

New Jersey American Water
Geospatial Asset Planning Department



CAD to GIS
Submission and Format Conversion

New Jersey American Water
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1. Overview

New Jersey American Water is providing an AutoCAD template along with format requirements, for all submissions to the water company. These submitted drawing(s) will be used to develop the New Jersey American Water GIS Database. Discussed within the proceeding pages is what to include and exclude along with text styles, layers, blocks, linework formatting, and labeling. New Jersey American Water understands your time constraints and has provided a step-by-step conversion process.

The drawing(s) are required for AutoCAD to GIS conversion. These drawings need to be functional before visually pleasing. Text styles should be formatted as instructed below but text height is not crucial.

Example 1:

Linework needs to be connected center-to-center along water and sanitary structures. This may interfere/overlap with block text, this is expected and accepted.

Example 2:

It is important for the linework to be broken at any intersecting object (within that family: water or sanitary), this may cause visibility problems with linetypes, this is expected and accepted.

1.1 Provided Template Data

New Jersey American Water encourages the use of our standards to be incorporated into your everyday workflow. This process will eliminate portions of the following steps, and decrease your investment in the conversion time.

2. Drawing Setup

New Jersey American Water is providing an AutoCAD template. The template includes the following: blocks, layers, text styles, and linetypes. The labeling should be entered in model space **only**. The submitted drawing(s) should not use paper space or layouts and title blocks are not required. Details or detail sheets should not be included within the submitted drawing(s).

2.1 Drawing Scale

All submitted drawing(s) must be drawn at a 1 to 1 scale in model space.

2.2 Coordinate Systems

The coordinate systems expectations are as follows. Standard AutoCAD does not support coordinate systems and as a result will not be required by New Jersey American Water if this is the drafting package being utilized. If the drafting package used by your company supports coordinate systems, such as AutoCAD Map 3D or AutoCAD Civil 3D, New Jersey American Water then requires the drawing(s) to be in the correct spatial location and in NAD83 New Jersey State Plane, US Feet coordinates.

2.3 Working with External References (XREFs)

External References (XREFs) will not be accepted within the submitted drawing(s). New Jersey American Water expects all external references to be inserted into the submitted drawing(s) with the use of the AutoCAD “Bind” command.

1. Within the design drawing, start the “External Reference” command.
 - Drop-down “Insert > External References...”
 - Ribbon “Blocks & References tab > References panel”
 - Command Line Entry – Type “XR” or “XREF”
2. Within the External References dialog box, select the external drawing (highlight).
Depending on the version:
 - Click the “Bind” button in the right hand column
or
 - Right-click, select “Bind”
3. In the “Bind Xrefs” dialog box, select “Insert”:
4. Click “OK”

The External Reference file is now part of the current design file, as a block. To convert the block into individual AutoCAD objects (such as: lines, blocks, and text) the explode command must be applied.

5. Start the “Explode” Command
 - Drop-down “Modify > Explode”
 - Command Line Entry – Type “X” or “Explode”
6. Select block in drawing area, select “Enter”.

3. Submission Required Objects

3.1 Level of Detail

New Jersey American Water currently receives comprehensive civil packages which include excessive amounts of data. New Jersey American Water is requesting the following items to be included in the drawing.

Different utilities require various levels of detail, for the submitted drawing. Water and sanitary require the highest level of detail, while other utilities such as communications, electric, gas, and storm require the least amount of details.

These particular utilities communications, electric, gas, and storm should not include connecting underground or overhead pipes or cable. These utilities only require structure placement and the default label provided in the template.

3.2 Required Objects

3.2a Utilities - Water Features

(If available within design drawing)

1. Mains
2. Laterals
3. Manholes
4. Fire Hydrants
5. Blowoff
6. Meters
7. Meter Pits
8. Valves
9. Reducer
10. Plugs
11. Crosses
12. Tees
13. Tapping Valves
14. Miscellaneous Objects

3.2b Utilities - Sanitary Features

(If available within design drawing)

1. Mains
2. Laterals
3. Manholes
4. Cleanouts
5. Miscellaneous Objects

3.2c Utilities - Storm Features

(If available within design drawing)

1. Manholes
2. Catch Basin
3. Head/End Walls
4. Miscellaneous Objects

3.2d Utilities - Gas Features

(If available within design drawing)

1. Manholes
2. Valves
3. Meters
4. Miscellaneous Objects

3.2e Utilities - Electric Features

(If available within design drawing)

1. Manholes
2. Utility Poles
3. Light Poles
4. Miscellaneous Objects

3.2f Utilities - Communications Features

(If available within design drawing)

1. Manholes
2. Utility Poles
3. Miscellaneous Objects

3.2g Plan Features

(If available within design drawing)

1. Boundary, Parcel, and Tract Lines
2. Building Footprint
3. Curblines
4. Edge of Pavement
5. Street Centerline
6. Water Easements

3.2h Labels –Water Features

(If available within design drawing)

1. Sizes
2. Types
3. Materials
4. All labels detailing water utilities

3.2i Labels –Sanitary Features

(If available within design drawing)

1. Sizes
2. Types
3. Materials
4. Slopes
5. Inverts
6. Rims Elevation
7. All labels detailing sanitary utilities

3.2j Labels –Plan Features

(If available within design drawing)

1. Street Names
2. Boundary, Parcel, and Tract – Block and Lot Information **only**
3. ROW (right-of-way) information

3.3 Remove All

3.3a Utilities – Storm Features

(Please remove from drawing)

1. Mains / Pipes

3.3b Utilities – Gas Features

(Please remove from drawing)

1. Mains / Pipes

3.3c Utilities – Electric Features

(Please remove from drawing)

1. Underground Powerlines
2. Overhead Powerlines

3.3d Plan Features

(Please remove from drawing)

1. Sidewalks
2. Retaining Walls
3. Waterways (streams, creeks, rivers...)
4. Floodplains
5. Easements (except waterline easements)
6. Trees, and Treelines
7. All Hatching (building, roads, soils....)
8. Details
9. Building Setbacks
10. Contours

3.3e Labels - Plan Features

(Please remove from drawing)

1. Dimensions
2. Spot Elevation
3. Boundary, Parcel, and Tract – Bearing and Distances
4. Building Labels
5. Curb Labels
6. Street Centerline Stationing

4. Step 1 – Moving Required Data

There are many ways to move data between drawings. The method that is provided below, gathers all required information in one step and prepares for the insertion into the provided New Jersey American Water template.

4.1 Save As or Copy

New Jersey American Water recommends performing a “Save As” or copying the drawing(s) as a temporary file. Before extracting, moving, and deleting objects from your company’s current design drawing(s), and making the following modifications. Final drawing submittals must be saved as an AutoCAD 2007 format drawing, as the latest versions of AutoCAD and ArcGIS are not compatible.

4.2 Labels – All labels should be located in Model Space

(May not apply to your company standard)

Mentioned in the *Drawing Setup* section above, all objects and labels need to be in *model space*. There are different methods for labeling objects in AutoCAD. If your company labels everything in *model space* you can skip this step. If your company uses a combination of *paper space* or *layout* labeling New Jersey American Water requires all the water and sanitary labels to be placed in model space. Here are the steps to move the paper space or layout labeling into model space.

1. Select the *paper space* or *layout space* with the labels
2. Start the “Change Space “ command

Depending on version:

(2007 to Current)

- Drop-down “Modify > Change Space”
- Ribbon “Home tab > Modify panel”
- Command Line Entry – Type “CHSPACE”

or

(2006 or Prior)

- Drop-down “Express > Layout Tolls > Change Space ms/ps”

3. Select *water* and *sanitary* labels

4. Select “Enter”

4.3 Export Drawing Objects

After all required objects are located in *model space*, the linework and labeling have to be prepared for export using the “WBlock” command. Referring to sections above (“Required Objects” and “Remove All”) remove all unnecessary objects.

After preparing the drawing(s) (above step), the “Wblock” command will export the required objects leaving behind all unnecessary layers, styles, and blocks. Here are the steps to export the drawing objects.

1. At the command Line – Type “WBLOCK”.
2. Under Source – Select “Objects”.
3. Under Objects – Select “Select Objects”.
4. In drawing area – Select all objects, Press “Enter”.
5. Under Destination - Export to a predetermined location, such as the “Desktop”.
6. Select “OK”.

Note: AutoCAD Map 3D and AutoCAD Civil 3D users only.

7. Select “Yes” to *Include AutoCAD Map information in the export?*

4.4 Import Drawing Objects

After all required objects are exported, the objects will need to be imported into the New Jersey American Water template. Below are the steps to insert the drawing objects.

1. Locate the .dwg file (within this package) named “New Jersey American Water Template.dwg”.
2. Open “New Jersey Water American Template.dwg”.
3. Within the drawing file start the “Insert Block” tool.
 - Drop-down “Insert > Block”
 - Ribbon “Home tab > Block panel”
 - Command Line Entry – Type “INSERT” or “i”
4. Select the “Browse” button.
5. Navigate to the predetermined location above (Step 5).
6. Select drawing, Select “Open”.

7. Un-check “Specify On-Screen”.
8. Select “OK”.

The Block is now part of the current design file. To convert the block into individual AutoCAD objects (such as: lines, blocks, and text) the explode command must be applied.

9. Start the “Explode” Command
 - Drop-down “Modify > Explode”
 - Type “X” or “Explode”
10. Select the block in drawing area, select “Enter”.

5. Step 2 – Converting Linework

5.1 Layer Conversion

With the combined data (geometry and AutoCAD standards) in one drawing, a conversion can take place. Within the drawing template (Layer Properties Manager) and the tables below, a list of target layers for the linework are provided. The layering color scheme relates to the “ONE CALL” system: Blue=Water, Red=Electric, Yellow=Gas.... Existing object colors are a pastel shade, while proposed object colors are bright and bold. Please navigate the drawing using AutoCAD tools: Layer freeze, off, and isolate to convert the current linework to the destination provided.

5.1a Layer Translator

The Layer Translator tool is used to convert layers from the design drawing(s) to the destination layer within the New Jersey American Water template. This translation will change the layer names and match the layer properties. After mapping the correct layers you can save the translation mappings to a file (.dws) and reuse them for future needs.

1. Within the design drawing, start the “Layer Translator” command.
 - Drop-down “Tools > CAD Standards > Layer Translator...”
 - Ribbon “Tools tab > Standards panel”
 - Command Line Entry – Type “LayTrans”
2. In the *Layer Translator* dialog box, under the *Translate To* section, select the “Load” button.

3. Navigate to the provided New Jersey American Water template (it's fine if you are in the current template file).
4. Select Open.
5. Using the sections provided below (5.1c and 5.1d), map the layer to the designated layer.
6. Under *Translate From* section, select the layer name (highlight).
7. Under *Translate To* section, select the New Jersey American Water designated layer.
8. Click the "Map" button (Under the *Layer Translation Mappings* section the entry is complete).
9. Continue this process until all layers are mapped under the *Layer Translation Mappings section*.
10. Once the mapping is completed, select the "Save" button in the lower right corner.
11. In the *Save Layer Mapping* dialog box, change the *Files of type:* to (.dws), provide a name (such as "Company Name to New Jersey Standard mapping") and location.
12. Click *Save*.
13. Back in the *Layer Translator* dialog box, select the *Translate* button.

Note: The .dws file saved in step 12 will be used for future layer conversions. Instead of loading a .dwg (in step 2 above) you can select the saved .dws file and the Layer Translator tool will automatically create all the saved mappings.

5.1b Linework Layer Format

Layering is formatted using the following guidelines:

Field Status Indicator

E- *Existing/Surveyed field objects*

P- *Proposed/Designed field objects*

Major Object Class

x-BLDG- *Buildings, sheds, garages, or similar*

x-BND- *Boundary lines, tract Lines, parcels, or similar*

x-COM- *Structures only for communications cable, fiber, telephone, or similar*

x-ELE- *Structures only for electric, lighting, or similar*

x-GAS- Structures only for gas, oil, steam, petroleum, or similar

x-ROAD- Structures for roads or similar

x-SAN- Structures and pipes for sanitary sewer systems or similar

x-STM- Structures only for storm sewer systems, drains, or similar

x-WAT- Structures and pipes for water systems or similar

Minor Object Class

x-xxxx-CL- Road centerlines

x-xxxx -CURB- Road curb lines

x-xxxx-ADJOIN- Boundary Adjoining Parcel

x-xxxx -FITTINGS- Water Fittings: crosses, plugs, reducers, tapping valves, tees, valves, or similar

x-xxxx -LATERAL- Sanitary sewer/water laterals from building structure to main

x-xxxx -MAIN- Sanitary sewer/water mains

x-xxxx -MH- Manholes for communications, electric, gas, sanitary, storm, and water

x-xxxx -PAVE- Road edge of pavement

x-xxxx -STRUCTURES- Structures such as blowoffs, cleanouts, fire hydrants, light poles, meters, and utility poles

Labels/ Text Class

x-xxxx -xxxx-TXT Any and all labels or text within drawing

5.1c Existing Linework Conversion Set

Layer Description	Destination Layer
Existing Building	E-BLDG
Existing Building Text	E-BLDG-TXT
Existing Boundary Parcel Tract	E-BND
Existing Boundary Parcel Tract Text	E-BND-TXT
Existing Boundary Adjoining Parcel	E-BND-ADJOIN
Existing Boundary Adjoining Parcel Text	E-BND-ADJOIN-TXT

Existing Road Centerline	E-ROAD-CL
Existing Road Centerline Text (Street Name)	E-ROAD-CL-TXT
Existing Curb	E-ROAD-CURB
Existing Road Edge of Pavement	E-ROAD-PAVE
Existing Sanitary Lateral	E-SAN-LATERAL
Existing Sanitary Lateral/Pipe (2 Inch Diameter)	E-SAN-LATERAL-2inch
Existing Sanitary Lateral/Pipe (3 Inch Diameter)	E-SAN-LATERAL-3inch
Existing Sanitary Lateral/Pipe (4 Inch Diameter)	E-SAN-LATERAL-4inch
Existing Sanitary Lateral/Pipe (6Inch Diameter)	E-SAN-LATERAL-6inch
Existing Sanitary Lateral/Pipe (8 Inch Diameter)	E-SAN-LATERAL-8inch
Existing Sanitary Lateral Text	E-SAN-LATERAL-TXT
Existing Sanitary Main/Pipe (No Size Provided)	E-SAN-MAIN
Existing Sanitary Main/Pipe (4 Inch Diameter)	E-SAN-MAIN-4inch
Existing Sanitary Main/Pipe (6 Inch Diameter)	E-SAN-MAIN-6inch
Existing Sanitary Main/Pipe (8 Inch Diameter)	E-SAN-MAIN-8inch
Existing Sanitary Main/Pipe (Force Main)	E-SAN-MAIN-FM
Existing Sanitary Main/Pipe Text	E-SAN-MAIN-TXT
Existing Sanitary Pump House Station	E-SAN-PUMP-STATION
Existing Sanitary Pump House Station Text	E-SAN-PUMP-STATION-TXT
Existing Water (Only) Easement	E-WAT-EASEMENT
Existing Water (Only) Easement	E-WAT-EASEMENT-TXT
Existing Water Lateral	E-WAT-LATERAL
Existing Water Lateral/Pipe (0.75 Inch Diameter)	E-WAT-LATERAL-0.75inch
Existing Water Lateral/Pipe (1.5 Inch Diameter)	E-WAT-LATERAL-1.5inch
Existing Water Lateral/Pipe (1 Inch Diameter)	E-WAT-LATERAL-1inch
Existing Water Lateral/Pipe (2 Inch Diameter)	E-WAT-LATERAL-2inch
Existing Water Lateral/Pipe (3 Inch Diameter)	E-WAT-LATERAL-3inch
Existing Water Lateral/Pipe (4 Inch Diameter)	E-WAT-LATERAL-4inch
Existing Water Lateral/Pipe (6 Inch Diameter)	E-WAT-LATERAL-6inch
Existing Water Lateral/Pipe (8 Inch Diameter)	E-WAT-LATERAL-8inch
Existing Water Lateral Text	E-WAT-LATERAL-TXT
Existing Water Main/Pipe (No Size Provided)	E-WAT-MAIN
Existing Water Main/Pipe (10 Inch Diameter)	E-WAT-MAIN-10inch
Existing Water Main/Pipe (12 Inch Diameter)	E-WAT-MAIN-12inch
Existing Water Main/Pipe (16 Inch Diameter)	E-WAT-MAIN-16inch

Existing Water Main/Pipe (1 Inch Diameter)	E-WAT-MAIN-1inch
Existing Water Main/Pipe (2 Inch Diameter)	E-WAT-MAIN-2inch
Existing Water Main/Pipe (3 Inch Diameter)	E-WAT-MAIN-3inch
Existing Water Main/Pipe (4 Inch Diameter)	E-WAT-MAIN-4inch
Existing Water Main/Pipe (6 Inch Diameter)	E-WAT-MAIN-6inch
Existing Water Main/Pipe (8 Inch Diameter)	E-WAT-MAIN-8inch
Existing Water Main/Pipe Text	E-WAT-MAIN-TXT

5.1d Proposed Linework Conversion Set

Layer Description	Destination Layer
Proposed Building	P-BLDG
Proposed Building Text	P-BLDG-TXT
Proposed Boundary Parcel Tract	P-BND
Proposed Boundary Parcel Tract Text	P-BND-TXT
Proposed Boundary Adjoining Parcel	P-BND-ADJOIN
Proposed Boundary Adjoining Parcel Text	P-BND-ADJOIN-TXT
Proposed Road Centerline	P-ROAD-CL
Proposed Road Centerline Text (Street Name)	P-ROAD-CL-TXT
Proposed Curb	P-ROAD-CURB
Proposed Road Edge of Pavement	P-ROAD-PAVE
Proposed Sanitary Lateral/Pipe (No Size Provided)	P-SAN-LATERAL
Proposed Sanitary Lateral/Pipe (2 Inch Diameter)	P-SAN-LATERAL-2inch
Proposed Sanitary Lateral/Pipe (3 Inch Diameter)	P-SAN-LATERAL-3inch
Proposed Sanitary Lateral/Pipe (4 Inch Diameter)	P-SAN-LATERAL-4inch
Proposed Sanitary Lateral/Pipe (6 Inch Diameter)	P-SAN-LATERAL-6inch
Proposed Sanitary Lateral/Pipe (8 Inch Diameter)	P-SAN-LATERAL-8inch
Proposed Sanitary Lateral/Pipe Text	P-SAN-LATERAL-TXT
Proposed Sanitary Main/Pipe (No Size Provided)	P-SAN-MAIN
Proposed Sanitary Main/Pipe (4 Inch Diameter)	P-SAN-MAIN-4inch
Proposed Sanitary Main/Pipe (6 Inch Diameter)	P-SAN-MAIN-6inch
Proposed Sanitary Main/Pipe (8 Inch Diameter)	P-SAN-MAIN-8inch
Proposed Sanitary Main/Pipe (Force Main)	P-SAN-MAIN-FM

Proposed Sanitary Main/Pipe Text	P-SAN-MAIN-TXT
Proposed Sanitary Pump House Station	P-SAN-PUMP-STATION
Proposed Sanitary Pump House Station Text	P-SAN-PUMP-STATION-TXT
Proposed Water (Only) Easement	P-WAT-EASEMENT
Proposed Water (Only) Easement Text	P-WAT-EASEMENT-TXT
Proposed Water Lateral/Pipe (No Size Provided)	P-WAT-LATERAL
Proposed Water Lateral/Pipe (0.75 Inch Diameter)	P-WAT-LATERAL-0.75 inch
Proposed Water Lateral/Pipe (1.5 Inch Diameter)	P-WAT-LATERAL-1.5inch
Proposed Water Lateral/Pipe (1 Inch Diameter)	P-WAT-LATERAL-1inch
Proposed Water Lateral/Pipe (2 Inch Diameter)	P-WAT-LATERAL-2inch
Proposed Water Lateral/Pipe (3 Inch Diameter)	P-WAT-LATERAL-3inch
Proposed Water Lateral/Pipe (4 Inch Diameter)	P-WAT-LATERAL-4inch
Proposed Water Lateral/Pipe (6 Inch Diameter)	P-WAT-LATERAL-6inch
Proposed Water Lateral/Pipe (8 Inch Diameter)	P-WAT-LATERAL-8inch
Proposed Water Lateral/Pipe Text	P-WAT-LATERAL-TXT
Proposed Water Main/Pipe (No Size Provided)	P-WAT-MAIN
Proposed Water Main/Pipe (1 Inch Diameter)	P-WAT-MAIN-1inch
Proposed Water Main/Pipe (2 Inch Diameter)	P-WAT-MAIN-2inch
Proposed Water Main/Pipe (3 Inch Diameter)	P-WAT-MAIN-3inch
Proposed Water Main/Pipe (4 Inch Diameter)	P-WAT-MAIN-4inch
Proposed Water Main/Pipe (6 Inch Diameter)	P-WAT-MAIN-6inch
Proposed Water Main/Pipe (8 Inch Diameter)	P-WAT-MAIN-8inch
Proposed Water Main/Pipe (10 Inch Diameter)	P-WAT-MAIN-10inch
Proposed Water Main/Pipe (12 Inch Diameter)	P-WAT-MAIN-12inch
Proposed Water Main/Pipe (16 Inch Diameter)	P-WAT-MAIN-16inch

5.2 Linework Format

Linework for GIS conversion must be formatted differently than AutoCAD linework. Depending on the object type, there are different requirements:

1. Utility Linework should be broken at all intersecting objects.
2. Boundary, Parcel, and Tract Lines must be closed polygons (polylines).
 - See section 5.2b (below) for detailed instructions on how to take advantage of the AutoCAD “Boundary” command.
3. All remaining linework (Curbs, Building, Centerlines....) require no special format.

5.2a Examples - Utility Linework Format (water & sanitary)

Correct:

- Blue node (break point) at every intersecting point.
- Linework connects to the center of the objects and is created using a single line.

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.

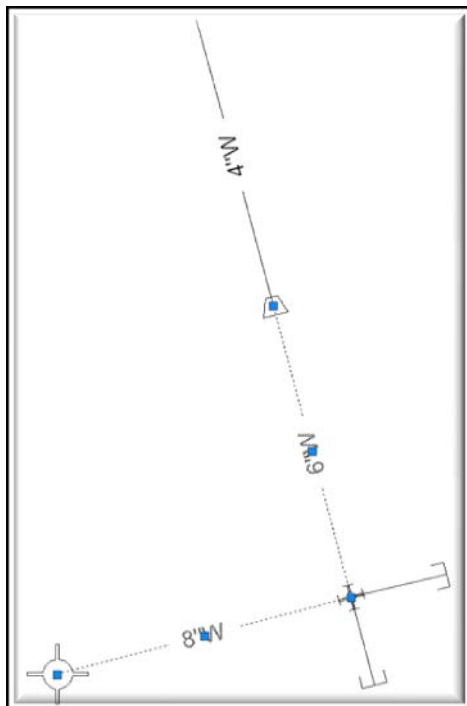
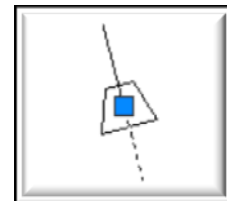
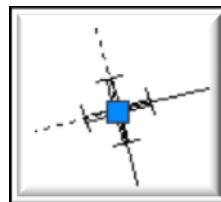


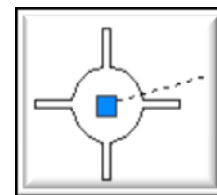
Figure - Overview



Reducer detail



Cross detail



Fire Hydrant detail

Incorrect:

- Bad intersecting points.
- Linework not connected to the center of objects.

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.

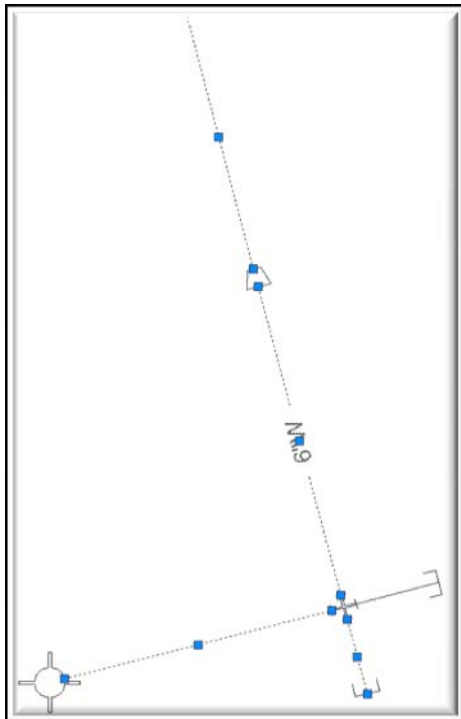
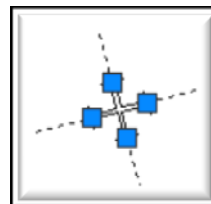
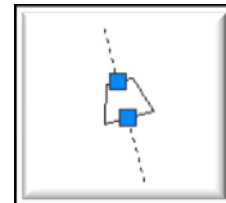


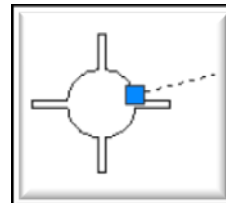
Figure - Overview



Cross detail



Reducer detail



Fire Hydrant detail

Correct:

- Blue node (break point) at every intersecting point.
- Linework connects to the center of the objects and is created using a single line.

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.

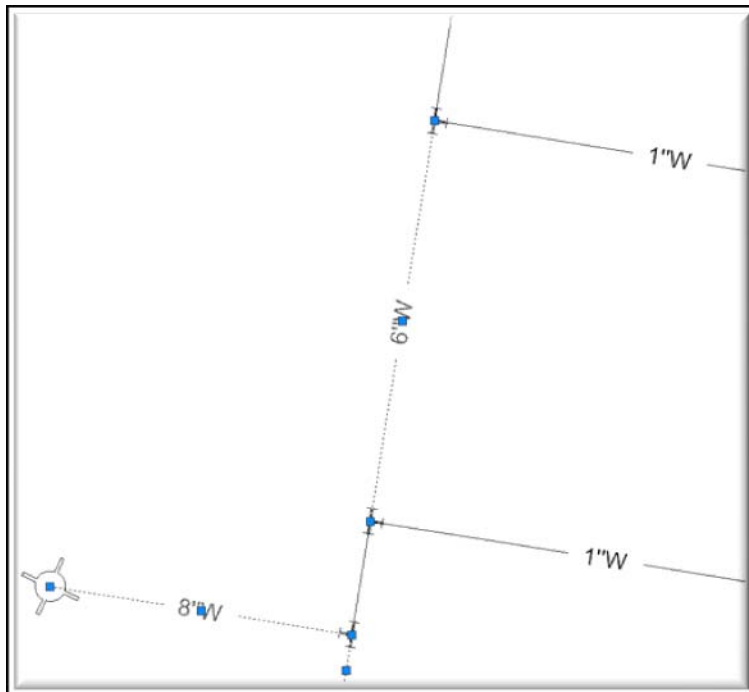
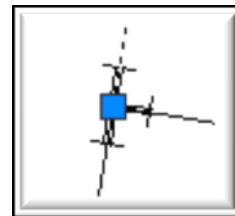
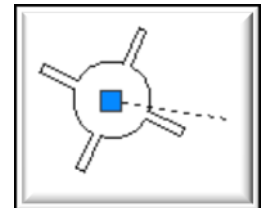


Figure - Overview



Tee detail



Fire Hydrant detail

Incorrect:

- No double lines showing pipe diameter.
- Linework not connected to the center of objects.

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.

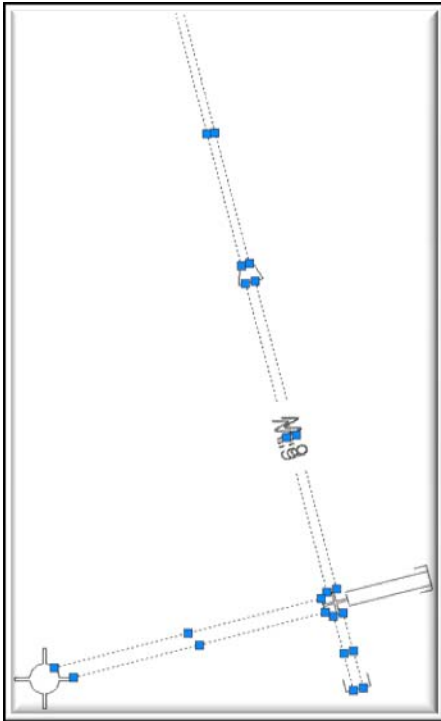
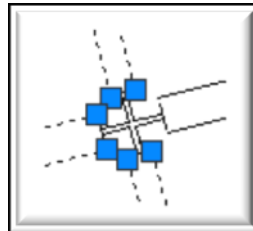
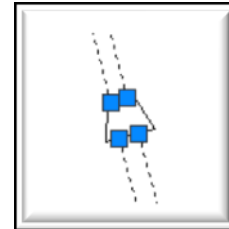


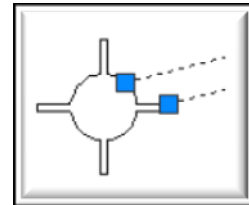
Figure - Overview



Cross detail



Reducer detail



Fire Hydrant detail

5.2b Examples - Boundary/Parcel/Tract Linework Format

Boundary, Parcel, and Tract Lines must be closed polygons (polylines). To create the closed polygon, New Jersey American Water recommends 2 different methods, depending on the current status of the linework within the design drawing(s). First, the Polyline Edit command will join the selected lines forming one continuous closed polygon. Second, the Boundary command will find the outside edge of any closed area converting it to a continuous polygon. See below for detailed instructions.

Polyline Edit Command

1. Within the design drawing, start the “Polyline Edit” command.
 - Drop-down “Modify > Object > Polyline”
 - Ribbon “Home tab > Modify panel”
 - Command Line Entry – Type “PE” or “PEDIT”
2. At the command line type “M” (for Multiple), select “Enter”.
3. In the drawing area, select drawing objects (lines and polylines), select “Enter”.
4. *Convert Line and Arcs to polyline [Yes/No]*, enter Yes, select “Enter”.
5. *Enter an option*, enter “J” (for Join), select “Enter”.
6. *Enter a fuzz distance*, leave default 0.0000, select “Enter”.
7. Press <Esc> on the keyboard to exit the command.

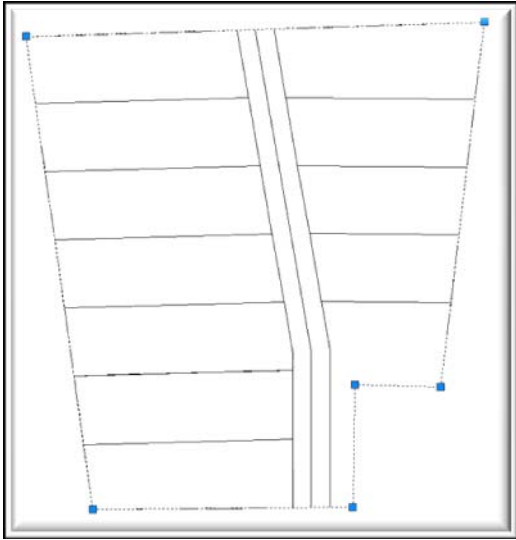
Boundary Command

1. Within the design drawing, start the “Boundary” command.
 - Drop-down “Draw > Boundary...”
 - Ribbon “Home tab > Draw panel”
 - Command Line Entry – Type “BO” or “BOUNDARY”
2. In the *Create Boundary* dialog box, select the icon next to “Pick Points”.
3. In the drawing area, select a point within a closed area.
4. Select “Enter”.

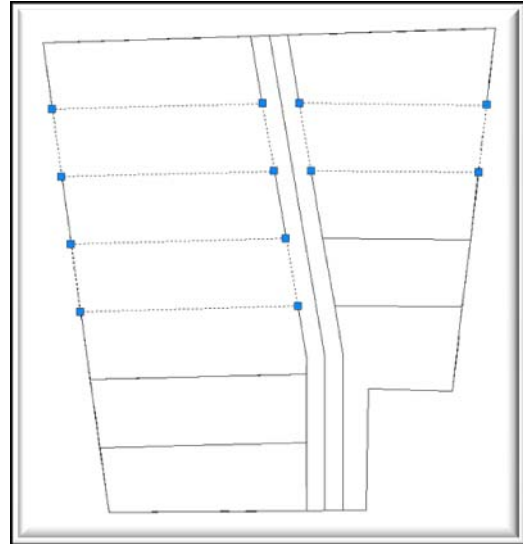
Correct :

- Existing boundary is a **closed** polygon/polyline (left side).
- Proposed lots are also **closed** polygons/polylines (right-side).

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.



Existing (outside boundary) - Overview

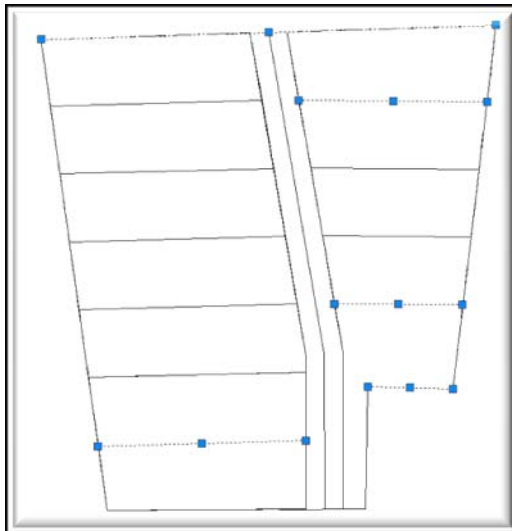


Proposed (inside parcels) - Overview

Incorrect:

- Both existing and proposed boundaries are broken into single line segments.

Refer to “New Jersey American Water Template.dwg” for detailed AutoCAD Examples.



Single line, not closed - Overview

6. Step 3 – Converting Block Objects (Structures)

6.1 Block Conversion

After all the linework has been converted to the proper New Jersey American Water layer and formatted (groomed) for GIS conversion, a block conversion should take place. The block conversion is a manual find-and-replace process. To alleviate this process, New Jersey American Water recommends using the provided blocks in your future design projects. All blocks that are required for the submission are provided within the “New Jersey American Water Template.dwg”. A chart below identifies all the block properties (block name, description, label, layer, and icon). New Jersey American Water recommends copying blocks from the provided chart (Inside the New Jersey American Water Template.dwg) to the designated location. The block layering color scheme relates to the “ONE CALL” system: Blue=Water, Red=Electric, Yellow=Gas.... The existing object colors are a pastel shade, while proposed object colors are bright and bold.

6.1a Block Naming Convention

Block names relate closely to the layering format used above, here are the block naming guidelines:

Field Status Indicator

E- Existing/Surveyed field objects

P- Proposed/Designed field objects

Major Object Class

x-COM- Structures only for communications cable, fiber, telephone, or similar

x-ELE- Structures only for electric, lighting, or similar

x-GAS- Structures only for gas, oil, steam, petroleum, or similar

x-SAN- Structures and pipes for sanitary sewer systems or similar


x-STM- Structures only for storm sewer systems, drains, or similar

x-WAT- Structures and pipes for water systems or similar








Minor Object Class

- x-xxxx -11.25- Water fitting 11.25 degree elbow*
- x-xxxx -22.5- Water fitting 2.5 degree elbow*
- x-xxxx -45- Water fitting 45 degree elbow*
- x-xxxx -90- Water fitting 90 degree elbow*
- x-xxxx -BLOWOFF- Water structure pressure relieve*
- x-xxxx -CB- Stormwater catch basin /inlet*
- x-xxxx -CO- Sanitary cleanout*
- x-xxxx -CROSS- Water fitting 4 way pipe intersection*
- x-xxxx -FH- Water structure fire hydrant*
- x-xxxx -GM- Gas meter*
- x-xxxx -GV- Gas valve*
- x-xxxx -HW- Stormwater headwall or endwall*
- x-xxxx -ID- Use this block to identify noteworthy, meaningful, significant, miscellaneous objects related to the major class*
- x-xxxx -LP- Light pole*
- x-xxxx -METER PIT- Underground water meter pit*
- x-xxxx -MH- Manholes for communications, electric, gas, sanitary, storm, and water*
- x-xxxx -METER PIT- Underground water meter pit*
- x-xxxx -PLUG- Water fitting end cap*
- x-xxxx -REDUCER- Water fitting pipe size reducer*
- x-xxxx -TAP&SLEEVE- Water fitting connection to existing water main*
- x-xxxx -TEE- Water fitting 3 way pipe intersection*
- x-xxxx -UP- Utility pole*
- x-xxxx -WM- Water meter*
- x-xxxx -WV- Water valve*





6.1b Existing Block Chart














Block Name	Desc.	Block Label	Label Layer	Block Layer	Drawing icon with label
E-WAT-11.25	Existing Water 11.25 degree elbow	E-11.25°	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-11.25°
E-WAT-22.5	Existing Water 22.5 degree elbow	E-22.5°	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-22.5°
E-WAT-45	Existing Water 45 degree elbow	E-45°	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-45°
E-WAT-90	Existing Water 90 degree elbow	E-90°	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-90°
E-WAT-BLOWOFF	Existing Water Blowoff	E-BLWF	E-WAT-VALVE -TXT	E-WAT-VALVE	 E-BLWF
E-WAT-CROSS	Existing Water Cross	E-CRS	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-CRS
E-WAT-FH	Existing Fire Hydrant	E-FH	E-WAT-STRUCTURE-TXT	E-WAT-STRUCTURE	 E-FH
E-WAT-PLUG	Existing Water Plug	E-PLG	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-PLG
E-WAT-REDUCER	Existing Water Reducer	E-RDC	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-RDC
E-WAT-TEE	Existing Water Tee	E-TEE	E-WAT-FITTINGS-TXT	E-WAT-FITTING	 E-TEE
E-WAT-TAP&SLEEVE	Existing Water Tap Valve	E-TPV	E-WAT-VALVE -TXT	E-WAT-VALVE	 E-TPV
E-WAT-	Existing Water	E-WV	E-WAT-	E-WAT-	 E-WV















WV	Valve		VALVE -TXT	VALVE	
E-WAT-MH	Existing Water Manhole	E-WAT MH RIM INV IN INV OUT	E-WAT-MH-TXT	E-WAT-MH	 E-WAT-MH ID: RIM:300 INV IN:296 INV IN:297 INV OUT:295
E-WAT-WM	Existing Water Meter	E-WM	E-WAT- STRUCTURE-TXT	E-WAT- STRUCTURE	 E-WM
E-WAT-METER-PIT	Existing Water Meter Pit	E-WTP	E-WAT- STRUCTURE-TXT	E-WAT- STRUCTURE	 E-WTP
E-SAN-CO	Existing Sanitary Cleanout	E-SANCO	E-SAN- STRUCTURE-TXT	E-SAN- STRUCTURE	 E-SANCO
E-SAN-ID	Existing Sanitary Marker	E-SANCO	E-SAN- STRUCTURE-TXT	E-SAN- STRUCTURE	 E-SANID
E-SAN-MH	Existing Sanitary Manhole	E-SAN MH RIM INV IN INV OUT	E-SAN-MH-TXT	E-SAN-MH	 E-SAN-MH ID: RIM:300 INV IN:297 INV IN:296 INV OUT:295
E-GAS-ID	Existing Gas Marker	E-GID	E-GAS- STRUCTURE-TXT	E-GAS- STRUCTURE	 E-GID
E-GAS-GM	Existing Gas Meter	E-GM	E-GAS- STRUCTURE-TXT	E-GAS- STRUCTURE	 E-GM
E-GAS-MH	Existing Gas Manhole	E-GAS MH	E-GAS- STRUCTURE-TXT	E-GAS- STRUCTURE	 E-GAS MH
E-GAS-GV	Existing Gas Valve	E-GV	E-GAS- STRUCTURE-TXT	E-GAS- STRUCTURE	 E-GV
E-STM-CB	Existing Storm Catch Basin	E-STM CB	E-STM- STRUCTURE-TXT	E-STM- STRUCTURE	 E-STM CB
E-STM-HW	Existing Storm Headwall	E-STM HW	E-STM- STRUCTURE-TXT	E-STM- STRUCTURE	 E-STM HW
E-STM-ID	Existing Storm Marker	E-STM ID	E-STM- STRUCTURE-TXT	E-STM- STRUCTURE	 E-STM ID


E-STM-MH	Existing Storm Manhole	E-STM MH	E-STM-STRUCTURE-TXT	E-STM-STRUCTURE	 E-STM MH
E-ELE-LP	Existing Electric Light Pole	E-LP	E-ELE-STRUCTURE-TXT	E-ELE-STRUCTURE	 E-LP
E-ELE-ID	Existing Electric Marker	E-ELEID	E-ELE-STRUCTURE-TXT	E-ELE-STRUCTURE	 E-ELEID
E-ELE-MH	Existing Electric Manhole	E-ELE MH	E-ELE-STRUCTURE-TXT	E-ELE-STRUCTURE	 E-ELE MH
E-ELE-UP	Existing Electric Utility Pole	E-UP	E-ELE-STRUCTURE-TXT	E-ELE-STRUCTURE	 E-UP
E-COM-ID	Existing Communication Marker	E-COMID	E-COM-STRUCTURE-TXT	E-COM-STRUCTURE	 E-COMID
E-COM-MH	Existing Communication Manhole	E-COM MH	E-COM-STRUCTURE-TXT	E-COM-STRUCTURE	 E-COM MH

6.1c Proposed Block Chart

Block Name	Desc.	Block Label	Label Layer	Block Layer	Block icon
P-WAT-11.25	Proposed Water 11.25 degree elbow	P-11.25°	P-WAT-FITTINGS-TXT	E-WAT-FITTING	 P-11.25°
P-WAT-22.5	Proposed Water 22.5 degree elbow	P-22.5°	P-WAT-FITTINGS-TXT	E-WAT-FITTING	 P-22.5°
P-WAT-45	Proposed Water 45 degree elbow	P-45°	P-WAT-FITTINGS-TXT	E-WAT-FITTING	 P-45°
P-WAT-90	Proposed Water 90 degree elbow	P-90°	P-WAT-FITTINGS-TXT	E-WAT-FITTING	 P-90°

P-WAT-BLOWOFF	Proposed Water Blowoff	P-BLWF	P -WAT-VALVE -TXT	P -WAT-VALVE	 P-BLWF
P-WAT-CROSS	Proposed Water Cross	P -CRS	P -WAT-FITTINGS-TXT	P -WAT-FITTING	 P-CRS
P-WAT-FH	Proposed Fire Hydrant	P -FH	P -WAT-STRUCTURE-TXT	P -WAT-STRUCTURE	 P-FH
P-WAT-PLUG	Proposed Water Plug	P -PLG	P -WAT-FITTINGS-TXT	P -WAT-FITTING	 P-PLG
P-WAT-REDUCER	Proposed Water Reducer	P -RDC	P -WAT-FITTINGS-TXT	P -WAT-FITTING	 P-RDC
P-WAT-TEE	Proposed Water Tee	P -TEE	P -WAT-FITTINGS-TXT	P -WAT-FITTING	 P-TEE
P-WAT-TAP&SLEEVE	Proposed Water Tap Valve	P -TPV	P -WAT-VALVE -TXT	P -WAT-VALVE	 P-TPV
P-WAT-WV	Proposed Water Valve	P -WV	P -WAT-VALVE -TXT	P -WAT-VALVE	 P-WV
P-WAT-MH	Proposed Water Manhole	P -WAT MH RIM INV IN INV OUT	P -WAT-MH-TXT	P -WAT-MH	 P-WAT-MH ID: RIM:300 INV IN:298 INV IN:297 INV OUT:295
P-WAT-WM	Proposed Water Meter	P -WM	P -WAT-STRUCTURE-TXT	P -WAT-STRUCTURE	 P-WM
P-WAT-METER-PIT	Proposed Water Meter Pit	P -WTP	P -WAT-STRUCTURE-TXT	P -WAT-STRUCTURE	 P-WTP
P-SAN-CO	Proposed Sanitary Cleanout	P -SANCO	P -SAN-STRUCTURE-TXT	P -SAN-STRUCTURE	 P-SANCO
P-SAN-ID	Proposed Sanitary Marker	P -SANCO	P -SAN-STRUCTURE-TXT	P -SAN-STRUCTURE	 P-SANID

P-SAN-MH	Proposed Sanitary Manhole	P -SAN MH RIM INV IN INV OUT	P -SAN-MH-TXT	P -SAN-MH	 P-SAN-MH ID: RIM:300 INV IN:297 INV IN:296 INV OUT:295
P-GAS-ID	Proposed Gas Marker	P -GID	P -GAS- STRUCTURE-TXT	P -GAS- STRUCTURE	 P-GID
P-GAS-GM	Proposed Gas Meter	P -GM	P -GAS- STRUCTURE-TXT	P -GAS- STRUCTURE	 P-GM
P-GAS-MH	Proposed Gas Manhole	P -GAS MH	P -GAS- STRUCTURE-TXT	P -GAS- STRUCTURE	 P-GAS MH
P-GAS-GV	Proposed Gas Valve	P -GV	P -GAS- STRUCTURE-TXT	P -GAS- STRUCTURE	 P-GV
P-STM-CB	Proposed Storm Catch Basin	P -STMCB	P -STM- STRUCTURE-TXT	P -STM- STRUCTURE	 P-STMCB
P-STM-HW	Proposed Storm Headwall	P - STMHW	P -STM- STRUCTURE-TXT	P -STM- STRUCTURE	 P-STMHW
P-STM-ID	Proposed Storm Marker	P -STMID	P -STM- STRUCTURE-TXT	P -STM- STRUCTURE	 P-STMID
P-STM-MH	Proposed Storm Manhole	P -STM MH	P -STM- STRUCTURE-TXT	P -STM- STRUCTURE	 P-STM MH
P-ELE-LP	Proposed Electric Light Pole	P -LP	P -ELE- STRUCTURE-TXT	P -ELE- STRUCTURE	 P-LP
P-ELE-ID	Proposed Electric Marker	P -ELEID	P -ELE- STRUCTURE-TXT	P -ELE- STRUCTURE	 P-ELEID
P-ELE-MH	Proposed Electric Manhole	P -ELE MH	P -ELE- STRUCTURE-TXT	P -ELE- STRUCTURE	 P-ELE MH
P-ELE-UP	Proposed Electric Utility Pole	P -UP	P -ELE- STRUCTURE-TXT	P -ELE- STRUCTURE	 P-UP
P-COM-ID	Proposed Communication Marker	P -COMID	P -COM- STRUCTURE-TXT	P -COM- STRUCTURE	 P-COMID

P-COM-MH	Proposed Communication Manhole	P -COM MH	P -COM-STRUCTURE-TXT	P -COM-STRUCTURE	 P-COM MH
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7. Step 4 - Object Labeling

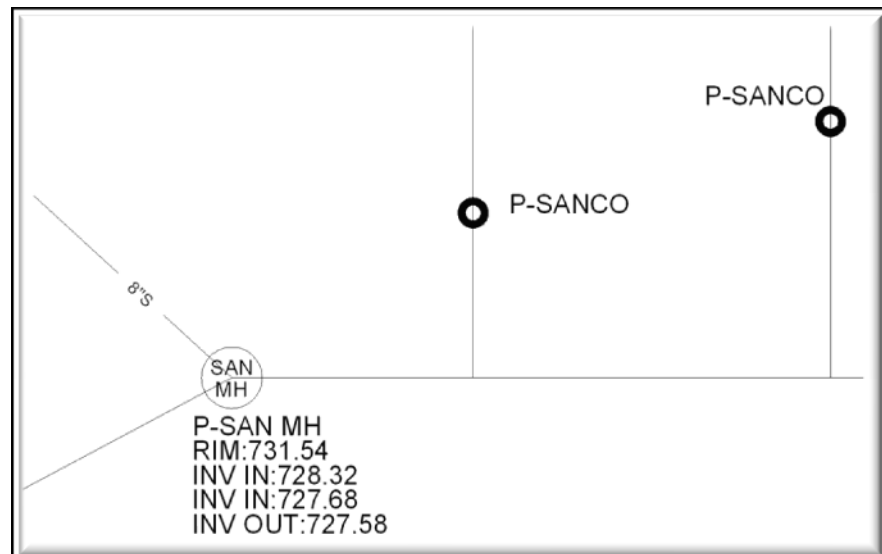
As mentioned previously in the document, water and sanitary require the highest level of detail available, see detailed sections below for labeling water and sanitary utilities. Furthermore, street names and property boundaries, tract, and parcel information (block and lot numbers **only**) are also required in the submitted drawing. Within the “New Jersey American Water Template.dwg” the text style “Standard” is provided and should be the only text style used. New Jersey American Water recommends adding labels by copying them from the provided chart (Inside the New Jersey American Water Template.dwg) to the destination location, and then entering required sizes, types, slopes...

One thing to keep in mind, the submitted drawing(s) is required for an AutoCAD to GIS conversion. Although appearance should still remain important, it should not be crucial. These drawings need to be functional before visually pleasing. Text should be formatted as instructed in the sections below but text height is not crucial. All labeling should be in model space **only**.

7.1 Utility Structure Labeling

The required structure label types for water /sanitary:

1. MH Types
2. Rim Elevation
3. Inverts in
4. Invert out
5. Material
6. Sizes
7. Depths

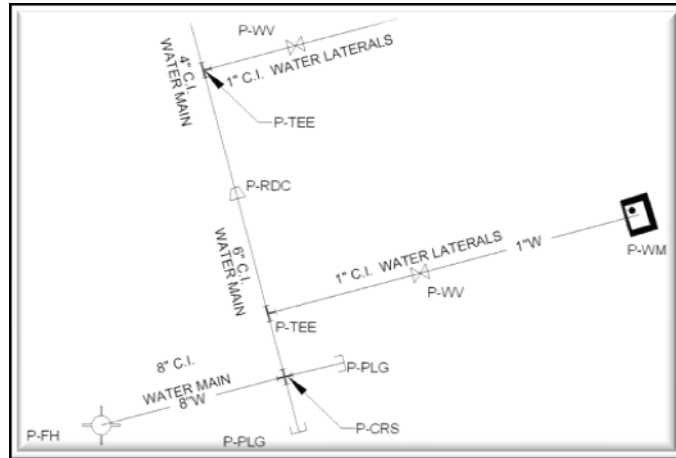


All other typical blocks have a default tag provided in the AutoCAD block chart. These typical blocks do not require any further labeling.

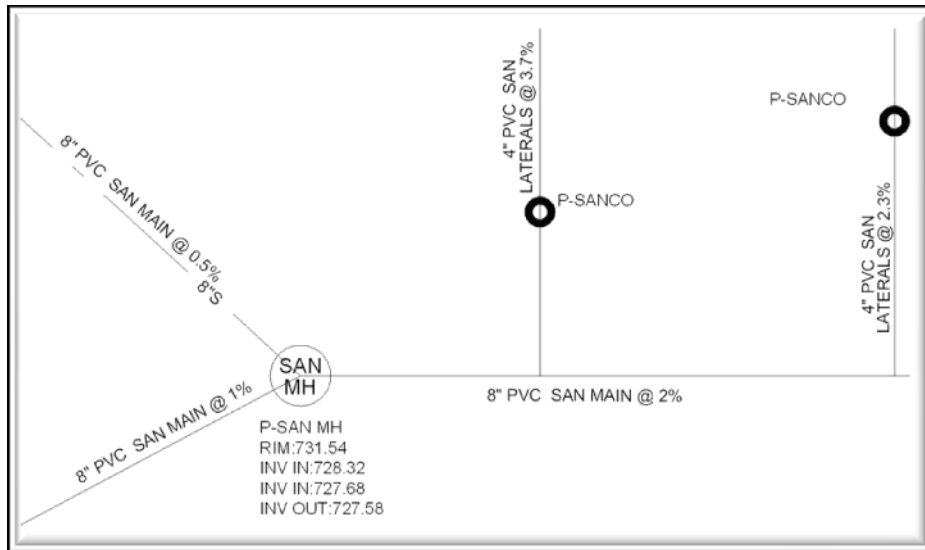
7.2 Utility Line Labeling

The required line label types for water /sanitary:

1. Size
2. Type
3. Slope



Water Line Labeling - Overview

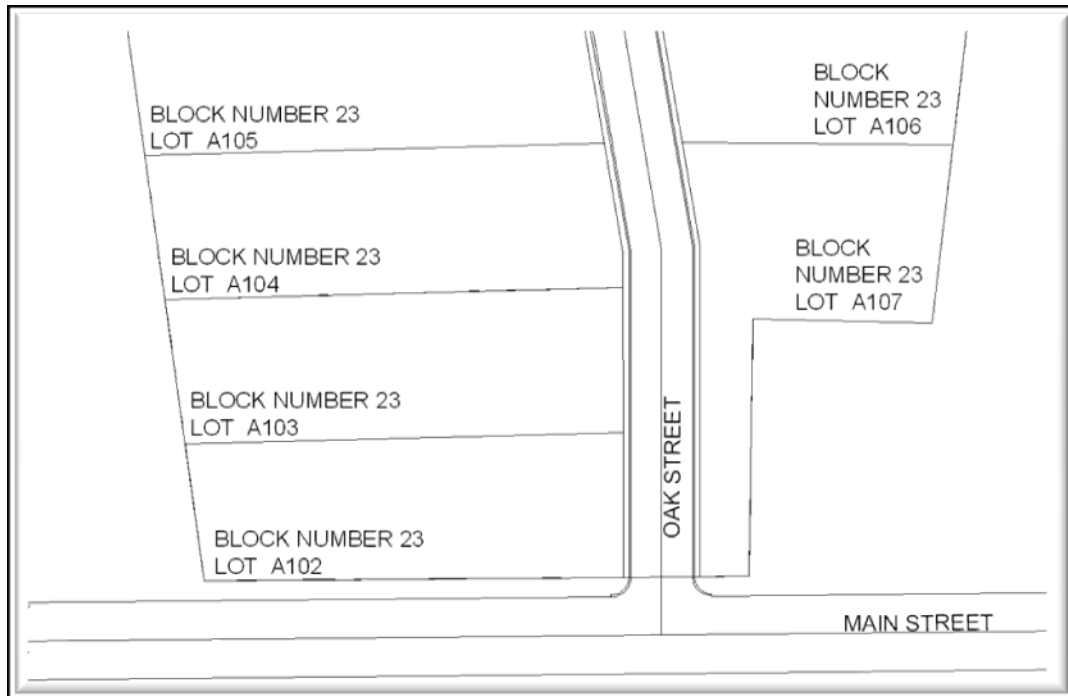


Sanitary Line Labeling - Overview

7.3 Boundary and Street Labeling

The required label types for boundary, tract, and parcels:

1. Block Numbers
2. Lot Numbers
3. Street Names



Boundary and Street - Overview

8. Step 5 – Block Attribute Updates

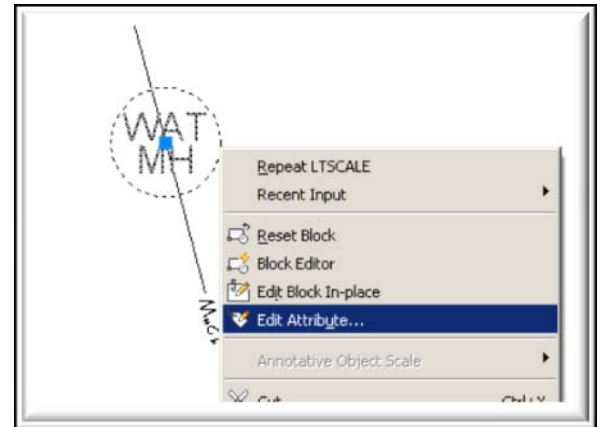
After blocks and labels are located, the next and final step is to update the attributed blocks. Attributes are placed inside the blocks definitions. There are 6 different objects that require attribute editing: Water Valves, Water Tapping Valves, Water Blowoffs, Water Hydrants, Water Manholes, and Sanitary Manholes. There are many different types of information needed Feature IDs, Rim Elevation, Inv In, Inv Out, see below for attribute editing process.

8.1 Editing Attributed Block Data

Instructions for block attribute editing:

1. To open the attribute editor

- a. Double click the block of interest
or
- b. Select block of interest, right-click, select "Edit Attribute..."
2. Once the Attribute Editor is open
 - a. Select the "Attribute" tab
 - b. Under "Tag" highlight (Select) attribute of interest
 - c. Enter required Information in the "Value:" Area
 - d. Select "OK" button



Access Attribute Editor

Water Valves

- Feature ID

Water Tapping Valves

- Feature ID

Water Blowoffs

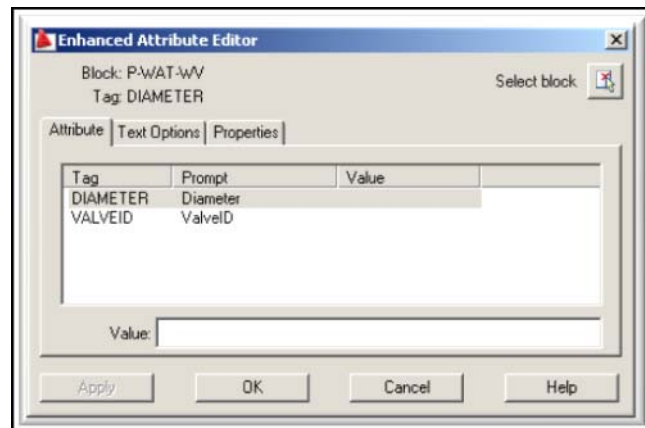
- Feature ID

Water Hydrants

- Feature ID

Sanitary and Water Manholes

- Feature ID
- Rim Elevation
- Inv In
- Inv Out



Attribute Editor

9. Step 6 – Drawing Cleanup & File Format

After all drawing(s) have been converted to the above standards, a cleanup process and file format change should take place.

9.1 Delete all Tables, Charts, and Examples

Within the final drawing(s), all provided New Jersey American Water tables, charts, and examples should be deleted prior to submitting.

9.2 Purge the Drawing

After all tables, chart, and examples are deleted, the “Purge” command should be run.

1. Start the “Purge” command
 - Drop-down “File > Drawing Utilities > Purge”
 - Ribbon “Tools tab > Drawing Utilities panel”
 - Command Line Entry – Type “PU” or “Purge”
2. In the Purge dialog box, select “Purge All”
3. In the *Purge – Confirm Purge* dialog box, select Purge All Items

Note: The purge command should be run multiple times, purging all unnecessary data from the drawing(s).

9.3 Drawing File Format

All submitted drawings must be in the AutoCAD file format 2007 or earlier (2004, 2000...). Depending on your current AutoCAD version, a file format transformation may need to take place. If your company’s AutoCAD is 2010 or greater a Save As (AutoCAD 2007 Drawing (*.dwg)) will need to happen prior to sumitting the drawing(s).

1. Start the “Save As” command
 - Drop-down “File > Save As...”
 - Command Line Entry – Type “SaveAs”
2. In the *Save Drawing As* dialog box, change the “Files of Type” to AutoCAD 2007 Drawing (*.dwg).
3. Click “Save”.

10. Summary

Here at New Jersey American Water, we value your time and appreciate your business. For your convenience we designed this step-by-step process to format AutoCAD for GIS conversion to make it as easy as possible.

11. Included AutoCAD Files

11.1 Printing

Included within the New Jersey American Water Template package you will find the “American_Water.ctb” file. The American_Water.ctb file controls the line thickness for printing depending on colors applied in the drawing. After the conversion has been completed, please use the “American_Water.ctb” pen table for printing check plots.

11.2 Linetypes

Included within the New Jersey American Water Template package you will find the “American_Water.lin”. This file is used to load custom linetypes into new drawing files.

Contact Information

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213 Carriage Lane
Delran, NJ 08075
856-824-2596