How to make Culvert TSL Sheet and annotate the structures

These instructions were created July 2023 These instructions were created with:

This is the step in the workflow where the Create Drawing dialog to automate the drawing and sheet model creation and place the views in them is used.

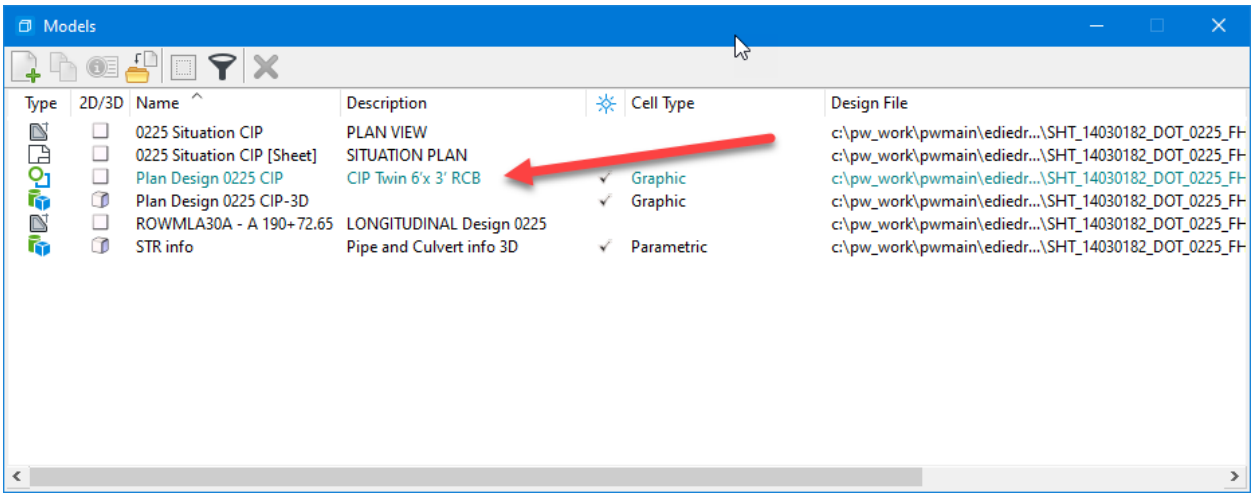
To create a Culvert TSL sheet, open the DGN file. This example will use the SHT_14030182_DOT_0225_FHWANO_CIP_Z07.dgn

For proper file naming please refer to CONNECT Seed Files and Naming Conventions and CONNECT Models and Naming Convention.

Note: To do this properly, establish the Design numbers for each design to name each sheet and named boundary correctly. Request design numbers and Asset ID numbers, if applicable, before proceeding with these instructions.

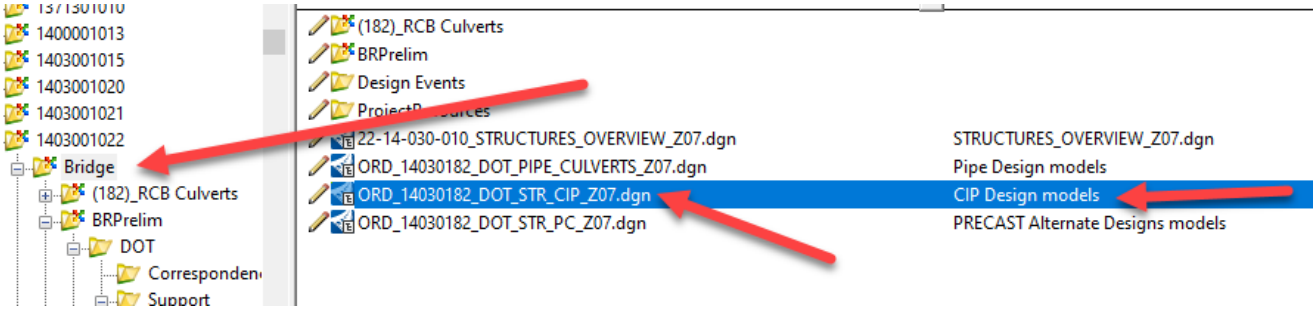
Note: Keep in mind that this process is for B01 work and not B02 work. B01 event work is for RCBs and other structures that will require Final Design detailing done to them. If designing crossroad pipes, that is B02 work and sheeting is done differently. Please refer to the PW workflow documents for instructions.

Rename the Default 2D model to Plan Design 0225 CIP model.

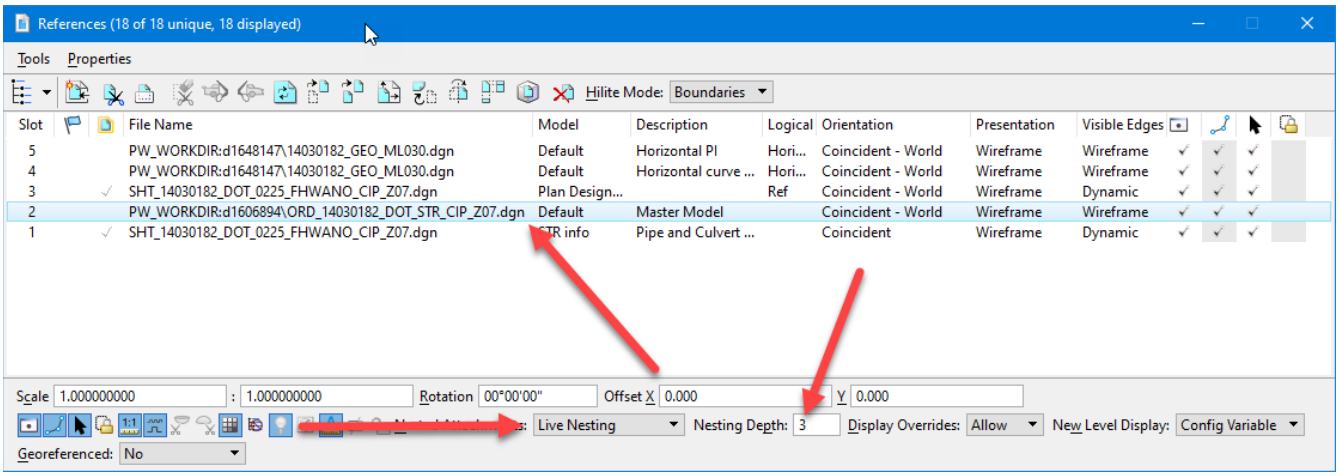


Reference the corresponding structure model file under the Bridge folder that goes with that sheet file.

For this example, ORD_14030182_DOT_STR_CIP_Z07.dgn

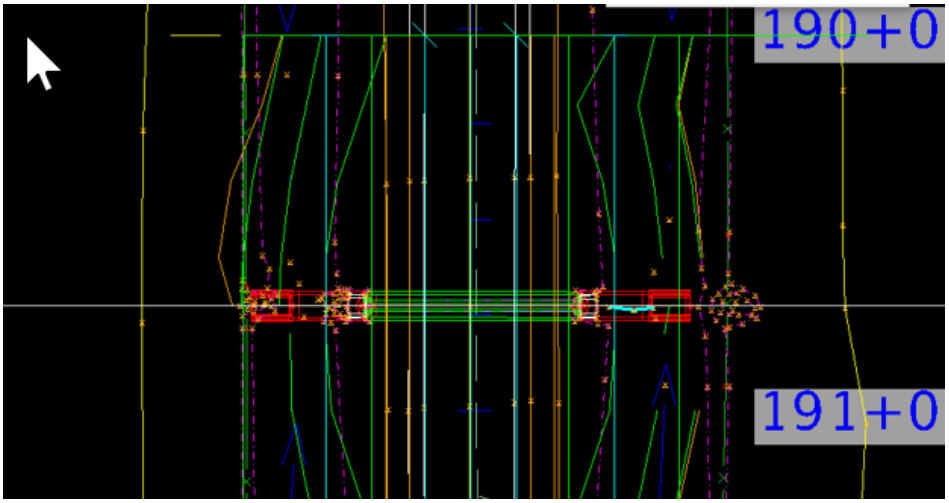


Set to Live Nesting with Nest Depth of 3



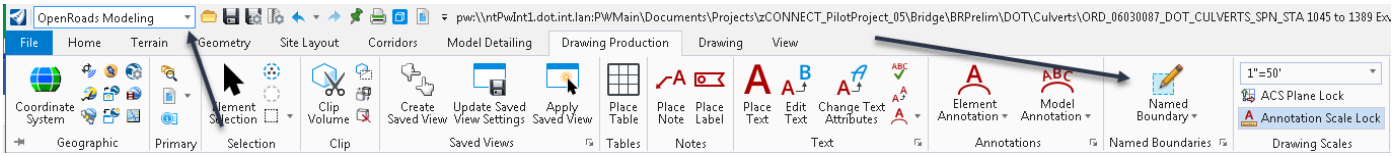
Next rotate the view in the 2D Model into the orientation that is needed to be displayed on the TSL sheet.

It should look something like this:

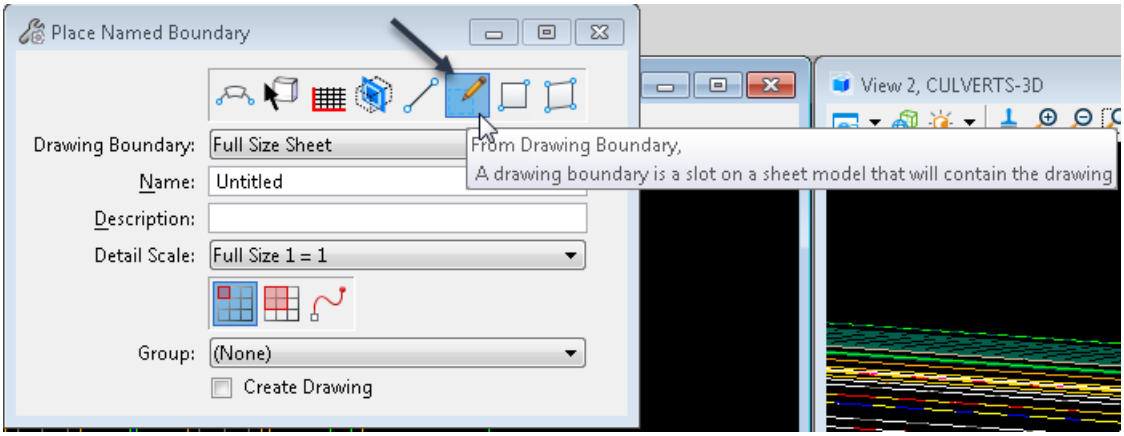


Next, under the OpenRoads Modeling workflow, select the **Named Boundary** tool.

Note: Working in a Multi-Model View, be sure to have the 2D view active when placing the boundary in the 2D view. Also make sure to have all the references turned on in the 3D view for the information to properly display on the plan sheet.



Selecting the Named Boundary tool will open the Place Names Boundary dialog box, select **From Drawing Boundary** option at the top.

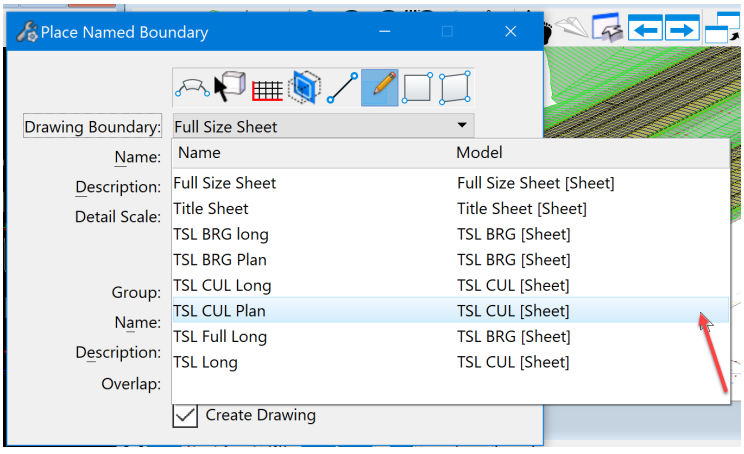


In the From Drawing Boundary pull down, select the sheet seed that will best fit the desired output.

The first Drawing Boundary needed is the **TSL CUL Plan.** This will place the traditional plan view and will leave space on each side of the plan view for extra notes.

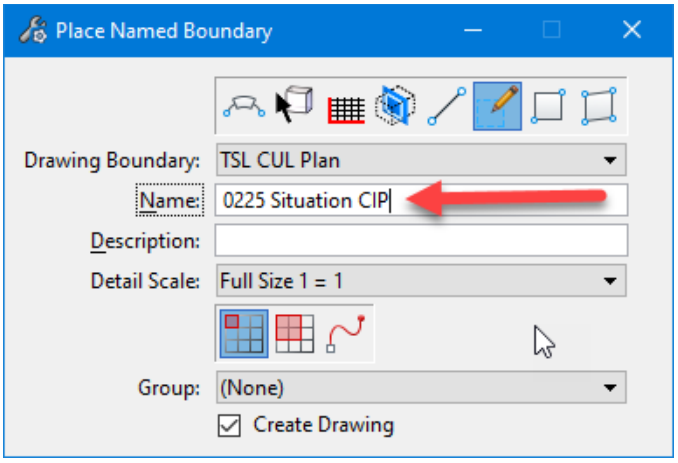
The second Drawing Boundary needed is the **TSL BRG Plan**. This will place a plan view that will cover the full width of the TSL page and is intended to be used in the bridge TSL creation process.

Decide what plan view is ideal for the design and sheet layout. For this example, use the TSL CUL Plan boundary.



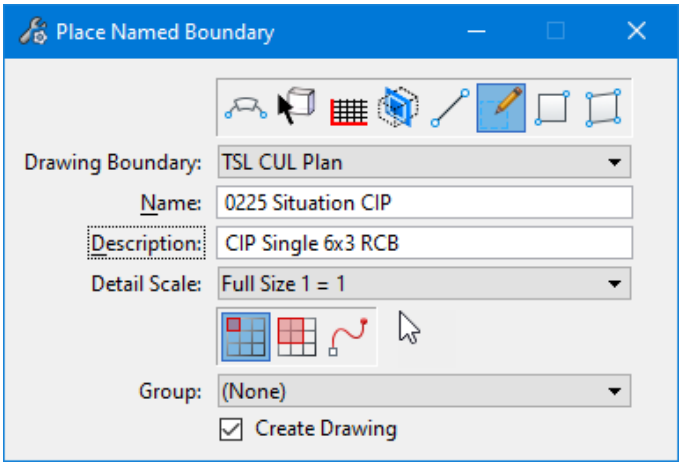
In the **Name** field, name it the County number, Design number and Situation Type of structure.

For this example, it will be 0225 Situation CIP.

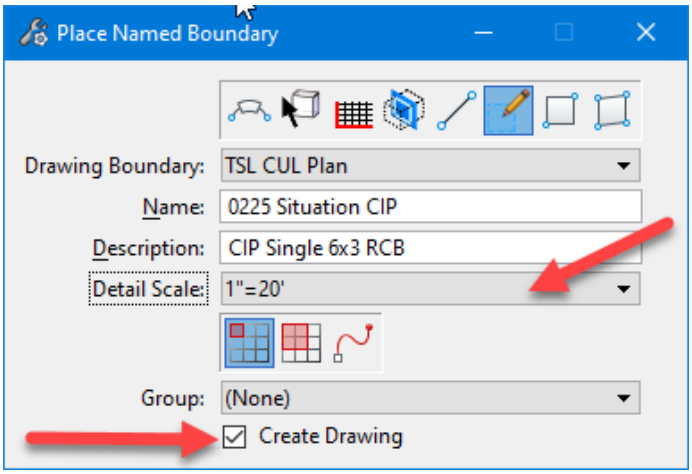


In the **Description field**, describe the structure.

For this example, use CIP Single 6x3 RCB.

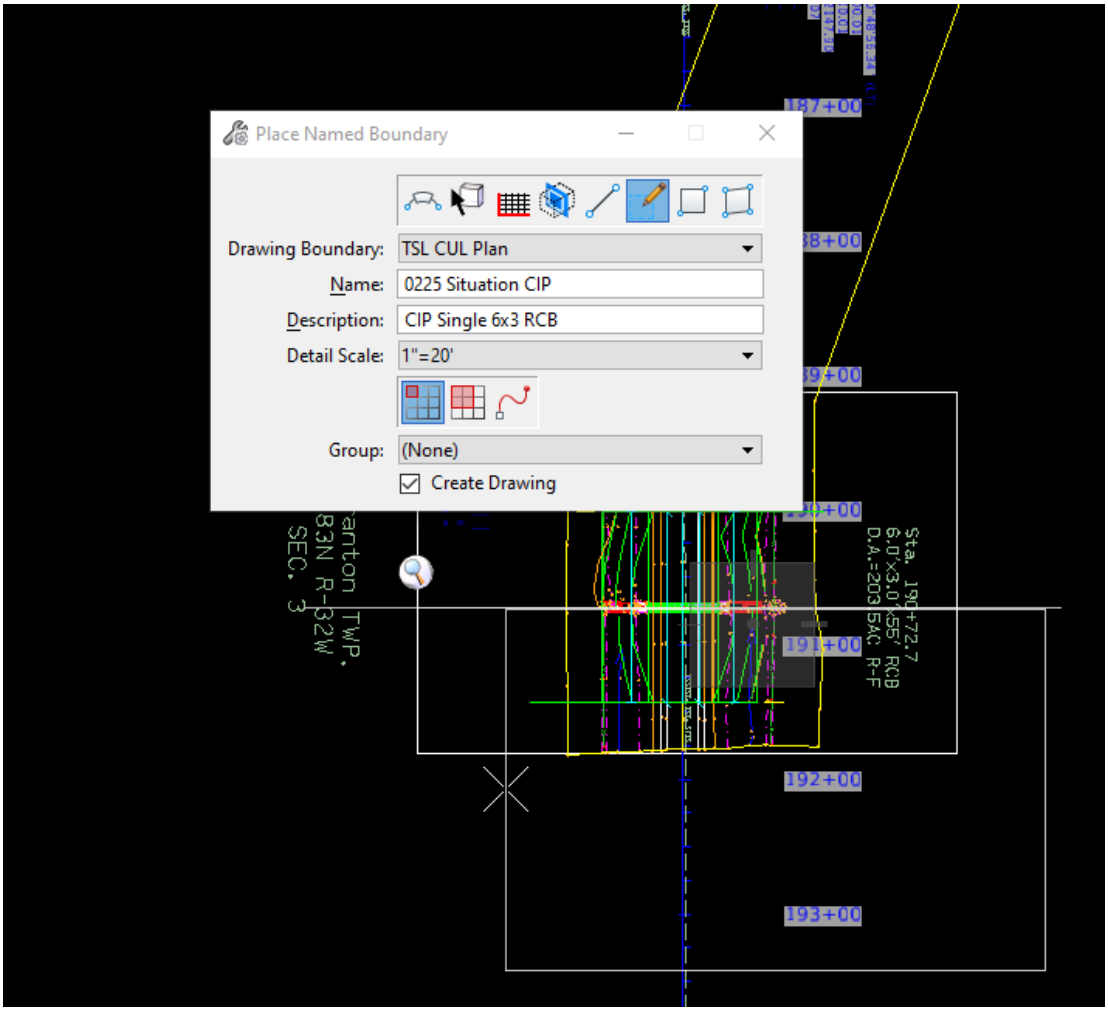


Select the detail scale of 1” = 20’.

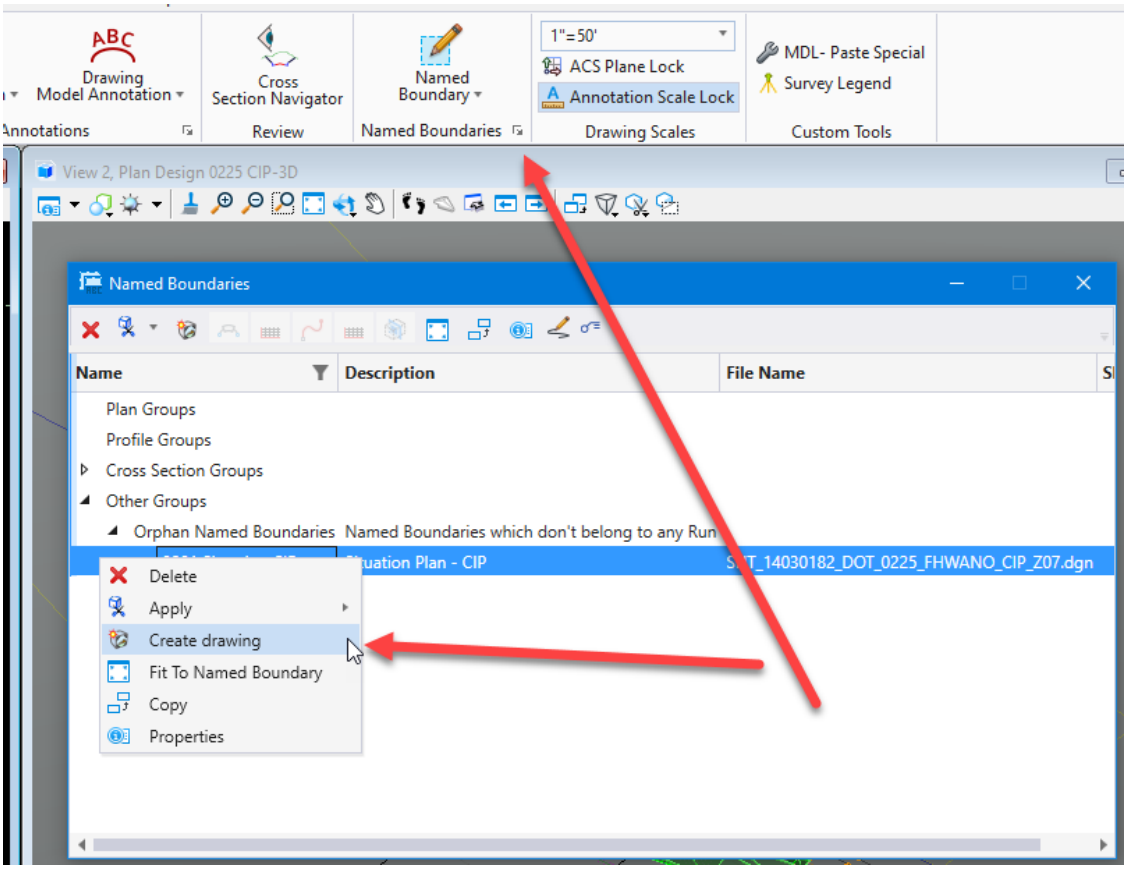


Now place the boundary. It will appear at the end of the cursor.

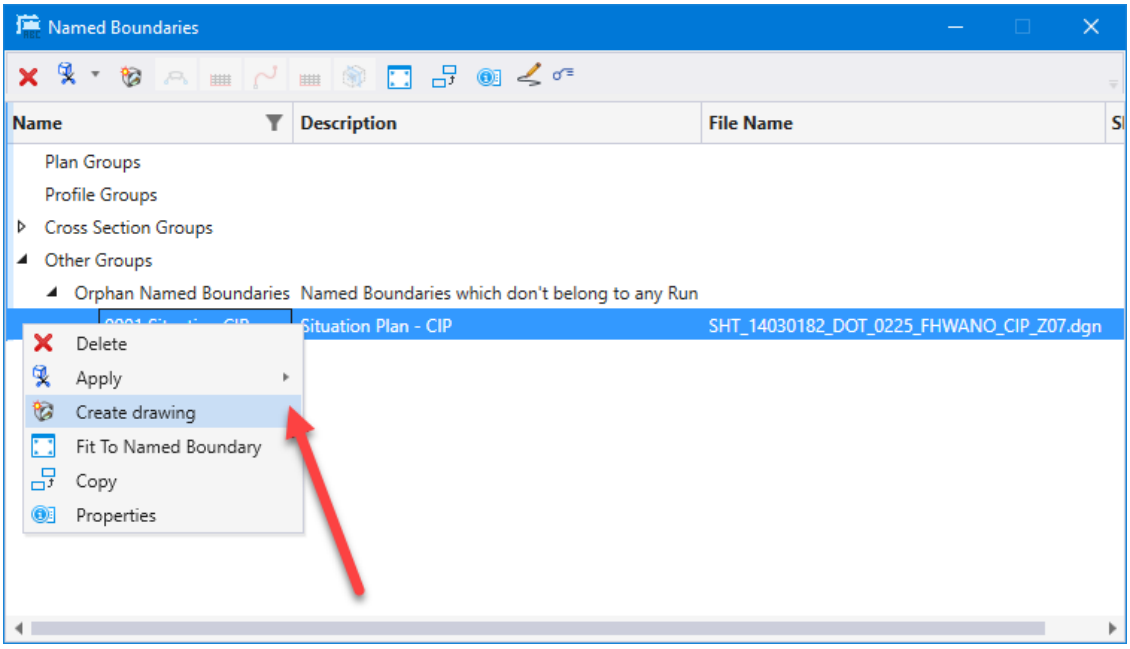
Note: It may be preferred to place it on the outer edge of the structure layout and then move it to the correct location to ensure that the center of the plan view detail on this sheet will be at the centerline of the structure = centerline of the roadway. Move the boundary before making the drawing model and sheet. Make sure to <u>not</u> have “Create Drawing” toggled on so that the named boundary can be moved after it is placed to enable an ideal position in relationship to the structure. Then the drawing and sheet model will be created. This is what will be done in the following example. If there is confidence in the initial placement of the boundary, have “Create Drawing” toggled on and skip the next few steps after placing the boundary.



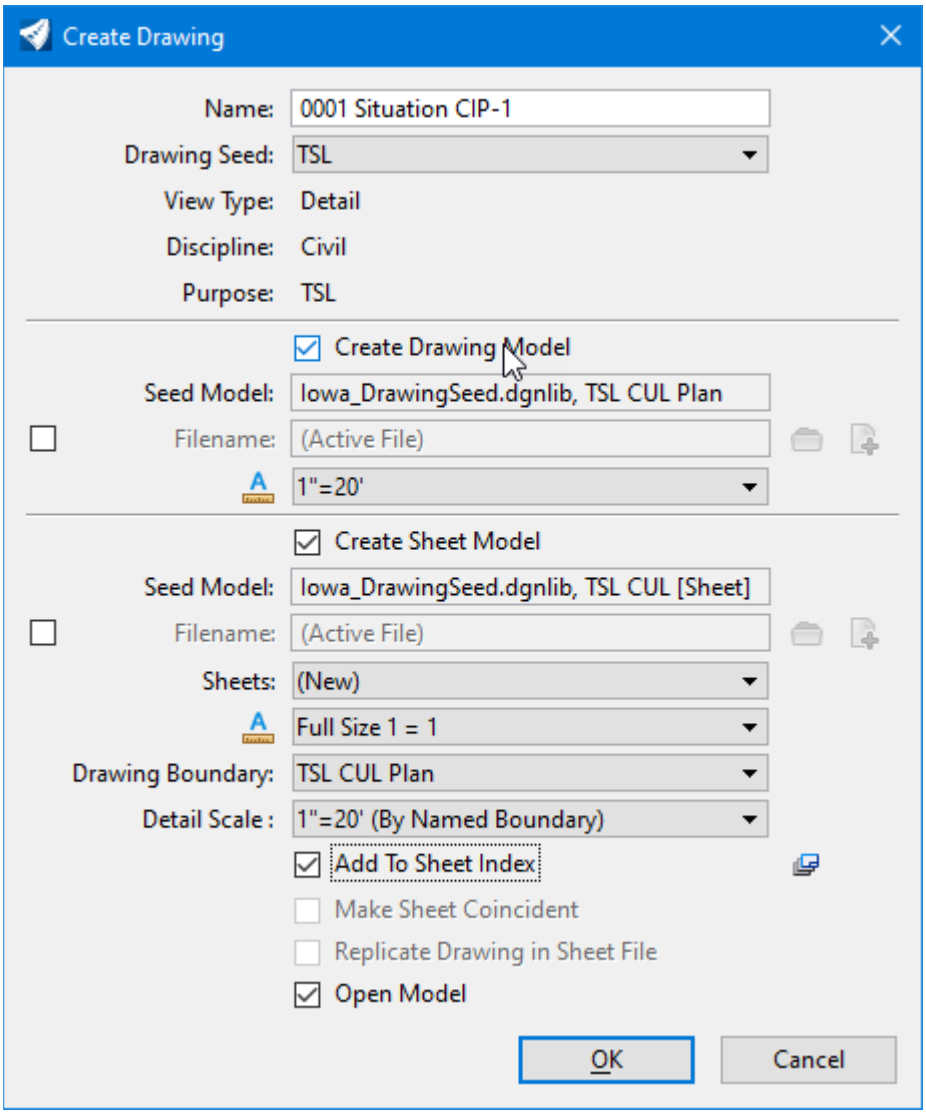
To move the boundary after it is placed, use the Element Selection tool and select the boundary. Use the move command to move the boundary to the position that is needed. Once placed, then select the Named Boundaries tool to open the dialog box.



Select the boundary that was created and right click on it. Select the **Create Drawing** option.



This Create Drawing dialog box will open. The name will be filled out based on the name of the boundary. For this example, used STA 2179+27.00).



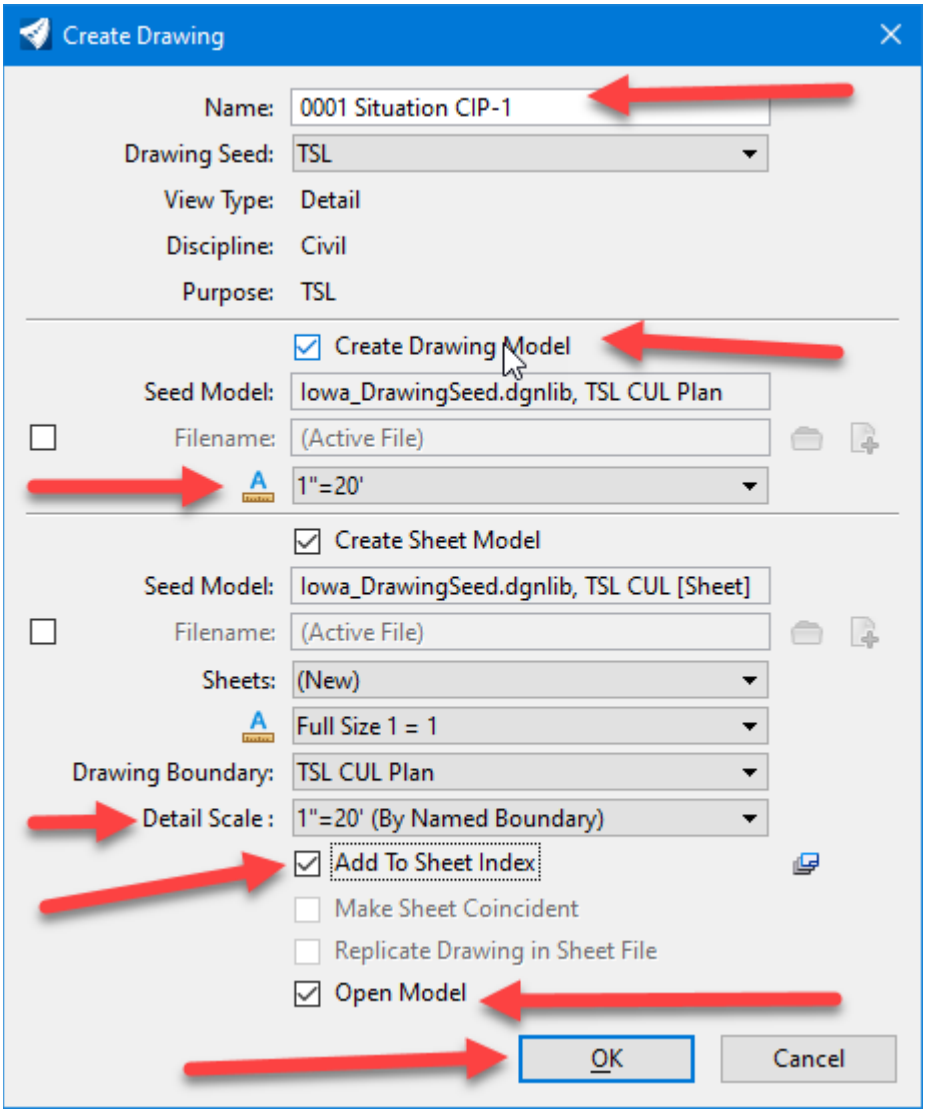
Next, ensure the scales are set correctly for the sheet.

1. Under the Create Drawing Model section set this to 1“=20’. The scale is set to match the scale used when referencing the Drawing Model details into the Sheet Model.

2. Under the Create Sheet Model section set this to Full Size 1 = 1 and ensure that the Detail Scale is set to 1” = 20’ (By Named Boundary). The scale is set to match the scale used when referencing the Drawing Model details into the Sheet Model.

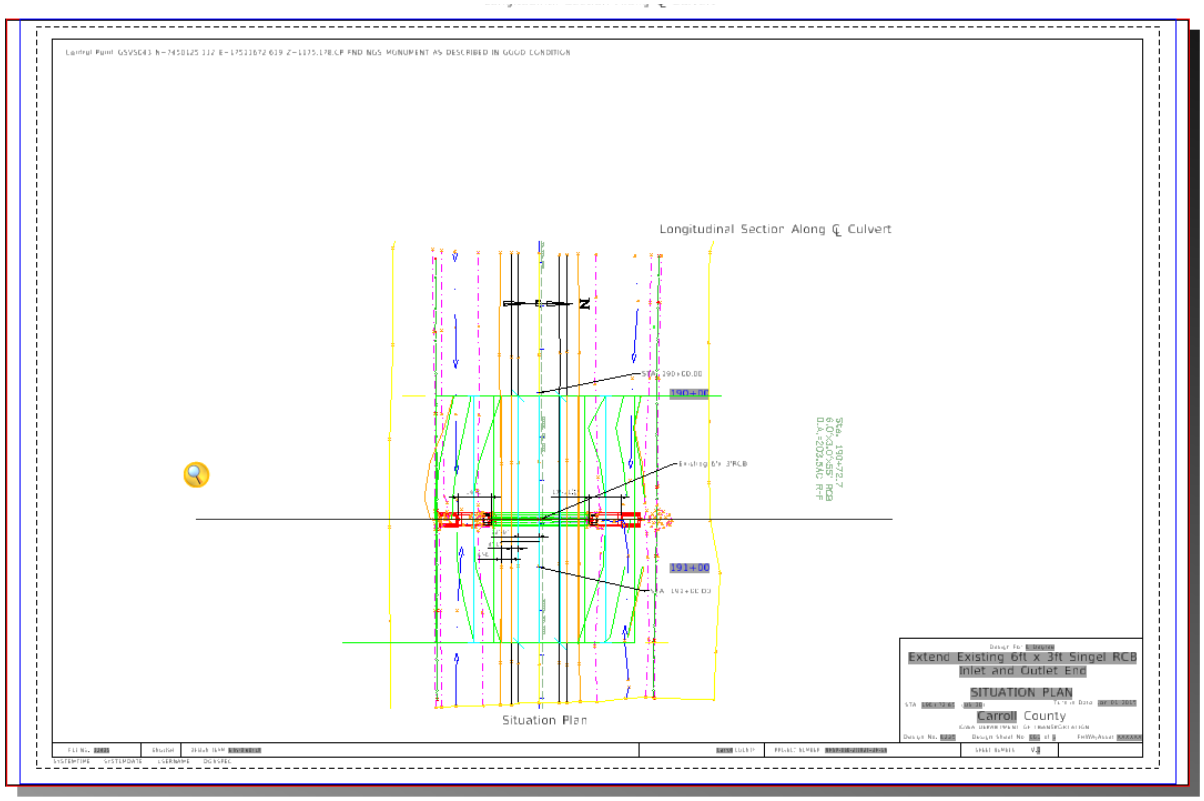
Toggle on Open Model, if desired. Add to Sheet Index may be toggled on also. Sheets may be added to the Sheet Index later in the plan sheet development process.

If everything is correct, then click OK.



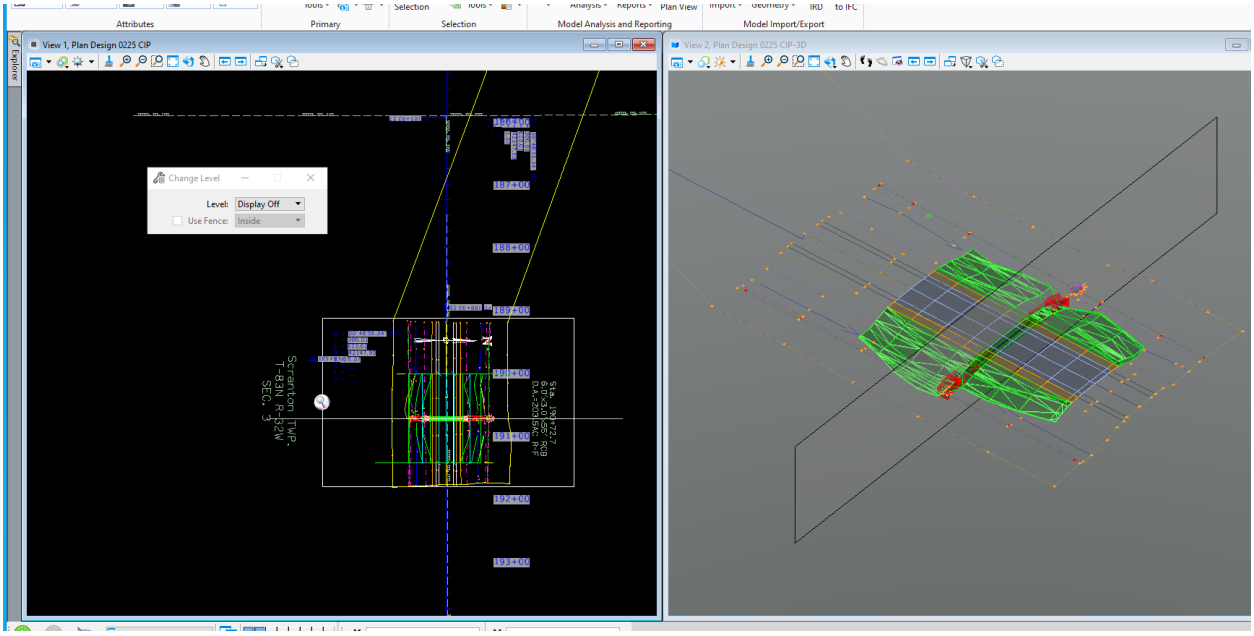
This will create the plan sheet.

It should look something like this:



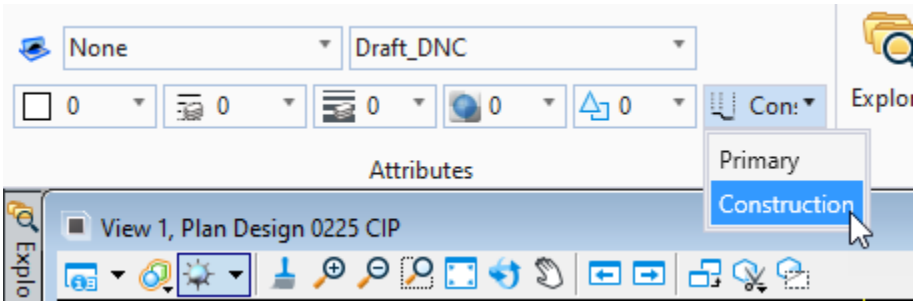
Situation Plan

Next, go back to the Multi-Model View to make the Longitudinal Cross Section for the sheet.

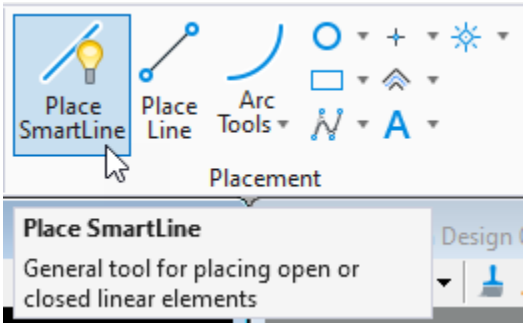


It is recommended to place a guideline for placing this cut. Work in the 2D view.

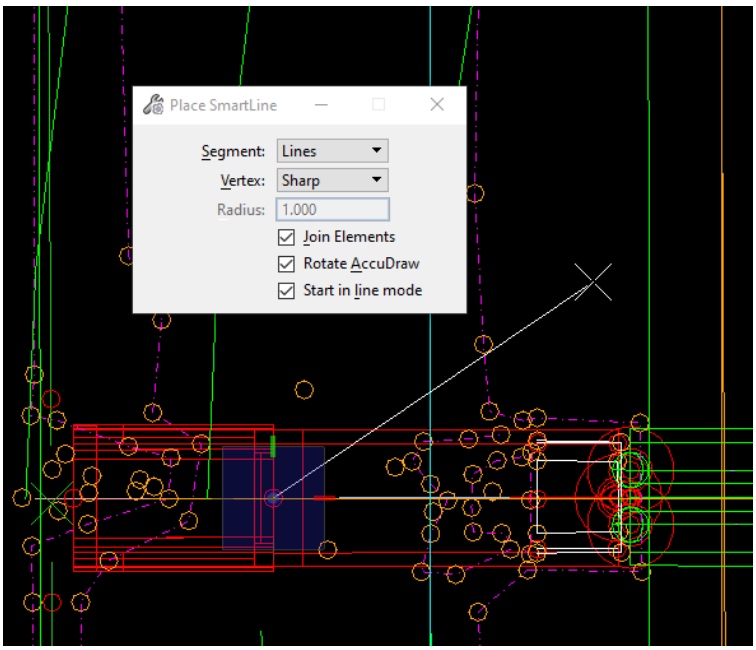
First set the symbology to level Draft_DNC which means Draft Do Not Construct and the class to Construction. The guideline will not show on the sheet and will appear as part of the design.

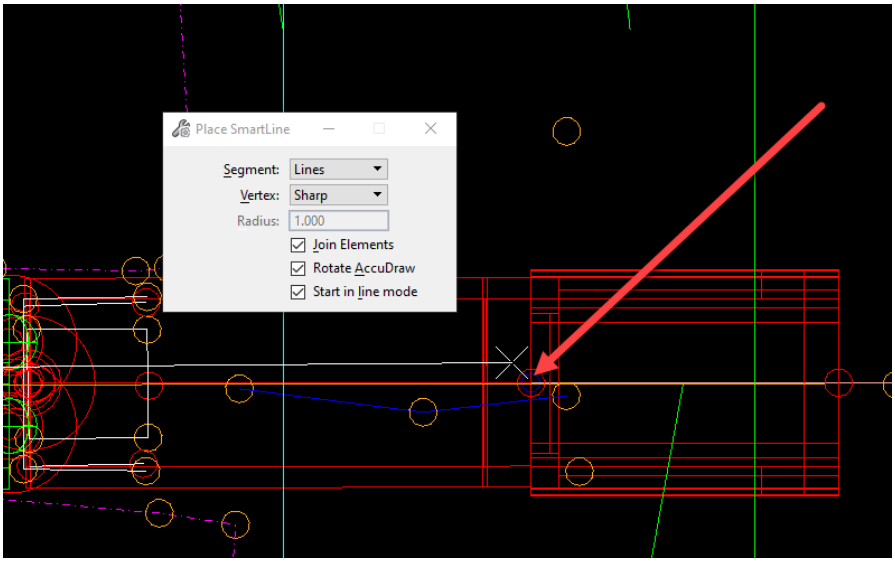


Use the place smart line tool to place the guideline.

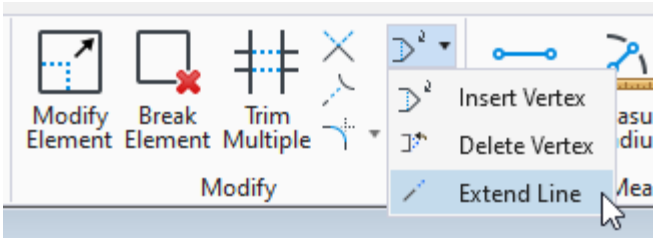


Start by placing the line at the calculated invert at one end of the structure then ending it at the other invert. The purpose of this is to ensure cutting the section at the true center of the structure.

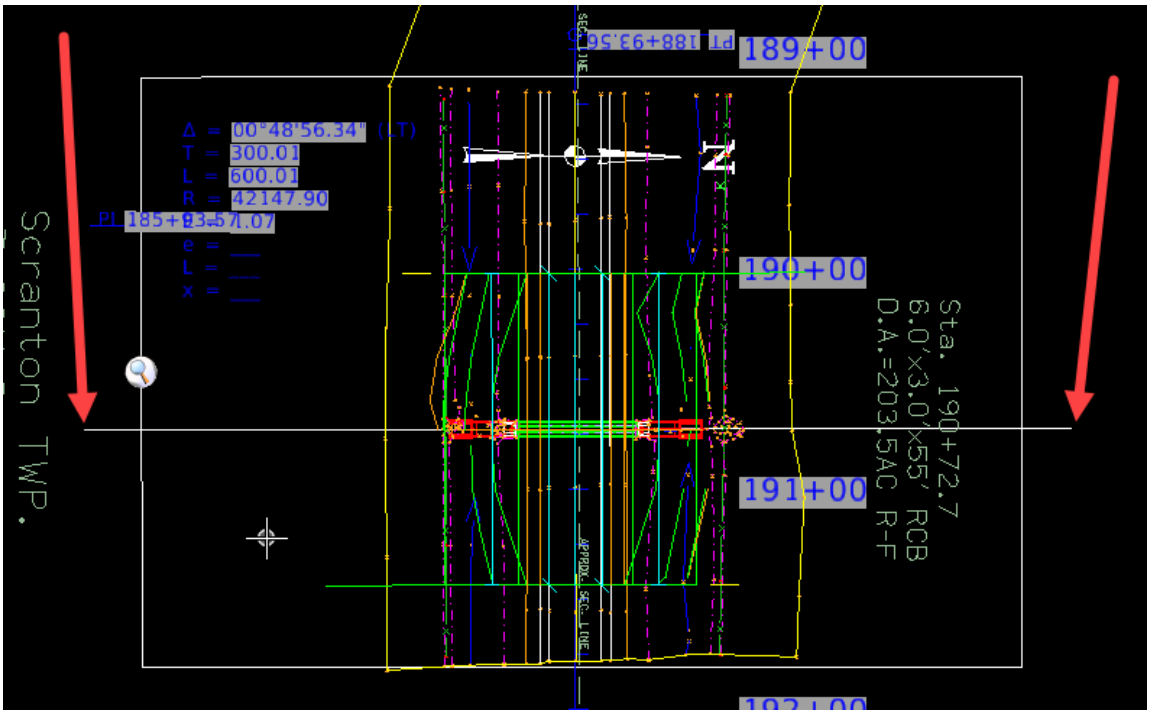




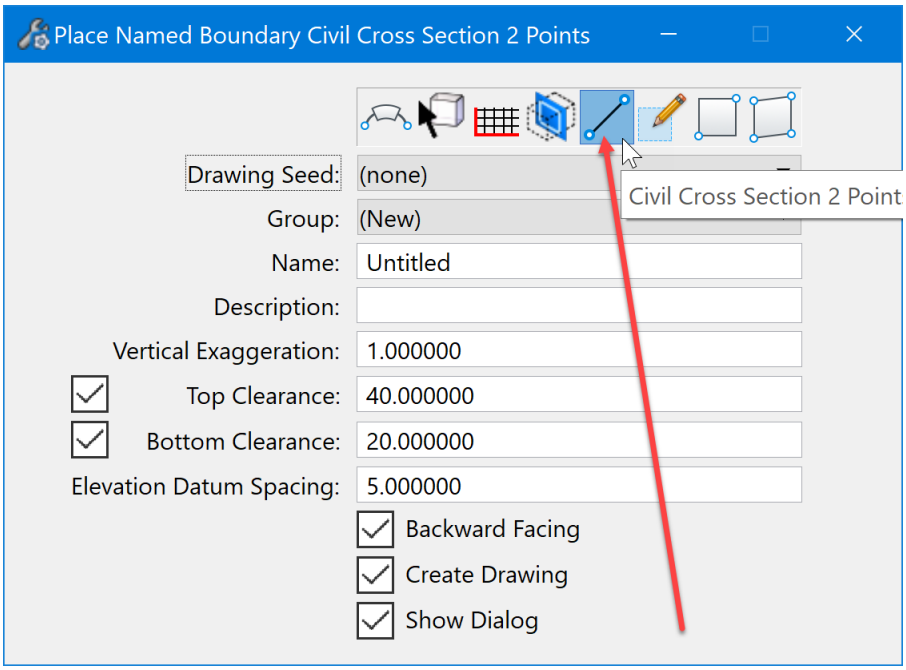
Use the Extend line tool to stretch the line past the plan view name boundary.



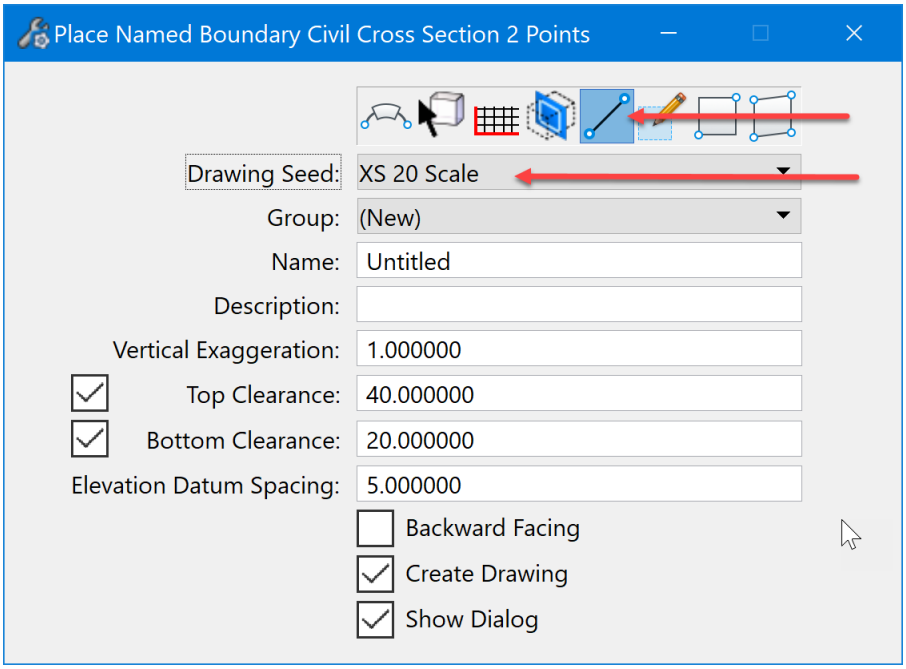
It should look something like this:



Next, make the Longitudinal Cross Section for the sheet using the **Civil Cross Section by 2 Point** boundary. This tool is also located on the Place Named Boundary dialog box.

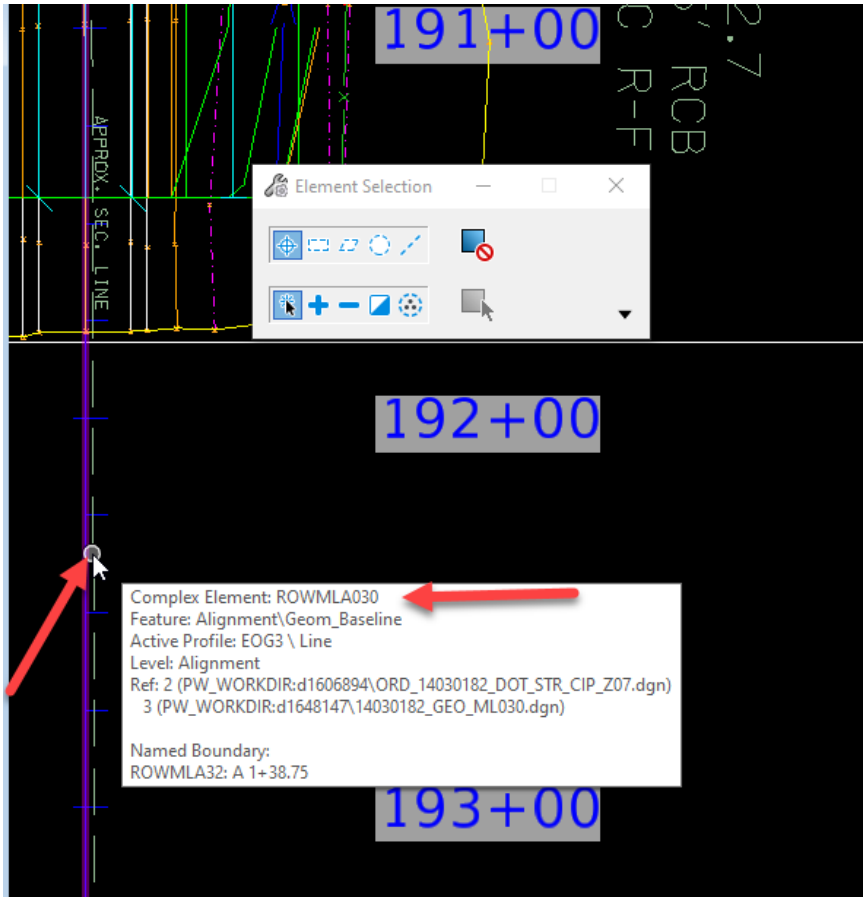


Select a **Drawing Seed.** For this example, use the XS 20 Scale seed to make a 1” = 20’ scale cross section.

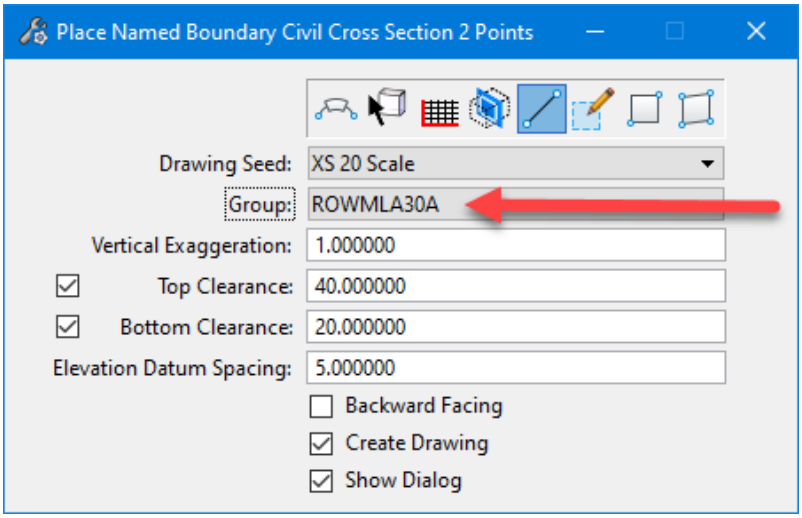


Next identify the path element. For this process, it will be the roadway horizontal alignment that intersects the structure shown on the sheet.

Note: Selecting the alignment will also set the Group. It is very important to set this so that in a large corridor project the cross sections can be placed on their own sheets when the drainage design is complete. To identify the path element, select it in the 2D view.

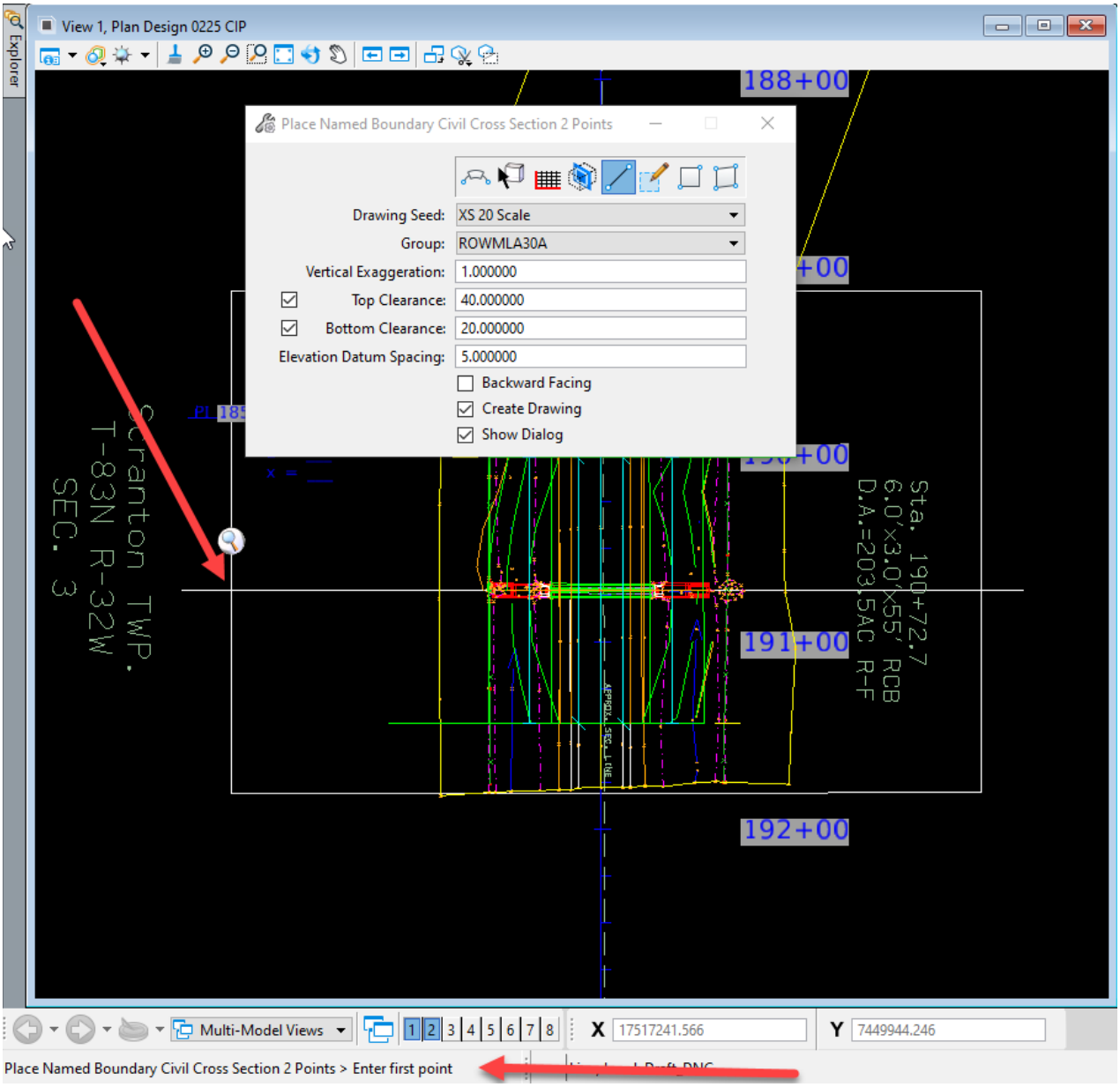


The **Group** should be named the same as the alignment.



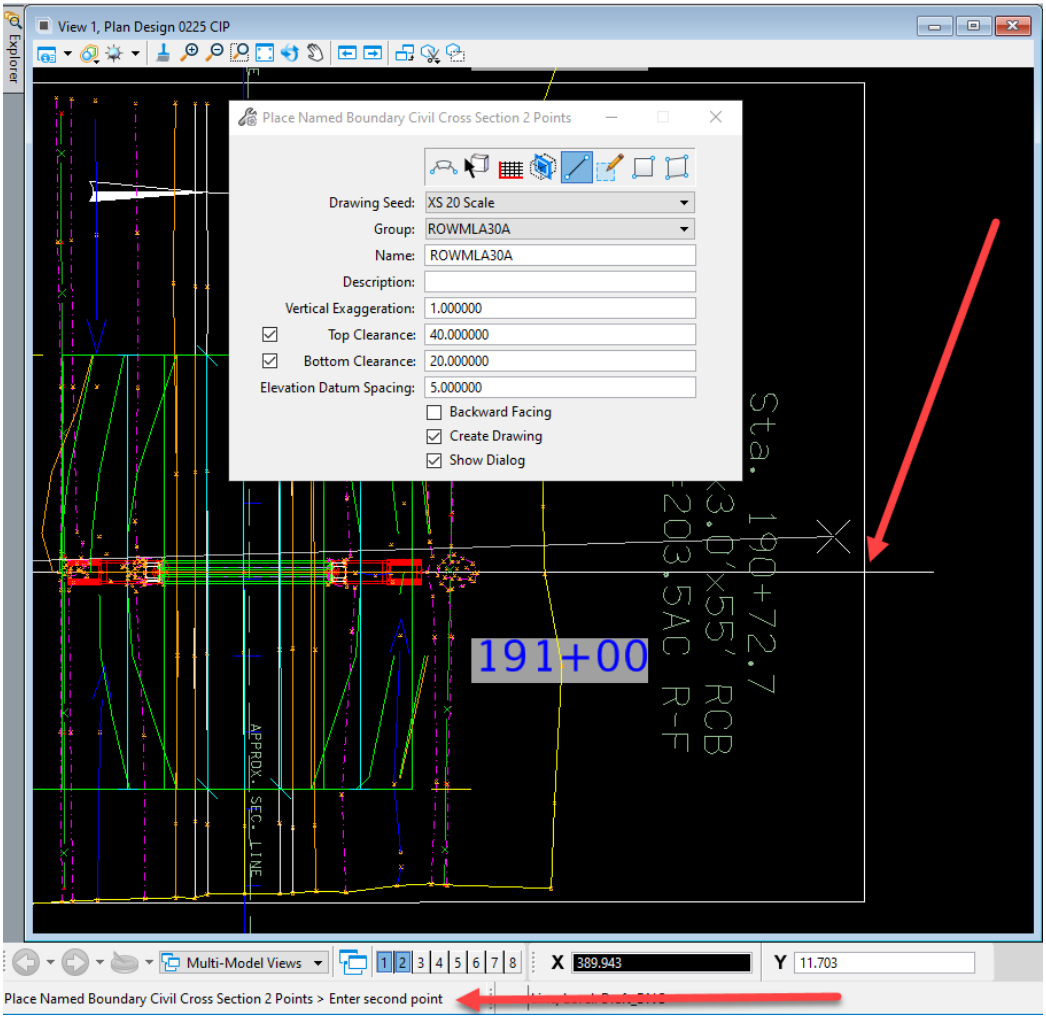
Next, identify the start point.

Snap to the intersection point of the structure centerline and the edge of the plan view boundary placed earlier.

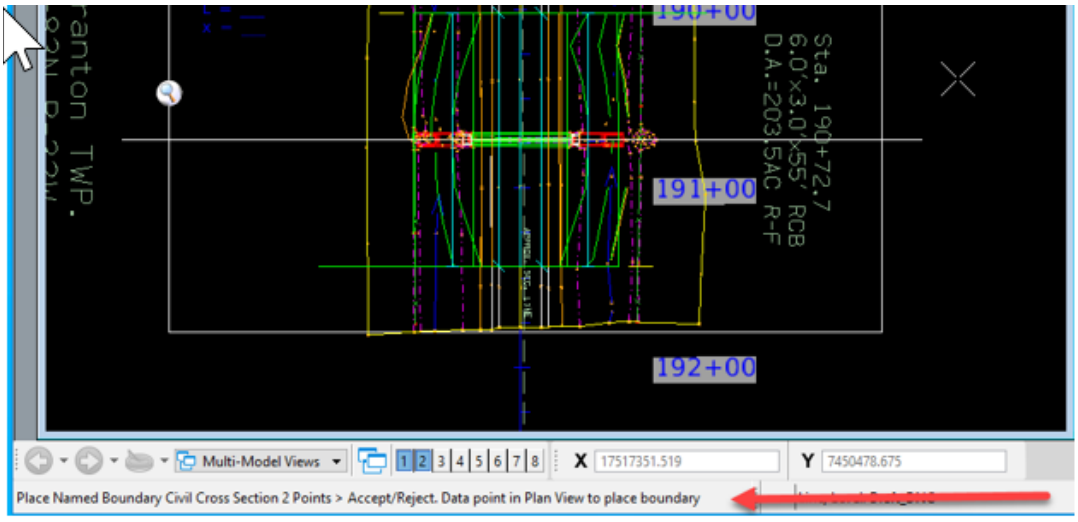


Then, identify the end point.

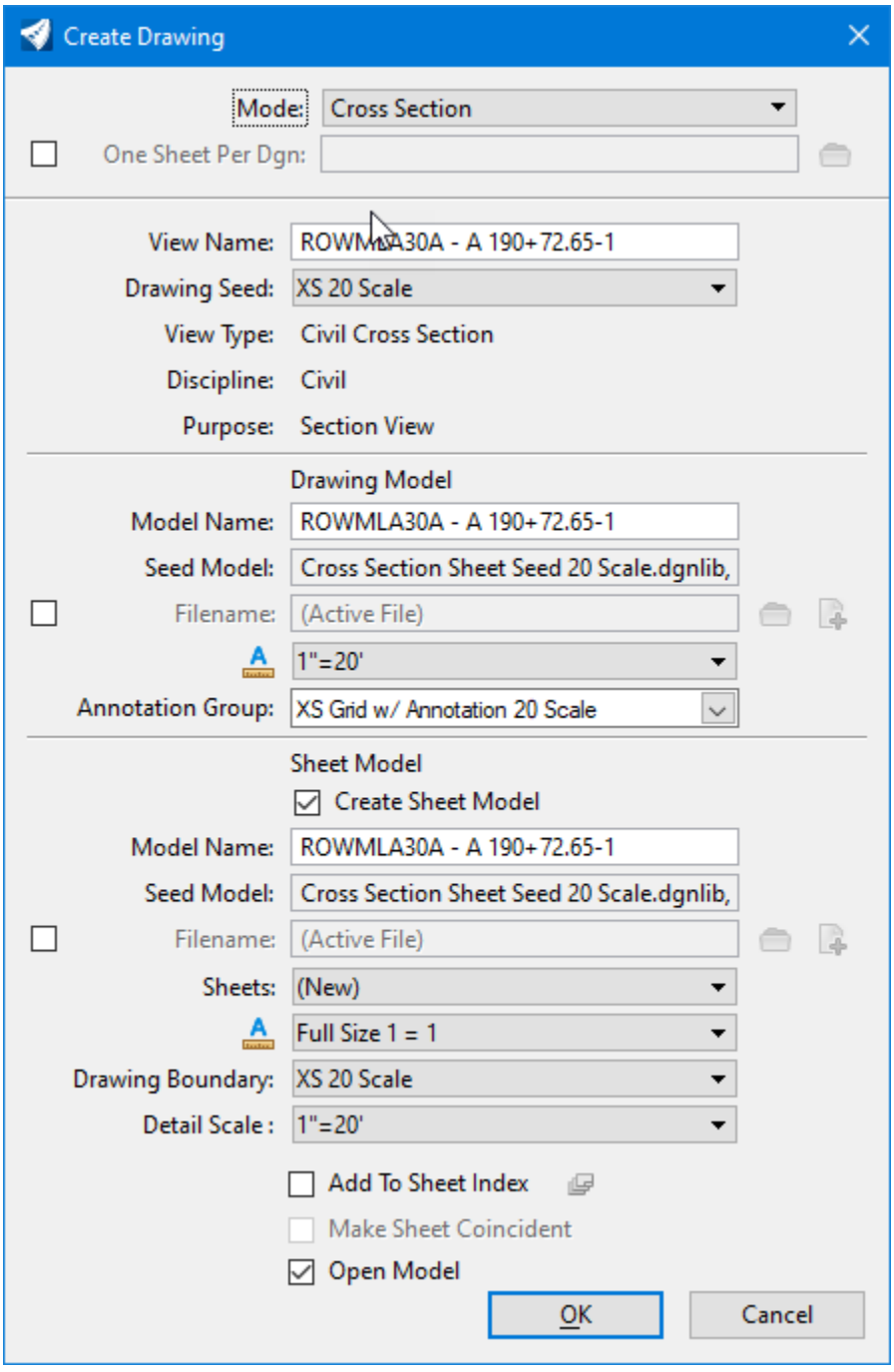
Snap to the intersection point of the structure centerline and the edge of the plan view boundary placed earlier.



It will prompt to Accept or Reject.

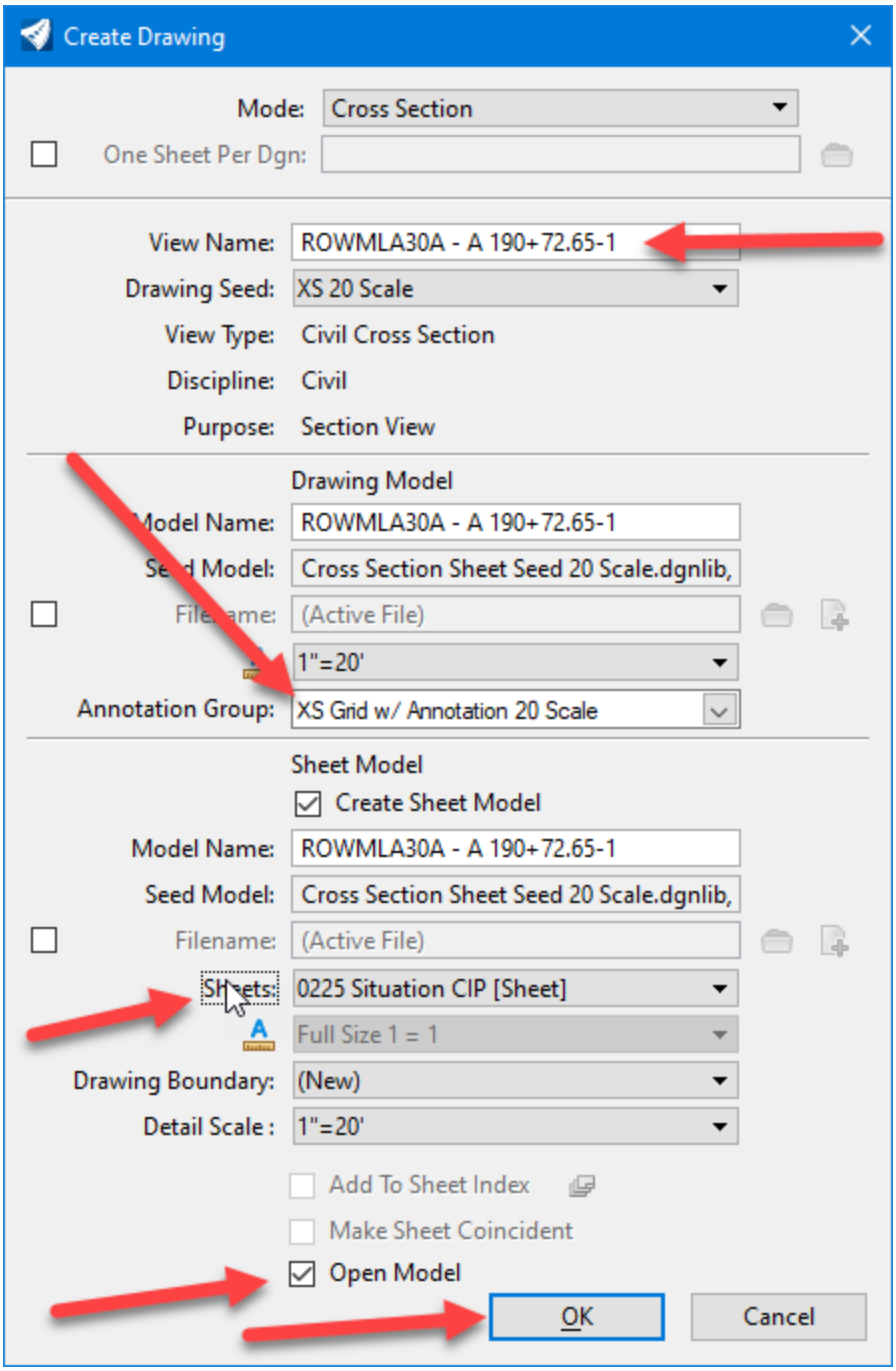


Once everything is set correctly, Data point in the plan view to accept the settings and this will open the Create Drawing dialog box.



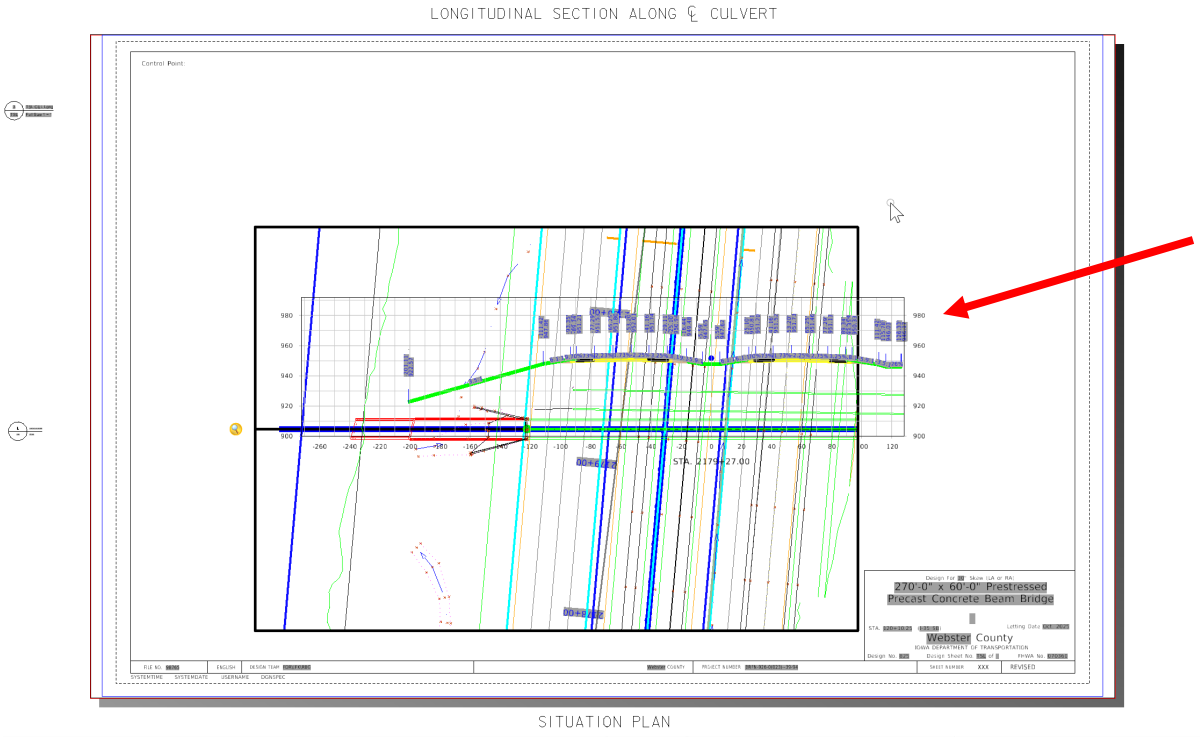
Select an **Annotation Group** and select the **Sheet** that the section will be placed on. Toggle on Open Model.

When adding a detail/cross section to an existing plan sheet, the Add to Sheet Index option is grayed out. When creating a new plan sheet, the Add to Sheet Index option will appear selectable.

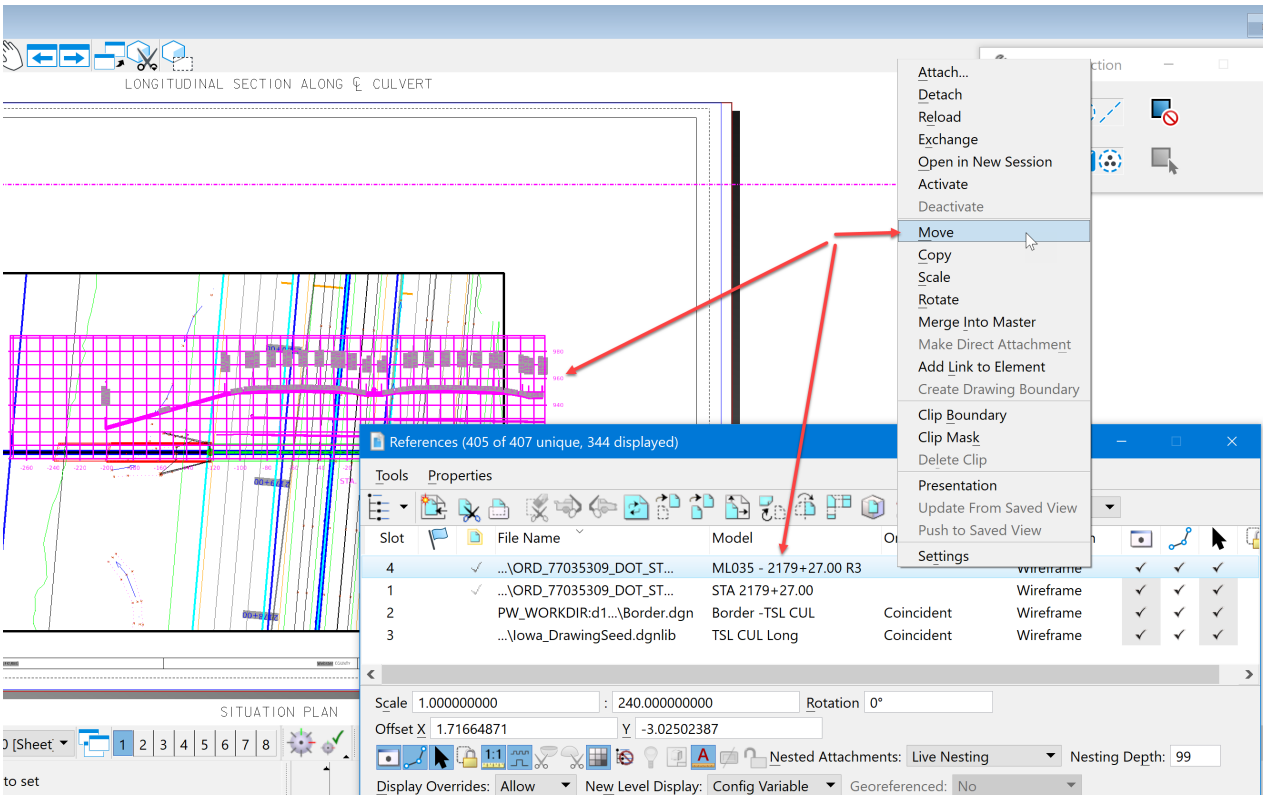


Click OK.

This will place the cross section on the sheet as the Longitudinal Cross Section. It will appear in the center of the sheet.

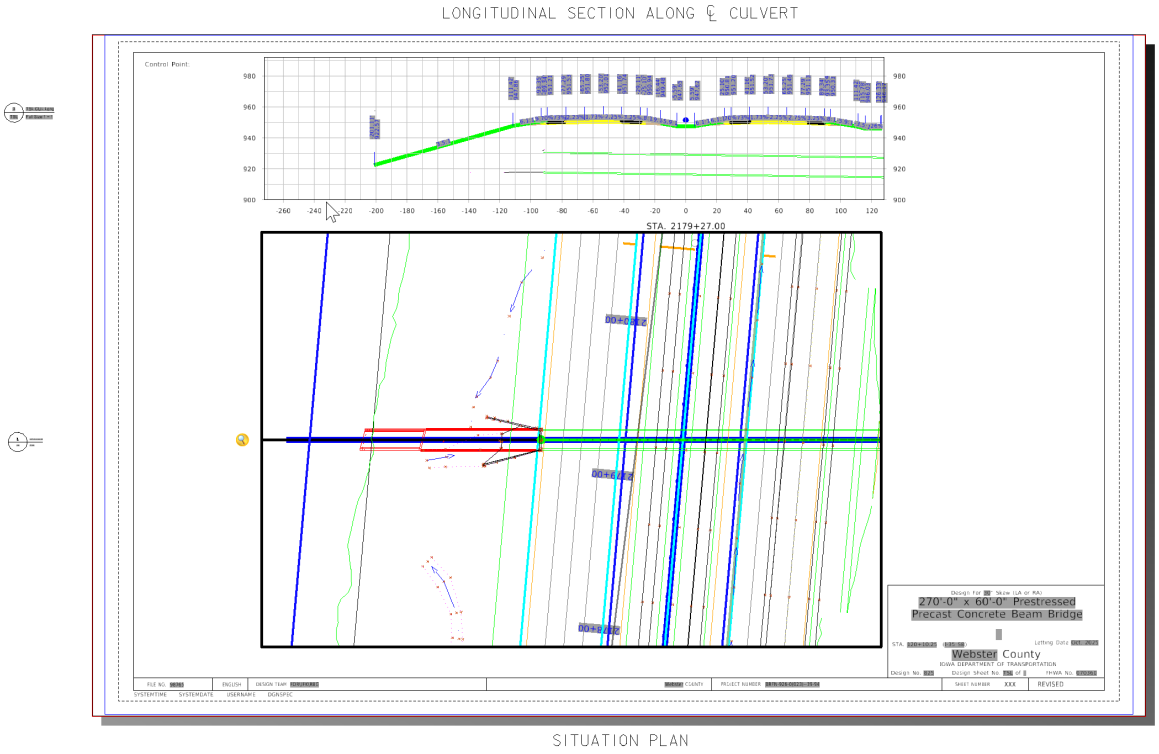


To move it to the proper placement, open the Reference dialog box. Then select it in the list, right click and select move. This is a reference so the reference move tool is used.



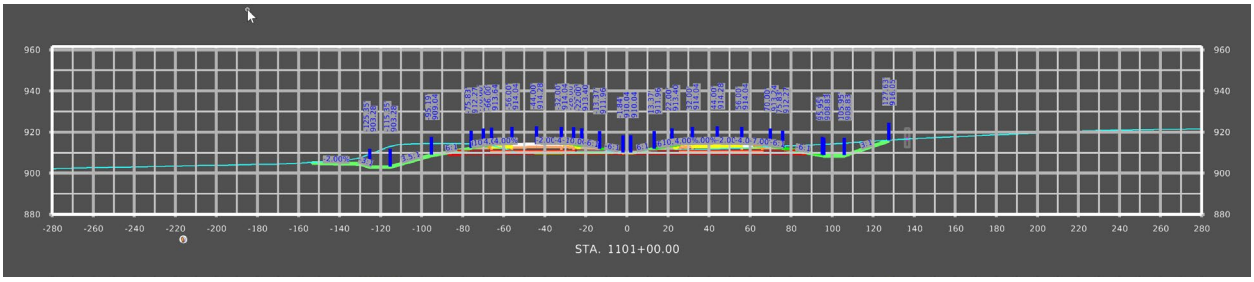
Data point somewhere outside of the sheet and with the AccuDraw compass locked vertically, move it up into the correct position.

The sheet should look something like this:



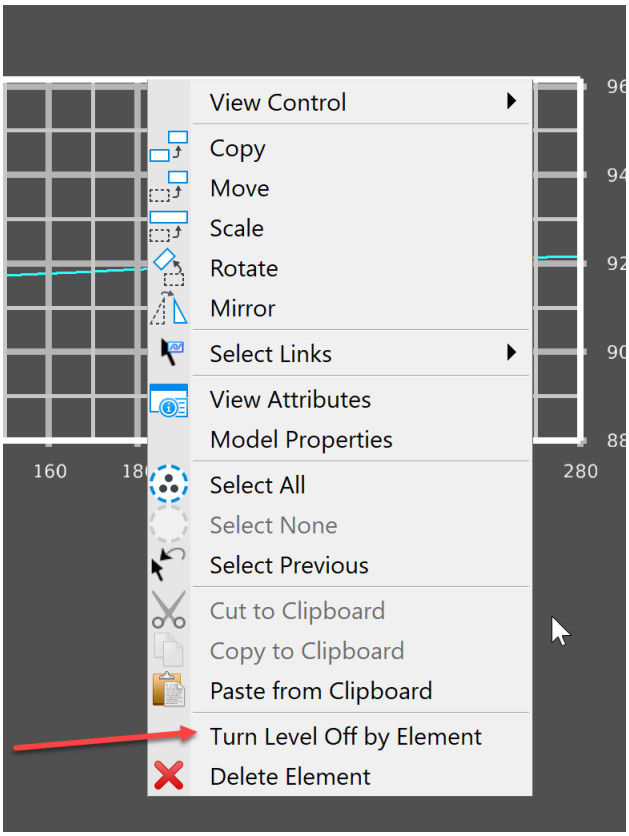
Next, annotate the structure in the Plan View drawing model and in the Longitudinal Cross Section drawing model.

For this example, start with the Longitudinal Cross Section drawing model.



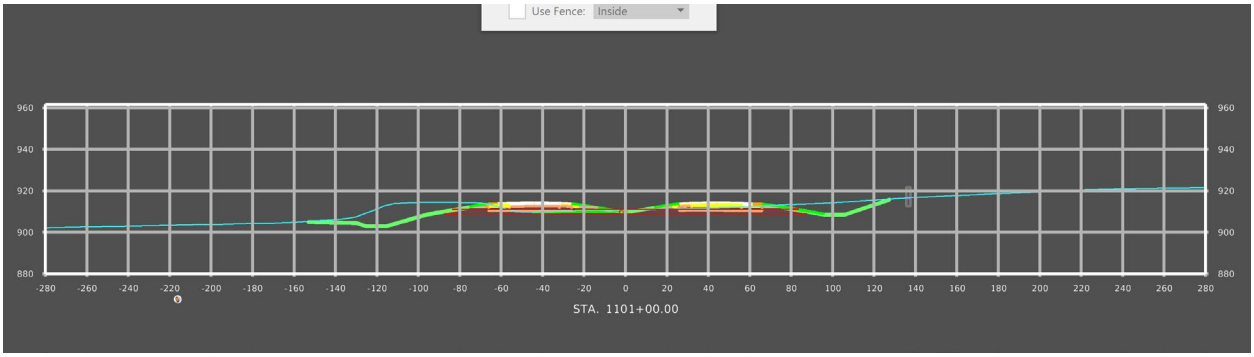
Turn off some of the automatic annotations of this Longitudinal Cross Section to make room for some of the information that needs to be displayed.

To turn off some of the automatic annotations, right click and hold to bring up the context sensitive menu.



Then select the Turn Level Off by Element option, click on the items not needed for the sheet.

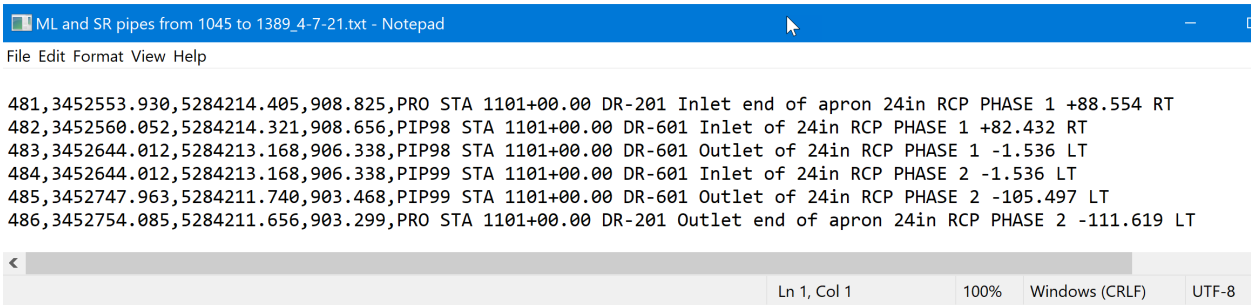
It should look something like this:



When annotating a structure in the Longitudinal Cross Section, label these items listed below.

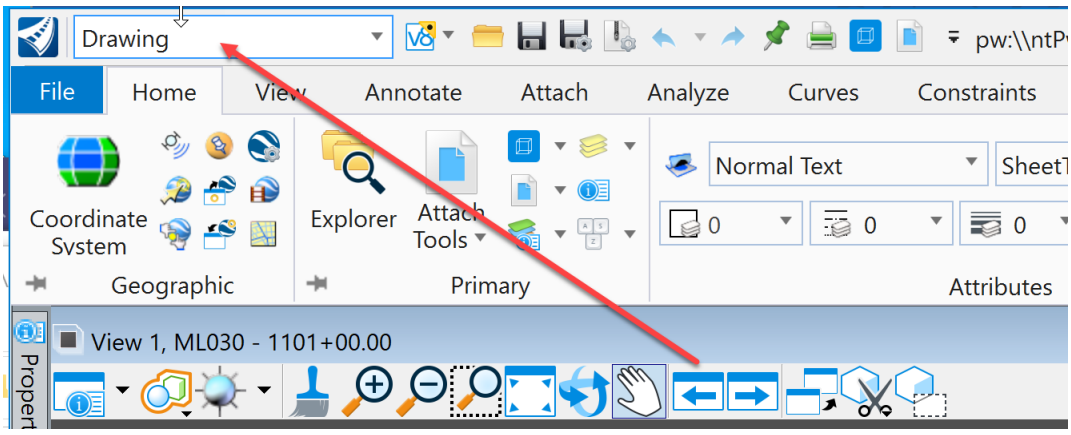
1. Design Cover.
2. Profile Grade Elevation.
3. Distance from centerline right.
4. Distance from centerline left.
5. Flowline Elevation at each critical point in the structure.
6. Structure description and any other unique items that need to be called out.
7. Total Distant Left and Right (if an offset baseline is need for that standard).
8. Also any other items that apply from the Preliminary Design RCB Checklist.

Some of this information is stored in the ASCII graphics input file. It is helpful to have that file open for the structure that is being annotated when doing this process. Copy and paste information from it to the Place Note tool to help save on typing.



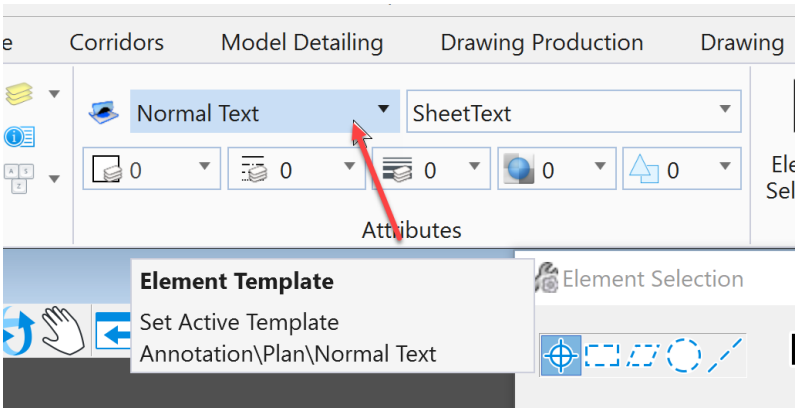
Before starting to place annotations, some settings need to be selected. The first is to change the workflow to the Drawing workflow.

Note: This may be a user's preference because some users find it easier to locate the tools to annotate in this workflow. These tools are available on other workflows as well.



The second is to select the correct Element Template for placing the annotations.

Click on the Element Template pull down in the Attributes toolbox on the home tab.



Browse down to the Annotation Plan folder and select the Dimension Text Element Template.

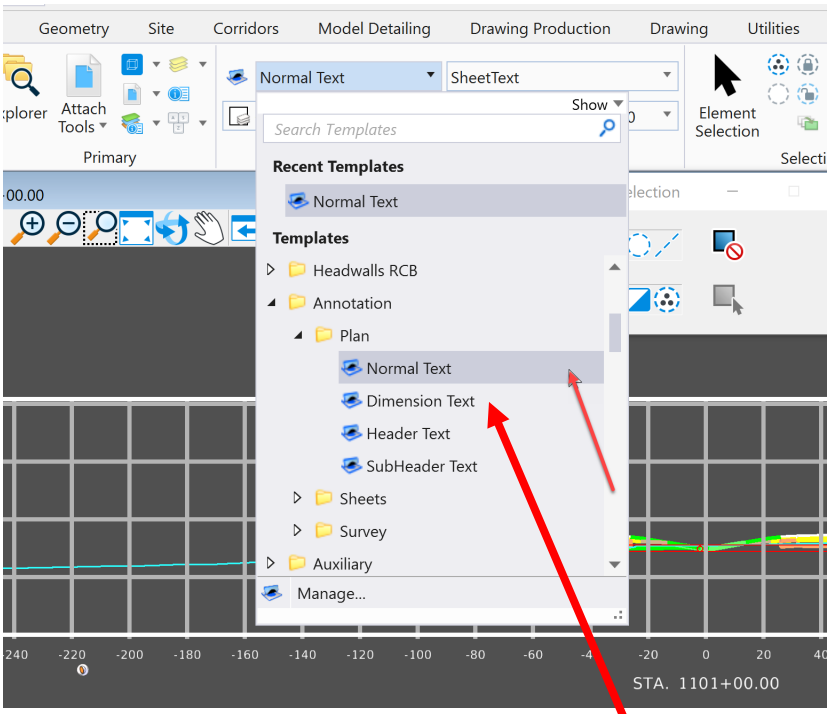
Typical use of the options is:

Normal Text - Use for any notes that are not dimension leader notes.

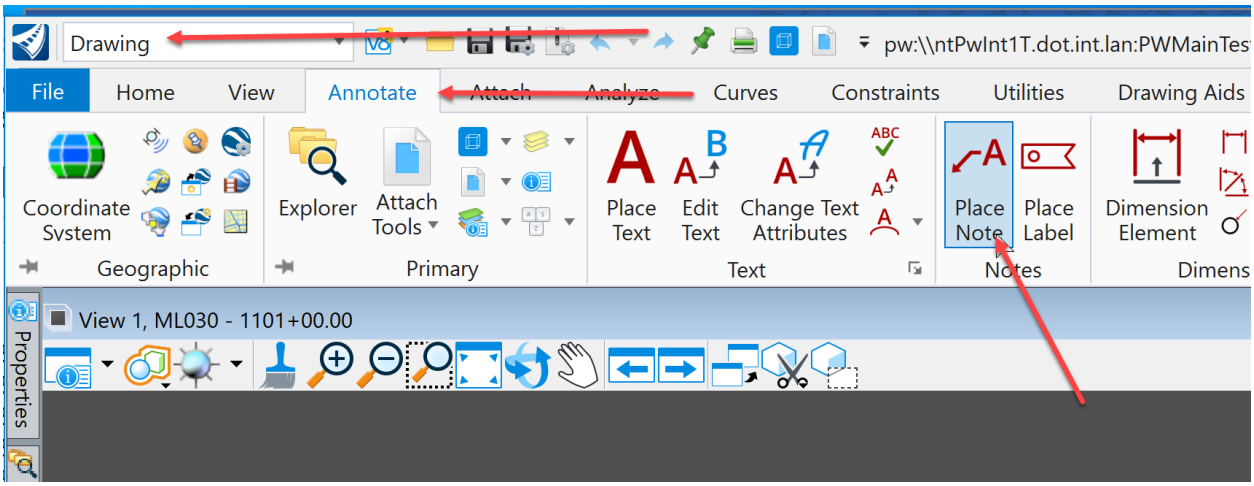
Dimension Text - Use for all dimensions, leader notes and dimensional numerical values and text used in tables or fields. See tables used on Iowa DOT Culvert Barrel Details standard sheets as an example.

Header Text - Use for all headers and title blocks.

SubHeader Text - Use when Header and Normal text do not seem appropriate. An appropriate case would be the word Notes used when labeling a group of notes or instructions.

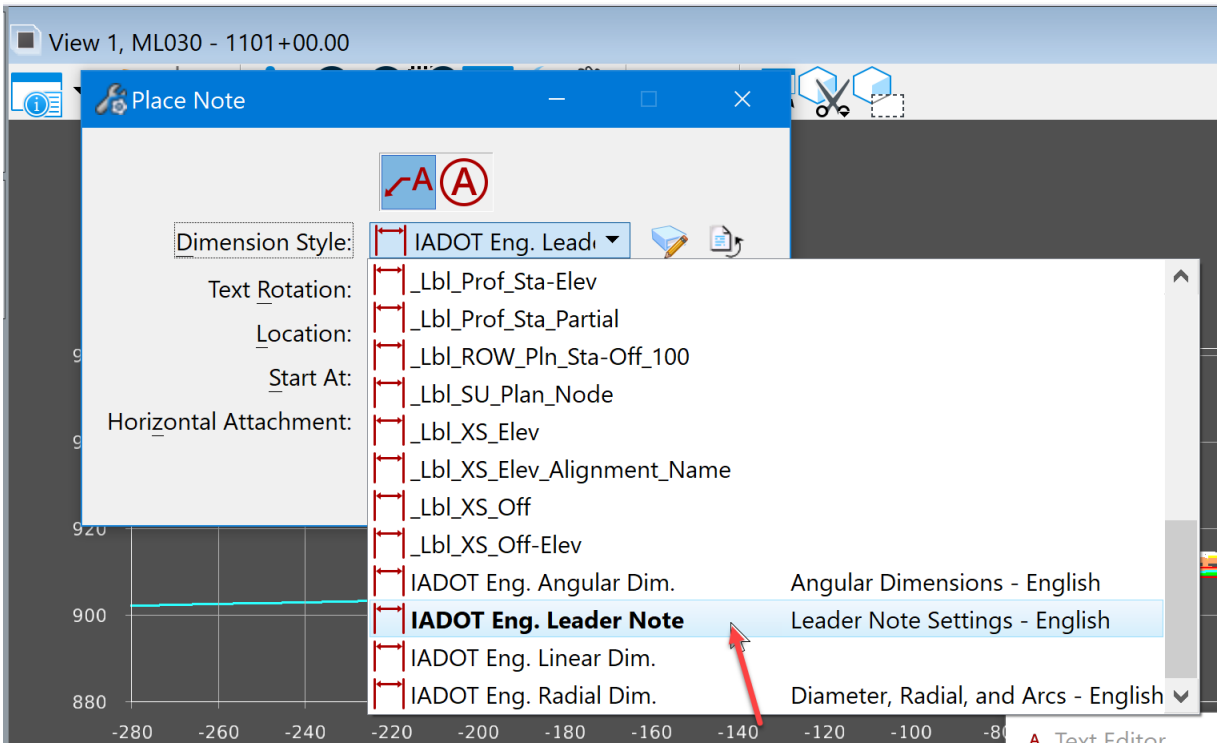


Next, select the correct annotation tool. This example will be for placing the Flowline Elevation at the Inlet end of the apron and the offset from centerline. Use the Place Note tool.



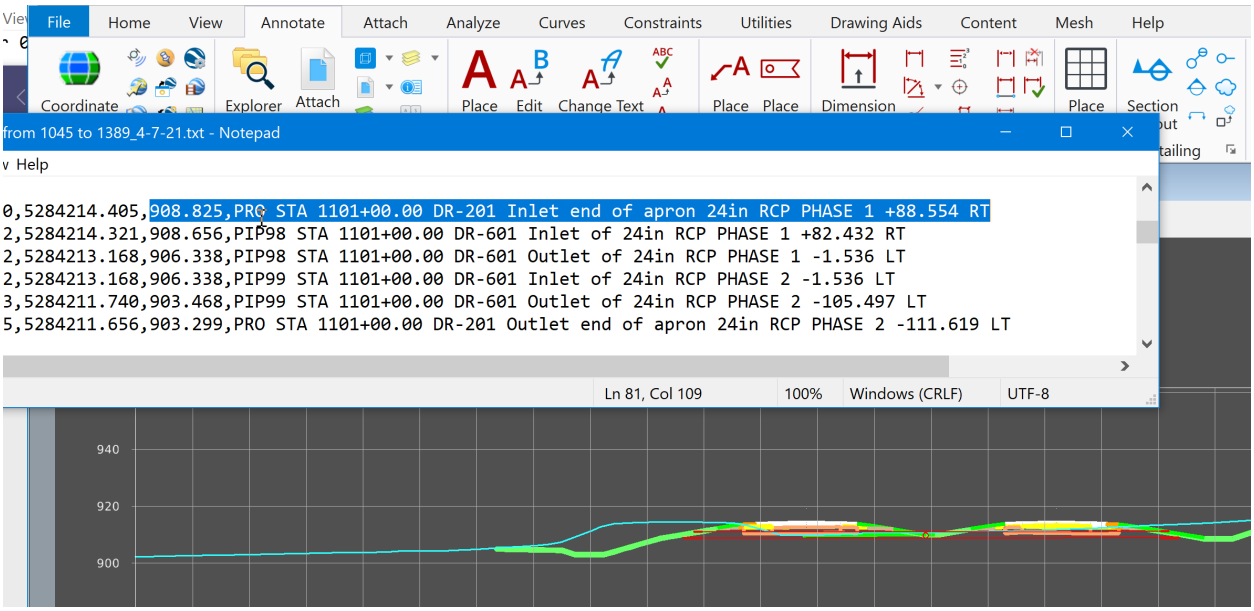
Selecting the Place Note tool will open the dialog box. Select the correct Dimension Style.

For this example use the IADOT Eng. Leader Note style.

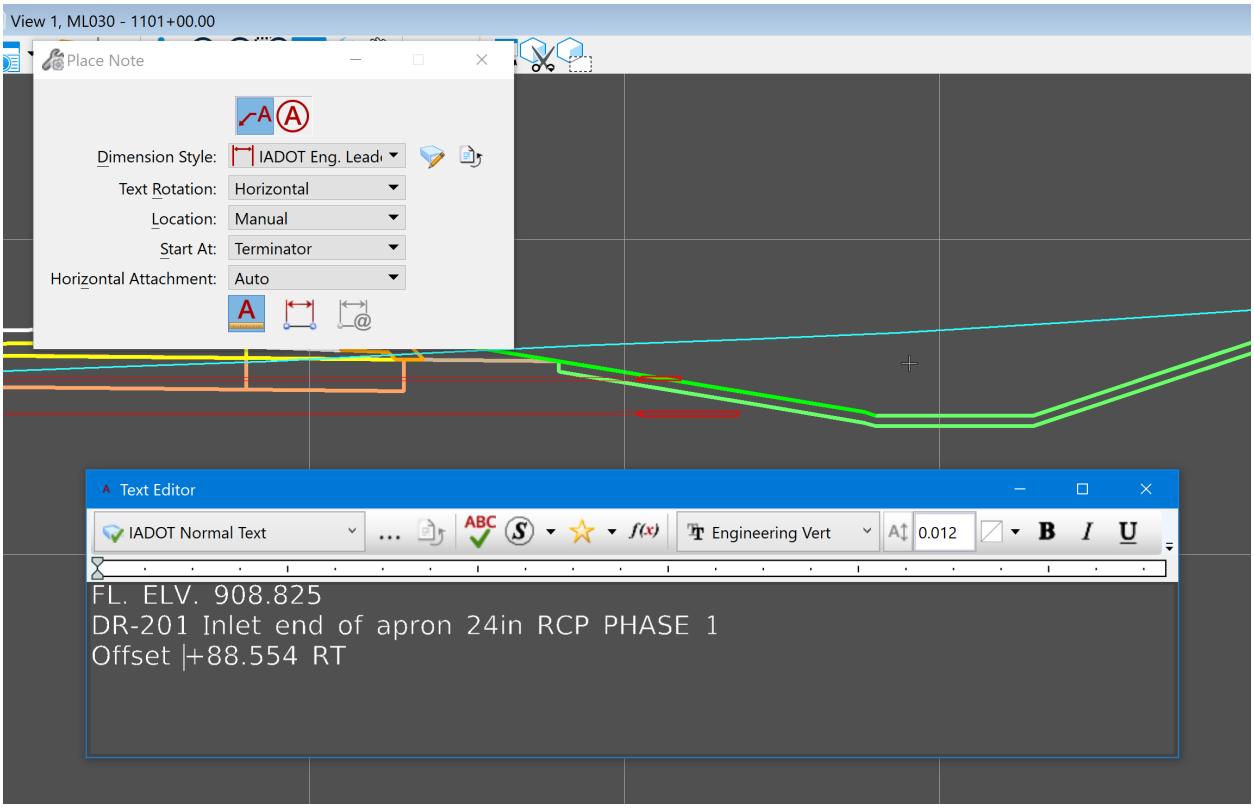


By selecting the correct Dimension Style and Element Template, this ensures the notes are placed with the correct settings. Once this is set, type in the note needed.

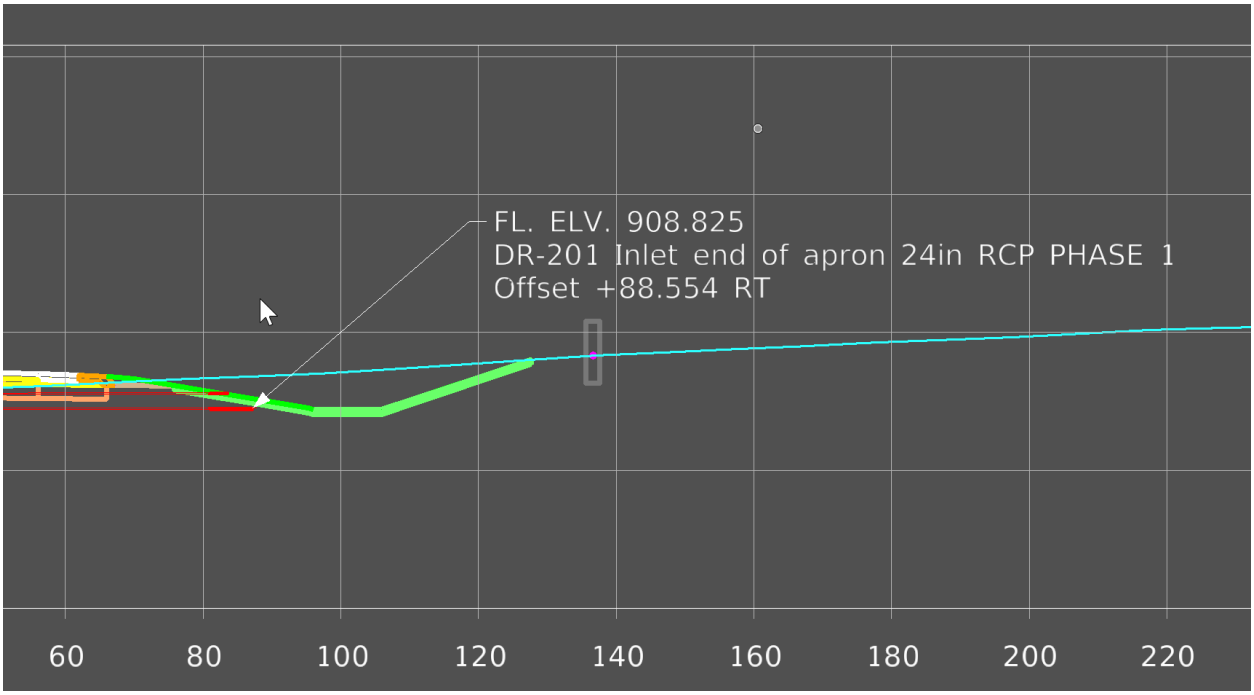
This is where the ASCII graphics input file may be used. With it opened to the specific structure, highlight the information needed to be placed and copy it from the ASCII graphics input file.



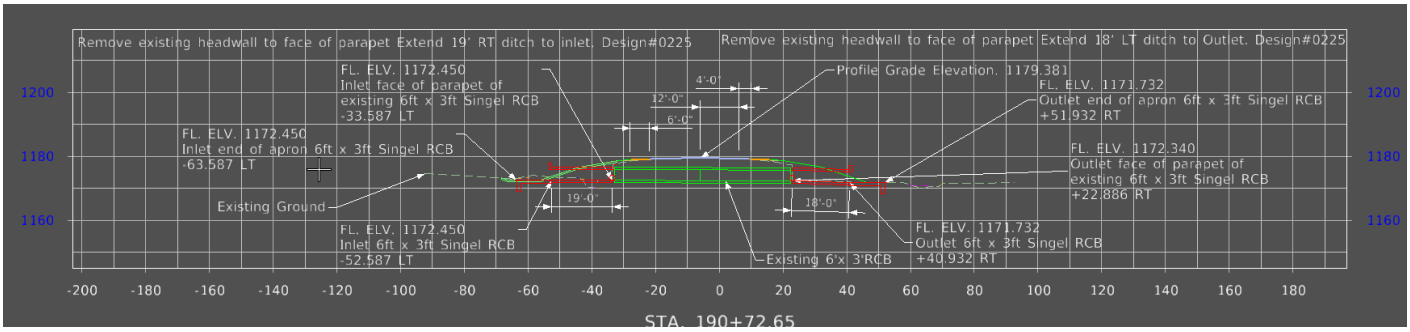
Then paste it into the text window.



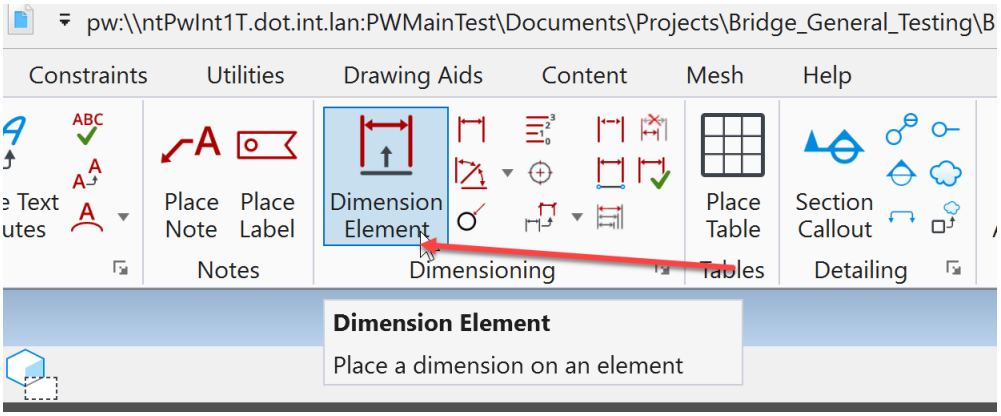
Snap to the appropriate point to locate the note and place the note.



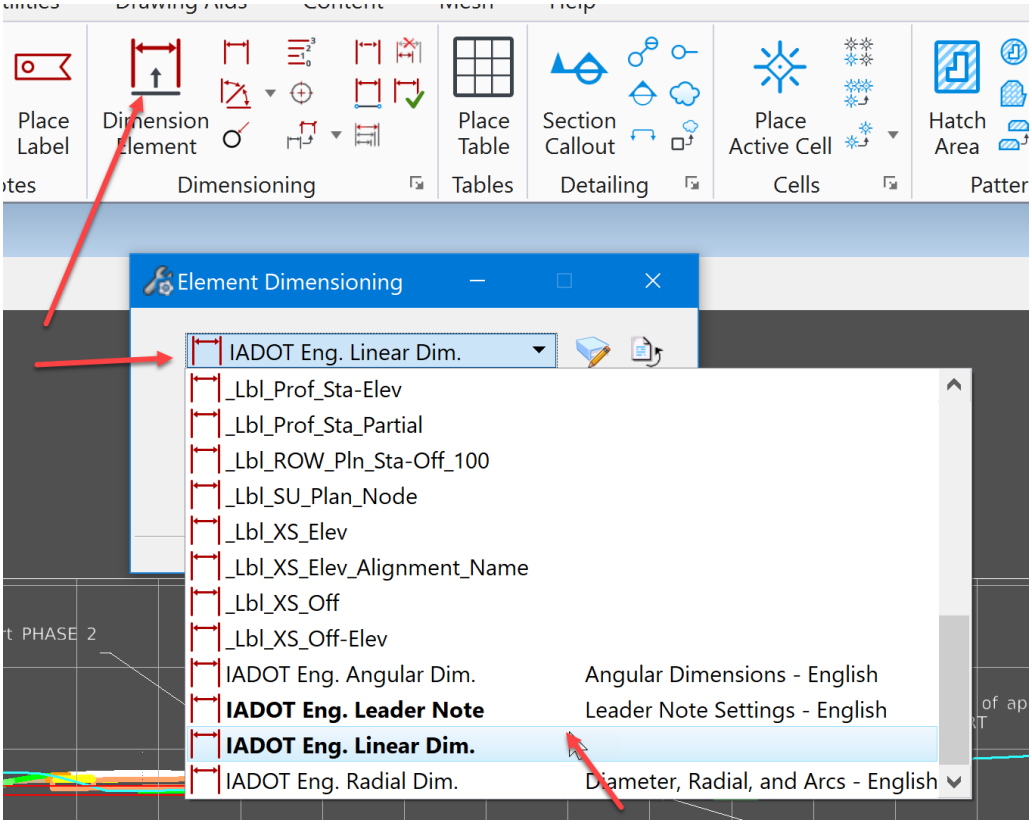
Then repeat the same process to place all the annotation notes needed. When complete it should look something like this:



Once done placing the notes, then dimension the structure. Select the Dimension Element tool on the Annotate tab in the Drawing workflow.

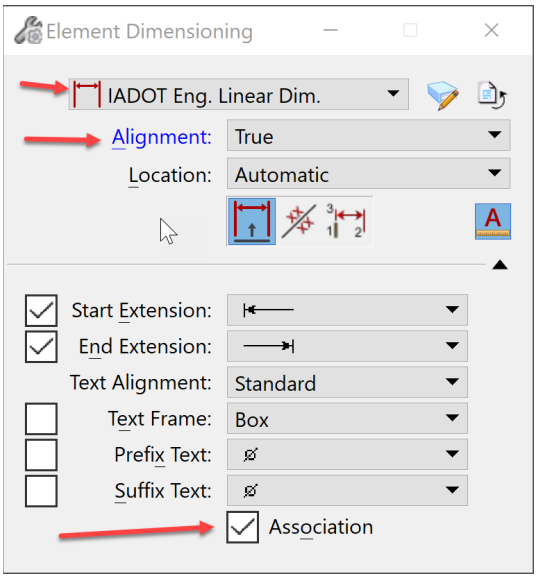


Next, select the correct Dimension Style. This example will use the IADOT Eng. Linear Dim style.

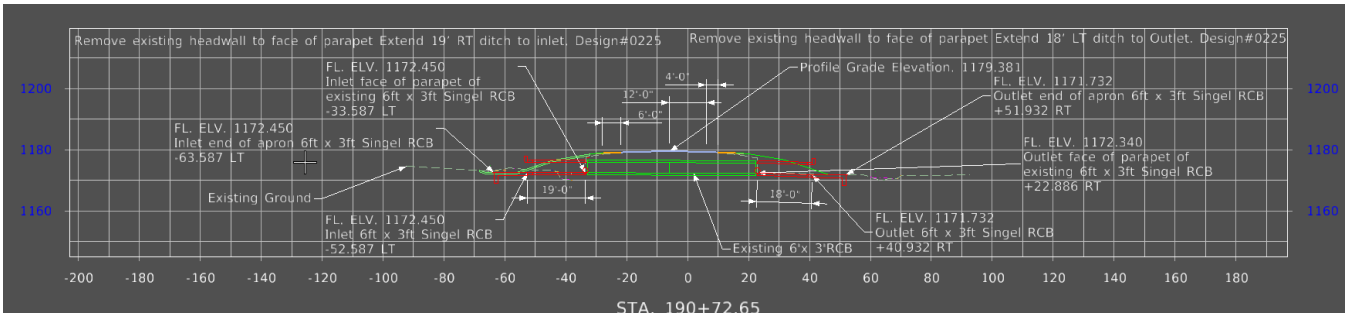


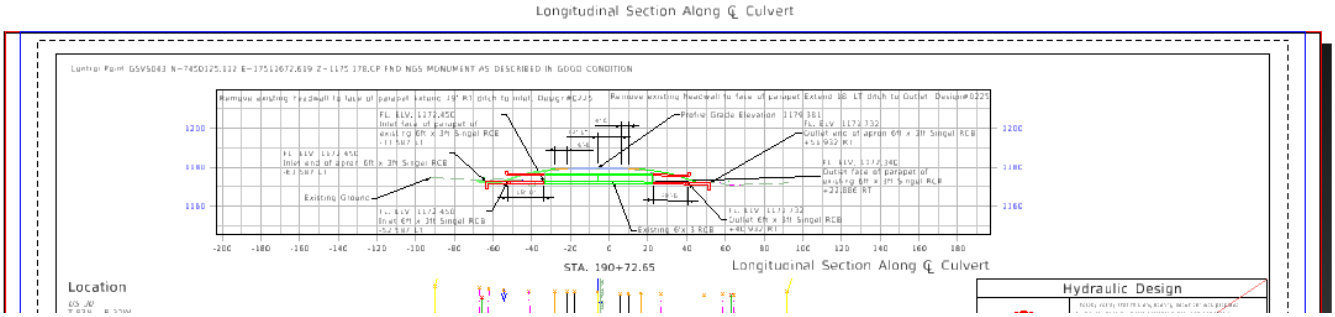
By selecting the correct Dimension Style and Element Template, this ensures the dimensions are placed with the correct settings.

Next, set the **Alignment** to True and the **Location** to Automatic. If Association is toggled on, it will make the dimension capable of auto correcting if the structure is adjusted.



It should look something like this:



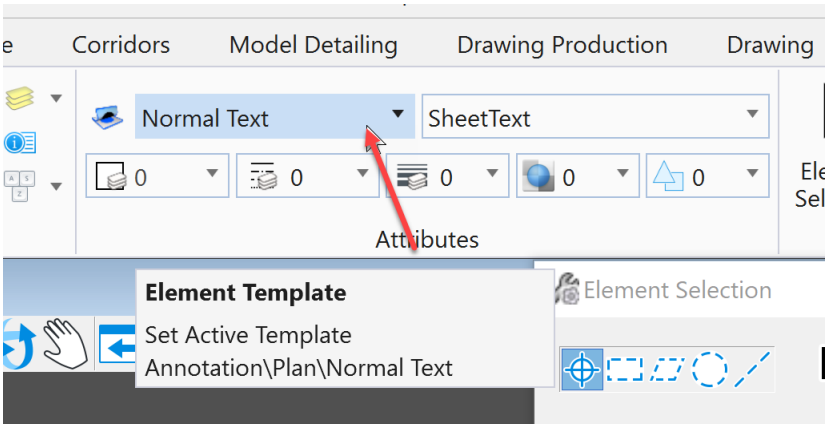


Next, annotate the Plan View portion of the TSL Sheet.

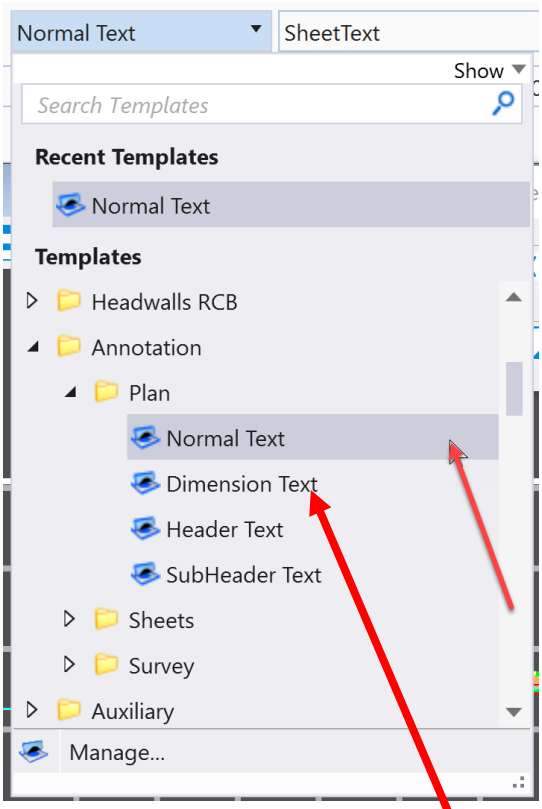
When annotating a structure in the Plan View, label these items listed below.

1. Station at centerline of structure = centerline of the alignment.
2. Station at Even Station tic marks before and after the structure.
3. Station of the outside corners of the proposed revetment.
4. Dimension distance from centerline left.
5. Dimension distance from centerline right.
6. Dimension to length of new structure.
7. Also any other items that apply from the Preliminary Design RCB Checklist.

Similar to annotating the Longitudinal Cross Section, make sure to select the correct Element Template for placing the annotations.

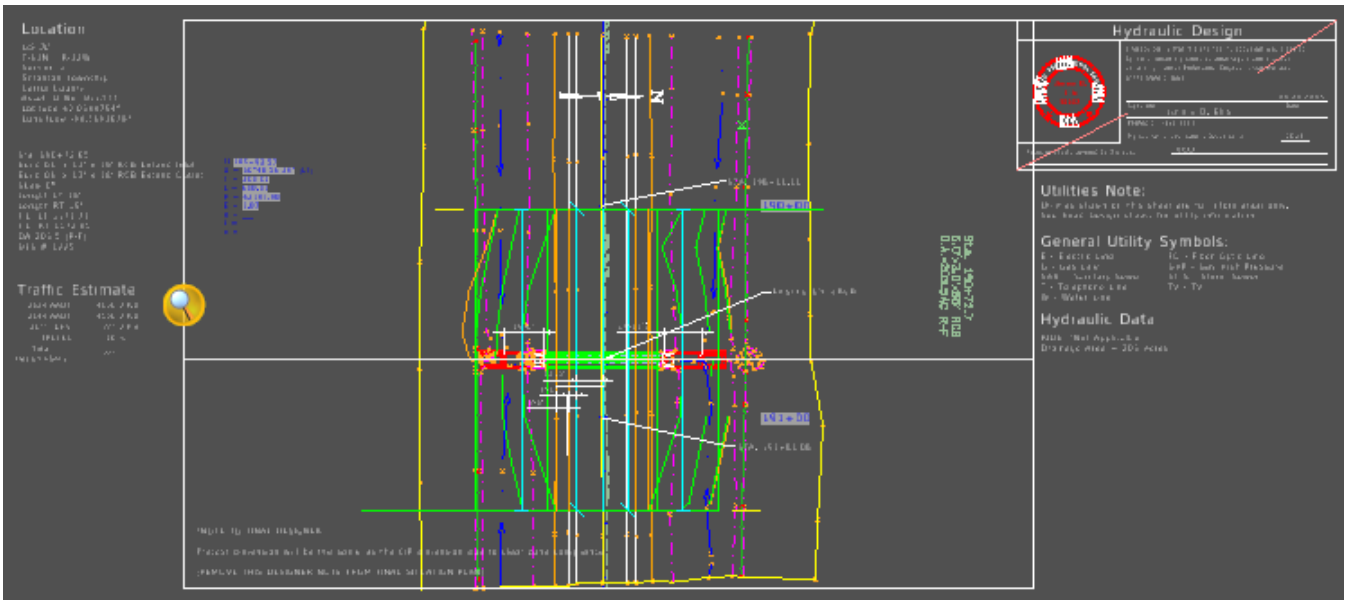


Browse down to the Annotation Plan folder and select the Dimension Text Element Template.

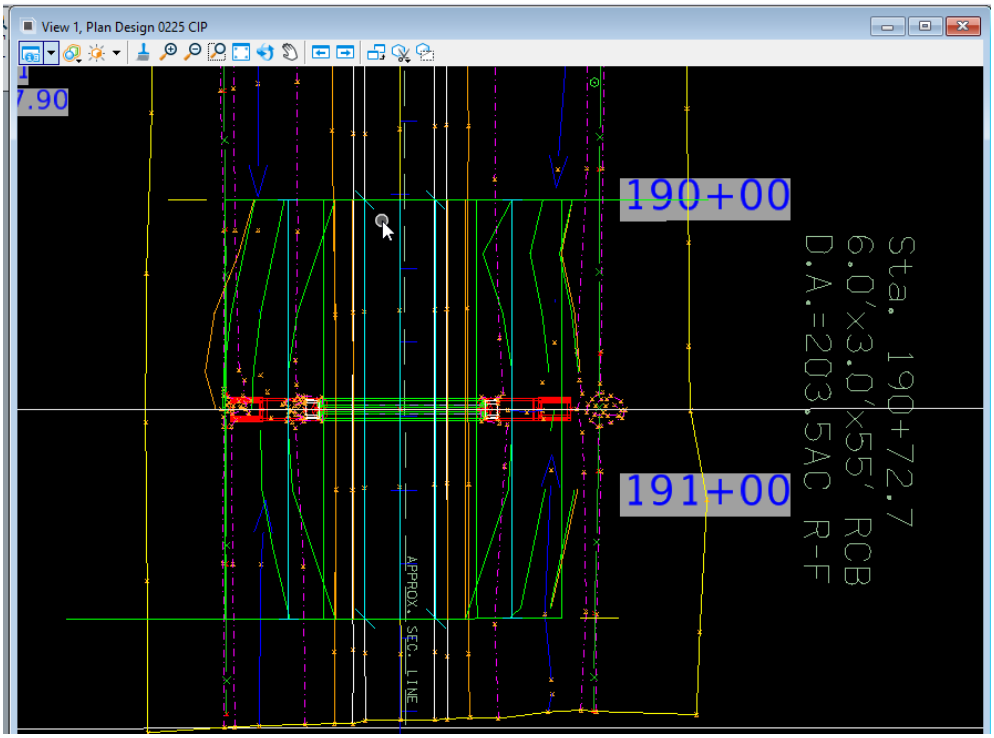


By selecting the correct Dimension Style and Element Template, this ensures the notes are placed with the correct settings.

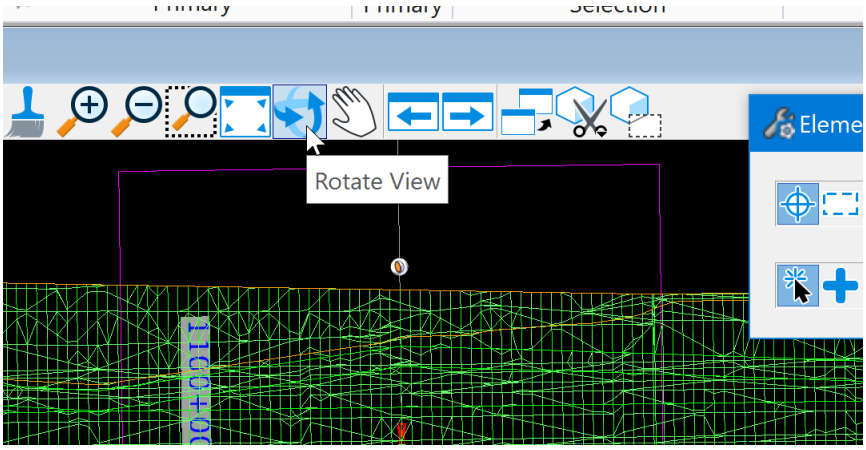
It should look something like this:



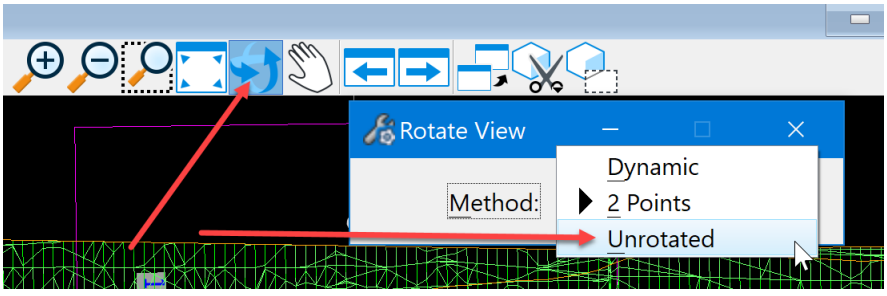
Once all the annotation is complete, then place the North Arrow in the Plan View. Go to the Multi-Model View in the 2D Design model in the SHT file.



Then reset the rotation of the view to unrotated. Select the Rotate View tool at the top of the view.

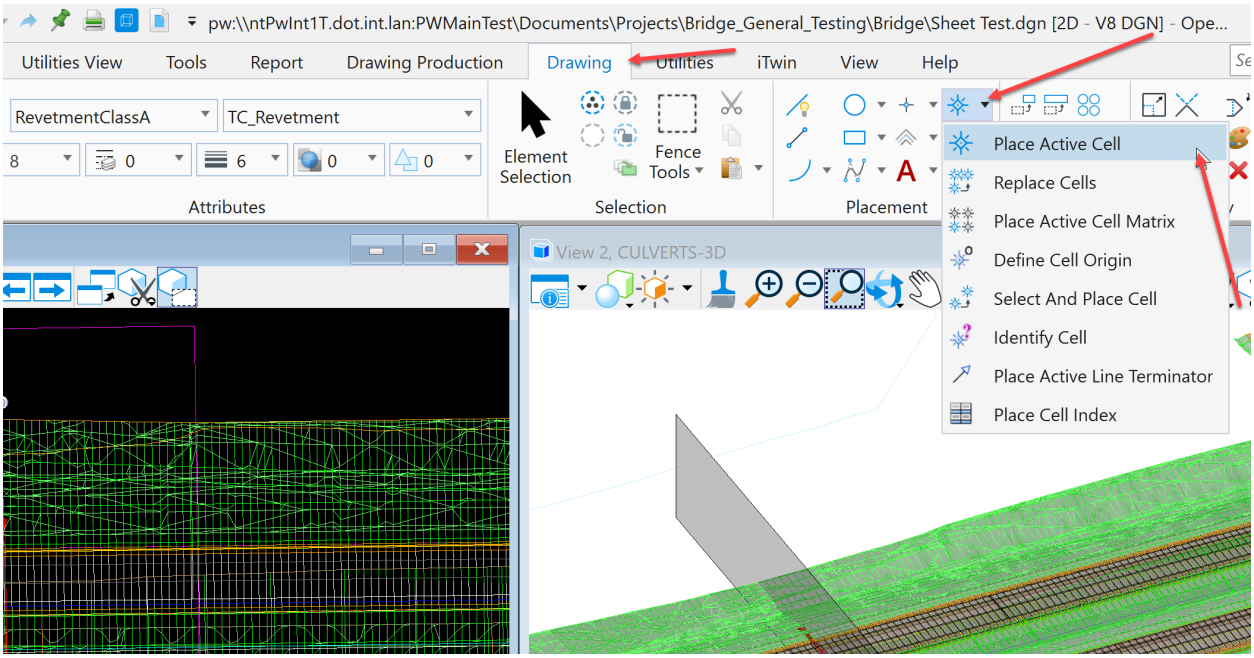


Select the Unrotated Method.

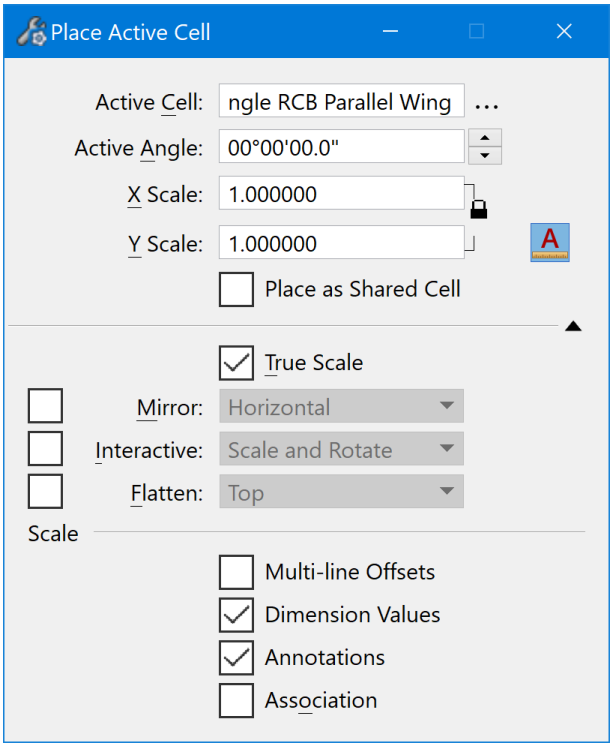


This will set it so that the Design model will have North to the top of the view.

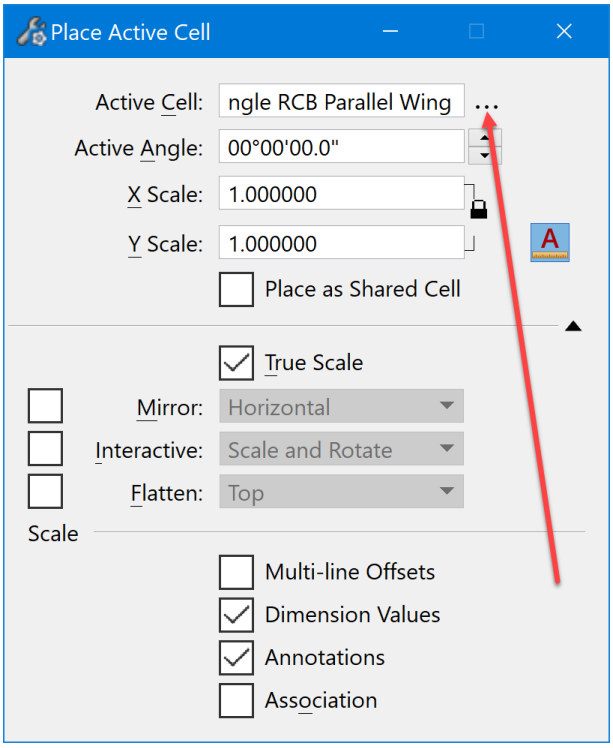
Next, choose the Place Active Cell tool on the Drawing tab in the placement toolbox.



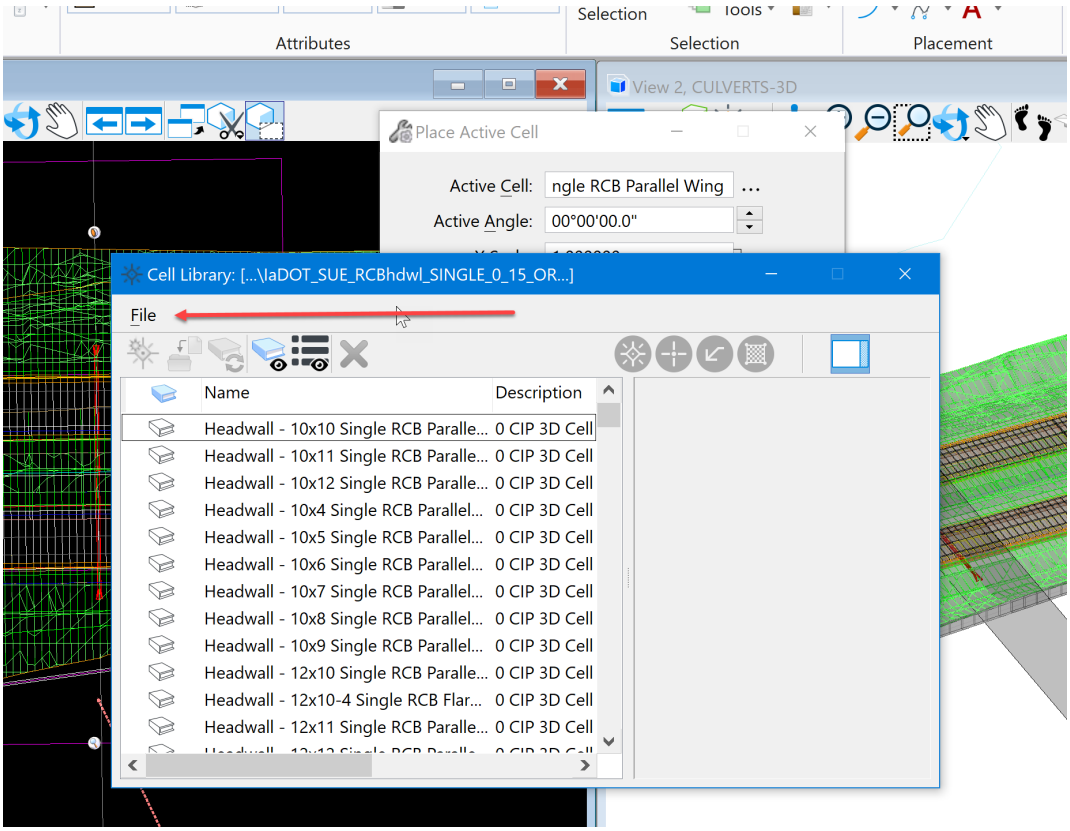
It will open the Place Active Cell dialog box.



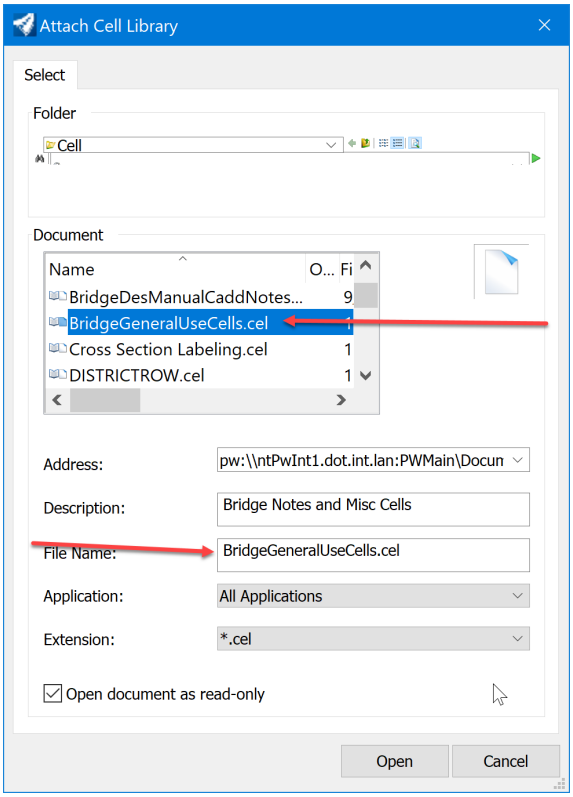
Make the North Arrow cell the active cell. Click on the three dots next to the Active Cell field.



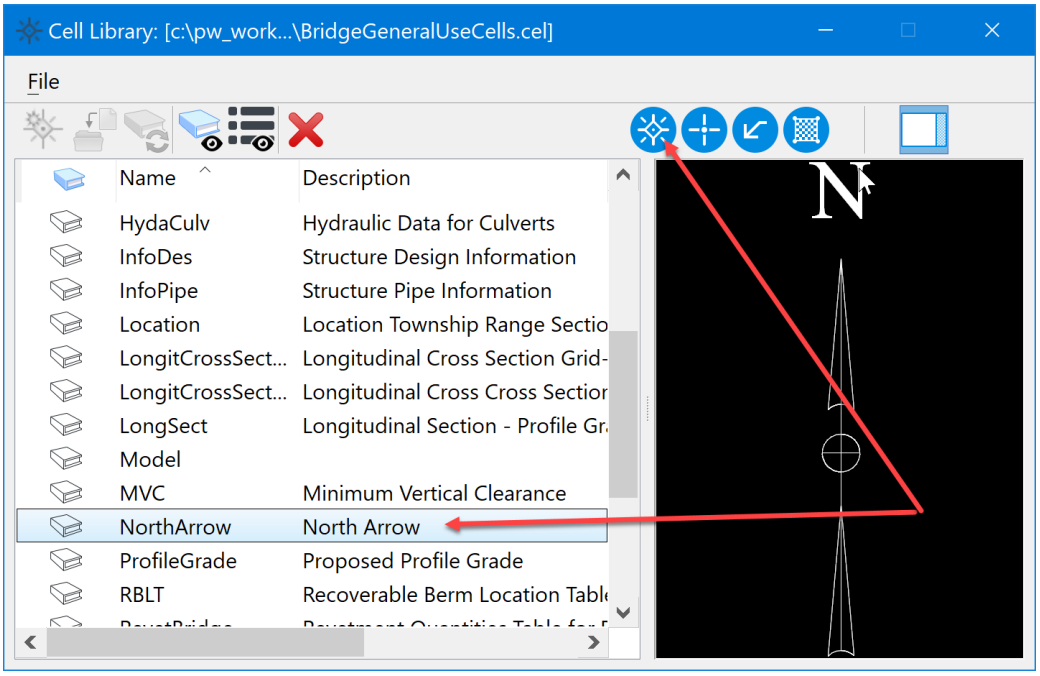
It will open the Cell Library dialog box.



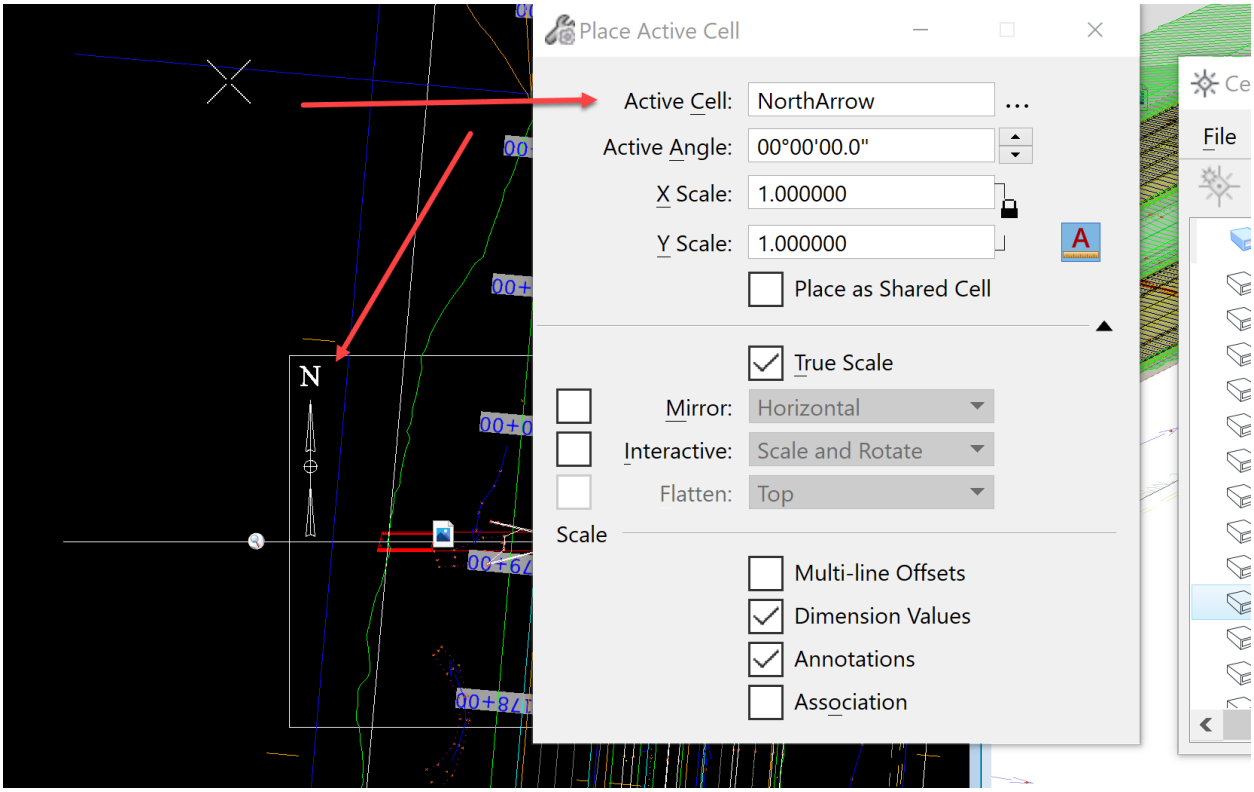
Click on the File menu to browse to the BridgeGeneralUseCell.cel file under PWMain\Documents\IowaDOTStandardsConnect\Configuration\Organization-Civil\IowaDOT_Standards\Cell\BridgeGeneralUseCells.cel and select the North Arrow cell.



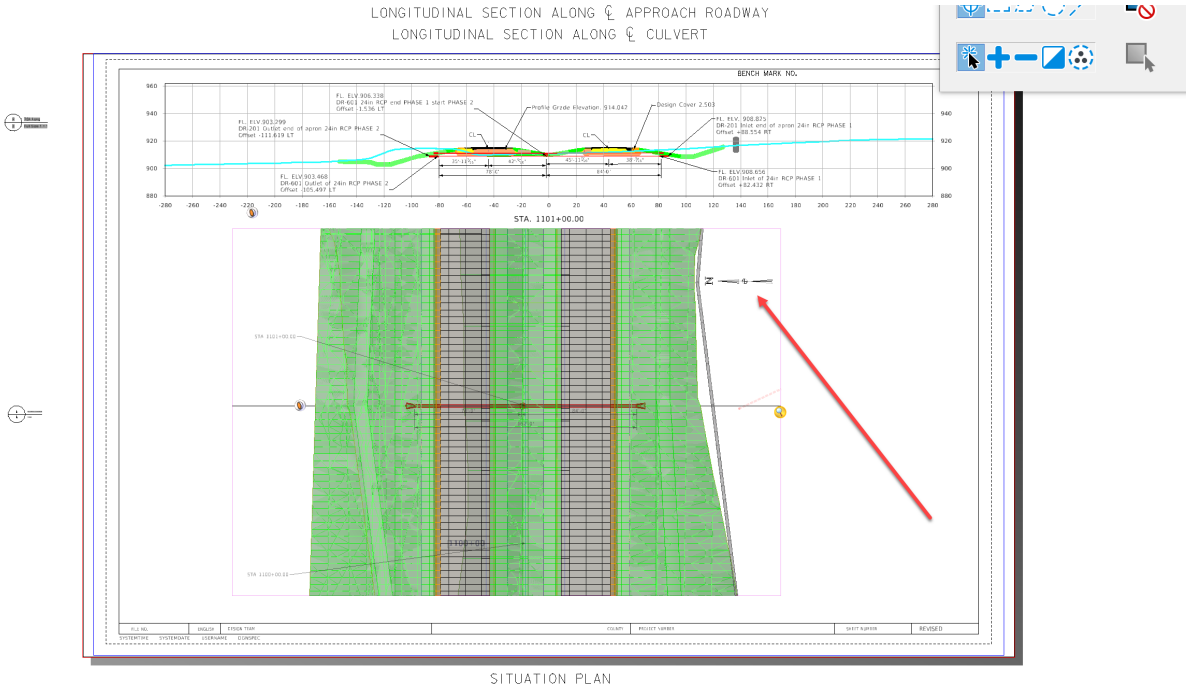
Then click on the Place Active Cell tool.



Place it in the Unrotated 2D design model within the plan view boundary.



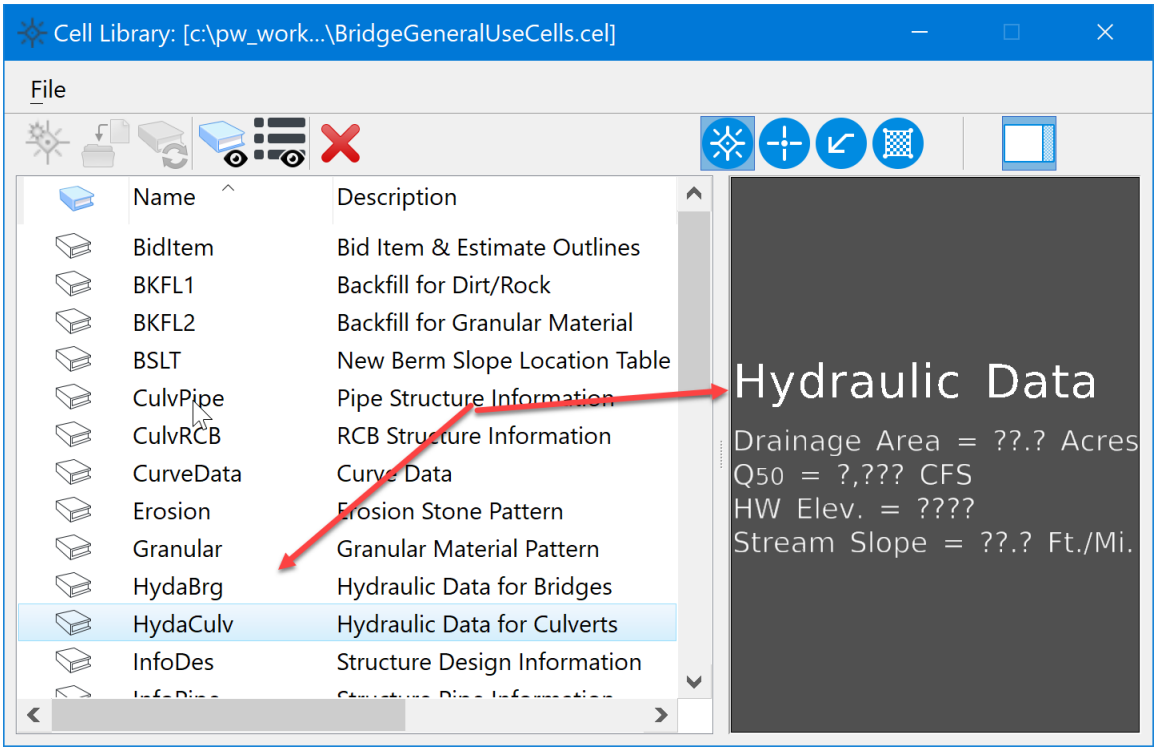
This will make it appear on the sheet at the correct scale and true North Azimuth of the Design file.



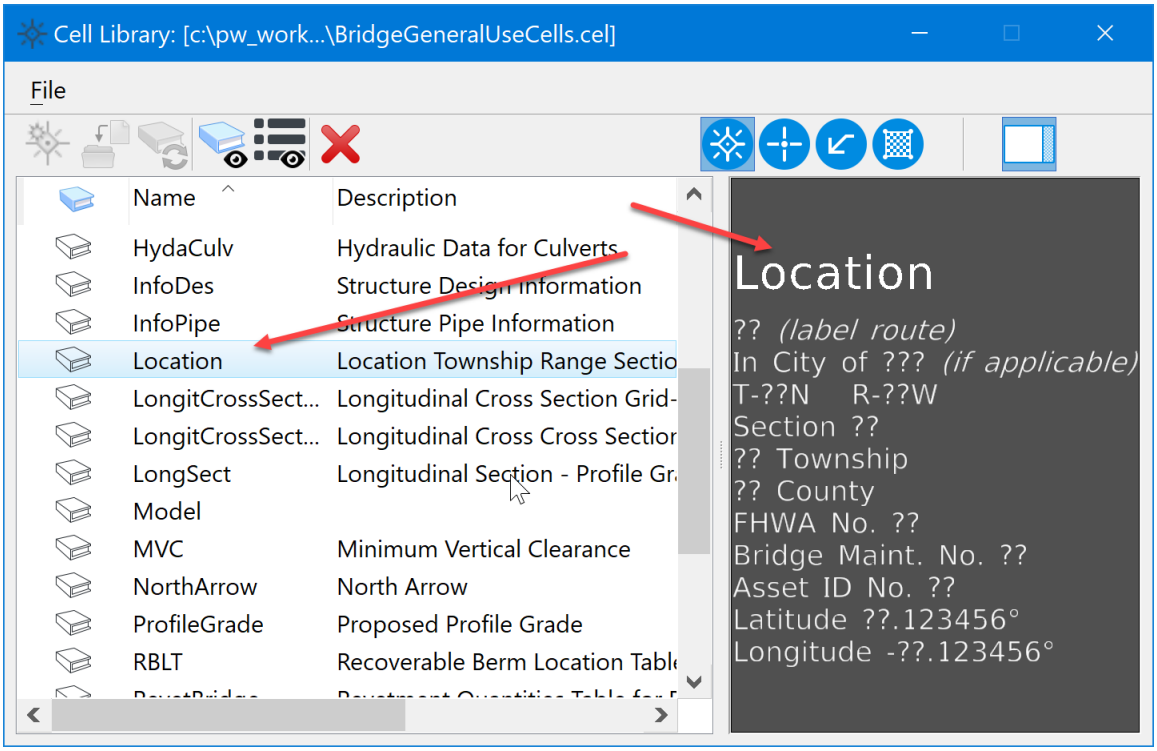
Next, place any of the other notes that need added to this sheet model to properly convey the design intent of the structure.

In the plan view Drawing model, place the following cells.

1. Hydraulic Data.

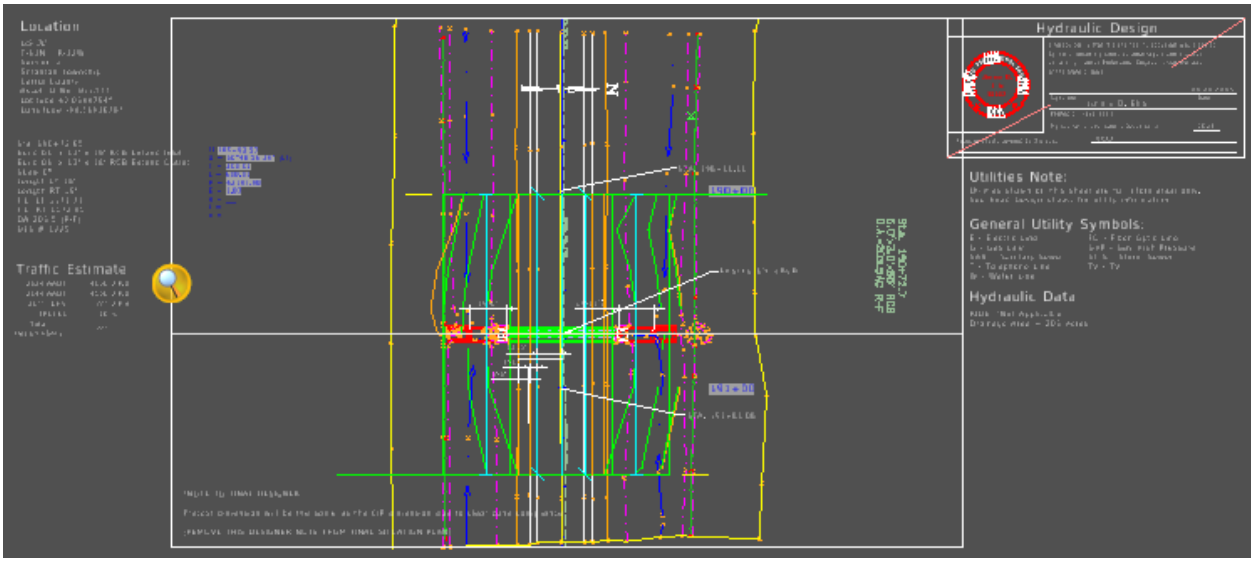


2. Site location.

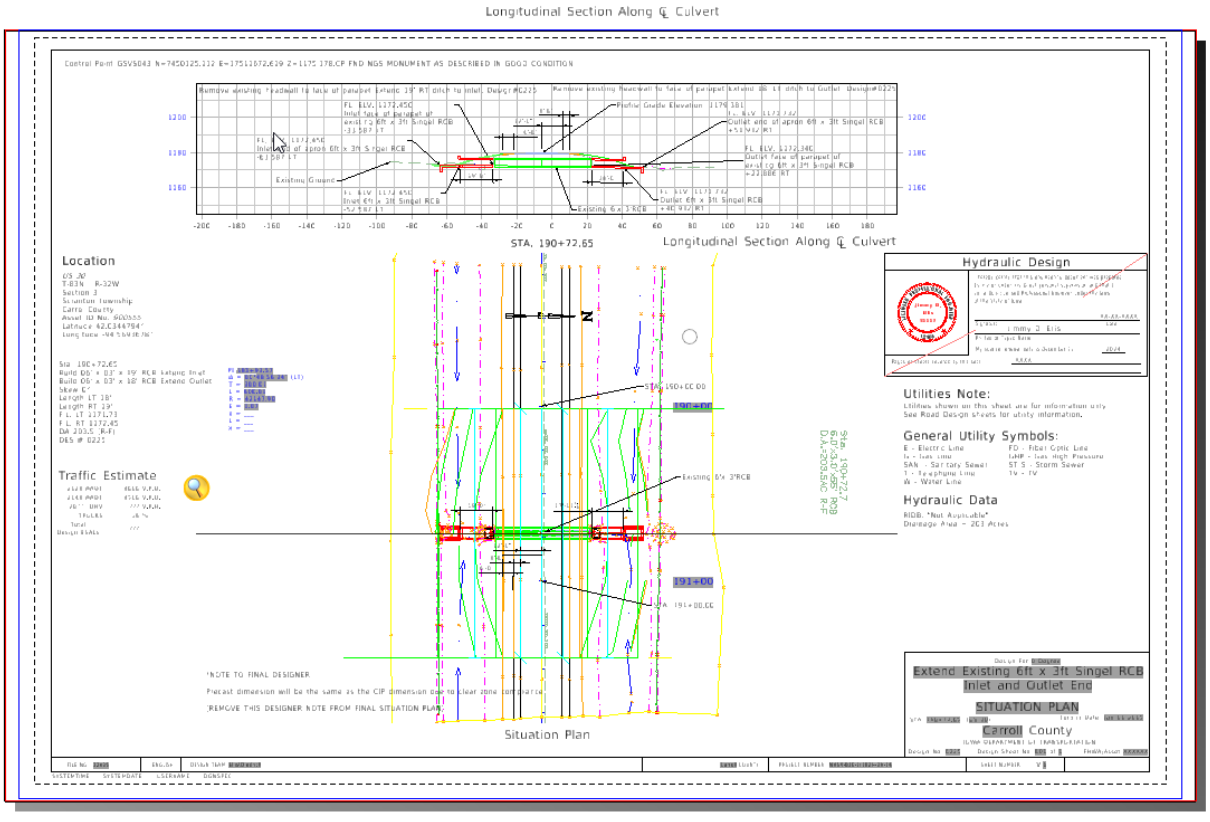


3. Any other notes needed to convey the design intent of the structure. Also any other items that apply from the Preliminary Design RCB Checklist.

Once completed, it should look something like this:



The sheet model should look something like this:



Situation Plan

Next, enter the Control Point information on the sheet. This information is in the SHT_PS_CCRRRPPPZ00.dgn file in the PrelimSurvey directory in ProjectWise. Once the correct control point for the structure is determined, edit the text on the sheet model of the TSL sheet to add this information.

The last steps in completing the TSL sheet is the Title Block information and working with the Sheet Index in the IaDOT_WS file that is accessed thru the Project Explorer. Refer to the next chapter CW07 Editing Title Block Information on TSL Sheets and Printing