

GDOT ORD Design Workflow Processes

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Chapter 1: Required Right of Way and Easement Alignments

Required Right of Way and Easement alignments must be created in two, separate Design Models in the **PI#REQD.dgn** file, in order to avoid the displaying of overlapping lines on the plan sheets:

- **REQD**: this model contains only the plotted points, alignments, and associated annotation
- **RWParcelGeom**: this model contains all non-plotted, complete, closed Right of Way and Easement shapes, for use in creating the Right of Way Tables and .out files for Deed generation.

Existing Property ORD defect:

There is a known ORD defect (now, an outstanding Enhancement Request #1135597), where some overlapping, existing property lines may appear as solid lines instead of dashed lines on plan sheets. In these cases, it is recommended to copy the property lines directly into the PI#REQD.dgn file, so that no property lines overlap. All level settings have been updated to turn ON the *PROP_E_PAR-PL-Line* level for existing property lines when PI#REQD.dgn is referenced, but users may need to turn this level off manually when PI#TOPO.dgn is also referenced, to avoid the erroneous displaying of solid lines on the plans. Once ORD has incorporated this Enhancement Request, this workaround should no longer be necessary.

REQD Design Model

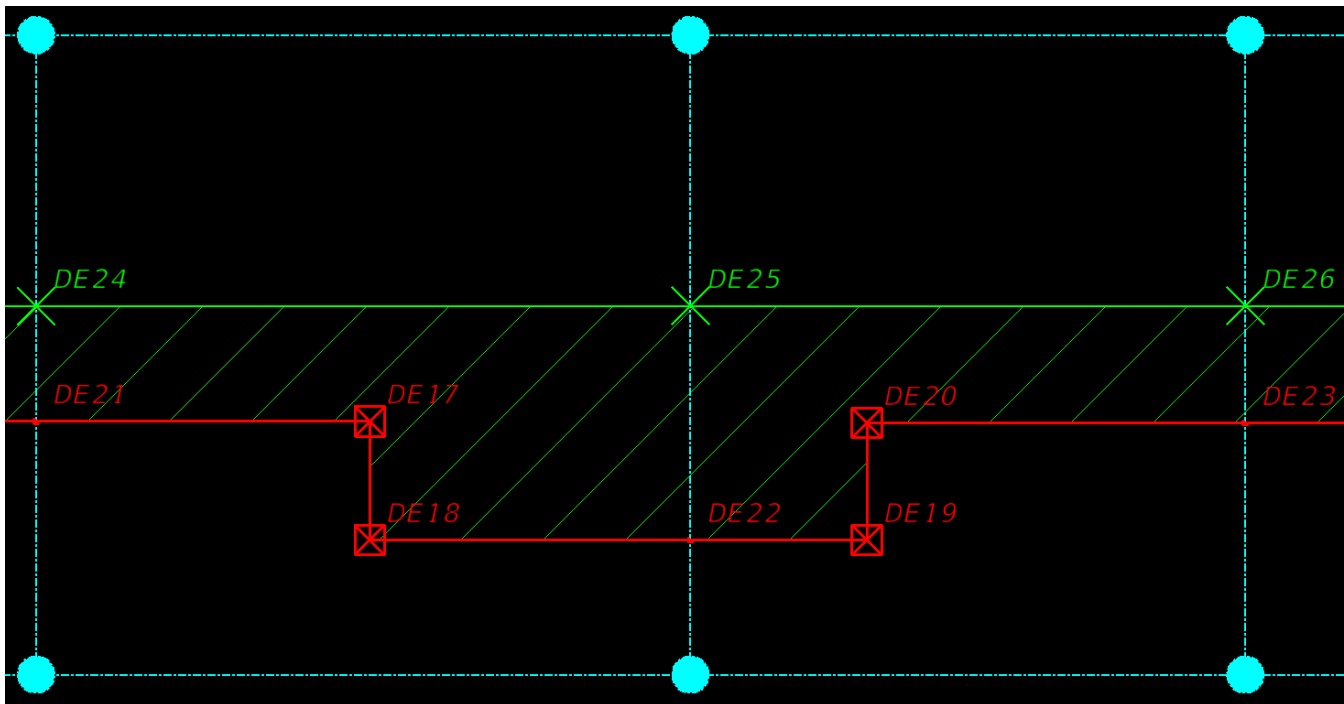
It is recommended to first draw the desired points and lines/arcs that need to plot in this model, before creating the closed shapes in the RWParcelGeom model. Only this **REQD** model should be referenced into the PI#SheetMaster.dgn file.

Points

Points must be created using the Geometry\Point command so that they have Feature Definitions, which facilitates using Element Annotation. The Elevation Mode should be set to none. The Rotation Mode may be used as desired, either set to None, Absolute Value or to rotate Relative to Alignment. The Feature Definition for the point must be one of the following:

Feature Definition	Description
REQD_P_DWESMT	Driveway Easement point
REQD_P_PESMT	Permanent Easement point
REQD_P_TESMT	Temporary Easement point
REQD_P_REQD	Required Right of Way point, no directional change of line
REQD_P_RWRM	Required Right of Way point, directional change of line

Below is an example showing directional change, to aid in determination of whether to use Feature Definition REQD_P_REQD or REQD_P_RWRM. An example of Permanent Easement is included.



Lines and Arcs:

Lines/Arcs that need to be plotted on plans should be drawn by using various Geometry commands (i.e. *Line Between Points*), to assist in following the workflow in [Chapter 2](#). Ensure that only the following Feature Definitions are assigned to the R/W Geometry:

Feature Definition	Description
REQD_P_DWESMT	Driveway Easement line
REQD_P_PESMT	Permanent Easement line
REQD_P_TESMT	Temporary Easement line
REQD_P_REQD	Required Right of Way line

Annotation of Points:

Group Annotation has been set up so that all points can be annotated using the *Annotation\Element Annotation\Annotate Element* command. Once annotated, move the annotation around as needed for legibility.

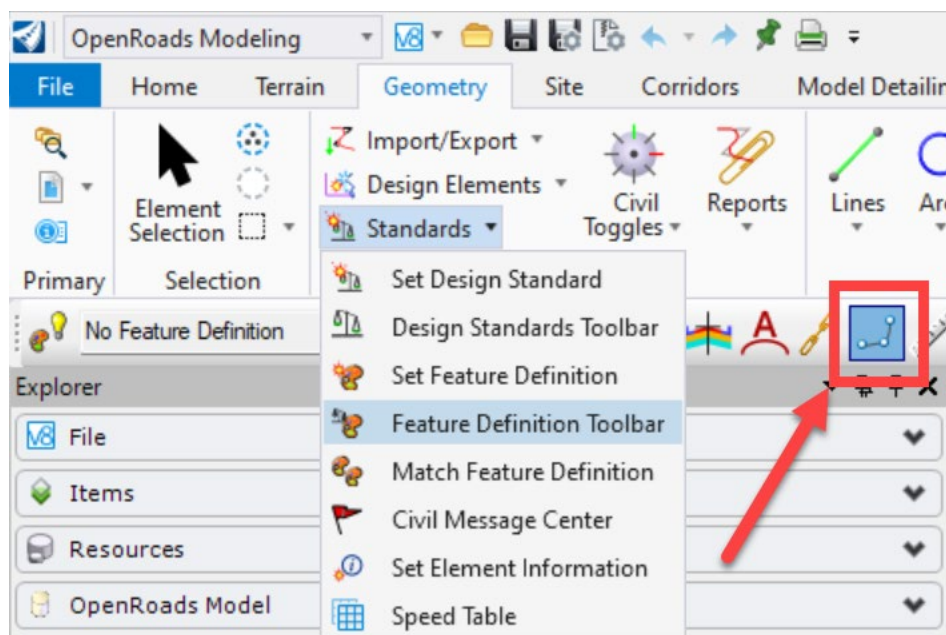
RWParcelGeom Design Model

This model is necessary to draw the closed shapes in order to create the Right of Way Tables and .out files for Deed generation, so that they don't interfere with the displaying of overlapping lines on the plan sheets. This model should *not* be plotted on plan sheet deliverables.

Attach any reference files that are needed to generate these shapes. Typically, attaching PI#SheetMaster.dgn should give what is needed for this purpose, but other files may be attached if needed. **Do not attach this model to PI#SheetMaster.dgn.**

Only Geometry commands should be used to generate the closed shapes, as Feature Definitions are required for Right of Way Tables/Deed generation.

Important: Persist Snaps must be enabled, as shown below. Ensure that all lines and arcs are constructed in a clockwise manner using the origin snap to connect to the Geometry points created in the **REQD** Design Model.



Also, ensure that only the following Feature Definitions are used in the construction of lines, arcs and complex elements:

Feature Definition	Description
REQD_P_DWESMT	Driveway Easement line
REQD_P_PESMT	Permanent Easement line
REQD_P_TESMT	Temporary Easement line
REQD_P_REQD	Required Right of Way line

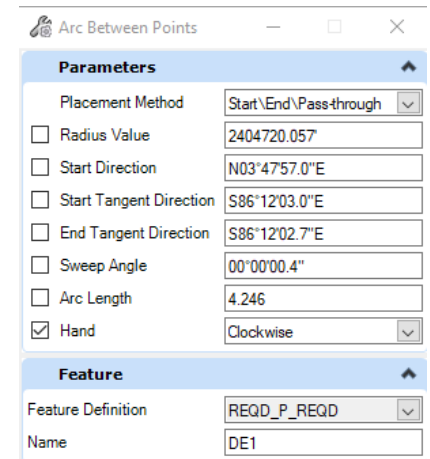
Lines:

Since the points were already created in the **REQD** Design Model, the *Geometry\Lines\Line Between Points* command can be used to construct any lines that will be part of the final shape of each parcel.

Arcs:

To construct arcs, use the *Geometry\Horizontal\Arcs\Arc Between Points* command. There should be existing arcs to use as a guide, either newly constructed arcs in the **REQD** Design Model or from the existing property/right of way referenced from the PI#TOPO.dgn file. Therefore, the simplest Placement Method is the Start\End\Pass-through option.

The Hand option may need to be changed to Counter Clockwise or Clockwise, depending on the direction you need to construct the arc. Use the origin snap for the Start/End points, and the Near snap to get a Pass-through point along the referenced arc.



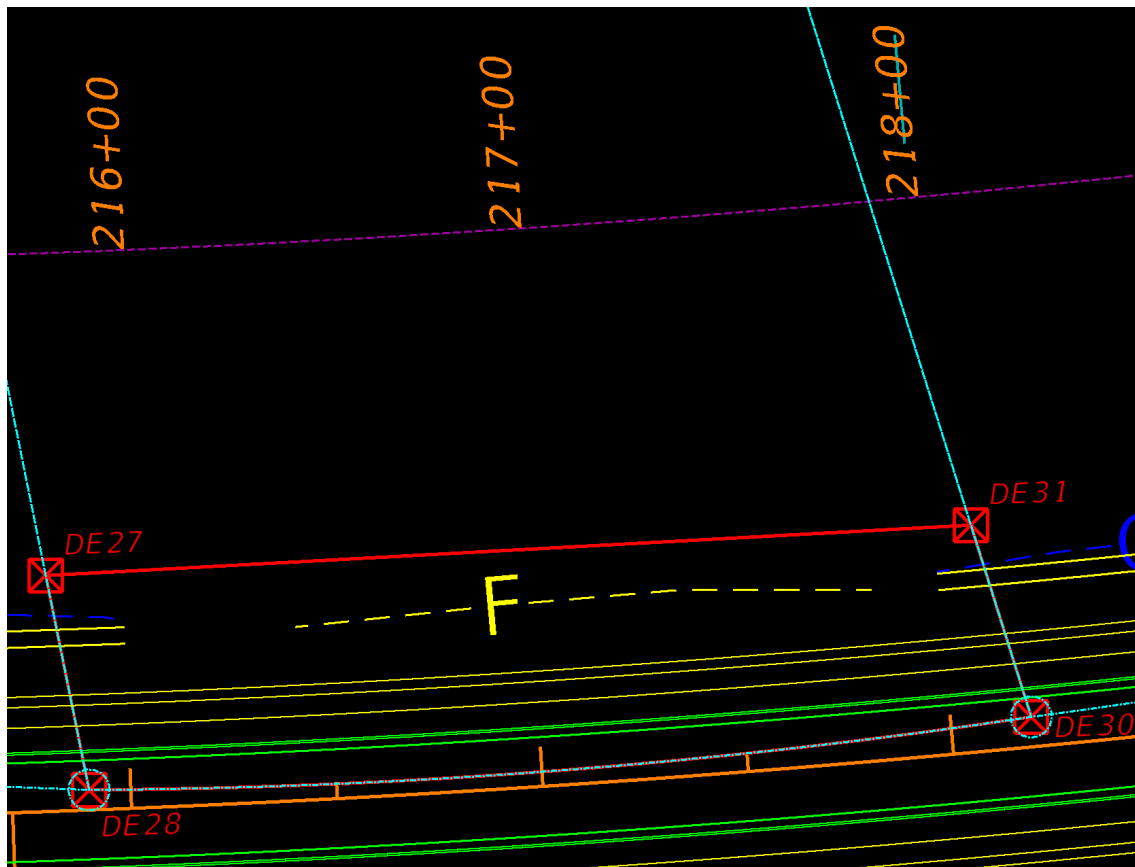
Parameters	
Placement Method	Start\End\Pass-through
<input type="checkbox"/> Radius Value	2404720.057
<input type="checkbox"/> Start Direction	N03°47'57.0"E
<input type="checkbox"/> Start Tangent Direction	S86°12'03.0"E
<input type="checkbox"/> End Tangent Direction	S86°12'02.7"E
<input type="checkbox"/> Sweep Angle	00°00'00.4"
<input type="checkbox"/> Arc Length	4.246
<input checked="" type="checkbox"/> Hand	Clockwise

Feature	
Feature Definition	REQD_P_REQD
Name	DE1

Creating a Parcel Alignment:

To create the closed parcel alignment shape, use the command *Geometry\Horizontal\Complex Geometry\Complex By Element*. The *Manual Method* is preferred when adjacent parcel alignments and/or geometry exist, because using the *Automatic Method* could cause the command to fork in an undesired direction, potentially creating an incorrect parcel alignment. Isolated parcel alignments (meaning, no adjacent parcel alignments and/or geometry are present) could instead utilize the *Automatic Method*, but ensure that it is formed in a clockwise manner (hint: you can see the direction arrow before you accept the drawing).

Important: The starting point for the parcel alignment should be the point closest to the baseline alignment, at the lowest station. For example, in the provided screen shot below, the line connecting points DE28 and DE27 should be the first element selected, followed by the line connecting DE27 and DE31, then continuing clockwise.



Editing Existing Parcels:

If for some reason the Complex Element command creates a parcel alignment in the wrong direction, simply use the *Geometry\Horizontal\Modify\Transpose Element* command to create a copy of the alignment in the reverse direction. After that, you may delete the old alignment.

If you move any Geometry Points created in the **REQD** Design Model, those points will automatically update in the **RWParcelGeom** Design Model. If only lines are impacted by the change, no other steps need to be taken; however, arcs that change may mean you need to restore the alignment from scratch. In this case, delete the old alignment first before recreating the parcel alignment.

Reports:

To create the reports for Deed and/or the Right of Way Tables, refer to the Style Sheet Help files for GDOT Deed_ORD and GDOT RW Table_ORD.

Internally, these files are located in ProjectWise [here](#). For external users, they are included in the workspace in the *\Configuration\Organization-Civil\GDOT_Org_Civil_Standards\Reports\GDOT\Style Sheet Help Files\PDF File* folder.

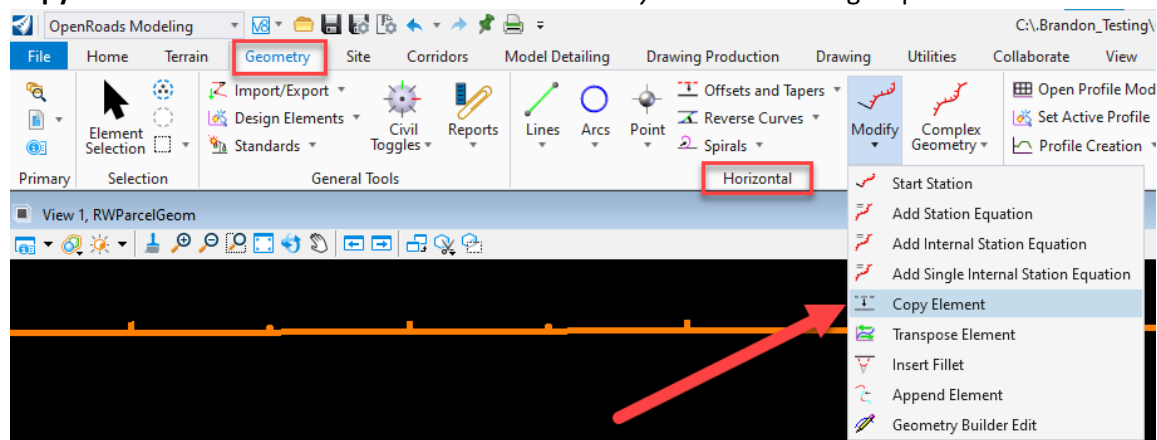
Chapter 2: Displaying R/W & Easements Annotation on Cross Sections

Requirements:

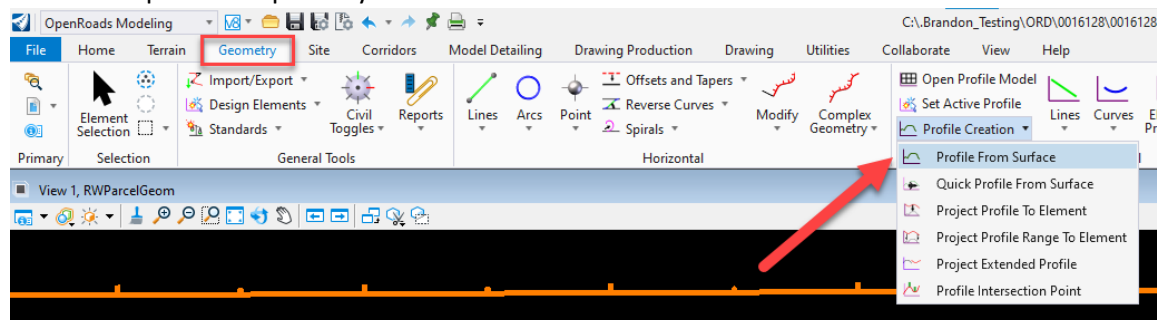
- All R/W & Easement lines must have the correct Feature Definition applied (i.e., REQD – *REQD_P_REQD* & Existing – *PROP_E_PAR* or *PROP_E_RWE*; Easements - *REQD_P_DWESMT*, *REQD_P_TESMT*, *REQD_P_PESMT*)
- An Existing Surface will need to be Active in the REQD model.
- All R/W & Easement lines to be annotated must have a Profile created in the REQD model.
- The REQD model will need to be referenced to the Section 23 dgn file - (PI#_23.dgn)

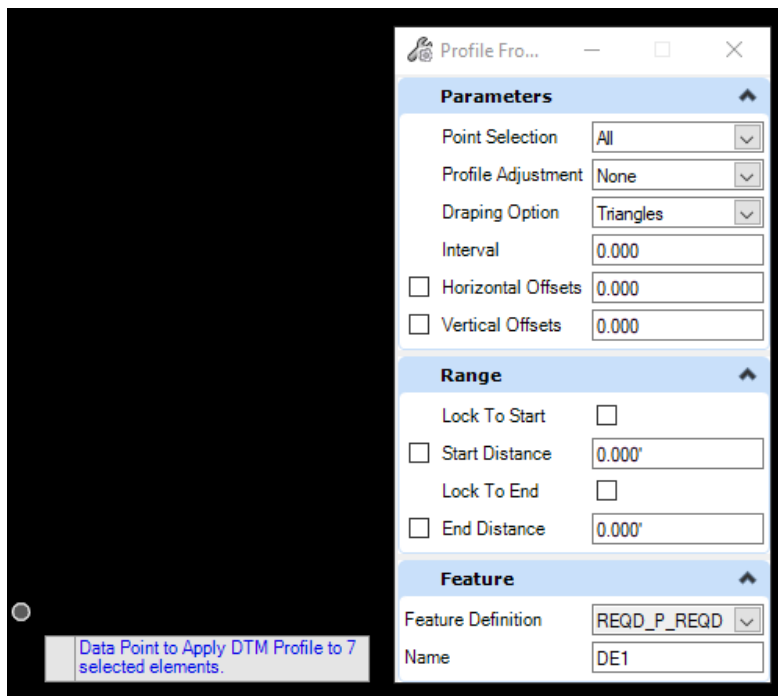
Featurizing and Profiling R/W & Easement Lines:

1. REQD, Existing R/W, and Easement lines need to have a *Feature Definition* applied separately. The Existing lines will need to be copied into the model. Turn off all levels except the ones you want placed in the model and create a selection set. Copy them into the REQD model using the **Copy Element** command located within the *Geometry* tabs *Horizontal* group.

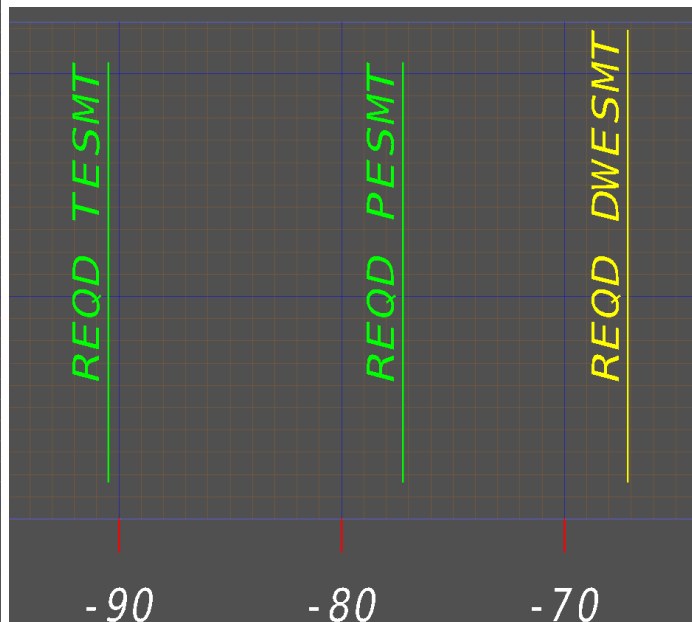
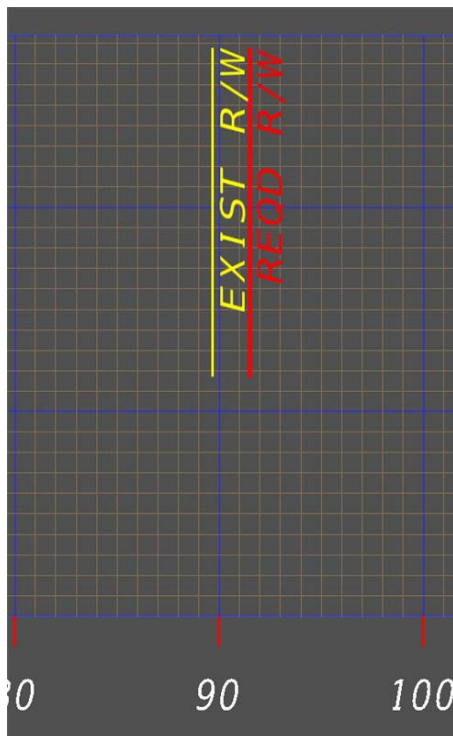


2. Once the R/W & Easement lines are live in the model they can have the correct *Feature Definition* applied according to whether they are REQD (*REQD_P_REQD*), Existing (*PROP_E_PAR*, *PROP_E_RWE*) or Easements (*REQD_P_DWESMT*, *REQD_P_TESMT*, *REQD_P_PESMT*). Make a selection set of the REQD R/W lines and use the **Profile From Surface** command located within the *Geometry* tabs *Vertical* group to apply a *Feature Definition* and a Profile from the Active Surface. Repeat the command while selecting the Existing R/W lines. Easement lines will also need to be profiled separately.





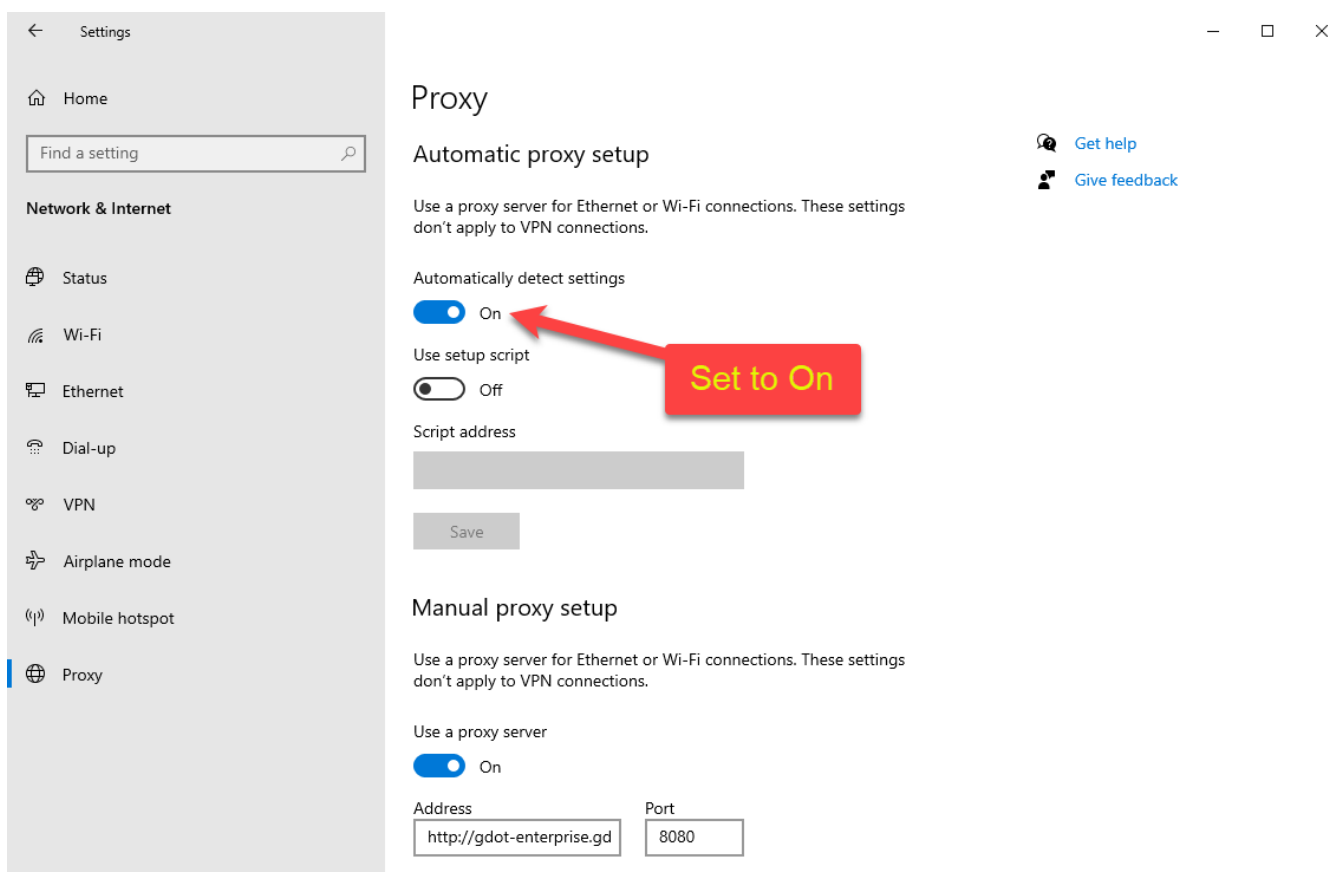
- When all REQD, Existing R/W, and Easement lines have been profiled, reference the REQD model to the Section 23 .dgn file (PI#_23.dgn). Verify the profiles are intersecting the placed Named Boundaries inside of the 3D view. The annotation group will then read the profiled lines and annotate them in each cross section drawing model.



Chapter 3: Bing Maps Static Imagery

Requirements:

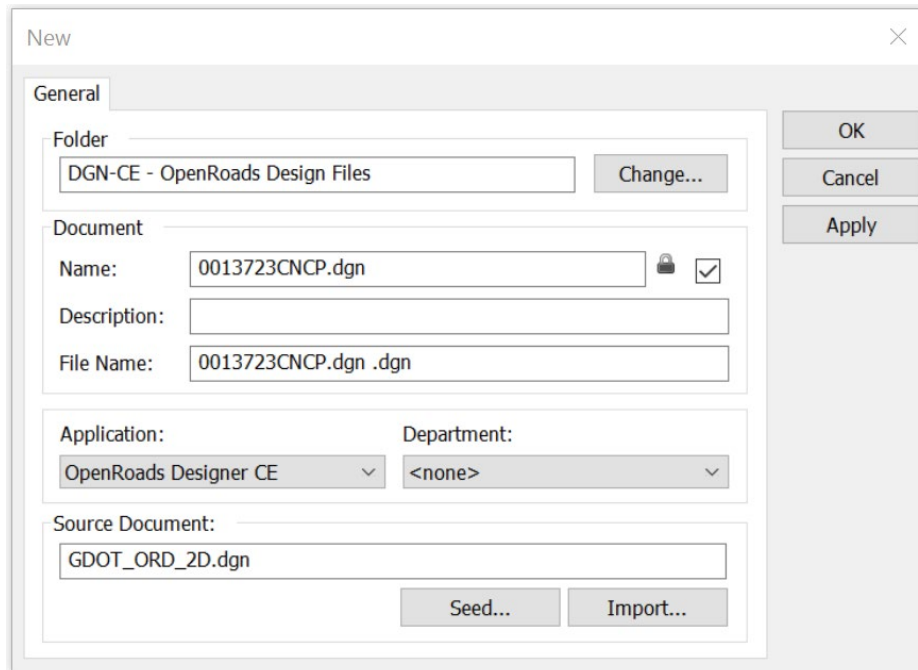
- Logged into Bentley Connect Client
- Geographic Coordinate System must be applied to file
- A good internet connection
- Save file/settings as needed throughout this process (after attachments, prior to exiting/changing files, etc.)
- Automatic proxy setup should be set to on. Go to Start>Settings>Network & Internet>Proxy and ensure the Automatic detect settings radio button is set to on position.
 - Refer to item 33 in the Troubleshooting Section for additional proxy setting information



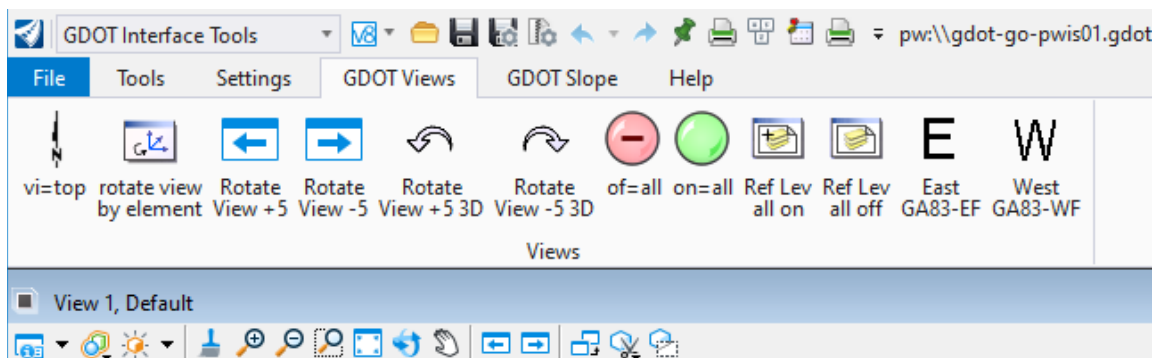
Attaching Bing Maps Imagery:

4. For MicroStation V8i projects it is necessary to submit a request to the Solutions Center for a **DGN-CE** folder to be created for the project in ProjectWise, with a **starting_point.dgn** file placed in an **ORD_Imagery** subfolder within. This allows DGN files to open in ORD and function properly in the GDOT ORD workspace.
5. Navigate to and open the **starting_point.dgn** file in ProjectWise.

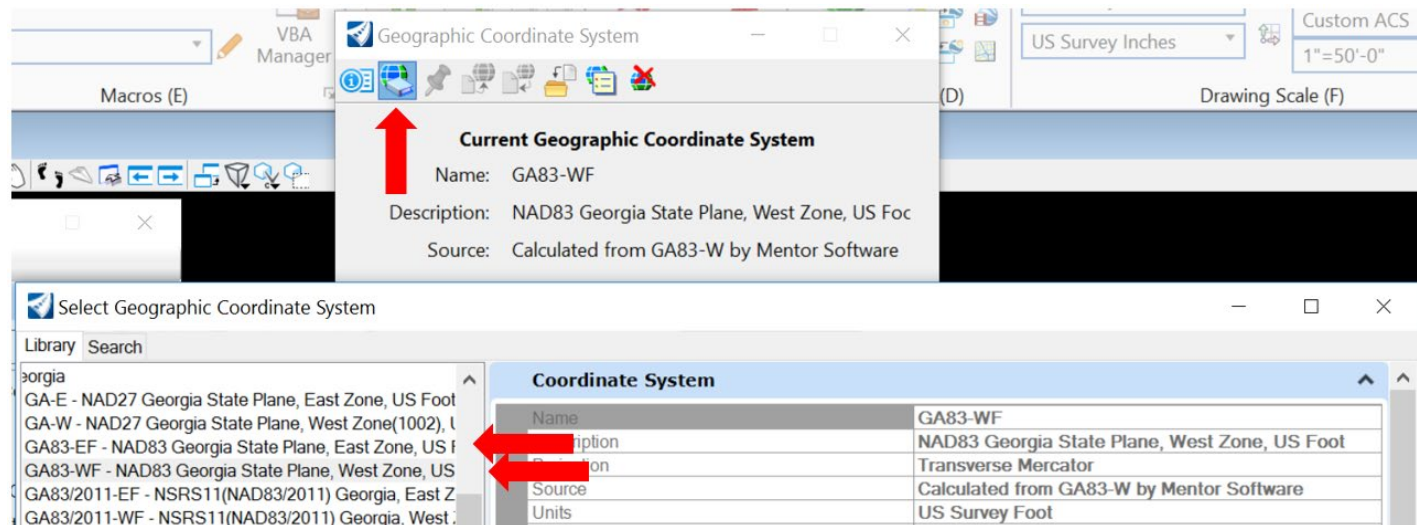
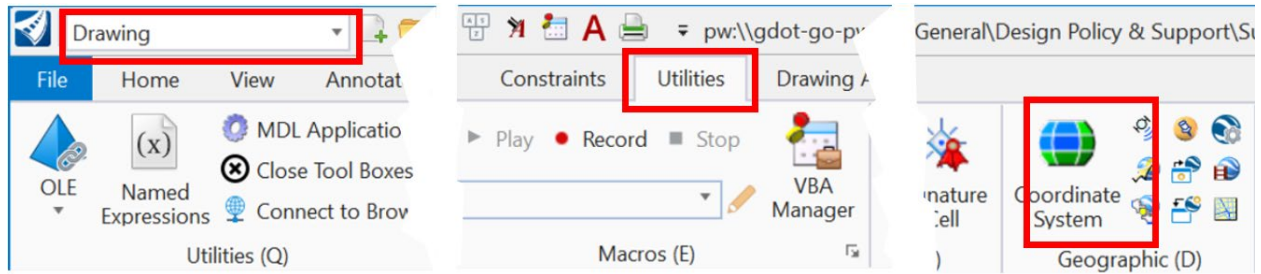
6. Create a new ORD file (Example: 0013723CNCP.dgn file) via selecting **File > New > No Wizard >** and keying in the file name when the **New** dialog (depicted below) appears. If the appropriate seed file is not already listed in the **Source Document** field, click on the Seed button and select it. Ensure that the dialog matches the following and click Ok:



7. Free the starting_point.dgn file. **NOTE:** *It is important to always create a new file and not just start working in a starting_point.dgn file and then renaming it later. The reason for this is that creating a new .dgn file will use the latest Seed file and include any updates that may have been done since the starting_point.dgn file was originally created.*
8. Associate the file to the appropriate geographic coordinate system via **GDOT Interface Tools > GDOT Views > Views > East GA83-EF or West GA83-WF**



9. **Note:** The geographic coordinate system can also be set and/or confirmed via Drawing workflow > the Utilities tab > the Coordinate System button > From Library button and selecting GA83-EF or GA83-WF from the library.

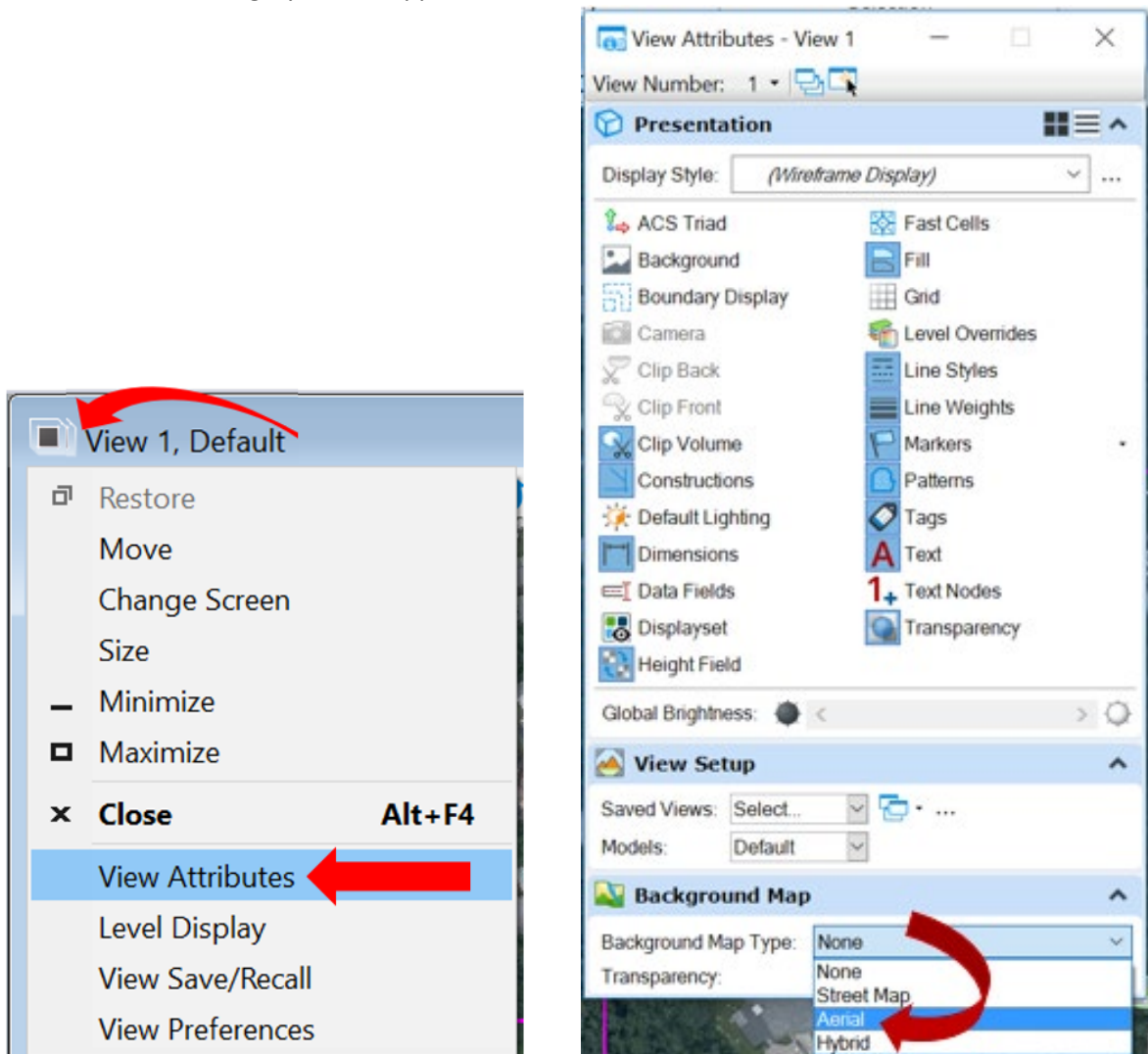




GEORGIA COORDINATE ZONE MAP

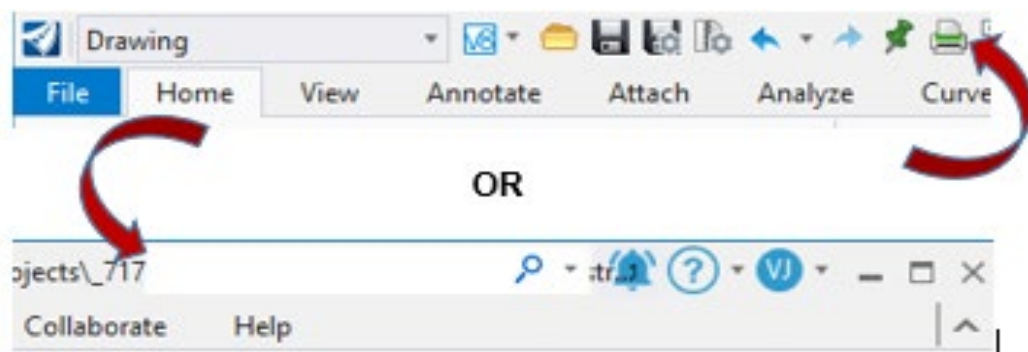
10. Attach the reference file(s) that coincide(s) best with the area for which imagery is required (topo, main, or WMS imagery for example). Always use the coincident world setting when attaching these files. These files may also be MicroStation V8i files as demonstrated in this example.
 - a. Reference files should also be associated with the appropriate Geographic Coordinate System.
 - b. Avoid use of the SHEETMASTER.DGN file or other files with nested files and related nested depths.

11. To view the imagery for project location, select the View icon, View Attributes, and the appropriate Background Map Type at the bottom of the View Attributes dialog as illustrated below and the imagery should appear.

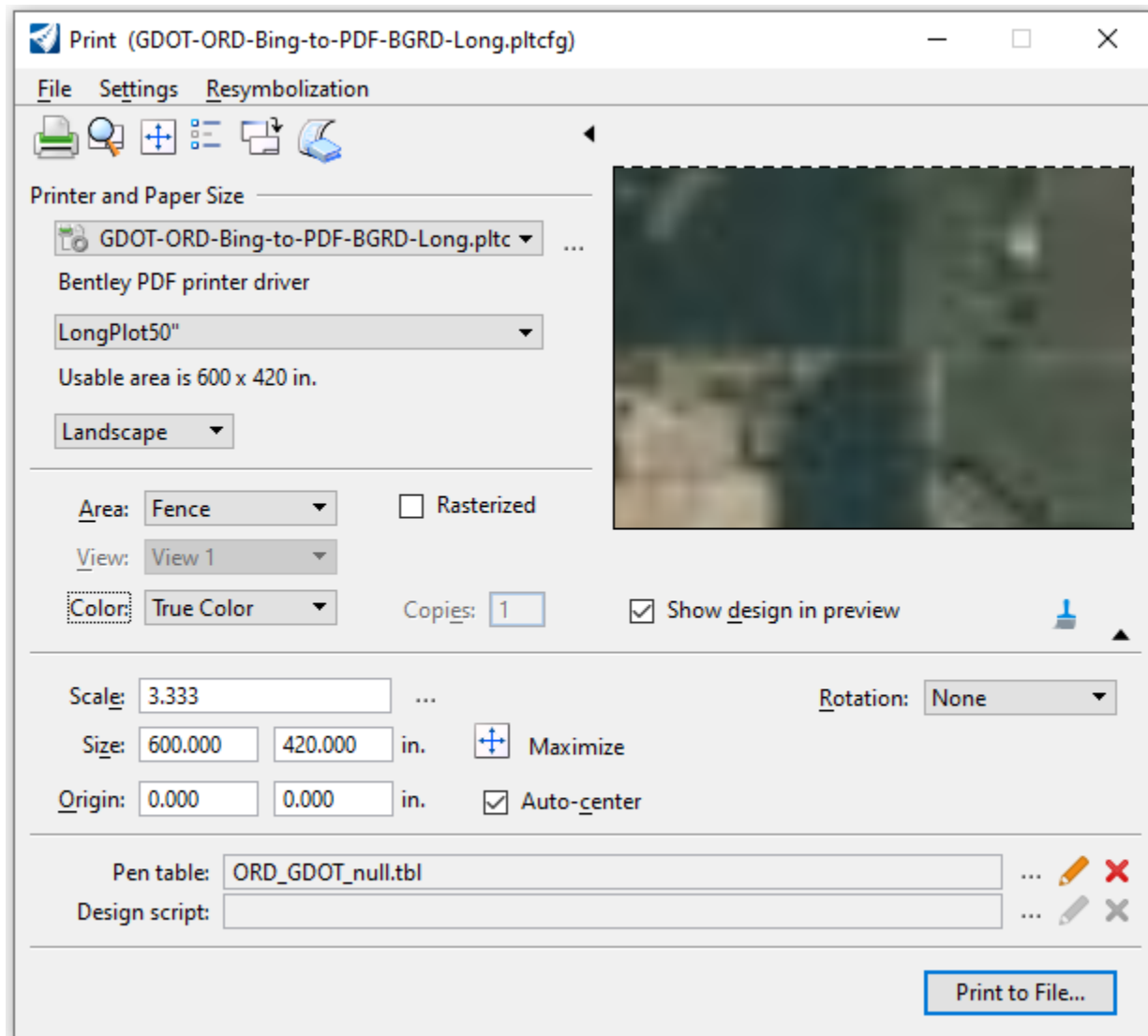


Creating “Static” Background images:

12. Rotating the file such that most of the project area is positioned horizontally in the active view may enhance the results.
13. Attach the GDOT-GN-Sheets.cel cell library and choose one of the following cells:
GPLN-CE, GLG50, GLG75, GLG100, GLG125, GLG150, GLG175, GLG200.
 - a. These cells are representations of a standard plan sheet (GPLN-CE), and long plot borders 35 wide by 50, 75, 100, 125, 150, 175 or 200 long for the others.
 - b. Set the scale to cover the required area.
 - c. It doesn't have to be an exact scale at this point. If a scale of 178 provides the required coverage this will suffice.
 - d. The smallest number that provides sufficient coverage will also provide the best quality. A scale of 200 or less is recommended.
 - e. The different long plot sizes range from 35x50 (GLG50) to 35x200 (GLG200) in increments of 25.
 - f. The size that provides the best results is recommended.
 - g. Repeat this step if the project is large enough to require more than one plan sheet. Rotate as needed for each cell.
14. Detach all reference files and ensure that there are no graphic elements in the file since this could compromise the quality of the final product.
15. The sole purpose of this file is for background imagery.
16. Place a fence around the sheet border attached in step 10.
17. Access the Print dialog via CTRL+P, the print icon or keying “print” in the search field to the upper right.

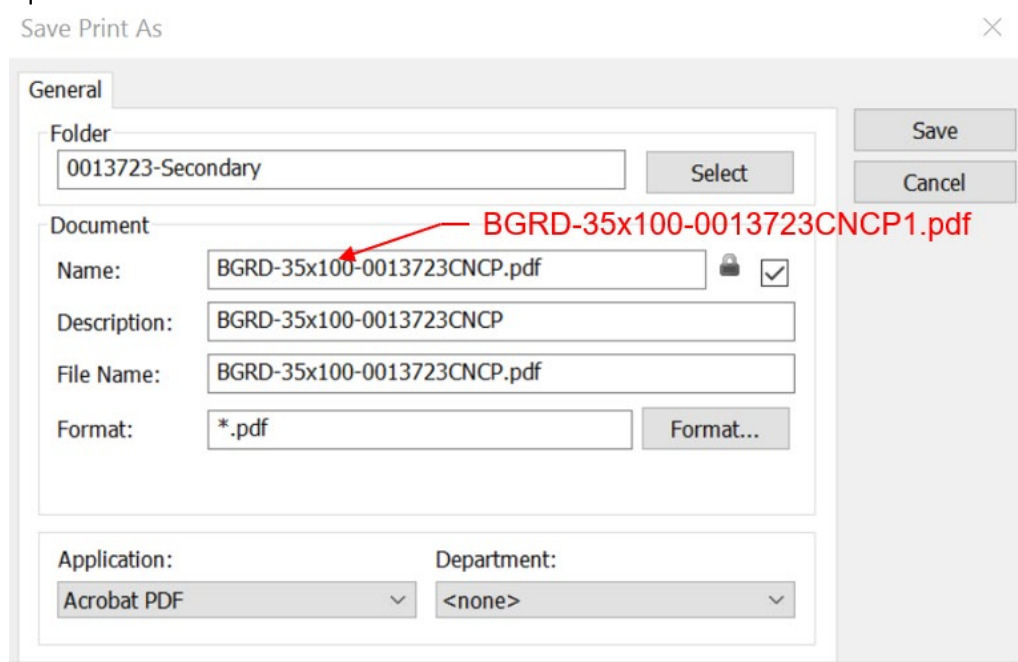


18. From the Print dialog select the following options so that they coincide with the selections listed in the image below.
 - a. Select the GDOT-ORD-Bing-to-PDF-BGRD-Long.pltcfg file option.
 - b. Select the appropriate Long Plot size (50, 75, 100, 125, 150, 175 or 200).
 - c. Select the Fence option in the Area field.
 - d. Select the ORD_GDOT_null.tbl.
 - e. Select the Maximize option.
19. The scale does not have to be precise; a round number will suffice at this point. Adequate coverage is more important. A scale of 178 that provides adequate coverage is not a problem for background imagery. Scales less than 200 are recommended because smaller scales provide better image quality.



20. Click the Print to File button and select the No Wizard option and click OK.

21. If a series of background plots are to be made (for longer projects), sequential numbering can be added to the PDF file name as follows. Repeat steps 13-17 as needed if multiple plots are required.



Save Print As

General

Folder: 0013723-Secondary [Select]

Document

Name: BGRD-35x100-0013723CNCP.pdf [lock icon] [check icon]

Description: BGRD-35x100-0013723CNCP

File Name: BGRD-35x100-0013723CNCP.pdf

Format: *.pdf [Format...]

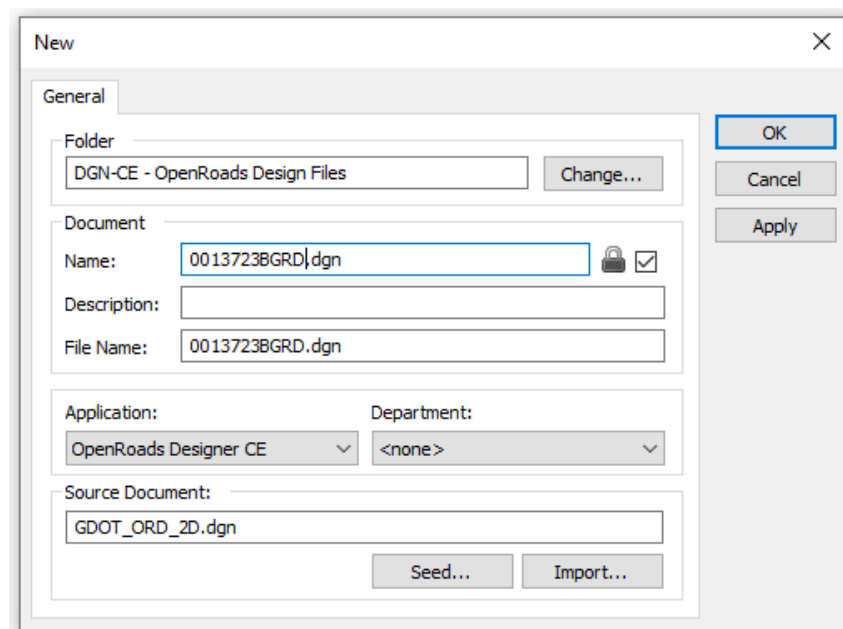
Application: Acrobat PDF [v]

Department: <none> [v]

[Save] [Cancel]

BGRD-35x100-0013723CNCP1.pdf

22. Select the Save option.
23. The PDF file will be created and opened automatically.
24. Inspect the PDF file for appropriate coverage.
25. Close the PDF and the Print dialog.
26. Create a **new** ORD 2D dgn file to be used as a background reference file via selecting File > New > No Wizard > and keying in the file name when the New dialog appears, (0013723BGRD.dgn was used for this example). Multiple files may be required based on the size of the layout. If the appropriate seed file is not already listed in the Source Document field, click on the Seed button and select it.



New

General

Folder: DGN-CE - OpenRoads Design Files [Change...]

Document

Name: 0013723BGRD.dgn [lock icon] [check icon]

Description:

File Name: 0013723BGRD.dgn

Application: OpenRoads Designer CE [v]

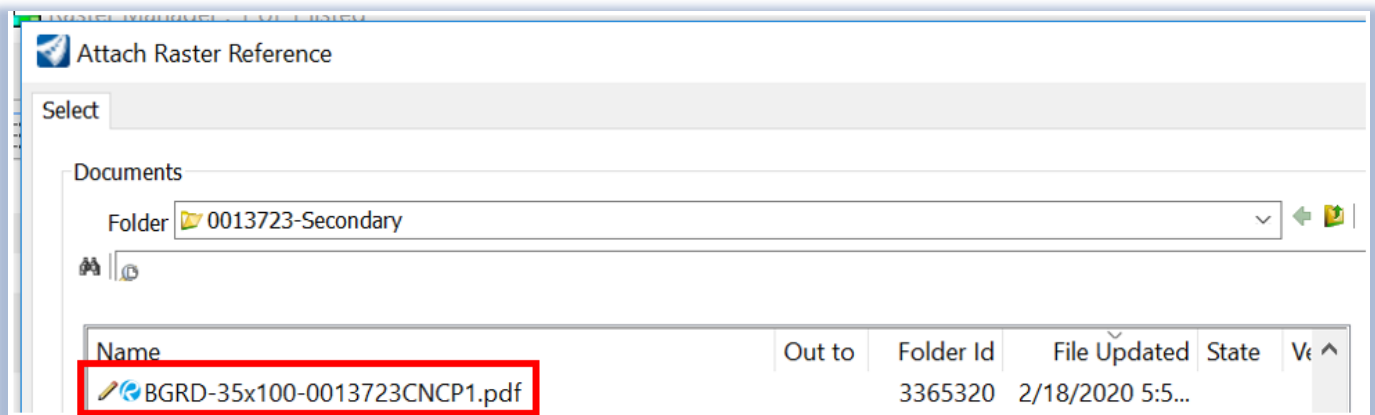
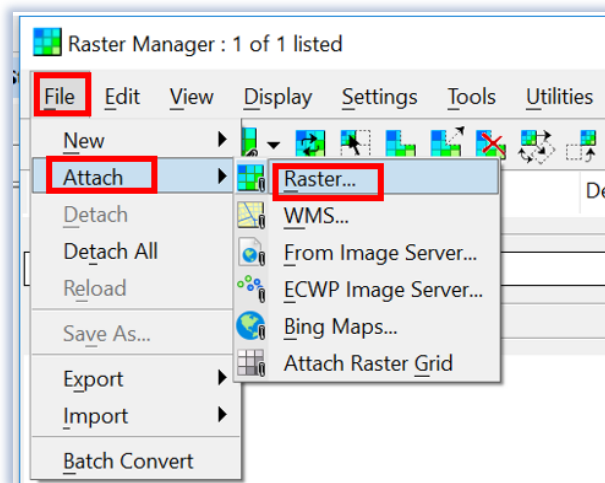
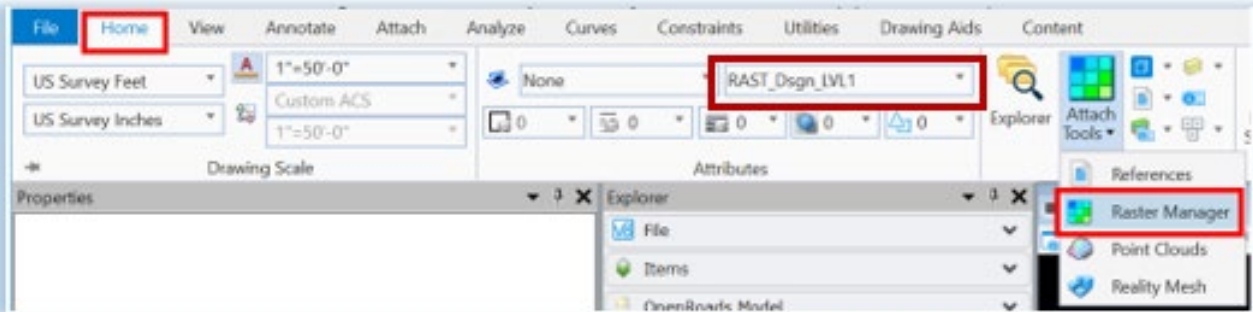
Department: <none> [v]

Source Document: GDOT_ORD_2D.dgn

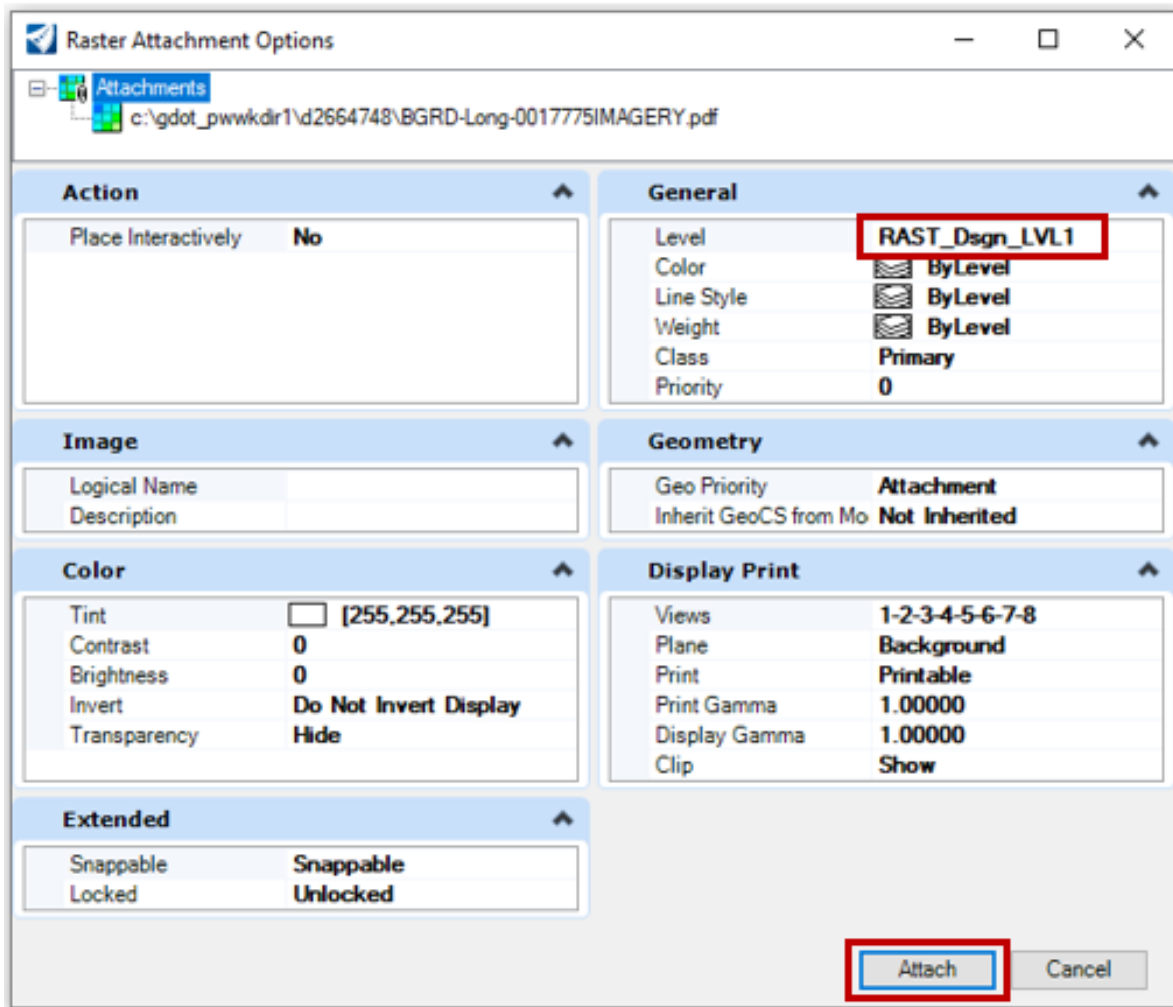
[Seed...] [Import...]

[OK] [Cancel] [Apply]

27. The 0013723BGRD1.dgn and 0013723BGRD2.dgn file naming convention provides consistency for this workflow (with BGRD used as an abbreviation for Background).
28. Repeat step 5 to set the coordinate system to the East GA83-EF' or West 'GA83-WF' Zone.
29. Set the level in the newly created DGN file to a Raster Level from the Level Manager (see examples of pre-defined levels in step 28).
30. Use the Raster Manager to attach the previously created PDF file(s) as follows:



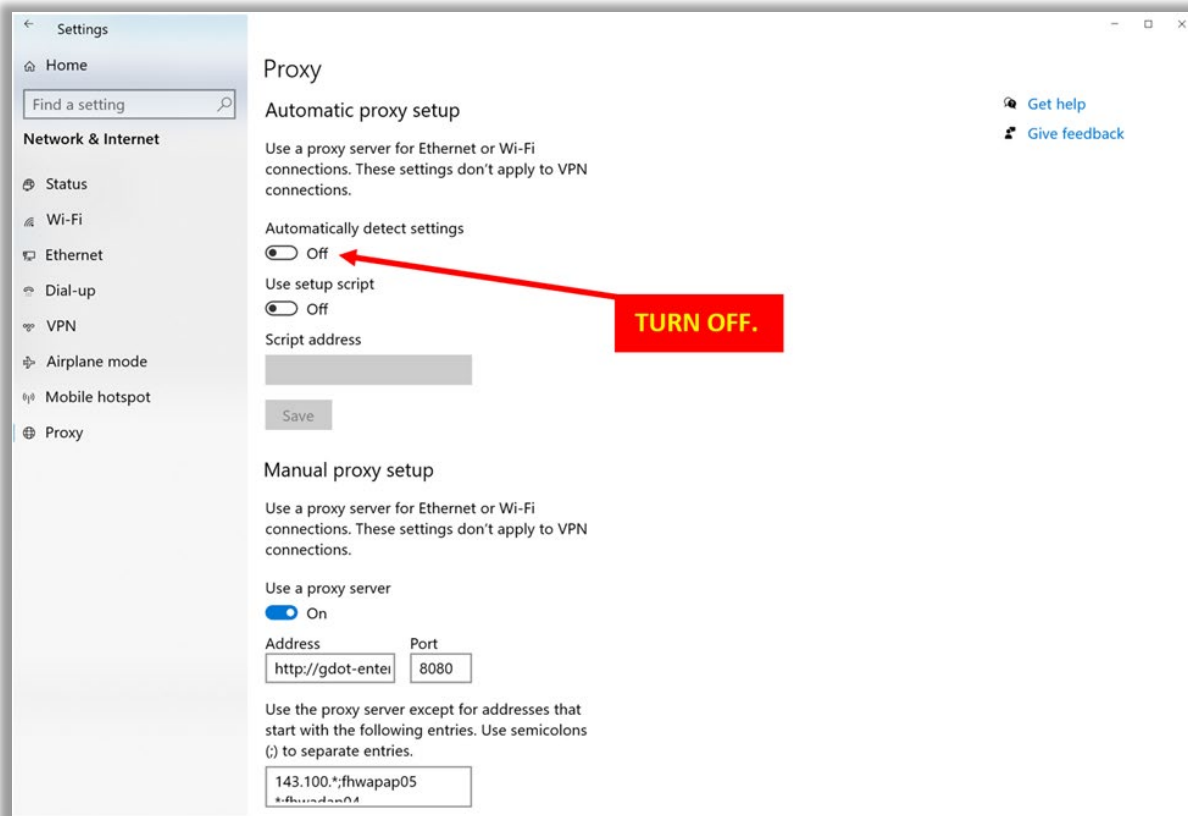
31. Click OK and when the Raster Attachment Options Dialog appears select one of the 4 pre-defined raster levels available as follows (for this example the RAST_Dsgn_LVL1 level selected for the active DGN file in Step 26 was also selected for the raster attachment in this step):
 - a. RAST_Dsgn_LVL1
 - b. RAST_Dsgn_LVL2
 - c. RAST_Dsgn_LVL3
 - d. RAST_Dsgn_LVL4



32. Plot settings are defined so that they will display correctly when these pre-defined levels are used.
33. Select the Fit View to view the raster, PDF (background image).
34. Clip as needed to exclude any unwanted areas of the background image.
35. This DGN file **with the raster PDF attached** can now be attached to a new DGN file as a Regular 'Reference File' with the PDF background image automatically included.
 - a. The purpose of this workflow is to make the plotting process much faster.
 - b. Processing occurs much more rapidly because the software does not have to process a raster image that covers the entire State of Georgia.
 - c. Note: This file is only used for the purposes of creating the static background image.

Troubleshooting Bing Maps Imagery:

36. In the event of problems with imagery functionality that may occur after the previously listed requirements and workflow steps have been adhered to, each of the following troubleshooting steps should be implemented and tested individually and in order prior to progressing to the subsequent troubleshooting step if needed.
 - a. Save Settings > Compress the file
 - b. Navigate to the proxy settings: Go to Start>Settings>Network & Internet>Proxy
 - i. Change the Automatic detect settings radio button settings to the Off position.
 - ii. Save the changes.
 - c. Reboot the workstation



Chapter 4: Level Synchronization Across Models

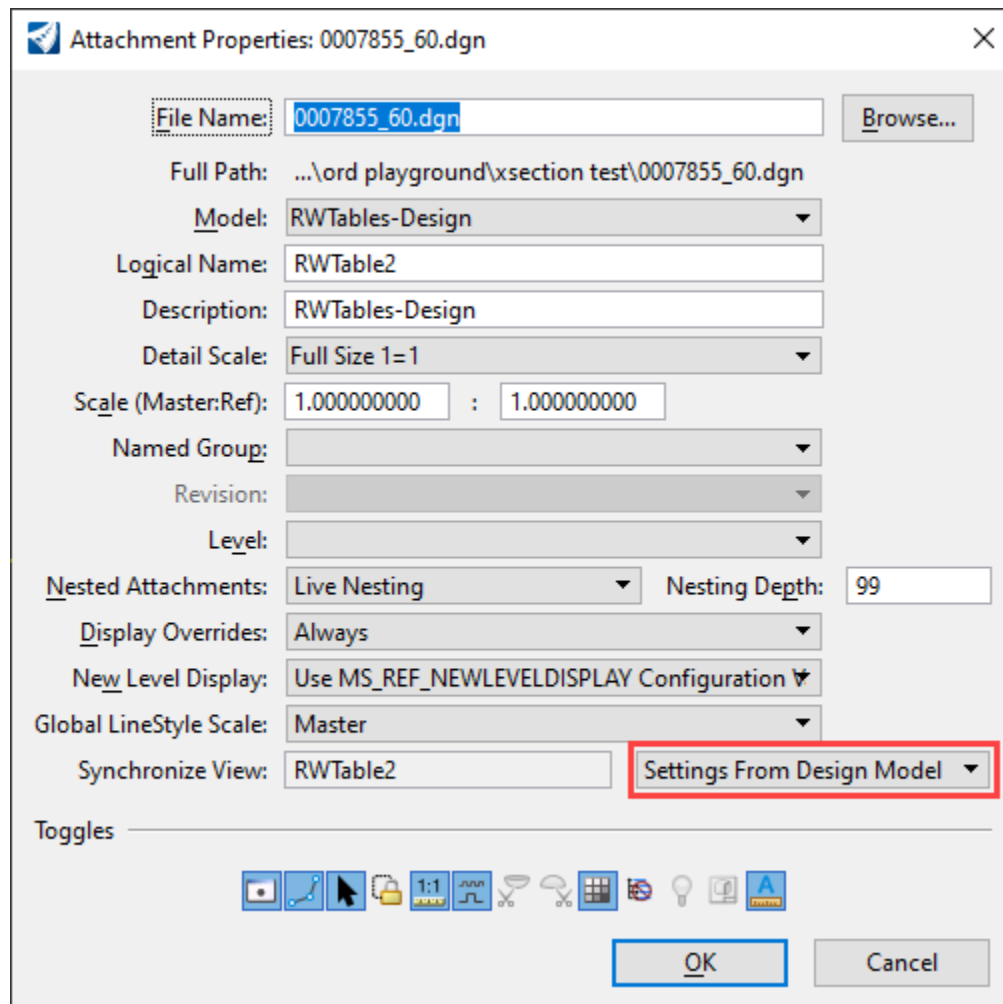
Beginning with ORD version 10.10.00.103, level synchronization between the Default/Design Model and Drawing Model (and therefore downstream to the Sheet Model) can be fully automated.

All GDOT Sheet Seeds have been updated such that any new sheets created will have this new feature turned on by default. If any levels are turned on/off in the Default/Design Model, they will immediately be synchronized downstream to the Drawing/Sheet Model.

Synchronizing Existing Files

For existing projects that have older sheets created in an ORD version prior to version 10.10.00.103, users may update their Drawing Models manually to incorporate this new feature and synchronize level changes, thusly:

1. Open a Drawing Model
2. Open the Reference File Dialog window and double click on the Reference File of the Default/Design Model, to open up its Settings.
3. In the “Synchronize View” section, select “Settings From Design Model” (this option is new in version 10.10.00.103).



4. Repeat for any other Drawing Models.