
USACE / NAVFAC / AFCEC UFGS-01 78 30.00 23 (October 2016)

Preparing Activity: NAVFAC NW

Superseding
UFGS-01 78 30.00 23 (January 2012)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

Use this Section for NAVFAC Washington Projects Only

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SECTION 01 78 30.00 23

CADD DATA FOR GIS DELIVERABLES
10/16

NOTE: This specification covers the requirements for the preparation of accurate georeferenced CADD data following construction, for integration into Naval District Washington (NDW Geographic Information System (GIS) environment.

The Design Manager (DM) shall convey to the appropriate Construction Manager (CM) that the submittal and deliverables provided by this specification section are furnished to the regional GeoReadiness Center (GRC) Manager or his/her designee at the installation level.

Comments, suggestions and recommended changes for this guide specification are welcomed. Suggestions should be forwarded to:

CI - Specifications and Criteria
Naval Facilities Engineering Command
NAVFAC WASHINGTON
1314 Harwood Street SE,
Washington Navy Yard, DC 20374-5018
email: NAVFACWashCISpecsandCriteria@navy.mil

Adhere to UFC 1-300-02

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-1-300-02>

Unified Facilities Guide Specifications (UFGS)

Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer. Remove information and requirements not required in respective project, whether or not

brackets are present.

This guide specification includes tailoring options for Design-Build and Design-Bid-Build project delivery types. Selection or deselection of a tailoring option will include or exclude that option in the section, but editing the resulting section to fit the project is still required.

NOTE: Modify this specification section for facilities built on Marine Corps (MC) Bases. The Marine Corps has a different set of GIS data layers and mapping from NDW. Marine Corps also has a different Public Works (PW) structure and may involve different personnel in the review and quality assurance of the CADD data.

PART 1 GENERAL

NOTE: This specification is only applicable to CAT I or CAT II Design/Construction projects greater than \$500K. It is not applicable to large utility infrastructure projects.

The CADD Data submitted per the requirements of this specification will be used only to support general planning purposes. It is not to be used for design purposes.

The designer shall indicate a GIS boundary to show the site limits required by this specification section.

For pricing purposes under the NAVFAC Washington AOR, the pricing basis for work to be performed on this specification section is \$1000/day of field work and \$750/day of office work. Expect one day of office work per day of field work.

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the

Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

THE CAD/BIM TECHNOLOGY CENTER FOR FACILITIES, INFRASTRUCTURE, AND ENVIRONMENT (USACE)

ERDC/ITL TR-09-2 (2009) A/E/C CAD Standard, Release 4.0

ERDC/ITL TR-04-1 (2004) CAD Details Library

FEDERAL GEOGRAPHIC DATA COMMITTEE (FGDC)

FGDC-STD-001-1998 (R 1998) Content Standard for Digital Geospatial Metadata

U.S. DEPARTMENT OF DEFENSE (DOD)

SDSFIE Spatial Data Standard for Facilities, Infrastructure & Environment Ver. 3.0

1.2 SUBMITTALS

NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For Design-Bid-Build projects select the bracketed paragraph below. Select first bracketed item for Navy Design-Bid-Build and Air Force projects; select the second bracketed item for Army projects.

Do not use paragraph below for Navy Design-Build projects.

[Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:]

NOTE: Select the following bracketed paragraph below for Navy Design-Build projects.

Do not use paragraph below for Design-Bid-Build projects.

Review submittal description (SD) definitions in Section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

[Government approval is required for submittals with a "G" designation for submittals found in RFP PART 2. Additional construction submittals reserved for Government approval are listed in the section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES. Submittals with a "G" designation found in the sections used by the Contractor to create construction specification, require DOR approval. DOR approved submittals are also listed in the "CONSTRUCTION SUBMITTALS" paragraph in each RFP PART 4, Performance Technical Specifications. Submit the following in accordance with section 01 33 10.05 20 DESIGN SUBMITTAL PROCEDURES and section 01 33 00.05 20 CONSTRUCTION SUBMITTAL PROCEDURES.]

SD-02 Shop Drawings

GIS Record Drawings[; G][; G, [_____]]

SD-11 Closeout Submittals

NOTE: Include the bracketed option for a Non-Disclosure Letter for projects in Marine Corps Base (MCB) Quantico.

CADD Data for GIS[; G][; G, [_____]]

Survey Report[; G][; G, [_____]]

Survey Control Database[; G][; G, [_____]]

Underground Utility Location Plan[; G][; G, [_____]]

[Non-Disclosure Letter[; G][; G, [_____]]

]1.3 GENERAL REQUIREMENTS

This section provides the requirements for georeferenced CADD data for the development and creation of Geographic Information System (GIS) deliverables in a form that requires minimum translation and post processing ensuring data accuracy.

The requirements of this section are limited to the GIS boundaries indicated on the site plan. If no separate GIS boundary is indicated on the site plan then the limits of the CADD data deliverable submitted as part of this specification section will be considered the Limit of Disturbance.

1.4 OWNERSHIP

All digital files, final hard-copy products, source data acquired for this project, and related materials, including that furnished by the Government, will become the property of the Government and shall not be issued, distributed, or published by the Contractor.

1.5 GOVERNMENT PROVIDED INFORMATION

NOTE: For projects in Naval District Washington (NDW) include the first bracketed sentence and delete the second bracketed sentence.

NOTE: For projects in MCB Quantico include the second bracketed sentence and delete the first bracketed sentence.

The Government will provide access only to information pertinent to the Contract. [This information, which may include but is not limited to geospatial data, reports, and schematics, will be provided either through the regional GeoReadiness Center (GRC), or through a data copy upon completion of the request forms and security information.][GIS data requests will need to go through the MCB Quantico IGI&S Office. The GIS data provided shall require a signed non-disclosure letter from the requester and all entities including sub contractors who will require the data. A copy of the non-disclosure letter and data request form will be provided by the MCB Quantico IGI&S Office.]

1.6 DATA COLLECTION PROCEDURES

Data collection must include:

Feature Attributes: The Contractor shall identify the classification, type, location, ID number, and any other necessary attributes specified by the Government for new, updated or edited features, first by field verification and then by existing sources.

1.6.1 Field Data Collection

Data shall be collected employing conventional and other methods, such as Total Station, or Global Positioning System (GPS) in accordance with the applicable Geospatial Positioning Accuracy Standards.

1.6.1.1 Location of Utility Lines and Other Features

- a. Surveyed data on the location of utility lines including, but not limited to, potable water pipelines, wastewater and storm-sewer water pipelines, electrical conduits and lines, grounding rods and cables,

telephone lines, CATV fiber-optic lines, and various process pipelines, shall be captured at a minimum every 15 meters 50 feet and at each turn or bend in the line, and processed as a line feature type.

- b. Surveyed data on the location of utility points and other features shall be captured at the centroid of the feature unless signal obstruction or access prohibits; otherwise, points will be captured at a uniform distance and direction from the centroid.
- c. Surveyed data on polygon (area) features shall be collected at every vertex of the feature and processed as a contiguous polygon.

Capture vertical data indicating the top and invert elevations of manholes, catch basins, headwalls, finished floor of buildings, top of slabs, top of curbs, invert of dikes, and other elements, with an accuracy of 0.03 meters 0.1 feet.

Topography shall be provided at 0.3 meters 1.0 foot contour intervals.

The Contractor shall locate all sub-surface utilities prior to backfilling.

1.6.1.2 Horizontal Accuracy level

Provide at a minimum, High Accuracy Mapping-Grade GPS collection at an accuracy level of plus or minus 0.15 meters 0.5 feet using differential correction.

GPS data collection activities must be based on a post-processed environment using an accurately sighted base station. Base station files for post-processing acquired locally (off-site Continuous Operating Reference Station) will be verified for accuracy.

1.6.2 Survey Report

Provide the Government with the survey data, collected in a digital format and with an attached hard copy survey report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, quality control report and field survey data.

1.6.3 Survey Control Database

Provide a digital Survey Control Database consisting of a survey marker database and a survey traverse database, for all survey control points established under this Contract. Include the horizontal and vertical order and coordinate location of each point.

1.7 CADD DATA FOR GIS

CADD data for GIS include but is not limited to attribute and vector data of the planimetric features included on Appendix 01 78 30.00 23-1, PLANIMETRIC FEATURES FOR GIS. Each planimetric feature is identified as a point, line, or area feature. Minimum attribute data to be collected for the included features are: Feature Description, Elevations and Material Type.

CADD drawings shall be in accordance with the requirements of the A/E/C CAD Standard (publications ERDC/ITL TR-09-2 and ERDC/ITL TR-04-1). These standards can be obtained at

<https://www.wbdg.org/ffc/army-coe/cad-bim-technology-center>.

Contract deliverables incorporating CADD data shall meet the following guidelines:

- a. The Industry Standard model file and sheet naming conventions, consisting of a Discipline/Code Designator, Drawing Type Code, Sheet Type Code/Designator, and Sheet Sequence Identifier shall be used for all submissions - diagrams of this naming convention can be found in the A/E/C CAD Standard.
- b. Submittals shall include any standard sheets (abbreviations, symbols, fonts, etc.) necessary for a complete project, and document any nonstandard fonts, tables and symbols that are used.
- c. Submittals shall include templates, plot files, pen assignments and Color-Dependent Plot Style Tables (CTB) files used to generate CADD layouts.
- d. Files which are used as external references (XREFs) to share drawing information and are applicable to the project shall be included.

NOTE: Acceptable drawing scales depend on the type of drawing and the size of the area the drawing encompasses - A detailed description of which drawing scale to select can be found in tables 3-7 and 3-8 of the A/E/C CAD Standard.

- e. Files shall be drawn full scale (scale 1.0). Hardcopies of each site may be printed at any of the following scales: [1:100,] [1:200,] [1:250,] [1:300,] [1:400,] [1:500,] [1:600,] [1:1000,] [1:2000,] [1:5000,] [1:10000,] [and 1:20000] [1 inch = 10 feet,] [1 inch = 20 feet,] [1 inch = 30 feet,] [1 inch = 40 feet,] [1 inch = 50 feet,] [1 inch = 100 feet,] [1 inch = 200 feet,] [1 inch = 300 feet,] [1 inch = 400 feet,] [1 inch = 1000 feet,] [and 1 inch = 2000 feet]. The plot shall be made such that the site plan occupies as much of the page as possible.

1.7.1 CADD File Format

NOTE: Confirm with Project Manager which version of AutoCAD should be included in the bracketed option below provided it has NMCI approval.

Provide drawing files in AutoCAD [2010][_____] DWG file format. No other CADD format is acceptable. Drawing files shall be full files, uncompressed, and unzipped.

1.7.2 CADD File Orientation

NOTE: For projects in Naval District Washington (NDW) include the first bracketed option and delete the second bracketed option.

NOTE: For projects in MCB Quantico include the
second bracketed option and delete the first
bracketed option.

Each CADD file shall be drawn in model space, and georeferenced (oriented such that items are located at their true State Plane Coordinate System (SPCS) coordinates). The coordinates shall be in the U.S. Survey Foot unit of measure using Northing and Easting Coordinates consistent with the SPCS for the region of Naval District Washington. [Horizontal coordinate system for Naval District Washington region is NAD83][Horizontal coordinate system for MCB Quantico is WGS84 projected in UTM Zone 18 North (meters)] and vertical coordinate system is NAVD88. Orient the drawing such that North is pointing at the top of the screen.

1.7.3 Vector Graphics and Raster Files

The CADD files shall be in vector form only. The files shall be created using vector entities. Scanned and raster files may be used only for referencing purposes. If used, insert raster files as attachments in a separate layer and include a world file (WLD) with georeferenced coordinates. Refer to Appendix A of the A/E/C CAD Standard for layer naming conventions.

1.8 DATA INTEGRITY

The Contractor shall employ appropriate quality standards to ensure that data is topologically correct, accurate, and complete to include:

- a. Point and line features must be snapped together where appropriate to support networks. Linear features must not break for labeling or other aesthetic purposes.
- b. Lines and line strings which represent the same graphic element must be continuous (i.e., not broken or segmented), unless that segmentation reflects a specific visual line type. Lines/strings representing the same type of data must not cross except at intersections.
- c. Straight lines must be represented by only the beginning and ending x- and y-coordinate points. Line strings must not cross back on themselves or be of zero length.
- d. Polygons must be closed (i.e., the first x- and y-coordinates must exactly match the last x- and y-coordinates). Each polygon must have a single unique centroid to which attributes (i.e., an attribute table) can be attached. Polygons of the same coverage must not overlap and must cover the area of interest completely (i.e., have no gaps or slivers in coverage).
- e. The digital representation of the common boundaries for all graphic features must be exactly the same, regardless of level/layer. Each feature within a map theme must be represented by a single graphic element (e.g., polygon, line, or line string).
- f. Geometric network connectivity must be maintained for utility networks.

NOTE: For projects in MCB Quantico include the bracketed sentence to reference ArcGIS 10 Geodatabase Topology Rules.

[Data deliverables shall comply with ArcGIS 10 Geodatabase Topology Rules when appropriate.]

1.9 GIS RECORD DRAWINGS

The GIS record drawings and CADD Data provided by this specification section shall not be considered as-built drawings for the overall construction project but can be used to support and is in addition to any required as-built deliverable requirements.

Record drawings shall be prepared in accordance with Section 01 78 00 CLOSEOUT SUBMITTALS.

In addition, record drawings shall clearly indicate the following mandatory information:

- a. Location and elevation of new lines, conduits, valves, fire hydrants, meters, terminal points using at least two ties to permanent points (manholes, power poles, curbs, or storm-sewer water inlets), or GPS coordinates with accuracy to at least 0.15 meters 0.5 feet, or better if more stringent accuracy requirements are specified in other sections of this Contract.
- b. Location and elevation of underground structures and utilities including but not limited to, potable water pipelines, wastewater and storm-sewer water pipelines, electrical conduits and lines, grounding rods and cables, telephone lines, CATV and fiber optic lines, and various process pipelines.
- c. Distance measurements of new lines from property easement lines or edges of pavement shall be shown at intervals of 90 meters 300 ft.
- d. All utility routing and interface changes indicated clearly on the drawings to scale and defined with sufficient dimensions.
- e. Elevation contour lines shall be shown at 0.3 meters 1.0 foot interval. Indicate high and low points with spot elevations.

NOTE: Include the text in the following paragraph if the GIS boundary is not provided in the site plan.

[The extent of the CADD data deliverable will be considered as the Limit of Disturbance.

1.9.1 Underground Utility Location Plan

The Contractor shall prepare and submit an Underground Utility Location Plan with the input of a Registered Land Surveyor.

Indicate in the plan the method used to horizontally and vertically locate new underground utilities, lines, and conduits provided as a result of

this Contract, including change orders, addendums, and modifications. Include provisions to locate new underground utilities prior to backfilling. The plan shall be composed on ANSI A sheets (216 by 279 mm 8 1/2 by 11 inches) only; no legal sheets are allowed.

The plan shall include as a minimum:

- a. A cover sheet with the Project title and Contract number.
- b. Name, address, and phone number of Contractor.
- c. Name, address, and phone number of company performing the survey work.
- d. A full description of the method used for locating new underground utilities for the survey.
- e. Printed name and signature of the Contractor's Project Manager.
- f. Printed name, signature and stamp of the Registered Land Surveyor.

Submit [3][_____] copies of the Underground Utility Location Plan prior to performing any construction work. The plan shall not be considered as an acceptable means of location until approved by the Contracting Officer. The Government will not define the Contractor's method of locating underground utilities.

1.10 REQUIREMENTS FOR CADD AS A GIS DELIVERABLE

CADD Drawings may be accepted by the Government as GIS deliverables provided that the drawings adhere to the coordinate system, locational and data integrity requirements outlined in this document.

NOTE: For projects in MCB Quantico include the bracketed sentence to reference SDSFIE and FGDC.

[Data shall comply with the SDSFIE and the FGDC-STD-001-1998 standard for geospatial Metadata.]

1.11 GOVERNMENT REVIEW

Data deliverables shall be submitted for review and approval via compact disk read-only memory (CD-ROM) or digital versatile disk read-only memory (DVD-ROM).

NOTE: The cost of the work required by this specification section needs to be included as a Bid Item that will not be removed for cost purposes. The intent of this cost is to support ensuring construction contractor completion and delivery of these requirements. Invoice payments for portions of work completed towards this specification section requirement shall not be made until 100 percent complete.

The Government will review the submitted data and documentation for

accuracy and completeness before acceptance. Review period for the Government will be [14][21][_____] days. The Contractor will have 14 days to make corrections and produce the final data deliverable. Missing or incomplete items will be documented and forwarded to the Contractor for completion. Failure for non-compliance of the specifications outlined in this document, will result in non-acceptance of data deliverables and the withholding of invoice payments for 100 percent of the Bid Item cost identified at contract award or as modified by contract modification. To avoid rejection of final data deliverables, the Contractor is urged to submit data and documentation samples at 25 percent and 75 percent completion.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

Appendix 01 78 30.00 23-1 PLANIMETRIC FEATURES FOR GIS

INFRASTRUCTURE:

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Existing Structures	BLDG-OTLN-E	structure_existing_area
Slabs	SLAB-OTLN	slab_area
Canopy Pavilion	CNPY-PAVI	canopy_pavilion_area
Open Storage Area	OPEN-STOR	open_storage_area
Sheds	SHED-OTLN	shed_area
Carports	SITE-CARS	carport_area

TRANSPORTATION:

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Road Centerline	ROAD-CNTR-LINE	road_centerline
Road Area	ROAD-OTLN	road_area
Curb Line	ROAD-CURB	curb_line
Driveways	DRIV-OTLN	vehicle_driveway_area
Parking Lots	PRKG-OTLN	vehicle_parking_area
Road Bridge	ROAD-BRDG	road_bridge_area
Railroad tracks (centerline)	RAIL-CNTR	railroad_centerline
Pedestrian Sidewalks	SWLK-OTLN	pedestrian_sidewalk_area
Footbridge	BRDG-SWLK-OTLN	footbridge_area
Airfield Surface	AFLD-OTLN	airfield_surface_area
Airfield Surface Centerline	ALFD-SURF-CNTR	airfield_surface_centerline
Airfield Surface Marking Line	ALFD-SURF-MRKG	airfield_surface_marking_line
Piers and Docks	SITE-DOCK	small_craft_marina_area

IMPROVEMENT GENERAL:

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Fence Line	SITE-FENC	fence_line
Road Guard Rail	ROAD-GRAL-LINE	road_guardrail_line
Barricade	STRC-BRCD-OTLN	barricade_area
Gates	GATE-OTLN	gate_line
Walls	SITE-WALL-LINE	wall_line
Playground	SITE-PLAY	playground_area
Swimming Pool	SITE-POOL	swimming_pool_area
Athletic Court	SITE-EQPM	athletic_court_area
Athletic Field	SITE-SPRT	athletic_field_area
Boat Ramp	SITE-RAMP	boat_ramp_area
General Improvements	SITE-GENF	general_improvement_feat_point
Recreation Trail (area)	SITE-TRAL-OTLN	recreation_trail_area
Recreation Trail (centerline)	SITE-TRAL-CNTR	recreation_trail_centerline
Recreation Park	SITE-PARK	recreation_park_area

ENVIRONMENTAL:

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Underground Storage Tanks	FUEL-UGND-OTLN-H	underground_storage_tank_area
Aboveground Storage Tanks	FUEL-TANK-OTLN-H	aboveground_storage_tank_area
Forest Stand Area / Tree Line	SITE-TREE-OTLN	forest_stand_area
Vegetation Line	LAND-VEGE-LINE	land_vegetation_line
Water Well	WATR-WELL	water_well_point
Bulkhead Line	EROS-BLKH-LINE	bulkhead_line

TOPOGRAPHY:

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Elevation Contour Lines	TOPO-MAJR	elevation_contour_line
Spot Elevation Point	TOPO-SPOT	spot_elevation_point
Topographic Survey Area	TOPO-SURV	topographic_survey_area
Survey Traverse Line	SURV-LINE	survey_traverse_line

UTILITIES:

1. Electrical Distribution

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Electrical Cables	POWR-CABL	electrical_cable_line
Underground Ductbank	POWR-DBNK	electrical_ductbank_line
Meters	ELEC-INST	electrical_meter_point
Transformer Bank	POWR-XFMR-BANK	elect_tranformr_bank_point
Transformer Vault	POWR-XFMR-PADM	elect_xformer_vault_point
Grounding Rod	ELEC-GRND	electrical_ground_point
Exterior Lighting	LITE-EXTR	exterior_lighting_point
Switches	POWR-SWCH	electrical_switch_point
Regulators	ELEC-DEVC	electrical_regulator_point
Generators	POWR-GENR	electrical_generator_point
Junction Boxes	POWR-JBOX	electrical_junction_point
Substations	POWR-SUBS-OTLN	electrical_substation_area

2. Water Distribution

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Domestic Water Pipe	DOMW-PIPE-LINE	water_line
Water Pump	WATR-EQPM	water_pump_point
Water Pump Station	WATR-EQPM-STA~	water_pump_station_area
Water Meter	DOMW-INST	water_meter_point
Water Tank	WATR-TANK-OTLN	water_tank_area
Water Valve	DOMW-VALV	water_valve_point
Water Fire Connection	FIRE-DEVC	water_fire_connection_point
Water Fire Line	DOMW-FIRE-LINE	water_line
Fire Hydrant	DOMW-HYDT	water_hydrant_point
Water Treatment Plant	WATR-PLNT	water_treatment_plant_area

3. Storm-Sewer Drainage

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Storm-Sewer Drainage Pipe	STRM-PIPE	storm_sewer_line
Culvert Pipe	STRM-CIPR	storm_sewer_culvert_line
Headwall	STRM-HWAL-LINE	storm_sewer_headwall_line
Storm-Sewer Junction Box	STRM-JBOX	storm_sewer_junction_point
Inlet	STRM-INPR-OTLN	storm_sewer_inlet_area
Discharge Point	STRM-DISC	storm_sewer_discharge_point
Storm Sewer Valve	STRM-VALV	storm_sewer_valve_point
Ponds, Catch Basins, & Treatment Measures	STRM-DRAN-BASN	stmswr_drainage_basin_area
Oil/Water Separator	STRM-OIL~-OTLN	stmswr_oil_wat_separator_area

4. Wastewater Collection

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Wastewater Pipe	SSWR-PIPE	wastewater_line
Wastewater Fitting	SSWR-FTTG	wastewater_fitting_point
Wastewater Inlet Pipe	SSWR-INPR	wastewater_inlet_point
Wastewater Valve	SSWR-VALV	wastewater_valve_point
Manhole	SSWR-MHOL	wastewater_junction_point
Vent	SSWR-VENT	wastewater_vent_point
Pump Stations	SSWR-EQPM	wastewater_pump_point
Grit Chamber	SSWR-GRIT	wastewater_grit_chamber_point
Grease Trap	SSWR-GT~~	wastewater_grease_trap_point
Oil / Water Separator	SSWR-DEVC-OIL~	wstewat_oil_wat_separatr_point
Septic Tank	SSWR-TANK	wastewater_septic_tank_point
Treat Plant	SSWR-PLNT	wastewater_treat_plant_area
Aerated Lagoon	SSWR-LAGN	wastewater_lagoon_area

5. Industrial Waste Collection

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Industrial Waste Pipe	INDW-LINE	industrial_waste_line
Industrial Waste Pump	INDW-EQPM	industrial_waste_pump_point
Industrial Waste Tank	INDW-TANK	industrial_waste_tank_point
Industrial Waste Valve	INDW-VALV	industrial_waste_valve_point

6. Telecommunications

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Antenna Area	COMM-ANT~-OTLN	comm_antenna_area
Coaxial Lines	CABL-COAX-LINE	comm_coaxial_line
Fiber Optic Lines	CABL-FIBR-LINE	comm_fiber optic_line
Communication Line	COMM-LINE	comm_line
Underground Ductbank	COMM-DBNK-LINE	comm_ductbank_line
Manholes	COMM-MHOL	comm_manhole_point
Telephone Booth	COMM-BOTH	comm_telephone_booth_point
Pedestal	COMM-DEVC-PED~	comm_pedestal_point
Pullbox	COMM-PULL	comm_pullbox_point
Sensor	COMM-SNSR	comm_sensor_point
Twisted Pair Line	COMM-TP~	comm_twisted_pair_line

7. Oil & Fuel

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Fuel Oil Pipeline	FUEL-LINE	fuel_line
Fuel Pump	FUEL-EQPM	fuel_pump_point
Fuel Pump Booster Station	FUEL-EQPM-STAN	fuel_pump_booster_statn_point
Fuel Tank	FUEL-TANK-OTLN	fuel_tank_area
Fuel Hydrant	FUEL-HYDT	fuel_hydrant_point
Oil/Water Separator	FUEL-DEVC	fuel_oil_water_separator_point

8. Natural Gas

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Natural Gas Pipeline	NGAS-PIPE	natural_gas_line
Natural Gas Meter	NGAS-INST	natural_gas_meter_point
Natural Gas Pump	NGAS-EQPM	natural_gas_pump_point
Natural Gas Valve	NGAS-VALV	natural_gas_valve_point
Natural Gas Anode Test Station	NGAS-ANOD-TEST	nat_gas_anode_test_statn_point

9. Compressed Air

<u>Common Feature Name</u>	<u>DWG Layer Name</u>	<u>GIS Layer Name</u>
Compressed Air Pipeline	CAIR-PIPE	compressed_air_pipe_line
Compressed Air Valve	CAIR-INST	compressed_air_valve_point

10. Other Utility Features

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