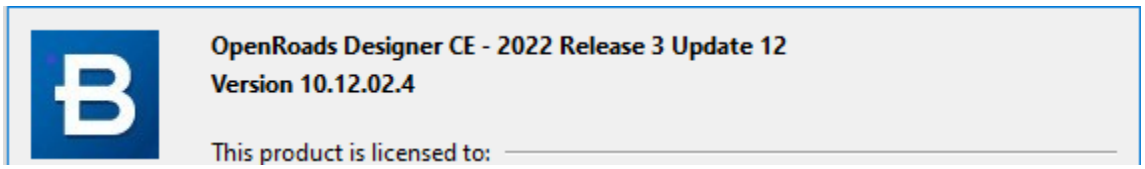
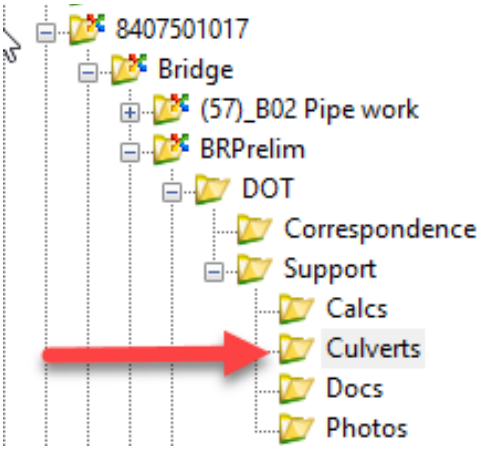
Modeling Pipes in CONNECT

These instructions were created April 2024. These instructions were created with:



Once the invert coordinates of the pipes to be modeled are determined, then place them into the ASCII input file. To do this, copy the PIPE SEED.txt file from the PWMain\Documents\Resources\ClientWorkspaces\IowaDOT\IowaDOTProduction\Organization-Civil\IowaDOT_Standards\Cell\BridgeDesignDetails\ folder to the project folder.

Iowa DOT personnel should create a Culverts folder under the \Bridge\BRPrelim\DOT\Support\ subfolder for the project and copy the text file there.

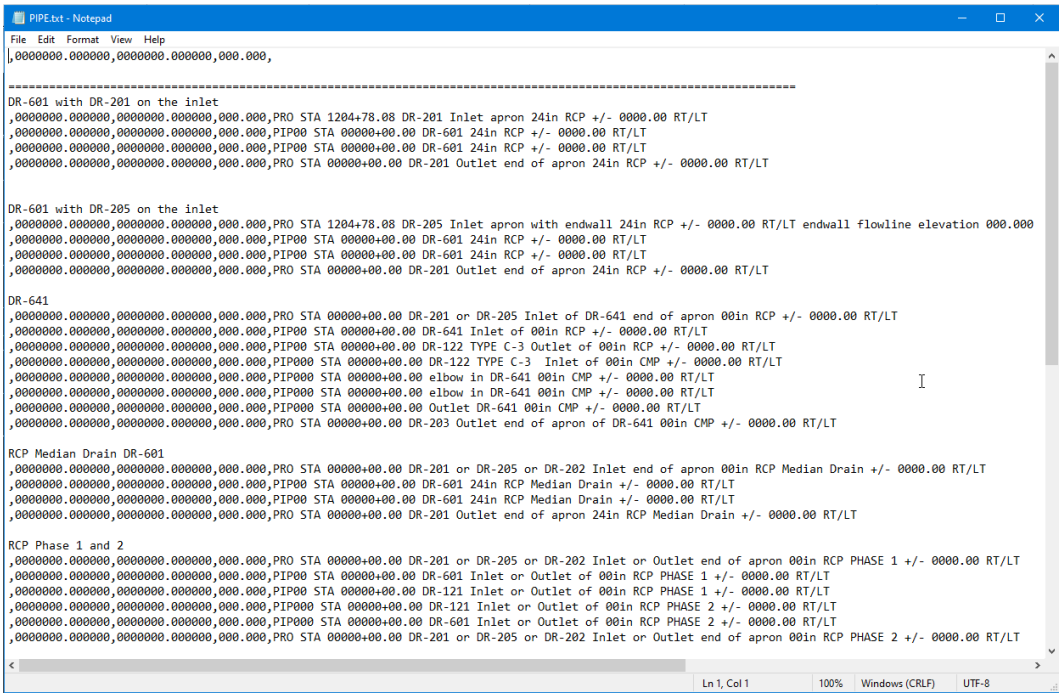


Consultant designers should create a Culverts folder under the \Bridge\BRPrelim\XYZ-CORP\Support\ subfolder for the project and copy the text file there. The XYZ-CORP folder will be renamed for the consultant contracted for the design project.

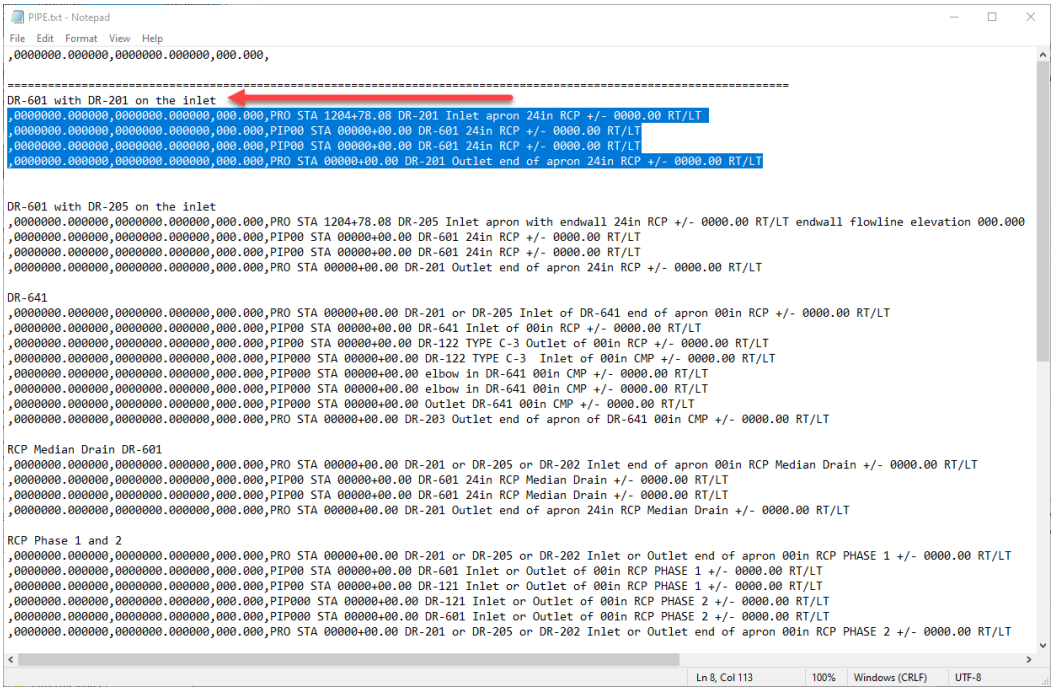
For more information refer to : Consultant ProjectWise CONNECT Bridge Project Folder Structure

Once the seed file is copied, rename it to Pipes.txt. Then open it in Notepad or other similar text editor.

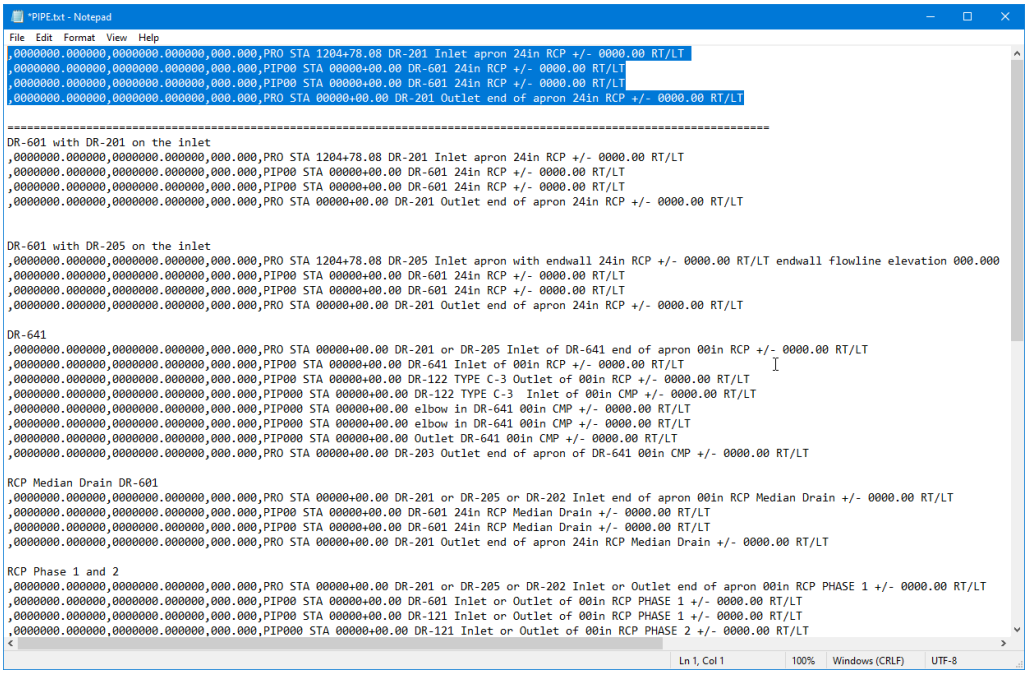
It should look something like this:



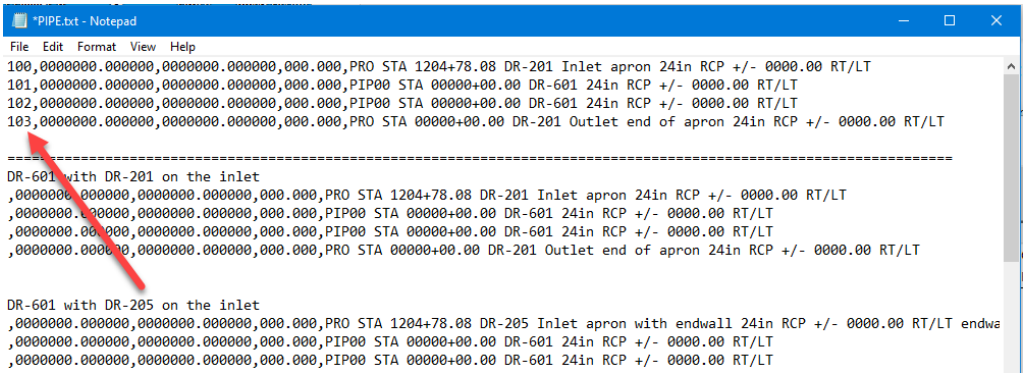
This file was made to provide some of the templates of the data that will be stored and saves some of the typing that is needed to create the ASCII input file. Now, find the template that best suits the pipe design and highlight it in the lower portion of the file and make a copy of it. For this example, the design is for a typical crossroad pipe that would be a DR-601.



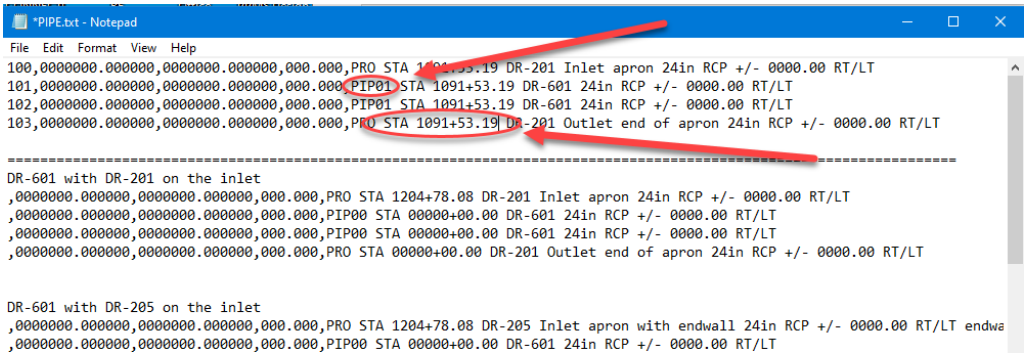
Then paste it at the top of the file like this:



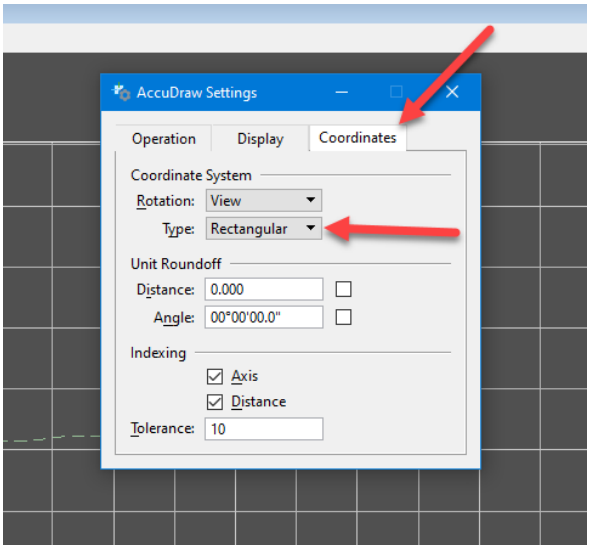
Next, add the point number to each line. It is suggested to start with 100.



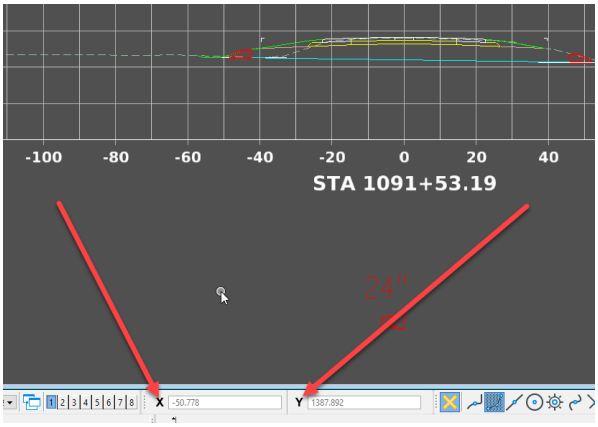
Next fill out the station and set the first feature number like this.



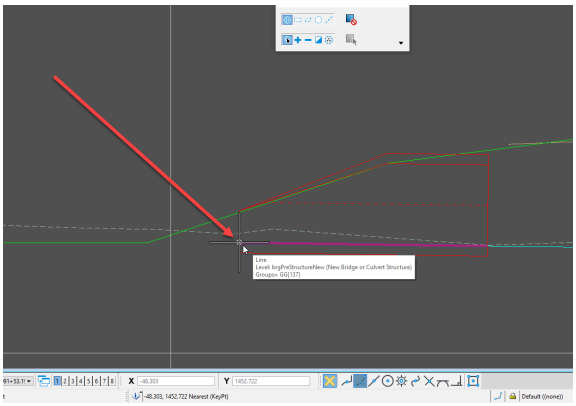
Go back to the cross section used to design the pipe. Open the AccuDraw settings and make sure it is set to Rectangular under the Coordinates tab.



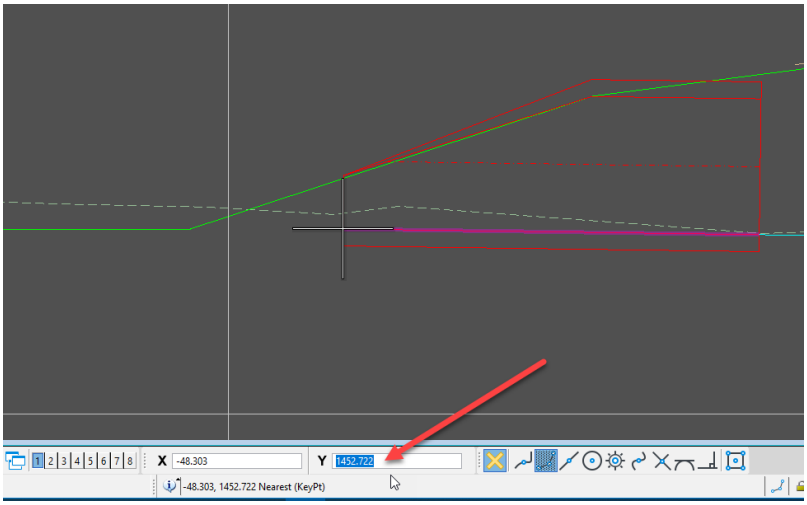
This will provide the Coordinates read out at the bottom of the application window.



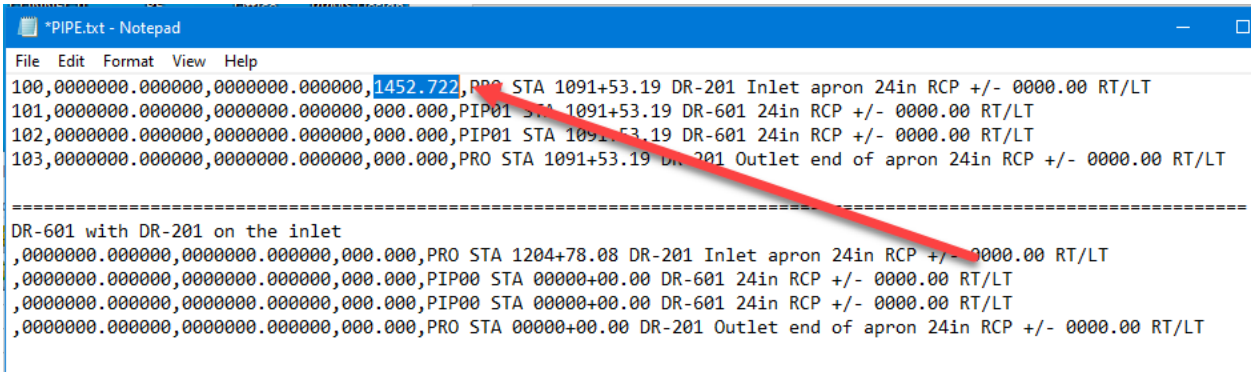
Then in the cross section, select the Element Selection tool and make a tentative snap to the end of the inlet apron in the design.



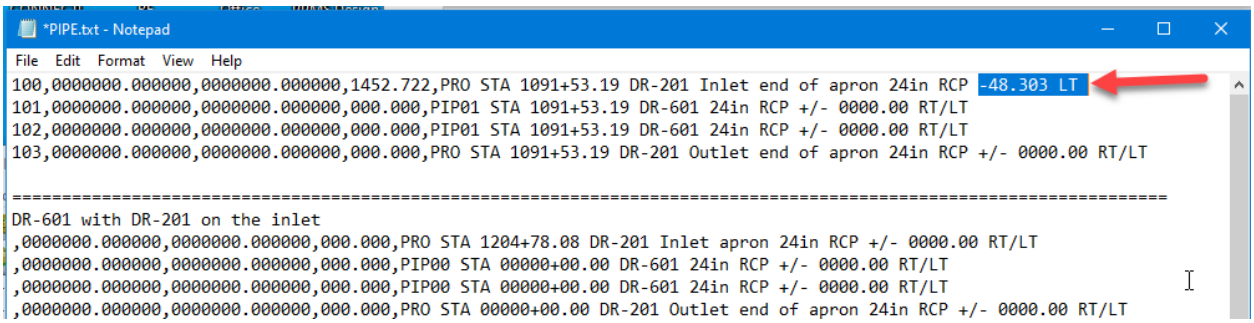
The AccuDraw Coordinates readout is displaying the Elevation in the Y window and the offset in the X window. Highlight the number in the Y window and use the Ctrl + C keys on the keyboard to copy that number.



Then go to the ASCII input file and paste the inlet elevation in the correct location.

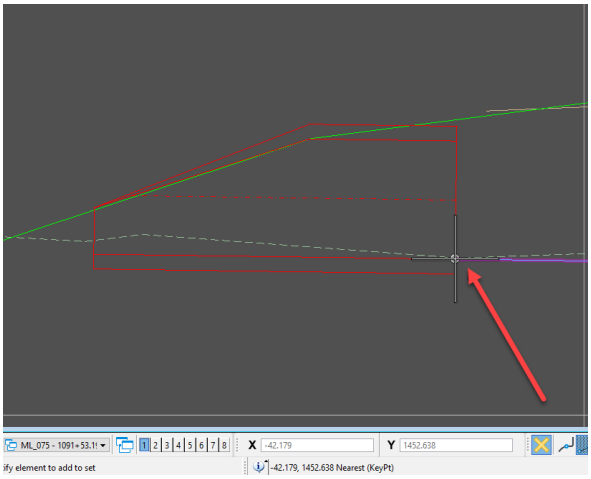


Next, copy the offset from the X window of the AccuDraw Coordinates readout display and paste it in the correct location in the ASCII input file.



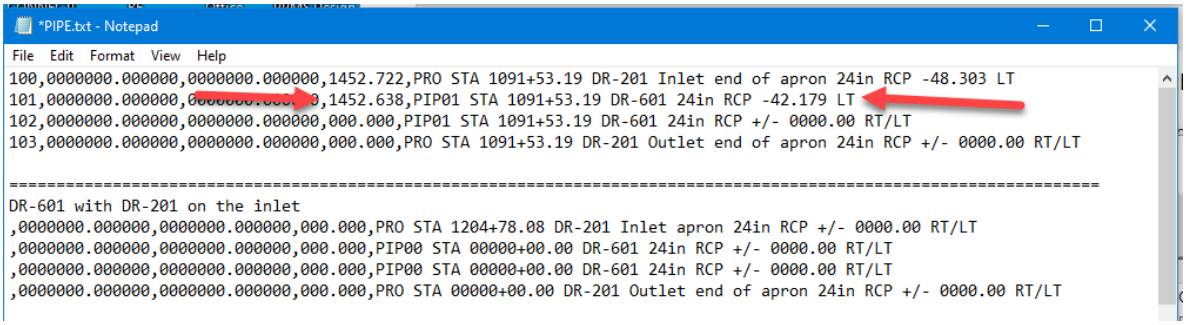
Then in the cross section, select the Element Selection tool and make another tentative snap to the junction of the pipe apron and the first pipe section at the flowline.

It should look something like this:



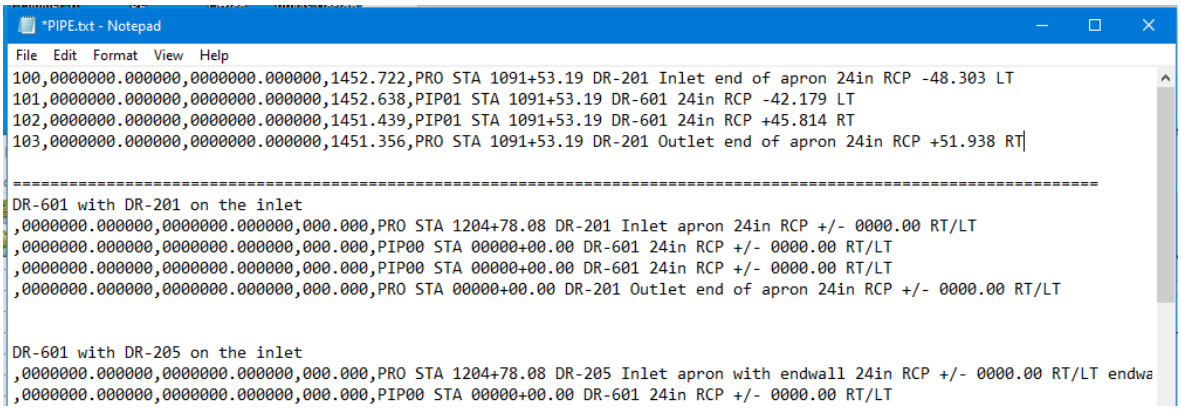
Then copy and paste the elevation and offset from the AccuDraw Coordinates readout and paste it in the correct location in the ASCII input file.

it should look something like this.



Repeat the process at the other end of the pipe starting at the junction of the pipe apron (the last section of the pipe at the flowline of the outlet) and the point at the end of the outlet apron and paste them in the ASCII input file.

When done it should look like this:



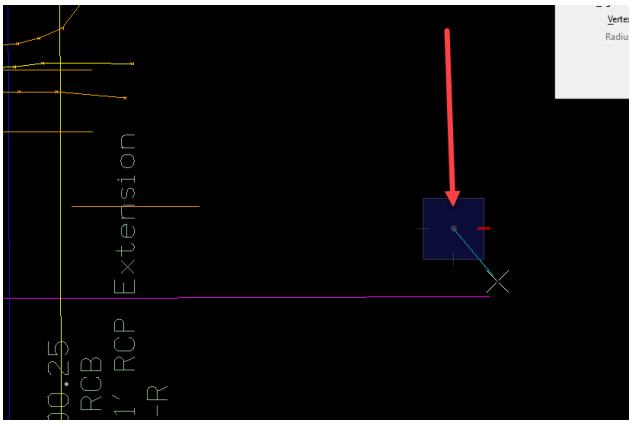
Keep in mind that up to 256 characters can be used to describe the point that will be mapped. On the outlet it is suggested to include the comment that will become the notes on the schedule sheet. This will make it easier to input the information into the database by copying and pasting and not retyping it. This note can consist of any information appropriate to convey to the contractor building the pipe. For example, “Jack new 24" RCP. Remove Existing pipe at Sur Sta. 1090+68.1 or will be plugged and abandoned with flowable mortar.” For this example, use “Culvert is designed to be cut and cover. Lay 88' of 24" 2000D RCP with two DR-201 Aprons.”

Next, calculate the X and Y Coordinates of the four points in the ASCII input file. To do this, close and check in the SHT file and open the ORD model file under the Bridge folder. Once the file is open, find the pattern line used to cut the cross section from. For this example, it was the line at STA 1091+53.19.

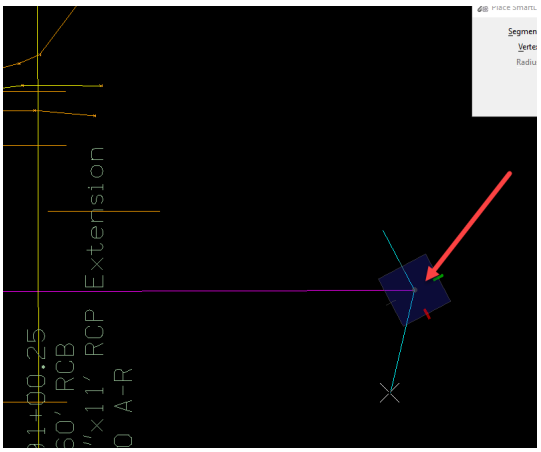
Hint: If uncertain where to look in the file for the pattern line, using the Open Cross Section View tool is helpful in locating the pattern line.

Next, place construction lines to locate the x and Y Coordinates. With the Place Smart Line command and AccuDraw on, locate the left off set points. Start on the right side of the pattern line making the first point just above or below the pattern line.

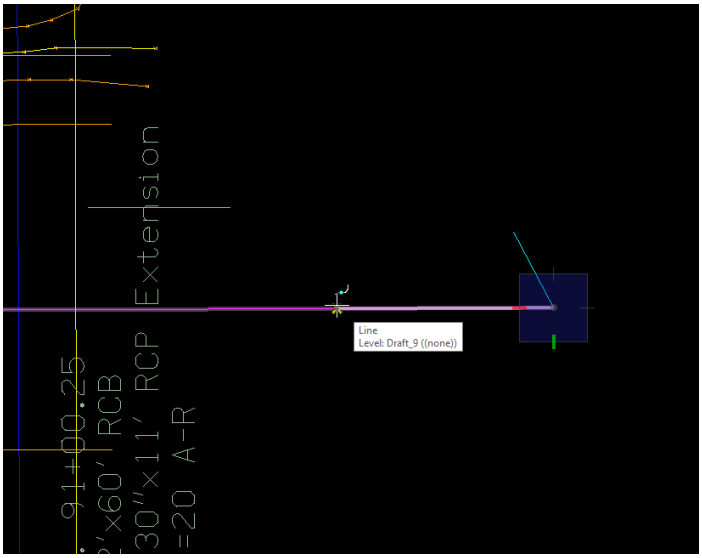
It should look like this:



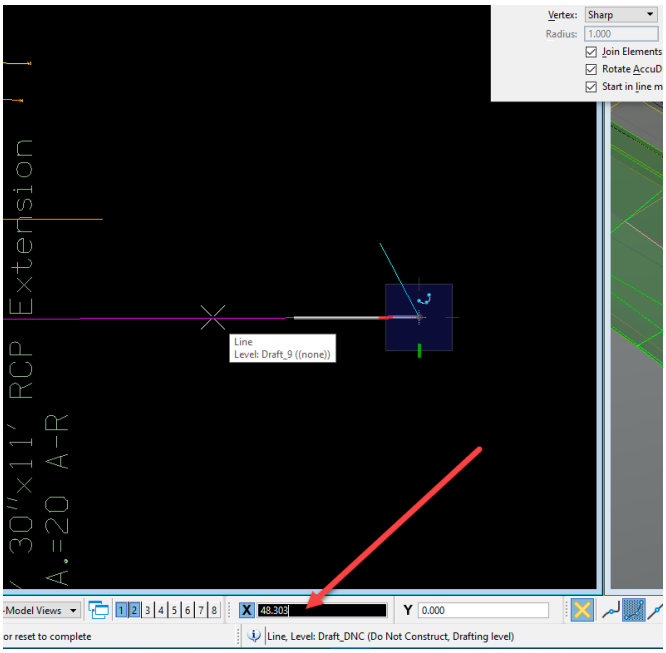
Next snap to the end of the pattern line.



Now, on the keyboard type Q then R. This is the command in AccuDraw to quick rotate. This will make the AccuDraw compass rotate. Then, select the near snap and snap on the pattern line. This assures the line will be drawn exactly along the pattern line.

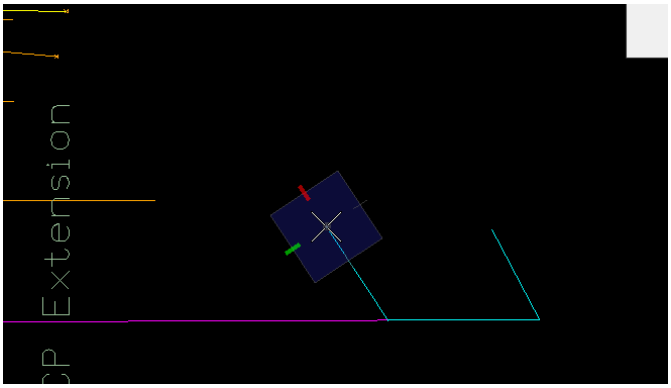


Next, type in the left offset distance to the end of the left apron stored in the ASCII input file. For this example, it is -48.303.

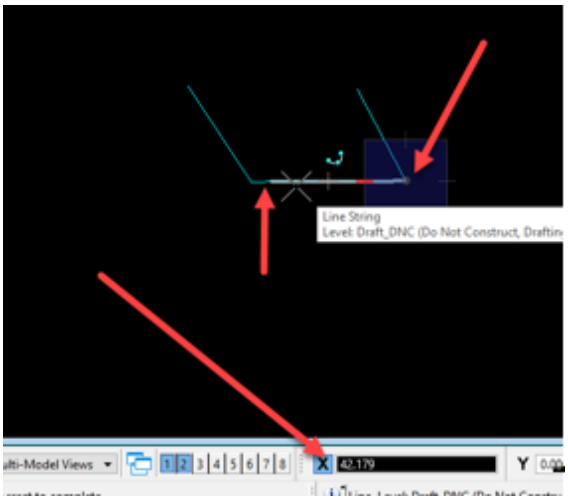


Then draw a line off that point to make it easier to find.

It should look something like this:

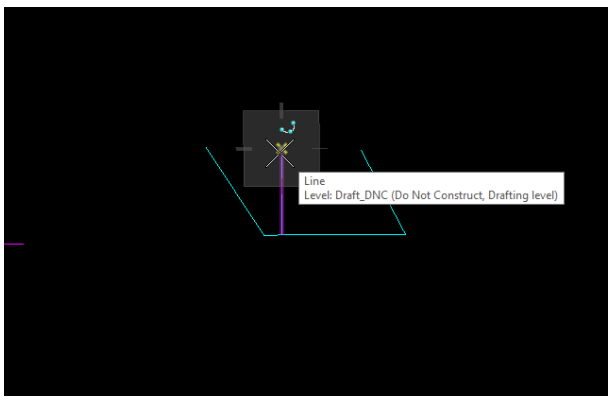


Next, select the smart line just created and move it off the pattern line to make it easier to define the other points. Next, define the next point that is left of the centerline. To do this, snap to the smart line from the measured point and rotate the compass to match the last distance point and type in the next offset distance (like before). For this example, it will be 42.179.



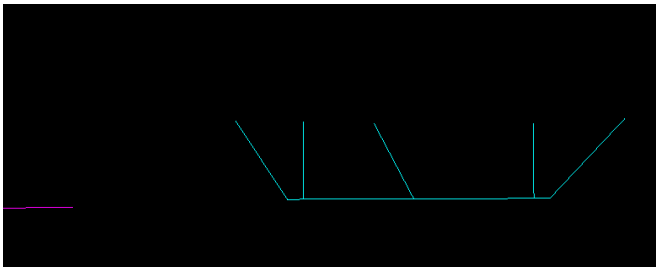
Then draw a line to make it easier to snap.

It should look something like this:

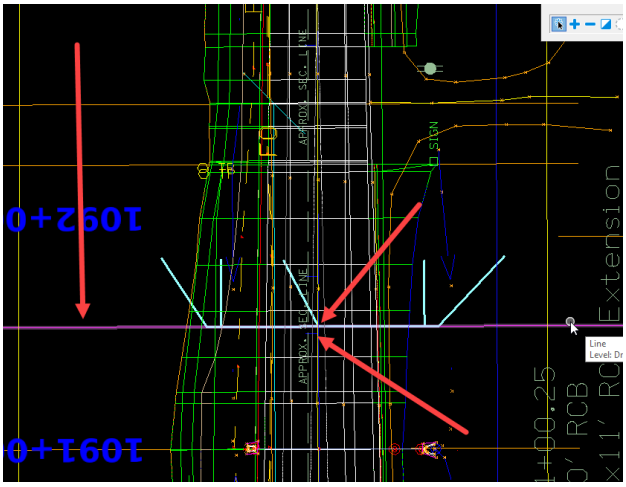


Next, draw lines for the right off set points (same way as the left points).

It should look something like this:

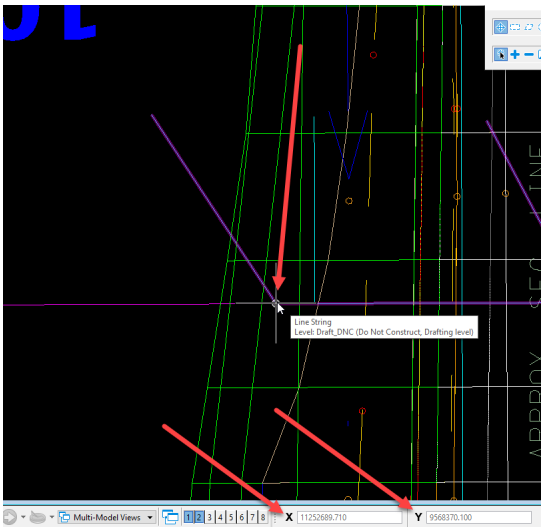


Now with the Element Selection tool, select the smart lines just created. Move them to the location to do this snap to the centerline point and place it at the intersection of the alignment and the pattern line.



Once it is moved, then unselect the smart lines that were moved into place.

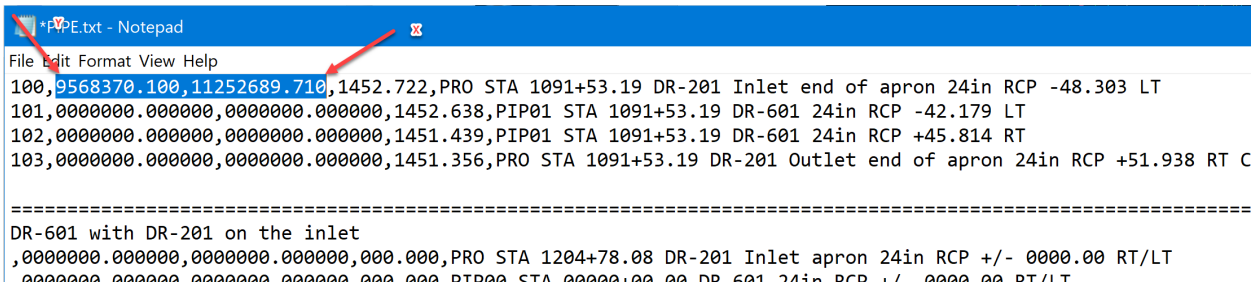
Next, make a tentative snap to the first point to define the X and Y coordinates in the ASCII input file.



Next, copy the Y and X coordinates and paste them into the ASCII input file in the correct locations.

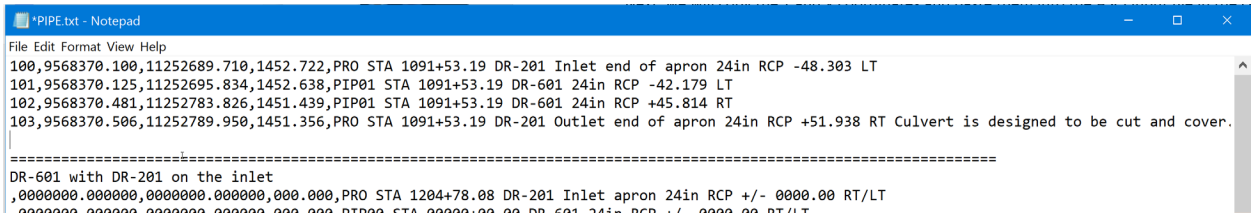
Hint: Remember that ASCII input file stores the coordinates as Y – X – Z in that order.

It should look something like this:



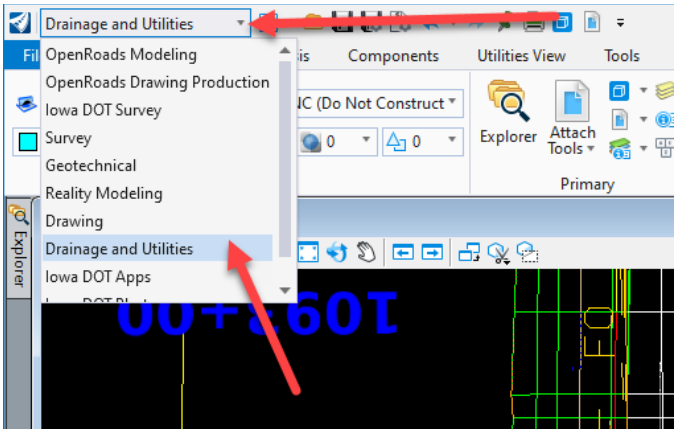
Repeat on the other points and finish the structure in the ASCII input file.

It should look like this once completed:

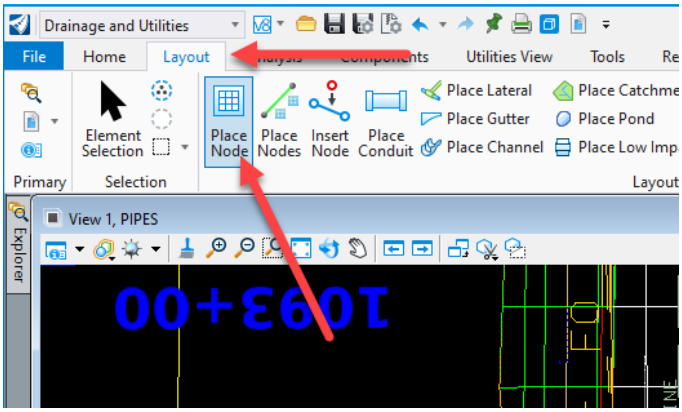


Now, the file is ready to model the pipe in the model file.

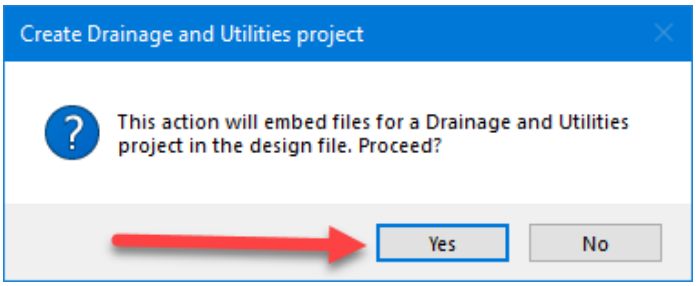
First change the workflow to Drainage and Utilities.



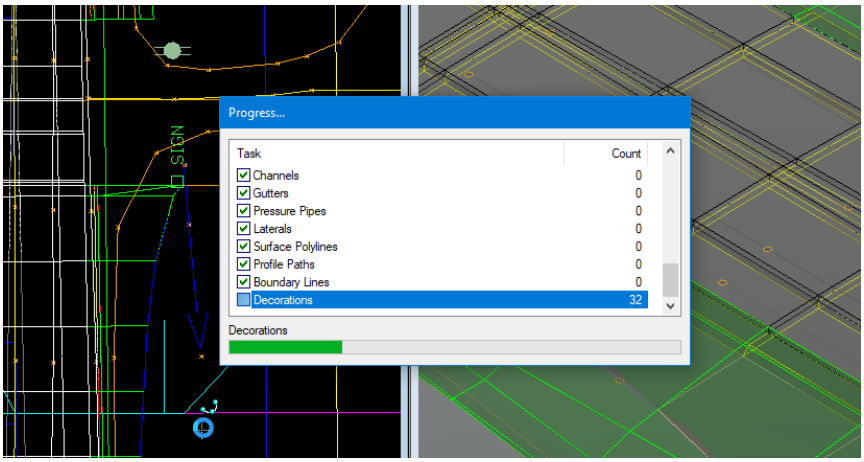
Then select the Place Node tool in the Layout tab.



A prompt to proceed will display. Click Yes. This only displays the first time the DU tools are leveraged.



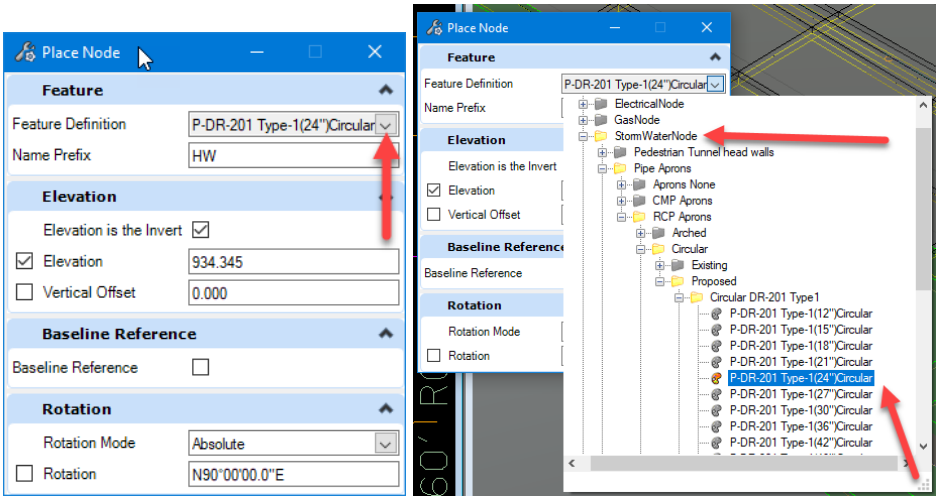
Next, set the file up to use the Drainage and Utilities tools.



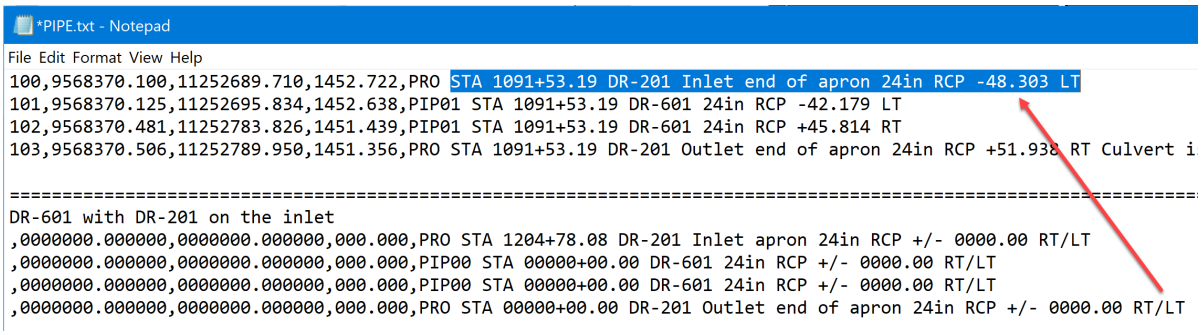
Make sure to work in view 1, the 2D model. Select the Place Node tool again. It will open the dialog box needed to define the Feature Definition, the Name Prefix and the Elevation constraints.

First, set the Feature.

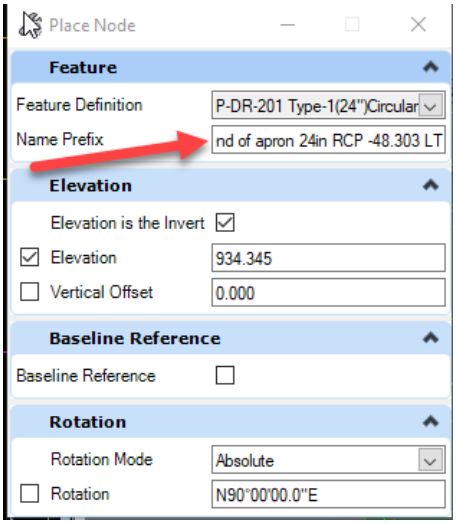
For this example, it will be 24 in DR-201.



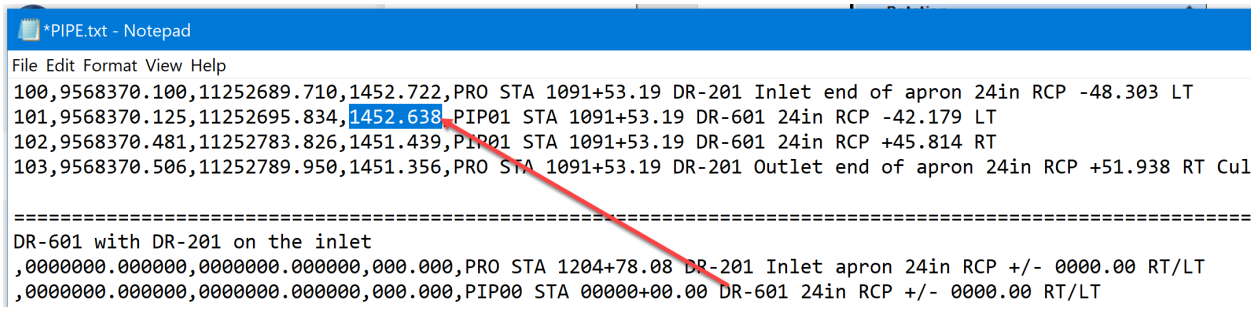
Next, place the Name Prefix. This will be a part of the description from the ASCII input file. It will consist of the Station, standard, description and offset.



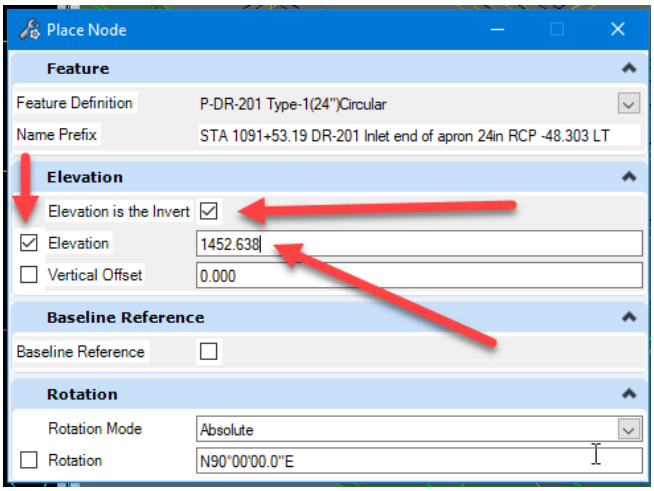
This is why it is easier to type it in the ASCII input file and then copy and paste it in the Name Prefix field instead of typing it in the Name Prefix each time. This also maintains consistency in the naming of the descriptions.



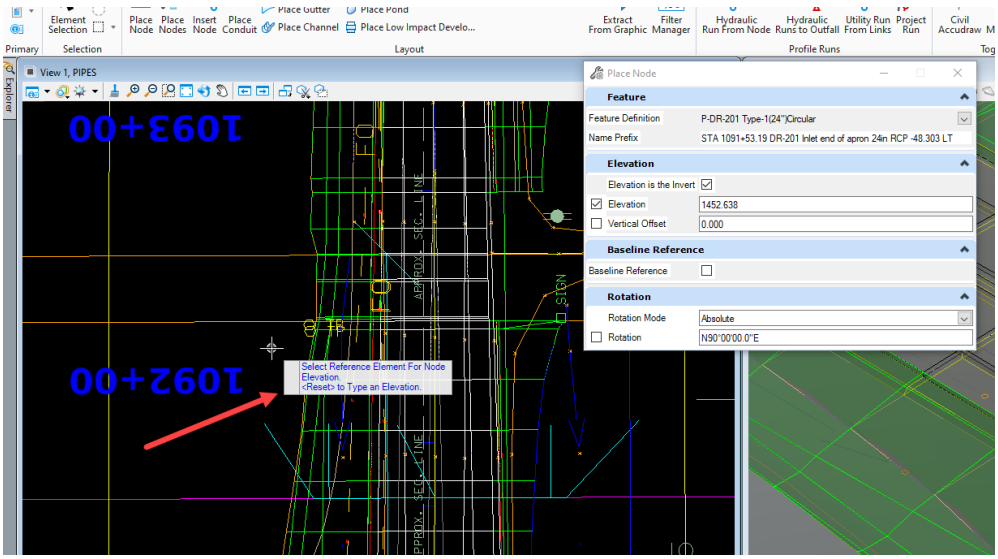
Last, define the invert elevation. The invert elevation is the elevation at the connection of the pipe apron and the first pipe section. For this example, it will be 1452.638



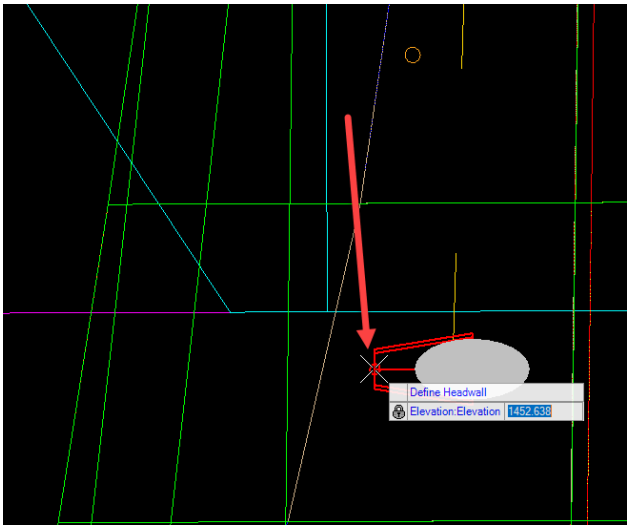
This can be copied from the ASCII input file then pasted into the field. Toggle on the Elevation is the Invert and the Elevation options.



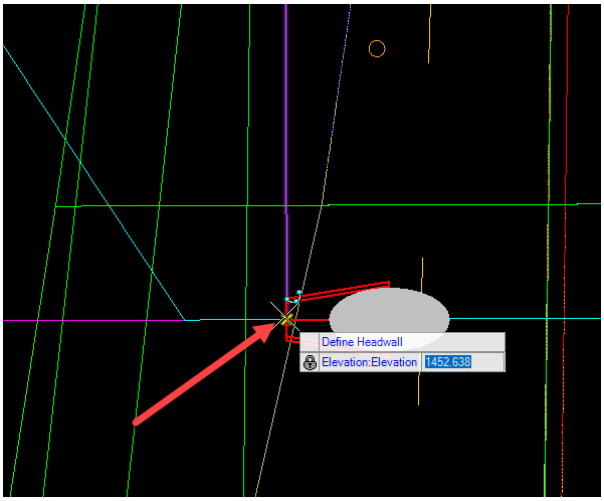
Once the settings are completed, it will prompt to select Reference for Node Elevation or <Reset> to type an Elevation.



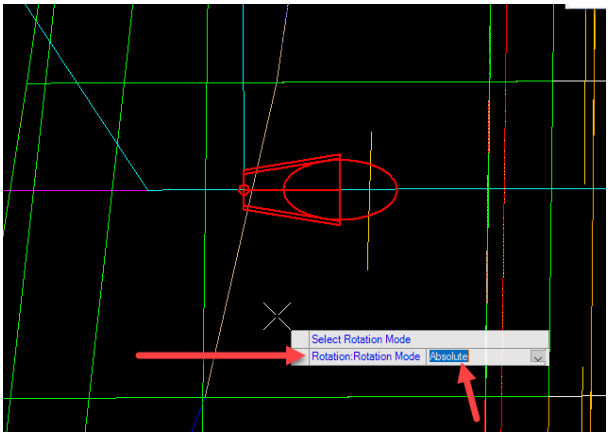
Reset with the mouse. Then the apron appears at the end of the cursor.



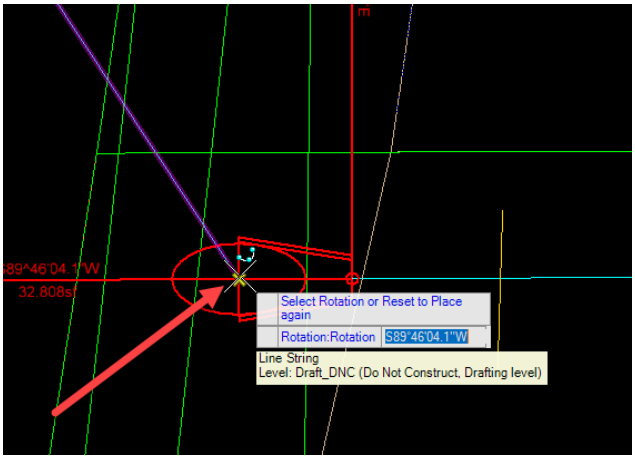
Next, snap to invert location that was mapped with the smart lines.



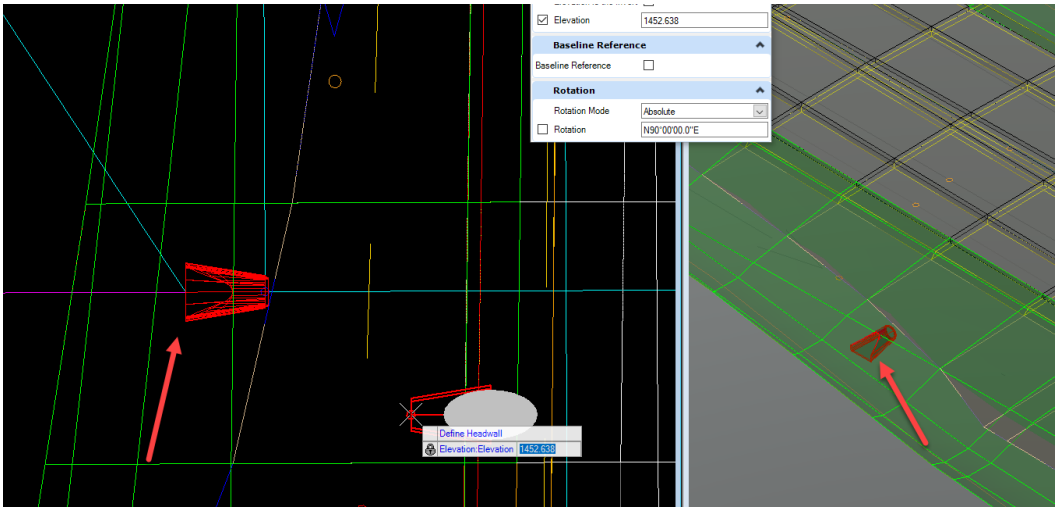
Then, it will prompt for the method to use to rotate. Select Absolute.



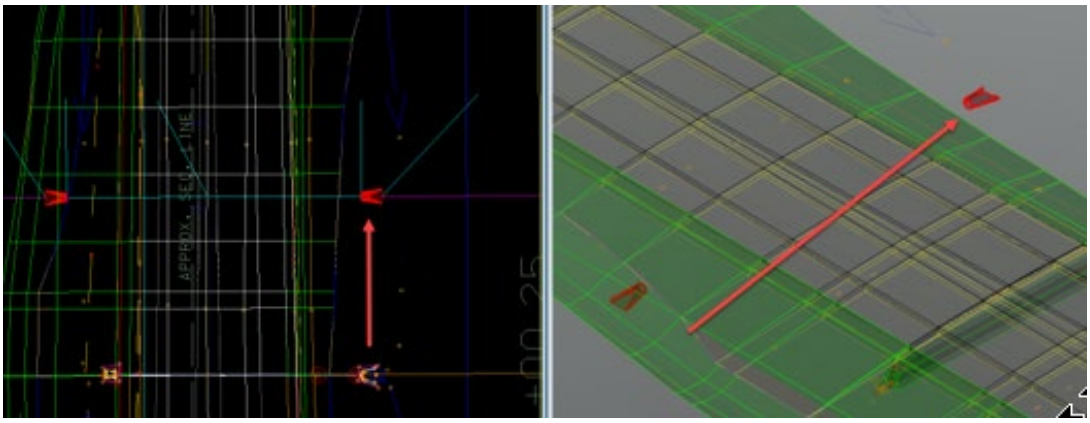
Next, rotate the apron to the smart line that represents the end of the apron.



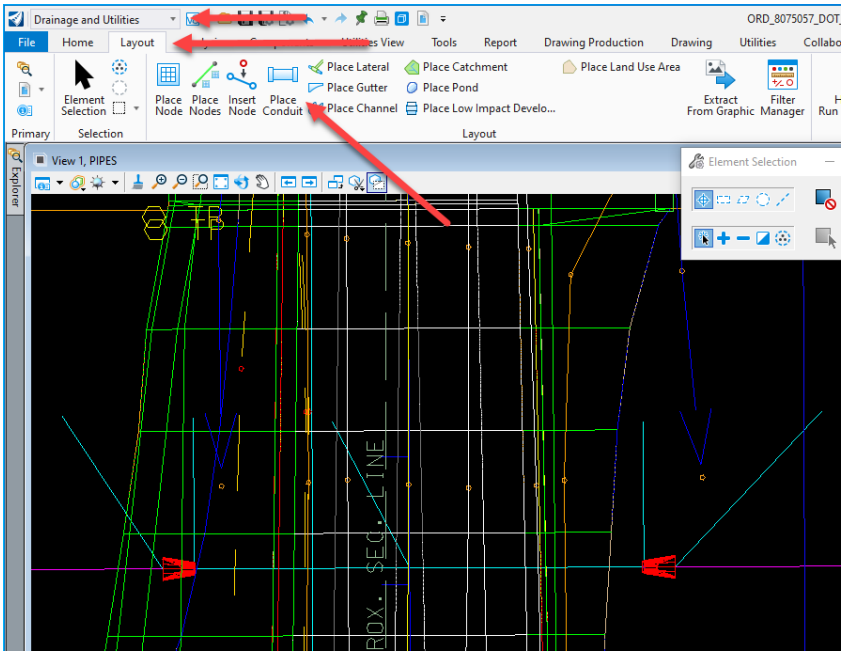
Data point to accept the rotation then DU will place the apron in the 2D and 3D model. It should look something like this:



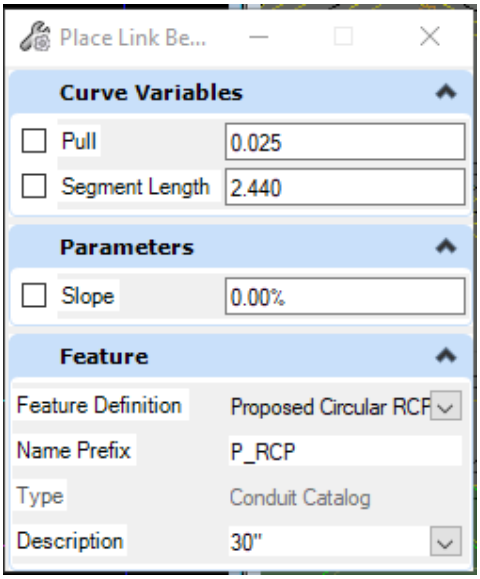
Hit the Esc key to exit the command. Next, repeat the process on the other end of the pipe to place the other apron.



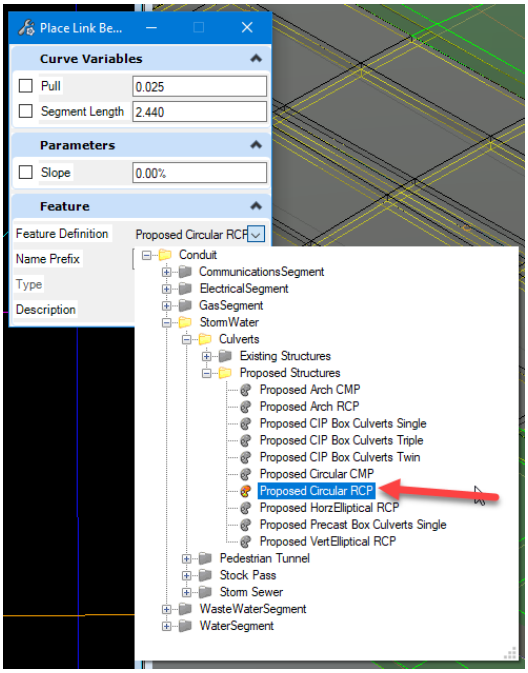
Once both aprons are placed, the pipe can be placed. To do this, use the Place Conduit tool located on the Layout tab.



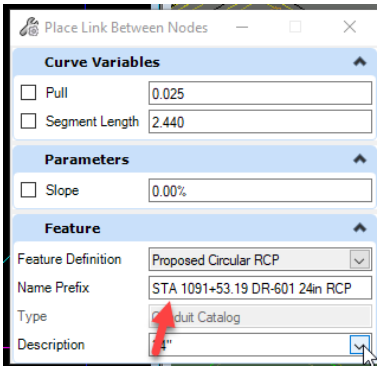
It will open the Place Link Between dialog box. Set the Feature Definition and Name Prefix and Description as Size of pipe.



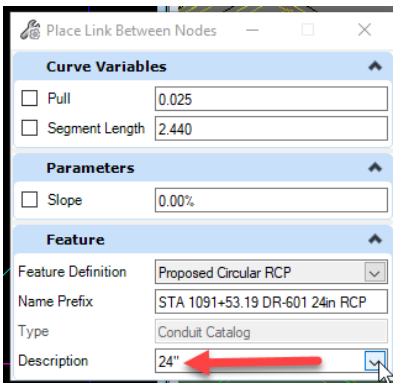
For this example, place a 24” DR-601 RCP by picking the Proposed Circular RCP feature.



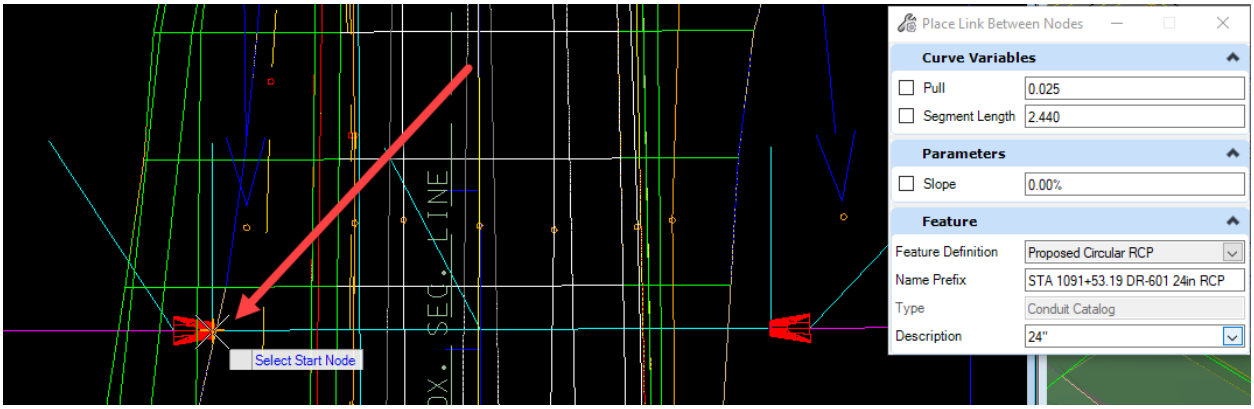
Next, place the Name Prefix. This will be a part of the description from the ASCII input file. It will consist of the Station, standard and description.



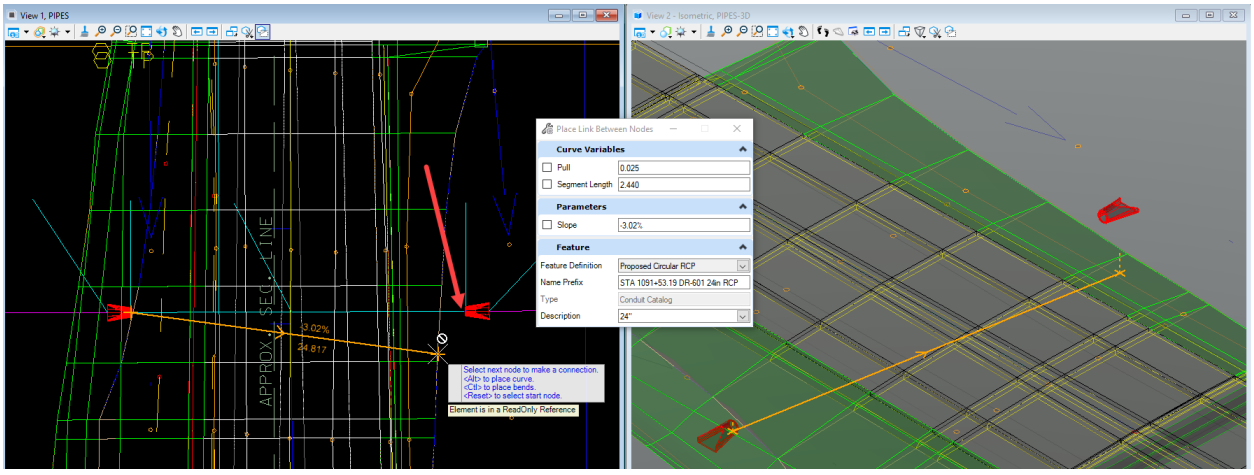
Next, Set Description as Size of pipe.



Then in the 2D window, find the inlet apron and select it as the Start Node.

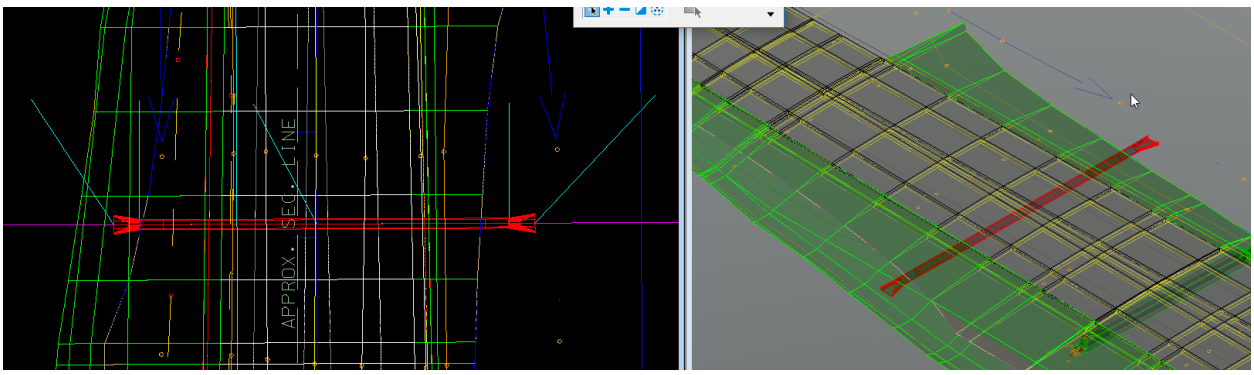


Then select the outlet to complete the pipe.



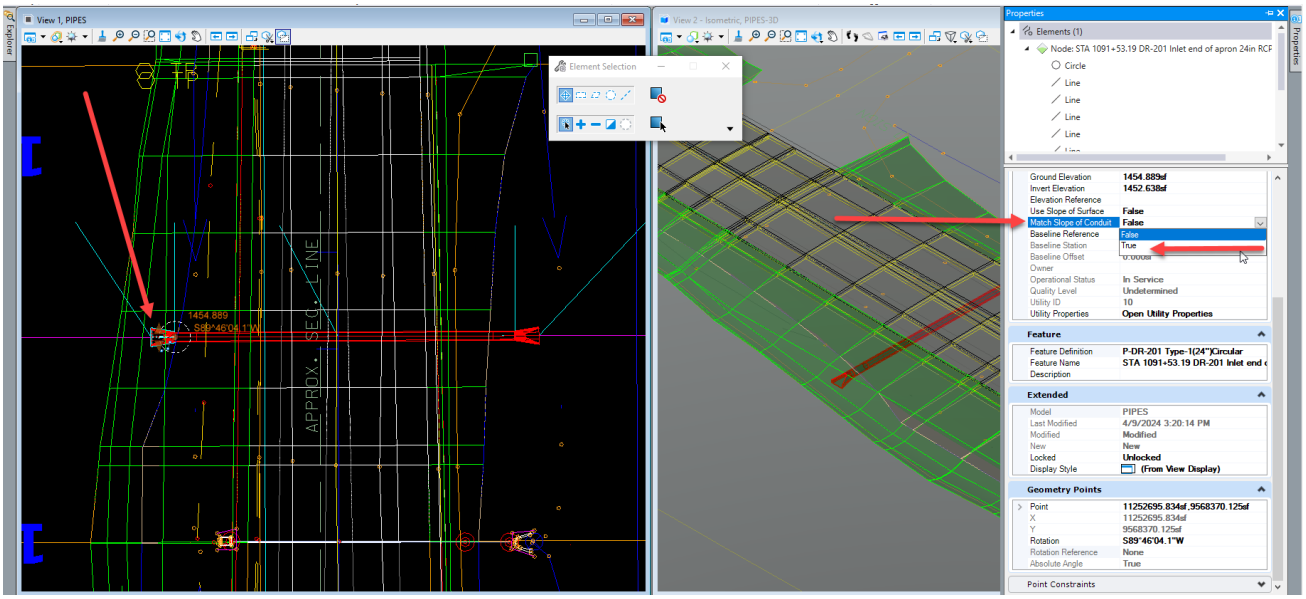
It will model the pipe in the 2D and 3d model at the same time.

When done, it should look something like this:



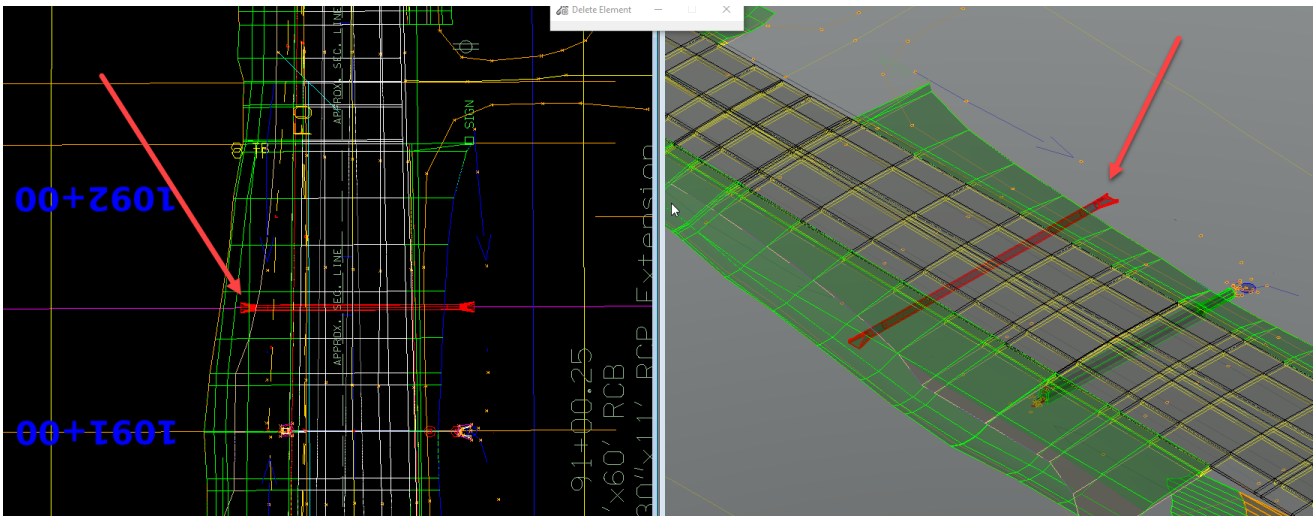
The last step in modeling the pipe is to set the aprons to Match Slope of Conduit. To do this, select the 2D apron node in the 2D model and open the Properties window. Then set the Match Slope of Conduit

field to True. Complete for each end of the pipe. This will rotate the apron to match the pipe in elevation.

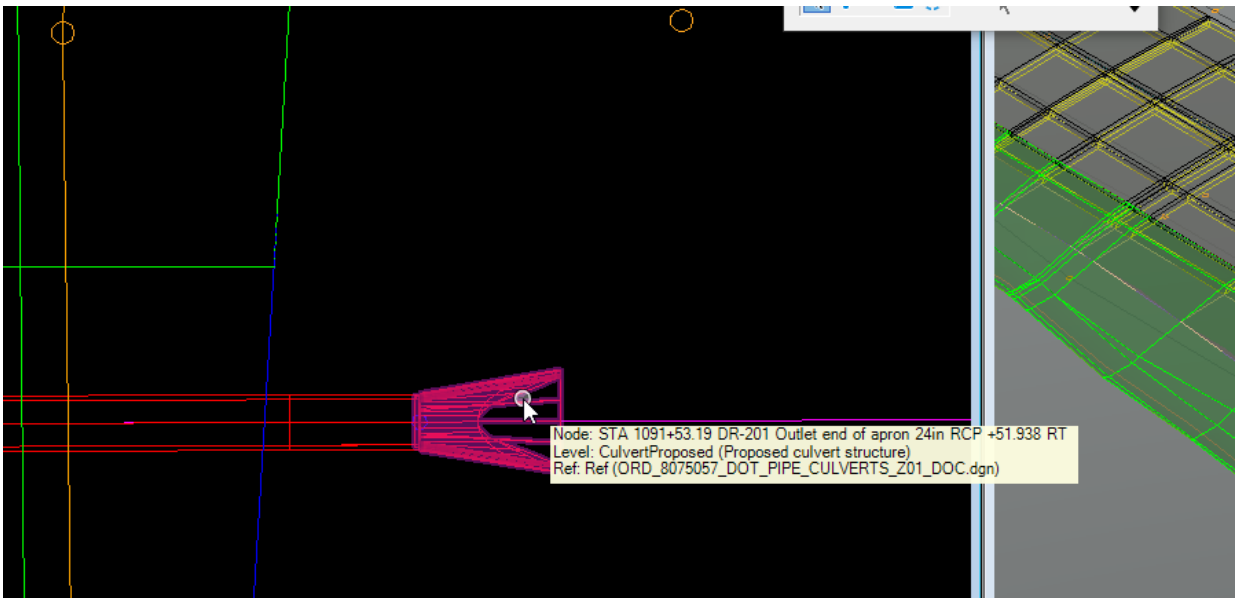


Once the pipe is modeled correctly, delete the smart line created to model the pipe.

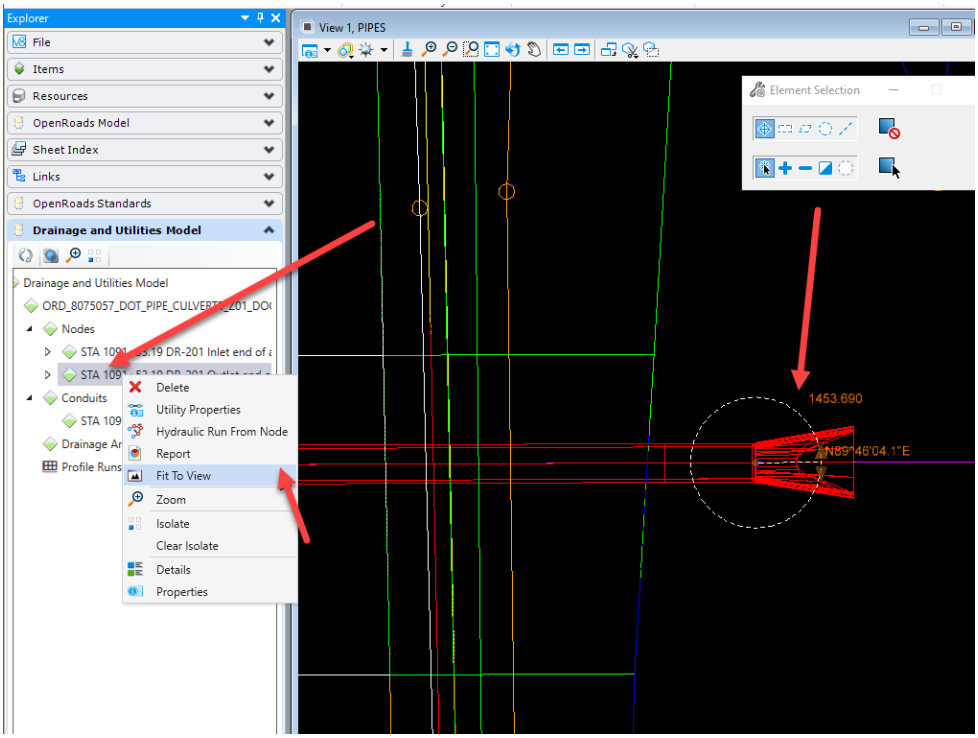
It should look like this:



The advantage of entering the proper Name Prefix is that when hovered over the pipe or aprons will display the Name Prefix making it easier to use the file.



Also, when changes to any of the pipes are required, access the pipe information thru the Explorer tool. It is more efficient to find pipes in large corridor projects by selecting the item in Explorer then right clicking and selecting Fit To View. This will zoom the view to that item.



Continue to the cross section creation.
[PW04 Making Pipe X-section Sheets]