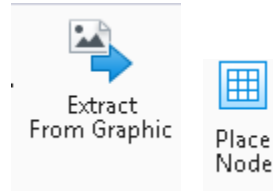


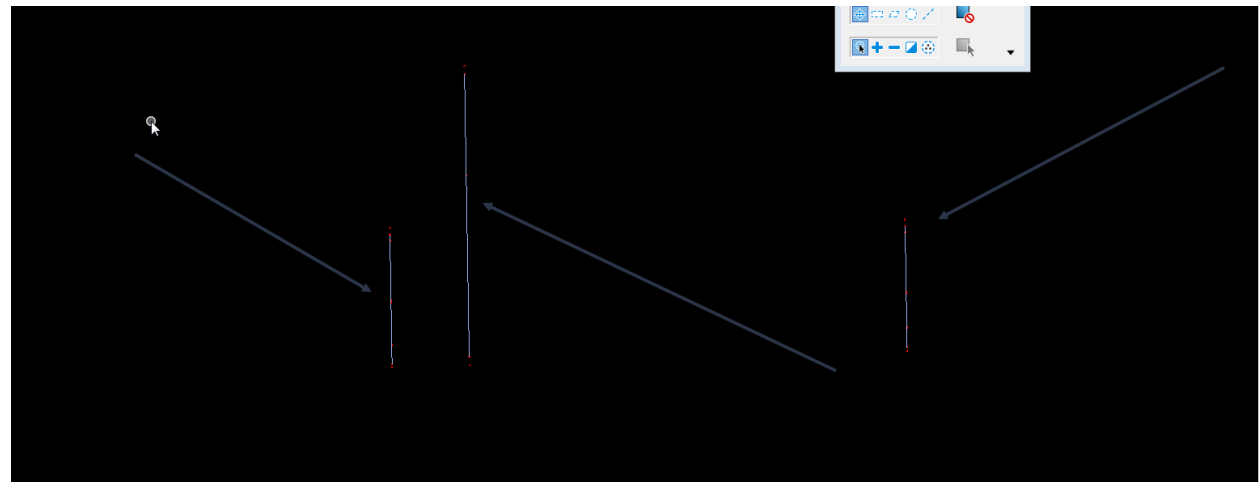
How to Place Pipes with the Drainage and Utilities Tools

These instructions were created on 1/03/2021 and revised on 5/5/2021 These instructions were created with:

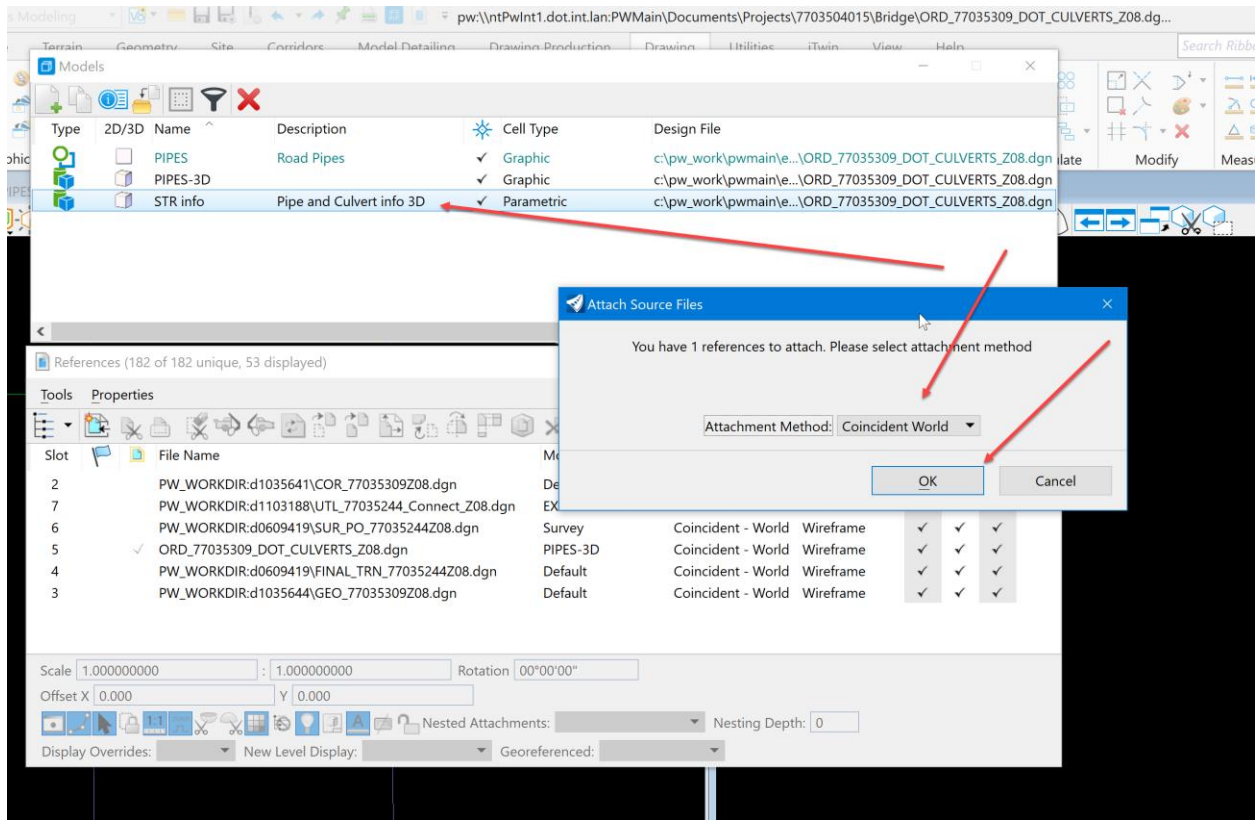


Once the invert coordinates of the pipe and/or culverts to be modeled are determined, then there are two options to place the structure. Place Nodes with Civil AccuDraw or ASCII graphics.

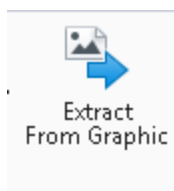
The following instructions cover the Extract by graphics workflow first. To use this tool, generate a 3D line beginning and ending at the determined invert coordinates. Complete this with AccuDraw or with the ASCII file. Note: This method is not the preferred method. It is an old workflow that has some limitations but is quicker and easier to use.



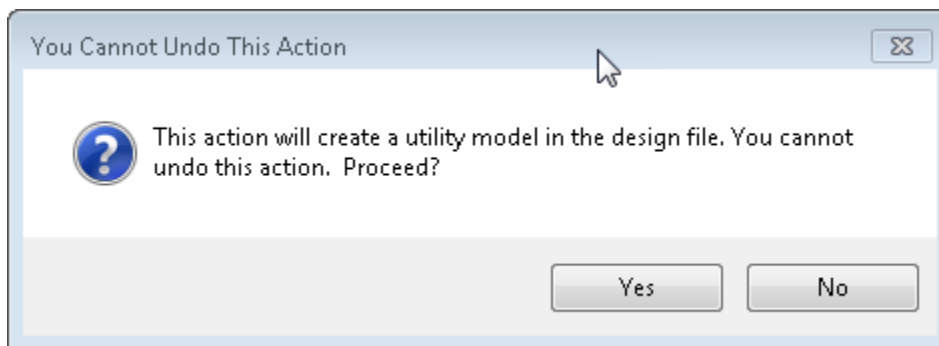
Once the points and lines from the ASCII graphics input file are loaded and the correct location is verified, then start creating the structures. To do this, open the PIPES model and reference in the STR info model. Keep in mind, that the PIPES model is a 2D model and once the STR info model (which is a 3D model) is reference in, MicroStation will automatically create a PIPES-3D model. This is a managed model that cannot and should not be deleted.



The PIPES (2D) model is ready to create the structures. Note: Always make the structures in the 2D model not the 3D model. Next, select the referenced line from the STR info model and activate the utility model by clicking on the Extract From Graphic tool under the Drainage and Utilities workflow on the Lay out tab.

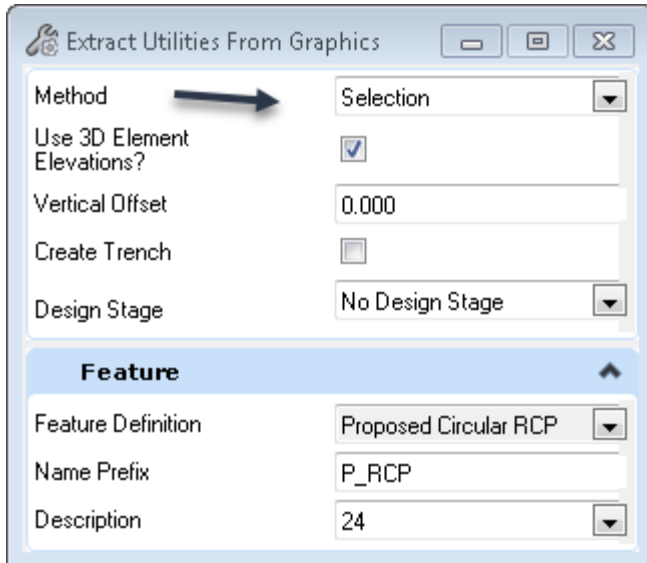


It will display this warning.

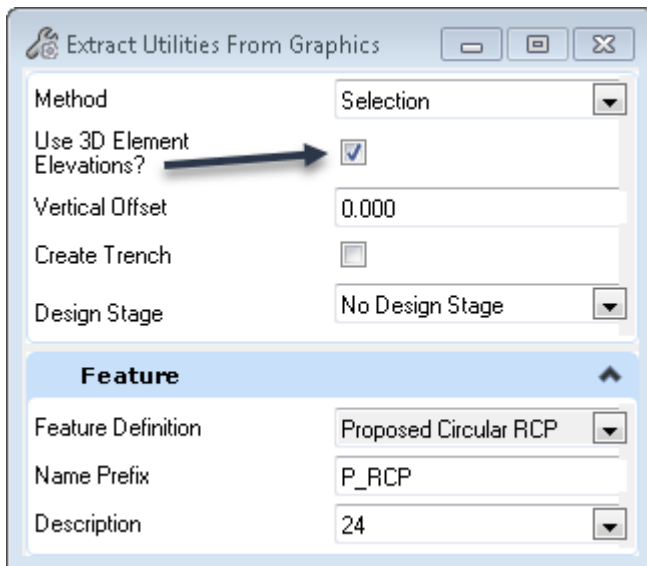


Click Yes. Then select the line again and click on the Extract From Graphic tool again.

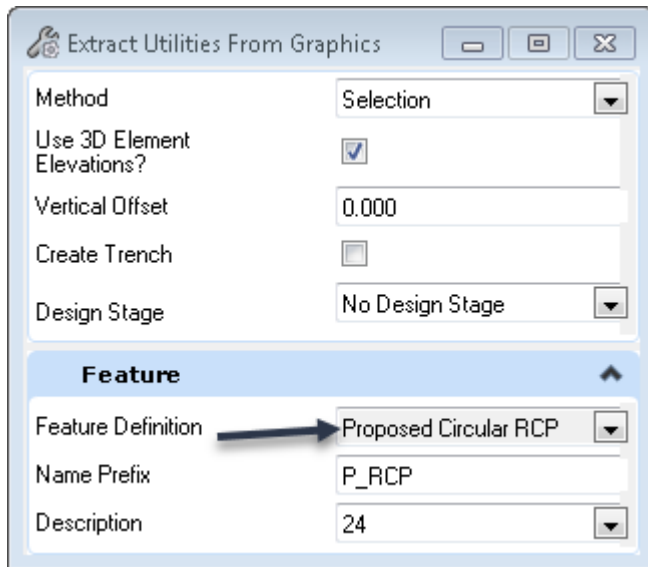
This will open this Extract Utilities From Graphics dialog box. Select the Selection option from the Method drop down list.



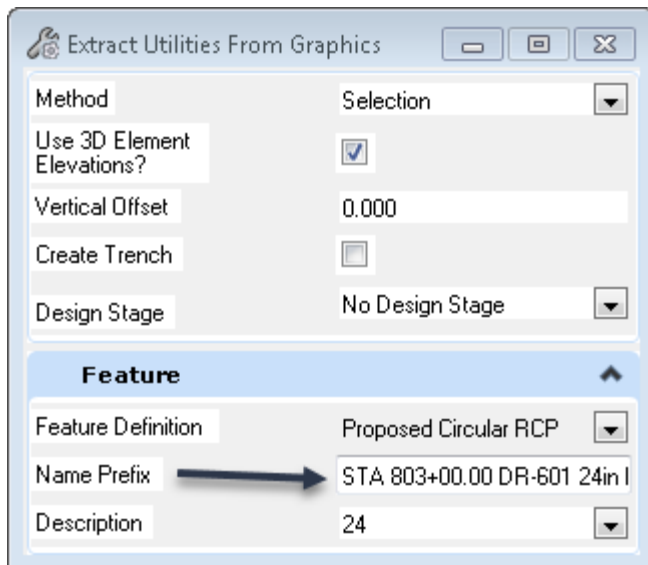
Make sure that the Use 3D Element Elevations is toggled on.



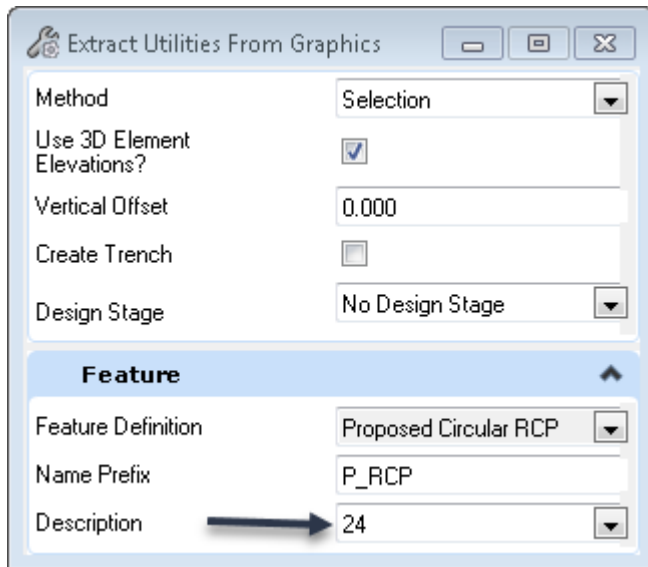
Then, select the feature definition for the structure being designed. In this example, create a Proposed Circular RCP.



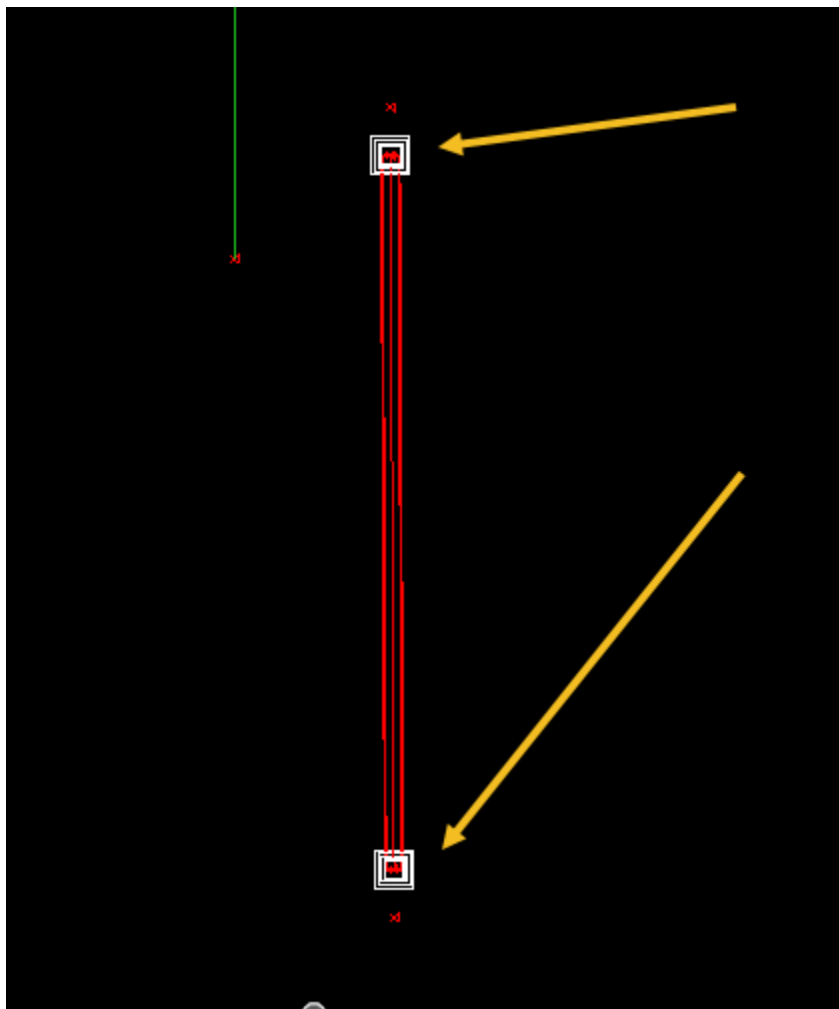
The Name Prefix is the point description from the survey ASCII import input file.



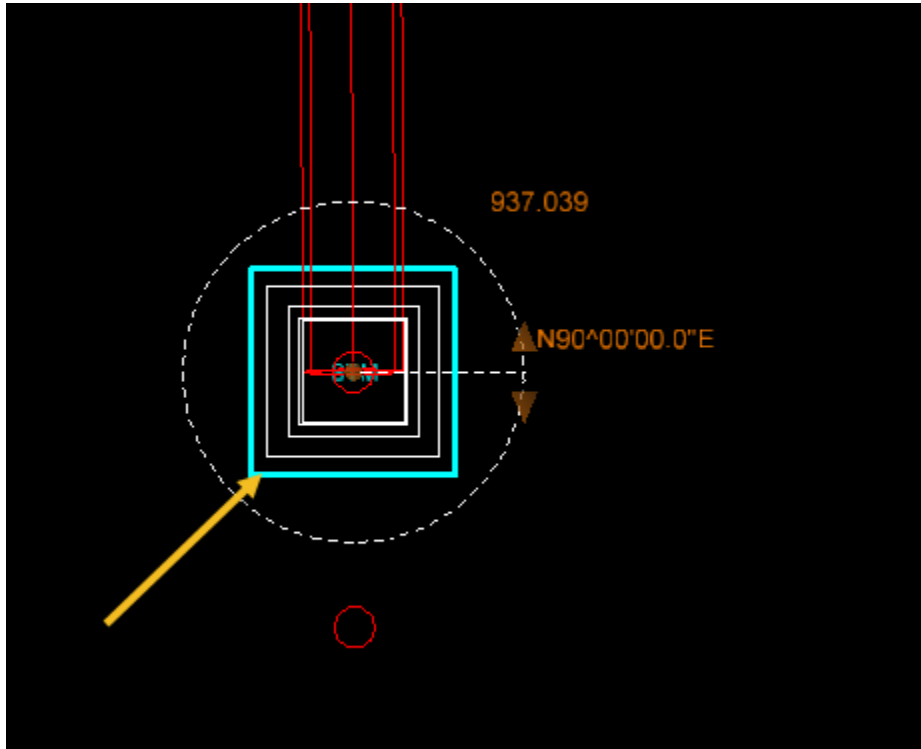
Then, select the description that is the size of the pipe.



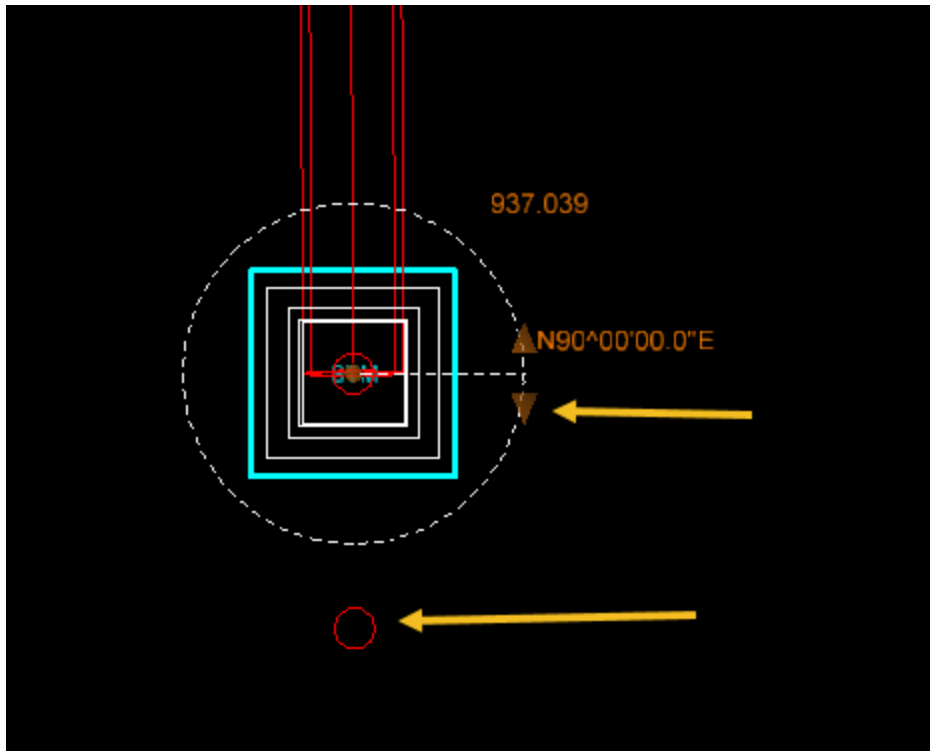
In this feature, it will place the conduit with two of the default nodes attached at each end. It should look something like this.



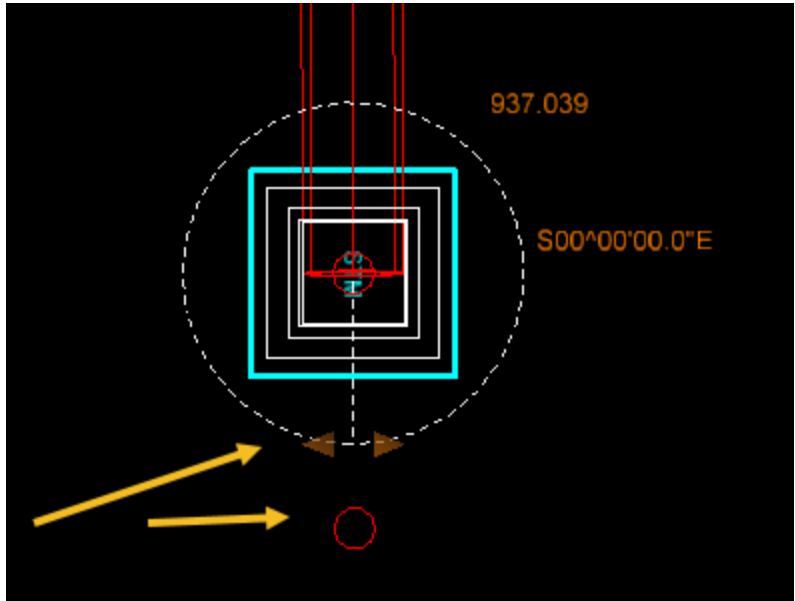
In this example, it is a 24-inch RCP so aprons will be placed on this conduit. To replace these default nodes with aprons, first rotate them then change the feature. To rotate the node, select the outside square and the compass will appear like this.



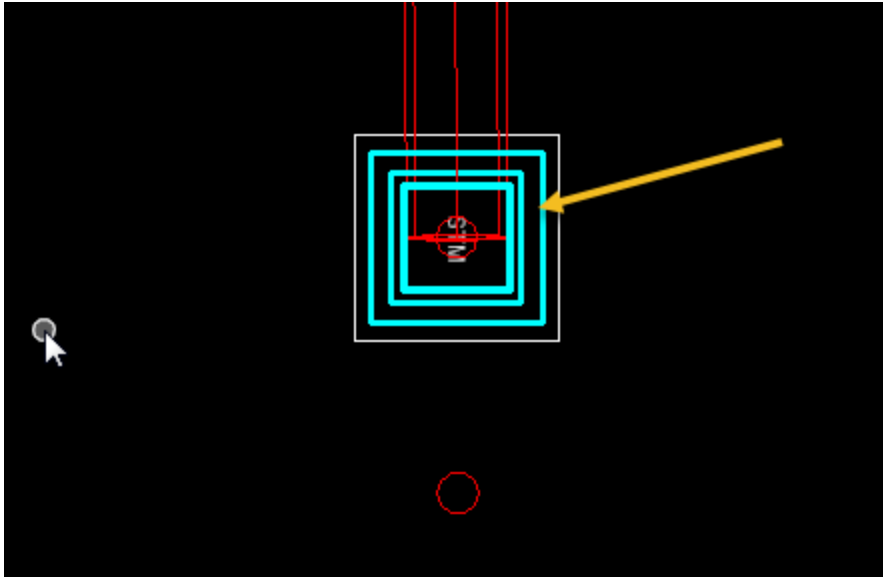
Once the compass shows up, select one of the compass arrows and snap to the PRO point from the input file.



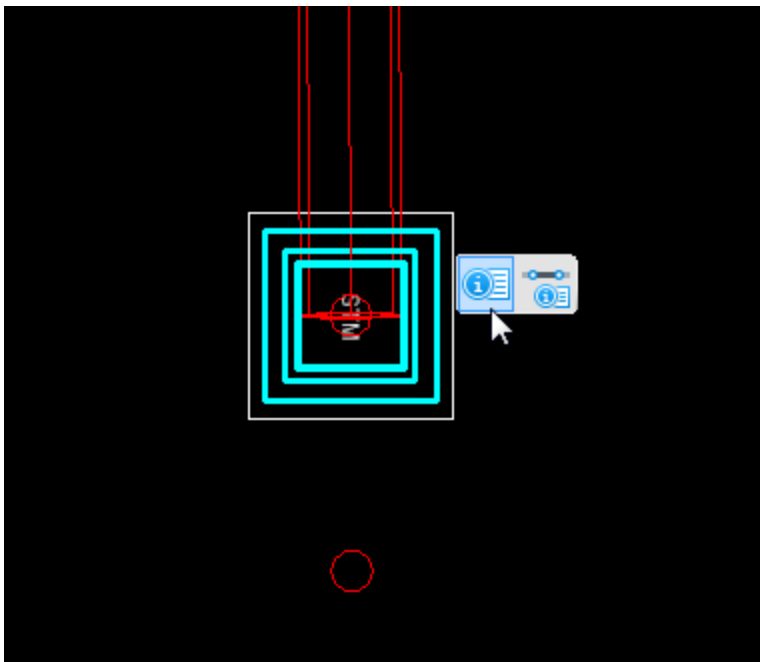
It should look something like this.



Next, change the feature to model the apron required. To do this, select the inner square.



Then hover over it to bring up the heads-up tools. Then select the Properties window.



In the properties window define:

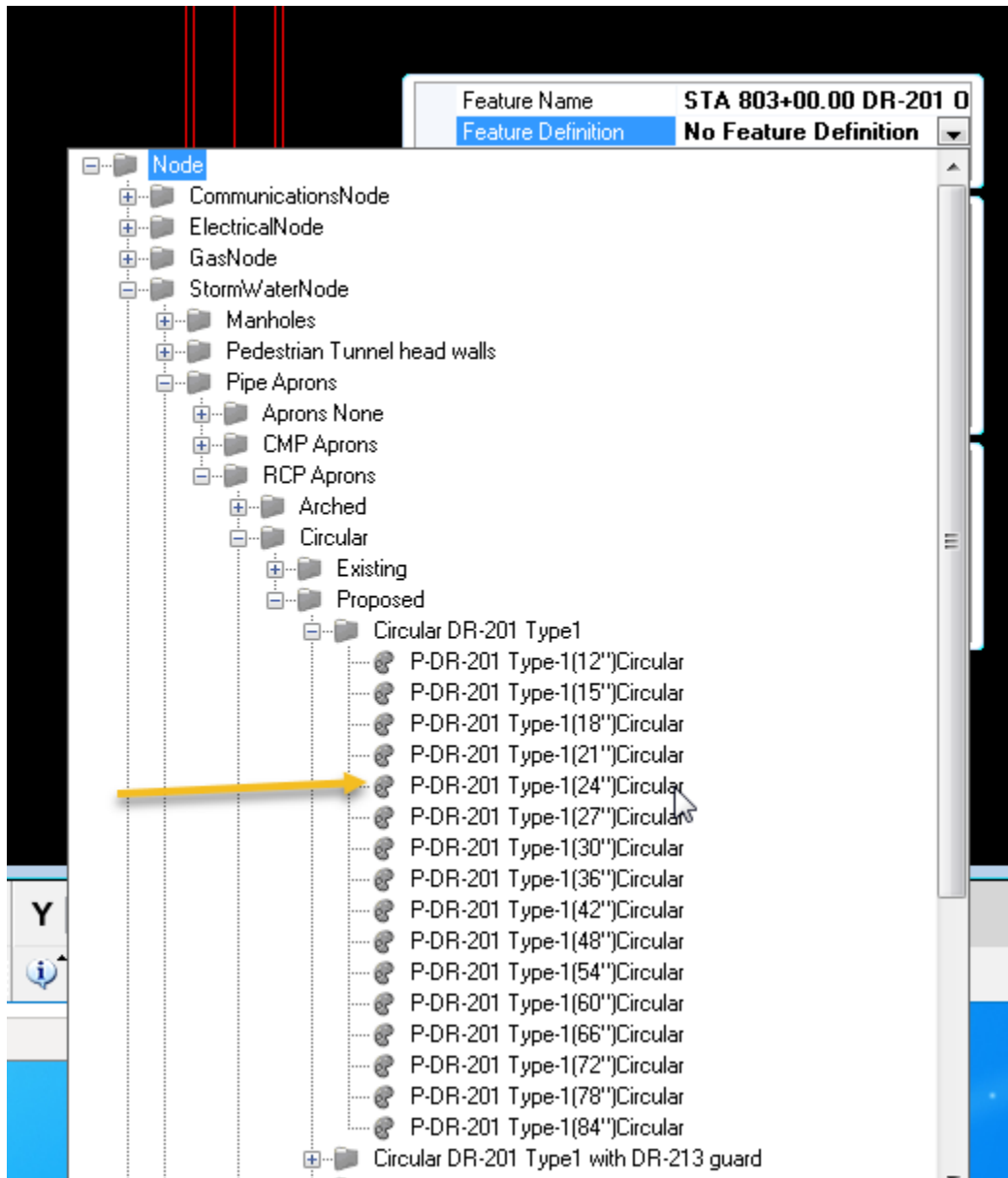
1. The Feature Name that will be the station, standard and either inlet or outlet. For this example, it will be "STA 803+00.00 DR-201 Outlet". This can be copied from the point description of the PRO shot from the input file.
2. The description will be the second half of the point description of the PRO shot. For this example, "Outlet end of apron 24in RCP Median Drain"
3. Then select the Feature Definition.

The image displays a software interface for managing utility features. On the left, a small map view shows a utility line with a red circle indicating a feature location. Three yellow arrows labeled 1, 2, and 3 point to specific fields in the property table.

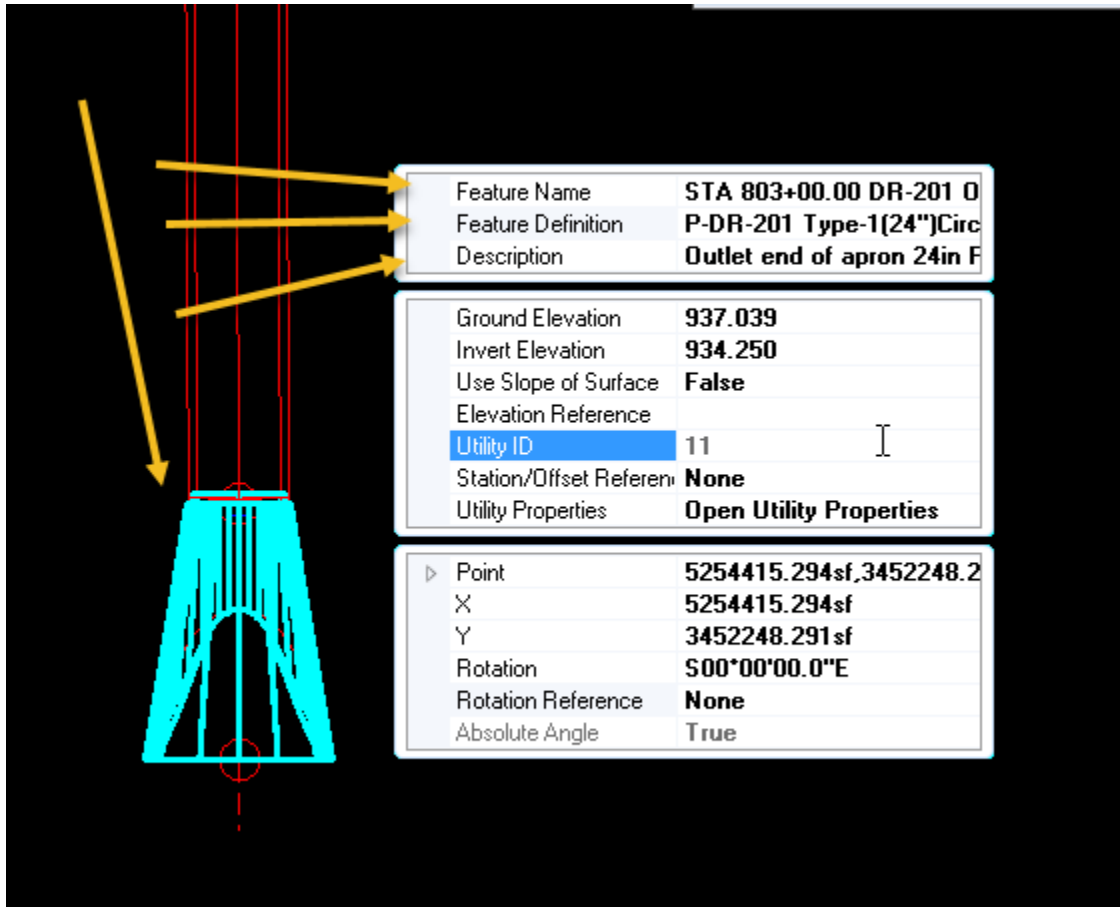
Feature Name	SN-2
Feature Definition	No Feature Definition
Description	

Ground Elevation	937.039
Invert Elevation	934.250
Use Slope of Surface	False
Elevation Reference	
Utility ID	11
Station/Offset Referen	None
Utility Properties	Open Utility Properties

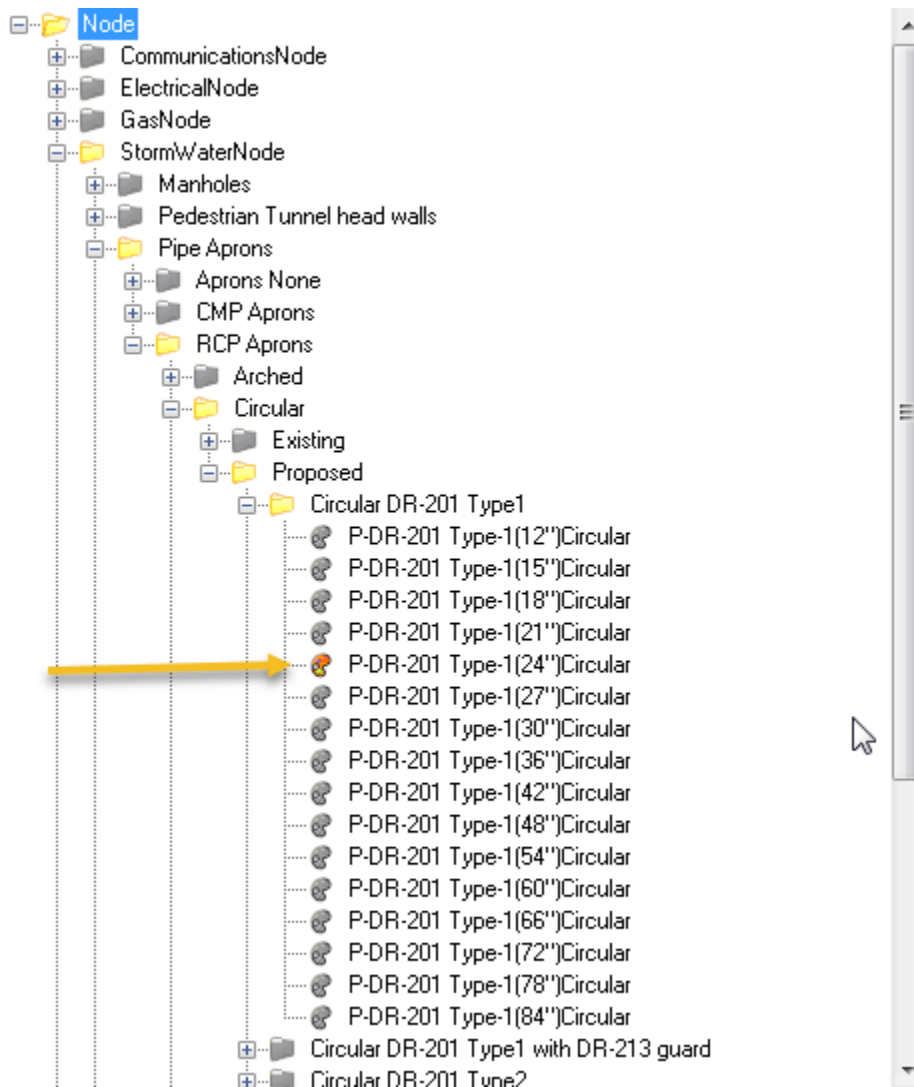
Point	5254415.294sf,3452248.2
X	5254415.294sf
Y	3452248.291sf
Rotation	S00°00'00.0"E
Rotation Reference	None
Absolute Angle	True



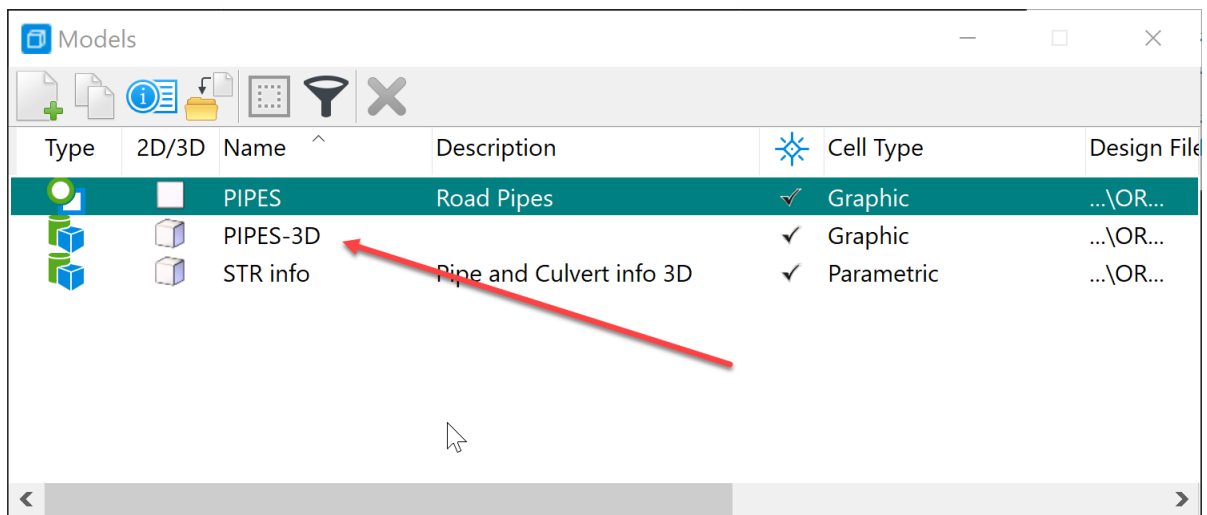
It should look something like this.



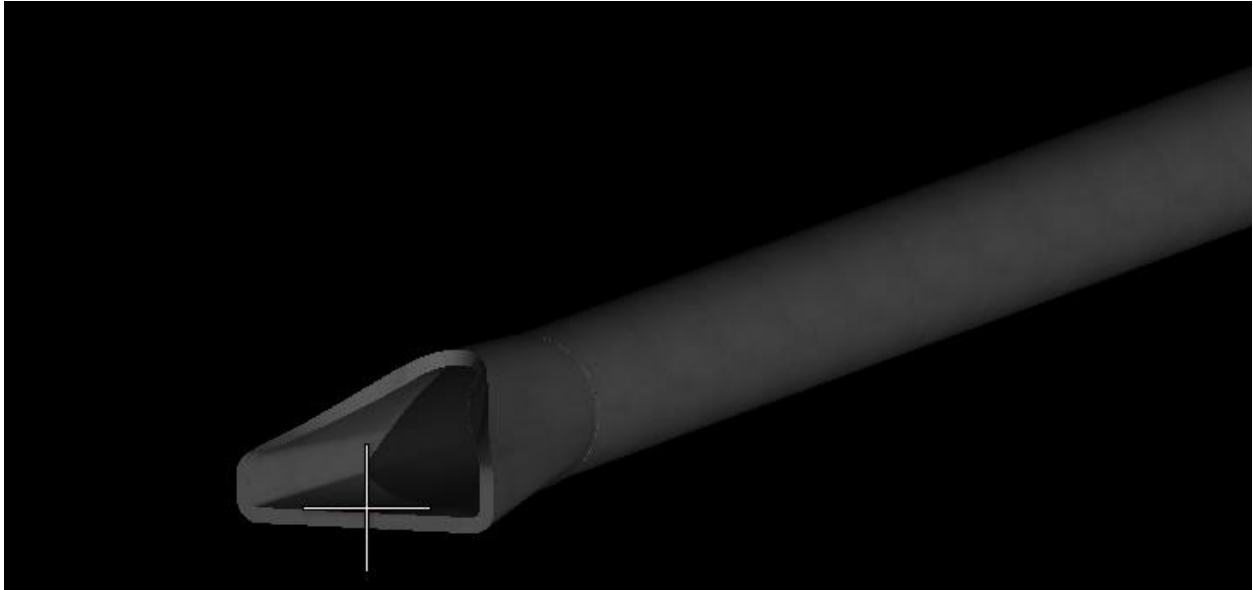
Repeat this process at each end of the structure. Once a feature is used, it will become highlighted and embedded into the file.



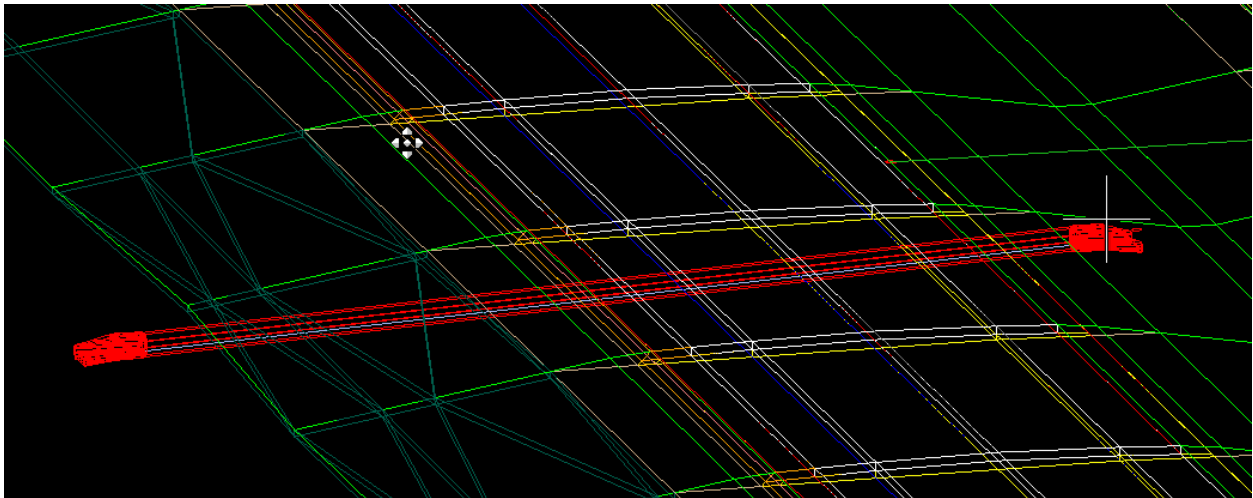
Once that is completed the structure will be modeled in the PIPES-3D model.



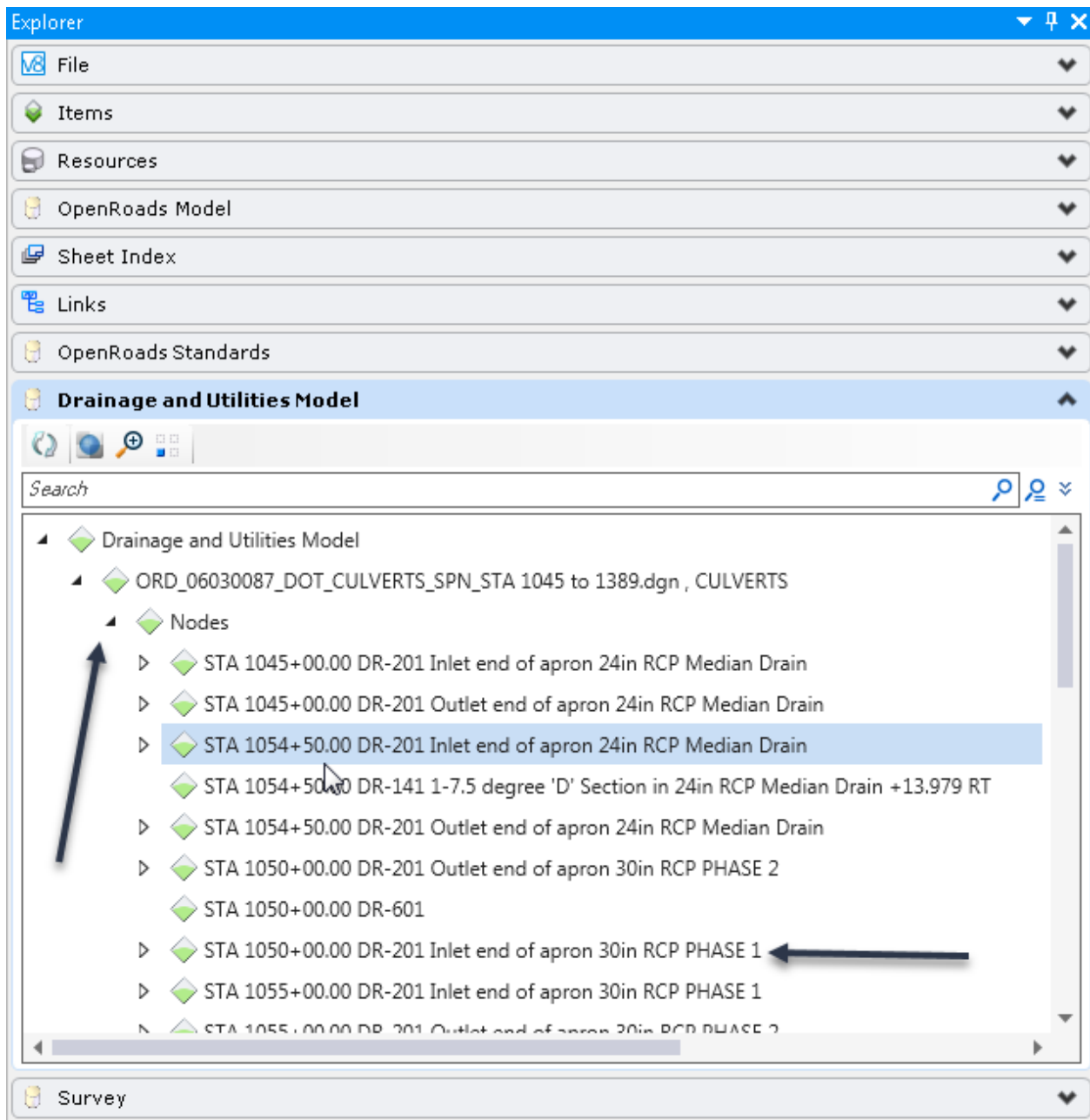
View the structure by opening the PIPES-3D model. It should look something like this.



Then reference in the COR files and see how the drainage design correlates to the Road Design earth work and grading design.



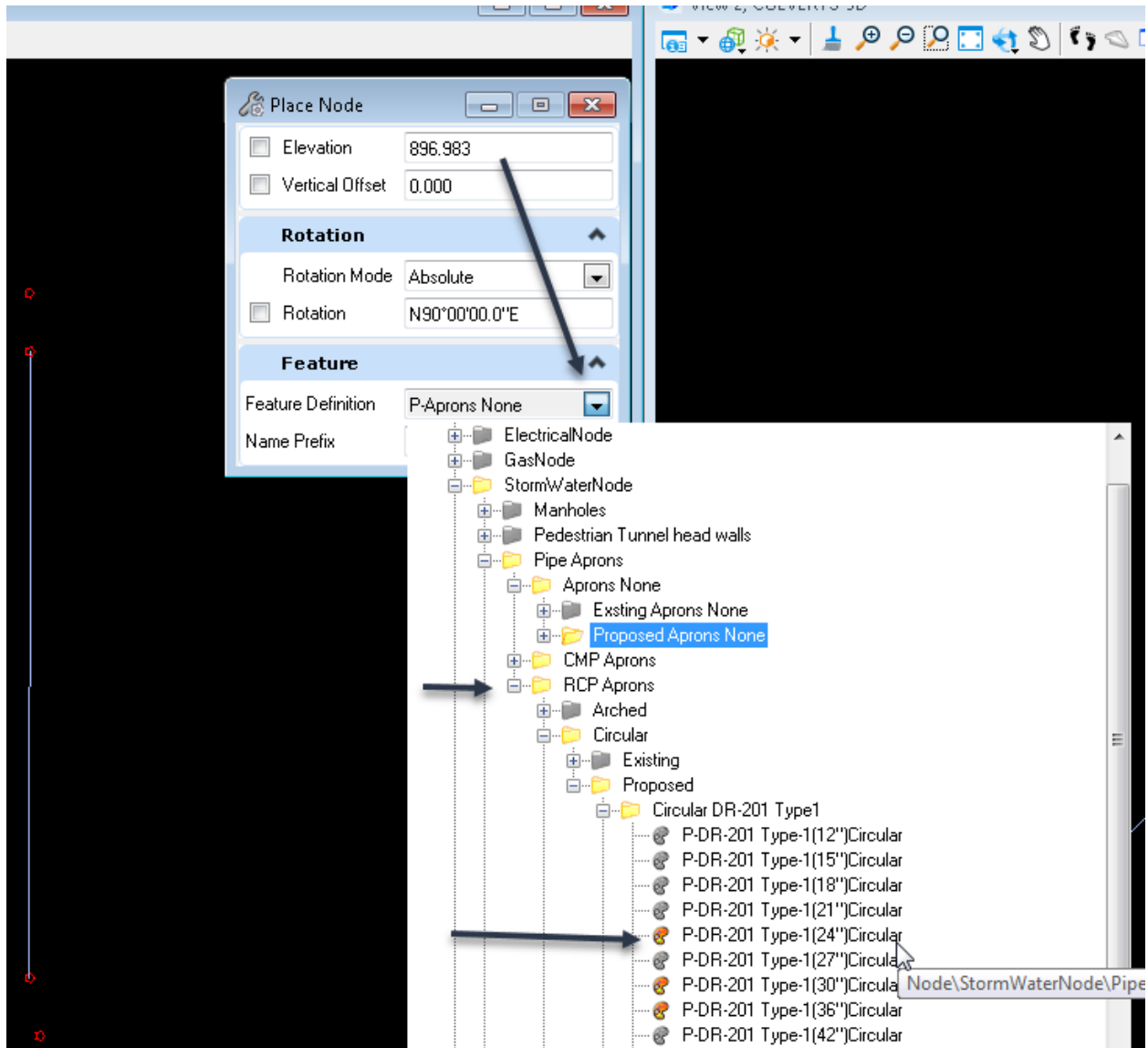
The reason the nodes and conduits are named this way, is that when viewing the information in project Explorer in the Drainage and Utilities Model, it makes it easier to find the correct entry for each structure modeled in the project.



Place Node

The 2nd method of modeling the pipes or culverts is Place nodes.

The Place Node workflow can be done with AccuDraw or with the ASCII graphics as shown before. The following instructions cover using ASCII 3D graphics as shown before. To do this, click on the Place Node tool. Then select the feature of the node to be placed. For this example, place a 24-inch RCP apron.



Use the description field from the ASCII file for the Name Prefix.

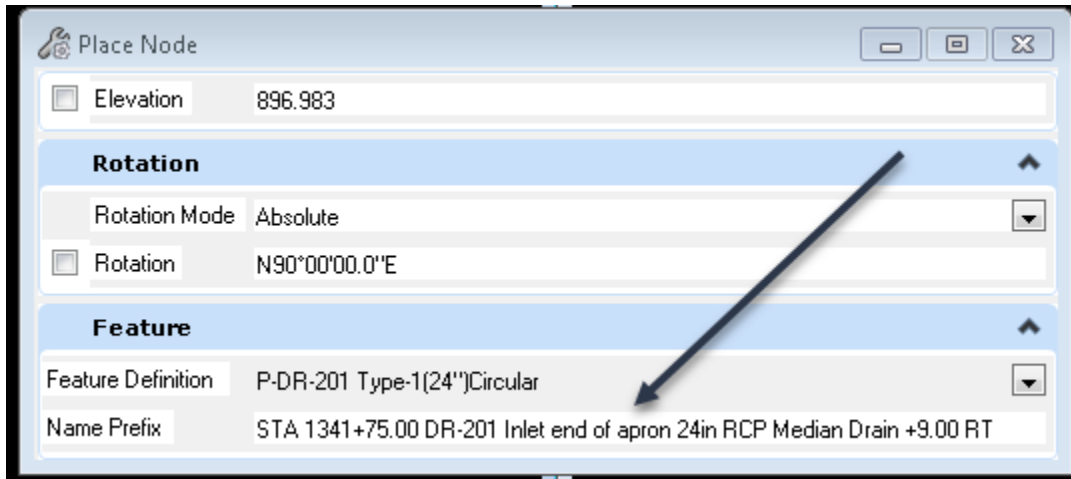
699,3452954.566,5308286.119,896.149,PRO STA 1341+75.00 DR-201 Inlet end of apron 24in RCP Median Drain +9.00 RT

700,3452948.442,5308286.216,896.068,PIP159 STA 1341+75.00 DR-601 Inlet of 24in RCP Median Drain +15.12 RT

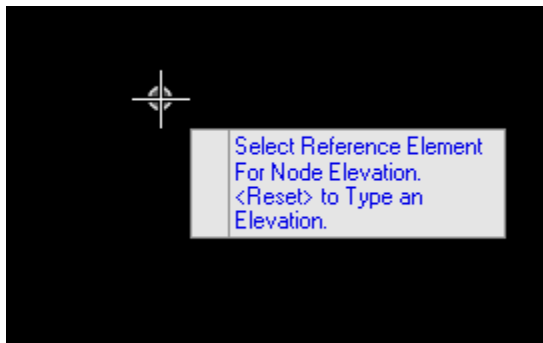
701,3452882.444,5308286.185,895.190,PIP159 STA 1341+75.00 DR-601 Outlet of 24in RCP Median Drain +81.11 RT

702,3452876.334,5308287.275,895.109,PRO STA 1341+75.00 DR-201 Outlet end of apron 24in RCP Median Drain +87.24 RT

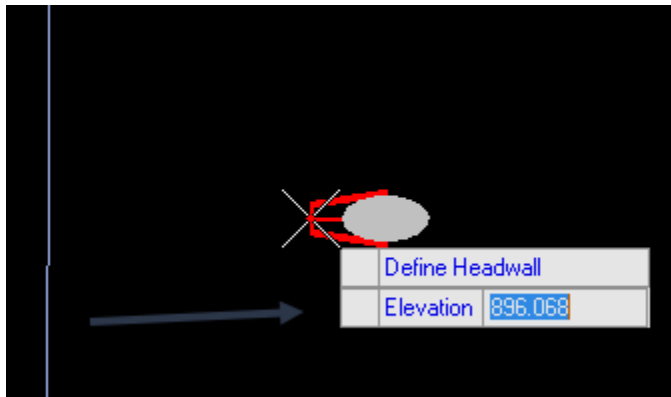
It should look something like this.



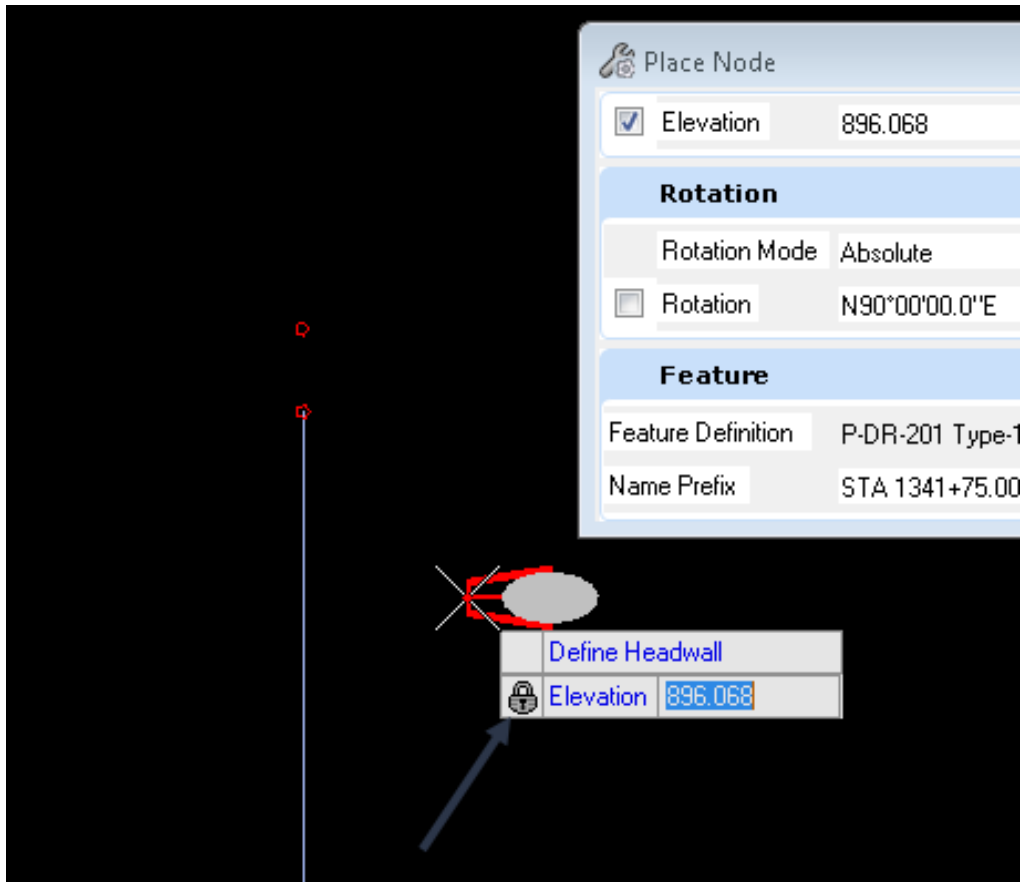
Next, move the cursor to the 2D view and it will prompt to Select Reference Element or to Reset to Type an elevation. Reset and type the elevation.



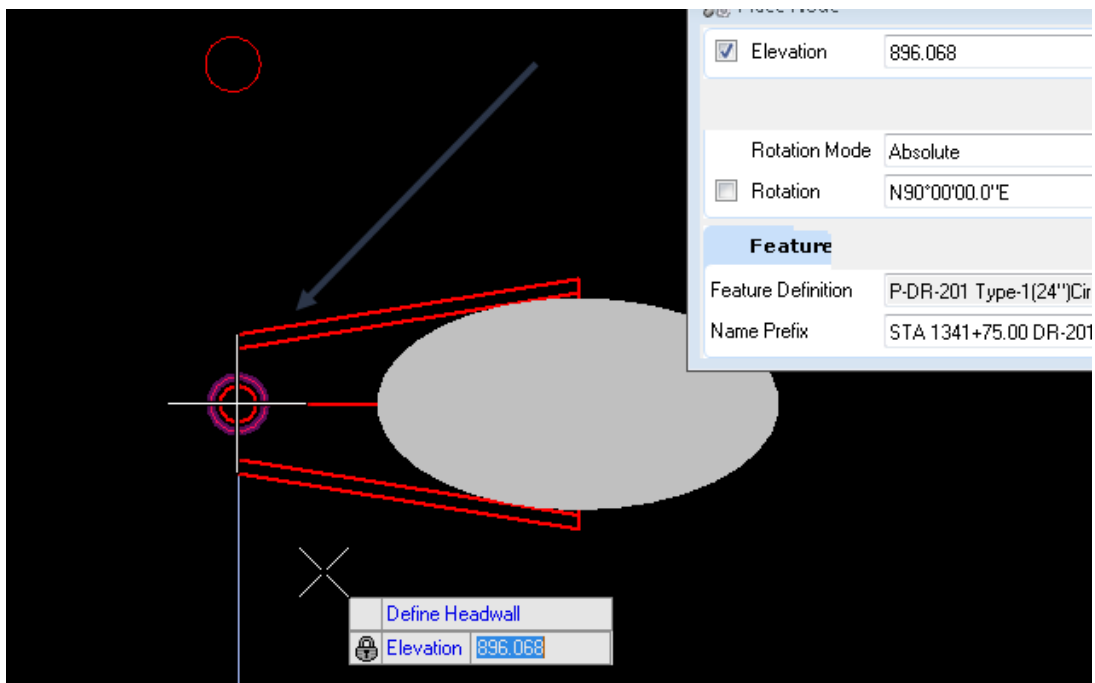
For this example, use 896.068 that is the flowline elevation of the design.



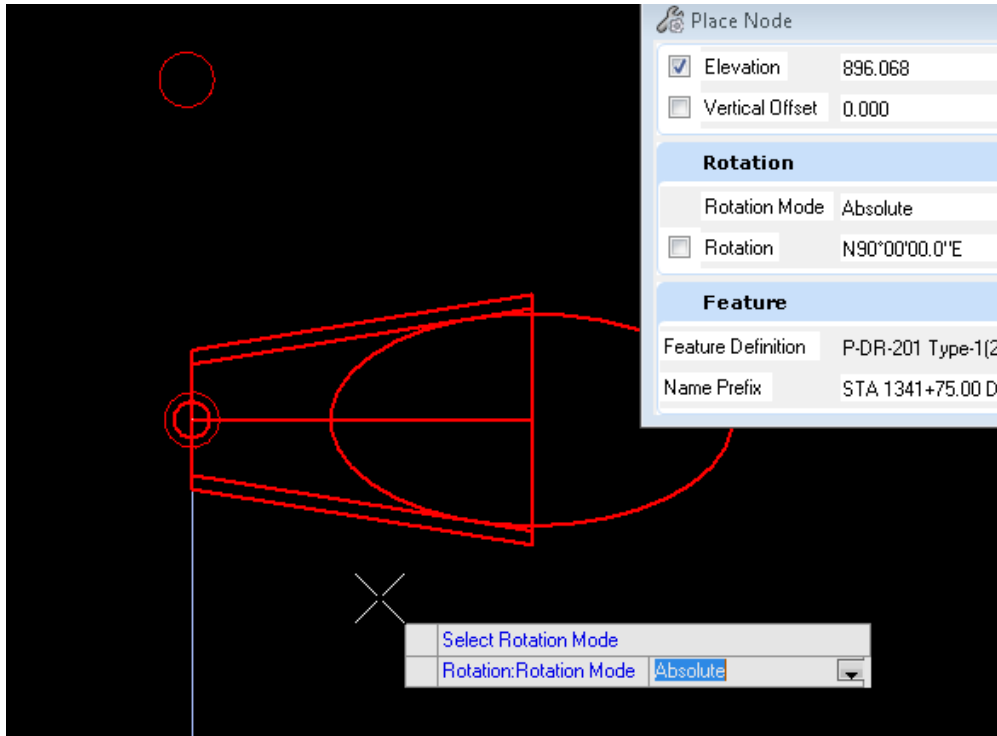
Next hit the enter key and it will lock this elevation and look like this.



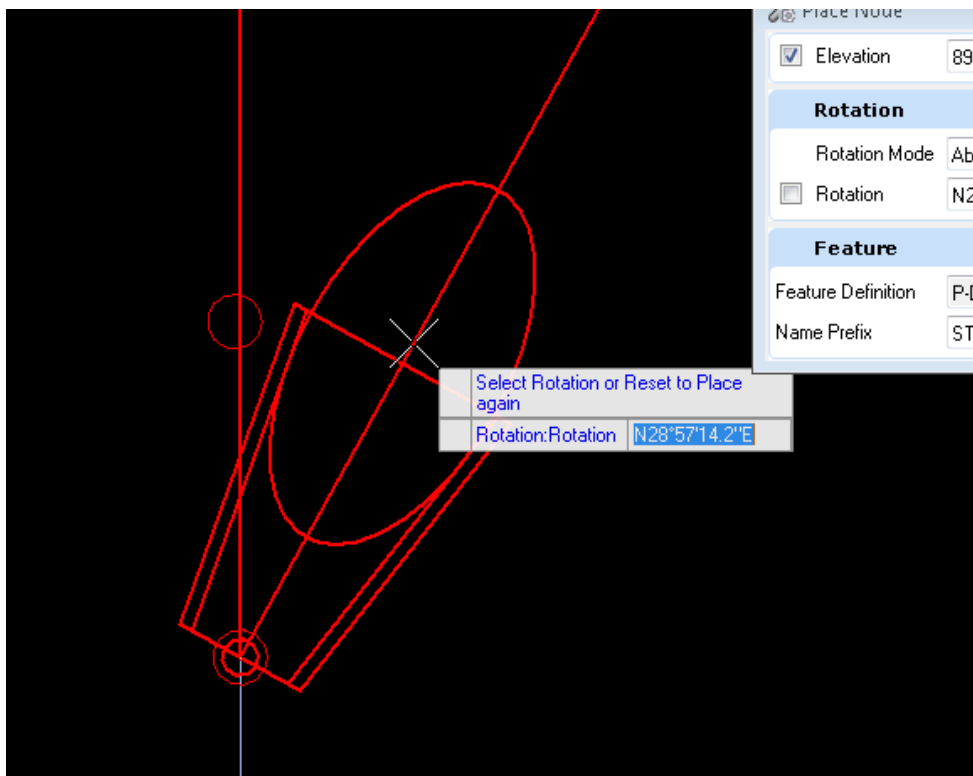
Then, snap to the ASCII graphics to place the apron or node like this.



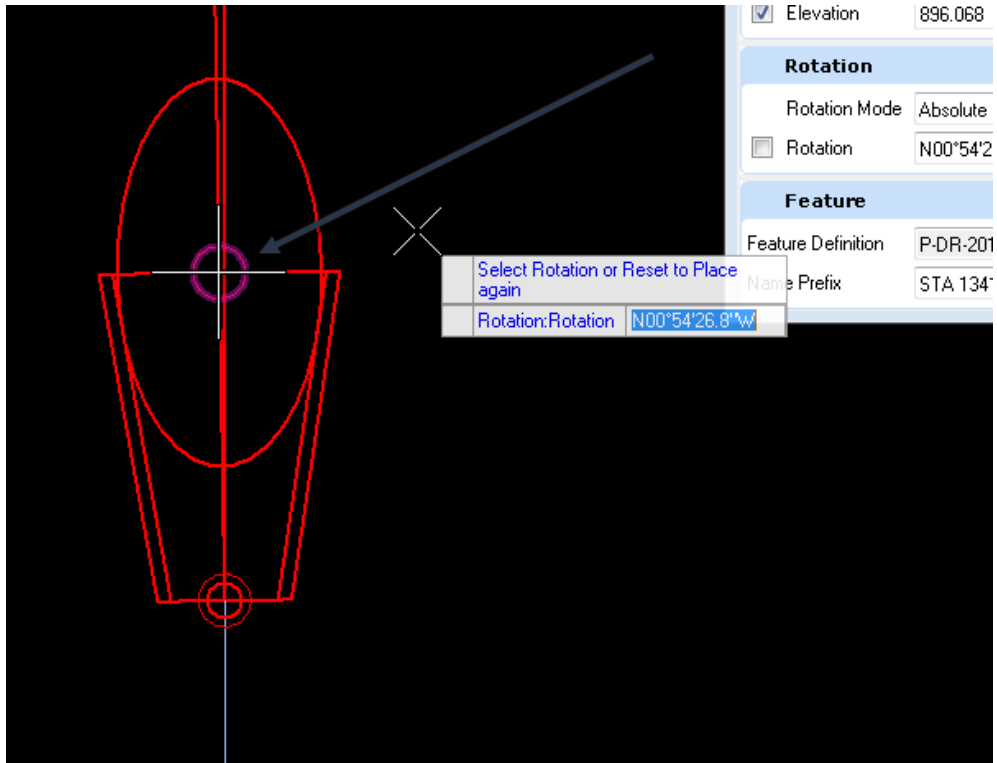
Then, data point to accept it and it will prompt to select rotation mode. For this example, use the absolute mode.



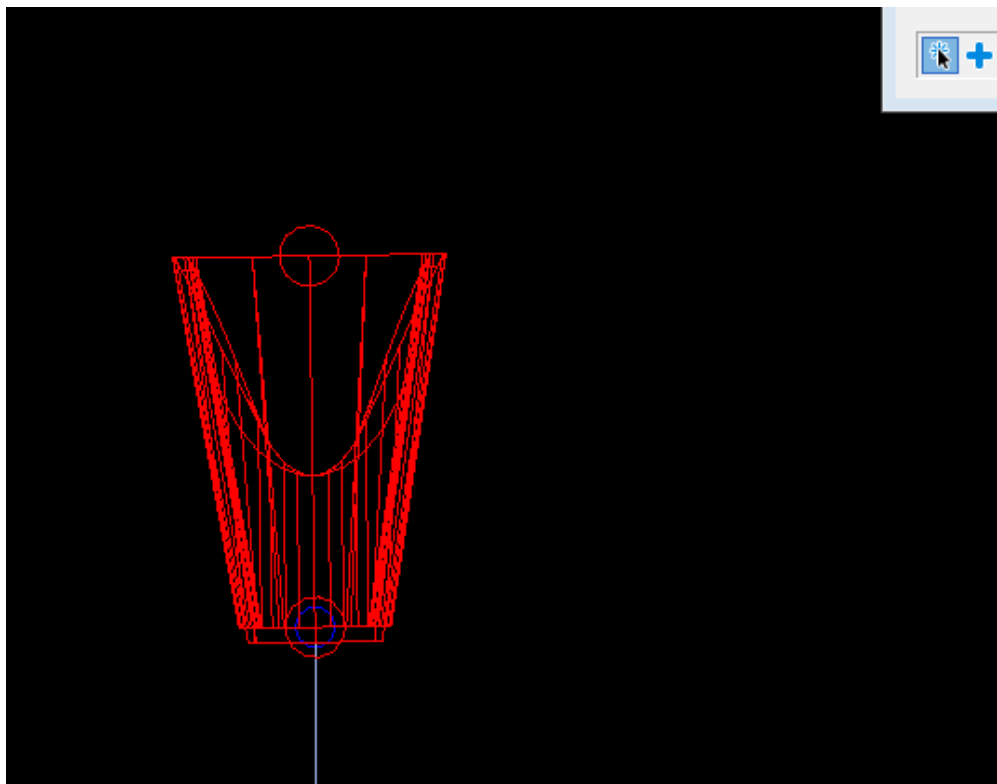
Data point again and the apron will rotate until another data point to accept the rotation.



Snap to the ASCII graphics to set the rotation to the PRO graphic from the ASCII input.

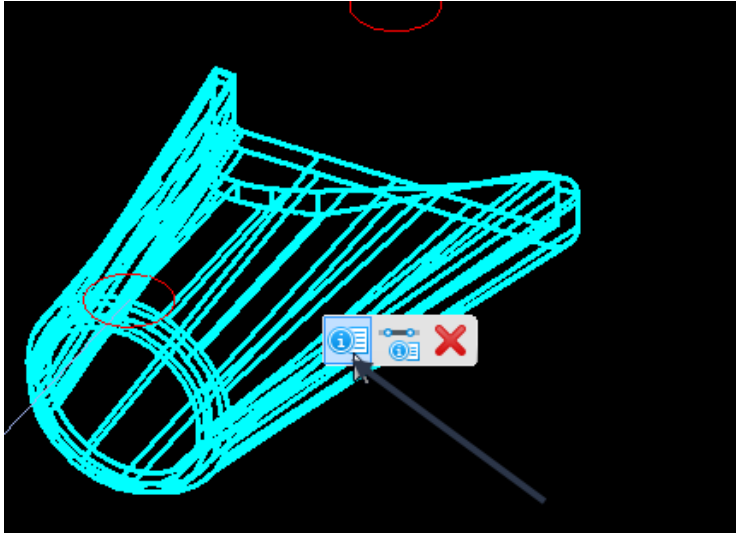


Then, data point to accept. Once it is done placing the node, hit the escape key to exit the tool. It should look like this:

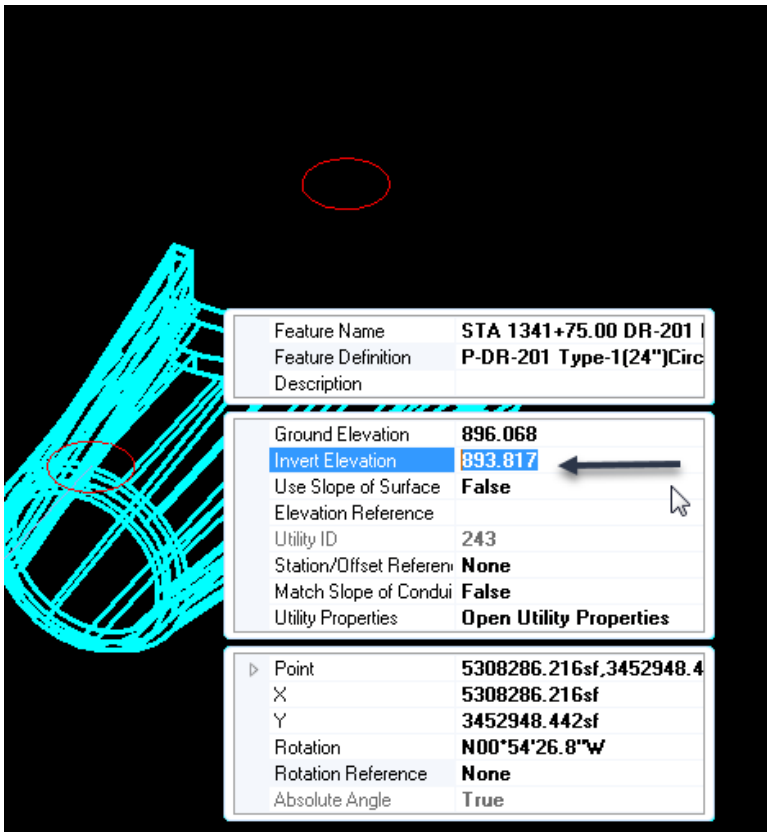


Repeat this on the other end and/or at any vertices along the conduit using the appropriate node in each location.

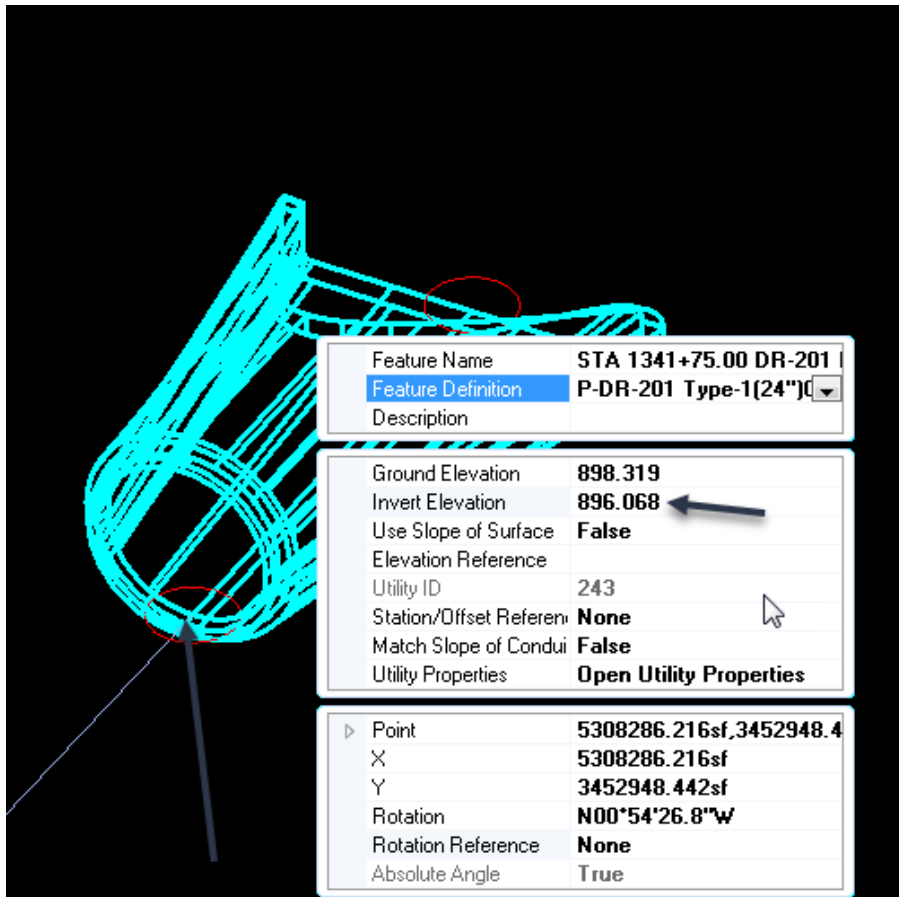
Keep in mind, that the elevation typed in is the invert elevation not the ground elevation that the software is asking for. To fix this look at the node in the 3D view and select it with the element selection tool.



Then bring up the properties of the element and edit the invert elevation to match the design invert elevation.



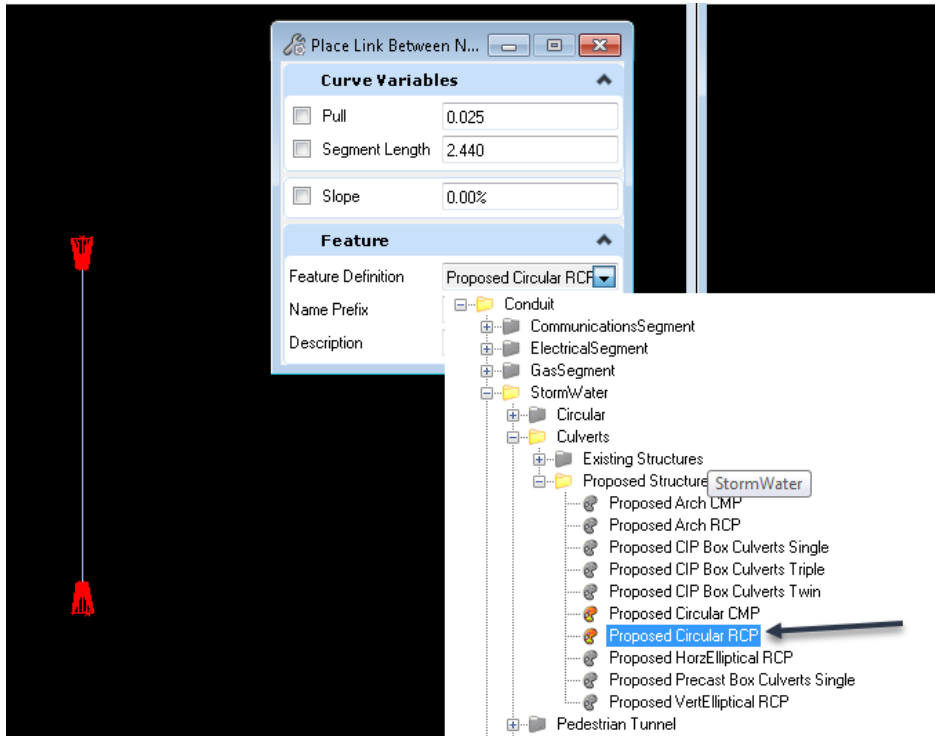
This will correct the elevation placement.



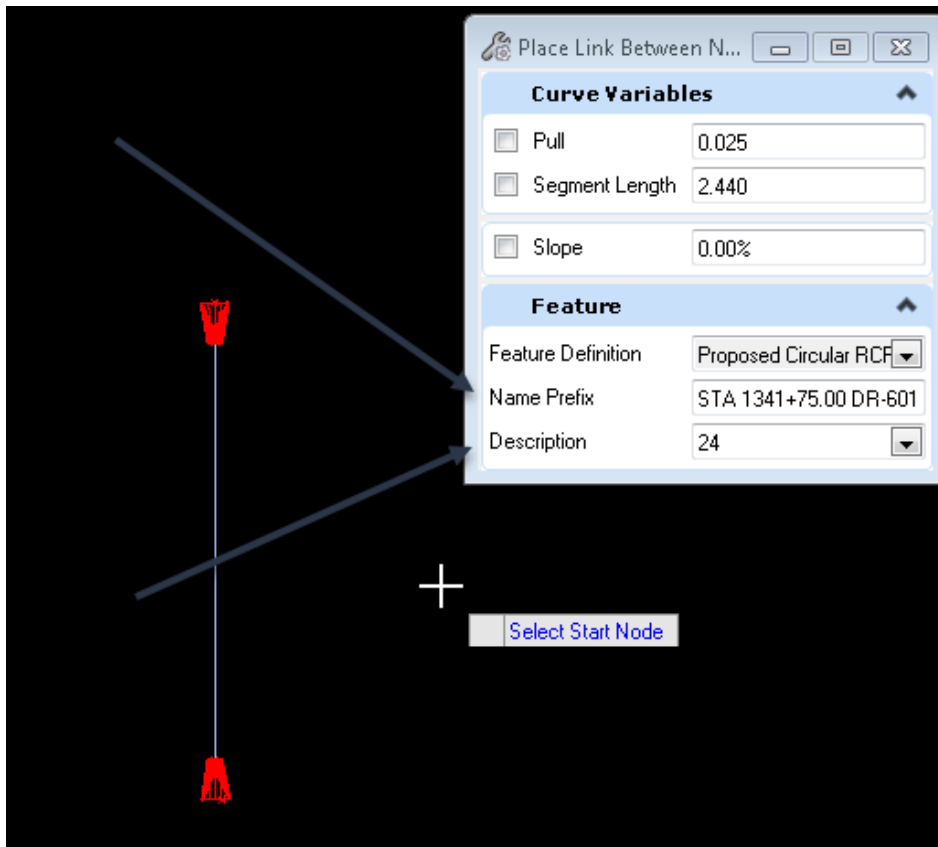
After the nodes are placed that are needed to model the structure, then connect the nodes with the appropriate conduit. To do this, select the Place Conduit tool.



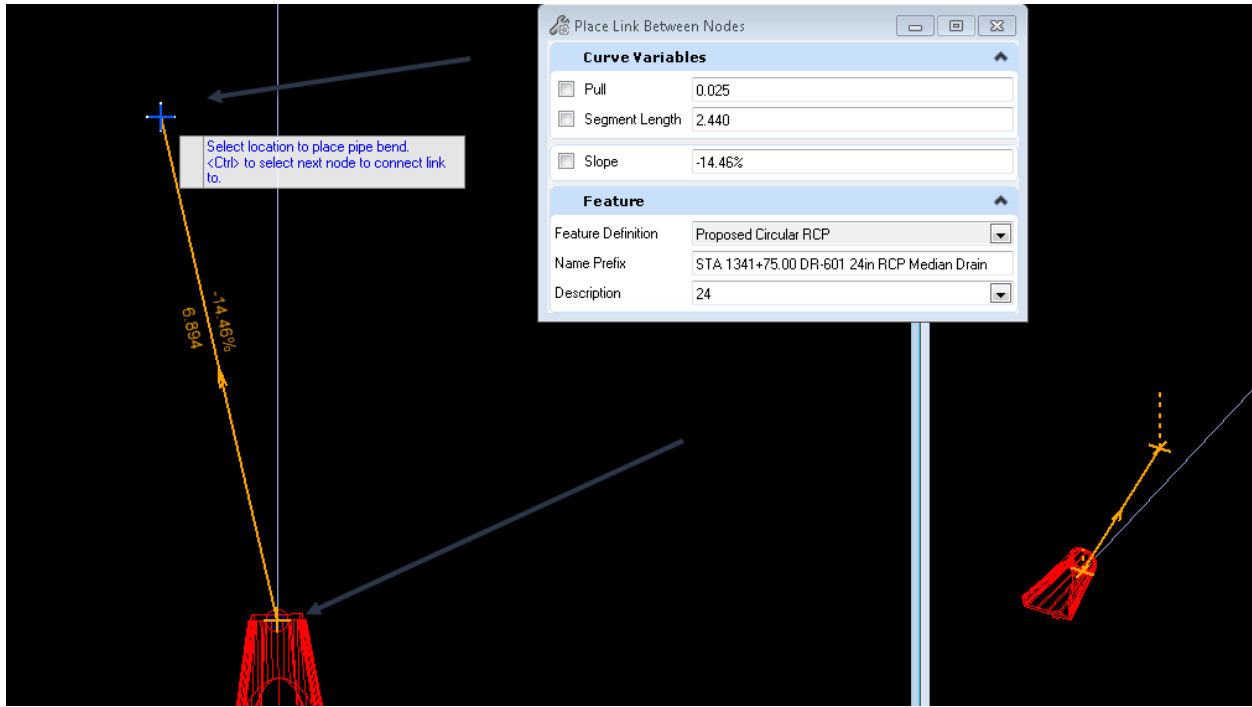
Then, select the feature that is needed to model the structure.



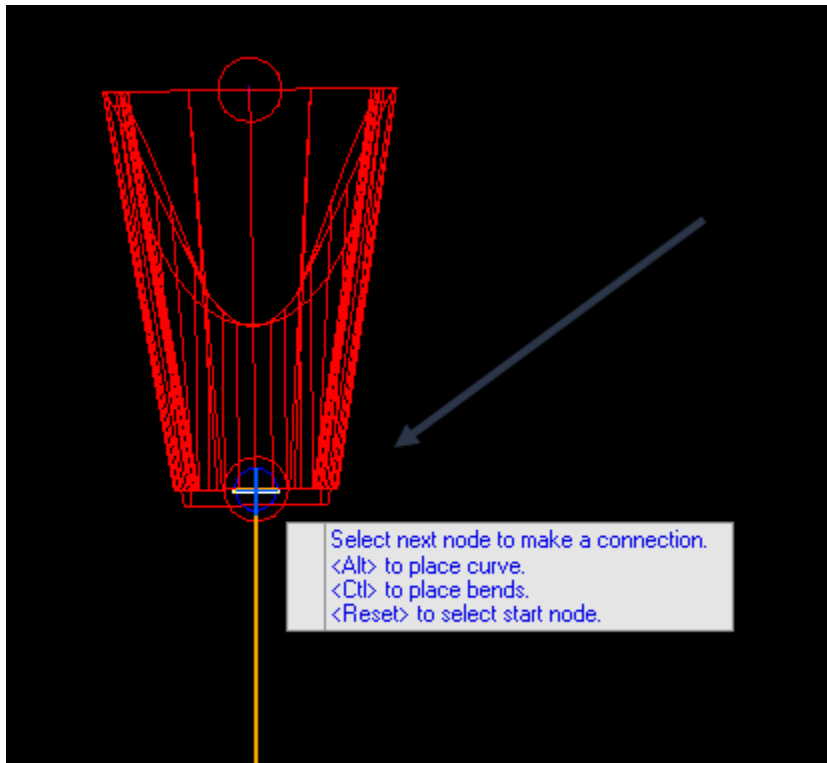
For this example, use the Proposed Circular RCP.



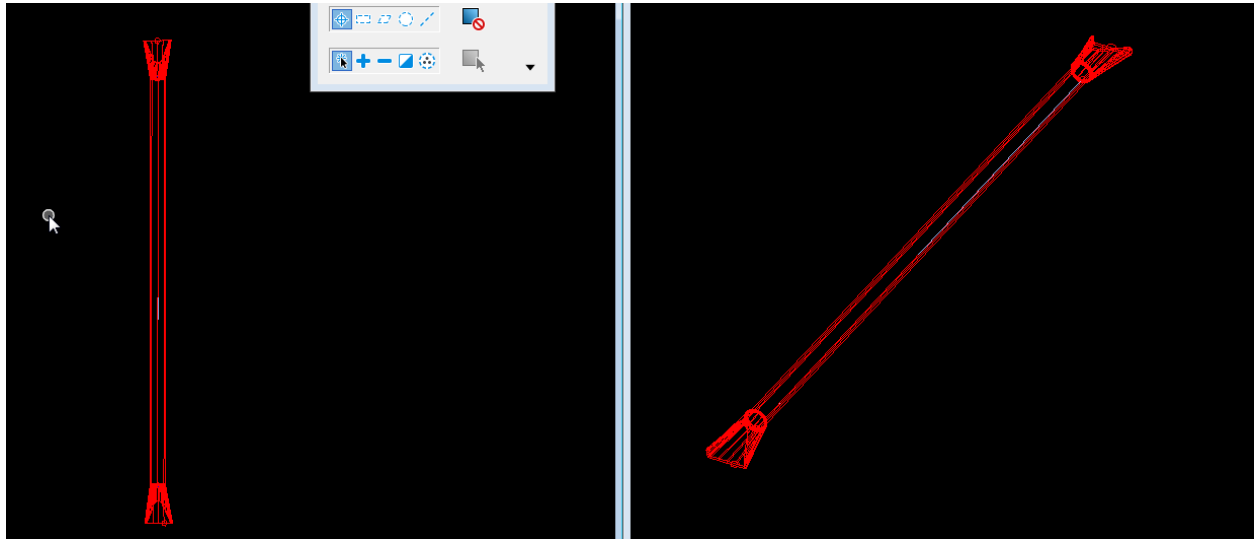
Use the description field from the ASCII file and place it in the Name Prefix field. Then select the size of the structure in the description field. Next, select the node to start from.



Then select the next node along the structure.



It should look something like this.



Now turn on the reference COR files and see how the drainage design correlates to the Road Designs earth work and grading design.