

How to place Box Culverts with the Drainage and Utilities tools Connect Edition

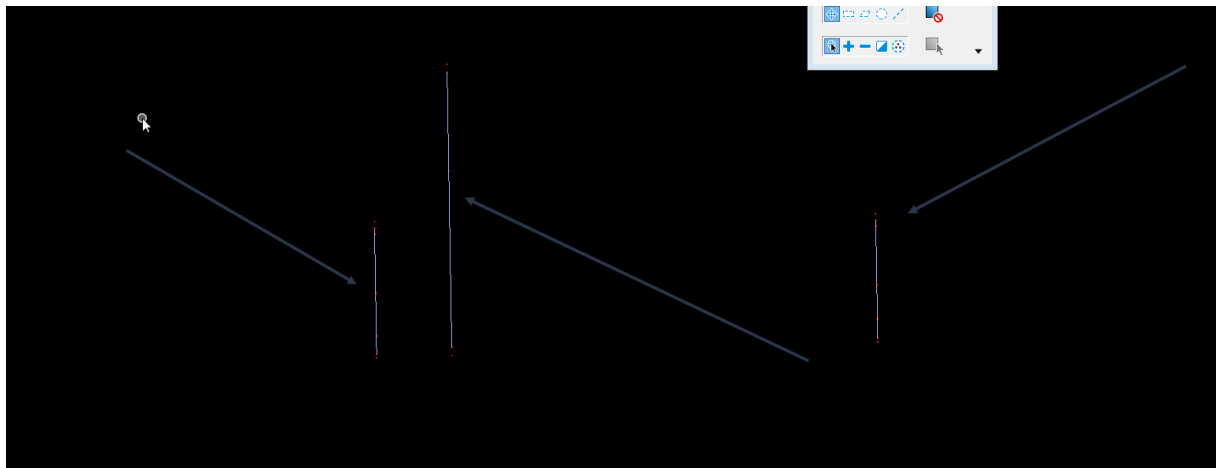
These instructions were created July 2023. These instructions were created with:



OpenRoads Designer CE - 2021 Release 2 Update 10
Version 10.10.21.04

Reference everything that will be used to design the structure, all the source information that will be needed and/or wanted displayed on the TSL sheet in the plan view. The TXT_CCRRRPPP.dgn file from the Design folder will be needed to get the station and tick marks for the alignment. For more information on this, please refer to [CW01 Setting up ORD File for Drainage Design](#).

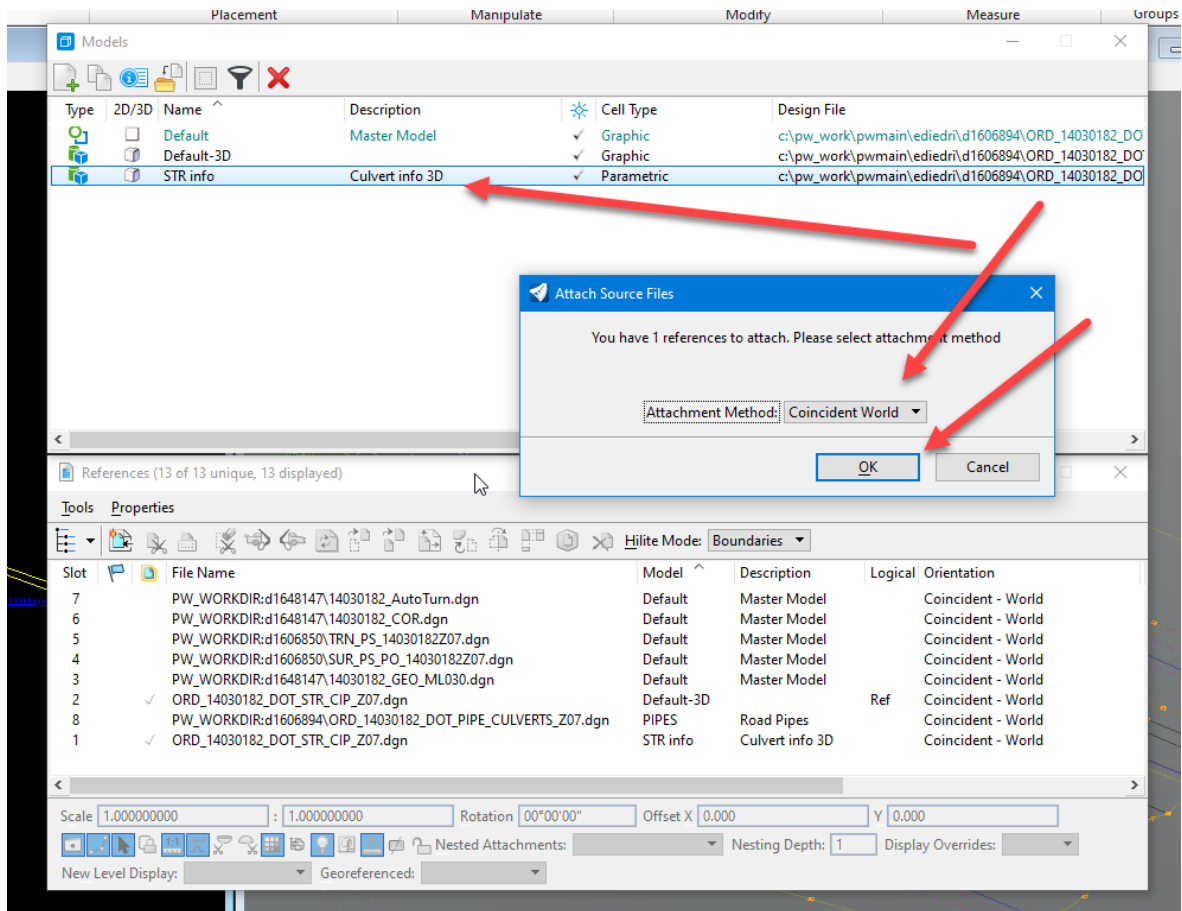
Once the invert coordinates of the RCB to be modeled are determined, there are two options to place it. Place nodes with civil AccuDraw or ASCII graphics. The method used in these instructions will be the ASCII graphics file. Refer to [CW04 Loading ASCII Graphics Input File into ORD File](#) for the instructions on importing this information.



Once the points and lines from the ASCII input file are loaded, then verify that the locations are correct. At this point, you are ready to start creating the structures.

Open the correct model that the RCB will be modeled in and reference in the STR info model.

For this example, a CIP RCB will be modeled so it will be placed in the file named ORD_CCRRRPPP_DOT_STR_CIP_ZZZ.dgn. Refer to the [CONNECT Seed Files](#) and the [CONNECT Models](#) for more information on correct file naming and structure of the files. The modeling should always be done in the Bridge folder.



In the Default 2D model, create the structures.

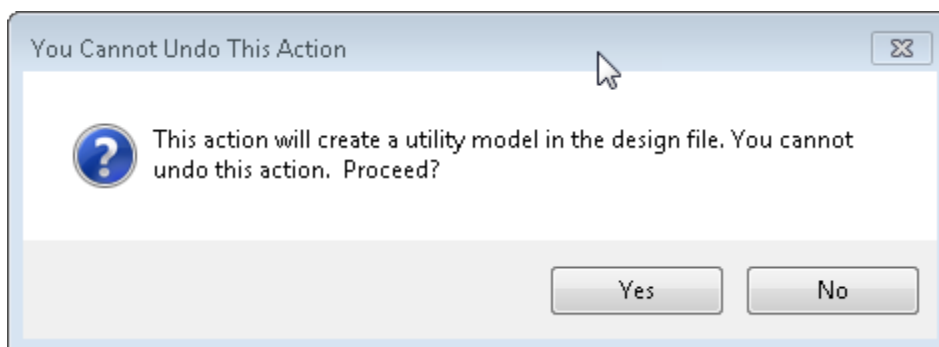
Note: Creation of the structures needs to be done in the 2D model not the 3D model.

Activate the utility model by clicking on the Place Node tool on the Drainage and Utilities workflow on the Lay out tab.



Place
Node

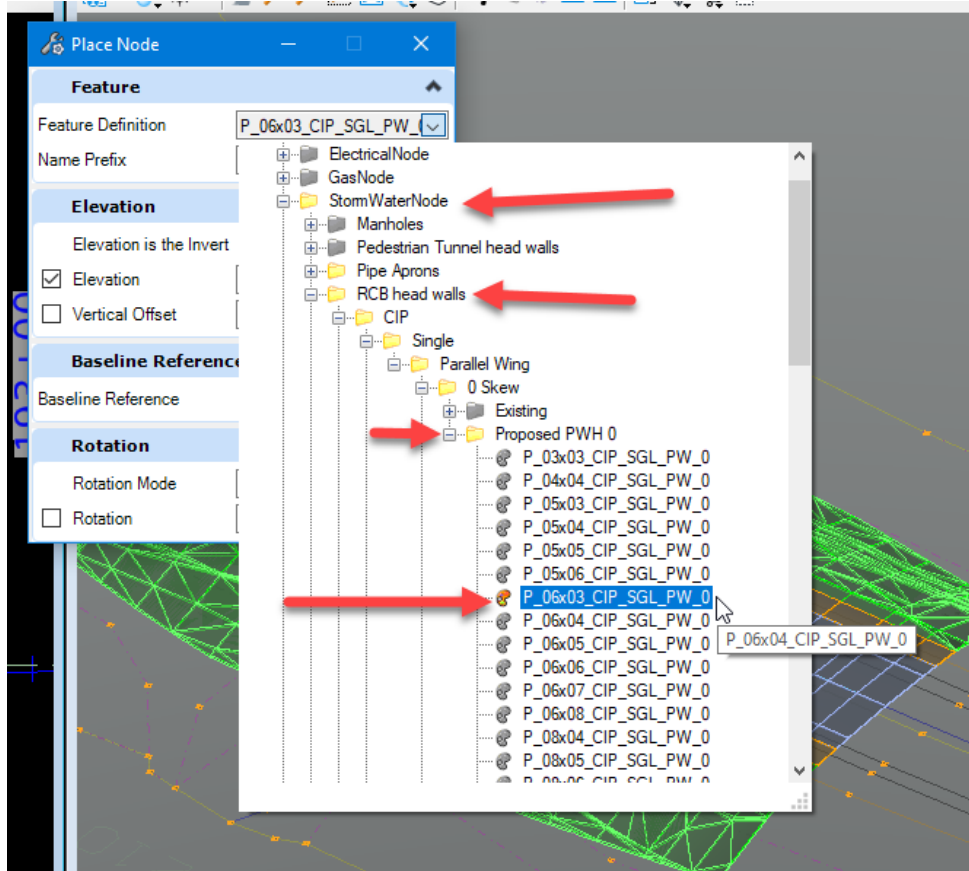
A warning will display.



Click Yes button. This will create the utility model database that will store all the utility information.

Next, start placing the headwalls. With the STR info model referenced to the CIP model, select the Place Node tool.

Then select the feature of the node to be placed. For this example, place a P_06 x 03_CIP_SGL_PW_0



Use the description field from the ASCII file to fill in the Name Prefix.

06,7450175.351,17517388.285,1172.450,PRO STA 190+72.65 Inlet end of apron 6ft x 3ft Single RCB -63.587 LT Remove existing headwall to face of parapet Extend 19' RT ditch to inlet. Design#0225

107,7450186.351,17517388.179,1172.450,PIP3 STA 190+72.65 Inlet 6ft x 3ft Single RCB -52.587 LT

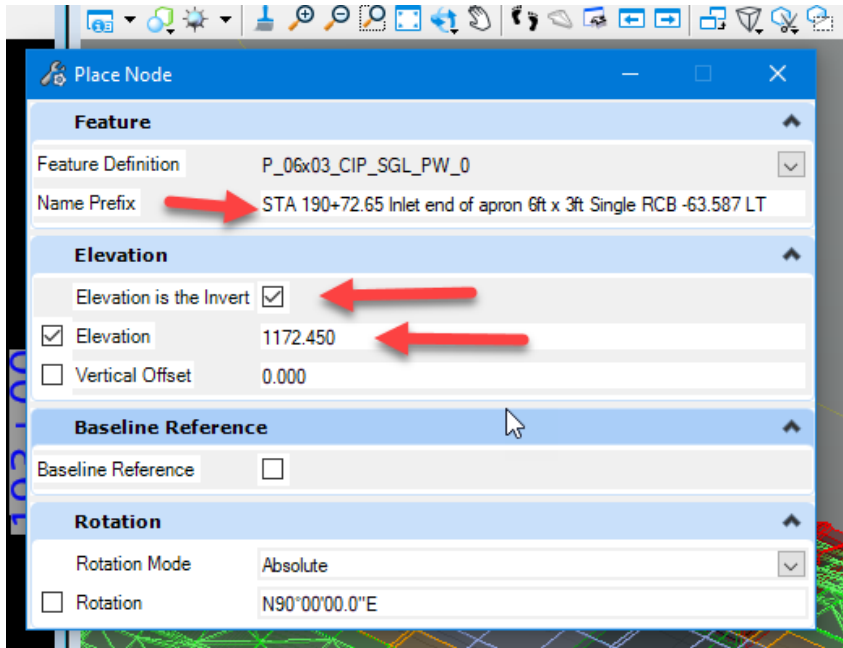
108,7450205.350,17517387.995,1172.450,PIP3 STA 190+72.65 Inlet face of parapet of existing 6ft x 3ft Single RCB -33.587 LT

109,7450261.877,17517387.447,1172.340,PIP4 STA 190+72.65 Outlet face of parapet of existing 6ft x 3ft Single RCB +22.886 RT

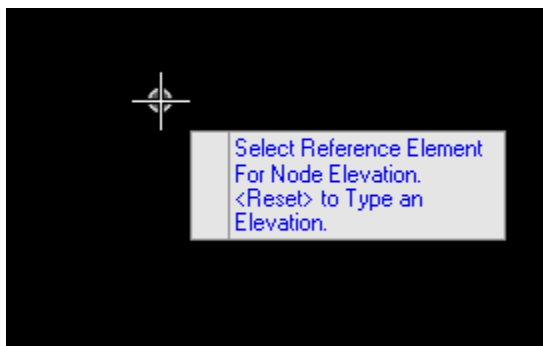
110,7450279.866,17517387.273,1171.732,PIP4 STA 190+72.65 Outlet 6ft x 3ft Single RCB +40.932 RT

112,7450290.866,17517387.166,1171.732,PRO STA 190+72.65 Outlet end of apron 6ft x 3ft Single RCB +51.932 RT Remove existing headwall to face of parapet Extend 18' LT ditch to Outlet. Design#0225

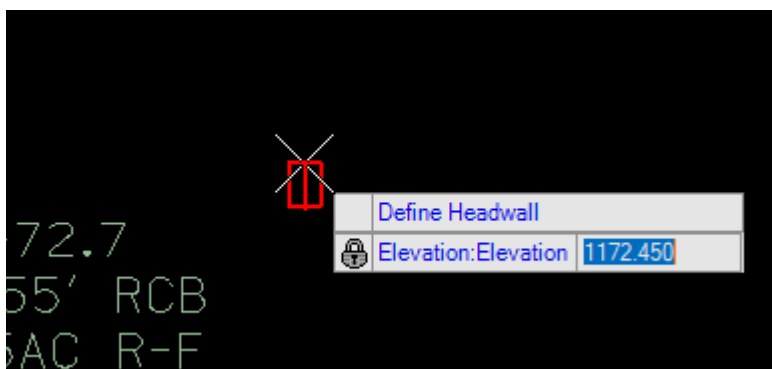
It should look something like this:



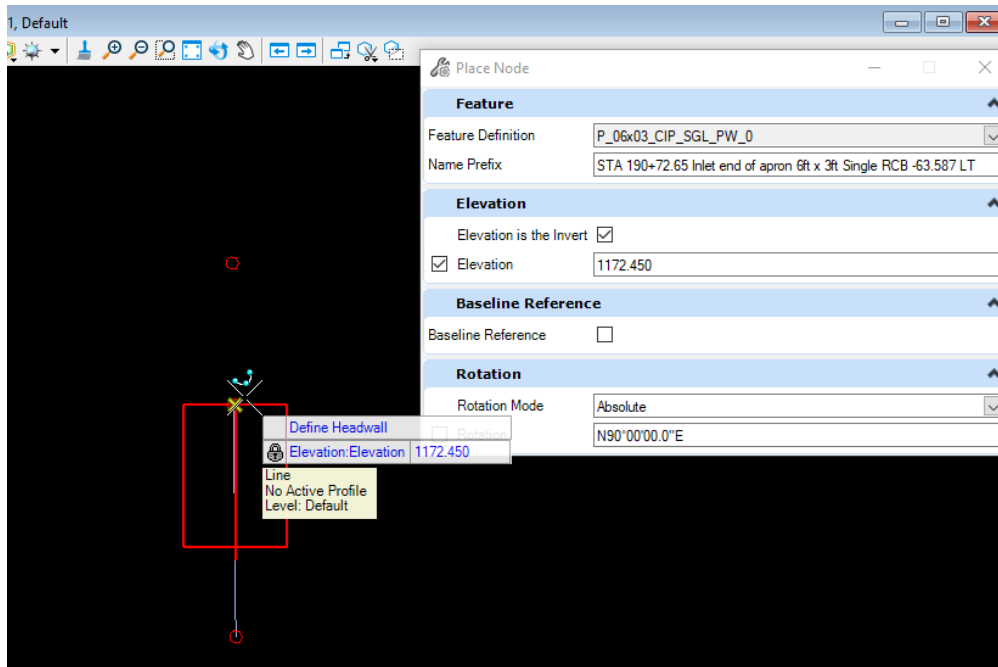
Once that is set, then move the cursor to the 2D view. It will prompt to Select Reference Element or to Reset to Type an Elevation. Reset and type the elevation.



For this example, use 1172.450, the invert flowline elevation of the design structure. Then, hit the enter key and it will lock this elevation.

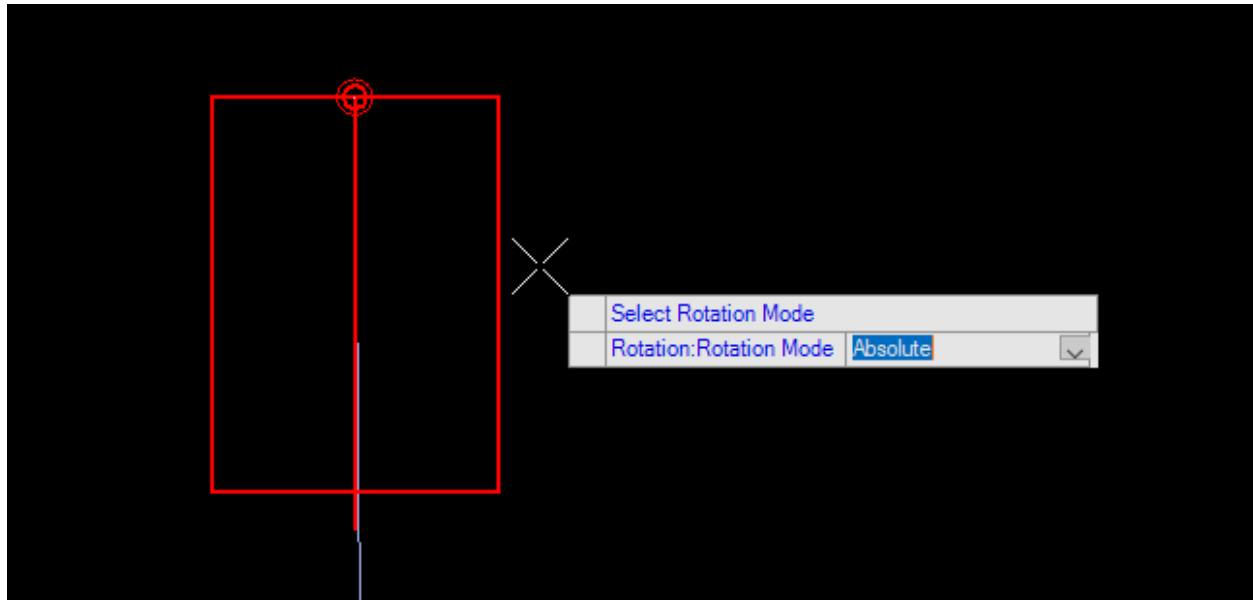


Snap to the ASCII graphics to place the apron or node.

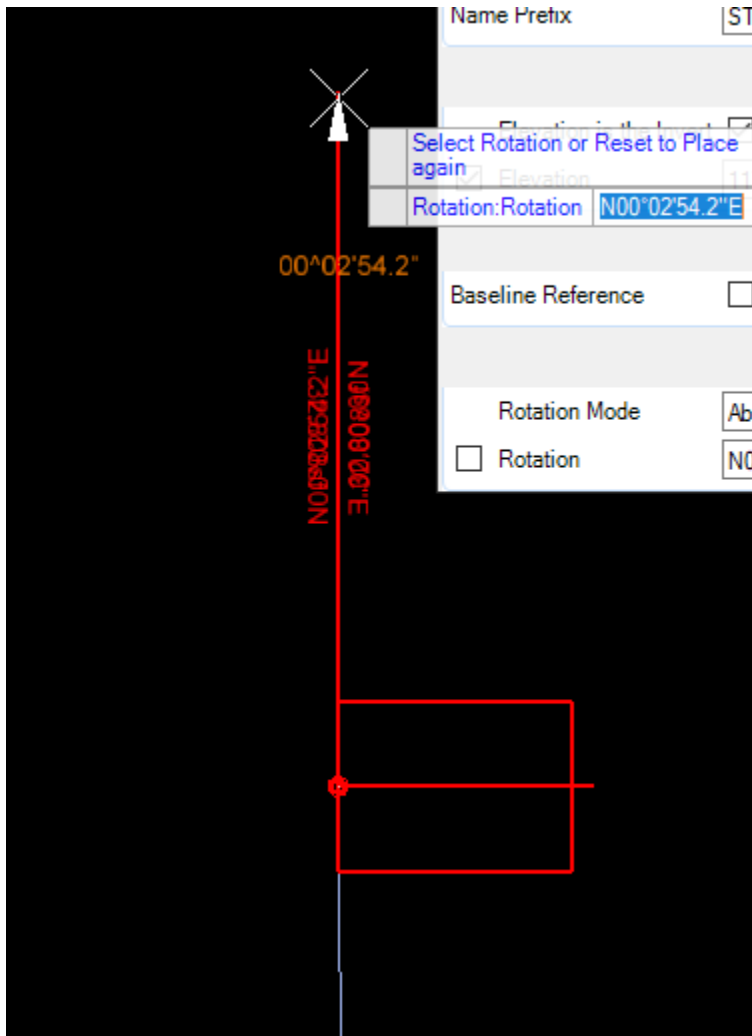


Data point to accept it and it will prompt to select which rotation mode.

For this example, use the absolute mode.



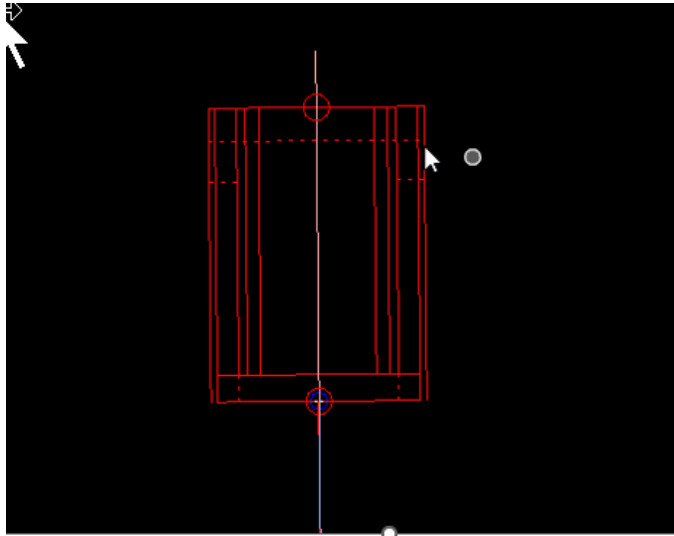
Data point again and the apron will rotate until the data point to accept the rotation is entered.



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.

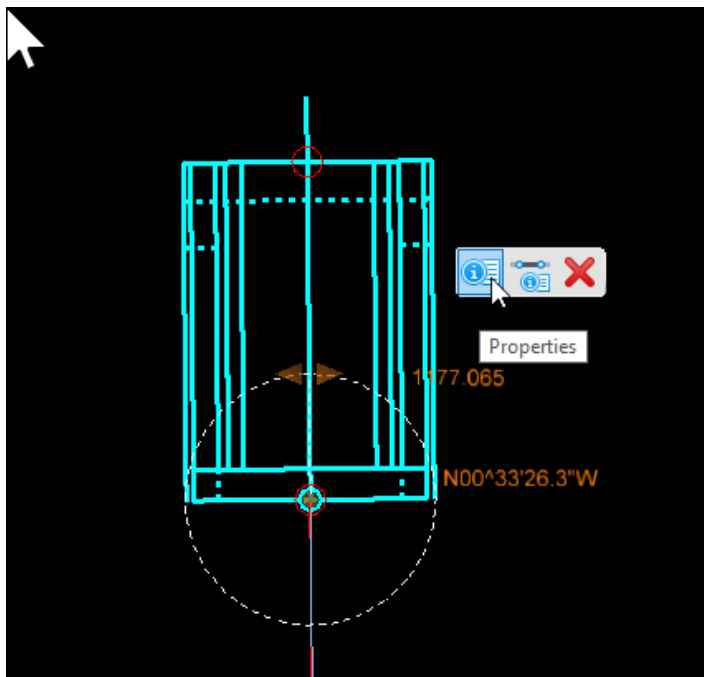
It should look like this:

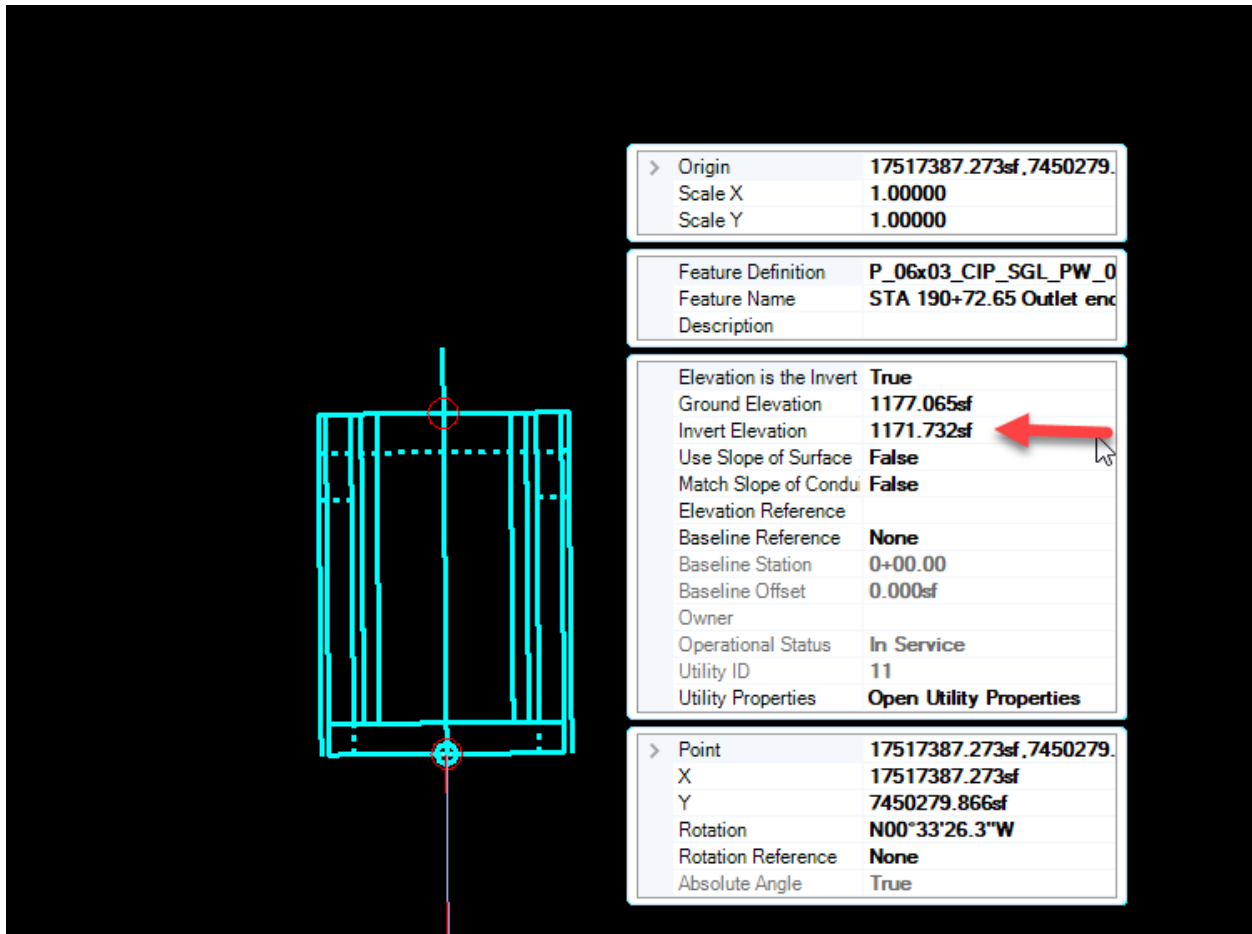


Repeat this on the other end and/or at any vertices along the conduit using the appropriate node in each location.

Keep in mind, that the elevation typed in is the invert elevation not the ground elevation that the software is asking for.

Hint: If a bad elevation is used, look at the node in the 2D view and select it with the element selection tool. Bring up the properties of the element and edit the invert elevation to match the design invert elevation.





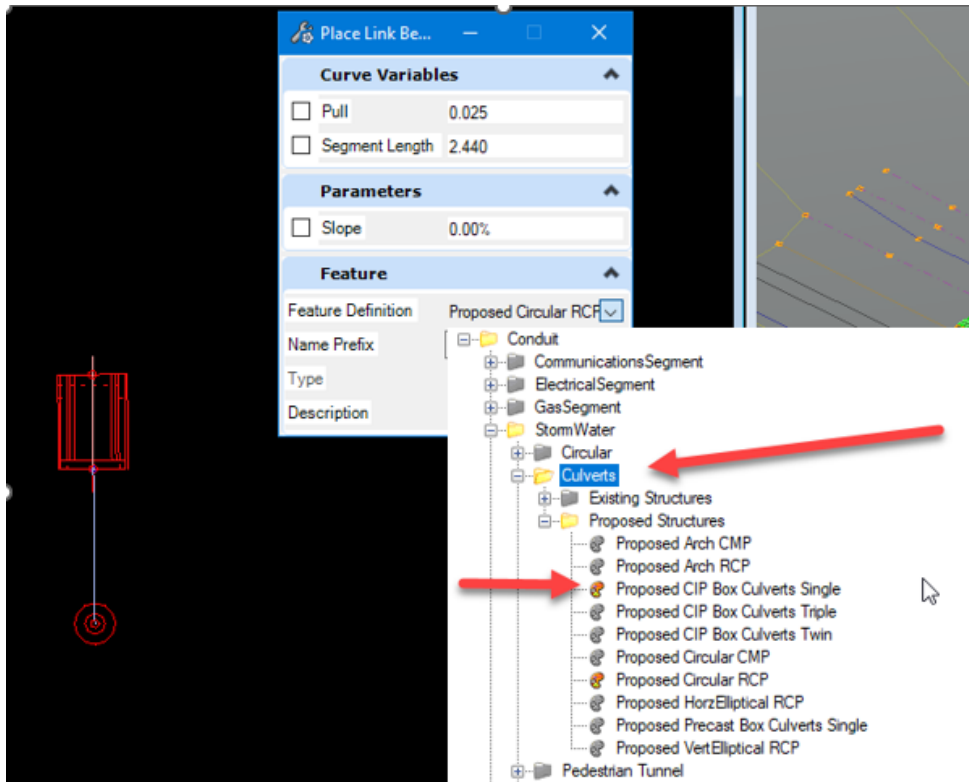
This will correct the elevation placement.

Once nodes are placed at each end of the structure, then connect the nodes with the appropriate conduit. To do this, select the place conduit tool.

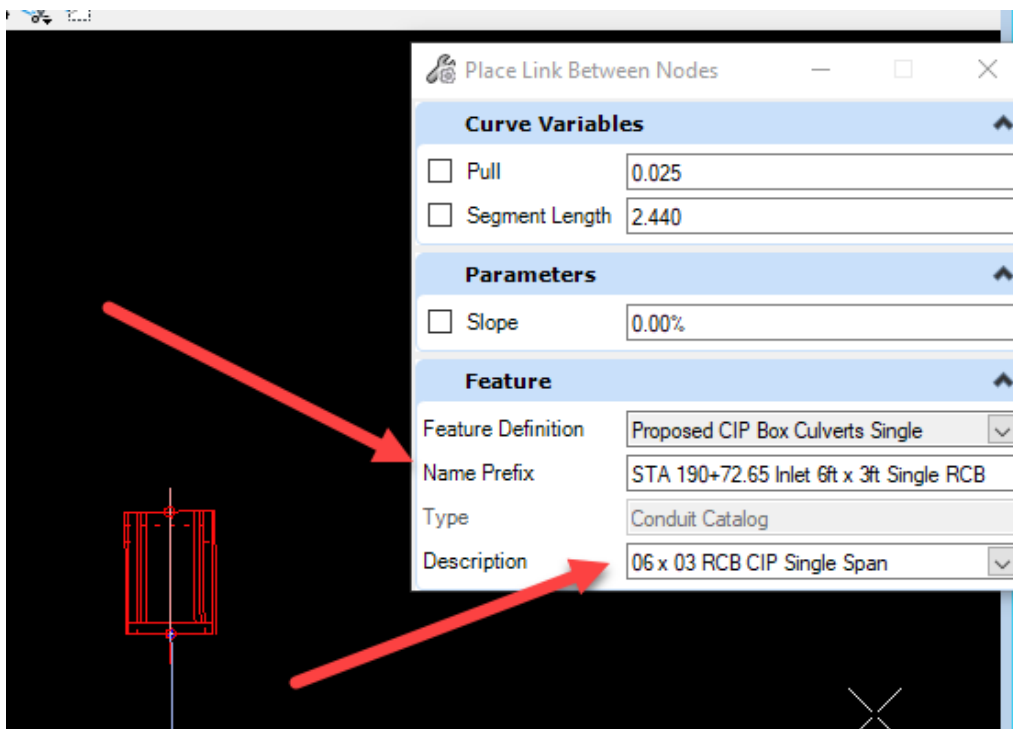


Then select the feature that is needed to model the structure.

For this example, use the Proposed CIP Box Culverts Single.

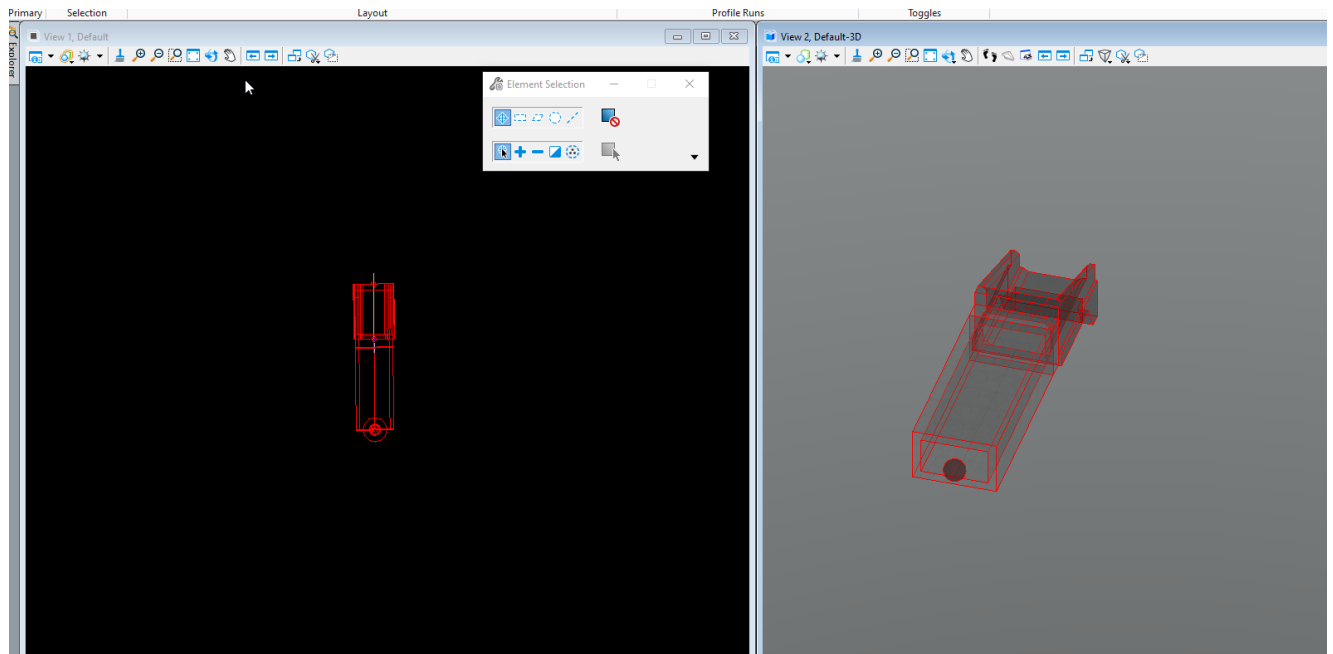


Use the description field from the ASCII file and place it in the name prefix field. Then select the size of the structure in the description field.

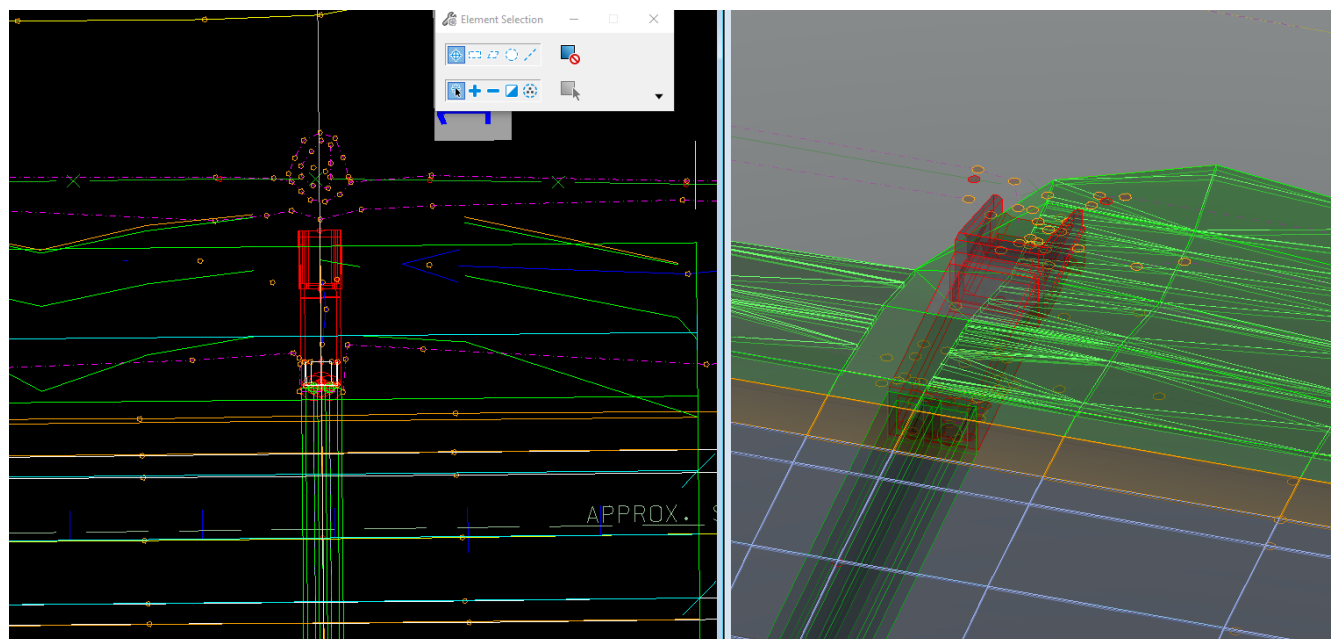


Select the inlet node to start from and then select the next node along the structure.

It should look something like this:



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



If everything looks good, then proceed to making the TS&L sheet of the structure.

Refer to [CW06 How to Create Culvert TSL Sheet and Annotate Structures](#)