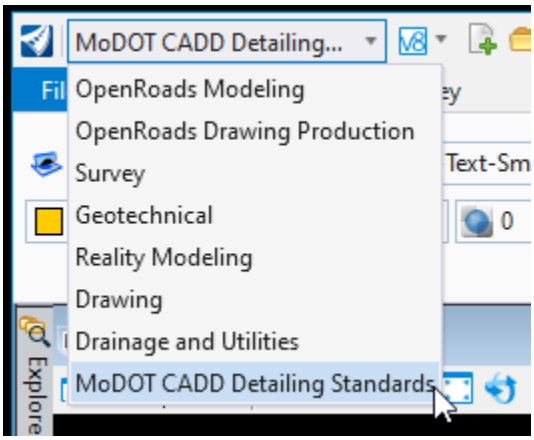
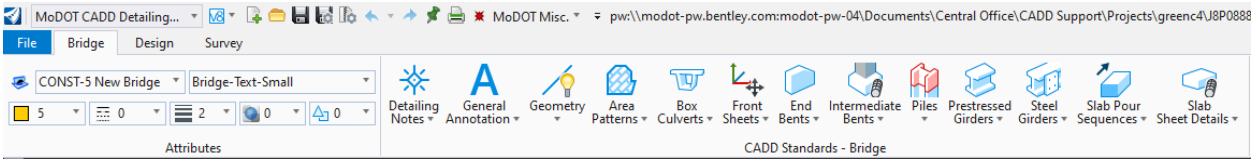
MoDOT CADD Detailing Standards

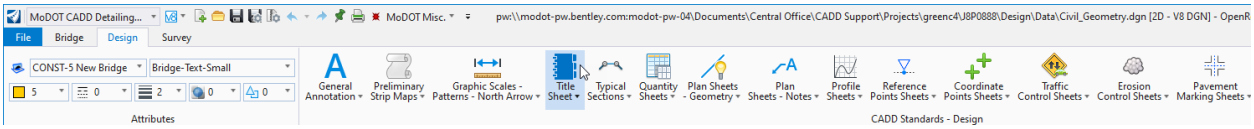
MoDOT CADD Detailing Standards – General Information

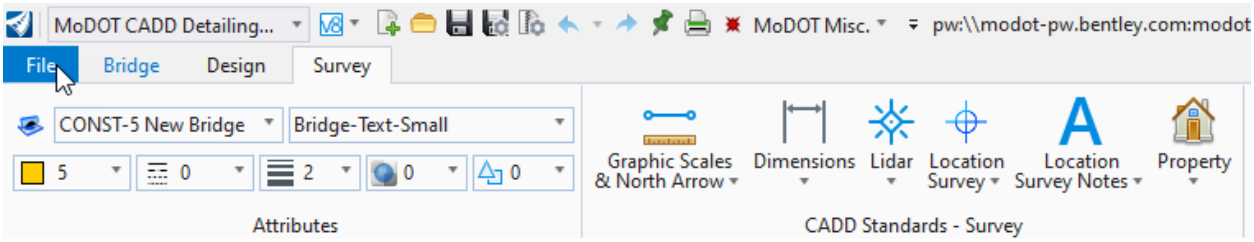
The MoDOT CADD Detailing Standards workflow is created to allow users to create geometry in sheet and drawing models that will adhere to our MoDOT standards.



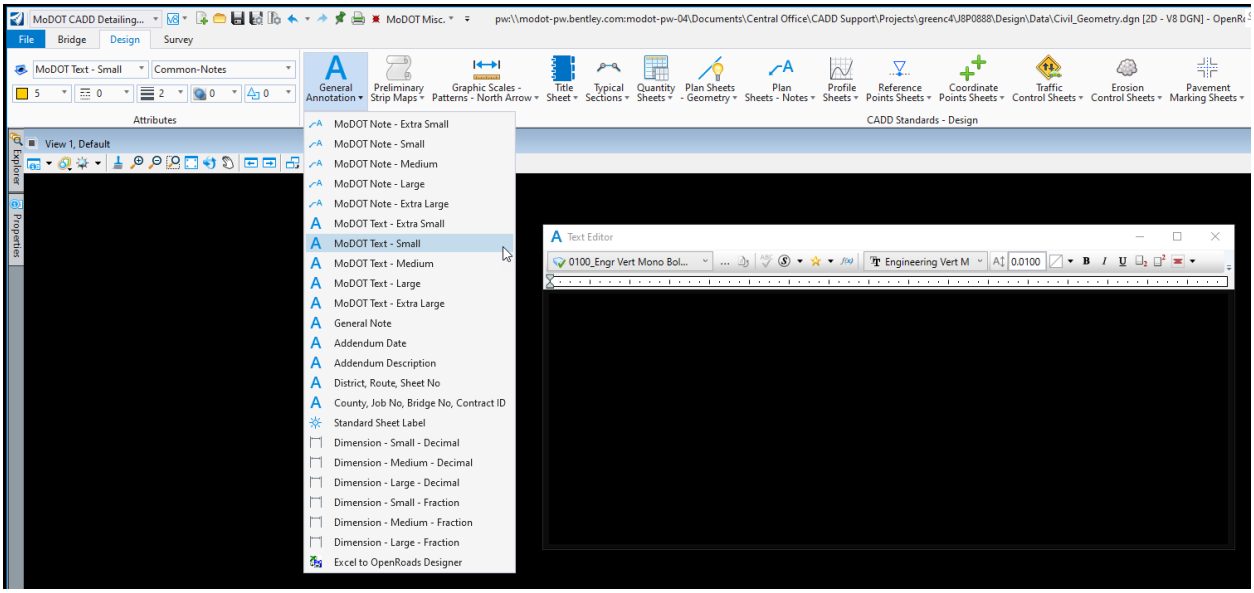
MoDOT utilizes the workflow and ribbons for the CADD Standards to enable users to place standardized items such as line styles, text, dimension, patterns, cells, and scales. The workflow and ribbons will enable the user to place geometry with the correct element attributes (level, color, linestyle, line weight) and also invoke the recommended tool with a single mouse click. The workflow has been broken out into 3 different ribbons – Bridge, Design, and Survey.





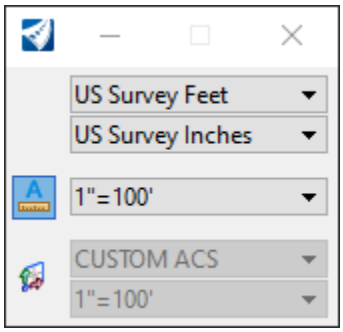


Each ribbon is then broken out into other groups to make it easy to find the correct task for the operation that you are doing at that time. Once you select the appropriate task under the ribbon, it will call up the appropriate tool to use and change the attributes and/or other settings to the correct MoDOT standards.



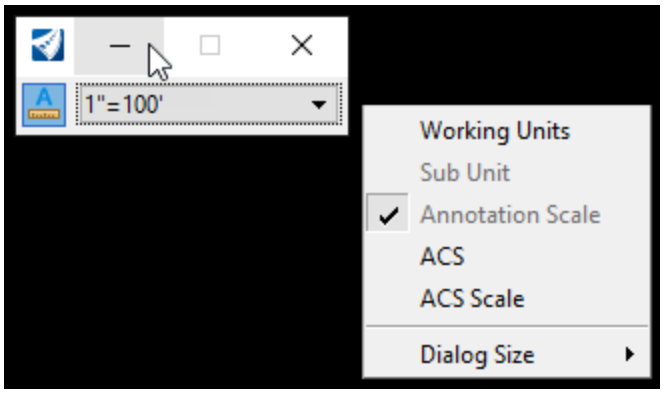
What is Drawing Scale (Annotation Scale)?

The Drawing Scale window is a dockable window that contains controls for viewing and/or modifying working units, the annotation scale factor, the Annotation Scale Lock, the active Auxiliary Coordinate System (ACS), ACS scale, and ACS scale lock. These settings are particularly relevant to the process of creating sheet models for drawing production.



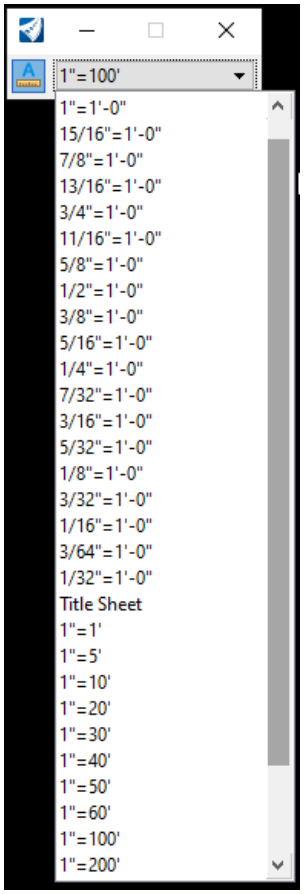
Undocked Drawing Scale window

The selection of controls displayed in the Drawing Scale window can be customized by right-clicking in the window. The technique is the same as that for showing and hiding tools in toolboxes.



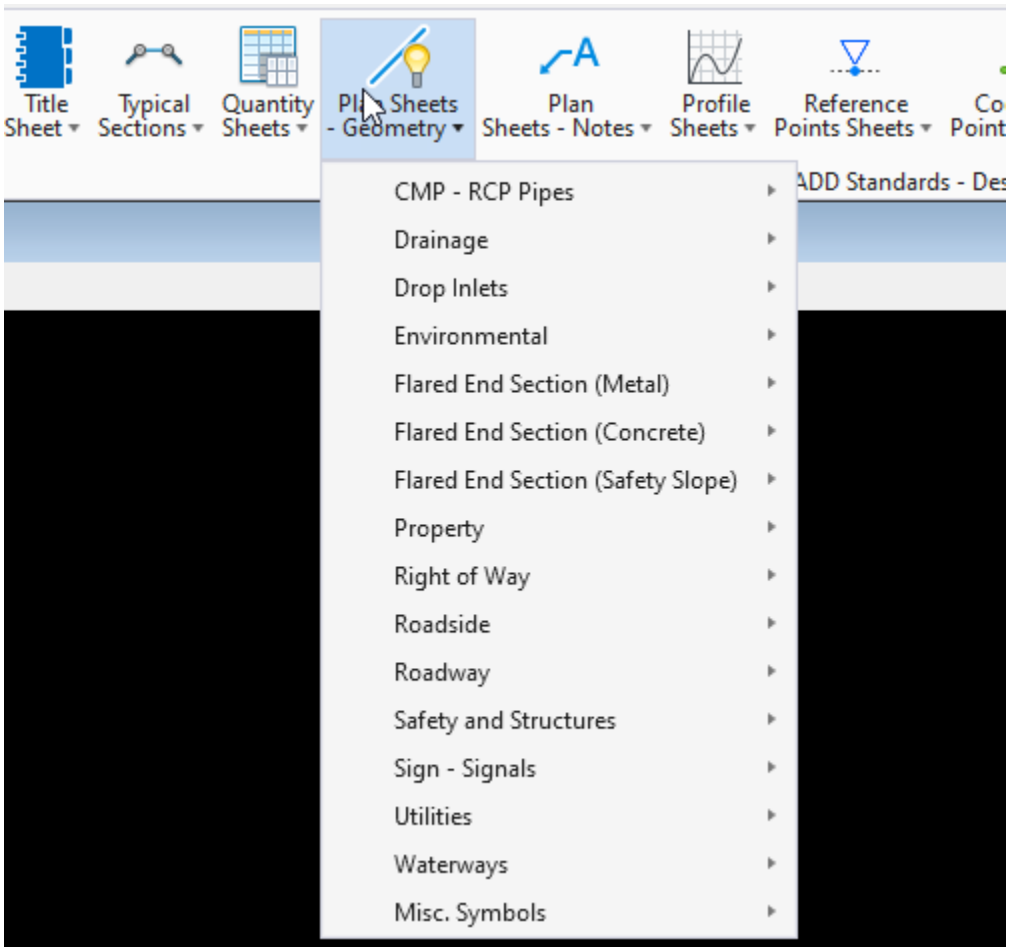
For MoDOT standards, the Annotation Scale in the Drawing Scale tool has been customized to include all Design files scales and all Bridge file scales. The Annotation Scale should be set to the scale of the Named Boundary placed into the file.

The Annotation Scale will control the size of cells, text, patterns, and dimensions that are placed as well as the display of custom linestyles (guardrail line, r/w lines, utility lines, etc.) in the file. It can also control the size of geometry for reference files in the active file if necessary.



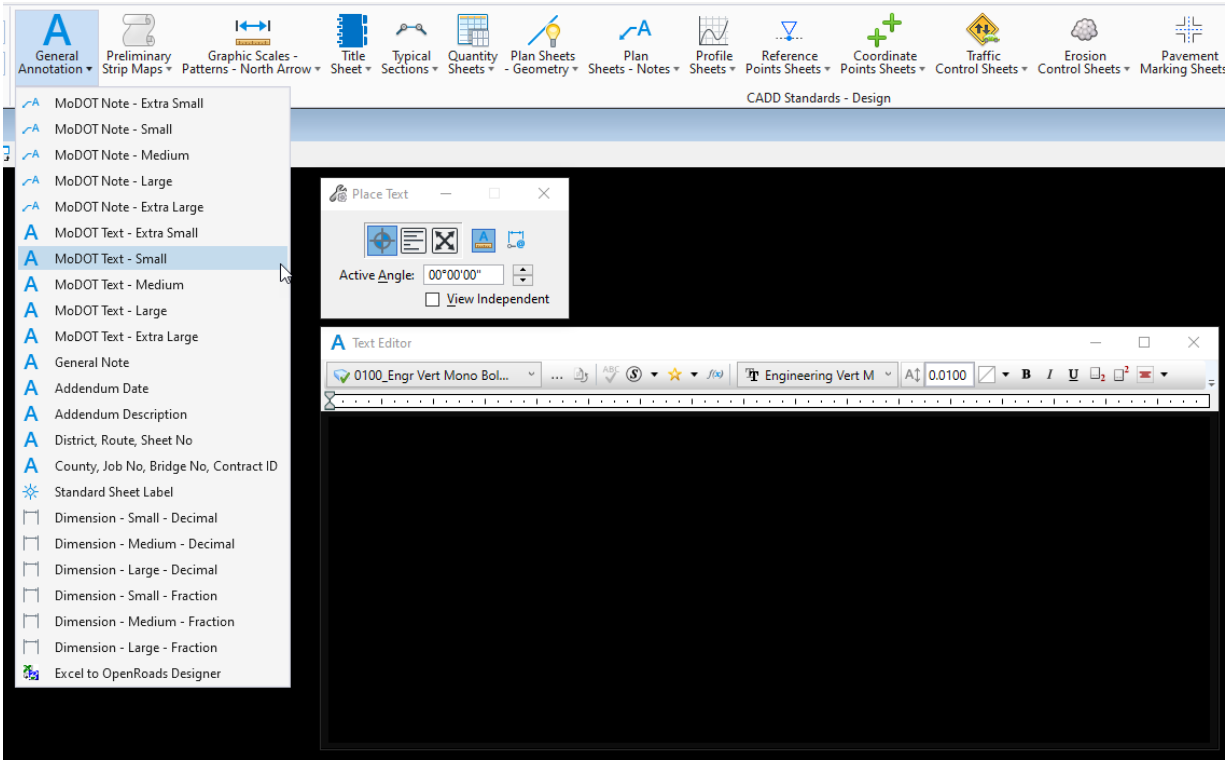
Activating the CADD Detailing Standards

The CADD Standards are activated by selecting the appropriate ribbon. The ribbon will be broken out into groups that contain tasks that are associated to that group like CMP-RCP Pipes, Drainage, Drop Inlets, etc.



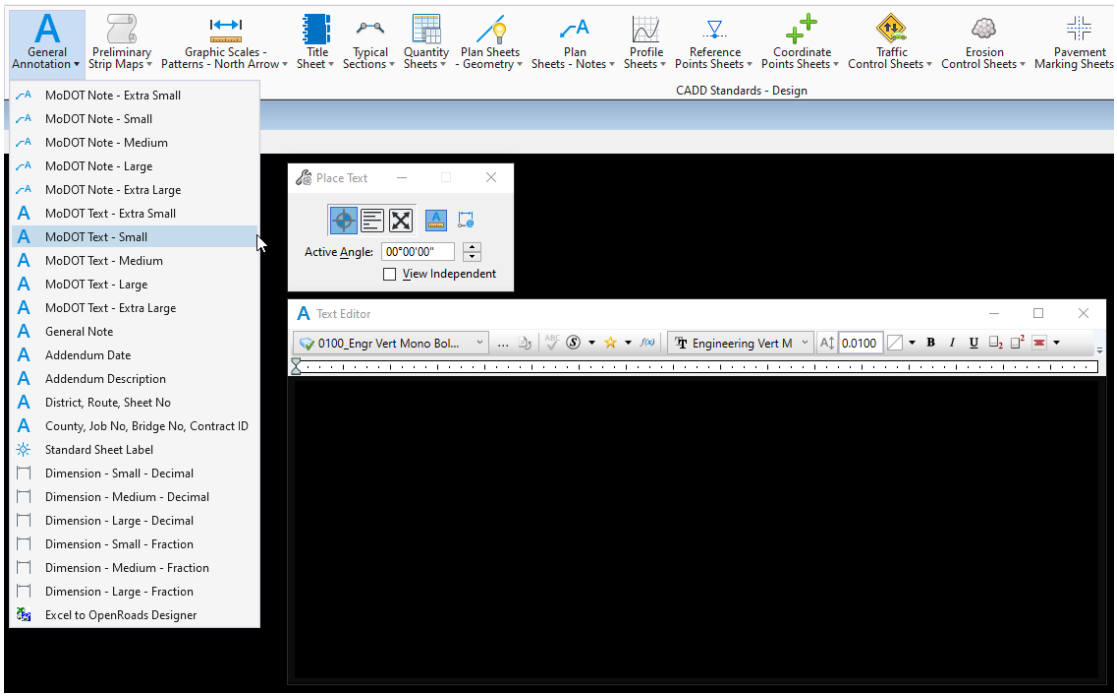
Once you navigated to the proper group, select the task as needed.

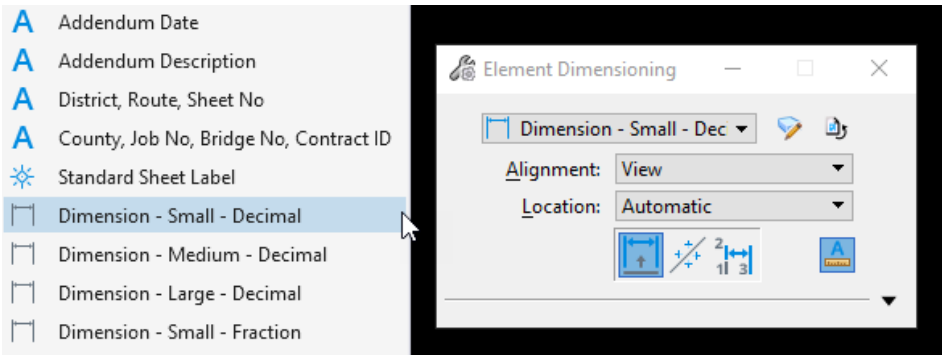
Selecting a task with a single mouse button click will allow that item to be placed on the correct level, color and weight. Using the task also keeps the user from having to attach a cell library or look up what level items are to be placed so that everyone at MoDOT is placing the same cells on the same levels. This also keeps the user from having to set text heights, widths and spacing. Dimensions are also incorporated in the group to set the correct text attributes, arrowhead sizes and other dimension attributes properly.



When viewing the tools under a certain group, you will see icons on the left side. These are indicators that basically tell you what tool it will call up when you select that option.

Tasks that are associated to the Place Text tool or the Place Dimension tool will have a style applied to that task. Styles are named sets of attributes, such as font, width, height, color, arrowheads, etc. that allow you to place text or dimensions within a file in a consistent and automated manner. The text and dimensions styles are stored in read-only DGN Libraries to allow management of text attributes and dimension attributes throughout the department.





Once a style has been used, it will embed itself in the file. This allows the file to be easily transferred to another department or company that may not have our MoDOT CADD setup, like a utility company.

Since styles will embed themselves in the file, the style can be modified or changed to whatever settings needed for that text or dimension to be placed. These settings will stay applied to the text style or dimension unless you select a certain text or dimension task. Then it will pull the style from the DGN Library for that text or dimension you need to place in the file.

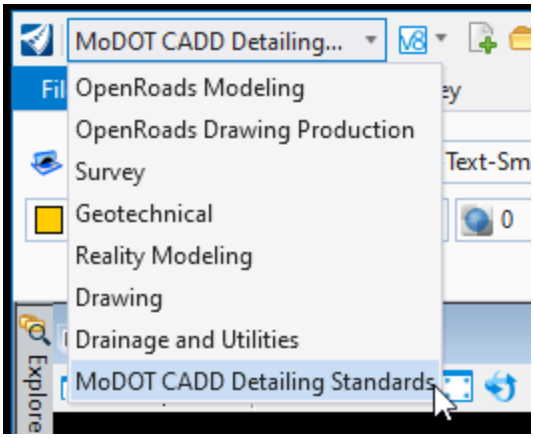
OpenRoads Designer Customized Items

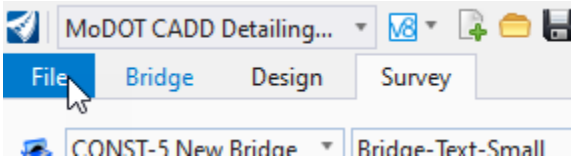
MoDOT has customized a couple items inside of OpenRoads Designer. This has been done to help users locate certain tools that may be hard to find in the default ribbons that are provided in OpenRoads Designer. It has been done also in ensure our CADD detailing standards are located in a location for our users to easily find them.

CADD Detailing Standards

The ***MoDOT CADD Detailing Standards*** workflow is created to give users a central location to have all detailing standards for plan production. It is broken out into 3 separate ribbons called Bridge, Design, and Survey.

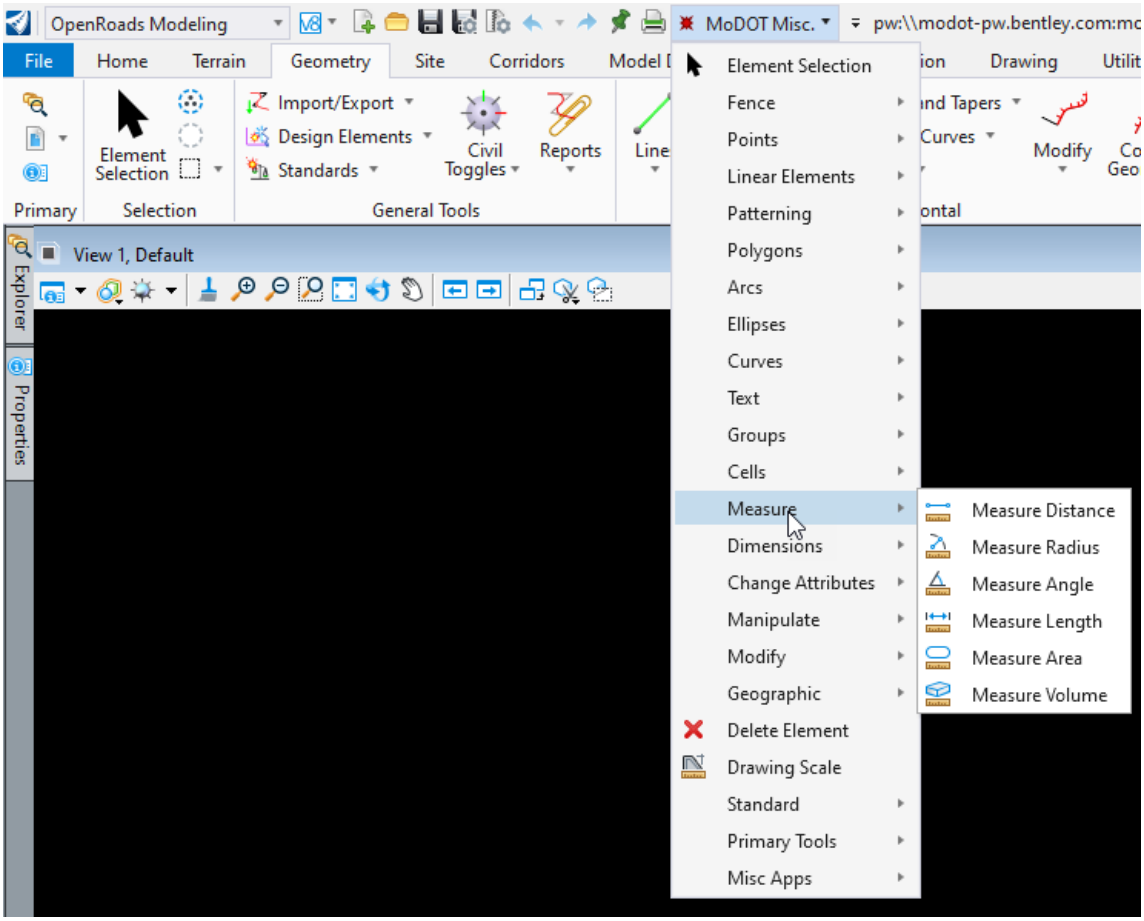
For more details on this subject, they are provided in the section called ***CADD Detailing Standards and Annotation Scale***.



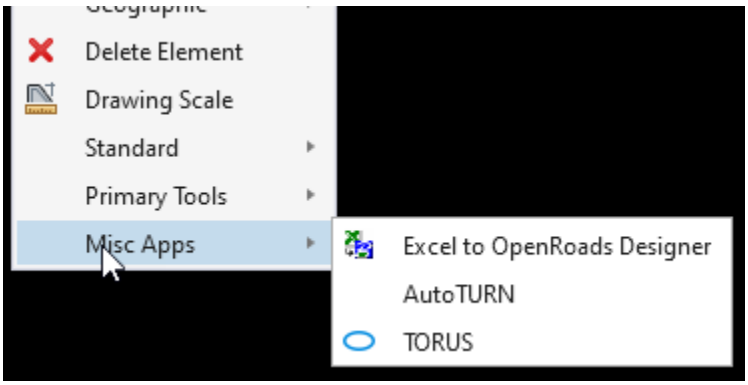


MoDOT Misc. Pulldown

The ***MoDOT Misc***. pulldown is added to the interface for users to easily find tools that may be hard to locate in the default ribbons in OpenRoads Designer.



At the bottom of the list will be an option called ***Misc Apps***. This will contain tools to activate applications that may be installed on the computer that work in conjunction with OpenRoads Designer.



Civil Accudraw

Civil Accudraw – General Information

Civil AccuDraw performs many of the same functions as MicroStation AccuDraw but has greatly expanded capabilities for the civil designer. It allows the user to define a point location at any stage of any placement tool and accepts input that results in more sophisticated point locations.

There are many benefits in using Civil AccuDraw. It extends the drafting power of MicroStation by providing Civil point location methodologies in all the MicroStation and Civil commands. It will also eliminate the need to create temporary construction geometries just to perform more complex point locations. In general, Civil AccuDraw works in a similar way to MicroStation AccuDraw. However, there are some differences and some limitations that will be addressed in future versions.

Differences

- Smart lock (<Enter>) is not supported in Civil AccuDraw. Similar functionality is possible by key-in and locking a value corresponding to the compass point.
- Spacebar does not switch Civil AccuDraw modes. It opens the mnemonic pop-up which provides similar and additional functionality.
- O shortcut is subtly different. MicroStation AccuDraw reads the cursor position at the instant that O is pressed. Civil AccuDraw waits for a DP. In addition, in Civil AccuDraw, the O shortcut also serves to pick the base element for station or offset ordinates. **Once chosen this element is remembered for the duration of the session or until changed by user.**
- In Civil AccuDraw, the delta Z origin can be set independent of the XY origin.
- When in a 3D model, the Civil AccuDraw compass always considers X, Y and Z as separate and distinct. For example, using Civil AccuDraw in a side view, the Y and Z ordinates will dynamically track values. On the other hand, MicroStation AccuDraw would still call the ordinates X and Y even though in a side view. Keeping the ordinates distinct and separate lays the groundwork for future enhancements where other Z ordinates such as slope will be introduced.

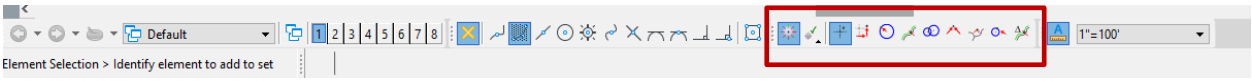
Limitations

- Angle input:
  The use of d, m and s for degree, minute and seconds delimiters is not supported.
  Input angle in the form DD^MM.mm is improperly interpreted as DD^00'MM.mm".
- Stationing:Station-offset using a closed B-spline may be incorrect. Civil AccuDraw cannot consume the stationing on alignments stored in GPK, ALG nor FIL files. The graphical elements representing these alignments can be selected but Civil AccuDraw will interpret the starting station as zero.
- When using Civil AccuDraw and viewing the shortcuts list, there may be shortcuts listed which have no function in Civil AccuDraw. Civil AccuDraw shares the shortcuts.txt file with MicroStation AccuDraw and some of the shortcuts are not relevant or have not been implemented in Civil AccuDraw.
- In the shortcuts list, if ordinates are station-offset and you choose Set Origin, clicking Run has no effect.
- Alternate Coordinate Systems (ACS) are not recognized by Civil AccuDraw.
- Civil AccuDraw will override File Settings > Grid Lock. This is by design. Toggle Civil AccuDraw off if the grid lock function is required. Similar functionality can be achieved within Civil AccuDraw by setting the round off values in Civil AccuDraw settings.

Working with Civil Accudraw

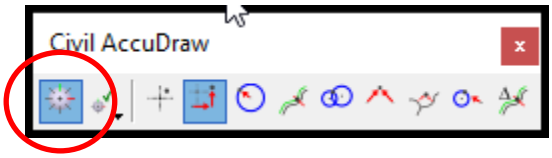
Activating Civil Accudraw

By MoDOT default, the Civil Accudraw toolbar is active and located at the bottom on the window.



The toolbar can also be activated by going to *Tools* > *Civil Accudraw* > *Activate Toolbar.*

To activate Civil Accudraw, toggle on the Civil Accudraw icon.

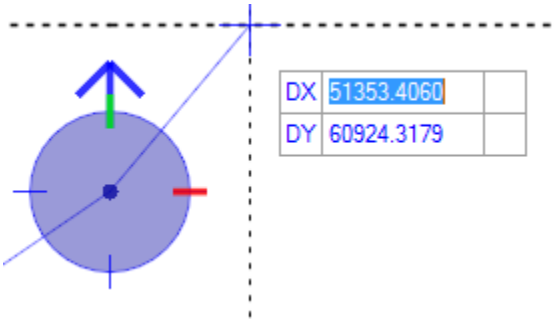


Coordinate Display

The coordinates of the current cursor position are displayed by default in a floating dialog. You can switch between the floating or fixed dialogs using the up and down arrow keys. The contents of the dialog will depend upon the current ordinate system selected. For example, the default system of Distance and Direction will display distance and angle. If the model is 3D, Z will also be displayed.

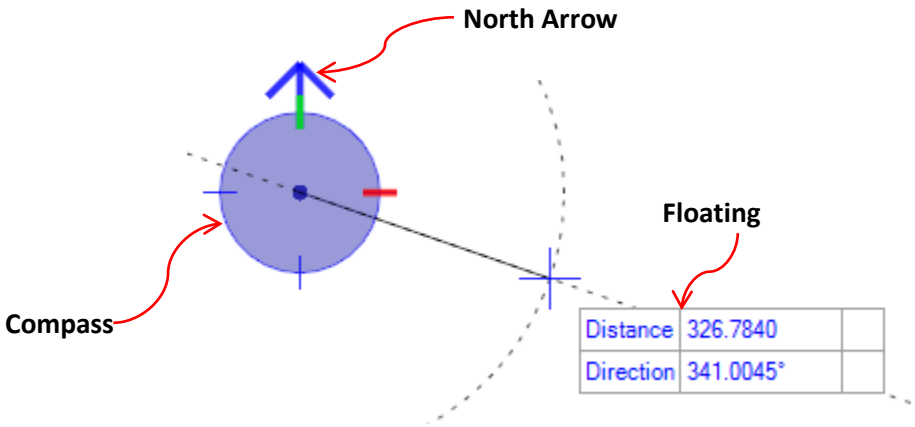
Only one dialog is displayed at a time.

Floating Dialog
The floating dialog is displayed close to the current position of the cursor. As the cursor moves, the dialog moves and is automatically updated with the new coordinate information. Press the down arrow to switch to the fixed dialog.



Fixed Dialog
The fixed dialog is a normal dialog and can be repositioned or docked. As the cursor moves, the dialog is automatically updated with the new coordinate information. Press the up arrow to return to the floating dialog.

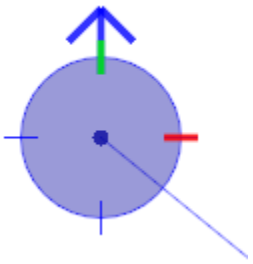
Fixed Dialog versus Floating Dialog
The default operation of Civil AccuDraw is with a floating dialog at the cursor for feedback and input of ordinate values as shown below.



Compass

The center of the compass indicates AccuDraw's origin point. The Civil AccuDraw compass is only displayed when Civil AccuDraw is active. It can also be disabled in *Settings* > *Operation* tab.

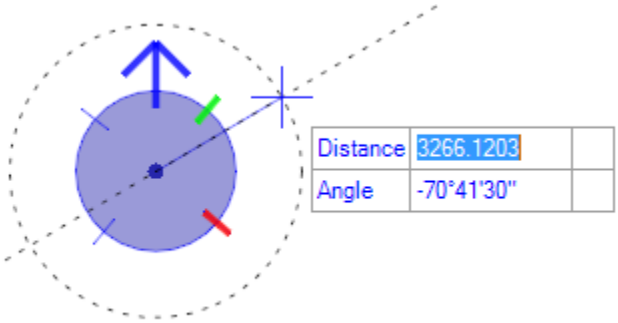
The compass is always circular and is marked by a number of tics. The default is 4 compass points, this can be changed in *Settings* > *Operation* tab.



Compass Shortcuts

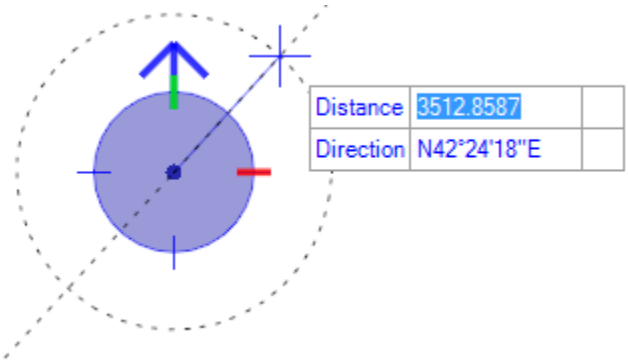
The compass can be rotated with the V, B, T, RQ, RE shortcuts. The north arrow on the compass will always point to north as defined in *Settings* > *Design File* > *Angle Readout*.

If the Civil AccuDraw settings have context sensitive turned on, then the compass auto-rotates in a similar fashion to MicroStation AccuDraw:



Note that rather than Direction being shown, the label and value are now an angle. This is because the context is based on the direction of the preceding line segment rather than an absolute direction.

Use the T (Top) shortcut or the corresponding drop-down to return to a pure direction.



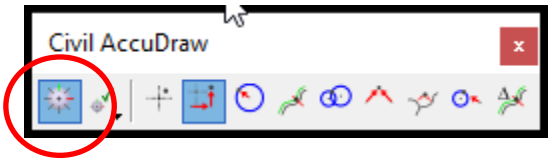
The angle/direction settings used in Civil AccuDraw are taken from the file settings. See *Settings* > *Design File Settings* > *Angle Readout* category topic of MicroStation help.

Tips when using with MicroStation or Civil Geometry tools

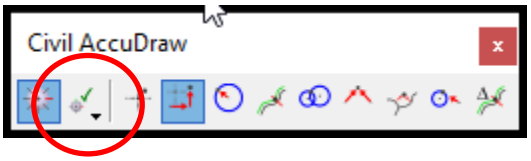
- Selecting the **Tab** key while in an entry field will change focus.
- Selecting **Enter** will set the value in the field and lock it
- Selecting the **End** key will unlock the field
- Selecting the **Left or Right Arrow key** will move through the favorite options.
- Selecting the **Down key** will bring up the associated command entry dialog in addition to the heads-up display.
- Selecting the **Up key** will remove the command entry dialog and just display the heads-up display.
- Selecting the **O key** will allow to select a reference element or point for using certain civil accudraw commands like Station-Offset, Offset-Offset, Distance-Distance, etc.
- To input a Bearing in the direction field for civil accudraw, the following are valid forms:
    - **12:34’56**
    - **12:34’56”**
    - **12:34:56**
    - **12^34’56**”

Civil Accudraw toolbar

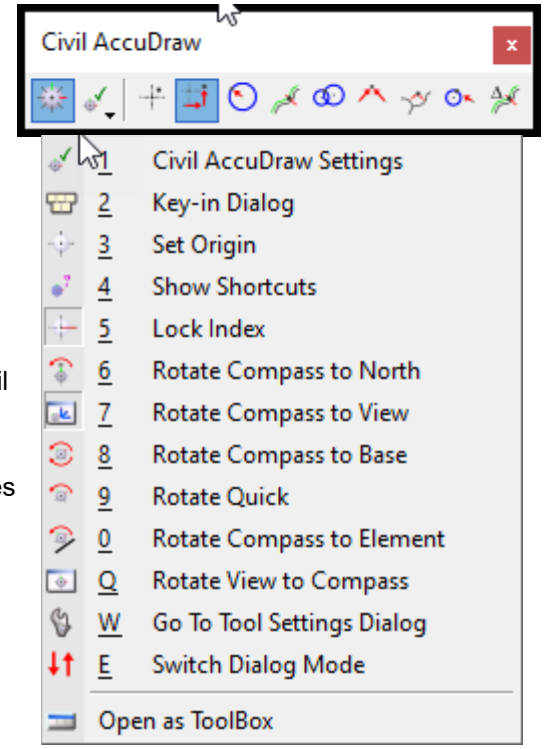
This toolbox consists of icons to toggle Civil AccuDraw and access the Civil AccuDraw commands.



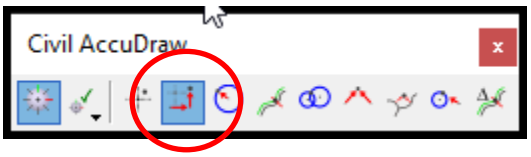
Toggle Civil Accudraw
To activate or deactivate Civil Accudraw



Civil Accudraw Settings
To access the Civil Accudraw settings dialog. See Civil Accudraw Settings section for more information.
A quick drop-down menu will be display when holding down the left mouse button over the icon. This provides access to many Civil Accudraw shortcuts.



X-Y
To set the order of entry based on absolute X-axis and Y-axis, with both sharing the same point of origin.

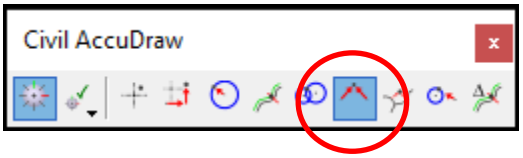


DX - DY
To set the order of ordinate entry to the difference in X coordinate then the difference in the Y coordinate, with both sharing the same common point of origin.

Distance & Direction
To set the order of ordinate entry to distance then direction, with both sharing the same point of origin.

Station & Offset
To set the order of ordinate entry to station identification then offset value, with both sharing the same point of origin.

Distance & Distance
To set the order of entry to distance for the first ordinate then distance for the second ordinate, without a common point of origin.



Direction & Direction
To set the order of entry to direction for the first ordinate then direction for the second ordinate, without a common point of origin.

Offset & Offset
To set the order of entry to offset for the first ordinate then offset for the second ordinate, without a common point of origin.

Civil Accudraw Coordinate Systems

Horizontal Ordinates

With MicroStation AccuDraw, the user is limited to X-Y (rectangular) or Distance-Direction (polar) coordinate systems. With Civil AccuDraw, the user may define an ordinate system from virtually any combination of the following ordinates.

Note: Some combinations are not allowed simply because they do not make sense. For example: Dx - Dx

X: Absolute value of X coordinate
Y: Absolute value of Y coordinate
Dx: Delta X (change in X) from compass origin
Dy: Delta Y (change in Y) from compass origin
Distance: Horizontal distance from the compass origin
Direction: Direction (as per Settings > Design Settings > Angle Readout) from the compass origin.
Station: The distance measured along an element. Any graphic linear element may be used. Use the Origin shortcut to choose the element.
Offset: The distance measured perpendicular from an element. Any graphic linear element may be used. Use the Origin shortcut to choose the element.

Angle Syntax

The input for angle and direction fields follows the *MicroStation Settings > Angle Readout* settings.

Valid forms
Valid forms for the various settings are as follows:

DD.DDDD, Radians or Grads - Use the customary decimal input.
DD MM SS or DD MM - The following delimiters are supported between degrees, minutes and seconds:

- Colon - For example DD:MM:SS
- ^ (caret) to designate degrees, minute (’r;) and second (”r;) - For example DD^MM’SS”

The following are not supported in the current version:

- A space between degrees, minutes and seconds because space launches the Civil AccuDraw popup menu
- Use of d, m and s to designate degrees, minutes and seconds.

Examples
The following are all valid forms for 12 degrees, 34 minutes, 56 seconds:

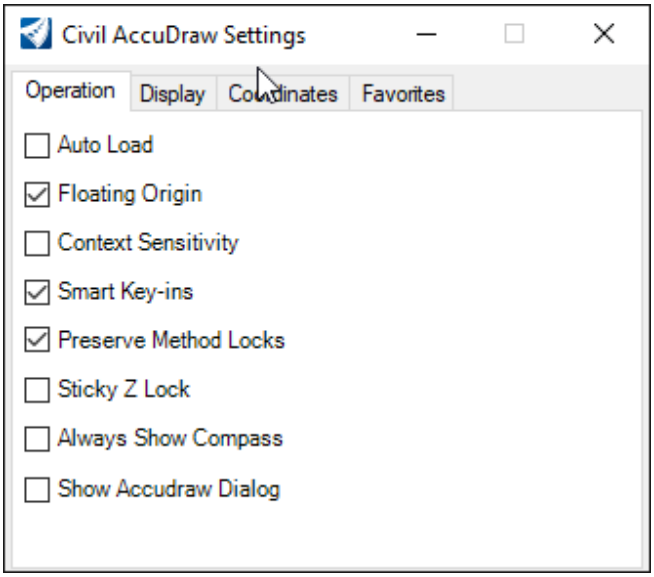
- 12:34’56
- 12:34’56”
- 12:34:56
- 12^34’56”

Civil Accudraw Settings

There are various Civil AccuDraw settings to enable you to customize the functionality and appearance of the Civil AccuDraw tools.

You can open Settings by selecting the icon from the Civil AccuDraw toolbox.

Operation tab



Auto Load
On: Civil AccuDraw starts when MicroStation is loaded.

Floating Origin
On: the origin moves to the last point placed.
Off: the origin remains fixed.

Context Sensitivity
On: the compass rotates in response to the context of various tools.
Off: the origin remains fixed

Smart Key-Ins
On: Civil AccuDraw interprets a number as positive or negative, depending on the direction of the pointer from the compass.
XY ordinates only: Smart Key-ins cause Civil AccuDraw to move the focus to either the x or the y field depending on the pointer position.

Preserve Method Locks
On: the locked values remain locked after switching the ordinate methods. For example, using station-offset ordinates and a lock station of 1+00, switch to distance-direction ordinates. Station 1+00 will remain locked while inputting distance-direction. The resulting effect will be a distance-direction-station lock.

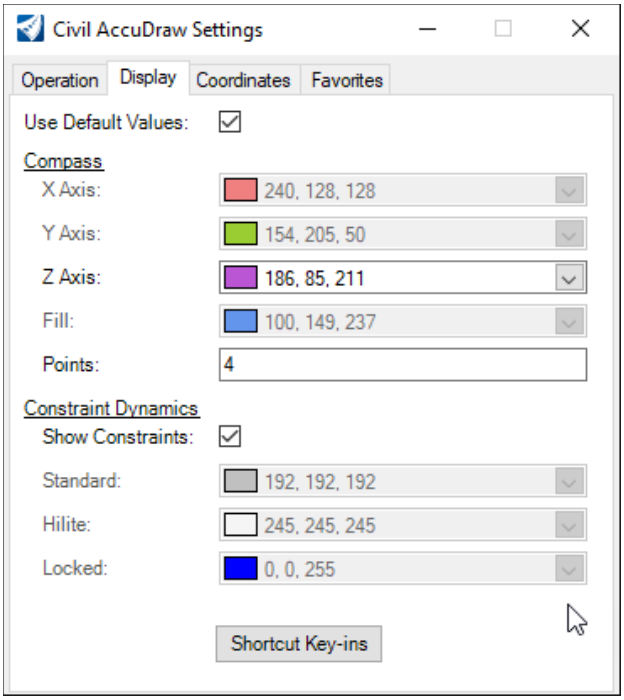
Sticky Z Lock
On: inputs to Z ordinates remain locked (sticky) until they are changed. This is useful in a 3D file to control the Z ordinate. For example, input 100.00 for the Z ordinate and the value remains constant until changed.
Off: the Z ordinate follows the cursor dynamics.
This also controls whether the origin for delta Z measurements follows the XY origin or is independent of XY.

On: the origin for delta Z is completely independent of the XY origin. For example, the user can set the origin for dXdY measurements from point A and set dZ to be measured from a second point B. The Z origin does not change until reset by the user. The effect will be apparent when drawing a linestring. When drawing a linestring, the dynamic orientation of the compass will adjust to align with the most recent line segment. The Z origin will remain fixed wherever the user placed it at in the beginning.

Note: When Accudraw ordinates are set to X,Y the sticky Z toggle does not apply. This is because, by definition, XY mode is always assumed to be absolute.

Always Show Compass
On: the compass is always visible.
Off: the compass is only visible when the appropriate input is required.

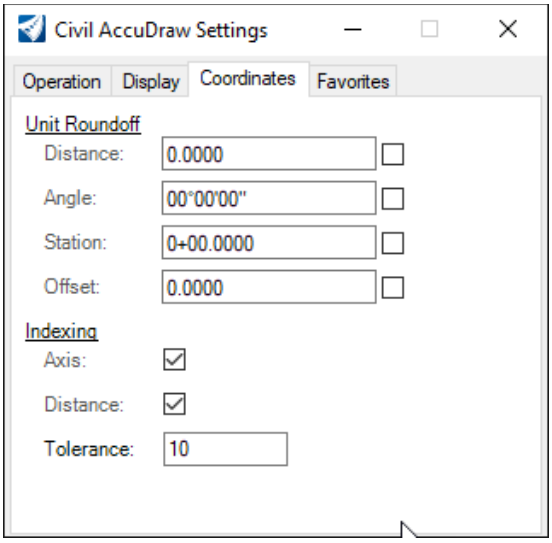
Display tab



Compass
X Axis: Sets the color of the positive X axis tick mark on the compass.
Y Axis: Sets the color of the positive Y axis tick mark on the compass.
Fill: Sets the fill color of the compass circle.
Points: Sets the number of compass points indicated by tic marks. In addition to tic marks, the axis locks are also honored on the tic marks.

Constraint Dynamics
Show Constraints: Shows dynamic feedback for the ordinate systems in use. For example, with Distance-Direction ordinates a circle indicating distance and a line indicating direction is displayed.
Standard: The color of the constraint dynamics.
Hilite: The color of constraint dynamics when they are constrained by an axis lock.
Locked: The color of the dynamics when they are locked by a user key-in.

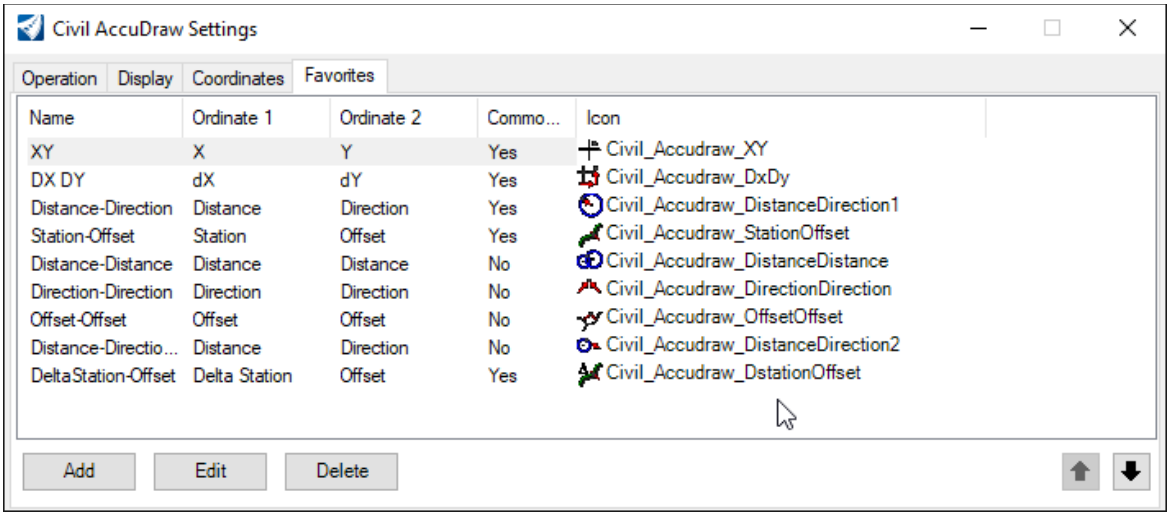
Coordinates tab



Unit Round-off
Defines a stepping value so that ordinate values are rounded to an even increment. Separate round off values are available for distance, angle, station and offset. The distance value also affects coordinates. Check the tick box beside each setting to enable it.

Indexing
Axis: If ON and if you get close to a compass point then the Civil AccuDraw dynamics lock onto the compass point direction.
Distance: If ON and if you get close to a recall distance then the dynamics lock to the recalled value.
Tolerance: For indexing, how close the cursor must be to the item in question when the indexing takes effect

Favorites tab



The **Favorites** tab allows for the configuration of the most commonly used ordinate systems. It is one of the primary differentiators between Civil AccuDraw from MicroStation AccuDraw. The favorite selected determines what input fields are available during the placement of an element.

Most logical combinations of ordinates are allowed. See the section *Civil Accudraw Coordinate Systems* > *Horizontal Ordinates* for an explanation of the ordinate types.

Name: The user defined name of the designated coordinate system

Ordinate 1: The type of ordinate set for the first ordinate. (Available ordinates are X, Y, Distance, Direction, Station, Offset, Dx, Dy)

Ordinate 2: The type of ordinate assigned to ordinate 2.

Common Origin: If YES, the two ordinates have the same origin.
If NO, the two ordinates are measured from different origins. For example, for a Station-Offset ordinate system where Common Origin is set to YES, the station and offset are both measured from the same alignment.
If NO, then the station is measured from one alignment and the offset is measured from a different alignment.

Icon: The icon displayed on the Civil AccuDraw toolbox. Usually a suitable icon is selected automatically, but you can define any icon.

Named Boundary

Named Boundary – General Information

The Named Boundary tool is used for the composition of drawing models and sheet models. From the default model, this tool will basically create a drawing model and a sheet model. The Drawing model is used to detail elements that don't need to be in the default model. Geometry like text, notes, dimensions, etc. are examples of what are commonly placed in the drawing model. The Sheet model will contain what has been placed from the default model and drawing model. Along with that, the border file will also be placed the sheet model.

Nothing should be done in the sheet model, except for editing the title block information. Any other modifications done the sheet model will not be supported by MoDOT CADD Support.

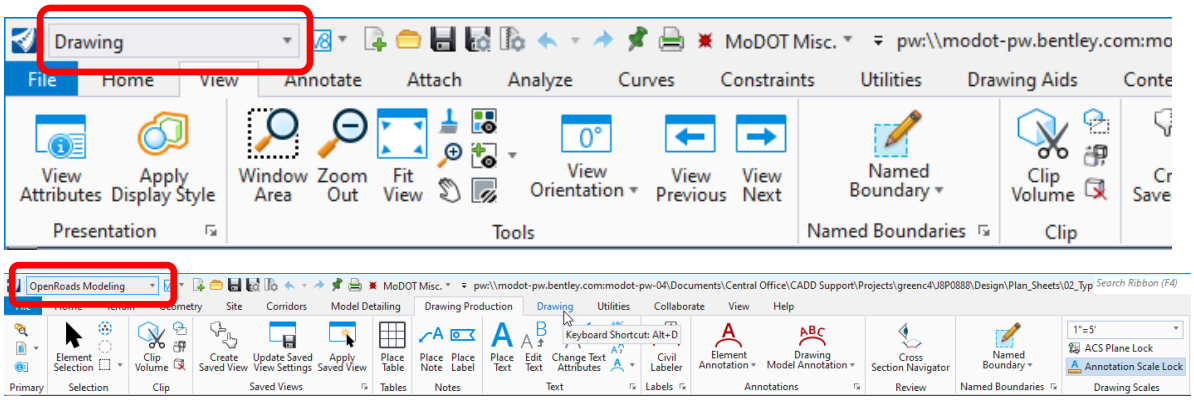
While there are many different variations that you can do when using the Named Boundary tool to create certain plan production drawing and sheet models that will contain the border, the steps below will give you a general workflow on how to use the Named Boundary tool for a detailed file like typical sections, quantities, special sheets, bridge drawings, etc.

For information on using the Named Boundary tool to create plan, profile, plan-profile, plan-plan and cross sections, please refer to the MoDOT online training documentation under OpenRoads Designer – Road 1. There is a chapter called Plans Production that will go into detail on those type of sheets.

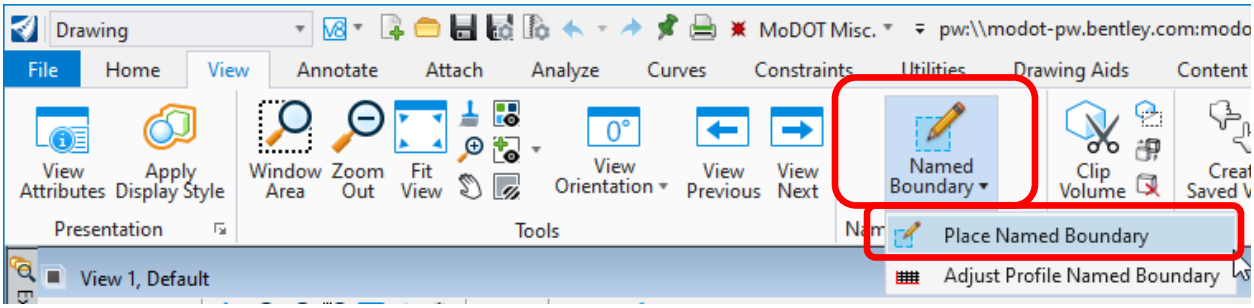
For more detailed information on the Named Boundary tool, please refer to the online Bentley help in MicroStation section.

Named Boundary – General Workflow

1. Select a workflow that contains the **Named Boundary** tool.

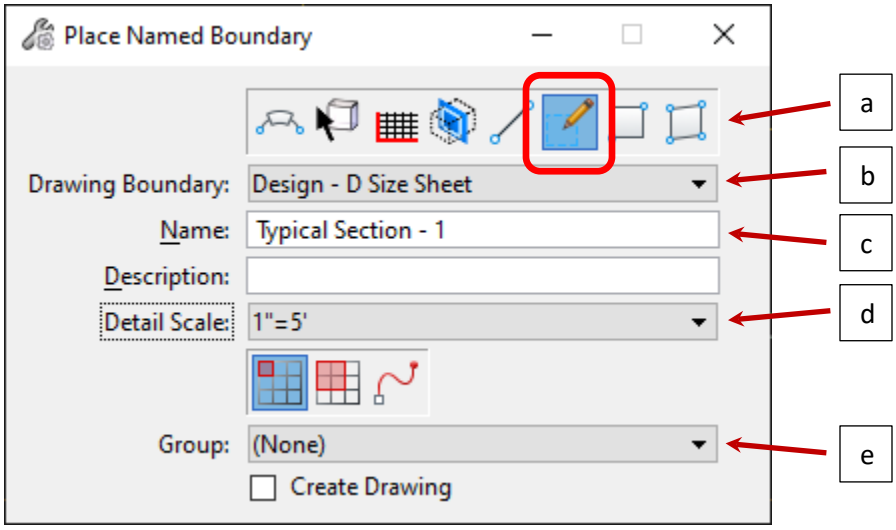


2. Select the **Placed Named Boundary** option under the **Named Boundary** tool.



3. In the **Place Named Boundary** dialog, change the options as desired to produce the clipping shape for the plan sheet.

- For this example, fill out as shown below.



a) **Clipping shape options** - set to **From Drawing Boundary**

b) **Drawing Boundary** - select **Design - D Size Sheet**

c) **Name** – user defined. This will be the name of the boundary under the Name Boundaries after the boundary has been created

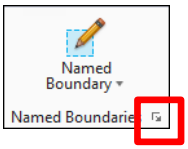
d) **Detail Scale** – as desired to get geometry inside the boundary

e) **Create Drawing** - toggle **off**

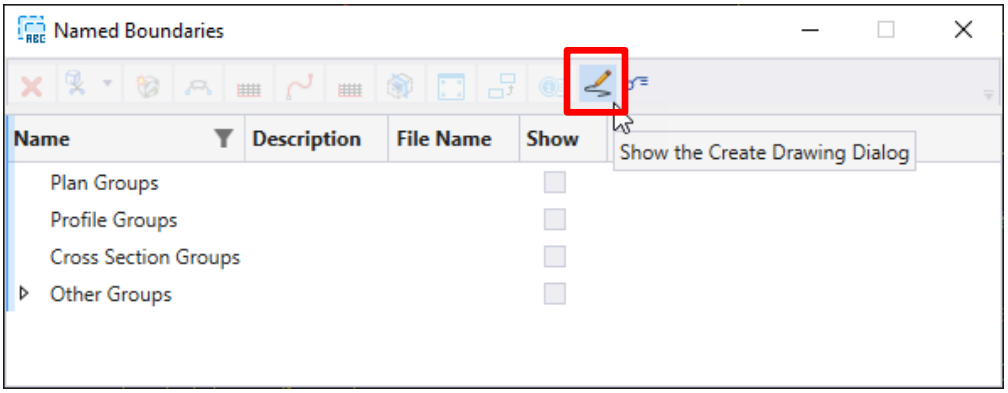
4. Once the **Named Boundary** dialog has been completely filled out, place the boundary in the desired location in your default model. The boundary can be moved after it has been placed if needed.

5. Now that the boundary has been created, you can now start the process to create the plan sheet.

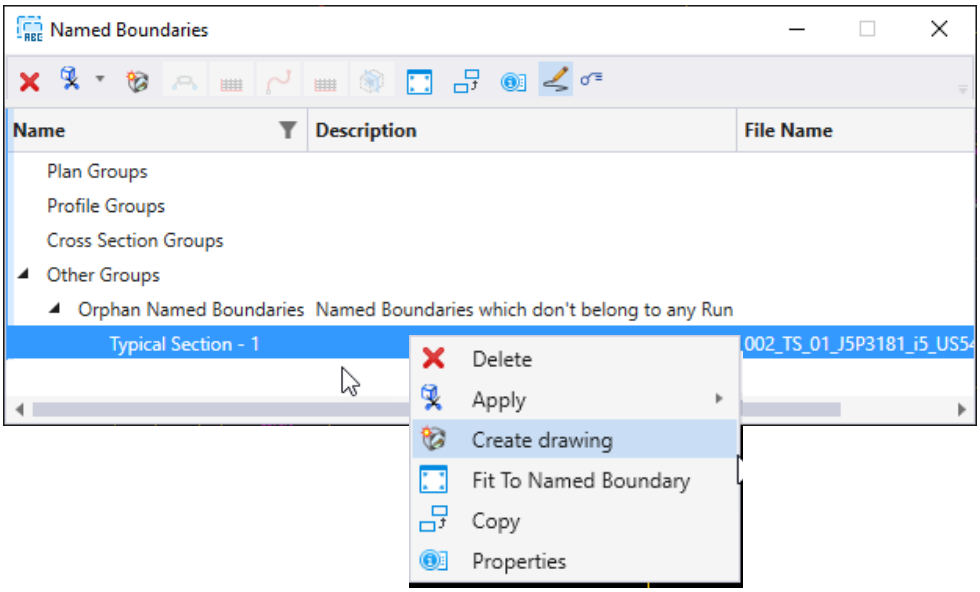
   Select the **Manage Named Boundary** tool.



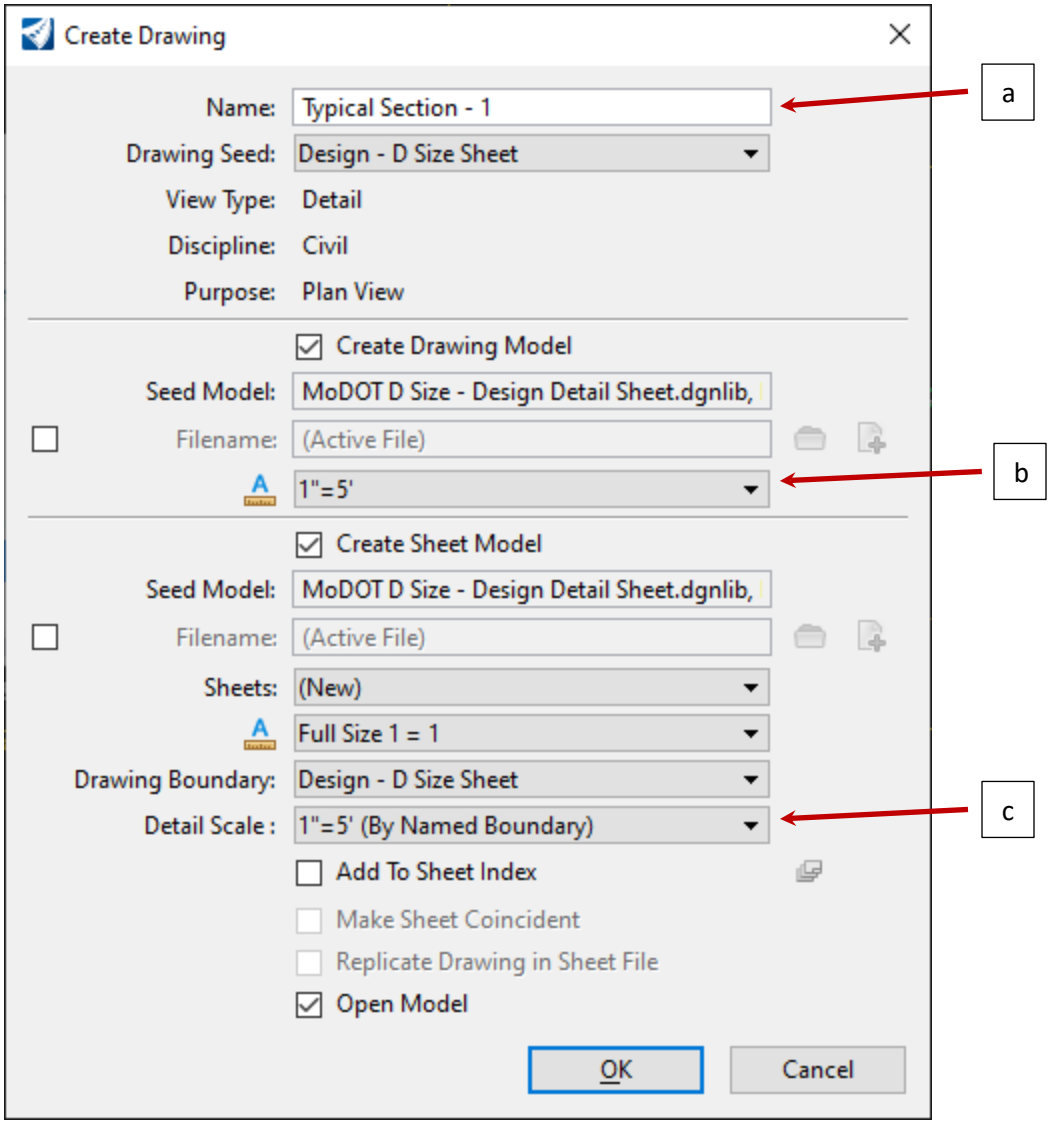
6. Toggle **on** the **Show the Create Drawing Dialog** option.



7. Click on the triangle (down arrow) to expand out the **Other Groups**. ***Right click*** over the desired group or boundary and select the **Create drawing** option.



8. In the **Create Drawing** dialog, most options will be set to the proper settings and you will not need to modify. But there's a few that you will need to review and possibly change.
    - For this example, fill out the dialog exactly like the dialog below.



a) **Name** – will be the name of the drawing and sheet model. Keep this in mind if you use the Sheet Index so you can arrange them properly

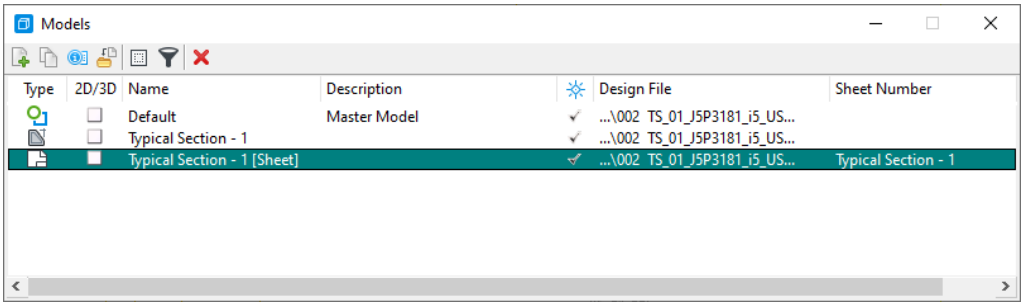
b) **Annotation Scale (drawing model)** – set to the same scale of the placed named boundary

c) **Detail Scale** – set to the same scale of the placed named boundary

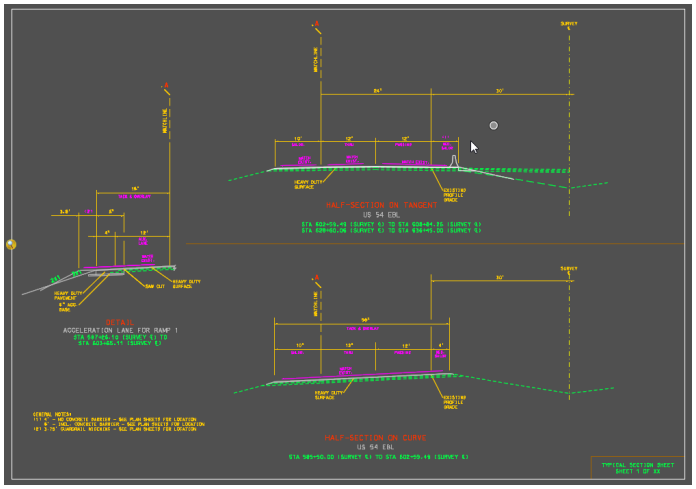
Once everything is set, click **OK** to create the drawing and sheet models.

9. Open the sheet file and review.

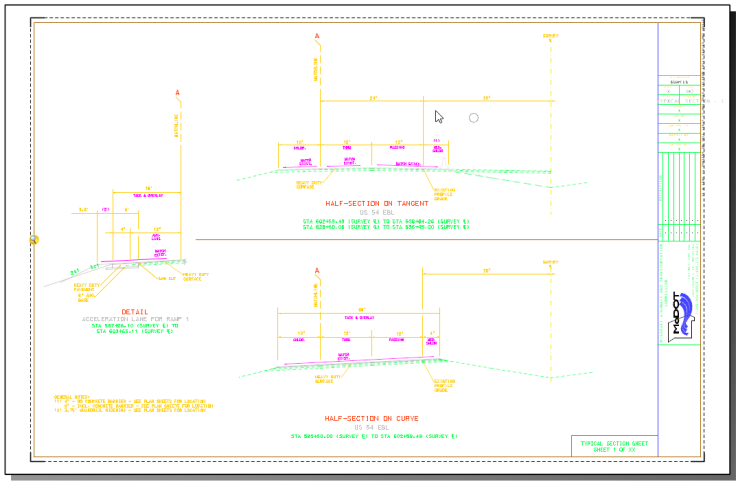
In the **Models** tool, you will see that it created a drawing model and a sheet model.



The **Drawing model** is designed to add geometry like text, notes, dimensions, extra reference files, etc. to the file. The drawing model is still a 1:1 scale, so everything is the same scale as from the file that you cut the sheets from.



The **Sheet model** takes what is in the default and drawing models and scales it down to fit the border that is in the Sheet Model. Adding geometry (except for the text that is needed for the border information) to the sheet model is **not recommended or supported** by CADD Support.



Sheet Index

Sheet Index – General Information

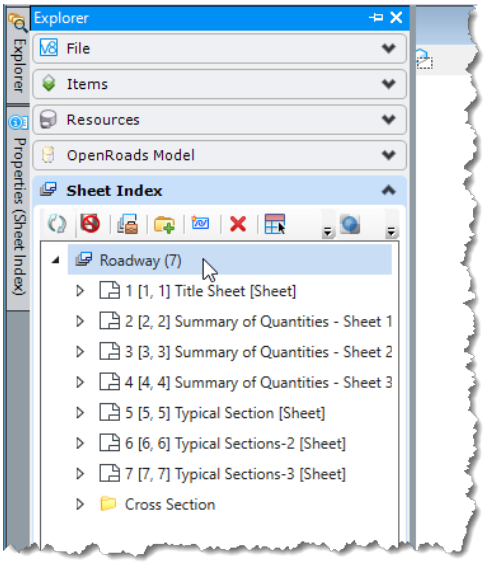
A sheet index is a centralized and structured collection of sheets in your project. Sheet index can be useful in creating a sheet set that contains all the sheet models. You may link any sheet model from any design file of your project into a sheet index. You can then collectively manage properties of all the sheet models within the sheet index. Sheets can be organized hierarchically in folders. Sheet indexes can also be opened using the Print Organizer for printing.

While using the sheet index, the sheet numbering rules enable you to define rules to generate sheet numbers for all sheets in the sheet index. Custom properties can be attached to sheets and placed as text fields in the sheet. Custom properties can also be attached to the folders and the sheet index.

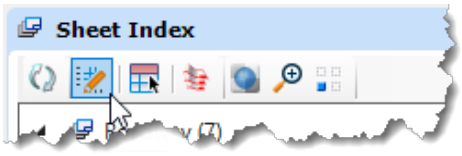
Note: Sheet numbering and custom properties will not be used at this time at MoDOT. The Create Renditions application currently will not read the text for the sheet numbers and custom properties fields properly from the ORD file.

Sheet Index – Adding Sheet Models to Index

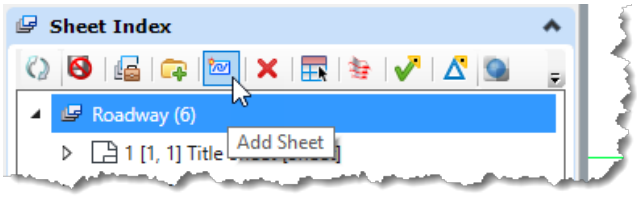
1. In the **Sheet Index** tab within Explorer, select the sheet index or the folder to which you want to add the sheet(s) into.



2. Click **Open Sheet Index for Edit** to open the sheet index in editing mode.

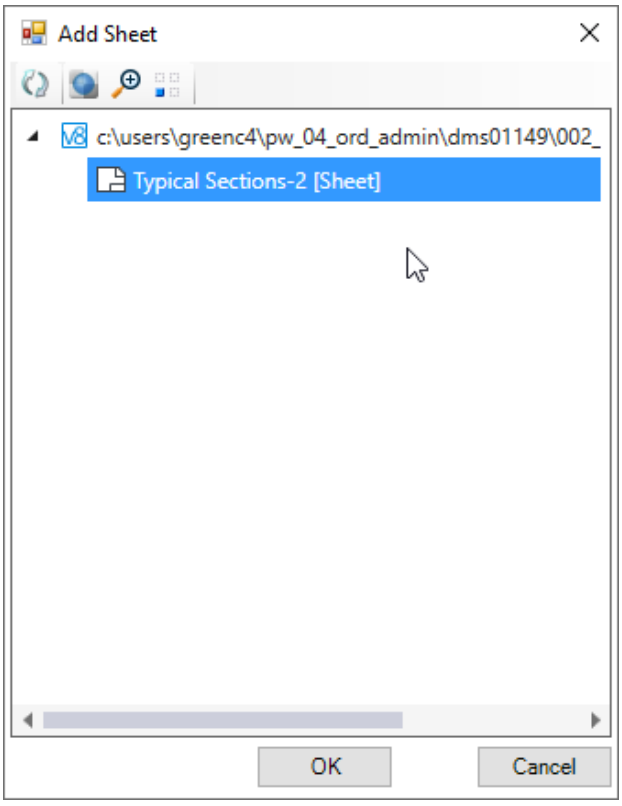


3. Click **Add Sheet**.



4. In the Add Sheet dialog, select the files that contain the sheet models and click **OK**.
5. The next Add Sheet dialog will list the sheet models available for being added to the sheet index.

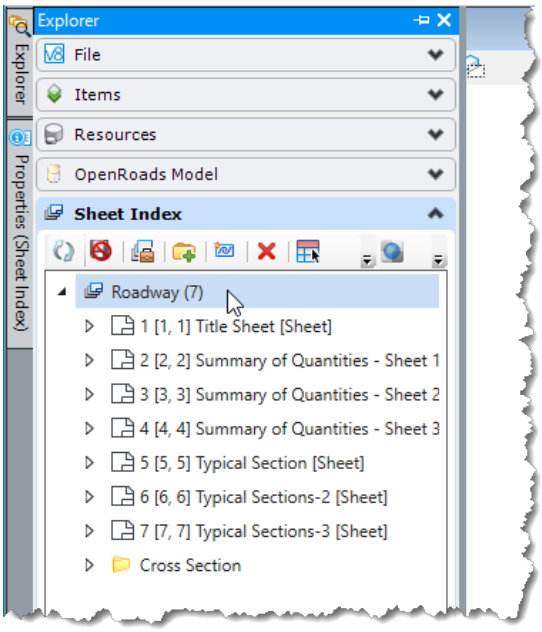
   Select the sheet(s) that you want to add the sheet index.



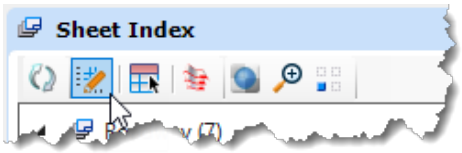
6. Click **OK** to accept.

Sheet Index – Deleting Sheet Models from Index

1. In the **Sheet Index** tab within Explorer, select the sheet index (Roadway).

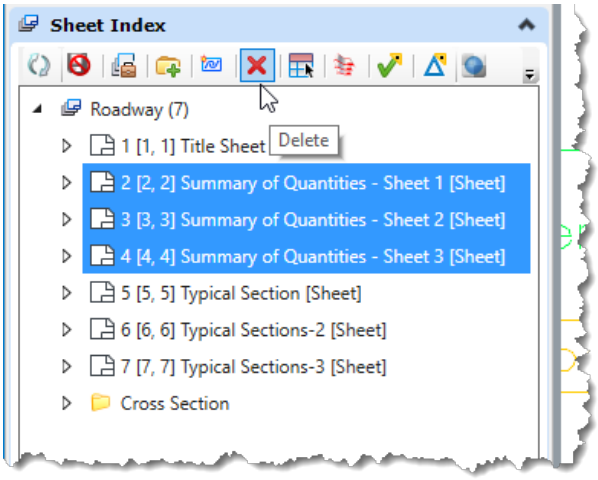


2. Click **Open Sheet Index for Edit** to open the sheet index in editing mode.



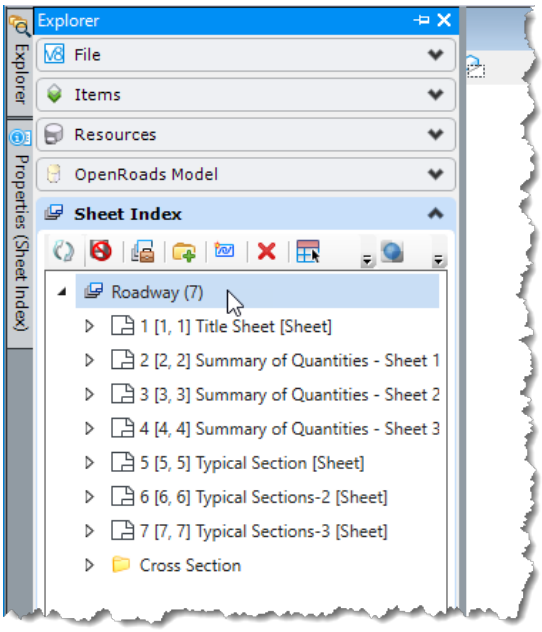
3. Select the sheet(s) that you need to remove.

   Then click **Delete** to remove sheets from the index.



Sheet Index – Rearranging Sheet Models

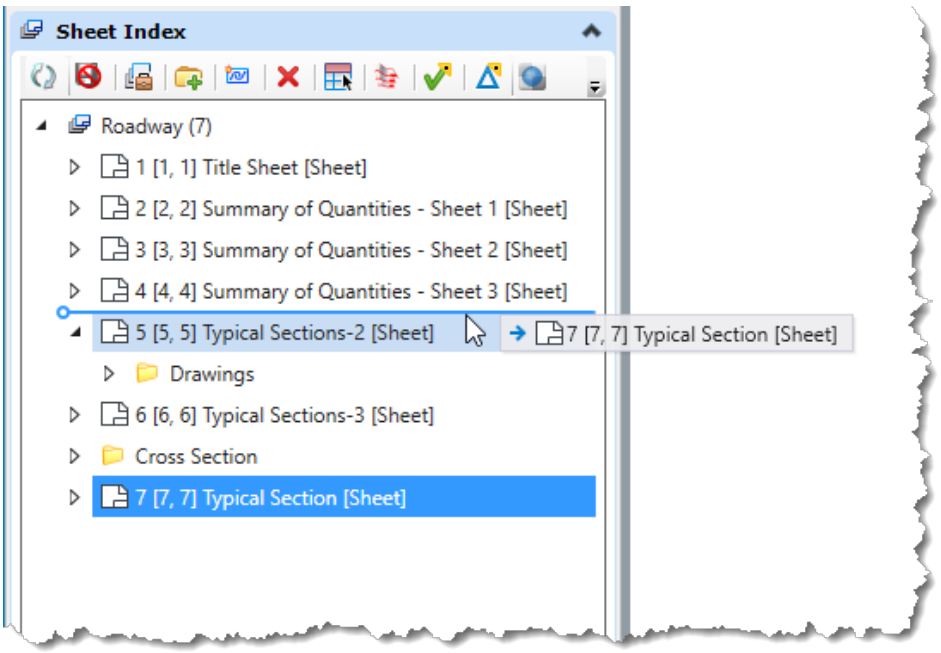
1. In the **Sheet Index** tab within Explorer, select the sheet index (Roadway).



2. Select the sheet model that needs to be moved.

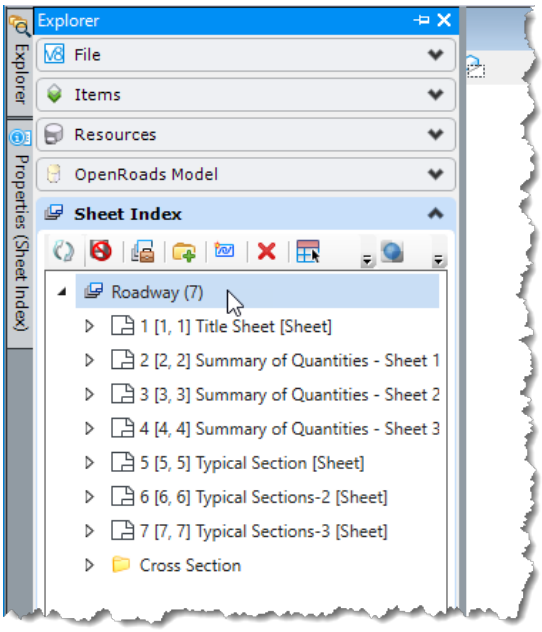
3. While holding the left mouse button down, simply drag the sheet model the desired location between other sheet models. The blue line will indicate the location of where it will be place at.

   Release the mouse button to place the sheet model in the new location.

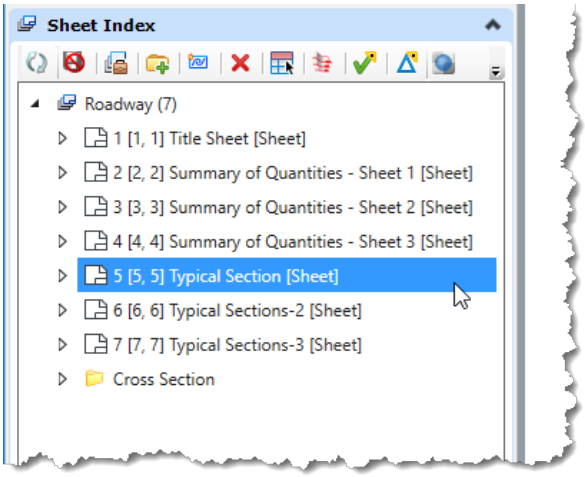


Sheet Index – Opening a Sheet Model through the Index

1. In the **Sheet Index** tab within Explorer, select the sheet index (Roadway).



2. Select the sheet model.



3. Then simply double left click on the sheet model. This will open the file that contains that sheet model.

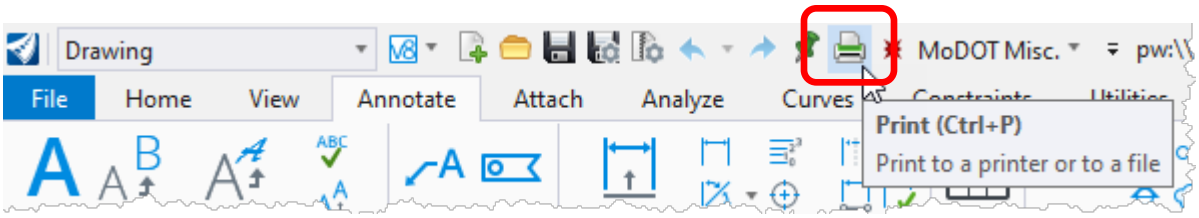
Printing

Printing – General Information

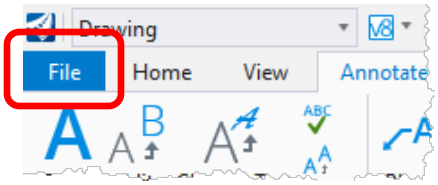
Printing files in OpenRoads Designer will consist of two options. One option is to use the standard print tool inside of ORD. This has been configured to print .dgn files to .pdf files to the desired location inside or outside of ProjectWise. The other option will be to use the Create Renditions option inside of ProjectWise to create the .pdf file. Then the .pdf files can be printed to the user defined printer.

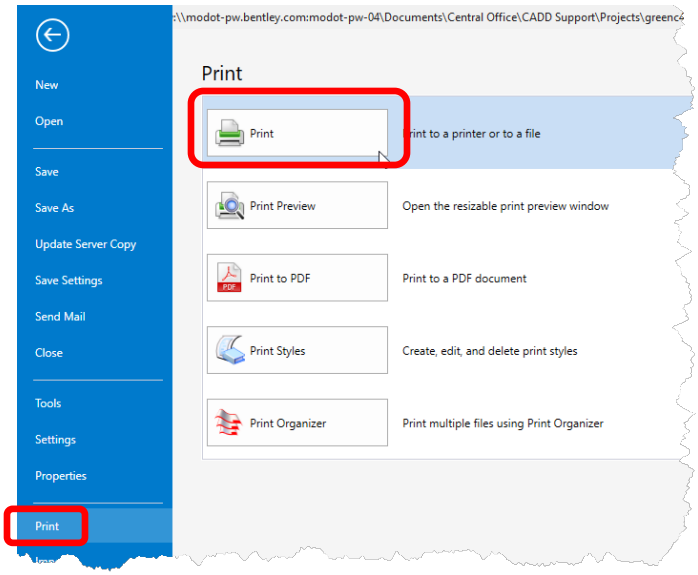
Printing – Sheet Model

4. With the sheet model active, select the **Print** tool in the Quick Access toolbar.

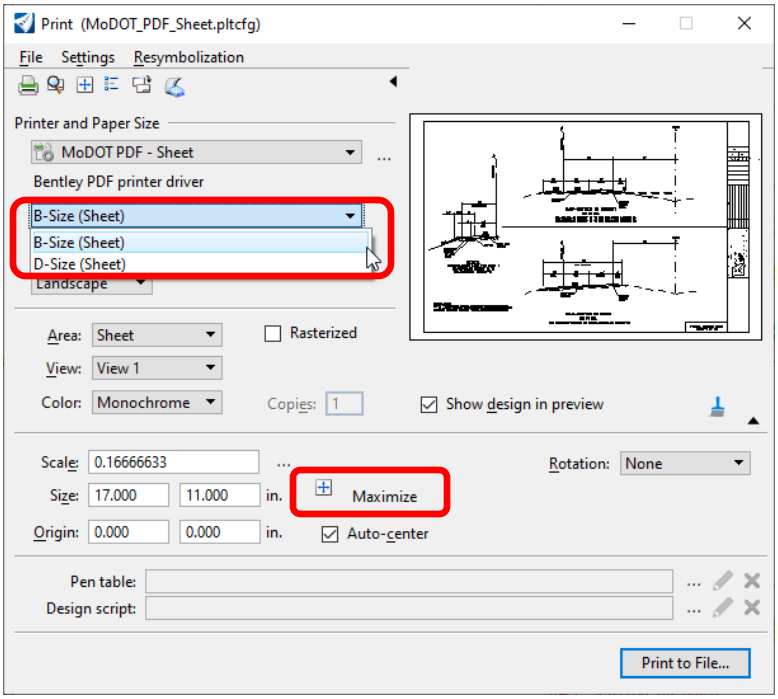


OR go to the **File** ribbon and select **Print** under the **Print** option.



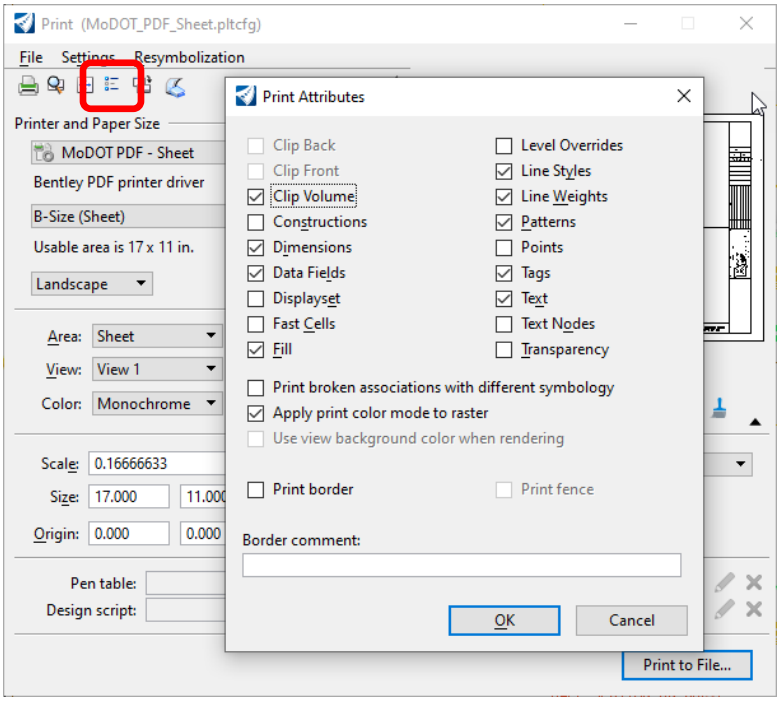


5. Change the sheet size to the desired size (**B-Size** or **D-Size**). If you change the sheet size, you will need to select the **Maximize** option to maximize the sheet model.

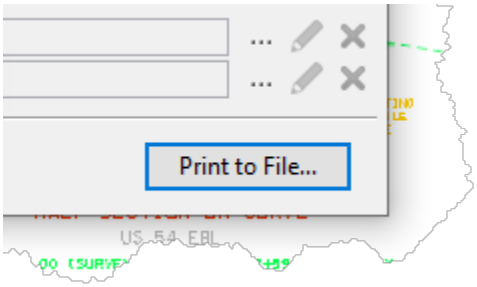


6. Review the **Print Attributes** and turn on/off the attributes as desired for your sheet print.

   Click **OK** when the attributes are set.



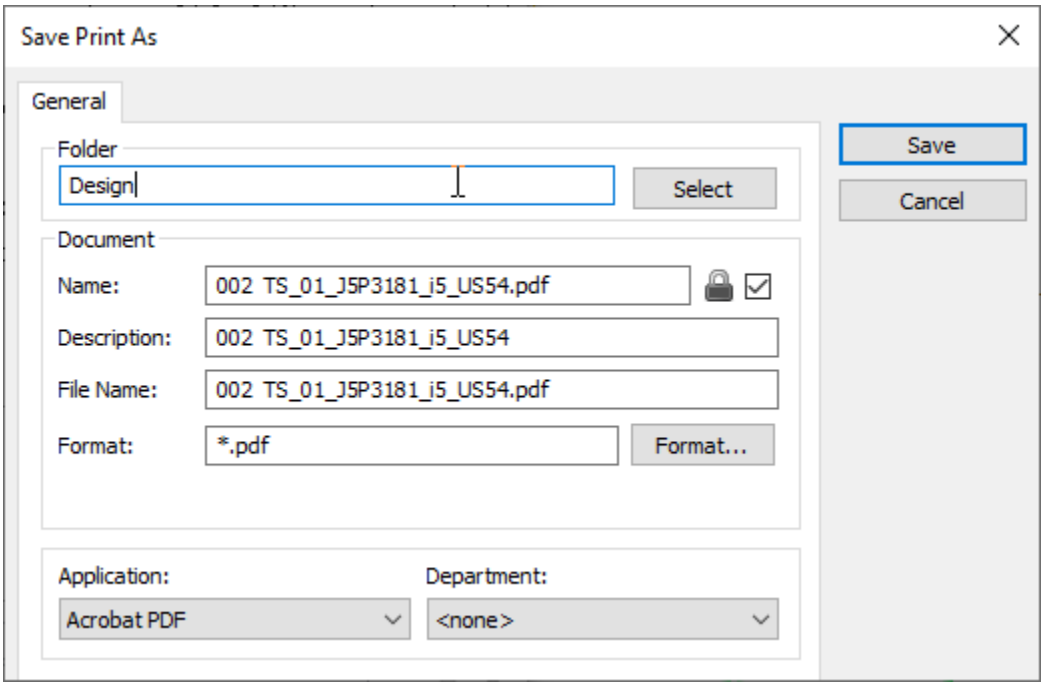
7. Select **Print to File…** to create the print.



8. In the *Save Print As* dialog, determine the location of where you want to save the .pdf file to.

   You can also change the **Name** and **File Name** if desired.

   Once you have everything set, select **Save** to create the sheet model .pdf file.



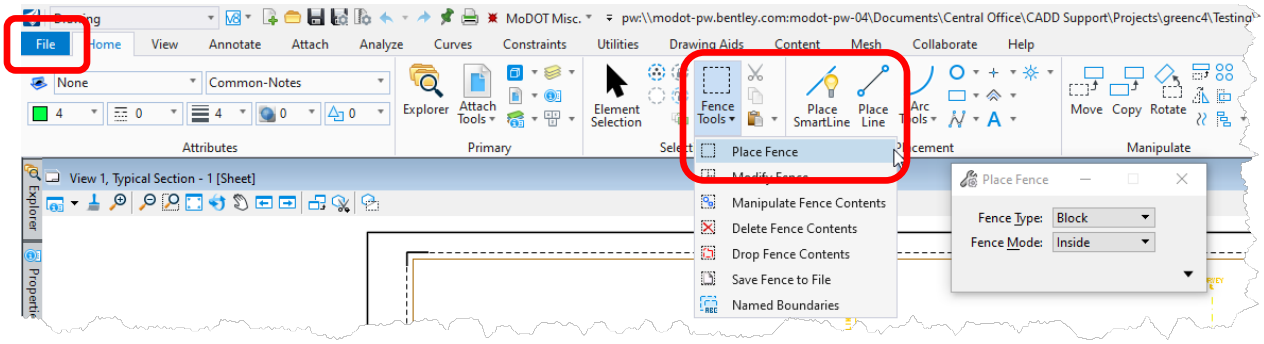
9. Now the .pdf file will be created in the folder you assigned it to be created into. Then you can open the .pdf file and print it out to the desired MoDOT printer.

Printing – Fence Area

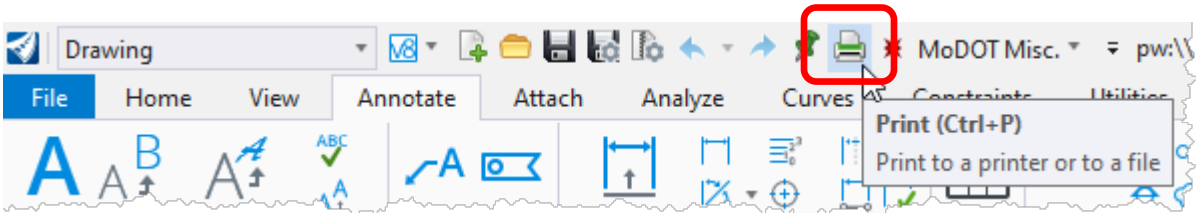
1. Open the model (default, drawing, or sheet) you need to create printing fence into.

   Select the **Place Fence** under the **File** ribbon.

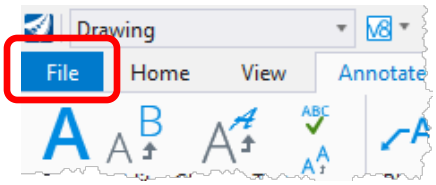
   Place the fence around the area that you need to print out.

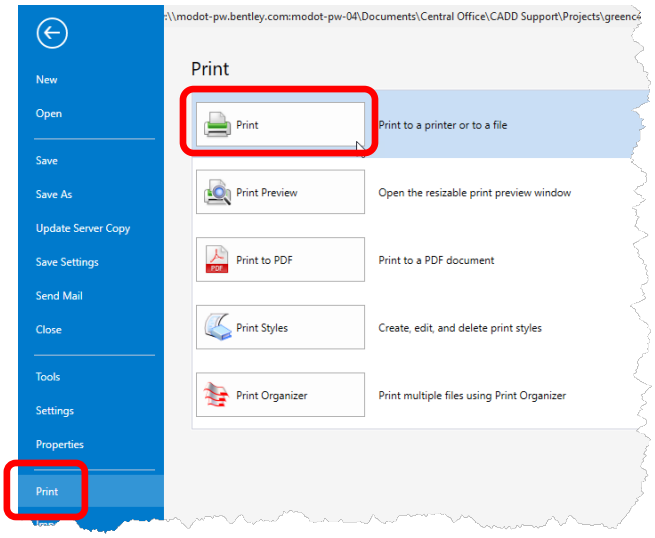


2. Select the **Print** tool in the Quick Access toolbar.

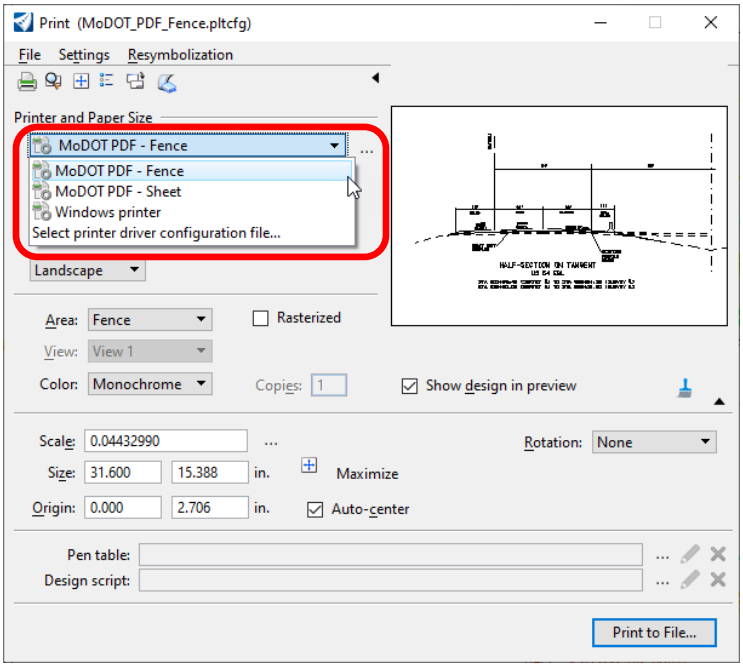


   OR go to the **File** ribbon and select **Print** under the **Print** option.



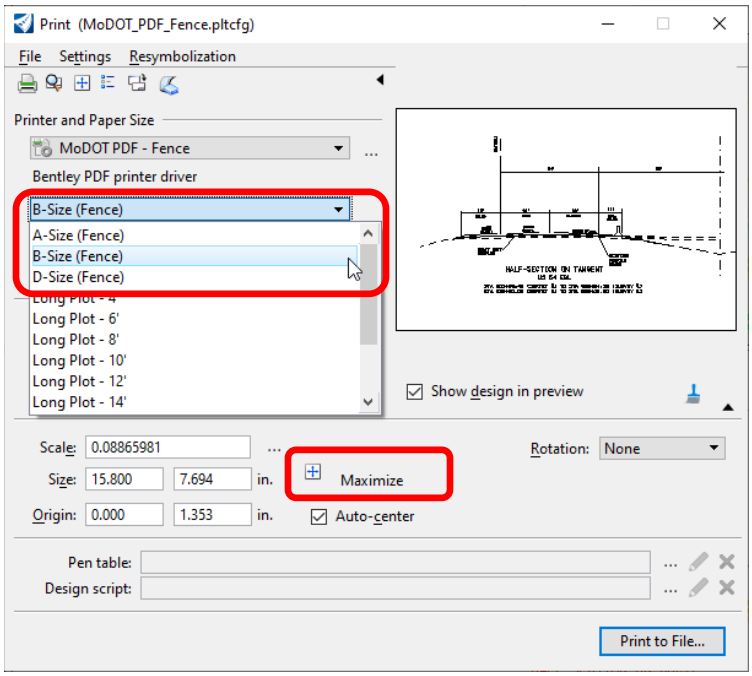


3. Change the *Printer and Paper Size* option to **MoDOT PDF – Fence**. This will allow you to use the fence that you defined instead of the sheet model properties.



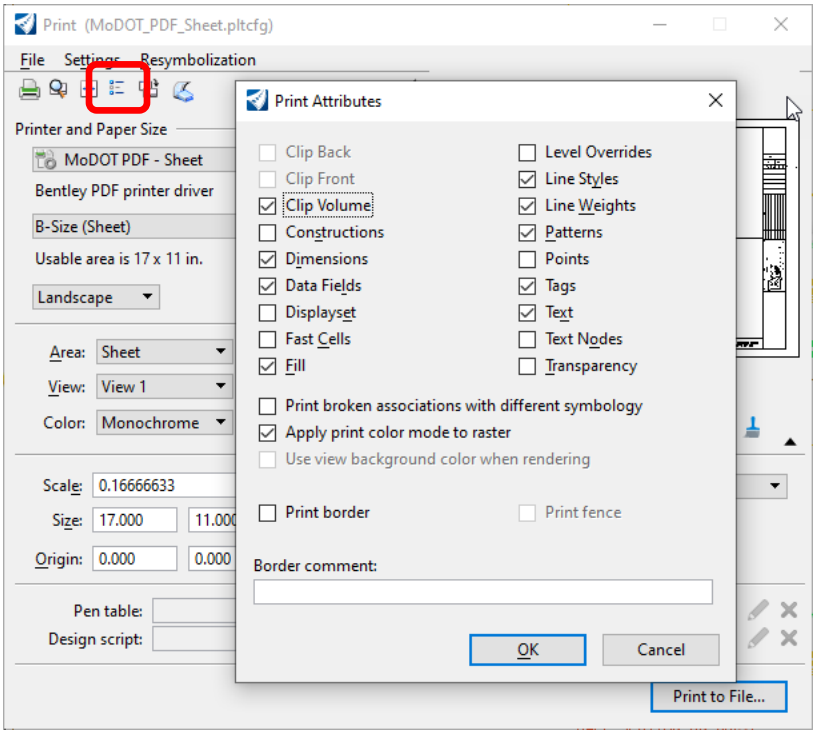
4. Change the sheet size to the desired size. If you change the sheet size, you will need to select the **Maximize** option to maximize the fenced area.

   Long plot sizes are only to be used for fenced area for a long project strip map. This will be cover in a different section in printing.

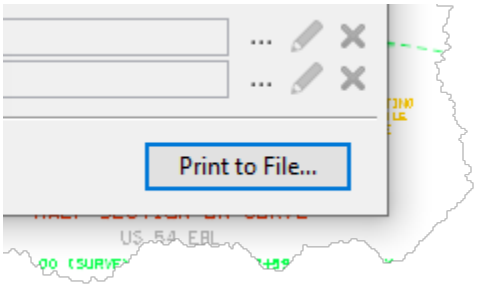


5. Review the **Print Attributes** and turn on/off the attributes as desired for your sheet print.

   Click **OK** when the attributes are set.



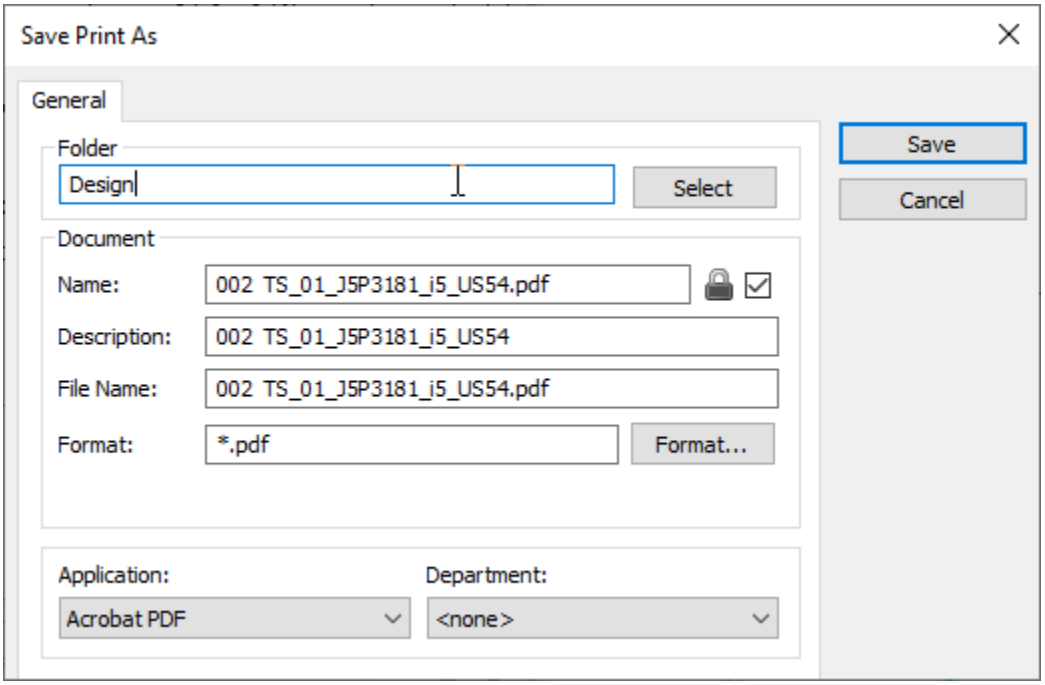
6. Select **Print to File…** to create the print.



7. In the *Save Print As* dialog, determine the location of where you want to save the .pdf file to.

   You can also change the **Name** and **File Name** if desired.

   Once you have everything set, select **Save** to create the sheet model .pdf file.

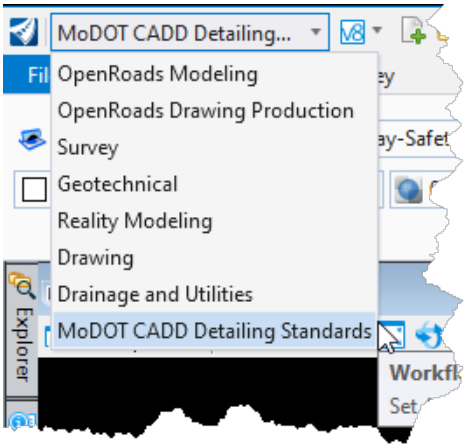


8. Now the .pdf file will be created in the folder you assigned it to be created into. Then you can open the .pdf file and print it out to the desired MoDOT printer.

Printing – Using Fence for Preliminary Strip Map

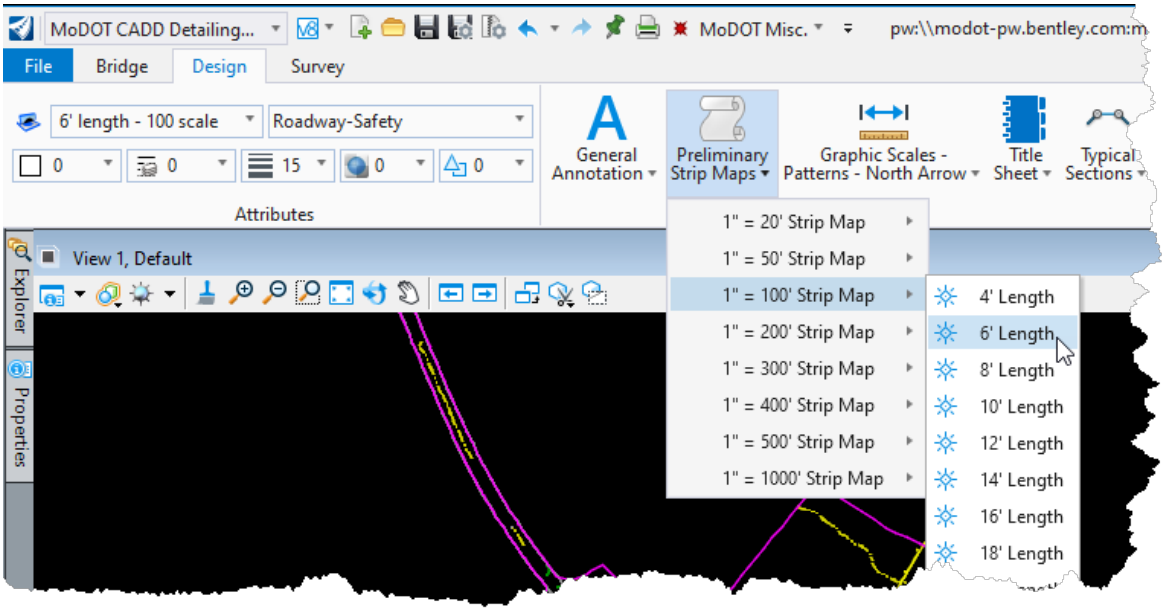
1. You will need to place the correct preliminary strip map cell for the limits of the desired printing area you wish to print out.

   Go to the **MoDOT CADD Detailing Standards** workflow.

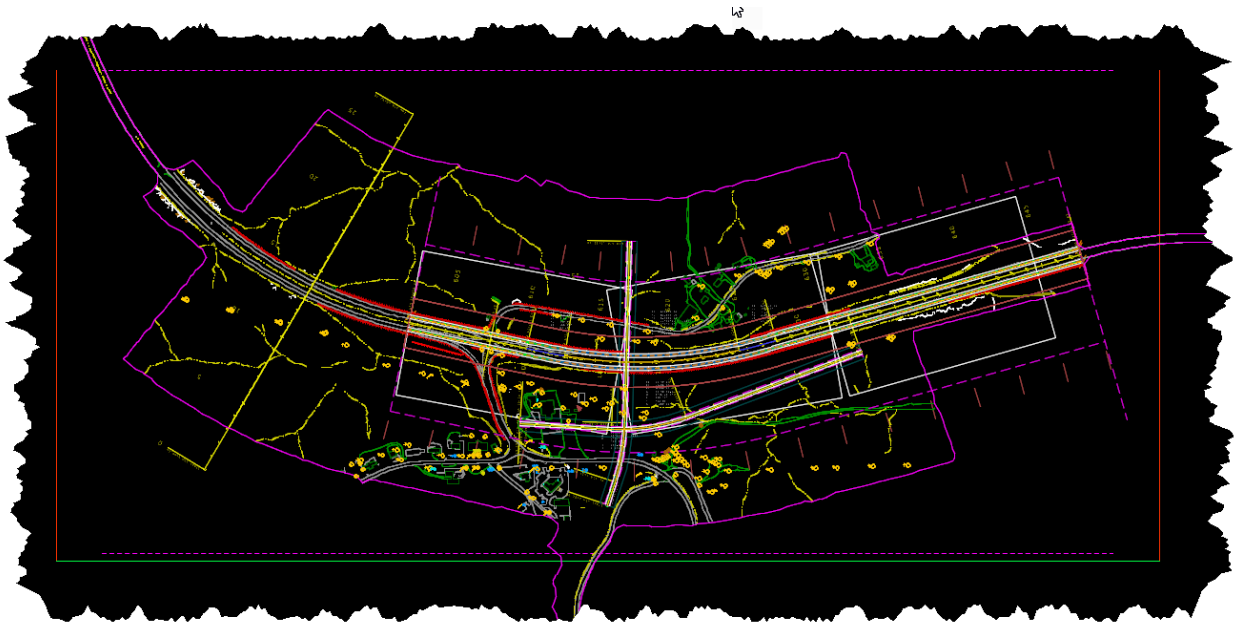


2. Go to the **Design** ribbon and select the **Preliminary Strip Maps** tools.

   In here, select the proper annotation scale and length for the limits of the project area.



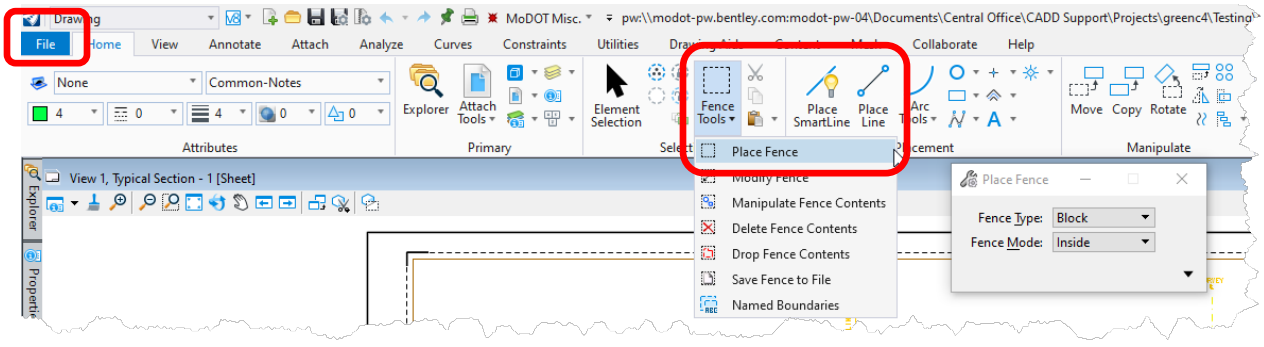
3. Place the cell in the desired location. You can now use this cell as the boundary limits for when you create the fence to define the printing area. Using the cell will ensure the scale is correct when you print it out.



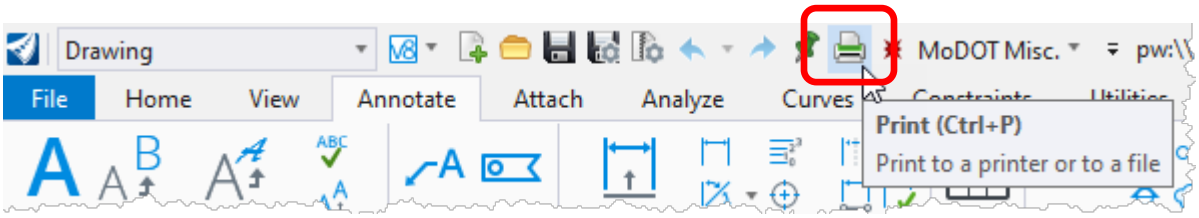
4. In the default model that the preliminary strip map cell is placed in, you will need to create the printing fence.

   Select the **Place Fence** under the **File** ribbon.

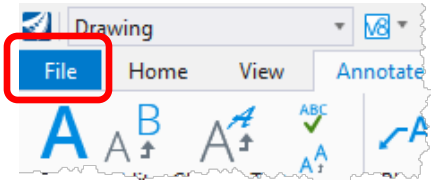
   Use the cell shape and select the upper left and lower right corners of the shape to place the fence around the area.

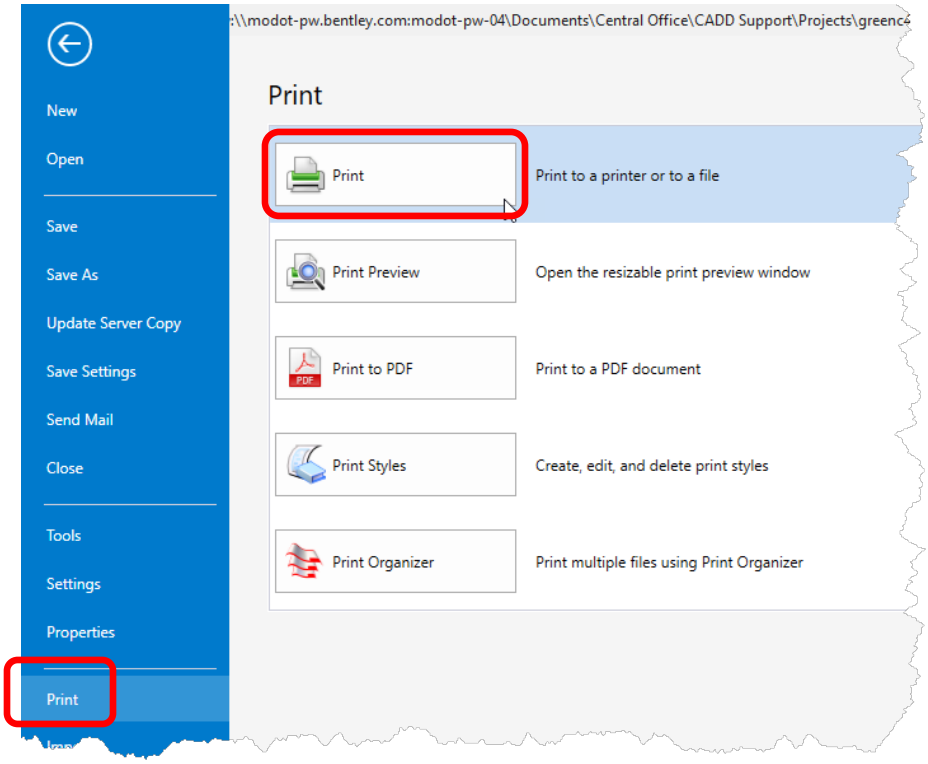


5. Select the **Print** tool in the Quick Access toolbar.

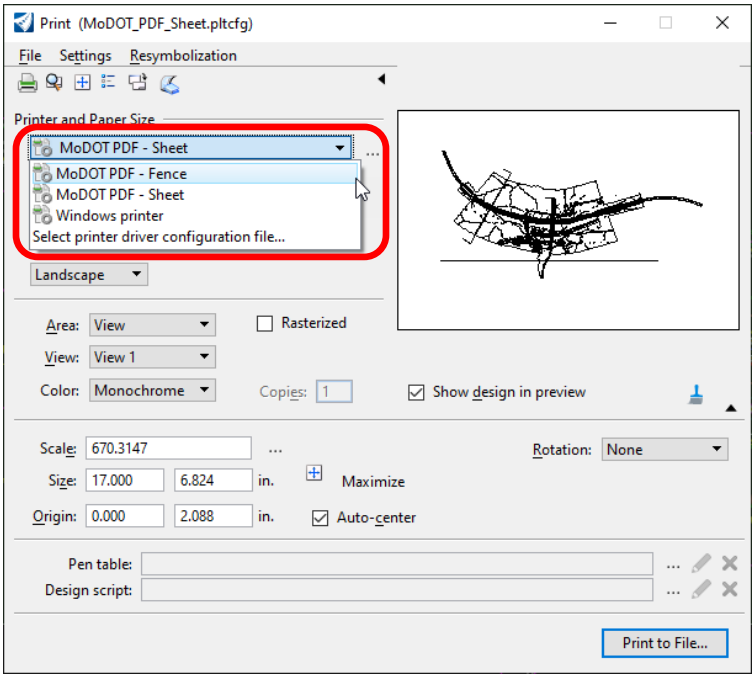


OR go to the **File** ribbon and select **Print** under the **Print** option.



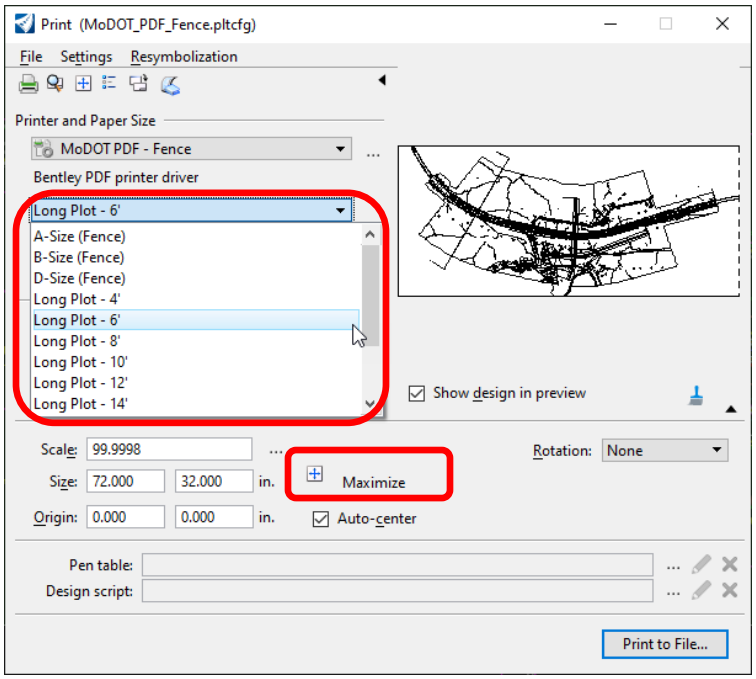


6. Change the *Printer and Paper Size* option to **MoDOT PDF – Fence**. This will now use the fence that you defined instead of the sheet model properties.



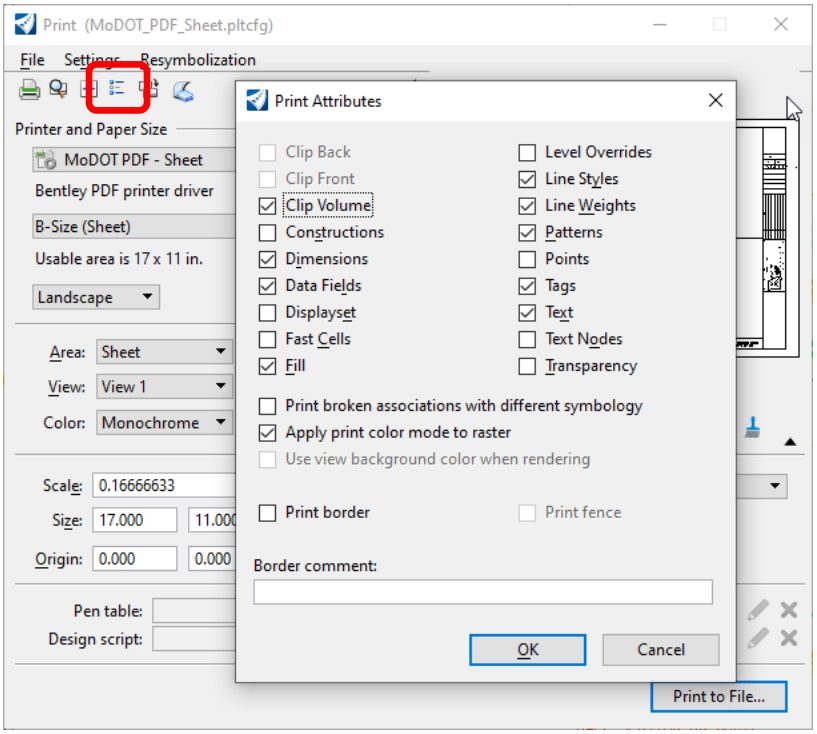
7. Change the sheet size to the desired “Long Plot” size. This should match the size of the cell that you previously place in the .dgn file.

   If you change the sheet size, you will need to select the **Maximize** option to maximize the fenced area.

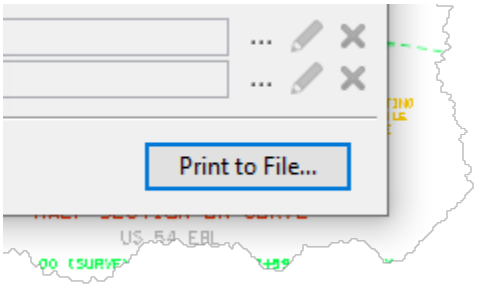


8. Review the **Print Attributes** and turn on/off the attributes as desired for your sheet print.

   Click **OK** when the attributes are set.



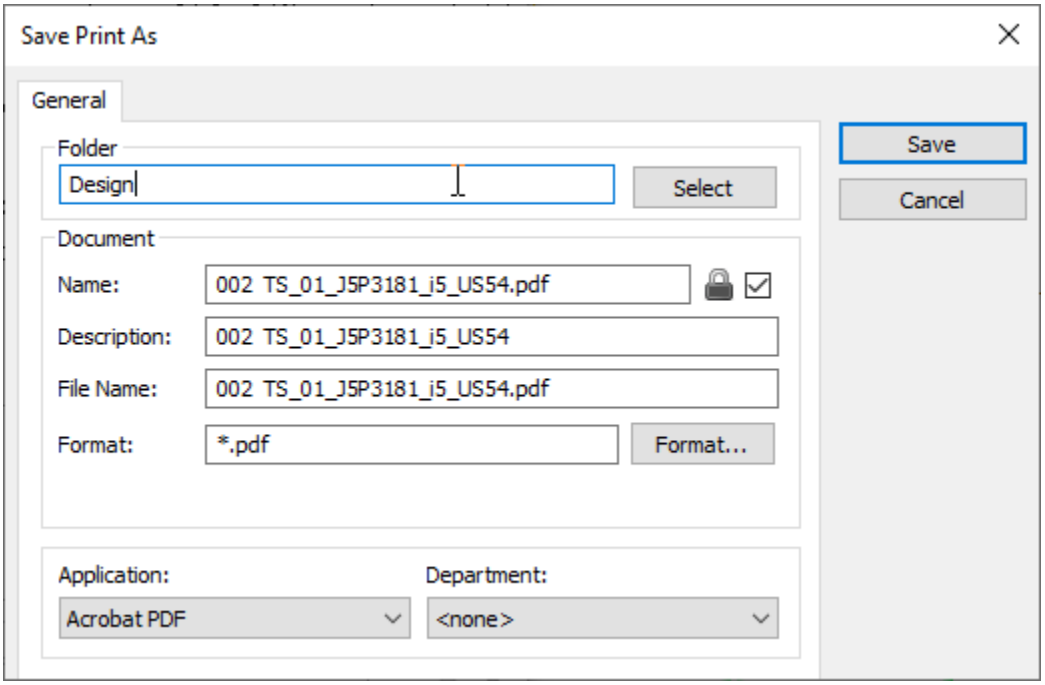
9. Select **Print to File…** to create the print.



10. In the *Save Print As* dialog, determine the location of where you want to save the .pdf file to.

    You can also change the **Name** and **File Name** if desired.

    Once you have everything set, select **Save** to create the sheet model .pdf file.



11. Now the .pdf file will be created in the folder you assigned it to be created into. Then you can open the .pdf file and print it out to the desired MoDOT printer.

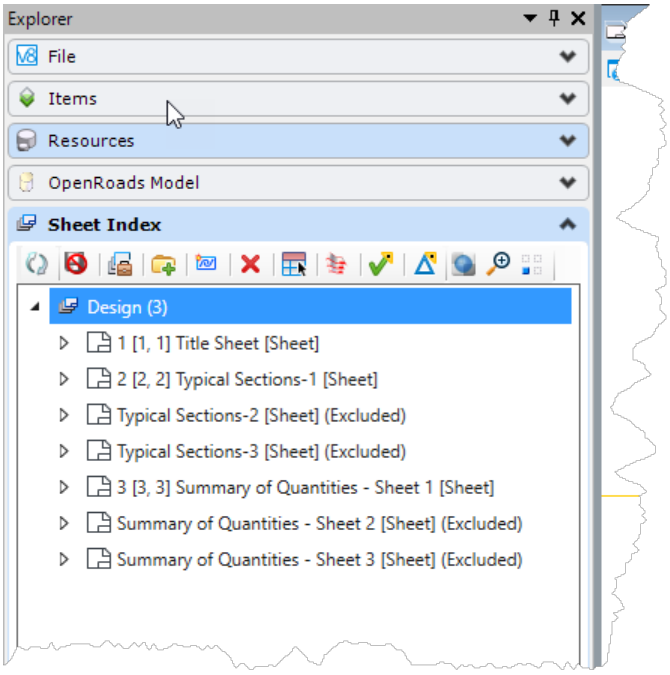
Printing – Multiple Sheets (Using Sheet Index)

In order to print multiple .dgn files inside of OpenRoads Designer, you will need to use the application called Print Organizer. The Print Organizer basically allows you to add and subtract sheet models inside of it and then you can print out all those files at one time. It also allows you to save the set of files for future printing if desired.

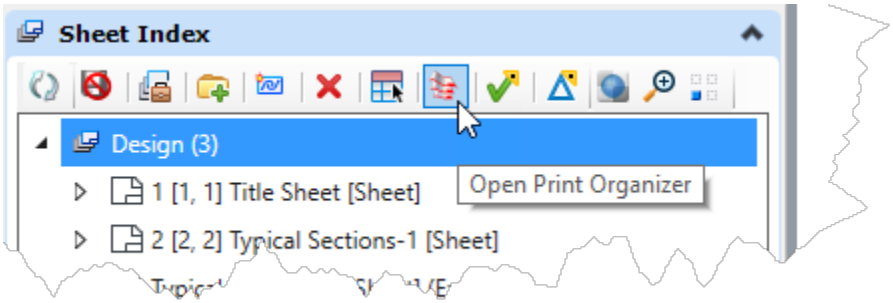
If the Sheet Index is set up, you can use that list of sheet models for the Print Organizer application. You can also access the Print Organizer through the backstage, but you would need to manually add the sheet models you want to print out.

1. Go to the *Explorer* and select the **Sheet Index** option.

   Select **Design** in the Sheet Index.

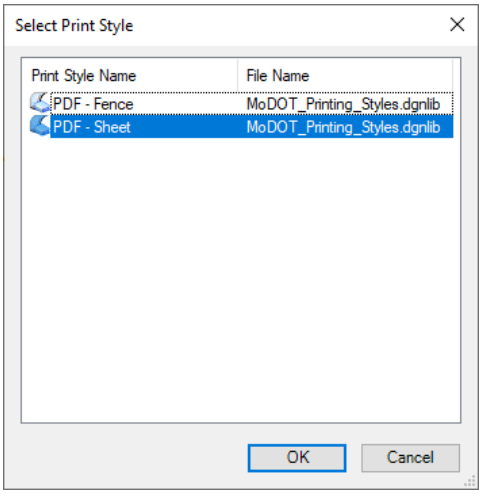


2. Click on the **Open Print Organizer** tool inside of the *Sheet Index*.

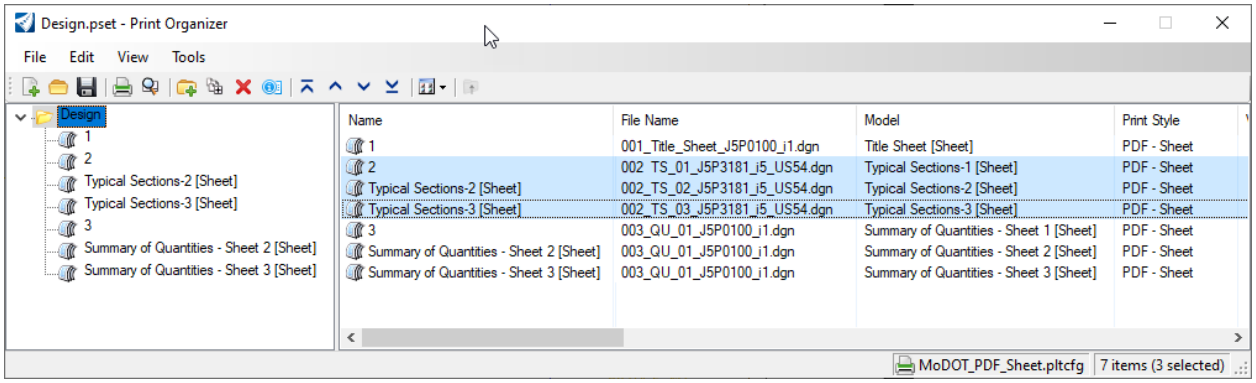


3. In the *Select Print Style* dialog, select the **PDF – Sheet** style and click **OK**.

   The PDF – Fence style will not work in this situation for printing multiple files.



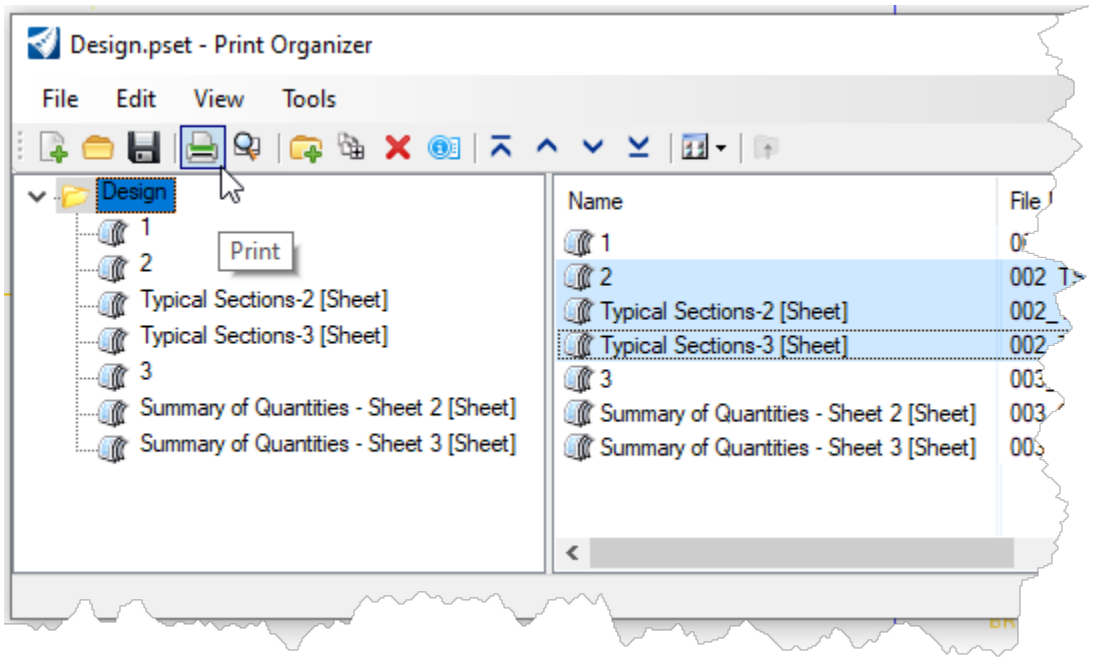
4. This will open the **Design.pset** (print set) in the *Print Organizer*. In here, you can select which files you want to print out. Whatever is listed on the right side of the dialog box will be what you can select to print.



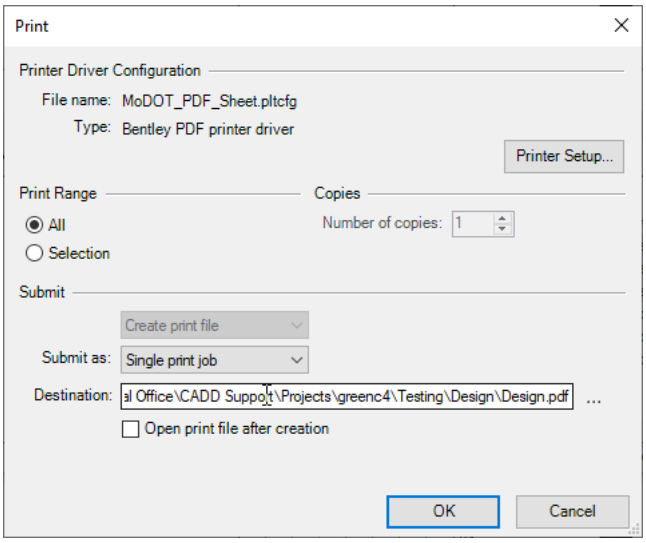
You can also add files or/and folder to this print set if needed.

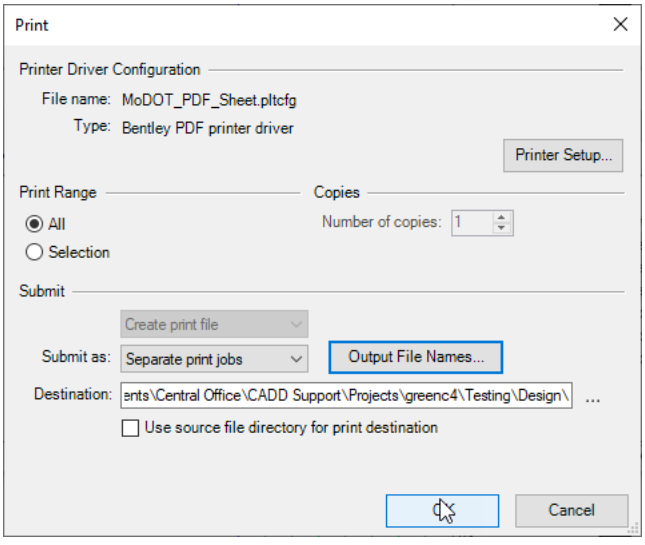
Once you have the list of sheet models completed, select the **Print** option.

If you are wanting to just print out certain models in the list and not the whole list, select those files first and then select the **Print** option.



5. In the **Print** dialog, you will need to determine the following options:





- **Print Range - All** the sheet models or **Selection** of files that you previously selected
- **Submit As** – **Separate Print Jobs** which will print the files into separate .pdf files or **Single Print Job** which will combine all the selected files and put them into one single .pdf file.

- **Destination** – location for the .pdf file(s) being created. The *Use source directory for print destination* toggle allows you to create the .pdf files in the same location as the source sheet model.
- **Output File Names** – when using the Separate Print Jobs option, you will have the option to change the way it outputs the name of the files you are print out.

Once you set all the options to the way you want them, click **OK** to create the .pdf files.

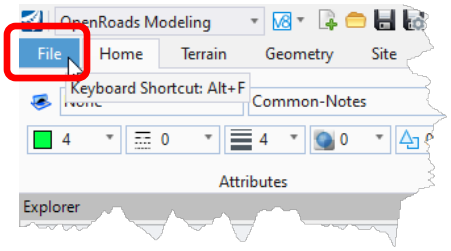
6. The .pdf file(s) will be created in the folder you assigned it to be created into. Then you can open the .pdf file(s) and print it out to the desired MoDOT printer.

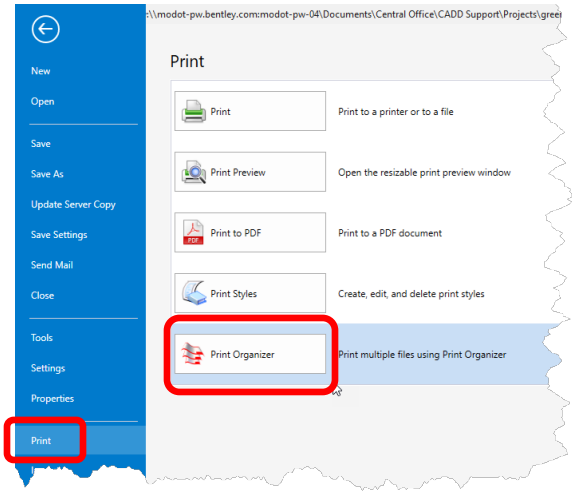
Printing – Multiple Sheets (Through the Backstage)

Accessing the Print Organizer through the backstage will work the same as if you accessed it through the Sheet Index. The only difference is you will need to manually add which files (sheet models) you want to print. All the other steps work the same for the Print Organizer application.

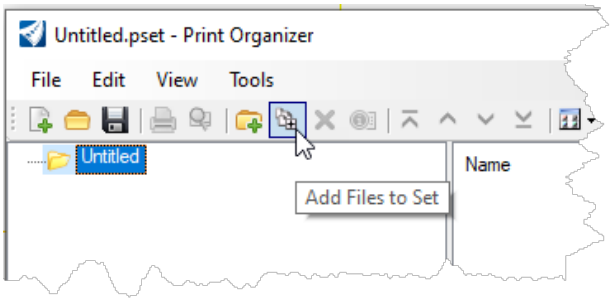
1. Go to the **File** tab.

   In the backstage, select the **Print Organizer** application under the **Print** option.





2. Now you will need to manually add the sheet models to the print set.



The other steps for printing multiple sheets are exactly the same as the **Printing – Multiple Sheets (Using Sheet Index)** section.

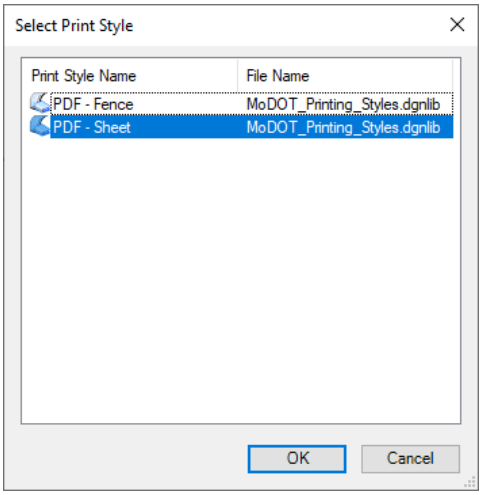
Printing – Creating & Saving Print Set

When using the Print Organizer, you can save out the print set (.pset) file. Saving a print set will allow you to print out that same set of files again without manually adding those files over and over each time. This could be useful for printing out preliminary plans, set of traffic sheets, set of typical section sheets, etc. and then you could access that print set on a later date to print them out.

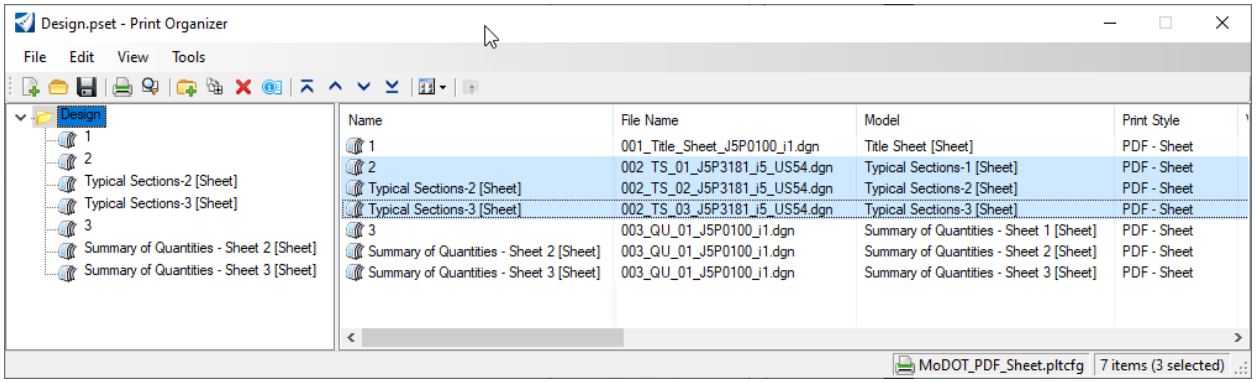
1. Open the **Print Organizer** through the Sheet Index or from the Backstage window.

2. In the *Select Print Style* dialog, select the **PDF – Sheet** style and click **OK**.

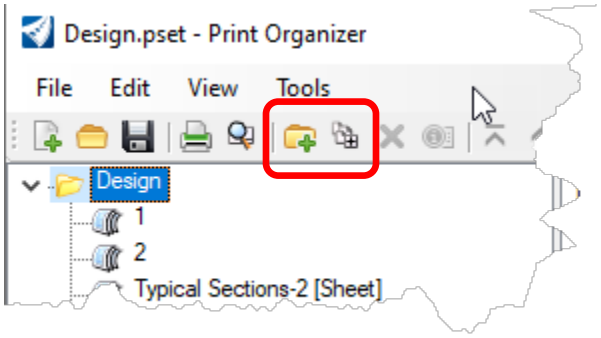
   The PDF – Fence style will not work in this situation for printing multiple files.



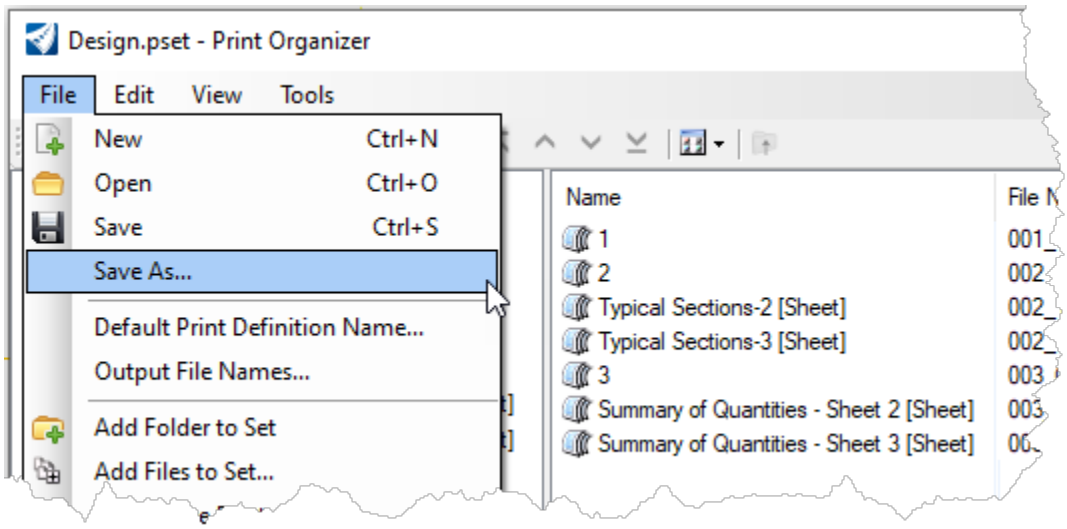
3. This will open the **.pset** (print set) in the *Print Organizer*. In here, you can select which files you want to print out. Whatever is listed on the right side of the dialog box will be what you can select to print.



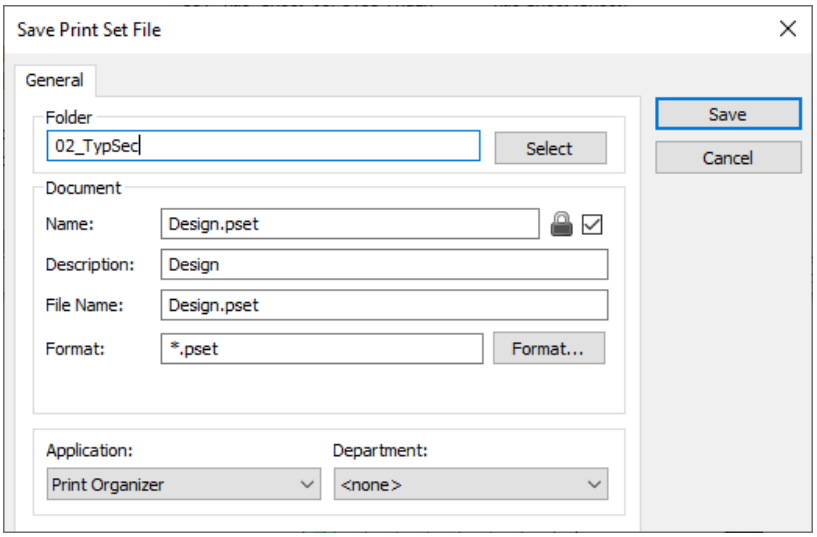
You can add files or/and folder for the print set if desired.



4. Once you have the list of sheet models completed, select **File > Save As**.

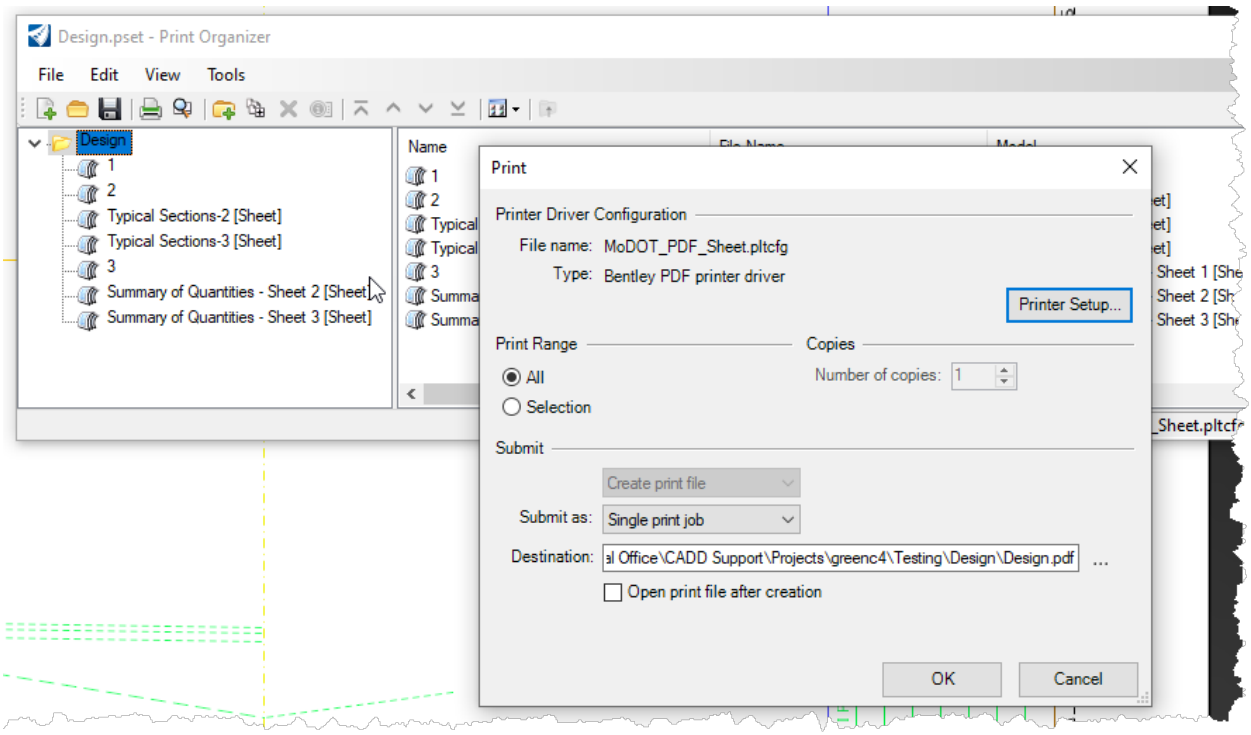


5. In the **Save Print Set File** dialog, change the *Name* and *File Name* for the name of the print set file. Also change the *Folder* location to the desired location. Select **Save** to save the print set.



6. Now anytime you use the Print Organizer, you can come back and open that .pset print set file to print out those sheet models in the list.

   Note: If you print out those sheets and changed some settings inside the **Print** dialog box, those settings will also be saved with the print set if the print set is saved after doing the print.



MoDOT Default Function Key Assignments

F1 - Activates the OpenRoads Designer Help information

F2 - Opens the CADD Services SharePoint page

F3 - Opens the CADD Services YouTube Channel for online videos

F4 - Defaults to the PowerSelector tool and deselects everything in the file

F5 - Activates the Redraw tool under the Survey task

F6 - Used to open View 2 in an Isometric rotation along with the Display Style representation set to Illustration. Used for 3d files only.

F7 - Toggles off/on Construction elements

F8 - Toggles background color (black to white, white to black)

F9 - Activates View Settings pop-up

F10 - Activates the Excel to OpenRoads Designer tool to import data from the Quantab excel sheet.

F11 - Activates the Analyze Point tool under the Terrain Model task. Also toggles on Civil Accudraw and sets the Civil Accudraw option to Station-Offset

F12 - Opens the corridor template library

Ctrl+F1 - Creates a Display Set of the elements that you have selected within the file

Ctrl+F2 - Clears out an active Display Set

Ctrl+F6 - Activates key tips for the ribbons

Ctrl+F7 - Activates tab key tips for the ribbons

Shift+F1 - Activates a tool to exaggerate a terrain model. This will only work in a 3d file and it creates a temporary model for viewing purposes only.

Shift+F7 – Toggles off/on Line Weights

Shift+F9 – Removes any unused fonts and compresses the file

MoDOT Default Mouse Button Assignments

Left Button - Data (accepting a command, operation, or tool)

Middle Button - Pan

Right Button - Reset (exiting a command, operation or tool)

Left & Right Button - Tentative Snap

Alt + Left Button - Match attributes from cursor

Alt + Middle Button - Rotate view from cursor

Alt + Left & Right Button - 3d data (3D file only)

Ctrl + Middle Button - Navigate swivel (3D file only)

Ctrl + Left & Right Button - Accudraw set origin (Accudraw must be active)

Shift + Middle Button - Rotate view dynamically

Shift + Right Button - Popup ribbon for View tools

Shift + Left & Right Button - Popup ribbon for Snap options