

DIGITAL SUBMISSION
STANDARD OPERATING PROCEDURE
for
CITY OF ROSWELL



WKD NO. 20200057.00.AT

May 2020

The City of Roswell, Ga (City) has decided to incorporate Geographic Information Systems (GIS) to manage its stormwater, utility & various other data. This will enable all departments within the City to share data thru network sharing or web access. This sharing allows for easy planning among all departments for the future while providing a central location for existing data. Construction documents provided to the City in Computer Aided Design (CAD) must be converted to shapefiles in order to load into their GIS database. A shapefile is a form of data storage that supports a point, line/polyline or polygon. Once created in AutoCAD they can then be imported into GIS. The purpose of this Standard Operating Procedure (SOP) is to provide the necessary guidance for survey or engineering firms with accomplishing the CAD to GIS conversion. There are 2 ways to convert CAD data to GIS shapefiles:

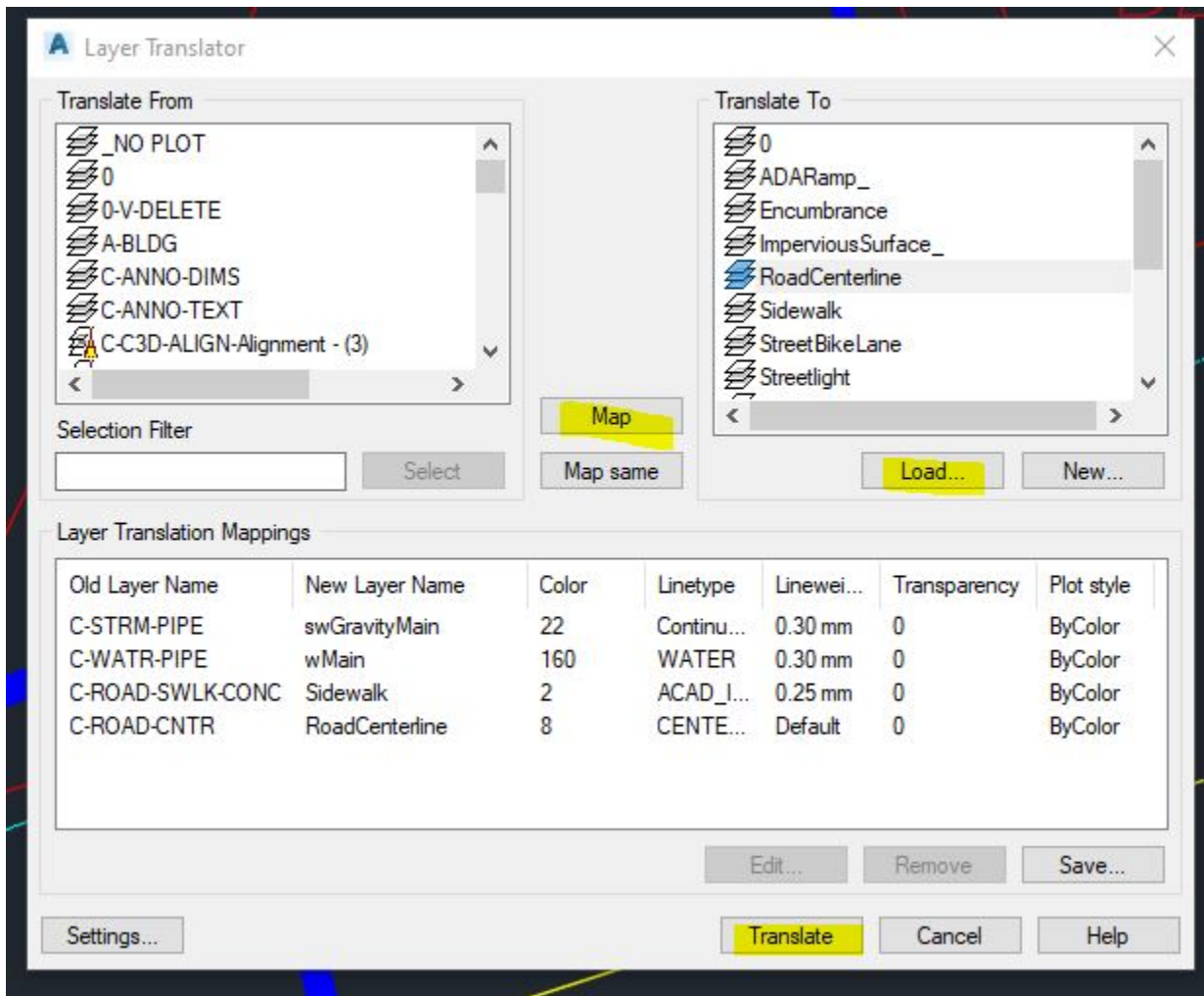
1. Attach attribute data to the objects using an object data table and then export to shapefile or
2. Export to shapefiles the attributes created by Building Information Modeling (BIM) data using Spatial Data Files (sdf) that are exclusive to AutoCAD. A pipe network is an example of BIM data.

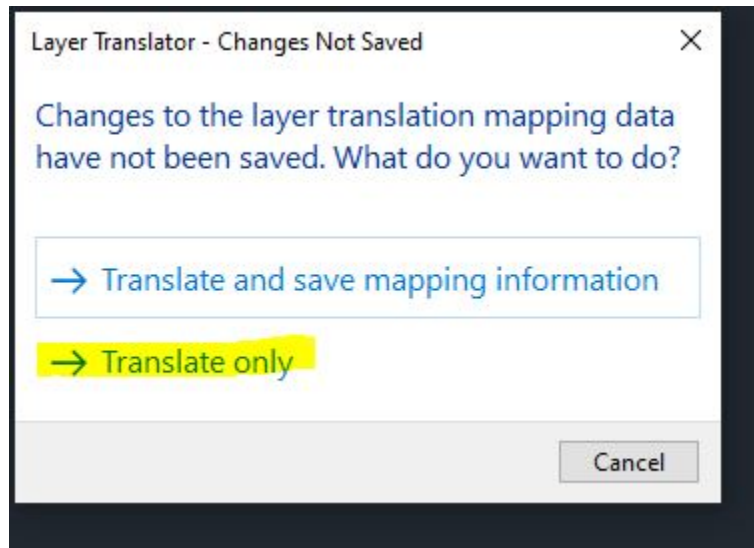
In this SOP we will address the conversion using option 1, attaching attribute data.

The City will provide a template (RoswellDigitalSubmittal.dwt) and a drawing standards file (RoswellDigitalSubmittal.dws) that will aide in the conversion process. For submittal purposes, only the model tab in the Cad drawing is needed. The drawing should be stripped of all external reference (xref's) data. Only the layers that will be submitted should remain in the drawing. These layer names and types are as follows:

- Water Layers
 - wMain – Line
 - wFitting – Point
 - wSystemValve – Point
 - wHydrant – Point
 - wServiceConnection -Point
- Storm Water Layers
 - swGravityMain – Line
 - swNetworkStructure – Point
- Transportation Layers
 - Sidewalk – Line (Centerline)
 - RoadCenterline – Line
 - StreetBikeLane – Line
 - ADA Ramp – Point
 - Streetlight – Point
 - ImperviousSurface – Polygon
- Encumbrance Layer – Polygon

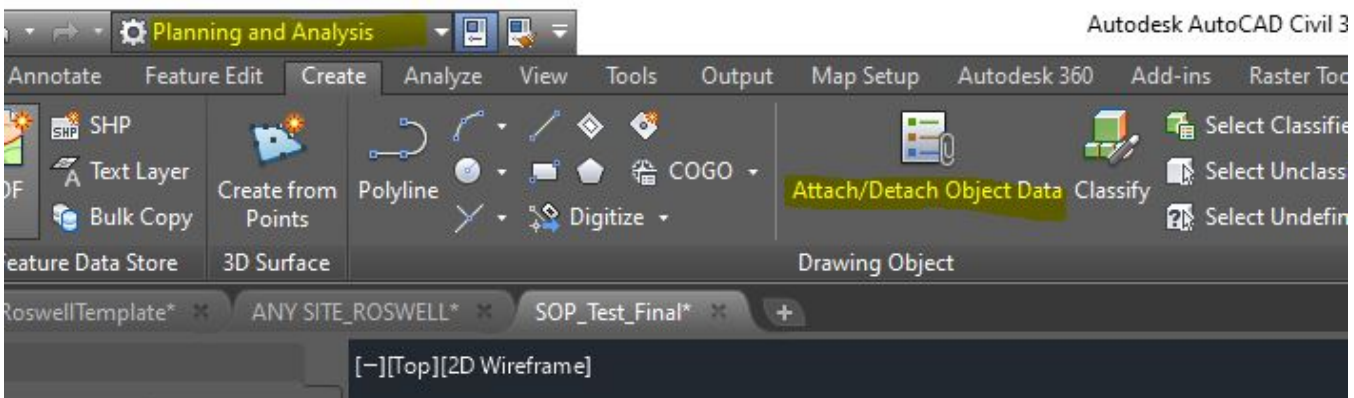
If the layers in your drawing do not match the layer names required above, the command LAYTRANS (ribbon: Manage Tab -CAD Standards – Layer Translator) will allow for layer conversion. On the left side of the dialog box are the layers currently in your drawing. On the right side of the dialog box, Translate To, load the dws file. Once loaded, the Translate To box will contain the Roswell standard layers. Select the drawing layer, then the layer to translate to, and then select Map. The layers will show in the Layer Translation Mappings box. You also have the option to save this mapping for future conversions. When all layers have been mapped, select translate, then translate only.



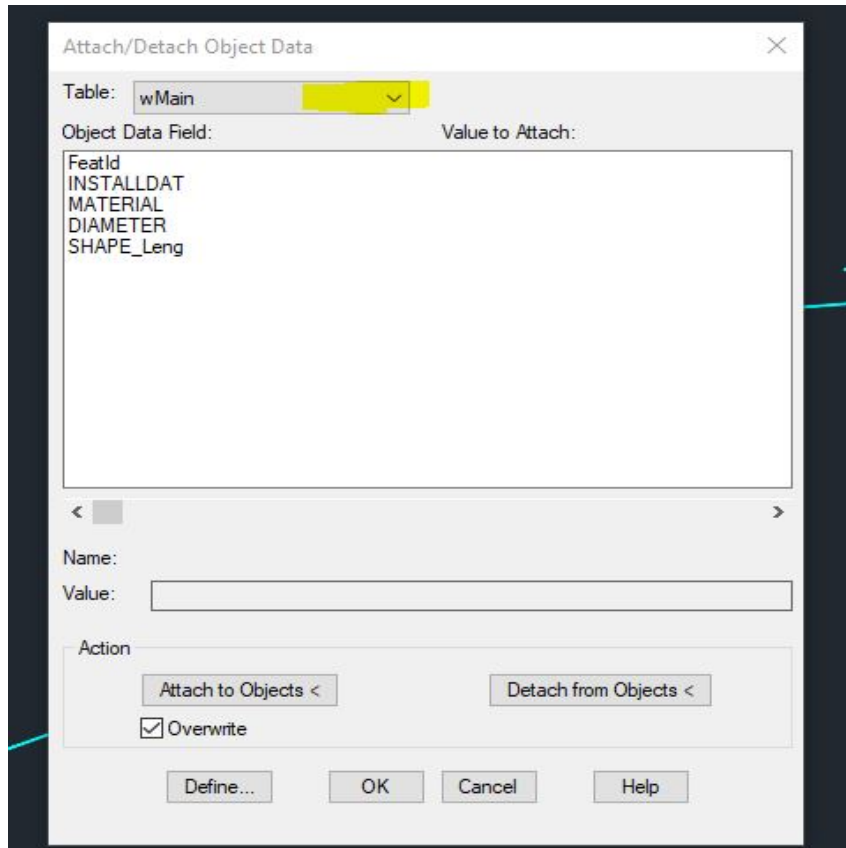


The layers in the drawing have now been renamed to the required layers. Save your drawing. Open the template file (.dwt). Insert the saved drawing file, Insert tab or type Insert on command line, then save the .dwt as a .dwg file. Do not save the template file. This will insert the object data templates into the submittal drawing and preserve the template file for future use.

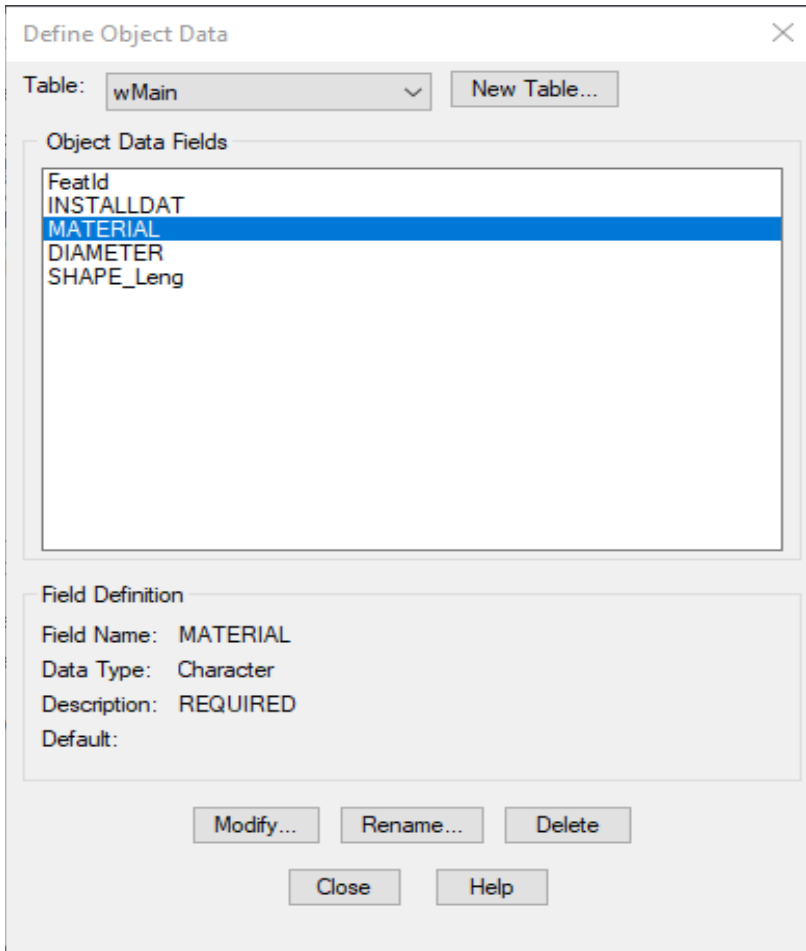
Isolate the layers one at a time, for this submittal we will use the wMain layer as an example. Once isolated use the command ADEATTACHDATA (ribbon: switch to Planning and Analysis Workspace – Create – Attach/Detach Object Data). Note: All commands can be typed on command line in Civil 3d workspace or using the ribbon in the Planning & Analysis Workspace.

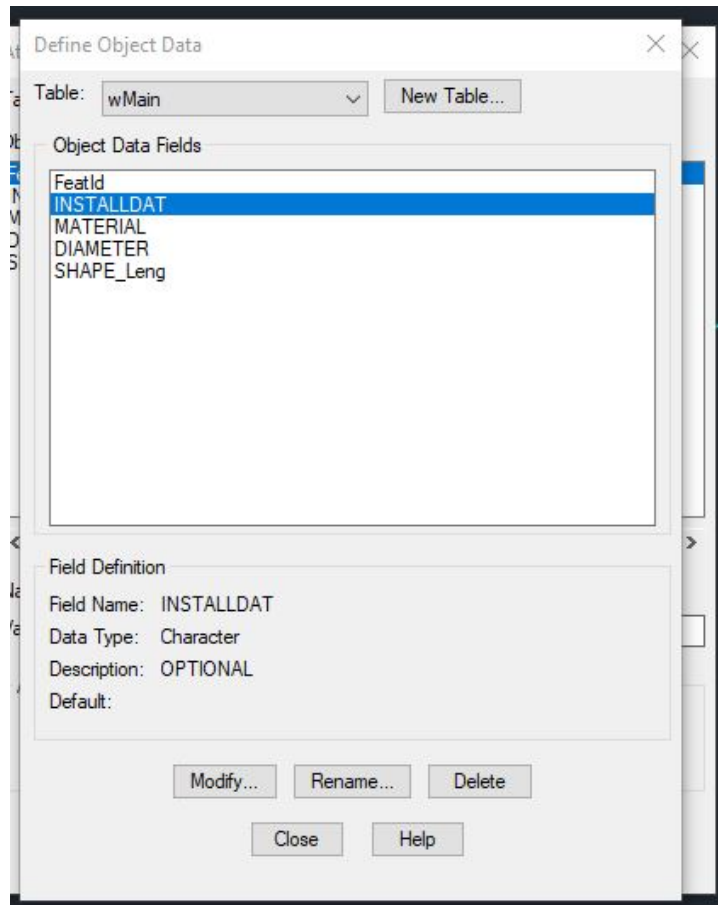


Select the table you want to attach data.

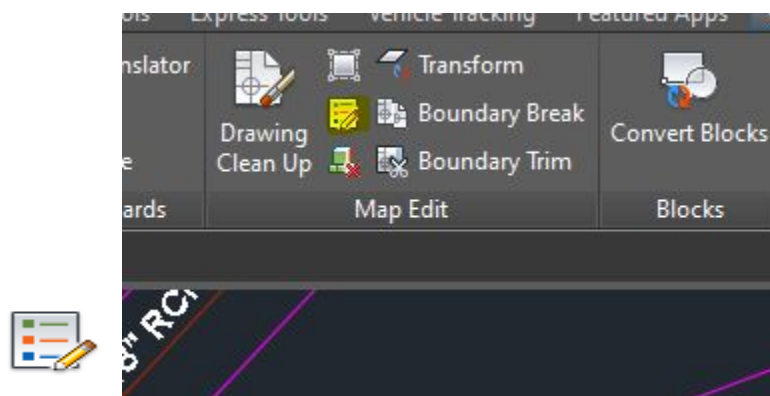


Select "Attach to Objects", then select all the mains. The command line will show the number of objects the data table attached. Notice the data field list, select a field, the Description will indicate if the attribute data is required or optional.

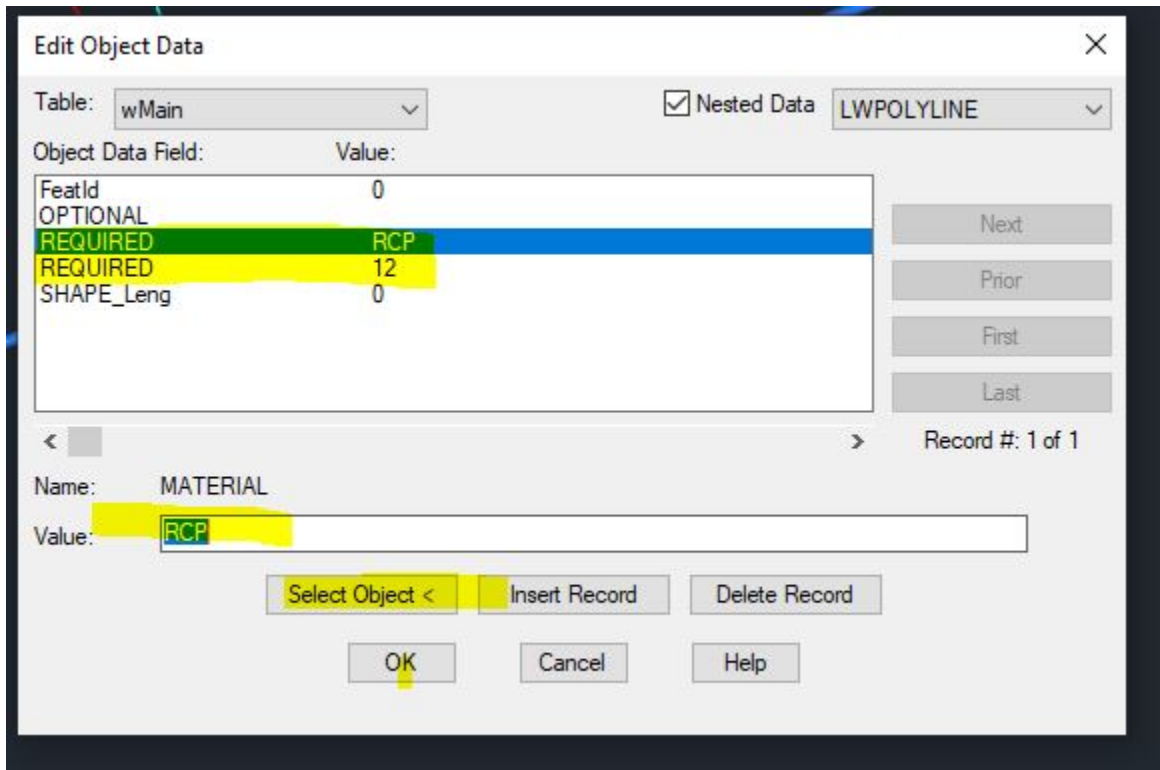




After attaching the table to the objects, the command ADEEDITDATA (ribbon: Tools – MapEdit) is used to attach the data.



Once the objects are selected, the attribute data can be added. After each value is added, select object, OK, finishes the record.



These can be done individually or if multiple objects have the same values, they can all be applied at once. Table 1-1 shows the list of water line & storm pipe materials required by the City. Continue this procedure until all layers have been populated with the attribute data. Optionally the data can be populated thru the properties dialog box.

PROPERTIES

Polyline

General

Color	ByLayer
Layer	C-WATR-DOMW-PIPE
Linetype	ByLayer
Linetype scale	0
Plot style	ByColor
Lineweight	ByLayer
Transparency	ByLayer
Hyperlink	
Thickness	0

3D Visualization

Material	ByLayer
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Geometry

Current Vertex	1
Vertex X	2242708
Vertex Y	1471119
Start segment width	0
End segment width	0
Global width	0
Elevation	0
Area	5554
Length	284

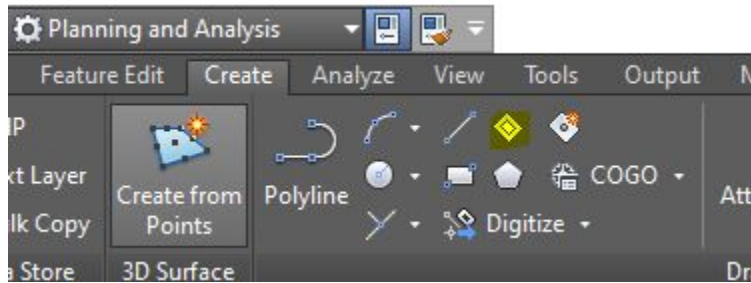
Misc

Closed	No
Linetype generation	Enabled

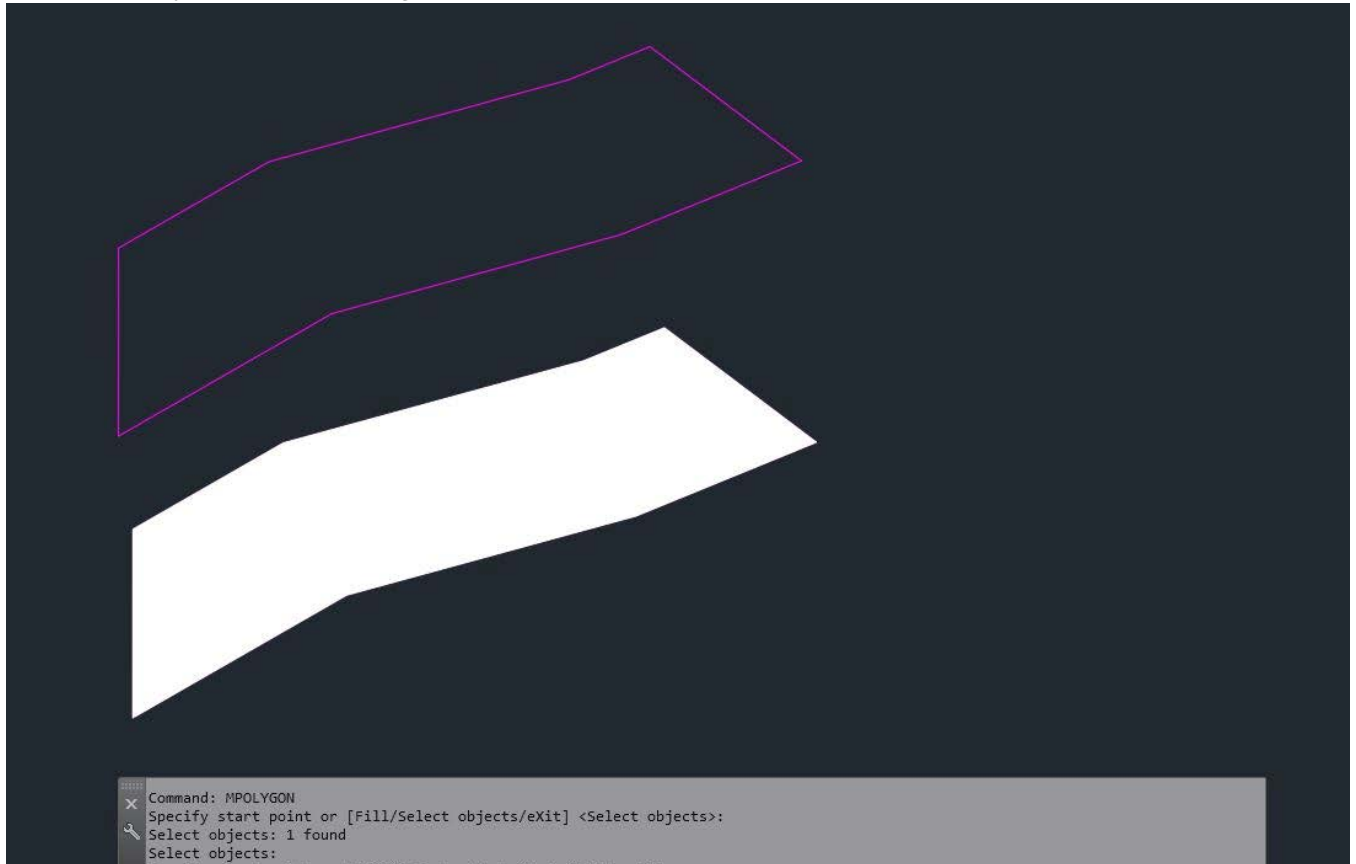
OD:wMain

FeatId	0
INSTALLDAT	
MATERIAL	
DIAMETER	0
SHAPE_Leng	0

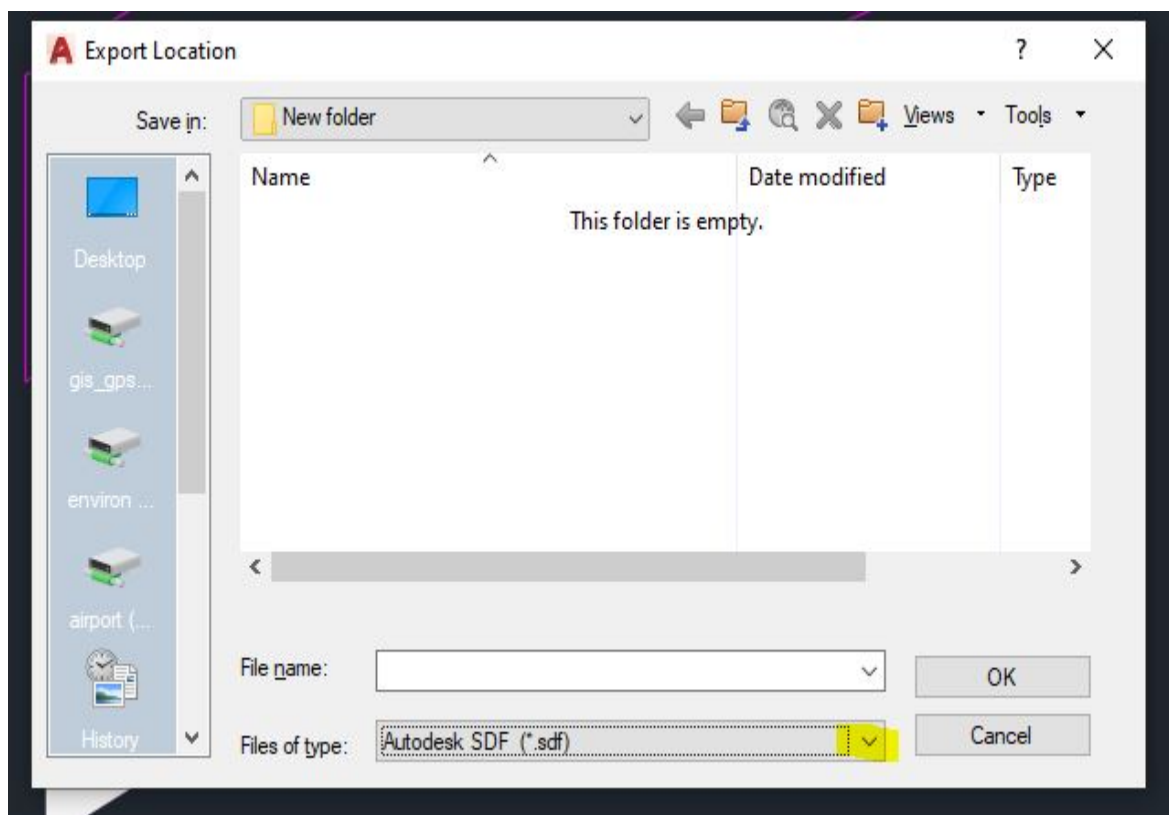
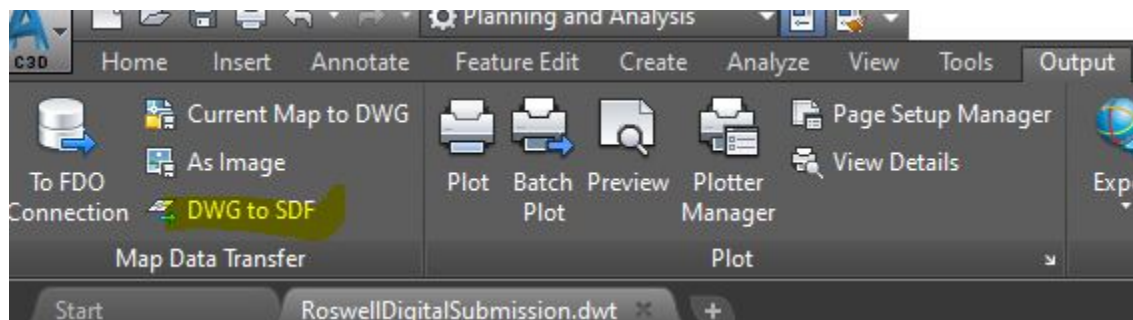
As previously mentioned, shapefiles can be either lines/polylines, points or polygons. For polygon types, a closed polyline must be converted to a mpolygon in order to create the shapefile. The Encumbrance & Impervious Surface layers are polygons. We will use Encumbrance for demonstration. Once again layer isolation will be used to create the files. After isolation, the command MPOLYGON (ribbon: Create - Mpolygon) is used.



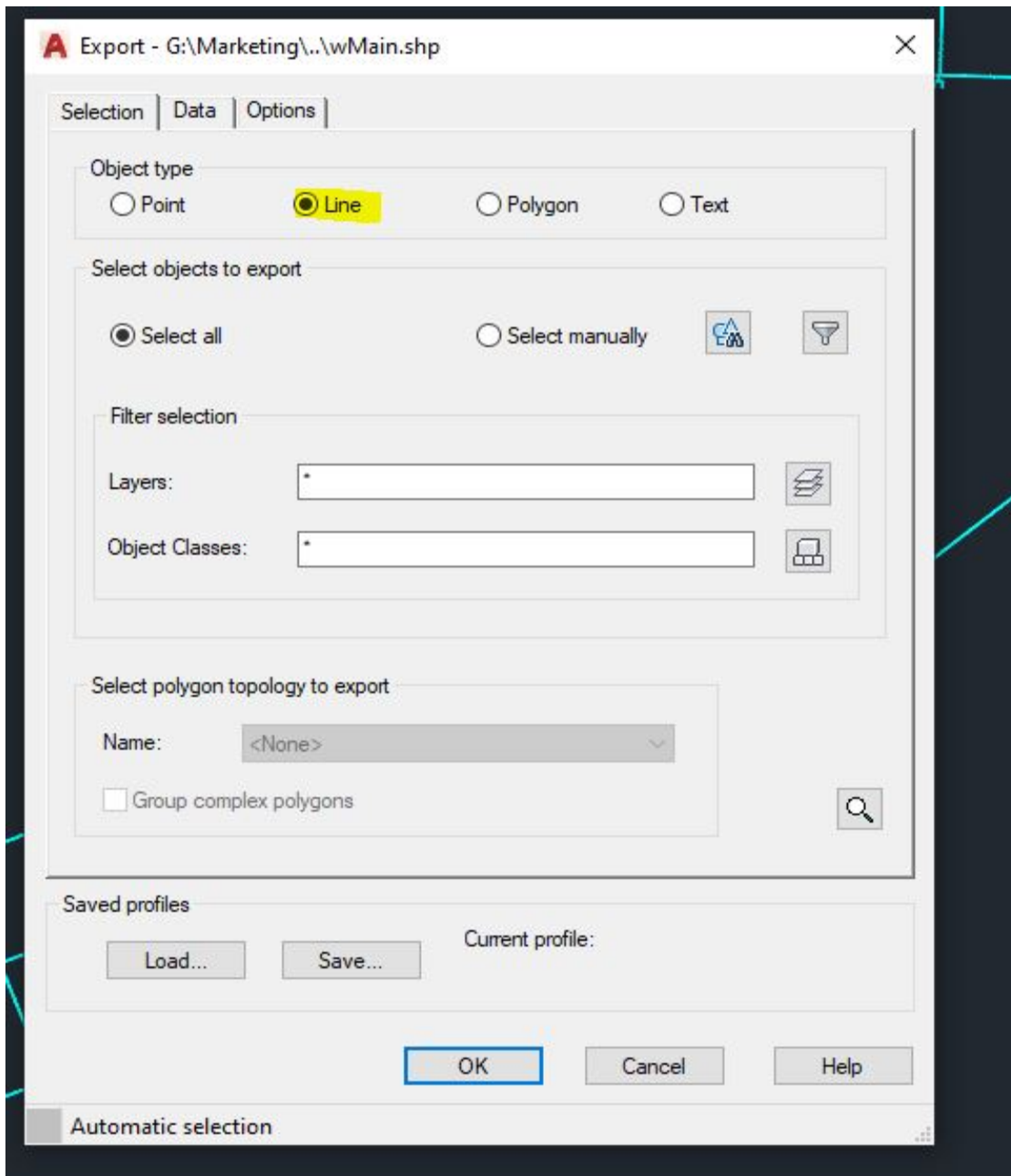
Select the closed polyline, a filled solid will be created. If not solid, then ensure the polyline is closed and try the command again.



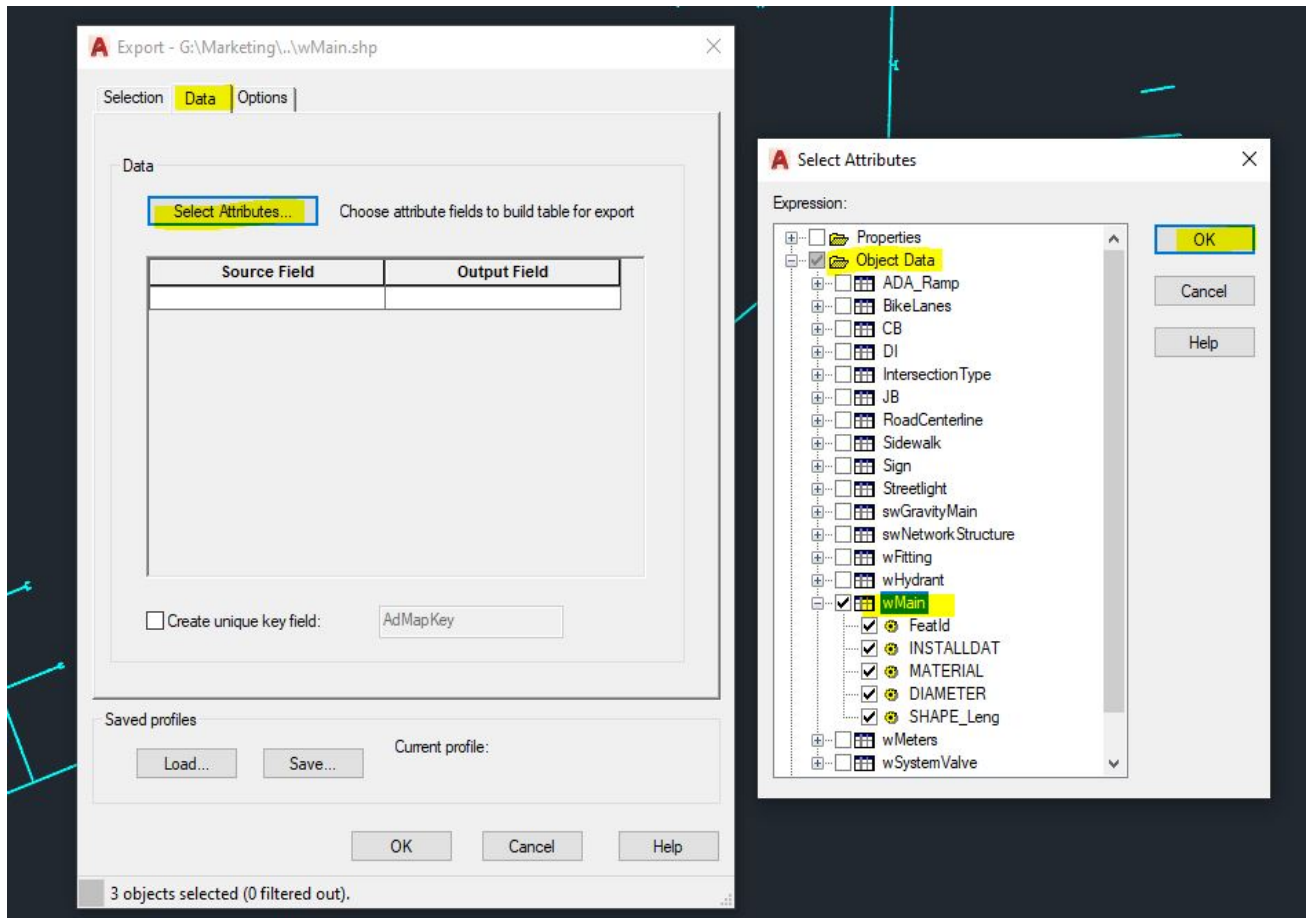
When all data has been attached to objects and mpolygons created, shapefiles can now be created. Each layer must be individually exported; thus, layer isolation will again be used. MAPEXPORT (ribbon: Output – Map Data Transfer – DWG to SDF; change output from .sdf to .shp).



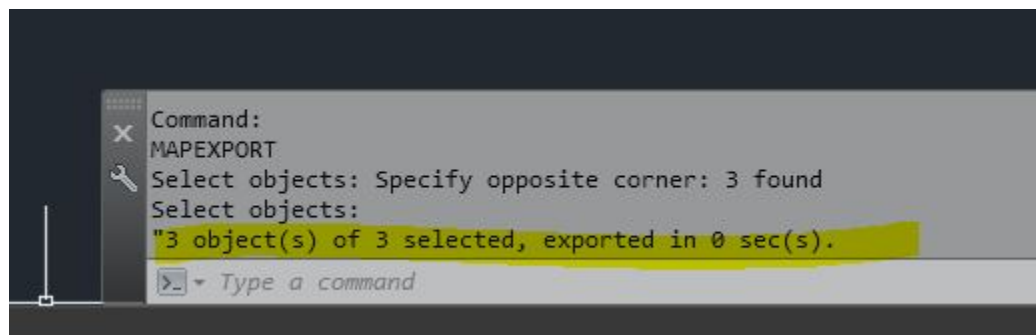
The procedure is identical for all layers, but the object type must be changed for each. We will export the wMains layer. Select the location for the shapefile creation and the file name, click OK, the export dialog box opens.



The water mains are lines thus the radio button for line is selected. There is an option to select all, select manually or select by layer. Select the objects. You will notice the number of objects selected is shown at the bottom of the dialog box. Next, select the Data tab, select attributes, Object data, the layer you are exporting, click OK, click OK to close the dialog box and create the shapefile. If the selection shows any objects filtered out, investigation will be needed to determine why the line(s) was not selected. For lines, it may be a block that was not exploded.



The command line will show the number of objects exported.



Repeat this procedure for all of the layers. Once the shapefiles have been created (6 files for each layer), they along with the drawing can be submitted to the City.

Pipe materials in Table 1-1 are approved materials for use on water and storm drainage applications.

Table 1-1 Roswell Standard Water & Storm Pipe Materials	
Water Pipe Materials	Storm Pipe Materials
CI	METAL
DI	PRE-CAST CONCRETE
GS	HIGH DENSITY POLYETHYLENE (HDPE)
PVC	CAST-IN-PLACE CONCRETE
OTHER	OTHER