air for projects that create excessive dust/demolition adjacent to the terminal building. Construction documents shall locate air handling equipment that requires filtration during construction. The Contractor shall be required to replace filters at cost at the end of construction, as well as replacement of filters during the construction duration, in coordination with MDOT MAA Office of Facilities Maintenance.

9.3 CO_2 Demand Ventilation

For holdroom, baggage claim, ticketing, and other areas with large assemblies (occupancy), provide demand controlled outdoor air ventilation based on carbon dioxide concentrations within the occupied space, per ASHRAE/IESNA Standard 90.1 – 1999 Users Manual Regarding Ventilation Control with CO_2.

9.4 HVAC Pipe Flushing

All newly installed HVAC piping systems shall be cleaned and flushed prior to placing the pipe into operation. These HVAC piping systems include chilled water piping, condenser water piping, high temperature hot water (HTHW) piping, and primary / secondary heating water piping. This design standard is intended to cover HVAC piping installed at BWI Marshall and Martin State Airports as part of the Maryland Aviation Administration capital projects, as well as tenant improvements, and other equipment procurements.

9.4.1 HVAC Pipe Flushing Background

Due to the increase in occurrences of contaminated HVAC piping systems during construction at the Airport, the following standard has been created. It is the intention of this standard to provide contractors with methods to clean and flush all new HVAC piping prior to placing the piping into operation. This will reduce the chance of damage to the chilled water, HTHW, and heating water systems within the Main Terminal and Central Utility Plant.

9.4.2 HVAC Pipe Flushing Design Specification Requirements

Add the following in PART 3 of applicable hydronic piping specification sections.

“3.XX CLEANING AND FLUSHING OF PIPING SYSTEMS

A. The following applies to all temporary and permanent HVAC piping installations, both aboveground and underground. All of the following items must be completed prior to placing new connected HVAC pipes into operation with existing and/or new piping systems. The following items apply to condenser water piping, chilled water piping, high temperature hot water (HTHW) piping, and heating water piping systems.
   1. Use clean potable water source. If not available from the Airport’s water supply, then the Contractor must provide his own source of clean potable water. If high volumes of water are to be drawn from the Airport’s water supply system, then the Contractor will provide a strainer to remove sand and grit which may be drawn from this water supply system.
   2. The Contractor shall provide temporary pumps and strainers with fine mesh screens to obtain minimum eight (8) feet per second flushing velocity within the HVAC piping systems.

3. ***(This should be deleted if not desired for a particular project. This option may be considered if pre-approved by MDOT MAA Maintenance and Engineering, and if the logistics and costs for temporary pumps cannot be easily provided by the Contractor.)*** It may be possible to use existing pumps in the HVAC system, or pumps which are new as part of this project to obtain the minimum eight feet per second flushing velocity. If the Contractor wishes to utilize any new pumps or existing pumps within the HVAC piping system to obtain the minimum flushing velocity, this must be approved by the Engineer and MDOT MAA Maintenance. In addition, the Contractor shall provide additional strainers with fine mesh screens to insert into the existing strainers during flushing operations. Once the flushing is complete, the temporary strainers will be replaced with new strainer inserts matching existing and/or new pumps as utilized. In addition, if the new or existing pumps are used, the Contractor shall replace all pump seals after flushing operations, and then provide an additional set of pumps seals for Maintenance's use.
4. During the flushing operation, the Contractor shall add chemicals (cleaning agent) as necessary to clean all piping process oils and dirt/debris from within the piping systems. These chemicals shall not harm the new piping systems and any connected piping systems, including all valves, pumps, equipment, seals, gaskets, and other items associated with the piping systems. All cleaning agents subject to approval by the Engineer and MDOT MAA Maintenance.
5. The cleaning operation for each section of piping installed shall be for a minimum of three (3) hours, or as necessary to completely clean all pipes. This water shall then be drained. Once drained, the piping shall be flushed with clean potable water.
6. **(*Delete this item if #3 is selected, or if not necessary due to the size of the piping additions.)*** After the cleaning and flushing operations are completed, the Contractor shall provide an additional set of pump seals and strainer inserts for each existing pump in each respective HVAC piping system which has been affected by this project. The pump seals and strainer inserts shall match existing.
7. ***(Consider the following for applicable projects with underground piping installations.)*** For underground pipes installed, prior to flushing the piping systems as described above, the Contractor shall provide television inspection of the entire pipe installation. This can be accomplished as the pipes are installed in several hundred foot sections (or the limit of the camera equipment used by the Contractor). The Contractor shall provide DVDs of the pipe interiors to show that no (or very minimal) excavation and backfill dirt has entered the piping systems. Two copies of these pipe inspections shall be provided to the Engineer. The DVDs should clearly indicate the date, time, and section of piping being videoed. If these DVDs indicate that there are large amounts of debris within the piping system, the Engineer may either direct the Contractor to open the pipes in the areas of question and clean them out, or have the Contractor re-record the pipe sections after the pipes are flushed. This will be at no additional cost to the MDOT MAA.

B. The above noted items are minimum requirements for the Contractor to complete to clean and flush the HVAC piping systems. The Contractor is fully responsible for a satisfactory flushing operation. Any damage to existing pumps, boilers, chillers, cooling towers, control valves, and other associated items within the piping systems due to poor flushing and cleaning of the piping systems will be the responsibility of the Contractor. The Contractor shall make all necessary repairs at no additional cost to the Owner.

After flushing and refilling each HVAC piping system, provide chemicals (match existing chemicals used by MDOT MAA Maintenance) to bring new piping additions and existing piping system which are affected back to existing Central Plant or Terminal Piping system chemical level conditions. Coordinate introduction and verification of chemical concentrations with MDOT MAA Maintenance through the Engineer."

9.5 Hydrostatic Water Pipe Testing

Please refer to Chapter 10.3 Hydrostatic Water Pipe Testing for hydrostatic water pipe testing requirements.

9.6 Boilers and Pressure Vessels

All Boiler and/or Pressure Vessel installations shall meet the following requirements:

A. As defined by the State of Maryland "Boiler and Pressure Vessel Safety Act," no Boiler or Pressure Vessel installation may be legally operated that has not been registered and issued a Certificate of Inspection by the Chief Boiler Inspector.
B. The Technical Provisions/Specifications for new and renovation projects at BWI Marshall Airport and Martin State Airport shall contain references to COMAR 09.12.01 when applicable. Part I – General Information shall contain a statement of Contractor's responsibilities, including payment of fees by the Contractor for State inspections.
C. The Technical Specification related to boiler or pressure vessel installation shall include the following statement, "State law requires that the Installer notify the State of Maryland, DLLR not less than 30 days prior to commencement of installation. The Contractor shall fill out and submit the "Notice of Installation" form.(see Appendix 2B - Standard Forms).The Contractor must also notify the Construction Manager (CM) so that the MDOT MAA boiler insurance inspector may be notified." The information should be included in "Part 3 Execution" of the technical specification.
D. The Technical Specification related to boiler or pressure vessel installation shall include the following statement, "The Contractor shall be responsible for obtaining the Air Quality General Permit to Construct as applicable. A copy of all permit applications, and approvals must be provided to the Environmental Compliance Section in the Office of Environmental Services." The information should be included in "Part 3 Execution" of the technical specification. The website for the permit can be found below.

The following references are provided for additional Maryland State information/requirements for Boiler and Pressure Vessel Installation:

Maryland Code:	Public Safety: Title 12. Building and Material Codes; Other Safety Provisions: Subtitle 9. Boiler and Pressure Vessel Safety Act.
COMAR:	Title 09 Department of Labor, Licensing, and Regulation Subtitle 12 Division of Labor and Industry Chapter 01 Board of Boiler Rules (COMAR 09.12.01).
DLLR:	Boiler and Pressure Vessel Safety - Safety Inspection

Law, References and Publications - Boiler and Pressure Vessel Safety (includes links to applicable provisions of the Maryland Code and COMAR.)

MDE: Air and Radiological Health Management Permits & Approvals

Forms State: Notice of Installation of a Boiler or Pressure Vessel (Downloadable form)

ASME: www.asme.org
800-THE-ASME.
State libraries.

9.7 Natural Gas Piping

All Natural Gas Piping installations shall be designed and specified per the following requirements:

A. Material for Natural Gas Piping (above ground and underground) shall be ASTM A 53, Grade B, Schedule 40, Type E or S.
   1. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and polyethylene (PE).
B. Material for Underground Natural Gas Piping shall be PE Pipe, ASTM D 2513, SDR 11.
   1. PE Fittings: ASTM D 2683, socket-fusion type or ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
   2. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
C. Natural Gas Piping shall be constructed with threaded joints for gas pressure 5.0 PSIG or less.
D. Natural Gas Piping shall be constructed with welded joints for gas pressure higher than 5.0 PSIG.
E. Corrosion protection shall be provided for gas pipes installed underground, encased in concrete, and in wet or corrosive environments.
F. Exposed gas pipes subject to damage shall be protected. All installations shall follow NFPA 54, ANSI Z 223.1, Current Edition. Piping installed aboveground shall be securely supported from physical damage by vehicles or hand trucks, dollies, platform trucks, etc. Provide shields, bollards or pipe sleeve to protect exposed gas pipes as required.
G. Exposed natural gas piping shall be protected against mechanical damage in accordance with requirements of NFPA 54-7.2.
H. Comply with NFPA 54 and the International Fuel Gas Code for design, installation and purging of natural-gas piping.
I. Outdoor Natural Gas Piping Installations
   1. All underground natural-gas piping installations must be buried at least 36 inches below finished grade. If natural gas piping must be installed less than 36 inches below finished grade, it must be installed in an appropriate containment conduit
   2. Trench Backfill
      a. The gas pipe shall be placed in the trench on top of a minimum of 6 inches of aggregate bedding material, which also extends to 4 inches above the top of pipe and compacted. If the gas pipe is to be installed in an area with new bituminous or concrete pavement, then the aggregate bedding material shall be extended above new gas to the bottom of proposed subbase material. Compaction of earth or aggregate material in pipe trench shall only be accomplished by using hand mechanical tampers until the backfill material has been placed a minimum of 2 feet above the gas pipe.
J. Indoor Natural Gas Piping Installations
   1. Above Ceiling Installations: Natural-gas piping, fittings, valves, and regulators may be installed in accessible concealed ceiling spaces. Natural gas piping in concealed ceiling spaces does not require containment conduit. Provide proper access in locations where appropriate for maintenance and shut offs. Natural gas pipes must be identified utilizing permanent labels as required by code.
   2. In-Floor Installations: Natural-gas piping may be installed in cast-in-place concrete interior floors with a minimum of 1½ inches of concrete cover. Natural gas piping installed in interior floors must have welded joints and protective coating. All in-floor natural-gas piping installations must be in containment conduits constructed of steel pipe with welded joints. A vent pipe must be provided from containment conduit to outdoors and terminated with weatherproof vent cap cover. Gas pipes shall not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Do not embed piping in concrete slabs containing quick-set additives or cinder aggregate. Provide proper access in locations where appropriate for maintenance and shut offs.
   3. In-Floor Channels: Natural-gas piping may be installed in floor channels where appropriate and not in public view. Channels must have cover and be open to space above for ventilation.
K. Prohibited Locations:
   1. Natural gas pipes shall not be installed in or through circulating air ducts, clothes or trash chutes, chimneys, or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
   2. Natural gas pipes shall not be installed in solid walls or partitions.
   3. Natural gas pipes shall not be installed on roofs of any building except branch pipes to roof mounted HVAC equipment. Branch Pipes shall be mounted on pipe stands.
   4. Natural gas pipes shall not be installed on the exterior fascia of any building except where it may need to enter buildings or branch pipes to exterior equipment.
   5. Natural gas pipes shall not be installed in Electrical and Communication Rooms.
L. LABELING AND IDENTIFYING

1. Underground gas pipes:
    a. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable b metal detector when tape is buried up to 30 inches (750) deep; colored yellow.
2. Aboveground Pipe Labels:
    a. Preprinted, color-coded, with lettering indicating service, and showing flow direction.
    b. Spaced at maximum intervals of 25 feet along each run, and 2 feet on either side of wall penetrations.

M. VALVE TAGS
1. Install ceiling tags for above ceiling mounted valves, ceiling tags shall be provided for all kinds of ceilings including suspended ceilings.

9.7.1 Metering of Gas

Gas meter shall be provided by each tenant. These meters must be compatible with MDOT MAA Power Monitoring System (Square-D Power Logic System). With prior coordination with MDOT MAA Utilities, RS 485 communication cable with one spare cable in one-inch conduit shall be extended from the meter to the nearest MDOT MAA Power Logic metering panel.

The gas meter shall be compatible with MOD BUS RTU – RS 485 protocol or MOD BUS RTU – TCP/IP protocol. The output gas reading displayed in Power Logic should be in units of Standard Cubic Feet per Minute (SCFM). Information for conversion from pulse rate to SCFM should be provided with meter specifications. Gas meter and any accompanying devices needing power should be compatible with power available on site.

9.8 Kitchen Hoods

All “Type I and II Commercial-Kitchen Hoods” shall be designed, fabricated and installed according to this standard.

- Commercial cooking recirculating ventless type hood systems are strictly prohibited in terminal building.
- Ventless deep fat fryers are strictly prohibited in terminal building.
- Ventless ovens are allowed in terminal building only if they are under type-II hood.
- Ventless Combi ovens are prohibited in terminal building unless they are under type-I hood.
- Conveyer ovens and toasters are allowed in terminal building only if they are under a type-II hood.

All new restaurant kitchen hoods shall comply with MDOT MAA adopted codes and standards. During major kitchen renovations, the consultant should evaluate the existing system(s) to determine if it complies with MDOT MAA adopted codes and standards. Analysis on the existing system shall be included in the design documents. If the system does not comply, the consultant shall meet prior to design document submission with the Office of the Fire Marshal, Office of Facilities Maintenance, Office of Architecture Division of Planning and Engineering, and the MDOT MAA project manager to determine the extent of upgrading to operate the system(s) safely and within code compliance.

9.8.1 Design, Fabrication and Installation of Kitchen Hoods

Kitchen hoods shall be designed, fabricated, installed, and tested in accordance with current versions of NFPA 96 and International Mechanical Code and approved manufacturers’ design guidelines.

9.8.2 Type I Exhaust Hood Design

Consultants shall review and include the following requirements in the contract documents regarding design of Type I exhaust hoods:

A. The rate of supply airflow (CFM) from make-up air unit shall be a maximum of 80% of the exhaust airflow (CFM) and can be reduced as required based on total space air balance tabulation to achieve overall negative balance of approximately 1000 cfm. Slight negative balance is required to minimize food odor migration to common areas of terminal. Balance between the make-up airflow and exhaust airflow shall be provided through the building air distribution system and rooftop or air handling unit(s), dedicated for the dining and kitchen areas. Provide table of devices/ equipment and air balance in accordance with air balance schedule as included in this standard.
B. Overall kitchen and dining areas shall be negative versus other spaces, including corridors, offices and hold rooms.

9.8.3 Type II Exhaust Hood Design

Consultant shall include the following requirements in the contract documents regarding operation of Type II exhaust hoods:

A. Make up air shall be provided by the building air distribution system or by a dedicated outdoor make up air unit where required by MDOT MAA, Office of Facilities Maintenance and/or Office of Architecture Division of Planning and Engineering. Consultant shall coordinate with Facilities Maintenance and Office of Architecture Division of Planning and Engineering during the design or major renovations of type II exhaust hoods.
B. Hood Controls shall be a hood or wall mounted control cabinet. Sequence of operation shall be as follows:
    1. Exhaust Fan: On-off switches shall start and stop the exhaust fan.

2. Interlock the exhaust fan with any cooking appliances located under the kitchen hood to begin ventilation when the cooking appliances are turned on. Interlock exhaust fan with gas solenoid valve to insure no gas supply for cooking without exhaust system turned on.
3. Interlock the exhaust fan with make-up air unit if provided.

9.8.4 Air Balance in Kitchen and Dining Areas

Include air balance schedule for the kitchen and dining areas per the following Air Balance Schedule.

Air Balance Schedule- Kitchen area/ Dining Area							
Unit/ Area	**OA, provided**	**OA, Required**	**SA**	**RA**	**EA**	**Balance**	**Remarks**
Hood MAU							
Exhaust Fan(s)							
Kitchen RTU/AHU							
Dining area RTU/AHU							
Airport Central Air system: VAV's or Const. air to kitchen/ dining areas							
Transfer air from other areas							
Total for OA							
Total for EA							
Total for SA							
Total for RA							

Abbreviations:

MAU	Make up Air unit
RTU	Rooftop Unit
AHU	Air Handling Unit
VAV	Variable Air volume
Const. Air	Constant Air
OA	Outside Air
SA	Supply air
RA	Return air
EA	Exhaust Air

9.9 Exhausts Air Ducts and Exhaust Fans for Kitchen Hoods

“Exhaust and Make-up Air Ducts and Exhaust Fans for Commercial-Kitchen Hoods” shall be designed, fabricated, installed, and tested according to this standard.

During major kitchen renovations, the consultant should evaluate the existing system(s) to determine if it complies with MDOT MAA adopted codes and standards. Analysis on the existing system shall be included in the design documents. If the system does not comply, the consultant shall meet prior to design document submission with the Office of the Fire Marshal, Office of Facilities Maintenance, and the MDOT MAA project manager to determine the extent of upgrading to operate the system(s) safely and within code compliance.

9.9.1 Design, Fabrication and Installation of Exhaust System(s) and Exhaust Fans

Exhaust system(s) and exhaust fans shall be designed, fabricated, and installed in accordance with NFPA 96 and approved manufacturers’ design guidelines.

10.1 Backflow Preventers

All Compartment Sinks, Mop, and Service Sinks installed shall be equipped with backflow preventers in accordance with the following requirements:

A. Backflow preventers shall be installed on cold and hot water lines that serve sinks.
B. Backflow preventers shall be double check valve type, equal to Watts, Model 9D.
C. Backflow preventers shall be equipped with integral strainer, ball shut off valves, and drain connection.
D. Backflow preventers shall be all bronze construction with stainless steel internal parts.

10.2 Grease Interceptors

All food and beverage facilities and other facilities where liquid containing grease is discharged into the sanitary sewer system shall be equipped with Automatic Grease Interceptors:

A. Grease Interceptors shall be automatic grease recovery type made of 304 Stainless Steel and internally lined with molded polyethylene equipped with the following devices:
    1. Rotating gear hydrophobic wheel assembly for automatic grease or oil removal.
    2. Integral flow control device.
    3. Self-regulating enclosed electric immersion heater.
    4. Vent connection.
    5. Integral gas trap.
    6. Programmable 24-hour multi-event time control.
    7. Gasket and fully removable 304 Stainless Steel lid.
    8. Electric motor with thermal overload protection and automatic reset switch.
    9. Removable solids strainer basket.
    10. Removable translucent collection container.
B. Grease Interceptors shall be Big Dipper as manufactured by Thermaco or approved equal.
C. Grease Interceptors shall be floor mounted.
D. Grease Interceptors shall be designed and located with sufficient clearances and space for service and maintenance.

10.3 Hydrostatic Water Pipe Testing

10.3.1 Hydrostatic Water Pipe Testing General Requirements

A. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing.
B. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure.
C. Isolate equipment from piping.
D. Install safety valve, set at a pressure of no more than one-third higher than test pressure, to protect system during test.
E. Provide signs where piping is under hydrostatic pressure.
F. Test pressure during examination shall be monitored and adjusted for the corresponding ambient temperature.
G. Prepare test and inspection report.

10.3.2 Hydronic Piping

A. Isolate expansion tanks and determine that hydronic system is full of water.
B. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."
C. After hydrostatic test pressure has been applied for at least 30 minutes, examine piping, joints and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.

10.3.3 Domestic Water Piping

A. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.
B. Isolate test area. Subject piping to static water pressure of 50 psig (345 kPa) above operating pressure without exceeding pressure rating of piping system materials and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.

11.0 Electrical Design Introduction

The electrical systems for all facilities shall be based on proven design principles and the NFPA 70 Electrical Code. The final configuration, selection and sizing of the electrical system shall be determined by the consultant during detailed design phase. The design shall utilize state of the art technology in available equipment and components. The electrical system shall be flexible to accommodate changes, additions and modifications as necessary. Straight forward designs shall be safe, reliable and cost effective.

Accessibility, ease of erection and dismantling of all the components of the system shall be a priority.

11.1 General Electrical Requirements

11.1.1 UPS Protection

All contract documents for retrofitting, modifying, or new building construction, which involve data jacks, cabling, etc., shall be designed to include, at a minimum, one duplex outlet on a UPS circuit adjacent to each data jack location. This requirement is in addition to any convenience outlet requirements, and is to provide UPS protection for each PC-CPU and future telephone system which is deployed.

11.1.2 Total Harmonic Distortion

A. In order to minimize potential effects of harmonics from: Frequency Converters (including 400 hertz ground power units for aircraft), and Uninterruptible Power Supplies (UPS) of 30,000 volt-ampere capacity or greater, the technical specifications for each piece of such equipment must include the following requirements:
   1. Harmonics Content: total harmonic distortion (THD) of the input current waveform, as measured at the input terminals where the equipment is connected to the premises electrical system, shall be 30% or lower whenever the load on the equipment is 50% of its rated output or higher, independent of external filters.
   2. Power Factor: the input power factor measured at the input terminals, where the equipment is connected to the premises electrical system, shall be 90% or higher whenever the load on the equipment is 50% of its rated output or higher.

B. For Adjustable Frequency Drives (AFDs) for motors 25 horsepower or larger, the technical specifications for each piece of such equipment must include the following requirements:
   1. Harmonics Content: total harmonic distortion (THD) of the input current waveform, as measured at the input terminals where the equipment is connected to the premises electrical system, shall be 15% or lower, and the THD of the voltage waveform shall be 3% lower whenever the load on the equipment is 50% of its rated output or higher, independent of external filters.
   2. Power Factor: the input power factor measured at the input terminals where the equipment is connected to the premises electrical system, shall be 90% or higher whenever the load on the equipment is 50% of its rated output or higher.

C. Branch Circuits: All circuits shall have a dedicated neutral conductor.
   1. The ungrounded and grounded conductors of each branch circuit shall be grouped by wire ties or similar means in at least one location within the panelboard or other point of origin, splice or terminations point.

In addition, for Adjustable Frequency Drivers of 300 horsepower or more or a group of Drives with horsepower adding to the 500 horsepower or more, a system study shall be performed by the consultant to demonstrate compliance with IEEE Std 519-1992 Tables 10.2 and 10.3. The point of common coupling for the study shall be the immediately upstream medium voltage to low voltage substation in the Airport distribution system. If the study indicates that the IEEE standard cannot be met with above THD limits, then the consultant shall specify lower limits so that the IEEE Standard requirements are met.

11.1.3 Approved Testing Laboratories for Electrical Systems

Refer to Volume 3, Section 4.2.

11.1.4 Aluminum Electrical Wire

No aluminum electrical wire shall be permitted at BWI Marshall and MTN Airports.

11.1.5 Final Cleaning of Electrical/Communication/IT Closets

All projects involving modifications to or in electrical, communication, and/or IT closets/rooms shall provide language within the specification requiring the entire area be cleaned by the contractor prior to demobilization, including removal of all debris, surface dust, etc.

11.1.6 Medium Voltage Cable Terminations

Components used for medium voltage cable terminations at equipment connections and splices, such as tubing used for sealing cable jackets shall bear a manufacturer's name and product series identifier.

Wherever practicable, cold shrinkable tubing shall be specified in preference to heat shrinkable tubing, to minimize potential damage from overheating and need for high levels of workmanship on the part of the installer.

11.1.7 Transformers

11.1.7.1 Transformer Safety Markings

A. Transformers shall be marked around visible edges with a 2-inch red reflective tape. The tape shall be installed so that 1 inch of material is on either side of the edge.
B. Existing transformers shall meet the Transformer Safety Marking requirements (Paragraph 11.1.7.1.A) when an existing transformer is in a location where there is a proposed change of use and/or alteration being made either to the area around the transformer or to the space the transformer is serving.

11.1.7.2 Transformer Sizing

Transformers for tenant improvement projects shall be sized on the basis of calculated/demand load plus 25% or the connected load, whichever is higher. The consultant shall submit complete set of calculations and demand factors for both calculated/demand load and connected load as part of permit drawing submission for the approval of MDOT MAA.

11.1.7.3 Transformer Location

No transformer above 10KVA shall be permitted above ceilings.
Exceptions:

A. Specialty transformers for low voltage lighting, neon lighting, or other similar systems shall be reviewed on a case-by-case basis.
B. When an existing transformer is in a location where there is no change of use, change of occupancy, or significant alteration either to the space being served or the area around the transformer, subject to the discretion of the Authority Having Jurisdiction (AHJ).
C. Transformers permitted in writing by the AHJ.

11.2 Grounding and Lightning Protection

11.2.1 Grounding

Whenever grounding electrode conductors are bonded to ground rods or other grounding electrodes, bonds shall be exothermic welds. Exothermic welds shall be coated against corrosion where direct buried.

Ground Rods: Ground Rods shall be ¾" in diameter, 10' long as a minimum. Materials of construction shall be copper-coated steel as a minimum. Ground rods shall be designed and installed per the National Electric Code.

11.2.2 Surge Suppression, Bonding and Grounding for Outdoor Systems

Surge Suppression, Bonding and Grounding, shall be included in the specifications and plans for the following outdoor installations:

1. Parking and Revenue Control Systems
2. Closed Circuit Television System (CCTV) Installations
3. Access Control
4. Any unprotected system that may be struck by lightning that would conduct the lightning energy to the inside of the facilities.

Note: Equipment product catalog numbers included in this design standard are for equipment manufactured and provided by Emerson Network Power, EDCO, Transient Voltage Surge Suppression, or by General Electric but these are not meant to be sole source or proprietary specifications. Products by other manufacturers, which meet or exceed the specifications of the named products and include salient features matching those named may be specified, and used.

11.2.2.1 Protection for Parking and Revenue Control Systems

Surge suppression devices shall be installed on all electrical conductors connected to lane toll equipment (revenue plaza equipment, ticket dispensers (spitters) and gates). Typical installations include data cabling (RS-422 for example) and electrical power circuits that feed the lane equipment, and booths.

A. Protection for Data Cabling
The RS 485/RS-422 circuits shall be protected with an EDCO PC-642-008LC signal line protection device. This device provides two stages of protection with an 8-volt clamp which coordinates well with the 6-volt normal operating voltages on RS-422/485 circuits. The LC suffix indicates low capacitance which allows the suppressor to operate at higher data rates. The EDCO PC series suppressor modules shall be ordered with a model PC-BIB base assembly. The first stage (odd numbered) terminals shall be connected to the field-side wiring and that the second stage (even numbered) terminals shall be connected to the equipment-side cabling to the protected equipment.

Many locations run RS-422 cables from lane-to-lane in a daisy-chain fashion (parallel connections). In these locations the inter-lane cabling shall be bridged in and then out to the next lane on the field-side wiring of the suppressor. This requires separate inbound and outbound inter-lane cables connected to the field-side of the suppressor with a short pigtail data cable between the suppressor equipment-side and the lane equipment. A suppressor shall be installed on the end of the inter-lane cabling where it attaches to an isolator or protocol converter. **Figure 1** below shows the inter-lane cabling configuration graphically.

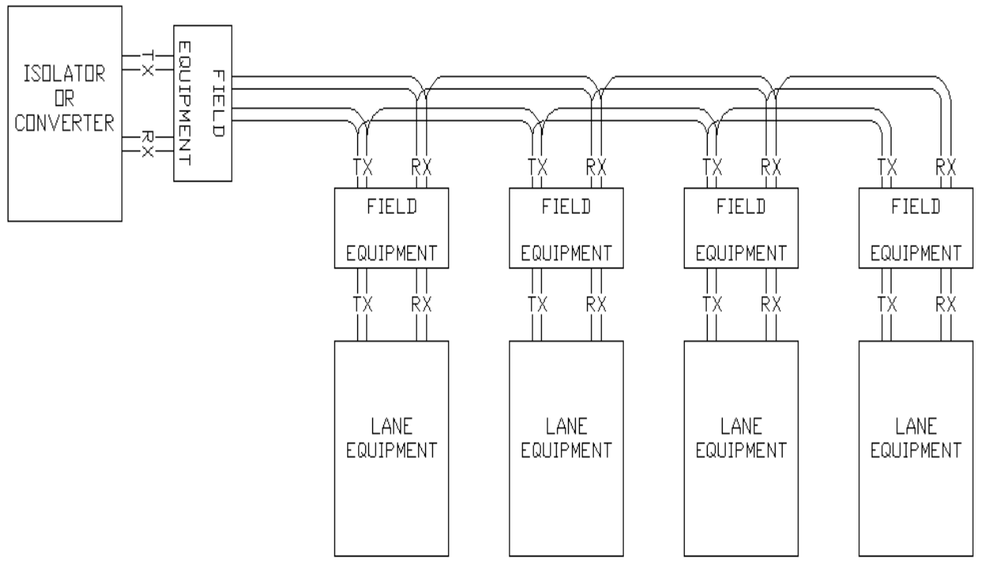


Figure 1 – Inter-Lane Cabling Configuration

Power ground wires and signal suppressor ground wires shall be as short as possible and be bonded to the equipment chassis as physically close to the suppressor as possible. This will minimize the effects of inductive voltage drop across these conductors and help control the voltage excursions that occur during a surge between the protected conductors and the equipment chassis. **Figure 2** below from the EDCO suppressor's application notes depicts these details.

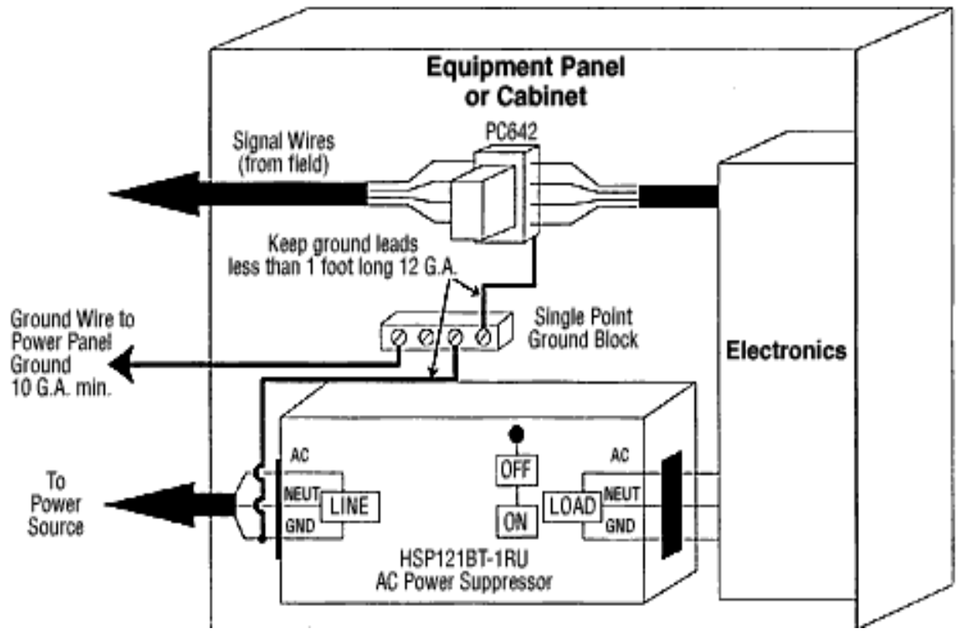


Figure 2 – Chassis Bonds for Suppressor Grounds

B. Protection for 120 Volt AC Powered Equipment

The 120 Vac powered cashier interface terminals, ticket spitters and gates shall be protected with either an EDCO model HSP121BT or a model HSP121A surge suppressor.

The EDCO HSP121BT has an external barrier strip which is suitable for installation inside ticket spitters, and gate operator housings that are not normally accessible to the cashier or others.

The EDCO HSP121A is mounted in a NEMA enclosure and has an internal terminal strip and knockouts that will accept conduit fittings or cord strain relief fittings. The EDCO HSP121A shall be used inside the cashier booths for protection of the cashiers' interface terminals. Using a cord strain relief fitting, the device shall be hard wired in series with the power input to the UPS at the booths. This will help ensure that the cashiers do not plug heaters into an unused receptacle protected by the surge suppression device as these devices are only rated for 15 amperes.

At the gates, these units shall be used to protect the 120 Vac feed to the controllers with the 120 Vac for the motors taken off upstream of the device. Motor loads shall not be fed through the surge suppressors.

The central equipment is typically located at the equipment cabinet in the Toll Plaza Administration building. The power equipment in the closet cabinet is usually supported by one or two plug-strips. An EDCO TS-1200G suppressor which will plug into one of the receptacles located in the cabinet shall be used. The plug-strip(s) can then be plugged directly into the EDCO TS-1200G. The "G" in the part number is an external binding post ground terminal. It connects to the internal grounds in the suppressor and provides a good point to attach the ground leads from the data line suppressors.

11.2.2.2 Protection for Closed Circuit Television Systems

Remote Closed Circuit Television (CCTV) cameras located at gates and parking areas are particularly susceptible to damage from lightning, largely due to the high level of exposure to direct lightning strikes or strikes in near proximity.

Protection for CCTV Cameras

The CCTV cameras typically include pan tilt assemblies, and are integrated units requiring 24 Vac power, RS-485 4-wire pan-tilt-zoom control and a coaxial video connection. A NEMA 4X rated equipment enclosure is typically installed at the base of each tower. This enclosure contains a quad electrical receptacle, a fiber-optic transceiver for video and control, a power transformer for camera power and a separate power transformer for the fiber-optic transceiver. Adequate space must be provided in the enclosure for the required surge suppression devices.

Figure 3 below depicts several measures that shall be taken at typical tower locations. An air terminal, fashioned from a galvanized ground rod shall be installed to protect the camera housing from direct lightning strike currents. A ground rod and bonding conductor to the tower shall be added to improve the ground resistance of the tower foundation. Continuous steel conduit shall be installed from the camera housing to the equipment enclosure to help shield the camera cabling from induced voltage if the tower is struck by lightning.

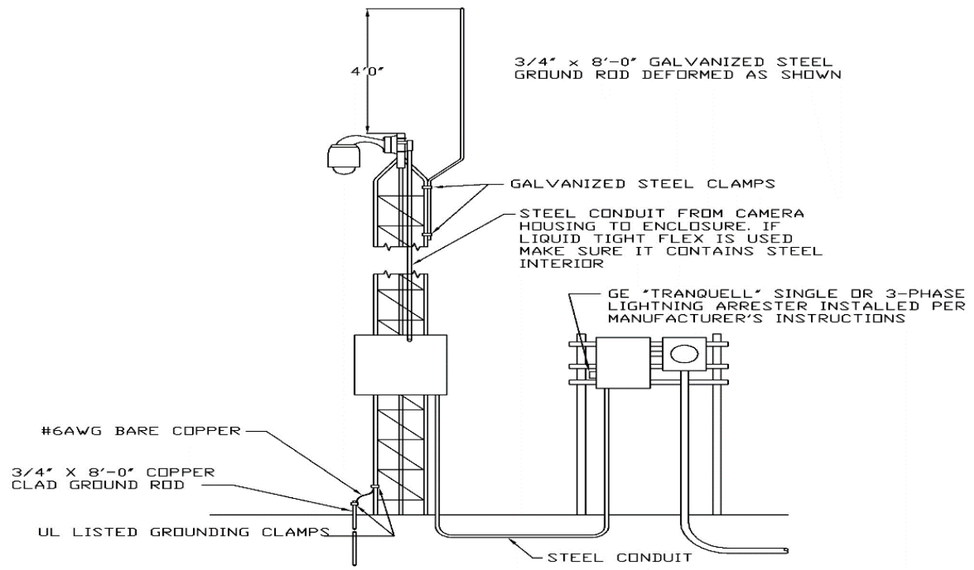


Figure 3 – CCTV Camera Tower Recommendations

Because of the relatively high exposure of these sites a high energy Metal Oxide Varistor (MOV) arrester shall be installed at the electrical panel serving each camera tower. The product recommended is a General Electric Tranquell device in either a 120/240 Vac single phase or 120/208 Vac three phase configuration. These units install in a knockout in the panel and either is directly connected to the buses or connected through a 30-ampere breaker. These units are rated for 10,000 ampere Category C exposure conditions and they will provide a first stage clamp down to a level between 2 kV and 3 kV. This provides an additional level of protection that will help extend the lifespan of suppressors installed inside the camera cabinet.

Figure 4 below shows the recommended configuration for the CCTV power, video and RS-422 pan-tilt-zoom control circuits at the base of the tower. These enclosures are typically equipped with quad 120 Vac receptacles to plug-in the camera power transformer and the plug-in DC supply for the fiber transceiver. Protect these receptacles with an EDCO HSP-121A, NEMA 4X, 120 Vac, suppressor. This suppressor (shown as A on Figure 4) is shown interconnecting these receptacles with the incoming power conductors. This suppressor will control voltage excursions from line-to-neutral and from line-to-ground to about 300-400 volts during 10 kiloampere Category C surge conditions. These suppressors are required in these locations due to the high exposure levels to direct lightning.

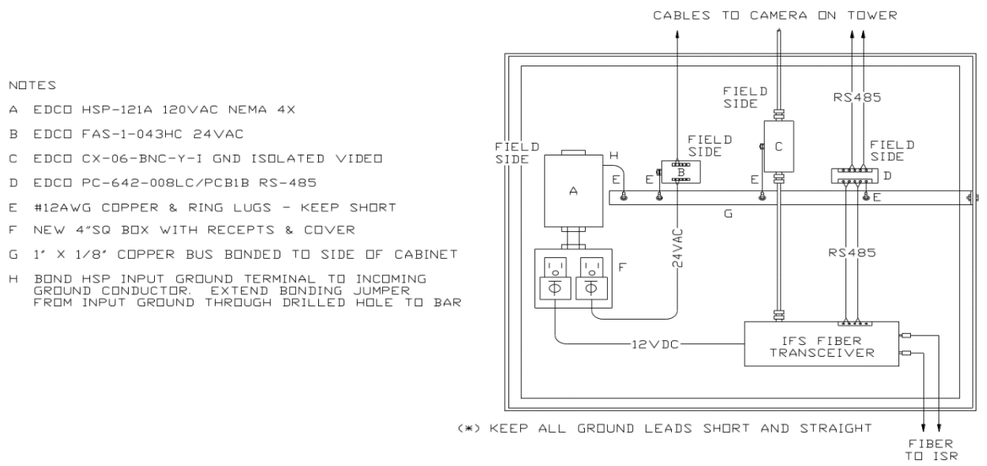


Figure 4 – CCTV Equipment Enclosure Recommended Configuration

An EDCO FAS-1-043HC, two-stage, suppression shall be installed to protect the 24 Vac power conductors to the camera assembly. This suppressor uses series inductors between the first and second stage rather than resistors, allowing it to pass several amperes of current.

An EDCO CX-06-BNC-Y-I, coaxial suppressor (shown as B on Figure 4) shall be installed to protect the camera video cable. This suppressor uses a female BNC connector on both the field-side and equipment-side. A clamp voltage of 6-volts is recommended as the peak-to-peak video levels should be around one volt.

An EDCO PC-642-008LC/PCB1B, two-pair low capacitance suppressor (shown as D on Figure 4) shall be installed to protect the RS-485 circuits with a clamping voltage of eight volts. This is consistent with the 6-volt operating range for the suppressor. This suppressor is polarity insensitive. The part number for this unit also includes a plug-in screw terminal base.

A copper ground bus (shown as G on Figure 4) shall be installed to terminate the ground leads for the suppressors. A flat conductor provides a significantly lower inductance than a round conductor, which is a major factor in having the suppressors track each other during high levels of lightning current. The bus bar is shown bonding to the side of the cabinet with stainless steel hardware and star washers to ensure that potentials inside the enclosure remain consistent with each other.

The power suppressor has a terminal strip for line, neutral and ground on both the unprotected and protected side. Line, neutral and ground conductors shall terminate on these strips. In addition, a #12 AWG copper conductor is shown between the unprotected ground terminal and the copper bus for the cabinet. This will help to ensure that the ground reference for the power suppressor and ground leads for the other suppressors track each other during surge handling.

Properly connect the suppressors with their unprotected or field-side wiring terminals to the cabling leaving the enclosure. If connected backwards, the more sensitive (but faster acting) second stage will be exposed to excessive current and the suppressors may be damaged by the first lightning event.

Separation of cabling is required to minimize coupling between protected and unprotected cabling. If it is necessary to cross these cables over each other, make the crossover using right angles. This will help to minimize the inductive and capacitive coupling of energy between protected and unprotected circuits.

Protection is not provided for the 12 Vdc power supply to the IFS transceiver as this power circuit does not leave the enclosure.

11.2.2.3 Protection for Access Control System Gates

Due to the exposed location of access control components located at vehicular gates, there is likely to be damage by direct or nearby lightning strikes and the metallic fencing's ability to conduct nearby strikes to the gate locations.

Figure 5 shows the recommended method for protecting the access control equipment at the gates. Install an EDCO HSP-121A, two-stage hybrid, NEMA 4X, suppressor (See A on Figure 5) on the exterior of the access control enclosure to protect the power conductors. This approach is recommended as access control enclosures typically have insufficient space to place the suppressor in the housing. The incoming 120 Vac power entering the enclosure is looped out, through the suppressor and back into the enclosure where it is hard-wired to the 27 Vdc regulated switching power supply.

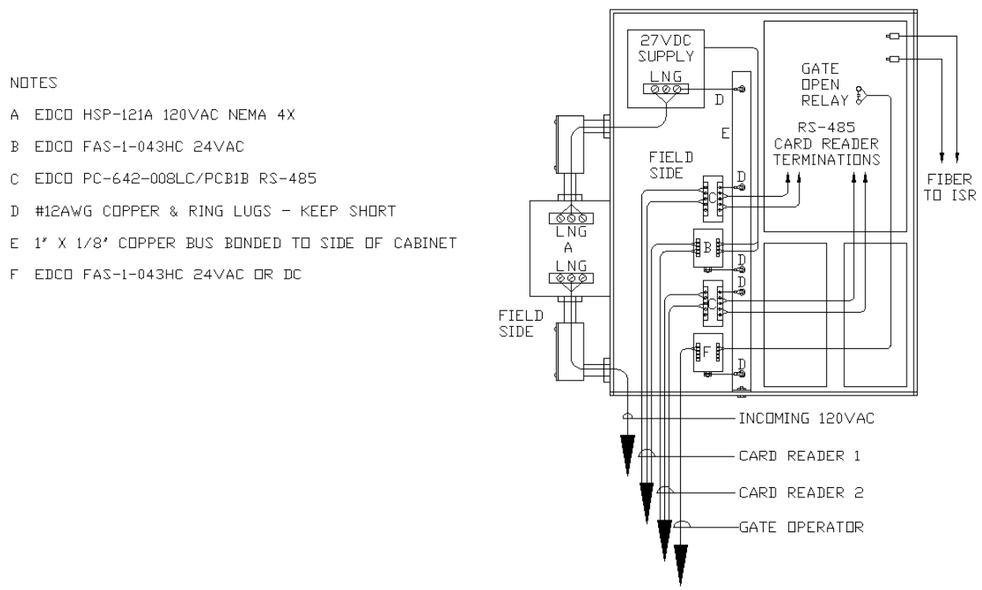


Figure 5 – Gate Access Control Recommended Configuration

An EDCO FAS-1-043HC, two-circuit, 24 Vac, suppressor shall be installed at each gate to protect the wiring to the two card readers. This EDCO AC suppressor was chosen for this application as the 27 Vdc used to power the remote readers is on the upper limit of what a 24 Vdc suppressor will tolerate. Since peak voltage on an AC circuit is 1.41 times the RMS value, the clamping threshold for the AC suppressor is actually set at 43-Volts. The suppressors for card reader power utilize a series inter-stage inductor rather than resistors making them suitable for this type of powering application.

Use EDCO PC-642-008LC/PCB1B, low capacitance, 8-volt, RS-485, suppressors for protection of the card reader data circuits. These suppressors shall include a plug-in screw terminal base that can be secured to the back or side panels in an enclosure.

In the event that Wiegand readers are ever required, the same manufacturer makes a 5-conductor Wiegand protector in the same package.

In lower exposure areas, there would not be concern about circuits that leave the enclosure isolated by a dry relay contact. Cases of welded relay contacts, contacts burned open and even miniature relays which were completely disintegrated have occurred in high exposure level situations. When this occurs there is often collateral damage to other components on the circuit board.

A 24 Vac suppressor shall be specified for in high exposure level situations. This is usable with AC or DC control voltages of up to about 30 volts as the clamping threshold is set at 43 volts. If higher voltages are required, a different suppressor may be utilized with a clamp setting that is workable with the voltage being switched.

All of the rules and guidelines recommended for the CCTV enclosure apply to the card access installation. This includes separation of protected and unprotected conductors and keeping ground leads short.

No detail was produced for the remote card readers themselves. These readers shall be equipped with one of the reader power suppressors (also available in a single pair configuration) and an RS-485 suppressor installed in the junction box behind the reader. Bond suppressor grounds to the metallic housing for the reader and reader pedestal.

11.3 Power Distribution System and Equipment

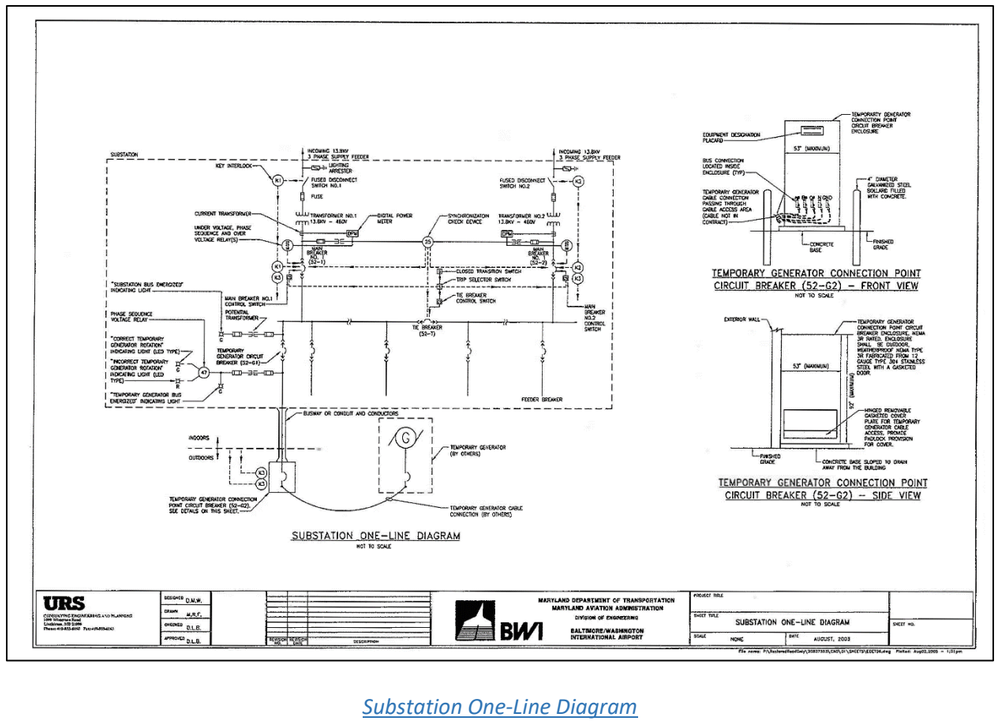
11.3.1 Substations

Below outlines the requirements for 13,800-480 volt electrical substations.

A. All equipment and installations shall be in accordance with the National Electrical Code (NEC) per edition approved and specified in the Maryland Model Performance Code.
B. All equipment locations shall be coordinated with the MDOT MAA Office of Engineering & Construction.
C. Substations shall be 13,800-480 volt, secondary selective configuration consisting of two primary (13,800 volt) feeders, two primary fused load interrupter switches, two power transformers, two secondary (480 volt) main circuit breakers, one tie breaker, and feeder breakers. All current carrying parts of the substation and related components shall be copper. Each substation shall be supplied by one North feeder and one South feeder originating from switchgear supplied from the BWI Marshall North and South substation respectively. Refer to Substation one-line diagram and the substation sequence of operation details for additional information. The current BWI Marshall medium voltage one-line diagram is included on the following pages.
D. The secondary main and tie circuit breakers shall be electrically operated draw-out type low voltage power circuit breakers or insulated case circuit breakers.
E. The feeder circuit breakers shall be manually operated draw-out type low voltage power circuit breakers, insulated case circuit breakers or molded case circuit breakers mounted in continuous metal enclosed switchgear or switchboard enclosure(s).
F. All substation short-circuit ratings shall be adequate for the combined available fault current contribution due to secondary closed transition switching. The available fault current shall be calculated for the moment that both secondary main breakers and the tie breaker are simultaneously closed and both transformers are energized from their primary source.
G. Ground fault protection shall be provided for all substation 480 volt circuit breakers including secondary main circuit breakers, tie breaker and all feeder breakers. Ground fault protection for 3 phase, 4 wire, solidly ground systems shall utilize current transformer (CT) sending for all phase and neutral conductors. Three (3) phase underground systems shall include a ground fault sensing and indication system.
H. Substations shall include a semi-automatic secondary closed transition switching scheme that allows for momentary simultaneous closing of both secondary main circuit breakers and tie circuit breaker for maintenance switching purposes. The closed transition scheme and associated components shall be designed and manufactured by the substation equipment manufacturer and designed specifically for this application. All components shall be integral to the substation. Refer to Substation one-line diagram and the substation sequence of operation details for additional information.

   The consultant shall contact MDOT MAA maintenance personnel to see if any operating problems have occurred recently with closed transition operation at existing substations. If so, the consultant shall request that BGE perform a circulating study. The consultant shall make recommendations based on the results of the study.

   The consultant shall contact BGE to see if any changes have been made that could affect the synchronization of incoming feeders and closed transition operation. If so, the consultant shall request that BGE perform a circulating study. The consultant shall make recommendations based on the results of the study.



SUBSTATION ONE-LINE DIAGRAM

NOT TO SCALE

TEMPORARY GENERATOR CONNECTION POINT CIRCUIT BREAKER (52-02) – FRONT VIEW

NOT TO SCALE

TEMPORARY GENERATOR CONNECTION POINT CIRCUIT BREAKER (52-02) – SIDE VIEW

NOT TO SCALE

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DRAWN	M.A.F.
CHECKED	D.L.B.
APPROVED	D.L.B.

REVISION NUMBER	DATE	DESCRIPTION

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION
DIVISION OF ENGINEERING
BWI
BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE

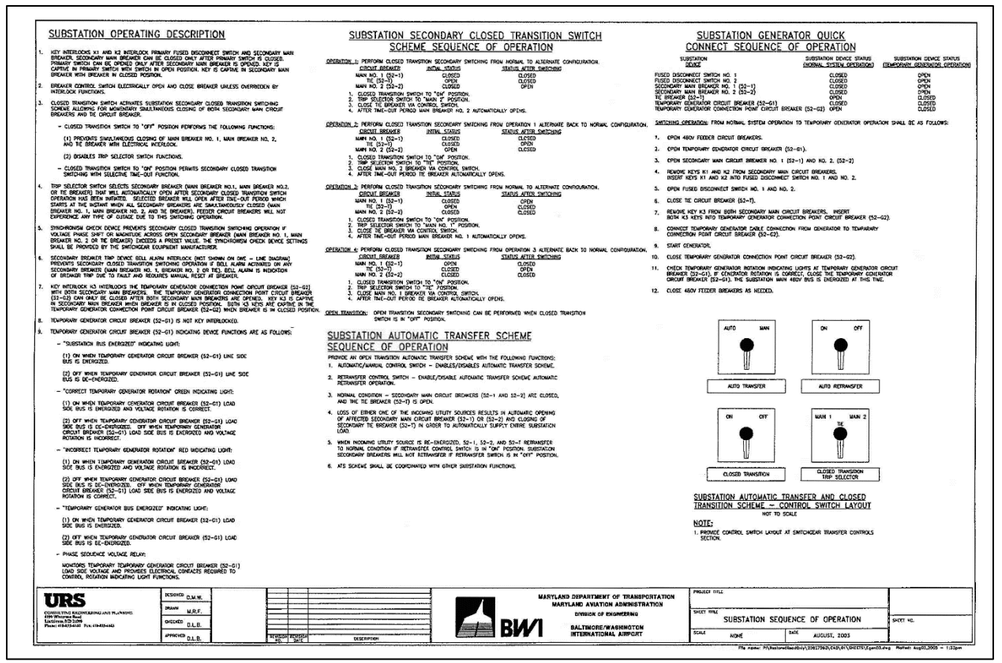
SHEET TITLE: SUBSTATION ONE-LINE DIAGRAM

SCALE: NONE | DATE: AUGUST, 2003

SHEET NO.

File name: P:\Systems\Facility\2003\1103\DWG\01\SHEET01E0216A.dwg Plotted: Aug 05, 2003 – 1:03 pm

Substation One-Line Diagram



Substation Sequence of Operation

I. Substations shall include a secondary automatic transfer scheme that will automatically open one secondary main breaker and close the tie breaker in order to transfer all load to one primary feeder if abnormal voltage is detected on one of the two incoming substation primary feeders. Since there is an automatic transfer on the primary feeders to the substations, the automatic secondary transfer should incorporate time delays of sufficient length to allow the primary transfer to occur prior the secondary transfer. Refer to Substation one-line diagram and the substation sequence of operation details for additional information.

J. Substations shall include an emergency power quick connect system which includes a permanent connection point for a temporary electric generator in order to supply temporary power to the entire substation in the event of a complete substation power outage. The quick connect system shall include a temporary generator circuit breaker (52-G1) (located within the substation), temporary generator connection point circuit breaker (52-G2) (located outdoors, remote from the substation at an area easily accessible to the temporary generator), feeder from 52-G1 to 52-G2, and control system. The location of the temporary generator connection point enclosure shall be approved by the BWI Marshall Office of Airfield Operations and Security, as well as the Office of Facilities Maintenance. Refer to Substation one-line diagram and the substation sequence of operation details for additional information.

Circuit breaker 52-G1 and 52-G2 shall be manually operated. Circuit breaker 52-G1 and 52-G2 and the feeder shall have a rated ampacity equal to the substation main circuit breakers.

The temporary generator connection point circuit (52-G2) shall be installed in a pad-mounted enclosure of sufficient size and configuration to allow for temporary generator cable connections. The enclosure shall have the following options: NEMA 3R 12-gauge type 304 stainless steel construction, gasketed door, front accessible only, padlock provision, key interlock, internal heater (with thermostat and internal control power transformer), internal hinged dead front door (that allows breaker to be operated with no possible access to energized parts), temporary generator cable access area, and number of cables. The entire enclosure shall be rated NEMA 3R while-in-use when temporary generator cables are connected and operational. All components of the temporary generator connection point circuit breaker shall be specifically designed for this purpose and manufactured by the circuit breaker manufacturer or by the circuit breaker manufacturer factory authorized field service organization. An 8-1/2” x 11” aluminum sign attached to outside of the enclosure shall be installed with the following wording: “Substation _____ Generator Connection.” The name of the substation shall be filled in the blank space.

Attach a 10” x 4” self-adhesive engraved, laminated acrylic sign 1/8” thick to the exterior of the quick connect enclosure stating the phase rotation for connecting a portable generator. This sign shall include the wording in white text (size 3/8”) with a red background stating,

SUBSTATION ____ (Blank to be filled in with substation number)
QUICK CONNECT CABINET

CONNECT GENERATOR AS FOLLOWS:
CABINET LEAD COLORS: B O Y
GENERATOR LEAD COLORS: B O Y

Quick connects that have a phase rotation of C-B-A shall have the leads swapped so the generator temporary connection will follow an A-B-C phase rotation and shall include a sign inside the quick connect enclosure with the same specifications as the exterior sign and with the wording,

SUBSTATION ____ (Blank to be filled in with substation number)
QUICK CONNECT CABINET
PHASE A AND C HAVE BEEN SWITCHED
TO MATCH THE PHASE ROTATION
OF SUBSTATION _____ (Blank to be filled in with substation number)

Placards shall not overlap or cover existing signage on the equipment required by code. Samples of the exterior and interior quick connect placards have been included in Section 11.3.2.4.

K. Contract documents shall require performance of a short-circuit and coordination study during construction to establish settings for all new adjustable system protection devices. All new devices shall be selectively coordinated with existing devices and operating schemes including but not limited to, overload/short-circuit protection and automatic transfer schemes.
L. Contract documents shall require furnishing and installation of permanently attached engraved instruction placards including substation one-line diagram and all substation sequence of operations. Locate on placard at substation interior wall with an emergency lighting fixture with integral battery back-up in close proximity. Locate one placard on the inside of the temporary generator connection point circuit breaker enclosure.
M. Contract documents shall require furnishing and installation of a framed wall-mounted one-line diagram for the substation and the entire downstream distribution system. Locate with substation room.

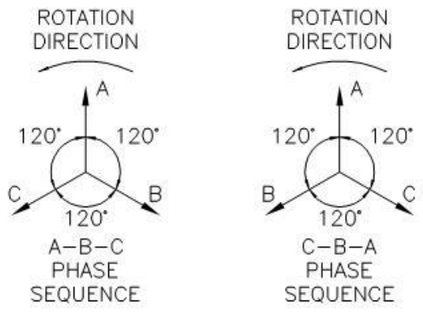
11.3.2 Medium Voltage Electrical Phasing and Rotation (BWI Marshall only)

This section details the electrical phasing and rotation conditions for the BWI Marshall medium voltage electrical distribution system.

11.3.2.1 Medium Voltage Electrical Phasing and Rotation Background

The BWI Marshall Airport medium voltage distribution system is a three-phase system. The phases are labeled A, B and C in accordance with industry standard practices. System phase rotation must be consistent where multiple power sources are available for the following reasons: (1) for system identification and safety purposes, (2) to provide correct system rotation, and (3) to allow for the use of alternate distribution system configurations made possible by using Airport tie circuit breakers.

The term rotation refers to the order that the phases reach their maximum instantaneous line-to-neutral voltage value. There are two possible system rotations, ABC (positive sequence) or CBA (negative sequence). The rotation of the system determines the direction that a three-phase motor will spin when connected to the system. A three- phase motor connected to an ABC system will rotate in the opposite direction as compared to a CBA system. This is particularly important for HVAC and other three-phase motor equipment, since the rotation of the equipment is based on the electrical connection. The figure below shows the vector diagram for each of the two system phase rotations.



Two-system Phase Rotations

The existing medium voltage distribution system at BWI Marshall is shown in the following Airport Wide Phase Rotation Drawing with the Sheet Title “Single Line Diagram with Phase Rotation”. The single line diagram shows the power distribution from the primary of each power transformer located in the BWI Marshall North and South substations through the three 13.8 kV switchgears and to 480 V substations. The phase rotation at each switchgear and substation is shown on the Single Line Diagram.

The Table titled “Switchgear, Substation and Quick Connect Switches-Phase Rotation” summarizes the phase rotation for each switchgear, substation and quick connect cabinet at BWI Marshall Airport. The actual phase rotation shown for the electrical equipment in this Table was measured and verified in 2014.

The BWI Marshall system has adopted labeling and color coding for all 480 VAC conductors as an ABC rotation, where at 480 VAC, 3-phase equipment, phase A is color coded Brown, Phase B is color coded Orange and Phase C is color coded Yellow, following the B-O-Y conventional nomenclature. As an example of how the color coding is implemented at BWI the color coding of the power conductors for substations ST-TU and A1 are as follows:

Substation ST-TU has a phase rotation ABC, and the color coding of the substation feeder conductors on the load side of the substation breaker looking into the front of the breaker is left terminal lug, Brown, center terminal lug, Orange and right terminal lug, Yellow. The motors connected from this substation will follow the connections Phase A to Phase A, Phase B to Phase B and Phase C to Phase C. The color coding of the connection of these feeder conductors at the motor will be the same as at the substation.

In the case of Substation A1, which has a CBA rotation, this requires that in order for a three phase motor to turn in the correct rotation, the power wiring connection at the motor will have the A and C phase conductors switched. The color coding for the feeder conductors on the load side of the substation breaker looking into the front of the breaker will be left terminal lug, Brown, center terminal lug, Orange and right terminal lug, Yellow. The color coding of the connection of these feeder conductors at the motor will be the same as at the substation. The correct motor rotation will be accomplished by switching the A and C phase motor leads, where motor lead phase A will be connected to feeder conductor phase C and motor lead phase C will be connected to feeder conductor phase A.

11.3.2.2 Power Distribution System Design

The Consultants and Contractors shall consider the phase rotation differences that exist within the BWI Marshall Airport electrical power distribution system, particularly for Projects where equipment is powered from substations that do not have matching phase rotations.

The electrical power system designs that are performed at the BWI Airport North and South substations will require that the phase rotation remain consistent with that already established. The existing phase labeling shall remain and the consultant shall contact BGE at 410-291-3156 to coordinate all work at the North and South substations.

11.3.2.3 Generator Connections

AC Generator electrical phase sequence must match plant and utility electrical phase sequence. When three-phase temporary generators are used on the BWI Marshall Airport distribution system, the generator will be connected to the quick connect breaker conductors in an ABC rotation. The following Table, “Switchgear, Substation and Quick Connect switches – Phase Rotation” shows that the quick connects for substations A1, B1, B2 and ST-BC have a rotation CBA. In order to keep the temporary generator connections consistent for all of the quick connects at BWI Marshall Airport, the A and C phase leads from the quick connect breaker for the A1, B1, B2 and ST-BC quick connect breakers have been switched. Temporary generator rotation shall be electrically tested by the Contractor prior to connecting to the BWI Marshall system. Generators connected to BWI Marshall 13.8 kV – 480 VAC unit substation emergency power quick connect systems shall be tested for proper rotation using the voltage phase sequence relay and associated generator rotation indicating light that is permanently installed on the quick connect breaker in most substations. A substation quick connect sequence of operation placard is required by the MDOT MAA Substation Standard (Chapter 11.3.1 Substations) to be located at the substation and on the temporary generator connection point circuit breaker. This placard explains the use of the quick connect scheme including the generator rotation indicating light.

11.3.2.4 Electrical Systems Identification Placards

Placards with phase rotation information are installed at all switchgears, substations and quick connect switches at BWI Airport. The Consultant shall include phase rotation placards as required by these Standards for new switchgears, substations, and quick connect switches as described below. Placards shall not overlap or cover any existing signage or labeling on the electrical equipment as required by code.

A. Switchgears
   The Consultant shall include phase rotation placards as required by these Standards for new switchgear at BWI Marshall Airport. The Consultant shall note in the Contract Documents to: “Attach a 6” x 3” self-adhesive engraved, laminated acrylic sign 1/8” thick to the exterior of switchgear stating the phase rotation. This sign shall include the wording in white text (size 3/8”) with a red background stating,

   SWITCHGEAR ____ (Blank to be filled in with Switchgear number)
   PHASE ROTATION
   A-B-C (OR C-B-A AS VERIFIED)

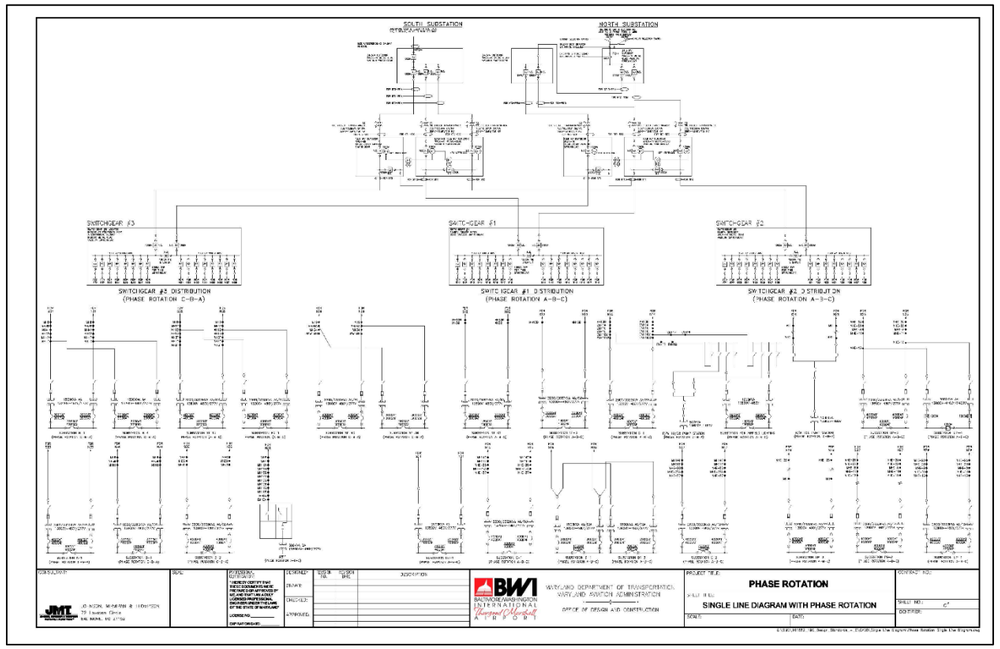
B. Substations

The Consultant shall include phase rotation placards as required by these Standards for new Substations at BWI Marshall Airport. The Consultant shall note in the Contract Documents to: “Attach a 6” x 3” self-adhesive engraved, laminated acrylic sign 1/8” thick to the exterior of the substation stating the phase rotation. This sign shall include the wording in white text (size 3/8”) with a red background stating,

SUBSTATION ____ (Blank to be filled in with Switchgear number)
PHASE ROTATION
A-B-C (OR C-B-A AS VERIFIED)

C. Quick Connect Switches
The details for the quick connect placards both exterior and interior (where required) are as described in Chapter 11.3.1 Substations, Item H.

Sample templates for each of the placards described above are included in the following pages.



Single line diagram with phase rotation

SWITCHGEAR, SUBSTATION AND QUICK CONNECT SWITCHES PHASE ROTATION				
SUBSTATION	**FED FROM SWITCHGEAR/ AS INDICATED**	**MEDIUM VOLTAGE FEEDER NUMBER**	**PHASE ROTATION**	**QUICK CONNECT PHASE ROTATION**
A1-NORTH	3	N33	CBA	CBA *
A1-SOUTH	3	S33	CBA	CBA *
B1-NORTH	3	N34	CBA	CBA *
B1-SOUTH	3	S34	CBA	CBA *
B2-NORTH	3	N35	CBA	CBA *
B2-SOUTH	3	S35	CBA	CBA *
PG-1-NORTH	3	N32	ABC	NO QUICK DISCONNECT

PG-1-SOUTH	3	S32	ABC	NO QUICK DISCONNECT
ST-TU-NORTH	3	N32	ABC	ABC
ST-TU-SOUTH	3	S32	ABC	ABC
ARFF	3	N38	ABC	NO QUICK DISCONNECT
UP-1-NORTH	2	N28	ABC	ABC
UP-1-SOUTH	2	S28	ABC	ABC
UP-2-NORTH	2	N26	ABC	ABC
UP-2-SOUTH	2	S26	ABC	ABC
UP-3-NORTH	2	N25	ABC	ABC
UP-3-SOUTH	2	S25	ABC	ABC
UP-4-NORTH	2	N25	ABC	NO QUICK DISCONNECT
UP-4-SOUTH	2	S25	ABC	NO QUICK DISCONNECT
PG-2-NORTH	2	N27	ABC	ABC
PG-2-SOUTH	2	S27	ABC	ABC
ST-AB-NORTH	3	N36	CBA	NO QUICK DISCONNECT
ST-AB-SOUTH	3	S36	CBA	NO QUICK DISCONNECT
ST-BC-NORTH	3	N36	CBA	CBA *
ST-BC-SOUTH	3	S36	CBA	CBA *
DY-1-NORTH	1	N11	ABC	ABC
DY-1-SOUTH	1	S11	ABC	ABC
DY-2-NORTH	1	N16	ABC	ABC
DY-2-SOUTH	1	S16	ABC	ABC
D-1-NORTH	1	N16	ABC	ABC
D-1-SOUTH	1	S16	ABC	ABC
NT-D-NORTH	1	N13	ABC	ABC
NT-D-SOUTH	1	S13	ABC	ABC
RW 15R PUMP STA.	2	N24/S24	CBA	NO QUICK DISCONNECT
E-1-NORTH	1	N15	ABC	ABC
E-1-SOUTH	1	S15	ABC	ABC
E-2-NORTH	1	N17	ABC	ABC
E-2-SOUTH	1	S17	ABC	ABC

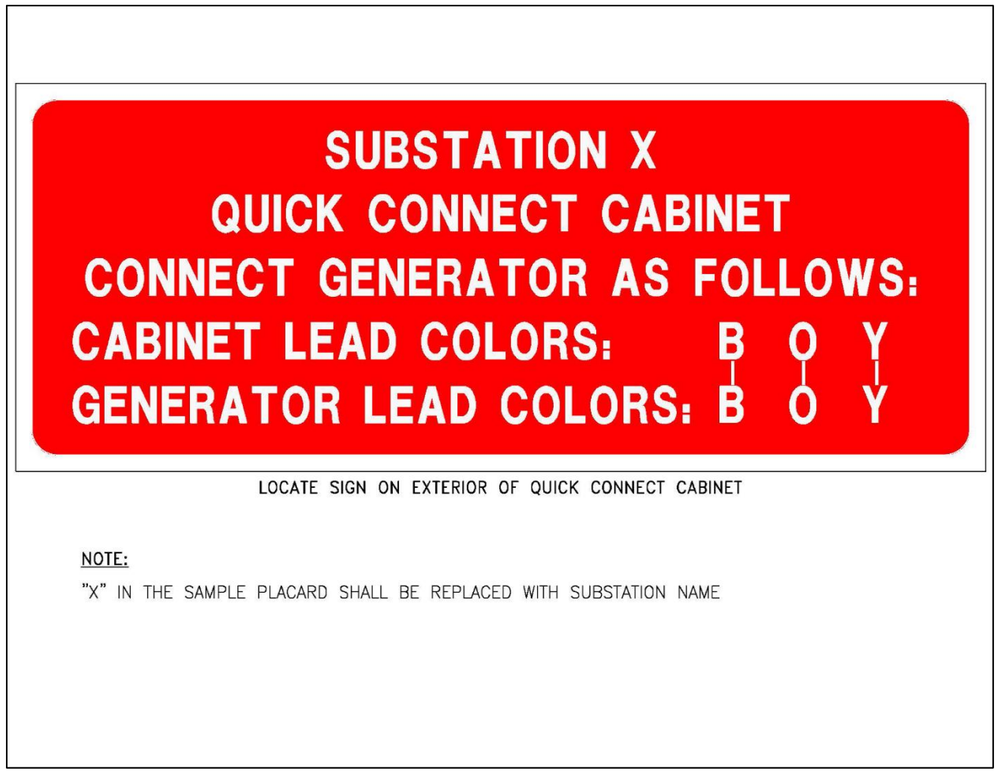
** The quick connect breaker feeder conductors are labeled and color coded with A-phase breaker connection as C-phase and C-phase breaker connection as A-phase*

Switchgear, substation and quick connect switches phase rotation 1

SWITCHGEAR, SUBSTATION AND QUICK CONNECT SWITCHES PHASE ROTATION				
SUBSTATION	**FED FROM SWITCHGEAR/ AS INDICATED**	**MEDIUM VOLTAGE FEEDER NUMBER**	**PHASE ROTATION**	**QUICK CONNECT PHASE ROTATION**
NT-CT-NORTH	1	N12	ABC	ABC
NT-CT-SOUTH	1	S12	ABC	ABC
B-3-NORTH	3	N31	CBA	NO QUICK DISCONNECT
B-3-SOUTH	3	S31	CBA	NO QUICK DISCONNECT
B-4-NORTH	3	N31	CBA	NO QUICK DISCONNECT
B-4-SOUTH	3	S31	CBA	NO QUICK DISCONNECT
C-1-NORTH	1	N14	ABC	ABC

C-1-SOUTH	1	S14	ABC	ABC
AIRFIELD LIGHTING-NORTH	1	N14	ABC	ABC
AIRFIELD LIGHTING-SOUTH	1	S14	ABC	ABC
SWITCHGEAR 1	34.5 KV NORTH SUBSTATION	NT1	ABC	NOT APPLICABLE
SWITCHGEAR 1	34.5 KV SOUTH SUBSTATION	ST1	ABC	NOT APPLICABLE
SWITCHGEAR 2	34.5 KV NORTH SUBSTATION	NT2	ABC	NOT APPLICABLE
SWITCHGEAR 2	34.5 KV SOUTH SUBSTATION	ST2	ABC	NOT APPLICABLE
SWITCHGEAR 3	34.5 KV NORTH SUBSTATION	NT3	CBA	NOT APPLICABLE
SWITCHGEAR 3	34.5 KV SOUTH SUBSTATION	ST3	CBA	NOT APPLICABLE

Switchgear, substation and quick connect switches phase rotation 2



Sample placard for exterior of quick connect cabinet

SUBSTATION X
QUICK CONNECT CABINET
PHASE A AND C HAVE BEEN SWITCHED
TO MATCH THE PHASE ROTATION
OF SUBSTATION X

LOCATE SIGN INSIDE OF QUICK CONNECT CABINET ENCLOSURE

NOTES:

1. "X" IN THE SAMPLE PLACARD SHALL BE REPLACED WITH SUBSTATION NAME.
2. THESE PLACARDS SHALL ONLY BE PLACED ON THE INTERIOR OF QUICK CONNECT CABINETS FOR SUBSTATIONS THAT HAVE A PHASE ROTATION OF C–B–A.

Sample placard for interior of quick connect cabinet

SAMPLE SWITCHGEAR PLACARD

SAMPLE SUBSTATION PLACARD

NOTE:

"X" IN THE SAMPLE PLACARD SHALL BE REPLACED WITH SWITCHGEAR OR SUBSTATION NAME AND RESPECTIVE PHASE ROTATION

Sample placard for switchgear and substations

11.4 Equipment

11.4.1 Panelboards (Power and Lighting)

BWI Marshall and MTN Airport projects shall only specify Square-D 120/208 circuit breaker panelboards. Accordingly, “No substitutions will be accepted” shall be used when specifying Square-D circuit breaker panelboards.

11.4.2 Raceways

11.4.2.1 Raceways – Within Buildings

Indoor wiring methods:

A. Exposed where subject to physical damage: Rigid galvanized steel (RGS) conduit from slab up to 10 feet above finished floor. Electrical metallic tubing (EMT) above 10 feet above finished floor.
B. Exposed where not subject to physical damage: EMT.
C. Concealed: EMT
D. Concealed where installing/fishing new wiring in existing wall or partition: Flexible metal conduit (FMC) or metal clad cable (MC). FMC and MC shall be directly connected to junction box located directly above existing wall or partition.
E. Connection to vibrating equipment (Including transformers and hydraulic, pneumatic, electric solenoid, or motor-driven equipment): Liquid tight flexible metal conduit (LFMC) or FMC. Use maximum of 6 foot length. Connections in wet or damp environments shall use LFMC.
F. Final connection to recessed and semi-recessed lighting fixtures: FMC or MC. Use maximum of 6 foot length from fixture to junction box only.
G. Minimum raceway size: Minimum Electrical raceway shall be ¾ inch and Minimum Communications raceway shall be 1 inch.
H. The use of any type flexible raceway or flexible cable other than those specifically mentioned above will not be accepted unless approved in advance.
I. In approved tenant spaces, MC Cable shall be permitted to be used for branch circuit wiring drops and lighting. Daisy-chained wiring is permitted. All home runs shall be installed in conduit from the panel to the main installation area, sleeved and fireproofed through walls and terminated with a junction box. All conduit, junctions, boxes, and device plates shall be properly labeled.
J. All spare and electrical conduits 1” and larger must have a bushing installed.
K. All fittings (couplings, connectors, etc.) for metal conduit shall be steel, set screw or compression type. No malleable of aluminum fittings will be considered.
L. Fittings for all flexible metallic conduits shall be steel T&B Tite-Bite style or equivalent. No malleable or aluminum fittings will be considered.
M. All Conduit Outlet Bodies (LB’s, T’s, etc.) not subject to physical damage must of Iron construction Crouse-Hinds Form 5, 7, 8, or equivalent. No Aluminum will be considered.
N. All Conduit Outlet Bodies and Device Boxes (LB’s, T’s, FS, FD, etc.) installed where subject to physical damage must be of Malleable Iron construction Crouse-Hinds Form 5 or equivalent. No aluminum will be considered.

Cable tray shall be permitted for low voltage communication wiring/cable only. All fire alarm and security related wiring/cable shall be installed in a raceway system as detailed in indoor wiring methods 1 through 8 shown above. Public Address System wiring if used to convey voice messages for public space evacuation, as required by the Office of the Fire Marshal, shall be considered fire alarm wiring and shall be installed in a raceway system and protected in accordance with NFPA 72.

All raceways and cables shall be properly installed and supported in accordance with the National Electrical Code (NEC) and the Code of Maryland Regulations (COMAR). All new construction materials shall be fire retardant. All new wiring/cable shall be plenum-rated. Cable and raceways shall be permanently labeled at a minimum of every 50 feet, at all junction boxes and at all terminations. Label information shall include equipment type/usage, supply panelboard/equipment and circuit number. Wherever old raceways, wiring and/or cables are to be abandoned, they shall be removed.

Metal Conduit Fittings: All fittings, coupling, etc. for metal conduit shall be steel, set screw or compression type. No malleable fittings will be considered.

Grounding: A ground wire properly sized to the largest phased conductor shall supplement all metallic conduits. Ground wire shall be identified by either green insulation coating or by the use of green tape.

11.4.2.2 Raceways – Underground

Marking tape indicating “Electrical Cable Buried Below” shall be installed. The tape should be 3” wide and positioned 8”-12” deep below top of ground, or 4” wide and positioned at a maximum 3”-6” deep below the bottom of pavements.

11.4.2.3 Raceways – Labeling

A. All labels shall be mechanical; no handwritten labels unless otherwise approved.
B. Cable and raceways shall be permanently labeled at a minimum of every 50 feet, every 25 feet when view is obstructed, and within 5 feet of any wall or floor/ceiling penetration at all junction boxes, terminations, and within 12 inches of electrical panel.
C. The area to be labeled shall be cleaned prior to labeling.
D. Labeling shall include: Type/Usage, Panelboard/Equipment, Circuit Number
E. For labeling requirements of installations consisting of multiple systems occupying the same space, see Chapter 11.4.2.4 Raceways – Voltages.

F. Wall switches, receptacles, occupancy sensors, wall dimmers, device plates and box covers, poke-through fittings, access floor boxes, photocells, time clocks, and other similar outlets shall be identified externally with circuit numbers and source. In areas exposed to the public, identifications should be made on the back side of device covers. Use machine-generated labels or neatly, handwritten permanent marker.
G. All Panelboard circuit directories shall be updated and mechanically generated. No handwritten updates or changes shall be made.

11.4.2.4 Raceways – Voltages

A. Wiring derived from different system voltages of 50V-600V shall be installed in separate conduits. Cables and conductors shall not occupy the same installation space (i.e. cable tray, metal wireways, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting) unless critical to the operation of installed equipment (motor starters, relays, contactors, etc.).

Exception #1: Wiring of different voltages may be permitted to be installed in the same junction box provided that a barrier is installed to separate the voltages.

Exception #2: Wiring of different voltages may be installed in cable tray and metal wireways (troughs) provided that the raceway is labeled "Multiple Voltages Present" at no more than 6' intervals when installed above a suspended ceiling, under a raised floor, or similar location and no more than 15' where installed elsewhere. Labeling shall be sized to ensure visibility from any access point.

B. Class 2 and 3 cables shall be permitted to share the same raceway as 50V-600V wiring when in compliance with NEC 725.55.
C. No wiring other than the primary voltage indicated shall be installed in electrical panels.
D. Wiring color code shall be standardized as follows:

120/208, 120/240	Black, Red, Blue and White
277/480 and higher	Brown, Orange, Yellow, and Gray

11.4.2.5 Raceways – Workmanship

A. Neat and Workmanlike Manner: Executed and/or installed in a skilled manner; e.g., plumb, level, square, in line, undamaged and without marring adjacent work. Conduits shall be run parallel to and/or perpendicular to the building structure.
In addition, Electrical work should be installed in accordance with ANSI/NECA 1-2006: Standard for Good Workmanship in Electrical Construction.
B. Conduits shall be supported within 2 feet of the beginning of a 90° bend or offset.
C. Performance of Work - All electrical work performed shall be under the direction of a master electrician licensed in the State of Maryland or in the county where the work is performed. In addition, all electrical work shall be performed by or under the direct supervision of a Journeyman electrician.

11.4.3 Receptacles

11.4.3.1 Electrical Receptacles in Offices, Other Spaces and Non-Public Corridors

Duplex receptacles shall be rated at 20 amperes, 125 volts, and be polarized, parallel blade type with ground and National Electrical Manufacturer's Association (NEMA) 5-20R configuration. Receptacles equivalent in quality to Pass & Seymour (P&S) Catalog number 5362, heavy duty specification grade, should be specified. The receptacles shall be side wired.

11.4.3.2 Electrical Receptacles in Airport Terminal Public Corridors, Ticketing Areas, and Baggage Claim Areas

Receptacles for these, and other areas subject to heavy use by housekeeping and cleaning machinery, should be equivalent in quality to Pass & Seymour (P&S) Catalog number 5362A, extra heavy duty. Receptacles shall be side wired, and spaced no more than 100 feet apart. These receptacles shall be placed on dedicated circuits, that is, they shall be isolated from receptacles in other types of spaces. In addition, no more than two receptacles shall be placed on the same circuit.

11.4.3.3 Cover Plates for Receptacles

Cover plates for receptacles shall be brushed stainless steel. Receptacles shall be identified by color-coding the face and body according to type of circuit they are connected to, per the following:

A. Regular Power – Brown or Ivory
B. Uninterruptible Power Supply (UPS) – Red
C. Isolated Ground – Orange/or Ivory with Orange Triangle

11.4.4 Charging Stations

11.4.4.1 Charging Stations - General

The purpose of this section is to define parameters for the installation of charging stations for personal electronic devices in common use hold rooms and public spaces within the airport terminal. The intent of the standard is to provide adequate and convenient charging stations for use by the traveling public. Ultimate layouts for charging stations will be on an installation by installation basis but must provide the charging station types and density prescribed.

11.4.4.2 Charging Station – Types

A mixture of duplex receptacles and 5v USB receptacle will be provided. Duplex receptacles for charging stations will meet the requirements of Chapter 11.4.3.1 Electrical Receptacles in Offices, Other Spaces and Non-Public Corridors. Electrical Receptacles in offices, other spaces, and Nonpublic Corridors. Induction type charging stations can be utilized for one third (1/3) of the positions required in Chapter 11.4.4.3 Charging Station – Density.

Stations can be for either standing or seating in a chair or stool. They should discourage sitting on the floor.

A. Standing stations
   Each standing/wall mounted station will include both receptacle types and a shelf or counter surface suitable for writing or supporting a laptop computer. Standing stations shall be located so as not to impede general pedestrian circulation, restrict egress pathways, and be ADA compliant.
B. Sitting Stations
   Sitting stations will include both receptacle types and will be either mounted directly on the furniture or on a wall receptacle at a height that provides convenient access from the associated seating. Furniture mounted units will be in 'InFlex' system by Acronas or an approved equal. Receptacles mounted on seating that is not located against a wall will be powered by recessed floor mounted receptacles. Cords from these receptacles will be managed and will not be readily accessible or pose a tripping hazard. Wall outlets providing power for adjacent seating stations should be positioned below the back of the seating to discourage disconnecting the power cords.

11.4.4.3 Charging Station – Density

A. Hold Rooms
   Charging Stations will be installed with a duplex receptacle for every two hundred (200) square feet and one USB outlet per every five hundred (500) square feet of hold room as defined in the Space Allocation Plan. New installations requiring freestanding seating with floor mounted outlets will require seating plans to be reviewed and approved by the MDOT MAA Office of Engineering & Construction and the Office of the Fire Marshal.
B. Public Areas
   Charging Stations in corridor areas will be installed with two (2) duplex receptacles and four (4) USB receptacles per three hundred (300) linear feet of corridor. Charging Stations in public lounge areas will be installed at the same density as hold rooms.

   Charging Stations in other public areas will be installed on an installation by installation basis.

11.4.4.4 Charging Stations – New Construction in Terminal

All new terminal construction shall be designed to include charging stations. Designs shall meet the charging station density requirements and provide all required infrastructure including adequate power supply. Charging station types and locations shall be approved by the MDOT MAA.

11.5 Emergency and Standby Power Systems

11.5.1 Diesel Powered Engine – Generator Load Bank

Permanent diesel powered engine-generator sets provided to power: emergency (Level 1 per National Fire Protection Association NFPA 110 Emergency and Standby Power Systems): legally required standby (Level 2 per NFPA 110): or optional standby circuits shall be designed to include a permanent load bank to provide electrical loading for testing and exercising the generator-set. Load banks shall be sized to provide at least 50 percent of the engine-generator set nameplate kilowatt rating. Load banks shall, if practical, be mounted next to the engine radiator and be connected to outside air duct for the radiator.

Include in requirements for the Automatic Transfer Switch associated with each engine-generator set an engine exerciser and requirements for setting it for at least 30 minutes exercise loading at least once a week.

Load banks shall be equipped with automatic controls so that the test or exercise load is automatically replaced with the emergency loads in the event of failure of the normal power source during the test.

11.5.2 Permitting and Review Requirements

Provision of fuel-powered generators shall be subject to review and permitting requirements of Volume 4, Section 1.4 Fuel Burning Equipment Permitting Process.

11.6 Metering of Power

Each substation at BWI Marshall and Martin State Airports shall be provided with secondary watt-hour demand meters. All watt-hour demand meters shall have digital readout and pulse output for future remote monitoring.

Watt-hour meters shall be provided by tenants drawing 150 kVa electrical load or more. These meters must be compatible with MDOT MAA Power Monitoring System (Square-D Power Logic System). A one (1) inch conduit with communication cable shall be installed from each meter to the nearest approved MDOT MAA power monitoring closet. All other tenants drawing less than 150 kVa electrical load shall provide a one (1) inch conduit from their electrical panel to the nearest approved MDOT MAA power monitoring closet.

Metering at substations shall be compatible with Square-D Power Logic System.

For double ended substations, a meter shall be provided on each side of the double ended switchgear. A meter shall be provided for each breaker in the substation. Meter shall measure all of the following: voltage; current; power; power factor; frequency; kilowatt-hours; and demand. Unit shall have the following additional features: four (4) optically isolated status inputs; two (2) optically isolated RS485 communications ports; and Modbus and DNP communications protocol. In addition, one meter in any group shall have an internal modem. An auxiliary contact on each main and tie circuit breaker shall be wired to the status inputs on one power meter. The transformer over-temperature alarm on each transformer shall be wired to a status input on the associated power meter. The RS485 ports on all meters shall be daisy-chained together. With prior coordination with MDOT MAA's Office of Information Technology, a category six (6) communication cable with one spare cable shall be extended from the meter with the internal modem to the nearest MDOT MAA communication closet.

11.7 Temporary Electric Power Service

For temporary electric power service during construction, consultants shall include the following requirements in the specifications. These requirements are usually found in:

Technical Specifications
Temporary Facilities and Control
Section 01500

Part 2 – Products
2.2 Equipment

H. Power Distribution System: Service entrance drop cable to the first disconnect may be aluminum, subject to conditions specified in Part 3 of this specification. Circuit wiring conductors, inward from the first disconnect, shall be copper.

I. Power Distribution System Circuits: Circuits for temporary power distribution and lighting, not exceeding 125 volts AC, 20 ampere rating, may be permitted to use nonmetallic sheathed cable, provided that:
   a. The installation meets requirements of the NEC, and
   b. The cables are installed overhead and left exposed for surveillance.

Add the following new language to:

"Part 3 – Execution", under Section 3.2 Temporary Utility Installation

If, as allowed under Part 2 – Products above, aluminum conductors are used for service drops, they shall be inspected monthly for the duration of their use. A written report on the cable condition shall be submitted to the MDOT MAA's authorized inspection firm.

11.7.1 Back-up Generator Requirements for Electrical Work (BWI Marshall Only)

This standard includes requirements for temporary emergency electrical generators for use during construction activities at BWI Marshall Airport. This standard addresses temporary generator requirements resulting from outages on the BWI Marshall distribution system from the utility service entrance locations down to and including the BWI Marshall customer utilization voltage equipment. During the planning and design phase, a study by the Consultant shall be conducted to determine the requirements of backup generator(s). Based on cost and the Consultant's recommendation, the MDOT MAA Project Manager shall determine if a backup generator is necessary.

A. The BWI Marshall medium voltage distribution system consists of the following major components:

1. Two utility service entrance substations designated North Substation and South Substation. These substations are located approximately on opposite sides of the Airport and are each supplied from a separate utility company feeder.
2. Multiple switchgear locations designated Switchgear #1, Switchgear #2 and Switchgear #3 (future, anticipated on-line May, 2004). Each switchgear is supplied by two feeders, one feeder from the North Substation and the other from the South Substation.
3. Multiple customer utilization voltage equipment (13,800 volt primary voltage, 480 volt or 4,160 volt secondary voltage) consisting of a double-ended unit substation, single ended unit substation or separate entrance transformer. All customer utilization voltage equipment is supplied from Switchgear #1, Switchgear #2 or Switchgear #3. Most of the customer utilization voltage equipment consists of double ended unit substations supplied by both a north and south switchgear feeder. The remaining customer utilization voltage equipment locations are supplied by a single switchgear feeder.

B. The consultant shall perform the following activities during the design phase of the project:
1. Contact the Maryland Aviation Administration (MDOT MAA) to obtain a current BWI Marshall medium voltage distribution system diagram that shows all electrical equipment from the North and South Substations down to and including all customer utilization voltage equipment at the secondary voltage level.
2. Develop and submit for approval a project specific electrical equipment outage and equipment switching schedule including, but not limited to, the location, number, duration and time of day for all anticipated electrical outages and associated equipment switching activities for all BWI Marshall distribution system electrical equipment from the North and South Substations down to and including all customer utilization voltage equipment at the secondary voltage level. An outage is defined as the electrical de-energization of any electrical equipment within the scope of this standard for any length of time. All outages shall be included regardless of duration. Whenever equipment is supplied by both a north and south feeder, the de-energization of one of the two feeders shall be considered an equipment outage. All switching activities shall be included regardless of outage impact.
3. Develop and submit for review a project specific temporary emergency electrical generator plan including proposed temporary emergency generator set size(s) as required for the electrical outages and/or switching operations. MDOT MAA shall be contacted for specific generator requirements.
4. Include all temporary generator requirements in the bid documents for the project.
5. All temporary emergency electrical generator requirements shall be coordinated with and approved by MDOT MAA Operations and MDOT MAA Office of Facilities Maintenance on a case-by-case basis.

C. Electrical outages shall be scheduled in accordance with, but not limited to, the following requirements:
1. All work that may potentially cause any electrical outage shall be performed during non-peak hours (usually from 12:00 midnight through 5:00 AM) unless otherwise approved by MDOT MAA. The consultant shall obtain the Engineer's approval for electrical outage periods.
2. Equipment outages shall be allowed on only one major electrical equipment item at any one time unless otherwise approved by MDOT MAA.
3. All outage durations shall be kept to a minimum.
4. Any work requiring a sustained electrical outage shall be performed continuously around the clock until work is completed unless otherwise approved by MDOT MAA.
5. Whenever equipment is supplied by both a north and south feeder, at least one feeder shall remain connected and active unless otherwise approved by MDOT MAA. The de-energization of one of the two supply feeders (North or South) shall be considered an outage for the purpose of this standard.

Temporary emergency electrical generators shall be diesel powered, low noise, self-contained on a dedicated containerized mobile trailer with integral fuel tank and fuel spillage containment system.

11.8 Airfield Electrical

On airfield work which requires temporary wiring of lights, signs, etc. – the temporary wiring shall be buried, placed in conduit and/or marked to prevent damage to cable or exposure to hazard by operations and maintenance personnel. All areas disturbed by temporary wiring shall be returned to its original condition following removal of the temporary wiring.

11.9 Arc Flash

11.9.1 Coordination Study and Arc Flash Study for Electrical Distribution Equipment

All new electrical distribution equipment installed at the substations and downstream to the distribution panels with overcurrent protection devices shall have overcurrent protection settings determined through a coordination study.

New electrical distribution equipment, such as switchgears, switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers shall have arc-flash incident energy information as determined through an Arc Flash Study. Calculations of incident energy shall be in accordance with IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations. Per NFPA 70E Standard for Electrical Safety in the Workplace, there are two methods for arc-flash studies, namely Arc Flash PPE Categories Method and Incident Energy Analysis Method. Arc Flash PPE Categories Method is allowed for new branch circuit panelboards if there are no new distribution panels involved. Otherwise, Incident Energy Analysis Method shall be used.

11.9.1.1 Construction Technical Specifications

A. **For MDOT MAA Capital projects**, consultants must conduct Short Circuit Study, Coordination Study, and Arc Flash Study and provide appropriate PPE label information based on the requirement of the project and these standards.

1. Consultants must prepare appropriate technical specifications to require the contractor to fabricate and affix appropriate PPE labels based on the requirement of the project and these standards.

B. **For Permit projects**, consultants must prepare appropriate technical specifications to require the contractor to conduct Short Circuit Study, Coordination Study, and Arc Flash Study, and the contractor shall fabricate and install appropriate PPE labels based on the requirement of the project and these standards.

11.9.2 Software Requirements for Updating the Master SKM Model for Arc Flash

All of the Coordination and Arc Flash studies with the Incident Energy Analysis Method shall be implemented by analyzing with the latest version of SKM Power Tools software. The MDOT MAA has Master SKM models built in SKM version 8.0.3.5 with capacity of 2000 buses for the existing electrical distribution system at BWI Marshall Airport Terminal, Martin State Airport, and the BWI Marshall Airport outbuildings. These models have electrical information consisting of BGE Utility power sources, existing feeders, and electrical distribution equipment.

Conduct and implement the Coordination and Arc Flash studies for the new electrical distribution equipment with the latest version of SKM Power Tools software for Windows.

11.9.3 Updating the Master SKM Model for Arc Flash

11.9.3.1 MDOT MAA SKM Model Discrepancies

The original master models that MDOT MAA maintains were not field verified by tracing circuits. During construction, if a discrepancy is found between the master model and existing field conditions, the MDOT MAA Task Manager must be notified in writing and provided photos for review.

Consultants shall note this requirement in the construction documents.

11.9.3.2 MDOT MAA SKM Model Coverage Areas

The consultant performing the Coordination and Arc Flash study for new electrical equipment shall obtain the corresponding MDOT MAA Master SKM Model data file for the appropriate coverage area from the Document Manager of MDOT MAA GIS & Engineering Technology Section (GETS). Models of coverage areas are listed below:

1. Switchgear 1 – Pier D, DX, DY, Commuter, Partial Pier C, CD Connector, DE Connector, Airfield Lighting Vault
2. Switchgear 2 – Pier E, Central Utility Plant (CUP), Daily Garage
3. Switchgear 3 – Pier A, B, Partial Pier C, AB Connector, BC Connector, Hourly Garage
4. BWI Outbuildings
   a) 107 – Airline Cargo Building (Tenant Storage)
   b) 111 – Signature Flight Support Cargo (Tenant Maintenance)
   c) 112 – American/DHL Freight (Tenant Administration)
   d) 113 – MAA Storage
   e) 115 – MAA Snow Team Dorm/Warehouse
   f) 116 – Grounds Maintenance
   g) 135 – Salt Dome
   h) 136 – FMX/Signature Storage Building
   i) 155 – Kauffman Building
   j) 166 – Daily Garage
   k) 172 – MAC (Materials Acquisition Center)
   l) 172A – 800 MHz Antenna
5. Martin State Airport

Any new building requiring Coordination Study and Arc Flash Study for Electrical Distribution Equipment shall be added to the SKM Master Model by the consultant.

11.9.3.3 Obtaining a Master SKM Model

The party responsible for updating the SKM model shall submit a Digital Data Request noting which model(s) are being requested based on the coverage areas listed in Volume 2, Section 11.9.3.2 MDOT MAA SKM Model Coverage Areas. MDOT MAA GETS will release a copy of the requested SKM Master Model upon Task Manager's approval of the Digital Data Request form (see PEGS V1, Chapter 1.2.5.2, Spatial Data Requests).

Based on the complexity of construction, some projects may have longer durations than others, and the same copy of a model may have been distributed to multiple projects. Consultants are responsible for obtaining the most up-to-date model for each project requiring a coordination/arc flash study.

11.9.3.4 Submitting SKM Model for Incorporation into Master Model

A. Arc Flash Study Performed by Project Construction Contractor
   After the study is complete, the contractor will add the electrical information from the new electrical equipment and feeders to the obtained copy of Master SKM model with equipment nomenclature matching the master model. The following items shall be submitted to MDOT MAA GETS as part of the as-built documents:

   1. Study SKM Model – updated by the contractor.
   2. Coordination Study and Arc Flash Study reports – provided by contractor.
   3. Construction as-built drawings.

Upon receipt of the items listed above, MDOT MAA will review the updated SKM model for acceptance. If the updated model is not acceptable, the MDOT MAA will return it to the contractor for corrections. Upon acceptance of the model, the updates will be incorporated into a new Master SKM Model.

B. Arc Flash Study Performed by Project Designer
   After the electrical portion of a construction is complete enough to generate the needed model data, the contractor changes are provided to MDOT MAA GETS who will forward to the designer of record. The designer will add the electrical information from the new electrical equipment and feeders to the obtained copy of Master SKM Model with equipment nomenclature matching the Master SKM Model. When updates are completed, designer will submit the following items back to MDOT MAA GETS:

   1. Study SKM Model – updated by the designer
   2. Coordination and Arc Flash Study – provided by the designer

Upon receipt of the items listed above, MDOT MAA will review the updated SKM model for acceptance. If the updated model is not acceptable, the MDOT MAA will return it to the designer for corrections. Upon acceptance of the model, the updates will be incorporated into a new Master SKM Model.

11.9.4 Installation of Arc Flash Labels

The contractor shall be responsible for fabrication and installation of the Arc Flash labels per NEC Article 110.16, OSHA and NFPA 70E Article 130.5(D) for all electrical equipment that was included in the Arc Flash Study submittal.

Proposed labels shall be provided by the contractor to MDOT MAA for review and approval. Upon approval, the labels are installed and incorporated into the as-builts by the contractor.

12.1 Interior Lighting

The Maryland Aviation Administration is committed to using lighting products that maximize energy efficiency and promote light quality. New lighting designs will receive review from the Office of Engineering & Construction and the Office of Facilities Maintenance.

12.1.1 Light Emitting Diodes (LED) Light Fixtures

LED lighting shall be considered for all new building/areas and existing building/area upgrades where practical. The lighting design shall consider selecting fixtures that the manufacturers will support for a minimum of 20 years.

Table 12.1.1 provides a list of acceptable LED lighting fixtures for BWI Marshall & MTN Airports. As the technology advances, the manufacturer product numbers may change, but the proposed fixture shall meet or exceed the specifications in Table 12.1.1.

As of this revision, LED fixtures must meet one of two certifications. The certifications include fixtures that are Design Lights Consortium qualified products and/or labeled as Energy Star.

Table 12.1.1 Acceptable LED Lighting Fixtures for BWI Marshall and MTN Airports

2x2 Lensed												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A1	Metalux 22GR LED	2000 2400 2800 3200 3600 4000 4300	2084 2432 2804 3212 3598 4016 4310	21 24 29 34 39 46 50	99.2 101.3 96.7 94.5 92.3 87.3 86.2	85	3000K 3500K 4000K 5000K	L70 - 60,000	NOTE 1, 2, 3	Universal	5-years	DLC Qualified
A2	Lithonia Lighting 2TLED	2000 3300 4000	2092 3339 3921	18 29 35	116.2 115.1 112	82	3000K 3500K 4000K 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 8, 9, 10	Universal	5-years	DLC Qualified
A3	Williams LPT-22	3000 4300	3000 4332	33 50	90.9 86.6	82	3000K 3500K 4000K	L85 - 50,000	NOTE 19, 21, 22	Universal 120V 277V	5-years	DLC Qualified

2x4 Lensed												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A4	Metalux 24GR LED	3000 3400 3800 4200	3009 3416 3766 4249	28 32 36 38	107.5 106.8 104.6 111.8	85	3000K 3500K **4000K** 5000K	L70 - 60,000	NOTE 1 2, 3	Universal	5-years	DLC Qualified

		4800 5600 6400 7200 8500 9000	4841 5553 6398 7174 8513 9020	44 52 61 64 79 86	110 106.8 104.9 112.1 107.8 104.9							
A5	Lithonia Lighting 2TLED	3000 4000 4800 6000 7200	3097 3946 4866 5589 7729	25 32 40 47 67	123.9 123.3 121.7 118.9 115.4	85	3000K 3500K **4000K** 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 8, 9, 10	Universal	5-years	DLC Qualified
A6	Williams LPT-24	4200 6700 9000	4296 6876 8731	39 65 87	110.2 105.8 100.4	83	3000K 3500K **4000K**	L85 - 50,000	NOTE 19, 21, **22**	Universal 120V 277V	5-years	DLC Qualified

1x4 Lensed												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A7	Metalux 14GR LED	2000 2400 2800 3200 3600 4000 4300	2084 2432 2804 3212 3598 4016 4310	21 24 29 34 39 46 51	99.2 101.3 96.7 94.5 92.3 87.3 84.5	85	3000K 3500K **4000K** 5000K	L70 - 60,000	NOTE 1, 2, 3	Universal	5-years	DLC Qualified
A8	Columbia Lighting LLT14	1950 2400 3100 3800	1950 2400 3100 3800	22 27 36 45	88.6 88.9 86.1 84.4	82	3000K 3500K **4000K**	L80 - 50,000	NOTE 10, 14, **15**	Universal	5-years	DLC Qualified
A9	Lithonia Lighting TL4	2000 3000 4000 4800 6000	2276 3234 4107 4932 5582	21 30 39 47 55	108.4 107.8 105.3 104.9 101.5	82	3000K 3500K **4000K** 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 8, 9	Universal	5-years	DLC Qualified

2x2 Direct/Indirect												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
	Metalux 22CZ	2000 2400 2900 3400 3900 4400	2166 2547 3077 3603 4118 4630	19 23 29 35 42 50	114 110.7 106.1 102.9 98 92.6	85	3000K 3500K **4000K** 5000K	L70 - 117,000	NOTE 1, 2, 3	Universal	5-years	DLC Qualified
A11	Lithonia Lighting 2VTL2	2000 3300 4000	2267 3717 4334	20 35 42	113.4 106.2 103.2	82	3000K 3500K 4000K 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 8, 9, 10	Universal	5-years	DLC Qualified
A12	Williams LT-22	2200 3400	2115 3559	21 36	100.7 98.9	82	3000K 3500K **4000K**	L85 - 50,000	NOTE 19, 21, 22	Universal 120V 277V	5-years	DLC Qualified

2x4 Direct/Indirect												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A13	Metalux 24CZ	3000 3500 4000 4500 5000 5500 6000 6500 7000 7500	3098 3641 4152 4694 5199 5724 6344 6888 7460 7905	25 30 34 40 45 51 57 62 69 75	123.9 121.4 122.1 117.4 115.5 112.2 111.3 111.1 108.1 105.4	85	3000K 3500K **4000K** 5000K	L70 - 117,000	NOTE 1, 2, 3	Universal	5-years	DLC Qualified
A14	Lithonia Lighting 2VTL4	3000 4000 4800 6000 7200	3096 3938 4858 5583 7705	25 32 40 47 68	123.8 123.1 121.5 118.8 113.3	82	3000K 3500K **4000K** 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 8, 9, 10	Universal	5-years	DLC Qualified
A15	Williams LT-24	3000 4300 7300	3066 4548 7462	29 40 71	105.7 113.7 105.1	82	3000K 3500K **4000K**	L85 - 50,000	NOTE 19, 21, 22	Universal 120V 277V	5-years	DLC Qualified

1x4 Direct/ Indirect												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A16	Metalux 14AC	2000 2500 2900 3500 3900 4400	2141 2460 2889 3638 4066 4709	20 25 28 37 47 53	107.1 98.4 103.2 98.3 86.5 88.8	82	3000K 3500K **4000K**	L70 - 117,000	NOTE 1, 2, 3, 23	Universal	5-years	DLC Qualified
A17	Lithonia Lighting VTL4	2000 3000 4000 4800 6000	2051 2899 3710 4757 5432	20 29 41 47 55	102.6 100 90.5 101.2 98.8	82	3000K 3500K **4000K** 5000K	L90 - 60,000	NOTE 4, 5, 6, 7, 10	Universal	5-years	DLC Qualified
A18	Williams LT-14	3000 4700	3026 5136	29 49	104.3 104.8	82	3000K 3500K **4000K**	L85 - 50,000	NOTE 19, 21, 22	Universal 120V 277V	5-years	DLC Qualified

4’ Lensed Strip Fixture												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A19	Lithonia Lighting WL4	2000 3000 4000	2255 3251 4325	19 29 40	118.7 112.1 108.1	82	3000K 3500K **4000K** 5000K	L90 - 60,000	NOTE 4, 5, 10	Universal	5-years	DLC Qualified
A20	Metalux 4SLWP	3900 4000	3910 4330	40 47	97.8 92.1	80	**4000K**	L70 - 50,000	NOTE 14	Universal	5-years	DLC Qualified
A21	Columbia Lighting LCL4	2500 5000 6100 10100	2500 4992 6050 10080	25 48 55 96	100 104 110 105	80	3000K 3500K **4000K** 5000K	L80 - 50,000	NOTE 4, 5, 10	Universal	5-years	DLC Qualified

4’ Enclosed & Gasketed Strip Fixture

Fixture Type	Manufacturer/Product Number	Lumen Output	Delivered Lumens*	Wattage	Fixture Efficacy (LPW)	CRI	CCT*	Rated Life (hours)	Driver	Voltage	Warranty	Certifications
A22	Columbia Lighting LXEM4	LW ML HL VL XL	4450 5350 6400 8150 10750	36 47 52 68 102	123.6 113.8 123.1 119.9 105.4	80	3000K 3500K **4000K** 5000K	L80 - 60,000	NOTE 10, 14, 15	Universal	5-years	DLC Qualified
A23	Williams 4VT2	5000 7900	5000 7900	47 82	106.4 96.3	82	3000K 3500K **4000K** 5000K	L85 - 50,000	NOTE 11, 12, 13, 18, 19	Universal 120V 277V	5-years	DLC Qualified
A24	Lithonia Lighting VAP	4000 6000 12000	4428 6150 10236	44 64 109	100.6 96.1 93.9	90	3000K 3500K **4000K** 5000K	L85 - 60,000	NOTE 15	Universal 120V 277V 480V	5-years	DLC Qualified

2x4 High Bay Linear Fixture												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
A25	Lithonia Lighting IBH	9000 12000 15000 18000 24000 30000	9366 13248 15370 20112 24737 30730	97 129 152 199 253 305	96.6 102.7 101.1 101.1 97.8 100.8	80	**4000K** 5000K	L70 - 97,000	NOTE 14, 15	Universal 120V 277V	5-years	DLC Qualified
A26	Williams GL-4	15000 20000 26000 30000	15470 20450 27050 30430	149 174 238 272	103.8 117.5 113.7 111.9	82	3500K **4000K** 5000K	L85 - 50,000	NOTE 14, 15	Universal 120V 277V	5-years	DLC Qualified
A27	Metalux HB	12000 18000 24000 30000 36000	12505 19358 24002 29302 35944	104 152 203 228 307	120.2 127.4 118.2 128.5 117.1	80	4000K **5000K**	L70 - 142,000	NOTE 14, 15, 23	Universal 120V 277V	5-years	DLC Qualified

6” Open Downlight												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
B1	Gotham 6" Evo	1000	1059	12	88.3	85	2700K	L70 - 60,000	NOTE 4,	Universal	5-years	Energy Star

		1500 2000 2500 3000 3500 4000 4500	1572 2058 2612 3077 3591 4046 4555	19 24 30 37 43 49 47	82.7 85.8 87.1 83.2 83.5 82.6 96.9		3000K **3500K** 4000K		5, 6, 7, 8,9,12, 13	120V 277V		
B2	Portfolio LD6A 6LMH	1000 1500 2000 3000	1013 1421 2202 2644	15 23 32 44	67.5 61.8 68.8 60.1	80	2700K 3000K **3500K** 4000K	L70 - 50,000	NOTE 10, 15	Universal 120V 277V	5-years	Energy Star
B3	Lithonia Lighting LDN6 LO6	600 1000 1500 2000	670 1090 1640 2140	12 18 26 35	55.8 60.6 63.1 61.1	80	2700K 3000K **3500K** 4000K	L70 - 50,000	NOTE 10, 15	120V 277V	5-years	Energy Star

6” Open Wallwash												
Fixture Type	**Manufacturer/Product Number**	**Lumen Output**	**Delivered Lumens***	**Wattage**	**Fixture Efficacy (LPW)**	**CRI**	**CCT***	**Rated Life (hours)**	**Driver**	**Voltage**	**Warranty**	**Certifications**
B7	Gotham 6" Evo WW	1000 1500 2000 2500 3000 3500 4000 4500	1029 1506 1982 2459 2993 3412 3888 4365	12 19 24 30 37 43 49 47	85.8 79.3 82.6 82 80.9 79.3 79.3 92.9	85	2700K 3000K **3500K** 4000K	L70 - 60,000	NOTE 4, 5, 6, 7, 8,9,12, 13	Universal 120V 277V	5-years	Energy Star
B8	Portfolio LD6A 6LM111H	1000 1500 2000 3000	1768 1462 2356 2780	15 23 32 44	117.9 63.6 73.6 63.2	80	2700K 3000K **3500K** 4000K	L70 - 50,000	NOTE 10, 15	Universal 120V 277V 277V	5-years	Energy Star
B9	Lithonia Lighting LDN6 LW6	600 1000 1500 2000	670 1090 1640 2140	12 18 26 35	55.8 60.6 63.1 61.1	80	2700K 3000K **3500K** 4000K	L70 - 50,000	NOTE 10, 15	120V 277V	5-years	Energy Star

** Delivered lumens value is based on CCT option shown bold in column*

1. Cooper Controls 0-10V Dimming driver
2. Cooper Controls Step-Dim driver
3. Cooper Controls Fifth light DALI driver (10-100% Dimming)

4. eldoLED dims to 1% (0-10 volt dimming)
5. eldoLED SOLOdrive 0-10V dimming driver. Minimum dimming level <1%.
6. eldoLED SOLOdrive DALI dimming driver. Minimum dimming level <1%.
7. eldoLED POWERdrive DMX with RDM (remote device management). Minimum dimming level <1%. Includes termination resistor.
8. Dims to 1%, XPoint wireless enabled
9. Dims to dark, XPoint wireless enabled
10. Step-level dimming
11. Philips Xitanium 0-10V dimming driver. Minimum dimming level 10%
12. Lutron® Hi-Lume® 2-wire forward-phase dimming driver. Minimum dimming level 1%
13. Lutron® Hi-Lume® 3-wire or EcoSystem® dimming driver. Minimum dimming level 1%
14. Fixed Output
15. 0-10V dimming
16. Osram Sylvania LED dimming driver prewired for 0-10V controls
17. Philips Xitanium LED driver prewired for non-dimming applications
18. Philips Xitanium DALI dimming driver
19. Philips Xitanium 40% step dimming driver
20. Philips Xitanium Mark X line voltage dimming driver
21. ULT driver prewired for non-dimming driver
22. ULT driver prewired for 0-10V dimming applications
23. Cooper Controls Fifth light DALI driver (1-100% Dimming)

12.1.2 Fluorescent and High Intensity Discharge Light Fixtures

All projects that require fluorescent and high intensity discharge (HID) fixtures shall be designed to specify light fixtures that require lamps that the Office of Facilities Maintenance currently keeps in stock. The following Table 12.1.2 has been prepared as a list of acceptable general purpose lamps for the BWI Marshall and MTN Terminals use. Approval for any lamps not listed in this table must be obtained from the office of Facilities Maintenance.

Neon and cold cathode lighting are not acceptable for general purpose lighting. The use of neon or cold cathode in combination with LED for signage and retail use will be reviewed on a case by case basis by the Office of Facilities Maintenance, Office of Commercial Management, and the Office of Engineering & Construction.

Maximum fluorescent tube length shall be 4 feet; No U shaped fluorescent tubes shall be used.

The use of dimming systems shall be limited. When applicable, the design shall be kept small in size – that is: simple, manually controlled, and not connected to the building-wide control system. Dimming systems should avoid complicated operating scenarios that would be difficult to maintain. Dimming system plans and details shall be submitted to the Office of Facilities Maintenance for review. Specifications for comprehensive field commissioning and Office of Facilities Maintenance training shall be included for any dimming control systems.

Table 12.1.2 Acceptable General Purpose Lamps for BWI Marshall and MTN Airports

Fluorescent Tube											
Ref. #	**Type of Lamp**	**Lamp ID Code**	**Manufacturer**	**Product Code**	**Approved Equal**	**Life, hours@ 12 hours/ start**	**Base Type**	**Lamp Watts**	**CRI**	**Color Temp-erature**	**Location**
1	2 Foot 17 Watts T8	F17T8/XL/SPX41/ ECO	General Electric	15484	Osram Sylvania, Philips	24,000	G13 Medium bi-pin	17W	80+	4100K	Terminal and other Buildings
2	3 Foot 32 Watts T8	F25T8/XL/SPX41/ ECO	General Electric	15491	Osram Sylvania, Philips	24,000	G13 Medium bi-pin	25W	80+	4100K	Terminal and other Buildings
3	4 Foot 28 Watts T8	F28T8/XL/SPX41/ ECO	General Electric	72866	Osram Sylvania, Philips	30,000	G13 Medium bi-pin	28W	80+	4100K	Terminal and other Buildings

4	4 Foot 32 Watts T8	F32T8/XL/SPX50/ ECO	General Electric	16313	Osram Sylvania, Philips	36,000	G13 Medium bi-pin	32W	80+	5000K	Daily and Hourly Garage
5	4 Foot 49 Watts T5 HO	F54T5/841/HO/EA/ ALTO49W ECO	Philips	22052-5	General Electric	40,000	Miniature bi-pin	49W	85+	4100K	High Bay Lighting and Terminal and other building

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Self-Ballasted Fluorescent Spiral											
Ref. #	**Type of Lamp**	**Lamp ID Code**	**Manufacturer**	**Product Code**	**Approved Equal**	**Life, hours@ 12 hours/ start**	**Base Type**	**Lamp Watts**	**CRI**	**Color Temp-erature**	**Location**
6	15 Watt T3	FLE15HT3/2/841	General Electric	25183	TCP, Maxlite	8,000	Medium E26	15W	80+	4100k	Terminal and other Buildings
7	20 Watt T3	FLE20HT3/2/841	General Electric	25186	TCP, Maxlite	8,000	Medium E26	20W	80+	4100k	Terminal and other Buildings

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Compact Fluorescent Plug-in											
Ref. #	**Type of Lamp**	**Lamp ID Code**	**Manufacturer**	**Product Code**	**Approved Equal**	**Life, hours@ 12 hours/ start**	**Base Type**	**Lamp Watts**	**CRI**	**Color Temp-erature**	**Location**
8	27 Watt PL	PLT32W/ 841/XEW/ 4Pin /ALTO27W	Philips	26872-2	Osram Sylvania,	20,000	4 pin GX24Q4	27W	80+	4100K	Down lights in Terminal & Piers
9	42 Watt PL	F42BX/SPX41/A/4P	General Electric	97636	Sylvania, Philips	17,000	4 pin GX24Q4	42w	82	4100k	Lower level Arrival loop

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Pulse Start Metal Halide											
Ref. #	**Type of Lamp**	**Lamp ID Code**	**Manufacturer**	**Product Code**	**Approved Equal**	**Life, hours@ 12 hours/ start**	**Base Type**	**Lamp Watts**	**CRI**	**Color Temp-erature**	**Location**
10	70 Watt, ED17, Universal Operating Position	MH 70W/U/PS	Venture	78138	Osram Sylvania, Philips, General Electric	30,000	Medium E26	70W	65+	4000K	Daily Garage
11	150 Watt, ED17, Universal Operating Position	MH 150W/U/PS	Venture	99584	Osram Sylvania, Philips, General Electric	15,000	Medium E26	150W	68+	4000K	Lower level Arrival loop Road crossing
12	320 Watt, ED28, Vertical Operating Position	MS 320W/V/PS/740	Venture	59194		20,000	Mogul E39	320W	68+	4000K	Hourly Garage pole Fixtures

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Ceramic Metal Halide											
Ref. #	**Type of Lamp**	**Lamp ID Code**	**Manufacturer**	**Product Code**	**Approved Equal**	**Life, hours@ 12 hours/ start**	**Base Type**	**Lamp Watts**	**CRI**	**Color Temp-erature**	**Location**

13	39 Watt Par 30, 25 Degree Beam, Screw Base	CMH39/PAR30/FL25	General Electric	42067	Osram Sylvania, Philips	10,000	Medium E26	39 W	81	3000K	Pier A Lower Baggage Claim Wood Wall
14	70 Watt, ED 17, Open Rated, Universal Operating Position	CMH70/C/U/830/MED/O	General Electric	31070	Osram Sylvania, Philips	16,000	Medium E26	70W	80	3000K	Open Lamp Applications
15	70 Watt Par 30, 40 Degree Beam, Screw Base	CMH70/PAR30L/830/FL	General Electric	22159	Osram Sylvania, Philips	10,000	Medium E26	70W	82	3000K	Red Column Accent Lights
16	70 Watt, Screw Base	CMH70/U/830/MED	General Electric	22119	Osram Sylvania, Philips	16,000	Medium E26	70W	80	3000K	Main Terminal Concourse
17	70 Watt, T6, Bi-Pin	CMH70/TU/830/G12	General Electric	20016	Osram Sylvania, Philips	15,000	G12 Bi-Pin	70W	83	3000K	Main Terminal Concourse
18	100 Watt Par 38, 25 Degree Beam, Screw Base	CMH100/PAR38/FL25	General Electric	45681	Osram Sylvania, Philips	15,000	Medium E26	100W	81	3000K	Main Terminal Concourse and Point Light Effect
19	150 Watt, T6, Bi-Pin	CMH150/TU/830/G12	General Electric	20017	Osram Sylvania, Philips	15,000	G12 Bi-Pin	150W	82	3000K	Pier A/B Exterior Canopy
20	150 Watt, ED 17,Open Rated, Universal Operating Position	CMH150/C/U/942/ MED/O	General Electric	31067	Osram Sylvania, Philips	15,000	Medium E26	150W	90	4200K	Main Terminal Concourse

12.1.3 Lamps

Fixtures used at BWI Marshall and MTN airports shall be specified to use the types of LED fixtures in the Table 12.1.1 and fluorescent and metal halide lamps in Table 12.1.2.

Approved equal lamps, or proposed substitutes shall have equal or better characteristics in the “Life”, and Color Rendering Index (“CRI”), columns, compared to the specified fixtures and/or lamps, and shall have similar color temperatures, lumen output, and efficiency.

12.1.4 Lamp Ballasts and Drivers

Metal halide ballasts shall be electronic, for Pulse-start or Ceramic Metal Halide lamps.

Linear Tubular fluorescent ballasts shall be high efficiency and electronic, compatible with lamps listed below.

Compact fluorescent ballasts shall be electronic rapid-start, with end of lamp life cut-off circuiting and keyed, quick connect nylon plugs for secondary and primary wiring.

LED drivers shall be as noted in Table 12.1.1. Approval for any lamps not listed in this table must be obtained from the Office of Facilities Maintenance.

Remote ballasts and drivers shall not be permitted. The use remote ballasts or drivers for decorative or retail use will be reviewed on a case by case basis by the Office of Facilities Maintenance, Office of Commercial Management, and the Office of Engineering & Construction.

12.2 Exterior Lighting

12.2.1 Apron Lighting

All lightpoles and fixtures shall be specified based on aesthetics, design parameters, and replacement/maintenance considerations. Consultants shall match existing products when modifying and/or expanding existing facilities. A list of lamps that are kept in stock is available for inspection by consultants in the Office of Architecture. In addition, all designs shall be coordinated with the MDOT MAA's Resident Architect in the Office of Architecture for aesthetics.

Consultants shall provide MDOT MAA's Resident Architect and the Office of Facilities Maintenance with cut-sheets on every light fixture and lamp proposed for MDOT MAA projects prior to final design for their review and approval.

Exterior lighting on the airfield ramp shall meet the performance required by latest FAA AC 150/5300-13A Appendix 5. The FAA AC 150/5300-13A, Appendix 5 states, "The area light beams must be directed downward and away from runway approaches and control towers. Shielding of the lights may be needed to minimize unwanted glare. Area light spread should cover all aircraft service areas uniformly. Refer to Illuminating Society of North America (IES), Recommended Practice for Airport Service Area Lighting, for additional guidance on apron lighting." The use of Light Emitting Diode (LED) type lamps in fixtures shall be specified for new and where practical for upgrade/replacement apron lighting as long as the criteria specified in the IES recommended practice for airport service area lighting are met.

Lamination levels must be uniform and consistent. The consultant shall provide the contractor with limitation chart/curves for each lightpole proposed or to be modified as part of the bid documents.

Each pole shall bear an identification tag (engraved on aluminum plate) which shall list the manufacturer, model number, date of manufacture, and date of installation.

Heights of the poles should match existing for all reconstruction and retrofit projects. Consultants shall coordinate each lightpole installation(s) with and submit an Airport Zoning Application to MDOT MAA's Office of Planning and comply with all State and Federal regulations. The consultant is fully responsible to check Part 77 for all lightpoles proposed or to be modifies. Lightpole height (including and lightning rods) shall not penetrate any navigational surfaces, i.e. FAR Part 77. If penetration is unavoidable, Federal Aviation Administration approval must be acquired. Refer to Volume 5, Section 2.2 FAA Requirements for Proposed Development.

The consultant must also check for any glare or line of sight issues when designing and locating lightpoles.

The consultant shall design the lightpoles to accommodate installation of banners on lightpoles, if requested by MDOT MAA. The consultant must inquire from the MDOT MAA Project Manager for any banner provisions and/or if any banners will be attached to the lightpoles.

Lightening protection and design must meet the current IES standards.

Color shall be black and smooth, unless otherwise approved by MDOT MAA's Resident Architect in writing. Arms, luminaries, and all other attachments shall be provided in matching color.

12.2.1.1 Apron Lightpole Lowering Devices

All apron lightpoles installed at a height above 35 feet shall be designed and specified to include lowering devices for luminaries and their mounting assemblies. The height shall be measured from finished grade to top of lightpole mast, excluding lightning rod.

An external portable winch unit shall be used to lower the luminaire assembly down to the pole base for servicing.

A. Lowering Device Specification Requirements:
   1. The lowering device shall be designed per the current American Association of State Highway and Transportation Officials (AASHTO) standards.
   2. Comply with AASHTO LTS (Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals). Verify current edition used by MDOT MAA.
   3. Lowering device light fixtures and lightpoles shall be manufactured and tested as one system and be provided and warranted by one manufacturer. Hoist cables for lowering device shall be stainless steel aircraft type, internal to lightpole, and factory installed.
   4. A power outlet for testing of luminaries in the lowered position shall be provided.

B. Portable Winch Unit and Transformer Requirements to be specified:
   1. For projects consisting of three (3) lightpoles or more, the contractor shall provide two (2) portable winch units. MORI forms must be prepared and submitted by the consultant.
   2. For projects consisting of two (2) lightpoles or less, lightpoles shall be by the same pole manufacturer currently used at BWI Marshall and/or MTN Airports. This will eliminate the need for providing a new portable winch unit. Consultant shall coordinate with Procurement for the need of a sole source justification for the lightpole(s).
   3. Portable winch units shall be 120-volt and be provided with wired remote controller, with cabling length of 15 feet minimum.

4. Transformer for portable winch unit shall also be portable, totally enclosed, permanent, primary and secondary, twist-locking plug connectors on pigtails to match pole-base power outlet and winch plug.
5. Primary of transformer shall be rated at the lighting-circuit voltage; secondary shall be rated at the voltage of the portable winch unit (120-volt).

12.2.2 Airfield Lighting and Visual Aids Systems and Fixtures

12.2.2.1 Light Fixtures

A. Light Emitting Diode (LED) type lamps in fixtures shall be specified for new airfield lighting projects at BWI Marshall and MTN Airports because of longer lamp life and lower energy consumption. ADB airfield lighting fixtures shall be used as the basis of design.
B. All fixtures used on BWI Marshall or MTN lighting projects shall be FAA approved types, with the type of lamp specified by the Consultant. Fixtures shall be certified under the Airport Lighting Equipment Certification Program described in FAA AC 150/5345-53, latest edition, and shall be of a type listed in Appendices 3 and 4 of the AC. Updates to the AC Addendum list of FAA approved fixtures are made periodically. Consult the FAA Advisory Circular web page to search for the most recent edition of FAA AC 150/5345-53 and to obtain the latest Addenda.
The Consultant shall include within Technical Specification L-125, "Installation of Airport Lighting Systems", the applicable FAA approved fixtures listed in the most recent edition of FAA AC 150/5345-53.
C. The current FAA AC 150/5345-53 Addendum list has added a special designation for LED equipped fixtures. The fixture type now has an (L), following the last letter after the L- number designation to indicate an LED lamp is required. Example:

L-850A uses an incandescent lamp
L-850A (L) uses an LED lamp

In-pavement light fixtures shall be specified to be Class 2, Style 3. The class and style designation must be indicated in the Contract Documents. Class 2 indicates that the light fixture is constructed to accommodate base mounting. The Style 3 fixture is defined as having a maximum height of ¼ inch above finished grade and is intended to prevent damage to in-pavement light fixtures during snowplowing operations.
D. LED light and incandescent sourced lights shall not be mixed in a run of fixtures. Do not insert a series of LED lights within a length of incandescent lights, unless there is a change in direction. Every effort shall be made by the consultant to minimize transitions from one type of light to the other.
E. LED lights shall be specified without heaters unless the consultant is otherwise advised by the MDOT MAA Project Manager of a project specific requirement.
F. Steel reinforcing cages shall be provided on all in-pavement lights installed in both asphalt and concrete pavements. Steel reinforcing cages shall be in accordance with the Steel Reinforcing Cage detail. Steel Reinforcing Cage detail is attached to this section.

12.2.2.2 Lockout / Tag-out for Airfield Lighting for S-1 Series Plug Cutouts

All S-1 series plug cutouts shall be the lockable type. The following is the specification for the S-1 series plug cutout:

A. SERIES PLUG CUTOUT TYPE S-1. S-1 series plug cutouts shall be lockable, individually keyed with two keys, capable of carrying 20 Amperes, and shall have four contacts that close the circuit between the regulator and series lighting loop. The body shall be constructed of high strength plastic. The series plug cutout shall be protected against arcing. Porcelain bodies shall not be used.

12.2.2.3 Airfield Lighting Cable

A. Cables for Airfield Lighting Circuits shall be FAA L-824, 5kV, Type B cable with EPR (Ethylene Propylene Rubber) insulation and CPE (Chlorinated Polyethylene) Jacket. Underground cable shall conform to the requirements of FAA AC 150/5345-7 or latest edition, be provided by an FAA certified manufacturer and conform to the following additional specifications:
   1. Cable shall be insulated and jacketed copper, #8 AWG, 7 strand (19 strand is acceptable).
   2. Cable shall be single conductor, suitable for direct burial and/or raceway installation in wet conditions and shall be rated for a minimum 90° C for continuous service and130° C, for short circuit conditions.
B. Available Manufacturers: Certified L-824, 5kV, Type B cable manufacturers are listed in FAA AC 150/5345-53 or latest edition, and shall be listed in the current Addendum to Appendices 3 and 4. Updates to the Addendum list of FAA approved cables are made periodically. Consult the FAA Advisory Circular web page to search for the most recent edition of FAA AC 150/5345-53 and to obtain the latest Addenda.
C. There may be lead times of up to 16 weeks for cables, thus phasing of deliveries, contract completion time, and/or advance ordering should be considered by the consultant.
D. Permanent wiring shall be placed in conduit.

12.2.2.4 Airfield Lighting Cable Identification Tags

Consultants shall include the following information on the contract documents:

A. Identification tags shall be provided for each cable entering and/or leaving manholes, handholes, junction boxes, and light fixture cans.
B. All tags shall be plastic "phenolic" tags with colors as shown in the table below.
C. Two heavy-duty UV resistant black nylon ties shall be used to secure each tag to the cable.

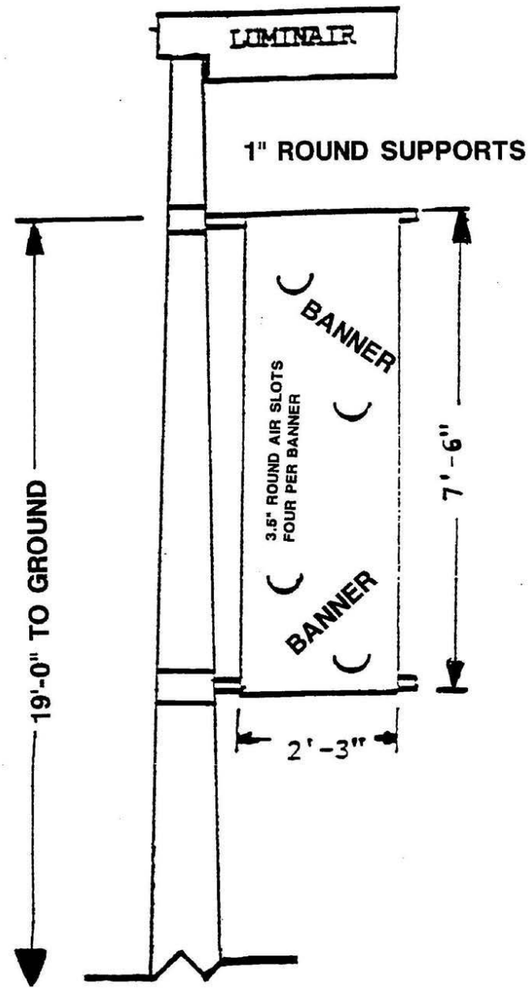
Identification	Tag Color	Engraved Letter Color

Primary Distribution	Red	White
Runway Edge	White	Black
Controls	Black	White
Taxiway Edge or Centerline	Blue	White
Runway Touchdown and Centerline	Yellow	Black
FAA and Communication	Green	White
Secondary Power	White	Red
Spare Wire	Orange	White

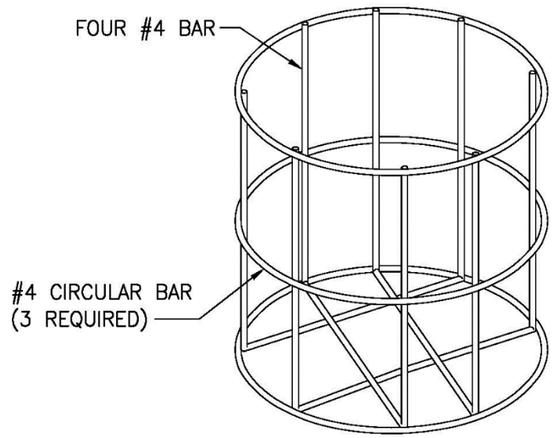
Additionally, cable identification tags shall be in accordance with the Cable Identification Tag detail. Cable Identification Tag detail is provided attached to this section.

12.2.2.5 Airfield Lighting Fixture Identification Tags

Fixture identification tags shall be provided for all elevated light fixtures on the runways and taxiways. Fixture identification tags shall be in accordance with the Fixture Identification Tag detail shown on. Fixture Identification Tag detail is attached to this section.



SHEET TITLE: LIGHT POLE	DATE: APRIL 2005



NOTE:

1. STEEL REINFORCEMENT SHALL CONFORM TO ASTM–A184, STANDARD SPECIFICATION FOR FABRICATED DEFORMED STEEL BAR MATS FOR CONCRETE REINFORCEMENT, OR ASTM–A704, STANDARD SPECIFICATION FOR WELDED STEEL PLAIN BAR OR ROD MATS FOR CONCRETE REINFORCEMENT.

SHEET TITLE: STEEL REINFORCING CAGE	DATE: FEB. 2010

12.2.3 Landside Lighting (Parking and Roadways)

All light poles and fixtures shall be specified based on aesthetics, design parameters, and replacement/maintenance considerations. Consultants shall match existing products when modifying and/or expanding existing facilities. A list of lamps that are kept in stock is available to Consultants in the Office of Architecture. New parking lots and roadways shall be designed with LED pole mounted light fixtures. In addition, all designs shall be coordinated with the MDOT MAA's Resident Architect in the Office Architecture for aesthetics.

Consultants shall provide MDOT MAA's Resident Architect and the Office of Facilities Maintenance with cut-sheets on every light fixture and lamp proposed for MDOT MAA projects. LED fixtures shall be considered for all new areas and existing area upgrades where practical.

Light poles shall be round tapered aluminum poles with steel anchor bolts, transformer base, 2" x 4" handhole and a smooth black finish. Poles shall meet the performance of #RTA30.

Luminaries shall meet the performance of Holophane (Mongoose LED) cast aluminum housing, LED light engines with L70 greater than 100,000 hours, 5000K color temperature, 15,000-36,000 lumen output, luminaries with 5-3/4" arms and smooth black finish, and DLC qualified. Existing luminaries that are to be matched are 250W, 400W, or 1000W, HPS at 277V with a separate grounding wire.

Each pole shall bear an identification tag (engraved on aluminum plate) which shall list the manufacturer, model number, date of manufacture, and date of installation.

The need to install banners on light poles shall be coordinated with MDOT MAA's Project Manager and the Office of Facilities Maintenance. Light poles, banner supports, and foundations shall be designed for banners, when required by MDOT MAA. The banner supports and hardware shall be coordinated with and approved by the Office of Facilities Maintenance. Harmonics shall be considered for lighpoles with banners.

Notwithstanding; FAA Part 77, heights of the poles should match existing for all reconstruction and retrofit projects. Consultants shall coordinate each light pole installation(s) with and submit an Airport Zoning Application to MDOT MAA's Office of Planning & Real Estate and comply with all Local, State and Federal regulations. Light pole design shall not penetrate any navigational surfaces, i.e. FAR Part 77. If penetration is unavoidable, Federal Aviation Administration approval must be acquired (Refer to Volume 5, Section 2.2 FAA Requirements for Proposed Development.)

Parking lot concrete foundation heights shall extend a minimum of 2-1/2 feet above finished grade to resist vehicle impact.

Color shall be black and smooth, unless otherwise approved by MDOT MAA's Resident Architect. Arms, luminaries, and all other attachments shall be provided in matching color.

12.3 Airfield Lighting Counterpoise for Lightning Protection

12.3.1 Purpose of Lighting Counterpoise

Per FAA AC 150/5340-30H, Design and Installation Details for Airport Visual Aids, Paragraph 12.5 or as amended, "The purpose of the counterpoise or lightning protection system is to provide low resistance preferred paths for the energy of lightning discharges to enter the earth and safely dissipate without causing damage to equipment or injury to personnel. The counterpoise is a separate system and must not be confused with equipment safety grounds that provide personnel protection from electrical shock hazards." Equipment safety grounds shall be provided per Paragraph 12.6 of the above cited Advisory Circular, and as amended later.

12.3.2 Lightning Protection Requirements for Airfield Lighting Equipment

To provide a level of protection from lightning strikes to underground power and control cables for airfield electrical equipment owned and maintained by the BWI Marshall and MTN Airports, all projects shall include installation of counterpoise wire above the wiring and conduit intended to be protected. Following are installation requirements for the installation of counterpoise wire:

A. The Counterpoise conductor shall be a bare solid copper wire, #6 AWG.
B. Counterpoise shall be connected to ground rods spaced a maximum of 500 feet apart.
C. Counterpoise shall be bonded to ground rods in accordance with Section 12.3.3.
D. Ground Rods shall be copper or copper-clad steel, 10 feet long by 3/4-inch diameter, minimum.
E. Ground rods shall be installed a minimum of 6" deep to top of ground rod.
F. Include provisions in the contract documents that if the resistance to ground of a ground rod exceeds 25 ohms, a supplemental ground rod shall be added.
G. Counterpoise shall be connected to an exterior ground lug on ALL Light Bases that are intended to contain wiring for Airport-Owned and Maintained Lighting, Navigational Aids (Navaids), and other miscellaneous Airfield Electrical Equipment. This includes, but is not limited to, all inpavement and elevated light base cans and sign base cans.
H. A rebar cage shall be installed around inpavement light bases in rigid pavement as well as in concrete encasement for light bases installed in flexible pavement. The counterpoise shall be bonded to the rebar cage.
I. Coat any exposed copper/brass at connections or bonds to base cans with a 6 mil layer of 3M ScotchKote electrical coating or approved equal.
J. Counterpoise connections shall be UL listed for direct earth burial.
K. Specifications shall require installation to comply with applicable requirements of NFPA 780, Standard for the Installation of Lightning Protection Systems.

L. At the Airfield Lighting Vault or other power source, bond counterpoise to vault or power source equipment grounding system.

12.3.3 Bonding

Whenever counterpoise wires are bonded to ground rods or other grounding electrodes, bonds shall be exothermic welds. Exothermic welds shall be coated against corrosion where direct buried.

Counterpoise Wire Installation - Provide Counterpoise wire in accordance with the following table:

Counterpoise Wire Requirements	
Duct or Conduit Installation Method and Configuration	**Counterpoise Wire Installation Requirements**
Single conduit, all sizes, not adjacent to pavement edge	4” above line to be protected
Single conduit, all sizes, running beneath pavement (apron area, paved shoulders)	4” above line to be protected
Single conduit, all sizes, running adjacent to edge of pavement, in grass area	8” below grade and located half the distance from edge of pavement to the conduit run centerline.
Multiple conduits and ductbanks, all widths and depths	Height of Counterpoise wire above conduit(s) to be protected shall be within a 45-degree zone of protection below the counterpoise. Provide number of Counterpoise wires as required to meet protection zone criteria. Minimum cover over counterpoise shall be 12”.
Directionally drilled conduit, single, double or in group of three	None – provide ground rod at each end of directionally drilled conduit and bond to counterpoise of circuit being placed in directionally drilled conduits.
Group of 4 or more directionally drilled conduits	#6 AWG, Minimum, in separate directionally drilled sleeve, centrally located. Provide ground rod at each end of directionally drilled conduit and bond to counterpoise wire.
Conduits in steel casing	None – Provide ground rod at each end of casing and bond with #6 counterpoise wire.
Buried FAA cables	Refer to FAA Design Standard 19e or latest edition.

Required Specification Sections:

To supplement the above design standard items, include in the contract documents the following specification sections from Advisory Circular 150/5370-10, current edition, ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS.

1. 108-3.7 EXOTHERMIC BONDING
2. 108-3.8 TESTING

13.1 Building Automation System

Building Automation System (BAS) for the BWI Marshall Airport shall be provided as outlined herein and according to the referenced Specifications located in Appendix 2D - Standard Specifications and guidelines described below.

The existing BWI Marshall Airport Building Automation System (BAS) is a Johnson Controls (JCI) Metasys system incorporating JCI legacy N2 protocol (old system) and BACnet MS/TP (New system). All current and future BAS modifications and additions must be performed by an authorized factory branch of Johnson Controls and will be required to communicate through the BWI Marshall Airport BAS site director which is a JCI Metasys ADX server.

The existing BAS system currently communicates on both Arcnet and Ethernet. Only minor modifications or additions will be performed with the JCI N2 protocol, except for remote facilities. Programming and modifications to the existing Person Machine Interface (PMI) archive and Network Integration Engine (NIE), and ADX server must be performed by persons regularly employed by Johnson Controls. BAS modifications or additions of size, such as additions of multiple HVAC systems or units, are required to communicate on the BWI Marshall Airport Ethernet through a JCI Network Automation Engine (NAE) or JCI Network Control Engine (NCE) on BACnet MS/TP at a baud rate of 38400. All work must be performed by an authorized representative of Johnson Controls, and any available software updates must be identified during design, so updates occur as part of the execution of the project.

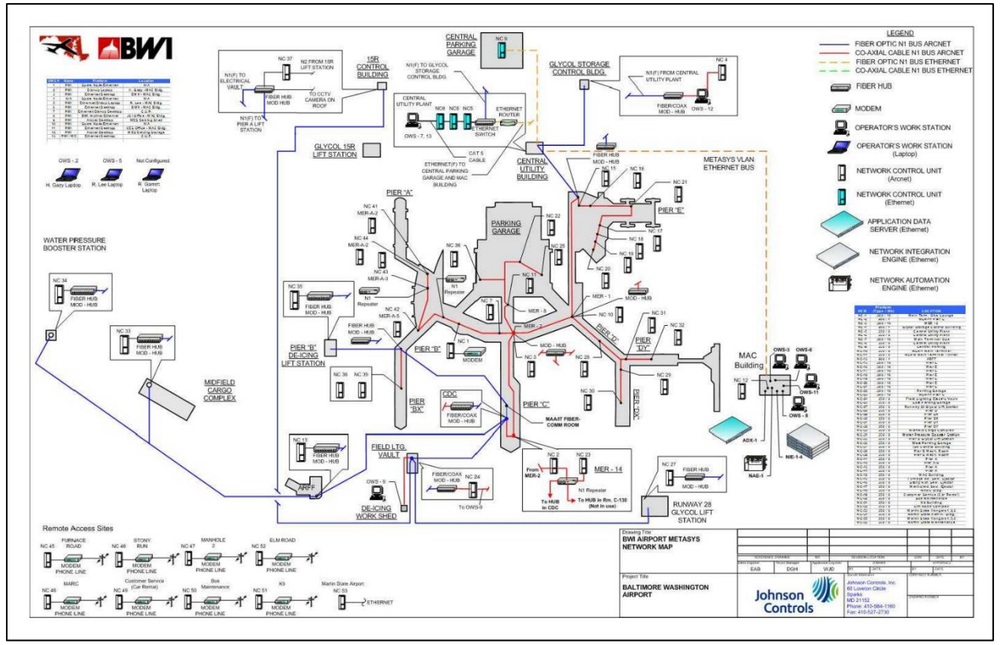
The old version of BAS is based on N2 protocols and covers majority of the Airport BAS system.

The new BAS system is a BACnet, Web-Based, JCI Metasys system that was installed in 2009.

The server that serves the BACnet, Web-based controls, is located in the MAC Building. A combination of one Application and Data Server (ADS), four Network Integration Engines (NIE's) and one Network Automation Engine (NAE) are major components of the server. The ADS provides 25 simultaneous access on the BWI Marshall Airport Ethernet system. Four Operator's Work Station (OWS) are also located in the MAC Building.

Refer to Metasys Network Map at BWI Marshall Airport detail on the following page for all existing controls and communication network.

The NIE integrates the old Metasys N2-based BAS into the new generation of technology that includes the internet, Information Technology (IT) and enterprise level global communication.



Metasys Network Map

All new controls shall be BACnet MS/TP direct digital controls as manufactured by Johnson Controls, except for remote facilities. A minimum of one Network Automation Engine (NAE) shall be installed as a Web-based extension to the existing Metasys ADX server network.

The old NC system shall be removed for major renovations where required and replaced with new NAE system. A major renovation is defined as a project that involves modification to the source component(s) of an HVAC system such as an air handler or central plant modification. Minor renovations involve the sub-systems or terminal units such as the VAV boxes, unit heaters, convectors, fan coil units, and space reheats. Each application needs to be explored for availability of BACnet network near the project location to identify the most cost effective approach, and impact on future projects.

New controls shall be designed and installed to meet the project specific requirements, MDOT MAA standards and sequence of operation. All new or updated software shall be installed in control units and operator workstations. Connect and configure equipment software to achieve sequence of operation.

Remote Facilities: There are several remote buildings and facilities that communicate with the existing BWI Marshall BAS (METASYS) by dial-up modem and they cannot be upgraded to the new system. These facilities are; Furnace Road, Stony Run, Manhole 2, Elm Road, MARC, Customer Service (Car Rental), Bus Maintenance, and K9. These facilities shall be handled separately, on a case-by-case basis and upgraded when a proper line of communication and network is available.

Ventilation shall be based on Demand-Controlled Ventilation (DCV), using CO_2 sensors. DCV shall be based on the indoor CO_2 level, compared with outside CO_2 level, to make adjustment to the rate of outside air to the building. CO_2 sensors shall be installed in spaces, return air duct, supply air duct as required and outside as a reference point to the inside level of the CO_2. Minimum outside air shall be provided for pressurization, exhaust systems, and to meet non-human pollutant levels as required. Refer to Chapter 13.1.2 Existing Demand-Controlled Ventilation (DCV) Software for a sample of DCV program/ software description.

Airflow Measuring System shall be Thermal Dispersion type. Refer to Appendix 2D - Standard Specifications for partial language that shall be used when specifying Airflow Measuring System at BWI Marshall Airport.

Flow meters shall be turbine type. Refer to Appendix 2D - Standard Specifications for partial language that shall be used when specifying flow meters at BWI Marshall Airport.

Spare Parts: Projects that involve the removal or replacement of N2 legacy equipment will require that all N2 application specific controllers and NCM supervisory controllers be turned over to the MDOT MAA as spare parts. Major renovations and additions utilizing BACnet MS/TP can require one application specific controller (FEC product) as a spare for each type utilized for the project.

Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics.

Control system shall include the Building Lighting Control System. Guidelines for the lighting controls are defined in the electrical specifications. The current standard for lighting control integration with the BAS system is BACnet MS/TP “smart breakers”. A notation on the mechanical plans and BAS specification should be made, so the mechanical contractor (the typical contracting agent for BAS) carries the BAS networking of the lighting controls in their scope of work.

Consultants shall coordinate with Johnson Controls throughout the design process for modifications or additions to the BWI Marshall Airport BAS. Contact Mr. Erik Badders (410-527-2607/erik.a.badders@jci.com) at Johnson Controls, so existing BAS capacity can be assessed and proper implementation of new Metasys controls occurs.

13.1.1 Design Guidelines for Building Automation Systems

Consultants shall prepare design drawings and specifications as follows:

A. Review, revise and update part one of the BAS specifications as required to suit the project scope of work.
B. Review, revise and update part two of the BAS specifications as required to suit the project scope of work.
C. Include part three, execution, in accordance with MASTERSPEC and project scope of work.
D. Provide sequence of operation and show on the drawings.
E. Provide general controls riser diagram.
F. Provide equipment controls riser diagrams, including, but not limited to, air handling units, pumps, exhaust fans, VAV boxes, heat exchangers, fan coils, unit heaters, cabinet heaters, chillers, cooling towers and boilers.
G. Provide composite BAS riser diagram of entire system, showing locations of all controllers, including but not limited to terminal equipment controllers (VAV boxes, reheat coils, finned tube, etc.) for new and existing.
H. All control valves for chilled and heating water systems shall be two way valves unless approved by the MDOT MAA for using three way valves or as required by the specific project requirements.
I. All control dampers shall be low leakage type.
J. All actuators for valves and dampers shall be electric type except for large valves and dampers that pneumatic actuators can be provided where pneumatic system is available or new pneumatic system is required due to the size of the project.

K. Provide all required software for all equipment controllers and equipment, including but not limited to ADX, NAE, NIE, FEC, etc. Install all required software on the two (2) MDOT MAA provided laptops. Provide all wiring, cables and all devices necessary to connect to controllers and the network. Provide training on all software and systems.
L. Include BAS commissioning by the BAS supplier (JCI) in the specifications as required. Coordinate with the MDOT MAA.
M. Coordinate Variable Frequency Drives (VFD) operation with the sequence of operation and JCI.
N. VFD's shall have minimum analog and digital inputs and outputs as shown on the sample specification. Coordinate with electrical for the VFD's requirements. Refer to Appendix 2D - Standard Specifications for VFD's special requirements.
O. Provide additional work station and laptops as required. Coordinate with the MDOT MAA.
P. Review, revise and update warranty for the BAS system. Coordinate with the MDOT MAA.
Q. Provide composite list of all required software, hardware, controllers, sensors, etc., required for the operation of the Metasys Extended Architecture system.
R. Include controls for lighting, emergency generators, switchgear/substation, and other systems and equipment as required by the scope of the work.

13.1.2 Existing Demand-Controlled Ventilation (DCV) Software

The following describes the existing DCV software at BWI Marshall Airport. Consultants shall ensure that all future designs are compatible with the following:

A. Ventilation Control Application.
   1. ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality, provides a procedure to determine outdoor air flow rates for buildings: The "Ventilation Rate Procedure."
   2. Hardware and software for DCV shall be designed and installed to respond to CO_2 level in less than five (5) minutes.
B. Software Features: The following software features shall be part of the DCV application.
   1. CO_2 Multiplexer--Controls the sampling sequence and storing of the three measured CO_2 concentrations.
   2. CO_2 Sensor Autozero function--Causes the controller to read outdoor air CO_2 concentrations for one hour each day for the auto zeroing algorithm in the CO_2 sensor.
   3. Outdoor Air Flow Calculator--Uses the CO_2 concentration data to calculate the outdoor air flow rate.
   4. Outdoor Air (ODA) Flow Controller--Uses the outdoor air flow rate as a controlled variable input for closed loop PI control of outdoor air flow. The primary setpoint is determined by the Outdoor Air Flow Controller's Setpoint Selector.
   5. Outdoor Air Flow Controller Backup--Takes over control when the ODA Flow Calculator output is not dependable for any reason. This is a redundancy that is not required for outdoor air flow control but is provided for space pressurization considerations.
   6. Outdoor Air Flow Setpoint Selector (with CO_2 High Limit Control)--The Setpoint Selector determines the setpoint of the Outdoor Air Flow Controller based on the highest of three signals: Scheduled setpoint based on estimated occupancy, space pressurization (i.e., volume matching) setpoint, and the CO_2 high limit control setpoint. The CO_2 high limit control function supplements the scheduled outdoor air flow function, addressing any higher than expected occupancy periods.
   7. Return Air CO_2 Alarm capability--Alerts building operators to conditions of high CO_2 levels, indicating loss of ventilation control, or conditions of low CO_2 levels indicating a CO_2 sensor fault.
   8. Controller Manager--Selects between the Outdoor Air Flow Controller and the conventional discharge air temperature controller/economizer for control of the mixed air dampers.
   9. CO_2 Concentration Values Check--Warns the operator if the CO_2 concentration values are not in the proper relationship; supply air CO_2 concentration should be higher than that of the outdoor air and lower than that of the return air.
   10. Lead Ventilation--Provides ventilation prior to occupancy, diluting building source contaminants to acceptable levels.
   11. Trend Tool--This Excel worksheet, in conjunction with an OWS and Metalink™, provides expanded graphic presentation of trend data.
   12. Outdoor Air Actuator Ramp Generator--Diagnostic software process compound ramps outdoor air damper through 0%, 50% and 100% positions for precommissioning tests and ventilation control verification.
   13. Trend Automator--Starts and stops trending of object attributes when the air handling unit is started and stopped. This avoids wasted disk space which occurs if trending continues during equipment off periods.
   14. Reliability Checker--Replaces unreliable trend data with zero.
   15. Outdoor Air Flow Calculator - Energy Balance Method--Uses mixed, return and outdoor air temperature data to calculate the outdoor air flow rate for comparison purposes (not for control).
C. Measurement of Outdoor Air Flow Rate

   The following are methods/options that can be used for measuring the Outdoor Air Flow Rates.

   - Option 1 requires specific software as described in this section and is being used at BWI Marshall Airport.
   - Option 2 requires modified software, written specially for multiple CO_2 sensors, and operating with a dedicated Outdoor Air Flow Measuring system.

   The preferred option shall be based on the latest installations at BWI Marshall Airport and shall be reviewed and approved by the MDOT MAA prior to design and installation.

   <u>Option 1:</u>

a. Outdoor air flow is measured indirectly, using the "CO_2 Concentration Balance" measurement method. In the "CO_2 Concentration Balance" method, the outdoor air flow is calculated from supply air flow (measured directly via airflow measuring station), and from three CO_2 concentrations. Outdoor, supply, and return air CO_2 concentrations are used to compute the fraction of outdoor air in the supply air stream. This provides a calculated outdoor air flow value as a controlled variable input for the Outdoor Air Flow Controller.
b. The volumetric concentration balance for the outdoor and return air streams being mixed can be calculated for any "tracer gas" injected into the air streams. Since human respiration generates significant amounts of CO_2 in the return air stream and CO_2 sensors are available, CO_2 is a good tracer gas for this method.

Option 2:

a. Provide duct-mounted air flow measuring system for outdoor air flow measuring and multiple CO_2 sensors for supply and/or return air ducts and outdoor air. The CO_2 measurement program shall be modified if duct-mounted air flow measuring is utilized and multiple CO_2 sensors are installed.

D. Implementation of Outdoor Air Flow Software Control Strategies

1. The multiplexed method of CO_2 measurement that is used to provide accurate CO_2 concentration values for the Outdoor Air Flow Calculator has additional capabilities in that it can compensate for exhaust air bypass and mixing plenum air leaks. It is the only method that can distinguish between outdoor and re-entrained return or exhaust air.
2. The method is derived from equations describing the mixing of the outdoor and return air streams in a common air handling unit. Each of these air streams contains some concentration of the tracer gas, CO_2
3. The outdoor air flow rate can then be determined as

$$CFM_{OA} = \frac{CO_{2,RA} - CO_{2,SA}}{CO_{2,RA} - CO_{2,0A}} \quad CFM_{SA}$$

using the supply air volumetric flow rate in CFM (or m^3/sec) and the CO_2 concentrations in ppm (parts per million).

4. The expression CO2,RA-CO2,SA / CO2,RA-CO2,OA can be viewed as a "flow coefficient" that determines the "outdoor air fraction" in the supply air. The typical return air CO2 concentration in an occupied building is in the range of 500 to 1000 ppm while the outdoor air CO2 concentration is in the range of 350 to 450 ppm. The mixing of the outdoor and return air streams will always cause the supply air CO2 concentration to be higher than that of the outdoor air and lower than that of the return air. When the outdoor and exhaust air dampers are fully closed and all the return air is being recirculated, the supply air CO2 concentration is equal to that of the return air and the flow coefficient will have a value of zero, correctly indicating that no outdoor air is being introduced into the space. When the outdoor and exhaust air dampers are fully open, the supply air CO2 concentration is equal to that of the outdoor air and the flow coefficient will have value of one, indicating that the air handling unit is using 100% outdoor air.
5. Single CO2 sensor with a sampling air pump and appropriate software is used to measure and store, in sequence, CO2 concentrations of the three air streams. Two solenoid air valves are used to connect the appropriate sampling line to the air sampling pump and to the sensor. Adequate time is provided for purging each sampling line and for the time response of the CO2 sensor.
6. With the use of a single CO2 sensor, the relative differences between CO2 concentrations can be measured with an error of less than 5 ppm. The effect of sensing errors such as drift, temperature effect and short term output variations will be identical for all three CO2 measurements. Because the flow coefficient requires only calculation of the ratio of the CO2 differentials, the identical errors in the individual measurements will cancel out. Only infrequent field calibration of the CO2 sensor is required because only the differentials are used, rather than absolute values.
7. The return air CO2 concentration, one of the three CO2 concentrations read and stored during the multiplexing cycle, can be utilized in some cases for purposes other than indirect outdoor air flow calculation. For example, it can be used for CO2 high limit control and for Return Air CO2 Alarms. For these applications, when an absolute CO2 measurement is needed, accurate CO2 sensor calibration is required.

E. CO_2 Sensing Point Location:

1. Selection of the CO_2 sensing locations should be as follows. The sampling tube (typically a 1/4 inch diameter plastic tube) is inserted into the duct in any convenient and easily accessible section of the ductwork. Note that, contrary to temperature sensing, the CO_2 concentration in mixed air is identical to the CO_2 concentration in the supply air. Therefore, there is never any need to sense CO_2 in the mixed air plenum where an averaging sensing probe would be required. Because the CO_2 concentration of an air stream is not affected by heating coils, cooling coils or humidifiers, the sensing point for the supply can be located downstream of the supply fan to ensure that the outdoor and return air streams are well mixed and have minimum stratification. The return air sensing point can be located in the return air duct, upstream or downstream of the return fan.
2. The supply air sensing point is subject to the fastest changes in CO_2 concentration, as the linked dampers change position. When presented with choices regarding equipment location, mount the controller in a location that will minimize the length of the supply air sensing tube, using a tube of up to 30 feet, in length.
3. The outdoor air sensing point should be located in free air outside the building or, alternatively, in the outdoor air intake. If the outdoor air CO_2 sample is obtained from a location that is isolated from the building exhausts, the CO_2 Concentration Balance method will automatically compensate for air which short-cycles from the exhaust louvers to the outdoor air intake. Either location compensates for air which short-cycles from the fan room into the mixing plenum. By placing the outdoor air CO_2 sensing point in a location that is isolated from the building exhausts, this method allows calculation of the true fresh air portion of the outdoor air flow intake from the three CO_2 measurements and the supply air flow. The outdoor CO_2 sensing point, if placed in the outdoor air intake duct for convenience reasons, should be placed far enough on the upstream side of the outdoor air damper so that its reading is not affected by a possible "backwash" of the mixed air at larger outdoor air damper openings. A good practical test is to check the outdoor air CO_2 sensing point reading while positioning the outdoor air damper from its fully closed to its fully open position and verify that the sensor reading does not change.

13.2 Controlled Access Security System (CASS)

Refer to Volume 7, Section 3.1.

13.3 CCTV

Refer to Volume 7, Section 3.2.

13.4 Interface of Fire Alarm and Security System

Refer to Volume 3, Section 2.4.

14.1 Exterior Signage

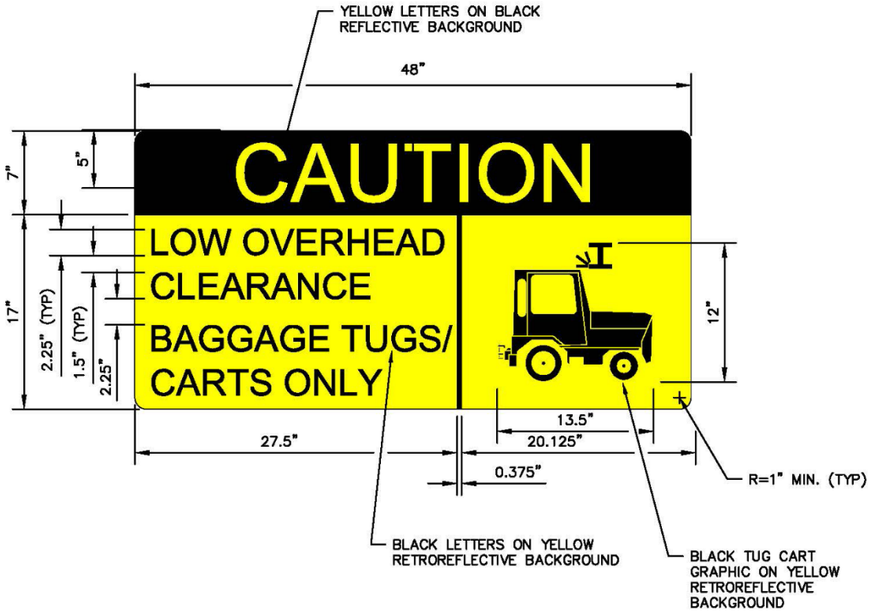
14.1.1 Apron/Airfield Signage

14.1.1.1 Electrical Characteristics of Airfield Signs

Each circuit shall be designed to handle all combinations of VA loading and power factor or the Consultant shall ensure that sign electrical characteristics, not covered by FAA Specifications, are included in the contract specifications, as appropriate. This is to help alleviate the substantial variances in volt-amp loading and power factor, from manufacturer to manufacturer as well as manufacturers who produce both high and low VA loading versions of the same sign.

14.1.2 Baggage Makeup Area Exterior Overhead Signage

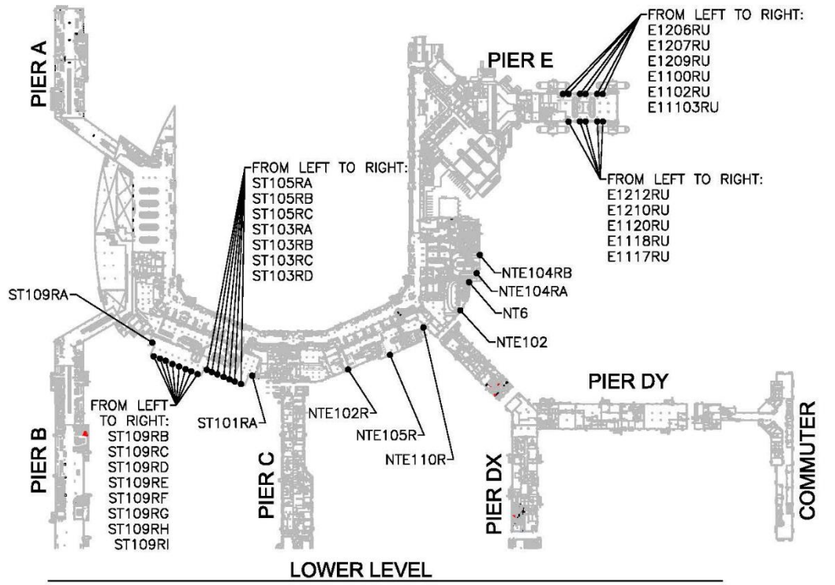
All vehicle entrances to and exits from baggage make-up areas shall have a sign installed to caution drivers of possible low overhead clearances inside the baggage make-up area per the standard detail on the following pages. Exits are included in order to account for all driver situations. Signs are to be mounted centered above doors whenever possible. When signs cannot be mounted above, signs are to be mounted to the left or right of the door with the top of the sign aligned with the top of the doorway, or as determined by the Consultant. Sign detail follows.

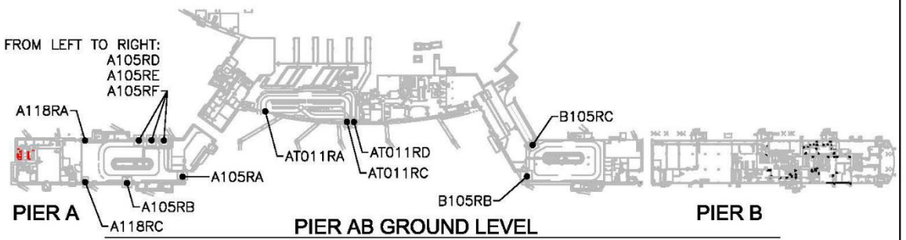


NOTES:

1. FONT TYPE: CLEARVIEWHWY–4–B
2. SIGN MATERIAL: ALUMINUM, 0.04" THICKNESS
3. ATTACHMENT METHOD: GALVANIZED HOLLOW MASONRY ANCHORS OR STAINLESS STEEL SHEET METAL SCREWS AND WASHERS, AS RECOMMENDED BY THE ENGINEER, PLACED IN EACH CORNER AND 24" O.C. MAX
4. INSTALL SIGN AT EACH ENTRY TO AND EXIT FROM BAGGAGE MAKE–UP AREAS. SIGN SHALL BE MOUNTED CENTERED ABOVE DOOR WHENEVER POSSIBLE. WHEN SIGN CANNOT BE MOUNTED ABOVE DOOR, SIGN SHALL BE MOUNTED TO LEFT/RIGHT WITH THE TOP OF THE SIGN ALIGNED WITH THE TOP OF THE DOORWAY, OR AS DETERMINED BY THE ENGINEER.

SHEET TITLE: BAGGAGE MAKE-UP AREA OVERHEAD CAUTION SIGN	DATE: JAN. 2015





DOOR LOCATION	NUMBER OF DOORS
PIER A	7
AB	3
PIER B	2
BC	17
CD	3
DE	4
PIER E	11

TOTAL NUMBER OF DOORS = 47

SHEET TITLE: BAGGAGE MAKE-UP AREA DOOR LOCATION MAP	DATE: OCT. 2014

14.2 Interior Signage

The graphic style for BWI Marshall signage is Helvetica Regular. All sign boxes shall be internally lighted. Sign boxes in the Domestic Terminal shall be black and those in the International Terminal shall match Benjamin Moore 1608 Grey. New signs shall match the Airport's Standard.

LED Signs shall match the existing signs manufactured by Winona Lighting, Cole Lighting, or Bergen Art Metal. LED message center shall be manufactured by Salescaster Displays or approved equal.

14.2.1 Exit Signs

Refer to Volume 3, Section 5.1 Exit Signs.

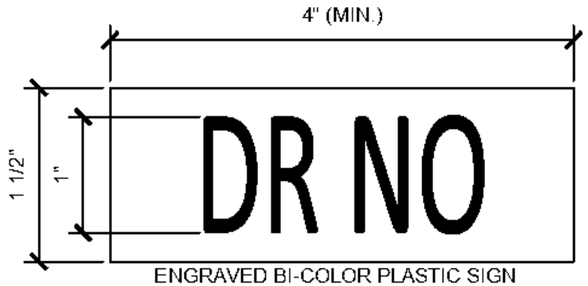
14.2.2 Identification Signage

14.2.2.1 Door Identification Signs

Refer to Volume 3, Section 5.2 Fire Protection Identification Signage.

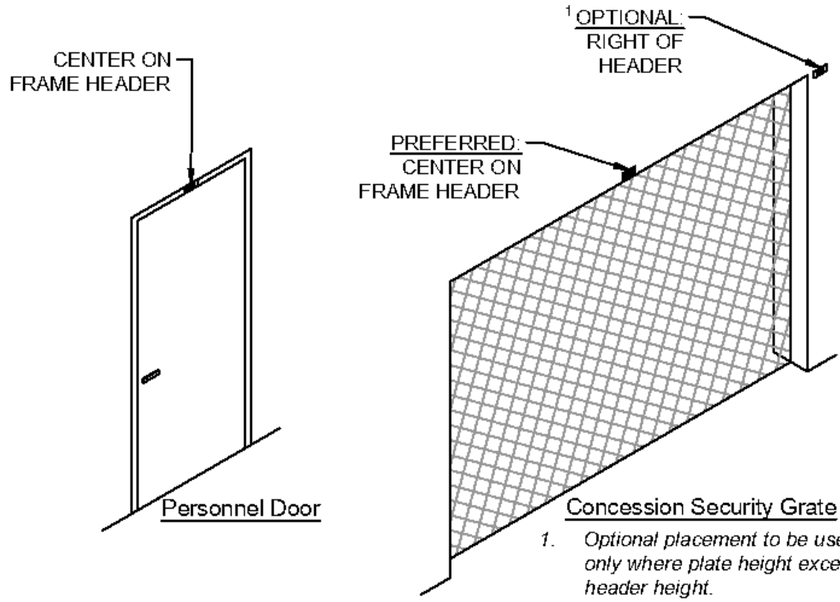
14.2.2.2 Door Numbering Plates

A. Door Number plates shall be installed centered on the doorframe header on the exterior (public) side of the door. Plate shall be 4" minimum width by 1-1/2" height, black plastic, engraved with the Door Number in 1" tall white lettering, fastened to the frame by self-adhesive mounting tape.
B. Door Number plates for overhead roll-up doors (both interior and exterior) shall be installed centered, as possible, on the exterior right side of the door jamb, facing inward. Plate shall be 10" minimum width by 5" height, black metal, engraved with the Door Number in 4" tall white lettering, fastened to the frame by screws.
C. Door Number plates for elevator doors shall be installed centered on the doorframe header at each floor/level.
D. See PEGS Volume 1, Section 2.4 Door Number Assignment for door numbering requirements.
E. Click each image to download the details in Adobe PDF format.



ENGRAVED BI-COLOR PLASTIC SIGN
AFIXED OUTSIDE OF DOOR (TYP.)
ACTUAL TEXT VARIES - NUMBERS
TO BE PROVIDED BY GETS

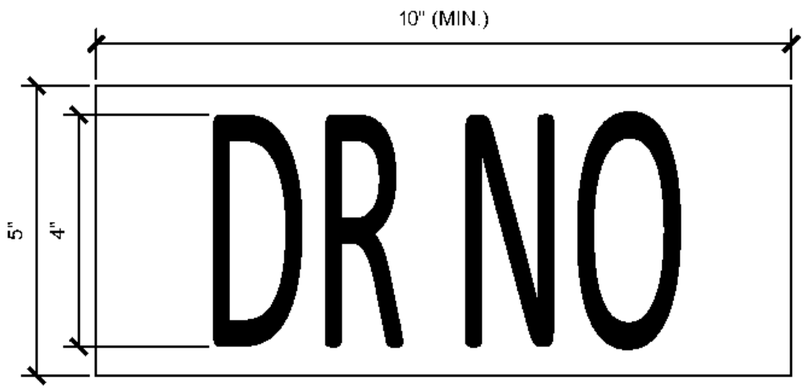
PLATE DETAIL



1. *Optional placement to be used only where plate height exceeds header height.*

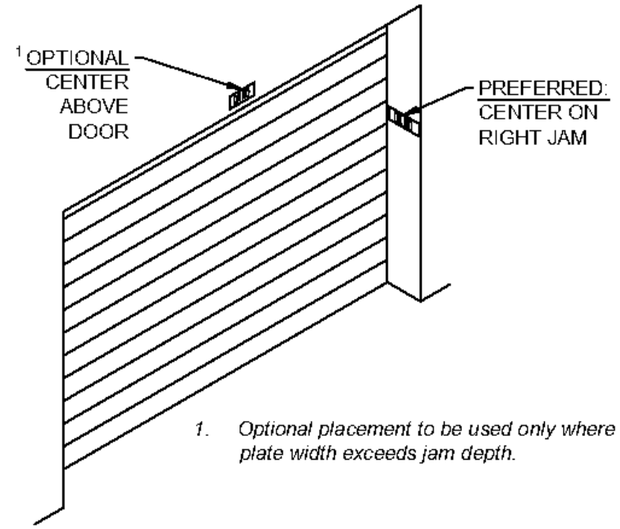
PLATE POSITION

SHEET TITLE: MAA DOOR NUMBER PLATE	**DATE: AUGUST 2021**



ENGRAVED BI-COLOR METAL SIGN
AFIXED OUTSIDE OF DOOR (TYP.)
ACTUAL TEXT VARIES - NUMBERS
TO BE PROVIDED BY GETS

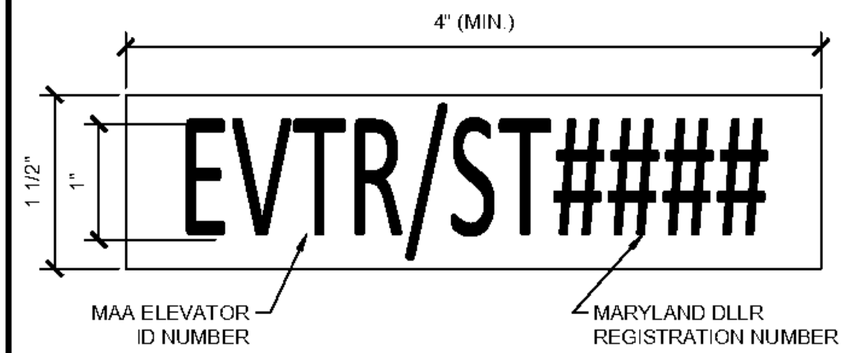
PLATE DETAIL



1. *Optional placement to be used only where plate width exceeds jam depth.*

PLATE POSITION

SHEET TITLE: MAA OVERHEAD DOOR NUMBER PLATE	**DATE: AUGUST 2021**



ENGRAVED BI-COLOR PLASTIC SIGN AFFIXED OUTSIDE
OF ELEVATOR DOOR ON EACH FLOOR/LEVEL (TYP.)
ACTUAL TEXT VARIES - NUMBERS TO BE PROVIDED BY GETS

PLATE DETAIL

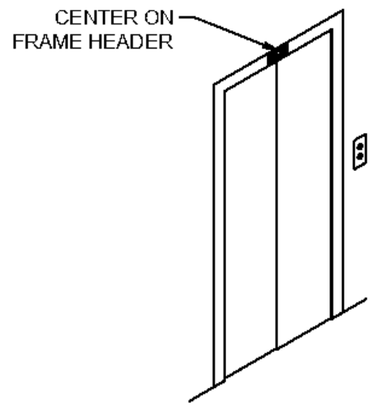


PLATE POSITION

SHEET TITLE: MAA ELEVATOR DOOR NUMBER PLATE	DATE: AUGUST 2021

14.3 Temporary Partition Wall Graphics

If a project (exterior or interior) involves the installation of construction or temporary partition wall(s) or barricade(s) with exposure to the public, the consultant shall include in the plans and specifications the provisions for installation of informational signs (i.e., Excuse Our Appearance, While We Are Under Construction; Pardon the Dust, Construction Underway; Pardon the Mess, We Are Making Progress; etc.) and graphics if available (e.g., 3D images or renderings of the proposed work) on the public side of the wall or barricade. The size and content of the informational signs and graphics shall be coordinate with the MAA's Task Manager, Office of Transportation and Terminal Services, Office of Marketing, Communications and Customer Service, the Airport's Master Concession Developer through the Office of Commercial Management, and other appropriate MAA staff.

15.1 Passenger Boarding Bridge General Information

The information below outlines the basic requirements for Passenger Boarding Bridge (PBB) design for MDOT MAA projects. It is important to note that ALL PBBs at BWI Marshall are owned by the MDOT MAA and therefore must be consistent with MDOT MAA's basic parameters so that maintenance and operation of the bridges are simplified. The initial steps in design and procurement of the PBBs are as listed below. In addition, please refer to the Specification 347713X_Apron Drive Passenger Boarding Bridges included in Appendix 2D - Standard Specifications for further details regarding PBB design.

15.2 Initial Steps in Design of Passenger Boarding Bridges

15.2.1 Step One – Programming

The consultant shall establish the Aircraft Fleet Mix that will be utilizing each existing or proposed passenger boarding bridge (PBB) in coordination with the following MDOT MAA Offices:

A. Engineering – The assigned Task Manager will assist and coordinate the definition and extent of the project effort.
B. Airport Operations – The representative will coordinate current and proposed use and schedule for the gate where the bridge will be installed and highlight any unique issues associated with each gate installation (schedule, fleet mix, existing conditions, etc).
C. Commercial Management – The representative will assist with airline coordination and development with the fleet mix requirements and typical accessories (Chapter 15.4 Typical Accessories) that are to be included. Typically, the fleet mix should have the most flexibility between the airline projected to use the gate and the needs of Operations. All parties shall be consulted in order to arrive at a design solution that most efficiently addresses the consensus of needs for the airport while meeting all of the code requirements in the process.
D. Planning/Fire Marshal – The representative will assist with approval of holdroom sizing requirements.
E. Facilities Maintenance– The representative will assist with the electrical sub-metering requirements.

15.2.2 Step Two – Site Evaluation

The consultant shall inspect and evaluate existing and proposed site conditions that may impact the operational capabilities of each PBB. Some of the limiting site conditions that may be encountered are the following:

A. Obstacles on or adjacent to the terminal or PBB that may inhibit the PBBs rotation (i.e. – light poles, building soffits and overhangs, trash compactors, access to garage or person doorways, pantograph mounting brackets, etc.).
B. Obstacles on or adjacent to the terminal or PBB that may inhibit the PBBs extension and/or retraction (i.e., PC Air Units, 400 Hertz Units, Roof Mounted Vents, etc.).

In the event an existing foundation is being modified or a PBB is being relocated, the existing site condition, bolt pattern, systems, etc. shall be inventoried and confirmed prior to commencing design.

15.2.3 Step Three – Design

The consultant shall select a standard PBB Model/Size that will accommodate the fleet mix of aircraft for each gate which can be used as the prototype for purposes of bidding. The PBB sizing shall be based on and meet the requirements as outlined in Chapter 15.3 Passenger Boarding Bridge Design Requirements.

As part of Step Three a design report is to be provided with signed and sealed calculations as required. The report shall include site plans for each gate showing the proposed fleet mix, swing of each gate including minimum and maximum PBB lengths, and any additional information for future reference.

15.3 Passenger Boarding Bridge Design Requirements

15.3.1 Slope and Code Requirements

The operation of a PBB shall satisfy American Disabilities Act (ADA) slope requirements for enplaning and deplaning passengers from each aircraft in the fleet mix for each respective gate. Each tunnel of the designed and specified PBB shall not exceed a 1/10 or 10 percent slope. At BWI Marshall the slope of each tunnel of a PBB shall be calculated by subtracting the center of cab elevation from the center of rotunda elevation, and dividing by the horizontal distance from the center of the cab to the center of the rotunda. The cab elevation shall equal the sill height of the aircraft.

$$\text{PBB Slope} = \frac{RE - CE - (T - 1)*0.5}{X}$$

Where: RE = Rotunda Elevation
CE = Cab Elevation
T = Number of Tunnels
X = Distance from Center of Cab to Center of Rotunda

Typically projects installing and/or modifying PBBs should be designed and specified to allow the operation of the PBB(s) to access the forward two (2) left passenger (L1 and L2) doors of the aircraft where applicable. However, the consultant should confirm these parameters with the departments mentioned above prior to completion of the design.

The operation of a PBB shall satisfy National Fire Protection Agency NFPA 415 requirements outlining the protection and safety of the passengers utilizing the PBB. PBB's shall conform to Section 12.4.10 of NFPA 101 Life Safety Code.

15.3.2 Structural Analysis

A structural analysis of the PBB foundation must be performed. The design consultant shall verify the adequacy of any existing foundation for any relocations, additions, modifications, etc. For new installations, the foundation system shall be designed with the intended PBB to be used based on Step 3 above. The analysis and/or design shall be signed and sealed by a professional engineer registered in the state of Maryland.

15.3.3 Construction Technical Specification

The installation of a PBB regardless if new or relocated, shall have a Technical Specification. The standard technical Specification 347713X_Apron Drive Passenger Boarding Bridges is included in Appendix 2D - Standard Specifications. It is important to note the technical specification needs to have the following acceptance testing and pavement marking:

A. Contractor Testing Requirements
   The operation of a PBB shall undergo a test for the most demanding aircraft docking procedures to ensure proper mating of the PBB to the aircraft. Temporary tape shall be utilized for the stop bar and lead-in lines for the aircraft test park. Following a successful test, the final pavement marking for the aircraft may then take place.

B. Pavement Marking
   The operation limits of a PBB shall be outlined by pavement marking to indicate the limits of travel to enhance the safety of persons on the apron hardstand and protect the PBB from vehicular conflicts. The pavement marking shall consist of three (3) 6-inch wide yellow reflectorized stripes separated by two (2) 6-inch spaces. The marking shall encompass and allow for the PBB to be extended to its furthest docking position, allow for the PBB to be contracted to its storage or staging position, while providing the necessary clearances for the oversized baggage slide and other hardware attached to the PBB at all times during its swept path. The limits depicted by the marking shall coincide with the limit switches set in the PBB itself. As a result, the pavement markings shall be set in the field after the PBB operations at each individual gate have been accepted and set. The quantity of marking is estimated by the design consultant based on the anticipated PBB movements outlined above, and presented to the contractor in square footage of marking required for bidding purposes. The limits of the pavement marking shall be as-built by the contractor in the field and provided back to the engineer of record and owner.

15.3.4 Remove and Dispose of Bridge

If a bridge is to be removed and disposed, the MDOT MAA Office of Facilities Maintenance shall be notified so that usable parts can be salvaged prior to the removal (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4 Typical Passenger Boarding Bridge Accessories

The following accessories are typically included and installed on a PBB and shall be discussed and confirmed with the Task Manager during the design effort and specified by the design consultant. As the MDOT MAA owns the PBB, they do not typically provide for or own the preconditioned air units or 400 Hz systems at domestic gates. Consultant is to confirm whether these items are to be provided.

15.4.1 Pantograph or Cable Conveyance System

Any new or relocated PBB shall be provided with a cable conveyance system of sufficient capacity to accommodate PC Air and 400 Hz units for the design aircraft fleet mix at the gate for which the PBB is intended. At a minimum, one four-inch (4") diameter aluminum pantograph will be provided, with length to cover the movable sections of the PBB for routing power to the PC Air and 400 Hz units. (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.2 Telephone

The PBB manufacturer shall make provisions for telephone service. There shall be one telephone outlet integrated in the cab area of the PBB. As a result, the design consultant shall coordinate with MDOT MAA's Office of Information Technology and shall provide adequate information in the plans and specifications to ensure that telephone service is provided at the PBB (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.3 Pre-Conditioned Air

The MDOT MAA does not typically provide Pre-Conditioned Air (PCA) units at domestic gates as previously noted. PCA units are typically owned by the airlines. If a PBB with a PCA unit is being relocated, the airline who owns the gate is to remove and reinstall on the PBB placed at the gate. This includes new or relocated PBBs.

PCA units installed on PBBs require structural and electrical load calculations to ensure the electrical loads can be supported by both the PBB and the electrical infrastructure. As a result, the design consultants shall provide adequate information in the plans and specifications to ensure that the load requirements, the power requirements, and contractual arrangements are satisfied. For additional requirements including utility metering installation requirements, refer to Section 15.5 Pre-Conditioned Air and 400 Hertz Systems and Associated Loading Bridge Requirements Chapter 11.1.2 Total Harmonic Distortion (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications). The Consultant shall locate the units based on the combined geometry of the PBB and aircraft layout to ensure that there are no conflicts with the equipment placement.

15.4.4 400 Hertz Point-of-Use

The MDOT MAA does not typically provide 400 Hertz (Hz) units at domestic gates as previously noted. 400 Hz units are typically owned by the airlines. If a PBB with a 400 Hz unit is being relocated, the airline who owns the gate is to remove and reinstall on the PBB placed at the gate. This includes new or relocated PBBs.

400 Hz Point-of-Use (POU) units installed on PBB(s) require structural and electrical load calculations to ensure the loads can be supported by both the PBB and the electrical infrastructure. As a result, the design consultant shall provide adequate information in the plans and specifications to ensure that the load requirements, the power requirements, and contractual arrangements are satisfied. For additional requirements including utility metering installation requirements, refer to Chapter 15.5 Pre-Conditioned Air and 400 Hertz Systems, Associated Loading Bridge Requirements, and Chapter 11.1.2 Total Harmonic Distortion (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications). The Consultant shall locate the units based on the combined geometry of the PBB and aircraft layout, and capability to accommodate regional jets to ensure that there are no conflicts with the equipment placement.

15.4.5 Electrical Submetering

Refer to Section 15.5.2 Metering.

15.4.6 Adjustable Cab Floor (Articulating Cab Floor (ACF))

All BWI Marshall PBBs shall be Regional Jet (RJ) capable. PBBs to be utilized for mating to regional jets shall be equipped with an adjustable cab floor to allow proper mating to the regional jet aircraft while preserving the ability of the PBB to be utilized for wider bodied aircraft. RJ capable bridges include the following:

A. Floor flap adjustment for RJ doors.
B. Fold out hand rails necessary for extension into the RJs with retractable air stairs.
C. Additional cushion on PBB for contact mating of bridge and aircraft fuselage.

The consultant shall provide the minimum and maximum height ranges required to be serviced at each individual gate by the PBB. The consultant shall identify to the MDOT MAA Project Manager and identify in the design report any restriction to larger aircraft using the PBB as a result of the RJ usage.

15.4.7 Task Lighting

Task Lighting installed on PBBs shall consist of two (2) floodlight fixtures. The first floodlight fixture shall be mounted 4 feet above the top of the PBB on the right side of the PBB to illuminate the apron area in the swept path of the PBB. The second floodlight fixture shall be mounted 10 feet above the left side of the PBB on the left side of the PBB to illuminate the apron area adjacent to the aircraft (See Typical Task Light Fixture Mounting Detail).

The floodlight fixtures require structural and electrical load calculations to ensure the added structural and electrical loads can be supported by both the PBB and the electrical infrastructure (See Task Lighting Mounting Detail - Elevation on the following pages). All calculations shall be signed and sealed by a professional engineer for the respective design responsibility and included in a design report. Task Lighting installations shall contain two (2) LED 60-minute rotary timers to minimize lighting costs (See Task Lighting Wiring Diagram on the following pages) (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.8 Solid Tires

Solid Rubber Tires shall be included in the specification requirements for all BWI Marshall PBBs.

15.4.9 Gate Identification Signs

Three Sided Gate Identification Signs shall be installed on new or relocated PBBs (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.10 Baggage Slides

Automated baggage slides are not to be provided with new (or relocated) bridges. The consultant shall coordinate with MDOT MAA Commercial Management to confirm. The consultant shall also coordinate with Commercial Management to confirm current accessories located at each gate (i.e. - cover, motorized lifting platform, etc.) and airline preferences, if any.

15.4.11 Subflooring

Subflooring on new PBB's shall be galvanized/galvanealed smooth steel or three quarter inch (3/4") marine grade plywood.

15.4.12 Finished Flooring

Cab flooring shall be of ribbed rubber (see Specification 347713X Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications for additional detail). Carpet shall be installed on the flooring of the PBBs (See Specification 347713X Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications). Per NFPA 415, carpet shall meet the requirements for Class-I carpet flame spread rating.

Consultants shall specify an additional 10% of carpet quantity in each contract to be used as MROI (a.k.a. attic stock). The amount shall be confirmed with MDOT MAA Office of Facilities Maintenance. (Refer to DST Chapter 4.5 Maintenance Repair and Operating Items MROI).

15.4.13 Exterior Finishes

Surface preparation, primer, and finish coat for the PBBs shall be provided (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.14 Canopy

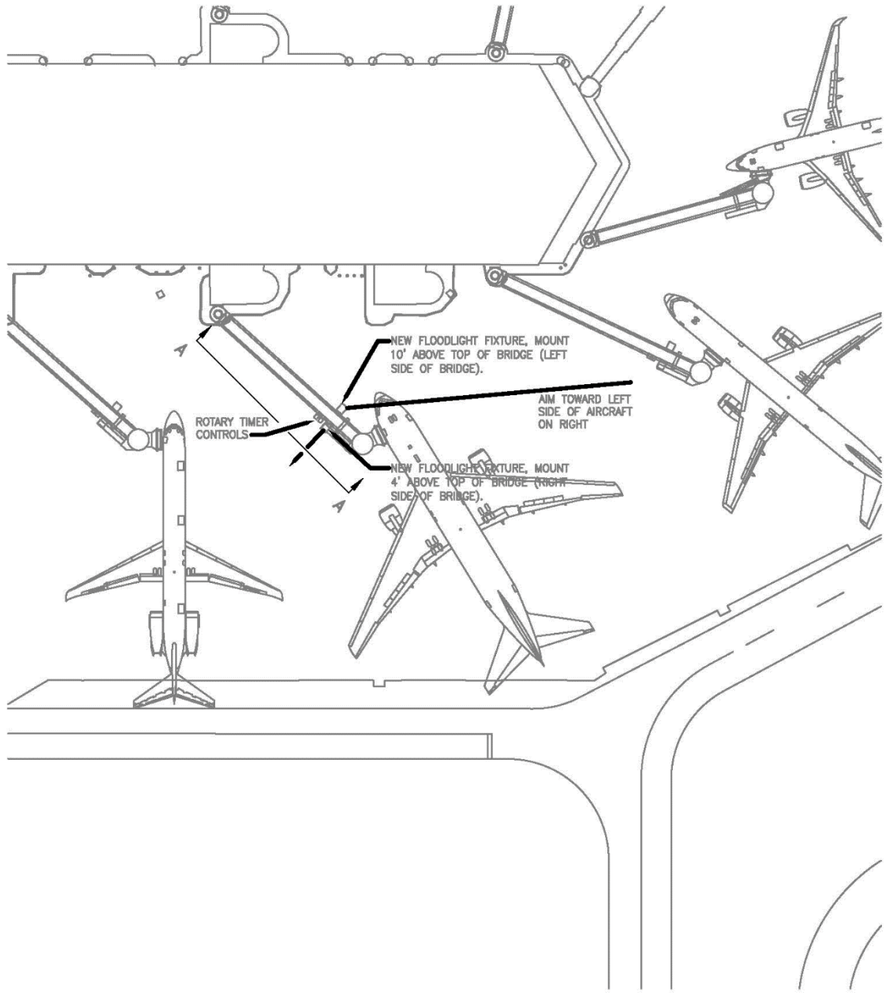
In order to satisfy NFPA 415, the PBB canopy is required to be lowered to mate with the aircraft fuselage. To ensure the PBB operator lowers to the canopy, the PBB manufacture shall include the lowering of the canopy in the sequence of operation, or program an alarm to sound as a reminder. (See Specification 347713X_Apron Drive Passenger Boarding Bridges in Appendix 2D - Standard Specifications).

15.4.15 Occupancy Sensors

Occupancy Sensors shall be installed on new or relocated PBBs to automatically turn off the interior lights and exhaust fans when the PBB is not in use.

15.4.16 Relocated Bridge

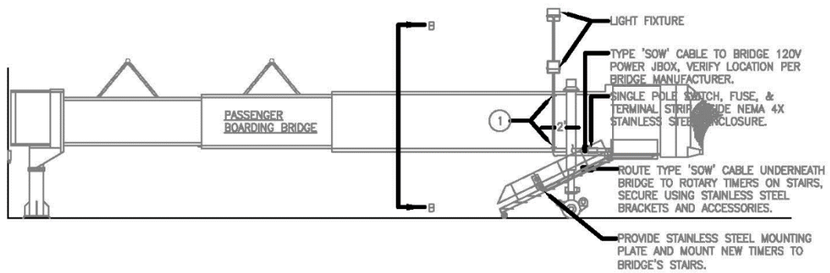
If a bridge is to be relocated from one (1) location to another, the bridge shall be reviewed for code compliance and refurbished to meet current codes.



TYPICAL TASK LIGHT FIXTURE MOUNTING DETAIL

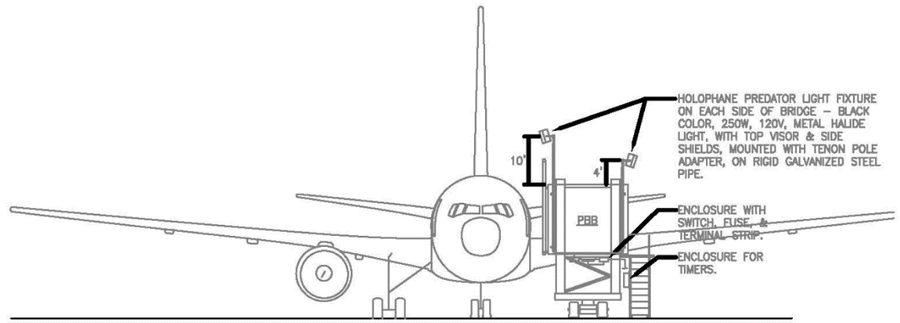
SCALE: 1" = 60'-0"

SHEET TITLE: TYPICAL TASK LIGHT FIXTURE MOUNTING DETAIL	DATE: JULY 2009



ELEVATION VIEW AA – TYPICAL TASK LIGHT FIXTURE MOUNTING DETAIL

NOT TO SCALE



ELEVATION VIEW B–B

NOT TO SCALE

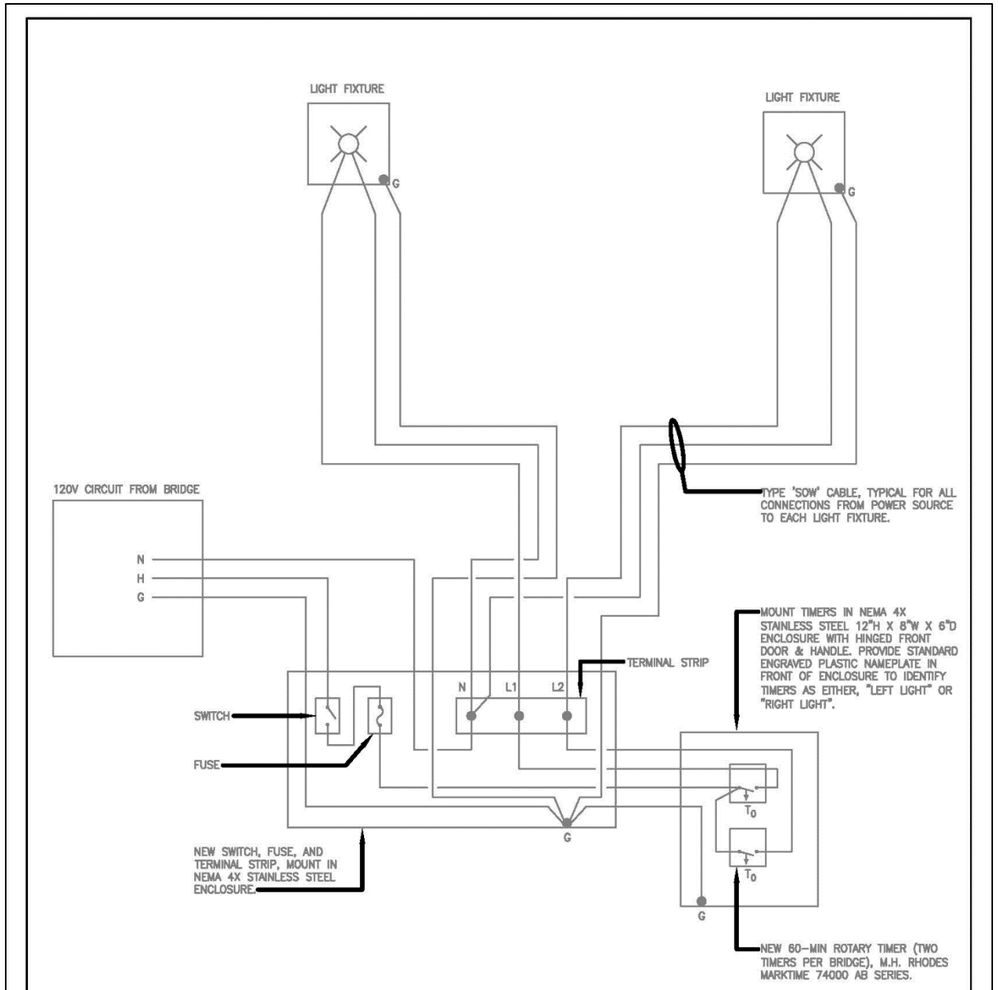
GENERAL NOTES:

1. COORDINATE WITH THE BRIDGE MANUFACTURER TO PROVIDE A 120V CIRCUIT FOR THE TASK LIGHTING FIXTURES. DO NOT CONNECT TO BRIDGE CONTROL CIRCUIT.
2. PROVIDE NOTES ON DRAWINGS FOR CONTRACTOR TO COORDINATE ADJUSTMENT OF AIMING.
3. PROVIDE TYPE 'SOW' CABLES FOR ALL WIRING ON BRIDGE.

DRAWING NOTES:

(1) PROVIDE LIGHT POLE OF ADEQUATE LENGTH AND SIZE TO SUPPORT FIXTURE AT REQUIRED HEIGHT WITHOUT OVERSTRESS OF POLE FROM APPLIED LOADS. THE POLE SHALL BE ADEQUATELY ANCHORED TO THE PASSENGER BOARDING BRIDGE (PBB) FRAMING. ANCHORAGE TO THE PBB SHALL NOT OVERSTRESS OR OTHERWISE WEAKEN THE STRUCTURAL INTEGRITY OF THE PBB OR ANY OF ITS COMPONENTS. ALL COMPONENTS OF THE LIGHT POLE MOUNTING AND ANCHORAGE SHALL BE GALVANIZED AND ALL MODIFICATIONS TO THE PBB SHALL BE TREATED FOR CORROSION PROTECTION. ALL NEW MEMBERS, BRACKETS, CONNECTIONS, BOLTS AND /OR WELDS SHALL COMPLY WITH THE APPLICABLE SECTIONS OF THE IBC AND AISC AND AWS REQUIREMENTS.

SHEET TITLE: TASK LIGHTING MOUNTING DETAIL - ELEVATION VIEWS	DATE: JULY 2009



SHEET TITLE: TASK LIGHTING WIRING DIAGRAM	DATE: JULY 2009

15.5 Pre-Conditioned Air and 400 Hertz Systems

An airline (tenant) assigned gates on a preferential use basis will be responsible for the installation and maintenance of PC and 400 Hz equipment on its preferential use passenger boarding bridges. Upon terminating the preferential use of the gate, the airline shall remove, at its sole expense, the PC Air and 400 Hz equipment.

MDOT MAA, which owns and assigns the common use gates, will be NOT responsible for the installation and maintenance of the PC Air and 400 Hz equipment on the common use passenger boarding bridge(s). MDOT MAA will determine the need and timetable for providing this equipment.

15.5.1 Design and Construction Requirements

A. Loading Bridge Requirements: Loading Bridges shall be specified to readily accept PC Air and 400 Hz equipment. In circumstances where the PC Air and 400 Hz equipment is to be installed at a later date, the loading bridge shall be specified to allow installation of the heaviest Point of Use (POU) equipment which satisfies the largest aircraft requirements of that gate.
B. All PC Air and 400 Hz equipment for preferential use and common use gates shall be designed and constructed to include separate metering, allow separate billing of electrical usage, and connection to MDOT MAA's METASYS Building Management System.
C. All PC Air and 400 Hz equipment installed at existing gates and passenger boarding bridges shall be POU units.
D. All PC Air and 400 Hz equipment installed at newly constructed terminals and concourses shall be POU units. Centralized systems will be considered by MDOT MAA when the installer can meet the following requirements:
    1. Demonstrates through cost benefit analysis the viability of the central system.
    2. Agrees to lease all areas associated with the central system equipment.
    3. Satisfies all concerns related to location of equipment in the building and on the aircraft ramp, line-of-sight issues, aesthetic issues, real estate issues, and operational issues.
    4. For centralized PC Air, the glycol loop piping shall be constructed with soldered or welded joints (not threaded), and will be placed in the lower level only, keeping it out of public spaces. All main supply piping for the glycol loop shall be located in the interior of the building.
    5. For 400 Hz systems, all main supply conduits and wires shall be located in the interior of the building, except for branch conduit and wire needed for connection to the passenger boarding bridge. 400 Hz systems are known to produce harmonics. In order to mitigate the harmonic effects, each piece of 400 Hz equipment must comply with the following performance criteria:
E. All PC Air and 400 Hz units shall be located on the underside of the passenger boarding bridges when possible. In situations where the PC Air unit prohibits the PBB from lowering to the required height to mate to an RJ Aircraft, the unit may be required to be installed on top of the PBB. No ground mounted units are permitted.
    1. Harmonics content: total harmonic distortion of the input current wave form, as measured at the input terminals, shall be 30% of the lower whenever load is 50% of rated output or higher.
    2. Power factor: the power factor measured at the input terminals shall be 90% or higher whenever load is 50% of rated output or higher.
F. Minimum height restrictor brackets shall be placed on all vertical lift columns to protect bridge-mounted equipment
G. Installation of the PC Air and 400 Hz equipment on the passenger boarding bridge should not affect the structural integrity, operation, or the warranty of the passenger boarding bridge.
H. Building Permit Approval: An airline (tenant) installing PC Air and 400 Hz equipment at its preferential use gate(s) will be required to obtain an MDOT MAA building permit. Notwithstanding the other requirements of the building permit process, the airline will be required to coordinate the installation of PC Air and 400 Hz equipment with MDOT MAA's passenger boarding bridge repair and maintenance contractor. MDOT MAA's contractor will review and inspect the installation. In addition, catalog cuts and data for all proposed equipment should be submitted to MDOT MAA for review and approval.

15.5.2 Metering

This standard is intended to require metering for all PBB electrical power for bridge power 400 Hertz, ground power and Pre-conditioned Air.

Electrical power is used at boarding bridges in three ways:

1. To position bridges up to aircraft doors and maintain bridges at an elevation matching the door height while the aircraft is parked at the gate (Bridge Power).
2. To provide ground power to operate electrically powered aircraft equipment, which uses power at 115 volts, alternating 400 times per second (400 Hertz), or in some cases at 28 volts Direct Current (DC).
3. To provide heated or cooled air to aircraft, called "Pre-conditioned Air" or PC Air (PCA).

15.5.2.1 Metering on Existing Passenger Boarding Bridges

Electrical metering is on all existing PBBs. During the design phase, the Consultant shall verify electrical metering is present for existing gates.

Existing loading bridges at BWI Marshall are outfitted with Bridge Power and various combinations of 400 Hertz and PCA units, powered in varying ways as outlined below:

A. Gates at Terminal A/B have a common circuit for Bridge Power and PCA at each gate. 400 Hertz is provided from a centralized system utilizing two motor generator sets.
B. Some bridges on Piers C, D, and the International Terminal have bridge-mounted 400 Hertz units, so called "Point of Use" or POU units. Some bridges are equipped with PCA units.
C. The existing bridge-mounted installations include the following arrangements:
    1. Bridge Power only, no PCA or 400 Hertz

2. Same circuit for Bridge Power, PCA and bridge-mounted 400 Hertz (POU)
3. Same circuit for Bridge Power and PCA (or 400 Hertz)
4. Individual circuits for Bridge Power, PCA and/or 400 Hertz

15.5.2.2 Requirements for Providing Metering on Existing Passenger Boarding Bridges

Provision of 400 Hertz and Pre-Conditioned Air at loading bridges that do not currently have them shall be a shared responsibility between MDOT MAA and the tenant. The tenant shall be responsible for providing the equipment as necessary, installing panels, wiring, and conduits, disconnect switches, and related equipment to provide the electrical infrastructure necessary to support the improvements.

The tenant shall obtain a building permit for the proposed improvements. The MDOT MAA shall be responsible for providing metering of the additional electrical service and modifications to the accounting system necessary to reflect the proposed service. Coordination of the timing of the improvements shall be the responsibility of the tenant.

The airport currently has a centralized metering data collection system. The meters required will be tied into the existing system, so that the Maryland Aviation Administration can charge these tenants to recover costs incurred by the airport for providing electrical power.

15.5.2.3 Metering Requirements for New or Renovated Passenger Boarding Bridges

Electrical metering shall be added to new gates. Coordinate with the MDOT MAA Project Manager during design.

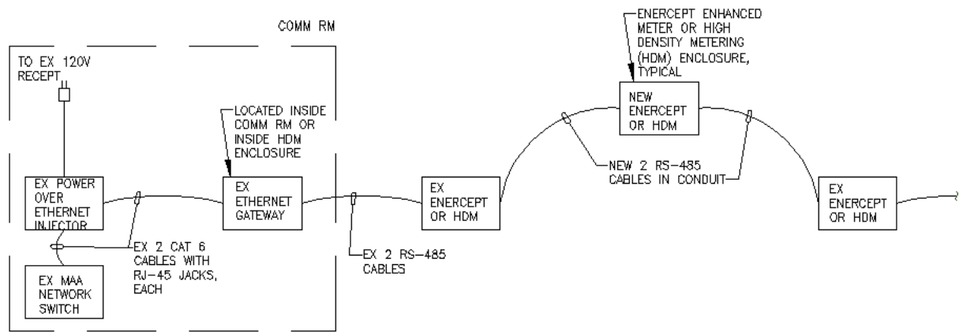
A. New or renovated loading bridges shall have individually metered circuits for:
   1. Bridge Power
   2. PCA (if equipped on bridge)
   3. 400 Hertz (if equipped on bridge, whether POU or Centralized)

B. The meter for each circuit shall be one of the following listed below and be fully compatible with the existing Square-D TMSCE (Tenant Metering Software Commercial Edition), Version 2.5 or higher and the System Management Software (SMS).
   1. High Density Metering (HDM) enclosure with PM750 meters (one meter per circuit). Provide 120V control power to HDM enclosures as necessary.
   2. Enhanced Enercept Meter, rated for circuit.

C. Daisy chain requirements:
   1. Daisy-chain connect each Enhanced Enercept meter to the existing metering network using two RS-485 cables (1 cable as spare) in 1” conduit. RS-485 cable shall be 600V rated Belden 1120A, or approved equal. Refer to the one-line diagram, “Typical Meter Loop One-Line.”
   2. Daisy-chain connect the HDM enclosure to the existing metering network using two plenum-rated RS-485 cables (1 cable as spare). RS-485 cable shall be 300V rated Belden 82841 cable, or approved equal.
   3. Each RS-485 daisy-chain network shall provide maximum 32 devices at cable length of maximum 4000 feet.

D. Provide testing and verifications procedure to ensure functionality of meters.

E. The existing TMSCE and SMS software shall be updated to reflect the new work.



TYPICAL METER LOOP ONE-LINE
NOT TO SCALE

15.6 Grounding Protection

A ground rod is required at each passenger boarding bridge pedestal base. The ground rod shall be connected to the pedestal in accordance with Chapter 11.2.1 Grounding.

15.7 Fire Safety Requirements

Refer to Volume 3, Section 4.3 Fire Safety Requirements for Passenger Boarding Bridge.

15.8 AIRPortal Submission Requirements

Refer to Specification 347713X Apron Drive Passenger Boarding Bridges.

16.0 Baggage Handling Systems Introduction

This standard is based on US airport baggage handling system applications and the design philosophies that have evolved / been established from projects already completed at BWI Marshall. Exceptions to these guidelines do exist. The baggage handling systems standards herein are for conventional slider bed conveyors, recirculating carousels, and checked baggage inspection systems as are being designed/installed in 2008. The standards are performance guidelines for either design/bid/build or design/build procurements. These standards can be utilized with all forms of TSA baggage screening equipment and protocols.

16.1 Baggage Handling Systems (BHS) General Codes and Criteria

A. BHS equipment shall be designed to meet OSHA, NEMA, NFPA, FAR requirements, as well as all local codes.
B. For all Baggage conveyor projects involving Baggage Security Screening, obtain and comply with the latest version of the TSA document, 'Planning Guidelines and Design Standards for Checked Baggage Inspection Systems' (PGDS).
C. Designs shall be based upon key parameters and metrics such as:
    1. Federal Aviation Administration's Terminal Area Forecast (TAF) and specific airline-user flight schedules
    2. Airline's Passenger Level-of-Service and operational procedures
    3. Current and future EDS technology and TSA requirements
    4. Airport development/master plans
    5. Airport and Passenger characteristics
    6. Aircraft Models
    7. Passenger Arrival Curves
    8. Bags per Passenger
    9. Load Factors
    10. Gate Utilization
D. Checked Baggage Inspection Systems (CBIS) shall be designed to be efficient and cost effective. CBISs shall be designed to maximize equipment utilization and minimize systems jams, faults, and errors. All designs shall provide ample clearance for equipment replacement and maintenance while maximizing conveyor layout economy.
E. The BHS shall be capable of processing standard baggage sizes up to 54" in length, 34" in height and 34" in width respectively. The smallest piece of luggage that a standard BHS must accommodate is 12" long, 3" high, and 3" wide; all baggage under these dimensions shall be processed in tubs, provided by the airlines. The maximum weight for standard luggage is 100 lbs.
F. The BHS shall be specified to be installed with industry standard conveyor components, with 39" Between Guide (BG) segments for the transport of standard sized baggage.
G. The BHS must accommodate oversize (O/S) baggage not exceeding 72" in length, 42" in height, 42" in width and 150 lbs in weight.
H. Conveyor right-of-way envelopes shall be no less than 4.5' wide and 4.5' high without catwalk, and no less than 7' wide by 4.5' high with catwalk. Catwalk height clearance should be as tall as possible.
I. Refer to the confined space sections (Volume 7, Chapter 2 Confined Spaces) within this manual with regards to classifying the catwalk spaces.
J. All proposed baggage claim devices installed at BWI Marshall Airport shall be designed to prevent unauthorized access from the non-secure areas into the SIDA while the device is unattended. If the installation does not characteristically prevent such access, the design shall provide a "bag cage" or similar enclosure on the SIDA side. The design shall specify the enclosure be configured to open and close via CASS and all controls shall be incorporated into the belt control logic.

    Consultant shall meet with MDOT MAA Security at concept design phase to obtain approval of method(s) used to prevent unauthorized access from baggage claim devices to the SIDA.

16.2 Baggage Handling and Baggage Inspection Systems Performance

BHS and CBIS shall meet the following performance criteria:

A. Baggage spacing (space between head and tail end of adjacent bags) shall be regulated to comply with current and future EDS technology requirements.
B. Speeds between two adjacent belts shall not vary more than 30% from sending to receiving conveyor.
C. CBIS/BHS shall transport all baggage from originating locations to security screening areas and then transport cleared bags to makeup, within the user's (airline and TSA) designated time frame. The consultant shall model the entire system with EDS which is given by TSA to ensure that the maximum time of a bag in the system is not exceeded.
D. Existing system shall be tied into new system.
E. CBIS/BHS shall queue bags into security areas to allow for varying processing times and efficiently feed TSA workstations as they become available.
F. Configure merges prior to make up units in a manner that does not cause dieback into the security screening matrix.
G. The BHS/CBIS shall not have jams in excess of 1%, based on number of checked bags over the course of an hour.
H. The maximum percentage of error bags entering the CBRA shall be 2% of the total bags for systems without a reinsertion line and 3% for systems with a reinsertion line, in a 24 hour period of time.
I. ATR's misread rate shall not exceed 5% during normal operation.
J. BMA's misread rate shall not exceed 5% during normal operation.

K. Bag tracking error rate (Lost in track, Added bags, or Missing bags) shall not exceed 0.5%.
L. Fail Safe operation activation shall not exceed 0.5% of total bag volume.
M. All conveyor input lines that feed an EDS matrix shall have a minimum capacity of 1800 bags/hour.

16.3 Mechanical Components

Conform to the following standards of mechanical components for BHS/CBIS for MDOT MAA projects:

A. The standard baggage clearance shall be 36” above TOB.
B. The maximum incline or decline angle for all non-tracked conveyors shall be 18°.
C. The maximum incline or decline angle for all tracked conveyors shall be 15°.
D. Slider-bed conveyor construction shall be 39” Between Guides (BG).
E. Oversize Slider-bed conveyor construction shall be 42” BG.
F. Install brake motors on incline and decline conveyors to keep belts from drifting under load.
G. Motors/Gearboxes:
    1. For standard drive units, specify right angle drives as first preference.
    2. Where space is constrained, or drive units will not fit on either side of conveyor, use under-slung drives.
    3. All motors shall have a “C” faced flange and be listed and labeled by the Underwriters Laboratories (UL).
    4. All motors shall have “Class F” insulation and shall have a service factor of 1.25
H. VFD’s shall be utilized on all conveyors upstream of EDS machines, with the possible exception of the take-away conveyors in the public spaces. VFD’s shall be utilized on all conveyors within the CBIS portions of the systems. VFD’s shall be utilized on all conveyors in any tracking zones.
I. Power Face Diverters (PFD) shall have a minimum throughput of 40 bags per minute and at least 5 years of proven successful operation in conveyor systems.
J. Tapered side guard guides (wedges) shall be provided for centering bags before EDS. The guides shall be formed with stainless steel, minimum 10-gauge, Type 304 with #4 brushed finished. All connections shall be smooth and flush without openings. The guides shall be provided with all necessary stiffeners.
K. Vertical Diverters shall have a minimum throughput of 30 bags per minute and at least 5 years of proven successful operation in conveyor systems.
L. Conveyor support structure shall be designed for a minimum of 183 lbs. per linear foot of live load.
M. Catwalk alongside conveyors shall be provided where conveyor TOB elevations are greater than 7’-0” AFF. Catwalk shall be of 30” wide with open grating, and fixed kneeling plates at drive locations.
N. Provide ladders and/or crossovers at all locations identified as bag jam points, at control stations, at conveyor access points, and as required by code to properly access and maintain conveyors.
O. Handrails shall be provided on all catwalks except where adjacent to conveyor.
P. Protect all BHS equipment from damage caused by tug/cart movement using guardrails and/or pipe rails.
Q. Each conveyor section shall be permanently and indelibly marked with its respective number as shown on BHS Contractor’s shop drawings for conveyor identification. Each conveyor number shall be carefully and neatly painted or stenciled in a contrasting color, nominally 4” high, in a conspicuous location on the conveyor drive. Temporary markings on the conveyors or other equipment shall be made with a medium which is readily removable with water or a readily available commercial solvent, such that they may be removed without requiring refinishing of the surface on which they appear.

16.4 Electrical Controls

Conform to the following standards of electrical components for BHS/CBIS for MDOT MAA projects:

A. Remote access to the BHS control system head-end shall be provided through a Virtual Private Network (VPN) connection.
B. E-Stops shall be incorporated into the design at a minimum of every 25’ along each conveyor line.
C. High resolution, shaft mounted tachometers/encoders shall be provided in tracking zones.
D. Baggage Measurement Array (BMA) technology with a history of at least 5 years proven successful operation in conveyor systems shall be provided.
E. Stack light colors within Screening area.
    1. Stand-Alone and Mini-Inline Systems (As defined by the PGDS):

Green	Cleared Bag
Red	Alarmed Bag
Amber	Unknown Bag
White	EDS/BHS Communications Error

    2. Medium Speed and High Speed Inline Systems (As defined by the PGDS):

Green	Normal Run

White	EDS/BHS Communications Error
Amber	BHS Fault
Red	Start Up
Blue	Failsafe

All screening area stack lights shall be equipped with audible alarms.

F. Photoelectric sensors shall be retro-reflective type with polarized lenses.
G. When integrating L3-Examiner 6000's with the BHS, require one MVI card for each EDS device. [Note - other EDS, and later generations of L3 equipment may not require the MVI communications cards.]
H. When a new section of BHS (or CBIS) is being integrated into an existing system, replace the existing PLC with a new control unit to control the entire system. In other words, do not attempt to integrate the new PLC with the existing.
I. Meet or exceed the EDS manufacturer's electrical requirements.
J. One Operator Interface Terminal (OIT)/Human Machine Interface (HMI) shall be provided per Motor Control Panel, to display subsystem diagnostic, maintenance, and control information.
K. Each conveyor motor shall have one heavy duty, 480V, 3 Phase, NEMA 1 disconnect switch and an auxiliary contact to report status of disconnect to PLC for system monitoring.
L. Each Automatic Tag Reader (ATR) shall be a minimum of ten head array and a history of 5 years of proven successful operations in conveyor systems.
M. BHS Contractor shall provide software and hardware consistent with industry standards such as:
    1. Windows based software platform;
    2. Operating system and Graphic User Interface (GUI) shall be user friendly and capable of simultaneously handling multiple programs while incorporating Object Linking and Embedding (OLE); and,
    3. Shall not be Proprietary, or 'Sole Source' hardware or software.
N. PLC System and Centralized Supervisory computers shall be fully redundant to meet the specific functional requirements of the BHS for maintenance information. The controls system shall constantly update the BHS control room's Graphic User Interface(s).

16.5 Outbound Conveyor System

The following design standards shall be met:

A. Ticket Counter/Curbside - Standard ticket counter or curbside load conveyor belt speed shall be 90 Feet per Minute (FPM).
B. Meet or exceed structural floor slab requirements per machine, as stated by EDS supplier.
C. Comply with TSA and FAA noise requirements for staffed areas.
D. Provide a tug aisle clear height of 8'-0" (minimum) from finished floor to lowest hanger or drive component.
E. Make-up unit control stations shall be located within a 16" to 22" arm reach from the perimeter of the unit.

16.6 Inbound Conveyor System

The following design standards shall be met:

A. Design the length of each load belt for a four (4) cart tug train.
B. Make provisions for an unimpeded thirty six (36) inch personnel work space between the load belt and the tug train parking lane.
C. The standard tug train parking lane shall be seven (7) feet wide.
D. Top of Bed elevations for load belts shall be 1'-6" AFF.
E. Load belt speeds shall be 90 fpm.
F. Claim Unit speed shall be 90 fpm.
G. Claim Unit finishes which are visible to the public shall be stainless steel finish.
H. Claim Unit drive motor (primary and redundant) will be capable of starting the carousel under full load conditions.

16.7 Testing and Commissioning

Conform to the following standards for testing and commissioning of BHS/CBIS for MDOT MAA projects:

A. TSA certification testing procedures shall be performed as defined in the TSA document, 'Planning Guidelines and Design Standards for Checked Baggage Inspection Systems', latest edition.
B. Static and dynamic functionality testing, as well as a system throughput test or system 'stress test', shall be performed.

16.8 Warranty/Maintenance/Training/Manuals

Conform to the following standards for BHS/CBIS Warranty Issues and Maintenance Manuals for MDOT MAA projects:

A. The BHS Contractor shall provide one (1) year of Extended Warranty Services including Operation and Maintenance in addition to standard one (1) year general contractor warranty.
   1. On outbound systems with CBIS, provide a minimum of 40 hours training, flexible over all shifts. The training shall be divided up into:
   2. 8 hours of Operational Training for airline personnel.
   3. 8 hours of Operational Training for TSA personnel.
   4. 24 hours of maintenance training for designated operation and maintenance personnel.
B. Draft copies of the Operation and Maintenance (O&M) Manuals shall be submitted 120 calendar days prior to substantial completion and final copies shall be submitted 30 calendar days prior to substantial completion. The final copies of the O&M Manuals shall be bound in an orderly manner in loose-leaf lockable 3-ring binders with complete table of contents. Manuals shall include the as-built drawings, operating and maintenance instructions, wiring diagrams, connections and complete parts list of all items. Include manufacturer's literature, catalog/cutsheet, sources of purchase and similar information.

16.9 Design Coordination Guidelines

Conform to the following Design Coordination Guidelines for MDOT MAA BHS/CBIS projects:

A. Coordinate issues with EDS supplier, such as:
   1. Refer to current integration guide for specific EDS machine (to be provided by TSA).
   2. Proper Standard and Emergency power (such as the NFPA 70-700-1).
   3. Uninterrupted Power Supply (UPS) quantities, requirements and locations.
B. Coordinate issues with TSA: The consultant shall meet with TSA to determine baggage screening technology and protocol. Consultant should also coordinate delivery of survey equipment with schedule for commissioning of BHS.
C. Coordinate new equipment with existing: The consultant shall coordinate existing BHS and controls and compatibility with new equipment. They shall also coordinate new / existing electrical systems, as well as Motor Control Panels.
D. Coordinate with electrical and special systems/communications consultants for:
   1. Start-up sequence (Audio &Video) and card swipe interface.
   2. Security door integration.
   3. Fire system integration to fire doors and conveyor system.
   4. Smoke detectors and Spark detectors.
   5. Baggage Information Display System (BIDS).
   6. Power requirements for outlets and lighting in TSA and non TSA areas.
   7. Emergency power for TSA and non TSA equipment.
   8. Uninterrupted Power Supply (UPS) quantities, requirements and locations for all TSA equipment such as On Screen Resolution (OSR) workstations and Explosive Trace Detection (ETD) workstations.
   9. Network architecture for TSA and BHS communications including master PLC interface with core switch(s) and primary edge switch(s) connections.
   10. Audio/Video Systems interface for baggage control system oversight.
E. Coordinate with the architectural/structural consultant for issues such as:
   1. Spare parts room and maintenance workshop for spare parts and maintenance personnel.
   2. Baggage control room layout and furniture/casework.
   3. Coordinate sizes and locations of wall openings, and associated facility door locations with the Office of the Fire Marshal.
   4. Specify draft curtains location and wall interface detail.
   5. Coordinate sizes and locations of floor penetrations.
   6. Verify that structure above ceiling hung conveyor can support conveyor equipment.
   7. Design waterproofed server/communication rooms.
   8. Coordinate EDS machine placement for structural support.
   9. Threat Containment Unit/Threat bag removal paths to comply with local LEO procedure.
F. Coordinate with mechanical engineers to:
   1. Identify complete heat dissipation for all electrical and mechanical loads of the baggage handling system.
   2. Coordinate the conditioning of TSA Checked Baggage Reconciliation Area (CBRA) and other equipment such as Baggage Viewing Stations (BVS), ETD, Search Work Stations (SWS), etc. (Check with TSA at the time of design to ensure updated design equipment and requirements, if possible). Ensure that all baggage conveyors and components have appropriate facility identity/numbering.
   3. Verify that all ancillary equipment installed is free from all conveyor clearance spaces.
   4. Confirm adequate EDS air conditioning condensate drainage.
   5. Specify proper fire protection over and under required areas according to local code.
G. Safety Standards Coordination: As-Built Plans (Red-lined/CD's), equipment placed, and system management systems shall have uniformity of labeling/signage placed in order to implement the appropriate safety standards associated with OSHA/MOSHA Lock-out/Tag-out work place policies for MDOT MAA Inspections and Final Acceptance Testing.

2A.1 Checklist (5 pages)

Click the image to download the document in Adobe PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION
OFFICE OF ENGINEERING AND CONSTRUCTION MANAGEMENT

AIRPORT CONSTRUCTION PROJECT CHECKLIST
DIVISION OF FACILITIES DESIGN

MAA Project No.: _____

Project Title: _____

FAA Funding? ____ Yes ____ No **FAA Project No.:** _____

Instructions: All projects designed for the Maryland Aviation Administration, Office of Engineering and Construction Management will be performed in accordance with this checklist. The checklist should be completed as design progresses, and must be included with each submission of design documents. In general, any item on the following checklist which is checked "N/A" (not available or not applicable) should include a short explanation of action taken

Items on the checklist are to be completed by the Engineer, except as noted otherwise. Where checklist items call for approval, coordination, or notification of other agencies, including those outside of MAA, documentation shall be made by the Engineer in writing. If information is not transmitted in a timely manner, the Engineer should send a follow-up request. If no response is received, the Engineer should document such non-response and notify the MAA project manager.

Any changes in project scope, design and/or construction costs, or schedule resulting from design reviews or other causes must be approved by the Manager, Design Services in writing before design work may proceed. There will be no exceptions.

For Federally-funded projects, the FAA Project Checklist (see Schedule B) must also be completed.

Yes	No	N/A	
___	___	___	1. Has the Planning Division Checklist been received? Have all items noted in this checklist been addressed and coordinated with the Office of Planning & Environmental Services, and will they have any impact on design? Can design proceed?
___	___	___	2. Have airport property plats and descriptions been reviewed? If the proposed project is not on MAA property, has the project been coordinated with the MAA Division of Real Estate?

2A.2 Schedule A (3 pages)

Click the image to download the document in Adobe PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION
FACILITIES DEVELOPMENT AND ENGINEERING

AIRPORT CONSTRUCTION PROJECT CHECKLIST
OFFICE OF DESIGN
SCHEDULE A

MAA Project No.: _____

Project Title: _____

Yes	No	N/A	
___	___	___	1. Has the project been coordinated through the Office of Airport Operations with affected tenants?
___	___	___	2. Has the project been coordinated with the Office of Commercial Management where leases and tenant agreements are affected?
			Traffic Control Plan
___	___	___	1. Has the traffic control plan been coordinated with Airport Operations, State Highway Administration, and county government (i.e., detours, temporary pavement marking, lighting, signage, directional arrow board, etc.)?
___	___	___	2. Have temporary markings on airfield pavements been specified to be painted? (The use of temporary tape markings must be approved by Airport Operations.)
___	___	___	3. Is adequate temporary lighting specified?
___	___	___	4. Are adequate customer/pedestrian protection, temporary signs, dust control measures, etc. specified?
			Civil and Landscaping
___	___	___	1. Have adequate storm water management, erosion and sediment control measures during construction been specified?
___	___	___	2. If needed, have special treatments for establishing ground cover (minimum requirement: topsoil, seed, and mulch) been specified?
___	___	___	3. Have landscaping plans been approved by the MAA Maintenance Division?
			Electrical
___	___	___	1. Have Mode II runway and taxiway signs been specified?
___	___	___	2. Have “switch hitter” runway centerline lights been specified?

2A.3 Schedule B (2 pages)

Click the image to download the document in Adobe PDF format.

FEDERAL AVIATION ADMINISTRATION
PLANS AND SPECIFICATIONS REVIEW CHECKLIST

SCHEDULE B

Airport: _____ **AIP No.**: _____

Yes	**No**	Item
___	___	1. Do the plans and specifications cover all the work included in the tentative allocation? If not, please explain. _____ _____
___	___	2. Do the plans and specifications include any non-eligible development?
___	___	3. Have all coordination (sponsor, users, FAA, etc.) comments been satisfied? If not, please explain. _____ _____
___	___	4. Has an Engineer's Report been submitted to FAA?
___	___	5. For projects containing airport paving, has the FAA Pavement Design Form (FAA Form 5100.1) been submitted to the FAA?
___	___	6. Was a pre-design conference held?
___	___	7. Are there any waivers to FAA standards included in Engineering Report? Have waivers been: Requested: Yes_____ No _____ Approved: Yes_____ No _____
___	___	8. Does the development included in the plans and specifications conform with the approved Airport Layout Plan? If not, please explain. (Note: This can be controlled by including a general layout sheet in the plan set with all grant work items listed in the legend and shown at the location on the airport where it will be constructed. The location and size shown should agree with the approved ALP). _____ _____
___	___	9. Are there any special environmental conditions or requirements that need to be incorporated in the plans and specifications? If yes, please explain. _____ _____

2B.1 Forms

Meeting Minutes Form (.docx, 2 pages)

Click the image to download the document in Microsoft Word format.

<INSERT YOUR COMPANY LOGO HERE>

MEETING MINUTES

MEETING DATE:		**MEETING LOCATION:**	
TASK NUMBER:		**TASK TITLE:**	
MEETING SUBJECT:			

	NAME	E-MAIL ADDRESS	PHONE NUMBER
MAA TASK MANAGER:			
CONSULTANT TASK MANAGER:			
MINUTES PREPARED BY:			

	INVITED PARTICIPANTS	ATTENDEES	REPRESENTING	E-MAIL ADDRESS	PHONE NUMBER
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Construction Cost Estimating Template (.xlsx, 1 page)

Click the image to download the document in Microsoft Excel format.

<Insert Contract Number>
<Insert AE Task Number> . <Insert Task Title>
CONSULTANT: <Insert Consultant>
<Insert Date>

ESTIMATING LEVEL: ☐ Budget ☐ Concept ☐ 30% ☐ 60% ☐ 100% ☐ Bid

ITEM	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL	COMMENT
	CONSTRUCTION COST ESTIMATE					
1					$ -	
2					$ -	
3					$ -	
4					$ -	
5					$ -	
6					$ -	
7					$ -	
8					$ -	
9					$ -	
10					$ -	
11					$ -	
12	Life safety Contingency (If applicable)				$ -	
13	Stormwater Management Contingency (If applicable)				$ -	
14	Asbestos/Lead Removal Contingency (If applicable)				$ -	
15					$ -	
	Special Systems – BAS (Metasys)				$ -	
	Special Systems – FAS (Honeywell)				$ -	
	Special Systems – CASS				$ -	
	Special Systems – CCTV				$ -	
	Special Systems – BGE				$ -	
	Special Systems – Verizon				$ -	
	Special Systems – BHS (Baggage Handling Systems)				$ -	
	Special Systems – Other Systems (Specify)				$ -	
	SUBTOTAL A				$ -	
	Temporary Construction Items (shall not exceed 3% of A)			3%	$ -	
	SUBTOTAL B				$ -	
	Mobilization (shall not exceed 5% of B)			5%	$ -	
	SUBTOTAL C				$ -	
	Design Contingency (25% of C)			0%	$ -	
	SUBTOTAL D				$ -	
	General Conditions X% of D (If not included in Unit Costs)			0%	$ -	
	Contractor O&P X % of D (if not included in Unit Costs)			0%	$ -	
	Construction Security Plan (X % of D)			0%	$ -	
	SUBTOTAL E				$ -	
	Construction Quality Control Plan (3% of E)			3%	$ -	
	SUBTOTAL F				$ -	
	Miscellaneous Construction Allowance (Minimum 10% of F)			0%	$ -	
	Construction Quality Control Plan (3% of Misc. Construction Allowance)			3%	$ -	
	TOTAL CONSTRUCTION COST ESTIMATE				$ -	
	ADDITIONAL PROGRAM COSTS					
	Estimated Design Fee (**As Required**-or 10% to 20% of Construction Cost*)			0%	$ -	
	Design Fee Contingency (% of Estimated Design Fee)			15%	$ -	
	Estimated MAA Project Management Fee (% of Estimated Design Fee)			10%	$ -	
	Estimated CMI Fee (% of Construction Cost)			10%	$ -	
	TOTAL CAPITAL PROGRAM COST ESTIMATE				$ -	
	Escalation Factor X% (if applicable)			0%	$ -	
	GRAND TOTAL				$ -	

Level of Accuracy	☐ Quantity Take-Off	☐ General Square Foot	☐ Comparison with other installations/facilities
List of Sole Source Items Included in this Contract	1 2	3 4	5 6
List of Assumptions			

2B.2 SSI Forms

Refer to Volume 7, Appendix 7A.

2B.3 MROI Forms

MROI – List (.pdf, 1 page)

Included in Specification 010003X_Maintenance, Repair and Operating Items (MROI).

MROI –Approval List (.docx, 1 page)

Click the image to download the document in Microsoft Word format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Maintenance, Repair and Operating Items Approval

Construction Contract Number	
Construction Task Number (If Applicable)	
Construction Contract Title	
Design Task Number	
Design Task/Subtask Title	
Airport	

MROI LIST	Specification Section	Material/Product and Description	Quantity	Units	MAA Person Requesting Item

MAA REPRESENTATIVES	OFFICE	SIGNATURE	DATE
	Design and Construction		
	Capital Programs		
	Procurement		
	Maintenance & Utilities (If applicable)		
	Information Technology (If applicable)		

Notes:

1. This form shall be completed by the consultant and included in the Final Design Report. If no design report is prepared, a scanned copy of this form shall be emailed to the MAA Task Manager for inclusion in the task file.
2. Once MAA signatures have been obtained for the approved MROI, designer shall transfer this list to the "MROI List" form, which is to be included in the Technical Specifications behind Item 010003X.

MROI – Record of Delivery (.pdf, 1 page)

Included in Specification 010003X_Maintenance, Repair and Operating Items (MROI).

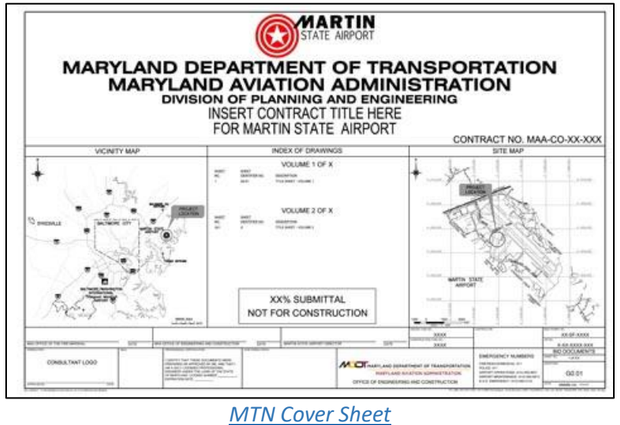
2C.1 01 Cover Sheets

Click an image to download a single AutoCAD DWG file.

2C.1.1 BWI

BWI Cover Sheet

2C.1.2 MTN

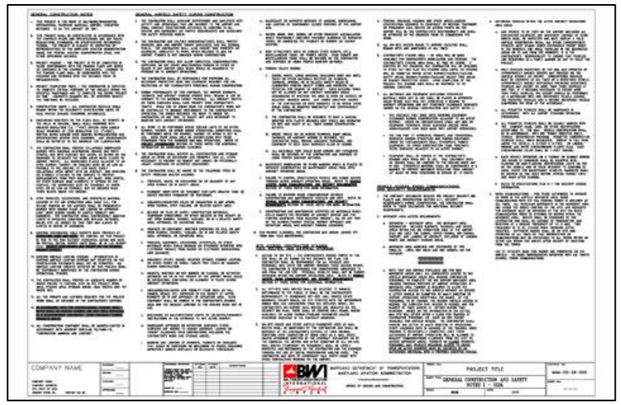


MTN Cover Sheet

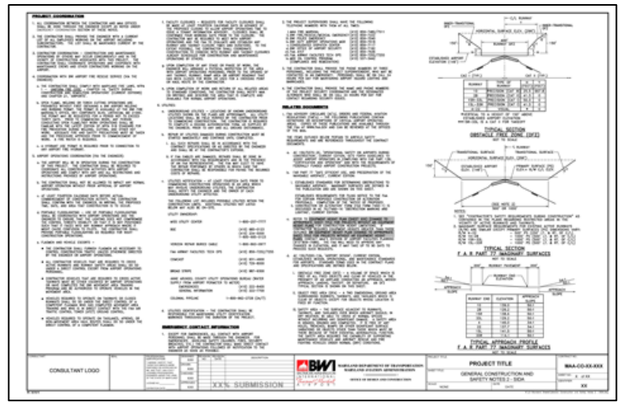
2C.2 02 General Construction and Safety Notes

Click an image to download a single AutoCAD DWG file.

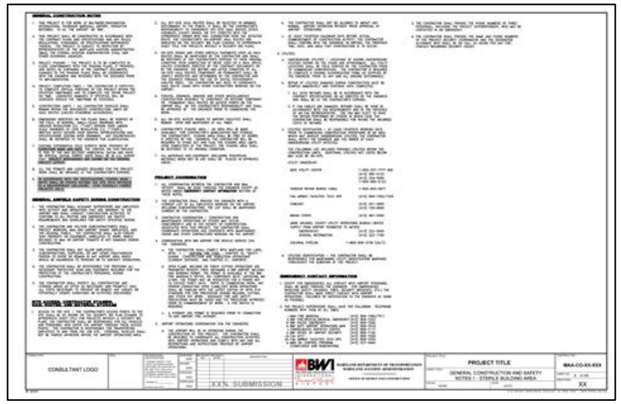
2C.2.1 BWI



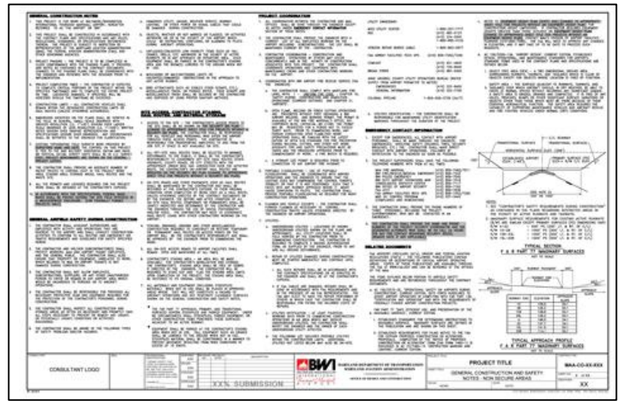
SIDA 1



SIDA 2



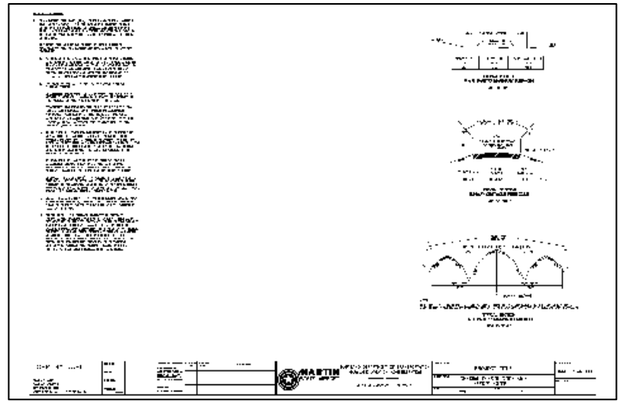
Sterile Building Area



Non-Secure Areas

2C.2.2 MTN

Sheet 1



Sheet 2

2C.3 03 Erosion and Sediment Control

Refer to Volume 4, Appendix 4A.

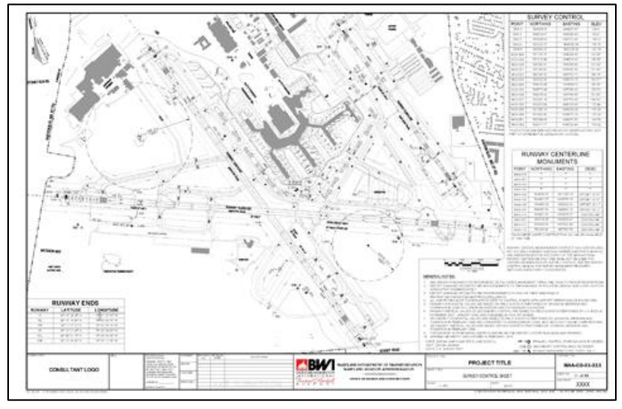
2C.4 04 Vegetative Stabilization Notes

Refer to Volume 4, Appendix 4A.

2C.5 05 Survey Control

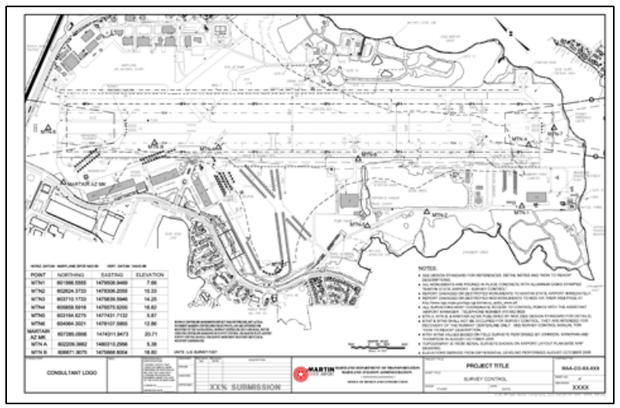
Click an image to download a ZIP file.

2C.5.1 BWI



BWI

2C.5.2 MTN



MTN

2C.6 06 General Stormwater Management Notes

Refer to Volume 4, Appendix 4A.

2C.7 MAA Logo Images

Refer to Volume 1, Appendix 1D – Section 1D.4.1.8.

2D.01 Division 01 - MAA Standard Specifications

Click the following links to download the individual specifications in Microsoft Word format.
Specification 010001X Mobilization - Demobilization

Specification 010002X Construction Quality Control Plan (CQC)

Specification 010003X Maintenance, Repair and Operating Items (MROI) with forms

Specification 010004X Temporary Construction Items

Specification 010010X Survey Requirements During Construction (AGIS)

Specification 010011X Misc Construction Allowance

Specification 017419X Construction Debris Management and Disposal

Specification 017823X Operation and Maintenance Data

2D.08 Division 08 - Openings (Doors and Windows)

Click the following links to download the individual specifications in Microsoft Word format.
Specification 087100 Door Hardware

2D.23 Division 23 - Heating, Ventilation, & Air Conditioning

Click the following links to download the individual specifications in Microsoft Word format.
Specification 230519 Air Flow Measuring Systems (AFM-AFMS)

Specification 230519 Flow Meter - Turbine Flowmeters

Specification 230900 Building Automation System (BAS)

2D.26 Division 26 - Electrical

Click the following links to download the individual specifications in Microsoft Word format.
Specification 262300 Power Monitors for Low Voltage Switchgear

Specification 262416 Panelboards

Specification 262923 Variable Frequency Drives (VFDs)

2D.27 Division 27 - Communications (MAA Office of Technology Standards and Specifications)

Refer to Volume 6, Appendix 6B.

2D.28 Division 28 - Electronic Safety and Security

Refer to Volume 7, Appendix 7B.

2D.32 Division 32 - Exterior Improvements

Refer to Volume 4, Appendix 4B.

2D.33 Division 33 - Utilities

Click the following links to download the individual specifications in Microsoft Word format.
Specification 335103X Natural Gas Distribution

2D.34 Division 34 - Transportation

Click the following links to download the individual specifications in Microsoft Word format.
Specification 347713X Apron Drive Passenger Boarding Bridges

2D.50 Division 50 - FAA Specifications (MAA's Standard Specifications)

Click the following links to download the individual specifications in Microsoft Word format.
Specification L-109 Modifications and Additions to Airfield Lighting Control System

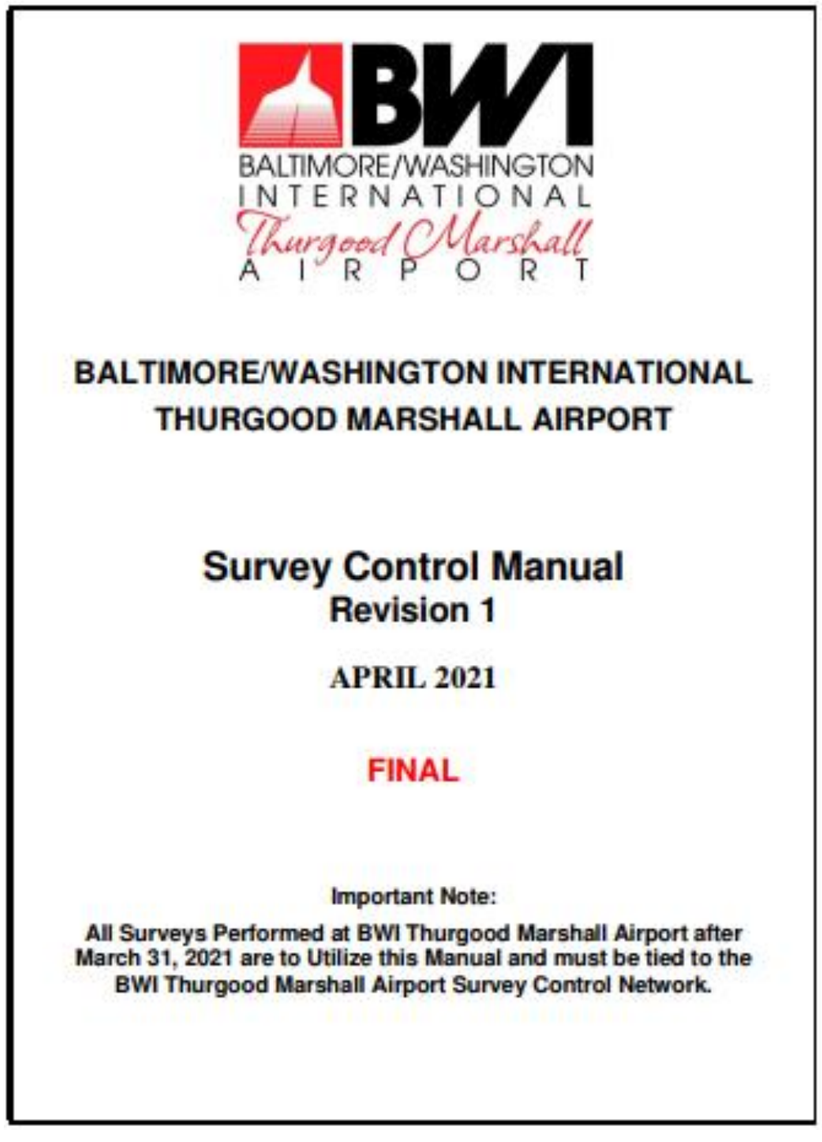
Specification L-125 Installation of Airport Lighting Systems

Specification P-209 Crushed Aggregate Base Course

Specification P-401 Plant Mix Bituminous Pavements

2E.1 BWI

BWI Survey Control Manual (.pdf, 64 pages)
Click the image to download the document in Adobe PDF format.



BALTIMORE/WASHINGTON INTERNATIONAL
Thurgood Marshall AIRPORT

BALTIMORE/WASHINGTON INTERNATIONAL
THURGOOD MARSHALL AIRPORT

Survey Control Manual
Revision 1

APRIL 2021

FINAL

Important Note:

All Surveys Performed at BWI Thurgood Marshall Airport after March 31, 2021 are to Utilize this Manual and must be tied to the BWI Thurgood Marshall Airport Survey Control Network.

2E.2 MTN

Martin State Airport Survey Control Manual (.pdf, 29 pages)

Click the image to download the document in Adobe PDF format.

MARTIN STATE AIRPORT

Survey Control Manual

February 1, 2014

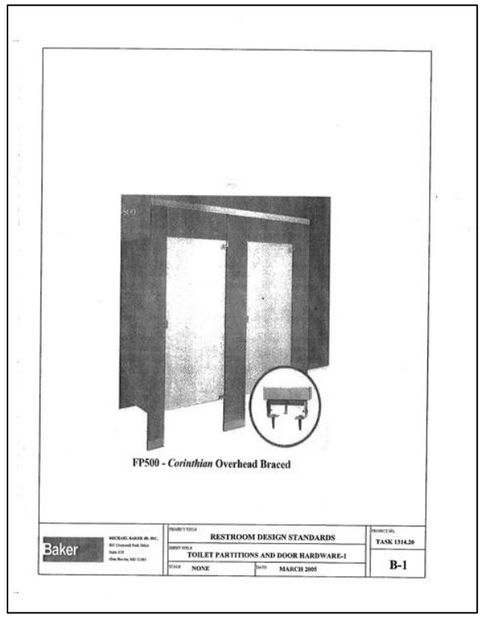
Important Note:

All Surveys Performed at Martin State Airport after February 1, 2014 are to Utilize this Manual and must be tied to the Martin State Airport Survey Control Network.

(See MAA Design Standard No. 8.1.1.2)

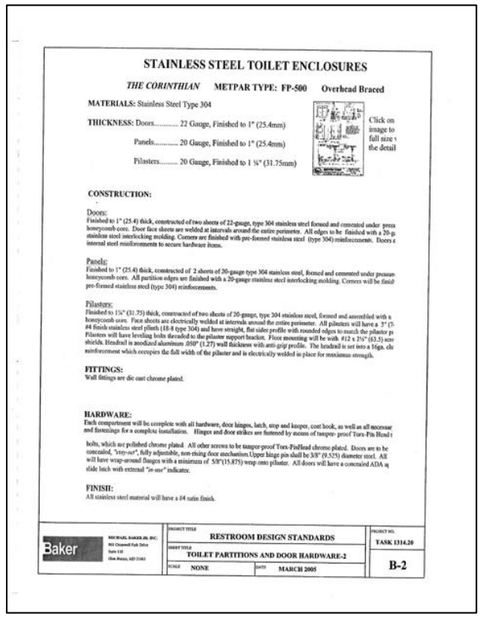
2F.1 Partition Hardware

Click an image to download a single cut sheets in Adobe PDF format.
Click Here to download the entire set of Partition Hardware cut sheets (20 pages) in a Single PDF file.


FP500 - *Corinthian* Overhead Braced

Baker | MICHAEL BAKER JR. INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: TOILET PARTITIONS AND DOOR HARDWARE-1 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-1

B-1: TOILET PARTITIONS AND DOOR HARDWARE-1


STAINLESS STEEL TOILET ENCLOSURES

THE CORINTHIAN METPAR TYPE: FP-500 Overhead Braced

MATERIALS: Stainless Steel Type 304

THICKNESS: Doors..... 22 Gauge, Finished to 1" (25.4mm)
Panels..... 20 Gauge, Finished to 1" (25.4mm)
Pilasters..... 20 Gauge, Finished to 1 ¼" (31.75mm)

Click on image to full size the detail

CONSTRUCTION:

Doors:
Finished to 1" (25.4) thick, constructed of two sheets of 22-gauge, type 304 stainless steel formed and cemented under press honeycomb core. Door face sheets are welded at intervals around the entire perimeter. All edges to be finished with a 20-g stainless steel interlocking molding. Corners are finished with pre-formed stainless steel (type 304) reinforcements. Doors a internal steel reinforcements to secure hardware items.

Panels:
Finished to 1" (25.4) thick, constructed of 2 sheets of 20-gauge type 304 stainless steel, formed and cemented under pressure honeycomb core. All partition edges are finished with a 20-gauge stainless steel interlocking molding. Corners will be finish pre-formed stainless steel (type 304) reinforcements.

Pilasters:
Finished to 1¼" (31.75) thick, constructed of two sheets of 20-gauge, type 304 stainless steel, formed and assembled with a honeycomb core. Face sheets are electrically welded at intervals around the entire perimeter. All pilasters will have a 3" (7- #4 finish stainless steel plinth (18-8 type 304) and have straight, flat sides profile with rounded edges to match the pilaster pa Pilasters will have leveling bolts threaded to the pilaster support bracket. Floor mounting will be with #12 x 2½" (63.5) scre shields. Headrail is anodized aluminum .050" (1.27) wall thickness with anti-grip profile. The headrail is set into a hinge, cle reinforcement which occupies the full width of the pilaster and is electrically welded in place for maximum strength.

FITTINGS:
Wall fittings are die cast chrome plated.

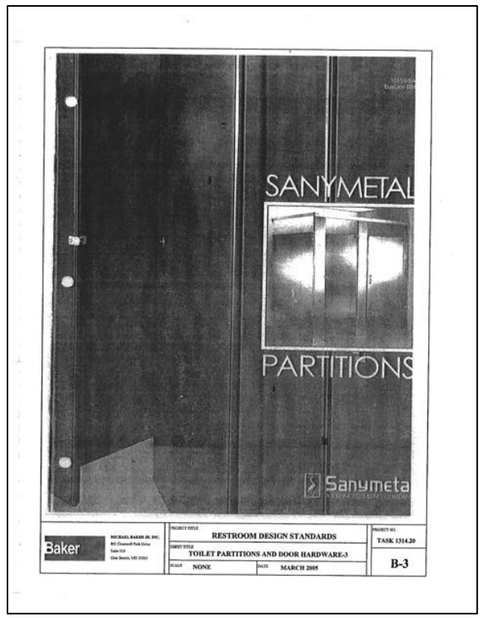
HARDWARE:
Each compartment will be complete with all hardware, door hinges, latch, strip and keeper, coat hook, as well as all necessar and fittings for a complete installation. Hinges and door strikes are fastened by means of tamper- proof Torx-Pin Head s

bolts, which are polished chrome plated. All other screws to be tamper-proof Torx-Pinhead chrome plated. Doors are to be concealed, "easy-set", fully adjustable, non-sticking door mechanism.Upper hinge pin shall be 3/8" (9.525) diameter steel. All will have wrap-around flanges with a minimum of 5/8"(15.875) wrap onto pilaster. All doors will have a concealed ADA st slide latch with external "in-use" indicator.

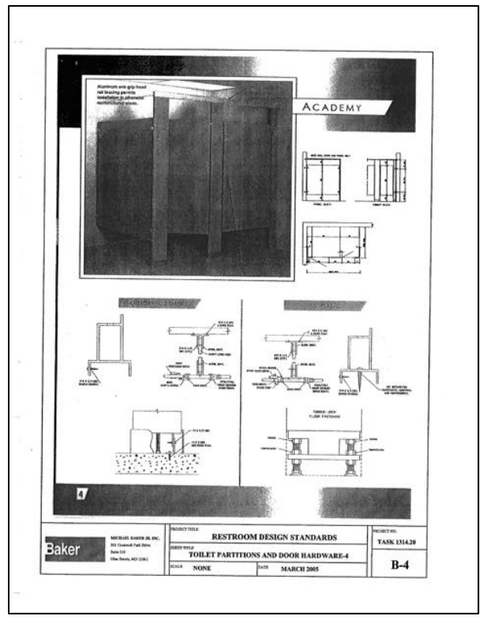
FINISH:
All stainless steel material will have a #4 satin finish.

Baker | MICHAEL BAKER JR. INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: TOILET PARTITIONS AND DOOR HARDWARE-2 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-2

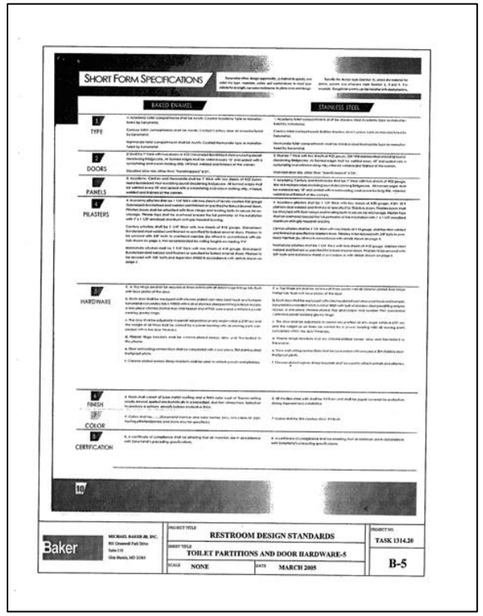
B-2: TOILET PARTITIONS AND DOOR HARDWARE-2



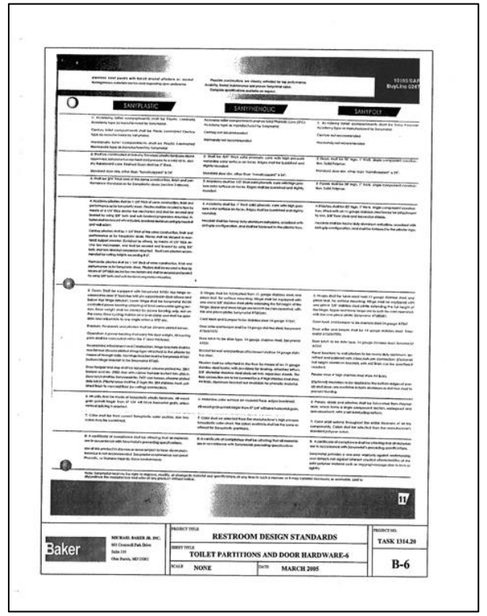
[B-3: TOILET PARTITIONS AND DOOR HARDWARE-3]



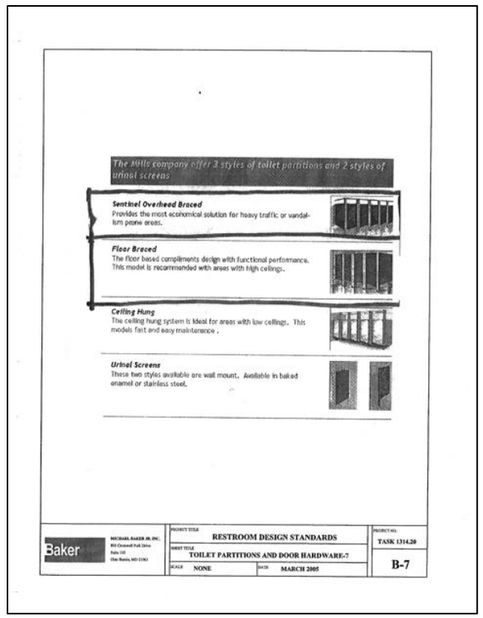
[B-4: TOILET PARTITIONS AND DOOR HARDWARE-4]



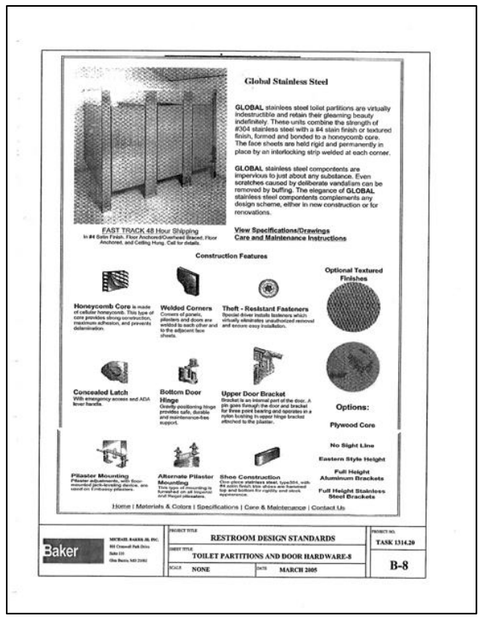
[B-5: TOILET PARTITIONS AND DOOR HARDWARE-5]



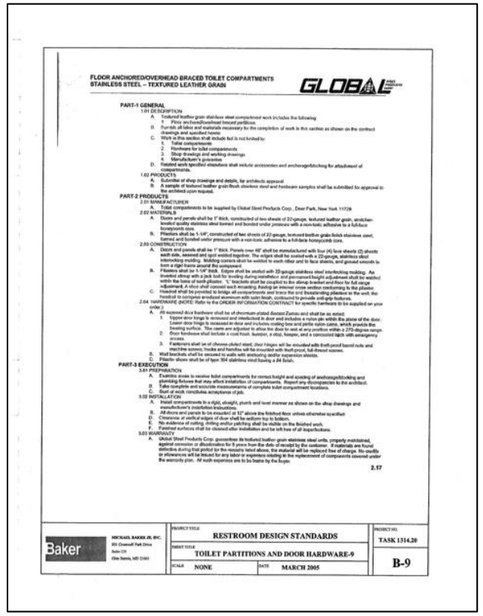
[B-6: TOILET PARTITIONS AND DOOR HARDWARE-6]



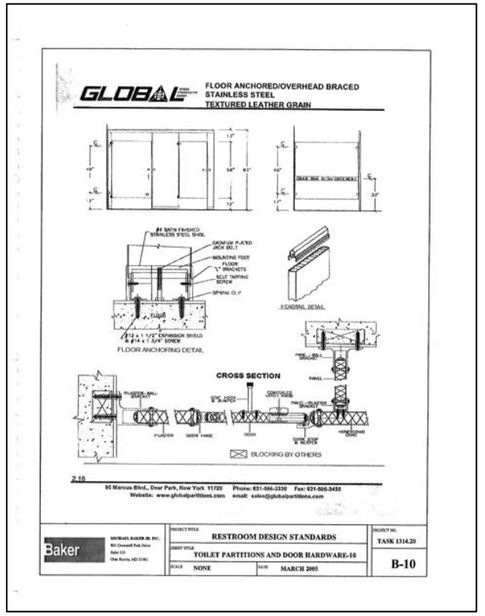
[B-7: TOILET PARTITIONS AND DOOR HARDWARE-7]



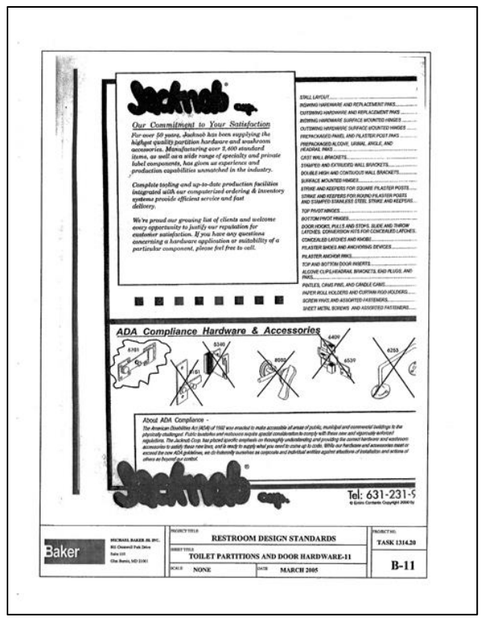
[B-8: TOILET PARTITIONS AND DOOR HARDWARE-8]



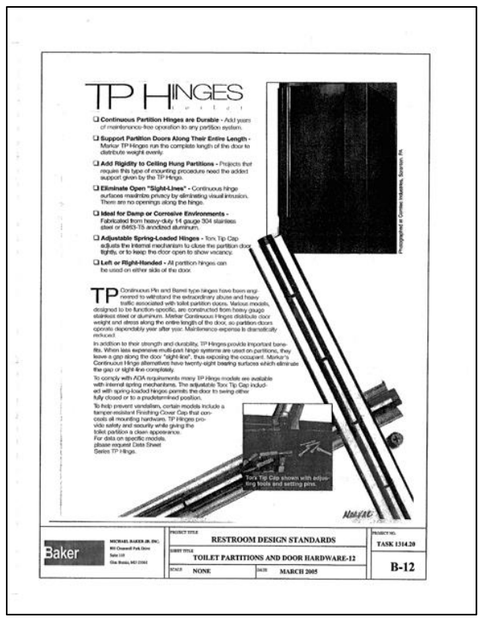
[B-9: TOILET PARTITIONS AND DOOR HARDWARE-9]



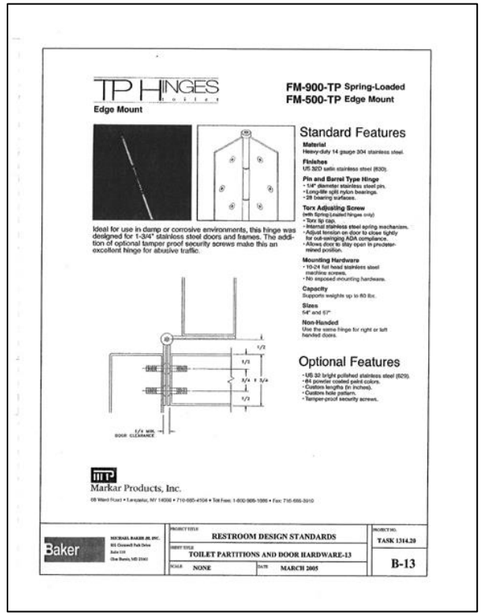
[B-10: TOILET PARTITIONS AND DOOR HARDWARE-10]



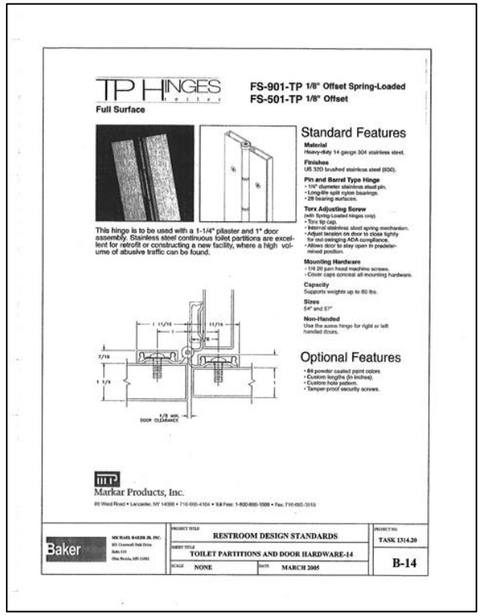
[B-11: TOILET PARTITIONS AND DOOR HARDWARE-11]



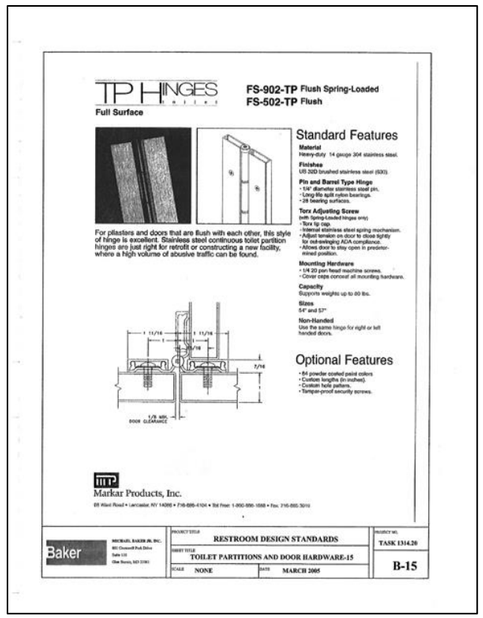
[B-12: TOILET PARTITIONS AND DOOR HARDWARE-12]



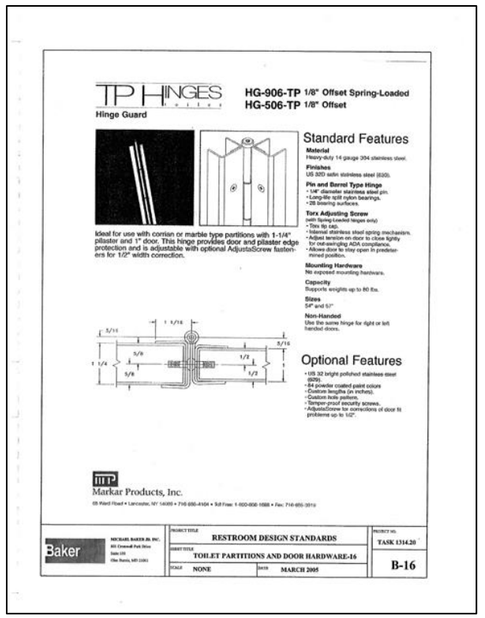
[B-13: TOILET PARTITIONS AND DOOR HARDWARE-13]



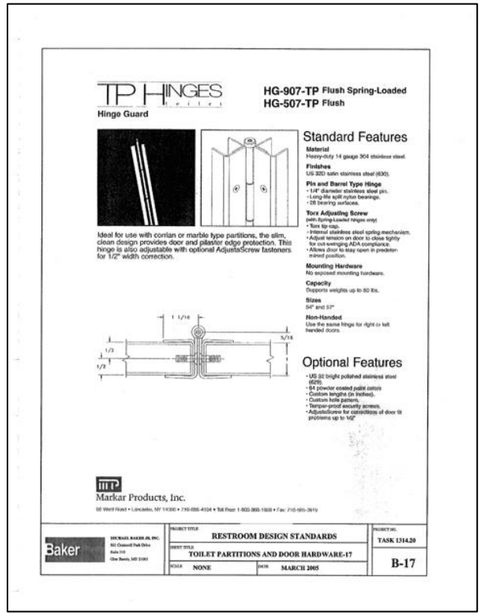
[B-14: TOILET PARTITIONS AND DOOR HARDWARE-14]


TP HINGES
Full Surface
FS-902-TP Flush Spring-Loaded
FS-502-TP Flush
Standard Features
Material
Heavy-duty 14 gauge 304 stainless steel.
Finishes
US 32D brushed stainless steel (630).
Pin and Barrel Type Hinge
• 1/4" diameter stainless steel pin.
• Long-life split nylon bearings.
• 2B bearing surfaces.
Torx Adjusting Screw
(with Spring-Loaded hinges only)
• Torx tip cap.
• Internal stainless steel spring mechanism.
• Adjust tension on door to close tightly for out-swinging ADA compliance.
• Allows door to stay open in predetermined position.
Mounting Hardware
• 1/4 20 pan head machine screws.
• Cover caps conceal all mounting hardware.
Capacity
Supports weights up to 80 lbs.
Sizes
54" and 57"
Non-Handed
Use the same hinge for right or left handed doors.
For pilasters and doors that are flush with each other, this style of hinge is excellent. Stainless steel continuous toilet partition hinges are just right for retrofit or constructing a new facility, where a high volume of abusive traffic can be found.
Optional Features
• 64 powder coated paint colors
• Custom lengths (in inches).
• Custom hole pattern.
• Tamper-proof security screws.
1 11/16
1 11/16
5/16
7/16
1/8 MIN. DOOR CLEARANCE
Markar Products, Inc.
Baker
MICHAEL BAKER JR, INC.
PROJECT TITLE
RESTROOM DESIGN STANDARDS
SHEET TITLE
TOILET PARTITIONS AND DOOR HARDWARE-15
SCALE
NONE
DATE
MARCH 2005
PROJECT NO.
TASK 1314.20
B-15

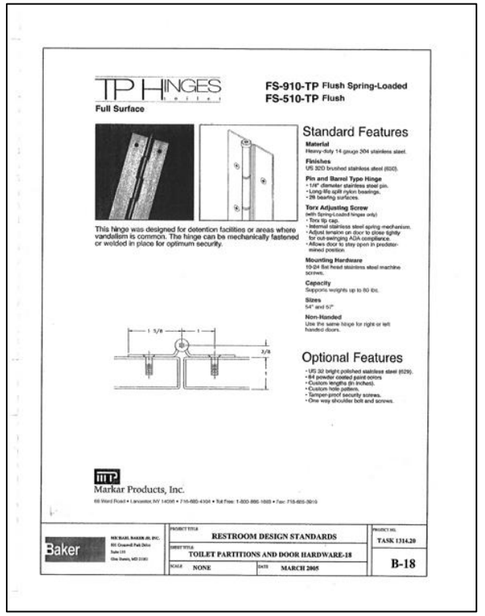
[B-15: TOILET PARTITIONS AND DOOR HARDWARE-15]


TP HINGES
Hinge Guard
HG-906-TP 1/8" Offset Spring-Loaded
HG-506-TP 1/8" Offset
Standard Features
Material
Heavy-duty 14 gauge 304 stainless steel.
Finishes
US 32D satin stainless steel (630).
Pin and Barrel Type Hinge
• 1/4" diameter stainless steel pin.
• Long-life split nylon bearings.
• 2B bearing surfaces.
Torx Adjusting Screw
(with Spring-Loaded hinges only)
• Torx tip cap.
• Internal stainless steel spring mechanism.
• Adjust tension on door to close tightly for out-swinging ADA compliance.
• Allows door to stay open in predetermined position.
Mounting Hardware
No exposed mounting hardware.
Capacity
Supports weights up to 80 lbs.
Sizes
54" and 57"
Non-Handed
Use the same hinge for right or left handed doors.
Ideal for use with corrian or marble type partitions with 1-1/4" pilaster and 1" door. This hinge provides door and pilaster edge protection and is adjustable with optional AdjustaScrew fasteners for 1/2" width correction.
Optional Features
• US 32 bright polished stainless steel (629).
• 64 powder coated paint colors
• Custom lengths (in inches).
• Custom hole pattern.
• Tamper-proof security screws.
• AdjustaScrew for corrections of door fit problems up to 1/2".
1 1/16
3/16
5/8
1 1/4
1/2
5/8
Markar Products, Inc.
Baker
MICHAEL BAKER JR, INC.
PROJECT TITLE
RESTROOM DESIGN STANDARDS
SHEET TITLE
TOILET PARTITIONS AND DOOR HARDWARE-16
SCALE
NONE
DATE
MARCH 2005
PROJECT NO.
TASK 1314.20
B-16

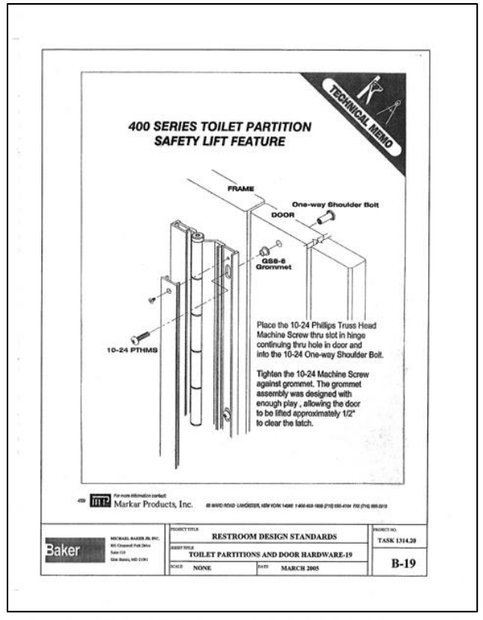
[B-16: TOILET PARTITIONS AND DOOR HARDWARE-16]


TP HINGES
Hinge Guard
HG-907-TP Flush Spring-Loaded
HG-507-TP Flush
Standard Features
Material
Heavy-duty 14 gauge 304 stainless steel.
Finishes
US 32D satin stainless steel (630).
Pin and Barrel Type Hinge
• 1/4" diameter stainless steel pin.
• Long-life split nylon bearings.
• 2B bearing surfaces.
Torx Adjusting Screw
(with Spring-Loaded hinges only)
• Torx tip cap.
• Internal stainless steel spring mechanism.
• Adjust tension on door to close tightly for out-swinging ADA compliance.
• Allows door to stay open in predetermined position.
Mounting Hardware
No exposed mounting hardware.
Capacity
Supports weights up to 80 lbs.
Sizes
54" and 57"
Non-Handed
Use the same hinge for right or left handed doors.
Ideal for use with corrian or marble type partitions, the slim, clean design provides door and pilaster edge protection. This hinge is also adjustable with optional AdjustaScrew fasteners for 1/2" width correction.
Optional Features
• US 32 bright polished stainless steel (629).
• 64 powder coated paint colors
• Custom lengths (in inches).
• Custom hole pattern.
• Tamper-proof security screws.
• AdjustaScrew for corrections of door fit problems up to 1/2".
1 1/16
5/16
1/2
1/2
Markar Products, Inc.
Baker
MICHAEL BAKER JR, INC.
PROJECT TITLE
RESTROOM DESIGN STANDARDS
SHEET TITLE
TOILET PARTITIONS AND DOOR HARDWARE-17
SCALE
NONE
DATE
MARCH 2005
PROJECT NO.
TASK 1314.20
B-17

[B-17: TOILET PARTITIONS AND DOOR HARDWARE-17]


TP HINGES
Full Surface
FS-910-TP Flush Spring-Loaded
FS-510-TP Flush
Standard Features
Material
Heavy-duty 14 gauge 304 stainless steel.
Finishes
US 32D brushed stainless steel (630).
Pin and Barrel Type Hinge
• 1/4" diameter stainless steel pin.
• Long-life split nylon bearings.
• 2B bearing surfaces.
Torx Adjusting Screw
(with Spring-Loaded hinges only)
• Torx tip cap.
• Internal stainless steel spring mechanism.
• Adjust tension on door to close tightly for out-swinging ADA compliance.
• Allows door to stay open in predetermined position.
Mounting Hardware
10-24 flat head stainless steel machine screws.
Capacity
Supports weights up to 80 lbs.
Sizes
54" and 57"
Non-Handed
Use the same hinge for right or left handed doors.
This hinge was designed for detention facilities or areas where vandalism is common. The hinge can be mechanically fastened or welded in place for optimum security.
Optional Features
• US 32 bright polished stainless steel (629).
• 64 powder coated paint colors
• Custom lengths (in inches).
• Custom hole pattern.
• Tamper-proof security screws.
• One way shoulder bolt and screws.
1 1/8
1
3/8
Markar Products, Inc.
Baker
MICHAEL BAKER JR, INC.
PROJECT TITLE
RESTROOM DESIGN STANDARDS
SHEET TITLE
TOILET PARTITIONS AND DOOR HARDWARE-18
SCALE
NONE
DATE
MARCH 2005
PROJECT NO.
TASK 1314.20
B-18

[B-18: TOILET PARTITIONS AND DOOR HARDWARE-18]

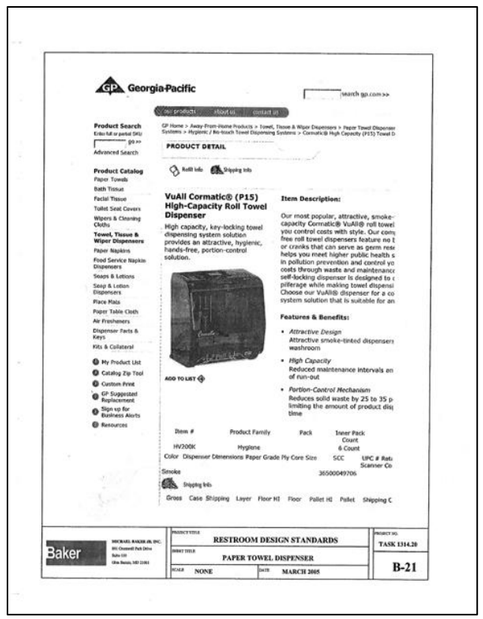


[B-19: TOILET PARTITIONS AND DOOR HARDWARE-19]

[B-20: TOILET PARTITIONS AND DOOR HARDWARE-20]

2F.2 Accessories

Click an image to download a single cut sheet in Adobe PDF format.
Click Here to download the entire set of Accessories cut sheets (26 pages) in a Single PDF file.


Georgia-Pacific

PRODUCT DETAIL

VuAll Cormatic® (P15) High-Capacity Roll Towel Dispenser

High capacity, key-locking towel dispensing system solution provides an attractive, hygienic, hands-free, portion-control solution.

Item Description:

Features & Benefits:

- *Attractive Design*
- *High Capacity*
- *Portion-Control Mechanism*

Baker

RESTROOM DESIGN STANDARDS

PAPER TOWEL DISPENSER

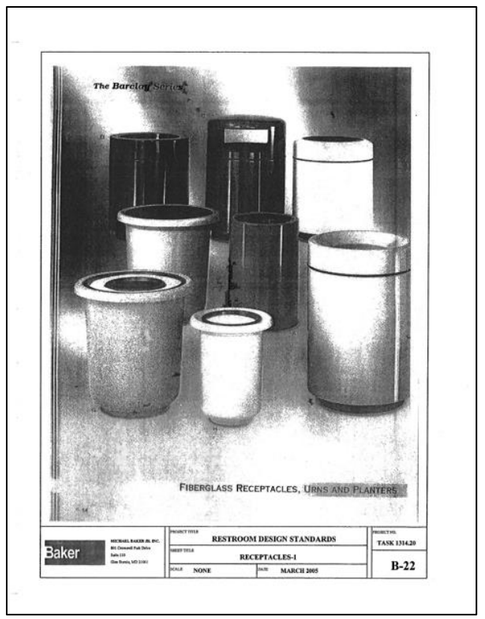
NONE

MARCH 2005

TASK 1314.20

B-21

[B-21: PAPER TOWEL DISPENSER]



Baker

RESTROOM DESIGN STANDARDS

RECEPTACLES-1

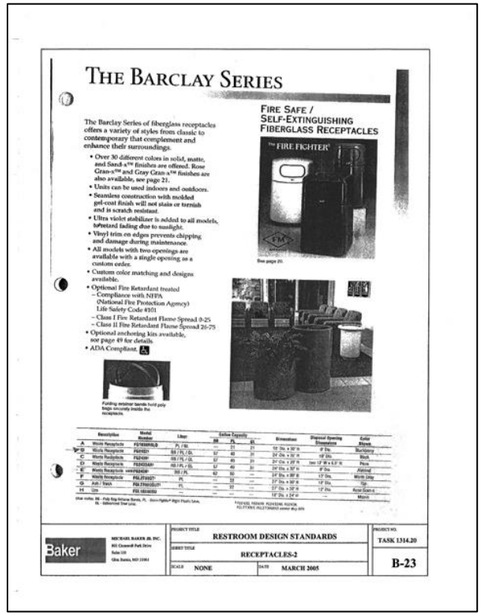
NONE

MARCH 2005

TASK 1314.20

B-22

[B-22: RECEPTACLES-1]


THE BARCLAY SERIES

FIRE SAFE / SELF-EXTINGUISHING FIBERGLASS RECEPTACLES

The Barclay Series of fiberglass receptacles offers a variety of styles from classic to contemporary that complement and enhance their surroundings.

- Over 30 different colors in solid, matte, and Sand-a™ finishes are offered. Rose Gran-a™ and Gray Gran-a™ finishes are also available, see page 21.
- Units can be used indoors and outdoors.
- Seamless construction with molded gel-coat finish will not stain or tarnish and is scratch resistant.
- Ultra violet stabilizer is added to all models, to protect fading due to sunlight.
- Vinyl trim on edges prevents chipping and damage during maintenance.
- All models with two openings are available with a single opening as a custom order.
- Custom color matching and designs available.
- Optional Fire Retardant treated
  - Compliance with NFPA (National Fire Protection Agency) Life Safety Code 101
  - Class I Fire Retardant Flame Spread 0-25
  - Class II Fire Retardant Flame Spread 26-75
- Optional anchoring kits available, see page 49 for details.
- ADA Compliant

Baker

RESTROOM DESIGN STANDARDS

RECEPTACLES-2

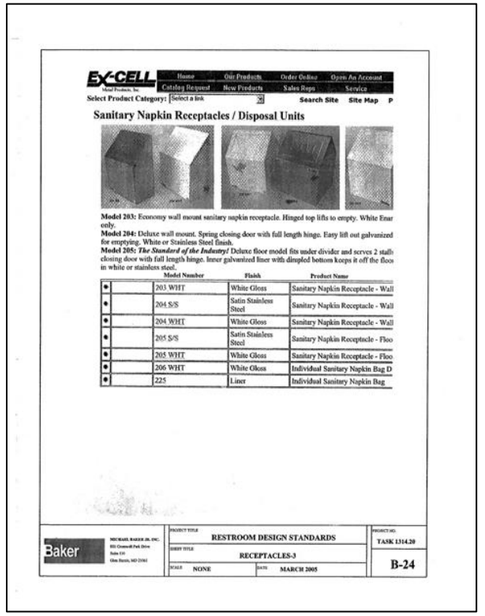
NONE

MARCH 2005

TASK 1314.20

B-23

[B-23: RECEPTACLES-2]


EXCELL

Sanitary Napkin Receptacles / Disposal Units

Model 203: Economy wall mount sanitary napkin receptacle. Hinged top lifts to empty. White Enar only.

Model 204: Deluxe wall mount. Spring closing door with full length hinge. Easy lift out galvanized for emptying. White or Stainless Steel finish.

Model 205: ***The Standard of the Industry!*** Deluxe floor model fits under divider and serves 2 stalls closing door with full length hinge. Inner galvanized liner with dimpled bottom keeps it off the floor in white or stainless steel.

	Model Number	Finish	Product Name
●	203 WHT	White Gloss	Sanitary Napkin Receptacle - Wall
●	203 S/S	Satin Stainless Steel	Sanitary Napkin Receptacle - Wall
●	204 WHT	White Gloss	Sanitary Napkin Receptacle - Wall
●	205 S/S	Satin Stainless Steel	Sanitary Napkin Receptacle - Floo
●	205 WHT	White Gloss	Sanitary Napkin Receptacle - Floo
●	206 WHT	White Gloss	Individual Sanitary Napkin Bag D
●	225	Liner	Individual Sanitary Napkin Bag

Baker

RESTROOM DESIGN STANDARDS

RECEPTACLES-3

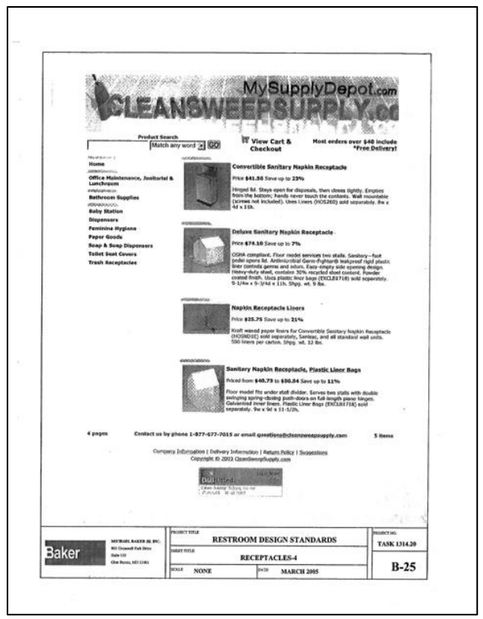
NONE

MARCH 2005

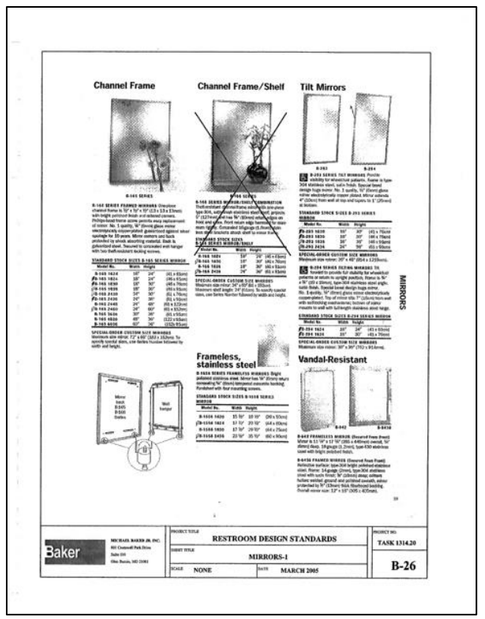
TASK 1314.20

B-24

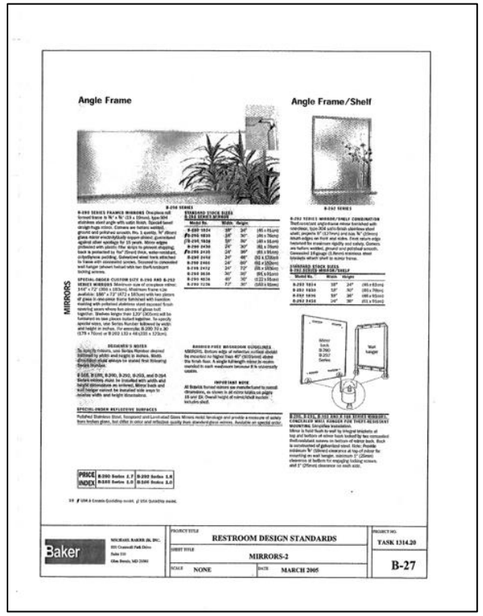
[B-24: RECEPTACLES-3]



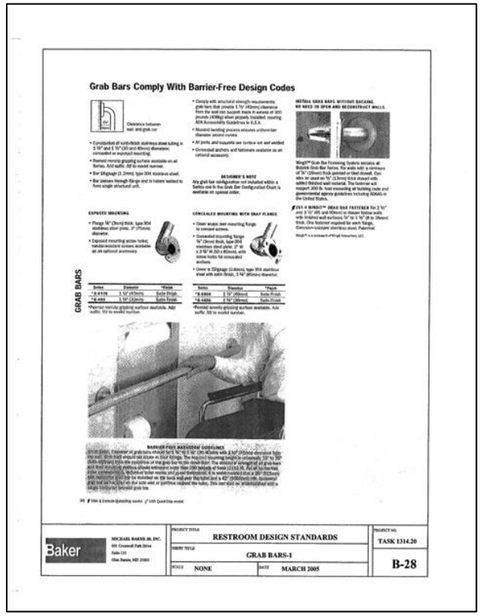
[B-25: RECEPTACLES-4]



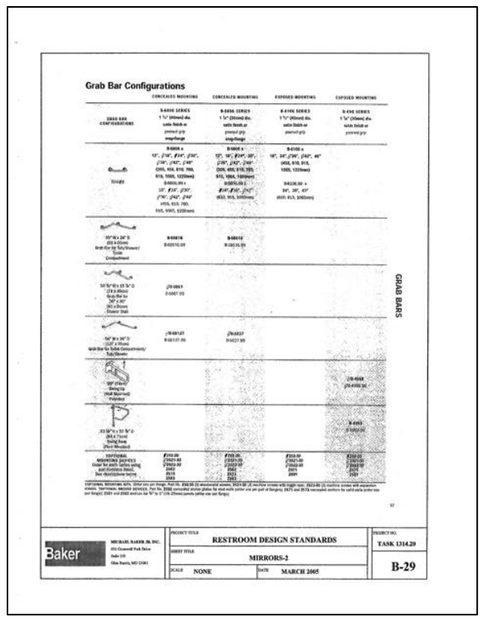
[B-26: MIRRORS-1]



[B-27: MIRRORS-2]

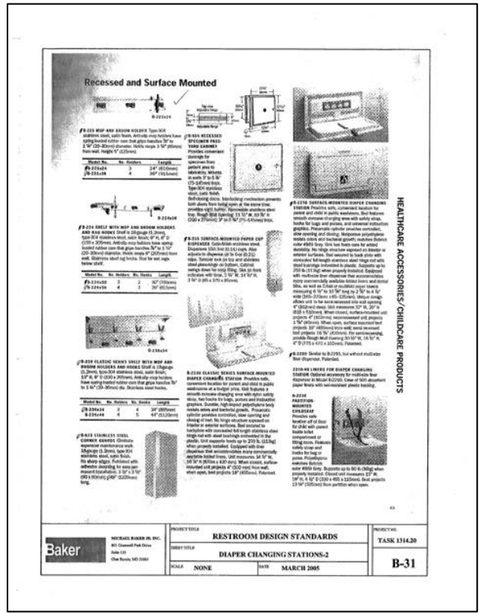


[B-28: GRAB BARS-1]

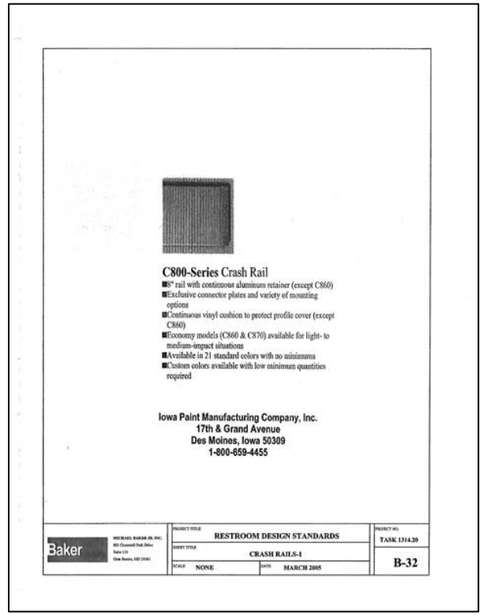


[B-29: GRAB BARS-2]

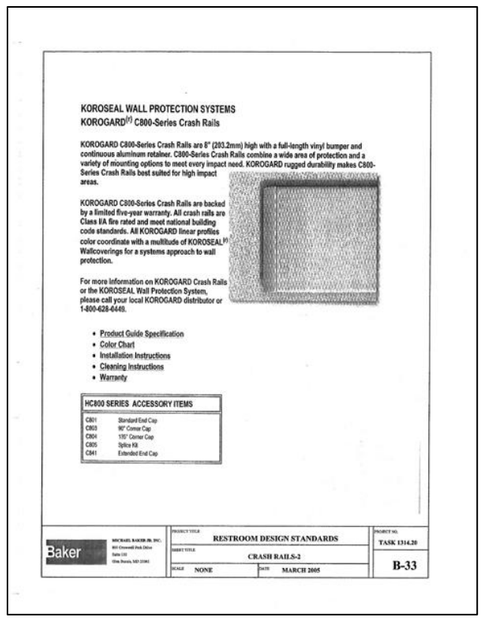
[B-30: DIAPER CHANGING STATIONS-1]



[B-31: DIAPER CHANGING STATIONS-2]



[B-32: CRASH RAILS-1]



KOROSEAL WALL PROTECTION SYSTEMS
KOROGARD[R] C800-Series Crash Rails

KOROGARD C800-Series Crash Rails are 8" (203.2mm) high with a full-length vinyl bumper and continuous aluminum retainer. C800-Series Crash Rails combine a wide area of protection and a variety of mounting options to meet every impact need. KOROGARD rugged durability makes C800-Series Crash Rails best suited for high impact areas.

KOROGARD C800-Series Crash Rails are backed by a limited five-year warranty. All crash rails are Class IIA fire rated and meet national building code standards. All KOROGARD linear profiles color coordinate with a multitude of KOROSEAL[R] Wallcoverings for a systems approach to wall protection.

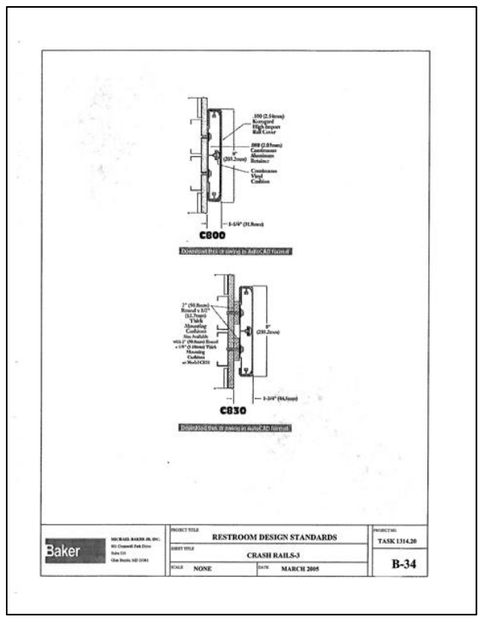
For more information on KOROGARD Crash Rails or the KOROSEAL Wall Protection System, please call your local KOROGARD distributor or 1-800-628-6449.

- Product Guide Specification
- Color Chart
- Installation Instructions
- Cleaning Instructions
- Warranty

HC800 SERIES ACCESSORY ITEMS	
C801	Standard End Cap
C803	90° Corner Cap
C804	135° Corner Cap
C805	Splice Kit
C841	Extended End Cap

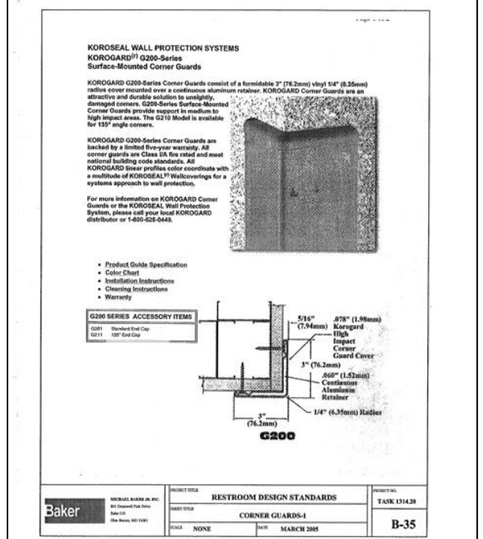
Baker | MICHAEL BAKER JR, INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: CRASH RAILS-2 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-33

[B-33: CRASH RAILS-2]



Baker | MICHAEL BAKER JR, INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: CRASH RAILS-3 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-34

[B-34: CRASH RAILS-3]



KOROSEAL WALL PROTECTION SYSTEMS
KOROGARD[R] G200-Series
Surface-Mounted Corner Guards

KOROGARD G200-Series Corner Guards consist of a formidable 3" (76.2mm) vinyl 1/4" (6.35mm) radius cover mounted over a continuous aluminum retainer. KOROGARD Corner Guards are an attractive and durable solution to unsightly, damaged corners. G200-Series Surface-Mounted Corner Guards provide support in medium to high impact areas. The G210 Model is available for 135° angle corners.

KOROGARD G200-Series Corner Guards are backed by a limited five-year warranty. All corner guards are Class IIA fire rated and meet national building code standards. All KOROGARD linear profiles color coordinate with a multitude of KOROSEAL[R] Wallcoverings for a systems approach to wall protection.

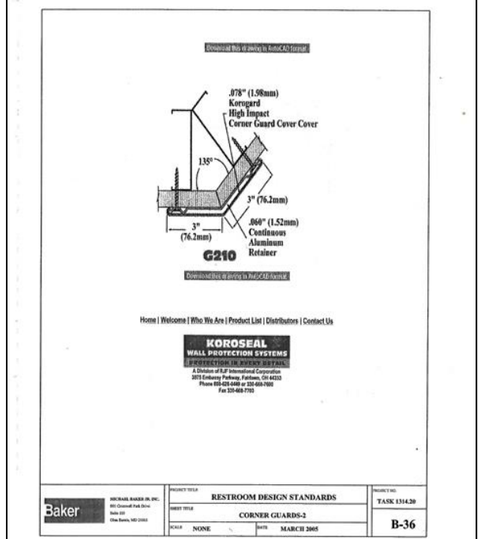
For more information on KOROGARD Corner Guards or the KOROSEAL Wall Protection System, please call your local KOROGARD distributor or 1-800-628-6449.

- Product Guide Specification
- Color Chart
- Installation Instructions
- Cleaning Instructions
- Warranty

G200 SERIES ACCESSORY ITEMS	
G201	Standard End Cap
G211	135° End Cap

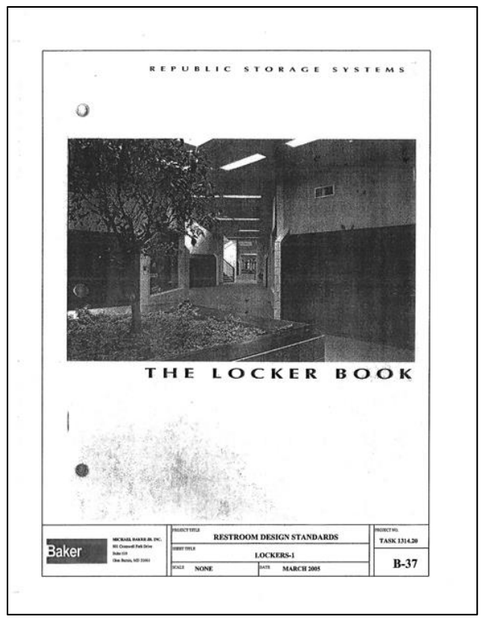
Baker | MICHAEL BAKER JR, INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: CORNER GUARDS-1 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-35

[B-35: CORNER GUARDS-1]



Baker | MICHAEL BAKER JR, INC. | PROJECT TITLE: RESTROOM DESIGN STANDARDS | SHEET TITLE: CORNER GUARDS-2 | SCALE: NONE | DATE: MARCH 2005 | PROJECT NO.: TASK 1314.20 | B-36

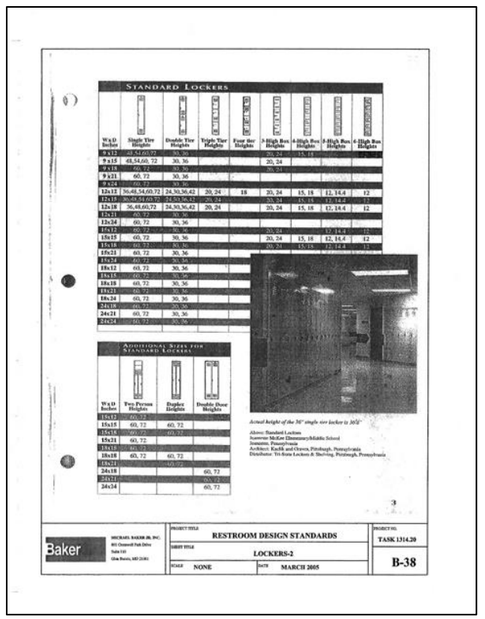
[B-36: CORNER GUARDS-2]


REPUBLIC STORAGE SYSTEMS

THE LOCKER BOOK

Baker | RESTROOM DESIGN STANDARDS | LOCKERS-1 | NONE | MARCH 2005 | TASK 1314.20 | B-37

[B-37: LOCKERS-1]


STANDARD LOCKERS

W x D Inches	Single Tier Heights	Double Tier Heights	Triple Tier Heights	Four tier Heights	3-High Box Heights	4-High Box Heights	5-High Box Heights	6-High Box Heights
9 x 12	48,54,60,72	30, 36			20, 24	15, 18		
9 x 15	48, 54, 60, 72	30, 36			20, 24			
9 x 18	60, 72	30, 36			20, 24			
9 x 21	60, 72	30, 36						
9 x 24	60, 72	30, 36						
12x12	36,48,54,60,72	24,30,36,42	20, 24	18	20, 24	15, 18	12, 14.4	12
12x15	36,48,54,60,72	24,30,36,42	20, 24		20, 24	15,18	12, 14.4	12
12x18	36, 48,60,72	24,30,36,42	20, 24		20, 24	15, 18	12, 14.4	12
12x21	60, 72	30, 36			20, 24			
12x24	60, 72	30, 36						
15x12	60, 72	30, 36			20, 24	15, 18	12, 14.4	12
15x15	60, 72	30, 36			20, 24	15, 18	12, 14.4	12
15x21	60, 72	30, 36						
15x24	60, 72	30, 36						
18x12	60, 72	30, 36						
18x15	60, 72	30, 36						
18x18	60, 72	30, 36						
18x21	60, 72	30, 36						
18x24	60, 72	30, 36						
24x18	60, 72	30, 36						
24x21	60, 72	30, 36						
24x24	60, 72	30, 36						

ADDITIONAL SIZES FOR STANDARD LOCKERS

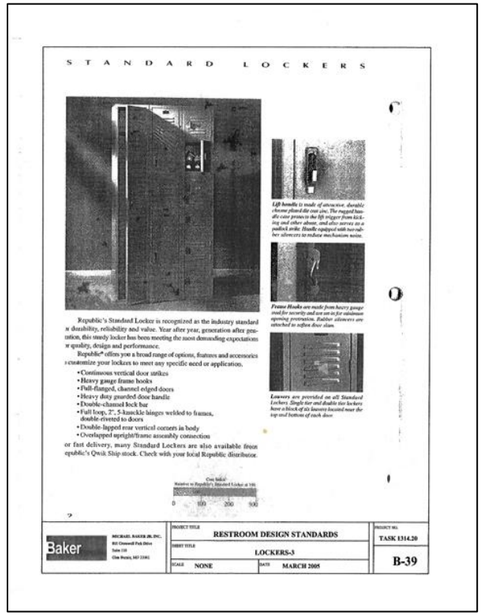
W x D Inches	Two Person Heights	Duplex Heights	Double Door Heights
12x12	60, 72		
15x15	60, 72	60, 72	
15x18	60, 72	60,72	
15x21	60, 72		
18x18	60, 72		
18x18	60, 72	60, 72	
18x21	60, 72	60,72	
24x18			60, 72
24x21			60, 72
24x24			60, 72

Actual height of the 36" single tier locker is 365/8"

Above: Standard Lockers
Somerset Elementary/Middle School
Somerset, Pennsylvania
Architect: Rauhl and Ostrem, Pittsburgh, Pennsylvania
Distributor: Tri-State Lockers & Shelving, Pittsburgh, Pennsylvania

Baker | RESTROOM DESIGN STANDARDS | LOCKERS-2 | NONE | MARCH 2005 | TASK 1314.20 | B-38

[B-38: LOCKERS-2]


STANDARD LOCKERS

Republic's Standard Locker is recognized as the industry standard
in durability, reliability and value. Year after year, generation after gen-
eration, this sturdy locker has been meeting the most demanding expectations
for quality, design and performance.

Republic® offers you a broad range of options, features and accessories
to customize your lockers to meet any specific need or application.

- Continuous vertical door strikes
- Heavy gauge frame hooks
- Full-flanged, channel edged doors
- Heavy duty gnarled door handle
- Double-channel bolt bar
- Full loop, 2", 5-knuckle hinges welded to frames, double-riveted to doors
- Double-lapped rear vertical corners in body
- Overlapped upright/frame assembly connection

for fast delivery, many Standard Lockers are also available from
epublic's Qwik Ship stock. Check with your local Republic distributor.

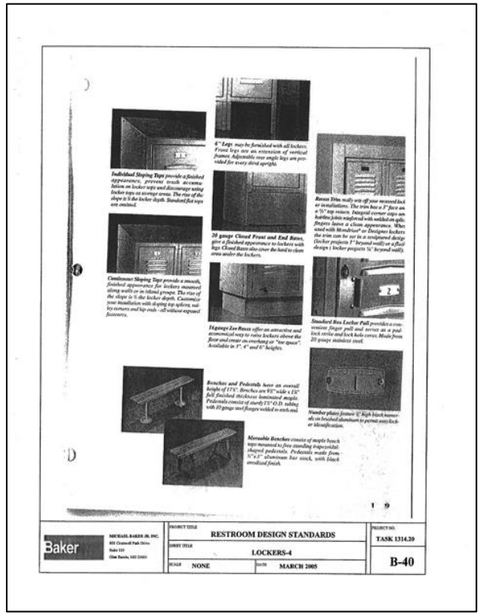
Lift handle is made of attractive, durable chrome plated die cast zinc. The rugged handle case protects the lift trigger from kicking and other abuse, and also serves as a padlock strike. Handle equipped with two rubber silencers to reduce mechanism noise.

Frame Hooks are made from heavy gauge steel for security and are set in for minimum opening protrusion. Rubber silencers are attached to soften door slam.

Louvers are provided on all Standard Lockers. Single tier and double tier lockers have a block of six louvers located near the top and bottom of each door.

Baker | RESTROOM DESIGN STANDARDS | LOCKERS-3 | NONE | MARCH 2005 | TASK 1314.20 | B-39

[B-39: LOCKERS-3]


6" Legs may be furnished with all lockers. Frame legs are an extension of vertical frames. Adjustable rear angle legs are provided for every third upright.

Individual Sloping Tops provide a finished appearance, prevent trash accumulation on locker tops and discourage using locker tops as storage areas. The rise of the slope is ¼ the locker depth. Standard flat tops are omitted.

20 gauge Closed Front and End Bases give a finished appearance to lockers with legs. Closed Bases also cover the hotel to clean area under the lockers.

Continuous Sloping Tops provide a smooth, finished appearance for lockers mounted along walls or in island groups. The rise of the slope is ¼ the locker depth. Customize your installation with sloping top options, sub-base lockers and hip ends - all without exposed fasteners.

Vestibule Box Bases offer an attractive and economical way to raise lockers above the floor and create an overhang or "toe space". Available in 3", 4" and 6" heights.

Benches and Pedestals have an overall height of 17½". Benches are 9½" wide x 12" full finished thickness laminated maple. Pedestals consist of sturdy 13" O.D. tubing with 10 gauge steel hanger welded to each end.

Movable Benches consist of maple bench tops mounted to free standing trapezoidal-shaped pedestals. Pedestals made from 1" x 2" aluminum bar stock, with black anodized finish.

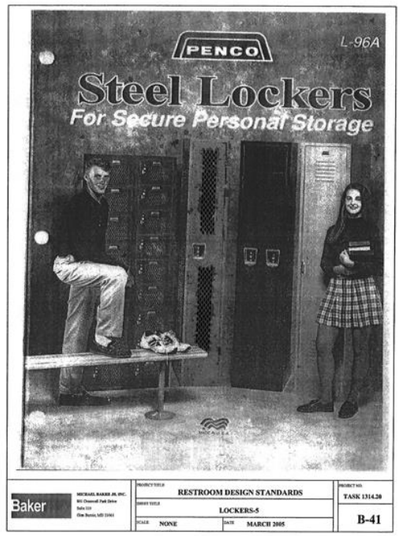
Recess Trim neatly cuts off your recessed locker installations. The trim has a 3" face and a ¾" top return. Integral corner caps are built-in for neat appearance. Where doors and fingers have a clean appearance. When used with Monobloc® or Designer lockers the trim can be set in a toeplanted design (locker projects 1" beyond wall) or a flush design (locker projects ¾" beyond wall).

Standard Box Locker Pull provides a recessed, unique finger pull and mates as a padlock strike and lock-box cover. Made from 20 gauge stainless steel.

Number plates feature ½" high black numerals on brushed aluminum to permit easy identification.

Baker | RESTROOM DESIGN STANDARDS | LOCKERS-4 | NONE | MARCH 2005 | TASK 1314.20 | B-40

[B-40: LOCKERS-4]



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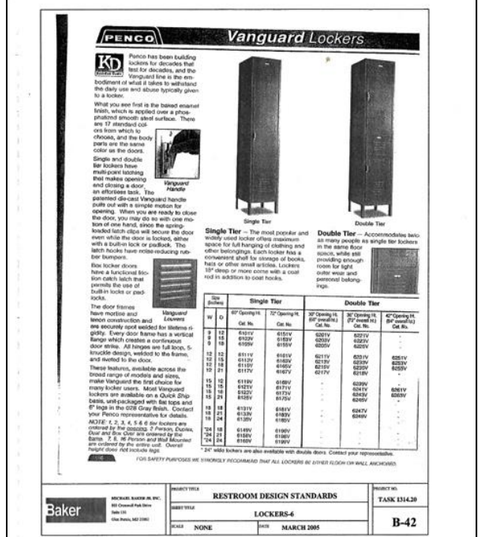

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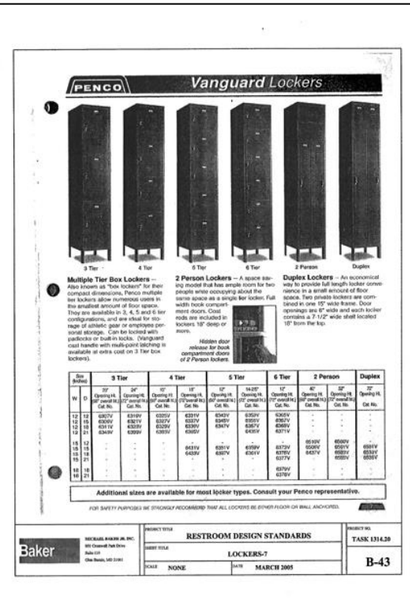

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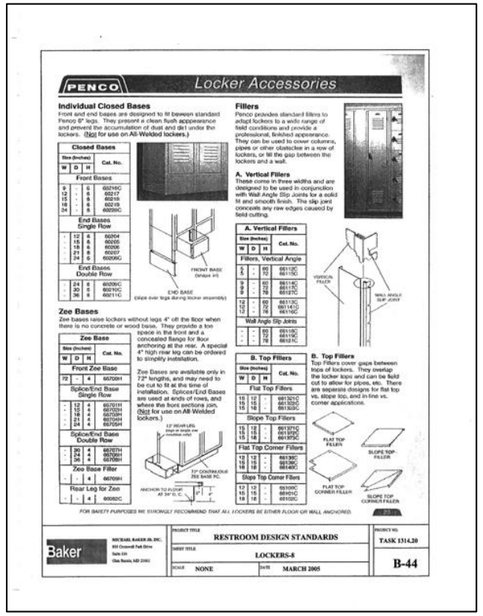

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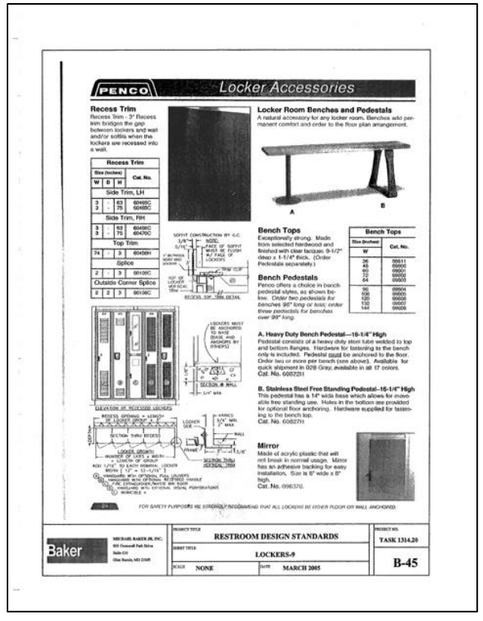

PENCO

Locker Accessories

Recess Trim
Recess Trim - 3" Recess trim for 60gm the gap between lockers and wall locker soffits when the lockers are recessed into a wall.

Recess Trim			
Size (Inches)			Cat. No.
W		H	
Side Trim, LH			
3	-	63	60465C
3	-	78	60485C
Side Trim, RH			
3	-	63	60466C
3	-	78	60470C
Top Trim			
24	-	3	60458H
Splice			
2	-	3	59159C
Outside Corner Splice			
6	2	3	59139C

Locker Room Benches and Pedestals
A natural accessory for any locker room. Benches add permanent comfort and order to the floor plan arrangement.

Bench Tops
Exceptionally strong. Made from selected hardwood and finished with clear lacquer. 9-1/2" deep x 1-1/4" thick. (Order Pedestals separately.)

Bench Tops	
Size (Inches)	
W	Cat. No.
36	09511
45	09505
60	09500
72	09501
84	09503
90	09504
108	09555
120	09556
132	09557
144	09506

Bench Pedestals
Penco offers a choice in bench pedestal styles, as shown below. Order two pedestals for benches 90" long or less; order three pedestals for benches over 90" long.

A. Heavy Duty Bench Pedestal—16-1/4" High
Pedestal consists of a heavy duty steel tube welded to top and bottom flanges. Hardware for fastening to the bench only is included. Pedestal must be anchored to the floor. Order two or more per bench (see above). Available for quick shipment in 628 Gray, available in all 17 colors. Cat. No. 60602H

B. Stainless Steel Free Standing Pedestal–16-1/4" High
This pedestal has a 14" wide base which allows for maximum free standing use. Holes in the bottom are provided for optional floor anchoring. Hardware supplied for fastening to the bench top.
Cat. No. 60627H

Mirror
Made of acrylic plastic that will not break in normal usage. Mirror has an adhesive backing for easy installation. Size is 6" wide x 8" high.
Cat. No. 09637G

FOR SAFETY PURPOSES WE STRONGLY RECOMMEND THAT ALL LOCKERS BE EITHER FLOOR OR WALL ANCHORED.

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		SHEET TITLE: LOCKERS-9	B-45
		SCALE: NONE	DATE: MARCH 2005

[B-45: LOCKERS-9]

Corbin Russwin

Trim Designs

Mortise Locksets ML2000 Series

Lustra
Complies with codes requiring lever to return to within ½" (13mm) of door face. Brass, bronze or stainless steel

LWA
Lever: Wrought
Rose: Wrought
Door Thickness: 1¾" (35mm), 1¾" (44mm), 2¼" (57mm)

LWB
Lever: Wrought
Rose: Cast
Door Thickness: 1¾" (35mm), 1¾" (44mm), 2¼" (57mm)

LSA
Lever: Cast
Rose: Wrought
Door Thickness: 1¾" (35mm), 1¾" (44mm), 2¼" (57mm)

LSB
Lever: Cast
Rose: Cast
Door Thickness: 1¾" (35mm), 1¾" (44mm), 2¼" (57mm)

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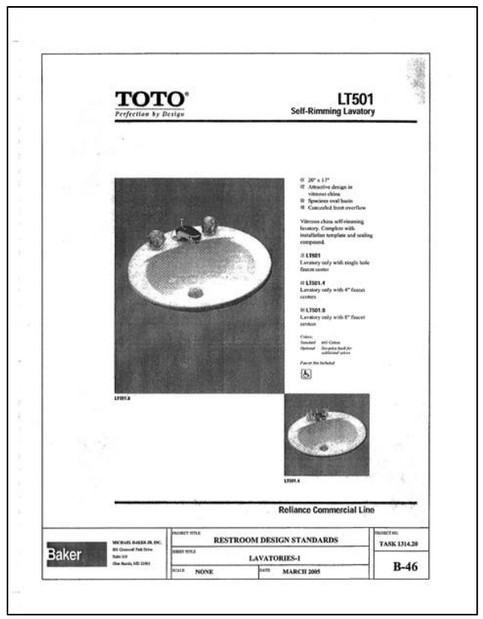
		SHEET TITLE: MORTISE LOCKSET DOOR LEVER	B-63
		SCALE: NONE	DATE: MARCH 2005

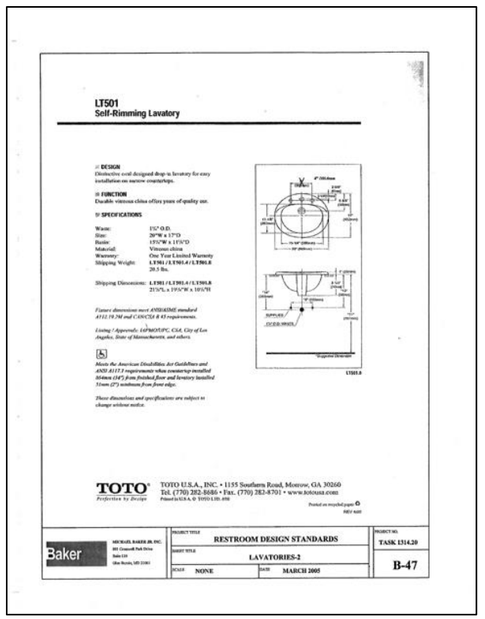
[B-63 RESTROOM DOOR LOCKSET]

2F.3 Fixtures

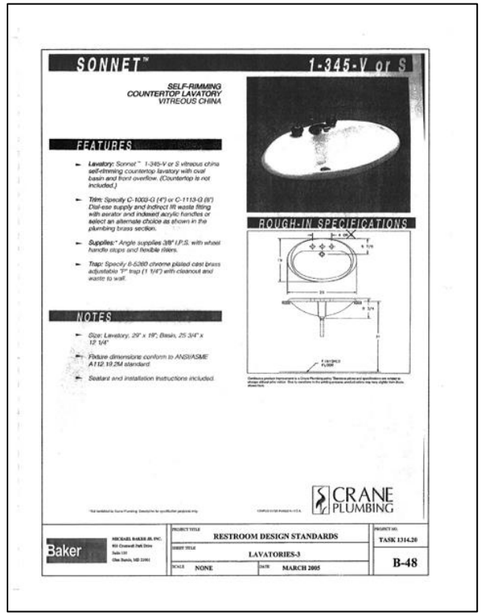
Click an image to download a single cut sheet in Adobe PDF format.
Click Here to download the entire set of Fixtures cut sheets (15 pages) in a Single PDF file.



[B-46: LAVATORIES-1]



[B-47: LAVATORIES-2]

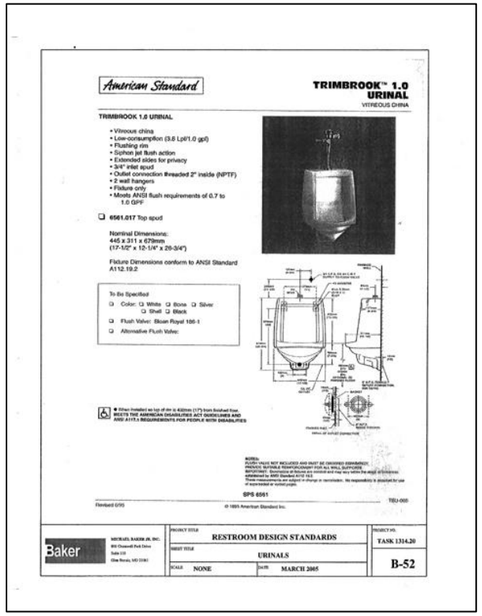


[B-48: LAVATORIES-3]

[B-49: LAVATORIES-4]

[B-50: LAVATORY GUARD-1]

[B-51: LAVATORY GUARD-2]



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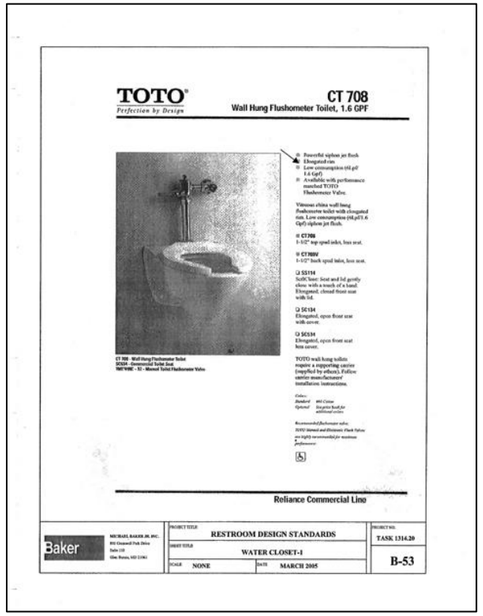
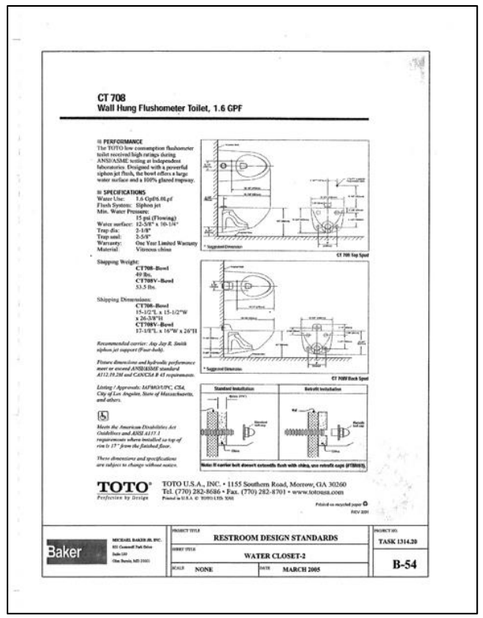


[B-53: WATER CLOSET-1]



CT 708
Wall Hung Flushometer Toilet, 1.6 GPF

TOTO
Perfection by Design

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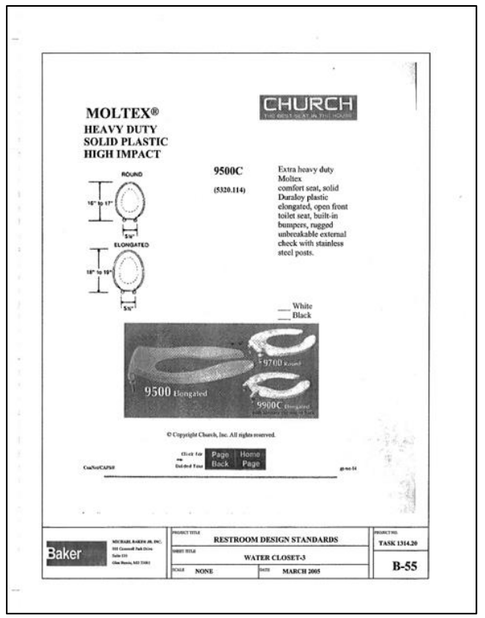
RESTROOM DESIGN STANDARDS
WATER CLOSET-2
NONE
MARCH 2005
TASK 1314.20
B-54

[B-54: WATER CLOSET-2]



MOLTEX®
HEAVY DUTY
SOLID PLASTIC
HIGH IMPACT

CHURCH

ROUND
ELONGATED

9500C
(5320.114)

Extra heavy duty Moltex comfort seat, solid Durabuy plastic elongated, open front toilet seat, built-in bumpers, rugged unbreakable external check with stainless steel posts.

White
Black

9500 Elongated
9700 Round
9900C Elongated

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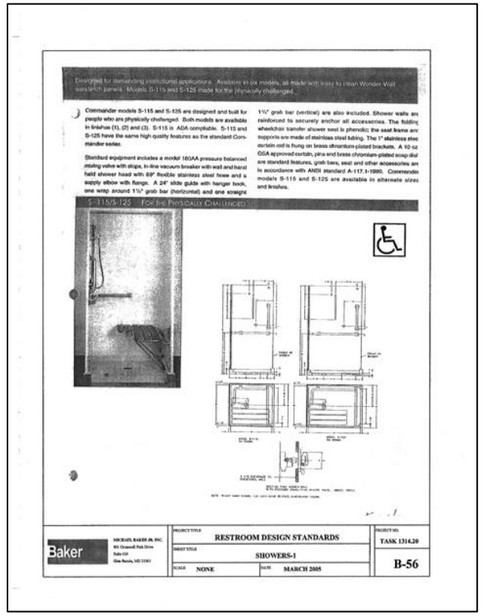
RESTROOM DESIGN STANDARDS
WATER CLOSET-3
NONE
MARCH 2005
TASK 1314.20
B-55

[B-55: WATER CLOSET-3]



Designed for demanding institutional applications. Available in six models, all made with easy to clean Wonder-Wall sanitech panels. Models S-115 and S-125 made for the physically challenged.

Commander models S-115 and S-125 are designed and built for people who are physically challenged. Both models are available in finishes (1), (2) and (3). S-116 is ADA compliable. S-115 and S-125 have the same high quality features as the standard Commander series.

Standard equipment includes a model 180AA pressure balanced mixing valve with stops, in-line vacuum breaker with wall and hand held shower head with 69" flexible stainless steel hose and a supply elbow with flange. A 24" slide guide with hanger hook, one wrap around 1¼" grab bar (horizontal) and one straight 1½" grab bar (vertical) are also included. Shower walls are reinforced to securely anchor all accessories. The folding wheelchair transfer shower seat is phenolic; the seat frame and supports are made of stainless steel tubing. The 1" stainless steel curtain rod is hung on brass chromium-plated brackets. A 10-oz GSA approved curtain, pina and brass chromium-plated soap dish are standard features, grab bars, seat and other accessories are in accordance with ANSI standard A-117.1-1980. Commander models S-115 and S-125 are available in alternate sizes and finishes.

S-115/S-125 For the Physically Challenged

Baker

RESTROOM DESIGN STANDARDS
SHOWERS-1
NONE
MARCH 2005
TASK 1314.20
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[B-56: SHOWERS-1]

14

COMMANDER® SHOWER CABINETS

Commander shower cabinets are made for demanding institutional use. Special Wonder-Wall panels and top frame are made of galvanized-bonderized steel finished in (1) baked enamel inside and out, (2) stainless steel inside and out or, (3) stainless steel walls, baked enamel outside. Wonder-Wall panels with a 1" core and water impervious insulation significantly reduces noise and vibration. Floors are durable, one-piece pre-cast terrazzo. Coved corner interior walls are formed with 1" radii at all four corners for easy cleaning. There are no corner joints, cracks or crevices to leak or to harbor germs and grime.

On Commander models with back and side walls, panels are jointed with anodized aluminum extruded molding.

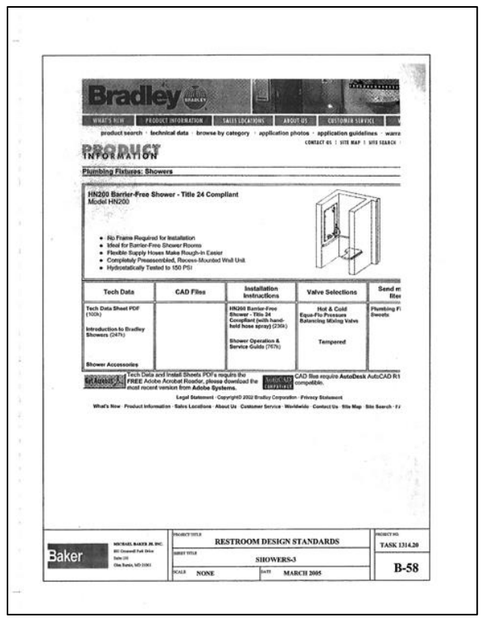
Standard equipment includes a model 190AA pressure-equalizing valve with stops, shower head, arm and flange. Also included are a stainless steel curtain rod, chromium-plated brass brackets, curtain and chromium-plated brass soap dish.

S-94 Single Access From Ordered
S-101 Single Access, Trunk Ordered, NIO Corner
S-92 Double Access Corner Ordered
S-91 Double Access Wall Through

Baker

RESTROOM DESIGN STANDARDS
SHOWERS-2
NONE
MARCH 2005
TASK 1314.20
B-57

[B-57: SHOWERS-2]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PRODUCT INFORMATION

Plumbing Fixtures: Showers

HN200 Barrier-Free Shower - Title 24 Compliant
Model HN200

- No Frame Required for Installation
- Ideal for Barrier-Free Shower Rooms
- Flexible Supply Hoses Make Rough-In Easier
- Completely Preassembled, Recess-Mounted Wall Unit
- Hydrostatically Tested to 150 PSI

Tech Data	CAD Files	Installation Instructions	Valve Selections	Send m files
Tech Data Sheet PDF (102k) Introduction to Bradley Showers (247k)		HN200 Barrier-Free Shower - Title 24 Compliant (with hand-held hose spray) (230k) Shower Operation & Service Guide (767k)	Hot & Cold Equa-Flo Pressure Balancing Mixing Valve Tempered	Plumbing Fi Sweets
Shower Accessories				

Get Acrobat Reader — Tech Data and Install Sheets PDFs require the FREE Adobe Acrobat Reader, please download the most recent version from Adobe Systems.

AutoCAD Compatible — CAD files require AutoDesk AutoCAD R1 compatible.

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PROJECT TITLE: RESTROOM DESIGN STANDARDS
SHEET TITLE: SHOWERS-3
SCALE: NONE
DATE: MARCH 2005
PROJECT NO.: TASK 1314.20
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[B-58: SHOWERS-3](#)


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PRODUCT INFORMATION

Plumbing Fixtures: Showers

HN250 Barrier-Free Shower - Title 24 Compliant
Model HN250

- Ideal for Barrier-Free Shower Rooms
- Flexible Supply Hoses Make Rough-In Easier
- Completely Preassembled, Surface-Mounted Wall Unit
- Hydrostatically Tested to 150 PSI

Tech Data	CAD Files	Installation Instructions	Valve Selections	Send m files
Tech Data Sheet PDF (102k) Introduction to Bradley Showers (247k)		HN250 Barrier-Free Shower - Title 24 Compliant (with hand-held hose spray) (245k) Shower Operation & Service Guide (767k)	Hot & Cold Equa-Flo Pressure Balancing Mixing Valve Tempered	Plumbing Fi Sweets
Shower Accessories				

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AutoCAD Compatible — CAD files require AutoDesk AutoCAD R1 compatible.

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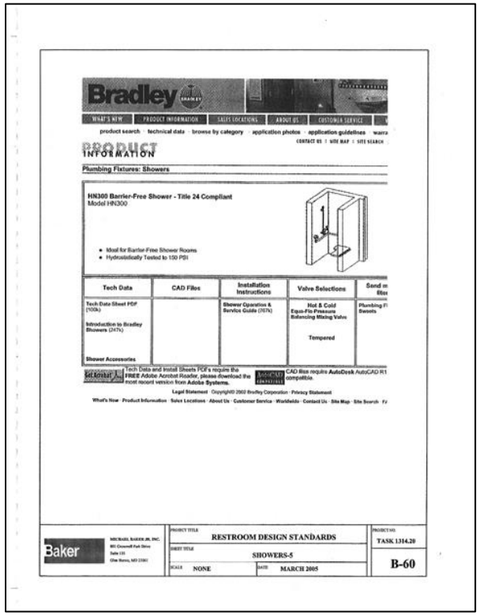
PROJECT TITLE: RESTROOM DESIGN STANDARDS
SHEET TITLE: SHOWERS-4
SCALE: NONE
DATE: MARCH 2005
PROJECT NO.: TASK 1314.20
B-59

[B-59: SHOWERS-4](#)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PRODUCT INFORMATION

Plumbing Fixtures: Showers

HN300 Barrier-Free Shower - Title 24 Compliant
Model HN300

- Ideal for Barrier-Free Shower Rooms
- Hydrostatically Tested to 150 PSI

Tech Data	CAD Files	Installation Instructions	Valve Selections	Send m files
Tech Data Sheet PDF (102k) Introduction to Bradley Showers (247k)		Shower Operation & Service Guide (767k)	Hot & Cold Equa-Flo Pressure Balancing Mixing Valve Tempered	Plumbing Fi Sweets
Shower Accessories				

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PROJECT TITLE: RESTROOM DESIGN STANDARDS
SHEET TITLE: SHOWERS-5
SCALE: NONE
DATE: MARCH 2005
PROJECT NO.: TASK 1314.20
B-60

[B-60: SHOWERS-5](#)

2F.4 Janitorial

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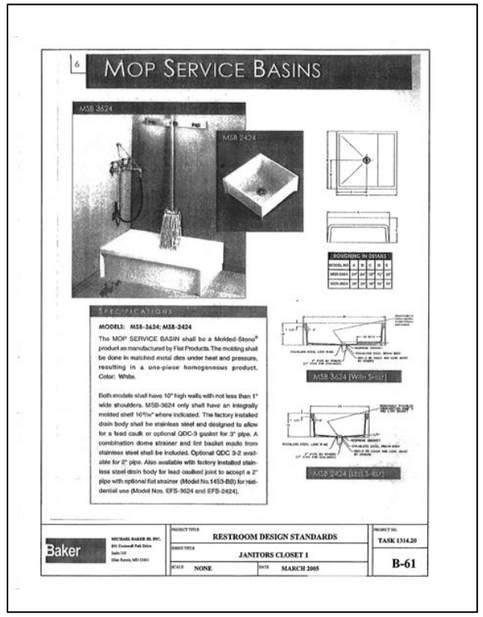
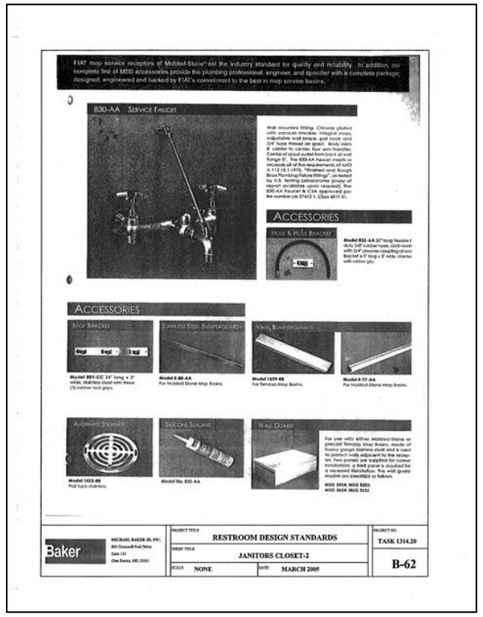


B-61: JANITORS CLOSET-1



B-62: JANITORS CLOSET-2

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 3

Life Safety

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

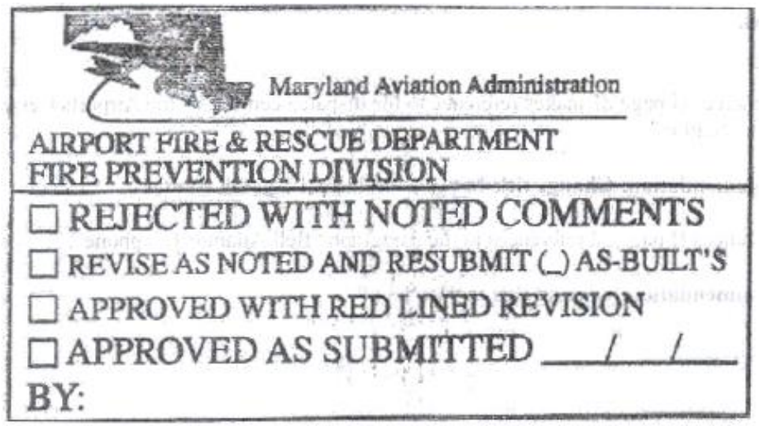
MARTIN STATE AIRPORT

1.1 Office of the Fire Marshal (OFM) Coordination

The Authority Having Jurisdiction (AHJ) for enforcement of fire related codes, standards, and laws on MDOT MAA owned or leased facilities and properties is the MDOT MAA Office of the Fire Marshal. Questions involving interpretation or enforcement of fire related codes and standards shall be directed to the Office of the Fire Marshal.

1.2 Office of the Fire Marshal Shop Drawing/Submittal Review

During construction, the Construction Manager will forward a copy of the appropriate shop drawing/submittals to the Fire Marshal at the same time they are sent to the Consultant. The Construction Manager will then schedule a meeting one week later with the Fire Marshal, Consultant, Construction Manager, and MDOT MAA Office of Engineering & Construction. At that meeting, all shop drawing issues will be addressed, and a decision will be rendered as to the status of the submittal and noted on the MDOT MAA stamp shown below. The shop drawings/submittals will be returned to the Construction Manager at that time for further action.



The shop drawing/submittal review meeting will also provide an opportunity for the Consultant, Construction Manager, and Fire Marshal to review contract revisions and modifications.

2.1 Authority Having Jurisdiction (AHJ)

A. The MAA Office of the Fire Marshal (OFM) is designated as the Authority Having Jurisdiction (AHJ) for the enforcement of all adopted fire-related Codes and Standards for BWI Marshall and MTN Airports, including the Maryland State Fire Prevention Code and the fire safety aspects of the building codes.

B. The adopted Codes and Standards, located in Appendix 3B of this document, are applicable to all new project designs, specifications, construction, and existing occupancy at BWI Marshall and Martin State Airports. As such, the Office of the Fire Marshal enforces them during plan review and inspections as authorized representatives of the Maryland State Fire Marshal. Failure to comply with the fire and life safety related requirements of the Codes and Standards listed herein shall result in the withholding of project design approvals, inspection approvals, or occupancy approvals by the Office of the Fire Marshal. Additionally, violations of these codes are subject to the penalties set forth in the Public Safety Article of the Annotated Code of Maryland.

C. MAA facilities and offices in non-MAA owned properties, and MAA leased properties and facilities that are not located at BWI Marshall Airport or Martin State Airport, are subject to the requirements of the codes which apply in the jurisdiction in which they reside, but in all cases the State Fire Prevention Code, and thereby the requirements of the NFPA 101 Life Safety Code, apply to all such spaces within the State of Maryland. When questions may occur regarding egress requirements regarding these facilities, contact the Office of the Fire Marshal.

2.1.1 Definitions & Abbreviations

A. BWI Marshall Terminal Building Designations

Designation/ Abbreviation	Description
ST	South Terminal (All Areas, Upper and Lower Levels)
CT	Central Terminal (All Areas, Upper and Lower Levels)
NT	North Terminal (All Areas, Upper and Lower Levels)
NTE	North Terminal Extension (All Areas, Upper and Lower Levels)
N.I.T.	International Terminal E (historically referred to as “New International Terminal”)
A, B, C, D, DX, DY, E	Individual Concourses (historically referred to as “Piers”) These are the departure gate areas.
Throat	Generally refers to the Security Checkpoints at each Concourse entrance
Main Exit	The exits to the Upper Level Curbside via the Vestibules at the Ticketing Lobby. All doors (including those labeled for “Entry” to the Ticketing Lobby) may be used in calculating the required egress width.

B. The following Definitions are used throughout this Chapter.

OFM	Office of the Fire Marshal
AHJ	Authority having Jurisdiction
OT	Office of Information Technology
IASS	Integrated Access Security System
FACP	Fire Alarm Control Panel
SHECCG	Concourse Holdroom & Egress Code Compliance Guide
EBI	Enterprise Building Integration
CASS	Controlled Access Security System
AED	Automated External Defibrillator
AOA	Air Operations Area
MDOT MAA	Maryland Aviation Administration
COMAR	Code Of Maryland Regulation

2.2 General Fire Protection Design Information

2.2.1 Signature and Seal Requirements of Design Documents, Fire Protection Systems, Studies, and Reports

A Fire Protection Engineer, who is a licensed Professional Engineer in the State of Maryland, shall prepare/approve and seal all design documents, studies, reports, shop drawings, and supporting calculations for the following:

A. Life Safety and Building Code study and/or analysis.
B. Egress calculations including performance based designs for Time-based Egress Analysis. See Chapter 2.3.3 Special Criteria for Controlled Evacuation Conditions.
C. Fire sprinkler systems including wet, dry, pre-action, standpipe, and fire pump system designs and shop drawings.
D. Fire detection and fire alarm system designs and shop drawings.
E. Fire suppression systems including kitchen hood suppression shop drawings.
F. Smoke control and smoke removal systems.
G. Special hazard systems including clean agent, deluge, foam, etc. designs and shop drawings
H. Other systems as deemed necessary by the OFM.

2.2.2 Drawings, Specifications and Reports

All design documents and reports for new buildings, additions, and renovations must include the following fire protection design information, at a minimum or as applicable:

A. A complete list of currently applicable adopted fire and life safety related codes, regulations and standards that apply to the project.
B. "Height and Area" calculations that demonstrate conformance with the required type(s) of construction, in accordance with IBC.
C. Code classification(s) of the type(s) of construction for the new work and existing building (if applicable) in accordance with.
D. Detailed locations and ratings of all fire rated walls, floor-ceiling assemblies, roof-ceiling assemblies, fire rated columns, and other structural elements.
E. Complete floor plan(s), showing egress route(s) and measured travel distance(s) to each required exit.
F. Occupant load(s) and egress capacity calculations.
G. Smoke control calculations, if applicable.
H. A complete door schedule, with door fire ratings, door hardware, frame types, glazing sizes and types, and identifying door numbers assigned by GETS (see PEGS Volume 1, Section 2.4 Door Number Assignment) ~~the Office of the Fire Marshal~~.
I. Interior finish schedules, including flame spread and smoke development ratings, for interior finishes and trim.
J. A schedule of fire damper locations, sizes, and an installation mounting detail. Type(s) of automatic fire suppression and fire alarm systems for specific areas and spaces, as required. Fire Protection Schedule shall include the following information provided by the Office of the Fire Marshal: the MAA-Valve No., Zone control location, Fire Alarm VT and WF point numbers.
K. Locations of fire standpipe systems and fire department connections.
L. Locations of fire hydrants.
M. The 100 ft. radius of potential fuel spill points.
N. Knox Box locations and sizes.
O. New Automated External Defibrillator (AED) locations
P. Existing Automated External Defibrillators (AED) to be stored during construction.
Q. Any special detailed requirements based on use and occupancy contained in IBC.
R. All casework is to be constructed of minimum Class B materials (fire retardant treated wood is permitted).

2.3 Terminal Evacuation at BWI Marshall

2.3.1 Terminal Evacuation Plans

The MAA Office of Architecture, in coordination with the Office of the Fire Marshal is only responsible for assisting in the development, approval, and location of all written Evacuation Plans and drawings. Responsibility for submitting written Evacuation plans and drawings to MAA for review and approval shall be the Designer of Record under MAA Capital Program projects, and the tenant organization and/or the tenant organization's General Construction Contractor under the MAA Building Permit process. Upon approval of the Evacuation plans and drawings, and as directed by MAA, the General Construction Contractor for the Capital Program project or the tenant organization shall be responsible for the placement of the Evacuation Plan Drawings.

Provide Hard copy drawings and CAD generated evacuation plans with a "you are here" designation and the egress paths clearly shown on a floor plan. Permanent signage, with the capability for changing inserts, shall be provided by the general contractor.

2.3.2 Voice Evacuation System Requirements

A. No stand-alone voice evacuation system exists at the Airport. The public address system, although not Underwriter Laboratories (U.L.) listed as a fire alarm voice evacuation system, is monitored 24 hours a day by airport communications (paging) personnel and BWI Marshall Dispatch personnel. Historically, this system was accepted by the Maryland State Fire Marshal (OSFM) for use as a voice evacuation system following the NFPA 101 Life Safety Code Section 8-3.4.1, Exception No.2 (1994 Edition.)
B. Public Address (PA) System

1. The Main Terminals (and Concourses are served by the public address system. The system is a microprocessor-based public address system with remote speakers located in holdrooms, public corridors, lobbies, restrooms, and concession areas. The speakers are connected to head-end equipment via plenum rated cable in cable tray or in conduit (except in some older, unrenovated areas of the terminal where cable is strapped to structural steel above the ceiling).
2. Projects that modify or add to public areas, areas of assembly, or areas presently served by the public address system shall include all necessary work to provide public address system coverage to the areas of the project. Provide instruction and maintenance manuals, as built drawings, and schematic one-line drawings for revisions to the existing PA system and all new systems.
3. Provide PA system training as required by the MDOT MAA.
4. Survivability of the public address system is critical since it provides voice evacuation to all public areas. All work must comply with applicable sections of NFPA 72. All circuits necessary for the operation of the notification appliances shall be protected until they enter the evacuation-signaling zone that they serve. Any of the following methods shall be considered acceptable as meeting the requirements of this subsection:
    a. A 2-hour fire rated circuit integrity (CI) cable
    b. A 2-hour fire rated cable system (electrical circuit protective system)
    c. A 2-hour fire rated enclosure
    d. Performance alternatives approved by the authority having jurisdiction (AHJ)
    e. Buildings fully protected by an automatic sprinkler system installed in accordance with NFPA 13 Standard for the Installation of Sprinkler Systems, and with the interconnecting wiring or cables used for the operation of notification appliances installed in metal raceways and in accordance with Article 760 of NFPA 70.
5. It is preferred that all public address system wiring be run in conduit to the extent possible. However, wiring may be run in cable tray. Long runs of wire strapped to roof structures above suspended ceilings are prohibited. Coordinate with MDOT MAA and the Office of the Fire Marshal for approval of routing method.
6. All wire, which is not in conduit, shall be plenum rated.
7. For large renovation and new construction projects, create separate public address zones for dedicated use only by Airport personnel. Coordinate with the Office of the Fire Marshal for identification of the limits of such zones. Add the following
    a. The Office of Information Technology (OT) has detailed standards for the paging system. These standards shall be the overriding standards and documents for the paging system including infrastructure. The OT Standards can be found in Volume 6 of this manual.
    b. The specific section dealing with the paging system is: Public Address Emergency Communication System
8. Normal PA Operations
9. The PA system at BWI Marshall Airport provides a means to allow for general announcements to the entire Terminal (all-call) or to selected zones from the BWI Marshall Dispatch. Paging/microphone stations exist throughout the concourses (piers) at ticket lift counters for use by airline personnel when making announcements within a specific holdroom. Announcements to selected zones are performed by entering a zone specific numeric code at a paging console keypad.
10. Emergency PA Operations
11. During emergency situations in the Terminal, Authorized Airport personnel can communicate with BWI Marshall Dispatch personnel via radio or house phone and direct the operator to issue emergency/evacuation announcements to the entire Airport (all-call) or to selected zones within the terminal. A system hierarchy exists whereby all emergency announcements take precedence over all other PA system activity.

2.3.3 Special Criteria for Controlled Evacuation Conditions

Time-based Analysis for Concourses C, D, E and Future Concourses

In addition to meeting the requirements of the Model Code criteria, a time-based analysis must be provided that ensures that Concourses C, D, E and Future Concourses can be evacuated under a controlled evacuation condition. The controlled evacuation analysis shall comply with the following requirements (Note: Concourses A and B were evaluated for compliance with this condition at the time of design and are considered compliant as long as Concourses A or B are not increased in area or passenger seating count.)

A. The controlled evacuation analysis shall be performed using a time-based egress modeling method acceptable to the Office of the Fire Marshal.
B. 100% of the Concourse occupant load is required to egress toward the front of the Concourse and through the Terminal Building to the curbside. Egress via a secure corridor adjacent to the front exit to the Terminal Building, connecting to another Concourse through a horizontal barrier which complies with NFPA 101, is also considered as being egress via the front of the Concourse.
C. The evacuation analysis must demonstrate that the entire Concourse population is capable of being evacuated within 20 minutes via the Terminal Building to the curbside, unless alternate evacuation time criteria are approved by the Office of the Fire Marshal in advance.
D. A Fire Protection Engineer, who is a licensed Professional Engineer in the State of Maryland, shall prepare all calculations and supporting justification for review by the Office of the Fire Marshal, and shall sign and seal them accordingly.

2.4 Interface of Fire Alarm, Life Safety and Security Systems at BWI Marshall

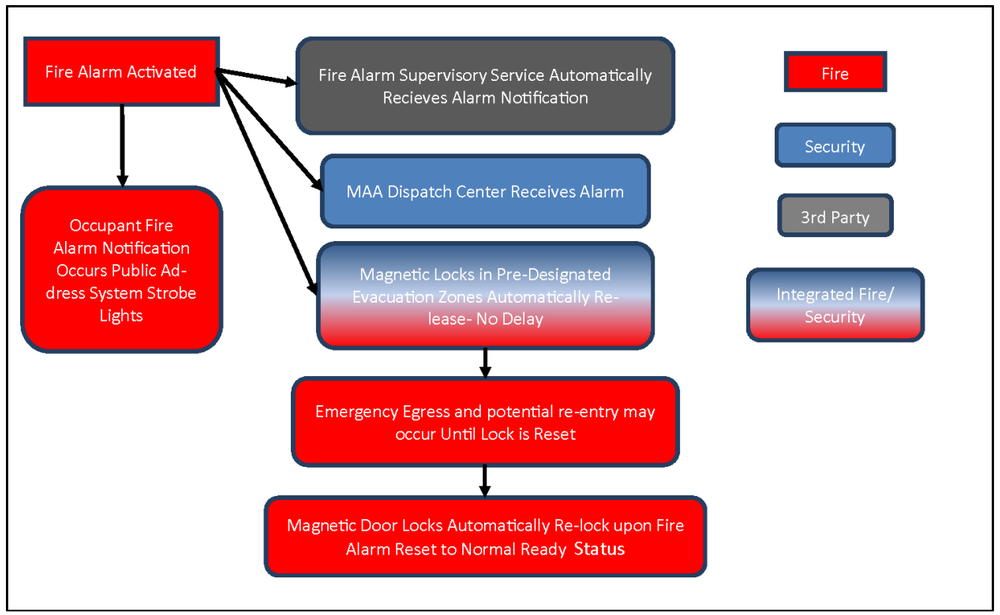
2.4.1 BWI Marshall Fire Alarm System (Terminal)

A. The BWI Airport has a Honeywell Fire Alarm system. All modifications to the fire alarm system shall match the existing system components and be compatible with the existing infrastructure. The specified Honeywell Fire Alarm system shall function, operate and be compatible with the existing BWI Marshall Fire Alarm system.

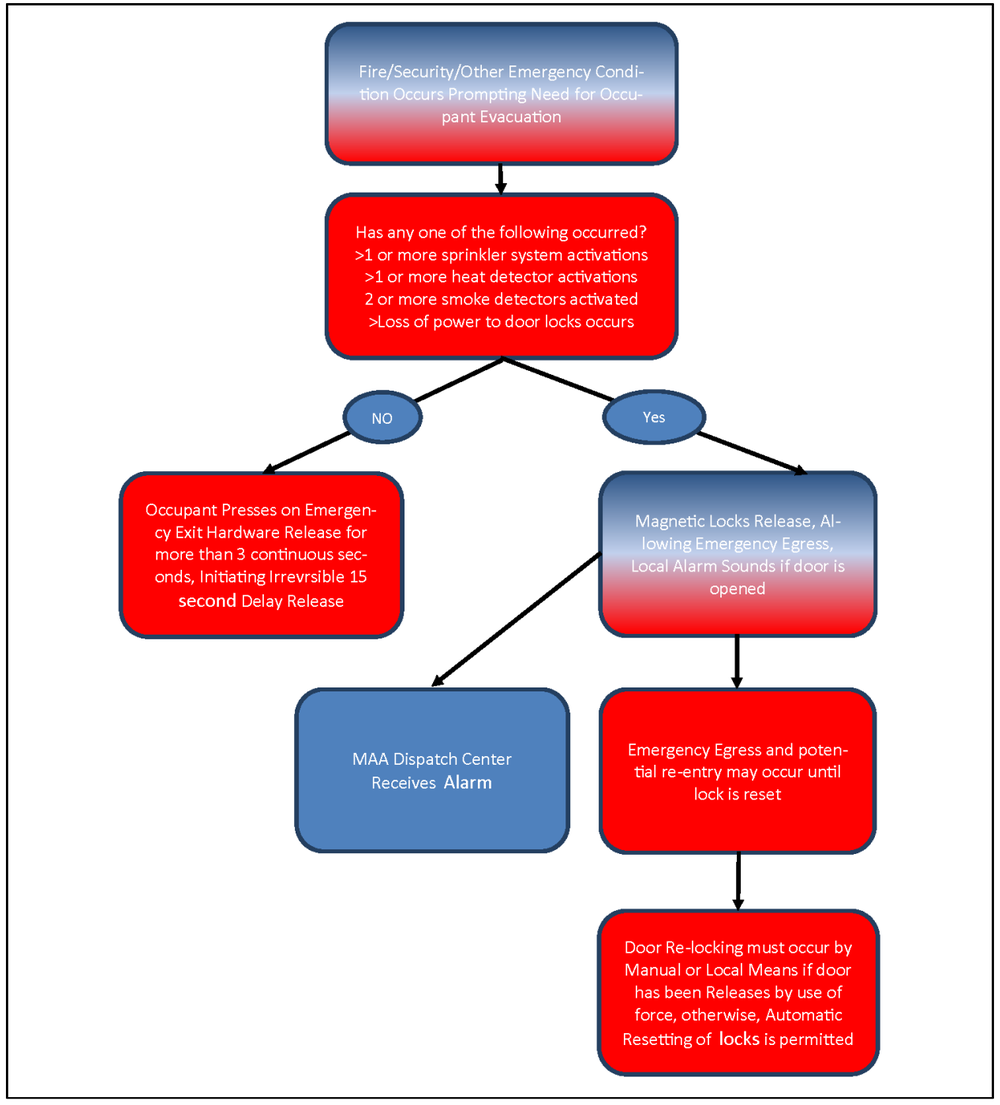
B. All components of the fire alarm system shall be UL listed and/or FM approved.
C. The Project Specifications shall require the following:
    1. Contract with Honeywell to provide all programming changes to the fire alarm system.
    2. Submit fire alarm shop drawings to the OFM for review and approval.
    3. Submit a hard copy of the as-built fire alarm shop drawings to the Office of the Fire Marshal for record purposes.
    4. Design and submit AutoCAD files of the fire alarm system floor plans to Honeywell to update the Fire Alarm Central Graphic Computer.

2.4.2 Access Controlled Egress Doors

A. Access Control or Controlled Access Security System (CASS) is part of the Airport's Integrated Access Security System (IASS).
B. The following requirements shall apply to access controlled emergency egress doors. The consultant shall confirm any variance from this standard with MDOT MAA and FAA personnel.
    1. Magnetic locks shall be mounted to the top of door/frames. Only when clearance issues prohibit the use of mag-locks will the use of electric door strikes (electrified door hardware) be considered. Electric door strikes are not acceptable without the prior approval of the Office of the Fire Marshal.
    2. Provide panic hardware with door strike (this is not an electric door strike) and delayed egress magnetic locks that provide local alarm upon being activated and provide alarm to the BWI Marshall Dispatch upon activation of the non-reversible release countdown.
    3. Provide IASS system components. They are typically the door controller, combination card reader/keypad, door status contacts, audio/visual device and the door-locking device (mag-lock). Configure the system as follows:
        a. IASS shall release the mag-lock for all personnel who use the combination card reader/keypad. This is an approved non-emergency egress.
        b. The mag-lock will not release until a preset delay has expired. Pushing on the panic hardware for more than three (3) seconds starts the delay countdown.
        c. In the event of an emergency, occupants will push on the panic hardware, the local alarm will immediately sound, an alarm will be sent to the BWI Marshall Dispatch and the delay countdown will begin. When the delay has expired, the audio/visual device will sound, the mag-lock will release and the IASS will alert the police and the BWI Marshall Dispatch of the alarm condition. The security system audio/visual device shall be coded differently from the fire alarm system audio/visual device.
        d. The delay on release should be set to 15 seconds.
    4. Signage shall be placed on each egress door, stating "EMERGENCY EXIT ONLY". Delayed egress doors shall be additionally equipped with signage stating "PUSH UNTIL ALARM SOUNDS, DOOR CAN BE OPENED IN 15 SECONDS".
    5. The upper level emergency egress stairwell door in all holdrooms will be the secured door (with IASS). Only approved exceptions will allow the secured door to be on the lower level (ramp level). The consultant, MDOT MAA Security and the tenants shall decide which stairs will be utilized by airline personnel who may not have a BWI Marshall Security Badge, but need access to lower level operations areas.
    6. The door control microprocessor shall be provided with a battery backup power supply.
    7. All door status contacts are to be interfaced with the door control panel that is designed to send an immediate local and a remote alarm of unauthorized access to the Dispatch Center (DC). The panel is to be interfaced with the local door control microprocessor that is designed to send an immediate local and a remote alarm of unauthorized access with a local reset. The microprocessor is to be interfaced with the keypad/card reader access device and the secure side magnetic lock release device and be designed to distinguish the difference between an authorized and unauthorized access.
    8. All electronic panic hardware (crash bars) devices are to be directly wired to the magnetic lock to minimize chance of malfunction.
    9. All magnetic locks and access control electronics are to be on dedicated circuits and connected to a dedicated panel.
    10. Where egress doors are used in conjunction with operations, the release function from the secured side shall be coordinated with and approved by MDOT MAA Security.



Emergency Egress During Fire Alarm Activation Conditions
(Controlled Access Security Systems-Based Systems Only)



Emergency Egress During Non-Fire Alarm Activation Conditions
(Controlled Access Security System-Based Systems Only)

2.4.3 Elevators

Elevators shall be interconnected with the fire alarm system to initiate Phase I and Phase II recall. Heat detectors shall be used for shunt trip when necessary. All elevators shall be equipped with a flow switch for zoning/indicting purposes.

2.4.4 Building Automation Systems

Mechanical systems used for smoke management, purge and/or control shall be interconnected with the fire alarm system. Duct detectors and smoke dampers shall be interconnected with the fire alarm system.

Fire dampers are not required to be tied into the fire alarm system.

2.4.5 Public Address Systems

The public address system is not interconnected with the fire alarm system.

2.4.6 Sprinkler/Special Hazard Systems

Sprinkler and Special Hazard systems shall be interconnected to the fire alarm system to monitor alarm, supervisory, and trouble signals.

2.5 Fire Detection and Fire Alarm Systems

2.5.1 Existing Fire Detection and Alarm System

The primary fire alarm systems serving BWI Marshall is the Honeywell EBI (Enterprise Building Integration) System).

The signals report to a Honeywell EBI Graphics System located in the BWI Marshall Dispatch Center (BWI Marshall Dispatch).

The fire alarm components in the terminal building shall be as follows:

A. Fire Alarm Notification Appliances
   1. Notification Signals:
      a. Terminal Building - all areas will be zoned as either a public area or a tenant area.
      b. Public areas shall have visual appliances (strobe lights) and audible appliances (horns). Emergency announcements shall come from terminal-wide public address (PA) system. In the event of a failure of the PA System, horns will be activated manually from the BWI Marshall Dispatch. All appliances in this zone, horns and strobes, shall be activated separately via manual control from the BWI Marshall Dispatch. Horns shall be silenced during PA System announcements without silencing the strobes. Upon completion of announcements, the horns shall reactivate.
      c. Tenant areas shall have audio/visual (horn/strobe) notification. Publicly accessible portions of tenant spaces shall have PA speakers for emergency announcements as noted above. All appliances in this zone shall be automatically activated by the associated FS-90 FACP or the XLS panels.
   2. Remote Annunciators shall not be provided unless otherwise required by the Office of the Fire Marshal.
   3. EBI Central Color Graphic Computers shall be programmed and updated as required by expansions and modifications to the Fire Alarm. System. Cost of programming and computer upgrades shall be included in the construction project along with associated construction costs.

B. Fire Alarm Initiating Devices
   Addressable Interface Units (monitoring modules) shall be used to monitor indicating devices that are not otherwise equipped for multiplexed addressable communication such as sprinkler valve tamper switches.
   1. Manual Pull stations shall be addressable double action type without glass rod inserts. Provide waterproof Lexan covers on pull stations located outdoors and in parking garages.
   2. All surface mounted smoke detectors shall be addressable photoelectric type. Ionization type detectors are not permitted.
   3. Duct Smoke Detectors shall be addressable photoelectric type.
   4. Heat Detectors shall be addressable combination rate of rise and fixed temperature type within air-conditioned spaces.
   5. Pressure Switches for pre-action systems, shall be supplied with addressable monitoring modules.
   6. Water Flow Switches for sprinkler systems, shall be supplied with addressable monitoring modules for alarm conditions.
   7. Fire Extinguishing System Control Panels for fire suppression systems (such as carbon dioxide systems, clean agent, foam systems, etc.) shall be supplied with addressable monitoring modules.

C. Fire Alarm Supervisory / Control Devices
   Special provisions for exhausting noxious or hazardous atmospheres shall be designed on a per project basis. The design shall utilize HVAC systems and controls; zoning strategies and supplemental exhaust.

2.5.2 New Fire Detection and Alarm System

A. The Office of the Fire Marshal is the local Authority Having Jurisdiction for MDOT MAA owned facilities. The Consultants must coordinate with the Office of the Fire Marshal during the design of fire detection and alarm systems. Submit relevant drawings and specifications to MDOT MAA FDE for transmittal to the Office of the Fire Marshal for review at each required submission. At a minimum MDOT MAA recommends meeting with the Office of the Fire Marshal prior to 50% completion of design. General requirements of the Office of the Fire Marshal include, but are not limited to, the following:

B. The Fire Detection and Alarm System shall comply with the following requirements:
   1. Conductors and Circuit Type:
      a. Initiating circuits shall be Class A
      b. Indicating circuits shall be Class A

c. Only copper conductors shall be used. Conductor wire shall be solid. Stranded conductors will not be allowed. The only exception allowed for stranded wire will be for the installation of speakers in a fire alarm controlled voice evacuation system.

2. Conductor Size:
   a. Initiating circuits shall be a minimum of No. 14 AWG twisted pair. No. 16 AWG may be used, if pre-approved by the Office of the Fire Marshal, for initiating circuits, depending on electrical system design and manufacturer's requirements. No. 18 AWG shall not be permitted.
   b. Indicating circuits shall be a minimum of No. 12 AWG.
3. Conductor Requirements:
   a. Insulation - THHN or THHW (NEC Article 310, Table 31016).
   b. Voltage Rating· 600 volt.
   c. Temperature Rating· 90°Cl194°FP.
   d. No. 14 AWG shall have 6 turns per foot.
   e. No. 16 AWG shall have 10 turns per foot.
4. Color Codes:
   a. Work on new systems shall comply with equipment manufacturer's requirements.
5. Work on existing systems shall match existing color-coding of wire in Volume 2, Chapter 11 Electrical. Conduit:
   a. All fire alarm wiring shall be in conduit complying with applicable NEC articles. (Exception: Existing speaker wiring which serves as part of the PA portion of the fire alarm system may remain as presently installed, without conduit, unless an area is renovated to an extent that the Office of the Fire Marshal determines that encasement in conduit is required.)
6. Identification of conduit and junction boxes will be done with red paint and wording that clearly identifies the installation as being a fire alarm system. Panel Connections:
   a. Shall be on the left hand or right hand sides. No connections shall be done from the bottom.
   b. Top mount connections shall be permitted only if waterproof connectors are used.
7. Power Supply:
   a. All fire alarm systems shall be provided with a primary and a secondary power supply.
   b. Secondary power shall automatically supply the energy to the system within 30 seconds. Secondary power shall be from a storage battery capable of operating the complete alarm system in normal or supervisory (non-alarm) mode for a period of 24 hours and at the end of this period, have sufficient capacity to operate the system, including alarm indicating devices in either alarm or supervisory mode for a period of 15 minutes. This requirement applies to new panel installations and any existing panels affected by renovation work.
   c. The batteries in all Fire Alarm Control Panels (FACPs) shall be supervised.
   d. An engine-driven generator with automatic transfer switch arranged in accordance with NFPA 72 may be used for secondary power in lieu of storage batteries.
8. Fire Alarm Control Panel Location:
   a. Shall be determined by the Office of the Fire Marshal only.
   b. Shop drawings shall include a floor plan showing the location of the fire alarm panel.
   c. Fire alarm system zones shall follow fire protection sprinkler zones as appropriate.

C. All duct type smoke detectors shall be provided with remote test switches and indicator lights with identification signage. The test switches shall be readily accessible and have readily visible (below ceiling) indicators. Smoke detectors shall be provided with two sets of contacts. One set for alarm and one set to shut down related HVAC equipment. All duct detectors shall be accessible for inspection, maintenance, repair and replacement.

D. All sprinkler water flow, switches and tamper switches shall be connected to the fire alarm system.

E. The Honeywell EBI Graphical Central Computer shall be programmed with a specific designation of the alarm location (for example, boarding bridge gate number or other geographic locator).

F. Install a dedicated MDOT MAA "IN-HOUSE" telephone adjacent to all fire alarm control panels (FACP). This requirement applies to new panel installations and any existing panels affected by renovation work. Design shall include an empty conduit between the proposed telephone location and the nearest telephone closet. Coordinate with MDOT MAA Telecom Section for MDOT MAA to install the telephone

G. YOU ARE HERE" designation and the egress paths clearly shown on a floor plan. Permanent signage, with the capability for changing inserts, shall be specified to be included in the construction contract. See Chapter 2.3.1 Terminal Evacuation Plans. Provide a floor plan submittal showing the proposed locations of the evacuation plans(s) for approval by the Office of the Fire Marshal.

H. Signs shall have red lettering and a white background encased or enclosed in an approved box. Provide directional exit signs in the main corridor of the concourses (piers) to direct occupants to the exit stairs along the exterior holdroom walls.

2.5.3 Fire Detection Systems Table

AUTOMATIC FIRE AND SMOKE DETECTION SYSTEMS REQUIRED	
Areas Protected	**Smoke Detection**
Communication Rooms	X

AUTOMATIC FIRE AND SMOKE DETECTION SYSTEMS REQUIRED	
Areas Protected	**Smoke Detection**
Electrical Sub-Station Rooms	X
Tenant Space Transformer Rooms	X
Hazardous Materials Storage Rooms	X
Bag Belts at fire rated assemblies	X (Note 1)
Airfield Light Vaults	X
Automatic Smoke Doors at Pedestrian Tunnels	X (Note 2)
Automatic Smoke Doors at Skywalks	X (Note 2)

NOTES FOR TABLE “AUTOMATIC FIRE AND SMOKE DETECTION SYSTEMS REQUIRED”

1. Smoke detectors are not required on both sides of fire rated assemblies where bag belt penetrations occur provided the fire shutters activate upon water flow alarm.
2. Smoke detectors are required on both sides of smoke doors at Skywalks and Pedestrian Tunnels. They are to activate the smoke doors or fire doors at each opening.
3. Wherever “Heat Detection” is required above, combination Rate-of-Rise and Fixed Temperature (ROR-FT) detectors may be used except where specifically “Heat Detection Only” is listed (e.g. – Break rooms with kitchenette, Elevator shunt trip, Kitchens). In “Heat Detection Only” locations, combination ROR-FT detectors may not be used, however it is permissible to install ROR-FT detectors in those locations if only the FT portion of the combination detector is wired to be functional for detection notification.
4. Fire Alarm Control Panels (FACP) are not to be set to provide automatic building evacuation signaling in public areas upon receipt of a water flow, smoke, heat detection signal, or manual pull station activation, but are to provide automatic evacuation signaling in tenant areas. They are to transmit a fire alarm signal to the Emergency Communications Center (BWI Marshall Dispatch). All FACPs are to be non-self-resetting.

2.5.4 Manual Fire Alarm Pull Station Table

NFPA 72 MANUAL FIRE ALARM PULL STATIONS REQUIRED	
Areas Protected	**Manual Pull Station**
Exit Doors and Egress Stairwells	X (Note 1)
Fire Doors at Skywalks	X (Note 2)

NOTES FOR TABLE “NFPA 72 MANUAL FIRE ALARM PULL STATIONS REQUIRED”

1. Fire alarm pull stations are required at each main exit door, each egress stair, and at each vestibule leading to the outside. They are not required at tenant space public entrances/exits unless travel distance requires it.
2. Fire alarm pull stations are required on the terminal side of skywalk doors and on the parking garage side of skywalk doors.

2.5.5 Martin State Airport (MTN)

MTN has various fire alarm system manufacturers (Honeywell, Tyco Integrated Security, Simplex, etc.). Contact the Office of the Fire Marshal in advance to coordinate any work involving replacement, modifications, or extensions to any existing fire alarm equipment.

2.5.6 Fire Alarm Communication Requirements

2.5.6.1 Panels Reporting to Central Station

Existing Plain Old Telephone Service (POTS) lines are permitted to remain in use until the fire alarm panel is replaced. All new and upgraded fire alarm panels shall report to central station via cellular or radio. Other means of communication may be presented to the Office of the Fire Marshal for approval. One form of communication is permitted if NFPA 72 requirements are followed. Otherwise, two forms of communication are required.

Existing fire alarm panels may continue to transmit zone information only to central station. All new and upgraded fire alarm panels shall report point addresses for the alarm, supervisory, and trouble signal(s) to central station. Submittal packages shall indicate how all required signals are being transmitted to central station. Product data for shared communications equipment shall be submitted for review prior to installation.

2.5.6.2 Panels on Networks

All new fire alarm control panels in MDOT MAA owned facilities on MDOT MAA property shall be connected to the existing network. If the existing network is not available, central station requirements above may be considered if approved by the Office of the Fire Marshal.

2.6 Fire Suppression Systems

2.6.1 General

A. Fire sprinkler systems are to be designed to meet the requirements of NFPA 13 Hazard and NFPA 415 Classifications, as follows:
   1. All areas within the BWI terminal are to be considered as “Ordinary Hazard, Group II”.
   2. Cargo Buildings and Freight Terminals are to be designed for “Extra Hazard”.
   3. Areas outside of the BWI terminal (MTN, CRCF, MAC Building, etc.) shall be designed in accordance with NFPA 13.

B. “Fuel Farms” are to be protected with sub-surface automatic foam fire suppression systems.

C. Although there are existing CO2, clean agent, and Halon 1301 systems in some protected areas, they are not to be used in new construction without the approval of the Office of the Fire Marshal. When performing work in such an existing area, consult with the Office of the Fire Marshal for guidance.

D. Concealed sprinklers are not permitted. Exceptions shall require OFM approval.

E. Isolation valves shall be provided for each concession and/or future concession space.

F. Isolation valves shall be provided for every cooler/freezer or group of coolers/freezers.

G. All piping in wet and dry pipe systems, shall be Schedule 40 black steel. Piping installed in exterior locations shall be painted.

H. Fire sprinkler shop drawings shall follow NFPA 13 requirements for submittals. The shop drawings shall also include the following:
   1. The geographical location of sprinkler zone control valve(s) and flow switch locations for new and existing devices.
   2. The fire alarm address of the existing zone valve tamper switch and the flow switch.

   For location assistance designers/contractors should contact OFM or MAA Office of Utilities.

I. Listed sprinkler head guards shall be installed per NFPA 13 requirements and are required for all sprinklers that meet any of the following conditions.
   1. All sprinklers in baggage areas, spaces with low ceilings, industrial/mechanical spaces, electrical rooms, telecommunications rooms, and rack storage regardless of height.
   2. All sprinklers that are at or less than 7’-6” above the finished floor.
   3. All sprinklers that are subject to damage from a power-driven source such as a forklift or baggage tug.
   4. The OFM inspector will determine if any additional sprinkler guards are required at the time of final inspection due to field conditions.

J. Where baggage belts penetrate a fire-resistance wall, the flow switch to the sprinklers on each side of the penetration shall be programmed to initiate closure of the fire door/shutter upon activation of water flow.

Sprinkler system types shall be installed per the Table below.

AUTOMATIC FIRE SUPPRESSION SYSTEMS REQUIRED					
Areas Protected	**Special Agent Suppression Systems**	**NFPA 17A Type, Wet, Hood Systems**	**Wet Automatic Sprinklers**	**Dry Automatic Sprinklers (Non Pre-Action)**	**Dry Automatic Sprinklers (Pre-Action)**
Terminals, Concourses, and Public Areas, Tenant Spaces, etc.			X		
Critical Communications Rooms (Note 1)	X				
Skywalks			X		
Electrical Sub-stations, Interior, (13.8 KVA Incoming)					X
Main Electrical Rooms					X
Cooking Hoods, Class I		X			
Drive-Thru Tunnels				X	

NOTES FOR TABLE “AUTOMATIC FIRE SUPPRESSION SYSTEMS REQUIRED” (MUST BE COMPARED WITH OT MANUAL)

1. Examples of critical communications rooms are those related to:
   a. Airfield Lighting.
   b. Emergency Paging Systems.
   c. Emergency Communications for consolidated Police and Fire (BWI Marshall Dispatch).
   d. Computer Servers.
   e. Main Telephone Rooms.
   f. Critical Computer Systems.
   g. Fire Alarm Servers.

h. “IDF” Emergency Paging Rooms (fiber optics in/out and data routers for networks).
i. Other rooms, or spaces, as may be designated critical to operations or life safety by Office of the Fire Marshal or MDOT MAA or FAA.

2.7 Fire Hydrants

2.7.1 General Fire Hydrant Requirements & Specifications

A. Specify fire hydrants manufactured by American Darling, Model B-62-B; Kennedy Valve, Model K-81-A; or Mueller, Super Centurion 250.
B. Hydrant valve opening shall be at least 5-inch diameter, net. Inlet connection shall be 6-inch mechanical joint with accessories (glands, plain rubber gaskets, and stainless steel bolts and nuts).
C. Hose connections shall consist of two 2 1/2 -inch diameter hose connections with National Standard Threads (NST) with threaded caps and one 5-inch diameter integrated Storz connection with a ¼” bleed off/pressure relief valve.
D. Operating nut shall be 5 sided, 1 5/16 inches from point to flat, and shall turn left (counterclockwise) to open.
E. Outer casting shall be one-piece cast iron, designed to permit its extension without excavating.
F. Hydrant design shall be such that when the barrel is broken, it may be replaced without excavating or breaking adjacent pavement; that the entire barrel, including all working parts, along with the main and waste valve seats, may be removed for inspection or repair without excavating or disturbing the ground; and that underground flanges with bolts and nuts are eliminated.
G. The main valve seal shall be compression type sealing against a bronze seat and the valve shall open against pressure.
H. Between elbow and top cap, the barrel shall be made in two parts connected by a swivel segment to permit facing the nozzles in any direction.
I. Bonnet shall be bolted to the standpipe and shall have cast on the top an arrow and the word “Open” indicating the direction for opening.
J. For ramp-side hydrants, Fire Hydrant shall be set within a gravel or crushed stone drainage, well extending the full width of the trench.
K. Where hydrants are to be relocated, the Contractor shall ascertain whether or not the hydrant valve has been restrained before removing the hydrant to be relocated. The lead pipe shall be capped and blocked so that service can be restored to the parent main pending the removal or plugging of the mainline tee.
L. The outside of all fire hydrants above the breakaway flange shall be painted with two coats of OSHA orange industrial enamel paint, as manufactured by Sherwin Williams, or equal. The riser pipe from ground to breakaway flange shall be painted with two coats gloss black industrial enamel paint as manufactured by Sherwin Williams, or equal before installation. The Hydrant bonnet shall be painted to indicate its gallons per minute (GPM) per NFPA 291.
M. International Symbol Signs meeting the requirements of NFPA 170 shall be attached on the Terminal siding located 10 feet above the ramp side fire hydrants, each as a 10” by 10” white on red reflective symbol sign. (See attached NFPA 170 Fire Safety Symbols).
N. All fire Hydrants at Martin State Airport shall be designed and installed in accordance with the Baltimore County Fire Department specifications and NFPA-24, The Installation of Private Service Mains And Their Appurtenances.
O. All fire Hydrants at BWI Marshall Airport shall be designed and installed in accordance with NFPA-24, The Installation of Private Service Mains And Their Appurtenances.

2.7.2 Underground Fire Hydrants (Aircraft Loading Areas)

Underground fire hydrants are not permitted. Exceptions shall require Office of the Fire Marshal approval.

Flush type fire hydrants shall be Mueller A-415 or approved equal with a 5 sided 5/16” operating nut, two 2½” diameter hose connection (with National Standard Threads) and a 5” diameter Storz pumper connection with a ¼” bleed off/pressure relief valve.

Consultant shall provide details for a reinforced concrete structure around the underground fire hydrant. The cover shall be 36” x 36” Model HLC-4 by Bilco or equal, suitable for aircraft loading. Structure shall have a door with flush mounted hinges and stainless steel hardware, spring cushion operators, and hold open arm. Cover shall be painted red with a white Fire Hydrant Symbol, which is a minimum 2 feet long, painted to match the NFPA 170 Figure 4-2.5.

2.7.3 Construction Phasing for Fire Hydrants and Water Mains

In accordance with Title 29 06.01, State Fire Prevention Code, the following applies to new construction: Section 41-2, Fire Safety During Construction, subsection 41-2.3.2, Water Supply – “Where underground water mains and hydrants are to be provided, they shall be installed, completed, and in service prior to construction work.” Office of the Fire Marshal will allow the pad to be installed and the steel to be erected prior to the underground water mains and hydrants being in service.

2.8 Use, Occupancy and Construction Types

2.8.1 Use Classifications

The following use classifications are used by the Office of the Fire Marshal for various airport spaces. In the case of unusual spaces, consult the Office of the Fire Marshal to determine the assigned use classification.

USE CLASSIFICATIONS		
Space or Area	**Use Classification Assigned by AHJ**	
Airline Ticket Counter	**A-3**	Public Assembly (Public Areas)

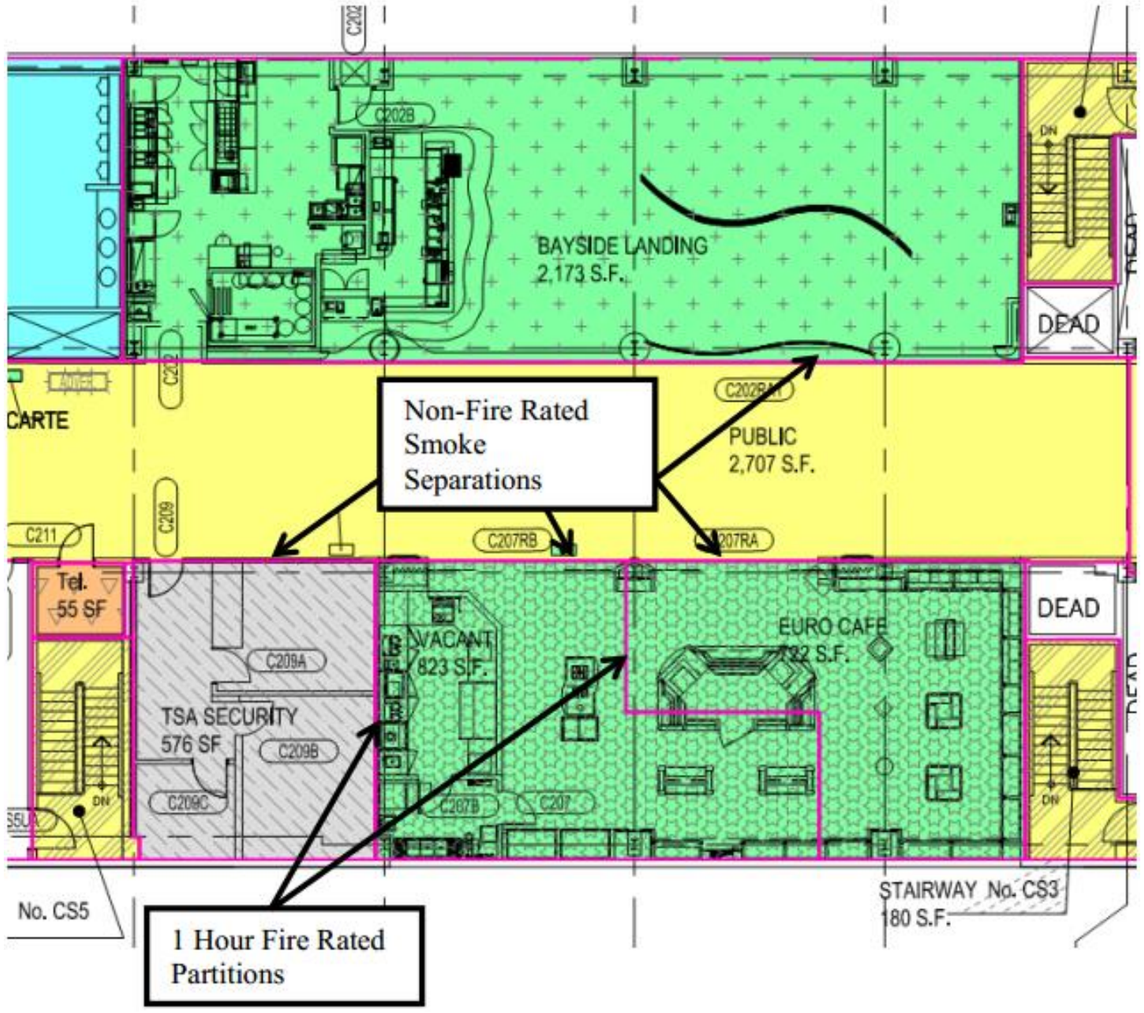
Airline Ticket Office (ATO)	**B**	Office (Private Areas)
Baggage Claim	**A-3**	Public Assembly (Public Areas)
Baggage Make-Up / Baggage Screening	**S-1**	Moderate Hazard Storage
Baggage Service Office (BSO)	**B**	Office
Holdrooms	**A-3**	Public Assembly (Public Areas)
Offices	**B**	Office
Restaurant/Food Court Tenants	**A-3**	Public Assembly
Storage (Non-Hazardous)	**S-1**	Moderate Hazard Storage
Stores, Retail	**M**	Mercantile
Utility (Electrical, etc.)	**S-1**	Moderate Hazard Storage

2.8.2 Existing Construction Types and Use Group and Smoke Separations

A. The AHJ has determined the following Construction Types for the various portions of the BWI Marshall Terminal complex and the required Use Group and Smoke Separations:

Location	Use Group Separations (and Smoke Separations)	Construction Type	Code Built Under
A/B Terminal	Separated Mixed Use	IBC Type IB	IBC 2000 NFPA 101-2000
A Concourse	Separated Mixed Use	IBC Type IB	IBC 2000 NFPA 101-2000
B Concourse	Separated Mixed Use	IBC Type IB	IBC 2000 NFPA 101-2000
B-C Connector	Separated Mixed Use	IBC Type IB	IBC 2009 NFPA 101-2009
South Terminal	Separated Mixed Use	IBC Type IB	Unknown
Central Terminal	Separated Mixed Use	Undocumented Construction Type	Unknown
North Terminal	Separated Mixed Use	IBC Type IB	Unknown
North Terminal Extension (Between D and E)	Separated Mixed Use	Undocumented Construction Type	Unknown
C Concourse	Separated Mixed Use	IBC Type IB	IBC 2012
D Concourse Including DX & DY	Non-Separated Mixed Use	Undocumented Construction Type/IIA IBC Type IB/NFPA 101 II	Unknown BOCA IBC 2012
D-E Connector	Non-Separated Mixed Use	Type IB	IBC 2012 NFPA 101 2012
E Terminal	Covered Mall (Atrium) Non-Separate Mixed Use	Unprotected Type I or Type II up to 3 stories	BOCA 1993 IBC 2012
E Concourse 90 ft Extension	Non-Separated Mixed Use	Type IB	IBC 2012 NFPA 101 2012
E Concourse 150 ft Extension	Non-Separated Mixed Use	Type IIA	IBC 2015 NFPA 101 2012

B. Upper Level Tenant Fire Separation Requirements
Tenant to tenant separation walls shall be 1 hour fire rated partitions. Tenant to public corridor separation walls can be non-rated partitions.

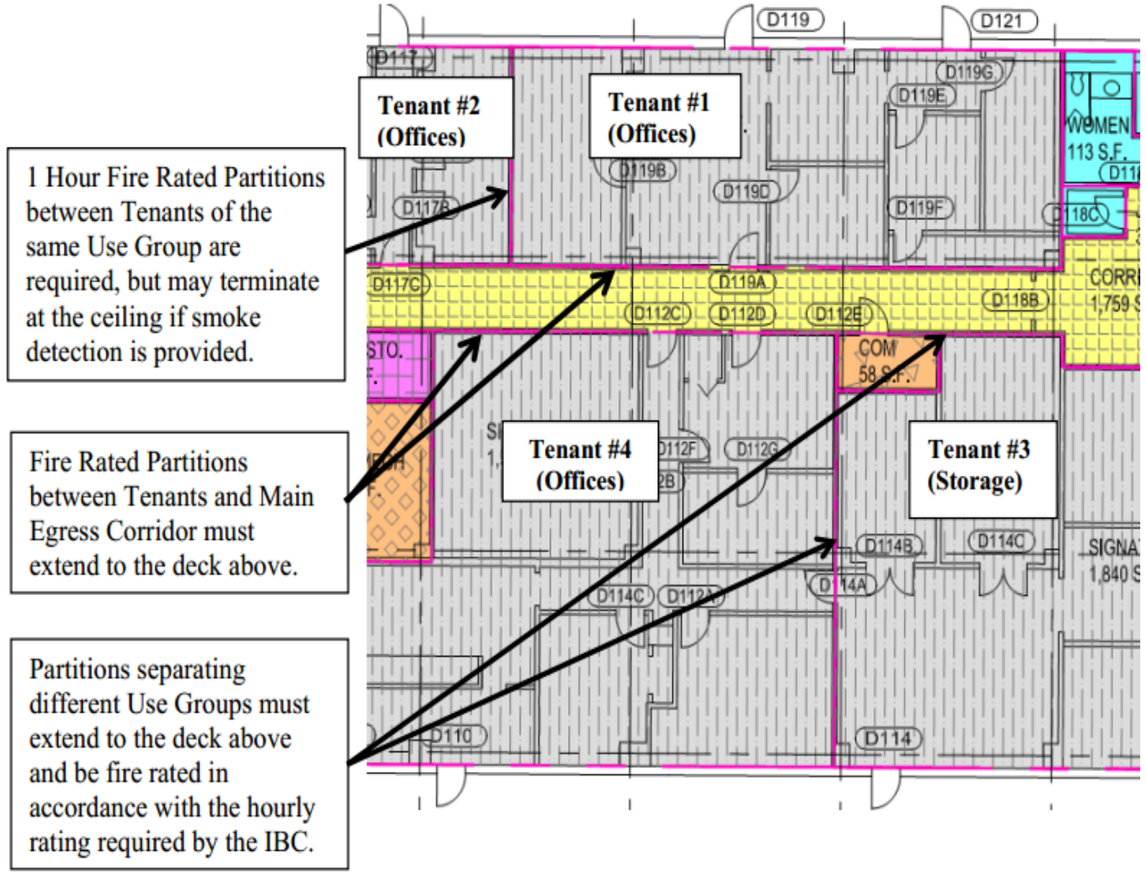


Example 1: Concourse Level

C. Lower Level Tenant Separation Requirements

Use Group Separations:

Fire rated fire separation walls are required between adjoining tenant spaces and also between tenant spaces and service corridors serving multiple tenants. If separating Use Groups, the fire rated walls are required to extend tightly to the underside of the floor or roof deck above with all ductwork penetrations provided with U.L. listed, self resetting, electrically actuated fire dampers shall be installed and all wiring penetrations protected in accordance with a U.L. listed penetration protection design. Fire rated separation walls between Use Groups shall comply with the fire rating requirements of the IBC and shall be constructed of non-combustible materials. Tenant Separations, Same Use Group: Fire rated fire separation walls are required between adjoining tenant spaces and also between tenant spaces and service corridors serving multiple tenants. If ceiling-mounted area smoke detection is provided within the tenant spaces, the fire separation wall may terminate at the underside of a UL listed fire rated floor-ceiling Assembly. Fire rated separation walls separating tenants shall be one (1) hour fire rated and constructed of non-combustible materials.



Example 2: Lower Level – Fire Rated Partitions

Note: Where a one (1) hour fire rated tenant separation is required for a new tenant that could potentially disturb an existing adjacent tenant space, the new tenant space may be separated in accordance with Figure 1 or Figure 2 below, an alternate U.L. listed one (1) hour rated assembly. In such case, the fire separation partition shall extend on either the ceiling or to the deck above, as appropriate per Paragraph 7 above.

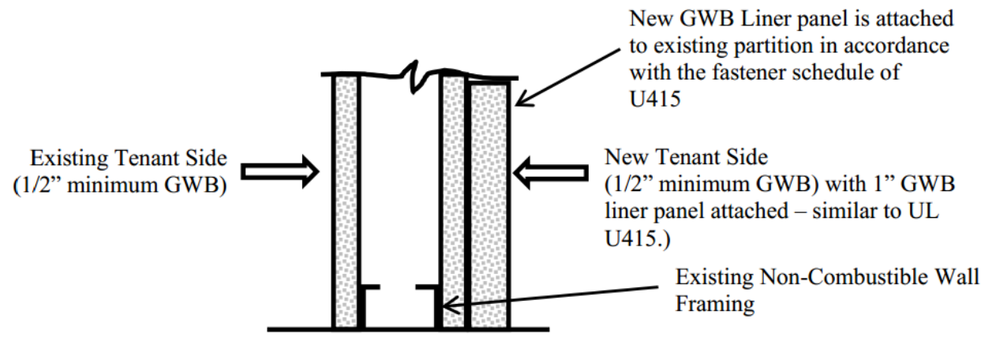


Figure 1– Condition where ½" drywall is on one, or both, sides of an existing tenant separation partition and does not currently provide a 1 hour rating without additional GWB liner panel being installed.

1-Hour Fire-rated Construction	Non-loadbearing		Acoustical Performance		Reference	
Construction Detail	**Description**	**Test Number**	**STC**	**Test Number**	**ARL**	**Index**
wt. 8 3⅛"	• 5/8" SHEETROCK FIRECODE Core gypsum panels, joints finished • 2-1/2" USG C-H Studs 25 gauge 24" o.c. • 1" SHEETROCK gypsum liner panels	**UL Des U415, System A** or **U469**	39	**USG-040901** Based on 4" C-H studs 25 gauge	SA926	1

Figure 2– Condition where 5/8" "Fire Code" drywall existing on only one side of the tenant separation partition and a gypsum liner panel is installed to completed the required separation.

2.8.3 Procedures for Determining Occupancy Loads and Minimum Required Egress Capacities for Concourses

A. Overview

This Policy shall be used in the planning and construction of all new Concourses, and in modifications or expansion of existing Concourses at BWI Marshall that affect egress capacity or occupant loads. It also applies to all future terminal development involving Concourse egress. It is intended to provide consistent and documented methods established by the Fire Marshal as the Authority having Jurisdiction (AHJ) for fire code enforcement at BWI Marshall Airport.

B. Egress and Occupant Loads:

1. An emergency egress plan from tenant spaces is required.
2. All travel distances from the Concourses must be taken to the non-secure side of the Security Checkpoint or to the nearest stairwell.
3. The occupancy load for each tenant space must be calculated and shown on the plans.
4. A performance based "Life Safety Evaluation", developed in accordance with NFPA 101, is required for all projects serving an occupant load of more than 6,000 persons. Significant alterations or additions to existing spaces may be required to comply. Check with the Office of the Fire Marshal regarding your project. A Professional Engineer who is licensed to practice in Maryland, and who is a Fire Protection Engineer, must prepare the Life Safety Evaluation.

C. Emergency Egress Capacity Requirements

Emergency egress capacity requirements for Concourses A and B are based on the Model Codes (NFPA 101, IBC), except as modified in the CHECCG. A Fire Protection Engineer, who is a licensed Professional Engineer in the State of Maryland, shall prepare any such required egress capacity and occupant load calculations, with supporting justification, for review of the Office of the Fire Marshal for any modifications or expansions of a Concourse that affect egress or occupant loads.

The following criteria shall be followed when evaluating Emergency Egress Capacity:

1. Egress components from Concourses must be sized to provide at least 50% of the Concourse occupant load through the front/main exit. The main/front exit of the Concourse is considered the egress route into the Terminal Building. Egress via an adjacent secure corridor that connects Concourses may also be considered contributing to the front/main exit egress capacity provided that the secure corridor leads to egress to the Terminal building or to a space designed to meet the requirements of NFPA 101, most recent adopted Edition, for "Horizontal Exits".
2. Egress components from Concourses must be sized to provide at least 100% of the Concourse occupant load through the Concourse egress stairs to the airfield-side apron to accommodate an incident that could block the front/main exit. The Fire Marshal has determined that a potential exists for an incident rendering the front Concourse exits possibly inaccessible or no longer well defined during the incident.

a. Exception 1: In existing Concourses, where 100% occupant load egress stair capacity is not currently provided, upgrading the stair capacity to achieve 100% capacity is not required unless the Concourse footprint is being increased in area.
b. Exception 2: In existing Concourses, where 100% occupant load egress stair capacity is not currently provided, upgrading the stair capacity to achieve 100% capacity is not required if the Concourse area is being increased in order to improve existing deficient egress via the required front exit (as per paragraph A above).

A. If there are more stringent egress requirements of the IBC, they shall apply.

2.8.4 Procedures for Holdroom Sizing

Refer to Volume 5, Chapter 1 Concourse Holdroom and Egress Code Compliance.

2.8.5 Occupant Capacity Calculations

OFM will need to obtain square footage calculations to determine occupant load capacity numbers. These numbers will require the gross and net floor areas to be provided to OFM. The gross floor area is within the inside perimeter of the outside walls of the building or area under consideration with no deductions for hallways, stairs, closets, elevators and building service shafts, or other features, but excluding floor openings associated with atriums and communicating shafts. The net floor area is the actual occupied area not including unoccupied accessory areas such as corridors, stairways, ramps, toilet rooms, mechanical rooms, closets, wall cavities and columns. The consultant shall provide OFM with both gross and net floor area calculations.

2.9 Other Life Safety Provisions & Requirements

2.9.1 Automated External Defibrillator (AED)

A. Consultant shall add a note on the drawings to state:
"When construction requires the temporary or permanent relocation of an AED, the Contractor shall be responsible to do the following regarding the AED and the cabinet in which it is stored:
1. For the AED: Notify the Fire Rescue Department (FRD) to schedule an EMS lieutenant to supervise the removal of the AED. Deliver the AED to the Fire Station and obtain a "Received Property" receipt from the person who receives the AED at the Fire House. All AED's are monitored by the CASS and will alarm upon cabinet being opened.
2. For the AED Cabinet: If the cabinet must be removed to accommodate construction, the Contractor shall remove it and deliver it to the Fire Station and obtain a "Received Property" receipt from the person who receives the cabinet at the Fire House.
3. Reinstallation: The Contractor shall retrieve the AED and the cabinet from the Fire House and reinstall them as soon as possible after construction in the affected area is complete. As required by the Fire Marshal, reinstallation may be required prior to Substantial Completion of the entire project.

2.9.2 Kitchen Hoods, HVAC and Natural Gas

Refer to Volume 2, Chapter 9.

2.9.3 Electrical Distribution Systems and Emergency Power Requirements

Refer to Volume 2, Chapter 11.

2.9.4 Exit Signs

Refer to Chapter 5, Signage and Graphics.

2.9.5 Door Numbering and Signage

Refer to the following:

A. PEGS Volume 3, Chapter 5 Signage and Graphics
B. PEGS Volume 1, Section 2.4 Door Number Assignment
C. PEGS Volume 2, Section 14.2.2.2 Door Numbering Plates

2.9.6 Knox Box System

A. The Knox Box System is a high security key box designed to give firefighters and emergency responders immediate access to locked buildings, elevators, and other secured areas. The Knox Box System has been approved by the MDOT MAA as a sole source procurement.
B. Applicable building contract documents shall include the requirements for the installation of Knox Box System.
C. The contract documents show required the contractor to contact the MDOT MAA's Office of the Fire Marshal for the Knox Box System Authorization/Order form and obtain the MDOT MAA Fire Marshal's signature.

D. The consultant shall coordinate the number size, and location of Knox Boxes with the MDOT MAA's Office of the Fire Marshal.

2.10 Pre-Occupancy Fire Inspection Checklist

A Pre-Occupancy Fire Inspection checklist (a form provided by the Office of the Fire Marshal) is available for use at Office of the Fire Marshal. This form may be used for self-checking readiness for inspection but is not all inclusive and does not relieve the user of any compliance requirements not listed.

This checklist will be incorporated into the contract documents by the Consultant.

3.1 Fire Lane Requirements

3.1.1 What Is the Legal Basis for Requiring Fire Lanes & Access Roads?

The State adopted Fire Code NFPA-1 which provides for emergency vehicle access to any building, structure, or location within the Airport community or off-site properties. This applies to all MDOT Maryland Aviation Administration (MDOT MAA) properties at BWI Marshall and MTN. The Fire Marshal is responsible for ensuring that emergency access is always available, and that all new and existing developments comply with emergency access requirements. For the purposes of this PEGS Section, Fire Department access roads shall consist of roadways, fire lanes, parking lot lanes, or a combination thereof.

3.1.2 Is There a Difference Between a Fire Lane, Fire Department Access, and a Private Street?

Private streets conform to a different design standard than designated fire lanes. However, they must always allow for appropriate emergency access just as a public street would and may, in some cases, be required to have fire lane markings.

Driveways, parking lot lanes, and private roadways shall be permitted to be used as fire lanes if they meet the requirements of this Section.

The fire lane should also be arranged so there is no confusion as to where emergency vehicles are to go in the event of a fire or rescue emergency in a building, on a runway, or in an aircraft.

3.1.3 Under What Circumstances Are Fire Lanes Required?

Fire lanes are generally required when any portion of a structure is located more than 150 feet from a public street. On occasion, emergency access requirements may be modified to be more or less stringent depending on circumstances unique to each site (e.g., occupancy type, building design, parking layouts, or landscape features).

3.1.4 What Are the Dimensional Requirements for a Fire Lane?

Fire lanes must have a minimum 24 feet wide working area between marking stripes and have an overhead clearance of not less than 14 feet. Turns in fire lanes shall be constructed to provide sufficient width to accommodate the largest piece of fire apparatus available to be operated on the fire lane, but in no case shall the radius to the outside curb line be less than 50 feet. The inside turning radius shall not be less than 38 feet. Conformance with this standard must be demonstrated by including a scale illustration on the submitted site plan for the development and/or project involved. One or more of the required access routes meeting this condition shall be located not less than 15 feet, no more than 30 feet from the building, and shall be positioned parallel to one entire side of the building.

If it is determined that a larger access road is required for emergency aerial apparatus, the minimum unobstructed width shall be 26 feet. The requirement for this larger access road shall be determined as required where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet. For the purposes of this requirement, the highest roof surface shall be determined by measurement to the eave of a pitched roof or the intersection of the roof exterior wall or top of parapet walls, whichever is greater.

A reduction in fire lane width may be allowed where it is clearly identified that sole purpose of the fire lane is for emergency vehicle use only.

Overhead utility and power lines shall not be located overhead in any area where fire department aerial operations are anticipated.

3.1.4 How Many Points of Access Are Required?

Structures exceeding three stories or 30 feet in height shall have fire lanes along three sides of the building. One or two-story buildings shall have fire lanes on two sides. Access for the Airport terminal building shall have space between aircraft and must be large enough to allow emergency response equipment access to terminal buildings and the aircraft.

3.1.5 What Types of Structural Material Are Allowed?

Fire lanes must be constructed of an approved all-weather material capable of supporting the imposed loads of emergency apparatus. The design engineer or architect shall certify to the MDOT MAA Office of Engineering & Construction that the proposed paved surface complies with this requirement.

3.1.6 What are the Maximum Grade and Angle of Approach/Departure Allowed?

Grades shall not be more than 10 percent. The angle of approach and the angle of departure shall not exceed 8 degrees at any point on the roadway or intersection with another roadway or fire lane. Grades and angles exceeding these requirements may be permitted where mitigation measures can be agreed upon.

3.1.7 Are Dead-End Fire Lanes Allowed?

Continuous fire lanes which connect to more than one outlet are preferred. However, it is understood that site limitations may not allow this in every case. Therefore, a dead-end fire lane may be allowed in certain cases, provided it does not exceed 150 feet in length. If a distance in excess of 150 feet is necessary, a turnaround feature must be incorporated as part of the designated fire lane. Turnarounds must be of an approved design that meets the dimensional requirements of the other portions of the fire lane. Other designs may be acceptable if approved by the Fire Marshal.

3.1.8 Can "Speed Bumps" or Other Traffic Calming Devices Be Placed in Fire Lanes?

The Fire Marshal understands and supports the desire for safe streets and vehicle/pedestrian interfaces. Islands, roundabouts, bump-outs, and other similar features may be incorporated within a fire lane in limited areas provided they reduce the width of the fire lane to no less than 20 feet and do not present an impediment to emergency operations. These features may be approved on a case-by-case basis.

3.1.9 How Must a Fire Lane Be Marked?

Fire lanes shall be marked with approved signs, approved roadway or curb markings, or other approved notices which shall be provided and maintained to prohibit the obstruction thereof or both.

Where necessary, fire department access roads may be marked in alternative manners as approved by the Fire Marshal. If such an alternative designation is allowed but fails to effectively control parking, the requirements in these guidelines will be required.

3.1.10 Can Fire Lanes Be Gated or Obstructed for Security Purposes?

The gating of fire lanes will be considered on a case-by-case basis. The clear opening through gates in fire lanes shall be 2 feet wider than the fire lane. All gates at the entrance to fire lanes shall be located a minimum of 30 feet from the roadway and shall open away from the fire lane unless other provisions are made. On a case-by-case basis, if the gate cannot be located 30 feet from the roadway, a wider than normal gate opening may be considered by the Fire Marshal, provided vehicle turning radius is addressed. The MDOT MAA Fire Marshal shall have the authority to require a means of unlocking a security feature that is installed by providing a Fire Department KNOX Gate Key Switch or Lock. This includes a required manual release of the gate so it can be opened in the event of power loss for a motor-controlled gate opener. Means shall also be provided to override normal operation and allow any gate to remain fully open until manually closed.

3.1.11 Can a Single Fire Lane Serve Two or More Buildings?

This is not preferred; however, it is possible in some cases, provided the emergency access is suitable, and all stakeholders agree.

3.1.12 Can a Bridge be Part of Fire Department Access?

When a bridge or elevated roadway is required to be used as part of a fire department access road, it shall be constructed using nationally recognized standards. The design shall be reviewed by the MDOT MAA Office of Engineering & Construction.

3.1.13 What are the Requirements for Parking Lots?

The minimum lengths of parking lot stalls shall be measured end to end, and the minimum stall length and aisle width shall be as shown in the supporting illustrations and explanatory text. Parking stalls shall be long enough so that parked vehicles shall not extend into the turning radius of fire lane or reduce the required width of the fire lane. See Section 3.1.17 Minimum Parking Lot Stall Dimensions and Minimum Aisle Lengths for further information.

3.1.14 Are There Any Alternatives or Exceptions to This Standard?

It is the desire of the BWI Marshall Fire Department and Office of the Fire Marshal to be as flexible as possible without compromising safety. If the designer engineer or architect has an alternative proposal, the Office of the Fire Marshal will consider it carefully. Alternatives may be approved if the design allows for adequate emergency access and deviations from these standards are justified by specific site considerations.

The information presented in this Section should address most situations encountered. However, unique circumstances will occur. Alternative proposals will be considered and may be approved with the safety of the public, MDOT MAA employees, contractors, and first responders in mind.

3.1.15 Can Traffic Control Signs be Placed in the Fire Lane?

Yes. Traffic control signs, pedestrian signs, and fire lane signs shall be set back so the sign does not protrude into the travel portion of the fire lane interfering with emergency apparatus turning radii.

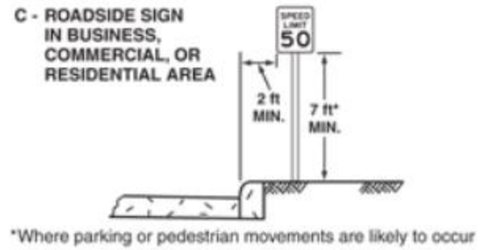


Figure 3.1.15.1-1 - 2009 MUTCD Edition Part 2 Figure 2A-2. Examples of Heights and Lateral Locations of Sign Installations

3.1.16 Supporting Illustrations

3.1.16.1 Examples of Emergency Apparatus Turn Arounds

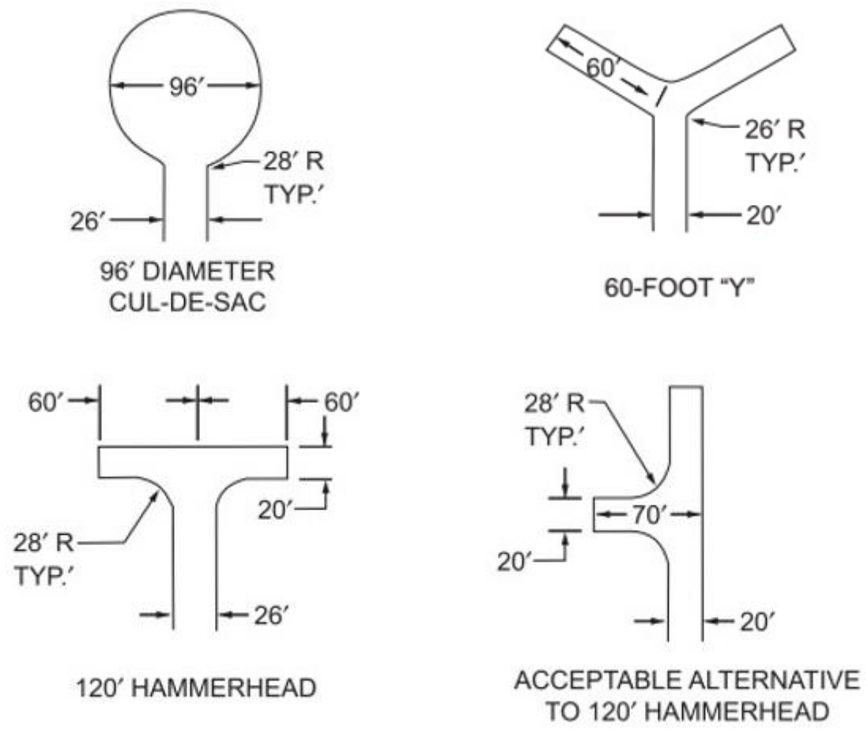


Figure 3.1.16.1-1 - Illustrations from NFPA-1141-2017

3.1.16.2 Fire Lane Signs

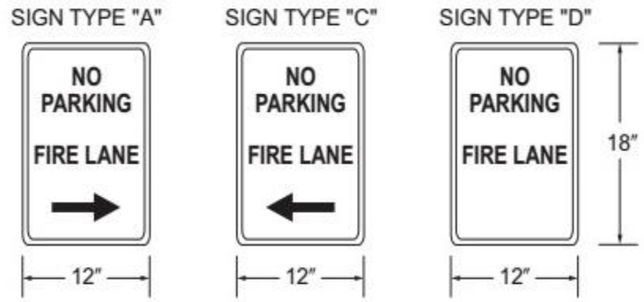


Figure 3.1.16.2-1 – Sign Types

Signs shall be metal, weather and UV resistant with white reflective background with red letters. Signs shall be posted on both sides of access roads that are 20 feet to 26 feet wide and posted on one side of access roads that are more than 26 feet wide. Signs shall be attached to metal post and posted 7 feet above grade.

3.1.16.3 Fire Lane Pavement & Curb Marking

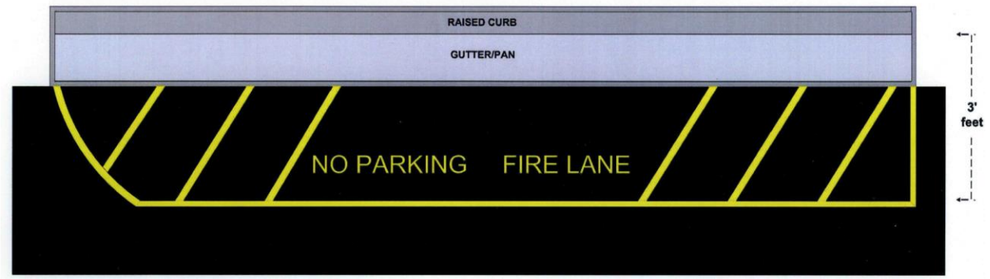


Figure 3.1.16.3-1 – Fire Lane Curb Marking

All striping shall be minimum 6 inches thick lines. Outer line shall be 3 feet from curb edge or road edge. Ends of designated area can be curved/rounded or boxed. Angled lines shall be 6 feet apart except where lettered graphics are placed. No Parking Fire Lane graphics shall be minimum 8 inches high, 2 inches cut out, at 50 feet intervals.

3.1.16.4 Fire Lane Pavement Marking at Fire Hydrants & Fire Sprinkler Connections

Figure 3.1.16.4-1 – Fire Lane Markings at Hydrants

To be used on airfield aprons and locations that do not include fire hydrant or fire sprinkler connection located within the fire lane.

3.1.17 Minimum Parking Lot Stall Dimensions and Minimum Aisle Lengths

Parking Angle	Minimum Stall Length		Minimum Aisle Width, One-Way Traffic Flow		Minimum Aisle Width, Two-Way Traffic Flow	
	ft	m	ft	m	ft	m
45 degrees	27.5	8.4	16	4.9	24	7.3
60 degrees	23.7	7.2	16	4.9	24	7.3
75 degrees	20.9	6.4	23	7.0	24	7.3
90 degrees	18.5	5.6	26	7.9	26	7.9

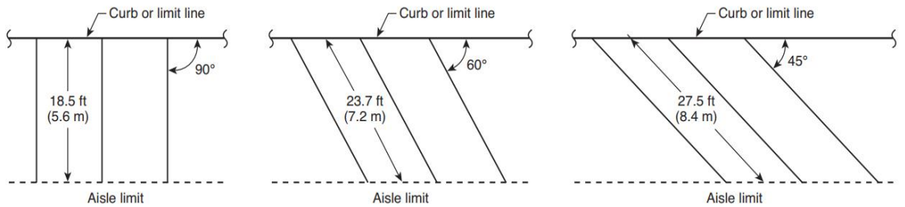


Figure 3.1.17-1 - Illustration from NFPA-1141-2017

3.1.17.1 BWI Emergency Apparatus Fleet Specifications

Vehicle Quick Reference							
		Width	Length	Height	Turning Radi		
	Unit	Over Road Vehicle Width [inches]	Over Road Vehicle Lenght [inches]	Over Road Vehicle Lenght [inches]	Inside Turning Radii [inches]	Wall-to-Wall Outside Turning Radii [inches]	GVW [pounds]
Basis of Design BOD	BOD ARFF	139	481	157	456	1,011	93,000
	BOD Engine	100	394	123	180	409	50,500
	BOD Special Service	100	562	147	180	536	76,800

Table 3.1.17.1-1 – Fleet Information

Note: This is general information provided for informational purposes. This information may not be the latest fleet information. Please consult with Office of the Fire Marshal to confirm accuracy of the information provided on this table.

3.1.18 Fire Lane Quick Reference Chart

Fire Lane Quick Reference		
Height of Building→	Roof up to 30'-0"	Roof higher than 30'-0"
Building Access, parallel along one entire side	Within 15' but not further 30' from the building.	Within 15' but not further 30' from the building.
Required minimum Fire Lane width	24'	26'
Required minimum Fire Lane Gate width Wider Gates may be required to accommodate turning vehicles, see Gate requirements for details.	26'	28'
Required minimum Fire Lane overhead clearance	14'	14'
Minimum Design Load	40 tons	40 tons
Minimum Outside radius, wall to wall	50'	50'
Maximum Inside radius	38'	38'
Maximum Fire Lane Grade	10%	10%
Maximum Fire Lane Cross Grade	5%	5%
Maximum Angle of Approach and Departure	8°	8°
Maximum Dead End Fire Lane Length without approved Turnaround	150'	150'
Speed Restrictions & Speed Bumps Minimum Fire Lane Width	20'	20'

Figure 3.1.18-1 – Fire Lane Quick Reference

4.1 Cipher Locks

Installation of all cipher locks shall comply with the requirements of the Life Safety Code, National Fire Protection Association NFPA 101, 2006 Edition or later adopted edition, as new editions are published and accepted and COMAR 05.02 – Department of Housing and Community Development,– Building and Material Codes. Per paragraph 7.2.1.5.1 of NFPA 101, no cipher locks shall be installed along required paths of egress travel. This requirement includes, but is not limited to, exterior doors, doors of egress from aircraft boarding bridges, and doors leading to stairways, corridors, etc. The Maryland Aviation Administration Fire Marshall is the governing authority in determining whether a door is part of a required path of egress.

The Fire Marshall shall be notified of the installation of any cipher lock. To allow emergency access, all cipher locks must have a key override. Three sets of keys shall be submitted to the Fire Marshall for each cipher lock installed.

The key override system shall have a Best core. Cipher locks to be installed on the exterior side of doors must be rated for exterior usage.

Magnetic card locks must meet requirements of NFPA 101 for delayed egress locks and are subject to review by the Office of the Fire Marshal.

4.2 Approved Testing Laboratories for Electrical Systems

All equipment and materials shall be tested and labeled by a nationally recognized testing laboratory. A current list of recognized laboratories should always be available on the following website, and should be regularly referred to for updates: MD Fire Marshal - Code Enforcement, Approved Contractors, & Regulations

Background:
Electrical Testing Laboratories are qualified private organizations that meet the requirements in 29 CFR 1910.7 to perform independent (i.e., third-party) safety testing and product certification, and thereby receive OSHA recognition. To be recognized by OSHA, an organization must: (1) Have the appropriate capability to test and evaluate products for workplace safety purposes; (2) be completely independent of the manufacturers, vendors, and users of the products for which OSHA requires certification; (3) have internal programs that ensure proper control of the testing and certification process; and (4) establish effective reporting and complaint handling procedures (29 CFR 1910.7(b)).

Any testing laboratory that is listed or otherwise recognized by the U.S. Department of Labor, Occupational Safety and Health Administration, National Voluntary Laboratories Accreditation Program (NVLAP), International Accreditation Service, Inc., or the International Code Council, is automatically accepted by the Office of the Fire Marshal and MDOT MAA.

4.3 Fire Safety Requirements for Passenger Boarding Bridges

All PBBs shall comply with NFPA 415. Documents stating the PBB meets NFPA 415 shall be supplied as part of the PBB submittal (See Specification 347713X Apron Drive Passenger Boarding Bridges in Volume 2, Appendix 2D - Standard Specifications).

Any modifications that are made to PBBs to accommodate regional jets shall meet the 5-minute fire resistance rating requirements of NFPA 415, and interior finishes shall be class “A” rated in accordance with NFPA 415.

Any modifications for PBBs to accommodate regional jets shall be subject to approval of the Office of the Fire Marshal and shall be provided for review and acceptance before use.

5.1 Exit Signs

All exit signs shall consist of red letters on a contrasting background, in accordance with NFPA 101. This type of sign is to match the existing area.

5.2 Fire Protection Identification Signage

Fire protection identification signs will be provided as outlined below. Consultant is responsible for developing a suitable permanent attachment method for approval by the MAA Project Manager and the Office of the Fire Marshal. Glue or tape shall not be used.

1. “SPRINKLER CONTROL VALVES” and “SPRINKLER/STANDPIPE CONTROL VALVES”
   - Metal type sign with red background and 2” tall reflective white letters.
   - Sign size: 26”x6"
   - The sign shall be placed on the door closest to the valves. These signs will be placed indoors and outdoors.

Sign type No. 1

Sign type No. 2

2. Electrical Substations (“WARNING ELECTRIC SUBSTATION PROTECTED BY WET SPRINKLER SYSTEM”)
   - This sign shall be used to identify the location of Electrical Substations.
   - Metal type sign with red background and 2” tall white reflective letters.
   - Sign size: 26”x6"
   - shall be placed on the outside of the door.

Electrical Substation Warning Sign

3. Standpipe Connection (“Fire Dept. Standpipe Connection”)
   - This sign shall be made like a bumper sticker. It will be used indoors only and placed on smooth metal or glass. It will be placed over existing signage on glass that is stenciled on the interior of the glass.
   - The sign contractor shall determine the sign size (minimum 10”x3"), color and size of the lettering.
   - The locations and placement shall be field determined.

Standpipe Connection Sign

4. Fire Command Room (“FIRE COMMAND ROOM FAP-HVAC-PA)
   - Metal type sign with red background and 2” tall white reflective letters.
   - Sign size: 26”x6”
   - The sign will be placed on the outside of the door.

Fire Command Room Sign

5.3 Secondary Entrance Door Identification Signage

Secondary entrance doors are defined as an entry/exit door normally located at the rear of an occupied space or property. These secondary doors include mercantile and food concessions, airline spaces, offices, storage rooms, etc. Occupants of spaces and properties are responsible for installing identification signage on secondary doors to aid in emergency dispatch. The signage shall provide the occupant tenant or business name so that first responders can quickly locate the correct space. This requirement is applicable to all BWI Marshall and Martin State Airport buildings.

1. Signage may be constructed of vinyl, plastic, or aluminum, and must be permanently installed and readily visible.
2. Door identification signs shall be located on the wall adjacent to the door or on the door at a mounting height of 60-inches from the floor to the center of the identification sign.
3. Signage installed on fire rated doors shall be permitted provided it does no exceed 5% of the fire area of the face of the door. Signage shall only be installed with adhesive. Attaching a sign using screws, nails or other methods is prohibited. Signage shall not be installed on glazing material on fire doors or non-rated doors or be installed anywhere that may impair or interfere with the proper operation of the door.
4. Minimum signage size shall be 6-inches by 6-inches. Signs shall be text based with a minimum font size of 72 (1-inch). The use of brands or corporate logos are not permitted.

5.4 Storage Cage Identification Signage

Fenced storage cages located inside of a room shared by multiple tenants shall be identified by signage. Occupants of spaces and properties are responsible for installing identification signage to aid in emergency dispatch. The signage shall provide the occupant tenant or business name and the door number associated with the room the storage cage is located in so that first responders can quickly locate the correct space. The requirement is applicable to all BWI Marshall and Martin State Airport buildings.

1. Signage may be constructed of vinyl, plastic, or aluminum, and must be permanently installed and readily visible.
2. Signs shall be located on the cage/fence gate at a mounting height of 60-inches from the floor.
3. Minimum signage size shall be 6-inchs by 6-inches. Signs shall be text based with a minimum font size of 72 (1-inch). The use of brands or corporate logos are not permitted.

3A.1 Standard Forms

OFM Standard forms shall be obtained from the MDOT MAA's Office of the Fire Marshal.

3B.1 Adopted Codes and Standards

A. Adopted Codes and Standards
MDOT MAA complies with all State of Maryland Codes, Standards and Regulations. The effective dates of the adopted codes and standards changes based on when the State of Maryland adopts a new edition. Consultants are required to comply with the following adopted codes and standards:

1. International Building Code (IBC), {as incorporated by reference in the COMAR Model Performance Code}
2. International Plumbing Code (IPC)
3. National Electric Code (NEC), Edition (NFPA 70)
4. International Mechanical Code (IMC)
5. International Energy Conservation Code (IECC)
6. International Green Construction Code (IgCC)
7. Maryland Accessibility Code {ADA with Maryland Amendments}
    a. COMAR 05.02.02.00
8. Maryland Building Rehabilitation Code {International Existing Building Code (IEBC) with Maryland amendments}
9. Maryland Fire Prevention Code, Amended effective October 7, 2019.
    a. NFPA 101-2018, Life Safety Code {as adopted and amended by COMAR 29.06.01.07}
    b. NPFA 1-2018, Fire Code {as adopted and amended by COMAR 29.06.01.08}
        i. See NFPA 1-2018 Chapter 2 Referenced Publications for a list of documents adopted by reference.

Consultants must visit the following websites for the most current adopted codes and standards:

1. COMAR Model Performance Code and Maryland Accessibility Code:
   https://www.dllr.state.md.us/labor/build/comar09125058.pdf

2. State of Maryland Fire Prevention Code
   https://mdsp.maryland.gov/firemarshal/Documents/State%20Fire%20Prevention%20Code%202019%20October%207%20Adopted.pdf

B. Effective Dates for Codes and Standards
The effective dates of the adopted codes and standards changes based on when the State of Maryland adopts a new edition. Consultants are required to comply with the most current adopted codes and standards applicable at the time of:

1. MDOT MAA Design projects – Project Design Notice To Proceed
2. Tenant projects – Permit application date

Projects designed for MDOT MAA or tenant projects which are inactive for one year or more from the date of approval from the Office of the Fire Marshal must resubmit documents to review for compliance under the most current adopted codes and standards.

3B.2 Other Regulatory Agency Requirements

Additionally, projects must comply with the requirements of several regulatory agencies:

Agency	Regulation
Federal Department of Transportation	

Federal Aviation Administration (FAA) Federal Aviation Regulations	Subchapters
	Part 77: Objects Affecting Navigable Airspace
	Part 139: Certification of Airports
	Part 150: Airports
	Part 151: Federal Aid to Airports
	Part 152: Airport Aid Program
Transportation Security Administration (TSA)	49 CFR Part 1542
Maryland State Highway Administration (SHA)	
Maryland Department of Transportation (MDOT)	
Maryland Department of the Environment (MDE)	
Occupational Safety and Health Administration (OSHA) Codes	
Environmental Protection Agency (EPA) Regulations	
Codes of Anne Arundel and Baltimore Counties	
United States Department of Agriculture	
American Association of State Highway and Transportation Officials (AASHTO) – Landside (non-airfield) projects shall follow AASHTO publication "A Policy of Geometric Design of Highways and Streets 1990" for all project design criteria. Design exceptions will only be required if the design falls below AASHTO minimum standards. In such cases, the consultant shall obtain SHA approval concurrently with MAA approval.	

The Consultant shall incorporate appropriate references to nationally accepted standards for the design, fabrication and installation of particular equipment. Also, the Consultant shall include in the design appropriate reference to the published MAA Directives. These include but are not limited to such topics as: security, vehicle operations, AOA licensing, badging, radio communications, display of signs, and key control.

3C.28 Division 28 – Electronic Safety and Security

Click the following links to download the individual specifications in Microsoft Word format.

Specification 283111 Fire Alarm System

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 4

Environmental and Noise

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.1 Environmental Coordination and Permitting

All permit applications shall be submitted in conjunction with and only after approval by MDOT MAA's Environmental Planning Section or Environmental Compliance Section. At project initiation, Consultant must schedule an initial consultation with MDOT MAA's Environmental Compliance Section to discuss permitting requirements for all planned or proposed environmental impacts.

1.2 MDOT MAA Office of Environmental Services Coordination

1.2.1 Maryland Department of the Environment (MDE) Stormwater Management and Erosion & Sediment Control

All correspondence, submittals, and re-submittals to MDE shall be forwarded by the Consultant to MDOT MAA's Manager of the Environmental Planning Section. This includes, but is not limited to: concept plans, Stormwater Management (SWM) reports, Erosion and Sediment Control (ESC) drawings, site development and final plans, responses to MDE comments, etc. Please refer to the current version of the Maryland Stormwater Management and Erosion & Sediment Control Guidelines for State and Federal Projects document for what should be included with each submission. If you have any questions, contact MDOT MAA Environmental Planning Section.

For projects involving greater than one acre of disturbance, a Notice of Intent (NOI) General Permit for Stormwater Associated with Construction Activity will be required. MDOT MAA Environmental Planning Section will apply for and manage this permit through the MDE ePermits system and serve as the principal contact; however, the Consultant shall provide information to MDOT MAA Environmental Planning Section, as requested, to complete the application. At a minimum, the Consultant shall provide the following information to MDOT MAA Environmental Planning Section as soon as possible in order to initiate the application: project area (square footage and acreage of LOD including 5% for potential expansion), a written description of the project's location, and latitude and longitude for the centerpoint of the project.

A. All submittals shall include a cover letter/transmittal to the attention of MDOT MAA Environmental Planning Section Manager stating the purpose of the submittal and a listing of the attachment(s), as well as any specific instructions or information that may be necessary for the submission.
B. The Consultant shall email a .pdf copy of the cover letter/transmittal to MDOT MAA's Design Task Manager.
C. The Consultant shall obtain a signed receipt from the Environmental Planning Section Manager or his/her designee for the document(s) delivered. The Environmental Planning Section Manager will maintain records of MDE submittals associated with individual projects for future reference.
D. The Environmental Planning Section Manager will forward the documents submitted by the Consultant to MDE for review. Concurrently, the Environmental Planning Section Manager will contact and coordinate with MDOT MAA's Expedited Reviewer at MDE regarding the forthcoming documents.
E. Comments and correspondence received on the submittal(s) from MDE will be forwarded by the Environmental Planning Section Manager to the Consultant for necessary action. The Consultant shall provide complete, point-by-point, response(s) to the MDE comments within ten (10) business days of receipt, unless directed otherwise. The "response to comments" letter shall be addressed to the MDE assigned staff, on behalf of the Environmental Planning Section Manager.
F. Refer to and insert the MDE Plan Review Number on all submittals, correspondence, and drawings to MDE once a number is assigned by MDE.
G. The Environmental Planning Section Manager or his/her designee shall sign the Owner's/Developer's Certification on the ESC plans and the Water Quality Summary sheets, as needed. If Environmental Planning Section Manager or his/her designee is unavailable, the Consultant may contact MDOT MAA's Manager of the Engineering Section for further instruction or to sign the documents.
H. For projects that fall below the threshold to require MDE's ESC review and approval but contain Erosion & Sediment Control drawings and specifications (for example, mill & overlay within existing paved areas), the Consultant shall submit the ESC documents to the Environmental Planning Section Manager for review and approval.
I. The Environmental Planning Section Manager or his/her designee will be the principal contact and responsible to manage the NOI process for the BWI Marshall and Martin State Airports' construction sites in compliance with the General Permit for Construction Activity and in accordance with the Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) stormwater program.
J. The Environmental Planning Section Manager will forward a copy of the approvals and permits to the Consultant, MDOT MAA Task Manager, MDOT MAA Construction Manager, and others, as necessary. The NOI shall be transferred electronically to the Contractor after the contract has been awarded via the MDE ePermits system, the Environmental Planning Section Manager or designee will inform these parties that the permit has been transferred. Once the project is complete, the NOI will be Terminated through a Notice of Termination on the ePermits system, and the Environmental Planning Section Manager or designee will inform these parties that the permit has been terminated.
K. After approval of the Final Stormwater Management Report by MDE, the Consultant shall submit a copy of the report to the MDOT MAA as an electronic deliverable to be uploaded with the Contract Documents and placed on record in AIRPortal. Refer to Volume 1, Section 1.4.2.2.B Stormwater Management Reports for more information on electronic submittals.
L. As-built requirements for Stormwater Management facilities are described in Section 3.1.1.2 Procedure for SWM As-Built Certification. Once as-built plans have been completed, the Consultant shall submit to Environmental Planning Section (EPS) one hard copy and one CD of the documents, which EPS will then submit to MDE. As-Built documentation and certification is required for all Stormwater Management Facilities.

1.2.2 MDE Non-tidal and Tidal Wetlands and Waterways and US Army Corps of Engineers (USACE)

A. For projects that may disturb nontidal or tidal wetlands, waterways, etc, coordination with the MDE Wetlands and Waterways division and the USACE will be necessary.
B. All coordination and correspondence with MDE and USACE for these approvals and permits shall be done through the MDOT MAA Environmental Planning Section.
C. Contact the Manager of the MDOT MAA Environmental Planning Section for further information.

1.2.3 Maryland Department of Natural Resources (MDNR)

A. The Maryland Forest Conservation Act was enacted in 1991 to minimize the loss of Maryland's forest resources during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. More information can be found on the Maryland DNR Forest Conservation Act web page.
B. Any activity requiring an application for a subdivision, grading permit or sediment control permit on areas 40,000 square feet (approximately 1 acre) or greater is subject to compliance with the Forest Conservation Act requirements and will likely necessitate a Forest Stand Delineation/Forest Conservation Plan (FSD/FCP) to be prepared by a licensed forester, licensed landscape architect, or other qualified professional UNLESS you are subject to one of the exemptions listed on MDNR's website.
C. All coordination and correspondence with MDNR for the approval of FSDs and/or FCPs shall be done through the MDOT MAA Environmental Planning Section.
D. Contact the Manager of the MDOT MAA Environmental Planning Section and consult MDOT MAA Standard Specification 329000X_Landscaping for further information.

1.2.4 MDNR Critical Area Commission

A. The Critical Area Act (1984) defines the Chesapeake Bay "Critical Area" as all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries. More information can be found on the Maryland DNR Critical Area Commission web page.
B. For projects that may fall within with the Critical Area (specifically, those at Martin State Airport), coordination with MDNR Critical Area Commission will be necessary.
C. All coordination and correspondence with the Critical Area Commission for the approval of the project within the critical area shall be done through the MDOT MAA Environmental Planning Section.
D. Contact the Manager of the MDOT MAA Environmental Planning Section for further information.

1.3 Permitting Process for the Construction of Air Emissions Sources

Please consult COMAR 26.11.02.10 for a list of sources which are exempt from having to obtain Air Quality Permits to Construct and/or Approvals.

When new sources of air pollution are planned for installation at BWI Marshall and Martin State Airports, an Air Quality Permit to Construct must be obtained (if required) from the Maryland Department of the Environment's Air and Radiation Management Administration (MDE/ARMA) prior to commencing construction. All permit applications shall be submitted to MDE/ARMA in conjunction with and only after approval by MDOT MAA's Environmental Compliance Section. At project initiation, Consultant must schedule an initial consultation with MDOT MAA's Environmental Compliance Section to discuss permitting requirements for all new air emissions sources that are planned or proposed. Preparing the applications for such permits is the responsibility of the Consultant. Later integration of new sources with facility air quality operating permits is the responsibility of the Owner (MDOT MAA).

Whenever practicable, Consultant/Owner should consider the incorporation of energy/fuel efficient, lower emission equipment into the design for air emission sources. In addition, when the purchase of a non-environmentally responsible piece of equipment is specified and/or recommended by the Consultant, justification in the form of a best available or economically feasible option will be required.

Whenever fuel burning equipment is added to the MDOT MAA inventory, the Environmental Compliance Section must be notified by the Consultant regarding the addition.

Unless otherwise stated, the general application for equipment capable of emitting air pollution (not including air pollution control devices, incinerators, and boilers) is the Application for Processing or Manufacturing Equipment (Form 5). Sources which have the potential to emit Toxic Air Pollutants (TAPs) and are subject to COMAR 26.11.15, also require a Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration (Form 5T) and an Emission Point Data (Form 5EP). If pollution control equipment is to be installed on the unit, then Application for Permit to Construct Gas Cleaning or Emission Control Equipment (Form 6) is required for any control device associated with the equipment described on Form 5.

All forms can be found on the Maryland Department of the Environment Permits to Construct and Operate Application Forms web page.

The application fee of $500 per piece of equipment will be invoiced once MDE/ARMA receives the permit application. This fee will be paid per the Consultant's contractual agreement with MDOT MAA. Three (3) copies of the permit application, each signed and dated individually, must be submitted to MDE/ARMA.

1.3.1 Permitting Process

The Consultant shall be responsible for completing the necessary applications for Air Quality Permits to Construct as set forth below. The permit applications shall be submitted to the MDOT MAA Environmental Compliance Section in the Office of Environmental Services. The Owner (MDOT MAA) shall be responsible for signing and submitting the appropriate permit applications to the MDE/ARMA. In addition, the MDOT MAA is responsible for paying all permitting fees as set forth below. If the MDOT MAA is notified that any permit application is deemed incomplete, the Consultant shall take immediate action to rectify the situation and submit the appropriate documents to MDE/ARMA.

After an *Application for Processing/Manufacturing Equipment* has been approved by MDE/ARMA, but prior to operating the processing/manufacturing equipment, the Environmental Compliance Section, upon notification by the Engineer, will submit an Application for Permit to Operate Process Equipment (Form 26).

Note that BWI Marshall and Martin State Airports each have different environmental regulatory requirements depending on the type and size of equipment to be constructed as the two airports have separate permits. BWI Marshall is a major source (NO_x emissions >25 tpy) under Title V (COMAR 26.11.02.17); therefore, the addition of equipment may constitute a major modification and trigger major source permitting. This imposes additional air pollution control requirements and significant delays due to the longer permitting process. An evaluation should be completed for any future projects involving the installation of sources emitting NO_x. On the other hand, Martin State is a minor source and therefore; additional equipment would most likely not trigger the need for major modification.

1.3.2 Sources Exempt from Permits to Construct

COMAR 26.11.02.10 lists sources which are exempt from having to obtain Air Quality Permits to Construct and/or Approvals.

For sources not listed in COMAR 26.11.02.10, if the source to be installed meets the following requirements, it may be exempt from an Air Quality Permit to Construct as follows:

- The installation is not subject to any source-specific State or Federal emission standard;
- The expected uncontrolled emissions are less than 1 ton per calendar year of each pollutant for which there is a Federal air quality standard or which is a Class II toxic air pollutant (TAP) as defined in COMAR 26.11.15.01B(5); and
- The emissions contain no more than one (1) pound per day of Class II toxic air pollutant, as defined in COMAR 26.11.15.01B(4).

1.4 Fuel Burning Equipment Permitting Process

1.4.1 Permitting Requirements for Emergency Generators

The following guidelines are for permitting of generators that will serve as emergency power supplies only. Generators that are to serve other purposes are subject to additional requirements.

After an *Application for Fuel Burning Equipment* has been approved by MDE/ARMA, but prior to operating the fuel burning equipment, the Environmental Compliance Section, upon notification by the Engineer, must submit an Application for Permit to Operate Fuel Burning Equipment (Form 28).

1. MDE/ARMA requires that all stationary internal combustion engines with an output greater than or equal to 500 brake horsepower (373kilowatts) have a Permit to Construct **prior to installation** of the equipment. The MDE/ARMA permit application process for emergency generators is three-fold and outlined below. It should be noted that emergency generators which were installed prior to October 1, 2001 and permitted after-the-fact do not require a Certificate of Public Convenience and Necessity (CPCN) Exemption (discussed below).

Certain types of generators are exempted from the CPCN process and may obtain a waiver from the MD Public Service Commission (PSC), including, but not limited to the following:

- Emergency generators which do not export any electricity to the distribution system and with a capacity equal to or less than 70 megawatts;
- Power generation projects for which the generating station produces on-site generated electricity (as defined in PUC Article 1-101(s)), the capacity of the generating station does not exceed 70 megawatts, and less than 20 percent of the annual energy generated is exported or sold on the wholesale market; or
- Power generation projects for which the capacity of the generating station does not exceed 25 megawatts and at least 10 percent of the electricity generated at the generating station each year is consumed on-site.

In order to receive an exemption from the CPCN process, a CPCN Exemption Application Form must be completed by following the steps listed below. A copy of the CPCN Exemption Application Form can be found on the Maryland Public Service Commission CPCN Exemptions web page. Specifically, the CPCN Exemption Application Form can be found in the dropdown menu entitled “Electric.”

a. The Owner shall send a letter to the local electric company, Baltimore Gas and Electric (BGE), requesting relief from the CPCN requirements, pursuant to the Public Utility Companies ("PUC") Article of the Annotated Code of Maryland. The letter shall also provide BGE with the proposed dates for installation and start-up of the generators, the quantity and size of the units, the fuel type, the location of the units, and how the generators will be used (in this case emergency only). A one-line drawing of the generators and routing design shall be included with the letter as well. The Consultant shall be responsible for supplying the technical attachments to the letter.
b. The electric company will determine if an Interconnection, Operation, and Maintenance Agreement (IOMA) is necessary. This is determined by the type of generator to be installed (Type I, II, III, or IV). Definitions of Type I, II, III, and IV generators are provided by the MD (PSC). For Type I generators (generators that will not be synchronized with the local electric company’s transmission and distribution system and will be configured so that there is no export of electricity to the transmission and distribution system - includes emergency back-up generators), the local distribution company will provide a letter indicating that an Interconnection, Maintenance, and Operation Agreement is not necessary. For Type II, III, and IV generators, an Interconnection, Maintenance, and Operation Agreement (“Agreement”) with the local electric company will be necessary, and must be filed with the PSC before the CPCN Exemption application will be approved. A Type III generator (synchronized with the electric system and will export electricity for sale on the wholesale electric market) will also require a wholesales agreement with the Independent System Operator. BWI Marshall and MTN airports do not have Type II, III, or IV generators; therefore, an Agreement is not required. The electric company will also determine if the generators' installation meets the criteria for a CPCN waiver. This approval by the electric company will allow the PSC to review and waive the CPCN requirements for the construction of generating units.
c. The Owner shall submit a CPCN Exemption Application to the PSC as required under PUC Article 7-207.1. In order for the Consultant to complete the application, additional information is required, including the following: the address and point of contact information for the facility, the manufacturer of the generators, a list of the equipment and facilities that will be powered by the generators, and the letter of agreement from BGE regarding the CPCN waiver. The Point of Contact will be the Manager of the MDOT MAA Environmental Compliance Section. The original signed (by legal counsel, an officer, or other person who has the authority to legally bind the Owner) application package (consisting of the application form and BGE's concurrence letter), along with fourteen (14) copies of the signed package, will be submitted to the PSC by the MDOT MAA. The PSC waives filing fees for a unit of State government. The PSC will then issue a waiver, if appropriate, to exempt the proposed generators from the CPCN process.

d. Once the MDOT MAA receives the waiver from the PSC, the Consultant shall prepare and the MDOT MAA shall submit an Air Quality Permit to Construct & Registration Application for Emergency Generators (Form 42), along with the waiver, to MDE/ARMA. To complete the permit application, Not-to-Exceed (NTE) emissions data is required and is obtained from the engine manufacturer submittal data. MDE/ARMA permitting fees are $500 per source and MDE/ARMA will notify the applicant of the appropriate fee upon receiving a complete application. Three (3) copies of the permit application, each signed and dated individually, must be submitted to MDE/ARMA.

2. If pollution control equipment is to be installed on the unit, then an Application for Permit to Construct Gas Cleaning or Emission Control Equipment (Form 6) is required and must be submitted with the Form 42.
3. All Form 42s require proof of Worker's Compensation for the Owner (not the Contractor) under Environmental article 1-202. The Consultant can obtain a copy of this proof from the MDOT MAA Employee Safety & Loss Prevention (410-859-7509).
4. If the emergency generators are subject to non-attainment New Source Review (NSR) or Prevention of Significant Deterioration (PSD) requirements, as defined by 40 CFR Part 51 and 40 CFR Part 52, COMAR 26.11.02.09, COMAR 26.11.02.12, COMAR 26.11.06.14, and COMAR 26.11.02.17, additional permitting may be required simultaneously with the application for an MDE/ARMA Permit to Construct.

1.4.2 Permitting Requirements for Internal Combustion Engines (Electrical Power Generators, Power Equipment, and Fire Protection Pumps)

The following guidelines are for permitting of electrical power generators (off grid, base load, peak, load shaving, etc.), power equipment (hydraulic, mechanical, etc.), and fire protection pumps. Guidelines for emergency use only generators are discussed in Chapter 1.4.1 Permitting Requirements for Emergency Generators.

1. MDE/ARMA requires that all stationary internal combustion engines with an output greater than or equal to 500 brake horsepower (373 kilowatts) have a Permit to Construct prior to installation of the equipment. The MDE/ARMA permit application process for electrical power generators is identical to the permit application process for emergency generators and is outlined below. It should be noted that power equipment (hydraulic, mechanical, etc.) and fire protection pumps do not require a CPCN Exemption from the Public Service Commission. Additionally, it should be noted that electrical power generators which were installed prior to October 1, 2001 and permitted after-the-fact do not require a CPCN Exemption (discussed below).
   a. The Owner shall send a letter to the local electric company, Baltimore Gas and Electric (BGE), requesting relief from the CPCN requirements, pursuant to the PUC Article of the Annotated Code of Maryland. The letter shall also provide BGE with the proposed dates for installation and start-up of the generators, the quantity and size of the units, the fuel type, the location of the units, and how the generators will be used. A one-line drawing of the generators and routing design shall be included with the letter as well. The Consultant shall be responsible for supplying the technical attachments to the letter. The electric company will respond with a letter stating what type of generators are to be installed using the definitions of generating systems under the Maryland PSC requirements (Type I, II, or III) and if the generators' installation meets the criteria for a CPCN waiver. This approval by the electric company will allow the PSC to review and waive the CPCN requirements for the construction of generating units.
   b. The Owner shall submit a CPCN waiver application to the PSC as required under PUC Article 7-207.1. In order for the Consultant to complete the application, additional information is required, including the following: the address and point of contact information for the facility, the manufacturer of the generators, a list of the equipment and facilities that will be powered by the generators, and the letter of agreement from BGE regarding the CPCN waiver. The Point of Contact will be the Manager of the MDOT MAA Environmental Compliance Section. The original signed (by legal counsel, an officer, or other person who has the authority to legally bind the Owner) application package (consisting of the application form and BGE's concurrence letter), along with fourteen (14) copies of the signed package, will be submitted to the PSC by the MDOT MAA. The PSC waives filing fees for a unit of State government. The PSC will then issue a waiver, if appropriate, to exempt the proposed generators from the CPCN process.
   c. Once the MDOT MAA receives the waiver from the PSC, the Consultant shall prepare and the MDOT MAA shall submit an Air Quality Permit to Construct & Registration Application for Internal Combustion Engines (Electrical Power Generators, Power Equipment, & Fire Protection Pumps) (Form 44), along with the waiver, to MDE/ARMA for the generators. Again, the waiver from the PSC is only required for electrical power generators (not for power equipment or fire protection pumps); power equipment and fire protection pumps only require an Air Quality Permit to Construct & Registration Application for Internal Combustion Engines. To complete the permit application, NTE emissions data is required and is obtained from the engine manufacturer submittal data. MDE/ARMA permitting fees are $500 per source and MDE/ARMA will notify the applicant of the appropriate fee upon receiving a complete application. Three (3) copies of the permit application, each signed and dated individually, must be submitted to MDE/ARMA.
2. If pollution control equipment is to be installed on the unit, then an Application for Permit to Construct Gas Cleaning or Emission Control Equipment (Form 6) is required and must be submitted with the *Air Quality Permit to Construct & Registration Application for Internal Combustion Engines (Electrical Power Generators, Power Equipment, & Fire Protection Pumps)*.
3. All Form 44s require proof of Worker's Compensation for the Owner (not the Contractor) under Environmental article 1-202. The Consultant can obtain a copy of this proof from the MDOT MAA Employee Safety & Loss Prevention (410-859-7509).
4. If the electrical power generators, power equipment, and/or fire protection pumps are subject to non-attainment NSR or PSD requirements, as defined by 40 CFR Part 51 and 40 CFR Part 52, COMAR 26.11.02.09, COMAR 26.11.02.12, COMAR 26.11.06.14, and COMAR 26.11.02.17, additional permitting may be required simultaneously with the application for an MDE/ARMA Permit to Construct.

1.4.3 Permitting Requirements for Boilers, Water Heaters, and Other Fuel Burning Equipment (including Snow Melters)

1. MDE/ARMA requires that all fuel burning equipment using fuel oil or gaseous fuel, and with a maximum heat input of one (1) million BTU per hour (MMBtu/hr) or greater, have a Permit to Construct prior to installation. COMAR 26.11.01.01B(17)(a) defines "fuel burning equipment" as any boiler or furnace that has the primary function of heating air, water, or any other medium through indirect heat transfer from the burning of fuels.
   a. All fuel burning equipment with a maximum heat input of ten (10) MMBtu/hr or greater requires an Application for Fuel Burning Equipment (Form 11) unless the boiler/heater/snow melter meets the requirements for a General Permit (see below). Form 11 requires an estimate of the potential annual fuel consumption and operating schedules for the equipment. The Consultant shall coordinate with the MDOT MAA Office of Facilities Maintenance for this information. In addition, Form 11 also requires stack parameters, total stack emissions, construction start and end dates for the permitted equipment, and the type of control device(s) associated with the equipment. The permitting fee is $500 per piece of fuel burning equipment and will be invoiced once MDE/ARMA receives the permit application. Three (3) copies of the permit application, each signed and dated individually, must be submitted to MDE/ARMA.
   b. If pollution control equipment is to be installed on the unit, then an Application for Permit to Construct Gas Cleaning or Emission Control Equipment (Form 6) is required and must be submitted with the Application for Fuel Burning Equipment.

c. Natural gas, liquid propane gas, or distillate oil-fired fuel burning equipment with a maximum heat input of one (1) MMBtu/hr or greater, but less than ten (10) MMBtu/hr may submit an Air Quality General Permit to Construct for Small Fuel Burning Equipment. This General Permit does not apply to fuel burning equipment that burns residual fuel oil (ASTM fuel oil Numbers 4, 5, and 6).

   In order to obtain an Air Quality General Permit to Construct for Small Fuel Burning Equipment, the Consultant can either request a General Permit to Construct package from MDE/ARMA by calling (410) 537-3230, or the Consultant may simply download the package from the MDE website listed above. The package will include the Air Quality General Permit for Small Fuel Burning Equipment, the Request for Coverage Form, instructions on how to submit the completed Request for Coverage, and information regarding the required permit fee. The General Permit includes any construction and/or operating requirements, air emissions limitations, and other regulatory obligations. The required permitting fee is $500 per piece of small fuel burning equipment and must be submitted to MDE/ARMA with the application form. Once a request for coverage under the General Permit is made by submitting the Request for Coverage Form and permit fee, the MDOT MAA may install and operate the applicable small fuel burning equipment stated on the Request for Coverage Form. A new Request for Coverage must be filed with MDE/ARMA, and another permit fee paid for any small fuel burning equipment which is moved to another facility. Three (3) copies of the permit application package, each signed and dated individually, must be submitted to MDE/ARMA.

d. Natural gas, liquid propane gas, or distillate oil-fired fuel burning equipment with a maximum heat input of ten (10) MMBtu/hr or greater, but less than thirty (30) MMBtu/hr may be eligible for an Air Quality General Permit to Construct for Medium Fuel Burning Equipment. This General Permit does not apply to fuel burning equipment that burns residual fuel oil (ASTM fuel oil Numbers 4, 5, and 6). Note that fuel burning equipment that falls under the Medium Fuel Burning Equipment General Permit is also subject to 40 CFR Part 60, the Federal, Subpart Dc New Source Performance Standards (NSPS) requirements (discussed below). Please note that BWI Marshall cannot use the Medium Fuel Burning Equipment General Permit since it is a major source of nitrogen oxide (NOx).

   In order to obtain a *General Permit to Construct for Medium Fuel Burning Equipment*, the Consultant can either request a General Permit to Construct package from MDE/ARMA by calling (410) 537-3230, or the Consultant may simply download the package from the MDE website listed above. The package will include the Air Quality General Permit for Medium Fuel Burning Equipment, the Request for Coverage Form, instructions on how to submit the completed Request for Coverage Form, and information regarding the required permit fee. The General Permit includes any construction and/or operating requirements, air emissions limitations, and other regulatory obligations, including NSPS Subpart Dc requirements. The required permitting fee is $500 per piece of medium fuel burning equipment, and must be submitted to MDE/ARMA with the application form. Once a request for coverage under the General Permit is made, by submitting the Request for Coverage Form and permit fee, the MDOT MAA may install and operated at the applicable medium fuel burning equipment stated on the Request for coverage Form. A new Request for Coverage Form must be filed with MDE/ARMA, and another permit fee paid any time medium fuel burning equipment which is moved to another facility. Three (3) copies of the permit application package, each signed and dated individually, must be submitted to MDE/ARMA.

1. All Permit to Construct Applications (Form 11 or General) require proof of Worker's Compensation Coverage for the Owner (not the Contractor) under Environmental article 1-202. The Consultant can obtain a copy of this proof from the MDOT MAA Employee Safety & Loss Prevention (410-859-7509).
   a. If the boilers/heaters/snow melters are subject to non-attainment NSR or PSD requirements, as defined by 40 CFR Part 51 and 40 CFR Part 52, COMAR 26.11.02.09, COMAR 26.11.02.12, COMAR 26.11.06.14, and COMAR 26.11.02.17, additional permitting may be required simultaneously with the application for an MDE/ARMA Permit to Construct.

1.4.4 Design Guidelines for Emergency Generators, Internal Combustion Engines, and Fuel Burning Equipment (including Snow Melters)

1. The Consultant shall be responsible for preparing all permit applications and submitting the appropriate documentation to the MDOT MAA for all required permits and exemptions as defined above. In addition, the Consultant shall specify equipment that meets all State and Federal air quality requirements.
   a. Specifications for all Fuel Burning Equipment requiring permits shall include:
      i. Notification that a permit to install the equipment is required;
      ii. Designation of the "Owner" or "Owner's Agent" as the party responsible for completing the permit application;
      iii. A projection of the permitting process duration after receipt of the required equipment data; and for generators, the CPCN exemption process, including utility approval, can take up to two (2) months and the permitting process can take up to ninety (90) days after a waiver is received and a complete application is received by MDE/ARMA.
         - For boilers/heaters/snow melters with a maximum heat input of ten (10) MMBtu/hr or greater that burn natural gas only and are not subject to the public review process, the permitting process can take up to ninety (90) days after a complete application is received by MDE/ARMA; however, for fuel oil fired boilers with a maximum heat input of ten (10) MMBtu/hr or greater, the permitting process can take up to six (6) months after a complete application is received by MDE/ARMA.
      iv. The specific equipment data required for the permit application listed in the "Submittals" paragraph.
   b. The Consultant shall specify equipment that meets the Federal requirements for units that are subject to 40 CFR Part 60 (NSPS), Subpart IIII - Standards of Performance for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE) and the Consultant is responsible for providing the Owner with the EPA Certificate of Conformity identifying the engine as a certified unit:

      Subpart IIII Applicability
      i. Stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:
         - Manufactured after April 1, 2006 and are not fire pump engines, or
         - Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.
      ii. Stationary CI ICE that are modified or reconstructed after July 11, 2005.

Subpart IIII Requirements

i. Emission standards (60.4204 and 60.4205) for owners and operators of stationary CI ICE vary based on model year ("pre-2007" vs. "2007 and later") and function ("non-emergency stationary CI ICE" vs. "emergency stationary CI ICE");
ii. Fuel requirements (60.4207), specifically diesel fuel requirements for owners and operators of stationary CI ICE, must meet the requirements of 40 CFR Part 80.510(a): sulfur content of 500 parts per million (ppm). Beginning October 1, 2010, owners and operators of stationary CI ICE subject to NSPS Subpart IIII, with a displacement of 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR Part 80.510(b) for nonroad diesel fuel: sulfur content of 15 ppm.
iii. Monitoring requirements (60.4209) for owners and operator of stationary CI ICE include installing a nonresettable hour meter prior to start-up of the engine. Also, if the engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high back pressure limit of the engine is approached.
iv. Compliance requirements (60.4211) for owners and operators of stationary CI ICE vary based on model year ("pre-2007" vs. "2007 and later") and function ("non-emergency stationary CI ICE" vs. "emergency stationary CI ICE").
v. Test methods (60.4212 and 60.4213) for owners and operators of stationary CI ICE vary based on the displacement of the engine ("less than 30 liters per cylinder" vs. "greater than 30 liters per cylinder").
vi. Notification, recordkeeping, and reporting requirements (60.4241) for owners and operators of stationary CI ICE vary based on model year, function, and displacement (per cylinder) of the engine.

c. The Consultant shall specify equipment that meets the Federal requirements for units that are subject to 40 CFR Part 60 (NSPS), Subpart JJJJ - Standards of Performance for Stationary Spark Ignition (SI) Internal Combustion Engines (ICE):

Subpart JJJJ Applicability

i. Stationary SI ICE that commence construction after June 12, 2006 where the stationary SI ICE are manufactured on or after:
   - July 1, 2007, for engines with a maximum engine power greater than or equal to 500 horsepower (except lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower);
   - January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower;
   - July 1, 2008, for engines with a maximum engine power less than 500 horsepower; or
   - January 1, 2009, for emergency engines with a maximum engine power greater than 19 kilowatts (25 horsepower).
ii. Stationary SI ICE that commence modification or reconstruction after June 12, 2006.

Subpart JJJJ Requirements

i. Emission standards (60.4233) for owners and operators of stationary SI ICE vary based on maximum engine power, date of manufacture, type of fuel combusted, burn type (e.g., lean vs. rich burn engine), and function ("non-emergency stationary SI ICE" vs. "emergency stationary SI ICE").
ii. Fuel requirements (60.4235) for owners and operators of stationary SI ICE that use gasoline must meet the requirements of 40 CFR Part 80.195.
iii. Monitoring requirements (60.4237) for owners and operators of stationary SI ICE vary based on the horsepower of the engine and the date which it was built. In general, monitoring requirements include installing a non-resettable hour meter.
iv. Compliance requirements (60.4243) for owners and operators of stationary SI ICE vary based on maximum engine power, date of manufacture, type of fuel combusted, whether or not the stationary SI ICE is certified, and function ("non-emergency stationary SI ICE" vs. "emergency stationary SI ICE").
v. Owners and operators of stationary SI ICE who conduct performance tests must follow the test methods and procedures outline in 60.4244.
vi. Notification, recordkeeping, and reporting requirements (60.4245) for owners and operators of stationary SI ICE vary based on maximum engine power, date of manufacture, and function ("non-emergency stationary SI ICE" vs. "emergency stationary SI ICE").

Whenever possible, the Consultant shall specify the requirement to install a certified engine under Subpart JJJJ. However, under this rule, manufacturers are not required to certify the majority of engines and therefore, certified engines are not readily available on the market. If a Subpart JJJJ engine is installed and not certified, initial compliance testing will be required for the engine within 180 days of startup. In addition, if the engine is greater than 500 hp, testing every 3 years after the initial compliance testing is also required.

d. The Consultant shall specify equipment that meets the following emission control requirements:
i. These units shall be fired with natural gas, and when necessary with No. 2 fuel oil as a back-up fuel, and designed to be high efficiency units. They shall be equipped with a low NOx burner system for guaranteed NOx performance when using natural gas at no greater than 30 ppm, dry volume basis and corrected to 3% excess oxygen (O2).
ii. Burner, boiler/water heater, and low NOx system shall be manufactured as a package by a single manufacturer. The unit's nameplate shall include the approved Underwriter's Laboratory (UL) low NOx model designation. The manufacturer shall provide the Contractor with a copy of the most recent stack testing results to demonstrate compliance with the 30 ppm NOx guarantee. After boiler installation is completed, the Contractor shall provide the services of a manufacturer's field representative for commissioning the unit and training the operator(s). A manufacturer's – approved and authorized commissioning report shall be submitted to the Engineer at the time of start-up.

iii. The Consultant shall specify equipment that meets the Federal requirements for 40 CFR Part 60 (NSPS) Subpart Dc – Small Industrial-Commercial-Institutional Steam Generating Units for all fuel burning equipment with a maximum design heat input greater than or equal to ten (10) MMBtu/hr, but less than or equal to one hundred (100) MMBtu/hr and constructed, modified, or reconstructed after June 9, 1989. In addition, the Consultant is responsible for ensuring that these units also meet the more stringent State of Maryland requirements under COMAR 26.11.09.05A, COMAR 26.11.09.06A, and COMAR 26.11.09.07A

1.5 Underground Storage Tanks (USTs) and Aboveground Storage Tanks (ASTs) Permitting Process

The storage of deicing compounds or other liquids which may be considered Volatile Organic Liquids (VOLs) may require a permit to construct as they could be subject to a NSPS under 40 CFR Part 60, Subpart Kb. Tanks that store VOLs with a capacity greater than or equal to 75 cubic meters and for which construction, reconstruction or modification began after July 23, 1984, are subject to Subpart Kb. The Consultant must consider the following requirements for tanks of certain sizes:

- Tanks with design capacity greater than 151 cubic meters and storing liquid with vapor pressure >5.2 kPa require fixed roof control or internal floating roof control with specific seal requirements.
- Tanks with design capacity greater than or equal to 75 cubic meters and less than 151 cubic meters and storing liquid with vapor pressure >27.6 kPa also require a fixed roof control or internal floating rood control with specific seal requirements.
- Tanks with design capacity greater than 75 cubic meters and storing liquid with vapor pressure >76.6 kPa require a closed vent system.

An Application for Processing or Manufacturing Equipment (Form 5) would be used to obtain a permit to construct for a tank subject to Subpart Kb and requiring a permit. All forms can be found on the Maryland Department of the Environment's Permits to Construct and Operate Application Forms web page.

1.6 Gasoline Dispensing/Motor Vehicle Refueling Facilities Permitting Process

When new Gasoline Dispensing/Motor Vehicle Refueling Facilities (GD/MVRFs) are planned for installation at BWI Marshall and Martin State Airports, a General Permit to Construct Motor Vehicle Refueling Facilities must be obtained from MDE/ARMA if the facility will dispense gasoline into the tanks of motor vehicles and have a gasoline storage tank larger than 2,000 gallons. Multiple tanks at the same location are considered a tank farm and only one permit is required for all the tanks in the tank farm. Preparing the applications for such permits is the responsibility of the Consultant.

The emission sources to which these regulations apply are gasoline storage tanks larger than 2,000 gallons and their associated equipment components in vapor or liquid gasoline service, including pressure/vacuum vents on storage tanks and equipment necessary to unload product from cargo tanks into the storage tanks. Equipment used for refueling motor vehicles is not deemed an emission source under these regulations.

No General Permit to Construct is required for the storage of diesel fuel, kerosene, jet fuel, or fuel oils. However, the Consultant must inform/notify MDOT MAA's Environmental Compliance Section with the appropriate information that will be necessary to update the Oil Operations Permit (OOP) for newly acquired permanent tanks greater than 10,000 gallons which store oil (includes but is not limited to the following: asphalt, gasoline, ethanol that is intended to be used as a motor fuel or fuel source, kerosene, aviation/jet fuels, diesel fuel, biodiesel fuel regardless of whether the fuel is petroleum based, used oil, waste oil, lubricating oils, hydraulic oil, mineral oil, and all heating oils) through MDE. Consultant must also provide sufficient information to allow for update and PE review/stamp of the Spill Prevention Control & Countermeasures (SPCC) Plan and the Stormwater Pollution Prevention Plan (SWPPP). Additionally, Form A and Form M92 must be completed prior to use of the tanks and can be found on the MDE Land Permit Applications and Instructions web page.

1.6.1 Permitting Requirements for GD/MVRFs

The Consultant shall be responsible for completing the Air Quality General Permit to Construct Application Package for Motor Vehicle Refueling Facilities, including the Request for Coverage Form (Form No. MDE/ARMA/PER.006). The Application Package can be obtained by calling MDE/ARMA at (410) 537-3230 or downloading from the MDE Air Quality General Permits to Construct Application Forms web page.

The Application Package shall be submitted to the MDOT MAA Environmental Compliance Section in the Office of Environmental Services. MDOT MAA shall be responsible for signing and submitting the Application Package to the MDE/ARMA. In addition, the MDOT MAA is responsible for paying the $200 permitting fee (payable to MDE Clean Air Fund) that must accompany the Application Package. If the MDOT MAA is notified that any permit application is deemed incomplete, the Consultant shall take immediate action to rectify the situation and submit the appropriate documents to MDE/ARMA.

Coverage under the General Permit to Construct begins on the day a complete Application Package (as determined by MDE/ARMA) and full payment of the permitting fee is submitted to MDE/ARMA.

1.6.2 Design Guidelines for GD/MVRFs

1. The Consultant shall be responsible for preparing all Application Packages and submitting the appropriate documentation to the MDOT MAA for all required permits and exemptions as defined above. In addition, the Consultant shall specify equipment that meets all State and Federal air quality requirements.
   a. Specifications for all GD/MVRFs requiring permits shall include:
      - Notification that a General Permit to Construct the equipment is required;
      - Designation of the "Owner" or "Owner's Agent" as the party responsible for completing the Application Package;

- A statement that Coverage under the General Permit to Construct begins on the day a complete Application Package (as determined by MDE/ARMA) and full payment of the permitting fee is submitted to MDE/ARMA. MDE/ARMA will reply with a letter acknowledging the receipt of the Application Package and fee payment, which must be retained along with the General Permit to Construct document.

2. Stage I and II Vapor Recovery
   - Stage I vapor recovery systems capture the gasoline vapors emitted when a tank truck refills the gasoline storage tank and is required for all gasoline storage tanks larger than 2,000 gallons.
   - Stage II vapor recovery systems capture gasoline vapors lost during vehicle refueling at the pump. Stage II vapor recovery is required for gasoline tanks larger than 2,000 gallons and facilities with a monthly throughput greater than or equal to 10,000 gallons in the following areas: Baltimore City, Anne Arundel, Baltimore, Calvert, Carroll, Cecil Charles, Frederick, Harford, Howard, Montgomery, and Prince George's counties.
3. Permitting and compliance requirements for GD/MVRFs are dependent on various thresholds of monthly throughput of gasoline, where monthly throughput is defined as the total volume of gasoline during a month as calculated on a rolling 30-day average. The Consultant shall be responsible for determining the projected throughput threshold, discussed below, that will drive design specifications and notification requirements to comply with state requirements as well as Federal requirements under 40 CFR Part 63 Subpart C. Please refer to Chapter 10 "Environmental Procedures and Requirements" for notification, recordkeeping, and reporting requirements.
4. Monthly Throughput of Less Than 10,000 Gallons – The Consultant shall specify a vapor balance line to load product into gasoline storage tanks per Part II.A(1)(a)(i) of the Air Quality General Permit to Construct Application Package for Motor Vehicle Refueling Facilities. Additionally, the Consultant shall specify a submerged fill pipe no higher than 6 inches from the bottom of the storage tank for loading product into the storage tank. Other specifications as necessary must be incorporated to minimize vapor releases, such as those that minimize gasoline spills, allow for expeditious cleanup of gasoline spills, use of gasketed seals for gasoline containers and storage tank fill pipes, and minimize product being sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices such as oil/water separators.
5. Monthly Throughput of 10,000 Gallons or More – The Consultant shall specify identical requirements as above for monthly throughput of less than 10,000 gallons. In addition, in order to comply with Subpart CCCCCC, all storage tanks at or above 250 gallons shall be loaded using submerged fill (drop tubes).
6. Monthly Throughput of 100,000 Gallons or More
   a. The Consultant shall specify identical requirements as outlined above in the section for facilities with monthly throughput of 10,000 gallons; in addition, in order to meet the requirements of Subpart CCCCCC, the facility must either (1) operate a vapor balance system that meets a specified enforceable State, local rule or permit or (2) operate a vapor balance system during storage tank loadings, test the system periodically to make sure it works correctly, and includes specific equipment or work practices according to the rule, or meets 95% control.
   b. Because BWI Marshall and Martin State Airports are located in Anne Arundel and Baltimore County, respectively, the Consultant must specify Stage II vapor recovery equipment for all new sources.
      - For Stage II vapor recovery equipment, the Consultant shall specify instructional signs, to be placed in conspicuous locations at each gasoline dispenser, that include instructions and illustrations for inserting and removing the nozzle and dispensing product, warn against attempts to continue refueling after automatic shut-off of the gasoline occurs (i.e. "topping off"), and that display the MDE/ARMA's toll-free number for submitting complaints or comments regarding use of the Stage II vapor recovery system.
   c. If the GD/MVRF had a permit for gasoline storage tanks issued before January 10, 2008, the facility is deemed to be in compliance with the following requirements. If not, the Consultant must specify the following (note: these requirements do not apply to gasoline storage tanks equipped with a floating roof or equivalent):
      - A vapor balance system having vapor connections and lines that are equipped with closures that seal upon disconnect, and a vapor line between the storage tank and cargo tank that is vapor-tight to 100% of the Lower Explosive Limit (when measured with a combustible gas detector, calibrated with propane, at a distance of one inch from the source). The vapor balance system must not allow the pressure in the tank truck to exceed 18 inches water pressure or 5.9 inches water vacuum when transferring product. All vapor recovery adaptors and connections must be designed to prevent over-tightening or loosening of fittings during normal product delivery.
      - If a gauge well separate from the fill tube is specified, it must be provided with a submerged drop tube that extends no more than 6 inches from the bottom of the tank. Liquid fill connections must be equipped with vapor-tight caps.
      - Pressure/vacuum (PV) vent valves shall be specified for the storage tank vent pipes. The pressure specifications for PV vent valves must be a positive pressure setting of 2.5 to 6.0 inches of water and a negative pressure setting of 6.0 to 10.0 inches of water. The total leak rate of all PV vent valves at the GD/MVRF must not exceed 0.17 cubic foot per hour at a pressure of 2.0 inches of water, and 0.63 cubic foot per hour at a vacuum of 4 inches of water.
      - The vapor balance system must be capable of meeting the static pressure performance requirement of the following equation:

        Pf = 2e-500.887/v

        Where
        Pf = Minimum allowable final pressure, inches of water
        v = Total ullage affected by the test, gallons
        e = Dimensionless constant equal to approximately 2.718
        2 = The initial pressure, inches water; and
      - For new or reconstructed facilities, or new storage tank(s) at an existing facility, the Consultant must specify gasoline storage tank(s) with a dual-point vapor balance system in which the storage tank is equipped with an entry port for a gasoline fill pipe and a separate exit port for a vapor connection.
   d. The Consultant shall specify that, at the time of installation and every three years thereafter, the PV vent valves must comply with the leak rate and cracking pressure requirements specified above, using the California Air Resources Board (CARB) Vapor Recovery Test Procedure TP-201.1E or alternative method approved by the MDE/ARMA.
   e. The Consultant shall specify that, at the time of installation, the vapor balance system must comply with the static pressure performance requirements specified above, using the CARB Vapor Recovery Test Procedure TP-201.3 or alternative method approved by the MDE/ARMA.

This requirement also applies every three years after initial installation.

f. If any alternative vapor balance system other than that described in 5.c., above, is specified, the Consultant must specify that initial compliance is demonstrated such that a 95 percent reduction in emissions is achieved by the vapor balance system using CARB Vapor Recovery Test Procedure TP-201.1, and determine and document alternative acceptable values for the leak rate and cracking pressure requirements described in (d) and (e), above.
g. The Consultant must specify the following initial CARB-approved tests:
   - A leak test in accordance with CARB Vapor Recovery Test Procedure TP-201.3
   - An air to liquid volume ratio test in accordance with CARB Vapor Recovery Test Procedure TP-201.5
   - A dynamic pressure performance test in accordance with CARB Vapor Recovery Test Procedure TP-201.4
   - A vapor return line vacuum integrity test for the Healy Model 400 ORVR System
   - A vapor return line vacuum integrity test for the Healy Model 600 System

1.7 Paint Booths and Abrasive Blasting Operations Permitting Process

Coating and painting operations, including the use of paint booths, require the consultant to apply for an Air Quality Permit to Construct prior to installation of a paint booth.

Paint booths and their associated spray coating activities are regulated under 40 CFR Part 63 (National Emissions Standards for Hazardous Air Pollutants [NESHAPs]), Subpart HHHHHH – Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources. Categories and entities potentially affected by NESHAP Subpart HHHHHH are paint stripping operations using methylene chloride (MeCl)-containing paint strippers, motor vehicle and mobile equipment surface coating operations, and miscellaneous surface coating operations located at area sources. An area source is defined in the Clean Air Act (CAA) section 112(a) as any stationary source of Hazardous Air Pollutants (HAPs) that is not a major source. A major source is defined as any stationary source or group of stationary sources located within a contiguous area and under common control that emits, or has the potential to emit, considering controls, in the aggregate, 10 tons per year (tpy) or more of any single HAP or 25 tpy or more of any combination of HAPs. For the purposes of this rule, paint stripping operations are those that perform paint stripping using MeCl for the removal of dried paint (including, but not limited to, paint, enamel, varnish, shellac, and lacquer) from wood, metal, plastic, and other substrates at area sources as either: (1) an independent activity where paint stripping is the principal activity at the source, or (2) an activity incidental to the principal activity (e.g., surface coating, inspection, maintenance, etc.) at the source.

For co-located operations, the EPA considers paint stripping activities that use one ton or less to be incidental to the principal activity and those using more than one ton to be performing paint stripping as a principal activity. Motor vehicle and mobile equipment surface coating operations involve the spray application of coatings at area sources to automobiles, light trucks, heavy duty trucks, buses, construction equipment, self-propelled vehicles, and equipment that may be drawn and/or driven on a roadway. Miscellaneous surface coating operations are those that involve the spray application of coatings that contain compounds of chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd), herein after referred to as target HAPs, to miscellaneous parts and/or products made of metal or plastic, or combinations of metal and plastic.

1.7.1 Permitting Requirements for Vehicle Surface Coating Operations

1. MDE/ARMA requires an Air Quality General Permit to Construct for Vehicle Refinishing. This general permit applies to auto body repair facilities that are at a fixed stationary location; use no more than 400 gallons of vehicle refinishing materials per year; have two or less paint spray booths; and do not use materials containing lead, formaldehyde, or pot life extenders. The Air Quality General Permit to Construct for Vehicle Refinishing can be found on the MDE Air Quality General Permits to Construct Application Forms web page.

   In order to obtain an Air Quality General Permit to Construct for Vehicle Refinishing, the Consultant can either request a General Permit to Construct package from MDE/ARMA by calling (410) 537-3230, or the Consultant may simply download the package from the MDE website listed above. The package will include the Air Quality General Permit for Vehicle Refinishing, an Initial Notification Form, a Compliance Notification Form, and information regarding the required permit fee. The General Permit includes any construction and/or operating requirements, air emissions limitations, and other regulatory obligations. The required permitting fee is $500 for the whole facility and must be submitted to MDE/ARMA with the application form. The Initial Notification Form must be sent to the EPA Region III and MDE/ARMA 180 days after initial start-up for new shops and by January 11, 2010 for existing shops. The Compliance Notification Form must be sent to the EPA Region III and MDE/ARMA 180 days after initial startup for new shops and by March 11, 2011 for existing shops. Three (3) copies of the permit application package, each signed and dated individually, must be submitted to MDE/ARMA.
2. All Permit to Construct Applications, including the Air Quality General Permit to Construct for Vehicle Refinishing, require proof of Worker's Compensation for the Owner (not the Contractor) under Environmental article 1-202. The Consultant can obtain a copy of this proof from the MDOT MAA Employee Safety & Loss Prevention (410-859-7509).
3. In addition to complying with all applicable Federal NESHAP Subpart HHHHHH requirements, the VOC content of the materials used shall not exceed the following limitations:

Coatings*	**VOC (lb/gal)**
Pretreatment	6.5
Precoat	5.5
Primer surface	4.8

Primer sealer	4.6
Topcoat	5.0
Multi-stage coating system	5.2
Specialty coating	7.0
<u>Preparation materials</u>	
Non-plastic	1.4
Plastic	6.5

*VOC content limitation is for coatings *as applied*.

1.7.2 Design Guidelines for Vehicle Surface Coating Operations

1. Per §63.11173(e), the consultant must ensure that motor vehicle and mobile equipment surface coating operations and miscellaneous surface coating operations meet the following requirements:
    a. All spray-applied coatings must be applied in a spray booth, preparation station, or mobile enclosure that meets the following requirements:
        i. All spray booths, preparation stations, and mobile enclosures must be fitted with a type of filter technology that is demonstrated to achieve at least 98-percent capture of paint overspray. The procedure used to demonstrate filter efficiency must be consistent with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Method 52.1, "Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter, June 4, 1992" (incorporated by reference, see 63.14 of subpart A of this part). The test coating for measuring filter efficiency shall be a high solids bake enamel delivered at a rate of at least 135 grams per minute from a conventional (non-HVLP) air-atomized spray gun operating at 40 pounds per square inch (psi) air pressure; the air flow rate across the filter shall be 150 feet per minute. Owners and operators may use published filter efficiency data provided by filter vendors to demonstrate compliance with this requirement and are not required to perform this measurement. Waterwash spray booths that are operated and maintained according to the manufacturer's specifications are not required to meet these requirements.
        ii. Spray booths and preparation stations used to refinish complete motor vehicles or mobile equipment must be fully enclosed with a full roof, and four complete walls or complete side curtains, and must be ventilated at negative pressure so that air is drawn into any openings in the booth walls or preparation station curtains. However, if a spray booth is fully enclosed and has seals on all doors and other openings and has an automatic pressure balancing system, it may be operated at up to, but not more than, 0.05 inches water gauge positive pressure.
        iii. Spray booths and preparation stations that are used to coat miscellaneous parts and products or vehicle subassemblies must have a full roof, at least three complete walls or complete side curtains, and must be ventilated so that air is drawn into the booth. The walls and roof of a booth may have openings, if needed, to allow for conveyors and parts to pass through the booth during the coating process.
        iv. Mobile ventilated enclosures that are used to perform spot repairs must enclose and, if necessary, seal against the surface around the area being coated such that paint overspray is retained within the enclosure and directed to a filter to capture paint overspray.
    b. The consultant must ensure that all spray-applied coatings must be applied with a high volume, low pressure (HVLP) spray gun, electrostatic application, airless spray gun, air-assisted airless spray gun, or an equivalent technology that is demonstrated by the spray gun manufacturer to achieve transfer efficiency comparable to one of the spray gun technologies listed above for a comparable operation, and for which written approval has been obtained from the Administrator. The procedure used to demonstrate that spray gun transfer efficiency is equivalent to that of an HVLP spray gun must be equivalent to the California South Coast Air Quality Management District's "Spray Equipment Transfer Efficiency Test Procedure for Equipment User, May 24, 1989" and "Guidelines for Demonstrating Equivalency with District Approved Transfer Efficient Spray Guns, September 26, 2002" (incorporated by reference, see 63.14 of subpart A of this part).
    c. There are additional miscellaneous metal coating regulations pertaining to paint booths for coating items other than motor vehicles that could impose other VOC control requirements. Please refer to COMAR 26.11.19.13 for more information depending on the product being coated.

1.8 Abrasive Blasting Operations Permitting Process

1.8.1 Permitting Requirements for Abrasive Blasting Operations

The MDOT MAA or tenant consultant is responsible for obtaining an MDE/ARMA Air Quality Permit to Construct if they meet the regulatory definition of abrasive blasting operations, specifically dry abrasive blasting operations which are regulated under 40 CFR Part 63 (National Emissions Standards for Hazardous Air Pollutants [NESHAPs]), Subpart XXXXXX. Entities potentially affected by NESHAP Subpart XXXXXX at MDOT MAA include owners or operators of an area source (see Chapter 1.7 Paint Booths and Abrasive Blasting Operations for definition of area source) that is primarily engaged in the operations in one of the following source categories: (1) Fabricated Metal Products; (2) Industrial Machinery and Equipment Finishing Operations; and (3) Valves and Pipe Fittings. More specifically, NESHAP Subpart XXXXXX applies to area sources in these source categories that use or have the potential to emit compounds of cadmium, chromium, lead, manganese, or nickel from metal fabrication or finishing operations.

Neither BWI Marshall nor Martin State Airports are primarily engaged in the operations of any of the nine source categories listed in this subpart; therefore, the regulations of NESHAP Subpart XXXXXX may not be applicable. However, obtaining a permit to construct for abrasive blasting operations in MD predates the promulgation of Subpart XXXXXX, therefore, a permit to construct may still be required. In addition, there may be tenant operations that require compliance with NESHAP Subpart XXXXXX. Tenant operations are commonly not included in the facility's permit because they are considered under separate ownership and would be required to operate under separate permits. For example, equipment owned/operated by an airline would be permitted under the airline and compliance would be the responsibility of the airline and not MDOT MAA.

Abrasive blast cleaning equipment using a suspension of abrasive in water is exempt from obtaining a Permit to Construct per COMAR 26.11.02.10O(1). Furthermore, per COMAR 26.02.07.03, open abrasive blasting for the abatement of lead-containing substances (i.e., lead-based paint) is prohibited.

1.8.2 Design Guidelines for Abrasive Blasting Operations

Particulate matter (PM) and (particulate) HAPs are typically emitted from abrasive blasting operations. These emissions are dependent on both the abrasive material and the targeted surface. COMAR 26.11, Air Quality, regulates visible emissions (VEs), as well as PM emissions. The consultant must ensure that the abrasive blasting operation:

- Does not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers as required under the general provisions in COMAR 26.11.06.02.C.
- Does not cause or permit to be discharged (from a confined source) into the outdoor atmosphere from any other installation, PM in excess of 0.03 gr/SCFD (68.7 mg/dscm) as required by COMAR 26.11.06.03.B(2). Confined sources are defined as installations that discharge into the atmosphere through a stack, duct, hood, flue, or other conduit.
- Does not cause PM emissions to be emitted from unconfined sources without taking reasonable precautions (i.e., installation and use of hoods, fans, and dust collectors to enclose, capture, and vent emissions) to prevent PM from becoming airborne. Unconfined sources are defined as installations that cause emissions which are not enclosed in a stack, duct, hood, flue, or other conduit but which escape into the atmosphere through openings such as windows, vents or doors, ill-fitting closures, or poorly maintained equipment.
- Does not cause or permit any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent PM from becoming airborne.

1.9 Stationary Welders Permitting Process

1.9.1 Permitting Requirements for Stationary Welders

In addition to dry abrasive blasting operations, welding operations that use materials that contain metal fabrication or metal finishing HAPs (MFHAPs) or have the potential to emit MFHAPs and use 2,000 pounds or more per year of welding rod containing one or more MFHAP (calculated on a rolling 12-month basis) are also regulated under 40 CFR Part 63 (National Emissions Standards for Hazardous Air Pollutants [NESHAPs]), Subpart XXXXXX – Nine Metal Fabrication and Finishing Source Categories Applicability and Compliance Dates. However, as explained in Chapter 1.8.1 Permitting Requirements for Abrasive Blasting Operations, neither BWI Marshall nor Martin State Airports are “primarily engaged” per 63.11522 in the operations of any of the nine source categories listed in this subpart; therefore, the regulations of NESHAP Subpart XXXXXX are not applicable.

Welding equipment powered by stationary compression ignition (CI) internal combustion engines (ICE) is subject to the requirements of 40 CFR Part 60 (New Source Performance Standards [NSPS]), Subpart IIII – Stationary Compression Ignition Internal Combustion Engines. Refer to Chapter 1.4.2 Permitting Requirements for Internal Combustion Engines for permitting requirements for CI ICEs.

Stationary welders would be permitted as process equipment and would require an Application for Processing or Manufacturing Equipment (Form 5) to be submitted to MDE to obtain a permit to construct and operate prior to construction. All forms can be found on the MDE Permits to Construct and Operate Application Forms web page.

It should be noted that portable welding equipment is exempt from obtaining an Air Quality Permit to Construct per COMAR 26.11.02.10G.

Maryland also has air toxics requirements under COMAR 26.11.15 that may apply to welding equipment. Under this regulation, any source that emits a Class I or Class II toxic air pollutant (TAP) into the atmosphere must demonstrate that those emissions do not endanger public health and that the emissions are being reduced through the implementation of control technology.

1.9.2 Design Guidelines for Stationary Welders

Welding equipment powered by stationary compression ignition (CI) internal combustion engines (ICE) is subject to the requirements of 40 CFR Part 60 (New Source Performance Standards [NSPS]), Subpart IIII – Stationary Compression Ignition Internal Combustion Engines. Refer to Chapter 1.4.4 Design Guidelines for Emergency Generators for NSPS, Subpart IIII applicability and requirements.

1.10 Parts Washers and Degreasers Permitting Process

1.10.1 Permitting Requirements for Parts Washers and Degreasers

Consultants should consider the use of non-solvent based parts washers and degreasers whenever practicable. Alternative non-solvent based (citrus-based or microbial cleaning agents) parts washers and degreasers do not require permitting and will reduce air emissions at MDOT MAA and tenant owned facilities. If an alternative non-solvent based parts washer and/or degreaser cannot be installed, the Environmental Compliance Section must be notified.

Cold and vapor degreasing and the control of VOC emissions is covered under COMAR 26.11.19.09 and specifies requirements for the use of VOC degreasing material. Specifically, the regulation prohibits the use of any VOC degreasing material that exceeds 1mm Hg at 20 degrees Celsius (0.019 psia). In addition, a person may not use VOC degreasing material in vapor degreasing unless the vapor degreasing is equipped with a condenser or a pollution control device with an

efficiency of not less than 90%. This regulation also provides provisions for good operating practices and there is no requirement for a permit to construct. A person subject to COMAR 26.11.19.09 may not use a halogenated substance that is a VOC in any cold degreasing. The use of halogenated solvents is not recommended to avoid the stringent requirements set forth in 40 CFR Part 63, Subpart T.

It should be noted that unheated volatile organic compound (VOC) dispensing containers or unheated rinsing containers (i.e., parts washers) of 60 gallons (227 liters) capacity or less are exempt from obtaining an Air Quality Permit to Construct per COMAR 26.11.02.10M.

1.10.2 Design Guidelines for Parts Washers and Degreasers

The consultant must ensure that cold and vapor degreasing machines meet the standards set forth in COMAR 26.11.19.09 and are equipped with a condenser or pollution control device with an efficiency of at least 90%. In addition, the Consultant shall ensure compliance with the other VOC control requirements by maintaining good operating practices such as ensuring all parts washers and degreasers are equipped with covers, lids, or other methods of minimizing evaporative losses. Consultants should also ensure that each parts washer and degreaser include a sign with the good operating practices established and displayed to all operators.

1.11 Snow Melters and Portable Emission Units Permitting Process

1.11.1 Permitting Requirements for Snow Melters and Portable Emission Units

According to MDE, temporary/portable snow melters are not required to be permitted at this time. However, based on the size of the units, the snow melters may be subject to federal requirements under 40 CFR Part 60, Subpart Dc. Subpart Dc applies to small industrial-commercial-institutional steam generating units built after June 9, 1989 and with a heat input capacity between 10 MMBtu/hr and 100 MMBtu/hr. The rule requires that daily fuel use be recorded and kept on site and that notification of construction (purchase of snow melter) and startup be submitted to EPA. In addition, semi-annual fuel reports should be submitted to EPA identifying the sulfur content of the fuel and excess emissions reports shall also be submitted if applicable. Since the snow melters would be applicable to Subpart Dc, snow melters that are permanently stationed at the facility are subject to a permit to construct and would need to follow the same permitting requirements set forth above in Chapter 1.4.3 Permitting Requirements for Boilers, Water Heaters, and other Fuel Burning Equipment according to their size.

1.11.2 Design Guidelines for Snow Melters

Snow melters with a heat input capacity between 10 MMBtu/hr and 100 MMBtu/hr shall meet the requirements of Subpart Dc as set forth above. The Owner shall be responsible for recordkeeping and reporting requirements under this rule.

1.12 Heating, Ventilation and Air Conditioning (HVAC) and Fire Suppression Equipment Containing Ozone Depleting Substances (ODS)

1.12.1 Requirements for HVAC Equipment Containing ODS

HVAC equipment containing refrigerants identified as ODS or fire suppression equipment containing Halon is subject to the monitoring, recordkeeping and reporting requirements of 40 CFR Part 82 - Protection of Stratospheric Ozone, Subparts F and H. This equipment is not subject to permitting by MDE. Part 82 includes requirements to have certified technicians to perform maintenance on HVAC equipment and prohibits the intentional venting or release of Class I and Class II ODS and their substitutes into the atmosphere. In addition, there are specific requirements for leak detection and repair for units containing more than 50 pounds of refrigerant per circuit and all recovery/recycling equipment used must be EPA approved. The sale of ODS is limited to certified technicians and purchases must be recorded and kept on site along with service records for the equipment.

1.12.2 Design Guidelines for HVAC Equipment

In order to comply with all of the requirements set forth above, it is imperative that the purchase/installation of any new HVAC equipment is reported to MDOT MAA's Environmental Compliance Section immediately so that the Owner can ensure continuing compliance with these regulations. The Consultant shall provide the manufacturer, model, serial number, refrigerant type, capacity (full charge), number of circuits, and the charge per circuit for any new HVAC equipment purchased. No permitting is required for this type of equipment.

2.1 Sediment Controls and Stormwater Management

2.1.1 Sediment and Erosion Control

Refer to Chapter 1.2.1 for Standard Maryland department of the Environment (MDE) Sediment and Erosion Control and 1.1 for Environmental Coordination and Permitting.

2.1.2 Stormwater Management (SWM)

The MDOT MAA Office of Environmental Services has prepared Institutional Stormwater Management Plans (IMPs) for BWI Marshall and Martin State Airports. Existing Conditions have been documented and approved by MDE for both BWI Marshall and Martin State Airports; future conditions are currently under development. The IMPs shall be utilized by consultants and requirements of these documents shall be followed in the design and construction of projects at BWI Marshall and Martin State Airports. Contact the MDOT MAA Environmental Planning Section for additional information.

The following information outlines the general requirements for SWM at BWI Marshall and Martin State (MTN) Airports.

2.1.2.1 Stormwater Management Requirements

Consultants must comply with the Maryland Department of the Environment's (MDE's) stormwater management requirements as set forth in MDE's Maryland Stormwater Design Manual Volumes I & II, current edition and all subsequent revisions, and the Stormwater Management Act of 2007. The regulations outlined in this manual must be used during the design of all new stormwater management facilities on MDOT MAA-owned properties. MDE requires a comprehensive design strategy for maintaining predevelopment runoff characteristics and protection of natural resources, known as Environmental Site Design or "ESD," which relies on integrating site design, natural hydrology, and smaller controls to capture and treat runoff. The "Maryland Stormwater Management and Erosion & Sediment Control Guidelines for State and Federal Projects," "Maryland Stormwater Management Guidelines" and *MDE Technical Memorandum #1* should be utilized in design.

Consultants must also comply with enforceable guidance set forth by FAA. To ensure the safety of the traveling public, consultants must adhere to FAA's enforceable guidance set forth in the latest FAA AC 150/5200-33 Hazardous Wildlife Attractants on and Near Airports to minimize wildlife strike hazards through the reduction of wildlife attractants.

FAA defines a wildlife attractant as:

> *Any human-made structure, land use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace, aircraft movement area, loading ramps or aircraft parking areas of an airport. These attractants can include but are not limited to architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aqua cultural activities, surface mining, or wetlands.*

The AC also provides guidance on placement and design of these facilities to achieve water quality goals while minimizing the potential for creation of a wildlife attraction. FAA's siting criteria for potential wildlife attractants state that wildlife attractants should not be within 10,000 feet of an airport's aircraft movement areas (including loading ramps and parking areas) or within 5 statute miles of approach or departure airspace, if the attractant may cause hazardous wildlife movement into or across the approach or departure airspace. When facilities that create open water exist within 5 statute miles of the airport, FAA's enforceable guidance requires that they drain within 24 hours following a one- or two-year storm event and within 48 hours following a ten-year storm event.

2.2 Landscaping

The MDOT MAA Office of Environmental Services has developed Landscaping, Topsoil, Seeding, and Sodding specifications for MDOT MAA owned and operated Airports. The specifications are found in Appendix 4B – Exterior Improvements and should be used in the design and construction of projects at BWI Marshall and Martin State Airports. Design of Forest Conservation Plans and exceptions to the specifications must be coordinated with the Manager, Environmental Planning Section.

2.2.1 Landscaping Guidance

MDOT MAA provides guidance for landscaping (including appropriate seed mixtures) in MDOT MAA Landscaping Reference: Approved Species List, MDOT MAA Landscaping Reference: Approved Installation Methods, and MDOT MAA Landscaping Reference: Wetlands Plant List (see Appendix 4B – Exterior Improvements). In these documents, MDOT MAA details appropriate species to be utilized during the design of landscape plans at stormwater management facilities.

2.3 Bird Deterrent Systems

2.3.1 Waterfowl Deterrent System for Sediment Traps at BWI Marshall

There is a need to discourage ducks and other waterfowl from being attracted to stormwater in sediment traps. The system proposed for BWI Marshall will interfere with the ducks' landing pattern by installing a grid using lightweight wire above the surface of the trap. As they approach a water-filled trap, ducks, geese, and other waterfowl will see the grid wires and not attempt to land. A perimeter fence consisting of two wire strands strung around the posts will keep birds from walking onto the traps.

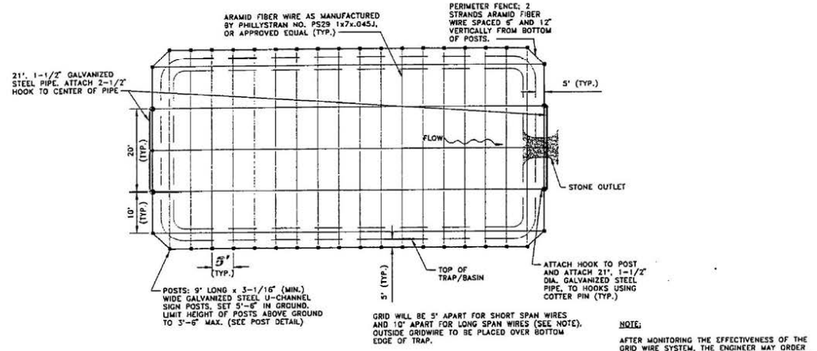
Initial grid spacing will be five feet for short spans and ten feet for long spans. See details for a typical layout. The ends of the grid wires will be strung from hooks placed on posts three feet above the ground. It is expected that the wires will sag as much as two feet and will exert a maximum line tension of thirty-five pounds.

Grid wire will be high-strength, lightweight synthetic material made from aramid fiber as manufactured by Phillystran, Inc., Part No. PS29 1x7x.045J, or approved equal.

Posts will be nine-foot long galvanized steel U-channel signposts, driven five and one half feet into the ground. The height above ground shall be no more than three and one half feet. Three holes will be drilled into each post to attach one 2 ½ inch hook and two 1 ½ inch eye bolts.

An access gate will be installed on the short end opposite the outlet to facilitate trap cleanout. Each gate consists of a twenty foot long, 1 ½" diameter horizontal pipe placed three feet above ground and spanning two posts spaced twenty feet apart. When sediment is to be cleaned out from the trap, the long pipe is removed. An identical horizontal pipe will also span the stone outlet weir at the opposite end of the trap. Each pipe will have a hook placed in the middle to attach the grid wire.

BIRD DETERRENT SYSTEM FOR SEDIMENT TRAPS AND SEDIMENT BASINS

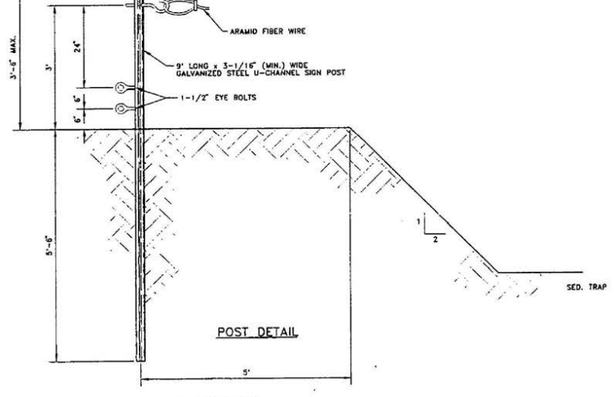


NOTE:

AFTER MONITORING THE EFFECTIVENESS OF THE GRID WIRE SYSTEM, THE ENGINEER MAY ORDER ADDITIONAL POSTS AND WIRES TO BE INSTALLED ON THE LONG SPAN, TO DECREASE SPACING TO 5-FEET.

BIRD DETERRENT SYSTEM FOR SEDIMENT TRAPS AND SEDIMENT BASINS

N.T.S.



CONSTRUCTION SPECIFICATIONS

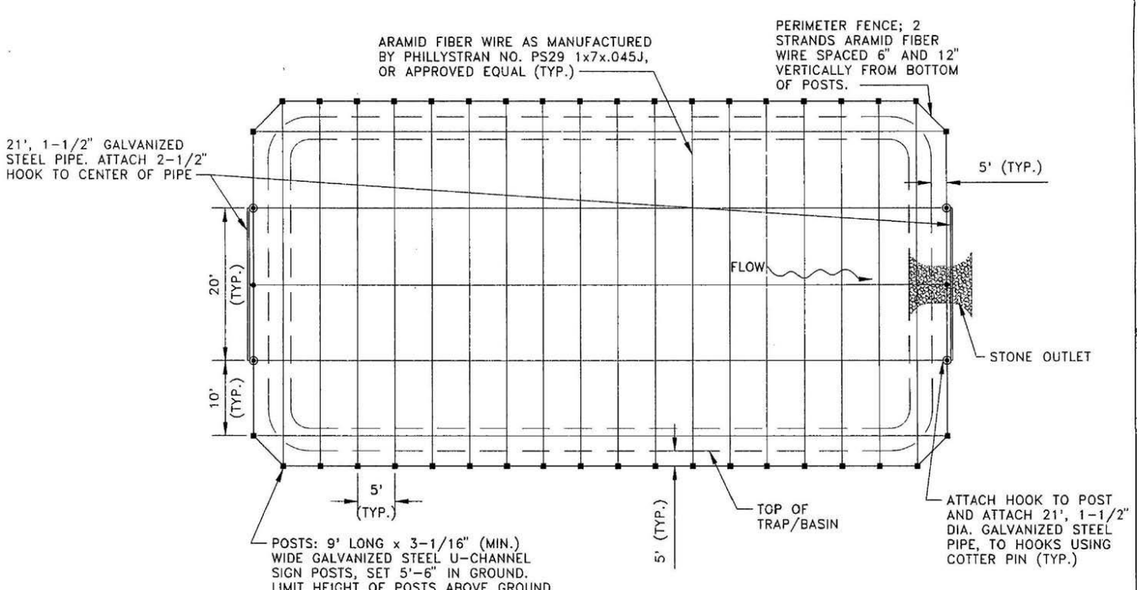
AFTER EACH SEDIMENT TRAP/BASIN IS CONSTRUCTED, POSTS ARE PLACED FIVE FEET OUTSIDE OF THE TOP EDGE OF THE TRAP/BASIN, SPACED FIVE FEET ON CENTER ON THE LONG SIDES AND TEN FEET ON CENTER ON THE SHORT SIDES, LEAVING ONE 20-FOOT GAP FOR THE GATE AND ANOTHER 20-FOOT GAP TO STRADDLE THE OUTLET WEIR. AFTER MONITORING FOR EFFECTIVENESS, INSTALLATION OF ADDITIONAL LONG SPANS MAY BE ORDERED BY THE ENGINEER. ATTACH HOOKS TO POSTS. ATTACH BEAMS TO POSTS STRADDLING OUTLET WEIR AND ACCESS GATE. GRID WIRES WILL THEN BE SIZED AND LOOPS ASSEMBLED ACCORDING TO MANUFACTURER'S DIRECTIONS. GRID WIRES ARE THEN ATTACHED TO POSTS STARTING WITH THE LONG DIMENSION FIRST SO THAT THE LONGER WIRES WILL SAG BELOW THE SHORTER STRANDS. WIRE LENGTHS SHOULD BE SIZED TO ALLOW THEM TO BE PULLED TIGHT WITH TWO FEET SAG IN THE MIDDLE OF THE SPANS. AFTER THE GRID IS IN PLACE, THE TWO-STRAND PERIMETER FENCE CAN BE INSTALLED.

WHEN SEDIMENT NEEDS TO BE CLEANED OUT, DISCONNECT AND STORE THE GRID WIRES. THIS CAN BE DONE WITH A TWO-MAN CREW, ONE ON EITHER END OF THE WIRE. EACH PERSON SHALL DISCONNECT THE WIRE FROM THE HOOK AT THE SAME TIME, WALK BEYOND THE TRAP/BASIN, HOLDING THE WIRE TAUT, AND PLACE THE WIRE ON THE GROUND. THE CREW THEN WOVES TO THE NEXT WIRE AND REPEATS THE PROCEDURE UNTIL ALL THE WIRES HAVE BEEN REMOVED. NEXT, THE CREW SHALL REMOVE THE PERIMETER FENCE STRANDS AT THE ACCESS GATES AS WELL AS THE 21-FOOT LONG HORIZONTAL BEAM. CONTRACTOR'S EQUIPMENT CAN THEN ENTER THE TRAP/BASIN TO REMOVE SEDIMENT. AFTER SEDIMENT REMOVAL, THE CREW SHALL RE-INSTALL GRID ASSEMBLY AS DESCRIBED ABOVE.

SHEET TITLE:	BIRD DETERRENT SYSTEM FOR SEDIMENT TRAPS AND SEDIMENT BASINS	DATE: APRIL 2005

SHEET TITLE: WATER FOWL DETERRENT SYSTEM FOR SEDIMENT TRAPS

DATE: APRIL 2005



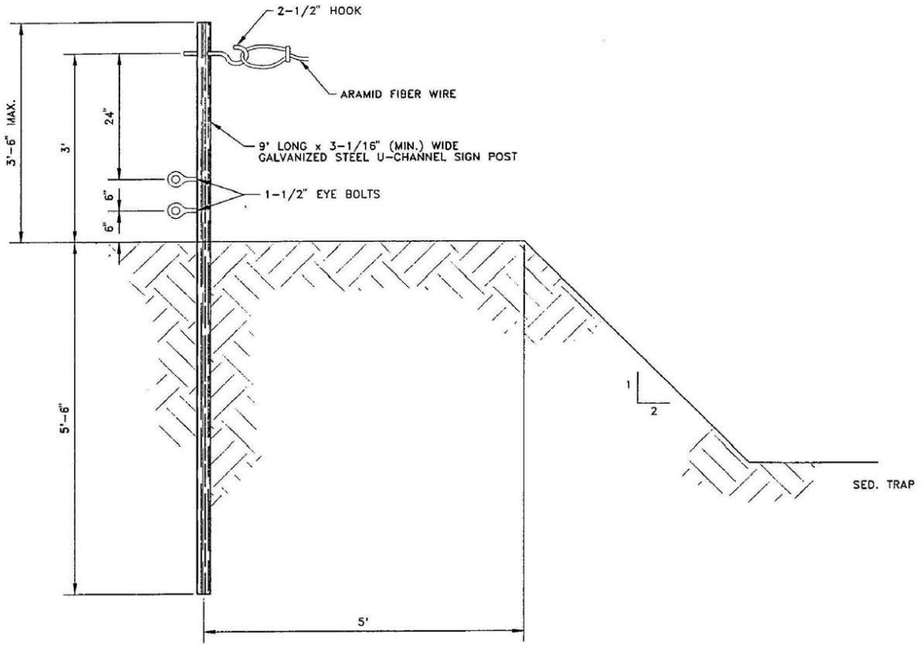
GRID WILL BE 5' APART FOR SHORT SPAN WIRES AND 10' APART FOR LONG SPAN WIRES (SEE NOTE). OUTSIDE GRIDWIRE TO BE PLACED OVER BOTTOM EDGE OF TRAP.

NOTE:

AFTER MONITORING THE EFFECTIVENESS OF THE GRID WIRE SYSTEM, THE ENGINEER MAY ORDER ADDITIONAL POSTS AND WIRES TO BE INSTALLED ON THE LONG SPAN, TO DECREASE SPACING TO 5-FEET.

BIRD DETERRENT SYSTEM FOR SEDIMENT TRAPS AND SEDIMENT BASINS

N.T.S.



POST DETAIL

SHEET TITLE: WATER FOWL DETERRENT SYSTEM FOR SEDIMENT TRAPS	DATE: APRIL 2005

Sediment Trap Bottom Dimensions, ft.	Approximate length per Gridwire, ft.	Number of Gridwires	Total length of Gridwire ft.	Total length of Perimeter Fence ft.	Number of Posts

40’ x 85’	113’	5	565’	362’	44
	68’	18	1,224’		
	Trap TOTAL:		**1,789’**		
40’ x 70’	98’	5	490’	332’	38
	68’	15	1,020’		
	Trap TOTAL:		**1,510’**		
30’ x 105’ (2 traps)	125’	4	500’	350’	50
	50’	22	1,100’		
	Trap TOTAL:		**1,600’**		
30’ x 150’	175’	4	700’	450’	70
	50’	32	1,600’		
	Trap TOTAL:		**2,300’**		
30’ x 155’	170’	4	680’	440’	68
	50’	31	1,550’		
	Trap TOTAL:		**2,230’**		
GRAND TOTAL:			**11,029’**	**2,284’**	**320**
TOTAL LENGTH OF GRIDWIRE: 11,029 + 2 x 2,284 = 15,597 feet					

2.3.2 Procedure for Installing and Removing Grid Wire System

After each sediment trap is constructed, posts are placed five feet outside of the top edge of the traps, spaced five feet on center on the long side of the trap and ten feet on center on the short sides, leaving one twenty foot gap for the gate. Attach hooks to posts. Attach beams to posts straddling outlet weir and access gate. Grid wires will then be sized and loops assembled according to manufacturer’s directions. Grid wires are then attached to posts starting with the long dimension first so that the longer wires will sag below the shorter strands. Wire lengths should be sized to allow them to be pulled tight with two feet sag in the middle of the spans. After the grid is in place, the two-strand perimeter fence can be installed.

When sediment needs to be cleaned out, disconnect, and store the grid wires. This can be done with a two-man crew, one on either end of the wire. Each person shall disconnect the wire from the hook at the same time, walk beyond the trap, holding the wire taut, and place the wire on the ground. The crew then moves to the next wire and repeats the procedure until all the wires have been removed. Next, the crew shall remove the perimeter fence strands at the access gates as well as the twenty-one foot long horizontal beam. Contractor’s equipment can then enter the trap to remove sediment. After sediment removal, the crew shall re-install grid assembly as described above.

2.4 Fueling Systems Management

2.4.1 Underground Storage Tanks (UST)

2.4.1.1 Conformance with Regulations, Codes, Standards, and Specifications

Underground Fuel Storage Tanks (UST) containing fuels or chemicals designated hazardous by the United States Environmental Protection Agency (U.S. EPA) or by the applicable codes and standards, shall be approved secondary containment systems and shall be in strict conformance with the most recent applicable regulations, manufacturer’s recommendations, codes, and standards.

A. U.S. EPA Final Rule; Federal Relations: Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks. Title 40, Code of Federal Regulations, Part 280 (40 CFR Part 280).
B. State of Maryland, Department of Environment (MDE), Title; 26, Subtitle 10, Oil Pollution and Tank Management (COMAR 26.10).
C. State of Maryland, Department of Public Safety and Correctional Services, Title; 12, Subtitle 03, Fire Prevention Commission (COMAR 12.03).
D. National Fire Prevention Association (NFPA) Standards:
    1. NFPA 30: Flammable and Combustible Liquids Code.
    2. NFPA 30A: Motor Fuel Dispensing Facilities and Repair Garage.
    3. NFPA 31: Standard for Installation of Oil-Burning Equipment.
    4. NFPA 70: National Electric Code.
E. Petroleum Equipment Institute (PEI) Recommended Practice (RP) For the Installation of Underground Liquid Storage Systems (PEI/RP 100-05).
F. American Petroleum Institute (API) Recommended Practice (RP) For the Installation of Underground Petroleum Storage Systems (API/RP 1615).
G. American Petroleum Institute (API) Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks.
H. Listing and Labeling: Provide equipment and accessories that are listed and labeled as defined in the National Electric Code (NEC), Article 100.

2.4.1.2 Underground Fuel Storage Tank Requirements

Underground storage tanks shall be warranted for 30 years against failure due to internal/external corrosion and when properly installed, against structural failure. Underground storage tanks shall also be UL listed of one of the following type:

A. Fiberglass Reinforced Polyester UST
   1. The underground storage tank shall be constructed of double-walled, fiberglass reinforced polyester (FRP).
   2. Tank shall be manufactured with 100% resin and glass-fiber reinforcement. Tank shall include an integral fiberglass-reinforced polyester (FRP) secondary containment.
   3. The tank shall be double wall construction for containment of leaks with interstitial space between primary (internal) and secondary (external) tank walls to allow for free flow of all leaked product from the primary tank. The entire tank system shall be fabricated as a single unit and delivered to the job site as a complete assembly.
   4. Both the primary storage tanks and secondary containment shall be UL approved for their use and shall be compatible with gasoline, gasohol, ethanol, E85, methanol, oxygenated fuels, jet fuel, av-gas, kerosene, diesel fuel, bio-diesel, and motor oil (new or used) at ambient underground temperature or fuel oil stored at temperatures not to exceed 100ºF. Tanks shall be chemically inert to petroleum products.
   5. Tank shall be designed with one 4-inch fitting that will access the tank bottom between the primary and secondary walls (annular space).
   6. Tanks with a 6-foot diameter or larger shall have a UL approved, integrally mounted reservoir installed on the tank for hydrostatic monitoring of the interstitial space. The reservoir shall be constructed of fiberglass reinforced plastic materials and warranted for 30 years against failure due to internal/external corrosion and when properly installed, against structural failure (same as tank warranty).
   7. The annular space of the tank shall be filled with a Brine Antifreeze solution provided by the tank manufacturer.
   8. The tank shall have one (1) 22-inch I.D. flanged manway complete with UL listed gaskets, bolds and cover and appropriate hold-down straps and lifting lugs.
   9. Each tank shall be provided with glass fiber reinforced plastic anchor straps for each tank. The number and location of straps shall be as specified by manufacturer. Each strap shall be capable of withstanding a maximum load for each tank diameter per the manufacturer's specifications. Straps shall be standard as supplied by the tank manufacturer.
   10. Precast concrete deadman anchors or poured-in-place concrete hold down slab shall be compatible with the manufacturers anchor straps. The concrete deadman or hold down slab and anchor straps shall prevent the fiberglass tank from floating out of the ground when the tank installation in an area of high groundwater or saturated soil conditions.
   11. The tank shall support accessory equipment such as ladders, submersible pumps, containment sumps, drop tubes, etc. when properly installed.
   12. Threaded fittings and optional equipment shall be consistent for use as directed by the Engineer.
   13. Striker plates shall be installed under each service fitting and manway opening.
   14. The Underwriters Laboratories (UL) label shall be permanently affixed to each tank.
   15. Provide lifting lug(s) on all tanks. Lifting lug system shall be capable of withstanding weight of tank with a sufficient safety factor.
   16. The tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's installation instructions. The tank shall withstand aircraft loading if the proposed location requires such loading.

B. HMW Polymer Extruded Double-wall Steel UST
   1. The underground storage tank shall be double-walled steel with a primary steel storage tank contained in a 360º, air-pressure testable and unbreakable jacket, bonded together and sealed off at the fittings. The secondary containment tank wall shall be made of high molecular weight (HMW) polymer extruded and applied at the tank factory. The tank shall be designed with one (1) 22-inch I.D. flanged manway complete with UL listed gaskets, bolts and cover, and appropriate hold-down straps and lifting lugs.
   2. The tank shall be double wall construction for containment of leaks with interstitial space between primary (internal) and secondary (external) tank walls to allow for free flow of all leaked product from the primary tank.
   3. Tank shall be designed with one 2-inch fitting that will provide access to the tank bottom between the primary and secondary walls (annular space).
   4. The tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's installation instructions. The tank shall withstand aircraft loading if the proposed location requires such loading.
   5. The tank shall be shipped, delivered, installed and 75% backfilled while maintaining a constant vacuum (minimum 12 inches of mercury vacuum) on the interstitial space to assure integrity of both the primary storage tank and secondary containment tank wall simultaneously.
   6. Each tank shall be provided with appropriate anchor straps, per the manufacturer's recommendations. The number and location of straps shall be as specified by manufacturer. Each strap shall be capable of withstanding a maximum load for each tank diameter per the manufacturer's specifications. Straps shall be standard as supplied by the tank manufacturer.
   7. Precast concrete deadman anchors or poured-in-place concrete hold down slab shall be compatible with the manufacturers anchor straps. The concrete deadmen or hold down slab and anchor straps shall prevent the tank from floating out of the ground when the tank installation in an area of high groundwater or saturated soil conditions.
   8. The tank shall support accessory equipment such as ladders, submersible pumps, containment sumps, drop tubes, etc. when properly installed.
   9. Threaded fittings and optional equipment shall be consistent for use as directed by the Engineer.
   10. Striker plates shall be installed under each service fitting and manway opening.
   11. The Underwriters Laboratories (UL) label shall be permanently affixed to each tank.
   12. Provide lifting lug(s) on all tanks. Lifting lug system shall be capable of withstanding weight of tank with a significant safety factor.

C. Double-wall Polyurethane-coated Steel UST
   1. The underground storage tank shall be double-walled steel, externally protected with 75mils thick of Polyurethane Coating System per corrosion control system specifications, and built in accordance with UL 58 Type I Construction criteria.
   2. The corrosion control system shall have a minimum of 30-year warranty against failure due to exterior corrosion and internal corrosion when used with compatible petroleum products. The tank will not require sacrificial anodes and therefore will not require cathodic monitoring.

3. The tank shall be double wall construction for containment of leaks with interstitial space between primary (internal) and secondary (external) tank walls to allow for free flow of all leaked product from the primary tank.
4. Tank shall be designed with one 2-inch fitting that will provide access to the tank bottom between the primary and secondary walls (annular space).
5. The tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's installation instructions. The tank shall withstand aircraft loading if the proposed location requires such loading.
6. The tank shall be shipped, delivered, installed and 75% backfilled while maintaining a constant vacuum (minimum 12 inches of mercury vacuum) on the interstitial space to assure integrity of both the primary storage tank and secondary containment tank wall simultaneously.
7. Each tank shall be provided with appropriate anchor straps, per the manufacturer's recommendations. The number and location of straps shall be as specified by manufacturer. Each strap shall be capable of withstanding a maximum load for each tank diameter per the manufacturer's specifications. Straps shall be standard as supplied by the tank manufacturer.
8. Precast concrete deadman anchors or poured-in-place concrete hold down slab shall be compatible with the manufacturer's anchor straps. The concrete deadman or hold down slab and anchor straps shall prevent the tank from floating out of the ground when the tank installation in an area of high groundwater or saturated soil conditions.
9. The tank shall support accessory equipment such as ladders, submersible pumps, containment sumps, drop tubes, etc. when properly installed.
10. Threaded fittings and optional equipment shall be consistent for use as directed by the Engineer.
11. Striker plates shall be installed under each service fitting and manway opening.
12. The Underwriters Laboratories (UL) label 58 Type I Construction label shall be permanently affixed to each tank.
13. Provide lifting lug(s) on all tanks. Lifting lug system shall be capable of withstanding weight of tank with a significant safety factor.

2.4.1.3 Underground Storage Tank Piping

All product piping that is buried underground shall be made of non-ferrous materials and shall be designed as double containment components.

A. Double-Wall Flexible Plastic
   1. Underground piping shall be 1-inch – 1.5-inch diameter Flexible, Double-Containment Piping and MUST comply with UL 971 (2004).
   2. Ducting for flexible double wall pipe shall be 4" nominal diameter HDPE duct utilized as a carrier for double wall pipe to allow ease of replacement of double wall pipe if leakage is detected. Duct shall be a minimum SDR of 11 with a wall thickness of 0.409". Bends within the duct shall be limited to a bend radius that is greater than or equal to the bend radius of the flexible double containment product piping.
   3. Flexible plastic piping systems shall not be utilized as direct fill lines, vent lines, stage II vapor recovery lines or aboveground.
   4. An automatic line leak detector must be installed on each fuel supply line that conveys product under pressure.

B. Coaxial Fiberglass Pipe
   1. An automatic line leak detector must be installed on each fuel supply line that conveys product under pressure.
   2. FRP piping shall not be utilized as direct fill lines or aboveground.

2.4.2 Aboveground Storage Tanks

2.4.2.1 Conformance with Regulations, Codes, Standards, and Specifications

Aboveground Storage Tanks (AST) containing fuels or chemicals designated hazardous by the EPA or by the applicable codes and standards, shall be approved secondary containment systems and shall be in strict conformance with the most recent applicable regulations, manufacturer's recommendations, codes, and standards.

A. U.S. EPA Spill Prevention Control and Countermeasure Plans. 40 CFR Part 112 as approved by MDOT MAA Manager of Environmental Compliance.
B. State of Maryland, Department of Public Safety and Correctional Services, Title; 12, Subtitle 03, Fire Prevention Commission (COMAR 12.03).
C. State of Maryland, Department of the Environment (MDE), Title; 26, Subtitle 10, Oil Pollution and Tank Management (COMAR 26.10).
D. National Fire Prevention Association (NFPA) Standards:
   1. NFPA 1: Fire Code
   2. NFPA 30: Flammable and Combustible Liquids Code.
   3. NFPA 30A: Motor Fuel Dispensing Facilities and Repair Garage.
   4. NFPA 31: Standard for Installation of Oil-Burning Equipment.
   5. NFPA 58: Liquefied Petroleum Gas Code.
   6. NFPA 59: Utility LP-Gas Code
   7. NFPA 59A: Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG).
   8. NFPA 70: National Electrical Code.
   9. NFPA 385: Standard for Tank Vehicles for Flammable and Combustible Liquids.
   10. NFPA 395: Standard for the Storage of Flammable and Combustible Liquids at Farms and Isolated Sites.
   11. NFPA 704: Standard System for Identification of Hazards of Materials for Emergency Response.

12. NFPA 780: Standard for the Installation of Lightning Protection Systems.

E. Petroleum Equipment Institute (PEI) Recommended Practice (RP) For the Installation of Aboveground Storage Systems for Motor-Vehicle Fueling (PEI/RP 200-03).
F. Underwriters Laboratories Inc. (UL) listing required – UL 142 – Standards for Steel Aboveground Tanks for Flammable and Combustible Liquids.
G. Underwriters Laboratories Inc. (UL) listing required – UL 2085 – Standards for Protected Aboveground Tanks for Flammable and Combustible Liquids.
H. American Petroleum Institute (API) Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks.
I. Steel Tanks Institute (STI), Shop Fabricated Atmospheric Tank Documents.

2.4.2.2 Aboveground Fuel Storage Tank Requirements

A. Storage tanks shall be warranted for 30 years against failure due to internal/external corrosion and when properly installed, against structural failure.
B. Aboveground storage tanks shall be UL-2085 or UL-142 listed and shall be equipped with the following design parameters:
   1. "Protected" Aboveground Storage Tank System (UL-2085)
      a. The storage tank shall be a UL-2085 thermally insulated double-walled, steel aboveground storage tank designed for the storage of flammable and combustible liquids at atmospheric pressure. The tank shall include steel primary tank, integral steel secondary containment and thermal insulation that provides a minimum two-hour fire rating. The entire tank system shall be factory fabricated as a single unit and delivered to the job site as a complete assembly. Secondary containment shall be a minimum 110% of the primary containment volume.
      b. Inner and outer tank shall be manufactured in accordance with UL-142 Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids. Entire tank shall be labeled for Underwriters Laboratories UL-2085 Standard for Insulated Secondary Containment Aboveground Tank for Flammable Liquids. The tank design shall comply with UL-2085 "Protected" Tank standard and shall be tested for Ballistics, Impact, Hose Stream, and Pool Fire UL-2085 performance standards. Each tank shall be delivered as a completed UL-listed assembly.
      c. Tank shall be manufactured and labeled per NFPA 704 for type of hazardous material stored and in strict accordance with Steel Tank Institute (STI) Fireguard® Thermally Insulated, Double Wall Steel Aboveground Storage Tank standards as applied by a license of the STI. Tanks shall be subject to STI's Quality Assurance program and backed by the STI 30-year limited warranty.
      d. Tank shall be fabricated per UL-142 of mild carbon steel with shall seams of continuous lap weld construction. Tank shall be of double wall construction and provide complete secondary containment of the primary storage tank's contents by an impervious steel outer wall. A minimum of 3-inches of porous, lightweight monolithic thermal insulation material shall be installed at the factory within the interstitial space between the inner and outer wall. The thermal insulating material shall be in accordance with American Society of Testing Materials (ASTM) Standards C-332 and C-495. The thermal insulating material shall allow liquid to migrate through it to the monitoring point. The thermal insulating material shall not be exposed to weathering and shall be protected by the steel secondary containment outer wall.
   2. Aboveground Storage Tank System (UL-142)
      a. The storage tank shall be a UL-142 double-walled, steel aboveground storage tank designed for the storage of flammable and combustible liquids at atmospheric pressure. The tank shall include steel primary tank and integral steel secondary containment. The entire tank system shall be factory fabricated as a single unit and delivered to the job site as a complete assembly. Secondary containment shall be a minimum of 110% of the primary containment volume. The tank shall be designed for possible relocation at a future date.
      b. Inner and outer tank shall be manufactured in accordance with UL-142 Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids. Each tank shall be delivered as a completed UL-listed assembly.
      c. Tank shall be fabricated per UL-142 of mild carbon steel with shall seams of continuous lap weld construction. Tank shall be of double wall construction and provide complete secondary containment of the primary storage tank's contents by an impervious steel outer wall.
C. Each tank shall be designed for possible relocation at a future date. Concrete encased tank designs are not recommended.
D. Each tank shall be equipped with OSHA approved stairs and platforms with handrails, supplied by the manufacturer. For tanks without remote fill assemblies, stairs shall be located at same end of tank as fill pipe, fill pipe shall be fully accessible to fuel delivery operator.
E. Lifting lugs shall be provided at balancing points to facilitate handling and installation of the tank.
F. Exterior protective coatings shall be applied per manufacturer's recommendations.
G. The interstitial space between tanks must be able to be monitored for leaks.
H. Tank Appurtenances – At a minimum each tank shall be equipped with the following. Any deviations from this requirement must be approved by the Engineer in writing. All tank appurtenances must meet the requirements of NFPA 30 and NFPA 30A.
   1. Normal vent;
   2. Emergency vent(s);
   3. Spill catchment basin;
   4. Site gauge capable of providing the level of liquid within the tank to the nearest inch (minimum);
   5. Overfill prevention valve;
   6. Vent whistle / high level alarm;
   7. Fire valve;
   8. Ball valve(s);
   9. Antisiphon valve / solenoid valve that will prevent the release of liquid from the tank by siphon flow; and
   10. Annular space leak detection gauge that will visually alert facility personnel to the presence of liquid within the annular space.

11. Minimum 30” diameter flanged manway access at top centerline of tank for tanks over 5,000gallon capacity.

I. The tank’s primary and secondary containments must be tested for tightness in the factory and in the field (following installation of all components) before commissioning.

2.4.2.3 Aboveground Storage Tank Venting (Normal Vent)

A. Storage tank shall be adequately vented to prevent the development of pressure or vacuum that can damage the tank or exceed the tank’s design pressure during filling or emptying of the tank. Each compartment of the primary tank shall be equipped with a normal venting device sized and installed in accordance with the requirements of NFPA 30, NFPA 30A, and API Standard 2000.
B. The normal vent shall be at least as large as the largest filling or withdrawal connection but shall not be less than 1.25-inches nominal inside diameter.
C. The normal vent for an AST system storing a flammable liquid shall extend a minimum of twelve (12) feet above the ground. The normal vent for an AST system storing a combustible liquid shall extend a minimum of three (3) feet above the top of the tank.
D. The venting device(s) shall be designed so vapors exhaust upward. Vent outlets shall be installed so that vapors will not be trapped by eaves or other obstructions, all vent outlets shall be a minimum of five (5) from building openings and air intakes.
E. Tank vents that are installed within or attached to a canopy shall extend a minimum of five (5) feet above the highest projection of the canopy.
F. Normal vents shall NOT be installed on any compartment of the tank that does not routinely contain petroleum products (i.e., interstitial spaces, closed portions of closed-top dike tanks).
G. Ball float vent checks shall NOT be used with an AST system.

2.4.2.4 Aboveground Storage Tank Venting (Emergency Vents)

A. Every aboveground storage tank shall have emergency relief venting (either through construction of device(s)) that will relieve excessive pressure caused by exposure to fire. This applies to every compartment of the primary tank, the interstitial space of the secondary tank, and the enclosed space of tanks of closed-top dike construction.
B. The necessary emergency relief venting capacity for a tank system shall be in accordance with NFPA 30, NFPA 30A, and the manufacturer’s recommendations.

2.4.2.5 Aboveground Storage Tank Piping

A. Aboveground piping shall be minimum Schedule 40 galvanized steel for ground product fuels and internally lined epoxy-coated or stainless steel for jet fuel. Galvanized piping shall not be used for diesel or aviation fuels.
B. Underground product piping shall be one of the following: UL approved double-walled fiberglass, or UL approved double-walled corrosion resistant flexible petroleum fuel piping including polyethylene conduit, or equal, including the installation of product containment sumps for dispensing units and transition points from aboveground to underground piping.
C. Piping systems of aboveground storage tanks in connection with pumps shall contain a sufficient number of control valves and check valves to control the flow of liquids properly in normal operation and in the event of physical damage or fire exposure.
D. Piping systems affiliated with aboveground storage tanks shall be protected and supported in a way that it will be protected from physical damage and excessive stresses arising from settlement, vibration, expansion, contraction, or exposure to fire.
E. Aboveground product supply piping shall be equipped with the following components, which shall be installed in the following order moving downstream from the tank (unless otherwise specified by the Engineer in writing):
    1. Block valve / Ball valve – capable of isolating the tank from the piping.
    2. Fire / Emergency valve – capable of automatically closing and isolating the tank and piping in the event of a fire. The fire / emergency valve shall be constructed of steel of nodular iron to prevent failure under fire conditions.
    3. Anti-siphon valve / solenoid valve – capable of preventing gravity-discharge / siphon flow of product from damaged piping. The anti-siphon valve may be electrically operated solenoid valves or mechanical check valves that open or close simultaneously with the operation of the pump motor. Anti-siphon valves are only required on tanks where the liquid level in the tank (at any point) is higher than the supply piping or dispensing unit. Where permitted, mechanical anti-siphon valves shall be installed in lieu of electric solenoid valves.

2.4.3 Storage Tanks Associated with Gasoline Dispensing/Motor Vehicle Refueling Facilities (GD/MVRFs)

Please see Chapter 1.6 Gasoline Dispensing/Motor Vehicle Refueling Facilities Permitting Process regarding the Gasoline Dispensing/Motor Vehicle Refueling Facilities Permitting Process and Design Requirements.

For the purposes of this section and all subsequent subsections, “Owner” refers to the Maryland Aviation Administration (MDOT MAA), or either of BWI Marshall and/or Martin State Airports as determined by the context. “Consultant” refers to any entity commissioned to design and/or specify equipment described herein for construction and/or installation at any MDOT MAA facility or location within the BWI Marshall and/or Martin State Airports.

Owner must ensure that proper procedures are followed during product transfer from cargo tanks to storage tanks to minimize vapor releases, such as minimizing gasoline spills, expeditiously cleaning up gasoline spills, using gasketed seals for gasoline containers and storage tank fill pipes, and minimizing product being sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices such as oil/water separators.
Owner must not permit cargo (delivery) trucks/tanks to unload gasoline into a storage tank unless proper connections in the vapor balance system are established, vapor-tight equipment and connections are used, and the tank truck vapor return equipment/hatches/seals are vapor- tight and compatible with the storage tank vapor balance equipment. Additionally, the cargo tank must carry documentation that it has met specifications of EPA method 27.

Owner must comply with general requirements pertaining to permit duration, availability of permit at permitted location, modifications, inspections, right of entry, violations, and penalties as outlined in Part III of MDE/ARMA’s *Air Quality General Permit to Construct Application Package for Motor Vehicle Refueling Facilities*.

In addition, the following recordkeeping, testing, notification, and reporting procedures are required for GD/MVRF storage tanks:

A. Recordkeeping
   1. For tanks with a monthly throughput of less than 100,000 gallons and Stage I vapor recovery equipment, owner must make gasoline throughput, gasoline spills and cleanups, and maintenance records available within 24 hours of a Maryland Department of the Environment's Air and Radiation Management Administration (MDE/ARMA) request.
   2. For tanks with monthly throughput of 100,000 gallons or more and Stage I vapor recovery equipment, owner must make those records outlined in item 1.a., above, as well as records of all tests performed and all notifications or reports submitted to the EPA or MDE/ARMA available within 24 hours of a MDE/ARMA request.
   3. All records must be kept by owner for a period of five years.
   4. Additional recordkeeping requirements are outlined for tanks with Stage II vapor recovery equipment (required for all new sources at BWI Marshall and Martin State Airports) in Part II, Section E(2) of MDE/ARMA's *Air Quality General Permit to Construct Application Package for Motor Vehicle Refueling Facilities*.

B. Testing
   1. For tanks with a monthly throughput of 100,000 gallons or more and Stage I vapor recovery equipment, owner must demonstrate compliance at the time of installation and every three years thereafter with those tests outlined in Section 4.8.5.2, subsection 5(d-g) and in Part II, Section B(1)(c) of MDE/ARMA's *Air Quality General Permit to Construct Application Package for Motor Vehicle Refueling Facilities*.
   2. Testing frequency as well as additional testing requirements for tanks with Stage II vapor recovery equipment are outlined in Part II, Section B(2) of the *Application Package*.
   3. Owner must ensure that all Stage II equipment is inspected at least daily, and that at least one employee shall be trained to conduct inspections through an approved training course.

C. Notifications
   1. Regulatory notifications are required for tanks with monthly throughput of 10,000 gallons or more and Stage I vapor recovery equipment. Notification types include Initial, Compliance, Change in Information, and Performance Test, and requirements increase for tanks with a monthly throughput of 100,000 gallons or more. These notification requirements and procedures are outlined in Part II, Section C of the *Application Package*.
   2. Except for Performance Test notifications, there are no other notification requirements for tanks of any size with Stage II vapor recovery equipment (see Part II, Section C(2) and Section D(2) of the Application Package). Owner must notify MDE/ARMA of any Stage II vapor recovery equipment performance tests at least 5 days before conducting the test. Copies of all test results and reports of test failures must be forwarded to MDE/ARMA within 45 days per Part II, Section D(2) of the Application Package.

D. Reporting
   1. There are no reporting requirements for tanks with monthly throughput of less than 100,000 gallons and Stage I vapor recovery equipment. For tanks with monthly throughput of 100,000 gallons or more and Stage I vapor recovery equipment, owner must report results of tests to EPA Region III and the MDE/ARMA within 180 days of test completion (see Part II, Section D(1) of the Application Package).

2.4.4 Oil Water Separator (OWS)

Oil/Water Separators offer environmental protection from surface water pollution meeting the needs of a wide variety of run-off applications. Oil/water separators serving as secondary containment as defined by 40 CFR Part 112.8 must be constructed to contain 110% of the volume of the largest oil storage container. This often includes mobile fuelers and bulk fuel storage containers.

Construction and performance of the oil/water separators must be in accordance with UL SU-2215. Oil/Water separators shall be listed to Underwriter's Laboratories UL SU-2215. Manufacturer must provide certification documentation detailing criteria under which the system was tested. UL SU-2215 label shall be prominently displayed on manway covers.

Capacities, dimensions, construction, and thickness of separators shall be in strict accordance with UL 58, double-walled construction with 360-degree steel secondary containment. The inner steel tank shall be completely contained within the outer tank, enclosing 100% of the tank volume. The tank must have a double steel shell with a space between the layers. The space between the inner and outer steel walls shall be monitored with an approved leak detection device.

Oil/Water separators shall have the structural strength to withstand static and dynamic hydraulic loading while empty and during operating conditions. The oil/water separators dimensions and thickness shall be in strict compliance with Roark's Formulas for Stress and Strain as presented in UL 58. Calculations shall be submitted to project Design Engineer to document structural strength under specified overbearing or external pressure. These calculations shall be included in the submittal for the Oil/water separator. The separator shall be installed in accordance with manufacturer's recommendations. Oil/water separators installed below ground shall be installed to withstand H-20 or aircraft rated loading depending on location.

Coalescer area calculations also must be provided during the submittal process and should illustrate specified performance under laminar flow conditions. Submitted calculations shall take into account the rate of flow, potential surge flow, influent concentration, particle characteristics (20-micron), fluid temperature, fluid specific gravity and pH.

Separators must be designed to remove all free oil droplets equal or greater than 20 microns. In addition, the effluent quality must meet a discharge limit of 15mg/L Oil and grease.

Corrosion control systems for separators shall be in accordance with UL 1746 standard for external corrosion protection systems for steel underground tanks. Accepted exterior surfaces include: polyurethane (PUR), polyurea, or fiber-reinforced plastic (FRP) coated systems. Galvanic-type cathodic protection systems are not acceptable. Each separator STI corrosion control system shall include a 15 mil thick interior polyurethane coating and all interior seams shall be steel welded before sand blasting and interior coating.

Oil/water separators may provide treatment with flow-through or actuated inlet tanks. Oil/water separator systems shall be fabricated, inspected and tested for leakage before shipment from the manufacturer as completely assembled units. The oil/water separator shall be tested in accordance with NFPA 30 Chapter 21.5.2 before being placed into service.

Separators shall never be intended for use with hazardous chemicals. Oil/water separators should not be used with additional tanks for collection of oil effluent downstream of the unit discharge.

The source of the influent to the separator shall be gravity flow from storm water runoff, hydrocarbon spills, and/or cleaning/maintenance operations.

Oil/water separator local alarm control panel shall consist of audible and visual alarms generated. Alarms shall consist of “high” oil level, “high, high” oil level, and “leak” detection. Control panel shall consist of NEMA 4 enclosure and level sensors shall be intrinsically safe. Liquid level sensing device shall comply with the Standard for Liquid Level Indicating Gauges for Oil Burner Fuels, UL 180, or Control Equipment for use with Flammable Liquid Dispensing Devices, UL 1238.

Separators shall be furnished with flanged inlet and outlet pipe connections.

Separators shall utilize necessary appurtenances, including, but not limited to, liquid level devices, overpressure devices, venting, heaters, pumps, monitors, shutoff valves, control panels, or other individual mechanical or electrical components.

Oil/water separators shall meet the following requirements:

A. Must comply with Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks—UL 1746
B. Normal Venting for Underground Storage Tanks—National Fire Protection Association NFPA 30, 2012. Flammable and Combustible Liquids Code.
C. Erosion and Sediment Control—COMAR 26.17
D. Gaskets and Seals—UL 157
E. Underwriter’s Laboratories UL SU-2215

Design must maintain positive drainage through the unit. Piping utilized for drainage from the unit shall be sized based on maximum discharge flowrates from the unit, pipe capacity, and necessary pipe strength based on depth of below ground pipe placement. Piping shall be installed with all necessary appurtenances, including seals at piping connections to prevent contamination by unit, cleanouts to allow access to entire length of installed piping, and necessary valves. Oil/water separator inlet and outlet piping shall be installed with a minimum slope of 1 percent, and to discharge non-erosively.

Oil water separator must be properly vented to prevent flow siphoning through the tank. Comply with oil/water separator manufacturer recommendations for vent pipe size and locations.

Oil/water separator must contain a minimum of two manways. One manway shall be directly above coalescers (either parallel plates or coalescer balls acceptable) to provide easy access during maintenance. The second manway shall be directly above either a final polishing coalescer, if applicable, or the sludge chamber. Each manway dimensions shall facilitate easy removal of either device during maintenance. No manway shall be less than ID 30 inches in size. The manway covering must be in accordance with Volume 2, Section 6.2.2 Manhole/Handhole Covers/LIDS.

Each separator shall be provided with a minimum warranty of one year material and workmanship against structural failure following placement into service.

Separators must be designed to remove all free oil droplets equal or greater than 20 microns. In addition, the effluent quality must meet a discharge limit of 15mg/L oil and grease.

Selected oil/water separator manufacturer shall have at least 5 years of experience in manufacturing similar units for comparable applications.

If there is a conflict between the MDOT MAA design standards and federal, state, or local code, the latest code or policy will govern.

2.4.5 Fuel Truck Parking

The design of all facilities at BWI Marshall and MTN, involving fuel loading and/or parking areas for mobile or portable fuel/oil storage containers must comply with NFPA 407, and must meet 40 CFR, Part 112 requirements of the Environmental Protection Agency’s Spill Prevention and Control Countermeasures (SPCC).

The MDOT MAA requires all owners of existing fuel operations at BWI Marshall and MTN to construct the secondary containment. New facilities must construct the required secondary containment prior to beginning operation. The requirement for secondary containment applies but is not limited to, the following conditions:

A. Fuel truck parking areas where filled and parked fuel trucks are left unattended. The fuel truck parking areas must be provided with secondary containment capable of holding the volume of the largest tank.

B. Truck loading/unloading areas. Areas where fuel is loaded or unloaded from a tank truck to a storage tank, or vice-versa, must be provided with secondary containment capable of holding at least the maximum capacity of any single compartment of a truck using the facility.

2.5 Hazardous Materials Management

2.5.1 Asbestos and Other Hazardous Materials

Current Federal and State environmental statutes require that certain potentially hazardous materials that may be affected by building improvements or modifications involving activities such as construction, repair, maintenance, alterations, and renovations be identified and removed prior to conducting these activities. The requirements mandate that hazardous materials be identified in order to comply with worker and occupant/tenant safety, environmental, and disposal requirements. The primary materials of concern include, but are not limited to, asbestos-containing materials (ACM), lead-based paint, PCB, and mercury-containing building elements.

Prior to developing a scope of work for the proposed improvements or modifications, the Consultant, Contractor and/or Tenants are required to coordinate with the Environmental Compliance Section to obtain recent hazardous materials surveys and to arrange for a Hazardous Materials Site Assessment. An MDOT MAA contractor will inspect the area and provide a report describing the hazardous materials that will be affected by the proposed activities and recommendations for their removal or management. Hazardous materials removal services will be arranged and managed by the MDOT MAA or by the tenant. In either case, "third party" abatement oversight will be provided by the Environmental Compliance Section. The 100% plans shall be submitted to the Environmental Compliance Section for review and coordination.

The following shall be incorporated into the construction documents for hazardous materials abatement work:

A. The Contractor shall coordinate through CMI the scheduling of the Environmental Compliance inspectors and industrial hygienist during the construction demolition phase. The Environmental Compliance Inspectors and Industrial Hygienist would identify any suspect hazardous material that may have been inaccessible during design, for example behind a wall or under a floor. If hazardous material is found during demolition, a Field Revision will be issued by the Engineer.
B. Include Miscellaneous Work Allowance for unforeseen asbestos removal.

The following addresses the post abatement deliverables from abatement contractors and provides a consistent method of reporting required information. This is designed to be included in contracts or agreements between MDOT MAA and abatement contractors.

Contract Language for Office of Engineering & Construction to Provide to Abatement Contractors:

The Abatement Contractor shall perform work in accordance with the contract terms, applicable Federal and State regulations, and approved Abatement Design. Within thirty (30) days of project completion the Contractor shall provide an Abatement Closure Report. The submittal shall consist of two hard copies of the Closure Report and one electronic version in PDF format. The Closure Report must include a Title Page containing the site or renovation area, project name (what was removed from where), Contractor name and information, Contract number, and dates of abatement. An Abatement Summary must be provided that describes the materials removed, controls used, work procedures, total amount removed and location(s) of removal. Indicate if "all" materials were removed or if remnant materials remain and where.

The following appendices must be provided:

- Copies of Abatement Design/Work Plan
- Copies of EPA Notifications or permits (as applicable)
- Copies of Contractor Supervisor and Worker certificates/licenses
- Copies of Daily Sign in Logs and Inspection Logs
- Copies of Air Sample Results
- Copies of Waste Manifests

The hard copy and electronic reports shall be submitted to MDOT MAA’s Environmental Program Manager, Environmental Compliance Section for review and acceptance.

2.5.1.1 Management of Asbestos

For renovation work, a checklist should be formulated to insure all possible sources of asbestos have been removed (i.e., ceiling tile, floor tile, insulation, etc.). If asbestos is suspected, the MDOT MAA Environmental Compliance Officer shall be contacted to initiate the proper documentation and testing of the site and determination of the proper abatement procedures.

Column Covers: Many of the column covers in the terminal building consist of preformed asbestos cement. Because this material is non-friable, there is no health hazard associated with its undisturbed presence. Any cutting, sawing, drilling, or work which disturbs the column will require a licensed asbestos abatement firm to properly isolate, contain, and dispose of debris produced.

2.5.1.2 Management of Lead Paint

The Consultant shall determine if the project has potential lead exposure. Where the potential for lead exposure exists, request the MDOT MAA Environmental Compliance Officer to test the project site for potential areas which may result in lead exposure above the action level. Test locations and results shall be shown on the contract plans. Incorporate the following into the Special Provisions:

"The Contractor shall fully comply with the requirements of COMAR 09.12.32 – 'Occupational Safety and Health Standard – Occupational Exposure to Lead in Construction Work,' dated November 28, 1988, and as may be amended."

"The Maryland Aviation Administration (MDOT MAA) had conducted preliminary tests of the project site to determine the potential lead exposure to workers above the action level. The location and results of those tests are shown in the contract documents."

"The MDOT MAA has conducted the tests and made the results available as a matter of courtesy to prospective contractors. This information in no way relieves the Contractor from performing his own tests or complying with the requirements set forth in COMAR 09.12.32."

Project inspectors shall follow-up and insure the requirements of COMAR 09.12.32 – "Occupational Safety and Health Standard – Occupational Exposure to Lead in Construction Work" are being complied with.

2.5.1.3 Management of Radioactive Wastes

The identification, handling, storage, transferring, and disposal of common radioactive wastes, specifically, self-luminous exit signs that may contain radioactive gas, such as tritium or radium, generated from construction projects is subject to Federal regulations that govern tritium or radium-containing signs which are found in the Nuclear Regulatory Commission regulations, 10 CFR Part 31. Accordingly, any construction project at BWI Marshall and Martin State Airports involving removal and disposal of common radioactive waste shall include Specification 010009X_Management of Radioactive Wastes. Specification 010009X can be found in Appendix 4B - Standard Specifications.

2.5.1.4 Management of Universal Wastes

The characterization, handling, storage, transport, and disposal of Universal Wastes (UW), such as mercury-containing equipment, batteries, mercury-containing lamps or bulbs, and fluorescent light ballasts that contain polychlorinated biphenyls (PCBs), generated from construction projects is subject to COMAR 26.13.10. Accordingly, any construction project at BWI Marshall and Martin State Airports involving removal and disposal of UW material/equipment shall include Specification 010008X_Management of Universal Wastes. Specification 010008X can be found in Appendix 4B - Standard Specifications.

2.5.2 Paint Booths

For the purposes of this section and all subsequent subsections, "Owner" refers to the Maryland Aviation Administration (MDOT MAA), or either of BWI Marshall and/or Martin State Airports as determined by the context. "Consultant" refers to any entity commissioned to design and/or specify equipment described herein for construction and/or installation at any MDOT MAA facility or location within the BWI Marshall and/or Martin State Airports.

The design and use of paint booths for paint stripping operations and surface coating operations must meet the requirements set forth in COMAR 26.11.01, COMAR 26.11.02, COMAR 26.11.03, COMAR 26.11.13, and COMAR 26.11.19, as well as the Federal regulatory requirements set forth in 40 CFR Part 63.11173 (if applicable).

2.5.2.1 Paint Stripping Operations

If MDOT MAA or Tenant paint stripping operations includes paint stripping using methylene chloride (MeCl) for the removal of dried paint (including but not limited to paint, enamel, varnish, shellac, and lacquer) from wood, metal, plastic, and other substrates, then the following steps should be taken:

A. Evaluate each application to ensure there is a need for paint stripping (e.g., evaluate whether it is possible to re-coat the piece without removing the existing coating);
B. Evaluate each application where a paint stripper containing MeCl is used to ensure that there is no alternative paint stripping technology that can be used;
C. Reduce exposure of all paint strippers containing MeCl to the air;
D. Optimize application conditions when using paint strippers containing MeCl to reduce MeCl evaporation (e.g., if the stripper must be heated, make sure that the temperature is kept as low as possible to reduce evaporation); and
E. Practice proper storage and disposal of paint strippers containing MeCl (e.g., store stripper in closed, air-tight containers).

Owners or operators of a paint stripping operation using paint strippers containing MeCl must submit an Initial Notification to EPA Region III and MDE/ARMA, as required by 40 CFR Part 63.9(b). For a new affected source, the initial Notification must be submitted no later than 180 days after initial startup. For an existing affected source, the Initial Notification must be submitted no later than January 11, 2010.

If the owner or operator of a paint stripping operation uses more than one ton of MeCl annually, a MeCl Minimization Plan must be development to address the management practices outlined in 40 CFR Part 63.11173(a)(1) through (a)(5). Paint stripping operations that use less than one ton of MeCl annually must comply with the management practices outlined in 40 CFR Part 63.11173(a)(1) through (a)(5), but are not required to develop and implement a written MeCl Minimization Plan.

Each paint stripping operation must maintain copies of annual usage of paint strippers containing MeCl onsite at all times.

MDOT MAA or tenant operations which include a paint stripping operation using paint strippers containing MeCl must submit an Initial Notification to EPA Region III and MDE/ARMA, as required by 40 CFR Part 63.9(b). For a new affected source, the Initial Notification must be submitted no later than 180 days after initial startup. For an existing affected source, the Initial Notification must be submitted no later than January 11, 2010.

MDOT MAA/tenant owners or operators of a paint stripping operation must maintain the records specified below:

A. Records of paint strippers containing MeCl used for paint stripping operations, including the MeCl content of the paint stripper used. Documentation needs to be sufficient to verify annual usage of paint strippers containing MeCl (e.g., material safety data sheets or other documentation provided by the manufacturer or supplier of the paint stripper, purchase receipts, records of paint stripper usage, engineering calculations);
B. Paint stripping sources that annually uses more than one ton of MeCl are required to maintain a record of the current MeCl Minimization Plan onsite for the duration of the paint stripping operations. Records of the annual review of, and updates to, the MeCl Minimization Plan must also be maintained;
C. Records of any deviation from the requirements in 40 CFR Part 63.11173, 40 CFR Part 63.11174, 40 CFR Part 63.11175, or 40 CFR Part 63.11176. These records must include the date and time period of the deviation, and a description of the nature of the deviation and the actions taken to correct the deviation; and
D. Per 40 CFR Part 63.111778, owners or operators of an affected source must maintain copies of the records listed above for a period of at least five years after the date of each record. Copies of records must be kept onsite and in a printed or electronic form that is readily accessible for inspection for at least the first two years after their date, and may be kept offsite after that two year period.

2.5.2.2 Surface Coating Operations

A. Per 40 CFR Part 63.11173(e), motor vehicle and mobile equipment surface coating operations and miscellaneous surface coating operations must meet the following requirements:
    1. All painters, including contract personnel, must be certified that they have completed training in the proper spray application of surface coatings and the proper setup and maintenance of spray equipment.
    2. All paint spray gun cleaning must be done so that an atomized mist or spray of gun cleaning solvent and paint residue is not created outside of a container that collects used gun cleaning solvent. Spray gun cleaning may be done with, for example, hand cleaning of parts of the disassembled gun in a container of solvent, by flushing solvent through the gun without atomizing the solvent and paint residue, or by using a fully enclosed spray gun washer. A combination of non-atomizing methods may also be used.

B. Owners or operators of a surface coating operation subject to NESHAP Subpart HHHHHH must submit an Initial Notification to EPA Region III and MDE/ARMA, as required by 40 CFR Part 63.9(b). For a new affected source, the Initial Notification must be submitted no later than 180 days after initial startup. For an existing affected source, the Initial Notification must be submitted no later than January 11, 2010.

C. Per 40 CFR Part 63.11176(a), owners or operators of a motor vehicle or mobile equipment, or miscellaneous surface coating affected source, are required to submit an Annual Notification of Changes Report in each calendar year in which information previously submitted in either the Initial Notification, Notification of Compliance, or a previous Annual Notification of Changes Report has changed. Deviations from the relevant requirements in 40 CFR Part 63.11173(a) through (d) or 40 CFR Part 63.11173(e) through (g) on the date of the report will be deemed to be a change. The Annual Notification of Changes Report must be submitted prior to March 1 of each calendar year when reportable changes have occurred.

D. Owners or operators of a surface coating operation must maintain the records specified below:
    1. Certification that each painter has completed the training specified in 40 CFR Part 63.11173(f) with the date the initial training and the most recent refresher training was completed;
    2. Documentation of the filter efficiency of any spray booth exhaust filter material, according to the procedure in 40 CFR Part 63.11173(e)(3)(i);
    3. Documentation from the spray gun manufacturer that each spray gun with a cup capacity equal to or greater than 3.0 fluid ounces (89 cc) that does not meet the definition of an HVLP spray gun, electrostatic application, airless spray gun, or air assisted airless spray gun, has been determined by the Administrator to achieve a transfer efficiency equivalent to that of an HVLP spray gun, according to the procedure in 40 CFR Part 63.11173(e)(4);
    4. Copies of any notification submitted as required by 40 CFR Part 63.11175 and copies of any report submitted as required by 40 CFR Part 63.11176; and
    5. Per 40 CFR Part 63.11178, owners or operators of an affected source must maintain copies of the records listed above for a period of at least five years after the date of each record. Copies of records must be kept onsite and in a printed or electronic form that is readily accessible for inspection for at least the first two years after their date, and may be kept offsite after that two year period.

2.5.3 Parts Washers/Degreasers

For the purposes of this section and all subsequent subsections, “Owner” refers to the Maryland Aviation Administration (MDOT MAA), or either of BWI Marshall and/or Martin State Airports as determined by the context. “Consultant” refers to any entity commissioned to design and/or specify equipment described herein for construction and/or installation at any MDOT MAA facility or location within the BWI Marshall and/or Martin State Airports.

Consultants should consider the use of non-solvent based parts washers and degreasers whenever practicable. Alternative non-solvent based (citrus-based or microbial cleaning agents) parts washers and degreasers do not require permitting and will reduce air emissions and eliminate the generation of associated hazardous wastes at MDOT MAA and tenant owned facilities. If an alternative non-solvent based parts washer and/or degreaser cannot be installed, the Environmental Compliance Section must be notified.

The design and use of parts washers and degreasers must meet the requirements set forth in COMAR 26.11.19.09, as well as the Federal regulatory requirements set forth in 40 CFR Part 63.462 (if applicable).

COMAR 26.11.19.09 requires that Good Operating Practices be employed when using VOC degreasing material. The following are considered Good Operating Practices:

A. A person subject to this regulation shall implement good operating practices to minimize spills and evaporation of VOC degreasing material.
B. Good operating practices shall include covers (including water covers), lids, or other methods of minimizing evaporative losses, and reducing the time and frequency during which parts are cleaned.
C. Good operating practices shall be established in writing and displayed so they are clearly visible to the operator.
D. The written good operating practices shall be maintained at the facility and made available for review by the Department upon request.
E. A person subject to this regulation may not use a halogenated substance that is a VOC in any cold degreasing.

2.5.3.1 Batch Cold Cleaning Machine Standards

A. Owners or operators of an immersion batch cold solvent cleaning machine shall comply with the requirements of 40 CFR Part 63.462(a)(1) through (a)(2).
B. Owners or operators of a remote-reservoir batch cold solvent cleaning machine shall comply with the requirements of 40 CFR Part 63.462(b).
C. Owners or operators of a batch cold solvent cleaning machine complying with 40 CFR Part 63.462(a)(2) or 40 CFR Part 63.462(b) shall comply with the work and operational practice requirements in of 40 CFR Part 63.462(c)(1) through(c)(9), as applicable.
D. Owners or operators of a batch cold cleaning machine shall submit an Initial Notification Report as described in 40 CFR Part 63.468 (a) and (b) and a Compliance Report as described in 40 CFR 63.468(c).

2.5.3.2 Batch Vapor and In-Line Cleaning Machine Standards

A. Owners or operators of an existing or new batch vapor or in-line solvent cleaning machine shall meet all of the required work and operational practices of 40 CFR Part 63.463(d)(1) through (d)(12).
B. Owners or operators of a solvent cleaning machine which complies with 40 CFR Part 63.463(b), (c), (g), or (h) shall comply with the requirements of 40 CFR Part 63.463(e)(1) through (e)(4).
C. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the idling emission limit standards in 40 CFR Part 63.463(b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall comply with the requirements of 40 CFR Part 63.463(f)(1) through (f)(5).

2.5.3.3 Batch Vapor and In-Line Cleaning Machine Test Methods

A. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with an idling emission limit standard in 40 CFR Part 63.463(b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall determine the idling emission rate of the solvent cleaning machine using Reference Method 307 in 40 CFR Part 63 Appendix A.
B. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with 40 CFR Part 63.464 shall, on the first operating day of every month ensure that the solvent cleaning machine system contains only clean liquid solvent. This includes, but is not limited to, fresh unused solvent, recycled solvent, and used solvent that has been cleaned of soils. A fill line must be indicated during the first month the measurements are made. The solvent level within the machine must be returned to the same fill-line each month, immediately prior to calculating monthly emissions as specified in 40 CFR Part 63.465(c). The solvent cleaning machine does not have to be emptied and filled with fresh unused solvent prior to the calculations.
C. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with 40 CFR Part 63.464 shall, on the first operating day of the month, comply with the requirements of 40 CFR Part 63.465(c)(1) through (c)(3).
D. Owners or operators of a batch vapor or in-line solvent cleaning machine using a dwell to comply with 40 CFR Part 63.463 shall determine the appropriate dwell time for each part or parts basket using the procedures specified in 40 CFR Part 63.465(d)(1) and (d)(2).
E. Owners or operators of a source shall determine their potential to emit from all solvent cleaning operations using the procedures described in 40 CFR Part 63.465(e)(1) through (e)(3).

2.5.3.4 Batch Vapor and In-Line Cleaning Machine Monitoring Procedures

A. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the equipment standards in 40 CFR Part 63.463(b)(1)(i), (b)(2)(i), (c)(1)(i), (c)(2)(i), (g)(1), or (g)(2) shall conduct monitoring and record the results on a weekly basis for the control devices, as appropriate, specified in 40 CFR Part 63.466(a)(1) through (5).
B. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the equipment standards of 40 CFR Part 63.463 (b)(1)(i), (b)(2)(i), (c)(1)(i), or (c)(2)(i) shall conduct monitoring and record the results on a monthly basis for the control devices, as appropriate, specified in 40 CFR Part 63.466(b)(1) and (b)(2).
C. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the equipment or idling standards in 40 CFR Part 63.463 shall monitor the hoist speed as described in 40 CFR Part 63.466(c)(1) through (c)(4).
D. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the equipment standards in 40 CFR Part 63.463 (b)(1)(i), (b)(2)(i), (c)(1)(i), or (c)(2)(i) using a reduced room draft shall conduct monitoring and record the results as specified in 40 CFR Part 63.466(d)(1) or (d)(2).
E. Owners or operators using a carbon adsorber to comply with this subpart shall measure and record the concentration of halogenated HAP solvent in the exhaust of the carbon adsorber weekly with a colorimetric detector tube. This test shall be conducted while the solvent cleaning machine is in the working mode and is venting to the carbon adsorber. The exhaust concentration shall be determined using the procedure specified in 40 CFR Part 63.466(e)(1) through (e)(3).
F. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the idling emission limit standards of 40 CFR Part 63.463 (b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall comply with the requirements specified in 40 CFR Part 63.466(f)(1) and (f)(2).
G. Owners or operators using a control device listed in 40 CFR Part 63.466(a) through (e) can use alternative monitoring procedures approved by the Administrator.

2.5.3.5 Parts Washers/Degreasers Recordkeeping Requirements

A. COMAR requires the MDOT MAA and tenants using VOC degreasing materials to maintain monthly records of the total VOC degreasing materials used and to make the records available to the Department upon request.
B. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.463 shall maintain records in written or electronic form specified in 40 CFR Part 63.467(a)(1) through (7) for the lifetime of the machine.
C. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with 40 CFR Part 63.463 shall maintain records specified in 40 CFR Part 63.467(b)(1) through (b)(4) either in electronic or written form for a period of 5 years.
D. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.464 shall maintain records specified in 40 CFR Part 63.467(c)(1) through (3) either in electronic or written form for a period of 5 years.

2.5.3.6 Parts Washers/Degreasers Reporting Requirements

A. Owners or operators of an existing solvent cleaning machine subject to the provisions of 40 CFR Part 63.468 shall submit an Initial Notification Report to the Administrator no later than August 29, 1995. This report shall include the information specified in 40 CFR Part 63.468(a)(1) through (a)(6).
B. Owners or operators of a new solvent cleaning machine subject to the provisions of 40 CFR Part 63.468 shall submit an Initial Notification Report to the Administrator. New sources for which construction or reconstruction had commenced and initial startup had not occurred before December 2, 1994, shall submit this report as soon as practicable before startup but no later than January 31, 1995. New sources for which the construction or reconstruction commenced after December 2, 1994, shall submit this report as soon as practicable before the construction or reconstruction is planned to commence. This report shall include all of the information required in 40 CFR Part 63.5(d)(1) of Subpart A (General Provisions), with the revisions and additions in 40 CFR Part 63.468(b)(1) through (b)(3).
C. Owners or operators of a batch cold solvent cleaning machine subject to the provisions of 40 CFR Part 63.468 shall submit a Compliance Report to the Administrator. For existing sources, this report shall be submitted to the Administrator no later than 150 days after the compliance date specified in 40 CFR Part 63.460(d). For new sources, this report shall be submitted to the Administrator no later than 150 days after startup or May 1, 1995, whichever is later. This report shall include the requirements specified in 40 CFR Part 63.468(c)(1) through (c)(4).
D. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.463 shall submit to the Administrator an Initial Statement of Compliance for each solvent cleaning machine. For existing sources, this report shall be submitted to the Administrator no later than 150 days after the compliance date specified in 40 CFR Part 63.460(d). For new sources, this report shall be submitted to the Administrator no later than 150 days after startup or May 1, 1995, whichever is later. This statement shall include the requirements specified in 40 CFR Part 63.468(d)(1) through (d)(6).
E. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.464 shall submit to the Administrator an Initial Statement of Compliance for each solvent cleaning machine. For existing sources, this report shall be submitted to the Administrator no later than 150 days after the compliance date specified in 40 CFR Part 63.460(d). For new sources, this report shall be submitted to the Administrator no later than 150 days after startup or May 1, 1995, whichever is later. The statement shall include the information specified 40 CFR Part 63.468(e)(1) through (e)(4).
F. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.463 shall submit an Annual Report by February 1 of the year following the one for which the reporting is being made. This report shall include the requirements specified in 40 CFR Part 63.468(f)(1) through (f)(3).
G. Owners or operators of a batch vapor or in-line solvent cleaning machine complying with the provisions of 40 CFR Part 63.464 shall submit a Solvent Emission Report every year. This Solvent Emission Report shall contain the requirements specified in 40 CFR Part 63.468(g)(1) through (g)(4).
H. Owners or operators of a batch vapor or in-line solvent cleaning machine shall submit an Exceedance Report to the Administrator semiannually except when, the Administrator determines on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the source or, an exceedance occurs. Once an exceedance has occurred, the owner or operator shall follow a quarterly reporting format until a request to reduce reporting frequency is approved. Exceedance Reports shall be delivered or postmarked by the 30th day following the end of each calendar half or quarter, as appropriate. The Exceedance Report shall include the applicable information in 40 CFR Part 63.468(h)(1) through (h)(3).
I. Owners or operators who are required to submit an Exceedance Report on a quarterly (or more frequent) basis may reduce the frequency of reporting to semiannual if the conditions in 40 CFR Part 63.468(i)(1) through (i)(3).

Owners or operators of a solvent cleaning machine requesting an equivalency determination, as described in 40 CFR Part 63.469 shall submit an Equivalency Request Report to the Administrator. For existing sources, this report must be submitted to the Administrator no later than June 3, 1996. For new sources, this report must be submitted and approved by the Administrator prior to startup.

2.5.4 Design Requirements for Glycol Collection

Underground Diversion Vaults, Lift Stations, and other similar structures related to glycol collection system shall be designed with Schedule 80 CPVC pipe and fittings. Ductile iron pipe will be accepted as an alternate piping material only if there is a potential for hydrocarbons, e.g. or fuel or oil to enter the piping system. Support brackets, clamps, and braces shall be non-metallic, and use non-corrosive materials. Hardware shall be corrosion resistant.

The deicing collection system shall communicate with the existing BWI Marshall Metasys Facility Management System (FMS).

3.1 Drawing Requirements

All drawing submissions to MDOT MAA shall meet the requirements described in this section as well as Volume 1, Appendix 1D - CAD Standard.

The following drawings shall be included in plan sets as applicable.

3.1.1 MDE Standard Erosion and Sediment Control Notes and Details

Erosion and Sediment Control (ESC) drawings shall be provided for all MDOT MAA projects involving site work and earth disturbance, regardless of whether an MDE permit is required. MDOT MAA has established standardized Erosion and Sediment Control Notes, Details and Sequencing Sheets for all projects at BWI Marshall or Martin State Airports. These sheets shall be the basis for all projects to ensure standardization of all Erosion and Sediment Control drawings for construction work at BWI Marshall or Martin State Airports.

The Erosion and Sediment Control Package has been assimilated for use for all projects at BWI Marshall and Martin State Airports. The details used are from the Maryland Department of the Environment, *Maryland Standards and Specifications for Erosion and Sediment Control,* current edition. Vegetative Stabilization Notes used are from the *Specifications for Performing Landscaping Activities for the Maryland Aviation Administration (Latest Edition).*

A. These represent the most widely-used Erosion and Sediment Control practices associated with MDOT MAA projects. They include the following sheets:
    1. Erosion and Sediment Control Notes 1
    2. Erosion and Sediment Control Notes 2
    3. Erosion and Sediment Control Plan (Border Sheet)
    4. Erosion and Sediment Control Details 1
    5. Erosion and Sediment Control Details 2
    6. Erosion and Sediment Control Details 3
    7. Erosion and Sediment Control Details 4
    8. Erosion and Sediment Control Details 5
    9. Vegetative Stabilization Notes

B. Details and requirements for use are to follow the information and guidelines from the following sources:
    1. The Maryland Department of the Environment, Maryland Standards and Specifications for Erosion and Sediment Control (latest edition).
    2. Specifications for Performing Landscaping Activities for MDOT MAA (Latest Edition), prepared by MDOT MAA Office of Environmental Services, Environmental Planning Section.
    3. The Maryland's Waterway Construction Guidelines prepared by the Maryland Department of the Environment Water Management Division issued September 1999 and revised November 2000.
    4. The Maryland Stormwater Management and Erosion & Sediment Control Guidelines for State and Federal Projects, by the Maryland Department of the Environment, Water Management Administration, published February 2015.

3.1.1.1 Erosion and Sediment Control Notes 1

This is a standard sheet used in the Erosion & Sediment Control package and therefore no additional changes are required to this sheet.

3.1.1.2 Erosion and Sediment Control Notes 2

Standard Erosion and Sediment Control Note 26 (Site Information): This information varies with each contract and should be completed by the Consultant.

Total Areas for the Facility represents the total area for each airport as follows:

A. BWI Marshall = 3,200 Acres
B. Martin State = 775 Acres
C. Total Area of Project Site: Site Specific
D. Area Disturbed: Equivalent to Limits of Disturbance (LOD)
E. Area to be roofed or paved: Site Specific
F. Total Cut: Site Specific
G. Total Fill: Site Specific
H. Off-Site Waste/Borrow Area Location: If a location has been provided within the plans refer to respective plan sheet(s). If a location has not been determined, then add statement "TO BE DETERMINED"
    1. Design Certification: Must be signed prior to MDE approval
    2. Owner's/Developer's Certification: To be signed by MDOT MAA-representative such as the MDOT MAA Project Manager

3. As-Built Certification Statement: To be signed by the Contractor at completion of the project (for SWM facilities only)
4. Sequence of Construction: A general sequence of construction has been provided on the sheet for both an Initial and Final Phase for Erosion and Sediment Control. The consultant is to provide the device information and a sequence at the locations where indicated “Designer To List Devices Used On Plans Here” and “Designer to Establish Sequencing Here”

Depending upon the complexity of the project, the Sequence of Construction shall be specific to the Construction Activity to take place. This may require additional line items which shall be numbered. Please note that on simplified projects a “Final Phase” may not be required. This will be determined on a project by project basis.

3.1.1.3 Erosion and Sediment Control Plan(s)

A. These plans will be specific for each project and may include more than one plan. Scales should meet MDOT MAA requirements.
B. The Sediment Control Legend is to remain on each plan sheet. Modifications can be made based upon project specifics and controls that are being used.
C. In some instances more detailed Sequence of Construction may be provided on these sheets as necessary.

3.1.1.4 Erosion and Sediment Control Details 1-8

A. Several sheets have been provided for use. The consultant is to use only the details required for the specific project. Other details not used may be removed.
B. If new or unique details are required, the consultant may add them to the detail sheet. Final approval for use will be made by MDE.
C. Any details not shown on these sheets and/or new details being provided should be provided to MDOT MAA for incorporation into the standardized sheets for future distribution.

3.1.1.5 Vegetative Stabilization Notes

This sheet reflects the information from the *Specifications for Performing Landscaping Activities for the Maryland Aviation Administration* and therefore no changes are required. However, if additional requirements are determined above and beyond requirements on this sheet, changes should be made to reflect these requirements.

3.1.1.6 Additional Erosion and Sediment Control Drawings

If required, the Consultant may be required to provide additional Plan, Detail, Note, and Sequencing sheets based upon complexity and size of the project.

3.1.2 Stormwater Management Plans

The Consultant shall ensure that the Stormwater Management Plans include As-Built certification, applicable SWM As-Built table(s), applicable SWM As-Built checklist and additional documentation, provided in accordance with MDE guidelines, electronically available at the following MDE weblinks:

Maryland Stormwater Management Guidelines for State & Federal Projects, April 15, 2010

Maryland Stormwater Management and Erosion & Sediment Control for State and Federal Projects, February 2015

Technical Memo No. 1 - Standard Items to Include on Erosion & Sediment Control Plans

Technical Memo No. 16 - As-built Submissions and Checklists

The Consultant shall ensure that the contract documents state that the Contractor is responsible for surveying, and providing the As-Built quantities, dimensions and elevations for the table of each SWM facility once construction has been completed. The Consultant shall convey through the contract documents that it is the responsibility of the contractor to provide the completed as-built certification package for each SWM facility in the contract. Refer to Section 1.2.1 Maryland Department of the Environment (MDE) Stormwater Management and Erosion and Appendix 4A - Standard Contract Drawings, General Stormwater Management Notes Sheet for submission requirements.

3.1.2.1 General Stormwater Management Notes Drawing

This is a standard sheet used in the Stormwater management package and therefore no additional changes are required to this sheet.

A. This sheet summarizes the requirements of the SWM facility As-Built certification which shall be completed for each facility on the contract.
B. The responsibilities of the Contractor are outlined as part of this plan sheet.
C. The As-Built Approval Checklist shall be completed for all facilities in the contract.

3.1.2.2 Procedure for SWM As-Built Certification

Deliverables shall be as described in Chapter 3 Deliverables.

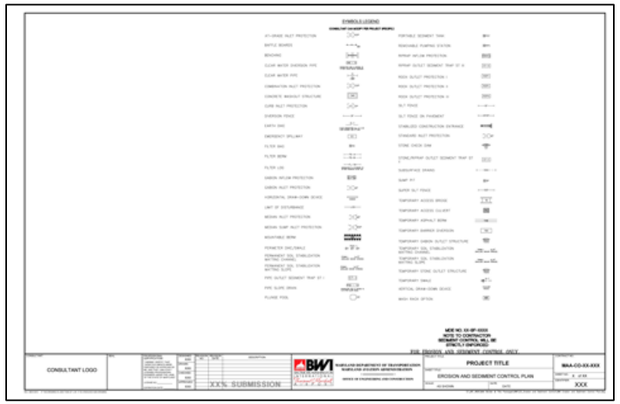
The Consultant shall be responsible for including the General Stormwater Management Notes Sheet in the overall contract documents for the project.

The Consultant shall convey through the contract documents that it is the responsibility of the contractor to provide the completed as-built certification package for each SWM facility. The Contractor is responsible for submitting a complete As-Built Certification Package for each Stormwater facility to MDOT MAA Environmental Planning Section (EPS), which shall then be submitted by the Environmental Planning Section to MDE for final acceptance. If a project has multiple SWM facilities, the Contractor (while consulting with MDOT MAA) will review contract documents to determine if the As-Built certifications for each SWM facility will be submitted to MDOT MAA separately (once the facility is constructed) or collectively (at the close of the project).

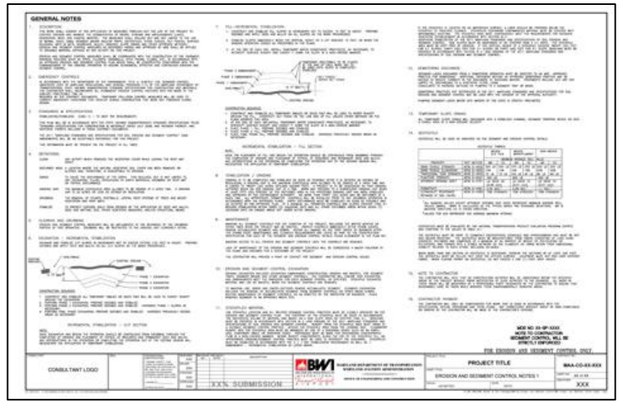
4A.1 01 Erosion and Sediment Control

Click an image to download a single AutoCAD DWG file.

4A.1.1 BWI

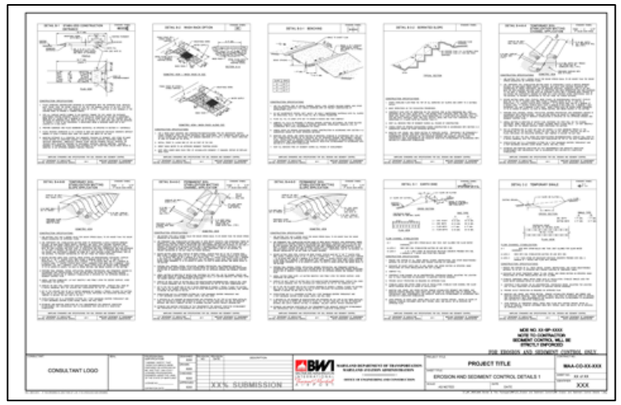


Plan

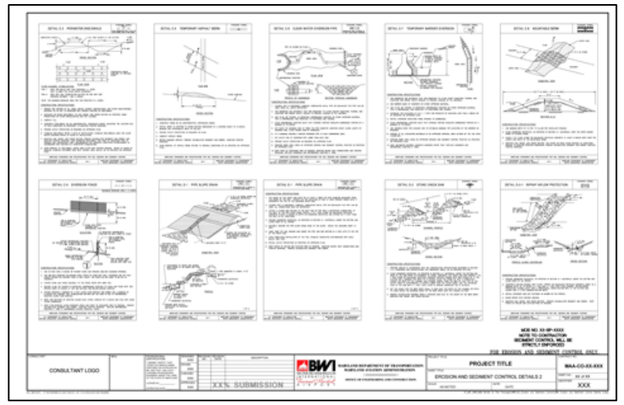


Notes 1

Notes 2



[Details 1]



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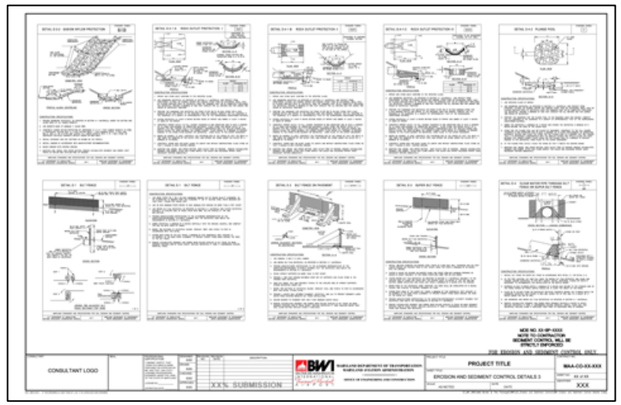

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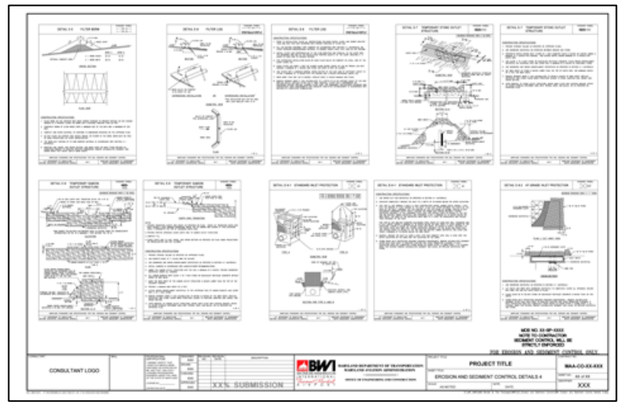

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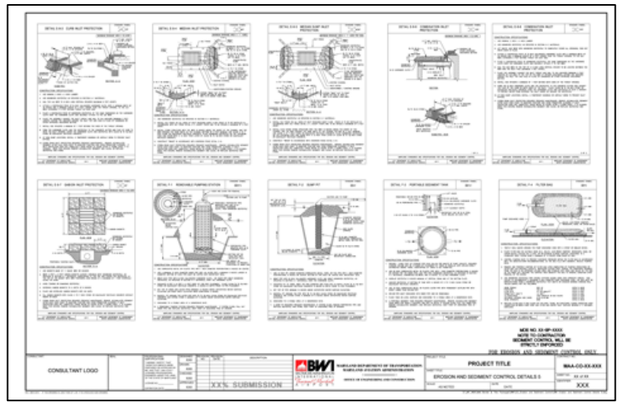

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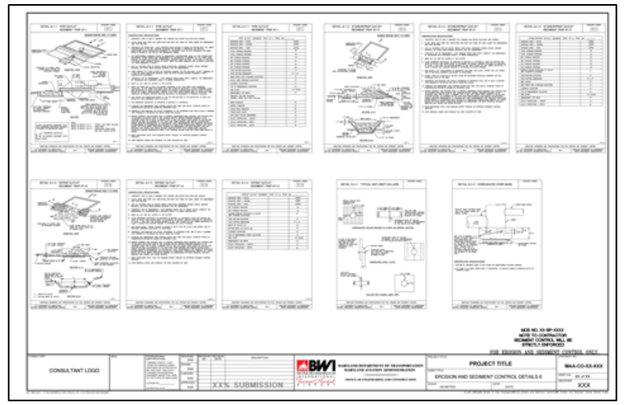

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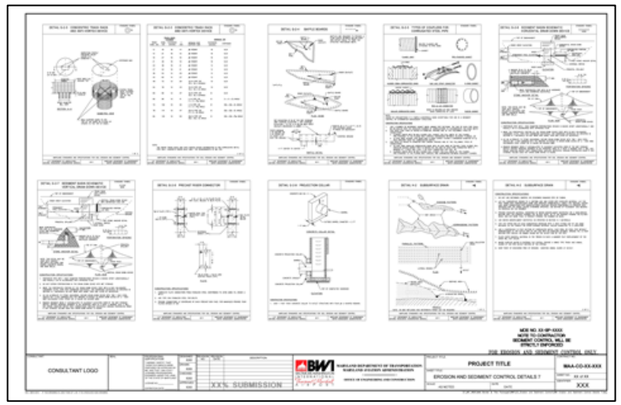

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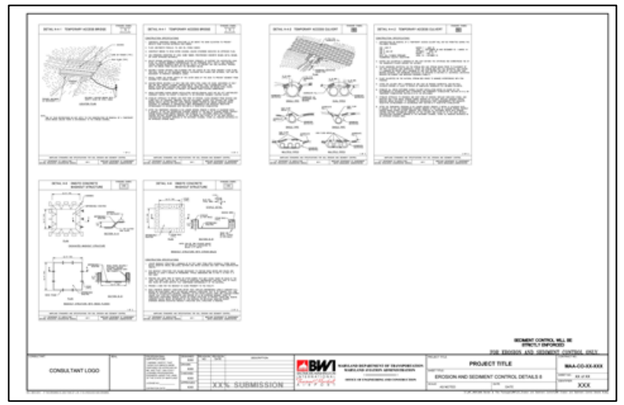

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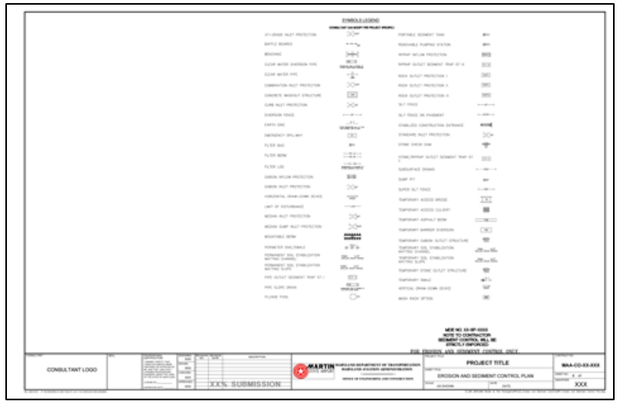
4A.1.2 MTN



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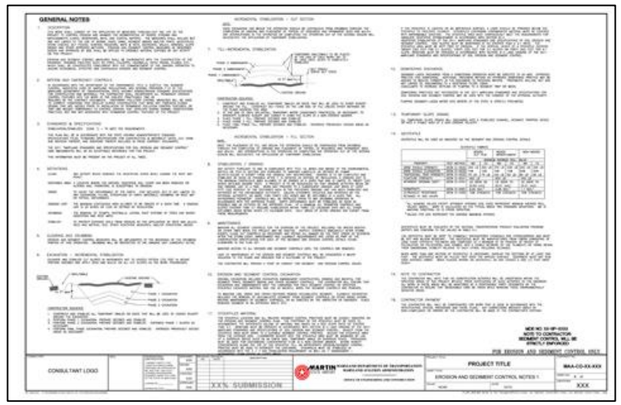

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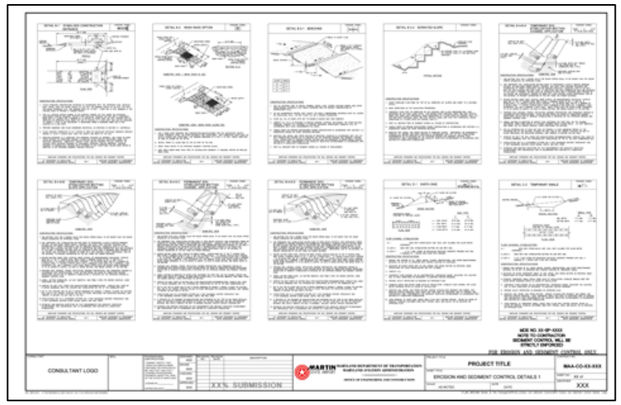

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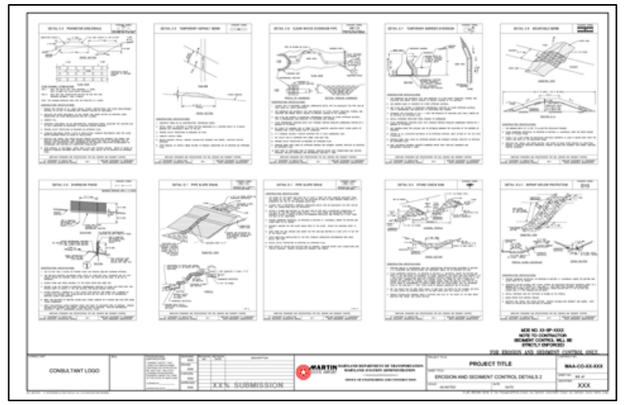

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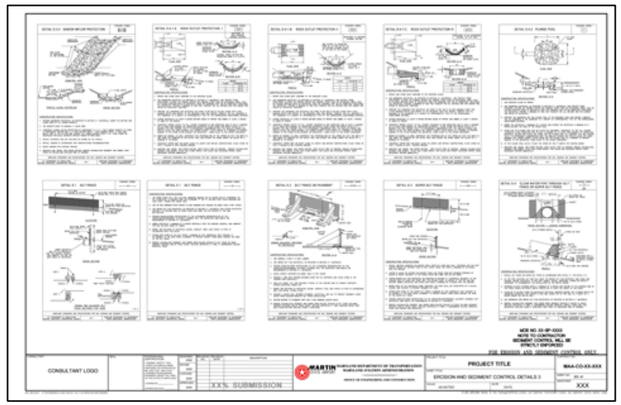

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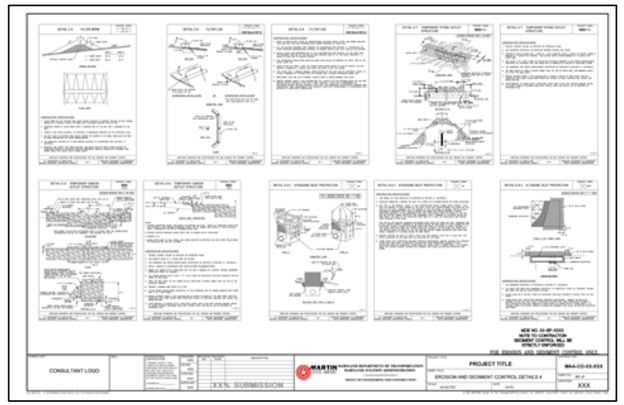

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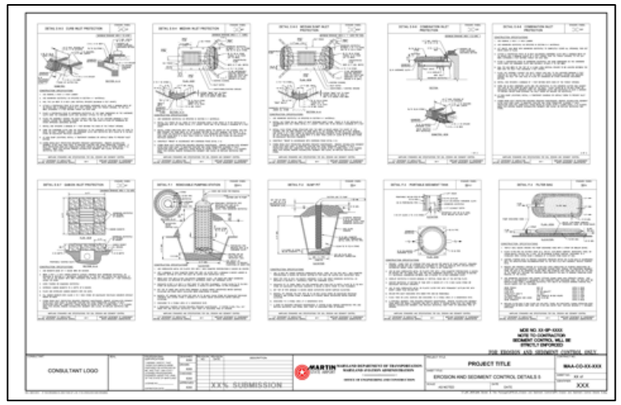

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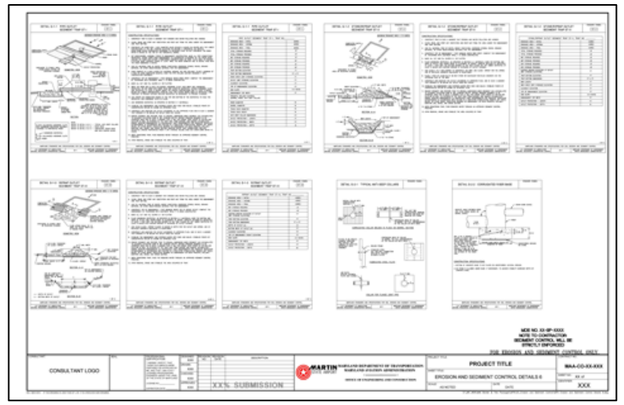

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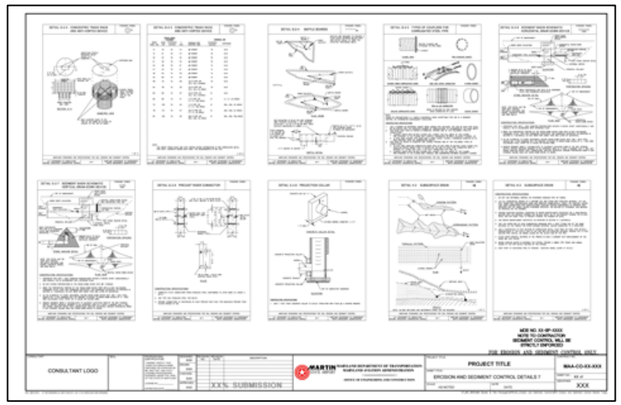

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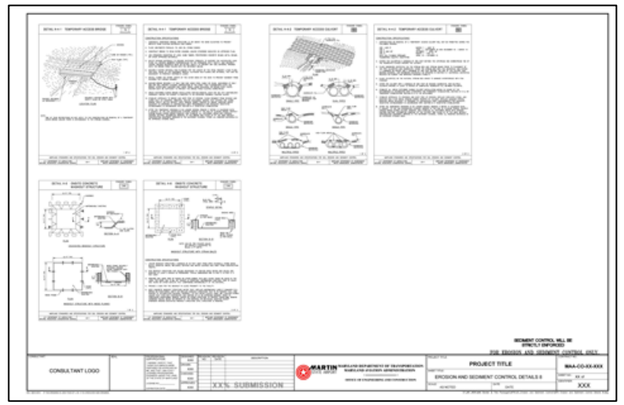

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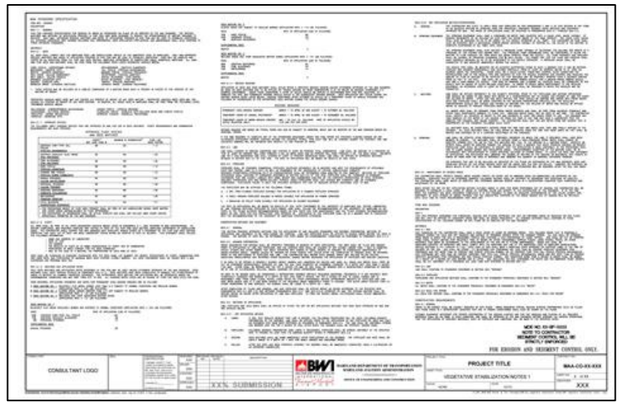
4A.2 02 Vegetative Stabilization Notes

Click an image to download a single AutoCAD DWG file.

4A.2.1 BWI



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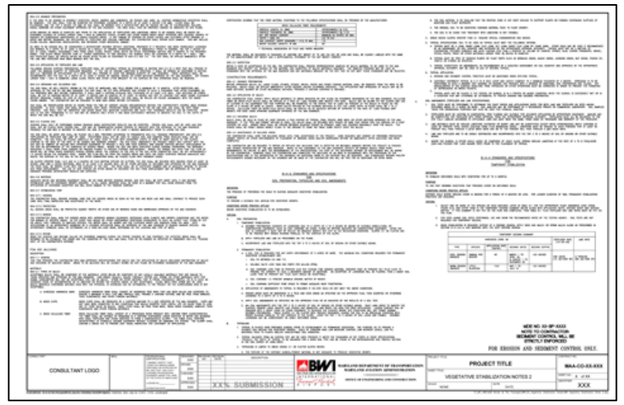

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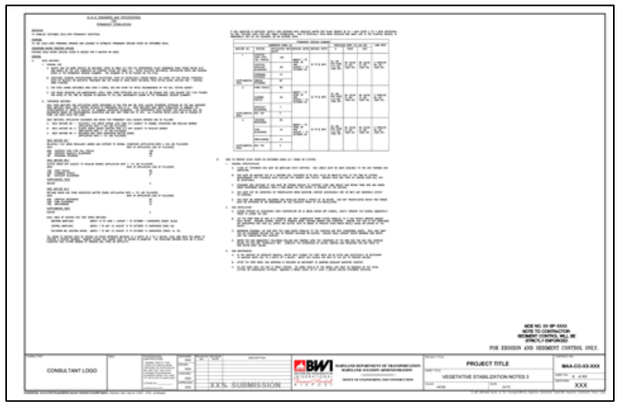

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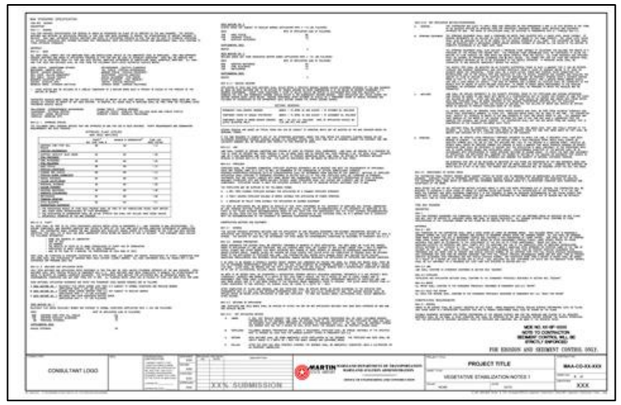

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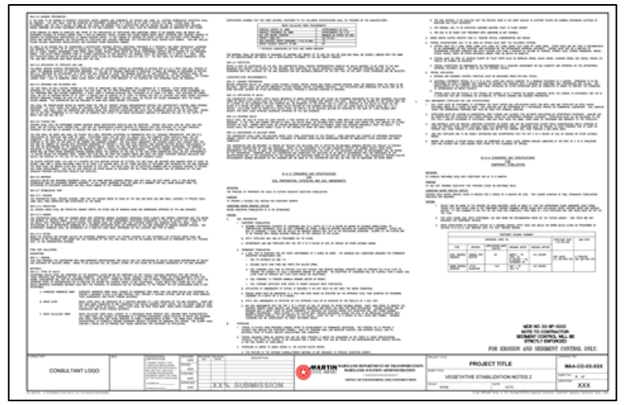

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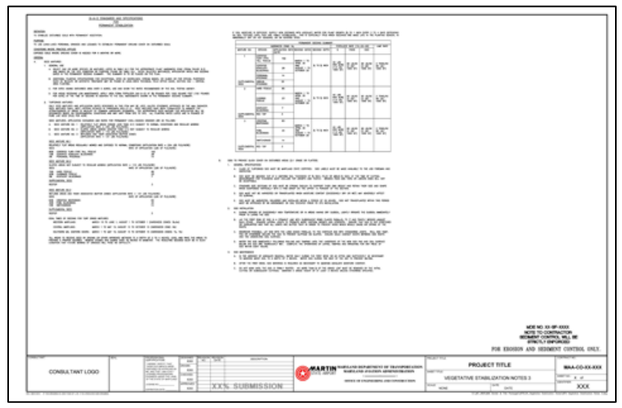


Vegetative Stabilization Notes 3

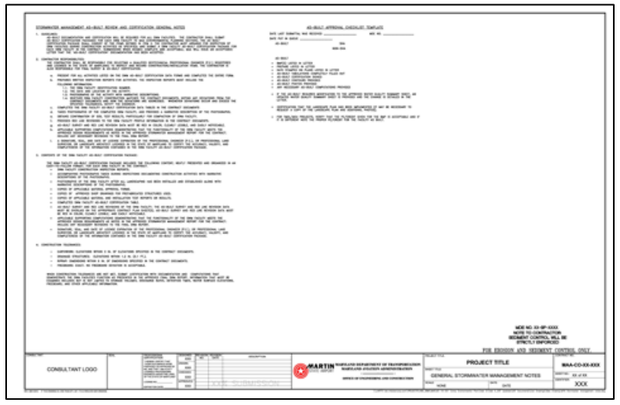
4A.3 03 General Stormwater Management Notes

Click an image to download a single AutoCAD DWG file.

4A.3.1 BWI

BWI

4A.3.2 MTN



MTN

4B.01 Division 01 - MAA Standard Procedures

Click the following links to download the individual specifications in Microsoft Word format.
Specification 010008X Management of Universal Wastes

Specification 010009X Management of Radioactive Wastes

4B.23 Division 23 - Heating, Ventilation, & Air Conditioning

Click the following links to download the individual specifications in Microsoft Word format.
Specification 231313 Underground Storage Tanks

Specification 231323 Above Ground Storage Tanks

4B.32 Division 32 - Exterior Improvements

Click the following links to download the individual specifications in Microsoft Word or PDF format.
Specification 329000X Landscaping

Specification 329115X Topsoil

Specification 329201X Seeding

Specification 329202X Sodding

Specification 329203X Mulching

Specification 329300X Plant Installation

Approved Installation Methods (.pdf)

Approved Species List (.pdf)

Wetland Plants List (.pdf)

MARYLAND DEPARTMENT OF TRANSPORTATION™

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Planning and Engineering

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(PEGS) Manual

Volume 5

Planning and Real Estate

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.0 Overview of Concourse Holdroom and Egress Code Compliance

This document is intended as a "quick reference" planning guide to be used in conjunction with applicable codes and policies of Maryland Aviation Administration (MDOT MAA) officials. It is not intended to be the sole information source regarding life safety code compliance or terminal design standards. Users are cautioned to verify contents with appropriate MDOT MAA officials. MDOT MAA policies and standards may change over time. It should be understood that the majority of BWI Marshall holdrooms and egress areas throughout the terminal were designed and constructed prior to the adoption of the 2011 Design Standards for holdroom sizing and egress.

The following sections outline concourse holdroom area sizing and egress requirements based on current aircraft parking plans and policies implemented by the BWI Airport Fire & Rescue Department (FRD).

1.1 Aircraft Parking Plan

The Aircraft Parking Plan (APP) indicates aircraft at each gate position based on current airline utilization and air service characteristics at BWI Marshall. The APP provides the basis for calculating holdroom sizes on all concourses, as well as occupancy loads for egress requirements on Concourses A, A/B, and B. Egress requirements for Concourses C, D, E, and the D/E Connector are based on square footage and occupancy load factors for the various concourse building functions (holdrooms, concessions, etc.).

The APP DOES NOT indicate apron capacity or gate capabilities to accommodate other aircraft types. Aircraft parking at MAA common-use gates is assigned at the discretion of MAA Airport Operations. Changes to the APP which affect holdroom sizing and/or concourse egress requirements are subject to the approval of the BWI Airport FRD. The APP is updated periodically to reflect airline activity and concourse enhancements.

The APP is on record at the MAA Office of Planning.

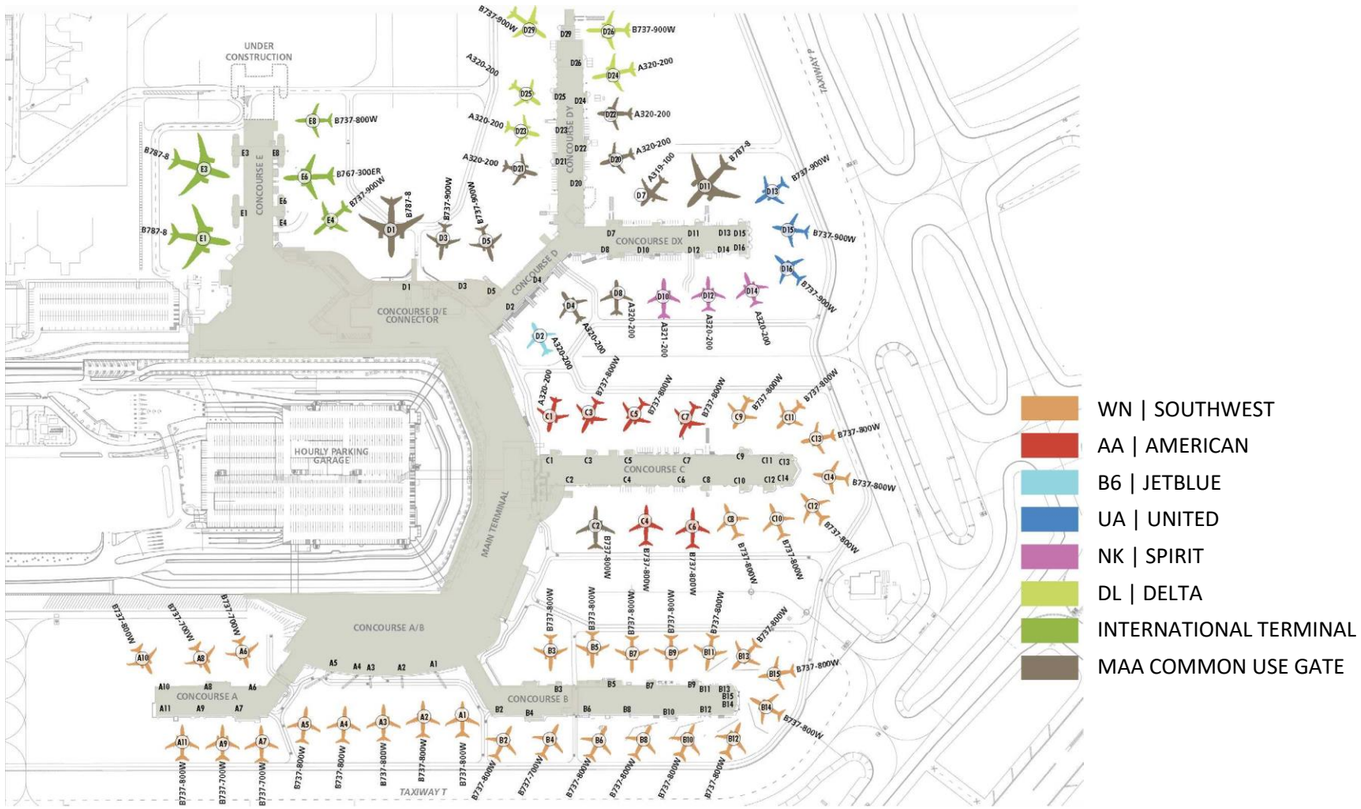


Figure 1-1. Aircraft Parking Plan

1.2 Holdroom Area Sizing

BWI Marshall Design Standards (DST) require 15.5 square feet of holdroom area per aircraft passenger seat, based on the designated aircraft for the Gate positions shown on the MAA APP (see Design Population).

The Minimum Holdroom Area (MHA) is the square footage required for passenger accumulation in a holdroom. The MHA calculation includes circulation reserved for Gate Access. HOWEVER, when Gate Access is co-located with, or adjacent to, an egress aisle/egress corridor leading to an emergency egress stair/exit, MHA DOES NOT include the Gate Access circulation area (see illustration on page 5). MHA DOES NOT include minimum area required for access to Life Safety Egress stairs and/or exits.

Design Population (DP) is equal to 100% of the seating capacity of the aircraft indicated in the Aircraft Parking Plan for that gate.

The MHA for new construction is determined per the formula:

MHA (sf) = 15.5 (square feet per passenger) x DP (passengers)

A. Example of a Miniumum Holdroom Sizing Calculation
   Assume in this example, a Gate is served by a B737-700 aorcraft (143 seats) as indicated on the MAA Aircraft Parking Plan. The required minimum size of the holdroom would be:

   MHA = 15.5 sf per passenger x 143 passengers = 2,217 sf

The MHA calculation includes circulation reserved for Gate Access. HOWEVER, if Gate Access is co-located with, or adjacent to an egress aisle/egress corridor leading to an emergency egress stair/exit, MHA DOES NOT include the Gate Access circulation area.

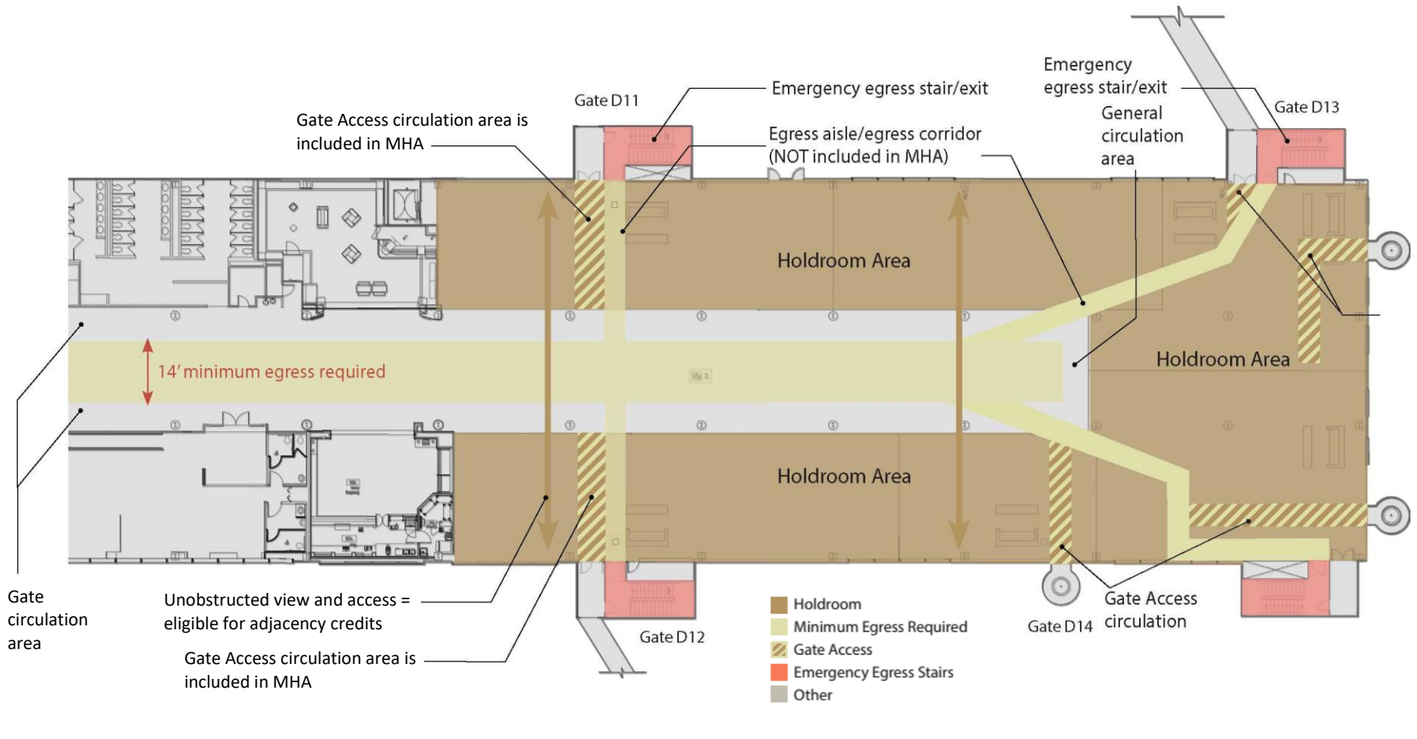


Figure 1-2. Gate Access Circulation Area

1.2.1 Adjacency Credits for Deficient Holdrooms

All new construction must meet minimum holdroom sizing standards. There can be no greater than a 20% deficiency in a minimum holdroom area. Proposed holdroom modifications must be coordinated through the BWI Airport FRD. Deficiencies greater than 20% in an isolated holdroom (or group of holdroom areas) require improvement to meet minimum holdroom sizing standards. If a substitute aircraft is proposed to exceed the 20% deficiency, holdroom improvement is required.

Adjacency Credit may be applied in determining the adequacy of existing holdroom areas. An Adjacency credit is defined as "surplus" area in one holdroom used to supplement a deficiency in the required area of an adjacent holdroom, or group of holdrooms. To utilize this surplus, holdrooms must be immediately adjacent and/or immediately visible with unobstructed access, and provide the ability for passengers to hear public address announcements elated to their flight. Holdrooms on opposite sides of a concourse circulation corridor qualify for adjacency as long as there are no intervening obstructions (e.g. moving walks, concession kiosks, visual obstructions).

A. Example of Holdroom Deficiency Calculation
   A B737-700 aircraft configured for 143 seats is proposed to be replaced by a B737-800 aircraft configured for 175 seats at a specific gate.
   Existing Holdroom Area = 2,300 sf
   New Required MHA = 175 pax x 15.5 sf/pax = 2,713 sf (Minimum Holdroom Area - MHA)

$$\frac{\text{Existing MHA (sf)} - \text{New Required MHA (sf)}}{\text{New Required MHA (sf)}} = \text{Deficiency (\%)}$$

   CALCULATE:

$$(2{,}300\text{ sf}) - (2{,}713\text{ sf}) = -15.2\%$$

(2,713 sf)

Because the new MHA is less than 20% deficient, the existing holdroom area of this individual gate would be acceptable without additional adjacency credits.

1.2.2 Concourses A and A/B Holdrooms

A. Concourse A Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
A6	B737-700 [2]	143	1,867	n/a	3,469	4,433	(964)	-22%	n/a
A8*	B737-700 [2]	143	2,034	432					
A7*	B737-700 [2]	143	2,369	404	3,567	4,433	(866)	-20%	n/a
A9	B737-700 [2]	143	1,602	n/a					
A10	B737-800	175	2,728	n/a	5,392	5,425	(33)	0%	n/a
A11*	B737-800	175	2,748	84					
Total		922	13,348		12,428	14,291			

B. Concourse A/B Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
A1*	B737-800	175							
A2	B737-800	175							
A3	B737-800	175	12,892	209	12,683	13,563	(880)	-6%	n/a
A4	B737-800	175							
A5*	B737-800	175							
Total		875	12,892		12,683	13,563			

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

[2] Design is underway to provide holdroom improvements at Gates A6/A8 and A7/A9 to accommodate B737-800 aircraft. These improvements are expected to be implemented in 2017.

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

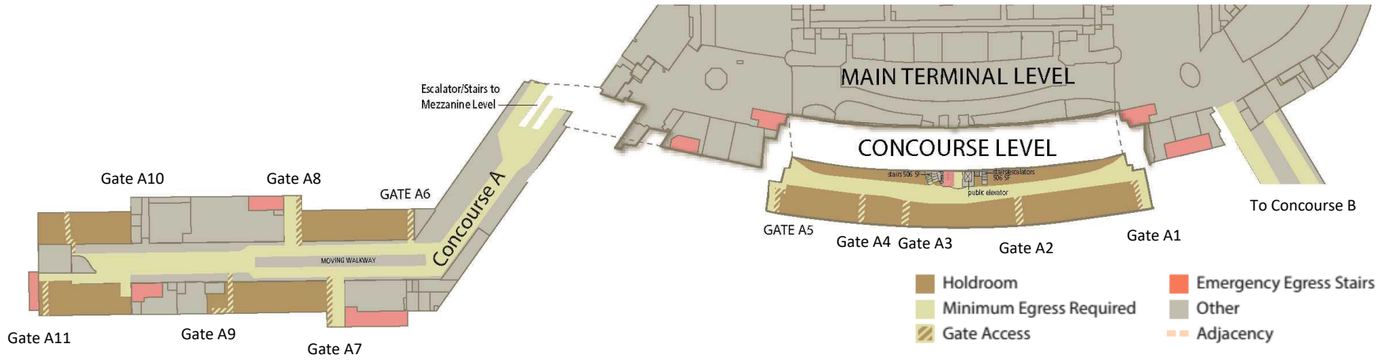


Figure 1-3. Concourse A and A/B Layout

1.2.3 Concourse B Holdrooms

A. Concourse B Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
B3	B737-800	175	3,558	n/a	3,558	2,713	845	31%	n/a
B2	B737-800 [2]	175	1,859	n/a	4,142	4,929	(787)	-16%	n/a
B4*	B737-700 [2]	143	2,367	84					
B5*	B737-800	175	2,552	186	5,120	5,425	(305)	-6%	-6%
B7*	B737-800	175	2,917	163					
B6	B737-800	175	2,510	n/a	5,032	5,425	(393)	-7%	
B8	B737-800	175	2,522	n/a					
B9*	B737-800	175	2,894	199					
B11	B737-800	175	2,402	n/a					
B10*	B737-800	175	3,960	163					
B12	B737-800	175	3,315	n/a	18,091	18,988	(897)	-5%	n/a
B13	B737-800	175	1,955	n/a					
B14*	B737-800	175	2,085	122					
B15*	B737-800	175	2,086	122					
Total		2,418	36,982		35,943	37,480			

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

[2] Design is underway to provide holdroom improvements at Gates B2 and B4 to accommodate B737-800 aircraft. These improvements are expected to be implemented in 2017.

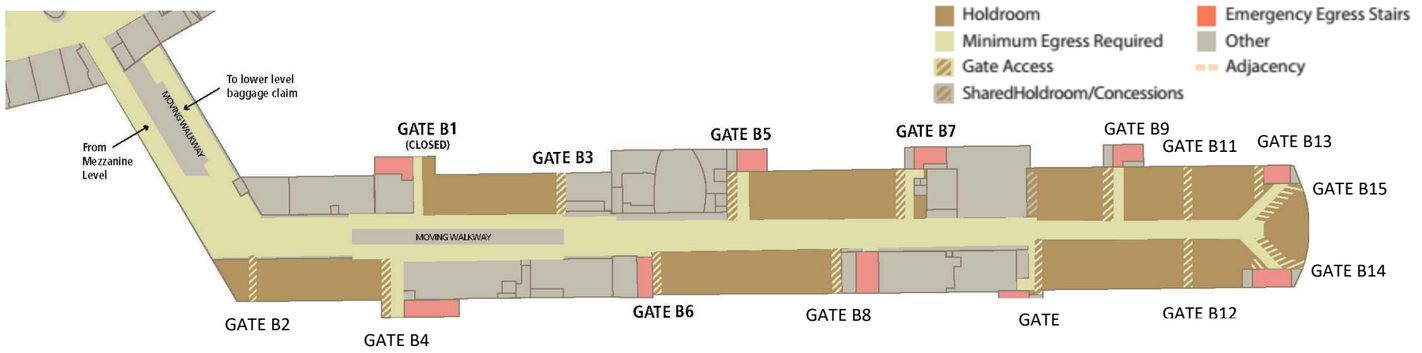


Figure 1-4. Concourse B Layout

1.2.4 Concourse C Holdrooms

A. Concourse C Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
C1*	B737-800	144	2,626	204	2,422	2,232	190	9%	n/a
C2*	B737-800	175	2,764	80	5,558	5,425	133	2%	n/a
C3*	B737-700	175	3,065	191					
C4*	B737-800	175	2,794	83	5,250	5,425	(175)	-3%	4%
C6*	B737-800	175	2,619	80					
C5*	B737-800	175	3,183	207	5,983	5,425	558	10%	
C7*	B737-800	175	3,064	57					
C8*	B737-800	175	2,360	283	5,028		(397)	-7%	
C10*	B737-800	175	3,224	273					
C9*	B737-800	175	3,095	274					-5%
C11*	B737-800	175	2,670	115					
C12*	B737-800	175	3,208	117	13,072	13,563	(491)	-4%	
C13*	B737-800	175	2,296	164					
C14*	B737-800	175	2,872	399					
Total		2,419	39,840		37,313	37,495			

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

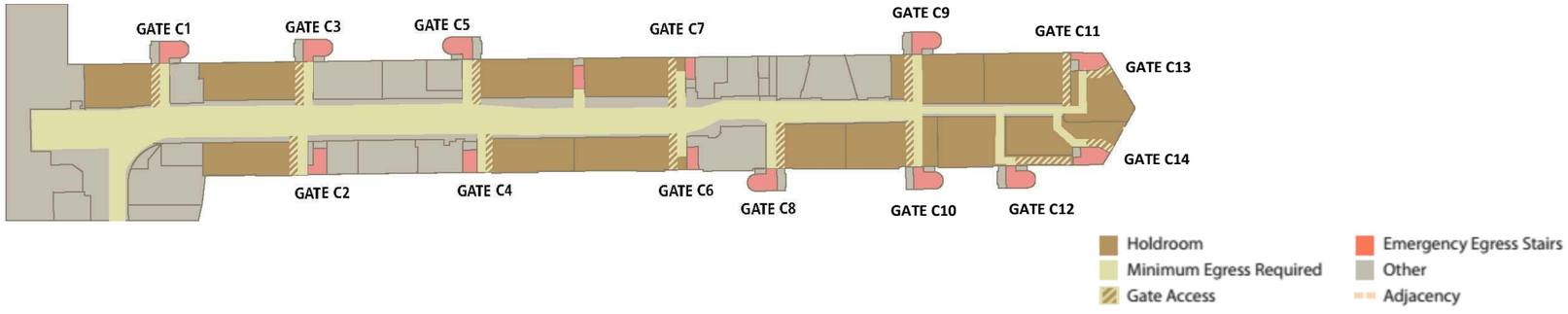


Figure 1-5. Concourse C Layout

1.2.5 Concourse D Holdrooms

A. Concourse D Throat Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	New Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
D2	A320-200	150	2,497	n/a	5,225	4,650	575	12%	n/a
D4*	A320-200	150	2,797	69					
Total		300	5,294		5,225	4,650			

B. Concourse DX Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	New Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
D7	A319-100	126	3,310	n/a	3,310	1,953	1,357	69%	-7%
D8*	A320-200	150	1,817	79	3,828	5,704	(1,876)	-33%	
D10*	A321-200	218	2,159	69					
D11*	B787-8	218	2,637	100	13,372	17,221	(3,849)	-22%	n/a
D13*	B737-900	179	2,201	48					
D12*	A320-200	178	1,758	75					
D14	A320-200	178	2,127	n/a					
D15	B737-900	179	2,229	n/a					
D16*	B737-900	179	2,692	49					
Total		1,605	20,930		20,510	24,878			

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

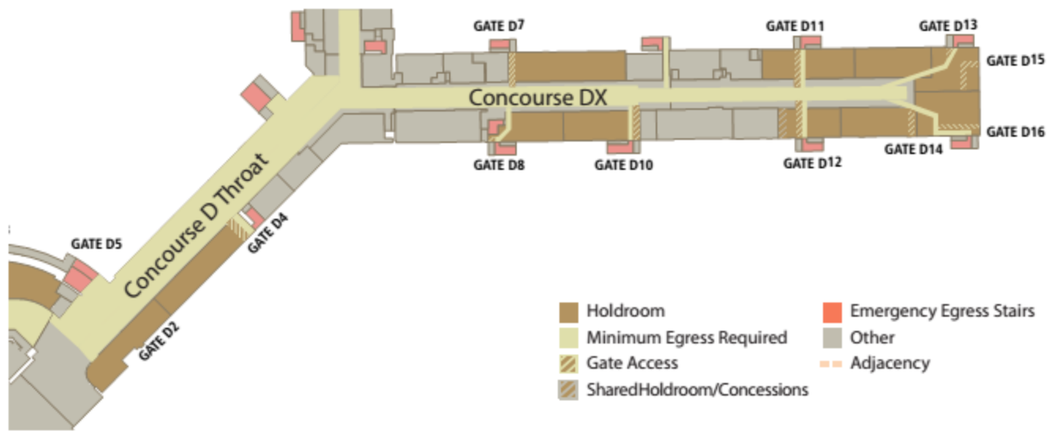


Figure 1-6. Concourse D Throat and DX Layout

C. Concourse DY Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
D20	A320-200	150	1,658	n/a	3,507	5,069	(1,562)	-31%	-28%
D22*	A320-200	177	1,957	108					
D21*	A320-200	150	1,828	149	3,480	4,650	(1,170)	-25%	
D23	A320-200	150	1,801	n/a					
D24*	A320-200	150	2,006	195	10,599	10,230	369	4%	n/a
D26	B737-900	180	3,127	n/a					
D25*	A320-200	150	1,711	109					
D27	Inactive	n/a	1,729	n/a					
D29	B737-900	180	2,330	n/a					
Total		1,287	18,147		17,586	19,949			

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

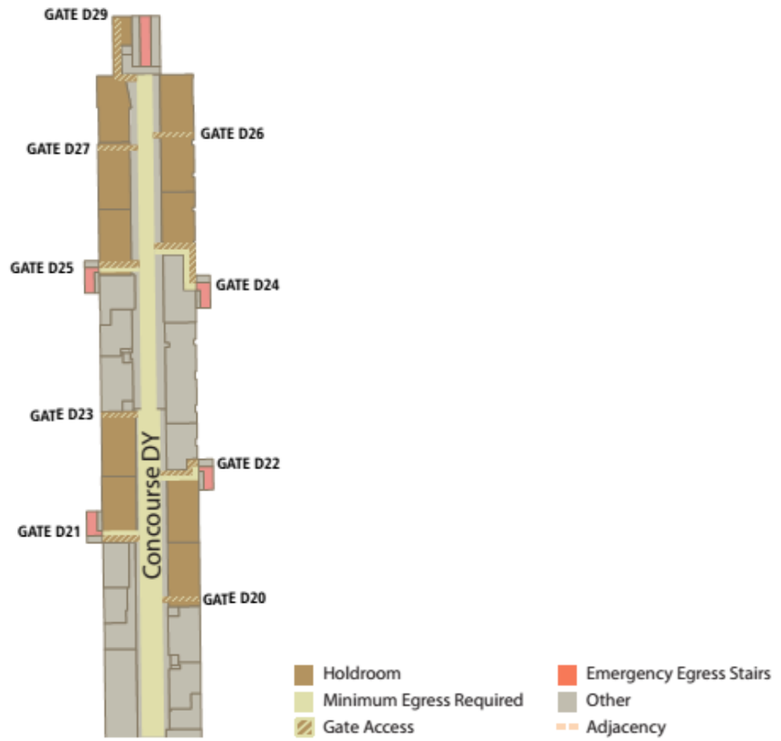


Figure 1-7. Concourse DY Layout

1.2.6 Concourse DE Connector Holdrooms

A. Concourse DE Connector Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	New Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
D1	B787-8	275	4,934	n/a					
D3 [2]	B737-900	180	3,091	n/a	10,157	9,843	949	10%	n/a
D5	B737-900	180	2,767	n/a					
Total		635	10,792		10,157	9,843			

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

[2] Gate D3 cam accommodate a B787-8 but this closes Gate D5. For holdroom sizing compliance, two simultaneous B737-900's at Gate D3 and Gate D5 is the governing condition.

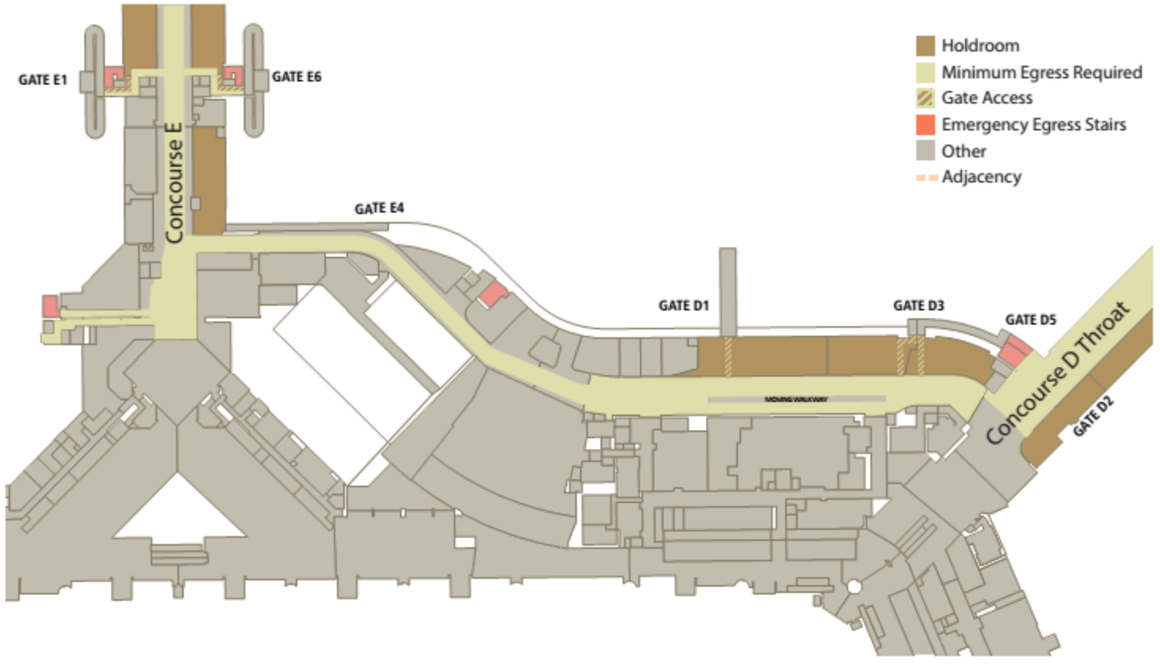


Figure 1-8. DE Connector Layout

1.2.7 Concourse E Holdrooms

A. Concourse E Holdroom Sizing

Gate	Designated Aircraft (APP)	Aircraft Seats (ea)	Existing Holdroom Area (sf)	Co-located Egress Aisle (sf)	Net Holdroom Area (sf)[1]	Code Compliance Requirement (sf)	Surplus or Deficit (sf)	Surplus or Deficit (%)	Adjacency Credit (%)
E4	B737-900	179	3,162	n/a	3,162	2,775	387	14%	-28%
E1*	B787-8	275	6,427	80	6,156	8,525	(2,369)	-28%	-14%
E3*	B787-8	275		191					
E6*	B767-300ER	201	7,302	207	7,038	5,828	1,210	21%	
E8*	B737-800	175		57					
Total		1,105	16,891		17,586	19,949			

* Co-located Gate Access and egress aisle leading to an emergency egress stair/exit

[1] Existing holdroom area minus area required to be clear for access to emergency egress stair/exit

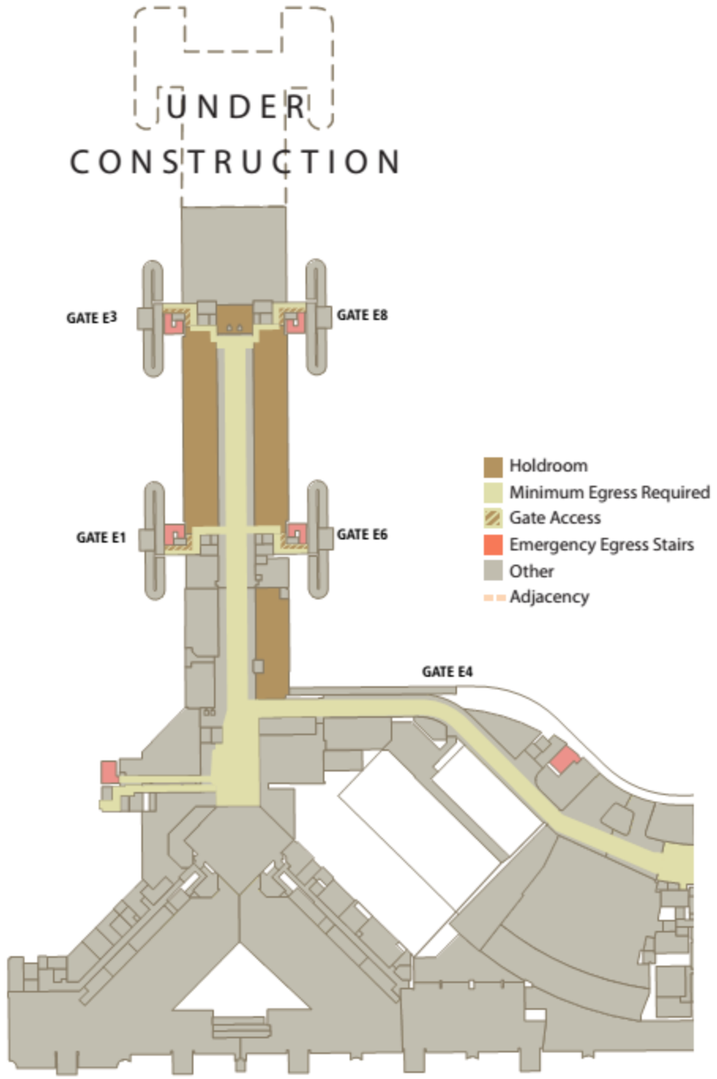


Figure 1-9. Concourse E Layout

1.3 Life Safety Standards for Concourse Egress

The method of determining the occupant load of concourses at BWI Marshall varies between concourses. Occupant Loads for Concourses A, A/B, and B are based on the MAA Aircraft Parking Plan and are calculated using a multiplier of aircraft seating capacity plus support staff. If the resulting occupant load is less than would be determined by the model code method, then the model code method applies. In lieu of the above occupant load determination methods, the Authority Having Jurisdiction (AHJ) may accept a performance-based life safety egress analysis for Concourses A, A/B, and B. Occupant Loads for Concourses C, D, D/E Connector, and E are calculated using National Model Codes (IBC and NFPA 101 - Life Safety Code) for building occupancy, and are based on concourse square footage.

The minimum egress width of 14.0 feet in Concourses A - D is for the area at the outer extent of the concourse (i.e. adjacent to the highest numbered gates). The required egress width in a concourse INCREASES progressively towards the main terminal to account for increased population accumulated by holdroom activity. The minimum egress width for Concourse E is 20.0 feet. The minimum Concourse egress width for the D/E Connector is 14.0 feet.

1.3.1 Occupant Load (Example)

The MHA calculation includes circulation reserved for Gate Access. HOWEVER, if Gate Access is co-located with, or adjacent to an egress aisle/egress corridor leading to an emergency egress stair/exit, MHA DOES NOT include the Gate Access circulation area.

MHA DOES NOT include minimum area required for access to Life Safety Egress stairs and/or exits.

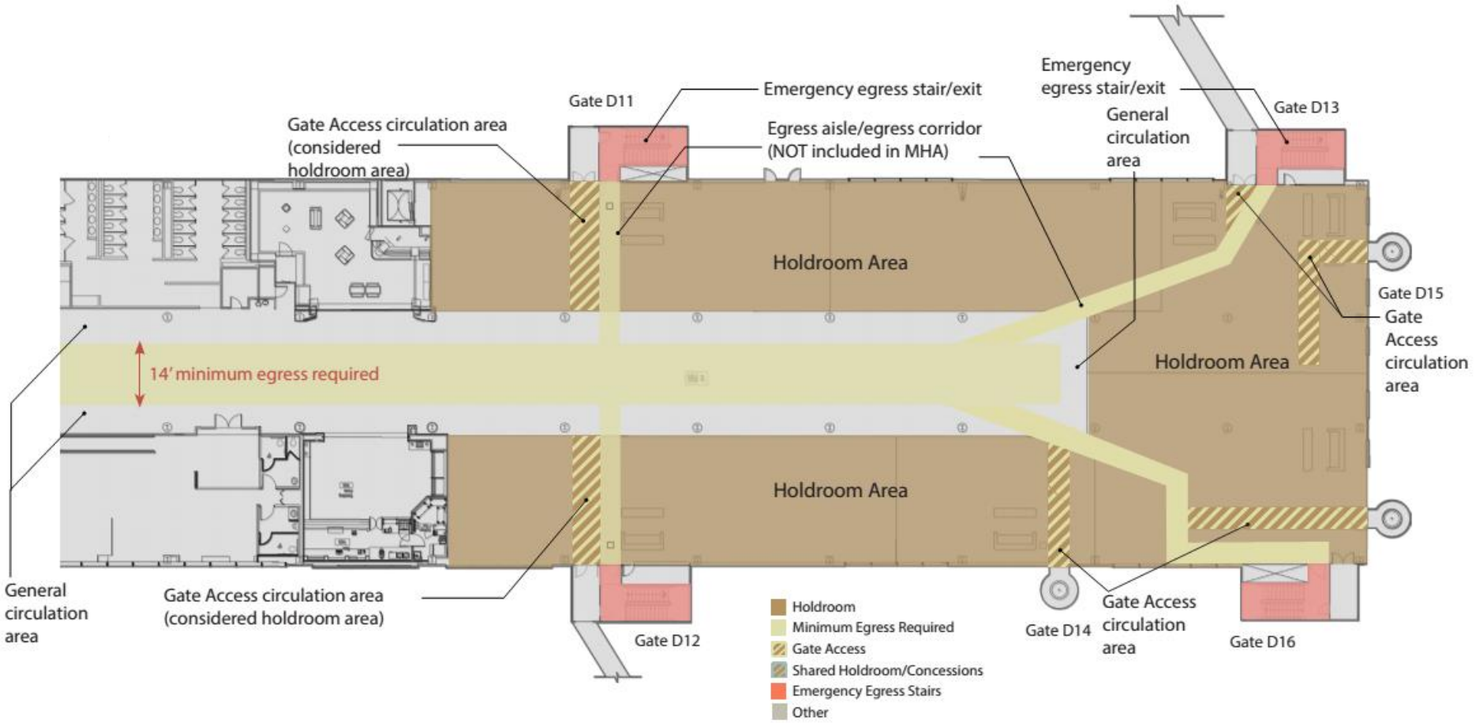


Figure 1-10. Occupant Load (Example)

1.3.2 Occupant Load – Concourses A, A/B, and B

A. Concourses A, A/B, and B occupant load based on FRD approved calculation of demand.
B. Seat capacity of aircraft indicated in Aircraft Parking Plan used as basis.
C. Calculation includes 153% of current aircraft seat capacity reflecting special operations for current airline.
D. Includes non-passenger loads to account for flight crews and concessions/service staff.
E. Non-passenger loads for each concourse are calculated according to the following metrics:
    1. 5 crew persons per operating gate
    2. 2 airline staff per operating gate
    3. 1 employee per small shop
    4. 1 employee per small bar

5. 8 employees per fast food restaurant or deli
6. Large restaurants and other spaces shall be determined by the FRD
7. 2 security staff and 1 airport maintenance staff shall be included in the overall concourse population

F. Therefore, the Occupant Load is calculated by the following formula:

Concourses A, A/B, and B Occupant Load = (1.53 x Total Aircraft Seating Capacity) + (Non-Passenger Load)

1.3.3 Occupant Load – Concourses C, D, D/E Connector, and E

The Occupant Load for Concourses C, D, D/E Connector and E are based on use group classifications defined in the NFPA 101 and IBC 1004.1 by space type, with an allowable occupant per square footage by the specified space type.

Locations/Spaces	NFPA 101 (2015), A.7.3.1.2 Occupant Load Factor (sf per person)	IBC (2015), 1004.1 Occupant Load Factor (sf per person)
Terminal Waiting Areas (Holdrooms)	15	15
Non-Holdroom Concourses (Circulation, Restaurants, Offices, Storage, Mercantile, Restrooms)	100	100

Therefore, the Occupant Load is calculated by the following formula:

$$\text{Occupant Load per space type} = \frac{\text{Total area by space type}}{\text{Allowable area per occupant}}$$

1.3.4 Concourses A and A/B Occupancy and Egress

A. Concourse A Occupancy and Egress

Gates	Aircraft Equipment	Aircraft Seats	% 1st Flight	1st Flight Pax	%2 Flight Pax	2nd Flight Pax	Total Pax	1st Flight Crew	Airline Staff	Concession Staff	Security Staff	Airport Maintenance Staff	Total Public
Other										40	2	1	43
A6	B737-700	143	95%	136	61%	83	219	5	2				226
A7	B737-700	143	95%	136	61%	83	219	5	2				226
A8	B737-700	143	95%	136	61%	83	219	5	2				226
A9	B737-700	143	95%	136	61%	83	219	5	2				226
A10	B737-800	175	95%	167	61%	102	269	5	2				276
A11	B737-800	175	95%	167	61%	102	269	5	2				276
Total		922		878		536	1,414	30	12	40	2	1	1,499
Total Concourse Occupant Load				1,499	persons								
50% Egress Via Front Exit				750	persons	x .2" Exit Width per Occupant							
Concourse Egress Width Required				150.0	inches								
Concourse Egress Width Required				12.5	feet*								

* Note: Minimum Concourse A Egress Width required by FRD = 14 ft.

B. Concourse A/B Occupancy and Egress

Gates	Aircraft Equipment	Aircraft Seats	% 1st Flight	1st Flight Pax	%2 Flight Pax	2nd Flight Pax	Total Pax	1st Flight Crew	Airline Staff	Concession Staff	Security Staff	Airport Maintenance Staff	Total Public
Other										0	2	1	3
A1	B737-800	175	95%	167	61%	102	269	5	2				276
A2	B737-800	175	95%	167	61%	102	269	5	2				276
A3	B737-800	175	95%	167	61%	102	269	5	2				276
A4	B737-800	175	95%	167	61%	102	269	5	2				276
A5	B737-800	175	95%	167	61%	102	269	5	2				276
	Total	875		835		510	1,345	25	10	0	2	1	1,383

Total Concourse Occupant Load	1,383	persons	
50% Egress Via Front Exit	692	persons	x .2" Exit Width per Occupant
Concourse Egress Width Required	138.4	inches	
Concourse Egress Width Required	11.5	feet*	

* Note: Minimum Concourse A Egress Width required by FRD = 14 ft.

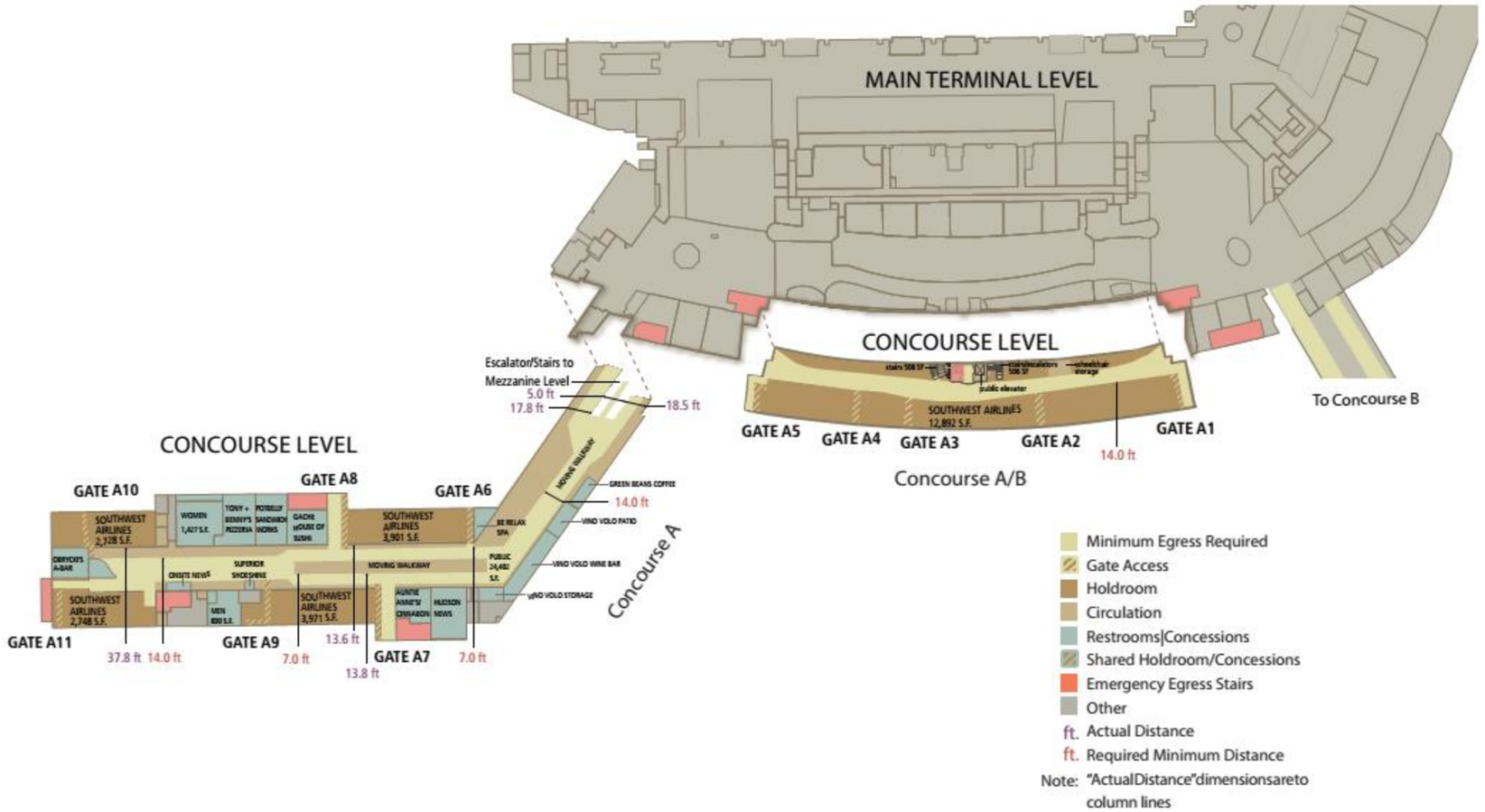


Figure 1-11. Concourses A and A/B

C. Concourse B Occupancy and Egress

Gates	Aircraft Equipment	Aircraft Seats	% 1st Flight	1st Flight Pax	%2 Flight Pax	2nd Flight Pax	Total Pax	1st Flight Crew	Airline Staff	Concession Staff	Security Staff	Airport Maintenance Staff	Total Public
Other										50	2	1	53
B3	B737-800	175	95%	167	61%	102	269	5	2				276
B2	B737-800	175	95%	167	61%	102	269	5	2				276
B4	B737-800	143	95%	136	61%	83	219	5	2				226
B5	B737-800	175	95%	167	61%	102	269	5	2				276
B7	B737-800	175	95%	167	61%	102	269	5	2				276
B6	B737-800	175	95%	167	61%	102	269	5	2				276

B8	B737-800	175	95%	167	61%	102	269	5	2				276
B9	B737-800	175	95%	167	61%	102	269	5	2				276
B11	B737-800	175	95%	167	61%	102	269	5	2				276
B10	B737-800	175	95%	167	61%	102	269	5	2				276
B12	B737-800	175	95%	167	61%	102	269	5	2				276
B13	B737-800	175	95%	167	61%	102	269	5	2				276
B14	B737-800	175	95%	167	61%	102	269	5	2				276
B15	B737-800	175	95%	167	61%	102	269	5	2				276
	Total	2,418		2,307		1,409	3,716	70	28	50	2	1	3,867

Total Concourse Occupant Load	3,867	persons	
50% Egress Via Front Exit	1,934	persons	x .2" Exit Width per Occupant
Concourse Egress Width Required	386.8	inches	
Concourse Egress Width Required	32.2	feet*,**	

* Note: Minimum Concourse A Egress Width required by FRD = 14 ft.
** The required Concourse front egress width exceeds the 28.5 feet available. Performance-based egress modeling, and other mitigation strategies, are under joint evaluation with the FRD to address this deficiency.

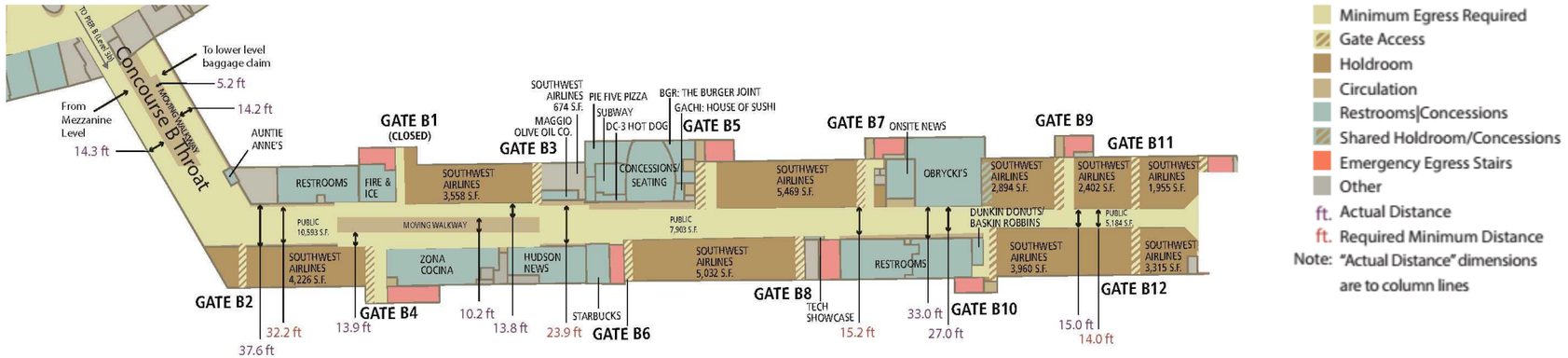


Figure 1-12. Concourse B

1.3.5 Concourse C Occupancy and Egress

A. Concourse C Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)
Net Holdroom Areas	37,313	15	2,499
Circulation Corridor	29,549	100	296
Restaurant	5,374	100	54
Retail	6,410	100	65
Office	-	100	-
Other	-	100	-
Mechanical/Storage	889	100	9

Restrooms	3,964	100	40	
Total	83,499		2,952	persons

Concourse Egress Exit Width (back into Terminal)			
% of Occupants Exit to Entrance	50%	1,476	persons
Exit Unit Width (inches/person)	0.2	295.2	inches
Minimum Exit Corridor Width		24.6	feet*

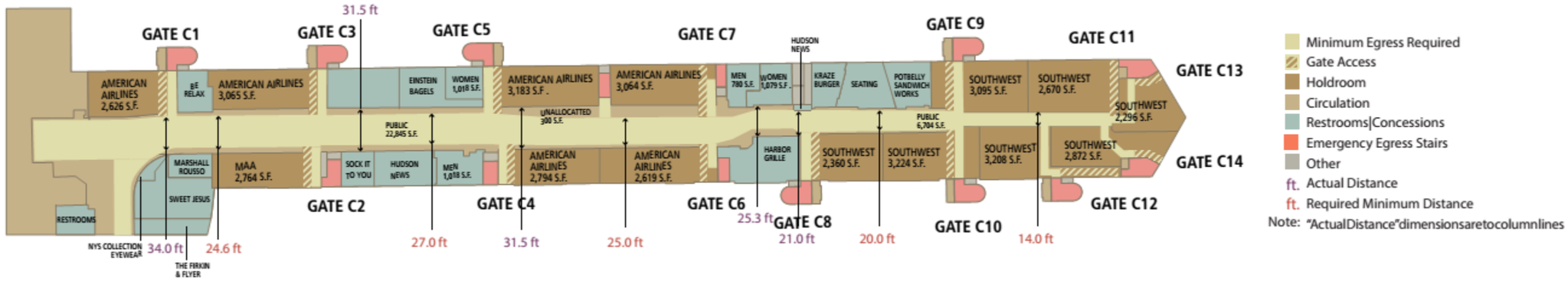


Figure 1-13. Concourse C

* Note: Minimum Concourse C Egress Width required by FRD = 14 ft.

1.3.6 Concourse D Occupancy and Egress

A. Concourse DX Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)	
Net Holdroom Areas	20,510	15	1,368	
Circulation Corridor	17,037	100	171	
Restaurant	5,201	100	53	
Retail	3,180	100	32	
Office	-	100	-	
Other	-	100	-	
Mechanical/Storage	-	100	-	
Restrooms	4,546	100	46	
Total	50,474		1,670	persons

Concourse DX Egress Exit Width (into D Throat)			
% of Occupants Exit to Entrance	50%	835	persons
Exit Unit Width (inches/person)	0.2	167.0	inches
Minimum Exit Corridor Width		13.9	feet*

* Note: Minimum Concourse D Egress Width required by FRD = 14 ft.

B. Concourse DY Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)	
Net Holdroom Areas	17,586	15	1,173	
Circulation Corridor	18,792	100	188	
Restaurant	6,486	100	65	
Retail	6,330	100	64	
Office	-	100	-	
Other	1,347	100	14	
Mechanical/Storage	-	100	-	
Restrooms	4,617	100	47	
Total	55,158		1,551	persons

Concourse DY Egress Exit Width (into D Throat)			
% of Occupants Exit to Entrance	50%	776	persons
Exit Unit Width (inches/person)	0.2	155.2	inches
Minimum Exit Corridor Width		12.9	feet*

* Note: Minimum Concourse D Egress Width required by FRD = 14 ft.

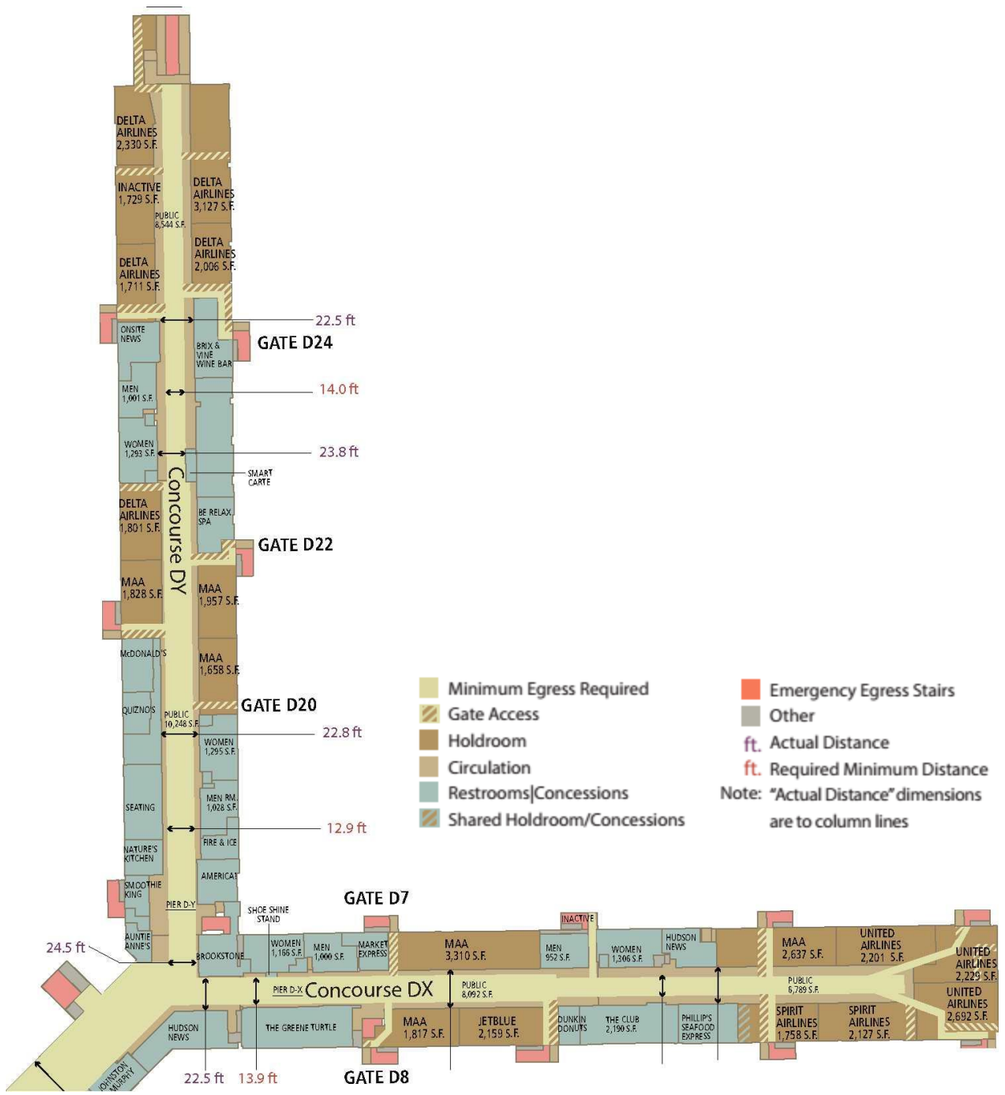


Figure 1-14. Concourses DX and DY

1.3.7 Concourse D Throat Occupancy and Egress

A. Concourse D Throat Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)
Net Holdroom Areas	5,225	15	349

Circulation Corridor	16,658	100	167	
Restaurant	-	100	-	
Retail	5,069	100	51	
Office	-	100	-	
Other	-	100	-	
Mechanical/Storage	-	100	-	
Restrooms	-	100	-	
Total	26,952		567	persons

Concourse D Throat Egress Exit Width (back into Terminal)			
% of Occupants Exit to Entrance	50%	284	persons
Exit Unit Width (inches/person)	0.2	56.8	inches
Minimum Exit Corridor Width		4.7	feet*

* Note: Minimum Concourse D, DX, DY Egress Width required by FRD = 14 ft.

B. Cumulative Concourse D (DX, DY, D Throat) Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)	
Net Holdroom Areas	43,321	15	2,889	
Circulation Corridor	52,487	100	525	
Restaurant	11,687	100	117	
Retail	14,579	100	146	
Office	-	100	-	
Other	1,347	100	14	
Mechanical/Storage	-	100	-	
Restrooms	9,163	100	92	
Total	55,158		3,783	persons

Concourse DX Egress Exit Width (into D Throat)			
% of Occupants Exit to Entrance	50%	1,892	persons
Exit Unit Width (inches/person)	0.2	378.4	inches
Minimum Exit Corridor Width		31.5	feet*

* Note: Minimum Concourse D, DX, DY Egress Width required by FRD = 14 ft.

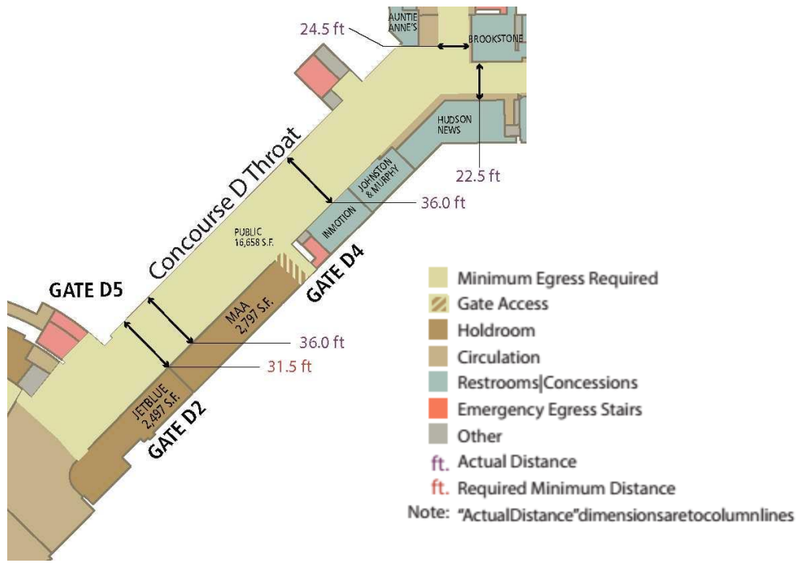


Figure 1-15. Concourse D Throat

1.3.8 Concourse D/E Connector Occupancy and Egress

A. Concourse D/E Connector Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)	
Net Holdroom Areas	10,792	15	720	
Circulation Corridor	33,312	100	334	
Restaurant	4,323	100	44	
Retail	3,528	100	36	
Office	88	100	1	
Other	1,926	100	20	
Mechanical/Storage	207	100	3	
Restrooms	2,460	100	25	
Total	56,636		1,183	persons
Concourse D/E Connector Egress Exit Width (back into Terminal)				
% of Occupants Exit to Entrance		50%	592	persons
Exit Unit Width (inches/person)		0.2	118.4	inches
Minimum Exit Corridor Width			9.9	feet*

* Note: Minimum Concourse D/E Connector Egress Width required by FRD = 14 ft.

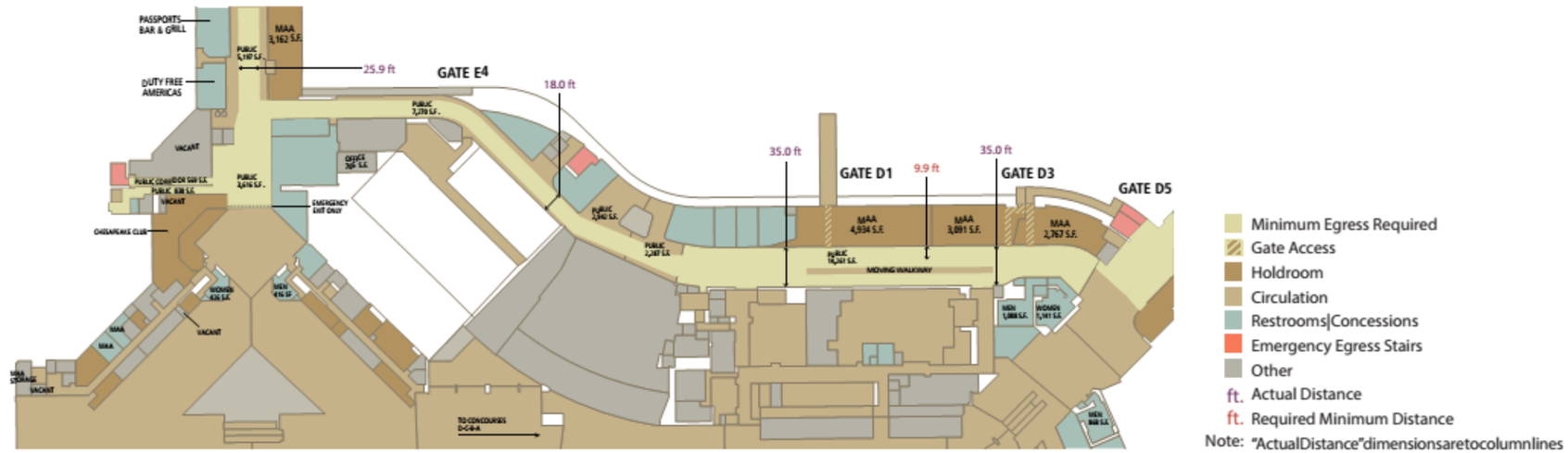


Figure 1-16. Concourse D/E Connector

1.3.9 Concourse E Occupancy and Egress

A. Concourse D/E Connector Occupancy and Egress

Space Type	Building Area (sf)	Code Factor (sf/pax)	Number of Occupants (persons)	
Net Holdroom Areas	16,356	15	1,091	
Circulation Corridor	18,575	100	186	
Restaurant	1,984	100	20	
Retail	2,077	100	21	
Office	166	100	2	
Other	4,277	100	43	
Mechanical/Storage	-	100	-	
Restrooms	1,632	100	17	
Total	45,067		1,380	persons
Concourse E Egress Exit Width (back into Terminal)				
% of Occupants Exit to Entrance		50%	690	persons
Exit Unit Width (inches/person)		0.2	138.0	inches
Minimum Exit Corridor Width			11.5	feet*

* Note: Minimum Concourse E Egress Width required by FRD = 14 ft.

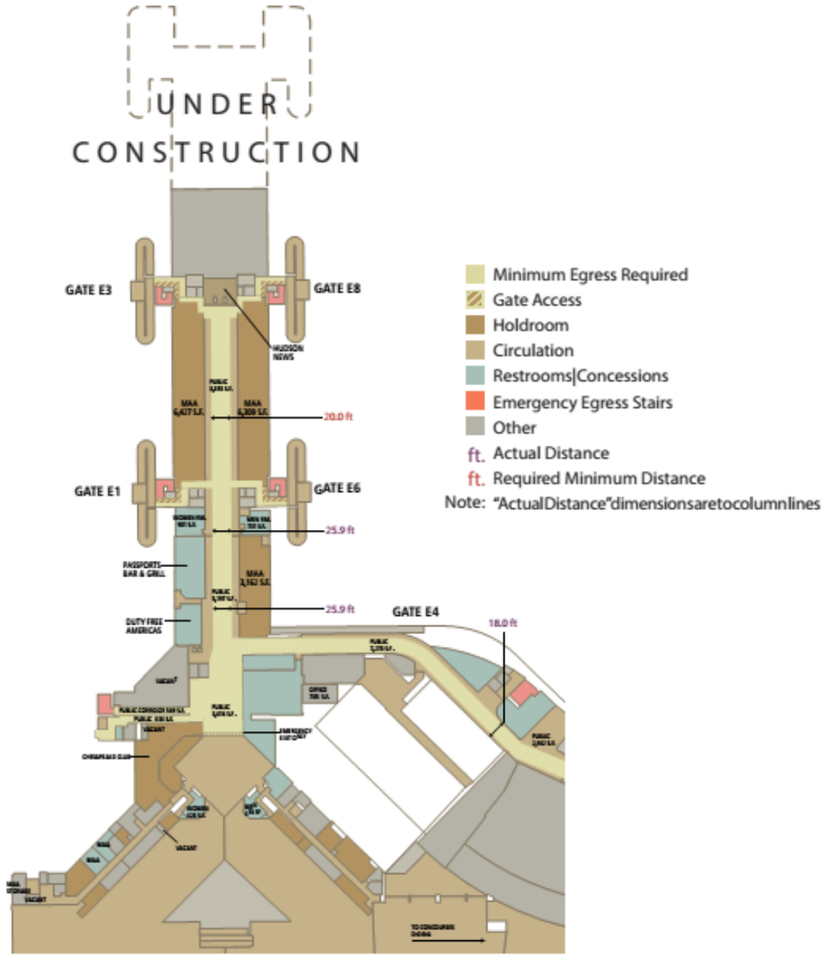


Figure 1-17. Concourse E

2.1 ALP Coordination

At the initiation of each project, designers shall confirm with the MDOT MAA Office of Planning & Real Estate that the project is included on a Federal Aviation Administration (FAA) approved ALP. If the project has not been included, the designer shall identify and coordinate with the MDOT MAA Office of Planning & Real Estate all changes to the Airport Layout Plan. FAA review time is approximately 14 days for pen and ink revisions and approximately 60 days for more substantial revisions.

2.2 FAA Requirements for Proposed Development

Federal Aviation Administration (FAA) requirements for proposed development must be followed at BWI Marshall and Martin State Airports. Designers shall take these items into consideration during the design process and develop project schedules accordingly. During preliminary design, designers shall identify to the Maryland Aviation Administration (MDOT MAA) Project Manager the impact of each requirement on the project.

Unless otherwise approved by the MDOT MAA Project Manager, it shall be the designers' responsibility to submit all required information identified below well enough in advance to receive all FAA approvals and permits prior to advertisement of the construction documents. Construction Notice to Proceed (NTP) shall not be given on any project until all FAA approvals have been obtained.

With prior approval from the MDOT MAA Project Manager, Consultants may submit items directly to the FAA on behalf of the MDOT MAA. All submissions shall be made to the FAA Washington Airports District Office (WADO) unless otherwise noted.

The following requirements apply:

1. Environmental document coordination for all development projects as follows:
   a. At the initiation of each project, the Consultant shall obtain a determination from the MDOT MAA Office of Environmental Services on the required environmental coordination and documentation needed for each project.
   b. For large/complex projects, designers shall set up a preliminary coordination meeting with the MDOT MAA Environmental Planning Section to coordinate the design with the environmental documentation preparation.
   c. For development projects with the potential to be categorically excluded, plans shall be submitted to the MDOT MAA Environmental Planning Section at the same time the review plans are submitted to the MDOT MAA Project Manager. MDOT MAA needs approximately 30 days to prepare and submit an Environmental Impact Evaluation Form A to the FAA. FAA review time is approximately 15 days. Note: Durations may be longer due to project specifics and the coordination required with state and federal agencies.
2. Pre-design meetings are required for all airfield projects prior to 30% completion.
3. Line of sight (shadow studies), ground radar interference and reflectivity studies for new or modified structures and buildings shall be submitted to the FAA prior to 30% design completion.
4. Eight copies of the construction safety and phasing plans shall be submitted for FAA approval. Designers must include on the Safety and Phasing plans the locations and heights of all structures penetrating any navigational surfaces. Both permanent and temporary structures, including construction equipment, are included in this requirement. Construction equipment heights should be estimated on a worst-case basis and equipment locations should be broadly shown, i.e. envelope locations with coordinates defining the corners.

   The Safety and Phasing Plan shall be submitted well enough in advance to receive approval prior to advertisement of the construction documents. Designers should submit eight copies of the Safety and Phasing plans to the FAA. Upon receipt, the FAA will review and approve the structure locations and heights in conjunction with the safety and phasing. FAA review time is 60-90 calendar days. Once approval is received, designers shall provide a copy of the FAA approved plans to MDOT MAA, Office of Planning & Real Estate.

   MDOT MAA's Office of Planning & Real Estate shall then issue an Airport Zoning Permit to the contractor per the accepted plan. If the Contractor wants to place equipment and/or cranes at locations and heights which differ from the FAA approved plan, they will be required to submit a Notice of Proposed Construction or Alteration (FAA Form 7460-1). Once Form 7460-1 has been approved by the FAA, the Office of Planning & Real Estate will issue an additional Airport Zoning Permit for those items which differ from the original plan.

Completed Modification of Standards (MOS) forms shall be submitted to the FAA for approval for each modification requested. FAA review time is approximately 60 days.

5. Changes to the FAA Part 139 signing and marking plans shall be submitted (on a separate drawing) to the MDOT MAA Project Manager and Office of Airport Operations (OPS) for internal review. Upon MDOT MAA approval, Consultants shall provide OPS with three copies of the plan(s), which will be forwarded on to the FAA Eastern Region for coordination and approval. Upon approval, the Eastern Region will send a copy of the approved plan(s) stating that the changes will be added to the next revision of the signage plan to MDOT MAA and WADO. The MDOT MAA Project Manager will forward an approved copy of the signed plan(s) to the designer. MDOT MAA coordination and review time is approximately 14 days, and FAA review time is approximately 30 days.
6. Temporary and permanent changes to the Airport Operations fence lines shall be submitted to the FAA for approval. FAA review time is approximately 30 days.
7. Copies of the plans, specifications, and design report for all projects which MDOT MAA plans to request AIP or PFC funding shall be submitted for FAA approval. In addition to the final submission, designers shall submit 60% plans and specifications to FAA for review and comment. MDOT MAA shall review the design report internally and submit it directly to the FAA. FAA review time is approximately 14 days.

2.2.1 Radar Reflectors

The FAA has installed radar reflectors throughout the airfield as part of the surface detection system. All contract documents at BWI Marshall Airport shall include the locations of radar reflectors. Radar reflector locations and removal/replacement requirements shall be coordinated with the FAA at 410-859-7252.

2.3 Zoning Permits

For all projects requiring cranes or tall structures, the Consultants shall contact the MDOT MAA Office of Planning & Real Estate for guidance and direction for a zoning permit.

2.4 Construction Safety and Phasing Plans (CSPP)

2.4.1 CSPP Review Checklist

2.4.1.1 Drawings

Construction Safety and Phasing Plans shall be submitted for FAA review as outlined in Section 2.2 FAA Requirements for Proposed Development. The Consultant shall attach Construction Safety and Phasing Plan Review Checklist from FAA AC 150/5370-2, current edition, to the drawings. The checklist is also included in Appendix 5A - Standard Forms.

The following information needs to be completed by the Consultant for BWI Marshall and MTN on their respective Construction Safety and Phasing Plans:

A. Airport Name/LOCID/Associated City
B. State
C. AIP No. (Include if available)
D. Date
E. Signature block for Operations
F. Checkmark for addressed items (Yes, No, N/A)
G. Comments, special conditions, other (if applicable; If there are no additional comments, remove the Additional Comments from the sheet.)

2.4.1.2 Design Reports/Narrative

If applicable to the project, the Consultant shall include an 8.5x11 copy of the Construction Safety and Phasing Plan Review Checklist (located in Appendix 5A - Standard Forms), and "additional comments, special conditions, others" in all submissions of the design report. The information included should be identical to what is on the Construction Safety and Phasing Plan Review Checklist drawing sheet. The design report and narrative may be the same, and shall include (at a minimum) the information required in FAA AC 150/5370-2, current edition. Aside from the required information, any information related to BWI Marshall/MTN unique operations should be included in the respective narratives.

The following information needs to be completed by the Consultant for BWI Marshall and MTN on their respective Construction Safety and Phasing Plans and the information included in the design report:

A. Airport Name/LOCID/Associated City
B. State
C. AIP No. (Include if available)
D. Date
E. Checkmark for addressed items (Yes, No, N/A)
F. Comments, special conditions, other (if applicable; If additional space is required, provide additional sheets titled "Additional Comments")

2.4.2 Phasing and Constructability

As design progresses, an effort shall be made to meet with the construction manager (CM) at the 60% level (or whenever the CM is selected) to review the phasing sequence and constructability of the project. The CM should agree in principal on the construction phasing prior to the pre-bid meeting. Meeting minutes will be adequate to determine at least one meeting has been held with the CM and preliminary consensus has been achieved. Once the design has stabilized (or the 90% level), the consultant shall engage FAA in the SMS/SRM process. This process involves a detailed presentation (PPT format) of the phasing to a selected FAA panel.

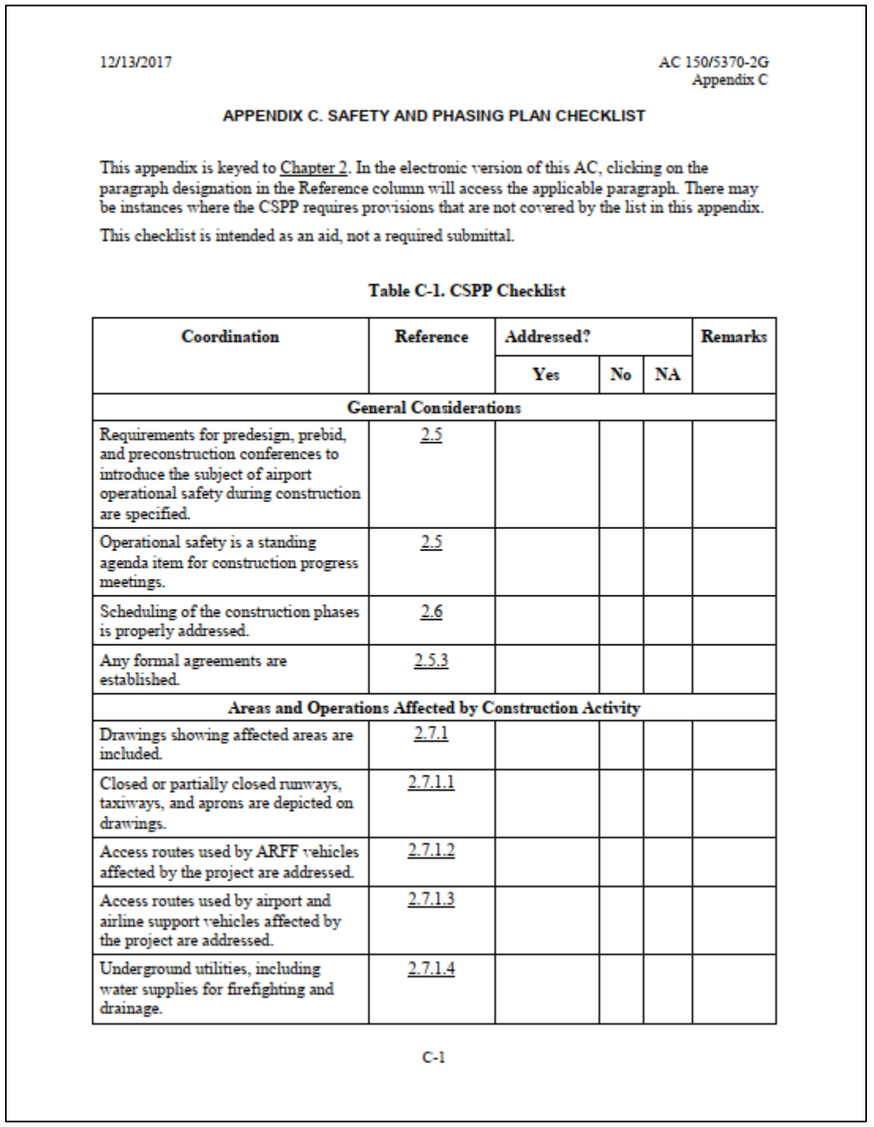
2.4.3 Sample CSPP

FAA AC 150/5370-2 has sample CSPP plans that the FAA suggests using as a guide. Seven (7) full-size copies of the MDOT MAA-approved CSPP, narrative and applicable specifications shall be submitted to the MDOT MAA Office of Planning & Real Estate for distribution to the FAA-WADO for final distribution/review.

5A.1 Checklists

Safety and Phasing Plan Checklist (AC 150/5370-2G) (.pdf, 5 pages)

Click the image to download the document in Adobe PDF format.



APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

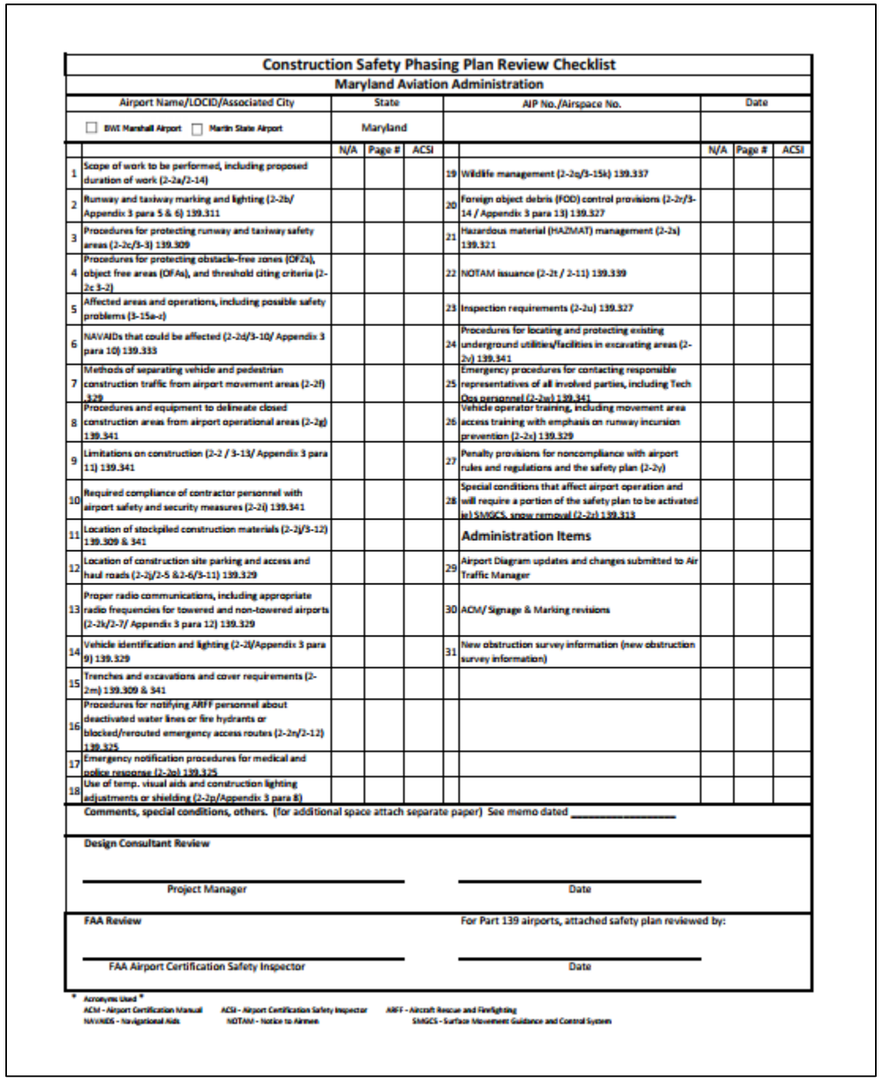
This checklist is intended as an aid, not a required submittal.

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	2.5				
Operational safety is a standing agenda item for construction progress meetings.	2.5				
Scheduling of the construction phases is properly addressed.	2.6				
Any formal agreements are established.	2.5.3				
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	2.7.1				
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	2.7.1.1				
Access routes used by ARFF vehicles affected by the project are addressed.	2.7.1.2				
Access routes used by airport and airline support vehicles affected by the project are addressed.	2.7.1.3				
Underground utilities, including water supplies for firefighting and drainage.	2.7.1.4				

Construction Safety Phasing Plan Review Checklist (AC 150/5370-2G) (.xls, 1 page)

Click the image to download the document in Microsoft Excel format.



Construction Safety Phasing Plan Review Checklist

Maryland Aviation Administration

Airport Name/LOCID/Associated City	State	AIP No./Airspace No.	Date
☐ BWI Marshall Airport ☐ Martin State Airport	Maryland		

		N/A	Page #	ACSI			N/A	Page #	ACSI
1	Scope of work to be performed, including proposed duration of work (2-2a/2-14)				19	Wildlife management (2-2q/3-15k) 139.337			
2	Runway and taxiway marking and lighting (2-2b/ Appendix 3 para 5 & 6) 139.311				20	Foreign object debris (FOD) control provisions (2-2r/3-14 / Appendix 3 para 13) 139.327			
3	Procedures for protecting runway and taxiway safety areas (2-2c/3-3) 139.309				21	Hazardous material (HAZMAT) management (2-2s) 139.321			
4	Procedures for protecting obstacle-free zones (OFZs), object free areas (OFAs), and threshold siting criteria (2-2c 3-2)				22	NOTAM issuance (2-2t / 2-11) 139.339			
5	Affected areas and operations, including possible safety problems (3-15a-c)				23	Inspection requirements (2-2u) 139.327			
6	NAVAIDs that could be affected (2-2d/3-10/ Appendix 3 para 10) 139.333				24	Procedures for locating and protecting existing underground utilities/facilities in excavating areas (2-2v) 139.341			
7	Methods of separating vehicle and pedestrian construction traffic from airport movement areas (2-2f) 329				25	Emergency procedures for contacting responsible representatives of all involved parties, including Tech Ops personnel (2-2w) 139.341			
8	Procedures and equipment to delineate closed construction areas from airport operational areas (2-2g) 139.341				26	Vehicle operator training, including movement area access training with emphasis on runway incursion prevention (2-2x) 139.329			
9	Limitations on construction (2-2 / 3-13/ Appendix 3 para 11) 139.341				27	Penalty provisions for noncompliance with airport rules and regulations and the safety plan (2-2y)			
10	Required compliance of contractor personnel with airport safety and security measures (2-2i) 139.341				28	Special conditions that affect airport operation and will require a portion of the safety plan to be activated ie) SMGCS, snow removal (2-2z) 139.313			
11	Location of stockpiled construction materials (2-2j/3-12) 139.309 & 341					**Administration Items**			
12	Location of construction site parking and access and haul roads (2-2j/2-5 &2-6/3-11) 139.329				29	Airport Diagram updates and changes submitted to Air Traffic Manager			
13	Proper radio communications, including appropriate radio frequencies for towered and non-towered airports (2-2k/2-7/ Appendix 3 para 12) 139.329				30	ACM/ Signage & Marking revisions			
14	Vehicle identification and lighting (2-2l/Appendix 3 para 9) 139.329				31	New obstruction survey information (new obstruction survey information)			
15	Trenches and excavations and cover requirements (2-2m) 139.309 & 341								
16	Procedures for notifying ARFF personnel about deactivated water lines or fire hydrants or blocked/rerouted emergency access routes (2-2n/2-12) 139.325								
17	Emergency notification procedures for medical and police response (2-2o) 139.325								
18	Use of temp. visual aids and construction lighting adjustments or shielding (2-2p/Appendix 3 para 8)								

Comments, special conditions, others. (for additional space attach separate paper) See memo dated _____

Design Consultant Review

_____ Project Manager

_____ Date

FAA Review

For Part 139 airports, attached safety plan reviewed by:

_____ FAA Airport Certification Safety Inspector

_____ Date

* Acronyms Used *
ACM - Airport Certification Manual ACSI - Airport Certification Safety Inspector ARFF - Aircraft Rescue and Firefighting
NAVAIDS - Navigational Aids NOTAM - Notice to Airmen SMGCS - Surface Movement Guidance and Control System

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 6

Information Technology

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.1 Guideline Introduction

Volume 6 - Information Technology, of the MDOT MAA Planning and Engineering Guidelines & Standards (PEGS) is dedicated to Division of Airport Technology (DAT) standards. These standards are comprised of guidelines, standard forms and specifications for Communications Systems and Infrastructure (commonly referred to as DAT STANDARDS). The DAT Standards are applicable for all MDOT MAA owned and operated facilities including Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall) and Martin State Airport (MTN). The DAT Guidelines are considered to be the minimum requirements and are a living document that will be expanded and updated to provide additional guidance.

The Division of Airport Technology (DAT) PEGS for Communications Systems and Infrastructure is divided into functional sections. All sections collectively are the (DAT) Standards. These standards shall not be modified in any way without written permission of DAT.

The official source of the Division of Airport Technology (DAT) standards shall be MDOT MAA PEGS Volume 6 – Information Technology.

1.1.1 Purpose

This Standard will provide Designers, Contractors and Installers (DCI), employees and tenants with the parameters, details, and standards that the DAT shall require to be incorporated into all projects, installations and repairs. This will provide consistency and compatibility between new and existing equipment/infrastructure. No deviation from these standards shall be permitted without an approved written variance from DAT.

1.1.2 Objectives

The objective of the DAT Standards is to provide consolidate standards and best industry practices in one place which have been confirmed as how all MDOT MAA representatives shall interpret the building code and standard references.

1.2 DAT Contact Information

1.2.1 DAT Office

Physical Address	Mailing Address
Maryland Aviation Administration ATTN: Division of Airport Technology 1500 Amtrak Way Linthicum Heights, MD 21090	Maryland Aviation Administration ATTN: Division of Airport Technology P.O. Box 8789 BWI Airport, MD 20240-0789

1.2.2 DAT System Contacts

All communication with the Division of Airport Technology (DAT) should be initiated through the MDOT MAA Project Manager.

1.3 Acronyms

ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
AVI	Automatic Vehicle Identification
BICSI	Building Industry Consulting Services International
CFR	Code of Federal Regulations
CR	Computer Room
DC	Data Center
DCI	Designers, Contractors and Installers
EVIDS	Electronic Video Information Display System
GIS	Geographic Information System
IBC	International Building Code (latest adopted version)
IDF	Information Distribution Facility
IEEE	Institute of Electrical and Electronic Engineers
IETF	Internet Engineering Task Force
ISO	International Organization for Standardization

ISR	Information System Room
BWI	Baltimore/Washington International Thurgood Marshall Airport
LAN	Local Area Network
MTN	Martin State Airport
MAA	Maryland Aviation Administration
MDOT	Maryland Department of Transportation
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Agency
PA	Public Address
PEGS	Planning and Engineering Guidelines & Standards
SAN	Storage Area Network
TD	Tenant Demarcation
TIA/EIA	Telecommunication Industries Association/Electronic Industries Alliance
UL	Underwriters Laboratory
WDN	Wireless Data Network

2.1 General Guidelines

The overarching goals for the Division of Airport Technology (DAT) systems associated with the MDOT Maryland Aviation Administration (MDOT MAA) facilities are flexibility, reliability, and cost effectiveness. To achieve flexibility, the design of technology systems and associated infrastructure should be scalable where possible and ready for anticipated technology trends, growth, and interface with disparate systems. The design and expansion of the technology systems will be made with a clear understanding of the future of each technology. Overall reliability must be considered not only in both system redundancy but also concerning expected end of life cycles for the technology components. Finally, the technology systems must be designed and implemented within the project budget and in coordination with existing and concurrently designed system to provide a cost-effective solution.

The following systems and associated infrastructure are included in the DAT Standards.

A. Communication Rooms
   1. Communication Rooms
   2. Equipment Closets

B. Infrastructure
   1. Pathways
   2. Backbone Cabling
   3. Horizontal Cabling

C. Networks
   1. Local Area Network (LAN)
   2. Wireless Data Network (WDN)

D. Data Storage
   1. Storage Area Network (SAN)

E. Workstations & Peripherals
   1. Workstation Deployment
   2. Printer Deployment

F. Telecommunication Systems (Under Development)
   1. Telephony
   2. E911

G. Radio (Under Development)

H. Operational Systems (Under Development)
   1. Master Clock
   2. Common Use System
   3. Geographic Information System (GIS)
   4. Automatic Vehicle Identification (AVI)

I. Passenger Systems (Under Development)
   1. Public Address (PA)
   2. Electronic Video Information Display System (EVIDS)
   3. Dynamic Roadway Signage
   4. Smart Park
   5. Info Kiosks

J. Financial Systems (Under Development)

K. Parking Revenue Control (Under Development)

2.2 Standards

Systems shall be implemented as per the manufacturer's requirements and in accordance with internationally recognized standards as well as local codes and requirements of authorities having jurisdiction, and particularly the most recent pertinent publications of the following organizations. Due to different organization publication updates, the most current published edition shall be used with any referenced industry standard.

NOTE: The DAT Standards may have more stringent requirements and may differ from industry published standards. DCI is responsible for an understanding of MDOT MAA, industry standards, and DAT Standards.

MDOT MAA	Maryland Department of Transportation Maryland Aviation Administration
MDOT MAA's AIRPortal Standard	
1. AIRPortal provides access and reference to the most current MDOT MAA documentation.	
2. The Planning and Engineering Reference Library provide access to the most current Standard Borders, Title Blocks and Index Sheets	
3. The URL for AIRPortal is https://www.airportal.maa.maryland.gov (user account required)	
MDOT MAA Planning and Engineering Guidelines & Standards (PEGS) - Division of Airport Technology (DAT) standards	
MDOT MAA's Design and Construction Standard	
MDOT MAA Data Quality Standard	
MDOT MAA Data Security Standard	
MDOT MAA Naming, Identification & Addressing Standard	
ANSI	American National Standards Institute
ANSI C2	National Electrical Safety Code (Latest adopted version)
ASTM	American Society for Testing Materials
BICSI	Building Industry Consulting Services International
	Telecommunications Distribution Methods Manual (TDMM)
	Information Transport Systems Installation Manual (ITSIMM)
	Network Design Reference Manual
	Outside Plant Design Reference Manual
	Wireless Design Reference Manual
CFR	Code of Federal Regulations
CFR 47 Part 15	Radio Frequency Devices
FM	Factory Mutual
IBC	International Building Code (latest adopted version)
IEEE	Institute of Electrical and Electronic Engineers
IETF	Internet Engineering Task Force
ISO	International Organization for Standardization
ISO/IEC 11801	Generic Cabling for Customer Premises
ISO 9001	Quality Assurance in Design / Development, Production, Installations, and Servicing
ISO 9003	Quality Assurance in Final Inspection and Test
ISO 9004	Quality Management and Quality System Elements Guidelines
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA 70	National Electric Code (NEC)
NFPA 75	Protection of Information Technology Equipment
NFPA 76	Protection of Telecommunications Facilities

NFPA 1221	Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.
OSHA	Occupational Safety and Health Agency
TIA/EIA	Telecommunication Industries Association
TIA-568-B	Commercial Building Telecommunications Cabling Standard
TIA-569-A	Commercial Building Standard for Telecom Pathways and Spaces
TIA-606	Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
TIA-607	Commercial Building Grounding/Bonding Requirements
UL	Underwriters Laboratory
UL497	Standard for Protectors for Paired-Conductor Communications Circuits
All local, county, state and federal regulations and codes in effect as of date of purchase	

2.2.1 Buy American – Use of Foreign Equipment

DCI shall indicate in the proposal all components that may be of foreign manufacture. If any are intended to be used, DCI shall note the country of origin. Equipment of foreign manufacture must meet U.S. codes and standards.

2.2.2 Conflicts with Standards

In the event of conflict between standards, guidelines, or specifications and existing field conditions, or end user requirements, the DCI shall contact the MDOT MAA Project Manager in writing (email) providing the following information:

A. Date of Discovery
B. Name and Contact Information of Person Submitting
C. Associated DAT Standard(s)
D. Description of Conflict

This information will be forwarded to DAT by the MDOT MAA Project Manager for the final determination to resolve the conflict such as which standard takes precedence.

2.2.3 Non-Compliant Existing Technology Conditions

In the event existing conditions within an area of work in the design of a new or current project does not meet the most current edition of the DAT Standards, the DCI shall contact the MDOT MAA Project Manager in writing (email). The DCI shall provide the information noted below. After coordination between the MDOT MAA Project Manager and DAT, the DCI will be notified if they are to include labor and materials to bring the area into compliance as part of the work being performed. If directed by the MDOT MAA Project Manager to include, the effort should be considered as part of the project's scope of work and existing conditions and the required work shall be documented in project submittals.

Should non-compliance be discovered during the construction of the project, the DCI shall contact the MDOT MAA Project Manager in writing (email) providing the following information:

A. Date of Discovery
B. Name and Contact Information of Person Submitting
C. Contract Number or Project Name
D. Associated DAT Standard(s)
E. Location of Conflict
F. Description of Conflict
G. Impact of Conflict
H. Recommended Remedy

The MDOT MAA Project Manager will coordinate with DAT.

The MDOT MAA Project Manager and DAT will review and determine if the non-compliance as noted by the DCI was included in the scope of work, or if the discovery is considered additional scope of work.

2.2.4 Application of DAT Standards

The DAT Standards (guidelines, forms, and specifications) shall be used for all communications designs, installations and testing. Any design work or work performed as part of a contract that does not use the DAT standards along with other information provided by the Division of Airport Technology (DAT) shall be considered non-compliant and will be rejected.

DAT shall review all related cut sheets, change orders, Extra Work Orders in conjunction with the designer of record if applicable. The DAT Team shall make all final determinations. Upon written agreement from DAT, the responsibility for approval of submittals may be transferred to the designer of record in conjunction with MDOT MAA Engineering & Construction. This transfer of responsibility is on a project-by-project basis. All product cut sheets approval shall occur prior to purchasing and installation by contractor.

These standards shall apply to any concessionaire tenant or Airline communications facilities installed at MDOT MAA owned properties unless a variance approved by DAT. Use of Tenant or Airline specific IT standards requires an approved variance. To obtain a variance, the DCI shall provide, in writing a request to the MDOT MAA Project Manager. Included in the variance request should be the following information:

A. Name and Contact Information of Person Submitting
B. Contract Number or Project Name
C. Tenant or Airline
D. Variance location (plan location(s))
E. Copy of IT Standards to be used

All designs using MDOT MAA standards or coordinated variance will be rejected and be required to be resubmitted. Temporary or emergency installations may be exempt from these standards with written permission of DAT.

2.3 System Documentation

During the course of a project, the necessity to obtain information related to current facilities and systems will be necessary. The following information provides the DCI with methods to obtain the information as well as document changes included in the project efforts.

2.3.1 Obtaining Record Documents

Obtaining records of all existing conditions for architectural/structural as well as technology systems should be obtained from the MDOT MAA AIRPortal system. Assistance with the site should be coordinated with the MDOT MAA Office of Engineering and Construction. The Division of Airport Technology (DAT) can further assist with confirmation that current information has been provided for use from these sources.

2.3.2 Documentation of DAT Systems

All new DAT systems and existing system revisions shall be fully documented and submitted to DAT and MDOT MAA project leadership. DCI shall coordinate with the Office of Engineering and Construction for inclusion of system documentation to the MDOT MAA AIRPortal. The DCI is responsible for complying with all MDOT MAA CAD Standards as defined in PEGS V1, Chapter 3 CAD Standards. Documentation shall be compatible with the record system being maintained by MDOT MAA/DAT at the time of installation.

2.4 Qualifications of Designers, Contractors and Installers (DCI)

The Division of Airport Technology (DAT) requires only qualified companies and staff to participate in the designing, installing, and maintaining technology systems at the MDOT MAA facilities. Following is an overview of these requirements. Additional information can be found in MDOT MAA Specification 270000 General Requirements for Communication Systems.

2.4.1 Company Experience

As part of the MDOT MAA contract procurement process, the DCI shall submit company information associated with the provision of telecommunications systems design or construction. The submitted company shall have and submit documentation demonstrating that the company has successfully designed, built, and customer has accepted to a minimum of (3) projects of similar size, complexity and scope within the last 5-years. Upon contract award, only the submitted telecommunication system design or construction contractor may be used. Company experience requirements are applicable to all MDOT MAA owned and operated facilities.

2.4.2 Staff Experience

As part of the MDOT MAA contract procurement process, the DCI shall submit staff experience information associated with the provision of telecommunications systems design or construction. Information shall be provided regarding the certification, training and experience of all key members of the project team. The project team shall include at a minimum one Registered Communication Distribution Designer (RCDD) certified by BICSI. The project team shall be identified, and resumes provided for the project team for review by DAT during the proposal evaluation process. The resumes shall include copies of all certifications and licenses required.

Installers of all communications facilities shall be supervised at a minimum by a BICSI certified IT Technician, in the discipline of the work to be performed. One BICSI certified IT Technician is required for every 6 uncertified technicians.

2.5 Project Planning Considerations

Inclusion of the Division of Airport of Technology (DAT) in the project planning process as early as possible is very important. Only DAT can assign or allocate communications facilities and access to those facilities.

All Information Technology (IT) related projects including related support infrastructure shall be coordinated with MDOT MAA DAT. The DCI shall contact the MDOT MAA Project Manager to coordinate a meeting with MDOT MAA DAT prior to the initial submittal of the project. The project coordination shall include all MDOT MAA projects as well as all Tenant related projects. Depending on the magnitude of the project, “Break-Out Session” meetings may also be necessary. The DCI shall also coordinate this with MDOT MAA DAT Team.

During the course of a project, access to the site will likely be required. DAT staff does not provide escorts for tenant services. DCI is required to coordinate with the MDOT MAA Project Manager to arrange for badging of personnel, or alternatively schedule an escort with appropriate access rights to the required project spaces. All tenant vendors shall be badged or escorted by tenant.

2.6 Reserving Existing DAT Resources

Projects at MDOT MAA facilities that include a technology component require both the previously mentioned planning considerations and formal reserving of existing DAT managed resources. If the use of existing MDOT MAA resources are required, a Resource Allocation Permit must be submitted and approved by DAT prior to start of work. Without the approved permit, DAT does not guarantee resource availably and will give preference to permit holders in the event of conflict.

2.6.1 Resource Definition

MDOT MAA DAT resources can be defined as systems or facilities owned and/or managed by the Division of Airport Technology. This includes, but is not limited to, the following examples:

MAA DAT Systems	Facilities

• Infrastructure
  ○ Fiber
  ○ Copper
  ○ Cable Tray
  ○ Conduit
• Systems
  ○ Telephony
  ○ Network Connectivity
  ○ Other Existing System Expansions
	• Comm. Room Floor Space
	• Comm. Room Wall Space
	• Comm. Room Rack/Cabinet Space

2.6.2 Existing Resource Allocation Permit

The DCI shall download the current DAT Existing Resource Allocation Permit from the MDOT MAA PEGS. The form can be found in PEGS V6, Appendix 6A Standards Forms.

Please note that the Permit is valid for six months from the date of issue. At the end of the six months, the resources will become available to others. In the event of project delays that require extension of the Permit past the permit validity period, the DCI shall coordinate the updated requirements with the MDOT MAA PM for coordination with DAT to determine if an extension can be obtained, or if a new Permit application will need to be submitted.

2.7 Naming and Identification

The Division of Airport Technology (DAT) requires consistent naming and identification of technology system components and locations at the MDOT MAA facilities. Requirements include how items are to be named as well as acceptable marking methods. Following is an overview of the items using the identification requirements:

A. Patch panels
B. Device plates
C. Outlets
D. Cabling
E. Equipment racks
F. Telecommunications room(s)

G. Structured cabling, including horizontal and backbone cabling
H. Communications cabling cross-connects
I. Communications backboards
J. Life Safety and Security Systems
K. Grounding and Bonding System

The DCI is responsible for review of detailed information found in MDOT MAA Specification 270553 Identification on the MDOT MAA AIRPortal.

2.7.1 Facility Warning Label Examples

Following are examples of the Facilities Warning Labels to be used for permanent marking of inside plant conduits 1" and above, junction boxes, and enclosures. See MDOT MAA Specification 270553 Identification, Part 5 for detailed information.

A. Telecommunications System: Green and Yellow

1. Copper Plant: Green and Yellow

2. Fiber Optics Plant: Green and Orange

3. Emergency Paging System: Green and Red

4. Data Networks: Green and Black

5. IASS Plant: Green and Purple

6. Flight Information Display System (FIDS) Plant: Green and White

7. Common Use Terminal Equipment (CUTE) Plant: Green and Grey

8. Building Automation Plant: Green and Brown

9. Radio/RF Networks: Yellow and Orange

2.8 General Warranty Requirements

The Division of Airport Technology (DAT) general warranty requirements align with the MDOT Maryland Aviation Administration's (MDOT MAA) requirements. Detailed information regarding warranty information can be found in the MDOT MAA's Standard Provisions for Construction Projects. This document is also referenced in the MDOT MAA Specification 270000 General Requirements for Communication Systems, Section 1.8.

2.9 Approved Products

The Division of Airport Technology (DAT) has reviewed market offering and specified technology products for use in DAT systems. The available and/or Basis of Design product manufacturers are listed in each associated specification section, as available on the MDOT MAA AirPortal, to direct the DCI to acceptable solutions. For proprietary systems, DCI is responsible for review and use of the identified products. These products have been proven at the MDOT MAA based on established product performance, appearance, installation means and methods and with input from subject matter experts, installers, and system maintenance providers. This list is for major components and assemblies. Incidental products shall follow industry standards and best business practices established by the MDOT MAA where applicable.

Only available and/or Basis of Design products as listed in the specifications shall be used. Functional equivalents and approved equals will NOT be allowed without DAT approval. DCIs wishing to have alternative products considered for use may follow the instruction provided for "Equal or Approved Equal" or "Substitutions" as found in MDOT MAA Special Provisions for Construction Contracts, Part 1, Section 5 Control of the Work.

2.10 DAT Typical Details

The Division of Airport Technology (DAT) has developed a set of typical details for use by the DCI. The following detail types can be found in PEGS V6, Appendix 6C Concept Drawings:

1. Typical Telecommunication Rooms
2. Typical Demarcation Cabinets
3. Typical Cable Tray Installation Details
4. Typical Containment Penetration Details
5. Typical Date Outlet Details
6. Typical Grounding Details
7. Typical Display Mounting Details
8. Typical Emergency Call Box Details
9. Typical Public Address Speaker & Ambient Noise Sensor Details
10. Typical Common Use Equipment Details

The DCI is responsible for the review and implementation of these design principles. Any deviation from the depicted concepts must be approved in writing by DAT.

3.1 Communication Room Introduction

The Division of Airport Technology (DAT) has established a system of communication rooms throughout the MDOT Maryland Aviation Administration's (MDOT MAA) facilities. These rooms house telecommunication and security system equipment and serve as a termination and distribution point for incoming telecommunication services to the building, and serve as a common distribution point for cables to other Communications Rooms or user locations. Following are definitions and requirements for the types of Communication Rooms in use a MDOT MAA facilities. In the case that current Communication Rooms do not meet or exceed the noted requirements, the DCI shall coordinate with DAT to determine acceptable modifications**.**

3.1.1 Definitions

A. Building Entrance Room (BER) is defined as a room serving as the primary entry for MDOT MAA site infrastructure and telecommunication service provider cabling.
B. Data Center (DC) is defined as a room or facility serving to house MDOT MAA primary and secondary system headend servers and equipment for communications services and systems that serve a critical function at BWI Marshall.
C. Computer Room (CR) is defined as communication room serving to house MDOT MAA servers and/or equipment specific for operational requirements of the nearby areas or as the primary room for a remote facility on the BWI Marshall campus. CRs also serve as distribution rooms for horizontal cabling requirements. Computer Rooms may have other airline or tenant equipment.
D. Telecommunication Room (TR) is defined as a communication room serving as a local distribution point for communication services to nearby spaces. Telecommunication Rooms may have other airline or tenant equipment.
E. Extended Tenant Demarcation (TD) is defined as a demarcation location that serves to extend communications facilities from a TR to a tenant's or Airline's leased space for connection to the MDOT MAA network, MDOT MAA Emergency Paging, PSN, or other communications providers.

3.1.2 Communication Room Identification

All facilities shall be documented and referenced by the door number. DAT does not recognize room numbers in official records. See PEGS V6, Chapter 2.9 Approved Products for additional identification information.

3.1.3 Communication Room Typical Layouts

Typical Communication Room layouts have been developed for use by the DCI. See PEGS V6, Appendix 6C.1 Typical Communication Rooms for example configurations. Any deviations from the depicted concepts must be approved in writing by DAT.

3.2 Requirements for All Communication Room Types

3.2.1 Architectural Requirements for Communication Rooms

3.2.1.1 Configuration

A. All Communication Rooms shall be rectangular in shape length. Provision of L-Shaped or other irregular shapes is not acceptable. Room shall have no obstructions, structural columns, or other equipment that infringes on the minimum dimensions noted for each Communication Room type.

B. The final size of the room will depend on the quantity of racks/cabinets and other equipment associated with systems. Future growth shall also be factored into the final size of the room without the need for moving existing equipment. BISCI TDMM room sizing guidelines coupled with the below noted clearance requirements are to be used as a basis for development of communication room requirements. Deviation from these guidelines must be approved by MDOT MAA DAT.

C. Clearance Requirements - Room size and layout must allow for the following clearances. Clearance may be shared between wall mounted and rack or cabinet devices but must accommodate the greater of the two clearance requirements.
   1. 3' clearance behind furthest protruding, rack mounted equipment or cabinet back to nearest item or structure.
   2. 4' clearance in front of face of rack mounted equipment or cabinet front to nearest item or structure.
   3. 3' clearance in front of face of wall mounted equipment to nearest item or structure. For sizing purposes, wall mounted equipment shall be assumed to be 12" in depth.
   4. Minimum 3' clearance between rows of equipment or cabinet backs and rack or cabinet faces.

3.2.1.2 Walls

A. Provide fire rated partitions between structural floor and ceiling for physical security and fire protection. Fire rating of partitions shall be as required per NFPA.
B. A minimum of two walls shall be provided with 3/4" FRT (Fire Retardant Treated) grade plywood. Paint requirements shall be the same as requirements for the walls. Plywood to be painted on all six sides prior to mounting. No

infrastructure or element shall be mounted directly to any wall. DCI to ensure fire rating marking is not obscured in one location on each piece of plywood, and fire rating marking shall be visible when plywood is mounted.

C. Wall surfaces to be painted with 2 coats of light-colored paint to enhance lighting and must be applied before room fit out. Paint shall be off-white/egg shell color; coordinate paint color (RAL number or AMS-STD-595 color) with MDOT MAA.

3.2.1.3 Flooring

A. The flooring shall have electrostatic-safe vinyl tile. An exception to this requirement is the use of a raised floor.
B. Tile shall be placed before the setting of racks and other equipment.
C. The tile shall be cleaned and waxed after the installation of all equipment and prior to final acceptance.

3.2.1.4 Ceiling

A. No suspended ceiling will be installed in Telecommunication Rooms. If possible, room shall be open to structure above.
B. Ceiling surfaces to be painted with 2 coats of light-colored paint to enhance lighting and must be applied before room fit out. Coordinate paint color (RAL number or AMS-STD-595 color) with MDOT MAA.

3.2.1.5 Entry

A. Entry door size is dependent upon type of communication room. See room specific details in Sections 3.3, 3.4, 3.5, and 3.6.
B. The door shall be a metal, hollow door, fire rated in accordance with NFPA.
C. Doors shall be a lockable outward-opening door.
D. Access Control Devices shall be provided for all Communications Rooms including card reader with PIN pad for entry, door position switch, electrified locking means, and Request to Exit device. DCI shall coordinate security requirements based upon PEGS Volume 7 - Safety and Security, and Office of Airport Security requirements.

3.2.1.6 Penetrations

A. All penetrations of fire rated walls shall be fire stopped in an approved manner to prevent the passage of flames, smoke, and fumes.
B. Installation of firestopping shall be performed by an installer trained and certified by the product manufacturer.
C. When trays intersect with walls or other fire-rated barriers they shall employ the use of re-enterable and re-useable Fire Stopping. The uses of fiberglass insulations, putties, caulks, pillows, or foams are not approved for this purpose.

3.2.1.7 Glazing

No windows are allowed in Communication Rooms.

3.2.2 Electrical Requirements

3.2.2.1 Lighting

A. Lighting shall be limited to the use of LED 4-foot industrial style light fixtures as identified in PEGS V2, Chapter 12.1 Interior Lighting.
B. Lighting shall be controlled via a light switch at each exit. No motion sensor or dimmer type switch shall be allowed, only manual toggle light switches shall be allowed.
C. The design luminance shall be a minimum of 500 lux in the horizontal plane and 200 lux in the vertical plane, measured 1 m (3 ft) above the finished floor in the middle of all aisles between cabinets and racks. Lighting shall be designed and installed to provide maximum coverage in front and behind equipment.
D. Suspend all light fixtures from a UL listed strut-type channel raceway.
E. Lighting shall be installed in accordance with MDOT MAA electrical and lighting standards.

3.2.2.2 Power

A. Power Routing
    1. Power and communications cables shall maintain a 3-foot separation to the greatest extent possible. Where the separation cannot be maintained, minimize parallel runs. Refer to Specification 270528 Pathways for Communication Systems, Clearances, for further information.
    2. In the event that communication and power cables must cross, the crossing must be at a 90° angle.

B. Electrical Panel Boards
   1. Electrical panel boards shall not be located within Communications Rooms except when required by code.
   2. Where necessary, panel boards shall be dedicated to loads within the Communications Room only and shall be located to minimize electromagnetic interference. All panel boards if required will be “Clustered” within the room to reduce overall clearance requirements.

C. Room Power
   1. The electrical circuits supporting all telecommunication rooms shall be generator-backed circuits (where available).
   2. Commercial power (dedicated 20A/120V circuit) duplex outlet shall be provided to duplex convenience receptacles serving the Communications Rooms spaced 12’ apart on walls at 12” above floor finish (AFF) to bottom of receptacles. The receptacles shall be accessible at all times and not be blocked by racks, cabinets or other equipment. Convenience outlets shall be for general maintenance purposes and communication equipment shall not be connected to these circuits.
   3. Power receptacles are to be labeled with circuit number, panel numbers and receptacle type in a permanent manner per MDOT MAA standards.
   4. Communication Rooms shall be provided with a 30A/208V normal power twist lock receptacle(s) capable of supporting an emergency cooling unit. Confirm location and requirement with DAT.
   5. Communication rooms shall be provided with outlets to support UPS units. Coordinate outlet type with UPS to be provided. UPS power circuits shall be provided from generator/Emergency power circuits (where available) and as noted below as part of the Cabinet and Rack Power requirements.

D. Cabinet and Rack Power
   1. All power and communications to racks and cabinets shall be top fed when raised flooring is not present.
   2. The availability of generator power varies between communication rooms, with some rooms having generator power available and other rooms not having it available. Provide commercial, generator, and UPS power as follows:
      a) For Telecommunication Rooms (TR), Computer Rooms (CR), and/or Building Entrance Rooms (BER) that do not have generator power available, provide each rack or cabinet two (2) 110V 30-amp twist lock receptacles above each location, one fed from commercial power, and the second from a UPS that is connected to commercial power.
      b) For Telecommunication Rooms (TR), Computer Rooms (CR), and/or Building Entrance Rooms (BER) that do have generator power available, provide each rack or cabinet two (2) 110V 30-amp twist lock receptacles above each location, one fed from generator power, and the second from a UPS that is connected to generator power.
      c) For Data Center (DC) spaces, these spaces are expected to have generator power available and a centralized, whole room UPS should be provided. For these rooms, provide each rack or cabinet two (2) 110V 30-amp twist lock receptacles above each location, both fed from the centralized UPS that is connected to generator power. If redundant UPS units are provided, provide each rack or cabinet should with a receptacle connected to each UPS unit.
   3. Where raised flooring is present, all communications cables shall be routed in overhead cable tray and transitioned to cabinets/racks via waterfall fittings; all electrical circuits shall be routed through the below-floor space and routed through the bottom of the cabinet/rack.
   4. Power Distribution Unit with circuit protection: Each rack/cabinet containing powered equipment shall have two independent Power Distribution Units (PDU) installed. For strip type PDUs to be mounted vertically, provide one on each side.
      a) The commercial power PDU shall be on the right side (facing from rear) and will be dedicated to commercial power. The PDU shall have sufficient outlets to provide service to the entire fully populated rack.
      b) The UPS PDU shall be on the left side (facing from rear) shall be delineated as UPS either with orange receptacles or permanently marked “UPS POWER”. Coordinate UPS PDU with available outputs on the provided UPS if rack mounted UPS units are provided.
   5. The minimum power requirements for each equipment PDU shall be 30A/120V (except as required to match the rack mounted UPS outputs).
   6. DCI will coordinate with DAT and the electrician for final connections
   7. Transformers
      a) Transformers shall not be located within Communications Rooms. Where necessary, transformers shall be dedicated to loads within the Communications Room only and shall be located to minimize electromagnetic interference.
      b) Transformers that provide power for communication rooms shall have a Faraday Shield installed to further improve noise immunity and be K-rated to accommodate non-linear loads. As an alternative, the transformer can use harmonic canceling techniques to mitigate the effects of harmonics.

E. UPS Power
   1. The purpose of the UPS is not to provide power during power outages. The primary function is to provide power filtering and to provide 15 minutes of backup power, so the system can be shut down in a regulated fashion.
   2. UPS units will be required to manage transitions to emergency power.
   3. A central UPS system may be considered in lieu of individual rack-mounted UPS devices.
   4. All MAA systems requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS inverter shall be sized to accommodate growth of the load, with the inverter sized to accommodate the calculated load plus a spare capacity of 100% (inverter shall be sized for double the calculated load). The batteries shall be sized for a run time of 15 minutes, and shall be expandable by adding batteries to provide not less than 15 minutes of run time at maximum inverter loading.

5. Minimum size of floor mount UPS units shall be 20 kVA, minimum size of rack mount units shall be 1400 VA. Floor units shall be equipped with a Battery Cabinet and Emergency Bypass Cabinet. Output panel board for UPS power distribution should be in the communication room.
6. The UPS shall be provided with (1) network interface cards for Simple Network Management Protocol (SNMP) connection for DAT monitoring. The UPS shall also be provided with (1) network interface card and components for the Building Automation System (BAS) connection, compatible with the Johnson Controls' Metasys System.

3.2.3 Telecommunications Requirements

3.2.3.1 Telecom Outlets

A. A wall mounted phone and all associated wiring shall be installed 48-inches above the finished floor located near the primary entrance/exit.
B. A minimum of one data outlet shall be located on each wall. Outlets shall be wall mounted, aligned and adjacent to electrical outlets. Mounting height to be as indicated in drawings.

3.2.3.2 Backbone Connectivity

A. Fiber and copper connectivity shall be provided from two diverse locations for reliability and redundancy.
B. Connection locations and cabling quantities shall be coordinated with DAT.

3.2.3.3 Raceways and Supports

A. A ladder style cable tray system shall be installed around the entire perimeter of the room and routed above each equipment rack/cabinet.
B. There shall be NO basket Cable Tray installed in any Communications Room. The type of cable system shall be ladder rack style as required per the communication room equipment specification.
C. A 4"x4" Yellow Fiber Duct shall be provided above the Ladder Racks between Racks or Cabinets to allow patching.
D. The mounting height of cable tray and fiber duct shall be a minimum of 12-inches above the racks and shall be supported per manufacturer recommendations.
E. Conduits from floor and wall entrances shall be 4" in diameter, labeled where they originate, and fire stopped with approved fire stop assembly.

3.2.3.4 Communication Media (Fiber and Copper)

A. All cabling shall be installed and properly dressed and labeled to present a professional and workmanlike installation.
B. All cabling shall be in cable tray.
C. No unsupported cabling length greater than two feet (2') shall be permitted.
D. All terminations, patch panels, splices (where allowed), and blocks must be installed, dressed and labeled in a neat order.

3.2.3.5 Cabinets and Racks

A. Communication Rooms shall be fitted with open frame racks or freestanding, enclosed equipment cabinets (per Specification 271123 Telecommunication Room Equipment) to support required equipment.
B. Freestanding, enclosed equipment cabinets shall be used for all security related equipment such as patch panels, switches, servers, and rack mounted UPS units.
C. Open frame racks shall be used for non-security devices such as switches, patch panels, system equipment, and rack-mounted UPS.
D. Horizontal and vertical cable management shall be provided for all cabinets and racks.

3.2.3.6 Ground and Bonding

A. All grounding and bonding shall be per code requirements.
B. Additional Grounding & Bonding information can be found in DAT Specification 270526 Grounding and Bonding for Communication Systems.
C. All Racks and Ladder trays shall be grounded to the TMGB or TGB depending on the room type.

3.2.4 Mechanical Requirements

3.2.4.1 Function

A. The environmental control system shall be designed to function properly for 24/7 operations.
B. The system shall be designed to operate under positive pressure with respect to its surroundings with a minimum of one air change per hour.
C. Maintain temperatures within the Communication Rooms at 64° to 75° F.

D. A fire damper shall be provided to maintain the room's 2-hour fire rating (if applicable).
E. See additional requirements for Data Centers and Computer Rooms in the associated sections.
F. Humidity Control - Equipment shall be sized and provided to maintain a relative humidity from 30% to 55%.

3.2.4.2 Equipment Selection

A. The equipment shall be sized and dedicated for the room it serves to maintain temperatures not to exceed 75-degrees F.
B. The design of the environmental control system shall be based on ultimate requirements of the space. The design shall account for a fully built out and populated communication room, not the initial installation. Example if 3 rack/cabinets are installed but the room is designed to accommodate up to 5 racks/cabinets, the HVAC shall be sized for 5 racks/cabinets and the associated active equipment expected to be installed should all of the cabinets be fully populated. The environmental control system for a communication room shall be dedicated to the communication room.

3.2.4.3 Equipment Location

A. Mechanical equipment shall be located outside of, but adjacent to, the room. This will reduce the possibilities of condensate water entering the racks/equipment.
B. However, in the event that equipment is approved by DAT to be located inside the room, drip pans and condensate pumps shall be provided to shield equipment from potential water damage. Approval will require a room of sufficient size that the mechanical equipment remains accessible and is not located above equipment or reserved spare space.
C. All temperature sensors and controls shall be located within the room the HVAC equipment serves and at no more than 5-feet above the finished floor.

3.2.5 Fire Protection

3.2.5.1 Monitoring and Detection

Smoke detection shall be provided within the Communication Rooms.

3.2.5.2 Fire Suppression

A. See Fire Suppression requirements associated with each Communication Room type. Refer to MDOT MAA PEGS Volume 3 - Life Safety and NFPA 75 and 76 (latest adopted version).
B. To determine the appropriate fire protection approach, reference Figure A.1.3 Decision Tree for Application of NFPA 75 and PEGS Volume 3 - Life Safety.

3.2.6 Fire Suppression

A. Critical Communication Rooms shall be provided with special agent suppression systems. Critical communication rooms are defined as the Data Center and the existing Main Telephone Rooms. In addition, rooms with emergency paging system equipment or emergency communication equipment may be considered for special agent suppression systems as deemed appropriate by the AHJ and DAT.

B. All Building Entrance Rooms, Computer Rooms, and Telecommunication Rooms shall be equipped with fire suppression systems as required in MDOT MAA PEGS Volume 3 - Life Safety and NFPA 75 and 76 (latest adopted version).

C. Pre-Action Fire Sprinkler System or Special Agent Suppression System: Should a pre-action fire sprinkler system or special agent suppression system be required for a Data Center, Building Entrance Room, Computer Room, or Telecommunication Room, the following shall apply:
   1. Pre-action fire sprinkler systems employ the basic concept of a dry pipe system in that water is not normally contained within the pipes. The water is withheld from the piping by an electrically operated valve, known as a pre-action valve. Valve operation is controlled by independent flame, heat, or smoke detection. Two separate events must happen to initiate sprinkler discharge. First, the detection system must identify a developing fire and then open the pre-action valve. This allows water to flow into system piping, which effectively creates a wet pipe sprinkler system. Second, individual sprinkler heads must release to permit water flow onto the fire. The system shall be sized and configured per all applicable codes and requirements. Alternatively, a Special Agent Suppression System may be selected for use. Requirements for the system shall align with those noted in the Computer Room requirements. The DCI shall coordinate the use of a pre-action system or special agent suppression system with DAT.
   2. Pre-Action Fire Control Panel shall not be installed in the room that it serves; the location of the Pre-Action Fire Control Panel shall be in a nearby room.
   3. A Fire Marshal approved monitoring module and smoke detector shall be installed at the location of the Pre-Action Fire Alarm Control Panel or Special Agent Suppression System Control Panel that protects the Communications Room(s). The control panel shall monitor the pre-action or special agent suppression system for any supervisory, trouble, or alarm signals. At a minimum, the control panel shall provide dry contact outputs for supervisory, trouble, and alarm signals that tie into a fire alarm module for the overall area or building fire alarm panel. These signals shall annunciate on the fire alarm control panel and on the UL listed fire alarm workstation(s) for the fire alarm system.

D. The existing Telecommunication Rooms have a mix of fire suppression systems that may not align with the current MDOT MAA standards. For rooms that are being revised, expanded, or undergoing major renovation that impacts over 50%

of the existing room floor space or increase the room floor space by over 25% of the existing area, the fire suppression system shall be brought into alignment with the current MDOT MAA standards and in accordance with the direction of the AHJ. In addition, for existing suppression systems that have reached end-of-life and require major refurbishment or replacement, the suppression system shall be brought into alignment with the current MDOT MAA standards and in accordance with the direction of the AHJ.

E. Any existing Telecommunication Rooms that are being renovated that does not current have smoke detection shall be provided with smoke detection as part of the renovation.

3.3 Additional Requirements for Building Entrance Rooms

Each Building Entrance Room (BER) shall meet the requirements as noted in Section 3.2 - Requirements for All Communication Room Types. The following requirements are in addition to previously noted.

3.3.1 Size

A. BERs shall be of sufficient size to accommodate, at a minimum, four 42 Rack-Unit (RU) high by 19 inches wide approved equipment racks. Communication Devices may be housed in open frame racks and on the BER walls as allowed by MDOT MAA DAT
B. Room shall be sized to accommodate required number of racks or cabinets plus space allocated for one additional, future rack or cabinet, plus adequate wall space for any MDOT MAA allowed wall-mounted equipment.

3.3.2 Entry

The single BER entry door shall comply with general requirements and have a minimum size of 36” wide and not less than 80” in height.

3.3.3 Backbone Cabling

High Density Protection Field - A high density protection field shall be required on all copper OSP facilities entering the room when exiting the splice case, the copper cabling shall be routed to a high-density protector frame using stub cables. The protector frame shall be located as close to the entry point as feasible and adjacent to the splice case. Distribution stub cables shall be extended from the protector frame to the main distribution frame.

3.3.4 UPS Power

A. All MAA DAT systems within the BER requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS inverter shall be sized to accommodate growth of the load, with the inverter sized to accommodate the calculated load plus a spare capacity of 100% (inverter shall be sized for double the calculated load). The batteries shall be sized for a run time of 15 minutes, and shall be expandable by adding batteries to provide not less than 15 minutes of run time at maximum inverter loading.
B. BER shall be equipped with UPS units with a minimum size of 1400 VA, but should larger units be required, the UPS may be floor mounted if in excess of 6 KVA.

3.4 Additional Requirements for Data Centers (DC)

Each Data Center Room shall meet the requirements as noted in Section 3.2 - Requirements for All Communication Room Types. The following requirements are in addition to previously noted.

3.4.1 Raised Floor

A. Data Centers shall have raised floor throughout the space.
B. Transitions from finished floor level to raised floor level shall occur outside of the calculated Data Center size requirement.

3.4.2 Size

A. Additionally, Data Centers shall be of sufficient size to accommodate the following minimum, ten 42 Rack-Unit (RU) high by 19 inches wide approved equipment cabinets or racks. All servers shall be housed in free-standing enclosed equipment cabinets. Non-server devices may be housed in open frame racks.
B. Room shall be sized to accommodate required number of racks or cabinets plus space allocated to accommodate additional racks or cabinets. The room shall be sized to provide 20% spare racks or cabinets, but not less than one. For example, a ten rack/cabinet room would be sized to accommodate two additional racks or cabinets, while a twenty rack/cabinet room would be sized to accommodate four additional racks or cabinets. For all DC rooms, the room should be sized to accommodate a minimum of two additional, future racks or cabinets.

3.4.3 Entry

The double Data Center entry door shall comply with general requirements and have a minimum size of 72” wide.

3.4.4 UPS Power

A. Data Centers shall utilize a central UPS system rather than individual rack-mounted UPS devices.
B. All systems requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS inverter shall be sized to accommodate growth of the load, with the inverter sized to accommodate the calculated load plus a spare capacity of 100% (inverter shall be sized for double the calculated load). The batteries shall be sized for a run time of 15 minutes, and shall be expandable by adding batteries to provide not less than 15 minutes of run time at maximum inverter loading.
C. Minimum size of floor mount UPS units shall be 20 kVA.
D. Floor units shall be equipped with a Battery Cabinet and Emergency Bypass Cabinet. Output panel board for UPS power distribution should be in the Data Center.
E. Data Center UPS unit power shall be provided from emergency/generator power sources.

3.4.5 Mechanical

For the Data Centers, in addition to the requirements mentioned previously in the communications room section, a dual/redundant HVAC system shall be provided.

3.4.6 Fire Suppression

A. Data Centers shall be provided with a Special Agent Suppression System that fully complies with NFPA (most current edition). A Clean Agent Fire Extinguishing System releases inert gas or chemicals stored in containers to extinguish detected fires and also includes smoke detection. This system uses no water and leaves little to no residue.
B. A Special Agent Suppression system will also require a separate room to house the system. The Data Center served by the Special Agent Suppression system shall be fire-stopped and sealed per the system requirement. The DCI shall coordinate with MDOT MAA DAT on the need for a Special Agent Suppression system.
C. A Fire Marshal approved monitoring module and smoke detector shall be installed at the location of the Special Agent Suppression Fire Alarm Control Panel for monitoring by the MDOT MAA Fire Alarm System.
D. Data Centers that have existing Suppression Agent Suppression Systems or Communications rooms that will have Clean Agent Fire Extinguishing Systems shall fully comply with NFPA (most current edition). This includes any new work in the rooms impacting sizing requirements and enclosure inspections. Example: running a new conduit, pipe etc. through the space. Smoke/pressure leakage testing in accordance with NFPA Standard for Special Agent Suppression Systems shall be required to check all work and that room sealing integrity has been maintained.

3.5 Additional Requirements for Computer Rooms (CR)

Each Computer Room shall meet the requirements as noted in Section 3.2 - Requirements for All Communication Room Types. The following requirements are in addition to previously noted.

3.5.1 Size

A. CRs shall be of sufficient size to accommodate the following at a minimum, four 42 Rack-Unit (RU) by 19 inches wide approved equipment cabinets or racks. All servers shall be housed in free-standing enclosed equipment cabinets. Non-server devices may be housed in open frame racks.
B. Room shall be sized to accommodate required number of racks or cabinets plus space allocated for one additional, future rack or cabinet.

3.5.2 Entry

The single CR entry door shall comply with general requirements and have a minimum size of 36” wide.

3.5.3 UPS Power

A. All MDOT MAA systems within the Computer Room requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS inverter shall be sized to accommodate growth of the load, with the inverter sized to accommodate the calculated load plus a spare capacity of 100% (inverter shall be sized for double the calculated load). The batteries shall be sized for a run time of 15 minutes, and shall be expandable by adding batteries to provide not less than 15 minutes of run time at maximum inverter loading. If non-MDOT MAA equipment is to be installed in the CR, coordinate if the non-MDOT MAA equipment loads are to be included in the UPS sizing or if an additional UPS is required to be provided by the equipment owner.

B. CRs shall be equipped with rack mount units with a minimum size of 1400 VA.

3.6 Additional Requirements for Telecommunication Rooms (TR)

Each Telecommunication Room shall meet the requirements as noted in Section 3.2 - Requirements for All Communication Room Types. The following requirements are in addition to previously noted.

3.6.1 Location

A. Telecommunication Rooms (TRs) should be located so that all service drops or outlet services cable within the area served by the closet are not in excess of 90 meters in length. The total circuit length shall not exceed 100 meters, which includes station cabling and patch cords at the Communications Room and outlet ends.
B. TRs should be stacked vertically floor-to-floor with connecting sleeves for backbone distribution. If rooms cannot be stacked, then additional pathway and interconnections between the rooms may be required. Coordinate room locations and requirements with DAT.
C. TRs should not be located below restrooms, plumbing chases, kitchen areas, pet relief areas, or other areas that would require supply or wastewater piping to be routed through or above the TR.

3.6.2 Size

A. TRs shall be of sufficient size to accommodate the following at a minimum, two 42 Rack-Unit (RU) by 19 inches wide approved equipment racks.
B. Room shall be sized to accommodate required number of racks plus space allocated for one additional, future rack.

3.6.3 Entry

The single TR entry door shall comply with general requirements and have a minimum size of 36” wide.

3.6.4 UPS Power

A. All systems within the TR requiring A/C power in shall be provided with an uninterruptible power system (UPS). The UPS shall be sized to accommodate calculated load plus 200% with run time of 15 minutes.
B. TR shall be equipped with rack mount units with a minimum size of 1400 VA.

3.7 TSA, CBP, and Other Special Requirement Communication Rooms

In addition to MDOT MAA communication rooms throughout the airport, there are also other communication rooms that may have specific requirements above and beyond the requirements listed above. Government agencies such as the Transportation Security Administration (TSA) and Customs and Border Protection (CBP) have specific requirements for their communication rooms. Refer to the TSA Checkpoint Requirements and Planning Guide (CPRG) (latest version) and Planning Guidelines and Design standards for Checked Baggage Inspection Systems (PGDS CBIS) (latest version) for any additional TSA requirements. Refer to U.S. Customs and Border Protection (CBP) Airport Technical Design Standard (ATDS) (latest version) for any additional CBP requirements. The CBP ATDS is a restricted document that is labeled For Official Use Only (FOUO) and is not available in the public domain. The CBP ATDS document may be requested from CBP for projects that are deemed to require the document and demonstrate a valid “need-to-know.”

3.8 Tenant Demarcation (TD) Requirements

The Tenant Demarcation (TD) is an enclosure that will be placed within or adjacent to a tenant space. The TD is expected to be a cabling interconnection point only and will not contain any active equipment. The TD shall include the following:

A. An enclosure that will be sized per the cabling to be installed, but not less than 24” x 24” x 8” deep. Cabinet shall be provided with a removable back panel to allow mounting of equipment within the enclosure.
B. Cabinet shall be provided with a lock and padlock hasp to allow for the MDOT MAA to secure the cabinet. Coordinate padlock with MDOT MAA DAT.
C. The cabinet shall be mounted in the ceiling or on a wall location as coordinated with MDOT MAA DAT. Cabinet shall be located so that cabinet will remain accessible and be protected from damage. The location shall account for possible changes in tenants.
D. The TD cabinet shall be connected back to the nearest TR or CR and shall provide conduit and cabling. Cabling shall include the following:
    1. Option 1. For Tenant Areas (Airlines, TSA etc.): Conduit size shall be sized with a 40% fill ratio, but not less than 2”, and include the following:
        a) (1) 50 pair Unshielded Twisted Pair (UTP) CAT 3 Copper
        b) (1) 12 strand Single Mode Fiber cable unless specified
        c) (1) RG 11 coaxial cable (refer to 270101-TC)

d) (1) E-page speaker facility (refer to 275116 – Public Address/Emergency Communication System)
e) (1) page shunt trip facility (refer to 275116 – Public Address/Emergency Communication System)
f) (Contact the PDS Administrator for location)

2. Option 2. For Concessions Area: Conduit size shall be sized with a 40% fill ratio and shall include the following:
   a) (2) 4 pair Unshielded Twisted Pair (UTP) CAT 6 Copper Cable
   b) (1) 6 strand Single Mode Fiber cable (unless noted otherwise on the drawings)
   c) (1) RG 11 coaxial cable (refer to 270101-TC)
   d) (1) E-page speaker facility (refer 275116 – Public Address/Emergency Communication System)
   e) (1) E-page shunt trip facility (refer to 275116 – Public Address/Emergency Communication System)
   f) (Contact the PDS Administrator for location)

E. Typical Communication Room layouts have been developed for use by the DCI. See PEGS V6, Appendix 6C.2 Demarcation Cabinets for example configurations. Any deviation from the depicted concepts must be approved in writing by DAT.

3.9 MDOT MAA Communication Room Prohibited Items

MDOT MAA Communication Rooms (including Equipment Closets) are for the exclusive use of MDOT MAA/DAT. No tenant or MDOT MAA contractor is to install equipment, frames, or electronics in these rooms without written permission from DAT.

The following may not be located in, or travel through an MDOT MAA Communication Room.

A. Non-communications electrical distribution equipment, custodial supplies, transformers, or other equipment that is not specific to the room. Additionally, no baggage systems equipment, electrical distribution conduits, or large HVAC ducts or piping unassociated with the communication room shall be allowed to be run through the room.
B. Lightning Protection: Down conductors or grounding components not associated with the communication room grounding shall not be present within the communication room.
C. Equipment: Any Tenant or MDOT MAA hardware, electronic equipment, wiring or racks that have not been approved by DAT.
D. Electronic Noise Emitters: Any equipment that emits EMI/EMF. Certification by the manufacturer shall be required.
E. Water, waste or drain lines: The installation in, through or above the room. In the event approval is sought and granted, DCI shall restrict routing of water, waste water, drain lines. through communications Room(s)and communication rooms may not be located below restrooms or plumbing chase areas. In no event shall the routing of water lines be over electronic equipment or racks.

3.10 Communication Room Drawings

Communication Rooms must be fully and accurately documented from design drawings through the submission of as-built documentation. The drawings shall show all systems within the Communications Room, coordinated with each other and shown on a composite drawing (Coordinated Drawing). The composite drawing will have related elevations, sections and plan views to validate coordination. In addition, the composite drawing shall show all floor and wall penetrations.

Additionally, the composite drawing shall also show at a minimum (2) adjacent rooms in all directions including floor above and floor below and shall show its location on a terminal plan.

4.1 Infrastructure Introduction

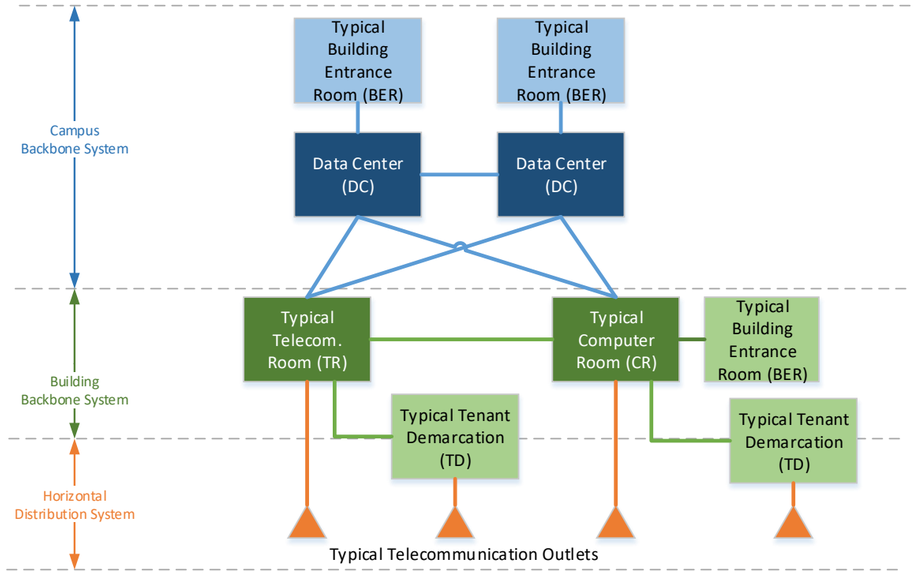
MDOT MAA facilities will be designed based upon the objective of creating and maintaining a modern, secure, and efficient airport environment. Technology has become one of the most valuable business enablers to create such environment, as it permeates every aspect of airport communications, operations, and security. A properly planned technology environment provides reliable systems that reduce costs and provide enhanced services to airlines and passengers as well as operational efficiency and enhanced safety and security. The Structured Cabling System (SCS) provides the infrastructure to accomplish this. The intent is to create and maintain systems that are capable of adapting to change with minimal disruption to the operating facilities. Equipment will be standardized to the greatest extent possible to simplify long term maintenance and operations. The structured cabling system is defined as all components required to provide a complete and end to end cabling infrastructure. The provision shall include all hardware, termination blocks, patch panels, telecommunications outlets, telecommunication cabling, and containment.

Refer to the following specifications for additional information regarding infrastructure requirements

A. 270000 General Requirements for Communication Systems
B. 270526 Grounding and Bonding for Communication Systems
C. 270528 Pathways for Communication Systems
D. 270536 Cable Trays for Communication Systems
E. 270553 Identification
F. 271123 Telecommunications Room Equipment
G. 271300 Backbone Cabling
H. 271400 Outside Plant Cabling
I. 271500 Horizontal Cabling
J. 271600 Telecommunications Station Equipment
K. 272100 Data Communications Network Equipment
L. 275116 Public Address Emergency Communications System

4.2 Infrastructure Configuration Concept

DAT has established the following philosophy as the ideal, strategic configuration for infrastructure connectivity on MDOT MAA properties. The following conceptual diagram provides a high-level understanding of the implementation strategy to be used on future projects. The existing physical configuration should be confirmed with DAT during the design process.



There are two categories of infrastructure backbone systems: The Campus Backbone System and the Building Backbone System. The Campus Backbone System connects a minimum of one Building Entrance Room (BER) to the Data Center (DC). The Campus Backbone System further connects the typical Telecommunication Rooms (TRs) or typical Computer Rooms (CRs) to both of the existing MDOT MAA DCs. The above diagram is logical in nature. The connection to both DCs provides for redundant connectivity that may be achieved via infrastructure that is routed through other existing TRs or CRs rather than dedicated homeruns. (See PEGS V6, Chapter 3.1.1 Definitions for Communication Room definitions.)

The Building Backbone System provides connectivity from CRs to TRs. Additionally, the Building Backbone System provides connectivity to any potential Tenant Demarcations (TDs) and from BERs to TRs or CRs if required.
The purpose of the Horizontal Distribution System is to provide infrastructure to end devices. The connectivity may come from TRs, CRs, or TDs. For additional information on these room types, please see PEGS V6, Chapter 3 Communication Rooms.

4.3 Pathways

Telecommunication pathways provide both routing and protection for telecommunication pathways. Optimal design and installation of these pathways require an understanding of general guidelines as well as specifics associated with underground and indoor conduits, innerducts, cable trays and risers. The following paragraphs in conjunction with the DAT specifications and industry standards provide that guidance for pathways to be installed at MDOT MAA facilities. All DAT pathways shall adhere to the following specification sections:

A. 270526 Grounding and Bonding for Communication Systems
B. 270528 Pathways for Communication Systems
C. 270536 Cable Trays for Communication Systems

4.3.1 General Guidelines

4.3.1.1 Backbone Containment Pathways

Backbone containment pathways (used for Campus and Building Backbone) shall provide cable pathways between locations for the purpose of backbone distribution. Primary and secondary cables to any single destination shall not share containment, not be located within the same corridor or space together and shall follow physically separate pathways to the greatest extent possible. Entry into a communication room shall be in two diverse locations with a minimum separation of 6’-0” as room layout allows. The cable shall be routed to maintain the separation as cable trays and conduits allow until routed into an equipment cabinet or rack for the purpose of final termination. Within a cabinet or rack, primary and secondary cables shall route on opposing sides. Typically, backbone pathways will carry larger diameter cables and particular care to minimum bend radii and containment transitions must be observed during final detailed design. All containment must provide adequate support for routed cables and must have facility for bundles of cables to be secured at regular intervals. Backbone containment pathways are recommended to be routed in conduit. If backbone is routed in cable tray, innerduct or armored cabling is required.

4.3.1.2 Distribution Containment Pathways

Distribution containment pathways are required to provide continuing containment routes from primary containment pathways to final data outlet locations. Distribution containment pathways are typically tertiary containment consisting of cable tray, conduit drops, and flexible conduit links.

4.3.1.3 Separation of Services

The infrastructure containment system shall be designed such that power and data cable separation fully complies with minimum requirements of applicable codes, industry standards referenced in this document, and manufacturer installation guidelines. Data cabling shall be separated from power cables and RF inductive loop/leaky feeder types of cable to avoid the possible effects of RFI and EMI. As a minimum, the distances which shall be maintained for separation of services are shown in Table 4.3-1, Separation Requirements.

Separation Requirements Between Power and Data Cabling	
Cable Rating – Load Volts/ Amps	**Minimum Separation Distances**
240V – 15A	12” (0.35m)
415V – 50A	24” (0.58m)
415V – 500A	36” (1.0m)
11,000V – 500A	60” (1.4m)

Table 4.3-1, Separation Requirements

Where the necessary cable separation distances cannot be maintained, all efforts shall be made to identify an alternative route. If there are no options available, then as a last resort the use of metallic conduits shall be adopted. All variances from minimum separation alternatives must be approved in writing by DAT.

4.3.1.4 Redundancy Separation Requirements

Physically separate backbone routes shall be maintained in the buildings to ensure cables designed to provide resilient connectivity are not routed on the same containment. Primary and secondary routes between any two locations shall maintain a minimum physical separation of 10 feet at wherever possible outside of communication rooms. When not feasible, the DCI shall seek written DAT approval of alternatives maintaining the maximum separation distance possible. When routing backbone cabling into a communication room or an equipment cabinet for the purpose of final termination, primary and secondary cables shall be terminated in separate racks or cabinets when possible. If not possible, then within a single rack or cabinet, primary and secondary cables shall route on opposing sides.

4.3.1.5 Pathway Fill Ratios

A. Communication conduit containment routes shall have a maximum cable fill ratio of 40% (for three cables and over), otherwise 31% for two cables and 53% for one cable shall apply for instances when innerduct is not used. The conduit fill and the use of long radius conduit fittings or bands this shall assist in maintaining minimum bend radii of cables.

B. Useable cable tray capacity is noted as being when the total cable cross sectional areas reach 50% of the tray fill area.
   1. New installations shall comply with fill requirements noted in Specification 27536 Cable Trays for Communication Systems, Part 3, Section 3.2.
   2. DCI to confirm current fill of all existing MDOT MAA cable trays intended for use. The additional cables to be install in existing MDOT MAA cable trays shall not cause the filled to beyond 40% of the usable capacity per the NEC fill ratio and per manufacturer recommendation/guidelines. Use of existing cable tray beyond 40% of useable capacity shall be approved in writing by MDOT MAA DAT.

4.3.1.6 Bend Radii

Minimum bend radii shall be as specified by applicable standards, or as shown in the table below. Additional consideration in defining bend radius requirements of the pathway is the minimum requirement as noted by the cabling manufacturer of cables to be routed within the pathway. At no time may the minimum radii be less than the allowable radii specified by the cable manufacturers.
Provide only long bend conduit sweeps or bends to facilitate the cable bending radius as noted below.

Communication Conduit Minimum Bend Radius Requirements		
Media	**Type / Location of Bend**	**Minimum Requirement**
Copper	Minimum bending radius for pulling during installation	8 times outer cable diameter

	Minimum bending radius installed	4 times outer cable diameter
Fiber	Minimum bending radius for pulling during installation	20 times outer cable diameter
	Minimum bending radius installed	10 times outer cable diameter

Table 4.3-2, Minimum Bend Radii

4.3.1.7 Fire Stopping

All locations where DAT containment passes through rated wall openings, fire separation barriers or fire compartments shall be fire stopped with an approved fire rated assembly/system in accordance with the building's applicable code(s). Only provide fire stop materials approved by the Authority Having Jurisdiction (AHJ) and the cable manufacturer shall be used. The material shall enable addition of further cables to routes in the future with only minor rework required to restore the fire rating of the penetrated barrier. DCI shall confirm all fire stopping meets or exceeds requirements noted in the PEGS firestopping guidelines and specifications.

Typical penetration details can be found in PEGS V6, Appendix 6C.4 Containment Penetrations. Any deviation from the depicted concepts must be approved in writing by DAT.

4.3.1.8 Grounding and Bonding

DAT containment must meet all requirements for grounding and bonding as noted in Specification 270526 Grounding and Bonding for Communication Systems and elsewhere in this document. Grounding or Earthing is a conducting connection, whether intentional or incidental, by which an electric circuit or equipment is connected to earth, or to some conducting body of relatively large extent that serves in place of the earth. Bonding is defined as the permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to conduct safely any current likely to be imposed. For Communication Systems, grounding and bonding is intended to provide not only the traditional life safety purposes, but also to provide protection for the DAT equipment to prevent damage due to surges or other differences in potential that could damage or interfere with the operation of the DAT equipment.

Typical busbars and schematic details can be found in PEGS V6, Appendix 6C.6 Grounding. Any deviation from the depicted concepts must be approved in writing by DAT.

4.3.2 Underground Pathways

Underground pathways require special considerations during design due to the additional cost and time required for installation. All underground pathways shall be designed for future growth and minimized disruption for future cabling changes. Additionally, the following factors shall be considered when designing an underground pathway system.

4.3.2.1 General Underground Considerations

A. Cable size, length, weight, and quantity of cables installed in each pathway.
B. Impact on airport operations during installation and future maintenance.

4.3.2.2 Underground Conduit Considerations

A. The overall length of the raceway from source to destination
B. The length of raceway between pulling points
C. The quantity of bends and offsets between pulling points to ensure no more than 180 degrees of deflection between pull points
D. The maximum pulling tension recommended by the cable manufacturer
E. The minimum bend radius recommended by the cable manufacturer
F. The minimum depth raceway shall be installed under runways, taxiways, apron areas, roadways, walkways, etc.
G. Location, size, and quantity of manholes/handholes
H. Protection of the raceway system
I. Provide concrete encasement for all underground conduits as coordinated with DAT and designed in accordance with project civil engineer
J. Manholes shall be rated to accommodate vehicle traffic with the vehicle types as expected in the installation location. Manholes should be designed to accommodate vehicle traffic based upon potential roadway, taxiway, or apron expansions or widening that may route traffic differently in the future.

4.3.3 Indoor Conduit and Innerducts

4.3.3.1 System Use

A. All Life Safety and Public Safety infrastructure (Copper and Fiber) shall be installed in conduit unless approved by DAT and the Authority Having Jurisdiction (AHJ). Termination point(s) will be specified by the DAT.
B. All Airport Security System device cabling shall be installed in conduit. See Division 28 Specifications for additional information.

4.3.3.2 Conduit Pathway Type Use

A. Indoors:
Apply pathway products as specified below unless otherwise indicated.
1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include the following:
    a. Mechanical, electrical, and utility rooms.
    b. Loading dock.
    c. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    d. Baggage handling areas.
    e. Exposed conduits that are below 8’-0” AFF.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Retrofit in Existing Wall Construction: Flexible conduit, maximum 10’ length
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric-Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: IMC.
7. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: EMT or Plenum-type optical fiber cable pathway in innerduct within cable tray.
8. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: EMT or Riser-type optical-fiber-cable pathway in cable tray.
9. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: EMT or General-use optical-fiber-cable pathway in cable tray.
10. Boxes and Enclosures: NEMA 250 Type 1, except use NEMA 250 Type 4 stainless steel in commercial kitchens, non-conditioned spaces, and damp or wet locations.

B. Outdoors
Apply pathway products as specified below unless otherwise indicated.
1. Exposed Conduit: PVC coated GRC or painted GRC.
2. Concealed Conduit, Aboveground: GRC, IMC, EMT, RNC, Type EPC-40-PVC.
3. Underground Conduit: RNC, Type EPC-40-PVC. All underground conduits shall be concrete encased unless requirement is waived in writing by MDOT MAA DAT. Coordinate with MDOT MAA DAT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures Above Ground
6. Housing Active Equipment: NEMA 250 Type 4 (IP66).
7. Housing ONLY Passive Equipment: NEMA 250 Type 3R.

C. Pathway Fittings
Compatible with pathways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10. Only long sweep conduits shall be allowed.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use compression, cast-metal fittings. Comply with NEMA FB 2.10.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric-Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.

4.3.3.3 Conduit Size Use

A. Conduits install in MDOT MAA facility space shall be a minimum of 1” diameter.
B. Conduits install in dedicated tenant space shall be a minimum of 1” diameter if more than one cable is to be installed.

4.3.3.4 Innerduct

A. All ISP innerduct must be plenum rated within a plenum ceiling. PVC innerduct will be approved provided the conduit path is continuous end to end via junction boxes, and that it does not enter the plenum ceiling.

B. When providing new conduit exceeding (2) two inch (duct bank or single duct), the contractor shall provide innerduct in the conduit. The purpose of the innerduct is to allow future use of the duct system.
C. Minimum number and size of innerduct to conduit size shall be:
    1. 2-inch conduit but less than 4-inch conduit, provide fabric type innerduct
    2. 4-inch Conduit, provide (3) 1 1/4-inch wall innerduct
    3. For conduits over 4". coordinate innerduct sizes and quantities with MDOT MAA DAT.
D. All conduits including innerduct shall be provided with a combination conduit measuring / pull tape installed in all empty innerducts. The tape shall include foot graduation markings to allow for the contractor to determine the length of the conduit run in the future. Pull tape selection to be based on the application and maximum tension required for cable to be pulled.
E. No fabric innerduct shall be allowed in conduits under 2-inch, 4-inch and over, or in tray without a variance from MDOT MAA DAT.
F. Provide a trace wire in all innerducts that are direct buried and carry fiber, or otherwise would need to be traced or located.

4.3.4 Cable Trays

The use of cable trays for cable containment may be used in MDOT MAA facilities. All components must meet the requirements as noted in the associated MDOT MAA DAT Specification 270536.

Typical cable tray installation details can be found in PEGS V6, Appendix 6C.3 Cable Tray Installation. Any deviation from the depicted concepts must be approved in writing by DAT.

4.3.4.1 Existing Cable Trays

Locations and use of existing cable trays shall be coordinated with DAT via the MDOT MAA Project Manager. Cable trays identified for potential use will be reviewed in conjunction with the proposed cable quantities, type, and purpose to ensure alignment with MDOT MAA requirements. The review shall include documentation of the existing cable tray capacity and loading for the sections proposed to be used.

4.3.4.1 New Cable Trays

New cable tray routes may be provided for cable containment. All new cable trays shall be ladder style with two I-beam side rails and transverse rungs. Material and minimum size requirement may be found in the DAT specification. DCI is responsible for coordinating location of cable tray with other trades prior to installation. Selected routing must allow for accessibility to add or remove cables. At no point shall cable tray be routed above hard ceiling, ductwork, conveyors or other items for a distance of greater than 10'. DCI shall transition to conduits having an equal usable capacity as the cable tray to be routed through the conduits for inaccessible distances, accounting for the allowable fill ratios of the conduits.

4.3.5 Risers

The infrastructure riser strategy is critical to ensure that telecommunication cable routing can be achieved between floors to support horizontal distribution cable length limitations. Within defined riser spaces, the use of vertical cable tray, conduit, and conduit sleeves may be used to provide riser containment. All components must meet the requirements as noted in the associated MDOT MAA DAT specification.

4.3.5.1 Existing Risers

Locations and use of existing infrastructure risers should be coordinated with DAT via the MDOT MAA Project Manager. The coordination shall include the documentation of the existing riser at that location by the contractor, the existing fill, the proposed riser to be utilized, and the cabling proposed to be added as part of that project.

4.3.5.2 New Construction Risers

Dedicated primary communication system risers are required to be positioned to allow free access from building areas accessible by DAT staff or contractors without closing or impacting passenger circulation areas. Riser locations are required at building cores to ensure coverage can be achieved and to ensure adequate resilient routes are available for backbone cabling.

Primary communication system risers shall form continuous vertical routes through the building where CRs or TRs are stacked. Riser sizing shall be based on providing a minimum 2 x 24" wide cable trays. Alternatively, the DCI may use conduits sized to provide the same useable capacity as the noted cable tray. Expansion within the route shall be possible through the provision of cable trays to the side walls. Sizing of final tray requirements will be required during detailed scheme design phase. Communication system riser containment will be required to provide a single continuous cabling route for the full height of the riser route. All communication system riser containment shall provide support to cables for the entire route and shall provide the capability and suitable access for cables to be secured at regular intervals for the entire duration of the riser route.

Secondary communication system risers will provide connection from each CR or TD Room to the redundant infrastructure serving the area. Secondary risers will be circular sleeved core drilled or precast sleeve penetrations. Final positions will be determined during detailed design phases to ensure that routes are created in usable positions in relation to architectural features and fit out plans. The minimum penetration size for a secondary riser will be a 4" circular core, each core will have a maximum fill ratio of 40%.

4.4 Cabling

4.4.1 Backbone Cabling

The Backbone Cable System in a building is the part of the premises distribution system that provides connection between equipment rooms, telecommunication rooms, and telecommunications service entrance facilities. The backbone subsystem provides either indoor (intra-building) connections between floors in multi-story buildings or outdoor (inter-building) connections in campus-like environments.

4.4.1.1 General Backbone Communication Cabling

All backbone copper and fiber cabling shall be installed in conduit. Conduit shall be properly sized for quantity and type of cabling. Fiber shall be installed within conduit and the proper rated innerduct.

Splicing of fiber optic cables is not allowed without written pre-approval from DAT.

4.4.1.2 Indoor Backbone Cabling

Indoor backbone cabling is comprised on high pair count copper cabling and fiber optic cabling. All backbone cabling shall meet the requirements as noted in Specification 271300 Backbone Cabling. Following are the general requirements.

A. Single Mode Fiber Optic Minimum fiber count 24 strands, Terminated with SC connector.
B. Multi-Mode Fiber Optic cable requires permission by DAT for use. When approved, minimum fiber count 12 strands, terminated with ST connector.
C. Copper feeder cable: Minimum copper count 100 pair, CAT 3

Note: When redundant and diverse pathways are used, half the pair/strand count shall be in each of the pathways to the communications room as noted above. For example, if 24 strands are to be routed to a specific communication room, 12 strands would be routed through each redundant pathway, providing the full complement of 24 strands.

4.4.1.3 Outdoor Backbone Cabling

Outdoor backbone cabling shall be required to be Outside Plant (OSP) rated when working outside the perimeter of conditioned air facilities. All outdoor cabling, copper and fiber optic, shall meet the requirements as noted in Specification 271400 Outside Plant Cabling as well as Specification 271300 Backbone Cabling.

A. High Density Protection Field – Surge Protection for Copper Cable
   All terminations of Outside Plant (OSP) shall be provided with DAT approved protection fields at both ends of the cable and shall be required on all OSP facilities entering the room when exiting the splice case, the copper cabling shall be routed to a high-density protector frame using stub cables. The protector frame shall be located as close to the entry point as feasible and adjacent to the splice case. Distribution stub cables shall be extended from the protector frame to the main distribution frame.

B. Cable Shield
   Copper cable end-to-end continuity isolated from ground; no connection to ground shall be present. No shield or grounding is required on backbone fiber.

C. Splice Enclosures
   Splicing of Fiber Optic Cables is not allowed without pre-approval from DAT. Upon approval, DCI shall use splicing enclosures that are re-enterable and filled with re-enterable flooding compound.

D. Installation
   All OSP conduits shall be generally buried to a minimum depth of 48” unless approved by DAT Engineer. Final design to be in conjunction with the project civil engineer. NOTE: Any conduits within a roadway easement or within 15’ of an existing roadway shall be buried at a minimum depth of not less than 60”.

E. Unlisted Cables
   All unlisted, outdoor cables must be transitioned to equivalent cables rated for use in the install environment within 50’ of the point of entrance into an MAA building. All cable use and transitions must align with NEC Article 770, 800, 820, and 830.

4.4.2 Horizontal Cabling

MDOT MAA DAT horizontal cabling is comprised of the following items.

A. Copper UTP Cable
B. Fiber Cable
C. Low Voltage Cabling

D. Coaxial Cabling
E. Audio Visual (AV) Cabling
F. Faceplates and Modular Jacks

All installed distribution cabling shall meet all requirements as noted in Specification 271500 Horizontal Cabling. Additionally, distribution cabling used in non-conditioned spaces will need to meet the requirements of Specification 271400 Outside Plant Cabling.

Data outlet sample schedules, mounting heights, and faceplate configuration typical details can be found in PEGS V6, Appendix 6C.5 Data Outlets. Any deviation from the depicted concepts must be approved in writing by DAT.

4.4.2.1 MDOT MAA Space Installation Configurations

The following requirements are specific to all MDOT MAA spaces within MDOT MAA facilities.

A. Cabling - All cabling shall be routed in conduit or cable tray. The use of J-Hooks is not allowed unless approved in writing by DAT. Copper UTP cabling horizontal distribution cables shall be bundled in groups of no more than 24 cables to avoid potential performance degradation. Do not mix fiber optic, low voltage, coaxial, or AV cabling with the copper UTP cabling; maintain segregation.
B. Work Area Outlets – A modular four port faceplate with four copper UTP cables shall be provided at each designated location. Coordinate with DAT for approval to use of lower quantities of outlets within low demand spaces.
C. Telephone Outlets – A single, flush mount modular faceplate with one UTP cable shall be provided at each designated location.
D. Furniture Faceplate – A minimum of a modular, two port faceplate with two UTP copper cables shall be provided at each designated location.

4.4.2.2 Non-MDOT MAA Space Installation Configurations

Upon written approval of DAT, installation configurations for non-MDOT MAA, dedicated use spaces may be allowed to use Airline specific specifications and requirements. Coordinate with DAT for approval. The following information will be required for review.

A. Project Name
B. Airline Identification
C. Drawing depicting spaces considered to be non-MDOT MAA use locations
D. Airline specifications and requirements to be used within the spaces.

4.4.2.3 Preferred Mounting Methods

Flush, wall-mounted devices shall be the preferred installation method for communications outlets. All wall-mounted communication outlets shall be recessed in the wall and terminate in a device box and have a device wall plate. Floor-mounted outlets and penetrations shall be avoided. Conduit stub out is not required and preferred NOT to be used to accommodate future move, add, change work.

4.4.2.4Abandoned Facilities

All abandoned communications facilities shall be removed, per NEC and NFPA, back to the source unless specifically approved by the DAT and AHJ.

4.4.3 Tenant Provided Fiber Optic Cabling

Tenant installed fiber shall be not less than 12 strands and meet all requirements per Specification 271500 Horizontal Cabling. All installed tenant fiber shall be installed as to “Touch” MDOT MAA communications rooms. “Touch” requires the cabling to have coordinated (with DAT) entry into an MDOT MAA TR or CR and land on a tenant provided patch panel located in an approved rack position. Upon departure of the tenant from the physical location the tenant installed fiber becomes the property of MDOT MAA DAT at no charge for use by subsequent tenants or the MDOT MAA.

4.5 DAT Power for End Devices

Ease of power availability to support devices is critical to the operation. Therefore, following are general power requirements to be coordinated with the electrical DCI. All electrical installations must adhere to MDOT MAA Guidelines, the National Electrical Code, and specifications associated with the electrical trade. It is the responsibility of the DAT DCI to ensure coordination.

A. Commercial power (dedicated 20A/120V circuit) shall be provided to the Communication Rooms as follows:
   1. General use receptables: Provide duplex convenience / housekeeping receptacles on each wall at 16” AFF height for general maintenance purposes. The convenience / housekeeping receptacles shall be provided on a separate circuit to allow use of maintenance equipment without impacting the dedicated equipment circuits. General receptacles shall be placed on each wall of the communication room, with larger rooms having receptacles every 10’ if wall is longer than 15’. Loading shall be per NEC guidelines. The receptacles shall be accessible at all times and not be blocked by racks, cabinets or other equipment.
   2. Equipment Receptacles: Provide receptables at heights as needed for specific wall mounted equipment. Coordinate receptacle type with the wall-mounted equipment provider. Wall mounted equipment shall be provided with dedicated circuits to serve each piece or type of equipment unless otherwise allowed by MDOT MAA DAT.

3. Provide outlet(s) at each equipment rack/cabinet as shown on the plans. Rack/cabinet receptacles shall be dedicated circuits unless otherwise allowed by MDOT MAA DAT. Provide Emergency Power (if available), UPS power (if available), or commercial power as noted on the plans. Provide the outlet type and mounting per the plans and in coordination with any provided UPS units or PDUs.

B. Back-up Power Sources
   1. UPS Power - Outlets noted as requiring backup power located where no generator power is available shall be connected a power source providing five minutes of UPS power based upon the calculated loading of the UPS for the expected equipment to be implemented in the design area.
   2. Generator Power - Outlets noted as requiring backup power where generator back-up power is available shall be connected a power source providing 15 minutes of back-up power based upon the calculated loading of the UPS for the expected equipment to be implemented in the design area.
   3. UPS units shall be designed so that the calculated loading does not exceed 50% of the inverter capacity upon completion of the project, and the battery backup time shall be not less than the times noted above. The UPS shall be able to have additional batteries added to extend the run time to achieve the run times noted above at up to 80% maximum loading of the inverter.

C. A duplex 20A/120V UPS receptacle shall be installed adjacent to workstation communication faceplates to support MDOT MAA IT PC's and associated hardware is required. If centralized UPS power is available and provided, the receptacle shall align with the color requirements noted in PEGS 11.4.3 Receptacles and shall be associated with UPS support. In the event that UPS power is not available, DCI shall coordinate requirement with DAT and electrical DCI.
   1. Modular furniture power outlets maybe exempt from the outlet color requirement. Industry approved marking may be used.
   2. NOTE: There shall be (1) duplex 20A/120V UPS receptacle next to every installed communications outlet (copper) (if centralized UPS power is available).

D. All MDOT MAA networked printers shall have a 20/120 VAC outlet protected by individual surge suppression device installed instead of a "standard outlet."

E. For areas with MDOT MAA IT PC's that do not have a centralized UPS available or where a centralized UPS is not provided as part of the project, provide emergency power outlets and provide individual UPS units to support each workstation location.

5.1 Local Area Network (LAN)

The MDOT MAA DAT Local Area Network (LAN) fault tolerant TCP/IP Ethernet network providing connectivity between each connected end device and servers, storage devices, and internet services. The LAN is converged to support voice, data and video.

5.1.1 Network Equipment

MDOT MAA LAN active components are comprised of Cisco devices managed by DAT personnel. The procurement of LAN equipment for projects has been problematic due to the constant evolution of technology. Depending upon the duration of a project, the network equipment models specified during the design may not be available, may be outdated, or may be at end-of-life by the time the project is completed. To prevent the provision of equipment that is not the current MAA DAT standard, the following needs to occur as part of the design:

At the approximately 70% design level, the engineer/designer shall coordinate the LAN requirements with DAT. For the coordination, the engineer/designer shall have determined the quantity of network ports to be provided as part of the project, the quantity that are expected to be active at the outset of the project, the breakdown of drops that will connect to the MDOT MAA LAN versus the MDOT MAA Security LAN in each communication room, and the expected maximum bandwidth for each communication room.

Based upon the data noted above at that stage of the design, MDOT MAA DAT will meet with the engineer/designer and determine the expected quantity and port count of switches in each communication room as well as determining the expected uplink bandwidth requirements. Based upon the review, DAT will assist the engineer/designer in providing a budget for the LAN equipment that will need to be provided for the project.

As the project reaches 95% design, the engineer/designer will need to review the current design and meet with DAT to update the budget based on the current project design. MDOT MAA DAT will provide a final budget to be carried as a line item in the bid. The line item shall include escalation for DCI Overhead and Profit. If the bid of the project is delayed for over three months, the budget line item may need to be escalated to account for inflation or pricing changes, or may need to be reconfirmed with MDOT MAA DAT.

The exact model numbers for the LAN equipment will not be provided in the MDOT MAA PEGS specifications. Instead, the DCI will be directed to coordinate the exact model numbers to be provided with DAT a minimum of three (3) months prior to the LAN equipment needing to be installed, with the three months including a minimum of three weeks for DAT to program and configure the switches. The intent is that the LAN switch models will be defined, and the switches procured as late as possible in the project to ensure that up-to-date equipment is provided. Refer to PEGS V6, Appendix 6B Standard Specifications for additional information.

5.1.1.1 Use of Existing Equipment

If the design proposes to use spare capacity on existing network switches, the use of the spare capacity must be coordinated with DAT. The use of spare capacity is solely at the discretion of DAT, and if not allowed, the provision of additional network equipment will be required.

5.1.1.2 Additional Equipment

Provision of additional active network equipment to be coordinated with DAT. Equipment procured by DCI shall be the current approved model as identified by DAT. Coordination of procurement with DAT may allow use of State contracts for purchase at reduced cost.

5.1.1.3 Addition of Equipment to an Existing Switch Stack or creating a switch stack

If existing switches or existing switch stacks are currently in place in the communication room(s) to be used for a project, it may be necessary to expand an existing stack or create a stack with an existing switch. The engineer/designer shall document any existing switches or switch stacks in the existing communication rooms and then coordinate with DAT for the approach to adding switches. If a stack is to be expanded, the engineer/designer shall specify and include any interconnect cables and uplink modules as required to expand or create a switch stack as part of the design.

5.1.2 Configuration and Installation

All active network equipment shall be delivered to DAT for configuration and setup. DAT will provide the programming and configuration of the equipment and notify the contractor that the equipment is ready for installation. The DCI shall pick up the equipment from DAT and install the equipment in the designated communication room. Coordination of equipment delivery to meet project deadlines is the responsibility of the DCI.

5.1.3 Network Connectivity

ONLY THE OFFICE OF TECHNOLOGY shall make final patching connections or connect circuits to live communications system(s). DCI to coordinate connectivity requirements and schedule with DCI.

5.2 MDOT MAA Wireless Data Network (WDN)

The MDOT MAA Wireless Data Network (WDN) is used to provide operational wireless access to the MDOT MAA LAN and internet services. DCI shall coordinate expansion or revision of the system with DAT. Specific system technology (802.11ac/ax) and frequencies (2.4 & 5.0 GHz) as well as performance requirements including signal strength, signal-to-noise ratio, and co-channel interference for the system will be defined based upon the intended use. The requirement for any pre-installation/design modelling will also be determined at that time.

5.3 Other Networks / Public Services

There are a number of existing service providers operating at BWI Marshall. Services offered include public Wi-Fi, cable/digital television, telephony, and internet connectivity. All facility expansions or revisions that impact public, airline, or tenant spaces will now require coordination with the entities occupying the space and a single service provider, SmartCity Wireless Solutions of BWI Marshall. The MDOT MAA has entered into a 15-year agreement with SmartCity Wireless Solutions of BWI Marshall to provide contracted technology services to airlines and tenants at BWI Marshall. SmartCity Wireless Solutions is a team of technology companies providing the systems. Included in the team are:

A. Slice Wireless
B. AT&T: Cellular DAS (digital antenna system),
C. Juniper Networks-owned Mist: AI-enabled Wi-Fi and Virtual Bluetooth Beacon technology,
D. Clear Channel: video, secure sponsors and advertisers,
E. NGEN: local network management support, and
F. Moon Lighting Electrical Service: installation of the physical infrastructure to support the public services.

Additional information regarding the transition to SmartCity Wireless from existing service providers may be obtained from the MDOT MAA Office of Commercial Management.

5.3.1 Public Wi-fi

SmartCity Wireless will design, furnish, install, operate and maintain a high-speed, free public Wi-Fi system throughout BWI Marshall Airport, including the passenger terminal, select areas within parking facilities and the rental car facility.

5.3.2 Distributed Antenna System

SmartCity Wireless has installed and operates a distributed antenna system throughout the passenger terminal. The system was implemented to boost cellular connectivity to the MDOT MAA, tenants, and travelling public.

5.3.3 Tenant/Airline Telephone Service

SmartCity Wireless will provide airlines and tenants VoIP phone service via a contracted agreement between the provider and the airlines or tenants.

5.3.4 Cable/Digital Television Service

SmartCity Wireless will provide cable or digital television programming through ClearChannel or other partners within public spaces of the airport for airline or tenant use upon a contracted agreement between the provider and the airlines or tenants.

5.4 Storage Area Network (SAN)

MDOT MAA DAT operates and manages a system of redundant Storage Area Network (SAN) equipment. Expansion of systems utilizing the SAN must be coordinated with DAT to ensure sufficient capacity to meet storage requirements. DCI shall coordinate number of devices and required storage space with DAT. If it is determined that there is not sufficient capacity to accommodate the request, the project introducing the additional requirements must notify the MDOT MAA Project Manager to coordinate storage expansion to support the need.

6.1 Workstation Deployment

Workstations provide access to systems and applications required for operations at MDOT MAA facilities. Workstations are defined as desktop computers, laptop computers, or tablets. DCI to coordinate device requirements with DAT prior to purchase. All devices to be connected to MDOT MAA networks must be configured by DAT prior to installation. New workstations shall be delivered to DAT for configuration and setup. After configuration is completed, the workstation will be returned to the DCI for installation and use. Coordination of equipment delivery to meet project deadlines is the responsibility of the DCI.

6.2 Printer and Copier Deployment

While ease of access to electronic documents has reduced the need for hardcopies, the use and availability of printers and copiers is still necessary. The DCI shall coordinate the requirements for additional printers or copiers with DAT prior to purchase or lease. This coordination will ensure standardization of manufacturers and models reducing spare and supply requirements and simplifying support. Ownership of lease and/or maintenance agreements associated with printers and copiers shall also be coordinated with DAT.

Similar to workstations, prior to installation, all devices to be connected to MDOT MAA networks must be coordinated with DAT for connectivity. Coordination of equipment connectivity to meet project deadlines is the responsibility of the DCI.

6A.1 Forms

Approved Product Request Form (.docx, 1 page)

Click the image to download the document in Microsoft Word format.

APPROVED PRODUCT REQUEST

All products submitted for consideration for inclusion into the OT standards may require testing by the OT. All costs associated with testing and field visits if required shall be the responsibility of the vendor.

Name: _____ Date: _____

Company: _____ Tel. No.: _____

1. Purpose of Request.

2. Justification for request (include discussion of design impact; code interpretation; budget increase/decrease; and other relevant facts).
   (Attach additional sheets as needed)

3. Design and Construction Cost impact if approved: $_____

BELOW THIS LINE IF FOR INTERNAL USE ONLY

A. Fire Marshal Comments. (if applicable)

B. ☐ Product approved as submitted.
   ☐ Product approved with comments incorporated.
   ☐ Product denied. *(OT shall not be required to provide detailed information pertaining to denial)*

_____ _____ _____ Yes _____No
Dwayne Abrams Date
Administrator
Premise Distribution System

_____ _____ _____ Yes _____No
Steven Ricks Date
Administrator
Telecommunication Systems

Change Request (.docx, 1 page)

Click the image to download the document in Microsoft Word format.

OT STANDARDS CHANGE REQUEST

Name:_____ Date: _____

Company: Tel. No.:

Date/Revision No. of Standard: _____

1. Section/paragraph to be changed:

2. Justification for change (site technical and code issues):
   (Attach additional sheets as needed)

BELOW THIS LINE IF FOR INTERNAL USE ONLY

CHANGE APPROVAL

_____ _____ Yes No
Mr. Dwayne Abrams
PDS Administrator
Date

Request for Variance (.docx, 1 page)

Click the image to download the document in Microsoft Word format.

REQUEST FOR VARIANCE TO OT STANDARDS

NOTE: This Request for Variance is applicable to this specific project only.

Name:_____ Date: _____

Company: Tel. No.:

Project Name: _____ MAA Contract No.: _____

1. Purpose of Variance Request.
2. Related Code References:
3. Justification for Variance (include discussion of design impact; code interpretation; budget increase/decrease; and other relevant facts).
   (Attach additional sheets as needed)
4. Design and Construction Cost impact if approved: $_____
5. Approval/Disapproval date of this request is required by: _____
   (Allow minimum 3 weeks.)

BELOW THIS LINE IF FOR INTERNAL USE ONLY

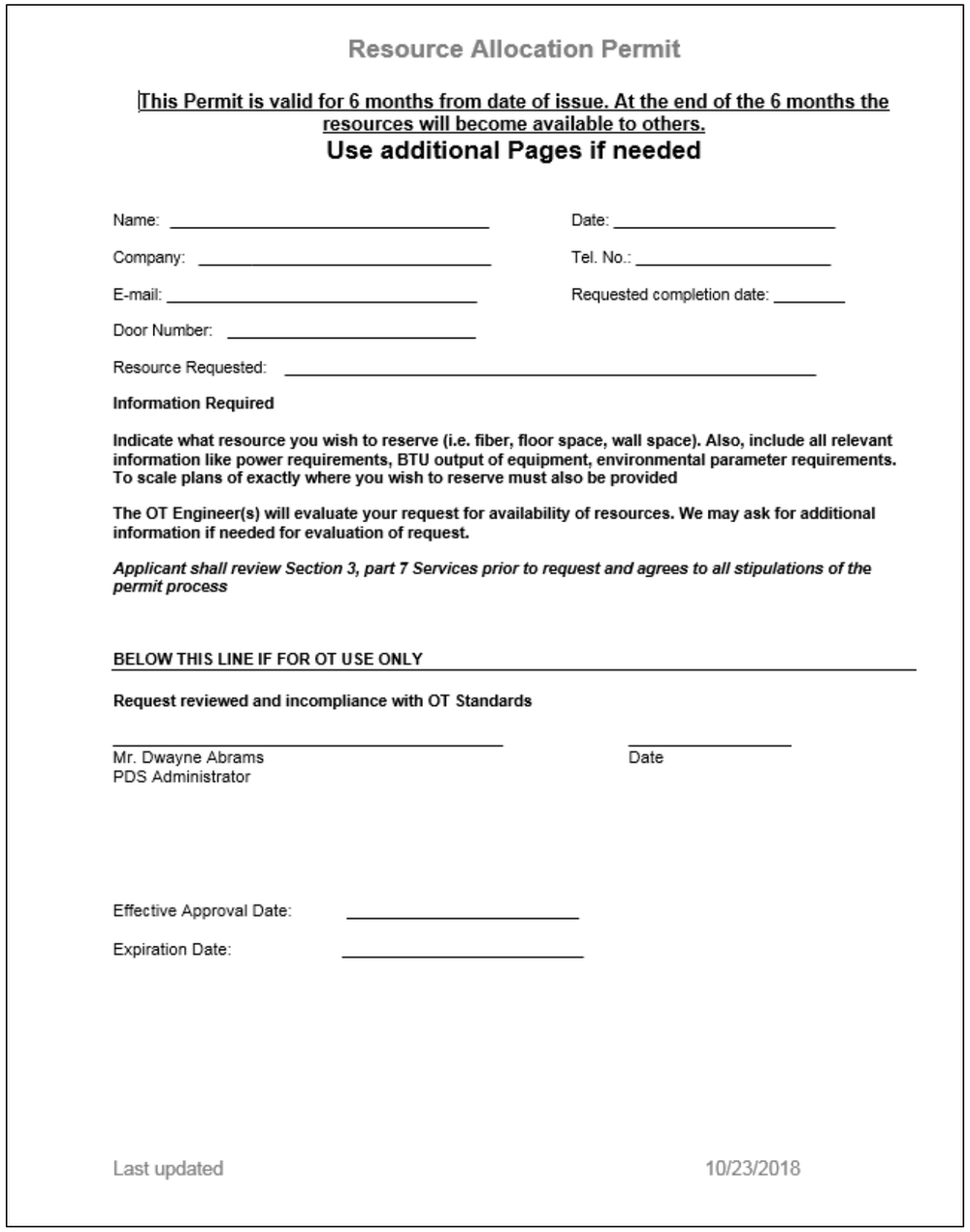
A. Fire Marshal Comments. (if applicable)

B.
- ☐ Variance approved as submitted.
- ☐ Variance approved with comments incorporated.
- ☐ Variance denied.

_____ _____ _____ Yes _____No
Dwayne Abrams Date
Administrator
Premise Distribution System

Resource Allocation Permit (.docx, 1 page)

Click the image to download the document in Microsoft Word format.



Resource Allocation Permit

This Permit is valid for 6 months from date of issue. At the end of the 6 months the resources will become available to others.

Use additional Pages if needed

Name: _____ Date: _____

Company: _____ Tel. No.: _____

E-mail: _____ Requested completion date: _____

Door Number: _____

Resource Requested: _____

Information Required

Indicate what resource you wish to reserve (i.e. fiber, floor space, wall space). Also, include all relevant information like power requirements, BTU output of equipment, environmental parameter requirements. To scale plans of exactly where you wish to reserve must also be provided

The OT Engineer(s) will evaluate your request for availability of resources. We may ask for additional information if needed for evaluation of request.

Applicant shall review Section 3, part 7 Services prior to request and agrees to all stipulations of the permit process

BELOW THIS LINE IF FOR OT USE ONLY

Request reviewed and incompliance with OT Standards

_____ _____

Mr. Dwayne Abrams
PDS Administrator

Date

Effective Approval Date: _____

Expiration Date: _____

Last updated 10/23/2018

6B.27 Division 27 - Communications (MAA Office of Technology Standards and Specifications)

Click the following links to download the individual specifications in Microsoft Word format.

270000 General Requirements for Communication Systems

270101-TC COMCAST Service Provider

270526 Grounding and Bonding for Communication Systems

270528 Pathways for Communication Systems

270536 Cable Trays for Communication Systems

270553 Identification

271123 Telecommunication Room Equipment

271300 Backbone Cabling

271400 Outside Plant Cabling

271500 Horizontal Cabling

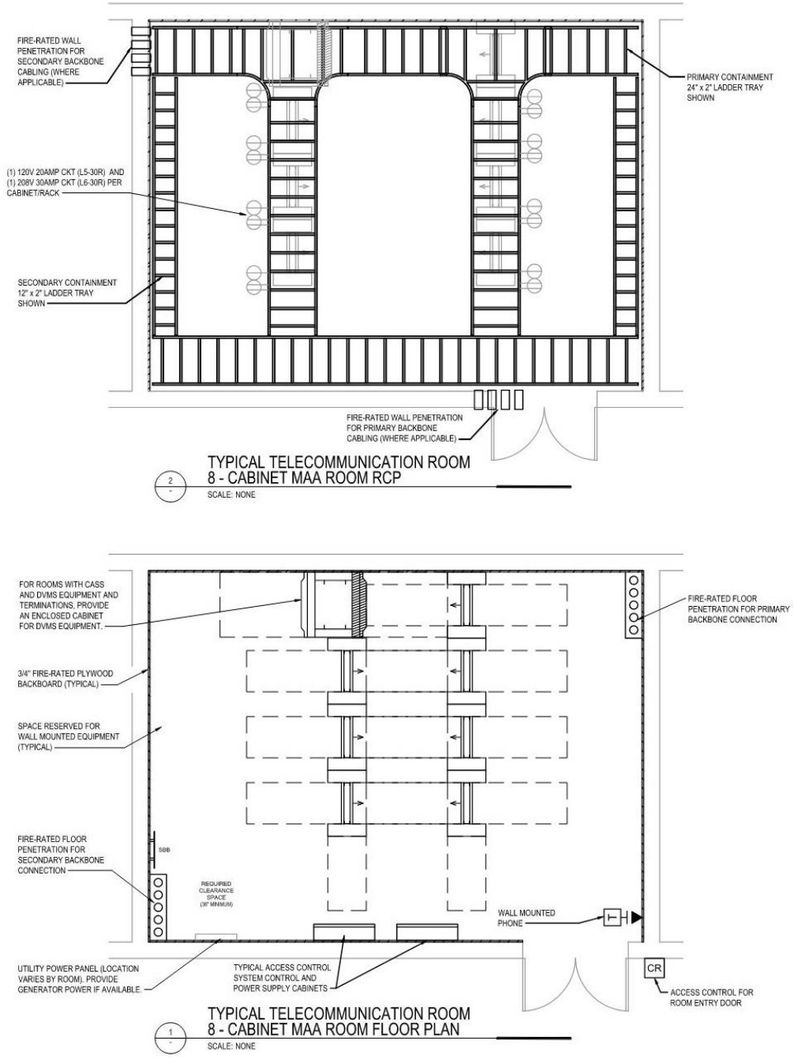
271600 Telecommunications Station Equipment

272100 Data Communications Network Equipment

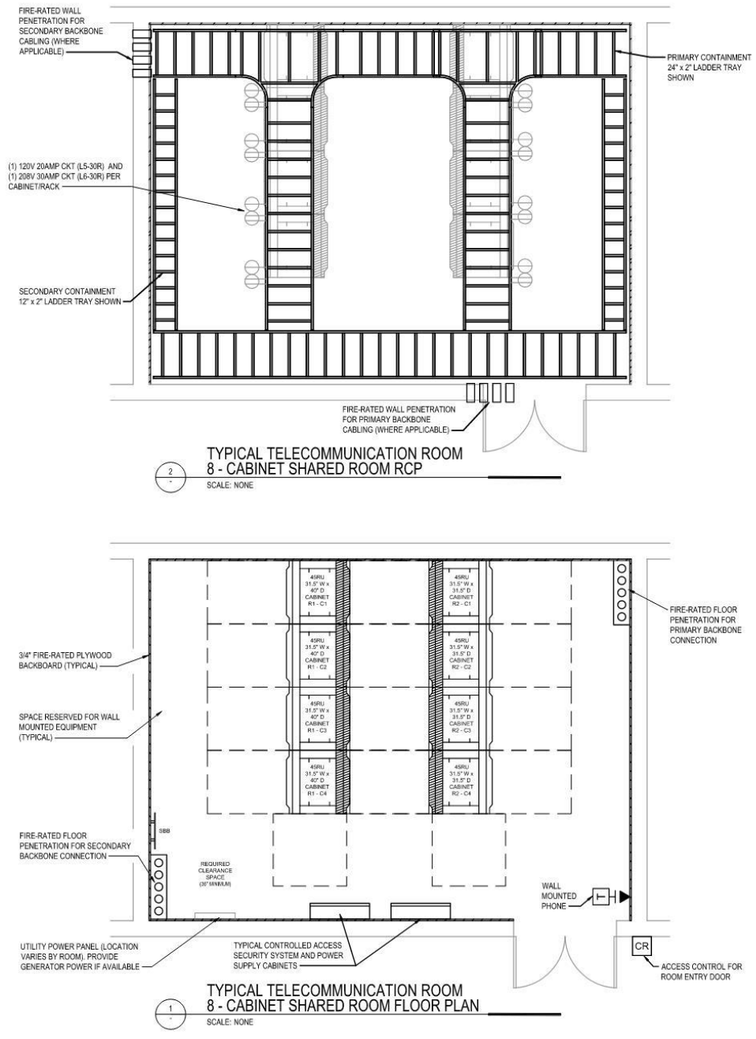
275116 Public Address Emergency Communications System

6C.1 Typical Communication Rooms

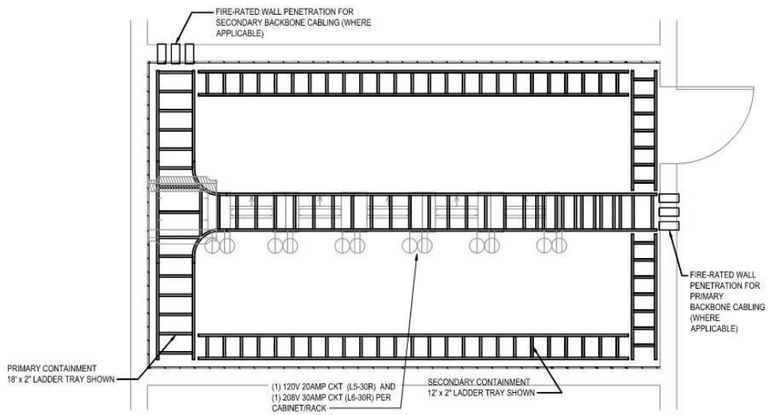
6C.1.1 Typical 8 Cabinet – MAA Telecommunication Room



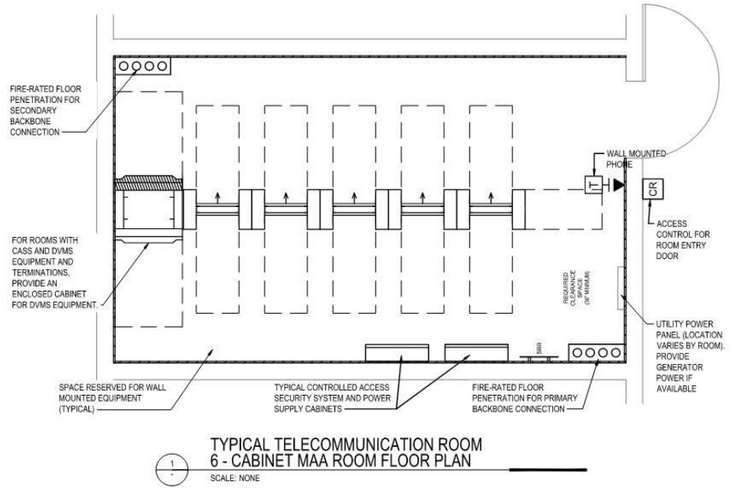
6C.1.2 Typical 8 Cabinet – Shared Telecommunication Room



6C.1.3 Typical 6 Cabinet – MAA Telecommunication Room

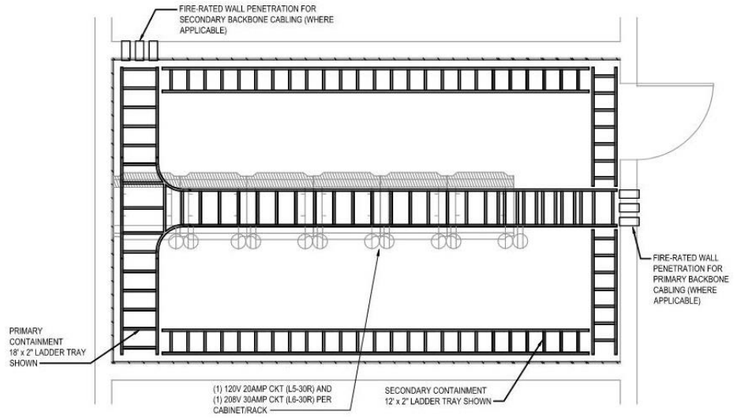


2 TYPICAL TELECOMMUNICATION ROOM
6 - CABINET MAA ROOM RCP
SCALE: NONE



1 TYPICAL TELECOMMUNICATION ROOM
6 - CABINET MAA ROOM FLOOR PLAN
SCALE: NONE

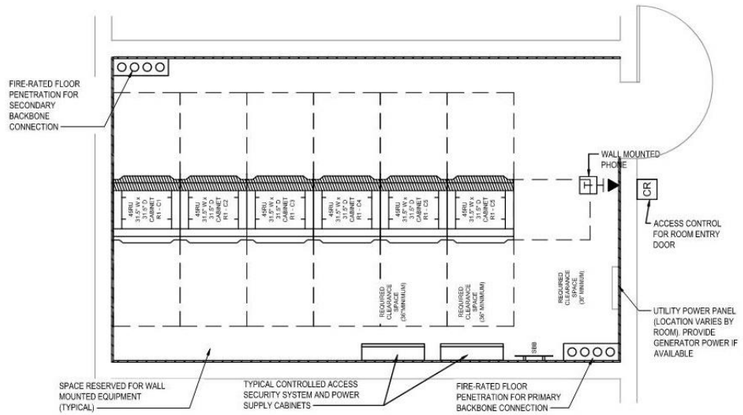
6C.1.4 Typical 6 Cabinet – Shared Telecommunication Room



2

TYPICAL TELECOMMUNICATION ROOM
6 - CABINET SHARED ROOM RCP

SCALE: NONE

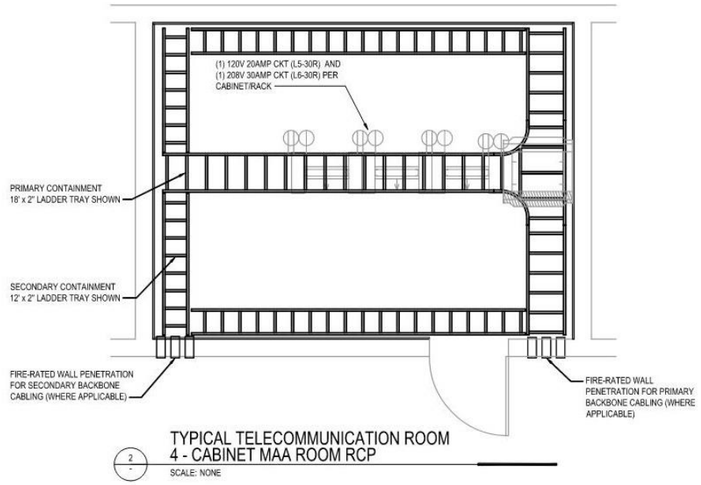


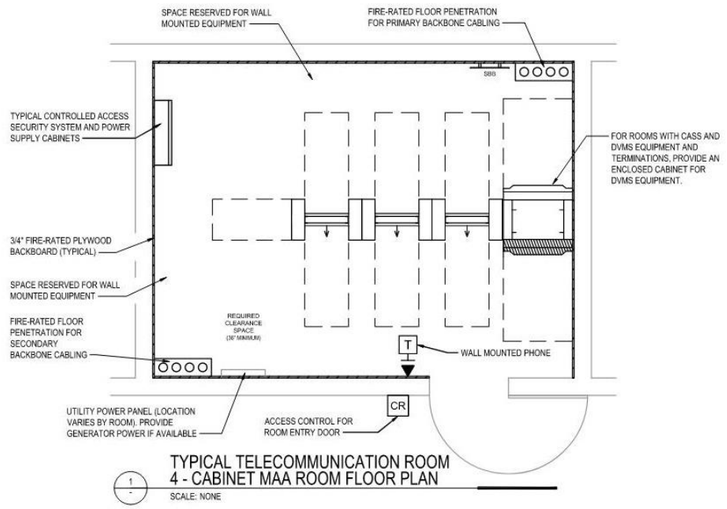
1

TYPICAL TELECOMMUNICATION ROOM
6 - CABINET SHARED ROOM FLOOR PLAN

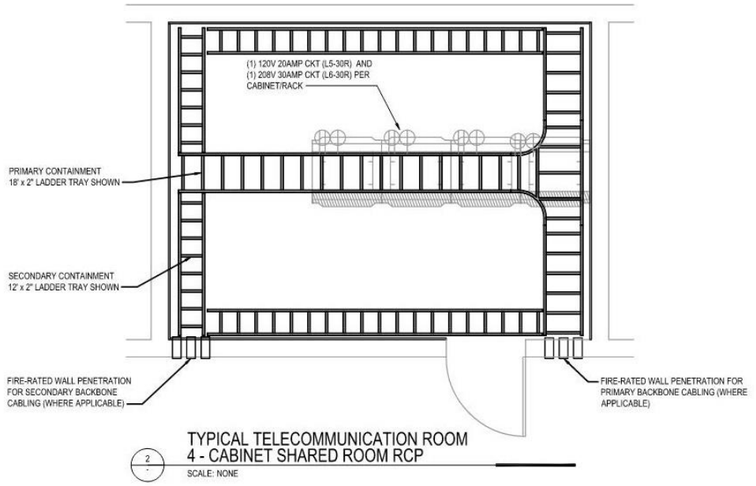
SCALE: NONE

6C.1.5 Typical 4 Cabinet – MAA Telecommunication Room





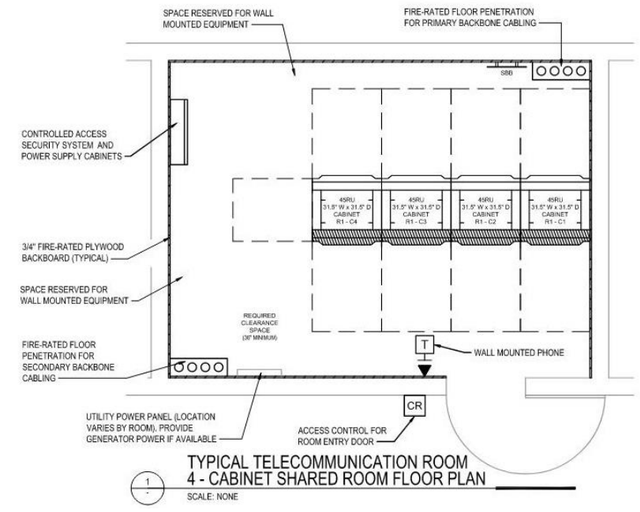
6C.1.6 Typical 4 Cabinet – Shared Telecommunication Room



2
-

TYPICAL TELECOMMUNICATION ROOM
4 - CABINET SHARED ROOM RCP

SCALE: NONE

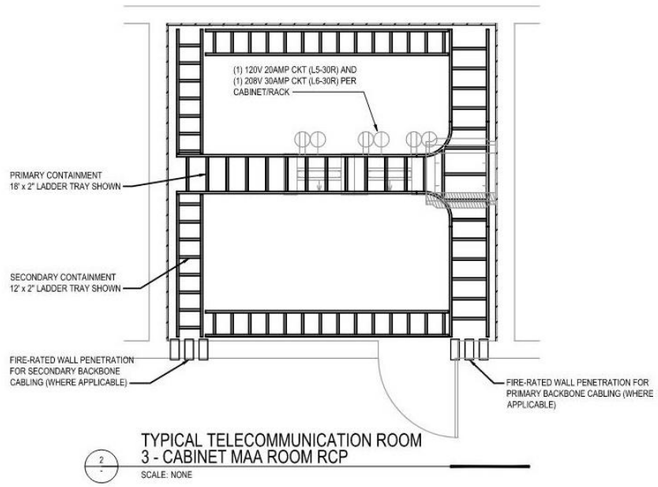


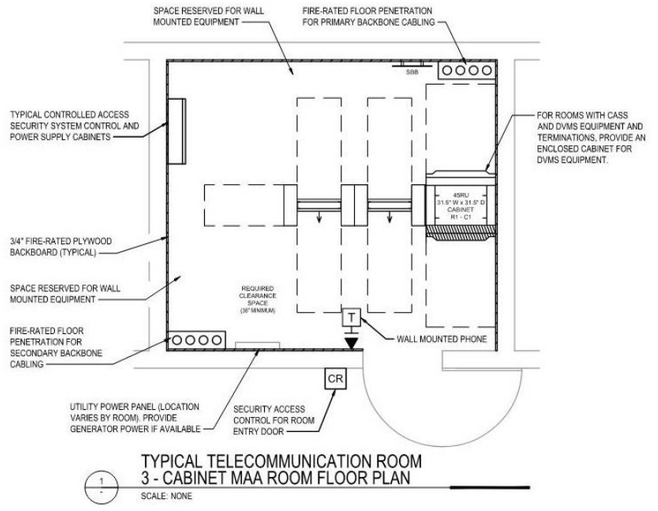
1
-

TYPICAL TELECOMMUNICATION ROOM
4 - CABINET SHARED ROOM FLOOR PLAN

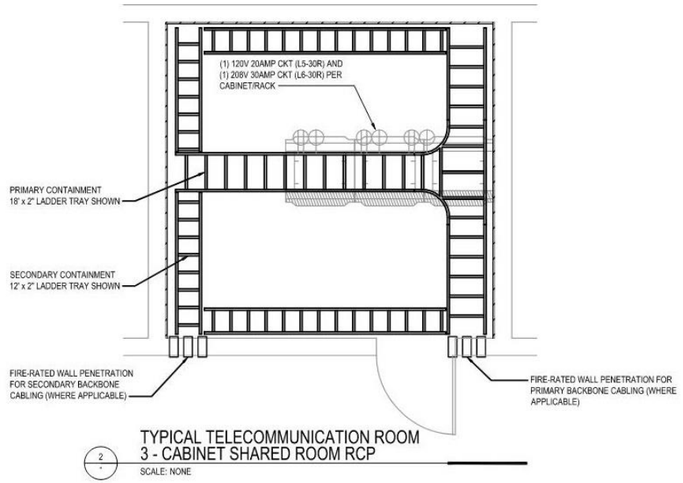
SCALE: NONE

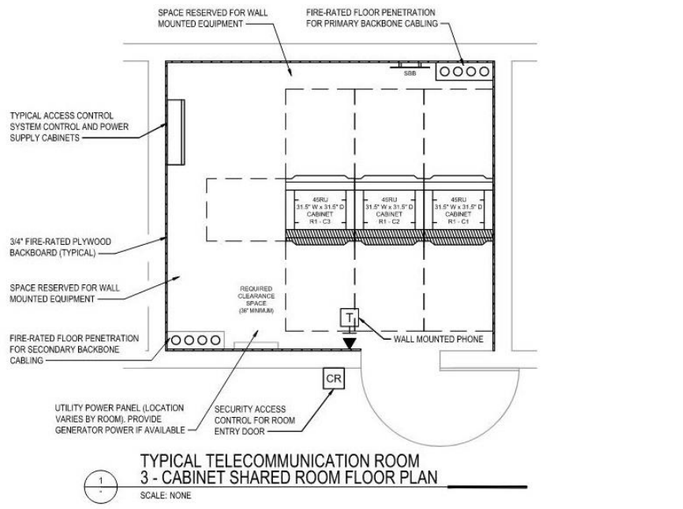
6C.1.7 Typical 3 Cabinet – MAA Telecommunication Room





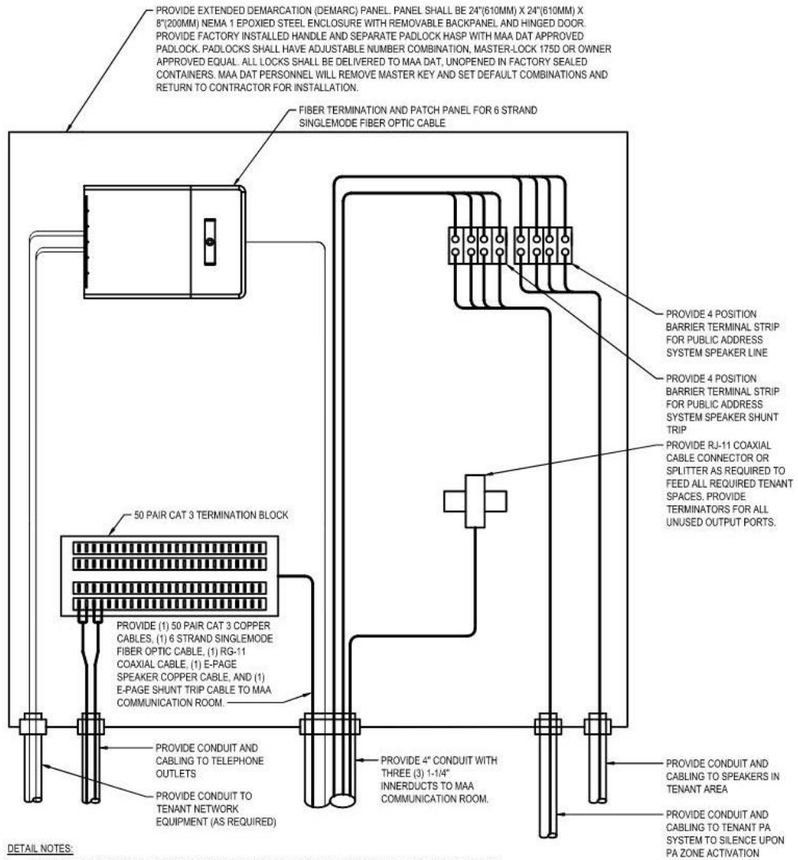
6C.1.8 Typical 3 Cabinet – Shared Telecommunication Room





6C.2 Demarcation Cabinets

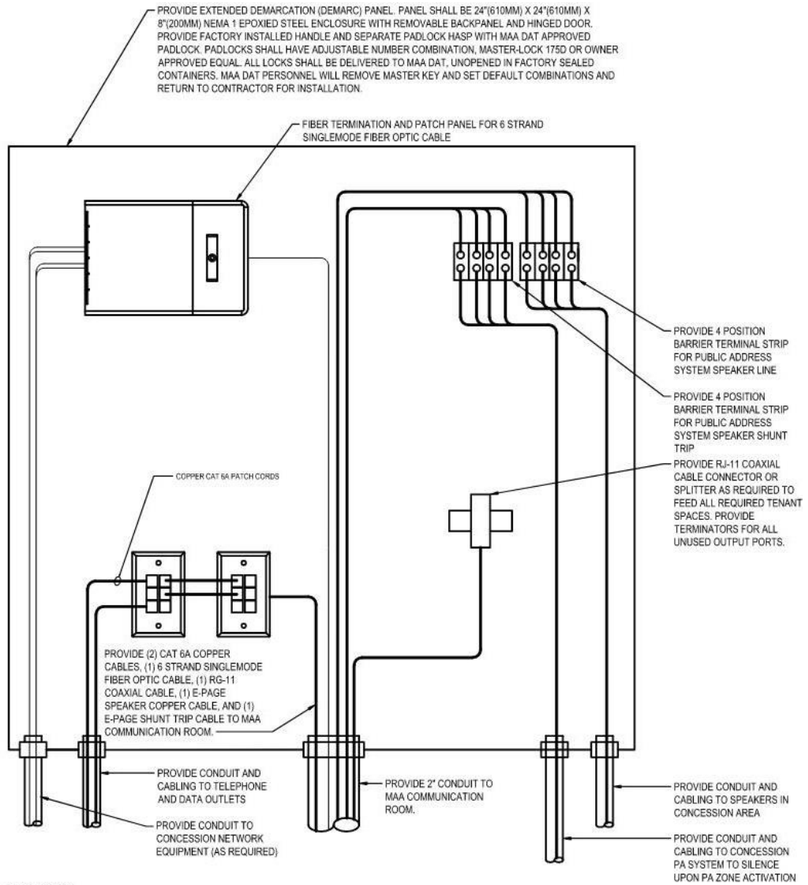
6C.2.1 Tenant Demarcation Cabinets



DETAIL NOTES:

1. PROVIDE EXTENDED DEMARC CABINETS ABOVE ACCESSIBLE CEILING IN TENANT AREAS OR BACK-OF-HOUSE CORRIDORS WHENEVER POSSIBLE. COORDINATE WITH AIRPORT FOR EXACT LOCATION.
2. PROVIDE ALL TERMINATION EQUIPMENT NOTED. TERMINATE AND TEST ALL CABLING PROVIDED.
3. PROVIDE BARRIER TYPE TERMINAL STRIP TO TERMINATE PUBLIC ADDRESS (PA) CABLING. CABLES SHALL BE TESTED FOR SHORTS AND GROUNDS.
4. PROVIDE CONDUIT AS INDICATED. ALL CONDUIT BENDS SHALL BE LONG SWEEP TYPE WITH A MINIMUM BEND RADIUS OF 10X CONDUIT ID. PROVIDE PULL BOXES EVERY 200 FEET(60M) OR EVERY 180 DEGREES OF BENDS.
5. ALL CONDUITS ENTERING THE CIB SHALL BE TROUGH THE BOTTOM OF THE ENCLOSURE WHENEVER POSSIBLE.

6C.2.2 Concession Demarcation Cabinet

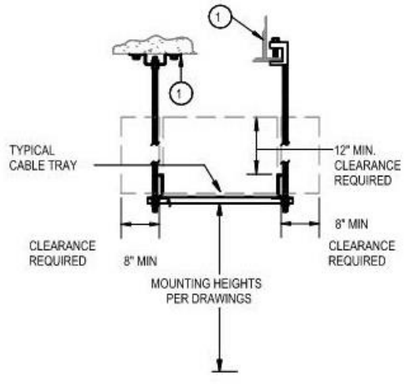


DETAIL NOTES:

1. PROVIDE EXTENDED DEMARC CABINETS ABOVE ACCESSIBLE CEILING IN CONCESSION AREAS OR BACK-OF-HOUSE CORRIDORS WHENEVER POSSIBLE. COORDINATE WITH AIRPORT FOR EXACT LOCATION.
2. PROVIDE ALL TERMINATION EQUIPMENT NOTED. TERMINATE AND TEST ALL CABLING PROVIDED.
3. PROVIDE BARRIER TYPE TERMINAL STRIP TO TERMINATE PUBLIC ADDRESS (PA) CABLING. CABLES SHALL BE TESTED FOR SHORTS AND GROUNDS.
4. PROVIDE CONDUIT AS INDICATED. ALL CONDUIT BENDS SHALL BE LONG SWEEP TYPE WITH A MINIMUM BEND RADIUS OF 10X CONDUIT ID. PROVIDE PULL BOXES EVERY 200 FEET(60M) OR EVERY 180 DEGREES OF BENDS.
5. ALL CONDUITS ENTERING THE CIB SHALL BE TROUGH THE BOTTOM OF THE ENCLOSURE WHENEVER POSSIBLE.

6C.3 Cable Tray Installation

6C.3.1 Cable Tray Mounting – Ceiling / Structure



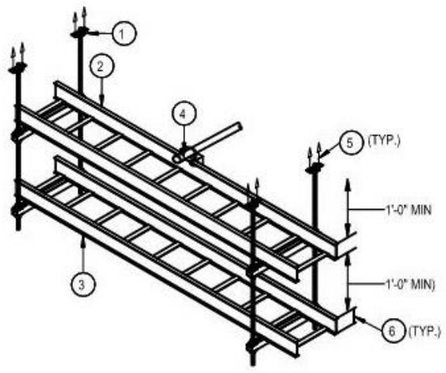
DETAIL NOTES :

1. APPROVED SUPPORT AND MOUNTING STRUCTURE AS REQUIRED BY MANUFACTURER, STRUCTURAL REQUIREMENTS, AND WEIGHT SUPPORTED.

TYPICAL CABLE TRAY MOUNTING
CEILING/STRUCTURE

SCALE: NONE

6C.3.2 Dual Tray Mounting Detail



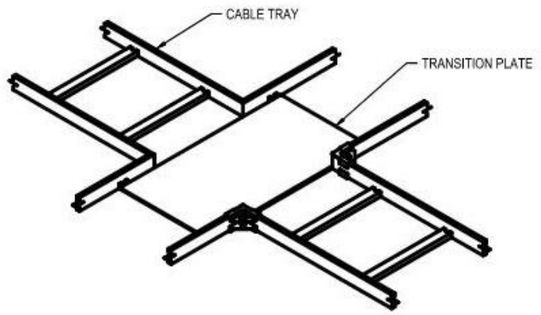
(#) DETAIL NOTES :

1. PROVIDE CABLE TRAY SUPPORT MOUNTING BRACKET. HARDWARE AND INSTALLATION AS REQUIRED BY STRUCTURE TYPE.
2. CABLE TRAY UPPER LEVEL
3. CABLE TRAY LOWER LEVEL
4. CONDUIT TERMINATION AT CABLE TRAY (TYPICAL). SEE CONDUIT TERMINATION DETAIL FOR ADDITIONAL INFORMATION
5. TO STRUCTURE (TYP)
6. REFER TO PLANS FOR TRAY SIZES, HEIGHTS, AND LAYOUTS.

TYPICAL DUAL TRAY
MOUNTING DETAIL

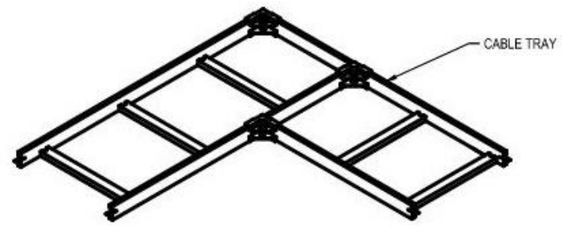
SCALE: NONE

6C.3.3 Cable Tray Installation



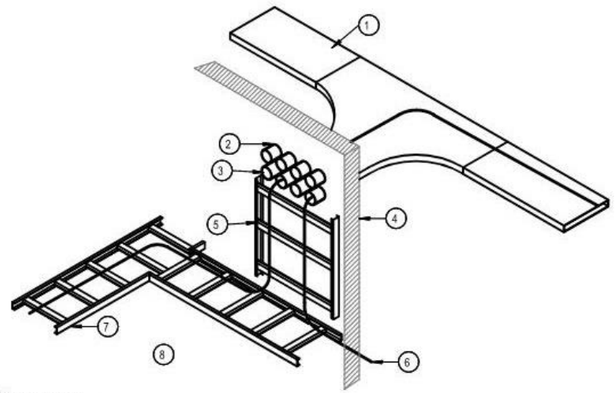
TYPICAL CABLE TRAY
TRANSITION
SCALE: NONE

6C.3.4 Cable Tray Ninety Degree Turn



TYPICAL CABLE TRAY
NINETY DEGREE TURN
SCALE: NONE

6C.3.5 Cable Tray Conduit Sleeve Entrance

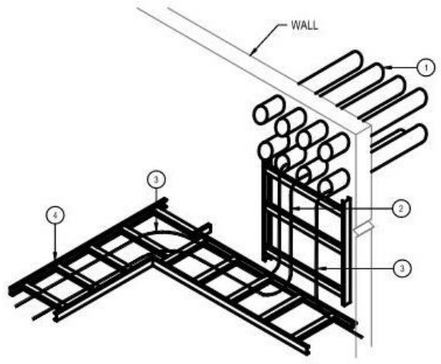


(#) DETAIL NOTES :

1. TYPICAL SOLID OR VENTILATED CABLE TRAY -REFER TO PLANS FOR TYPES, SIZES, MOUNTING HEIGHT AND LAYOUTS.
2. TYPICAL WALL PENETRATION SLEEVE - REFER TO PLANS FOR EXACT QUANTITY, SIZE, AND LOCATION. ALL SLEEVES SHALL BE MINIMUM 4" UON.
3. PROVIDE FIRE STOPPING AS REQUIRED PER SPECIFICATIONS.
4. TYPICAL WALL - REFER TO ARCHITECTURAL PLANS FOR DETAILS.
5. PROVIDE VERTICAL LADDER CABLE TRAY AS REQUIRED WHEN ENTRY CABLE TRAY IS GREATER THAN 20" ABOVE OR BELOW TELECOM ROOM CABLE TRAY.
6. TYPICAL CABLE - REFER TO PLANS AND CABLE SCHEDULES FOR ADDITIONAL INFORMATION.
7. TYPICAL LADDER CABLE TRAY USED WITHIN TELECOM. ROOMS - REFER TO PLANS FOR SIZES AND LAYOUTS.

(#) TYPICAL CABLE TRAY SLEEVE ENTRANCE
SCALE: NONE

6C.3.6 Cable Tray Conduit Entrance

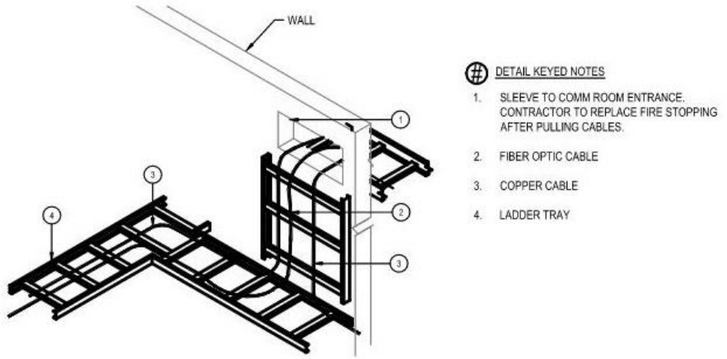


(#) DETAIL KEYED NOTES

1. OVERHEAD CONDUIT TO LADDER TRAY SYSTEM, STUBBED OUT MIN. 4" FROM WALL WITH BUSHINGS. CONTRACTOR SHALL REPLACE FIRE STOPPING AFTER PULLING CABLES.
2. FIBER OPTIC CABLE
3. COPPER CABLE
4. LADDER TRAY

(#) CABLE TRAY CONDUIT ENTRANCE
SCALE: NONE

6C.3.7 Cable Tray Wall Sleeve

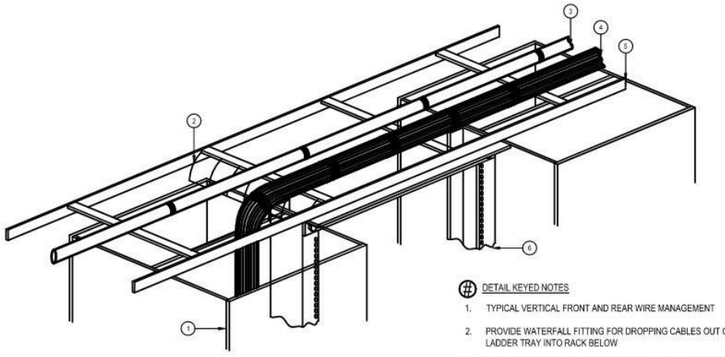


DETAIL KEYED NOTES

1. SLEEVE TO COMM ROOM ENTRANCE. CONTRACTOR TO REPLACE FIRE STOPPING AFTER PULLING CABLES.
2. FIBER OPTIC CABLE
3. COPPER CABLE
4. LADDER TRAY

CABLE TRAY
WALL SLEEVE ENTRANCE
SCALE: NONE

6C.3.8 Equipment Rack Cabling

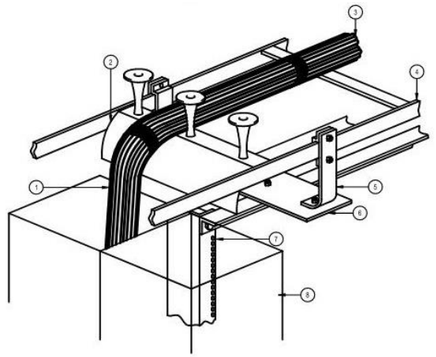


DETAIL KEYED NOTES

1. TYPICAL VERTICAL FRONT AND REAR WIRE MANAGEMENT
2. PROVIDE WATERFALL FITTING FOR DROPPING CABLES OUT OF LADDER TRAY INTO RACK BELOW
3. DATA VOICE RISER CABLE SECURED TO EACH RUNG WITH VELCRO
4. TYPICAL CABLE BUNDLE OF (24) CABLES
5. LADDER TRAY FOR ROUTING UTP CABLES.
6. TYPICAL EQUIPMENT RACK OR CABINET

EQUIPMENT RACK CABLING
IN TELECOM ROOM
SCALE: NONE

6C.3.9 Cable Tray Over Rack



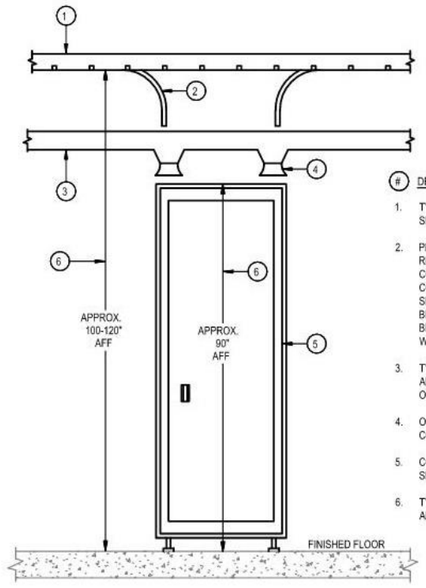
DETAIL KEYED NOTES

1. ROUTE CABLE DOWN THROUGH BACKSIDE OF VERTICAL CABLE MANAGEMENT UNIT. THEN FAN OUT CABLES STRAIGHT, NEAT, AND IN ORDER TO EACH PATCH PANEL.
2. PROVIDE WATERFALL FITTING TO MAINTAIN BEND RADIUS.
3. PROVIDE VELCRO WRAPS AROUND MAXIMUM OF 24 CABLES. BUNDLE CABLES FOR EACH ROW IN PROPER ORDER FOR PATCH PANEL. (TYP)
4. CABLE LADDER RACK TRAY.
5. CABLE RUNWAY ELEVATION KIT.
6. PROVIDE RACK-TO-RUNWAY MOUNTING PLATE.
7. EQUIPMENT RACK OR CABINET
8. VERTICAL WIRE MANAGER

CABLE TRAY OVER RACK ELEVATION ASSEMBLY

SCALE: NONE

6C.3.10 Cable Tray Rack Elevation



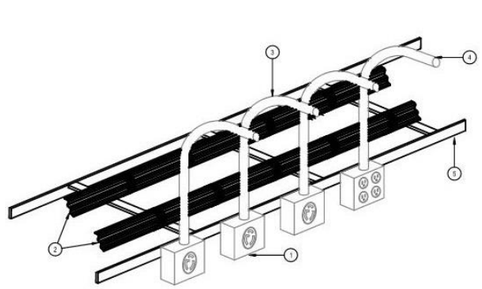
DETAIL NOTES :

1. TYPICAL LADDER CABLE TRAY (REFER TO PLANS FOR SIZES AND LAYOUTS).
2. PROVIDE DROPOUT OR "WATERFALL" ACCESSORIES AS REQUIRED TO PROPERLY MANAGE BEND RADII. COORDINATE LOCATION AND STYLE WITH FIELD CONDITIONS AND EQUIPMENT SELECTIONS. WATERFALL SHALL EXTEND TO 2" ABOVE CABINET. ALL CABLES SHALL BE SECURED WITH HOOK & LOOP FASTENERS AND SHALL BE PROPERLY SUPPORTED AND ROUTED INTO VERTICAL WIRE MANAGEMENT WITHIN THE CABINET.
3. TYPICAL OPTICAL FIBER PATCH CORD CONTAINMENT ALIGNED WITH VERTICAL WIRE MANAGEMENT ON FRONT OF CABINET.
4. OPTICAL FIBER PATCH CORD CONTAINMENT BEND RADIUS CONTROL TRUMPET.
5. COMMUNICATIONS RACK OR ENCLOSURE - REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. TYPICAL CLEAR HEIGHT DIMENSION. REFER TO PLANS AND LAYOUTS FOR ADDITIONAL INFORMATION.

TYPICAL CABINET ELEVATION

SCALE: NONE

6C.3.11 Equipment Rack Cable Tray – Rack Outlet



NOTE:
THE MOUNTING SHOWN IS THE PREFERRED MOUNTING. COORDINATE THE OUTLET LOCATIONS WITH ELECTRICAL CONTRACTOR AND MAA DAT.

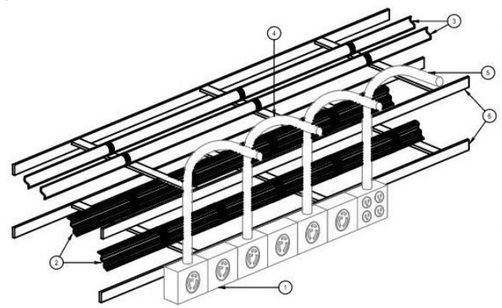
DETAIL KEYED NOTES

1. TYPICAL ELECTRICAL OUTLETS. SECURE TO LOWER LADDER TRAY FACING REAR OF RACKS. REFER TO ELECTRICAL SHEETS FOR REQUIREMENTS IN EACH TELECOM ROOM.
2. CABLING ROUTED ON LADDER TRAY
4. DO NOT ROUTE ELECTRICAL CONDUITS THROUGH TRAY, BELOW TRAY, OR WITHIN 12" OF TOP OF TRAY TO ALLOW EASY ACCESS FOR DATA CABLE ROUTING.
5. ROUTE CONDUITS SERVING ELECTRICAL OUTLETS UP AND AWAY FROM LADDER TRAY TO AVOID INTERFERENCE WITH CABLE ROUTING.
6. MOUNT LADDER RACK TRAY MINIMUM 8" ABOVE TOP OF RACK OR CABINET. IF CEILING DOES NOT ALLOW THIS MOUNTING, COORDINATE HEIGHT WITH MAA DAT.

EQUIPMENT RACK CABLE TRAY MOUNTED RACK OUTLET

SCALE: NONE

6C.3.12 Equipment Rack Dual Cable Tray – Rack Outlet



NOTE:
THE MOUNTING SHOWN IS THE PREFERRED MOUNTING. COORDINATE THE OUTLET LOCATIONS WITH ELECTRICAL CONTRACTOR AND MAA DAT.

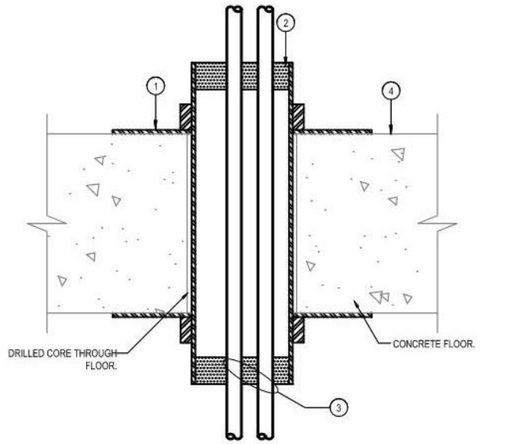
DETAIL KEYED NOTES

1. TYPICAL ELECTRICAL OUTLETS. SECURE TO LOWER LADD TRAY FACING REAR OF RACKS. REFER TO ELECTRICAL SH FOR REQUIREMENTS IN EACH TELECOM ROOM.
2. CABLE ROUTED ON LOWER LADDER TRAY
3. CABLE ROUTED ON UPPER LADDER TRAY
4. DO NOT ROUTE ELECTRICAL CONDUITS THROUGH TRAY, TRAY, OR WITHIN 12" OF TOP OF TRAY TO ALLOW EASY AC FOR DATA CABLE ROUTING.
5. ROUTE CONDUITS SERVING ELECTRICAL OUTLETS UP AN AWAY FROM LADDER TRAY TO AVOID INTERFERENCE WI CABLE ROUTING
5. DUAL LEVEL LADDER TRAY. MOUNT LOWER LADDER RACK MINIMUM 8" ABOVE TOP OF RACK OR CABINET, AND ALLOW BETWEEN TRAYS. IF CEILING DOES NOT ALLOW THIS MOU COORDINATE HEIGHTS WITH MAA DAT.

EQUIPMENT RACK DUAL CABLE TRAY MOUNTED RACK OUTLET

SCALE: NONE

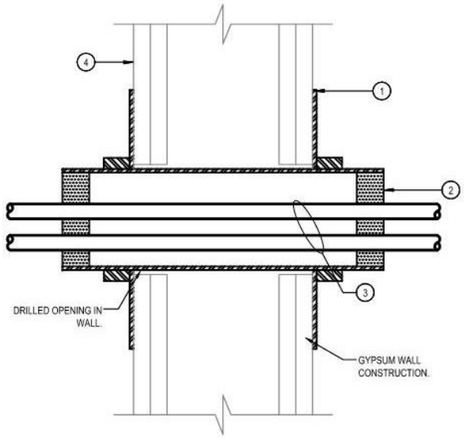
6C.4 Containment Penetrations



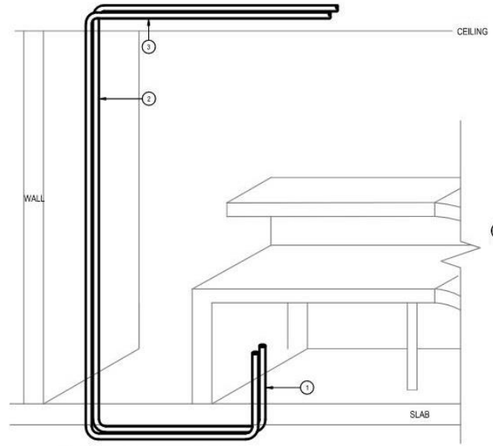
TYPICAL PENETRATIONS
CONDUIT THROUGH FLOOR
SCALE: NONE

(#) DETAIL KEYED NOTES

1. FIRESTOPPING SYSTEM MATERIAL BETWEEN SLEEVE AND PENETRATED SURFACE.
2. BACKFILL EACH SIDE WITH MINERAL WOOL AND FIRESTOP PUTTY CAULK
3. CABLING SHALL NOT EXCEED 40% CROSS SECTIONAL FILL AREA FOR 3 OR MORE CABLES..
4. PROVIDE FIRESTOP LABEL ON EACH SIDE OF PENETRATED SURFACE IN ACCORDANCE WITH ANSI/TIA-606-C



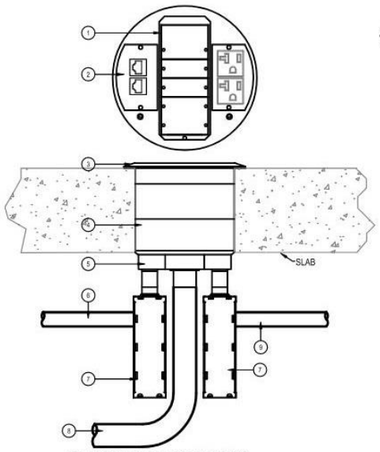
TYPICAL PENETRATIONS
CONDUIT THROUGH PARTITION
SCALE: NONE



TYPICAL PENETRATIONS
CONDUIT TO FREE STANDING MILLWORK
SCALE: NONE

(#) DETAIL KEYED NOTES

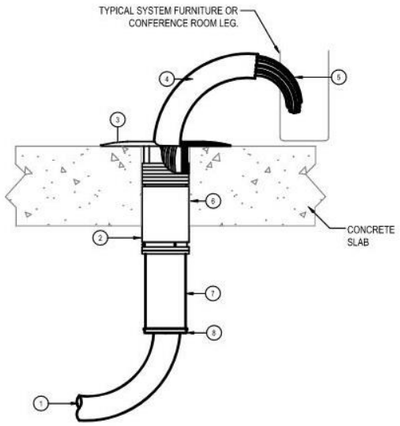
1. STUB CONDUITS UP INTO MILLWORK.
2. PROVIDE CONDUITS FOR ROUTING CABLING TO FREE STANDING FURNITURE LEAVE (1) AS SPARE FOR FUTURE CABLING.
3. STUB CONDUITS TO CABLE TRAY. CAP WITH NYLON BUSHINGS AND PROVIDE PULL STRING.



TYPICAL PENETRATIONS
AV/DATA/POWER POKE-THRU
SCALE: NONE

(#) DETAIL KEYED NOTES

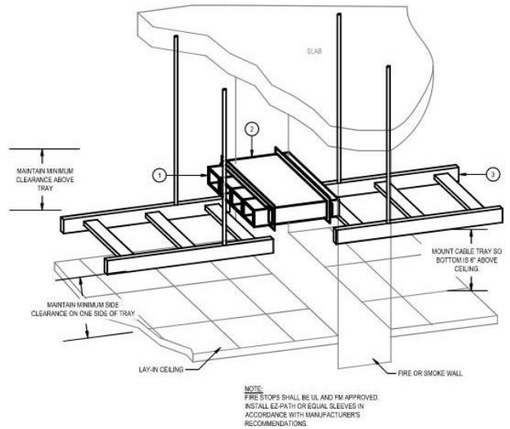
1. PROVIDE AV PLATES CONFIGURED/PROVIDED AS INDICATED ON THE DRAWINGS
2. PROVIDE COMM PLATE WITH RJ45 JACKS. REFER TO DRAWINGS AND SPECIFICATIONS.
3. PROVIDE SURFACE MOUNT COVER . VERIFY COLOR AND MATERIAL WITH OWNER PRIOR TO PURCHASE . REFER TO DRAWINGS AND SPECIFICATIONS.
4. PROVIDE 6" UN- WIRED POKE-THRU. REFER TO DRAWINGS AND SPECIFICATIONS.
5. PROVIDE BOTTOM HOUSING ASSEMBLY FOR 1-1/4" CONDUIT. REFER TO DRAWINGS AND SPECIFICATIONS.
6. PROVIDE (1)-1" CONDUIT FOR DATA. ROUTE CONDUIT CONTINUOUSLY UNDER FLOOR AND THEN THROUGH WALL TO ABOVE ACCESSIBLE CEILING IN ROOM SERVED BY POKE-THRU OR AS INDICATED ON DRAWINGS.
7. PROVIDE BOTTOM HOUSING ASSEMBLY WITH 3/4" CONDUIT AND JUNCTION BOX FOR DATA. REFER TO DRAWINGS AND SPECIFICATIONS.
8. PROVIDE (1)-1-1/4" CONDUIT FOR AV. ROUTE CONDUIT CONTINUOUSLY UNDER FLOOR AND THEN THROUGH WALL TO ABOVE ACCESSIBLE CEILING IN ROOM SERVED BY POKE-THRU OR AS INDICATED ON DRAWINGS. REFER TO DRAWINGS AND SPECIFICATIONS.
9. PROVIDE CONDUITS AS NECESSARY FOR ELECTRICAL.



(#) DETAIL KEYED NOTES

1. CONTINUE CONDUIT TO CABLE TRAY ON FLOOR BELOW. CABLES SHALL ROUTE TO TR AND UP TO TR ON SAME FLOOR AS OUTLET/POKE-THRU
2. POKE THRU FITTING
3. FLANGED POKE THRU DEVICE FOR ROUTING THROUGH DV CABLES. PROVIDED BY ELECTRICAL CONTRACTOR.
4. 2" LOOM CABLE WRAP (BY CABLING CONTRACTOR)
5. COORDINATE EXACT ENTRANCE INTO FURNITURE WITH SUPPLIER.
6. 3" DIA CORE DRILL HOLE. COORDINATE EXACT LOCATION WITH ARCHITECT.
7. 2" NPT CONDUIT FITTING.
8. TYPICAL NYLON BUSHING.

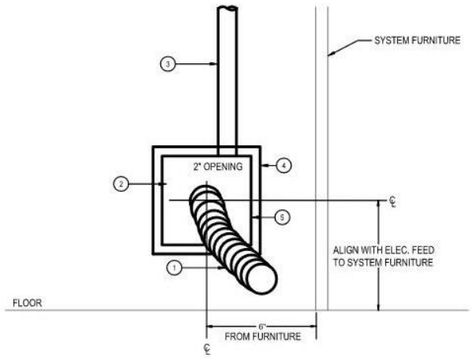
(#) - TYPICAL PENETRATIONS
THRU FLOOR TO FURNITURE
SCALE: NONE



(#) DETAIL KEYED NOTES

1. (4)-4" EZ-PATH OR EQUAL SLEEVES SHOWN HERE. PROVIDE QUANTITY OF EZ-PATH SLEEVES AS SHOWN ON PLANS. LOCATE BOTTOM OF EZ-PATH OR EQUAL 4" MAX FROM BOTTOM OF CABLE TRAY.
2. MULTI-GANG WALL BRACKET
3. CABLE TRAY

(#) - TYPICAL PENETRATIONS
CABLETRAY THRU FIRE OR SMAKE BARRIER
SCALE: NONE



(#) DETAIL KEYED NOTES

1. PROVIDE FLEXIBLE METAL CONDUIT WITH DATA/VOICE CABLING INSIDE, ROUTED INTO SYSTEM FURNITURE. SIZE CONDUIT AS NEEDED TO ACCOMMODATE CABLING, BUT NOT LESS THAN 1-1/4".
2. COORDINATE EXACT LOCATION WITH SYSTEM FURNITURE INSTALLER.
3. PROVIDE 1-1/4" CONDUITS FOR DATA/VOICE OUTLET CABLES
4. PROVIDE 4 - 11/16" x 4 - 11/16" x 2 - 1/8" BACK BOX WITH 1 GANG PLASTER RING
5. PROVIDE 2 GANG FACE PLATE

(#) - TYPICAL PENETRATIONS
CABLING TO SYSTEM FURNITURE
SCALE: NONE

6C.5 Data Outlets

6C.5.1 Schedule Sample

TYPICAL DATA OUTLET SCHEDULE

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES

SEE DATA OUTLET TYPE A-H NEXT PAGE

SEE MOUNT SCHEDULE BELOW

SEE MOUNT HEIGHT TYPES A-D, OR AS NOTED

TOTAL CABLE QTY @ DATA OUTLET

FOR USE SEE USE SCHEDULE BELOW

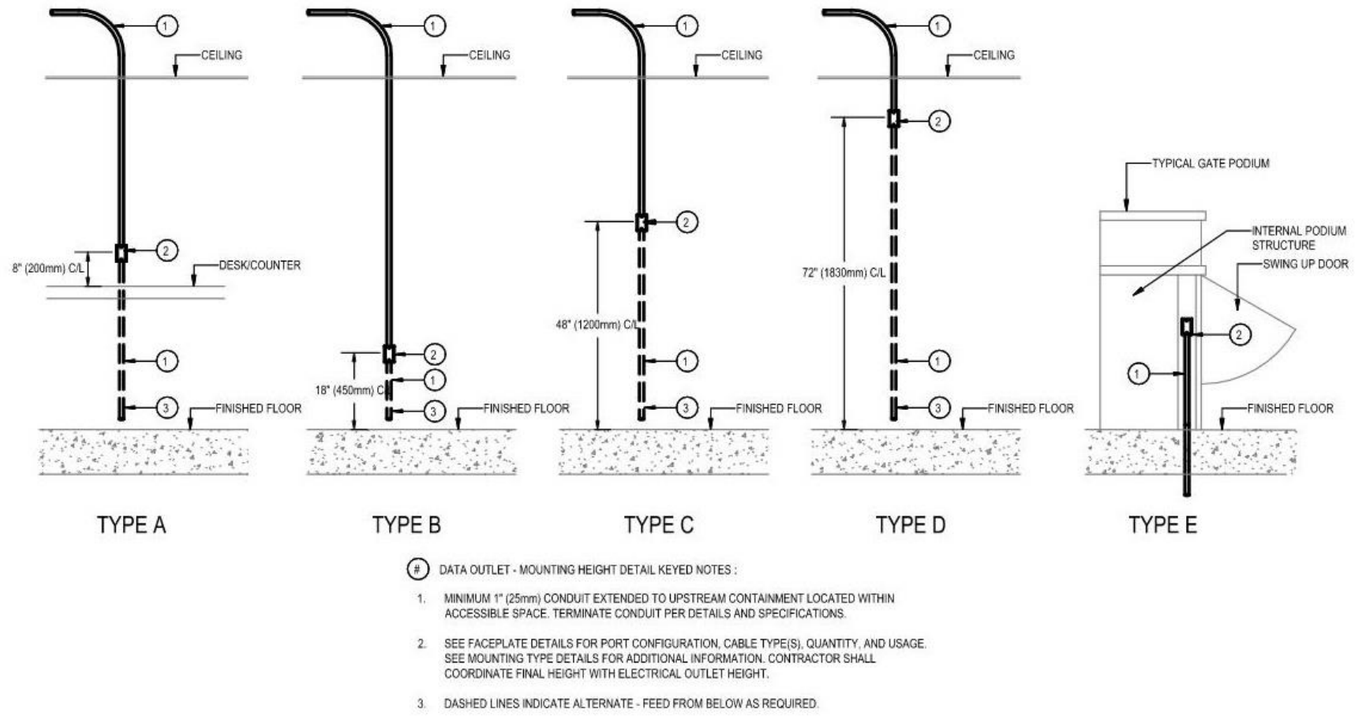
MOUNT SCHEDULE

ID	DESCRIPTION
1	FLUSH WALL MOUNT
2	SURFACE WALL MOUNT
3	CEILING MOUNT
4	ABOVE CEILING MOUNT
5	FLOOR MOUNT
6	BELOW RAISED FLOOR
7	POLE MOUNT
8	CABINET/ENCLOSURE MOUNT
9	OTHER MOUNT

USE SCHEDULE

USE	DESCRIPTION
ACS	ACCESS CONTROL SYSTEM
AV	AUDIO VISUAL SYSTEM
BAS	BUILDING AUTOMATION SYSTEM
BHS	BAGGAGE HANDLING SYSTEM
BRS	BAGGAGE RECONCILLIATION SYSTEM
CELL	CELLULAR SYSTEM
CLK	MASTER CLOCK SYSTEM
CUPPS	COMMON USE PASSENGER PROCESSING
DAS	DISTRIBUTED ANTENNA SYSTEM
EVIDS	ELECTRONIC VISUAL INFORMATION DISPLAY SYSTEM
FA	FIRE ALARM SYSTEM
M-SYS	MEDICAL SYSTEMS
NC	NURSE CALL SYSTEM
PA	PUBLIC ADDRESS SYSTEM
P-N	PERIPHERAL-NETWORKED
RI	ROUGH-IN ONLY
RTLS	REAL TIME LOCATION SYSTEM
SPARE	NO SYSTEM CONNECTIVITY
SSE	SECURITY SCREENING SYSTEM
TEL	TELEPHONY SYSTEM
TV	TELEVISION SYSTEM
UNASG	UNASSIGNED ACTIVE LAN PORT
VSS	VIDEO SURVEILLANCE SYSTEM
WAP	WIRELESS SYSTEM
W-PC	WORKSTATION-PC

6C.5.2 Mounting Heights



(#) DATA OUTLET - MOUNTING HEIGHT DETAIL KEYED NOTES :

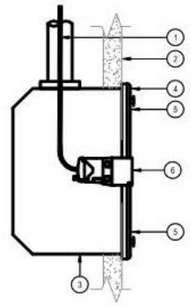
1. MINIMUM 1" (25mm) CONDUIT EXTENDED TO UPSTREAM CONTAINMENT LOCATED WITHIN ACCESSIBLE SPACE. TERMINATE CONDUIT PER DETAILS AND SPECIFICATIONS.
2. SEE FACEPLATE DETAILS FOR PORT CONFIGURATION, CABLE TYPE(S), QUANTITY, AND USAGE. SEE MOUNTING TYPE DETAILS FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL COORDINATE FINAL HEIGHT WITH ELECTRICAL OUTLET HEIGHT.
3. DASHED LINES INDICATE ALTERNATE - FEED FROM BELOW AS REQUIRED.

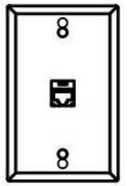
6C.5.3 Faceplates

The following faceplate typical configuration provide a visual depiction as well as a SAMPLE schedule that may be used for the data outlet using each faceplate type.

TYPE A
FACEPLATE - (1) CAT6A MODULAR OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
A	VOICE OVER IP TELEPHONE	1	C	1	1	TEL	0		0		0		





(#) DATA OUTLET DETAIL KEYED NOTES

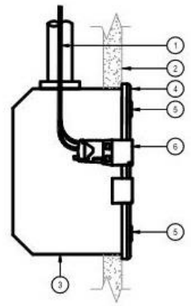
1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. UTP JACK(S) TERMINATED TO UTP CABLE(S)

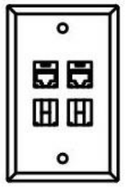
TYPE B
FACEPLATE - (2) CAT6A MODULAR OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
B	GATE INFORMATION DISPLAY	3	NA	2	0		2	GIDS	0		0		1

NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.



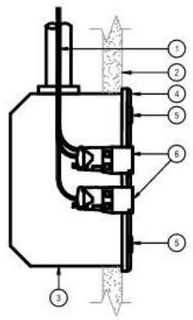


(#) DATA OUTLET DETAIL KEYED NOTES

1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. UTP JACK(S) TERMINATED TO UTP CABLE(S)

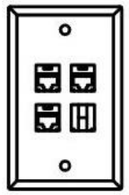
TYPE C
FACEPLATE - (3) CAT6A MODULAR OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
C	OFFICE WORKSTATION	1	B	3	1	VOIP	1	W-PCS	0		1	SPARE	1



NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.

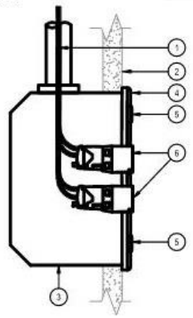


(#) DATA OUTLET DETAIL KEYED NOTES

1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. UTP JACK(S) TERMINATED TO UTP CABLE(S)

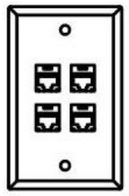
TYPE D
FACEPLATE - (4) CAT6A MODULAR OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
D	GATE PODIUM WORKSTATION	2	E	4	2	(1)VOIP/(1)MIC	1	W-PC	0		1	SPARE	1



NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.

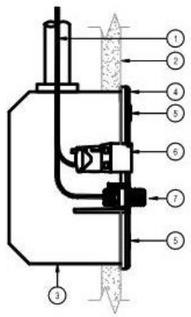


(#) DATA OUTLET DETAIL KEYED NOTES

1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. UTP JACK(S) TERMINATED TO UTP CABLE(S)

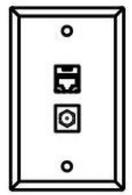
TYPE E
TV FACEPLATE - CAT6A & COAX MODULAR OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
E	CABLE TELEVISION	1	D	2	0		1	TV	1	TV	0		1



NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.

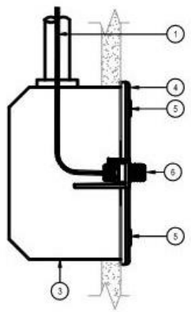


(#) DATA OUTLET DETAIL KEYED NOTES

1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. UTP JACK(S) TERMINATED TO UTP CABLE(S)
7. COAX F-CONNECTOR TERMINATED TO COAX CABLE

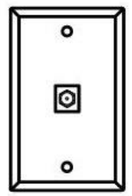
TYPE F
TV FACEPLATE - COAX OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
F	CABLE TELEVISION	1	D	1	0		0		1	TV	0		1



NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.



(#) DATA OUTLET DETAIL KEYED NOTES

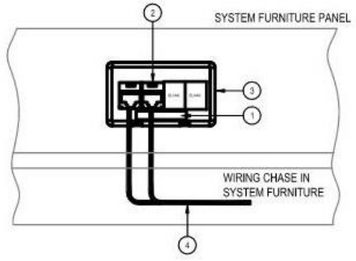
1. CABLE(S) ROUTED THROUGH CONDUIT TO CABLE TRAY.
2. FINISHED WALL SHOWN FOR REFERENCE SEE MOUNTING TYPE LEGEND FOR OTHER OPTIONS.
3. 2-GANG BACK BOX WITH 1-GANG PLASTER RING
4. SINGLE GANG FACEPLATE
5. OUTLET LABELS
6. COAX F-CONNECTOR TERMINATED TO COAX CABLE

TYPE G
SYSTEM FURNITURE PANEL OUTLET

TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
G	OFFICE WORKSTATION	1	PER MANUFACTURER	2	1	VOIP	1	W-PC	0		0		1

NOTES:

1. COORDINATE MOUNTING HEIGHT AND LOCATION WITH FINAL LOCATION OF ELECTRICAL OUTLETS.



(#) DATA OUTLET DETAIL KEYED NOTES

1. OUTLET LABELS
2. UTP JACK(S) TERMINATED TO UTP CABLE(S)
3. PROVIDE OPENINGS IN FURNITURE IF NECESSARY. PROVIDE MOUNTING PLATE TO SUPPORT DATA OUTLET.
4. ROUTE CABLE IN BASE OF TOP CAP. FOLLOW SYSTEM FURNITURE RACEWAYS AND MANUFACTURER GUIDELINES.

TYPE H
(2) CAT6A BISCUIT JACK

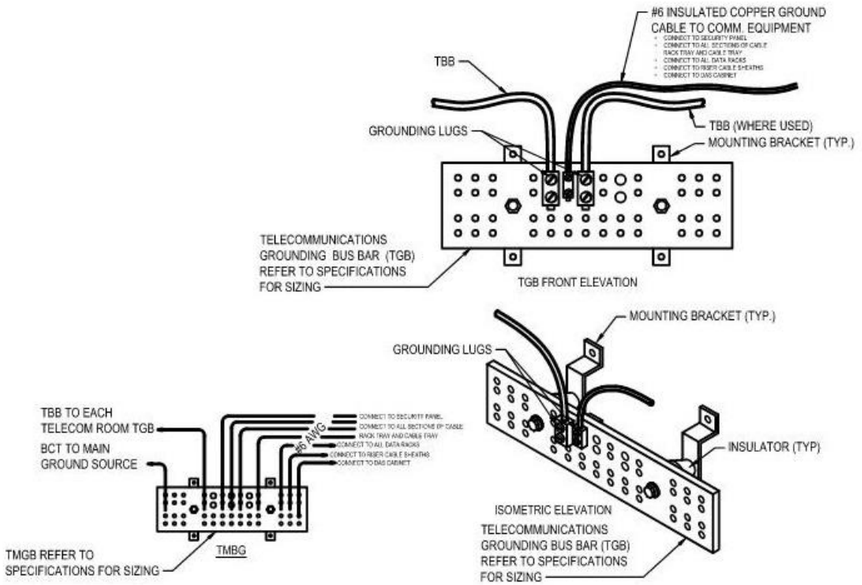
TYPE	TYPE DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	CABLE QTY	POE QTY	POE USE	NON-POE QTY	NON-POE USE	NON-LAN QTY	NON-LAN USE	SPARE QTY	SPARE USE	NOTES
WAP	WIRELESS ACCESS POINT	4	NA	2	1	WAP	0		0		1	SPARE	

(#) DATA OUTLET DETAIL KEYED NOTES

1. UTP JACK(S) TERMINATED TO UTP CABLE(S)

6C.6 Grounding

6C.6.1 Typical Busbars



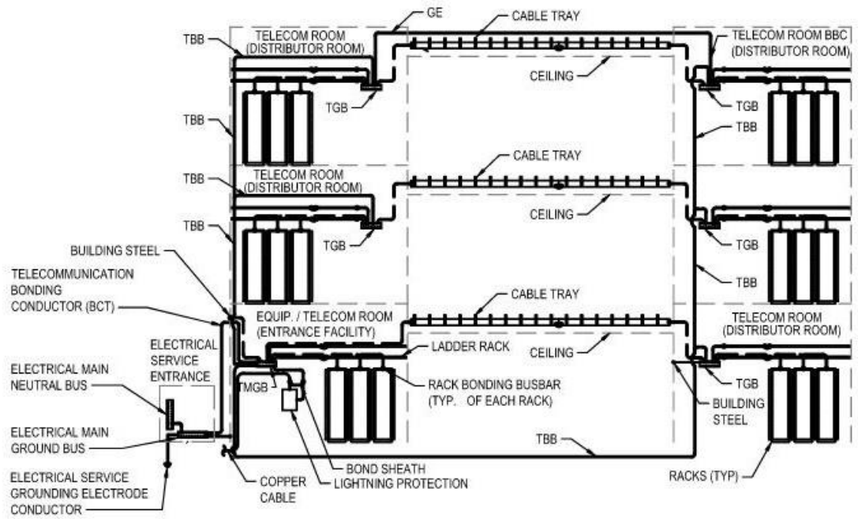
GROUNDING NOTES:

1. ALL GROUND CONNECTIONS SHALL BE MADE WITH HEAVY DUTY 2 HOLES COMPRESSION LUGS WITH STAINLESS STEEL HEX HEAD CAP SCREWS WITH STAINLESS STEEL LOCKING NUTS (TWO SCREWS AND NUTS PER 2 HOLES LUG).
2. RUN TBB CABLE IN EMT CONDUIT. PROVIDE INSULATED GROUNDING BUSHING - MALLEABLE IRON STEEL CITY #BG-807 AT CONDUIT ENDS AND GROUND PER NEC GROUNDING TO BUILDING STRUCTURE, CONDUITS, UTILITY PIPING, OR ELECTRICAL SUBPANELS IN LIEU OF BONDING TO BUILDING MAIN ELECTRICAL SERVICE GROUND IS NOT ACCEPTABLE.
3. GROUND ALL COMMUNICATIONS RACKS WITH #6 AWG INSULATED STRANDED COPPER GROUNDING CONDUCTOR TO MAIN GROUNDING BUSBAR. GROUND RACKS INDIVIDUALLY TO BUSBAR (DO NOT LOOP GROUNDS). ROUTE CONDUCTOR ALONG RACK REAR AND CABLE RUNWAY TO GROUNDING BUSBAR.
4. GROUND EACH CONDUIT AND CONDUIT SUPPORTS STRUTS IN ALL COMMUNICATION ROOMS WITH #6 AWG INSULATED STRANDED COPPER GROUNDING CONDUCTOR TO GROUNDING BUSBAR. ROUTE CONDUCTOR IN CABLE RUNWAY TO GROUNDING BUSBAR.
5. GROUND CABLE WITH #6 AWG SOLID BARE COPPER GROUNDING CONDUCTOR TO GROUNDING BUSBAR. ROUTE CONDUCTOR IN CABLE RUNWAY TO GROUNDING BUSBAR.
6. MARK CONDUCTOR 6" FROM TERMINATION WITH GREEN TAPE.
7. CONTRACTOR SHALL PROVIDE #3/0 COPPER CABLE FROM BUILDING GROUND AND OTHER TELECOM ROOMS TO GROUND BAR LOCATION AND PROVIDE GROUNDING BAR IN EACH TELECOM ROOM. CABLING CONTRACTOR SHALL PROVIDE GROUNDING CABLING FROM EACH PIECE OF EQUIPMENT WITHIN THE TELECOM ROOM, UNLESS OTHERWISE NOTED.

GROUNDING
TYPICAL BUSBARS

SCALE: NONE

6C.6.2 Grounding Scematic



LEGEND

6 AWG STRANDED, GREEN INSULATED GROUND WIRE

OSP COPPER CABLE

TBB - MUST BE CONTINUOUS WITH EXOTHERMIC WELD TAPS OR INDIVIDUAL HOME RUNS, NOT DAISY CHAINED SIZING BASED ON LENGTH, SEE ANSI/TIA-607-C.

TMBG - TELECOMMUNICATIONS MAIN GROUNDING BUS BAR

TGB - TELECOMMUNICATIONS GROUNDING BUS BAR

TEBC- TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR - SAME SIZE AS LARGEST

BCT- BONDING CONDUCTOR FOR TELECOMMUNICATIONS

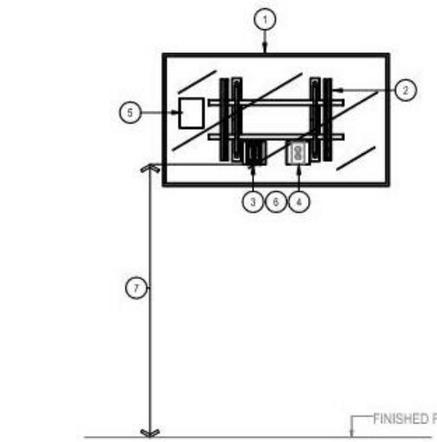
NOTE: GROUNDING DETAILS ILLUSTRATE GENERAL REQUIREMENTS AND MAY NOT COVER ALL REQUIREMENTS OF ANSI/TIA-607-C AT A MINIMUN.

GROUNDING SCHEMATIC

SCALE: NONE

6C.7 Display Mountings

6C.7.1 Landscape Display Mounting



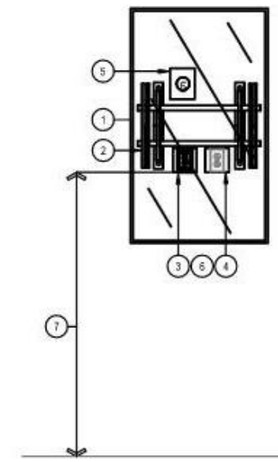
TYPICAL DISPLAY
LANDSCAPE MOUNTING

SCALE: NONE

(#) DETAIL KEYED NOTES

1. PROVIDE FLAT PANEL DISPLAY AS NOTED IN THE PROJECT DRAWINGS AND/OR SPECIFICATIONS.
2. PROVIDE DISPLAY MOUNT AND RELATED HARDWARE SIZED TO ACCOMMODATE THE FLAT PANEL. COORDINATE WALL STRUCTURAL SUPPORT OTHER TRADES.
3. MINIMUM 2-PORT CAT6A DATA OUTLET MOUNTED FLUSH INTO SUPPORT WALL BEHIND DISPLAY. SHOWN FOR REFERENCE ONLY. REFER TO TELECOM DRAWINGS FOR FURTHER DETAIL.
4. DUPLEX POWER OUTLETS MOUNTED FLUSH INTO SUPPORT WALL BEHIND DISPLAY. SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR FURTHER DETAIL.
5. IF REQUIRED, MOUNT IPTV SET-TOP BOX(STB) BEHIND DISPLAY. STB SHALL BE MOUNTED TO THE DISPLAY OR MOUNTING BRACKET. ALTERNATIVELY AN OPS-SLOT DEVICE CAN BE UTILIZED IF APPLICABLE. LOCATE IR RECEIVER SO THAT IT IS VISIBLE FROM THE FRONT OF THE DISPLAY.
6. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF OUTLETS AND JUNCTION BOXES BASED ON APPROVED DISPLAY MOUNTING SOLUTION.
7. REFER TO DISPLAY SCHEDULE FOR RECOMMENDED JUNCTION BOX MOUNTING HEIGHT. CONTRACTOR SHALL CONFIRM FINAL MOUNTING HEIGHT BASED ON COORDINATION WITH PROPOSED DISPLAY AND MOUNTING SOLUTION.

6C.7.2 Portrait Display Mounting



TYPICAL DISPLAY
PORTRAIT MOUNTING

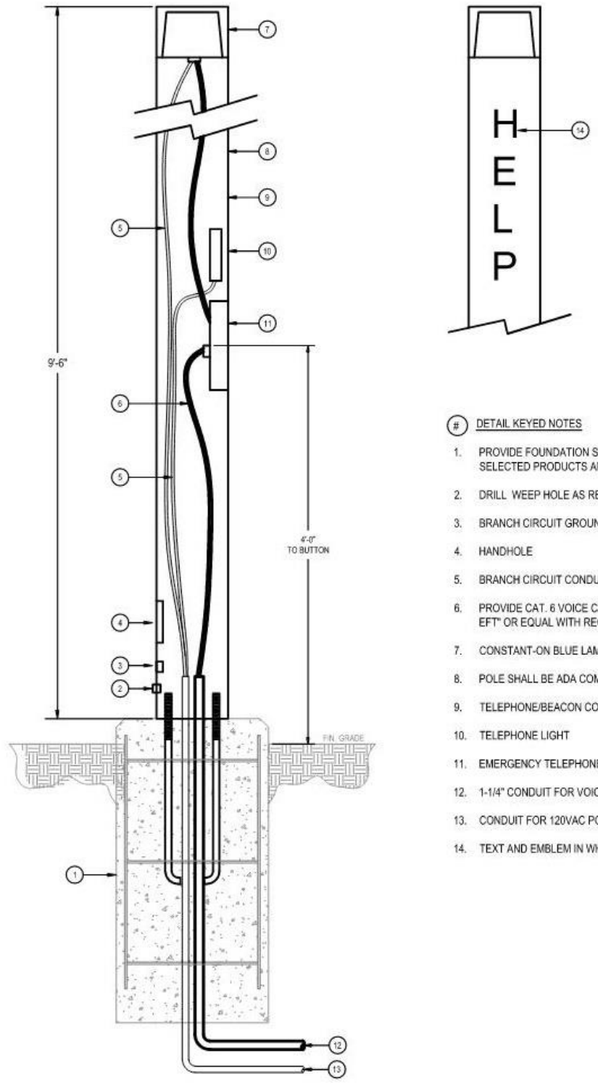
SCALE: NONE

(#) DETAIL KEYED NOTES

1. PROVIDE FLAT PANEL DISPLAY AS NOTED IN THE PROJECT DRAWINGS AND/OR SPECIFICATIONS.
2. PROVIDE DISPLAY MOUNT AND RELATED HARDWARE SIZED TO ACCOMMODATE THE FLAT PANEL. COORDINATE WALL STRUCTURAL SUPPORT OTHER TRADES.
3. MINIMUM 2-PORT CAT6A DATA OUTLET MOUNTED FLUSH INTO SUPPORT WALL BEHIND DISPLAY. SHOWN FOR REFERENCE ONLY. REFER TO TELECOM DRAWINGS FOR FURTHER DETAIL.
4. DUPLEX POWER OUTLETS MOUNTED FLUSH INTO SUPPORT WALL BEHIND DISPLAY. SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR FURTHER DETAIL.
5. IF REQUIRED, MOUNT IPTV SET-TOP BOX(STB) BEHIND DISPLAY. STB SHALL BE MOUNTED TO THE DISPLAY OR MOUNTING BRACKET. ALTERNATIVELY AN OPS-SLOT DEVICE CAN BE UTILIZED IF APPLICABLE. LOCATE IR RECEIVER SO THAT IT IS VISIBLE FROM THE FRONT OF THE DISPLAY.
6. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF OUTLETS AND JUNCTION BOXES BASED ON APPROVED DISPLAY MOUNTING SOLUTION.
7. REFER TO DISPLAY SCHEDULE FOR RECOMMENDED JUNCTION BOX MOUNTING HEIGHT. CONTRACTOR SHALL CONFIRM FINAL MOUNTING HEIGHT BASED ON COORDINATION WITH PROPOSED DISPLAY AND MOUNTING SOLUTION.

6C.8 Emergency Call Boxes

6C.8.1 Emergency Call Box – Pole Mount



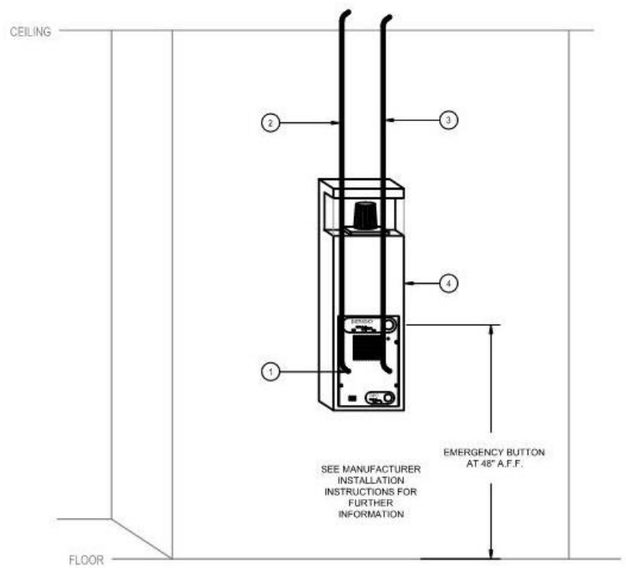
EMERGENCY CALL STATION
POLE MOUNT

SCALE: NONE

(#) DETAIL KEYED NOTES

1. PROVIDE FOUNDATION STRUCTURE PER MANUFACTURER'S REQUIREMENTS FOR SELECTED PRODUCTS AND LOCATION.
2. DRILL WEEP HOLE AS RECOMMENDED BY MANUFACTURER.
3. BRANCH CIRCUIT GROUND CONDUCTOR SHALL BE BONDED TO POLE
4. HANDHOLE
5. BRANCH CIRCUIT CONDUCTORS
6. PROVIDE CAT. 6 VOICE CABLE IN 1/2" CORRUGATED TUBING (CARLON "CARFLEX EFT" OR EQUAL WITH REQUIRED COUPLINGS AND TERMINAL ADAPTERS)
7. CONSTANT-ON BLUE LAMP WITH STROBE OR BEACON.
8. POLE SHALL BE ADA COMPLIANT
9. TELEPHONE/BEACON CONNECTION
10. TELEPHONE LIGHT
11. EMERGENCY TELEPHONE SINGLE BUTTON FLUSH MOUNTED
12. 1-1/4" CONDUIT FOR VOICE COMMUNICATION. ROUTE AS SHOWN ON PLANS.
13. CONDUIT FOR 120VAC POWER. SEE ELECTRICAL DRAWINGS.
14. TEXT AND EMBLEM IN WHITE ON ALL FOUR SIDES

6C.8.2 Emergency Call Box – Wall Mount

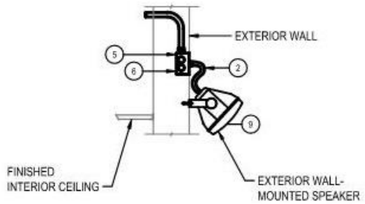


EMERGENCY CALL STATION
WALL MOUNT
SCALE: NONE

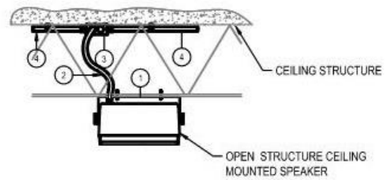
(#) DETAIL KEYED NOTES

1. ALIGN INCOMING CONDUITS WITH 3/4" CONDUIT KNOCKOUTS IN BACK OF CALL STATION.
2. (1)-3/4" CONDUIT FOR 120V POWER BY OTHERS
3. (1)-3/4" CONDUIT FOR COMMUNICATION CABLES. ROUTE TO NEAREST TELECOM ROOM AND/OR PULL-BOX AS SHOWN ON DRAWINGS.
4. COORDINATE LOCATION WITH ARCHITECT AND OWNER.

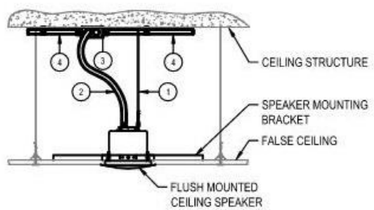
6C.9 Public Address Speakers & Ambient Noise Sensors



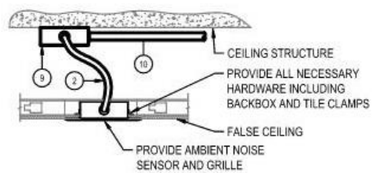
- TYPICAL SPEAKER MOUNTING EXTERIOR WALL
SCALE: NONE



- TYPICAL SPEAKER MOUNTING OPEN STRUCTURE
SCALE: NONE



- TYPICAL SPEAKER MOUNTING FLUSH MOUNT CEILING
SCALE: NONE



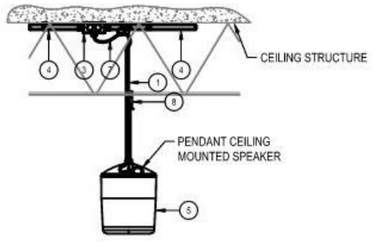
- TYPICAL AMBIENT NOISE SENSOR FLUSH MOUNT CEILING
SCALE: NONE

GENERAL NOTES

1. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS RELATED TO PUBLIC ADDRESS SYSTEM (PA) REQUIREMENTS AND SCOPE.
2. THE PA SPEAKER AND DEVICE DETAILS ARE DIAGRAMMATIC IN NATURE AND SHOW GENERAL INSTALLATION REQUIREMENTS PER DEVICE. VERIFY FIELD CONDITIONS PER LOCATION PRIOR TO CONSTRUCTION.
3. ALL CONDUIT TO BE RUN CONCEALED UNLESS NOTED OTHERWISE. LOCATE JUNCTION BOXES ABOVE CEILING IN ACCESSIBLE LOCATION. SUPPORT ALL CONDUIT AND SPEAKERS FROM BUILDING STRUCTURE. SPEAKER SHALL NOT BE SUPPORTED SOLELY BY THE CEILING.
4. PROVIDE SPEAKER, SPEAKER COMPONENTS, AND MOUNTING HARDWARE, AND MOUNT AS INDICATED ON PLANS AND IN SPECIFICATIONS. PROVIDE ALL MOUNTING AND SUPPORT HARDWARE AS REQUIRED BY THE MANUFACTURER. PROVIDE ALL CONNECTIONS OF FLEXIBLE CONDUIT AND/OR CABLING TO JUNCTION BOX.
5. EXPOSED CONDUIT AND HARDWARE MAY BE REQUIRED TO LOCATE SPEAKER CORRECTLY AND PROVIDE ACCESS TO ACCESSIBLE CEILING FOR CONDUIT RUN TO THE JUNCTION BOX. PROVIDE JUNCTION BOXES AS NEEDED. REFER TO PROJECT SPECIFICATIONS REGARDING PAINTING REQUIREMENTS FOR EXPOSED CONDUIT AND MOUNTING HARDWARE.
6. FINISHED CEILING, WALL, AND STRUCTURAL DECK CONSTRUCTION SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DETAILED INFORMATION.

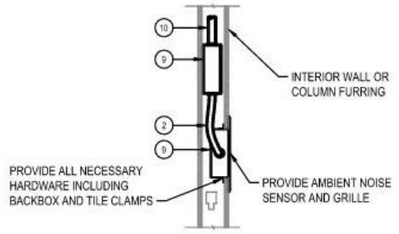
(#) PAS DETAIL KEYED NOTES

1. SUPPORT SPEAKER FROM RIGID STRUCTURE.
2. MINIMUM ¾" FLEXIBLE METAL CONDUIT. SUPPORT ANY FLEXIBLE CONDUIT LENGTH IN EXCESS OF 36".
3. PROVIDE JUNCTION BOX. FOR CEILING-MOUNTED SPEAKERS, LOCATE JUNCTION BOX ABOVE ACCESSIBLE CEILING.
4. PROVIDE MINIMUM 1" RIGID CONDUIT AND PA CABLING TO NEXT SPEAKER, TELECOMMUNICATION ROOM, OR PA ENCLOSURE.
5. MOUNT SPEAKER MINIMUM 12' AFF UNLESS OTHERWISE NOTED ON PLAN.
6. JUNCTION BOX AND ASSOCIATED CONDUIT MAY BE SURFACE MOUNTED TO THE FINISHED WALL IF FLUSH MOUNTING IS NOT FEASIBLE (MASONRY WALL, SECURE WALL, ETC.). IN SUCH INSTANCES, OBTAIN ENGINEER AND ARCHITECT APPROVAL PRIOR TO ROUGH-IN ON A CASE-BY-CASE BASIS.
7. PROVIDE FLEXIBLE STRANDED SPEAKER CABLE FROM JUNCTION BOX TO SPEAKER WITH WEATHER TIGHT CABLE GLANDS. SUPPORT CABLE TO CEILING STRUCTURE IN CEILING-MOUNTED APPLICATIONS.
8. PROVIDE SECONDARY SAFETY SUPPORT CONNECTION TO STRUCTURE.
9. PROVIDE JUNCTION BOX. FOR CEILING-MOUNTED AMBIENT NOISE SENSOR (ANS), LOCATE JUNCTION BOX ABOVE ACCESSIBLE CEILING.
10. PROVIDE MINIMUM 1" RIGID CONDUIT AND PA CABLING TO NEXT ANS, TELECOMMUNICATION ROOM, OR PA ENCLOSURE.



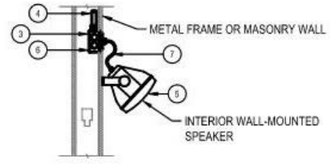
TYPICAL SPEAKER MOUNTING
PENDANT MOUNT

SCALE: NONE



TYPICAL AMBIENT NOISE SENSOR
WALL MOUNT

SCALE: NONE



TYPICAL SPEAKER MOUNTING
INTERIOR WALL MOUNT

SCALE: NONE

GENERAL NOTES

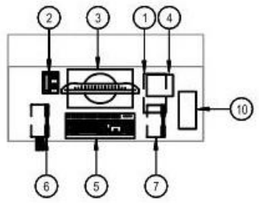
1. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS RELATED TO PUBLIC ADDRESS SYSTEM (PA) REQUIREMENTS AND SCOPE.
2. THE PA SPEAKER AND DEVICE DETAILS ARE DIAGRAMMATIC IN NATURE AND SHOW GENERAL INSTALLATION REQUIREMENTS PER DEVICE. VERIFY FIELD CONDITIONS PER LOCATION PRIOR TO CONSTRUCTION.
3. ALL CONDUIT TO BE RUN CONCEALED UNLESS NOTED OTHERWISE. LOCATE JUNCTION BOXES ABOVE CEILING IN ACCESSIBLE LOCATION. SUPPORT ALL CONDUIT AND SPEAKERS FROM BUILDING STRUCTURE. SPEAKER SHALL NOT BE SUPPORTED SOLELY BY THE FALSE CEILING.
4. PROVIDE SPEAKER, SPEAKER COMPONENTS, AND MOUNTING HARDWARE, AND MOUNT AS INDICATED ON PLANS AND IN SPECIFICATIONS. PROVIDE ALL MOUNTING AND SUPPORT HARDWARE AS REQUIRED BY THE MANUFACTURER. PROVIDE ALL CONNECTIONS OF FLEXIBLE CONDUIT AND/OR CABLING TO JUNCTION BOX.
5. EXPOSED CONDUIT AND HARDWARE MAY BE REQUIRED TO LOCATE SPEAKER CORRECTLY AND PROVIDE ACCESS TO ACCESSIBLE CEILING FOR CONDUIT RUN TO THE JUNCTION BOX. PROVIDE JUNCTION BOXES AS NEEDED. REFER TO PROJECT SPECIFICATIONS REGARDING PAINTING REQUIREMENTS FOR EXPOSED CONDUIT AND MOUNTING HARDWARE.
6. FINISHED CEILING, WALL, AND STRUCTURAL DECK CONSTRUCTION SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DETAILED INFORMATION.

(#) PAS DETAIL KEYED NOTES

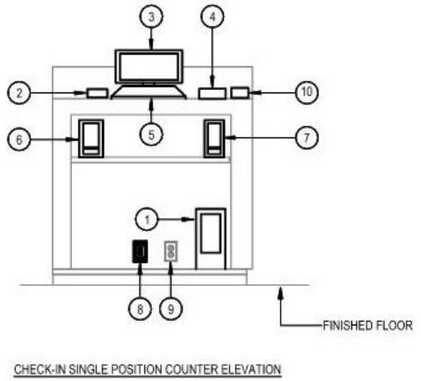
1. SUPPORT SPEAKER FROM STRUCTURE.
2. MINIMUM 3/4" FLEXIBLE METAL CONDUIT. SUPPORT ANY FLEXIBLE CONDUIT LENGTH IN EXCESS OF 36".
3. PROVIDE JUNCTION BOX. FOR CEILING-MOUNTED SPEAKERS, LOCATE JUNCTION BOX ABOVE ACCESSIBLE CEILING.
4. PROVIDE MINIMUM 1" RIGID CONDUIT AND PA CABLING TO NEXT SPEAKER, TELECOMMUNICATION ROOM, OR PA ENCLOSURE.
5. MOUNT SPEAKER MINIMUM 12' AFF UNLESS OTHERWISE NOTED ON PLAN.
6. JUNCTION BOX AND ASSOCIATED CONDUIT MAY BE SURFACE MOUNTED TO THE FINISHED WALL IF FLUSH MOUNTING IS NOT FEASIBLE (MASONRY WALL, SECURE WALL, ETC.). IN SUCH INSTANCES, OBTAIN ENGINEER AND ARCHITECT APPROVAL PRIOR TO ROUGH-IN ON A CASE-BY-CASE BASIS.
7. PROVIDE FLEXIBLE STRANDED SPEAKER CABLE FROM JUNCTION BOX TO SPEAKER WITH WEATHER TIGHT CABLE GLANDS. SUPPORT CABLE TO CEILING STRUCTURE IN CEILING-MOUNTED APPLICATIONS.
8. PROVIDE SECONDARY SAFETY SUPPORT CONNECTION TO STRUCTURE.
9. PROVIDE JUNCTION BOX. FOR CEILING-MOUNTED AMBIENT NOISE SENSOR (ANS), LOCATE JUNCTION BOX ABOVE ACCESSIBLE CEILING.
10. PROVIDE MINIMUM 1" RIGID CONDUIT AND PA CABLING TO NEXT ANS, TELECOMMUNICATION ROOM, OR PA ENCLOSURE.

6C.10 Common Use Equipment

6C.10.1 Check-in – Single Position



CHECK-IN SINGLE POSITION COUNTER DETAIL



CHECK-IN SINGLE POSITION COUNTER ELEVATION

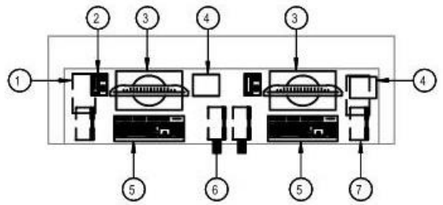
GENERAL NOTES:

1. CUPPS DEVICE PLACEMENT IN THE MILLWORK TO BE COORDINATED WITH THE MILLWORK AND INTERIOR DESIGN.
2. POWER AND ELECTRICAL SERVICES, INCLUDING CABLE AND CONDUIT ROUTINGS, TO BE COORDINATED WITH THE MILLWORK, ELECTRICAL, AND COMMUNICATIONS DESIGN.
3. TELEPHONE SHOWN FOR INFORMATION AND COORDINATION ONLY. TELEPHONES ARE NOT PROVIDED IN THE CUPPS SCOPE OF WORK.

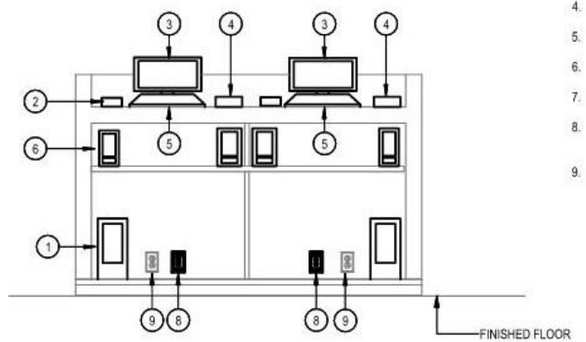
(#) COMMON USE DETAIL KEYED NOTES

1. CUPPS WORKSTATION CPU (TYP.)
2. TELEPHONE HANDSET (TYP.) NOT IN CUPPS SCOPE
3. CUPPS WORKSTATION MONITOR (TYPICAL)
4. MULTIFUNCTION DOCUMENT READER
5. CUPPS WORKSTATION KEYBOARD
6. BOARDING PASS PRINTER (TYPICAL)
7. BAG TAG PRINTER (TYPICAL)
8. COMMUNICATIONS OUTLET PER MILLWORK AND COMMUNICATIONS DESIGN (TYPICAL)
9. POWER OUTLET PER MILLWORK AND ELECTRICAL DESIGN - (TYPICAL)
10. BOARDING GATE READER

6C.10.2 Check-in – Dual Position



CHECK-IN DUAL POSITION COUNTER DETAIL



CHECK-IN DUAL POSITION COUNTER ELEVATION

GENERAL NOTES:

1. CUPPS DEVICE PLACEMENT IN THE MILLWORK TO BE COORDINATED WITH THE MILLWORK AND INTERIOR DESIGN.
2. POWER AND ELECTRICAL SERVICES, INCLUDING CABLE AND CONDUIT ROUTINGS, TO BE COORDINATED WITH THE MILLWORK, ELECTRICAL, AND COMMUNICATIONS DESIGN.
3. TELEPHONE SHOWN FOR INFORMATION AND COORDINATION ONLY. TELEPHONES ARE NOT PROVIDED IN THE CUPPS SCOPE OF WORK.

(#) COMMON USE DETAIL KEYED NOTES

1. CUPPS WORKSTATION CPU (TYP.)
2. TELEPHONE HANDSET (TYP.) NOT IN CUPPS SCOPE
3. CUPPS WORKSTATION MONITOR (TYPICAL)
4. MULTIFUNCTION DOCUMENT READER
5. CUPPS WORKSTATION KEYBOARD
6. BOARDING PASS PRINTER (TYPICAL)
7. BAG TAG PRINTER (TYPICAL)
8. COMMUNICATIONS OUTLET PER MILLWORK AND COMMUNICATIONS DESIGN (TYPICAL)
9. POWER OUTLET PER MILLWORK AND ELECTRICAL DESIGN - (TYPICAL)

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 7

Safety and Security

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.1 Security at BWI Marshall Airport

Construction projects at BWI Marshall that require work in the following locations shall include the standard Specification 010005X_Security Requirements During Construction at BWI, unless otherwise noted.

A. Within the Security Identification Display Area (SIDA)
B. Inside the terminal building
C. Within 300 feet from the face of the terminal building
D. Within 10 feet of the security fence.

Specification 010005X shall be included in its entirety. Consultants shall edit/tailor the "Project Specific Requirements" and the "Method of Measurement" sections of the specification to comply with each project's security requirements. This specification has been reviewed and approved by the Office of Airport Security (OAS) and shall not be modified, except where noted, unless approved by the OAS.

1.1.1 Security Plan

For projects at BWI Marshall meeting the criteria state above, a Security Bid Plan (SBP) with notes shall be prepared as a standard drawing with notes as part of the Contract documents and shall include the following:

A. Project specific security requirements coordinated in detail with Project Phasing.
B. Project Phases and the duration of each phase.
C. Provision of an internal secure perimeter system where possible. Any materials required to establish the perimeter shall be detailed on the SBP and specified in Specification 010005X to ensure there is no confusion of pay items with Temporary Construction Items.
D. Guard locations.
E. Access points/SIDA entrance/security guard locations. The consultant shall make note of anticipated processing times at access points, if any inspections should be anticipated, etc. The consultant shall make note that the Contractor shall consider the processing time when computing his bid price for this item.
F. Delivery Routes
G. Identification of worksites and definition of geographical work areas.
H. Locations/phases where an escort from MDOT MAA Operations is required.
I. Any other job specific security items.
J. Signature Block on each sheet to be signed by the Director of Airport Security.

The OAS shall review and approve all Security Bid Plans during design. If a changed security condition is proposed (i.e. security fence relocation), the Transportation Security Administration (TSA) requires a forty-five (45) calendar day review period of the SBP. Consider that more than one submittal may be required when scheduling the submittal.

Upon approval of the SBP by all parties, a meeting shall be set up with the OAS to obtain final signatures on the SBP to become part of the contract documents.

1.2 Security at Martin State Airport

All construction projects at MTN, whether airside or landside, shall include the standard Specification 010006X_Security Requirements During Construction at MTN. Specification 010006X for MTN is included in Appendix 7B - Standard Specifications.

Because security requirements at MTN are not as stringent, there is no direct payment for Specification 010006X. Security requirements shall be considered incidental to Specification 010004X_Temporary Construction Items or Division 01, General Requirements.

1.3 Sensitive Security Information

This section applies to all persons and entities that have access to information classified by the Maryland Aviation Administration as Sensitive Security Information (SSI) and provides instructions on the procedures that must be strictly adhered to when working with SSI information.

All projects designed, procured and constructed at BWI Marshall and MTN shall comply with these requirements.

SSI electronic files submitted to MDOT MAA, such as drawings, specifications, engineering reports, etc., shall be named per Volume 2, Section 3.3 Standard File Naming Convention.

A. The provisions of this section apply to the following physical security systems at the BWI Marshall Airport and their component data:

1. Controlled Access Security System (CASS)
2. Closed Circuit Television (CCTV)
3. Flex Response System
4. Computer Aided Dispatch (CAD)

B. Additionally, this section applies to the following groups of personnel who interface with these systems and must manage their associated SSI:
1. MDOT MAA Office of Engineering & Construction
2. MDOT MAA Office of Airport Security
3. MDOT MAA Office of Procurement
4. MDOT MAA Office of Airport Operations
5. MDOT MAA Office of Commercial Management
6. MDOT MAA Office of Information Technology
7. MDOT MAA Office of the Attorney General
8. Consultants
9. Construction Management and Inspection Consultants
10. Construction Contractors
11. Construction Subcontractors
12. Sole Source System Contractors under contract to MDOT MAA
13. Tenants and their consultants and contractors performing facility modifications under the authority of a MDOT MAA Building Permit

Personnel within these organizations that must handle SSI pursuant to discharging their professional responsibilities are considered “covered” with a “need to know.”

1.3.1 Protected SSI Systems

1.3.1.1 Controlled Access Security System (CASS)

A. Description - The Controlled Access Security System (CASS) provides a means of opening and closing doors to secure areas through the use of a card reader and data contained on an access card (MDOT MAA Security Badge). The system produces an automated log of all activity and interfaces with other security systems. Additionally, there are subsystems which use the same components for limited, related applications.

B. System Components
1. CASS Reader
2. Power Supply
3. Control Panel
4. Door Security Hardware
5. Head-end Equipment
6. Other Peripheral Devices

C. System Administration
1. System Manuals
2. System Drawings
3. Software
4. Training Documents

Note: Data logs, the employee database and other system data may be considered SSI but are beyond the scope of this section.

1.3.1.2 Closed Circuit Television (CCTV)

A. Description – The Closed Circuit Television (CCTV) System provides a means of viewing activity at various locations throughout the BWI Marshall campus through the use of a series of cameras and monitors. The system includes the capability to record video of images viewed through the remote camera. The system is integrated and can be controlled remotely. Additionally, there are subsystems which use the same components for limited, related applications (such as the Exit Lane Breach Detection System).

B. System Components
   1. Cameras
   2. Monitors
   3. Power Supply
   4. Digital Video Recorders
   5. Fiber Optic Transceivers
   6. Head-end Equipment
   7. CCTV – CASS Interface

C. System Administration
   1. System Manuals
   2. System Drawings
   3. System Codes
   4. Software
   5. Training Documents

1.3.1.3 Flex Response

A. Description – The Flex Response System is a stand-alone audible and visual alarm system that provides a means of alerting law enforcement and airline gate personnel of a security concern arising from personnel activity or carry-on baggage screening at pier security checkpoints. There are two alert levels: amber and red. Additionally, the system can be activated by opening a door to an Automated External Defibrillator (AED) cabinet.

B. System Components
   1. Strobe
   2. Audio alarm
   3. Power Source
   4. Head-end Equipment
   5. Activation switches

C. System Administration
   1. System Manuals
   2. System Drawings
   3. Training Documents

1.3.1.4 Computer Aided Dispatch System (CAD)

A. Description – The Computer Aided Dispatch (CAD) System is an automated point of entry which provides an integrated information gathering function from multiple call, alarm, and signaling sources and distributes that information to appropriate emergency response units for public safety purposes. Basic functions provided by CAD include resource management, call taking, location verification, dispatching, unit status management, and call disposition. Interface with mobile data computers and other external safety and security systems, along with local, state and federal information systems, benefit timely and effective response to emergency situations.

B. System Components
   1. Computer Hardware and Software
   2. Audio headsets
   3. Audio visual monitors
   4. Keyboards
   5. Cable connections
   6. Workstation units
   7. Integration of communication, safety, and alarm systems:
      a. Telephone

b. State and Regional NCIC
c. Fire Alarm System
d. Controlled Access Security System (CASS)
e. Closed Circuit Television System (CCTV)
f. Flex Response System
g. Fire Rescue Facility Alerting and Activation
h. Messaging System
i. Master Time Clock
j. Records Management System (RMS)

C. Systems Administration
1. Systems Manuals
2. Systems Drawings
3. Systems Codes
4. Software
5. Training Documents
6. Maintenance and Service

1.3.2 Security System Drawings

Security System design shall be produced as separate and unique sections in the Contract Drawings. Security Systems shall be defined as the Controlled Access Security System (CASS), the Digital Video Management System (DVMS) or Close Circuit Television (CCTV) system, and the supporting communication and storage systems including the Local Area Network (LAN), the fiber-optic backbone, system servers, and the Storage Area Network (SAN). With the prior written authorization of the MDOT MAA's Office of Information Technology, infrastructure design elements that are located in secure telecommunication rooms or other secure locations may be kept in the general Contract Documents rather than be considered to be part of the Security System design. This authorization will be made on a contract by contract basis and does not alleviate the designer from any coordination required for the design of Security Systems.

All information pertaining to the Security System design must be clearly tagged as Security Sensitive Information (SSI). All Security System submittals and Contract Documents must be labeled, bound, and transmitted separately. These documents shall be protected when being transmitted or transferred using encrypted files with passwords to prevent unauthorized access. These documents must also carry the following statement:

> WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR Part 15 and 49 CFR Part 1520.

1.3.3 SSI General Requirements

1.3.3.1 General SSI Requirements

The Maryland Aviation Administration maintains physical security systems which are contained within, and integrated into, various facilities. Even though these systems (which are listed above in Section 1.3) are maintained and operated by sole source system contractors, they may be affected by various construction projects.

The design and construction of these projects involve the disclosure, reproduction and distribution of SSI among the owner, consultant design team and the contractor team.

1.3.3.2 Access to SSI

Access to SSI is limited to "covered persons" listed in 49 CFR 1520.7 with a "need to know," as defined in 49 CFR 1520.11. "Need to know" is limited to persons who carry out or supervise the maintenance or improvement of designated systems in the performance of their job.

1.3.3.3 Categories of SSI

There are sixteen categories of SSI. Five of those categories pertain to this section. These are highlighted below:

1. Security Programs and Contingency Plans
2. Security Directives
3. Information Circulars

4. **Performance Specifications**
5. Vulnerability Assessments
6. Security Inspection or Investigative Information
7. Threat Information
8. Security Measures
9. Security Screening Information
10. **Security Training Materials**
11. Identifying Information of Certain Transportation Security Personnel
12. **Critical Aviation or Maritime Infrastructure Asset Information**
13. **Systems Security Information**
14. **Confidential Business Information**
15. Research and Development
16. Other Information

1.3.3.4 Determination of SSI

Determination of SSI designation for design and construction projects shall be made in accordance with the provisions of this section by the Maryland Aviation Administration Director of Airport Security (DOAS). At each project design kick-off meeting, it shall be the responsibility of the assigned MDOT MAA Project Manager (Design) to discuss the project scope with the DOAS and obtain a preliminary SSI determination for the project. The DOAS shall be required to provide a written document outlining what portions of the design are considered SSI subject to the provisions of this section. The MDOT MAA Project Manager (Design) shall be responsible for ensuring that this documentation is obtained and distributed only to those team members with a "need to know," and that all portions of the design designated by the DOAS as SSI are adequately marked in accordance with the provisions of this section.

If a subordinate MDOT MAA staff member or consultant design team member believes that the SSI designation has been omitted, he shall immediately inform the MDOT MAA Project Manager (Design) for a designation determination. In the absence of the MDOT MAA Project Manager, the next highest member of the chain of command shall be notified for a designation determination.

1.3.3.5 Control and Release of SSI

SSI may be released to federal, state and municipal government officials and employees, local law enforcement officials, and regulated parties who have a "need to know" as established by regulation, authorized by procedure established by the DOAS, or authorized by the TSA Administrator.

SSI requested under the Freedom of Information Act (FOIA) is exempt from disclosure under the FOIA based on Exemption 3, 5 USC 552(b)(3). Any decision to release SSI under the FOIA must have the concurrence of the TSA Administrator. Requests for Information that are addressed to regulated parties, such as requests under state and local freedom of information or open records acts, should be referred to the DOAS, who may need to refer the request to the TSA Administrator.

> *If a record contains SSI but also contains non-SSI that may be disclosed, the latter will be provided in response to a FOIA request, provided the record is not otherwise exempt from disclosure under FOIA, if it is practical to redact the requested information from the record.*

Maryland State Government Article Section 10-611 et seq. grants the public a broad right of access to records that are in the possession of state and local government agencies. It has been a part of the Annotated Code of Maryland since its enactment as Chapter 698 of the Laws of Maryland 1970 and is similar in purpose to the FOIA, 5 USC. §552, and the public information and open records acts of other states. **SSI is exempt from the provisions of PIA.**

1.3.3.6 Protective Marking and Media Containing SSI

A. **General**: - Any person who creates a record containing SSI shall include a protective marking and distribution limitation statement.
B. **Paper ("Hard Copy"):** - All SSI documents shall contain the following protective marking in the document header:

Sensitive Security Information

This protective marking should be stamped or typed in plain style bold text.

The following distribution limitation statement shall be contained in the document footer and informs the viewer that the record must be protected from unauthorized disclosure.

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR Part 15 and 49 CFR Part 1520.

The Header and Footer described above shall appear on the cover page of any document, report or specification that contains **any** SSI and on every page of the document containing SSI.

The distribution limitation statement described above shall be included on all project plan sheets, diagrams, shop drawings, record drawings or any other drawings that contain SSI about the affected systems or their component parts.

Charts, maps, and drawings designated as SSI must have the appropriate protective marking and the distribution limitation statement affixed in a manner that is plainly visible.

C. **Facsimile Cover Sheets**: - Documents used to transmit SSI (such as facsimile cover sheets) but that do not themselves contain SSI, must be marked with the protective marking and distribution limitation statement. The following statements must be affixed to the front page of the cover sheet:

This facsimile is intended for the recipient only. If this is received by someone other than the intended recipient, the person receiving the message should immediately contact the sender for further instructions.

The protective marking SENSITIVE SECURITY INFORMATION and/or the distribution limitation statement on this page are cancelled when the attachments containing SSI are removed.

D. **Transmittal Letters:** – Like facsimile cover letters, transmittal letters do not themselves contain SSI, but may cover other documents that do and must be marked with the protective marking and distribution limitation statement. The following statements must be affixed to the front page of the transmittal letter:

This transmittal letter is intended for the recipient only. If this is received by someone other than the intended recipient, the person receiving the message should immediately contact the sender for further instructions.

The protective marking SENSITIVE SECURITY INFORMATION and/or the distribution limitation statement on this page are cancelled when the attachments containing SSI are removed.

E. Plans and Specifications containing SSI:

1. **Plans and Specifications containing SSI (hereafter also referred to as "plans and specifications")** - All project plans and specifications used in design and construction that contain SSI shall comply with the provisions of Volume 2, Section 3.1.2 Electronic documents containing Sensitive Security Information (SSI), Protective Marking of Media Containing SSI.

   Plan and specification sets shall be numbered by the MDOT MAA Project Manager or his designee. Set numbers shall be recorded by the MDOT MAA Project Manager by project phase (design, procurement or construction).

   In the case of plan sets or other cases in which these drawings are combined into a single bound document, the document cover page/sheet shall contain the protective marking and distribution limitation statement, and all project plans and specifications that contain SSI shall comply with the provisions of Volume 2, Section 3.1.2 Electronic documents containing Sensitive Security Information (SSI), Protective Marking of Media Containing SSI.

2. **Electronic media:** - SSI contained on electronic media and magnetic media must have the protective marking and the distribution limitation statement applied at the beginning and end of the electronic and magnetic text; on each side of the disk and the disk sleeve / jacket; on the non-optical side of the CD-ROM, DVD or other format disk; and on both sides of the CD-ROM, DVD or other format disk case. Memory sticks that contain SSI shall be indelibly marked "SSI" on both sides of the device.

3. **Electronic Mail (e-mail):** - SSI contained within an electronic mail message must include the protective marking within the subject line of the message and the distribution limitation statement applied at the end of the message text.

1.3.3.7 Protection and Safeguarding of SSI

All personnel possessing SSI are responsible for ensuring that such information is safeguarded at all times from disclosure to unauthorized personnel. When the information is not under the individual's direct physical control, the individual is responsible for ensuring that it is safeguarded and protected so that it is not physically or visually accessible to persons who do not have a need to know. When unattended, SSI must be secured in a locked container, office, or other restricted access area with access to the keys or combination limited to those with a "need to know."

A person who receives an unmarked record containing SSI should apply the protective marking and distribution limitation statement and inform the sender of the omission.

Anyone possessing SSI is responsible for ensuring that the information and records containing SSI are protected at all times from disclosure to anyone who does not have a "need to know."

When SSI is not under direct physical control, the covered person must ensure that it is protected in such a way that it is not physically or visually accessible to persons who do not have a "need to know."

The authority to share SSI with any person or entity without a "need to know" is limited to the TSA Administrator.

Every covered person has the responsibility to safeguard SSI according to the CFR and TSA policies. If a covered person encounters a situation in which SSI has been inadvertently shared with a person without the "need to know," immediately notify the MDOT MAA Project Manager.

1.3.3.8 Transmission of SSI

A. Non-electronic methods:
   1. Mail – Material will be placed in a single opaque envelope or container and sufficiently sealed to prevent inadvertently opening and to show evidence of tempering. The envelope or container will bear the complete name and address of the sender and addressee. SSI materials will be mailed by US Postal Service First Class Mail or a reputable commercial delivery services such as Federal Express or UPS. The outside wrapping will NOT be marked as SSI.
   2. Interoffice mail – SSI must be sent using unmarked, opaque, sealed envelope so that SSI cannot be read through the envelope.
   3. Hand-carrying between buildings – SSI material carried by hand within or between buildings must be protected to prevent inadvertent visual disclosure.

B. Electronic methods:
   1. Electronic mail - Prepare SSI information, marked accordingly, in a separate password protected document. Passwords should be sent separately with no subject line or shared either in person or via telephone. Use as attachment in email. SSI should not be sent to personal email accounts. Guidance for passwords:
      a. Be at least 8 characters in length
      b. Have at least one letter upper case and one letter lowercase
      c. Contain at least one special character
      d. Contain at least one number
      e. Not be a word in the dictionary
   2. Web Posting – MDOT MAA does not authorize the posting of SSI on Internet or Intranet sites, unless the site has met prescribed MDOT MAA security standards.
   3. Facsimile – Use marked coversheet, mark documents appropriately, and ensure receiver is available to retrieve information immediately. Preferable to be constant voice contact during transmission to confirm receipt.

      Facsimiles sent to a controlled, secure area where unauthorized people cannot intercept the SSI material may be sent without requiring the recipient to be there.
   4. Telephone – Will be done carefully to prevent eavesdropping. Land lines in non-public locations are more secure that cellular telephones.
   5. CD's AND DVD's – Should be encrypted or password protected, and the SSI Header and Footer should be affixed to the CD or DVD.
   6. Electronic Presentations (e.g., PowerPoint) – Should be marked with the SSI Header on all pages and the SSI Footer on the first and last pages of the presentation.
   7. Video and Audio – Should be marked the SSI Header and the SSI Footer on the protective cover when able and the header and footer should be shown be shown and/or read at the beginning and ending of the program.
   8. When Leaving Your Desk or Computer – SSI must be secured in a locked container, office, or other restricted access area with access to the keys or combination limited to those with a need 'to know" and the computer should be turned off.
   9. SSI Stored on Network Folders – Will either require a password to open or the network should limit the access to the folder to covered persons only.

1.3.3.9 Reproduction of SSI

The reproduction of SSI shall be kept to a minimum with only those with a "need to know" being allowed access to the subject files. Documents shall only be reproduced for the expressed use of personnel actively involved with work pertaining to the project. These electronic documents shall be shared via password protected files with the approval of the SSI coordinator. Hard copy reproduction should be avoided unless absolutely necessary and only allowed with the approval of the SSI coordinator. In the event a hard copy is approved by the SSI coordinator, only the trained person with the "need to know" shall be allowed to reproduce the document.

Documents containing SSI may be reproduced by an external organization (e.g., FedEx, Kinko's, Staples, etc.). The individual(s) assigned to make the reproduction(s) must first sign a non-disclosure agreement (NDA) to be kept by whoever contracted for or purchases such services. A covered person* must be physically present to oversee the process and ensure that the person making the copies does not read or intentionally or unintentionally retain a copy of the SSI document.

* A covered person, as defined by 49 CFR Part 15 and 49 CFR Part 1520, may reproduce records containing SSI. Reproductions may only be shared with covered persons with a need to know.

1.3.3.10 The Project Process

A. Project Responsibilities:

Responsibilities for SSI during the Project process are shown in the following table:

Project Phase	Responsible MDOT MAA Staff	Cognizant (support) Staff
Pre-Design and Design	Project Manager (Design)*	Design (Consultant) Project Manager Sole Source System Contractor MDOT MAA and other Staff participating in Design Review
Procurement	Project Manager (Procurement)*	Design (Consultant) Project Manager Project Manager (Construction) Sole Source System Contractor Contractors/Bidders (Signing the Non-Disclosure Agreement)
Construction	Project Manager (Construction)*	Construction Manager (Consultant) Construction Inspector (Consultant) Contractor Subcontractor Sole Source System Contractor

Note: * MDOT MAA Project Phase Management Staff will retain responsibility for the safeguarding and management of SSI by their respective team members from their first contact with SSI until the project is complete and all SSI is retained in archived documents or destroyed.

B. The Pre-design Phase:

1. General – At the project design kick-off meeting, a preliminary SSI determination will be made by the MDOT MAA Director of Airport Security (DOAS) The MDOT MAA Project Manager (Design) shall consult with the DOAS and the affected Sole Source System Contractor(s) in making this determination.

   If the project is identified as containing SSI, the project management personnel (MDOT MAA and Consultant) and MDOT MAA reviewers shall obtain MDOT MAA Security (Red) Badges and successfully complete MDOT MAA SSI training prior to handling SSI throughout the project.

2. MDOT MAA DOAS – The MDOT MAA DOAS is responsible for providing SSI training to project personnel and for issuing red security badges to project management personnel (MDOT MAA and Consultant). For MDOT MAA reviewers, the MDOT MAA DOAS is responsible for providing SSI training and for ensuring that reviewers pass a TSA Criminal History Record Check (CHRC) and a TSA Security Threat Assessment (STA).

C. The Design Phase:

1. MDOT MAA Project Manager (Design) – **The MDOT MAA Project Manager (Design) is the responsible officer for the safeguarding of SSI generated and handled by the Design Team throughout the duration of the project.** The MDOT MAA Project Manager (Design) assigned to a project that includes SSI shall be thoroughly familiar with the provisions of this section and shall ensure that the Design (Consultant) Project Manager receives a copy of this section for reference and compliance. The MDOT MAA Project Manager (Design) shall obtain signed "MDOT MAA Confidentiality and Non-Disclosure Agreement – Sensitive Security Information" forms (contained in Appendix 7A - Standard Forms) from all design team members, Design A/E's, Construction Management and Inspection members and Sole Source System Contractor(s).

The MDOT MAA Project Manager (Design) shall also ensure that the contract documents prepared by the design team include the required SSI language in the Notice to Contractors and Specification 010007X_Sensitive Security Information (SSI) System Requirements During Construction, (contained in Appendix 7B - Standard Specifications) in the project specifications.

The MDOT MAA Project Manager (Design) shall ensure the accounting of all Plan and Specification review sets and their destruction. The MDOT MAA Project Manager (Design) shall maintain a master list of design team covered persons with "need to know" (including MDOT MAA reviewers) throughout the project and ensure that all design team project management staff comply with security badging and SSI training prior to handling SSI. The MDOT MAA Project Manager (Design) shall provide and account for final plans and specification sets provided to the affected Sole Source System Contractor(s) for use during design and the procurement phase.

2. Design (Consultant) Project Manager – The Design (Consultant) Project Manager shall work under the direction of the MDOT MAA Project Manager (Design) and ensure compliance with all provisions of this section by all design team members.

3. Design Review Conferences –The MDOT MAA Project Manager (Design) shall ensure that project stakeholders who have the "need to know" and participate in the design review process for projects with SSI understand and comply with SSI provisions contained herein. Plan and Specification sets used for staff review shall be numbered and accounted for by the MDOT MAA Project Manager (Design). Upon completion of all design reviews, all Plan and Specification sets shall be returned for destruction under the supervision of the MDOT MAA Project Manager (Design).

4. Sole Source System Contractor – Affected Sole Source System Contractor(s) shall avail themselves to the MDOT MAA Project Manager (Design) for design coordination. Affected Sole Source System Contractor(s) shall attend and participate in all design review conferences.

D. The Procurement Phase:

1. General – Plan and Specification Sets will be sold only to Contractors and Subcontractors who meet all of the requirements listed within the Notice to Contractors (contained in Section 1.3.3 SSI General Requirements).

   All advertisements for projects containing SSI shall include the language contained in Section 1.3.4 SSI Language to be included in the Notice to Contractors.

2. MDOT MAA Project Manager (Procurement) – **The MDOT MAA Project Manager (Procurement) is the responsible officer for the safeguarding of SSI generated and handled by the Procurement Team throughout the duration of the project.** The MDOT MAA Project Manager (Procurement) shall maintain a master list of covered persons (including Contractors who purchase Plans and Specifications) with "need to know" during this phase of the project. The MDOT MAA Project Manager (Procurement) shall obtain signed MDOT MAA Confidentiality and Non-Disclosure Agreement – Sensitive Security Information forms (contained in Appendix 7A - Standard Forms) from all bidders and shall require a refundable deposit of $6,000 in the form of a certified check which shall be held until Plan and Specification sets are returned intact to MDOT MAA Procurement personnel. The MDOT MAA Project Manager (Procurement) shall schedule and conduct the pre-bid conference in accordance with requirements contained herein.

3. Pre-Bid Conference – The pre-bid conference for a project that includes SSI within the Plans and Specifications shall include a briefing by the MDOT MAA Project Manager (Procurement) to all bidders on the SSI handling requirements contained herein, with special emphasis on the provisions of the MDOT MAA Confidentiality and Non-Disclosure Agreement – Sensitive Security Information, bidding, coordination with sole source system contractor(s), and control of SSI during the construction phase.

4. Sole Source System Contractor - The bidder(s) and the SSSC will confirm task assignments and bid accordingly. Sole source system contractor(s) local representative(s) shall attend the pre-bid conference if their system is affected by the project and avail themselves to bidders to coordinate bid preparation.

E. The Construction Phase:

1. General – Plans and Specifications shall be used during the construction phase on a "need to know" basis with the disclosure and acknowledgement of the Contractor and Subcontractors and the assistance of the MDOT MAA Project Manager (Construction). The Contractor shall obtain the Project SSI Management Plan template from the DOAS to complete. The Contractor shall be required to submit the SSI Management Plan after receipt of a Notice of Recommended Award (NORA). The Contractor's SSI Management Plan must be accepted by MDOT MAA before MDOT MAA will issue a Notice to Proceed (NTP) for the project.

   The SSI Management Plan is subject to an MDOT MAA review and acceptance process wherein MDOT MAA has seven (7) calendar days to review and comment on the SSI Management Plan each time it is submitted for review. The Contractor shall be allowed up to thirty-five (35) calendar days from NORA (including MDOT MAA review periods) to prepare and gain approval of the SSI Management Plan. If acceptance of the SSI Management Plan occurs after thirty-five (35) calendar days from NORA, the Contract Performance Time specified elsewhere in the contract shall be reduced by the number of days of delay in MDOT MAA acceptance of the SSI Management Plan.

The Contractor's designated Project SSI Coordinator and the designated alternate SSI Project Coordinator shall obtain MDOT MAA Security (Red) Badges and undergo MDOT MAA SSI training prior to handling Plan and Specification sets.

2. MDOT MAA Project Manager (Construction) – **The MDOT MAA Project Manager (Construction) is the responsible officer for the safeguarding of SSI generated and handled by the Construction Team throughout the duration of the project.** The MDOT MAA Project Manager (Construction) shall maintain a master list of covered persons with a "need to know" during this phase of the project to ensure that all project management staff comply with security badging and SSI training prior to handling SSI. The MDOT MAA Project Manager (Construction) shall obtain signed MDOT MAA Confidentiality and Non-Disclosure Agreement – Sensitive Security Information forms (contained in Appendix 7A - Standard Forms) from all management-level members of the construction Management team (including the CM Management Consultant/Contractor and its Subcontractors and CMI staff who handle SSI). The MDOT MAA Project Manager (Construction) shall review and approve the Contractor's Project SSI Management Plan. The MDOT MAA Project Manager (Construction) shall account for the return of all Plan and Specification sets.

3. Construction Manager – The Construction Manager shall work under the direction of the MDOT MAA Project Manager (Construction) and ensure compliance with all provisions of this section by all Contractor and CMI team members.

4. Pre-Construction Conference – The pre-construction conference for a project that includes SSI within the plans and specifications shall include a briefing by the MDOT MAA Project Manager (Construction) to the prime contractor and affected subcontractor(s) on coordination with sole source system contractor(s) and control of SSI during the construction phase.

5. Sole Source System Contractor - Sole source system contractor local representatives shall attend the pre-construction conference if their system is affected by the project.

1.3.3.11 Destruction of SSI

When copies of records containing SSI are no longer needed, they must be promptly and completely destroyed. The objective of destruction is to preclude recognition or reconstruction of the information. Destroying SSI shall be done using a cross cut shredder. The applicable MDOT MAA Project Manager (Design, Procurement and Construction) shall supervise and coordinate the destruction of SSI from their applicable project phase and will ensure destruction at the earliest appropriate time.

When a Contractor or Consultant proposes to destroy records containing SSI, the Contractor or Consultant must first provide notification in writing, to the applicable MDOT MAA Project Manager (Design, Procurement and Construction), for approval. This notification must include the following minimum information: identification of information to be destroyed, quantity of copies, date and place of destruction, method of destruction, and residual SSI remaining in the custody of the Contractor or Consultant. After destruction of the documents, the Contractor or Consultant shall submit to the MDOT MAA Project Manager a certification and register of all documents destroyed.

1.3.3.12 Maintenance of Record Drawings and Specifications for Projects Containing SSI

Record Drawings and Specifications shall be maintained for all MDOT MAA projects containing SSI in accordance with established MDOT MAA procedures for the production of project record drawings. All project Record Drawings and Specifications shall be marked in accordance with this section and consolidated for storage in a secure area. The following notation shall be included in the header of SSI record drawings in place of the protective marking:

Sensitive Security Information –Record Drawings

Other record drawing notations required per Volume 2, Section 2.4.1 Record Drawing Preparation, shall be included as well.

The following notation shall be included in the header of SSI record specifications in place of the protective marking:

Sensitive Security Information –Specifications

Other contract documents containing SSI such as shop drawings, coordination drawings, Operations and Maintenance Manuals (O&M), Request for Information (RFI's) and construction progress photographs shall be identified accordingly.

1.3.3.13 Enforcement of SSI

Civil penalties are assigned for unauthorized disclosure of SSI.

1.3.4 SSI Language to be Included in the Notice to Contractors

All advertisements for projects containing SSI shall include the latest version of the language located on the following pages. The Design (Consultant) Project Manager shall contact the Office of Procurement to obtain the latest version of the SSI language to be included in the Notice to Contractors. The Contractor Representative Information Form (contained in Appendix 7A - Standard Forms) should also be attached to the Notice to Contractors.

1.3.4.1 Sample SSI Language to be Included in the Notice to Contractors

Coordinate specific language with Office of Procurement.

Sample language below:

THIS PROJECT CONTAINS SENSITIVE SECURITY INFORMATION (SSI). ALL CONTRACTORS INTERESTED IN THIS SOLICITATION MUST COMPLY WITH THE FOLLOWING REQUIREMENTS PRIOR TO MDOT MAA GRANTING ACCESS TO VIEW AND/OR PURCHASE THE PROCUREMENT DOCUMENTS.

This project contains Sensitive Security Information (SSI) which shall be handled in accordance with 49 CFR Part 1520. To comply with 49 CFR Part 1520 requirements, MDOT MAA has instituted the following new procedure for bidders interested in this project.

1.3.4.2 Sample SSI Language for New Contract Document Purchase Procedures

Coordinate specific language with Office of Procurement.

Sample language below:

Interested bidders shall not be permitted to view or purchase contract documents for this project or attend the Pre-bid meeting until they have satisfactorily cleared the **Transportation Security Administration (TSA)** Security Background Verification process. There are two levels of security background verification as follows:

1. **To Purchase and Hold SSI Documents:**
   a. **Bidders who currently possess a valid Red BWI Security badge** shall be required to submit to the Maryland Aviation Administration – Office of Procurement their Name, Company, Security Badge Number and Expiration date as it appears on the security badge. MDOT MAA will verify the validity of the bidders badge and Bidders will be notified of the results by email. Should notification not arrive within the specified period, bidders are urged to call Ms. Linda Marcucci, 410-859-7376 to inquire about their processing status.
   b. **Bidders who do not currently possess a valid Red BWI Security badge** must successfully complete a TSA Criminal History Record Check (CHRC) and a TSA Security Threat Assessment (STA). Bidders must complete the Application for Airport Identification Badge for all of their designated representatives that will be responsible for purchasing and handling SSI. Individuals who successfully complete a TSA CHRC and STA will be responsible for: protection of the SSI contained in the contract documents; return of all documents at the conclusion of the bidding process; and for any civil penalties incurred in the event that the requirements of 49 CFR Part 1520 are not complied with. **Please be advised that MDOT MAA reserves the right to prohibit any bidder that does not pass the Transportation Security Administration (TSA) Security Background Verification from purchasing or holding SSI for this project.**

      Bidders shall submit an original signed copy of each completed Application for Airport Identification Badge to the Maryland Aviation Administration – Office of Procurement for processing. It is recommended that all bidders submit at least two individuals for processing. (**Note: The MDOT MAA Office of Procurement will be the Authorized Signer for the Application, please do not place signatures in the Authorized Signer blocks**.) Processing of the application will take at least fourteen (14) Calendar Days and Bidders will be notified of the results by email. Should notification not arrive within the specified period, bidders are urged to call Ms. Linda Marcucci, 410-859-7376 to inquire about their processing status.

      NOTE: MDOT MAA CANNOT GUARANTEE TIMELY BIDDER APPROVAL AND/OR DOCUMENT DISTRIBUTION FOR LATE APPLICATIONS SUBMITTED. BIDDERS ARE ENCOURAGED TO SUBMIT APPLICATIONS AS EARLY AS POSSIBLE, PRIOR TO THE SCHEDULED PRE-BID DATE, TO ALLOW TIME FOR RECEIPT AND REVIEW OF DOCUMENTS PRIOR TO THE SCHEDULED BID DATE.

   c. Upon notification by MDOT MAA of successful Transportation Security Administration (TSA) Security Background Verification; or verification of the validity of the bidders red badge, the bidder's approved representative (Contractor's Representative hereafter) or red badge holder (Contractor's Representative hereafter) shall be eligible to purchase the contract documents at the Maryland Aviation Administration – Office of Procurement. In addition, the Contractor's Representative will be required to meet ALL of the following requirements to purchase a set(s) of plans and specifications:
      1. The Contractor's representative purchasing the contract Plan and Specification Sets shall be required to provide proof of identification before being granted access to the documents. The representative shall present for MDOT MAA inspection, two forms of original identification documents (**valid Driver's License and Social Security Card, Etc.)** matching the information supplied on the corresponding Application for Airport Identification Badge for the individual.
      2. The Contractor's Representative shall provide documentation to demonstrate that his/her firm is licensed and registered to do business in the State of Maryland.

3. The Contractor's Representative shall provide documentation from a surety registered to do business in the State of Maryland demonstrating that his/her firm can secure a bond for the project in the amount specified in the Contract Documents.
4. The Contractor must be registered in the eMaryland Marketplace as a vendor.
5. The Contractor's Representative will be required to execute an MDOT MAA Confidentiality and Non-Disclosure Agreement – Sensitive Security Information prior to purchasing project plans and specifications. (included in Appendix 7A - Standard Forms of this manual). The Contractor's Representative shall provide a refundable deposit of $6,000/set of plans and specifications in the form of a certified check or money order made payable to the Maryland Aviation Administration. The certified check or money order shall be held by MDOT MAA until the Plan and Specification sets are returned fully intact to MDOT MAA Procurement personnel at which time the check or money order shall be returned to the Contractor.

2. **To View SSI Documents, attend Pre-bid Meeting or attend Field Site Visit:**

a. Bidders who currently possess a valid Red BWI Security badge

Interested bidders who possess a valid red badge shall be permitted to view contract documents, attend the Pre-bid Meeting or attend the Field Site Visit for this project provided they have submitted to the Maryland Aviation Administration Office of Procurement their Name, Company, Security Badge Number and Expiration date as it appears on the security badge; and received verification of the validity of the bidders badge. Bidders will be notified of the validity of their badge within ten (10) days by email. Should notification not arrive within the specified period, bidders are urged to call Ms. Linda Marcucci, 410-859-7376 o inquire about their processing status.

Interested bidders who possess a valid red badge and would like to view contract documents, attend the Pre-bid Meeting or attend the Field Site Visit shall be required to present a valid red badge before being granted access to the documents and/or meetings/site visits.

b. Bidders who do not currently possess a valid Red BWI Security badge

Interested bidders shall not be permitted to view contract documents, attend the Pre-bid Meeting or attend the Field Site Visit for this project until they have satisfactorily cleared a TSA "No Fly List" Security Background Verification process. Bidders shall be required to complete the attached form titled Contractor Representative Information for all of their designated representatives that will be viewing the contract documents; and/or attending the pre-bid meeting and/or site inspection. Any individual submitting the Contractor Representative Information form shall be considered responsible for protection of the SSI contained in the contract documents and shall be responsible for any civil penalties incurred in the event that the requirements of 49 CFR Part 1520 are not complied with. **Please be advised that MDOT MAA reserves the right to prohibit any bidder that does not pass the Transportation Security Administration (TSA) "No Fly List" Security Verification from viewing the contract documents; and/or attending the pre-bid meeting and/or site inspection for this project.**

Bidders may submit the Contractor Representative Information form via email to the Office of Procurement to the attention of Ms. Linda Marcucci, lmarcucci@bwiairport.com. Processing of the Contractor Representative Information forms will take at least ten (10) Calendar Days and Bidders will be notified of the results by email. Should notification not arrive within the specified period, bidders are urged to call Ms. Linda Marcucci, 410-859-7376 to inquire about their processing status. **It is recommended that all bidders submit at least two individuals for processing.**

NOTE: MDOT MAA CANNOT GUARANTEE TIMELY BIDDER APPROVAL AND/OR DOCUMENT DISTRIBUTION FOR LATE APPLICATIONS SUBMITTED. BIDDERS ARE ENCOURAGED TO SUBMIT CONTRACTOR REPRESENTATIVE INFORMATION FORMS AS EARLY AS POSSIBLE, PRIOR TO THE SCHEDULED PRE-BID DATE, TO ALLOW TIME FOR RECEIPT AND REVIEW OF DOCUMENTS PRIOR TO THE SCHEDULED BID DATE.

Upon notification by MDOT MAA of successful **Transportation Security Administration (TSA) Security "No Fly List" Background Verification**, the Contractor's representative shall be permitted to view contract documents, attend the Pre-bid Meeting or attend the Field Site Visit. In addition, the Contractor's representative shall meet the following additional requirement:

The Contractor's representative(s) viewing contract documents, attending the Pre-bid Meeting or attending the Field Site Visit shall be required to bring with him/her and present to MDOT MAA Office of Procurement the original signed Contractor Representative Information form and proof of identification before being granted access to the documents and/or meetings/site visits. The representative shall present for MDOT MAA inspection, original identification documents (**valid Driver's License and Social Security Card)** matching the information supplied on the corresponding Contractor Representative Information form for the individual.

NOTE: PLANS AND SPECIFICATIONS FOR THIS PROJECT WILL BE NUMBERED AND ARE NOT AUTHORIZED FOR REPRODUCTION BY PROJECT BIDDERS. FAILURE TO RETURN ALL PLAN AND SPECIFICATION SETS FULLY INTACT, UNAUTHORIZED REPRODUCTION OF THE PLAN AND SPECIFICATION SETS OR FAILURE TO COMPLY WITH THE REQUIREMENTS OF THE 'MDOT MAA CONFIDENTIALITY AND NON-DISCLOSURE AGREEMENT – SENSITIVE SECURITY INFORMATION' SHALL RESULT IN THE FORFEITURE OF THE DEPOSIT AND MAY LEAD TO CIVIL PENALTIES.

2.1 Purpose

The Maryland Aviation Administration (MDOT MAA) has identified confined spaces on BWI Marshall and Martin State Airport property which require adherence to confined space entry procedures for personnel access in accordance with Occupational and Health Standards for Permit Confined Spaces (OSHA 29 CFR 1910.146). MDOT MAA has compiled and maintains a list of all known Confined Spaces located on BWI Marshall Airport property. This list is not guaranteed to be accurate or all inclusive, but is the result of a diligent effort by MDOT MAA to maintain an inventory of all confined spaces and associated potential hazards to workers at BWI Marshall Airport. The list is updated annually as confined space classifications change. Martin State Airport does not maintain a confined space list, so it is incumbent upon the Consultant to assess each potential confined space. The following requirements apply to all Consultants engaging in confined space entry as part of their work.

2.2 Consultant Requirements

When it is necessary for Consultants to access any confined space on BWI Marshall or Martin State Airport property, Consultants and contractors shall conduct all work related to the confined space entry in accordance with applicable Federal, State and local Confined Space Entry regulations contained in the OSHA Standard for Permit-Required Confined Spaces (29 CFR 1910.146), the MOSH Standard for Confined Spaces (COMAR 09.12.35) and the MDOT MAA Confined Space Entry Program (RM-1910.146). Forms that are required to be completed by the Consultant and contractor are listed in Section 2.3. Consultants and contractors shall conduct the confined space entry work at their expense and shall include all necessary labor, material and equipment costs in the Consultant price proposal or contractor bid price, as applicable.

The Consultant shall comply with the MDOT MAA Confined Space Entry Program (RM-1910.146) when working at the BWI Marshall Airport. Consultants shall provide their own STANDBY Rescue Team for all Immediately Dangerous to Life and Health (IDLH) permit required confined spaces. When working at Martin State Airport, the Consultant shall provide their own STANDBY rescue team at the Consultant's expense. Should there be a real life emergency the consultant should call 911 immediately.

2.3 Pre-Entry Submittal and Approval Requirements

No less than 24 hours prior to planned entry into a confined space, the Consultant or contractor shall provide the BWI Fire & Rescue Department's Deputy Chief on duty, 24 hours before entry into the confined space, the following pre-entry materials:

a. Confined Space Entry Procedure Checklist: A completed Confined Space Entry Procedure Checklist Form.
b. Confined Space Entry Evaluation: A completed Confined Space Entry Evaluation Form.
c. Confined Space Entry Permit: A completed Confined Space Entry Permit Form.
d. Confined Space Emergency Information: A completed Confined Space Emergency Information Form.

2.4 Entry Requirements

The Consultant shall comply with all operational procedures required by the MDOT MAA Confined Space Entry Program (RM-1910.146) before and during the confined space entry operations.

2.5 Debriefing Requirements

The Consultant shall attend a debriefing session with their Safety Department at the conclusion of the entry operations. This debrief shall include discussion and documentation of the permit space program followed including descriptions of any hazards confronted or created in permit spaces during entry operations. The following forms will be submitted to the MDOT MAA Office of Safety & Risk Management within 24 hours of completion of all confined space entries for use at the debriefing.

1. Confined Space Entry Procedure Checklist
2. Confined Space Entry Evaluation Form
3. Confined Space Entry Permit Form
4. Confined Space Entry Emergency Information Form
5. Confined Space Accountability Form
6. Confined Space Entry Critique/Review Sheet
7. Confined Space Entry Log

2.6 Requirements for Identification and Reporting of Confined Spaces during the Design Process

MDOT MAA requires that the creation of confined spaces resulting from the design of new facilities be minimized. The Consultant shall identify and report all possible new confined spaces during the design process, so that informed consent can be obtained from MDOT MAA. This MDOT MAA Design Standard provides guidance to Consultants related to potential new confined spaces.

The Consultant shall be familiar with the MDOT MAA Confined Space Entry Program, and requirements of 29 CFR 1910.146, Occupational Safety and Health Administration (OSHA) Standard for Permit-Required Confined Spaces, with the intent of minimizing the creation of new confined spaces, and especially permit-required confined spaces, during the design process. The Consultant shall consider how the definitions for confined space and permit-required confined space apply to the components and systems developed in the design process. If a confined space is anticipated to be created by the design, then the Consultant shall present possible alternatives to its creation and identify possible design features that can be incorporated to minimize permit required confined spaces.

Any new confined spaces, including those which are necessary as a course of the design (e.g. telecommunication manholes, sewer manholes) shall be identified by the Consultant in the 30% design submittal/design report. The Consultant shall include a section in the report dedicated to confined spaces. This section will identify each potential confined space and discuss the anticipated hazards associated with the confined space, including an evaluation of alternatives which resulted in the selection. For example, a confined space such as the dry well of a wet well/dry well sewage pump station could be anticipated to have hazards of hydrogen sulfide and methane gases which would make the dry well a permitted confined space.

However, the design could, at some additional cost to the project, include mechanical ventilation to reduce the classification to a non-permit confined space, in contrast, the confined space classification of the wet well would likely not benefit from any type of improvement investment. In this example, the design report would indicate both the wet well and dry well as permit controlled confined spaces. The consultant would then provide narrative regarding the pros, cons and cost of designing the dry well to comply with the requirements of a non-permit confined space by the addition of adequate ventilation and instrumentation etc. and a statement that the wet well will not benefit from any investment. The Consultant would then make a recommendation as to whether or not the improvements are warranted on a case by case basis.

The design shall include all necessary signs for confined spaces as applicable and practical. Whenever the design includes new permit controlled spaces, the Consultant shall include in the design documents adequate signage for confined space notification in accordance with OSHA requirements.

As the design is developed through the 60% and 100% submittals, the Consultant shall record in these submittals, specific details and an evaluation of alternatives based on development of the findings presented in the 30% design submittal/report. Confined Space CAD standards, including Confined Space Structure ID, are documented in Volume 1, Chapter 3.3.3 Civil/SUE Confined Space Drawings. Confined Space GIS data standards are documented in Volume 1, Chapter 4.3 Attributes & Domains.

As part of the Consultant Phase 3 Services, the Consultant shall identify all confined spaces and signage requirements for confined spaces created during the course of the design and include this information on the record drawings. All permit controlled confined spaces shall be clearly designated as such on the record drawings.

The Consultant shall also document all new confined spaces and provide the MDOT MAA Office of Safety & Risk Management and MDOT MAA Project Manager with a completed Confined Space Entry Evaluation Form for each new confined space.

3.1 Controlled Access Security System (CASS)

Security Systems Technical Specifications that have been developed for use at BWI Marshall.

Security System specifications must be requested from the MDOT MAA's Engineering Document Manager on a project-by-project basis. No alternations are to be made to the Security Systems Technical Specifications without written approval from MDOT MAA's Project Manager. Additional Security System specifications covering general conditions or project specific requirements may be required. Any additional or new specification documents pertaining to Security Systems shall be afforded the same level of SSI protection as the standard Security System specifications.

Security System design shall be produced as separate and unique sections in the Contract Technical Specifications. All information pertaining to the Security System design must be clearly tagged as Security Sensitive Information (SSI). All Security System submittals and Contract Documents must be labeled, bound, and transmitted separately. These documents shall be protected when being transmitted or transferred using encrypted files with passwords to prevent unauthorized access. These documents must also carry the following statement:

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR Part 15 and 49 CFR Part 1520.

3.2 CCTV

Security Systems Technical Specifications that have been developed for use at BWI Marshall.
Security System specifications must be requested from the MDOT MAA's Engineering Document Manager on a project-by-project basis. No alternations are to be made to the Security Systems Technical Specifications without written approval from MDOT MAA's Project Manager. Additional Security System specifications covering general conditions or project specific requirements may be required. Any additional or new specification documents pertaining to Security Systems shall be afforded the same level of SSI protection as the standard Security System specifications.

Security System design shall be produced as separate and unique sections in the Contract Technical Specifications. All information pertaining to the Security System design must be clearly tagged as Security Sensitive Information (SSI). All Security System submittals and Contract Documents must be labeled, bound, and transmitted separately. These documents shall be protected when being transmitted or transferred using encrypted files with passwords to prevent unauthorized access. These documents must also carry the following statement:

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR Part 15 and 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR Part 15 and 49 CFR Part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR Part 15 and 49 CFR Part 1520.

7A.1 SSI Forms

SSI – Confidentiality and Non-Disclosure Agreement (For Construction Contract Bidders) (.pdf, 3 pages)

Click the image to download the document in Adobe PDF format.

MAA CONFIDENTIALITY AND NON-DISCLOSURE AGREEMENT
SENSITIVE SECURITY INFORMATION
(For Construction Contract Bidders)

Date _____

_____ _____
Contract or Building Permit Number Contract or Building Permit Name

1. I, _____, an employee of

_____ ("Contractor"), under contract (the "Contract") with Maryland Aviation Administration (referred to herein as "MAA"), is executing the acceptance of its responsibilities for Airport Security at Baltimore/Washington International Thurgood Marshall Airport (referred to herein as "BWI Marshall") and Martin State Airport.

2. Pursuant to the Contractor's work for MAA under the Contract, the Contractor has and will request that MAA provide it with various documents or other records collectively, "documents".

3. I understand the following with respect to any documents, or information therein, that are provided by MAA to me, or which come into my possession pursuant to the Contractor's work for MAA:

A. These documents may be considered Sensitive Security Information ("SSI") under applicable Federal and State regulations;

B. These documents may be protected from disclosure under the Maryland Public Information Act;

C. These documents may be protected from disclosure under the Federal Freedom of Information Act;

D. These documents are considered by MAA to contain information that is vital to the security and safe operation of BWI Marshall Airport and Martin State Airport, whether or not these documents are otherwise classified by any other entity or law as containing such information;

E. These documents are considered by MAA to possibly contain information that is a trade secret.

SSI – Confidentiality and Non-Disclosure Agreement (For A/E, CMI, Tenant and Sole Source Provider) (.pdf, 3 pages)

Click the image to download the document in Adobe PDF format.

MAA CONFIDENTIALITY AND NON-DISCLOSURE AGREEMENT
SENSITIVE SECURITY INFORMATION
(For A/E's, CMI, Tenants and Sole Source Providers)

Date _____

_____ _____
Contract or Building Permit Number Contract or Building Permit Name

_____ _____
Task Number Task Description / Title

1. I, _____, an employee of

_____ ("Contractor"), under contract (the "Contract") with Maryland Aviation Administration (referred to herein as "MAA"), is executing the acceptance of its responsibilities for Airport Security at Baltimore/Washington International Thurgood Marshall Airport (referred to herein as "BWI Marshall") and Martin State Airport.

2. Pursuant to the Contractor's work for MAA under the Contract, the Contractor has and will request that MAA provide it with various documents or other records collectively, "documents".

3. I understand the following with respect to any documents, or information therein, that are provided by MAA to me, or which come into my possession pursuant to the Contractor's work for MAA:

A. These documents may be considered Sensitive Security Information ("SSI") under applicable Federal and State regulations;

B. These documents may be protected from disclosure under the Maryland Public Information Act;

C. These documents may be protected from disclosure under the Federal Freedom of Information Act;

D. These documents are considered by MAA to contain information that is vital to the security and safe operation of BWI Marshall Airport and Martin State Airport, whether or not these documents are otherwise classified by any other entity or law as containing such information;

SSI – Contractor Representative Information (.pdf, 1 page)

Click the image to download the document in Adobe PDF format.

CONTRACTOR REPRESENTATIVE INFORMATION FORM
Insert Contract Title
Insert Contract No.

Date: _____

Name: _____

Social Security Number: _____

Date of Birth: _____

Drivers License: State: _____

Drivers License No.: _____

Company Name: _____

Telephone No.: _____

Facsimile No.: _____

Email Address: _____

I understand that by signing this form, I grant my consent to allow the Maryland Aviation Administration to perform a Transportation Security Administration (TSA) "No Fly List" Security Verification of my background for the purpose of granting limited SSI privileges unto me. I further consent to comply with the requirements of 49 CFR 1520 and I understand and acknowledge that my failure to comply with the requirements of 49 CFR 1520 could result in civil penalties.

_____
Signature

_____
Print Name

7B.01 Division 01 - MAA Standard Procedures

Click the following links to download the individual specifications in Microsoft Word format.
Specification 010005X Security Requirements During Construction at BWI

Specification 010006X Security Requirements During Construction at MTN

Specification 010007X Sensitive Security Information (SSI) System Requirements During Construction

7B.28 Division 28 - Electronic Safety and Security

Click the following links to download the individual specifications in Microsoft Word format.
Specification 281301 Controlled Access Security System (CASS)

Specification 280780 Digital Video Management System (DMVS)

Specification 282300 Closed-Circuit Television (CCTV) System

MARYLAND DEPARTMENT OF TRANSPORTATION™

MARYLAND AVIATION ADMINISTRATION

Planning and Engineering

Guidelines & Standards

(PEGS) Manual

Volume 8

Tenant Standards and Guidelines

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

MARTIN STATE AIRPORT

1.0 Introduction to Permits Section

The Permits Section, a unit within the Maryland Aviation Administration (MDOT MAA), established in accordance with Code of Maryland Regulations [COMAR 05.02.07.04B (1)], is the permitting authority for all tenant construction and installation projects at Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall) and Martin State Airport (MTN). The Permits Section performs administrative work for the processing of permit applications, conducts inspections, and presides over the Permit Committee meetings which includes various MDOT MAA departments or offices (See Figure 1: MDOT MAA Permitting Process).

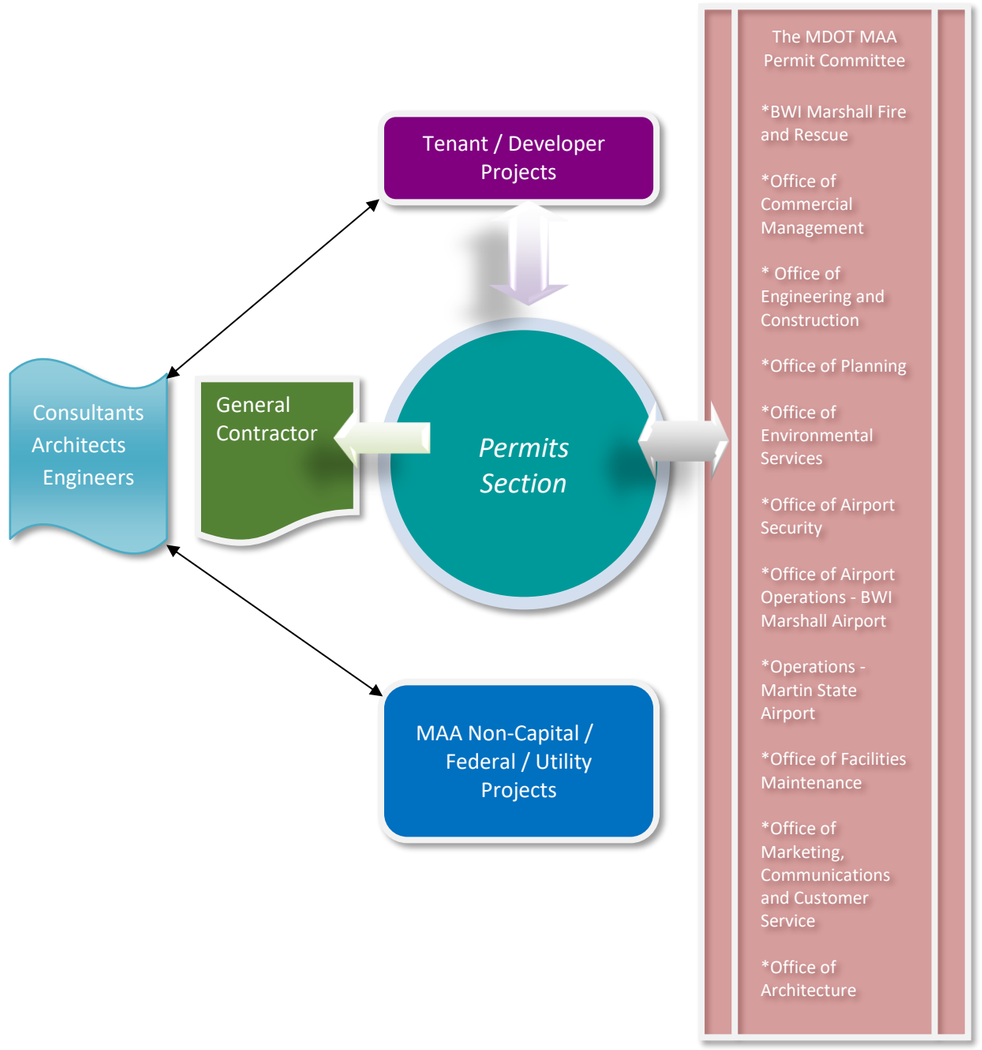


Figure 1 – MDOT MAA Permitting Process

1.1 Abbreviations and Definitions

1.1.1 Abbreviations

AACDH	Anne Arundel County Department of Health
ACORD	Agent-Company Organization for Research and Development
AHERA	Asbestos Hazard Emergency Response Act
AHJ	Authority Having Jurisdiction
AIC	Ampere Interrupting Capacity
ALP	Airport Layout Plan
AM	Morning
AAN	Approved as Noted
ANSI	American National Standards Institute
AOA	Airport Operations Area
APP	Approved
ASD	Airport Security Division
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASRU	Aviation Security Regulatory Unit
ATCT	Airport Traffic Control Tower
AZP	Airport Zoning Permit
BAZA	Board of Airport Zoning Appeals
BFP	Back Flow Preventer
BGE	Baltimore Gas and Electric
Bldg.	Building
BMS	Building Monitoring System
BP	Building Permit
BTUH	British Thermal Units per Hour
BWI Marshall	Baltimore/Washington International Thurgood Marshall Airport
C&R	Correct and Resubmit
CAD	Computer Aided Drafting
CD	Compact Disk
CFR	Code of Federal Register
CHRC	Criminal History Record Check
COMAR	Code of Maryland Regulations
CPR	Cardiopulmonary Resuscitation
DDC	Direct Digital Control
DEC	Division of Environmental Compliance
DLLR	Department of Labor, Licensing and Regulation
DVD	Digital Video Disk
Dwgs	Drawings
DST	MAA Design Standards
E	East
EA	Exhaust Air
EES	Emergency Evacuation System
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration

FM	Fire Marshal, BWI Marshall Fire and Rescue Department
FMC	Flexible Metallic Conduit
FOD	Foreign Object Debris
FT	Feet
HVAC	Heating Ventilation and Air Conditioning
HVACR	Heating, Ventilation, Air Conditioning, and Refrigeration
IBC	International Building Code
IDF	Intermediate Distribution Frame
IES	Illuminating Engineering Society
IMC	International Mechanical Code
IP	Installation Permit
IPC	International Plumbing Code
IT	Information Technology
JCI	Johnson Controls Inc.
KVA	Kilo Volt Ampere
LEL	Lower Explosive Level
LLC	Limited Liability Company
MA	Mixed Air
MAA	Maryland Aviation Administration
MD	Maryland
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MOSH	Maryland Occupation Safety and Health
MSL	Mean Sea Level
MTN	Martin State Airport
N	North
N/A	Not applicable
NAVAID	Navigational Aid
NEC	National Electric Code
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFG	National Fuel Gas Code
NFPA	National Fire Protection Association
No.	Number
NOTAM	Notice to Airmen
OAT	Office of Airport Technology
OFM	Office of the Fire Marshal, BWI Marshall Fire and Rescue Department
OSHA	Occupational Safety and Health Administration
PA	Public Address
PM	Afternoon
PPE	Personal Protective Equipment
PS	Permits Section
PVC	Polyvinyl Chloride
RA	Return Air
S	South
SA	Supply Air
SCBA	Self-Contained Breathing Apparatus

SIDA	Security Identification Display Area
SMACNA	Sheet Metal and Air Conditioning National Association
SPCC	Spill Prevention Control and Countermeasures
SPF	Security Perimeter Fence
Tel.	Telephone
TIA	Tenant Information Advisory
TSA	Transportation Security Administration
UL	Underwriters Laboratory
VAV	Variable Air Volume
VOC	Volatile Organic Compound
W	West

1.1.2 Definitions

Term	As Defined By	Definition
Airport Operations Area (AOA)	MAA	The portion of an airport designed and used for landing, taking off, or surface maneuvering of airplanes.
Airport Operator	MAA	The Maryland Aviation Administration is the BWI Marshall Airport Operator and is regulated under 49 CFR 1542. The Maryland Aviation Administration (MAA) holds an FAA Airport Operating Certificate which allows the operation of an airport regularly serving scheduled passenger operations or public charter operations
Airport Security Contractor	MAA	The private company currently under contract to the MAA providing personnel and equipment to perform all assigned security duties at BWI Marshall.
Airport Security Coordinator	MAA	The Director of the Office of Airport Security serves as the primary contact for all security-related activities and communications with the Transportation Security Administration (TSA).
Airport Terminal Building	NFPA	A structure used primarily for airport passenger enplaning or departing, including ticket sales, flight information, baggage handling, and other necessary functions in connection with air transport operation. This term includes any extensions and satellite buildings used for passenger handling or aircraft flight service functions. Aircraft loading walkways and mobile lounges are excluded.
Applicant	MAA	A person who has applied for a permit.
Application	MAA	Standard form(s) used to acquire a Building, Installation or Single Trade Permit.
Approved	IBC	Acceptable to the code official or authority having jurisdiction.
Aviation Security Regulatory Unit (ASRU)	MAA	The section within the TSA responsible for conducting tests of an Airport's Security Program, including special emphasis assessments and comprehensive assessments of the airport's security posture.
Badge	MAA	BWI Marshall Airport Identification/Access Badge
Building	IBC	Any structure used or intended for supporting or sheltering any use or occupancy.
Building Official	MAA	The officer or other designated authority charged with the administration and enforcement of codes, regulations and design standards, or a duly authorized representative.
Challenge Procedure	MAA	Airport-approved process by which individuals with unescorted access to the Security Identification Display Area (SIDA) or other areas controlled for security purposes verify that other individuals or vehicles present in those areas possess and display the appropriate airport-approved badge.
Commercial Vehicle	MAA	Any vehicle operated in connection with a commercial activity at the airport.
Concessions	MAA	The operation of a business providing goods and services to the public under a lease and concession contract with the MAA, for which the MAA is paid a fee for the privilege of operating such business on or within facilities on State-owned property under the jurisdiction of MAA.
Confined Space	MAA	See Section 1.6.4.
Construction Documents	IBC	Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

Contractor	MAA	The term applies to the Primary Contractor and all Subcontractors engaged by the Primary Contractor working on or within facilities on State-owned property under the jurisdiction of MAA. Although all Subcontractors are equally bound by all security rules, regulations, procedures and requirements in effect at BWI Marshall, the Primary Contractor is responsible for overseeing all Subcontractors and ensuring full compliance with all security rules and regulations for all work performed.
Criminal History Records Check (CHRC)	MAA	A fingerprint-based check of an individual's criminal history performed through the FBI's Criminal Fingerprint Database to determine if an individual has been convicted of one of 36 disqualifying crimes in accordance with the Airport Security Improvement Act of 2000 and the Aviation and Transportation Security Act. This is required of all new applicants for Unescorted SIDA access after December 23, 2000, by the Airport Security Improvement Act of 2000 and for all Airport Employees having unescorted SIDA access by the Aviation And Transportation Security Act.
Escort	MAA	A BWI Marshall badge holder who accompanies one or more non-badge holders into any of the BWI Marshall restricted areas for a legitimate airport business purpose. The term applies to both personnel and vehicles entering the restricted areas. All escort related activity shall fully conform to the procedures established by the ASD under applicable State and federal security rules and regulations.
Escorted Access	MAA	Person(s) authorized to be in the SIDA only when properly accompanied by an escort in accordance with the Airport Security Program. Proper escort procedures at BWI Marshall require the badge holder providing the escort to know the individual(s) escorted and that they remain within sight and reasonable speaking distance of those individual(s) while in the SIDA.
Escortee	MAA	The non-badge holder who seeks to enter any BWI Marshall restricted area under proper escort procedure.
Finalized	MAA	Refers to status of an issued permit meaning that all required inspections by MAA have been satisfactorily completed and the installed work accepted as compliant with the applicable codes.
Hot Work	OSHA	Riveting, welding, flame cutting or other fire or spark-producing operation.
Issued	MAA	Indicates that the permit application has been approved and Applicant may request a preconstruction meeting.
Jurisdiction	IBC	The government unit that has adopted this code under due legislative authority.
Maryland Aviation Administration (MAA)	MAA	The unit within the Maryland Department of Transportation (MDOT) charged with the administration of all Maryland State-owned aviation facilities.
Non-Concession Project	MAA	A project submitted for permit by entity other than MAA's designated Airport Concessionaire (AMM)
Occupancy	NFPA	The purpose for which a building or other structure, or part thereof, is used or intended to be used.
Office of Airport Security	MAA	The office within the MAA charged with coordinating and directing all airport security functions at BWI Marshall.
Permit	IBC	An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.
Person	IBC	An individual, heir, executor, administrator or assign, and also includes a firm, partnership or corporation, its successors or assigns, or the agent of any of the aforesaid.
Primary Contractor	MAA	The contractor awarded a contract and on whose behalf all Subcontractors will perform work under that contract on or within facilities on State-owned property under the jurisdiction of MAA.
Private Security Contractor (ASD Approved)	MAA	Any appropriately licensed private security contractor that can demonstrate the knowledge, experience, and ability to carry-out security contractor duties within BWI Marshall Restricted Areas as defined below.
Professional Engineer	DLLR	The person licensed by the Maryland Division of Occupational and Professional Licensing, Department of Labor, Licensing and Regulation (DLLR) to practice as a Professional Engineer in Maryland.
Project Security Manager	MAA	The BWI Marshall badge holder having escort authority, designated by the primary contractor to be responsible for overseeing and coordinating the implementation of and compliance with all established security rules, regulations, and procedures; responsible for designating individual Security Liaisons for each work site operating under an MAA contract. The Project Security Manager or an alternate shall be available to respond to the Director of Airport Security, 24 hours per day, 365 days per year for the duration of the contract.
Proposed Design	NFPA	A design developed by a design team and submitted to the authority having jurisdiction for approval.
Public Law 106-528	MAA	An act (Law #528) passed by the 106th United States Congress on November 23, 2000, titled, "The Airport Security Improvement Act".
Public Law 107-71	MAA	An act (Law #71) passed by the 107th United States Congress on November 19, 2001, titled, "The Aviation and Transportation Security Act".
Registered Architect	DLLR	The person shall be licensed by the Maryland Division of Occupational and Professional Licensing, Department of Labor, Licensing and Regulation (DLLR) to practice as a Registered Architect in Maryland,

Registered Design Professional	IBC	An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.
Restricted Area	MAA	Defined as all areas within BWI Marshall that requires an individual possess Unescorted Access Authority prior to gaining entry into these areas. Unescorted Access Authority is defined as authority to be in the SIDA, or other controlled areas for security purposes. An individual shall possess and properly display a BWI Marshall Badge or approved air carrier identification in order to have unescorted SIDA access privileges.
Secured Area	MAA	An area whose access control system meets the requirements specified in 49 CFR 1542.201. This area is also referred to as SIDA-Secured. It is made up of the aircraft ramps and loading areas around the main terminal building.
Security Identification Display Area (SIDA)	MAA	Any area identified in the Airport Security Program as requiring each person to continuously display an airport-approved identification badge, unless the person is under an airport-approved escort. The badge shall be displayed face out, above the waist but below the neck and on the outermost garment. At BWI Marshall, the SIDA is considered to be everything within the airport's security fence-line.
Security Liaison	MAA	The individual(s) responsible for compliance with security rules and regulations within a specific work site. The Security Liaison may exercise other responsibilities as long as they do not interfere with the monitoring and control of work site security. The Security Liaison must be able to monitor all construction activities from his/her location in order to ensure compliance with security requirements and may control more than one work area within the work site. The individual responsible for security on all work sites under an MAA Contract is the Project Security Manager and is the primary point of contact for issues encountered during non-working hours.
Security Perimeter Fence	MAA	Any portion of perimeter fence that controls access to any of the BWI Marshall Restricted Areas.
Sterile Area	MAA	An area to which access is controlled by the inspection of persons and property in accordance with an approved Security Program. Sterile Areas at BWI Marshall are restricted to ticketed passengers only and appropriately badged employees. As of April 1, 2003, individuals working in the sterile area must have undergone a criminal history records check via fingerprinting. The Sterile Areas at BWI Marshall are the Concourses or Piers.
Subcontractor	MAA	All contractors hired directly or indirectly by the Primary Contractor to perform work under an MAA Contract or for tenant construction.
Tenant	MAA	Any party with whom the Maryland Aviation Administration (MAA) has a written agreement, including lessees, sublessees, etc. and federal, State and local agencies.
Tenant Directive	MAA	A definite, written directive, course of action, method, or procedure conveyed to tenants at BWI Marshall Airport of a permanent nature to supplement Code of Maryland Regulations (COMAR). A BWI Marshall Tenant Directive is in effect until rescinded or suspended.
Tenant Information Advisory (TIA)	MAA	A BWI Marshall Tenant Information Advisory (TIA) is an announcement used to convey information affecting tenants at BWI Marshall for a limited duration. A BWI Marshall Tenant Information Advisory is only in effect until its expiration date. (See Section 6.1)
Trench	OSHA	Trench or Trench excavation means a narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.
Transportation Security Administration (TSA)	MAA	An agency of the Executive Branch of the United States Government responsible for Civil Aviation Security through the enforcement of regulations (Code of Federal Regulation, Title 49 – Transportation, Chapter 12 – Transportation Security Administration, Homeland Security) designed to safeguard Civil Aviation Operations against acts of violence or acts of unlawful interference, to include the safety and security of passengers, flight crews, ground operations personnel and the general public.
Unescorted Access	MAA	Persons authorized to be in the Security Identification Display Area (SIDA) or other controlled areas, that possess and properly display a BWI Marshall Badge or approved air carrier identification.
Withdrawn	MAA	Refers to the status of a permit application. It indicates that the application has been returned to the Applicant at his/her request.
Work Site	MAA	The Work Site refers to the largest area within which the Security Liaison can exercise reasonable control of all activities. The work site may be comprised of any number of smaller work areas; however, if a security violation occurs anywhere within the work site as a whole, penalties may be assessed against both the violator and the Security Liaison. The Security Liaison must be able to ensure positive control of all escorts within the work site. A single escort is comprised of the escort and up to five escorted. The escort is the primary responsible party for keeping all persons escorted within sight and reasonable speaking distance at all times. The Security Liaison must be able to report the number of escorts being conducted and the number of persons escorted within the work site. A single construction project may be comprised of numerous work sites. The Project Security Manager is responsible for designating Security Liaisons for each work site under an MAA Contract.

1.2 Types of Permits

The Permits Section processes three (3) types of permit applications, Building Permits, Single Trade Permits, and Installation Permits. Other MAA departments issue construction related permits. These include but are not limited to:

A. The BWI Marshall Fire and Rescue Department issues Special Use Permits for one or two-day events.
B. The Office of Planning issues Airport Zoning Permits (AZP) for BWI Marshall and MTN projects as well as for other properties located within the Airport Zoning District (see Section 1.6.2).

See Section 1.2.4 for a listing of construction activities that are exempt from permitting requirements.

1.2.1 Building Permits

An MAA Building Permit is required for all new construction, renovation, alteration, or site improvement work on State-owned property under the jurisdiction of MAA. Any installation that affects the existing electrical, mechanical, plumbing, or structural systems requires a Building Permit. As part of obtaining a Building Permit, approvals from the FAA, other federal and State regulatory agencies, and the Anne Arundel County Health Department may be required. (See Section 1.6 Additional Permits and Authorizations)

1.2.2 Single Trade Permits

An MAA Single Trade Permit is required for minor projects on or within facilities on State-owned property under the jurisdiction of MAA, involving a single trade such as electrical, mechanical, plumbing, or fire protection. Single Trade Permits shall be obtained by a Maryland-licensed Master Electrician, HVACR Master, Master Plumber, or Sprinkler Contractor. Work shall meet the requirements of all applicable codes and regulations. For any work that requires more than one trade, the Applicant must apply for a Building Permit.

1.2.3 Installation Permits

An MAA Installation Permit is required before placement or installation of new signs, carpeting, antennas, displays, fixtures, or equipment on or within facilities on State-owned property under the jurisdiction of MAA. Installation Permit issuance does not relieve the Applicant from his/her responsibility for proper design as well as means and methods of installation. (See Section 1.6 Additional Permits and Authorizations.)

1.2.4 Building, Single Trade and Installation Permit Exclusions

Minor projects involving repair or replacement of worn-out, broken, or defective, components may be excluded from the requirement of a Building, Single Trade or Installation Permit, except for the installation or replacement of carpeting which requires an Installation Permit. The following is a list of projects that do not require Building, Single Trade, or Installation Permits:

A. Interior and overhead door replacements or repairs, including hardware. (Note: Existing fire rated door assemblies are to be replaced with equivalently rated, U.L. listed assemblies and hardware.)
B. Painting, papering, or tiling.
C. Replacement of ceiling system components (grid tiles, lights, diffusers, and return grills).
D. Repair, maintenance, and replacement of existing electrical equipment, fixture wiring, or internal components.
E. Repair, maintenance, and replacement of existing mechanical components.
F. Repair, maintenance, and replacement of existing interior pipes, interior drainpipes, interior waste or vent piping, interior valves, and water closets.
G. Maintenance of trees, shrubs, mulch, and landscaped beds.
H. Pothole repairs and crack sealing.
I. Capital Funded MAA construction projects designed and managed by the MAA Office of Engineering and Construction.

1.3 Professional Seal Requirements

1.3.1 Building Permit Professional Seal Requirements

Architectural and engineering drawings shall be stamped with a current license seal and signed by a Maryland-licensed Architect or Professional Engineer. Each sheet shall bear the original seal and signature of the responsible Maryland registered Architect or Professional Engineer, as applicable. Digital signature by licensees are acceptable in accordance with COMAR 09.23.03.09.

Code of Maryland Regulations (COMAR 09.23.03.09) requires, in part, the following:

> *"A licensee may sign or seal plans, specifications, drawings, reports, or other documents that are required to be signed and sealed pursuant to Business Occupations and Professions Article, §3-501, Annotated Code of Maryland, only if the following requirements are met:*
> *1) The licensee is competent in the subject matter of those documents by virtue of education or experience, or both; and*
> *2) The licensee either:*

a) *Personally, prepared the documents; or*
b) *Approved the documents."*

1.3.2 Title Block Requirements for Building Permit Drawings

Code of Maryland Regulations (COMAR 09.21.02.04), partially quoted below, requires that all drawings submitted for a building permit review shall have the following:

A. The name of the entity shall appear in the title block, either as a Partnership, Corporation, Limited Liability Company (LLC), or other appropriate entity. In addition, the title block shall contain a date, printed name, signature and seal of one of the directors of a corporation, general partners of a partnership or members of a limited liability company, who prepared or approved the documents in accordance with these regulations.
B. The directors of a corporation, partners of a partnership, or members of a limited liability company through which architecture is practiced, may designate another employee of the entity to sign and seal the documents in accordance with the requirements set forth in these regulations if the designee:
   1. Is licensed in the State to practice architecture; and
   2. Prepared or approved the documents for a particular project in accordance with these regulations.

C. In addition, the title block shall contain the following certification:
   "Professional Certification.
   *I certify that these documents were prepared or approved by me, and that I am a duly licensed <**insert Architect or Professional Engineer as appropriate**> under the laws of the State of Maryland, license number _____, expiration date _____."*

   Title block, certification, seal, and signature shall appear in close proximity to each other.

1.3.3 Exclusions for Professional Seal

Below are types of projects that require a Permit, but for which signed and sealed architectural/engineering drawings are not required:

A. Installation of collision bollards.
B. Fences less than six feet high.
C. Sidewalks not part of accessible route.
D. Portable heating appliances or cooling unit.
E. Tiling, carpeting, built-in cabinets, and countertops.
F. Wall mounted signage, unless determined by the Permits Section to pose a threat to public safety.
G. Single Trade Permits*
H. Installation Permits*

***** *The Permit Committee reserves the right to ask for sealed drawings or details from a professional architect or engineer if the project involves alteration to means of ingress/egress or there are other public safety considerations*.

1.4 Permit Application Process

1.4.1 Pre-Application Requirements

1.4.1.1 Non-Concession Projects

Tenants and subtenants, including federal, State and local agencies may submit progress drawings to the Permit Committee for a preliminary review. Approval of progress drawings does not mean that additional comments will not be made during the permitting phase.

1.4.1.2 Concession Projects

Pre-application submissions are required for concession projects but are not considered part of the permitting process. The objective is to prepare applicants for the permitting process and to familiarize them with MAA design requirements. Designs shall comply with the PEGS Manual, if applicable. In the event of a discrepancy between Volume 8 and other Volumes of the PEGS Manual, the other Volumes shall prevail unless agreed otherwise in writing.

1.4.2 Permit Project Submissions

1.4.2.1 New Concessions

For all new build-out or new installation concession projects at BWI Marshall, a tenant or subtenant is required to submit 30% conceptual and design development drawings and specifications to the following MDOT MAA Departments for preliminary review:

A. Office of Engineering and Construction

B. Office of Commercial Management
C. Office of Maintenance and Utilities
D. Fire Prevention and Inspection Division, BWI Marshall Airport
E. Other Departments and Agencies listed in Section 1.7, if applicable.

An on-site walk-through is required to review the actual location for any hidden or potential issues not easily recognized from the drawings.

At a minimum, each 30% conceptual and design development drawings submittal shall include a detailed scope of work, sketches/renderings of concept build-out and materials board, if applicable, copies of all equipment cut-sheets, any changes to the base building and any utility requirements. Tenants and subtenants are encouraged to review existing plans of adjacent level(s) to avoid conflict with critical MDOT MAA infrastructure and shall verify existing utilities.

Submission of 100% drawings shall include HVAC, electrical and plumbing drawings for review.

1.4.2.2 Existing Concessions

For all redevelopment or renovation of existing concessions at BWI Marshall, each tenant and/or subtenant is required to submit 30% preliminary or design development drawings. At a minimum, each 30% conceptual and design development drawings submittal shall include a detailed scope of work, sketches/renderings of concept build-out and materials board, if applicable, copies of all equipment cut-sheets, any changes to the base building and utility requirements.

1.4.3 Applications Requirements

All permit applications require submission of the following:

A. **Application Form:** Building Permit, Single Trade Permit, or Installation Permit. These forms can be found in Appendix 8A – Standard Forms.
B. **Construction Documents:** In addition to the electronic submission to the permit coordinator, the applicant shall also provide five (5) hard copy (paper) sets of construction documents (drawings, specifications, and cut sheets) including the location plan and scope of work. Building Permit construction documents shall be signed and sealed by a Maryland Licensed Architect or Professional Engineer. Additional construction document requirements for each type of permit are detailed under Section 1.4.4 Permit Construction Documents.
   1. All construction documents shall comply with standard naming conventions and file formats outlined in Volume 3, Section 3.3 Standard File Naming Conventions.

      Mail sets of drawings to:
      Maryland Aviation Administration (MDOT MAA)
      Office of Architecture
      ATTN: Permits Section - Permit Coordinator
      P.O. Box 8766
      BWI Marshall Airport, Maryland 21240-0766

      Hand-carried or courier deliveries are accepted at:
      Maryland Aviation Administration
      ATTN: Permit Coordinator
      991 Corporate Boulevard
      Linthicum, MD 21090

C. **Construction License:** A Copy of a State of Maryland Construction License must be obtained on an annual basis from the Clerk of a Maryland Circuit Court. If the Contractor has not yet been selected, the Permits Section will withhold issuance of the permit until submission of the license.
D. **Insurance Certificate**: See Section 1.9 Insurance Requirements.
E. **Other Permits or Authorizations:** See Section 1.6 Additional Permits and Authorizations.

1.4.3.1 Application Fee

There is no application fee for Building, Single Trade, or Installation Permits.

1.4.4 Permit Construction Documents

1.4.4.1 Building Permit Construction Documents

Drawings and Specifications that completely describe the scope of the project shall be provided. Construction drawings shall include but may not be limited to the following, if applicable:

A. Cover Sheet with Location/Site Plan, Applicable Codes, and Code Data as required by the MDOT-MAA PEGS Manual
B. Civil Drawings
C. Architectural Drawings
D. Structural Drawings
E. Mechanical Drawings
F. Plumbing Drawings
G. Electrical Drawings
H. Life Safety, Fire Protection Drawings

Fire-stopping details are typically required for all projects that require penetration through walls or floors, and Panel Schedules are required for any project requiring electrical work. See Appendix 8A - Checklists for additional drawing requirements.

Shop Drawings and/or Product Data for Fire Alarm System, Fire Suppression System and Commercial Kitchen Fire Suppression Hood Design may be deferred but shall be submitted to MDOT MAA and approved by MDOT MAA prior to the start of construction. See Section 1.5.6 Deferred Submittals.

1.4.4.2 Single Trade Permit Construction Documents

Drawings and Specifications that completely describe the scope of the project shall be provided. Construction drawings/sketches shall be drawn to scale and be provided using 11” x 17” or larger format.
Permit submission shall include the following, if applicable:

A. Cover Sheet with Location/Site Plan and Applicable Code(s)
B. Floor Plan(s)
C. Mechanical Drawings
D. Plumbing Drawings
E. Electrical Drawings (including Panel Schedule)
F. Firestopping Details
G. Shop Drawings
H. Product Data
I. Copy of Trade License: Master Electrician, HVAC or Master Plumber

1.4.4.3 Installation Permit Construction Documents

Drawings and Specifications that completely describe the scope of the project shall be provided. Installation drawings/sketches shall be drawn to scale and be provided using 11” x 17” or larger format.

Permit submission shall include the following, if applicable:

A. Cover Sheet with Location/Site Plan
B. Floor Plan(s)
C. Firestopping Details
D. Mounting Details
E. Trench Details
F. Shop Drawings
G. Product Data
H. Flame Spread Rating(s)

1.4.5 Permit Resubmissions

Upon issuance of plan review comments, the applicant will have one hundred-eighty (180) calendar days to submit revised plans or drawings. If there is no resubmission or response from the applicant during this period, the application will expire. The applicant will then have to file a new application with updated drawings.

The following shall be provided with each resubmission:

A. New Building, Installation, or Single Trade Permit Application form completed and signed.
B. Five (5) hard copy (paper) sets of revised documents including:
    1. Updated drawings with revisions shown “clouded” on the drawing and referenced by revision number in the drawing revision block.
    2. Copies of letters, manufactures cut sheets, calculations, etc., that were generated as a result of plan review comments.
    3. Comment Response Sheet with original comment(s) from plan reviewer(s) and architect or engineer’s response to each comment.

An electronic copy of all resubmitted documents should be emailed to the permit coordinator.

1.5 Permit Committee Function

The function of the Permit Committee is to review applications for general compliance and conformance with applicable Codes, Regulations, PEGS Manual, and for compatibility of proposed work with the existing and planned facilities. The Permit Committee has the authority to render interpretations without waiving specific requirements of applicable Codes adopted by the State of Maryland. Interpretations of the Fire Code, or fire safety aspects of the Building Code, are reserved solely for the Fire Marshal. The issuance of comments or a permit creates no legal liability, expressed or implied, on the Permit Committee or Permits Section. It is the responsibility of the applicant, the designer of record, and the selected contractor to ensure that all construction or installation complies with applicable codes, regulations, PEGS Manual, and permit drawings approved for use in the field.

1.5.1 Permit Committee Meetings

Permit Committee meetings are held on Wednesday, except holidays. All materials required for the review and approval of applications must be submitted to the Permits Section and electronic files must be submitted to the Permits Coordinator by the close of business on Monday for inclusion on the next Permit Committee Meeting Agenda.

An applicant is not required to attend but may request an appearance before the Committee to explain the project prior to plan review or to discuss previously issued review comments. It is not necessary for an applicant to attend a Permit Committee Meeting for a permit to be assigned for review. It is highly recommended that if an applicant elects to attend a Permit Committee Meeting, that the applicant be accompanied by the architect or engineer of record.

Requests to appear before the Committee shall be delivered to the Committee Chairman at least two (2) business days prior to the meeting date. Contact the Permit Coordinator at 410-859-7796.

1.5.2 Review Time

New applications and resubmissions must be received by the Permits Section by the close of business Monday. Review periods begin on the Wednesday following receipt of the complete application or resubmission. The Permit Committee’s review time does not include the time requirements of the FAA or other regulatory agencies.

Review periods are typically fifteen (15) business days for new submissions and ten (10) business days for resubmissions. The Permits Section may extend the review period based on the complexity of the project.

Following the completion of a review, the Permit Coordinator or Permit Committee Chairman collects comments from the assigned document reviewers and e-mails the comments to the Applicant. Once review comments are issued, applicants are encouraged to contact each document reviewer directly to seek clarification or to agree on a workable solution. Contact information for each document reviewer is provided on the plan review comment letter to help facilitate the process.

1.5.3 Approval Status

Comments by each document reviewer are assigned one of the following designations, as follows:

A. **Approved as Noted (AAN)**: Comments shall be acknowledged by the applicant in writing. This confirms that the applicant will comply with comments before the permit can be issued. Additional comments may be provided on future resubmissions/clarifications.
B. **Correct and Resubmit (C&R)**: Applicant needs to correct drawings, specifications, and/or documents and resubmit. Additional comments may follow on future resubmissions.

1.5.4 Appeals and Requests for Waiver

If an applicant is aggrieved by comments issued by the Permits Section, made in the course of the administration of the rules for plan review adopted by the Maryland Aviation Administration under Code of Maryland COMAR 05.02.07.04B(1), the applicant may initially seek clarification from the plan reviewer whose comment is the subject of the grievance.

If the applicant is unsatisfied with the plan reviewer’s response, the applicant may appeal to the Permit Committee Chairperson by submitting the Appeal/Waiver Request Form (See Appendix 8A – Standard Forms) with necessary documents to support its position within twenty (20) calendar days from the date of issuance of the plan reviewers comments.

The Permit Committee Chairman will work with the Applicant and the plan reviewer to resolve the differences and will issue a determination within ten (10) calendar days from the date the Appeal/Waiver Request Form is submitted.

If the applicant is still unsatisfied, the applicant may appeal to the Chief Engineer, Division of Planning and Engineering, within ten (10) calendar days from the date the Permit Committee Chairman issues a determination on the grievance.

The Chief Engineer, Division of Planning and Engineering, will issue a determination on an appeal within ten (10) calendar days from the date the appeal is submitted. The Chief Engineer's determination shall be considered final.

1.5.5 Issuance of Permit

Once the Permits Coordinator and the Permit Committee are reasonably satisfied that an applicant has met all requirements, a permit is issued. Permit drawings are then stamped by MDOT MAA's Fire Prevention Division, Fire and Rescue Department. Permits may be issued with written comments attached to the permit drawings. A copy of the permit and OFM approved drawings are provided to the applicant at a preconstruction conference. These documents shall be kept on the project site until the completion of the project as required by the Building Code.

Issuance of a permit shall not preclude the Permits Section inspectors from requiring correction of work found to be in violation of applicable codes, regulations, or PEGS Manual that pose a danger or are inconsistent with the approved permit set.

1.5.6 Deferred Submittals

The Permits Section requires complete construction documents, including shop drawings, at the time of permit application. The submissions listed below may be deferred until the design is complete. All deferred submittals shall be reviewed by the design professional who shall forward them, via the Applicant, to the Permits Coordinator or the Fire Marshal's office prior to construction/installation of the deferred item(s).

A. Fire alarm system drawings and product data
B. Fire suppression (sprinkler) design drawings
C. Commercial kitchen fire suppression hood design
D. Site Specific Safety Plan
E. Project Security Plan

1.6 Additional Permits and Authorizations

1.6.1 Tenant Information Advisory

A BWI Marshall Tenant Information Advisory (TIA) will convey information affecting tenants located at BWI Marshall for a limited duration. The applicant shall submit a TIA form to the MDOT MAA Office of Airport Operations. The TIA should be written clearly and concisely and shall state the following:

A. Timeframe: days and hours of the work;
B. Who will be affected and how;
C. Location of the work; and
D. Scope of the project and the necessity.

TIAs shall be submitted at least ten (10) business days in advance to Patricia Koehnlein, Office of Airport Operations at pkoehnlein@bwiairport.com for processing with a copy to Ben Martinez, Office of Airport Operations, at bmartinez@bwiairport.com.

1.6.2 Airport Zoning Permit

The purpose of the Airport Zoning Permit (AZP) is to identify land uses, obstructions, and wildlife attractants that are incompatible with Airport Operations. The AZP application shall be submitted for projects within a Certified Noise Zone and/or Airport Zoning District (the area defined by a four-mile radius of BWI Marshall or a three-mile radius of MTN). For any construction or modification that will increase the height, change the use, or alter the exterior finish of an existing structure, or create a new structure, the Applicant shall obtain an Airport Zoning Permit. Refer to Volume 5, Section 2.3 – Zoning Permits.

In addition, applicants may be required to file a Notice of Construction or Alteration (FAA Form 7460-1) requesting that the FAA perform an obstruction evaluation. This evaluation process typically takes approximately 60 days. If the proposed project is not identified on the FAA approved Airport Layout Plan (ALP) then a revision to the ALP is necessary. No construction may proceed until the FAA approval has been received. The ALP approval process can take from four (4) months to two (2) years, depending upon the nature of the project.

Permit issuance does not relieve the applicant from responsibility for proper design and construction of the project. Forms are available and applications are coordinated through MDOT MAA Office of Planning.

1.6.3 Hot Work and Welding Permit

A Welding and Burning Permit is required for any work that involves welding, cutting or any task that would deplete oxygen, create toxic fumes and vapors, or create the potential for fire or explosion. This permit can be obtained from the BWI Marshall Fire and Rescue Department which can be reached at 410-859-7511. At Martin State Airport (MTN), the Hot Work Permit can be obtained from the Airport Operations Office in the MTN Terminal, at 410-682-8831.

1.6.4 Confined Space Authorization

Confined Space is defined as a space that (a) is large enough and so configured that an employee can enter and perform assigned work; (b) has limited or restricted means for entry or exit; and (c) is not designed for continuous employee occupancy.

There are two types of Confined Spaces:

A. Non-Permit Confined Space: A Confined Space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm.
B. Permit Required Confined Space: A Confined Space that has one or more of the following characteristics:
   1. Contains or has the potential to contain a hazardous atmosphere;
   2. Contains a material that has the potential for entrapping, engulfing, or suffocating an entrant;
   3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by floor which slopes downward and tapers to a smaller cross-section; and
   4. Contains any other recognized serious safety or health hazard.

For Permit Required Confined Spaces, the Applicant should submit the completed Confined Space Entry forms to:

Maryland Aviation Administration
Office of Safety, Training & Risk Management
Kauffman Building
1500 Amtrak Way
Linthicum, MD 21090

1.6.5 Trenching and Excavation Authorization

Before any trenching and excavation work can proceed, the Contractor shall obtain a Utility Modification/Digging Authorization. This part of the approval process is coordinated through the Permits Section inspection office at (410) 859-7524.

The Contractor is responsible for and required to use an independent underground utility locating service to locate all utilities within the impacted area(s). The underground utility locating service shall provide certification that it has located all utilities in the impacted area(s). The Tenant and its Contractor shall not begin or make any excavation without first notifying the MDOT MAA and every public service company which may have underground facilities in the area(s) of the proposed work at least seventy-two (72) hours prior to the commencement of such work. In Baltimore and Anne Arundel Counties, the Contractor shall notify the public service companies of work intentions by calling MISS UTILITY at 1-800-257-7777.

The Tenant and any Contractor are to protect and maintain service for all the existing water and sewer lines, telephone lines, gas lines, electrical lines, etc. during the progress of the work. The Tenant and any Contractor shall be fully responsible for any and all damages to underground and aboveground utilities and facilities resulting from the installation and maintenance. The Tenant and his/her Contractor shall have available on-call sufficient specialty Contractors, such as electrical, plumbing, etc., to repair any damage to existing facilities that might occur as a result of construction operations regardless of when the damage might occur.

1.6.6 Other Agency Approval: Permanent Food Service License and Change of Ownership, Anne Arundel County Department of Health (AACDH)

The Anne Arundel County Department of Health is responsible for licensing and inspecting all facilities at BWI Marshall that prepare food for the public. The applicant shall obtain a Food Service Facility License from the County before the permit can be issued for such projects.

For additional information, please contact Anne Arundel County Department of Health at: https://www.aahealth.org/food/ or

Anne Arundel County Department of Health
3 Harry S. Truman Parkway
Annapolis, MD 21401
Phone: 410-222-7095

1.6.7 Other Agency Approval: Liquor License, Anne Arundel County Liquor Board

For all projects that involve selling of alcoholic beverages at BWI Marshall, the applicant shall obtain a Liquor License from the Anne Arundel County Liquor Board.

The Board has several classes or types of licenses, the information about which can be obtained by contacting:

Board of License Commissioners for Anne Arundel County
Heritage Complex Building
2660 Riva Road, #360
Annapolis, MD 21401
410-222-1810

Or visit: http://www.aacounty.org/boards-and-commissions/board-of-license-commissioners/index.html

1.6.8 Other Agency Approval: Federal Aviation Administration (FAA)

Projects that may impact runways and taxiways require the following approvals prior to permit issuance:

A. Appropriate FAA environmental review for the proposed project including Tenant Certification.
B. State Clearinghouse Review/Approval of FAA's environmental finding/determination.
C. Other State and federal permits as appropriate (e.g., wetlands, stormwater management, sediment and erosion control, air quality, etc.)

At the earliest possible point in the project, FAA environmental review and all applicable approvals, shall be obtained and submitted in duplicate (2 copies) to:

Director, Office of Environmental Services
Maryland Aviation Administration
P.O. Box 8766
BWI Marshall Airport, Maryland 21240-0766

An accompanying transmittal letter shall include the project description, site location (map), whether the site is located on State property, whether any State or federal funding is associated with the project, and the project schedule along with all completed environmental forms and documented approvals to the MDOT MAA Director, Office of Environmental Services. Upon completion of the review, the final submission will be forwarded to the FAA and Maryland State Clearinghouse for review and approval. This process may take from sixty (60) to one hundred-twenty (120) days to complete.

1.6.9 Other Agency Approval: Maryland Department of the Environment (MDE)

The applicant is required to obtain additional permits from Maryland Department of the Environment (MDE), coordinated through the Permits Section, for projects that impact air and radiation management, waste management, and water management. Some projects may require additional approvals, permits, and operating plans to operate a facility once it has been constructed. Typical activities that would require permits include but are not limited to the following:

A. Air pollution sources that generally require State permits to construct: coating and painting operations, asphalt refurbishing, spray paint booth operations, fuel-burning equipment and the use of chemical processing equipment.
B. Air pollution sources that generally require State permits to operate: crushing equipment, VOC storage tanks, galvanizing operations, wood digesters, and pulverized material separators.
C. Permits that include petroleum storage and handling typically require oil operations permits. If total above ground storage is greater than 1,320 gallons or underground storage is greater than 42,000 gallons then the applicant shall submit a Spill Prevention Control and Countermeasures (SPCC) plan prior to the facility becoming operational. Appropriate secondary containment structures will be required for above ground storage tanks.
D. Work involving construction, removal or abandonment of underground storage tanks.
E. Work involving the installation or abandonment of drinking water wells or environmental monitoring wells.
F. Sediment and Erosion Control and/or Stormwater Management Plan approval is required for any construction activity that disturbs 5,000 square feet or more of soil, or results in the excavation of 100 cubic yards or more of soil.

All contractors should review the Business Guide to Environmental Permits and Approvals that contain important information about the different types of permits, licenses and approvals issued by the Maryland Department of the Environment (MDE). Additional information regarding MDE Activity, Site and Equipment approvals may be found at http://www.mde.state.md.us/Programs/Permits/Pages/index.aspx

Operating plans may be required including Facility Response Plans, Spill Prevention Control and Countermeasures (SPCC) Plans, and Stormwater Pollution Prevention Plans. Final copies of these plans shall be presented to the MDOT MAA Environmental Compliance Section prior to startup of a new facility.

1.7 Hazardous Materials

1.7.1 Asbestos

The MDOT MAA Environmental Compliance Section is responsible for the inspection, sampling, analysis, abatement and management of asbestos containing materials at BWI Marshall and Martin State Airport. The MDOT MAA is required to comply with federal regulations including: 40 CFR 763, 29 CFR 1926.1101, National Emission Standards for Hazardous Air Pollutants (NESHAP), and the Asbestos Hazard Emergency Response Act (AHERA) rule. Additionally, the MDOT MAA complies with State regulations regarding asbestos outlined in COMAR 26.11.21. The MDE also regulates how persons work with asbestos and train those who work with asbestos.

When asbestos fibers can easily be made into airborne dust, the material is known as friable. All friable asbestos from accessible locations within the BWI Marshall and MDOT MAA owned satellite buildings were removed by 1988. However, some asbestos may be present behind walls or column covers, in floor tiles or mastics, and in other inaccessible places. When work is identified in a permit application that could impact or disturb asbestos containing material, the MDOT MAA Environmental Compliance Section may perform an asbestos abatement project to remove such materials prior to construction. An applicant should contact the MDOT MAA Environmental Compliance Section at 410-859-7806 early in the renovation planning process to help determine if asbestos abatement is required and allow time in the construction schedule for proper abatement. The MDOT MAA Environmental Compliance Section reviews each permit application and project scope to determine if asbestos containing building materials could be impacted.

During the demolition phase of some projects, the MDOT MAA Environmental Compliance Section may have a licensed asbestos inspector or management planner present. If materials are identified in this phase of a project, and if plans call for disturbing the asbestos containing material, an asbestos abatement project may be required. If it is safe to do so, the MDOT MAA Environmental Compliance Section may decide to leave asbestos material that is not friable in place.

1.7.2 Lead Paint

Lead-based paint is no longer used in residential settings (its use was banned in housing in 1978) but it may be used in non-residential applications that require superior corrosion protection or durability. Lead-based paint may also be found on structures that have since been re-painted (painted over) with non-lead paint. Lead-based paint may be present on outdoor painted surfaces such as curbs, bollards, road or runway markings, metal doorframes and doors.

The MDOT MAA no longer uses lead-based paint. However, there are a number of older buildings, tenant spaces and structures that may have lead-based paint coated components. In 2018, MDOT MAA extensively surveyed accessible painted surfaces in and on MDOT MAA owned buildings at BWI Marshall and Martin State Airport for lead-based paint using an X-ray fluorescence device.

The MDOT MAA attempts to identify permits that may disturb lead-based paint and will perform encapsulation or abatement of these materials if required. It is also the duty of the contractor to immediately notify the MDOT MAA Environmental Compliance Section when lead paint is encountered in the project area. The MDOT MAA Environmental Compliance Section can be reached at 410-859-7806 during normal business hours.

1.7.3 Mold

The MDOT MAA Environmental Compliance Section is responsible for the inspection, sampling, analysis, and abatement of mold contaminated building materials at BWI Marshall and Martin State Airport. Mold evaluations are conducted in direct response to building occupant complaints of musty odors, damp or wet conditions, and/or a variety of health-related symptoms including allergic type reactions (difficulty breathing, general malaise, coughing/sneezing, etc.). MDOT MAA also conducts mold evaluations preemptively in response to a known water intrusion event, such as localized flooding, pipe leakage, stormwater/sewer backup, etc. In addition, mold contaminated building materials can be encountered during the demolition phase of various projects.

Abatement of identified mold issues are addressed on a case-by-case basis.

If mold contaminated surfaces are encountered during the demolition phase of a project, the construction permit applicant and/or demolition contractor shall contact the MDOT MAA Environmental Compliance Section at 410-859-7806 immediately upon encountering such surfaces to help determine if mold abatement activities such as those described above will be required.

All design and construction work shall comply with the Annotated Code of Maryland, Maryland Regulations, PEGS Manual, Maryland Building Performance Standards (COMAR 05.02.07) and industry standards. In the event of a conflict, the most stringent requirement shall be followed.

1.8 Applicable Codes, Regulations and Standards

1.8.1 Design Standards

A. Manual applies to all projects on or within facilities on State-owned property under the jurisdiction of MDOT MAA. These are available electronically at: http://www.marylandaviation.com/content/doingbusinesswithmaa/construction/index.html
B. Maryland Tenant Design Criteria and Checklist requirements apply to all projects that are managed and constructed by AMM and its subtenants.

1.8.2 Industry Standards

The following are included by reference for compliance:

A. The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) of the latest edition
B. The Illuminating Engineering Society (IES) Lighting Recommendations
C. Maryland Occupation Safety and Health (MOSH) Regulations
D. U S. Department of Labor, Occupational Safety and Health Administration (OSHA) Regulations

1.9 Insurance Requirements

As a condition of the Building/Installation Permit, the Applicant agrees to the following statement:

> *The Contractor shall, at its own cost, obtain and maintain such insurance as will protect it and the Maryland Aviation Administration and its employees on an occurrence basis and provide legal representation to address any claims for damages and personal injury which may arise from the operations under this Permit, whether such operations are performed by the Contractor or any subcontractor or by anyone directly or indirectly employed by them. The insurance shall cover claims arising solely in connection with this permit and shall not be subject to any degree of depletion as a result of claims arising in connection with other activities undertaken by the Contractor. Said insurance is to be issued with the Maryland Aviation Administration and its employees, as an additional insured, not as a named insured.*

The Applicant shall have its insurance company complete the ACORD Certificate of Liability Insurance Form and submit it with the permit application. Certificate holder shall read:

Maryland Aviation Administration
Division of Planning and Engineering
State of Maryland and Maryland Department of Transportation
Attn: Permits Coordinator
P.O. Box 8766
BWI Marshall Airport, MD 21240

1.9.1 General Liability Insurance (Non-Airfield Access)

Comprehensive General Liability Policies for Bodily Injury and property Damage Coverage with the combined single limit of not less than TWO MILLION DOLLARS ($2,000,000) per occurrence for landside (job site location). The policy must be written on an occurrence basis (not claims made basis).

1.9.2 Automobile Liability Insurance (Non-Airfield Access)

The liability insurance shall include comprehensive automobile liability insurance with a combined single limit of ONE MILLION DOLLARS ($1,000,000.00) (including garage liability, all automotive equipment owned, operated, leased, hired, and non-owned) for bodily injury and property damage for each accident.

1.9.3 General Liability Insurance (Airfield Access)

Comprehensive General Liability Policies for Bodily Injury and Property Damage Coverage with the combined single limit of not less than FIVE MILLION DOLLARS ($5,000,000) per occurrence for the Airfield Operations Area (AOA). The policy must be written on an occurrence basis (not claims made basis).

1.9.4 Automobile Liability Insurance (Airfield Access)

The liability insurance shall include comprehensive automobile liability insurance with a combined single limit of FIVE MILLION DOLLARS ($5,000,000.00) (including garage liability, all automotive equipment owned, operated, leased, hired, and non-owned) for bodily injury and property damage for each accident.

1.9.5 Worker’s Compensation and Employer’s Liability Insurance

Workers’ Compensation coverage shall be at statutory limits as required by the laws of the State of Maryland Aviation Administration and Employer’s Liability Insurance with limits not less than ONE MILLION DOLLARS ($1,000,000) per accident for bodily injury.

1.10 Indemnification

As a condition of a Building, Single Trade or Installation Permit, the Applicant will assume all risks incident to, or in connection with, its Building, Single Trade or Installation Permit and shall be solely responsible for all damages or injuries to persons, property or the environment caused by its operations and shall indemnify, defend and hold harmless the State of Maryland, the Maryland Department of Transportation, the Maryland Aviation Administration, and their authorized officers, agents, employees and representatives from and against any and all claims, actions, suits, losses, expenses, or damages for injuries (including death) to persons, or damage (including destruction) to property or the environment, of whatsoever kind or nature, including any claims or fines assessed by any federal agency, or any State of Maryland agency, arising directly or indirectly from the manner or method employed by the Applicant, its authorized officers, agents, employees, customers, contractors, subcontractors, representatives and assigns in the performance of the work or resulting from any act or omission of the Applicant, its authorized officers, agents, employees, customers, contractors, subcontractors, representatives and assigns in connection with the Building, Single Trade or Installation Permit. Applicant further agrees to defend, at its own cost, and to protect, indemnify, and otherwise hold harmless the Maryland Aviation Administration, its authorized officers, agents, employees and representatives (including but not limited to the posting of bond and release of attachment) from and against any and all claims in any way connected with or arising out of the Building, Single Trade or Installation Permit and arising out of repair or maintenance work hereunder (including but not limited to attachments, liens, and levies, whether or not such claim is meritorious) made, filed or asserted by any party other than the Applicant against the Maryland Aviation Administration, its authorized officers, agents, employees or representatives.

1.11 Permit Limitations and Work Without a Permit

1.11.1 Permit Expiration

Unless permitted work commences within one hundred-eighty (180) calendar days, or if the work is left abandoned for one hundred-eighty (180) calendar days after the issuance of a permit, the Building, Single Trade, or Installation Permit will expire and become null and void. Upon request from the Applicant, the Permits Section, at its own discretion, may extend the Permit.

1.11.2 Transfer of Permit

A permit is not transferable to another tenant unless approved by the Permits Section.

1.11.3 Suspension or Revocation of Permit

The Permits Section reserves the right to suspend or revoke any permit if it determines that a permit was issued in error due to misinformation or if the issuance was in violation of State statutes, codes, regulations, or PEGS Manual.

1.11.4 Work without a Permit

No construction work may begin prior to the issuance of any Permit by the MDOT MAA. Any work occurring without a Permit may have to be removed and the affected area restored to its original condition, at the tenant's expense, if so directed by the MDOT MAA.

1.12 Construction Process

1.12.1 Pre-Construction Meeting

Once the Applicant has received notice of permit approval, the Applicant is required to contact Inspections, in the Permits Section, to arrange a pre-construction meeting. The pre-construction meeting is attended by the Contractor, any subcontractor(s), Inspection staff, a Fire Marshal's representative and any other MDOT MAA department(s) that has an interest in the project. A pre-construction meeting may not be required for minor Installation or Single Trade Permit projects. The following shall be provided by the Tenant and the Contractor at the pre-construction meeting:

A. Copy of Construction Schedule
B. Primary Contractor point of contact, list of subcontractors and copies of current Trade Licenses
C. List of Emergency Numbers
D. Approved Project Security Plan (PSP) with signatures
E. Safety Plan

1.12.2 Work by More than One General Contractor

Work will be carried out under the supervision of no more than one Primary Contractor. If the Owner/Tenant has hired more than one Contractor working simultaneously, the Owner/Tenant shall be deemed as the Primary Contractor and will be asked to provide the required construction license and insurance information for the entire job.

1.12.3 Work Hours

Work deemed disruptive to airport operations shall be restricted to nighttime hours at the discretion of MDOT MAA.

1.12.4 Staging Area

If a staging area is needed, the Primary Contractor shall contact the MDOT MAA Office of Airport Operations which may provide the staging area if it is available.

The Owner/Tenant and its Primary Contractor shall be responsible for security and maintenance of their staging areas at all times.

It is intended that equipment and materials needed for the construction will be stored in the designated staging area. Equipment and materials required at the work site(s) may be transported to those site(s) only as necessary to meet approved schedules. At the end of each working day, all equipment shall be withdrawn to the designated staging area and placed in an orderly fashion. Emergency exits and means of egress are to be safeguarded against obstruction by equipment and materials during all periods of occupancy.

The Owner/Tenant and its Primary Contractor shall not utilize any area for storage or staging unless authorized by MDOT MAA in writing. Utilization of any MDOT MAA property for purposes not related to or inconsistent with the permitted project is prohibited and subject to immediate removal and restoration by the MDOT MAA at Tenant's expense.

Staging areas and all areas used for storage of equipment or material shall be restored to their pre-existing original condition immediately upon completion of each phase of the project.

1.12.5 Construction Signs

Construction signs shall consist of project name, Owner/Tenant and its Primary Contractor's identification, upcoming project announcement, or rendering.

Individual advertisement boards are not permitted.

1.12.6 Housekeeping

Access to the work site will be agreed upon during the pre-construction meeting to minimize disruption. Within the Airport terminal buildings, the contractor shall provide floor mats at construction entrances and exits to prevent dust from traveling outside. For projects which require moving of heavy equipment across tile or carpeted floors, ¾" plywood sheets may be required to protect the floor. The contractor shall clean all accidental spills immediately outside of the construction area and restore finishes to their original condition, within the confines of MDOT MAA property, if damaged during construction or material transportation.

1.12.7 Inspections

1.12.7.1 Inspectors

The Permits Section will assign an inspector(s) to monitor construction activities. Other inspectors from the Fire Marshal's Office, MDOT MAA Utilities, Office of Planning and Environmental Services, or Risk Management may perform unannounced inspections.

1.12.7.2 Permit Compliance

The Permits Section inspectors will inspect and monitor work to help ensure compliance with permit drawings/documents, relevant codes and PEGS Manual. However, observation of work by the designated inspector shall not relieve the Contractor of compliance with all applicable Codes and regulations, PEGS Manual, permit drawings and specifications. Any installation that does not comply with the permit requirements is subject to removal by the MDOT MAA at the Tenant's expense. It is the Tenant's responsibility to arrange and pay for construction management services to help ensure compliance with contract documents.

1.12.7.3 Stop Work Order

The Permits Section inspectors and the OFM may issue a "STOP WORK ORDER" on projects initiated without a permit or if work is being performed in a dangerous or unsafe manner. The Stop Work Order shall remain in effect until the cause(s) of the Stop Work Order has been satisfactorily resolved.

1.12.8 Revisions During Construction

Once the permit has been issued, major changes to layout, finishes, and structural elements shall be submitted in the form of addenda (revised drawings, sketches, specifications) to the Permit Committee for approval before commencing work. Revisions shall be marked (clouded) with a revision note and signed and sealed by the architect or engineer of record. For minor revisions, the Permits Section may allow revisions to be submitted via email in portable data file (.pdf) format for review prior to formal submission and approval.

1.12.9 Safety and Security Requirements

For safety and security requirements during construction, please see Chapter 2 – Supplemental Information.

1.12.10 Application Closeout

1.12.10.1 Final Inspection

Once the project is substantially complete, the Tenant's Contractor and/or agent shall submit a written request, either by fax or by email, to the Permits Section inspectors to request a final inspection at least three (3) days in advance of the requested date.

Upon recommendation from the designated inspector, the Permits Section will arrange the final inspection meeting on the work site, to be attended by Inspections staff, the Fire Marshal or a representative, and other MDOT MAA departments that have an interest in the project. The Tenant shall ensure that the Contractor and appropriate subcontractors are available to answer questions, test systems and provide access as necessary. At the meeting, a Compliance Report shall be signed by the Inspections and the Fire Marshal's office or a punch-list will be created in the presence of the Contractor. If the punch-list consists of minor items, the inspector shall recommend to the Fire Marshal or a representative to grant a conditional occupancy permit.

Inspection of the work shall not relieve the Contractor of responsibility to comply with applicable codes and regulations, PEGS Manual, permit drawings and specifications.

1.12.10.2 Supplemental Requirements Records Drawings

Within seventy (70) days of the Final Inspection, the Tenant shall provide a set of Record Drawings in hardcopy and AutoCAD as well as .pdf format drawings on CD/DVD to the permit coordinator. The Record Drawings shall incorporate all layout, dimension and note changes that were made since the issuance of the permit to allow the use of these drawings as base drawings for future renovations. The CD/DVD shall be clearly labeled with the company name, project title, permit number, and date of CD/DVD preparation. The AutoCAD drawings shall follow MDOT MAA Computer Aided Design (CAD) Standards as found in Volume 1, Appendix 1D – CAD Standards.

If Record Drawings are not received by an applicant in a timely manner, the MDOT MAA, at its discretion, may not issue another permit to the same tenant until the satisfactory receipt of all such documents.

2.1 Badging Requirements

Generally, BWI Marshall prefers that all individuals working in a restricted area successfully complete a fingerprint based Criminal History Record Check, a Security Threat Assessment, and be trained and tested prior to being issued a BWI Marshall Identification/Access Badge. It is understood that some individuals will not be able to successfully complete a Criminal History Record Check due to the presence of disqualifying crimes as defined by the Transportation Security Administration. These employees are permitted to work in a restricted area, but must be under continuous escort by a badge holder with escort authority.

2.2 Restricted Areas

BWI Marshall requires that the Primary Contractor develop and submit a Project Security Plan for approval to the BWI Marshall Security Division for all work performed within one of the Airport's Restricted Areas. The Project Security Plan must include all work performed by the Primary Contractor and all subcontractors that were hired under each separate MAA contract. The Project Security Plan shall be submitted for review and approval thirty (30) calendar days prior to commencement of work to allow the Airport Security Division time to submit a changed condition request to the Transportation Security Administration for approval (49 CFR 1542.107D). It must detail all measures that the Primary Contractor will undertake to implement the following:

A. Identify a Security Liaison for each work site who will be responsible for ensuring compliance by all Primary Contractor and subcontractor personnel to all Airport Security Division and Transportation Security Administration security rules and regulations. Each work site's Security Liaison (or a designated alternate) shall be present at the work site at all times while work is in progress and be available to respond to the Airport Security Division or Transportation Security Administration or their authorized representatives upon demand. The Project Security Liaison shall be available by telephone during non-working hours for the entire duration of the subject MAA contract.
B. Issue all non-badged personnel under escort hard hats of a single uniform red color and all Contractor personnel, acting as escort, shall have hard hats of a separate, single uniform blue color. All other personnel may use any color hardhat except red and blue.
C. Procure and deploy all fencing, gates, and barriers indicated in the Project Security Plans for the purpose of enveloping, enclosing and securing the work site during both working and non-working hours (see Attachment 1).
D. Identify the number of BWI Marshall ID badge holders with Escort Authority that will be responsible for escorting non-badged employees. Escorts may be conducted by the Contractor's own personnel (with Escort Authority), an Airport Security Division Approved Private Security Contractor or by the current Airport Security Contractor; however, all escort related costs, of both equipment and personnel, is the sole responsibility of the Primary Contractor. Under normal circumstances, one (1) badge holder with Escort Authority may escort no more than five (5) non-badged workers. Contractor personnel acting as escorts for non-badged personnel shall have no other work-related responsibilities while performing escort duties.
E. All Contractor self-propelled equipment and machinery shall be inspected and shall display a valid airfield registration decal. All other (unregistered) vehicles shall remain under continuous escort while in the work site and while traveling in the restricted areas or to and from the work site.
F. An airfield registered vehicle, driven by a badge holder with appropriate Escort, Power Gate and AOA driving privileges, shall lead all escorted unregistered vehicles, while in any restricted area, to and from the work site at all times and in accordance with established escorting procedures. For convoys of five (5) or more vehicles in number, a second airfield registered vehicle shall be provided by the Contractor to exercise control of the rear of the convoy. The second vehicle shall also be driven by an authorized badge holder with Escort, Power Gate, and AOA driving privileges.
G. All work requiring access through a non-power/unguarded perimeter gate shall be included in the Project Security Plan. Otherwise, a written amendment to the Project Security Plan shall be submitted for approval to the Airport Security Division a minimum of thirty (30) calendar days prior to the commencement of such work. All non-power/unguarded perimeter gates used by escort vehicles and equipment into any of the Airport's restricted areas shall be staffed by Airport Security Contractor personnel. A minimum of three Airport Security Contract officers shall be present at each perimeter gate being utilized in order to conduct the required searches and logging-in of escorts for both vehicles and individuals. All costs related to Airport Security Contractor personnel and equipment needed to comply with the security requirements of the Airport Security Division for use of non-power/unguarded perimeter gates are the sole responsibility of the Primary Contractor.
H. All work performed within ten feet (10') of the security perimeter fence shall be included in the Project Security Plan. Otherwise, a written amendment to the Project Security Plan shall be submitted for approval to the Airport Security Division a minimum of thirty (30) calendar days prior to the commencement of such work. If, at any point, the work being performed requires the opening, re-positioning or dismantling of any portion of the security perimeter fence where access into the airport's restricted area may be gained, the Contractor shall provide an adequate number of security Contractor personnel to maintain security at the work site as determined by the Airport Security Division. If any damage to the security perimeter fence is discovered at any time during the project, the Contractor shall immediately notify Airport Operations at 410-859-7018 and make arrangements to provide Airport Security Contractor personnel to maintain security at the work site of the damage until the damage is repaired by the Contractor and inspected and approved by the Airport Security Division.
I. The Primary Contractor should make provisions to obtain BWI Marshall ID badges for all Contractor personnel working on the project at least three weeks prior to the commencement of work. All individuals who require access into the restricted areas and who are, or believe they will be, unsuccessful in obtaining a BWI Marshall ID badge shall remain under close and continuous escort at all times while in the restricted areas in accordance with D above. All escorted construction personnel shall also provide to the Airport Security Division his/her full name, date of birth and social security number, as required by the Airport Security Division for screening purposes, at least seven (7) calendar days prior to actual date the escort is to be conducted. The information will be utilized to run the individual's name against the Federal "No-Fly/Selectee List".

Individuals will be issued an Escort Badge after successful comparison against the No-Fly/Selectee List. Individuals with a positive hit on the No-Fly Selectee List will be denied escorted access into a restricted area until they have successfully cleared their names from the No-Fly/Selectee List.

2.3 Non-Restricted/Public Areas

Work performed inside or within three hundred feet (300') of the BWI Marshall Main Terminal Building and other public areas within ten feet (10') of the security perimeter fence described below requires that the Primary Contractor develops and submits a Project Security Plan for approval by the BWI Marshall Airport Security Division. The Project Security Plan is developed and submitted by the Primary Contractor to include all work performed by the Primary Contractor and all Subcontractors hired under each separate MAA contract. The Project Security Plan shall be submitted for review and approval to the MAA Airport Security Coordinator within thirty (30) calendar days prior to the commencement of work and shall detail all measures the Primary Contractor will undertake to implement the following:

The Primary Contractor shall identify a Security Liaison for each work site who will be responsible for ensuring compliance by all Primary Contractor and subcontractor personnel to all Airport Security Division and Transportation Security Administration security rules and regulations. Each work site's Security Liaison (or a designated alternate) shall be present at the work site at all times while work is in progress and be available to respond to the Airport Security Division or TSA or their authorized representatives upon demand. The Project Security Manager shall be available by telephone during non-working hours for the entire duration of the subject MAA contract.

All work performed within ten feet (10') of the security perimeter fence shall be included in the Project Security Plan. Otherwise an amendment to the Project Security Plan shall be submitted for approval to the Airport Security Division a minimum of thirty (30) calendar days prior to commencement of work. If, at any point, the work being performed requires the opening, re-positioning, or dismantling of any portion of the security perimeter fence where access into the Airport's Restricted Areas may be gained, the Contractor shall provide an adequate number of Private Security Contractor or Airport Security Contractor personnel and equipment to maintain security at the work site as determined by the Airport Security Division. If any damage to the security perimeter fence is discovered at any time during the project, the Contractor shall immediately notify Airport Operations at 410-859-7018 and make arrangements to provide Private Security Contractor or Airport Security Contractor personnel to maintain security at the work site of the damage until the damage is repaired by the Contractor and inspected and approved by the Airport Security Division.

All work that requires a Contractor to park its work vehicles, or other self-propelled equipment, within three hundred feet (300') of the BWI Marshall Main Terminal Building shall obtain a Construction Vehicle Permit prior to commencement of work. These permits are issued to Contractors named in the Authorized Contractors List. Each vehicle belonging to the Contractor shall obtain a separate permit. Permits are issued based on the length of time for which they are required and expire either daily or monthly. Vehicles are inspected at Gate A and issued the permit for the appropriate length of time. The Contractor shall designate and maintain an individual to remain with the permitted vehicle(s) at all times while within three hundred feet (300') of the BWI Marshall Main Terminal Building.

2.4 Safety Requirements: Airfield Area

A. For all projects within the airfield, the Contractor shall comply with FAA AC 150-5370-2F. In addition, the Contractor shall acquaint its supervisors and employees with the Airport activity and operations that are inherent to BWI Marshall and shall conduct its construction activities to conform to all routine and emergency air traffic requirements and guidelines for safety specified herein.
B. The Contractor shall not allow employees, subcontractors, suppliers, or any other unauthorized person to enter or remain in any Airport area that would be hazardous to persons or to aircraft operations.
C. The Contractor shall be aware of the following types of safety problems and/or hazards:
    1. Trenches, holes, or excavations on or adjacent to any open runway or in safety areas.
    2. Unmarked/unlighted holes or excavation in any apron, open taxiway, open taxi lane, or related safety area.
    3. Mounds or piles of earth, construction materials, temporary structures, or other objects in vicinity of the open runway, taxiways, taxi lanes, or in a related safety, approach, or departure area.
    4. Vehicles, equipment, excavations, stockpiles, or other materials that could degrade or otherwise interfere with electronic signals from radios or NAVAIDs.
    5. Unmarked utility, NAVAID, weather service, runway lighting, or other power or signal cables that could be damaged during construction.
    6. Objects (whether or not marked or flagged) or activities anywhere on or in the vicinity of Airport which could be distracting, confusing, or alarming to pilots during aircraft operations.
    7. Unflagged/unlighted low visibility items (such as tall cranes or drills) anywhere in the vicinity of active runways, or in any approach or departure area.
    8. Misleading or malfunctioning obstruction lights or unlighted/unmarked obstructions in approach to any open runway.
    9. Inadequate approach/departure surfaces (These surfaces are needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas.)
    10. Inadequate, confusing, or misleading (to user pilots) marking/lighting of runways, taxiways or taxi lanes (including displaced or relocated threshold).
    11. Water, snow, dirt, debris, or other transient accumulation which temporarily obscures pavement marking or pavement edges or derogates visibility of runway/taxiway marking or lighting, or of construction and maintenance areas.
    12. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of airport operations area.
    13. Trash or other materials with Foreign Object Debris (FOD) potential, whether on runways, taxiways, aprons, or in a related safety area.
    14. Inadequate barricading or other marking to separate construction or maintenance areas from open aircraft operating areas.
    15. Failure to control vehicle and human access to, and nonessential non-aeronautical activities in, active aircraft operating areas.
    16. Failure to maintain radio communication between construction/maintenance vehicles and Airport Traffic Control Tower (ATCT).
    17. Construction/maintenance activities or materials which could hamper the response of aircraft rescue and firefighting equipment from reaching all aircraft or any parts of the runway/taxiway system, to runway approach and departure areas, and to aircraft parking locations.

18. Bird attractants such as edibles (food scraps, etc.) or other miscellaneous garbage, other trash, or ponded water on the Airport.

D. The Tenant and its Contractor are responsible for safety and health on the project. The Tenant and its Contractor shall conduct activities so as not to violate any safety requirements in applicable federal, State, and local regulations or the standards contained herein. The Primary Contractor shall inspect all construction and storage areas as often as necessary to be aware of conditions, and promptly take all steps necessary to prevent/remedy any unsafe or potentially unsafe conditions or activities discovered.

E. If the MAA representative becomes aware of any conditions that pose a serious or imminent danger to the health or safety of the public or MAA personnel, the MAA representative shall notify the Primary Contractor orally and send a written confirmation and request immediate corrective action. This notice, when delivered to the Primary Contractor or the Primary Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required immediately.

F. After receiving the notice, the Tenant and its Contractor shall immediately take corrective action. If the Tenant and its Contractor fails or refuses to promptly take corrective action, the MAA may issue an order stopping all or part of the work until satisfactory corrective action has been taken.

G. At no time shall the Tenant and its Contractor be relieved of the responsibility to be aware and immediately correct any unsafe conditions. Before actual commencement of construction activity, the Primary Contractor shall, through MAA Operations, give notice, using the NOTAM system, of proposed time and date of commencement of construction as well as the length and duration of the work in such areas. Upon completion of work and return of all such areas to standard conditions the Primary Contractor shall, through MAA Operations, give notice, using the NOTAM system, of completion of construction.

H. All Contractor's vehicles that are authorized to operate on the Airport outside of the designated construction area limits or haul routes as specified and in the active Airport Operations Area shall display in full view above the vehicle a 3' x 3' or larger, orange and white checkerboard flag, each checkerboard color being square. Any vehicle operating in the active Airport Operations Area during the hours of darkness shall be equipped with a flashing amber (yellow) dome type light, mounted on top of the vehicle and of such intensity to conform to local codes for maintenance and emergency vehicles.

I. Radio communications are required between the Contractor's representative and the Air Traffic Control Tower. Radio contact is required at all times while the Contractor has personnel and equipment on the work site and while they are in an active Airport Operations Area of BWI Marshall. Radios shall be furnished by the Contractor and shall be capable of transmitting and receiving at a ground frequency of 121.9 MHZ for BWI Marshall. Sufficient radios shall be on the work site and operating at all times so that instructions or communications may be dispatched to all crews and/or equipment working in an active Airport Operations Area within one minute after receipt from the Air Traffic Control Tower.

J. Debris, waste and loose material (including dust and dirt) capable of causing damage to aircraft landing gear or propellers or being ingested in jet engines shall not be allowed on active aircraft movement areas or adjacent grassed areas. Materials observed to be within these areas shall be removed immediately and/or continuously by the Contractor during construction.

K. The Tenant and its Contractor shall furnish, at their own expense, flagmen as necessary to control their traffic in accordance with these specifications unless otherwise directed by the MAA's representative, in which case the direction of the MAA's representative shall be followed.

L. All Contractor's vehicles that are required to cross active runways, ramp areas, taxiways and aprons shall do so under the direct control of a competent flagman who is in direct radio contact with the Air Traffic Control Tower. All aircraft traffic on runways, ramp areas, taxiways and aprons shall have priority over Contractor's traffic. Radios shall be supplied by The Tenant and its Contractor and shall be capable of transmitting and receiving at a frequency of 121.9 MHZ for BWI Marshall.

M. Where project access requires travel on or across runways, ramp areas, taxiways, or aircraft aprons, all personnel shall keep such surfaces clear of debris. At no time shall the Contractor's vehicles or personnel be allowed to enter or cross active runways or clear zones without proper authorization obtained through ground control.

N. Open flame, welding or torch cutting operations are prohibited unless adequate fire and safety precautions have been taken and the procedure previously permitted by the MAA and the Office of the Fire Marshal.

O. Equipment and stockpiled material shall be constrained in a manner to prevent movement resulting from aircraft jet blast or wind conditions.

P. The Contractor shall provide timber or bucket type construction barricades with flashing yellow lights as shown on the drawings or directed by the MAA to delineate the work areas when these areas are closed to airport traffic. Open trenches, excavations and stockpiled material located in the Airport Operations Area shall be prominently marked with aviation orange flags and lighted by approved light units during hours of restricted visibility and darkness.

Q. All materials and equipment when not in use shall be placed in approved areas where they will not constitute a hazard to aircraft operations and not penetrate clearance surfaces defined in Federal Aviation Regulation, Part 77 (14 CFR, Part 77).

R. The Contractor shall adhere to the requirements of FAA Order EA 5210.1, "Safety Requirements on Airports During Construction," current edition and Advisory Circular 150/5370 2C, "Operational Safety on Airports During Construction." Where Part 77, EA 5210.1 and Advisory Circular 150/5370 2C are in conflict, the most restrictive requirement shall be met.

S. Maximum equipment height shall not exceed twenty (20) feet unless prior approval is obtained from the MAA.

T. Debris, waste and loose material (including dust and dirt) capable of causing damage to aircraft landing gear, propellers, or being ingested in jet engines shall not be allowed on active aircraft movement areas or adjacent grassed areas. Materials observed to be within these areas shall be removed immediately and/or continuously by the Contractor during construction.

U. Upon completion of any stage/phase of the work the MAA will arrange a physical inspection with Airport operations personnel prior to opening for aircraft use any runway, taxiway, ramp area or Airport roadway that has been closed for work, on or adjacent thereto, that has been used for a crossing point or haul route by the Contractor.

V. Entrance to the airfield is subject to strict security regulations. All personnel entering the airfield shall obtain and display security identification badges. All vehicles shall have and display special permits issued by the Maryland Aviation Administration.

W. The Primary Contractor shall be responsible for assuring that all their employees who have unescorted access to the airfield, have background checks, including at a minimum, references and prior employment histories to the extent necessary to verify representations made by the employee relating to employment in the preceding five (5) years.

X. The smoking or carrying of lighted tobacco or other products is strictly prohibited on the airside of the Airport. Failure to comply may result in fines and/or suspension of individual security badges. If the MAA becomes aware of any conditions that pose a serious or imminent danger to the health or safety of the public or MAA personnel, the MAA representative shall notify the Tenant or its Contractor orally, with written confirmation, and request immediate

initiation of corrective action. This notice, when delivered to the Tenant or its Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required.

2.5 Existing Utilities

A. The Tenant and its Contractor shall not begin or make any excavation without first notifying the MAA and each and every public service company which may have underground facilities in the area(s) of the proposed work at least seventy-two (72) hours prior to the commencement of such work. In Baltimore and Anne Arundel Counties, the Contractor shall notify the public service companies of work intentions by calling MISS UTILITY at 1-800-257-7777.
B. The Contractor shall notify and receive approval from the MAA in writing seven (7) days in advance of any utility shut down that will affect the normal operations at BWI Marshall. Utility shut downs shall only be allowed at night and during hours determined by the MAA (normally between 11:00 pm to 5:00 am). The Contractor shall provide the MAA with the type of utility and anticipated duration of shut down and specific area(s) that will be affected as a result of this work.
C. The Tenant and his/her Contractor are to protect and maintain service for all the existing water and sewer lines, telephone lines, gas lines, electrical lines, etc. during the progress of the work.
D. The Tenant and his/her Contractor shall be fully responsible for any and all damages to underground and aboveground utilities and facilities resulting from the installation and maintenance.
E. The Tenant and his/her Contractor shall have available on-call sufficient specialty Contractors, such as electrical, plumbing, etc., to repair any damage to existing facilities that might occur as a result of construction operations regardless of when the damage might occur.

2.6 BIM Standard Requirements for Tenant Projects

Tenants/Tenant Consultants shall confirm with the MDOT MAA Permit Committee during the building permit process whether MDOT MAA's BIM Standards and Technical Specifications are applicable to their project.

2.7 Construction Debris Management and Disposal

Tenants/Tenant Consultants shall consult with the MDOT MAA Permit Coordinator during the permit review process is MDOT MAA's Standard Technical Specification "017419X Construction Debris Management and Disposal" is applicable to their project.

8A.1 Forms

Building Permit Application (.pdf, 1 page)

Click the image to download the document in PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Permits
P. O. Box 8766, BWI Airport
Maryland, 21240-0766
Tel. 410-859-7796
Fax: 410-859-5440

APPLICATION FOR BUILDING PERMIT

GENERAL INFORMATION (To be completed by the applicant, please print)	
Project Name:	Airport: ○ BWI ◉ MTN
Project Location (Bldg./Terminal, Level, Holdroom, Room No. etc.):	Tenant Space No.:
Name of Tenant:	Tel.: E-mail:
Applicant/Contact Person: Representing: Mailing Address:	Tel.: Cell No.: Fax: E-mail:
Brief Description of Project: (200 character limit) Estimated Construction Cost **(Required):** $	**Check Appropriate Box:** MAA ☐ Funding Source: Existing Tenant ☐ New Tenant ☐
Name of Architect/Engineer: Address: Name of Contact:	Tel.: Fax: E-mail:
Name of Contractor: Name of Contact:	Tel.: Cell/Emergency No: E-mail:
Maryland Contractor's License Number: * Attach Photocopy of Current MD Contractors License and Insurance Certificate.	Expiration Date:

Check Appropriate Box:

	Yes	No		Yes	No
Will a crane be used during construction?	☐	☐	Will the work be done in a "Confined Space?"	☐	☐
Will the work involve "Hot Work/Welding?"	☐	☐	Will the work involve Trenching and Excavation?	☐	☐
Will rooftop equipment be provided?	☐	☐			

If the answer to any of these questions is Yes, additional permits or authorizations may be required. (See Permits Information Guide for definitions and list of supplementary permits).

Applicant's Signature: _____ Date: _____

FOR OFFICE USE ONLY

	Yes	No		Yes	No
Complete Application Form	☐	☐	Safety Plan	☐	☐
Insurance Certification	☐	☐	Commercial Management Authorization	☐	☐
Copy of Contractor's License	☐	☐	Check List	☐	☐
Dwgs. Stamped by Licensed Architect/Engineer	☐	☐	CD	☐	☐

Permit Coordinator:	Date:
Date Received:	BP Number:
Date of Meeting:	
Date of Release:	

Installation Permit Application (.docx, 1 page)

Click the image to download the document in Microsoft Word format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Permits Section
P.O. Box 8766, BWI Airport
Maryland 21240-0766
Tel. 410-859-7796
Fax: 410-859-5440

APPLICATION FOR INSTALLATION PERMIT

GENERAL INFORMATION (To be completed by the applicant, please print)

Project Name:	Airport ☐ BWI ☐ MTN
Project Location (Bldg./Terminal, Level, Holdroom, Room No. etc.):	Tenant Space No.:
Name of Tenant:	Tel.: E-mail:
Applicant/Contact Person: Representing: Mailing Address:	Tel: Cell No.: Fax No.: E-mail:
The Installation is for: Exterior Signage ☐ Security Equipment ☐ Interior Signage ☐ Food Service Equipment ☐ Ticket/Information Counter ☐ Exhibit ☐ Dish/Antenna ☐ Data/Cable ☐ Other (Please Indicate):	Check Appropriate Box: New Installation ☐ Replacement ☐ Modification ☐
Project Description: Estimated Construction Cost (**Required**): $	MAA Only Funding Source:
Name of Contractor/Installer: Name of Contact: Maryland Contractor's License Number: ** Attach Photocopy of Current MD Contractor's License and Insurance Certificate.*	Tel.: Cell/Emergency No.: E-mail: Expiration Date:

Check Appropriate Box:

	Yes	No		Yes	No
Will the installation require alteration to electrical/ mechanical systems?	☐	☐	Will the installation require the use of new data outlets/cables?	☐	☐
Will the installation involve "Hot Work/Welding?"	☐	☐	Will the installation involve Trenching and Excavation?	☐	☐
Will a crane be used during installation?	☐	☐	Will the work be done in a "Confined Space?"	☐	☐

Temporary Installation
If the installation is temporary, indicate for how long: (Please select one)
☐ Less than 3 months ☐ 3-6 months ☐ 6-12 months ☐ More than 12 Months
* The applicant will be required to restore/patch existing surfaces to their original condition when the installation is removed.

Applicant's Signature: _____ Date: _____

FOR OFFICE USE ONLY

	Yes	No		Yes	No
Complete Application Form	☐	☐	Safety Plan	☐	☐
Insurance Certification	☐	☐	Commercial Management Authorization	☐	☐
Copy of Contractor's License	☐	☐			

Permit Coordinator:	Date:
Date Received:	**IP Number:**
Date of Meeting:	
Date of Release:	

Single Trade Permit Application (.pdf, 1 page)

Click the image to download the document in PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Permits
P.O. Box 8766, BWI Airport
Maryland 21240-0766
Tel. 410-859-7796
Fax: 410-859-5440

APPLICATION FOR SINGLE TRADE PERMIT

☐ **Electrical** ☐ **Gas**
☐ **Mechanical** ☐ **Fire Safety**
☐ **Plumbing** (Fire sprinkler, Fire Alarm, Suppression)

One application per trade only. If additional trades are added to the scope, within a period of 180 days from the date of last approval, the applicant will be required to submit a Building Permit application for the entire project.

GENERAL INFORMATION (To be completed by the applicant, please print)

GENERAL INFORMATION (To be completed by the applicant, please print)			
Project Name:		Airport:	☐ **BWI** ☐ **MTN**
Project Location:		Tenant Space No.	
Name of Applicant/Tenant Contact Person: Representing:		Tel.: E-mail: Tel.: E-mail:	
Mailing Address:		Emergency Contact and Number:	
Brief Description of Project: Estimated Construction Cost (Required): $		**Check Appropriate Box:** Existing Tenant? ☐ New Tenant? ☐	
Name of Master Electrician, Master Plumber or Master HVACR:		Tel.: E-mail:	
MD License No.: Expiration: Company/Organization: Street Address: City, State, Zip: Maryland Business License Number		Cell/Emergency No.	
*Attach Photocopies of Current MD License and Insurance Certificate		**Work By MAA Employees** Funding Source: Supervisor's Name: Supervisor's Signature:	

Check Appropriate Box:

	Yes	No		Yes	No
Will a crane be required during construction?	☐	☐	Will the work be done in a "Confined Space?"	☐	☐
Will the work involve "Hot Work/Welding?"	☐	☐	Will the work require trenching and excavation?	☐	☐
Will the work involve High Voltage?	☐	☐			

If the answer to any of those questions is Yes, additional permits are required.

Applicant's Signature: Date:

FOR OFFICE USE ONLY

	Yes	No		Yes	No
Is the Application Form complete?	☐	☐	Is Safety Plan provided?	☐	☐
Is Insurance Certificate provided?	☐	☐	Are Drawings sufficiently complete?	☐	☐
Is Copy of Trade License provided?	☐	☐	Are additional permits required?	☐	☐

Permit Coordinator Date:

Date Received:	**STP Number:**
Date of Meeting:	
Date of Release:	

Appeal/Waiver Request Form (.pdf, 1 page)

Click the image to download the document in PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Permits
P.O. Box 8766, BWI Airport
Maryland 21240-0766
Tel. 410-859-7796
Fax: 410-859-5440

APPEAL/WAIVER REQUEST FORM

GENERAL INFORMATION (To be completed by the applicant, please print)

Project Name:	Airport: ☐ BWI ☐ MTN
Project Location (Bldg./Terminal, Level, Holdroom, Room No. etc.):	Tenant Space No.:
Name of Tenant:	Tel.: E-mail:
Applicant/Contact Person: Representing: Mailing Address:	Tel.: Cell No.: Fax: E-mail:
Architect/Engineer of Record: Representing: Mailing Address:	Tel.: Cell No.: Fax: E-mail:
Permit No.:	
Date Original Permit Application Filed:	
Date of Permit Comments/Rejection Letter Issuance:	
Have the Reviewers/TIS been Contacted to resolve the Issue(s): ☐ Yes ☐ No	

Requested Waiver(s): *Please explain in detail reason(s) for the request (attach additional sheets if necessary)*

Statement of Hardship: *Please state how your project will be affected if waiver is not granted*

Signature of Applicant: **Date:**

Signature of Architect/Engineer of Record: **Date:**

FOR OFFICE USE ONLY

	Yes	No		Yes	No	Initials
Complete Application Form	☐	☐	Concurrence of Commercial Management	☐	☐	
Supporting Documents Provided	☐	☐	Concurrence of Fire Marshal	☐	☐	
Request Within 20 Days of Comments Issuance	☐	☐	Concurrence of Permit Committee Chair	☐	☐	
Signature of Architect/Engineer of Record	☐	☐	Approval by Chief Engineer, Division of Planning & Engineering	☐	☐	

Permit Coordinator: Date:

Date Appeal/Waiver Request Received:

Decision: ☐ Approved ☐ Denied

Date of Decision:

BP/EP/STP Number:

8A.2 Checklists

Drawing Checklist (.xlsx, 14 pages)

Click the image to download the document in Microsoft Excel format.

MARYLAND AVIATION ADMINISTRATION

PERMIT DRAWING CHECKLIST

BWI AIRPORT

Project _____

General

Is the task appropriate Code Analysis and the Life Safety - Egress Analysis plan included?	☐ YES	☐ NO	☐ N/A
Is queuing plan with directional arrows provided?	☐ YES	☐ NO	☐ N/A

Cover Sheet

Is a cover sheet provided?	☐ YES	☐ NO	☐ N/A
Is a Key Plan (with north arrow and/or project north) shown and is it consistent with other plans?	☐ YES	☐ NO	☐ N/A
Is tenant's name, number and address information indicated?	☐ YES	☐ NO	☐ N/A
Is the square foot area of renovation given?	☐ YES	☐ NO	☐ N/A
Are applicable codes indicated on the cover sheet? [Refer to Tenant Directive 007.1]	☐ YES	☐ NO	☐ N/A
Is sheet index provided on the cover sheet?	☐ YES	☐ NO	☐ N/A
Is there a note that all loose debris/trash shall be deposited in covered trash receptacle or removed from the site? (No loose debris/trash shall be left on roofs, spaces open to the airport operations area (AOA), conveyance or open trash receptacle at any time).	☐ YES	☐ NO	☐ N/A
Is there a note that the unused/abandoned floor/wall openings shall be sealed or firestopped?	☐ YES	☐ NO	☐ N/A
Are interior finishes classification indicated as per NFPA 101, 2006 edition, (Table A10.2.2) and IBC 2006 (Table 803.5), whichever is more stringent ?	☐ YES	☐ NO	☐ N/A

Inspection Tests (.pdf, 4 pages)

Click the image to download the document in PDF format.

MARYLAND DEPARTMENT OF TRANSPORTATION
MARYLAND AVIATION ADMINISTRATION

Tenant Improvements Section
P.O.Box 8766, BWI Airport
Maryland 21240-0766
Tel. 410-859-7796
Fax: 410-859-5440

INSPECTION TESTS

Test No.	Test	Reference	Procedure	Submittals Required
P-1	**Drainage and Vent Water Test** *[Provide P-1 or P-2]*	IPC 312.2	As per IPC 312.2; IPC 104.4	Plumbing contractor's standard form or letter indicating the following: Pipe Line/Equipment/Service being tested, Location [highlight test boundaries on plumbing drawings], piping material, specification test pressure, method of testing, time test started, time test ended, beginning and ending pressures, duration of test, name of foreman or witnesses with signature(s). The form / information shall be submitted to the inspector having jurisdiction at the time occupancy is granted.
P-2	**Drainage and Vent Air Test** *[Provide P-1 or P-2]*	IPC 312.3	As per IPC 312.3; IPC 104.4	Plumbing contractor's standard form or letter indicating the following: Pipe Line/Equipment/Service being tested, Location [highlight test boundaries on plumbing drawings], piping material, specification test pressure, method of testing, time test started, time test ended, beginning and ending pressures, duration of test, name of foreman or witnesses with signature(s). The form / information shall be submitted to the inspector having jurisdiction at the time occupancy is granted.
P-3	**Water Supply System Test**	IPC 312.5	As per IPC 312.5 ; IPC 104.4	Plumbing contractor's standard form or letter indicating the following: Pipe Line/Equipment/Service being tested, Location [highlight test boundaries on plumbing drawings], piping material, specification test pressure, method of testing, time test started, time test ended, beginning and ending pressures, duration of test, name of foreman or witnesses with signature(s). The form / information shall be submitted to the inspector having jurisdiction at the time occupancy is granted.

8B.1 Development Contacts

Fraport USA

(FedEx and UPS Only)
Baltimore/Washington Thurgood Marshall International Airport
Landside – Between Concourses D and E Baltimore, MD 21240
(USPS Only)
PO Box 377
Linthicum, MD 21240
Phone: 410.859.9201
Fax: 410.859.9204

Subtenant Coordinator – Food and Beverage
Contact: Cynthia Dunn
Email: c_dunn@airmallusa.com

Subtenant Coordinator – Retail and News & Gift
Contact: Amy Uthe
Email: a_uthe@airmallusa.com

Civic Contacts – Permitting

Building Permits
Maryland Aviation Administration – Office of Engineering and Construction
991 Corporate Drive
Linthicum, MD 21090
Note: All building permit-related communication shall occur directly through AIRMALL

Electrical Permits
Maryland Aviation Administration – Office of Engineering and Construction
Note: Electrical Permit is issued as part of overall building permit application. MAA requires independent fire alarm review/approval through the Office of the Fire Marshal (“OFM”)

Plumbing Permits
Maryland Aviation Administration – Office of Engineering and Construction
Note: Plumbing Permit is issued as part of overall building permit application

Health Department Plan Review
Anne Arundel County Department of Health 3 Harry S. Truman Parkway
Annapolis, Maryland 21401 Contact: Maria Marsteller, R.S. Phone: 410.222.7278
Email: hdmars01@aacounty.org
Note: Subtenant to contact Department of Health directly in conjunction with permit submission

Civic Contacts – Permitting

Building Inspections
Maryland Aviation Administration – Office of Design and Construction
991 Corporate Drive
Linthicum, MD 21090

Note: **All building inspection-related communication shall occur directly through AIRMALL Subtenant Coordinator**

Electrical Inspections
Please see "Building Inspections" reference above

Health Department Inspections
Anne Arundel County Department of Health 3 Harry S. Truman Parkway
Annapolis, Maryland 21401 Contact: Maria Marsteller, R.S. Phone: 410.222.7278
Email: hdmars01@aacounty.org
Note: **Subtenant to contact Department of Health directly in conjunction with health inspections**

Plumbing Inspections
Please see "Building Inspections" reference above

Fire Inspections
Maryland Aviation Administration Administration – Office of the Fire Marshal
Contacts: Tim Thompson, Curtis Contee Phone: 410.859.7222
Note: **Inspections to be scheduled directly through AIRMALL Subtenant Coordinator**

Proprietary Contractors

Information Technology & Telecommunications
COMCAST
Contact: Gary Diskin, Business Service Sales Mgr. Email: gary.diskin@cable.conmcast.com Phone: 410.520.2813

Fire Alarm (New and Repair – All Terminals)
Honeywell International, Inc. Contact: John Cottrell Phone: 443-677-2096
Email: john.cottrell@honeywell.com
Note: **Honeywell needs to be contacted during design to determine what devices and devices addressed are required to be noted on the plans/specs**

Water and Electrical Support and Metering Information
Note: There is no metering of utilities at this facility

Roofing (New and Repair – All Terminals)
Tecta America East, LLC 7340 Montevideo Road
Jessup, MD 20794
Phone: 410-799-1972
Note: This is not a proprietary contractor, but has performed work on site and has a working knowledge of the roofing systems at the airport

Natural Gas Service
Where available, natural gas service is provided by the MAA
Contact: AIRMALL Subtenant Coordinator
Note: **Natural Gas may not be available in all areas of the building or allotted to all retail suites**

Emergency PA Speaker
Washington Professional Systems (WPS) Contact: Geoff Owen, Dir. Of Technical Services 11242 Grandview Avenue
Wheaton, MD 20902
Phone: 301.942.6800 x 144
Note: **At least one speaker per retail suite is required to be installed and wired back to the MAA head-end system. Subtenant shall contact WPS during design to properly define scope on drawings**

Modular Construction Barricade System
Boston Barricade Co. Contact: Mr. Anthony Poskus Phone: 603.378.9200
Web: www.mallbarricade.com
Note: This is NOT a proprietary system, but this company is widely used on site

Glossary

#

2D CAD/GIS Term: Two Dimensional – an entity having length and width, but no height
3D CAD/GIS Term: Three Dimensional – an entity having length, width, and height

A

A/C Acronym: Aircraft
A/E/C (AEC) CAD Term: Architectural, Engineering and Construction
A/G Acronym: Air to Ground
A/H Acronym: Altitude/Height
AAC Acronym: Mike Monroney Aeronautical Center
AACDH Tenant Abbreviation: Anne Arundel County Department of Health
AAF Acronym: Army Air Field
AAI Acronym: Arrival Aircraft Interval
AAN Tenant Abbreviation: Approved as Noted
AAP Acronym: Advanced Automation Program
AAR Acronym: Airport Acceptance Rate
ABDIS Acronym: Automated Data Interchange System Service B
AC Acronym: FAA Advisory Circular
Acad CAD Term: Shortened version of the word AutoCAD (see: AutoCAD)
ACAIS Acronym: Air Carrier Activity Information System
ACAS Acronym: Aircraft Collision Avoidance System
ACC Acronym: Area Control Center
ACCT Acronym: Accounting Records
ACD Acronym: Automatic Call Distributor
ACDO Acronym: Air Carrier District Office
ACF Acronym: Area Control Facility
ACFO Acronym: Aircraft Certification Field Office
ACFT Acronym: Aircraft
ACID Acronym: Aircraft Identification
ACLS Acronym: Automatic Carrier Landing System
ACLT Acronym: Actual Landing Time Calculated
ACO Acronym: Aircraft Certification Office
ACORD Tenant Abbreviation: Agent-Company Organization for Research and Development
ADA Acronym: Air Defense Area
ADAP Acronym: Airport Development Aid Program
ADAS Acronym: AWOS Data Acquisition System
ADCAT Acronym: Airport Data Collection and Analysis Tool
ADCCP Acronym: Advanced Data Communications Control Procedure
ADDA Acronym: Administrative Data
ADF Acronym: Automatic Direction Finding
ADI Acronym: Automatic De-Ice and Inhibitor
ADIN Acronym: AUTODIN Service
ADIZ Acronym: Air Defense Identification Zone
ADL Acronym: Aeronautical Data-Link
ADLY Acronym: Arrival Delay
ADO Acronym: Airline Dispatch Office

ADP Acronym: Automated Data Processing
ADS Acronym: Automatic Dependent Surveillance
ADSIM Acronym: Airfield Delay Simulation Model
ADSY Acronym: Administrative Equipment Systems
ADTN Acronym: Administrative Data Transmission Network
ADTN2000 Acronym: Administrative Data Transmission Network 2000
ADVO Acronym: Administrative Voice
AEG Acronym: Aircraft Evaluation Group
AEIS Acronym: Airport Engineering Information System
AERA Acronym: Automated En-Route Air Traffic Control
AEX Acronym: Automated Execution
AF Acronym: Airway Facilities
AFB Acronym: Air Force Base
AFIS Acronym: Automated Flight Inspection System
AFP Acronym: Area Flight Plan
AFRES Acronym: Air Force Reserve Station
AFS Acronym: Airways Facilities Sector
AFSFO Acronym: AFS Field Office
AFSFU Acronym: AFS Field Unit
AFSOU Acronym: AFS Field Office Unit (Standard is AFSFOU)
AFSS Acronym: Automated Flight Service Station
AFTN Acronym: Automated Fixed Telecommunications Network
AGL Acronym: Above Ground Level
AHERA Tenant Abbreviation: Asbestos Hazard Emergency Response Act
AHJ Tenant Abbreviation: Authority Having Jurisdiction
AIA Acronym: American Institute of Architects - a professional organization for architects in the United States, offering education, government advocacy, community redevelopment, and public outreach to support the architecture profession
AIC Tenant Abbreviation: Ampere Interrupting Capacity
AID Acronym: Airport Information Desk
AIG Acronym: Airbus Industries Group
AIM Acronym: Airman's Information Manual
AIP Acronym: Airport Improvement Plan
AIRMET Acronym: Airmen's Meteorological Information
AIRNET Acronym: Airport Network Simulation Model
AIS Acronym: Aeronautical Information Service
AIT Acronym: Automated Information Transfer
AIXM Acronym: Aeronautical Information Exchange Model
ALP Acronym: Airport Layout PlanTenant Abbreviation: Airport Layout Plan
ALS Acronym: Approach Lighting System
ALSF1 Acronym: ALS with Sequenced Flashers I
ALSF2 Acronym: ALS with Sequenced Flashers II
ALSIP Acronym: Approach Lighting System Improvement Plan
ALTRV Acronym: Altitude Reservation
AM Tenant Abbreviation: Morning
AMASS Acronym: Airport Movement Area Safety System
AMCC Acronym: ACF/ARTCC Maintenance Control Center
AMOS Acronym: Automated Meteorological Observation Station

AMP Acronym: ARINC Message Processor (OR) Airport Master Plan
AMVER Acronym: Automated Mutual Assistance Vessel Rescue System
ANC Acronym: Alternate Network Connectivity
ANG Acronym: Air National Guard
ANGB Acronym: Air National Guard Base
ANMS Acronym: Automated Network Monitoring System
ANSI Acronym: American National Standards Institute - a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United StatesTenant Abbreviation: American National Standards Institute
AOA Tenant Abbreviation: Airport Operations Area
AOC Acronym: Airport Obstruction Chart
AP Acronym: Acquisition Plan
APP Acronym: ApproachTenant Abbreviation: Approved
APS Acronym: Airport Planning Standard
AQAFO Acronym: Aeronautical Quality Assurance Field Office
ARAC (1) Acronym: Army Radar Approach Control (AAF)
ARAC (2) Acronym: Aviation Rulemaking Advisory Committee
ARCTR Acronym: FAA Aeronautical Center or Academy
ARF Acronym: Airport Reservation Function
ARINC Acronym: Aeronautical Radio, Inc.
ARLNO Acronym: Airline Office ARO - Airport Reservation Office
ARO Acronym: Airport Reservation Office
ARP Acronym: Airport Reference Point
ARSA Acronym: Airport Service Radar Area
ARSR Acronym: Air Route Surveillance Radar
ARTCC Acronym: Air Route Traffic Control Centre
ARTS Acronym: Automated Radar Terminal System
ASAS Acronym: Aviation Safety Analysis System
ASC Acronym: AUTODIN Switching Center
ASCP Acronym: Aviation System Capacity Plan
ASD Acronym: Aircraft Situation DisplayTenant Abbreviation: Airport Security Division
ASDA Acronym: Accelerate-Stop Distance Available
ASHRAE Tenant Abbreviation: American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASLAR Acronym: Aircraft Surge Launch And Recovery
ASM Acronym: Available Seat Mile
ASOS Acronym: Automatic Surface Observation System
ASP Acronym: Arrival Sequencing Program
ASQP Acronym: Airline Service Quality Performance
ASR Acronym: Airport Surveillance Radar
ASRU Tenant Abbreviation: Aviation Security Regulatory Unit
ASTA Acronym: Airport Surface Traffic Automation
ASTM Acronym: American Society for Testing and Materials
ASV Acronym: Airline Schedule Vendor
AT Acronym: Air Traffic
AT&T Acronym: American Telephone and Telegraph
AT&TASDC Acronym: AT&T Agency Service Delivery Center

AT&TCSA Acronym: AT&T Customer Support Associate
ATA Acronym: Air Transport Association of America
ATAS Acronym: Airspace and Traffic Advisory Service
ATC Acronym: Air Traffic Control
ATCAA Acronym: Air Traffic Control Assigned Airspace
ATCBI Acronym: Air Traffic Control Beacon Indicator
ATCCC Acronym: Air Traffic Control Command Center
ATCO Acronym: Air Taxi Commercial Operator
ATCRB Acronym: Air Traffic Control Radar Beacon
ATCRBS Acronym: Air Traffic Control Radar Beacon System
ATCSCC Acronym: Air Traffic Control Systems Command Center
ATCT Acronym: Airport Traffic Control TowerTenant Abbreviation: Airport Traffic Control Tower
ATIS Acronym: Automated Terminal Information Service
ATISR Acronym: ATIS Recorder
ATM (1) Acronym: Air Traffic Management
ATM (2) Acronym: Asynchronous Transfer Mode
ATMS Acronym: Advanced Traffic Management System
ATN Acronym: Aeronautical Telecommunications Network
ATODN Acronym: AUTODIN Terminal (FUS)
ATOMS Acronym: Air Traffic Operations Management System
ATOVN Acronym: AUOTVON (Facility)
ATS Acronym: Air Traffic Service
ATSCCP Acronym: ATS Contingency Command Post
ATTIS Acronym: AT&T Information Systems
Attribute Data GIS Term: See Attributes
Attributes GIS Term: Alphabetical and/or numeric information that describes particular characteristics of a geospatial feature, such as its type, dimensions, usage, occupant, etc
AutoCAD Software: A full-featured CADD software program, produced by Autodesk Inc., which is capable of producing both 2D and 3D CADD designs. Its native file format is DWG, though it directly reads and writes DXF files (see: CADD, DWG)
AUTODIN Acronym: DoD Automatic Digital Network
AUTOVON Acronym: DoD Automatic Voice Network
AVN Acronym: Aviation Standards National Field Office, Oklahoma City
AVON Acronym: AUTOVON Service
AWIS Acronym: Airport Weather Information
AWOS Acronym: Automated Weather Observation System
AWP Acronym: Aviation Weather Processor
AWPG Acronym: Aviation Weather Products Generator
AWS Acronym: Air Weather Station
AZP Tenant Abbreviation: Airport Zoning Permit

B

BANS Acronym: BRITE Alphanumeric System
BART Acronym: Billing Analysis Reporting Tool (GSA software tool)
BASIC Acronym: Basic Contract Observing Station
BASOP Acronym: Military Base Operations
BAZA Tenant Abbreviation: Board of Airport Zoning Appeals
BCA Acronym: Benefit/Cost Analysis

BCR Acronym: Benefit/Cost Ratio
BDAT Acronym: Digitized Beacon Data
BFP Tenant Abbreviation: Back Flow Preventer
BGE Tenant Abbreviation: Baltimore Gas and Electric
BIM Acronym: Building Information Modeling
Bldg. Tenant Abbreviation: Building
Block CAD Term: An AutoCAD object formed by grouping other objects together to form a named, repeatable symbol within a particular file
BMP Acronym: Best Management Practices
BMS Tenant Abbreviation: Building Monitoring System
BOC Acronym: Bell Operating Company
BP Tenant Abbreviation: Building Permit
bps Acronym: bits per second
BRI Acronym: Basic Rate Interface
BRITE Acronym: Bright Radar Indicator Terminal Equipment
BRL Acronym: Building Restriction Line
BTUH Tenant Abbreviation: British Thermal Units per Hour
BUEC Acronym: Back-up Emergency Communications
BUECE Acronym: Back-up Emergency Communications Equipment
BWI Acronym: Baltimore/Washington International-Thurgood Marshall Airport
BWI Marshall Tenant Abbreviation: Baltimore/Washington International Thurgood Marshall Airport

C

C & R Tenant Abbreviation: Correct and Resubmit
CAA Acronym: Civil Aviation Authority
CAB Acronym: Civil Aeronautics Board
CAD Tenant Abbreviation: Computer Aided Drafting
CADD CAD Term: Computer Aided Drafting & Design - Computer software used by engineers and drafters to create and modify drawings in 2D and 3D (see: AutoCAD, MicroStation)
CARF Acronym: Central Altitude Reservation Facility
CASFO Acronym: Civil Aviation Security Office
CAT (1) Acronym: Category
CAT (2) Acronym: Clear-Air Turbulence
CAU Acronym: Crypto Ancillary Unit
CBI Acronym: Computer Based Instruction
CC&O Acronym: Customer Cost and Obligation
CCC Acronym: Communications Command Center
CCCC Acronym: Staff Communications
CCCH Acronym: Central Computer Complex Host
CCS7 Acronym: NI-Communication Channel Signal-7-Network Interconnect
CCSD Acronym: Command Communications Service Designator
CCU Acronym: Central Control Unit
CD Acronym: Common DigitizerTenant Abbreviation: Compact Disk
CD / CD-R Acronym: Compact Disk / Recordable Compact Disk – an optical data storage medium used to store and transfer digital data between computer systems, with a maximum capacity of 700 megabytes (MB) (see: DVD-R)
CDR Acronym: Cost Detail Report
CDT Acronym: Controlled Departure Time

CDTI Acronym: Cockpit Display of Traffic Information
CENTX Acronym: Central Telephone Exchange
CEQ Acronym: Council on Environmental Quality
CERAP Acronym: Central Radar Approach
CFC Acronym: Central Flow Control
CFCF Acronym: Central Flow Control Facility
CFCS Acronym: Central Flow Control Service
CFR Tenant Abbreviation: Code of Federal Register
CFWP Acronym: Central Flow Weather Processor
CFWU Acronym: Central Flow Weather Unit
CGAS Acronym: Coast Guard Air Station
CHRC Tenant Abbreviation: Criminal History Record Check
CLC Acronym: Course Line Computer
CLIN Acronym: Contract Line Item
CLT Acronym: Calculated Landing Time
CM Acronym: Commercial Service Airport
CNMPS Acronym: Canadian Minimum Navigation Performance Specification Airspace
CNS Acronym: Consolidated NOTAM System
CNSP Acronym: Consolidated NOTAM System Processor
CO Acronym: Central Office
COE Acronym: U.S. Army Corps of Engineers
Collection GIS Term: Any combination of data that are submitted by a provider at a given time
COMAR Tenant Abbreviation: Code of Maryland Regulations
COMCO Acronym: Command Communications Outlet
CONUS Acronym: Continental United States
CORP Acronym: Private Corporation other than ARINC or MITRE
CPE Acronym: Customer Premise Equipment
CPMIS Acronym: Consolidated Personnel Management Information System
CPR Tenant Abbreviation: Cardiopulmonary Resuscitation
CRA Acronym: Conflict Resolution Advisory
CRDA Acronym: Converging Runway Display Aid
CRT Acronym: Cathode Ray Tube
CSA Acronym: Communications Service Authorization
CSDGM Acronym: Content Standard for Digital Geospatial Metadata
CSIS Acronym: Centralized Storm Information System
CSO Acronym: Customer Service Office
CSR Acronym: Communications Service Request
CSS Acronym: Central Site System
CTA (1) Acronym: Controlled Time of Arrival
CTA (2) Acronym: Control Area
CTA/FIR Acronym: Control Area/Flight Information Region
CTAF Acronym: Common Traffic Advisory Frequency
CTAS Acronym: Center-Tracon Automation System
CTMA Acronym: Center Traffic Management Advisor
CUPS Acronym: Consolidated Uniform Payroll System
CVFR Acronym: Controlled Visual Flight Rules
CVTS Acronym: Compressed Video Transmission Service
CW Acronym: Continuous Wave

CWSU Acronym: Central Weather Service Unit
CWY Acronym: Clearway

D

DA (1) Acronym: Direct Access
DA (2) Acronym: Descent Advisor
DA (3) Acronym: Decision Altitude/Decision Height
DABBS Acronym: DITCO Automated Bulletin Board System
DAIR Acronym: Direct Altitude and Identity Readout
DAR Acronym: Designated Agency Representative
DARC Acronym: Direct Access Radar Channel
dBA Acronym: Decibels A-weighted
DBCRC Acronym: Defense Base Closure and Realignment Commission
DBMS Acronym: Data Base Management System
DBRITE Acronym: Digital Bright Radar Indicator Tower Equipment
DCA Acronym: Defense Communications Agency
DCAA Acronym: Dual Call, Automatic Answer Device
DCCU Acronym: Data Communications Control Unit
DCE Acronym: Data Communications Equipment
DDA Acronym: Dedicated Digital Access
DDC Tenant Abbreviation: Direct Digital Control
DDD Acronym: Direct Distance Dialing
DDM Acronym: Difference in Depth of Modulation
DDS Acronym: Digital Data Service
DEA Acronym: Drug Enforcement Agency
DEC Tenant Abbreviation: Division of Environmental Compliance
DEDS Acronym: Data Entry and Display System
DEIS Acronym: Draft Environmental Impact Statement
DEP Acronym: Departure
DEWIZ Acronym: Distance Early Warning Identification Zone
DF Acronym: Direction Finder
DFAX Acronym: Digital Facsimile
DFI Acronym: Direction Finding Indicator
DGN (.dgn) file File Format: MicroStation's native CADD file format (see CAD, MicroStation)
DGPS Acronym: Differential Global Positioning Satellite (System)
DH Acronym: Decision Height
DID Acronym: Direct Inward Dial
DIP Acronym: Drop and Insert Point
DIRF Acronym: Direction Finding
DITCO Acronym: Defense Information Technology Contracting Office Agency
DLLR Tenant Abbreviation: Department of Labor, Licensing and Regulation
DME Acronym: Distance Measuring Equipment
DME/P Acronym: Precision Distance Measuring Equipment
DMN Acronym: Data Multiplexing Network
DNL Acronym: Day-Night Equivalent Sound Level (Also called Ldn)
DoD (1) Acronym: U.S. Department of Defense
DOD (2) Acronym: U.S. Department of Defense
DOD (3) Acronym: Direct Outward Dial

DOI Acronym: Department of Interior
DOS Acronym: Department of State
DOT Acronym: Department of Transportation
DOTCC Acronym: Department of Transportation Computer Center
DOTS Acronym: Dynamic Ocean Tracking System
Drawing Sheet Format CAD Term: The sheet boundary lines, and title block geometry used to record administrative information about a CADD file
Drawing Sheet Sizes CAD Term: Standard size pieces of paper used for MAA projects. MAA uses standard sheet sizes defined by the American National Standards Institute (ANSI). ANSI sheet sizes are denoted by alphabetic designations such as ANSI-A, ANSI-B, ANSI-C, ANSI-D, and so on. MAA does not currently utilize either the International Organization for Standardization (ISO) standard sheet sizes or the commonly found Architectural (ARCH) sheet sizes.
DSCS Acronym: Digital Satellite Compression Service
DST Tenant Abbreviation: MAA Design Standards
DSUA Acronym: Dynamic Special Use Airspace
DTS Acronym: Dedicated Transmission Service
DUAT Acronym: Direct User Access Terminal
DVD Tenant Abbreviation: Digital Video Disk
DVD / DVD-R Acronym: Digital Versatile Disk / Recordable Digital Versatile Disk – an optical data storage medium used to store and transfer digital data between computer systems, with a maximum storage capacity of 4.7 gigabytes (GB). (see: CD-R)
DVFR (1) Acronym: Defense Visual Flight Rules
DVFR (2) Acronym: Day Visual Flight Rules
DVOR Acronym: Doppler Very High Frequency Omni-Directional Range
DWG (.dwg) file File Format: AutoCAD's native CADD file format (see CAD, AutoCAD)
Dwgs Tenant Abbreviation: Drawings
DXF (.dxf) file File Format: Drawing Interchange Format/Drawing Exchange Format – a CAD data file format developed by Autodesk to enable data interoperability between multiple CAD software programs. AutoCAD reads and writes DXF files directly.
DYSIM Acronym: Dynamic Simulator

E

E Acronym: MSAW - En-Route Automated Minimum Safe Altitude WarningTenant Abbreviation: East
EA Tenant Abbreviation: Exhaust Air
EARTS Acronym: En Route Automated Radar Tracking System
ECOM Acronym: En Route Communications
ECVFP Acronym: Expanded Charted Visual Flight Procedures
EDCT Acronym: Expedite Departure Path
EES Tenant Abbreviation: Emergency Evacuation System
EFAS Acronym: En Route Flight Advisory Service
EFC Acronym: Expect Further Clearance
EFIS Acronym: Electronic Flight Information Systems
EIAF Acronym: Expanded Inward Access Features
EIS Acronym: Environmental Impact Statement
ELT Acronym: Emergency Locator Transmitter
ELWRT Acronym: Electrowriter
EMPS Acronym: En Route Maintenance Processor System
ENAV Acronym: En Route Navigational Aids

EOF Acronym: Emergency Operating Facility
EPA Acronym: Environmental Protection AgencyTenant Abbreviation: Environmental Protection Agency
EPS Acronym: Engineered Performance Standards
EPSS Acronym: Enhanced Packet Switched Service
ERAD Acronym: En Route Broadband Radar
ESEC Acronym: En Route Broadband Secondary Radar
ESF Acronym: Extended Superframe Format
ESP Acronym: En Route Spacing Program
ESYS Acronym: En Route Equipment Systems
ETA Acronym: Estimated Time of Arrival
ETE Acronym: Estimated Time En Route
ETG Acronym: Enhanced Target Generator
ETMS Acronym: Enhanced Traffic Management System
ETN Acronym: Electronic Telecommunications Network
EVAS Acronym: Enhanced Vortex Advisory System
EVCS Acronym: Emergency Voice Communications System
External Reference (file) CAD Term: See: Reference File

F

F&E Acronym: Facility and Equipment
FAA Acronym: Federal Aviation AdministrationTenant Abbreviation: Federal Aviation Administration
FAAAC Acronym: FAA Aeronautical Center
FAACIS Acronym: FAA Communications Information System
FAATC Acronym: FAA Technical Center
FAATSAT Acronym: FAA Telecommunications Satellite
FAC Acronym: Facility
FAF Acronym: Final Approach Fix
FAP Acronym: Final Approach Point
FAPM Acronym: FTS2000 Associate Program Manager
FAR Acronym: Federal Aviation Regulation
FAST Acronym: Final Approach Spacing Tool
FAX Acronym: Facsimile Equipment
FBO Acronym: Fixed Base Operator
FBS Acronym: Fall Back Switch
FCC Acronym: Federal Communications Commission
FCLT Acronym: Freeze Calculated Landing Time
FCOM Acronym: FSS Radio Voice Communications
FCPU Acronym: Facility Central Processing Unit
FDAT Acronym: Flight Data Entry and Printout (FDEP) and Flight Data Service
FDE Acronym: Flight Data Entry
FDEP Acronym: Flight Data Entry and Printout
FDIO Acronym: Flight Data Input/Output
FDIOC Acronym: Flight Data Input/Output Center
FDIOR Acronym: Flight Data Input/Output Remote
FDM Acronym: Frequency Division Multiplexing
FDP Acronym: Flight Data Processing

Feature GIS Term: A manmade or natural object such as a building, runway, navigational aid, or river that appears in the real world.
Feature type GIS Term: A collection of all features of a given type, such as all runways or all buildings. Feature types are analogous to layers in many GIS applications and are also referred to as Entity Types and Feature Classes in other standards.
FED Acronym: Federal
FEIS Acronym: Final Environmental Impact Statement
FEP Acronym: Front End Processor
FFAC Acronym: From Facility
FGDC Acronym: Federal Geographic Data Committee
FIFO Acronym: Flight Inspection Field Office
FIG Acronym: Flight Inspection Group
FINO Acronym: Flight Inspection National Field Office
FIPS Acronym: Federal Information Publication Standard
FIR Acronym: Flight Information Region
FIRE Acronym: Fire Station
FIRMR Acronym: Federal Information Resource Management Regulation
FL Acronym: Flight Level
FLOWSIM Acronym: Traffic Flow Planning Simulation
FM Tenant Abbreviation: Fire Marshal, BWI Marshall Fire and Rescue Department
FMA Acronym: Final Monitor Aid
FMC Tenant Abbreviation: Flexible Metallic Conduit
FMF Acronym: Facility Master File
FMIS Acronym: FTS2000 Management Information System
FMS Acronym: Flight management System
FNMS Acronym: FTS2000 Network Management System
FOD Tenant Abbreviation: Foreign Object Debris
FOIA Acronym: Freedom Of Information Act
FP Acronym: Flight Plan
FRC Acronym: Request Full Route Clearance
FSAS Acronym: Flight Service Automation System
FSDO Acronym: Flight Standards District Office
FSDPS Acronym: Flight Service Data Processing System
FSEP Acronym: Facility/Service/Equipment Profile
FSP Acronym: Flight Strip Printer
FSPD Acronym: Freeze Speed Parameter
FSS Acronym: Flight Service Station
FSSA Acronym: Flight Service Station Automated Service
FSTS Acronym: Federal Secure Telephone Service
FSYS Acronym: Flight Service Station Equipment Systems
FT Tenant Abbreviation: Feet
FTS Acronym: Federal Telecommunications System
FTS2000 Acronym: Federal Telecommunications System 2000
FUS Acronym: Functional Units or Systems
FWCS Acronym: Flight Watch Control Station

G

GA Acronym: General Aviation

GAA Acronym: General Aviation Activity
GAAA Acronym: General Aviation Activity and Avionics
GADO Acronym: General Aviation District Office
GCA Acronym: Ground Control Approach
Georeference CAD/GIS Term: To place CAD or Raster objects at the coordinates within a CAD file which correspond to their geographic coordinates in the real world. When georeferenced, data will also be properly scaled, so that a 9'x18' parking space will measure 9'x18' within the CAD file.
Geospatial data GIS Term: Data that depict natural or manmade elements that occupy a specific location on the face of the earth. Examples include a runway, building, river, or underground pipe. Geospatial features of a particular type (i.e., all runways) are often referred to as a feature type, data set, or layer of spatial data.
Geospatially-referenced data GIS Term: See Geospacial Data
GIS Acronym: Geographical Information System - a system for creating, storing, analyzing and managing spatial data and associated attributes
GML Acronym: Geographic Markup Language
GNAS Acronym: General National Airspace System
GNSS Acronym: Global Navigation Satellite System
GOES Acronym: Geostationary Operational Environmental Satellite
GOESF Acronym: GOES Feed Point
GOEST Acronym: GOES Terminal Equipment
GPS Acronym: Global Positioning Satellite
GPWS Acronym: Ground Proximity Warning System
GRADE Acronym: Graphical Airspace Design Environment
GS Acronym: Glide Slope Indicator
GSA Acronym: General Services Administration

H

H Acronym: Non-Directional Radio Homing Beacon (NDB)
HAA Acronym: Height Above Airport
HAL Acronym: Height Above Landing
HARS Acronym: High Altitude Route System
HAT Acronym: Height Above Touchdown
HAZMAT Acronym: Hazardous Materials
HCAP Acronym: High Capacity Carriers
HDME Acronym: NDB with Distance Measuring Equipment
HDQ Acronym: FAA Headquarters
HELI Acronym: Heliport
HF Acronym: High Frequency
HH Acronym: NDB, 2kw or More
HI Acronym: EFAS-High Altitude EFAS
HLDC Acronym: High Level Data Link Control
HOV Acronym: High Occupancy Vehicle
HSI Acronym: Horizontal Situation Indicators
HUD Acronym: Housing and Urban Development
HVAC Tenant Abbreviation: Heating Ventilation and Air Conditioning
HVACR Tenant Abbreviation: Heating, Ventilation, Air Conditioning, and Refrigeration
HWAS Acronym: Hazardous In-Flight Weather Advisory
Hz Acronym: HERTZ

I

I/AFSS Acronym: International AFSS
IA Acronym: Indirect Access
IAF Acronym: Initial Approach Fix
IAP Acronym: Instrument Approach Procedures
IAPA Acronym: Instrument Approach Procedures Automation
IBC Tenant Abbreviation: International Building Code
IBM Acronym: International Business Machines
IBP Acronym: International Boundary Point
IBR Acronym: Intermediate Bit Rate
ICAO Acronym: International Civil Aviation Organization
ICSS Acronym: International Communications Switching Systems
IDAT Acronym: Interfacility Data
IF Acronym: Intermediate Fix
IFCP Acronym: Interfacility Communications Processor
IFDS Acronym: Interfacility Data System
IFEA Acronym: In-Flight Emergency Assistance
IFO Acronym: International Field Office
IFR Acronym: Instrument Flight Rules
IFSS Acronym: International Flight Service Station
ILS Acronym: Instrument Landing System
IM Acronym: Inner Marker
IMC Acronym: Instrument Meteorological Conditions
INM Acronym: Integrated Noise Model
INS Acronym: Inertial Navigation System
IRMP Acronym: Information Resources Management Plan
ISDN Acronym: Integrated Services Digital Network
ISMLS Acronym: Interim Standard Microwave Landing System
ISO Acronym: International Organization for Standardization
ITI Acronym: Interactive Terminal Interface
IVRS Acronym: Interim Voice Response System
IW Acronym: Inside Wiring

J

K

Kbps Acronym: Kilobits Per Second
KHz Acronym: Kilohertz
KVDT Acronym: Keyboard Video Display Terminal

L

LAA Acronym: Local Airport Advisory
LAAS Acronym: Low Altitude Alert System
LABS Acronym: Leased A B Service
LABSC Acronym: LABS GS-200 Computer
LABSR Acronym: LABS Remote Equipment

LABSW Acronym: LABS Switch System
LAHSO Acronym: Land and Hold Short Operation
LAN Acronym: Local Area Network
LATA Acronym: Local Access and Transport Area
LAWRS Acronym: Limited Aviation Weather Reporting System
Layer CAD Term: Property of an object within a CADD file. Layers function as organizational tools, allowing drawing objects to be categorized and grouped. Layers can be turned on or off within the CADD file, functioning much like acetate overlays. Layers can be assigned properties such as color and line weight, which then apply to all objects on the layer (individual objects' properties can be configured to override the Layers property).
LCF Acronym: Local Control Facility
LCN Acronym: Local Communications Network
LDA (1) Acronym: Localizer Directional Aid
LDA (2) Acronym: Landing Directional Aid
LDIN Acronym: Lead-in Lights
LEC Acronym: Local Exchange Carrier
LF Acronym: Low Frequency
LINCS Acronym: Leased Interfacility NAS Communications System
Linetype/Linestyle CAD Term: A symbol comprised of patterns of dashes, spaces, text, and/or symbols, applied to any linear object
LIS Acronym: Logistics and Inventory System
LLWAS Acronym: Low Level Wind Shear Alert System
LM/MS Acronym: Low/Medium Frequency
LMM Acronym: Locator Middle Marker
LMS Acronym: LORAN Monitor Site
LOC Acronym: Localizer
LOCID Acronym: Location Identifier
LOI Acronym: Letter of Intent
LOM Acronym: Compass Locator at Outer Marker
LORAN Acronym: Long Range Aid to Navigation
LRCO Acronym: Limited Remote Communications Outlet
LRNAV Acronym: Long Range Navigation
LRR Acronym: Long Range Radar

M

MAA Acronym: Maryland Aviation Administration (See: MDOT-MAA)
MALS Acronym: Medium Intensity Approach Lighting System
MALSF Acronym: MALS with Sequenced Flashers
MALSR Acronym: MALS with Runway Alignment Indicator Lights
MAP (1) Acronym: Modified Access Pricing
MAP (2) Acronym: Missed Approach Point
MAP (3) Acronym: Military Airport Program
MAP (4) Acronym: Maintenance Automation Program
Mbps Acronym: Megabits Per Second
MCA Acronym: Minimum Crossing Altitude
MCAS Acronym: Marine Corps Air Station
MCC Acronym: Maintenance Control Center
MCL Acronym: Middle Compass Locator

MCS Acronym: Maintenance and Control System
MDA Acronym: Minimum Descent Altitude
MDOT Acronym: Maryland Department of Transportation
MDOT-MAA Acronym: Maryland Department of Transportation Maryland Aviation Administration
MDT Acronym: Maintenance Data Terminal
MEA Acronym: Minimum En Route Altitude
Metadata GIS Term: Information about the data, such as source, accuracy, dates for which the data are valid, and security classification. Metadata is essential in helping users determine the extent to which they can rely on a given data item to make decisions.
METI Acronym: Meteorological Information
MF Acronym: Middle Frequency
MFJ Acronym: Modified Final Judgement
MFT Acronym: Meter Fix Crossing Time/Slot Time
MHA Acronym: Minimum Holding Altitude
MHz Acronym: Megahertz
MIA Acronym: Minimum IFR Altitudes
MicroStation Software: A full-featured CADD software program, produced by Bentley Systems Inc., which is capable of producing both 2D and 3D CADD designs. Its native file format is DGN, though it directly reads and writes DWG and DXF files. (see: CADD, AutoCAD, DWG)
MIDO Acronym: Manufacturing Inspection District Office
MIS Acronym: Meteorological Impact Statement
MISC Acronym: Miscellaneous
MISO Acronym: Manufacturing Inspection Satellite Office
MIT Acronym: Miles In Trail
MITRE Acronym: Mitre Corporation
MLS Acronym: Microwave Landing System
MM Acronym: Middle Marker
MMC Acronym: Maintenance Monitoring Console
MMS Acronym: Maintenance Monitoring System
MNPS Acronym: Minimum Navigation Performance Specification
MNPSA Acronym: Minimum Navigation Performance Specifications Airspace
MOA (1) Acronym: Memorandum of Agreement
MOA (2) Acronym: Military Operations Area
MOCA Acronym: Minimum Obstruction Clearance Altitude
MODEC (1) Acronym: Altitude Reporting Mode of Secondary Radar
MODEC (2) Acronym: Altitude-Encoded Beacon Reply
Model File CAD Term: Coordinately-correct CADD files which form the basis of a drawing set. Model Files are drawn at full size (1-to-1) and can contain 2D or 3D information. Model Files are typically used as Reference Files, attached to Print Files as underlays to assemble a completed, printable drawing. (see: Reference File, Print File)
Model Space CAD Term: The main drawing area within an AutoCAD file. All drawing or 'modeling' done within an AutoCAD file is done within Model Space, with 2D and 3D objects drawn at full-size or 1-to-1. An AutoCAD file can contain only one Model Space, represented by a tab at the bottom edge of the screen, but can contain multiple Paper Spaces (see: Paper Space)
MODES Acronym: Mode Select Beacon System
MOU Acronym: Memorandum of Understanding
MPO Acronym: Metropolitan Planning Organization
MPS Acronym: Maintenance Processor Subsystem (OR) Master Plan Supplement

MRA Acronym: Minimum Reception Altitude
MRC Acronym: Monthly Recurring Charge
MSA Acronym: Minimum Safe Altitude
MSAW Acronym: Minimum Safe Altitude Warning
MSL Acronym: Mean Sea Level
MSN Acronym: Message Switching Network
MTCS Acronym: Modular Terminal Communications System
MTI Acronym: Moving Target Indicator
MTN Acronym: Martin State Airport
MUX Acronym: Multiplexer
MVA Acronym: Minimum Vectoring Altitude
MVFR Acronym: Marginal Visual Flight Rules

N

NAAQS Acronym: National Ambient Air Quality Standards
NAD Acronym: North American Datum
NADA Acronym: NADIN Concentrator
NADIN Acronym: National Airspace Data Interchange Network
NADSW Acronym: NADIN Switches
NAILS Acronym: National Airspace Integrated Logistics Support
NAMS Acronym: NADIN IA
NAPRS Acronym: National Airspace Performance Reporting System
NAS Acronym: National Airspace System or Naval Air Station
NASDC Acronym: National Aviation Safety Data
NASP Acronym: National Airspace System Plan
NASPAC Acronym: National Airspace System Performance Analysis Capability
NATCO Acronym: National Communications Switching Center
NAVAID Acronym: Navigation Aid
NAVMN Acronym: Navigation Monitor and Control
NAWAU Acronym: National Aviation Weather Advisory Unit
NAWPF Acronym: National Aviation Weather Processing Facility
NCAR Acronym: National Center for Atmospheric Research; Boulder, CO
NCF Acronym: National Control Facility
NCIU Acronym: NEXRAD Communications Interface Unit
NCS Acronym: National Communications System
NDB Acronym: Non-Directional Radio Homing Beacon
NDNB Acronym: NADIN II
NEPA Acronym: National Environmental Policy Act
Nested Reference CAD Term: Reference Files attached to other Reference files. If A is attached to B as a reference, and B is attached to C, A will be also appear in C because it is nested with A. In AutoCAD, it is necessary to use the Attach rather than the Overlay option in the Xref command, in order to insure that Reference Files will nest. Using the Overlay option will prevent Reference Files from nesting.
NEXRAD Acronym: Next Generation Weather Radar
NFAX Acronym: National Facsimile Service
NFDC Acronym: National Flight Data Center
NFIS Acronym: NAS Facilities Information System
NGA Acronym: National Geospatial Intelligence Agency

NGS Acronym: National Geodetic Survey
NGVD Acronym: National Geodetic Vertical Datum
NI Acronym: Network Interface
NICS Acronym: National Interfacility Communications System
NM Acronym: Nautical Mile
NMAC Acronym: Near Mid Air Collision
NMC Acronym: National Meteorological Center
NMCE Acronym: Network Monitoring and Control Equipment
NMCS Acronym: Network Monitoring and Control System
NOAA Acronym: National Oceanic and Atmospheric Administration
NOC Acronym: Notice Of Completion
NOTAM Acronym: Notice to Airmen
NPDES Acronym: National Pollutant Discharge Elimination System
NPIAS Acronym: National Plan of Integrated Airport Systems
NRC Acronym: Non-Recurring Charge
NRCS Acronym: National Radio Communications Systems
NSAP Acronym: National Service Assurance Plan
NSSFC Acronym: National Severe Storms Forecast Center
NSSL Acronym: National Severe Storms Laboratory; Norman, OK
NSWRH Acronym: NWS Regional Headquarters
NTAP Acronym: Notices To Airmen Publication
NTP Acronym: National Transportation Policy
NTSB Acronym: National Transportation Safety Board
NTZ Acronym: No Transgression Zone
NWS Acronym: National Weather Service
NWSR Acronym: NWS Weather Excluding NXRD
NXRD Acronym: Advanced Weather Radar System

O

OAG Acronym: Official Airline Guide
OALT Acronym: Operational Acceptable Level of Traffic
OAW Acronym: Off-airway Weather Station
ODAL Acronym: Omni directional Approach Lighting System
ODAPS Acronym: Oceanic Display and Processing Station
OFA Acronym: Object Free Area
OFDPS Acronym: Offshore Flight Data Processing System
OFT Acronym: Outer Fix Time
OFZ Acronym: Obstacle Free Zone
OM Acronym: Outer Marker
OMB Acronym: Office of Management and Budget
ONER Acronym: Oceanic Navigational Error Report
OPLT Acronym: Operational Acceptable Level of Traffic
OPSW Acronym: Operational Switch
OPX Acronym: Off Premises Exchange
ORD Acronym: Operational Readiness Demonstration
Orthophoto CAD/GIS Term: An aerial image that has been taken from above (either from an aircraft or a satellite) and has been spatially corrected so that features shown on the photo are displayed in their actual geographic position within a specified range of tolerance.

OTR Acronym: Oceanic Transition Route
OTS Acronym: Organized Track System

P

PABX Acronym: Private Automated Branch Exchange
PAD Acronym: Packet Assembler/Disassembler
PAM Acronym: Peripheral Adapter Module
Paper Space CAD Term: An area within an AutoCAD file used to create a finished drawing, analogous to a sheet of electronic paper. Items in a files Model Space area may be seen in the Paper Space area through the use of polygonal viewports. An AutoCAD sile can contain multiple Paper Spaces, represented by tabs at the bottom edge of the screen, but only one Model Space. (see: Model Space, Viewport)
PAPI Acronym: Precision Approach Path Indicator
PAR (1) Acronym: Precision Approach Radar
PAR (2) Acronym: Preferential Arrival Route
PATWAS Acronym: Pilots Automatic Telephone Weather Answering Service
PBCT Acronym: Proposed Boundary Crossing Time
PBRF Acronym: Pilot Briefing
PBX Acronym: Private Branch Exchange
PCA Acronym: Positive Control Airspace
PCM Acronym: Pulse Code Modulation
PDAR Acronym: Preferential Arrival And Departure Route
PDC (1) Acronym: Program Designator Code
PDC (2) Acronym: Pre-Departure Clearance
PDF (.pdf) File Format: Portable Document Format - An open file format used to present documents independently of software, hardware, or operating systems
PDN Acronym: Public Data Network
PDR Acronym: Preferential Departure Route
PFC Acronym: Passenger Facility Charge
PHONE Acronym: Telephone
Photogrammetric CAD/GIS Term: The process of creating vector data, such as building outlines and elevation contours, from stereo imagery, or pairs of images taken of the same location but at different angles.
PIC Acronym: Principal Interexchange Carrier
PIDP Acronym: Programmable Indicator Data Processor
PIREP Acronym: Pilot Weather Report
Plot Stamp CAD Term: A line or group of text in a printable CADD file, which typically includes the file name and path; date and time of the plot; and the name of the user who generated the plot. In AutoCAD, Text Fields are often used to create plot stamps which automatically update their contents.
PMS Acronym: Program Management System
POLIC Acronym: Police Station
Polygon CAD/GIS Term: A complex object in a CADD file, composed of one or more straight or curved linear segments, forming a closed shape. In AutoCAD files, polygons can be one of several different AutoCAD-specific objects, such as circles, ellipses, or closed polyline objects.
Polyline CAD/GIS Term: A complex object in a CADD file, composed of one or more straight or curved linear segments, forming a 2D path. In AutoCAD, there are two types of Polyline objects, the 2-dimensional LWPolyline object, and the 3-dimensional Polyline object.

POP Acronym: Point Of Presence
Positional accuracy GIS Term: The difference between a geospatial feature's displayed position and its actual position. Absolute positional accuracy is the difference between a geospatial feature's displayed position and its actual position on the face of the earth. Relative positional accuracy is the difference between a geospatial feature's displayed position and that of other geospatial features in the same data set.
POT Acronym: Point Of Termination
PPIMS Acronym: Personal Property Information Management System
PR Acronym: Primary Commercial Service Airport
PRI Acronym: Primary Rate Interface
Print File CAD Term: Sometimes called Sheet Files. Print Files are CADD files configured to be a finished, printable sheet or drawing. Each Print File represents one plotted drawing. Within the Print File, elements such as References, text, title blocks and other elements are combined to create a finished, print-ready product. Print Files are generally drawn at the size of the printed output, i.e. an ANSI-D sheet is drawn 34"x24", and the contents of the sheet are scaled appropriately using Viewports. (see: Viewports)
PRM Acronym: Precision Runway Monitor
Project Copy CAD Term: A project copy drawing is part of the project copy process, which manages concurrent design updates to a single released drawing.
PSDN Acronym: Public Switched Data Network
PSN Acronym: Packet Switched Network
PSS Acronym: Packet Switched Service
PSTN Acronym: Public Switched Telephone Network
PUB Acronym: Publication
PUP Acronym: Principal User Processor
PVC Acronym: Permanent Virtual Circuit
PVD Acronym: Plan View Display

Q

R

RAIL Acronym: Runway Alignment Indicator Lights
RAPCO Acronym: Radar Approach Control (USAF)
RAPCON Acronym: Radar Approach Control
Raster CAD/GIS Term: A digital image file consisting of rectangular picture elements (pixels) which form an image, similar to a tile mosaic. Raster files typically contain image information such as scanned documents, photographs, and aerial imagery. Examples of raster file formats are SID, TIFF, JPG, BMP, and GIF.
RATCC Acronym: Radar Air Traffic Control Center
RATCF Acronym: Radar Air Traffic Control Facility (USN)
RBC Acronym: Rotating Beam Ceilometer
RBDPE Acronym: Radar Beacon Data Processing Equipment
RBSS Acronym: Radar Bomb Scoring Squadron
RCAG Acronym: Remote Communications Air/Ground
RCC Acronym: Rescue Coordination Center
RCCC Acronym: Regional Communications Control Centers
RCF Acronym: Remote Communication Facility
RCIU Acronym: Remote Control Interface Unit

RCL Acronym: Radio Communications Link
RCLR Acronym: RCL Repeater
RCLT Acronym: RCL Terminal
RCO Acronym: Remote Communications Outlet
RCU Acronym: Remote Control Unit
RDAT Acronym: Digitized Radar Data
RDP Acronym: Radar Data Processing
RDSIM Acronym: Runway Delay Simulation Model
Reference File CAD Term: Also called Xref or External Reference - A CADD file which is connected to another "child" CADD file, appearing as an overlay or underlay within the child file. Background mapping, borders, legends, and key plans are commonly used as Reference Files. A Reference File can be attached to multiple child files, eliminating the need to duplicate the contents of the reference. When a Reference File is altered, the alterations appear instantly in all child files to which it is attached. Date blocks in borders, for example, can be changed once, in the Reference File, and the change will appear in all plan sheets to which the border is attached.
REIL Acronym: Runway End Identification Lights
Revised Drawing CAD Term: A drawing that has been revised or modified after submission.
Revit Software: A full-featured BIM software program, produced by Autodesk Inc., which is capable of producing both 3D models and 2D plan sets. (See: BIM)
RF Acronym: Radio Frequency
RL Acronym: General Aviation Reliever Airport
RMCC Acronym: Remote Monitor Control Center
RMCF Acronym: Remote Monitor Control Facility
RML Acronym: Radio Microwave Link
RMLR Acronym: RML Repeater
RMLT Acronym: RML Terminal
RMM Acronym: Remote Maintenance Monitoring
RMMS Acronym: Remote Maintenance Monitoring System
RMS Acronym: Remote Monitoring Subsystem
RMSC Acronym: Remote Monitoring Subsystem Concentrator
RNAV Acronym: Area Navigation
RNP Acronym: Required Navigation Performance
ROD Acronym: Record of Decision
ROSA Acronym: Report of Service Activity
ROT Acronym: Runway Occupancy Time
RP Acronym: Restoration Priority
RPC Acronym: Restoration Priority Code
RPG Acronym: Radar Processing Group
RPZ Acronym: Runway Protection Zone
RRH Acronym: Remote Reading Hygrothermometer
RRHS Acronym: Remote Reading Hydrometer
RRWDS Acronym: Remote Radar Weather Display
RRWSS Acronym: RWDS Sensor Site
RSS Acronym: Remote Speaking System
RT Acronym: Remote Transmitter
RT&BTL Acronym: Radar Tracking And Beacon Tracking Level
RTAD Acronym: Remote Tower Alphanumeric Display
RTCA Acronym: Radio Technical Commission for Aeronautics

RTR Acronym: Remote Transmitter/Receiver
RTRD Acronym: Remote Tower Radar Display
RVR Acronym: Runway Visual Range
RW Acronym: Runway
RWDS Acronym: Same as RRWDS
RWP Acronym: Realtime Weather Processor

S

S/S Acronym: Sector Suite
SAC Acronym: Strategic Air Command
SAFI Acronym: Semi Automatic Flight Inspection
SALS Acronym: Short Approach Lighting System
SATCOM Acronym: Satellite Communications
SAWRS Acronym: Supplementary Aviation Weather Reporting System
SCC Acronym: System Command Center
SCVTS Acronym: Switched Compressed Video Telecommunications Service
SDF (1) Acronym: Simplified Direction Finding
SDF (2) Acronym: Software Defined Network
SDIS Acronym: Switched Digital Integrated Service
SDP Acronym: Service Delivery Point
SDS Acronym: Switched Data Service
SDSFIE Acronym: Spatial Data Standards for Facilities, Infrastructure and Environment
SEL Acronym: Single Event Level
SELF Acronym: Simplified Short Approach Lighting System With Sequenced Flashing Lights
SFAR-38 Acronym: Special Federal Aviation Regulation 38
Sheet FIle CAD Term: (see: Print File)
SHPO Acronym: State Historic Preservation Officer
SIC Acronym: Service Initiation Charge
SID (3) (.sid) File File Format: A raster file in MrSid format. The MrSid format was developed and patented by LizardTech for encoding of georeferenced raster graphics, such as orthophotos. (see: Raster, Georeference)
SID (1) Acronym: Station Identifier
SID (2) Acronym: Standard Instrument Departure
SIGMET Acronym: Significant Meteorological Information
SIMMOD Acronym: Airport and Airspace Simulation Model
SIP Acronym: State Implementation Plan
SM Acronym: Statute Miles
SMGC Acronym: Surface Movement Guidance and Control
SMPS Acronym: Sector Maintenance Processor Subsystem
SMS Acronym: Simulation Modeling System
SNR Acronym: Signal-to-Noise Ratio, also: S/N
SOC Acronym: Service Oversight Center
SOIR Acronym: Simultaneous Operations On Intersecting Runways
SOIWR Acronym: Simultaneous Operations on Intersecting Wet Runways
Spatial data GIS Term: Data that depict a real world feature such as a road, building, or runway on a map. The most basic types of spatial data are points, lines, and polygons, but spatial data can also include orthophotos and other more complex forms of locational information.
SRAP Acronym: Sensor Receiver and Processor

SSALF Acronym: SSALS with Sequenced Flashers
SSALR Acronym: Simplified Short Approach Lighting System
SSB Acronym: Single Side Band
SSI Acronym: Sensitive Security Information, as defined by the Code of Federal Regulations (49 CFR 1520).
STAR Acronym: Standard Terminal Arrival Route
STD Acronym: Standard
STMUX Acronym: Statistical Data Multiplexer
STOL Acronym: Short Takeoff and Landing
SURPIC Acronym: Surface Picture
SVCA Acronym: Service A
SVCB Acronym: Service B
SVCC Acronym: Service C
SVCO Acronym: Service O
SVFB Acronym: Interphone Service F (B)
SVFC Acronym: Interphone Service F (C)
SVFD Acronym: Interphone Service F (D)
SVFO Acronym: Interphone Service F (A)
SVFR Acronym: Special Visual Flight Rules

T

T1MUX Acronym: T1 Multiplexer
TAAS Acronym: Terminal Advance Automation System
TACAN Acronym: Tactical Aircraft Control and Navigation
TACR Acronym: TACAN at VOR, TACAN only
TAF Acronym: Terminal Area Forecast
TARS Acronym: Terminal Automated Radar Service
TAS Acronym: True Air Speed
TATCA Acronym: Terminal Air Traffic Control Automation
TAVT Acronym: Terminal Airspace Visualization Tool
TCA (1) Acronym: Terminal Control Area
TCA (2) Acronym: Traffic Control Airport or Tower Control Airport
TCACCIS Acronym: Transportation Coordinator Automated Command and Control Information System
TCAS Acronym: Traffic Alert And Collision Avoidance System
TCC Acronym: DOT Transportation Computer Center
TCCC Acronym: Tower Control Computer Complex
TCE Acronym: Tone Control Equipment
TCLT Acronym: Tentative Calculated Landing Time
TCO Acronym: Telecommunications Certification Officer
TCOM Acronym: Terminal Communications
TCS Acronym: Tower Communications System
TDLS Acronym: Tower Data-Link Services
TDMUX Acronym: Time Division Data Multiplexer
TDWR Acronym: Terminal Doppler Weather Radar
TELCO Acronym: Telephone Company
TELMS Acronym: Telecommunications Management System
TERPS Acronym: Terminal Instrument Procedures

TFAC Acronym: To Facility
TH Acronym: Threshold
TIFF (.tif) file File Format: Tagged Image File Format, a raster graphics format. Often used to contain aerial orthophotos. (see: Raster)
TIMS Acronym: Telecommunications Information Management System
TIPS Acronym: Terminal Information Processing System
TL Acronym: Taxilane
TM&O Acronym: Telecommunications Management and Operations
TMA Acronym: Traffic Management Advisor
TMC Acronym: Traffic Management Coordinator
TMC/MC Acronym: Traffic Management Coordinator/Military Coordinator
TMCC (1) Acronym: Terminal Information Processing System
TMCC (2) Acronym: Traffic Management Computer Complex
TMF Acronym: Traffic Management Facility
TML Acronym: Television Microwave Link
TMLI Acronym: Television Microwave Link Indicator
TMLR Acronym: Television Microwave Link Repeater
TMLT Acronym: Television Microwave Link Terminal
TMP Acronym: Traffic Management Processor
TMS Acronym: Traffic Management System
TMSPS Acronym: Traffic Management Specialists
TMU Acronym: Traffic Management Unit
TNAV Acronym: Terminal Navigational Aids
TODA Acronym: Takeoff Distance Available
TOF Acronym: Time Of Flight
TOFMS Acronym: Time of Flight Mass Spectrometer
TOPS Acronym: Telecommunications Ordering and Pricing System (GSA software tool)
TORA Acronym: Take-off Run Available
TR Acronym: Telecommunications Request
TRACAB Acronym: Terminal Radar Approach Control in Tower Cab
TRACON Acronym: Terminal Radar Approach Control Facility
TRAD Acronym: Terminal Radar Service
TRNG Acronym: Training
TSA (1) Acronym: Taxiway Safety Area
TSA (2) Acronym: Transportation Security Administration
TSEC Acronym: Terminal Secondary Radar Service
TSP Acronym: Telecommunications Service Priority
TSR Acronym: Telecommunications Service Request
TSYS Acronym: Terminal Equipment Systems
TTMA Acronym: TRACON Traffic Management Advisor
TTY Acronym: Teletype
TVOR Acronym: Terminal VHF Omnidirectional Range
TW Acronym: Taxiway
TWEB Acronym: Transcribed WeatherBroadcastTWR-Tower (non-controlled)
TY Acronym: Type (FAACIS)

U

UAS Acronym: Uniform Accounting System

UHF Acronym: Ultra High Frequency
URA Acronym: Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
USAF Acronym: United States Air Force
USGS Acronym: U.S. Geological Survey
USOC Acronym: Uniform Service Order Code

V

VASI Acronym: Visual Approach Slope Indicator
VDME Acronym: VOR with Distance Measuring Equipment
Vector CAD/GIS Term: Computer graphics comprised of mathematical representation of points, lines and other geometric entities.
VF Acronym: Voice Frequency
VFR Acronym: Visual Flight Rules
VHF Acronym: Very High Frequency
Viewport CAD Term: A polygonal viewing region in an AutoCAD file, in Paper Space. Viewports function as windows from Paper Space into Model Space, allowing objects in Model Space to appear in Paper Space, generally for the purpose of composing a completed Print File. (see: Paper Space, Model Space, Print File)
VLF Acronym: Very Low Frequency
VMC Acronym: Visual Meteorological Conditions
VNAV Acronym: Visual Navigational Aids
VNTSC Acronym: Volpe National Transportation System Center
VON Acronym: Virtual On-net
VOR Acronym: VHF Omnidirectional Range
VOR/DME Acronym: VHF Omnidirectional Range/Distance Measuring Equipment
VORTAC Acronym: VOR collocated with TACAN
VOT Acronym: VOR Test Facility
VRS Acronym: Voice Recording System
VSCS Acronym: Voice Switching and Control System
VTA Acronym: Vertex Time of Arrival
VTAC Acronym: VOR collocated with TACAN
VTOL Acronym: Vertical Takeoff and Landing
VTS Acronym: Voice Telecommunications System

W

WAAS Acronym: Wide Area Augmentation System
WAN Acronym: Wide Area Network
WC Acronym: Work Center
WCP Acronym: Weather Communications Processor
WECO Acronym: Western Electric Company
WESCOM Acronym: Western Electric Satellite Communications
WMSC Acronym: Weather Message Switching Center
WMSCR Acronym: Weather Message Switching Center Replacement
Workflow CAD Term: Routing process for information or documentation to the users responsible for working on them.
WSCMO Acronym: Weather Service Contract Meteorological Observatory
WSFO Acronym: Weather Service Forecast Office
WSMO Acronym: Weather Service Meteorological Observatory

WSO Acronym: Weather Service Office
WTHR Acronym: Weather
WX Acronym: Weather

X

Xref CAD Term: AutoCAD-specific term for External Reference (see: Reference File)

Y

Z