Module 6

Initial Corridor Modeling

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Module 6 – Initial Corridor Modeling

About this Practice Workbook...

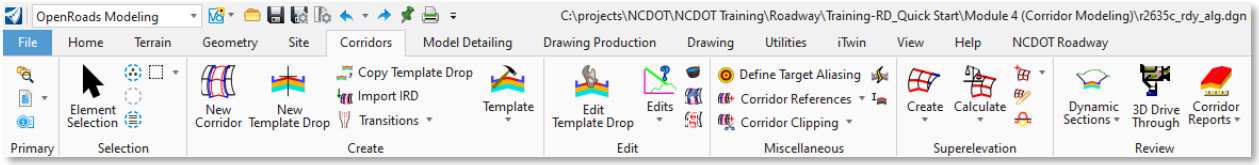
- The Module 6 - Initial Corridor Modeling.zip file will be provided for download.
- Extract the zip file to the root C:\
- All files are then automatically extracted here:
  C:\NCDOT Training\Roadway\Module 6 - Initial Corridor Modeling
- Module 6 - Initial Corridor Modeling PDF will also be located here.
- This PDF file includes bookmarks providing an overview of the document. Click on the bookmark to quickly jump to any section in the file. You may have to turn on the bookmark function in your PDF viewer, such as Adobe Reader.
- The dataset used throughout this module uses English units and US Survey Feet.
- Each module in this series is self-contained. You can jump to any section and begin the exercises.
- The ***NCDOT_WorkSets.inp*** on your desktop should be set to the following variables:
  - **NCDOT_USE_LOCAL_WORKSETS = L2**
  - **NCDOT_UNIT_TRAINING_WORKSETS = Roadway**
- This training module uses the **DOT-US North Carolina** WorkSpace, **R-2635C (Training)** WorkSet and **NCDOT_Roadway** Role. It is very important that you select the correct WorkSpace, WorkSet and Role.
- The color of the **Curb ang Gutter** and **Monolithic Island** changed from red to blue during the workbook creation. Screen shot color in this workbook is different from the WorkSpace.
- **This workbook was written with the release of OpenRoads Designer 10.10.XX.XX (2021)**
  OpenRoads Designer 2021 R2

Table of Contents

Overview

The intent of Initial Corridor Modeling is to “push” a template along a corridor to draw the base design elements into a 2D model for plan production while also producing a basic 3D model within the same dgn file. Corridor tools are accessed by selecting the Corridor Ribbon as shown below.

Corridor Ribbon



OpenRoads Designer Corridor Modeling Workflow

OpenRoads Corridor Modeling workflow is summarized below.

1. Create mainline CMD file using the provided NCDOT 2D Design seed file
2. Attach the existing terrain model (ETM) & the proposed geometry file (ALG)
3. Set the existing terrain model to be the active terrain
4. Develop and/or define templates for project
5. Create a corridor using the Horizontal and Vertical geometry that resides in the ALG file
6. Add template drop(s) based on project corridor specific typical sections
7. Make additional adjustments to your template(s) points based on project specific needs. These changes can be made using parametric constraints, point controls, and feature constraints. (optional)
8. Assign superelevation information to your project corridor (optional)
9. Process corridor
10. Review corridor in 2D,3D and Dynamic Cross-Section views and make any necessary revision

Notes:
This is a brief summary for a general workflow and is for informational purposes only. The exercise that follows provides more detail and is specific to the **Initial Corridor Modeling** Training.

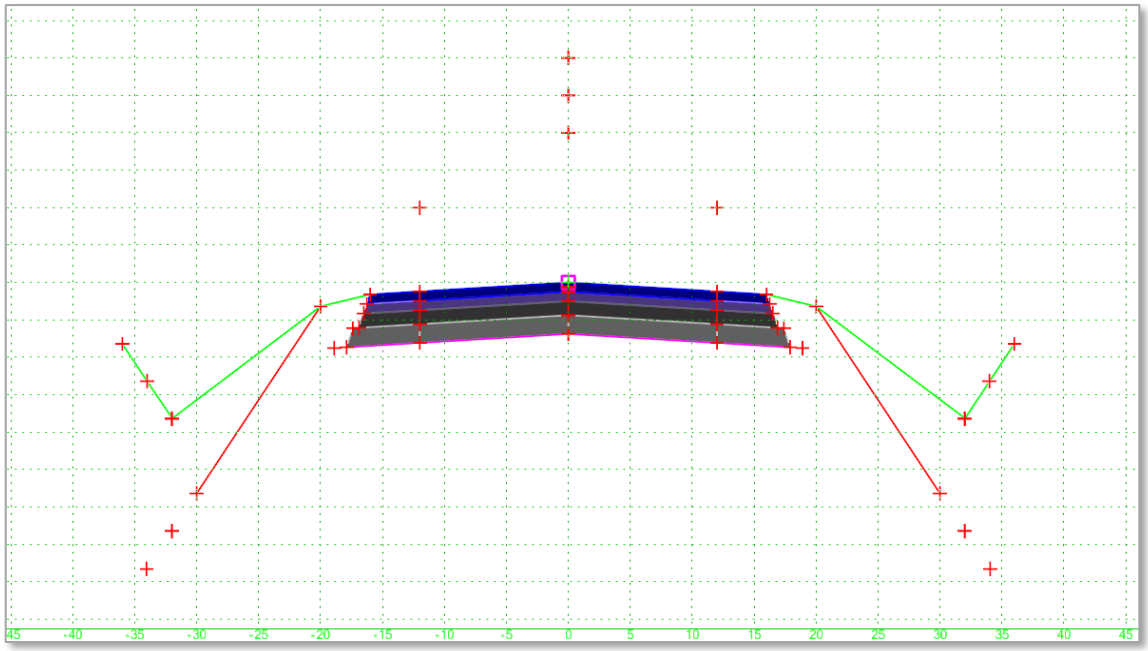
NCDOT recommends a maximum Corridor length of 1.5 miles. For larger projects, it may be necessary to break the project corridors up in order to accommodate this recommendation.

Corridor File Summary

Each Corridor DGN (CMD) file consists of both 2D and 3D views within a single DGN file. The 3D view includes all elements that have a vertical elevation associated with it. The user will be working exclusively in 2D to produce a Three-Dimensional model. The 2D view could be described as an interface used to develop and edit a 3D model. Once the corridor/3D model has been processed, 2D linework is generated as a by-product of the model itself and can be used for plans production. The 2D view and 3D model are co-dependent of one another.

Templates Summary

A template is fundamentally a typical section that is "pushed" along an alignment to create a proposed 3D model as well as 2D base design elements required to produce a set of plans. An example of an NCDOT template for a 2-lane undivided facility with shoulders is shown below.



Templates are stored in a template library (.itl) file and are made up of points, components, and end conditions. Generally, you will be working with a few template libraries at any given time: a workset template as well as a standards template library. The standards template library or libraries may contain pre-configured templates and/or components for building templates which can be copied from the standards library to the project specific workset template library as needed.

Standard NCDOT Corridor template library locations are shown below:

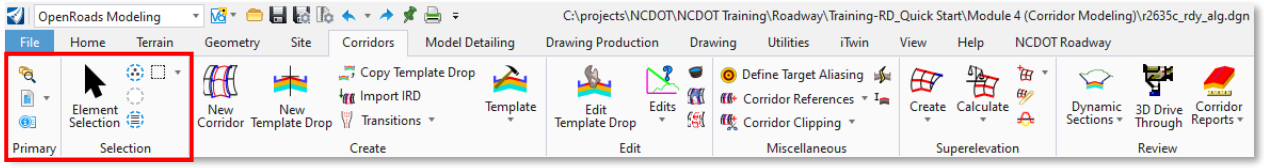
- Standard **NCDOT Roadway Corridor Template Libraries** are contained in the following folder:
  …\Configuration\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Template Library
- The **Workset Template Library** should be stored in the same folder as the CMD file itself.
  …\Roadway\Design

Corridor Ribbon Summary

The Corridor Modeling toolset is a group of highly interactive commands to create new design surfaces that represent a new roadway or other type of surface. Tools for creation, modification, management, and report functions are supported. The Corridor Ribbon tab is broken up into seven (7) groups.

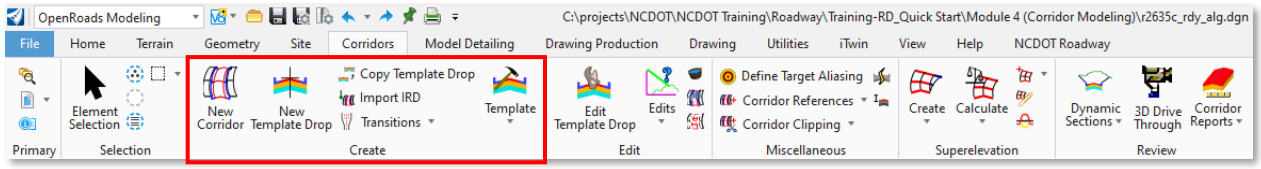
Primary & Selection

These two (2) groups are displayed throughout the ribbon, irrespective of which tab is selected.



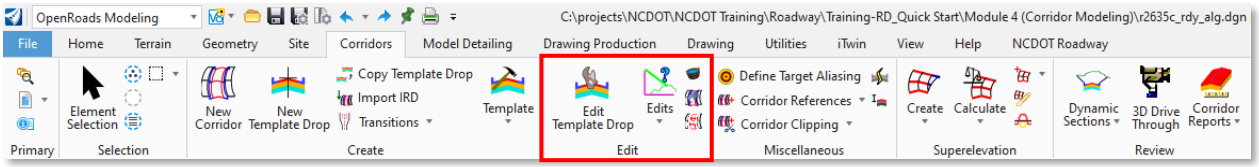
The **Primary** group is a launch point for commonly used tools and the **Selection** group is used to select and deselect elements for modification or manipulation.

Create



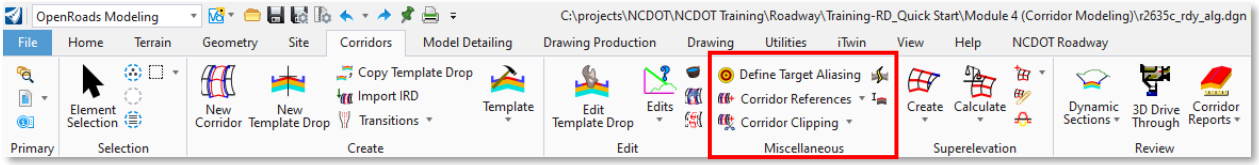
The **Create** group is used when starting a corridor design and includes tools for creating corridors, template drops, and transitions, along with various tools for working with the template library.

Edit



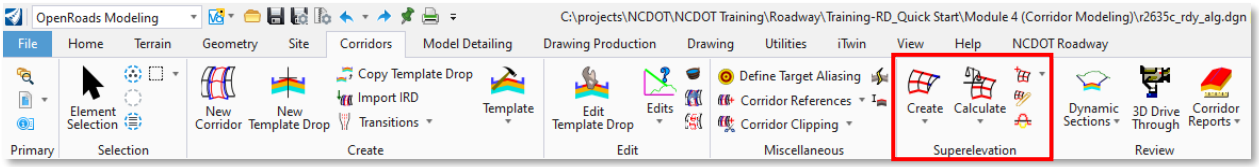
The **Edit** group contains tools for editing a previously created corridor and associated template drops. These tools enable the user to refine the model by adding more detailed information to respond to project-specific requirements and constraints. The **Corridor Objects** dialog can be accessed here which can be used to manage all corridor objects from one location.

Miscellaneous



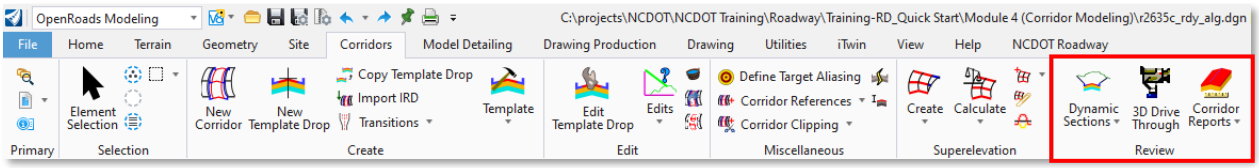
The **Miscellaneous** group contains additional tools meant for corridor manipulation.

Superelevation



The Superelevation group contains tools for creating, calculating, and editing superelevation lanes. Tools are also supported for importing CSV data and reporting.

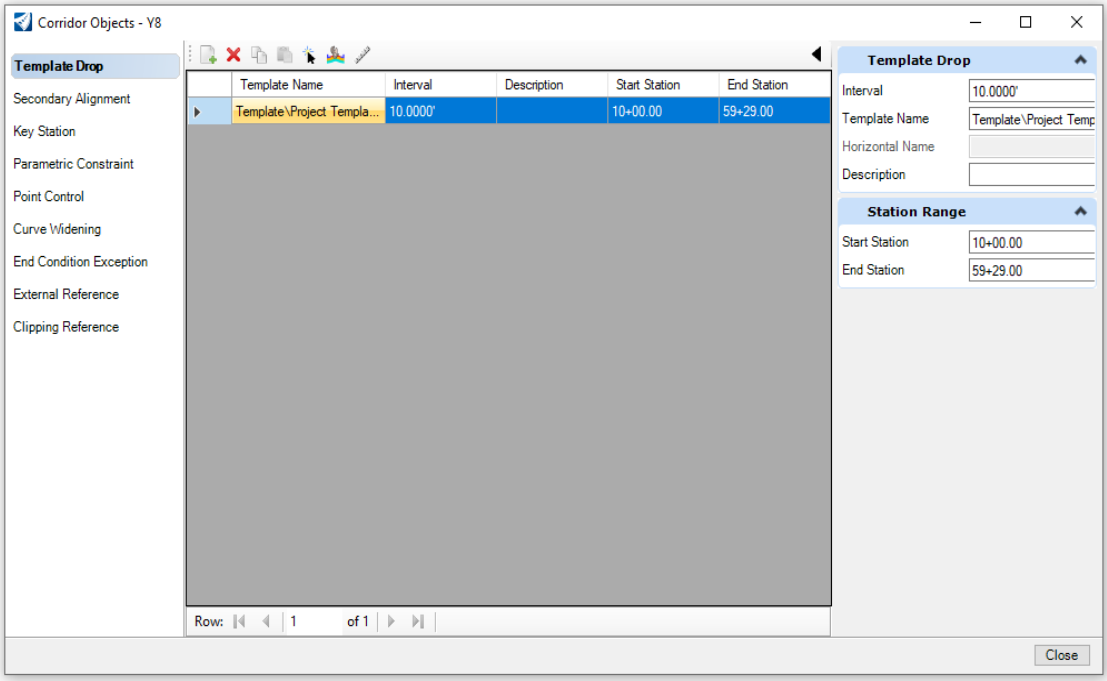
Review



The Review group contains tools used to analyze and report on corridors/3D models. The Dynamic Sections tools will be used extensively throughout the life of a corridor. The models cross section view is accessed here.

Corridor Objects Dialog Summary

The **Corridor Objects** dialog is a summary of all corridor modeling objects and provides an efficient method of managing data. Clicking on the various categories located on the left side of the dialog displays the appropriate data in the center section. Clicking on a single line in any display places the information to the layout at the right side of the dialog, where much of the information may be edited. The **Corridor Objects** dialog can be accessed from the ribbon **(Corridors > Edit > Corridor Objects)**.



Feature Definition Summary

Feature Definitions are used to control symbology, annotation, and various other properties that are applied to the geometric elements.

- Define what the geometric elements actually are. What is being modeled such as curb, centerline, edge of pavement, etc.
- Control symbology in various views, including capability to define differing symbology in plan, profile, and 3D spaces
- Define surface display characteristics
- Define terrain modeling attributes (spot, break line, void, etcetera)

Initial Corridor Modeling Exercise

In this exercise, you will learn how to create a corridor using pre-defined horizontal and vertical geometry. You will learn how to create/review/edit a corridor, assign template drops, use parametric constraints, and access the dynamic cross section view of your corridor. You will also be introduced to the corridor objects dialog. Throughout this exercise, all design and corridor manipulation will be performed exclusively within an NCDOT 2D dgn file.

1. **Launch OpenRoads Designer CONNECT Edition**

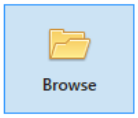
   Double-click on the NCDOT Roadway OpenRoads icon on your desktop to launch OpenRoads Designer into the NCDOT Roadway workspace.

2. **Set the Workspace and Workset**

   Select DOT-US North Carolina from the Workspace menu.
   Select NCDOT R-2635C (Training) from the Workset menu.

3. **Open the Y11 Corridor (CMD) dgn file**

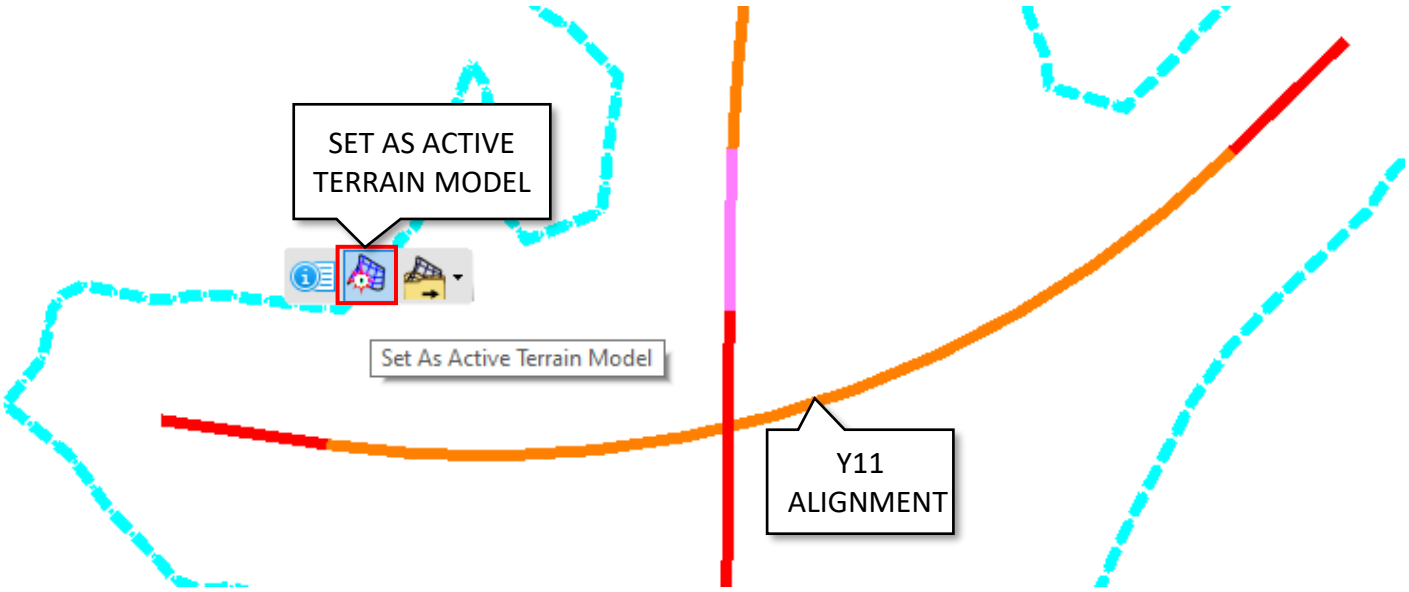
   Click the browse button and path to the C:\NCDOT Training\Roadway\Module 6 - Initial Corridor Modeling\Roadway\Design\ **Module 6 (Initial Corridor Modeling)** folder and open the R-2635C_RDY_CMD_Y11.dgn file.



4. **Attach Files required for Modeling the Y11 Corridor**

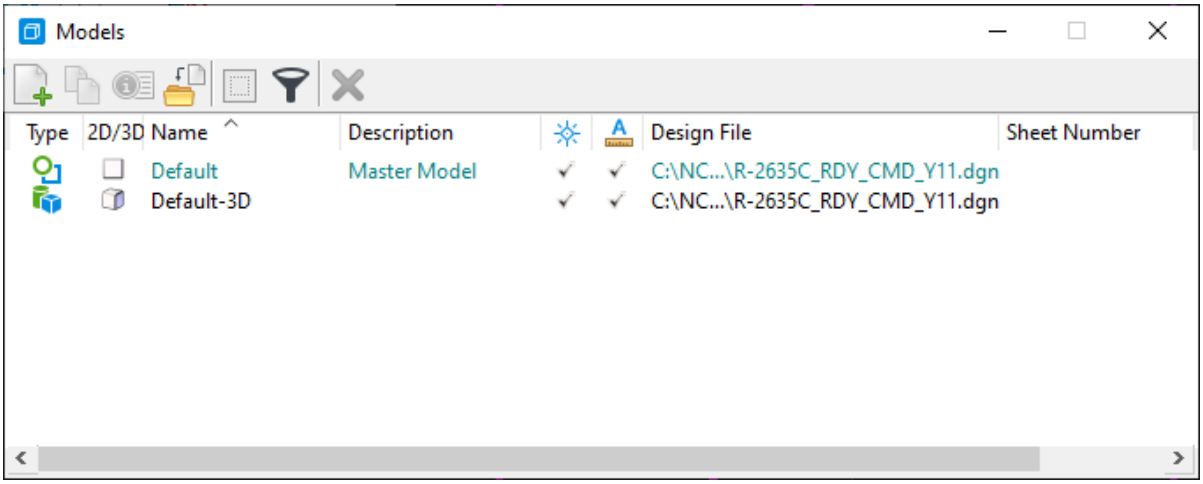
   A. Click the **References** button (**Corridors > Primary > References)** and the references dialog will open.
   B. Attach the following dgn files to your Corridor (CMD) file using the references dialog:
      - …NCDOT Training\Roadway\Module 6 - Initial Corridor Modeling\Final Survey\ R-2635C_RDY_ETM.dgn
      - …NCDOT Training\Roadway\Module 6 - Initial Corridor Modeling\Roadway\ Alignment\R-2635C_RDY_ALG.dgn

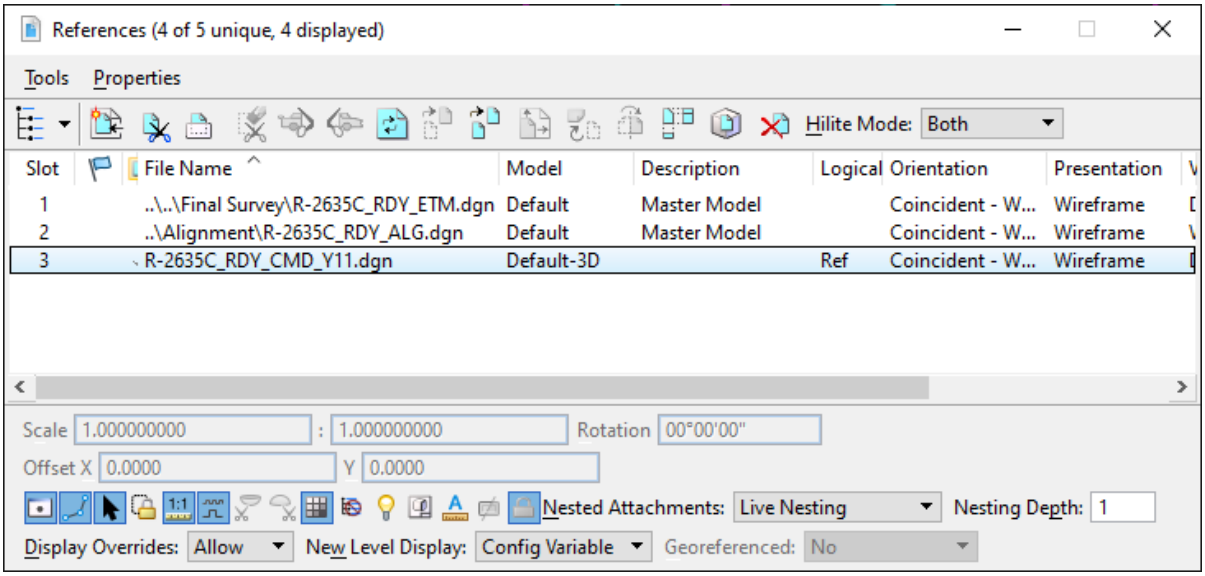
5. **Set the Existing Terrain Model to be the Active Terrain**
   A. Zoom-in near the **Y11** alignment as shown below.
   B. Click on the existing terrain boundary (shown in blue below) and hover for a few moments. Notice that a context menu with three (3) tool icons is displayed.
   C. Move your mouse over the **Active** icon tool and notice the display reads **Set As Active Terrain Model**.
   D. Click the **Active** icon tool and your existing terrain has now been set to the active terrain. (Note: this action can also be performed from the Terrain tab in the ribbon)



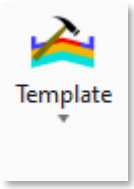
E. Click the **References** button **(Corridors > Primary > References)** and the **References** dialog will open as shown below.

F. A new model called **Default-3D** has been created and automatically attached as a reference file to the default 2D model. This occurs when an existing terrain model is set to active.



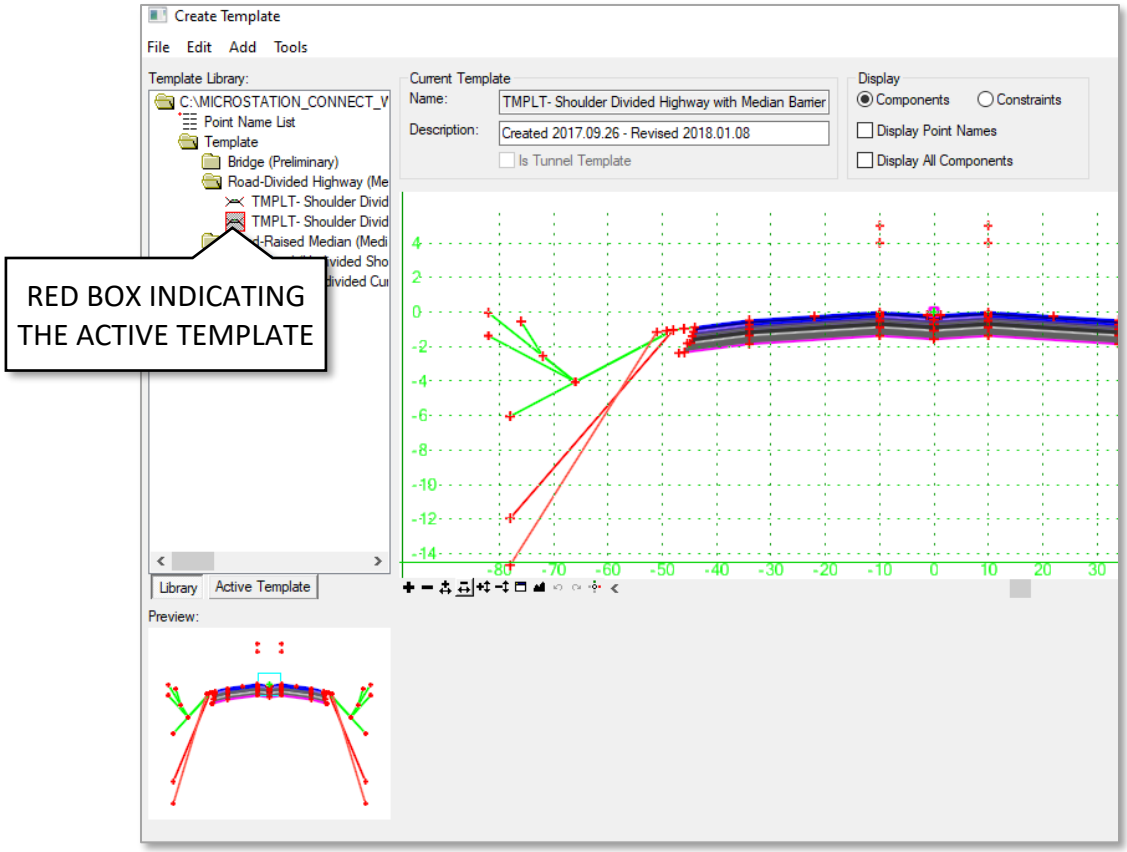


G. All elements that have an associated vertical property will now be visible in both the **Default** model and the **Default-3D** model. These elements will also be displayed in the default 2D view as well because the **Default-3D** model is attached. As you design in 2D, toggling the **Default-3D** model on and off using the **References** dialog can be very helpful to clean up the view.



6. **Set up Workset Template Library**
   A. Click the **Create Template button (Corridors > Create > Template > Create Template)**.
   B. The **Create Template** dialog will open. A workset template library will load by default if one exists. If one does not exist, the NCDOT_RDY_Standard_Templates.itl will be loaded instead. In our case, a workset template library does not exist and will need to be created.

      Note: The workset template library must follow the standard **NCDOT** naming convention and must be located within the workset template library folder as defined by **NCDOT**.



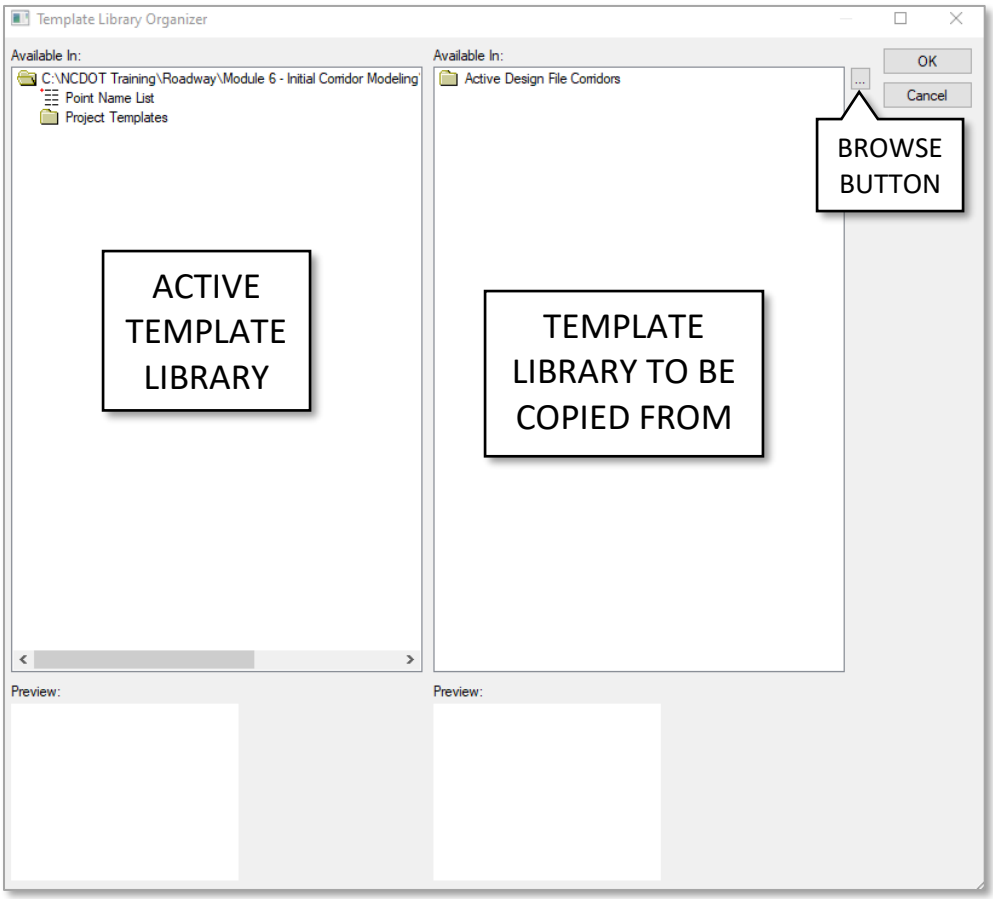
   C. From the **Create Template** dialog shown above, click **(File > New > Template Library)** and path to the C:\NCDOT Training\Roadway\Module 6 - Initial Corridor Modeling\Roadway \Design folder. Type NCDOT_Roadway_R-2635C (Training).itl in the file name dialog. You have now created the workset template library for this module. This workset template library will now be loaded by default, the next time the workset is loaded.

D. From the **Create Template** dialog, click **(File > New > Folder)** and create a Project Templates folder. Project specific templates should be stored and managed from this folder.

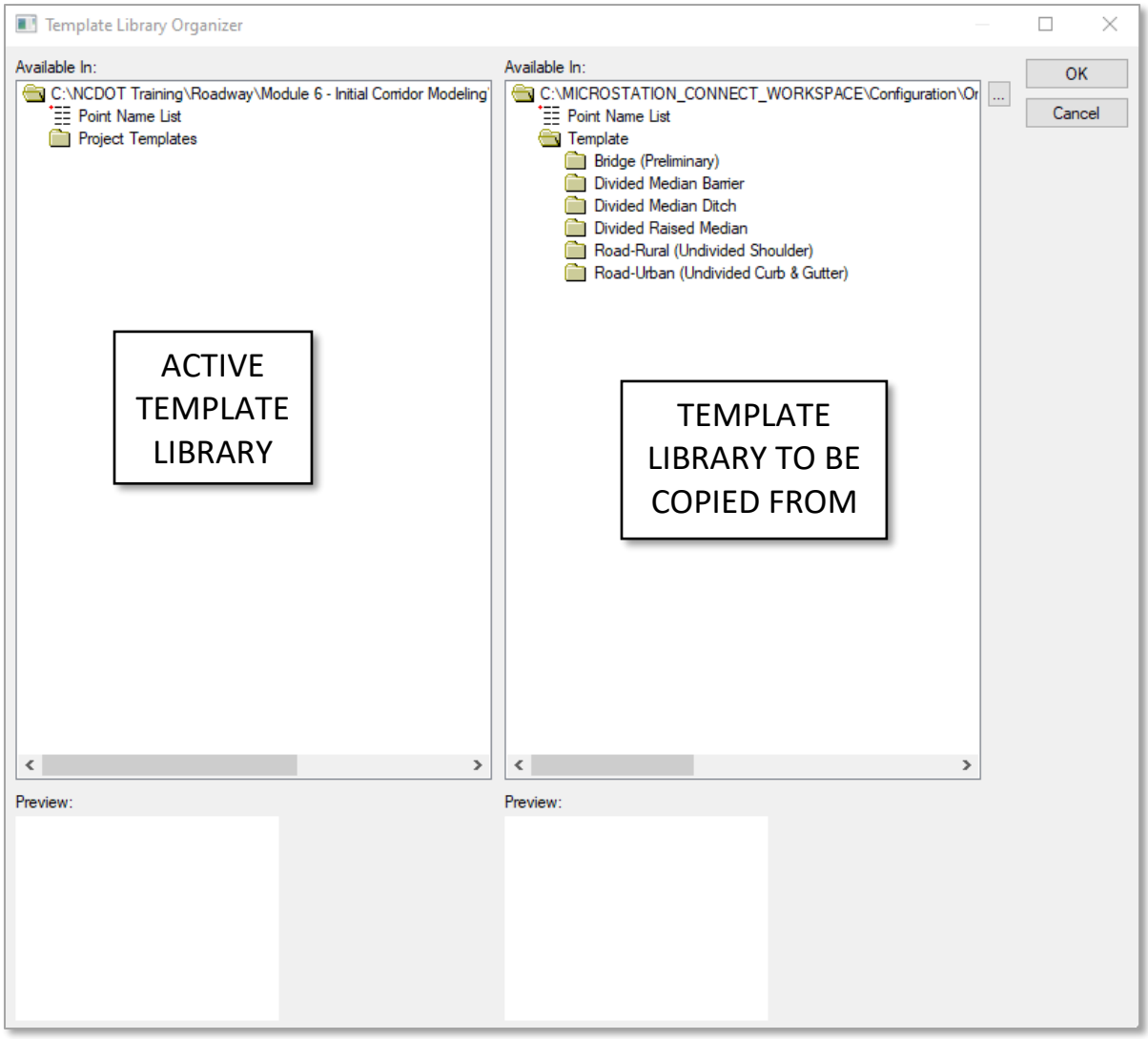
E. **Module 5** will be focused on the **-Y11-** alignment and require two (2) templates. The UF - 1+1 Lanes - LDSS template and the TMPLT- Bridge Dual Lane template. Both can be copied from the NCDOT_RDY_Standard_Templates.itl using the **Template Library Organizer**. The **Template Library Organizer** can be accessed by clicking **(Tools > Template Library Organizer)** from the **Create Template** dialog menu.

Note:
The **Template Library Organizer** is a tool that allows the user to copy templates from one template library to another. The **Template Library to be Copied From** is displayed on the right-hand side of the dialog, while the **Active Template Library** on the left-hand side of the dialog is the Library that the template will be copied to.

F. Once the **Template Library Organizer** dialog opens, click the **Browse** button as shown below.



G. Next, path to the C:\MICROSTATION_CONNECT_WORKSPACE\Configuration\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Template Library folder and select the NCDOT_RDY_Standard_Templates.itl file and click the **OPEN** button.



Notice that the NCDOT_RDY_Standard_Templates.itl folder structure is now visible in the preview pane on the right-hand side of the dialog.

H. Next, expand the Road-Rural (Undivided Shoulder) folder and then drag and drop the UF - 1+1 Lanes - LDSS template from the right-hand side of the dialog to the Project Templates folder under the **Active Template Library** on the left-hand side of the dialog.

I. Finally, copy the TMPLT- Bridge Undivided 1+1 template from the Bridge (Preliminary) folder to the Project Templates folder and click the **OK** button. When prompted to save data, select **Yes**.

7. Rename Project Templates to Coordinate with Y11 Corridor

A. Rename the UF - 1+1 Lanes – LDSS template to Y11_UF - 1+1 Lanes – LDSS template.

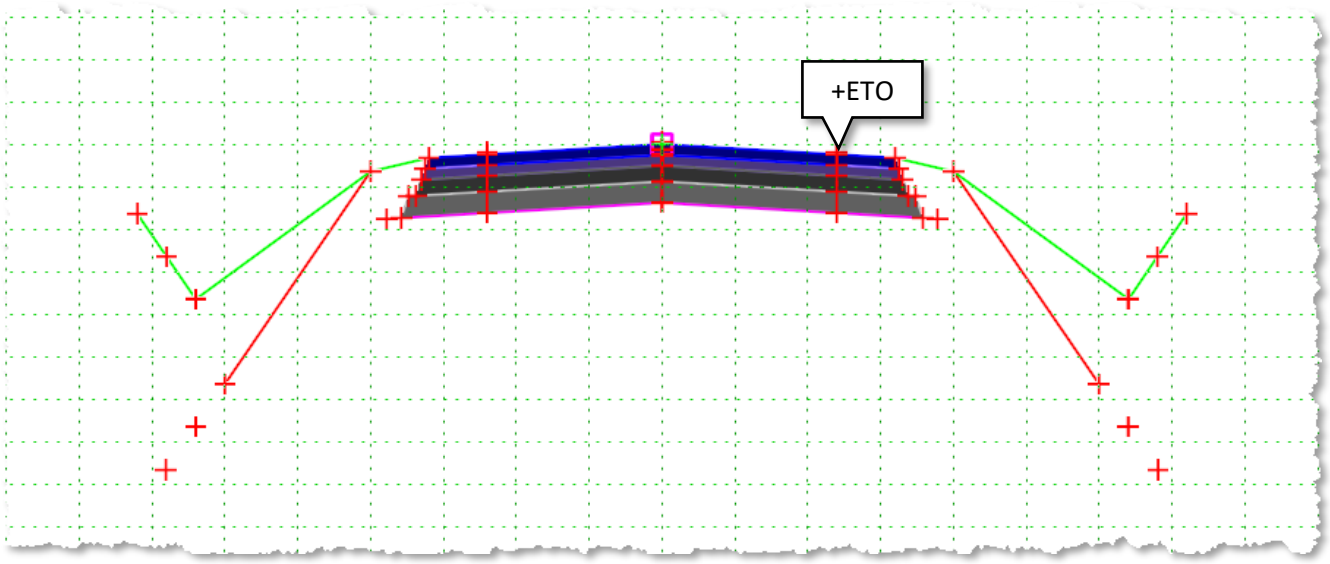
B. Rename the TMPLT- Bridge Undivided 1+1 Template to Y11_TMPLT- Bridge Undivided 1+1.

Note: The workset template naming convention should be discussed and agreed upon by the project team.

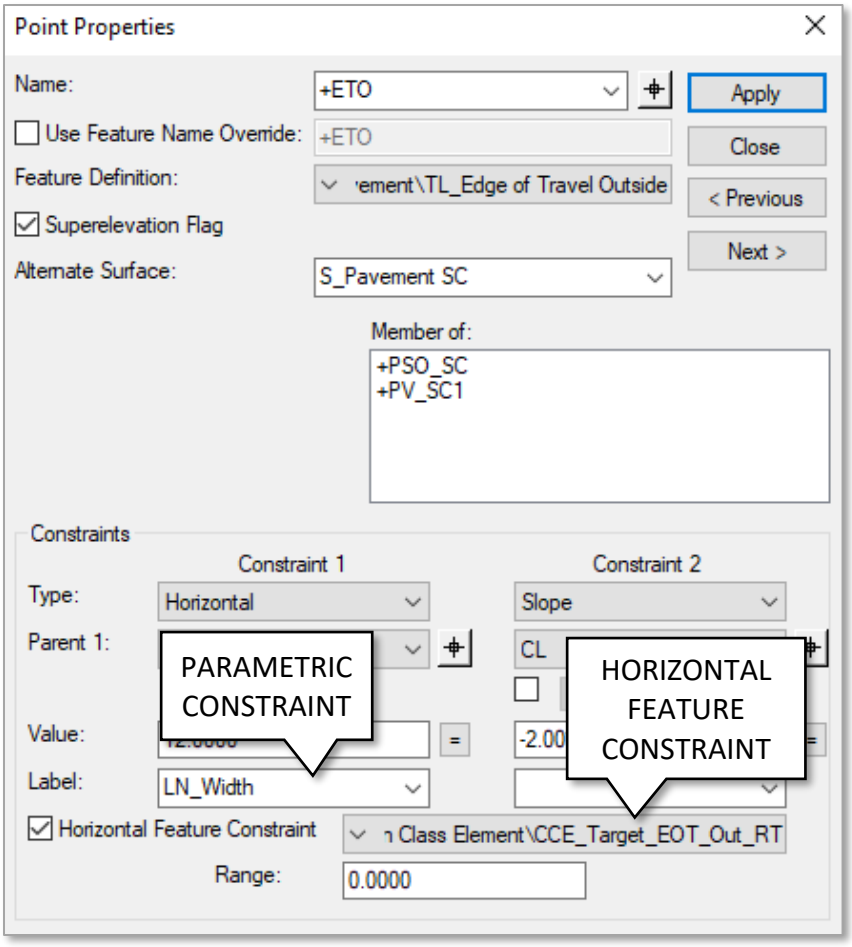
8. Review Project Template(s)

A. Double click on the Y11_UF - 1+1 Lanes – LDSS template under the Project Templates folder to make it active in the **Create Template** dialog box and then maximize the window to better examine it.

B. For this part of the exercise, you will be examining the **(+ETO)** point which is used to control the right-side edge of travel. To review the point properties, you must access the **Point Properties** dialog. This can be done by right-clicking on the point and selecting **Edit** from the dropdown or by simply double-clicking the point.



C. After double-clicking the **+ETO** point, the **Point Properties** dialog will open as shown below.



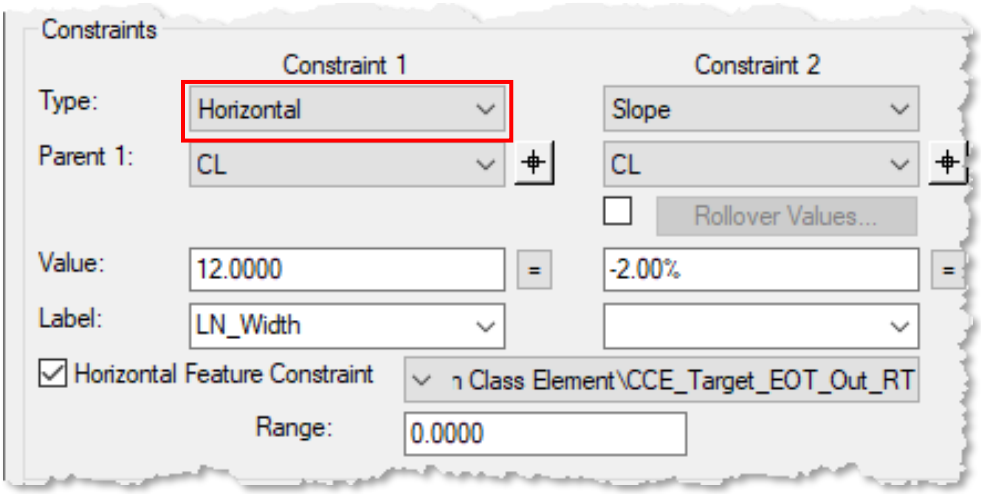
D. Two (2) template attributes that should be noted and considered throughout the entire modeling process are as follows:

- **Parametric Constraints** – redefinable variables that use the **Label** property defined on a points constraints to override the defined (default) value over a specified station range using the **Corridor Objects** dialog (**Corridor Objects** dialog will be covered in detail later in this exercise)
- **Horizontal Feature Constraints** – overrides the point constraints if a feature or alignment with a matching feature is found within a specified horizontal range

Both Constraints are used to define template point properties and can be accessed through the **Point Properties** dialog as shown above.

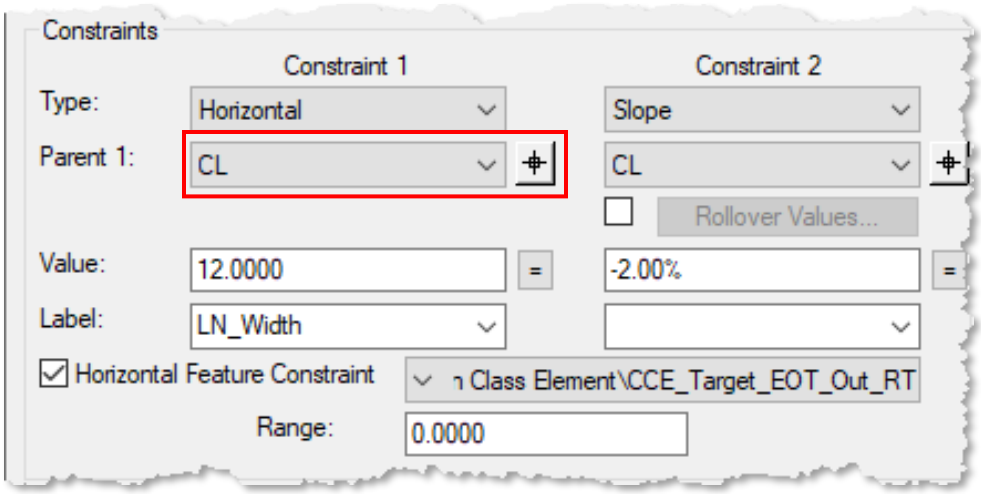
E. Notice the **Constraint 1** properties of the **+ETO** point shown below.

- **Constraint 1 Type: = Horizontal**



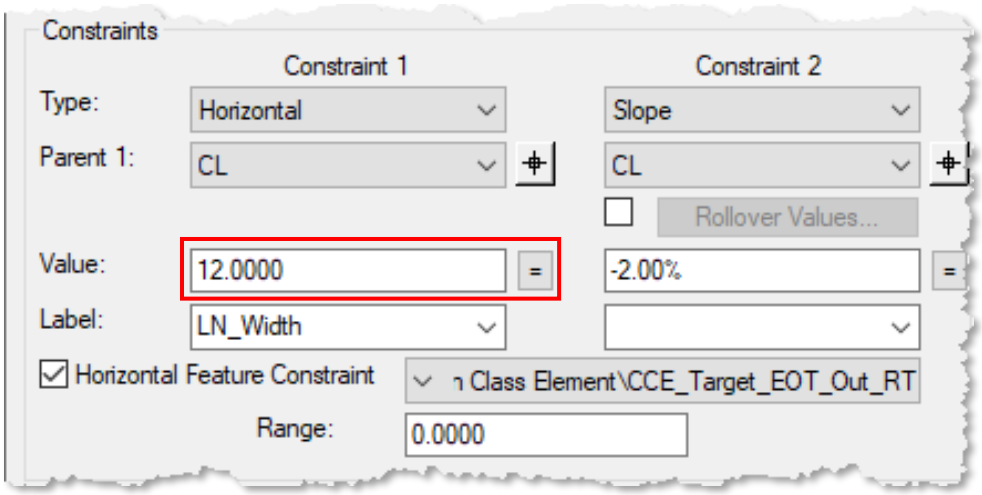
The **Type** property defines how a point is constrained.

- **Constraint 1 Parent 1: = CL**



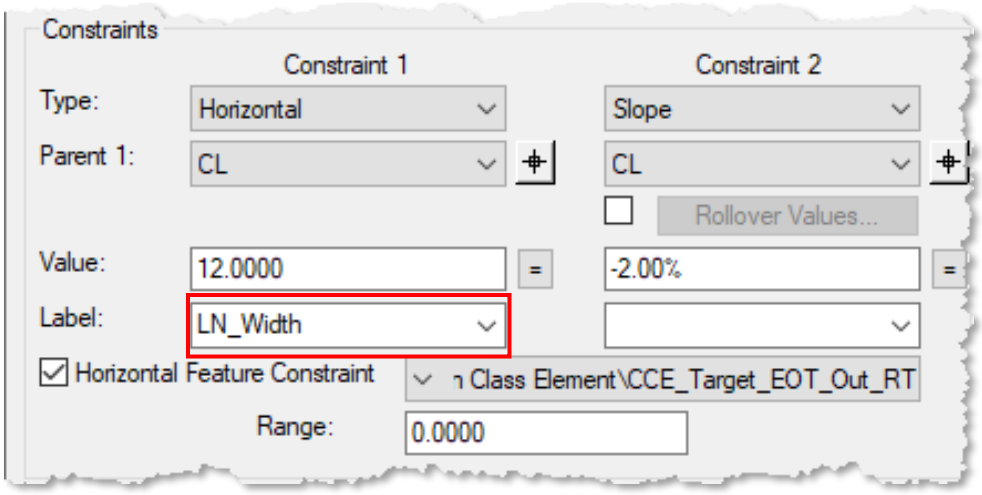
The **Parent 1** property defines the parent point of a constraint. Notice the **Target** icon to the right of the **CL** point. This indicates that a point can either be selected using the provided drop-down or directly from the template with a simple mouse click within the Template library.

- **Constraint 1 Value: = 12.0000**



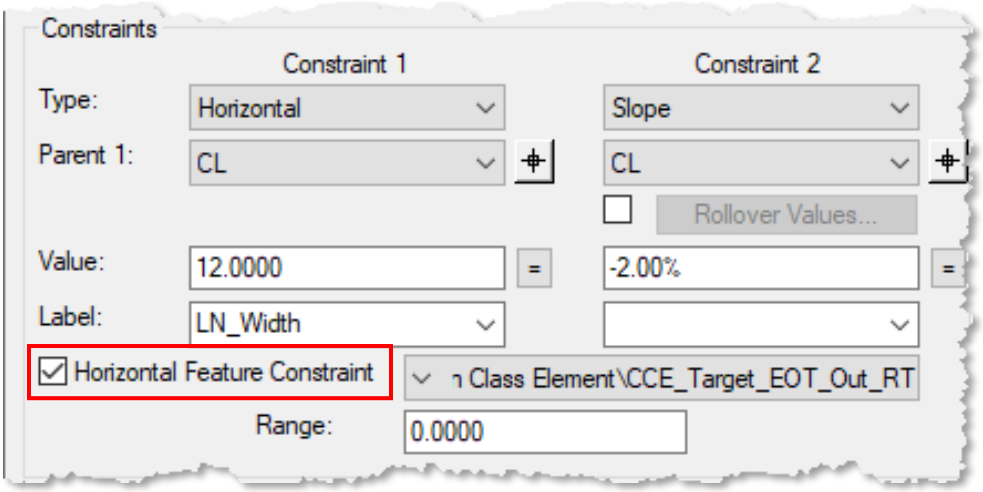
The **Value** property defines the default numeric value of the **+ETO** point as it relates to the **Parent 1 (CL)** point. In the example above this would indicate the **+ETO** point is 12’ to the right of the **CL** point. This default value can be redefined as needed per project specifications.

- **Constraint 1 Label: = LN_Width**



The **Label** property defines the name of the **+ETO** point’s **Parametric Constraint**. In the example above the value is set to **LN_Width .** This represents the name of a redefinable template variable that can quickly be changed as needed after the template has been applied to a corridor. This allows the user to override a default template value during design without having to modify the template itself.

F. Notice the **Horizontal Feature Constraint** checkbox for the **+ETO** point shown below:

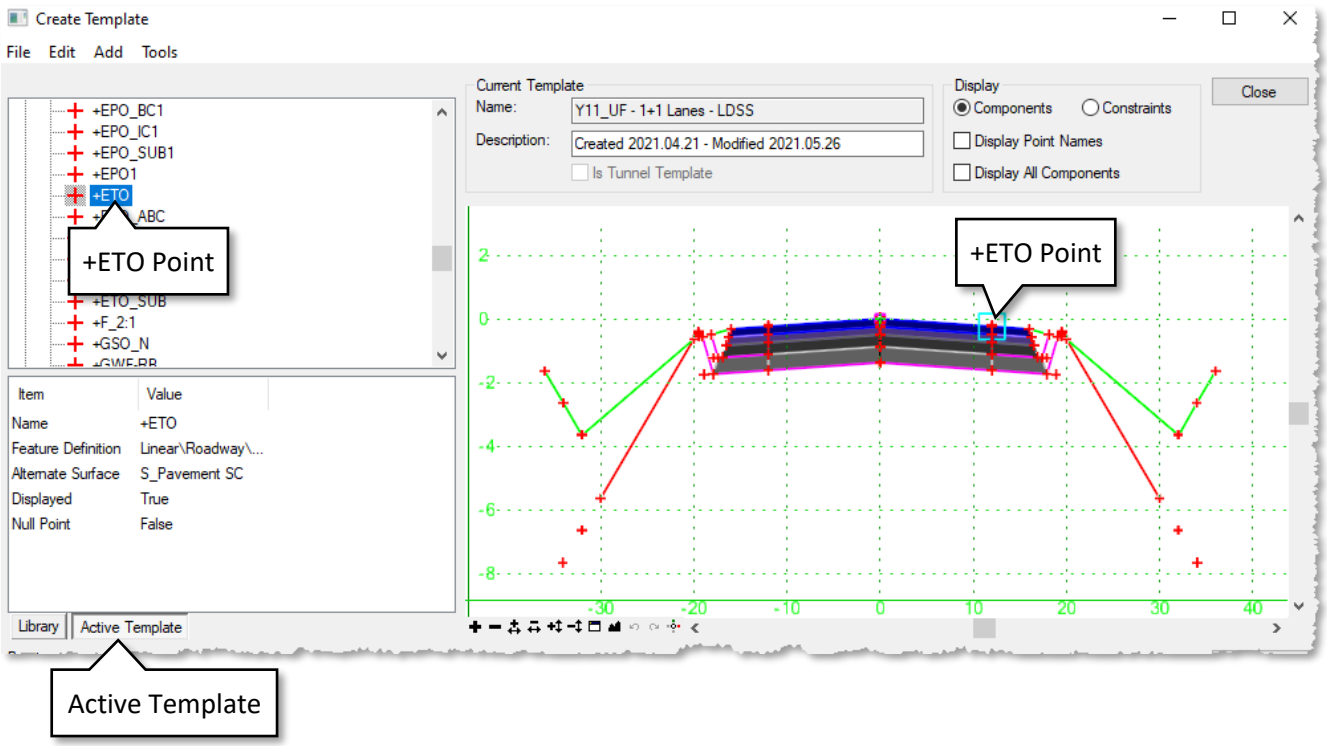


When the **Horizontal Feature Constraint** checkbox is marked, the template will search the corridor file for a pre-defined horizontal feature that is selected from the dropdown to the right. If that feature is located, the default horizontal point value will be ignored and follow the feature instead. In this instance the **Horizontal Feature Constraint** is **CCE_Target_EOT_Out_RT**. The **Range** value represents the horizontal distance that the template will search when looking for the defined **Horizontal Feature Constraint.** In this instance, notice that the **Range** value is set to **0.0000**. This value equates to an infinite search range.

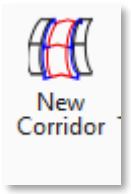
G. Close the **+ETO's Point Properties** dialog but keep the **Create Template** dialog open.

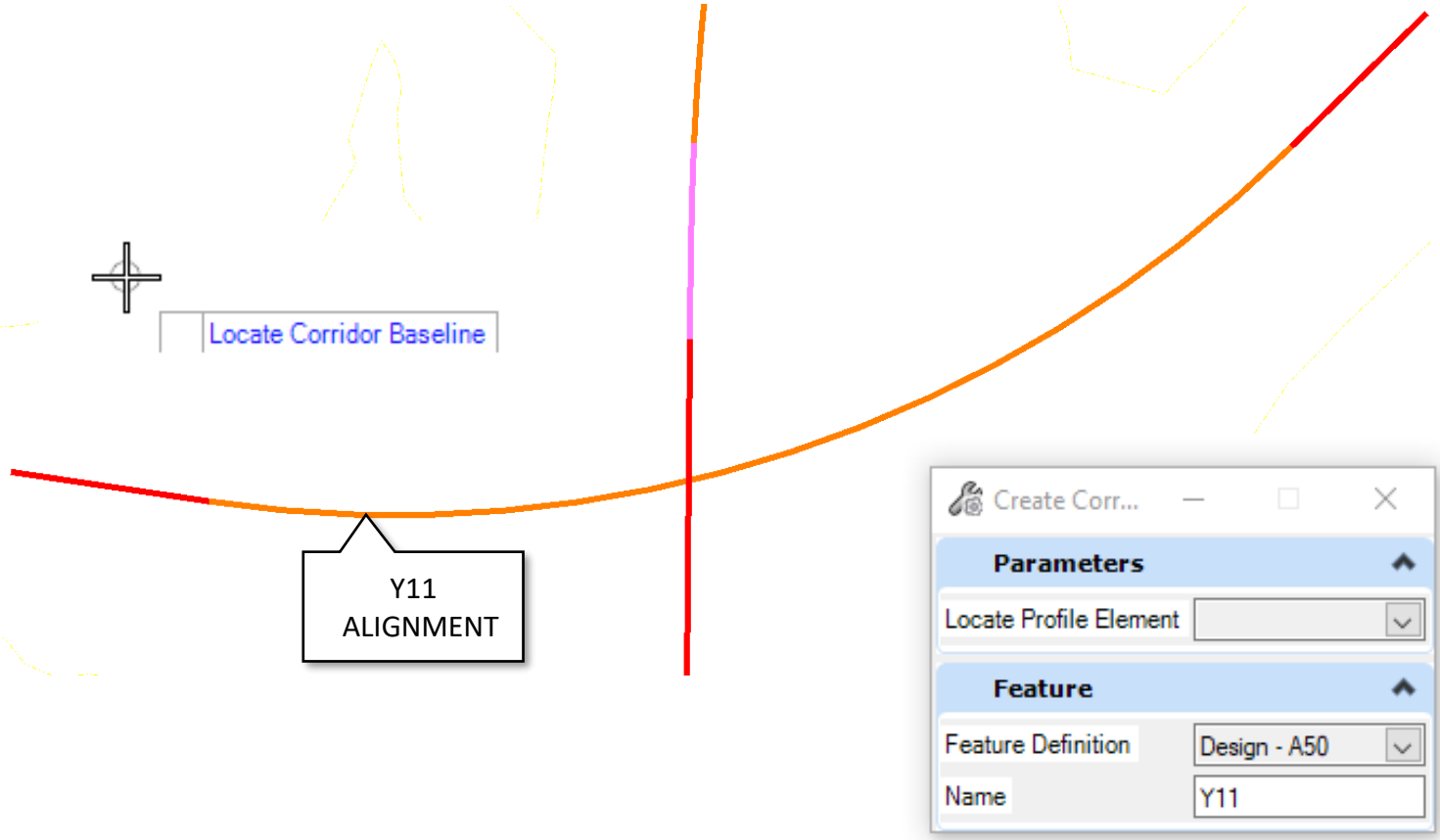
H. Template properties can also be accessed easily by selecting the **Active Template** tab. The template properties listed under the **Active Template** tab comprise information on every aspect of the active template including **Parametric Constraints** and **Template Points**. The **Active Template** tab is located near the bottom left corner of the **Create template** dialog as shown below.

I. Click the **+ETO** Point shown within the **Active Template** window and notice the **+ETO** Point is then highlighted blue in the **Create Template** dialog to the right.

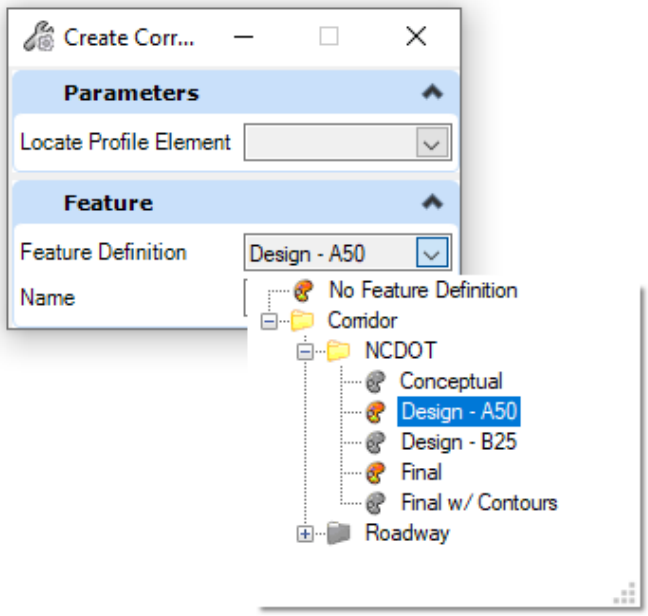


9. **Create a Corridor using the Y11 Baseline**
   A. Click the **New Corridor** button **(Corridors > Create > New Corridor)**. Notice the heads-up prompt displays **Locate Corridor Baseline.** A tool settings dialog box that corresponds with the heads-up prompt will also be visible. If you choose to provide information using the dialog box, the heads-up display will reflect your choices.





B. From the **Create Corridor** dialog box click on the **Feature Definition** dropdown as shown below. Notice the different feature definition options under the **NCDOT** folder. These are called **Design Stage** features. A **Design Stage** feature is selected when first creating a corridor and should be changed as the design progresses from **Conceptual** to **Final** design. Design staging helps to optimize a computers processing power by setting the level of detail a corridor requires per design stage.



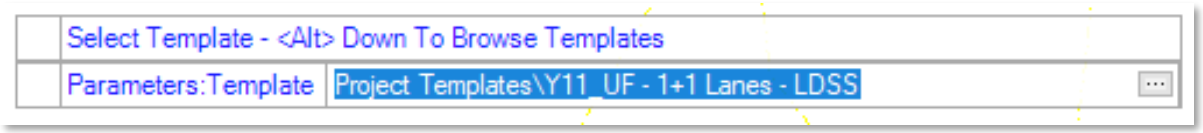
Corridor Feature Definition (formerly called Design Stage)

- Conceptual – "5" Corridor Template Drop Interval x "20" Multiplier = 100' Interval (Green)
- Design – A50 – "5" Corridor Template Drop Interval x "10" Multiplier = 50' Interval (Yellow)
- Design – B25 – "5" Corridor Template Drop Interval x "5" Multiplier = 25' Interval (Yellow)
- Final – "5" Corridor Template Drop Interval x "1" Multiplier = 5' Interval (Red)

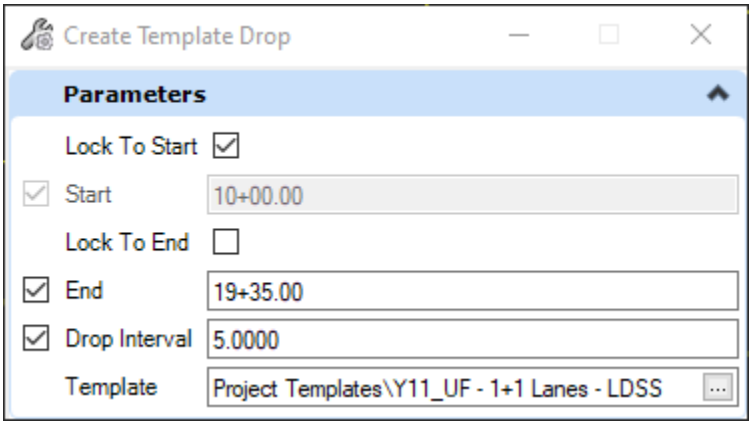
When used properly, the Corridor Feature Definition determines the increment distances in the Dynamic Cross Section View.

C. Set the **Create Corridor** dialog parameters as follows:
   - **Feature Definition** = **Design - A50 (Corridor > NCDOT > Design - A50)**
   - **Name = Y11**

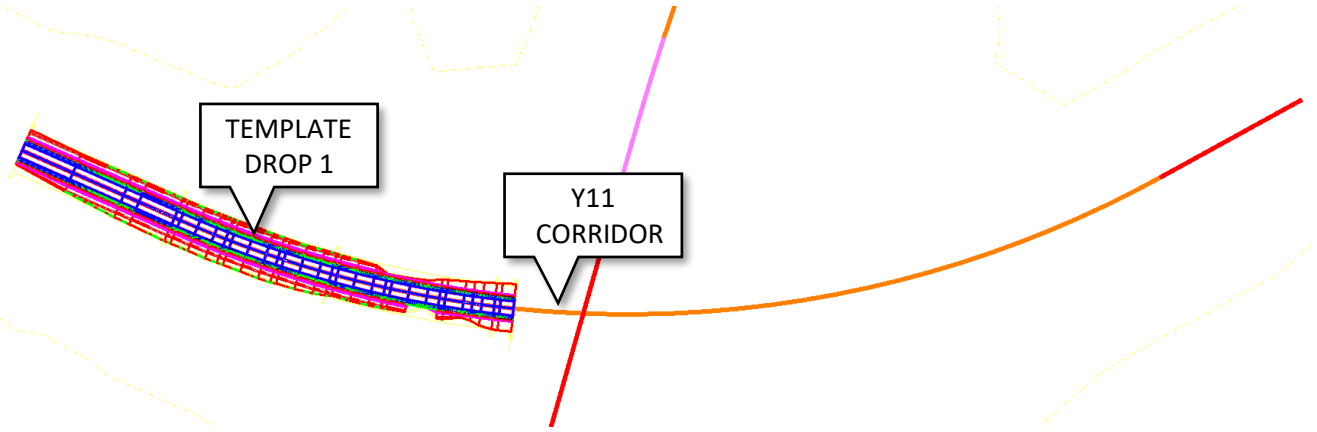
D. As directed by the prompt, click the **Y11** alignment. Notice the heads-up prompt now displays **Locate Profile-Reset For Active Profile**.
E. In this instance, right-click **Reset** to use the **Y11** active profile.
F. The heads-up display will now prompt you to select a template. Hold **Alt+Down** arrow or click the three dots to the right to browse to the Project Templates folder you created previously and choose the Y11_UF - 1+1 Lanes – LDSS template as shown below.



G. You will now be prompted for a start station. Notice as you move your cursor back and forth the station parameter changes based on the **Y11** stationing. You can either left-click to accept the station parameter as displayed in the prompt, key-in the start station, or hit the **ALT** key to lock to the start of the **Y11** alignment. In this instance, hit the **ALT** Key. This will lock the start station to the beginning of the **Y11** alignment.
H. Next you will be prompted for an end station. This time key-in **19+35.00** which will be the starting point for the **Y11** Bridge Corridor.
I. Finally, key-in **10.000** when prompted for a drop interval.
J. Notice the **Create Template Drop** dialog parameters are now set as follows:
   - **Start** = **10+00.00**
   - **End** = **19+35.00**
   - **Drop Interval** = **5.0000**
   - **Template** = **Y11_UF - 1 + 1 Lanes - LDSS**



K. A corridor called **Y11** has now been created and is visible on screen in the default 2D model/view as shown below.

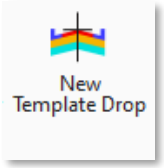


L. Because OpenRoads Designer recognizes when a corridor does not match the station limits of an associated alignment, you will be prompted for an additional template drop. In this situation an additional template drop is necessary, so key the following parameters into the **Create Template Drop** dialog:

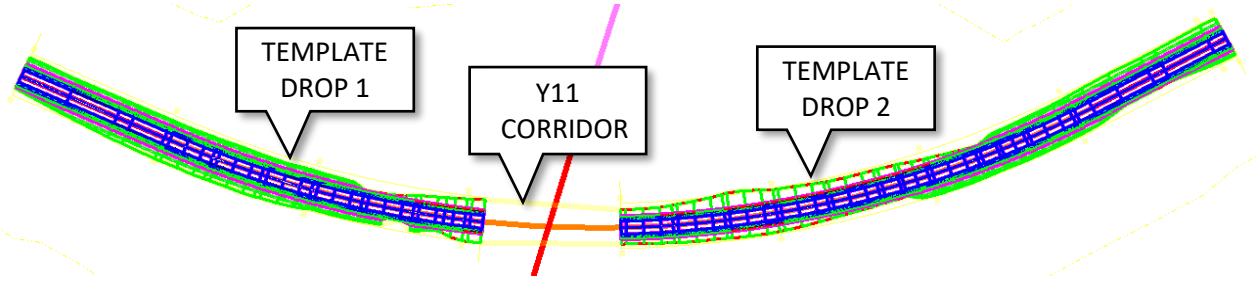
- **Start** = **22+00.00**
- **End** = **End of Alignment** (Alt to lock to ending station)
- **Drop Interval** = **5.0000**
- **Template** = **Y11_UF - 1 + 1 Lanes - LDSS**

Note:

- In a scenario where there is no need for additional template drops simply right click to end the prompting.
- The **Create Template Drop** dialog can also be accessed from the ribbon **(Corridors > Create > New Template Drop)**.
- A "Blank" template may be used as a placeholder in the area where the preliminary bridge is to be located.

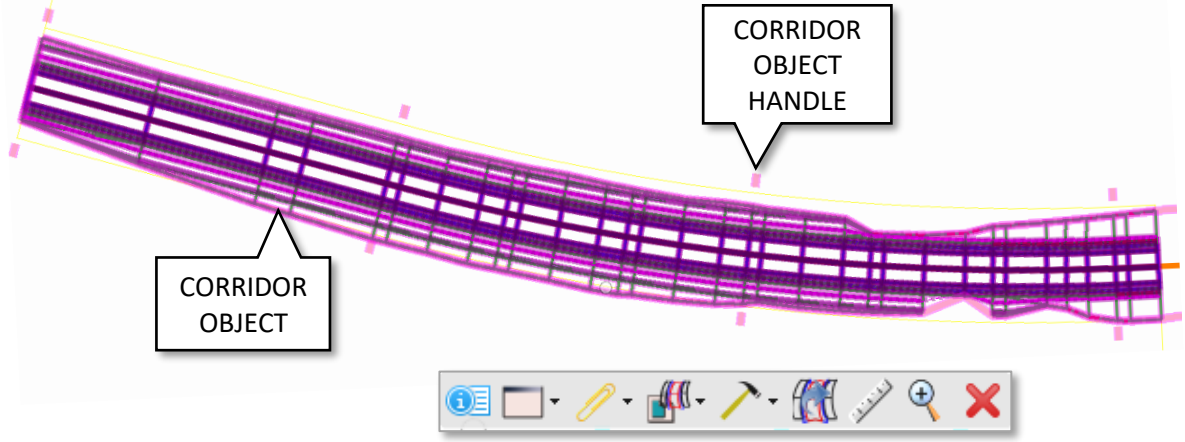


M. The **Y11** corridor has been updated and is now broken from **19+35.00** thru **22+00.00** as displayed below. The corridor has been broken in this range to accommodate a bridge corridor that will be included later in this exercise.



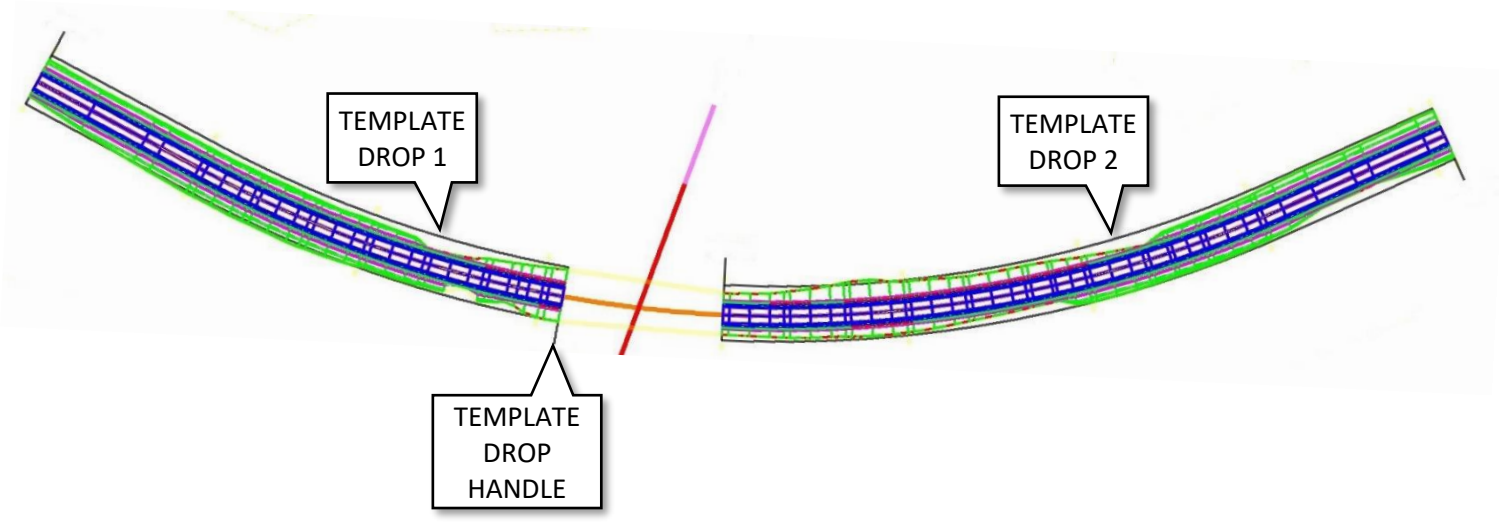
10. Review Corridor Object and Template Drops

A. in the **View 1-Default** window, zoom in closely to your corridor. Hover your curser over the **Y11** corridor and notice that the entire corridor displays pink. The pink highlight represents what is called the **Corridor Object**. The **Corridor Object** includes handles that are used to access a menu of common corridor commands.

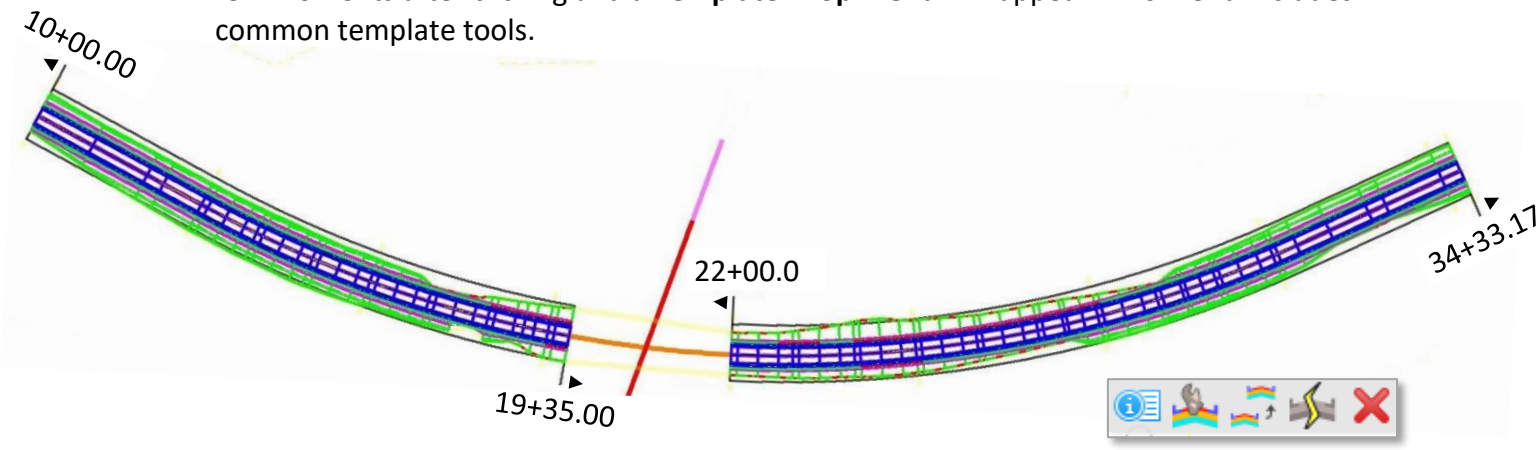


B. Click on one of the **Corridor Object Handles** (tick mark) and hover for a few moments to display the **Corridor Menu** as shown in **Step 10A**.

C. In addition to the Corridor Object, notice the two (2) closed shapes that run along the corridor. These represents the two (2) **Template Drops** and include **Template Drop Handles** at the beginning and end of each.



D. Click on any of the **Template Drop Handles** and notice that directional arrows and stationing are displayed at the beginning and end of the **Template Drop**. Hover over the handle for a few moments after clicking and a **Template Drop Menu** will appear. This menu includes common template tools.

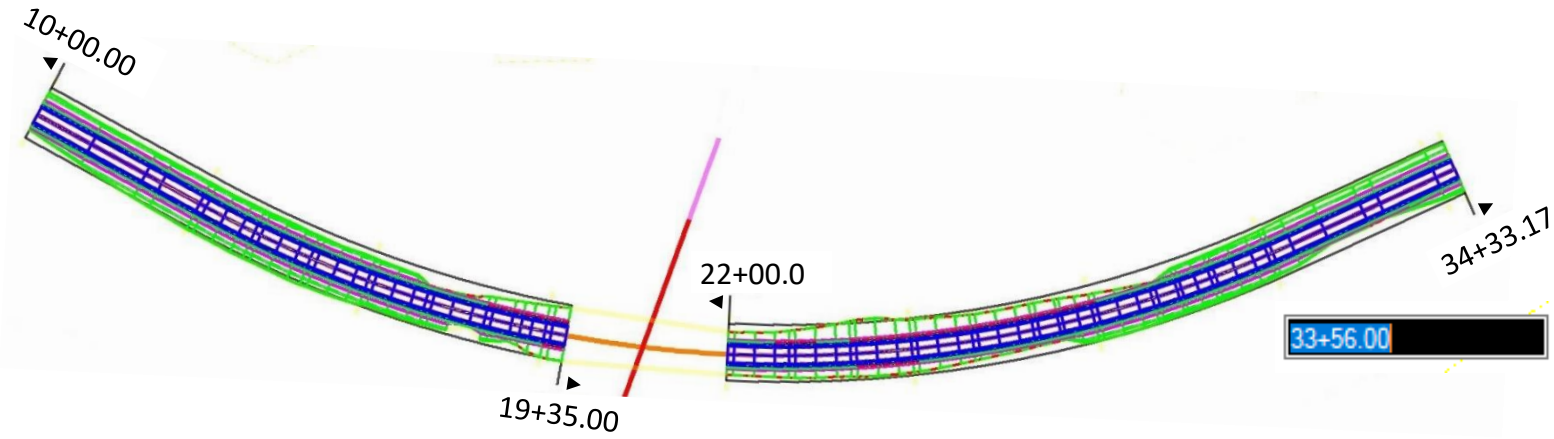


E. Next, click one of the **Template Drop Handle Arrows** and move your cursor back and forth. Notice that the corridor can be updated dynamically by adjusting the handle location.
F. Right-click to release the **Template Drop Handle Arrow**.

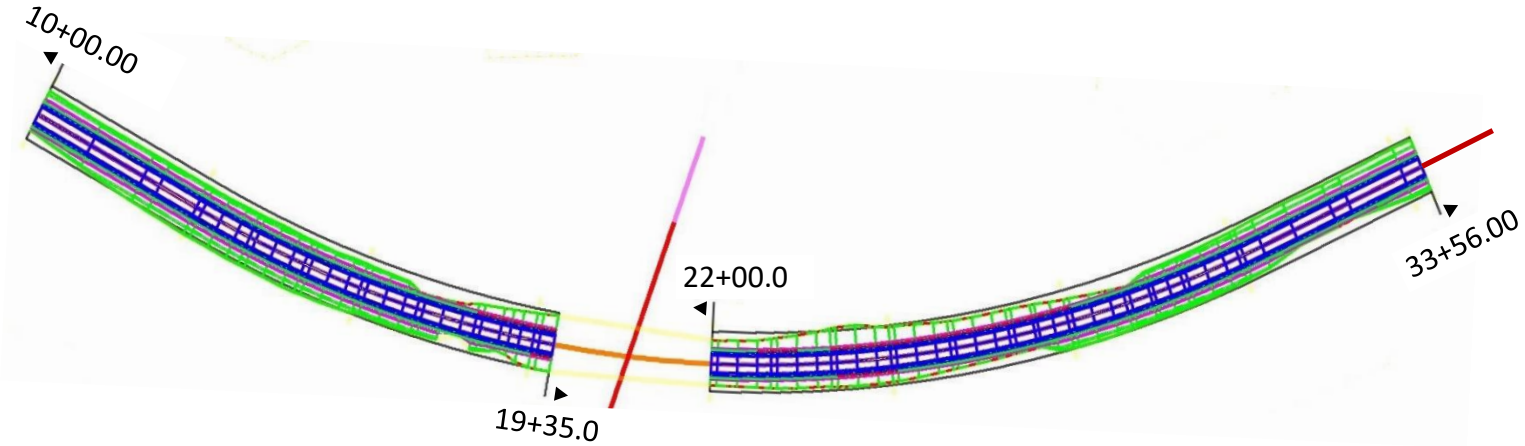
11. Use a Key-in to Adjust the Corridor End Station

A. Stationing can also easily be changed with a key-in. Simply click on the **Template Drop** end station text that currently reads **34+33.17** and notice that a station input box is now displayed as well.

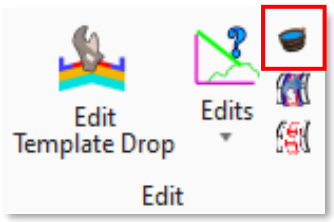
B. Key **33+56.00** into the input box and then hit enter.



C. The **Y11** corridor and **Template Drop** have now been dynamically updated and have an end station of 33+56.00.



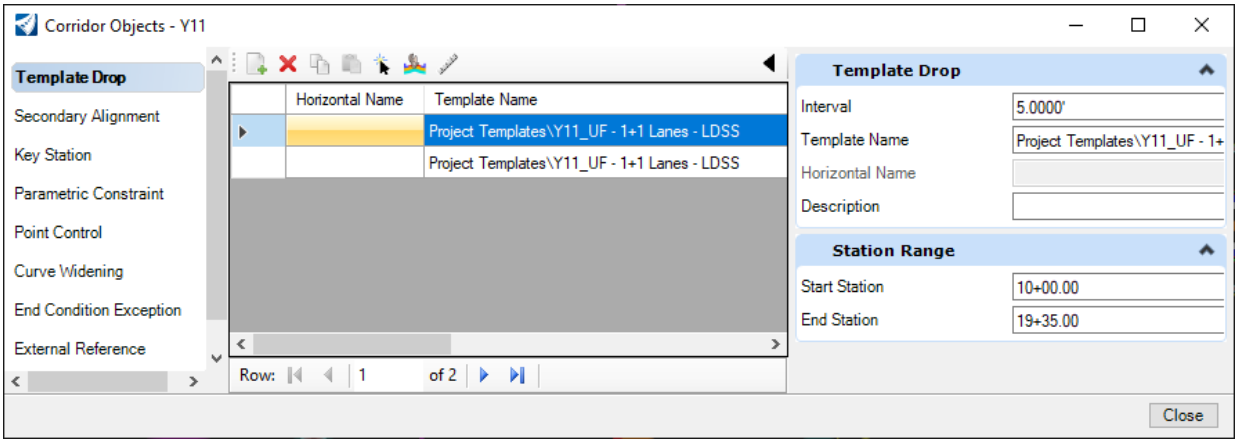
12. Use the Corridor Objects Dialog (the "bucket") to Edit the Corridor Start Station



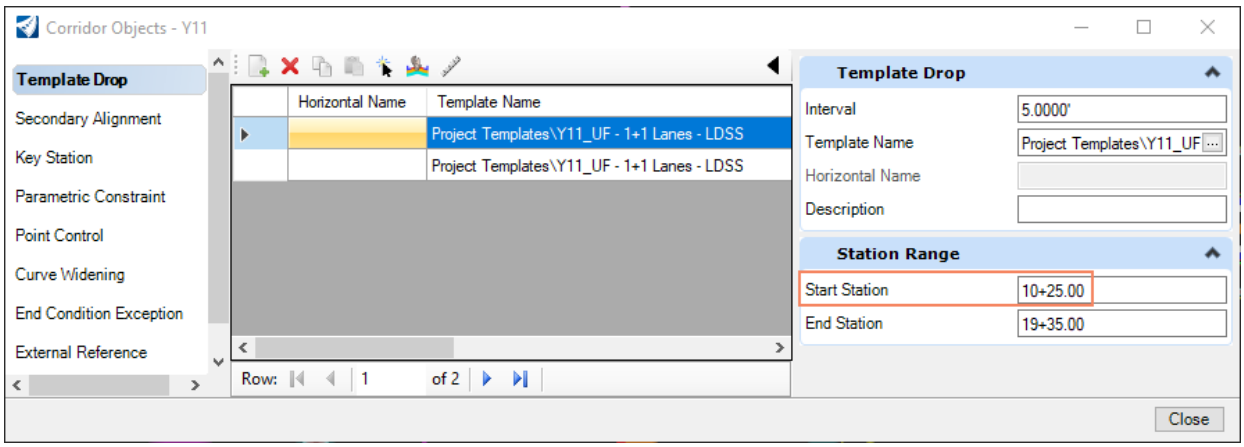
A. Click the **Corridor Objects** ("The Bucket") button located within the Edit group on the Corridor tab. Notice that the heads-up prompt displays **Locate Corridor**.

B. As directed by the prompt, click the **Y11** Corridor and the **Corridor Objects** dialog will load as shown below.

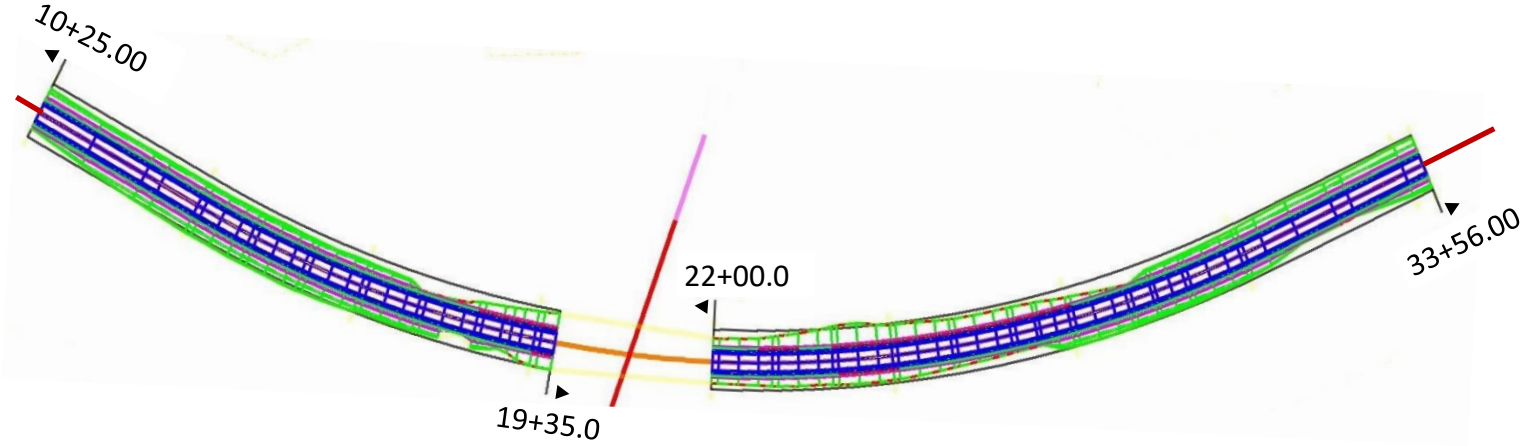
C. Keeping focus on the **Template Drop** row, select the first template drop at the top of the list, Notice the **Template Drop** properties are displayed to the right.



D. Under the **Station Range** Category change the **Start Station** from 10+00.00 to **10+25.00** as shown below.



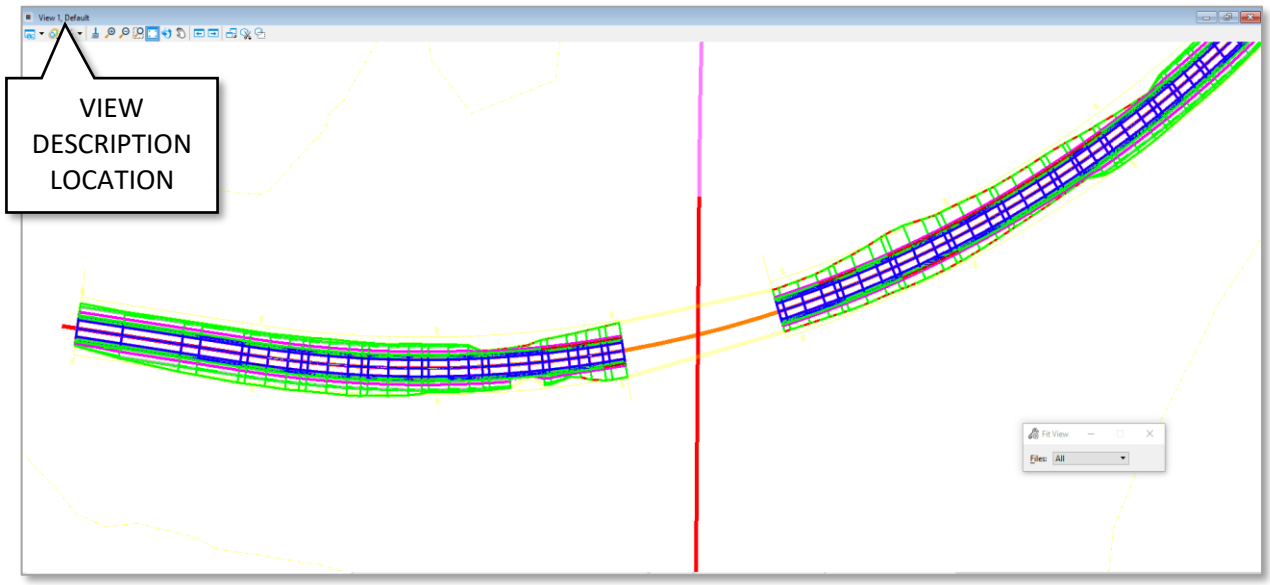
E. Close the **Corridor Objects** dialog and notice that the **Y11** corridor has been updated to begin at station **10+25.00** as shown below.



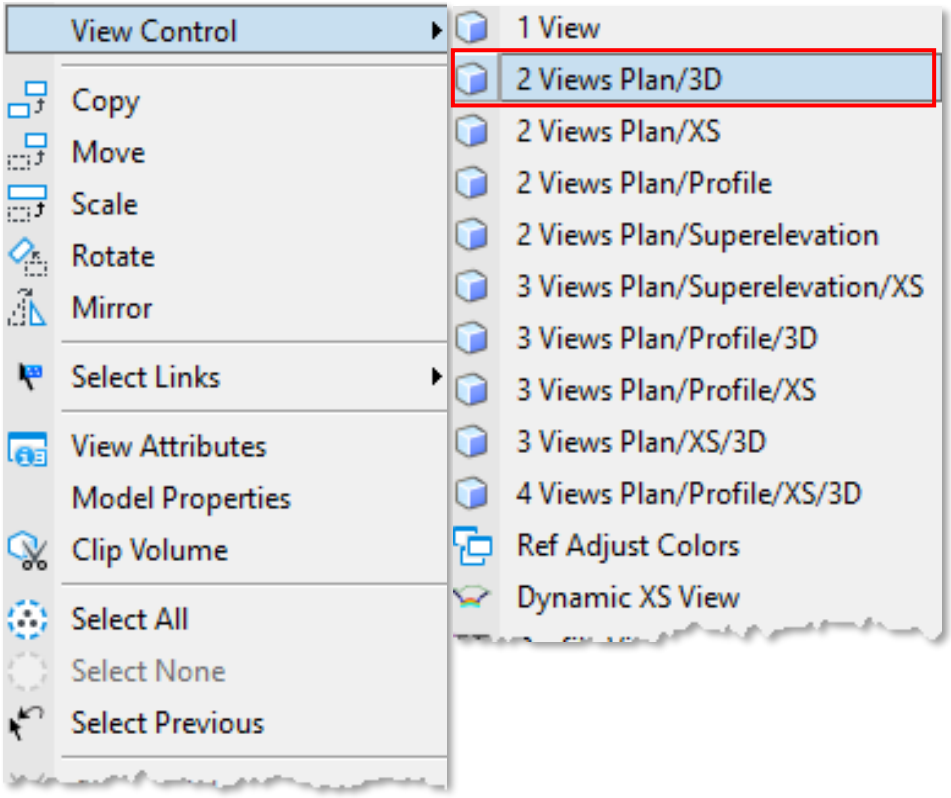
13. Use View Tools to Examine the Y11 Corridor in 3D

A. Up until this point you have been working exclusively in a Two-Dimensional view. As described earlier in this document, you will always design and manipulate your model in **2D**. However, it is very important to review your model in **3D** using a Three-Dimensional view.

B. In the top left corner of your window, notice the text that reads **View 1, Default.** This represents the view's description**.** As additional views are opened throughout the design/modeling process, this information will be visible in the same location per view.

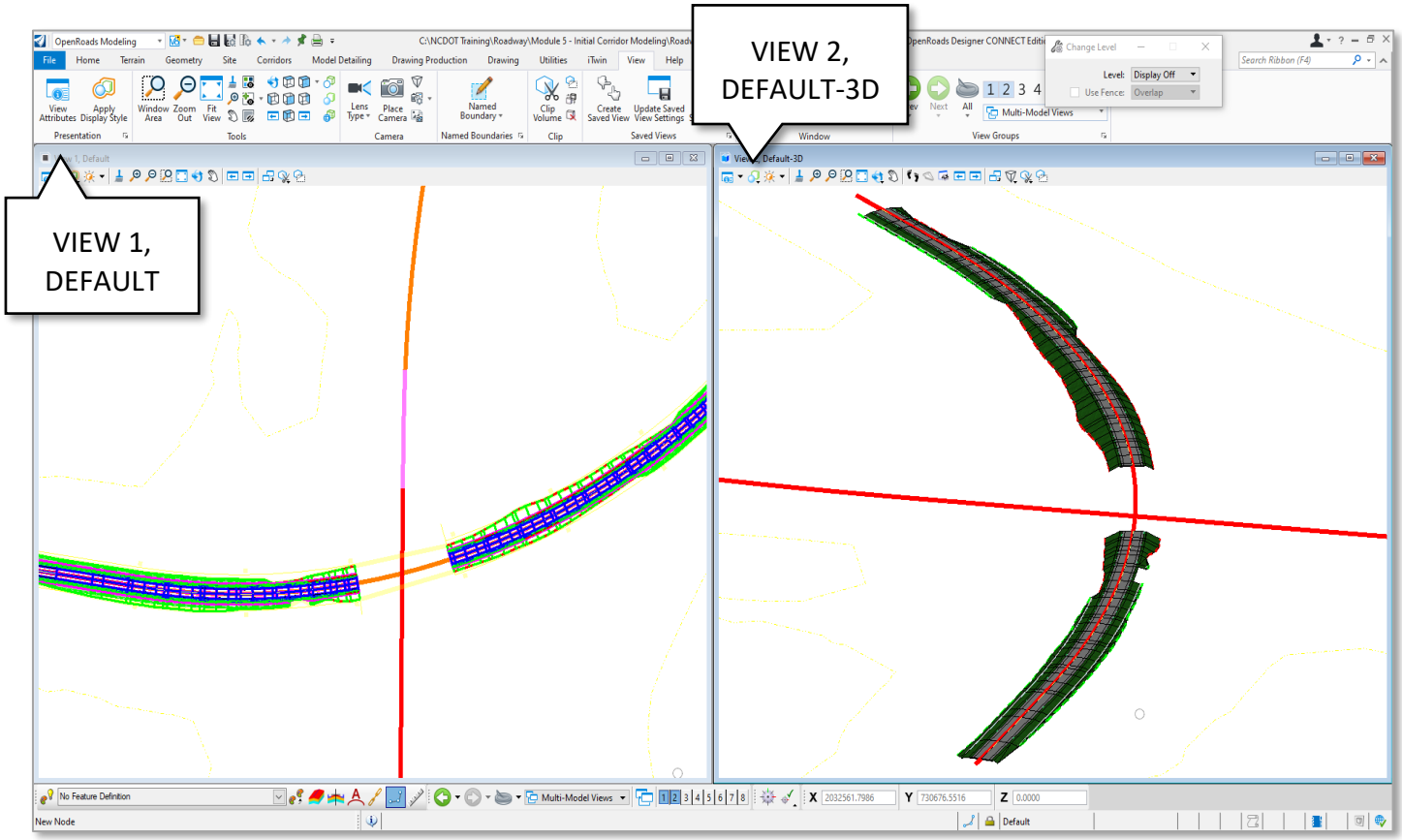


C. Multiple views and view combinations can be quickly accessed using the the OpenRoads Designer **View Control** tools. To access these tools, right-click and hold for a few moments anywhere within the **View 1, Default** window and a context menu will appear. The context menu contains a number of helpful quick access tools including a **View Control** menu shown at the top of the list.



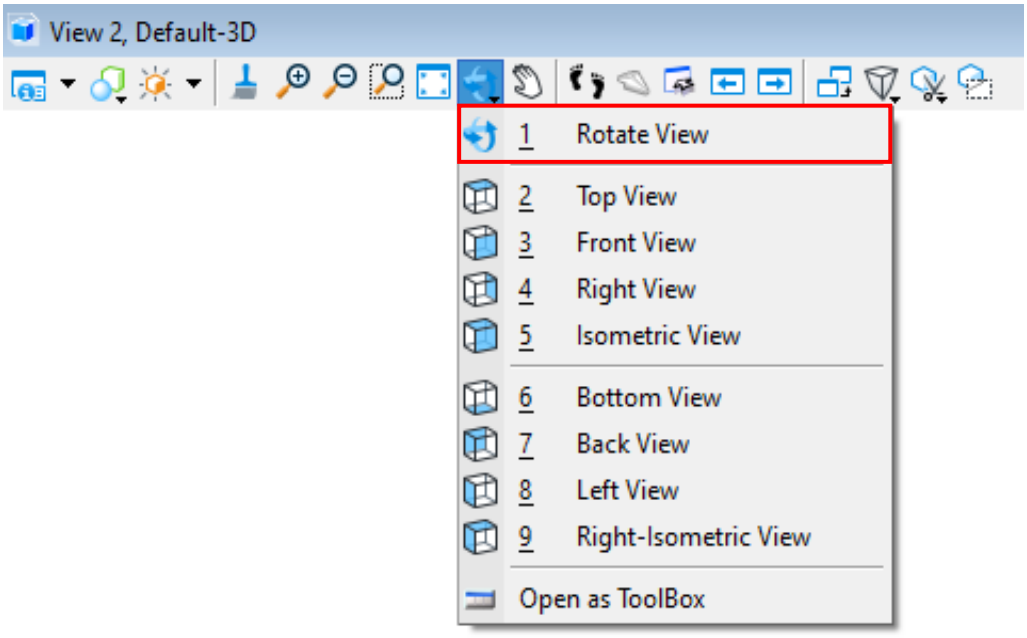
D. From the **View Control** tools sub-menu, select the **2 Views Plan/3D** option. Notice the number prefix for each of the view options listed. This number represents how many views will be opened when selected. In addition to the number prefix, each view option also includes a brief description. The prefix and description of the **2 Views Plan/3D** option selected indicate that two (2) views will open: the plan (2D) view as well as a 3D view.

E. Notice that your screen has split into two (2) separate views as shown below. There is now an additional view to the right of the original **View 1, Default** view. Notice the **View Description** of the additional view on the right reads **View 2, Default-3D.**

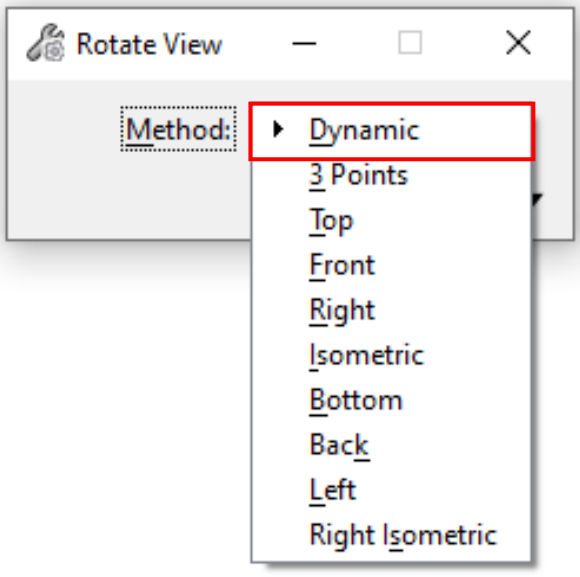


F. Notice the View 2 **View Description** includes the suffix **"-3D"** because it's a **3D** view. This is a quick and easy method to determine if a view is three-dimensional or not. If the suffix **"-3D"** acronym is not included in the View Description, it would indicate a **2D** view.

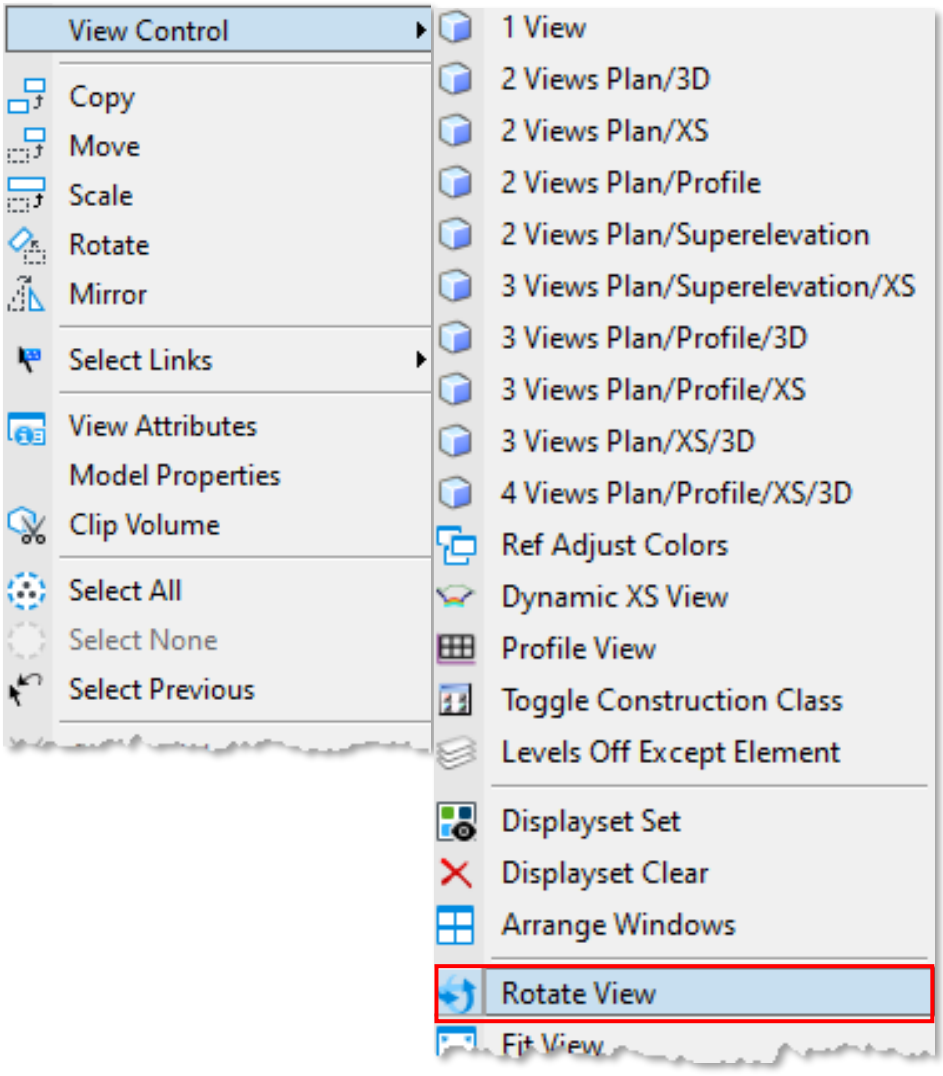
G. Zoom in closely to the **Y11** corridor in the **View 2, Default-3D** window and select **Rotate View** from the **View Rotation** menu located at the top left corner of the **View 2, Default-3D** window.



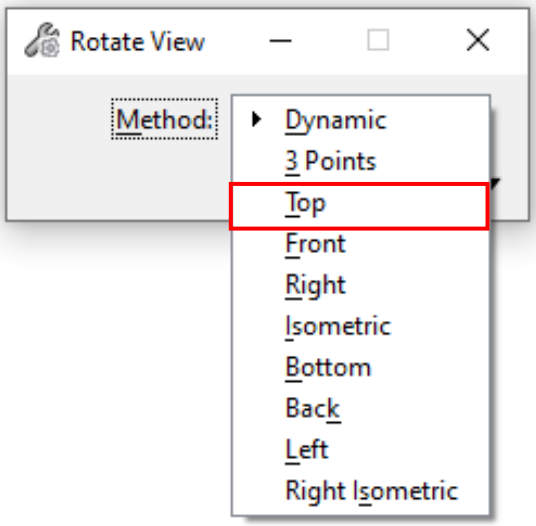
H. Notice that the **Rotate View** dialog box displays. From the **Rotate View** dialog, select **Dynamic** from the **Method** dropdown menu.



I. After selecting the **Dynamic** Method from the **Rotate View** dropdown, using the left mouse button, click and hold near the **Y11** corridor in the **View 2, Default-3D** window.
J. Continue holding the button down and slowly move your mouse in a circular motion. As you move your mouse, notice that the **Y11** corridor is rotating in **3D**.
K. Spend a few moments examining the **Y11** corridor and how it reacts to the movements of your mouse. Try zooming in and out and then repeating the rotation commands. Tentative snapping to an object will allow rotation and zooming focused on the snap point.
L. After you have finished examining the corridor in **3D**, right-click the screen and select the **View Control** option again, this time selecting **Rotate View** from the dropdown as shown below.

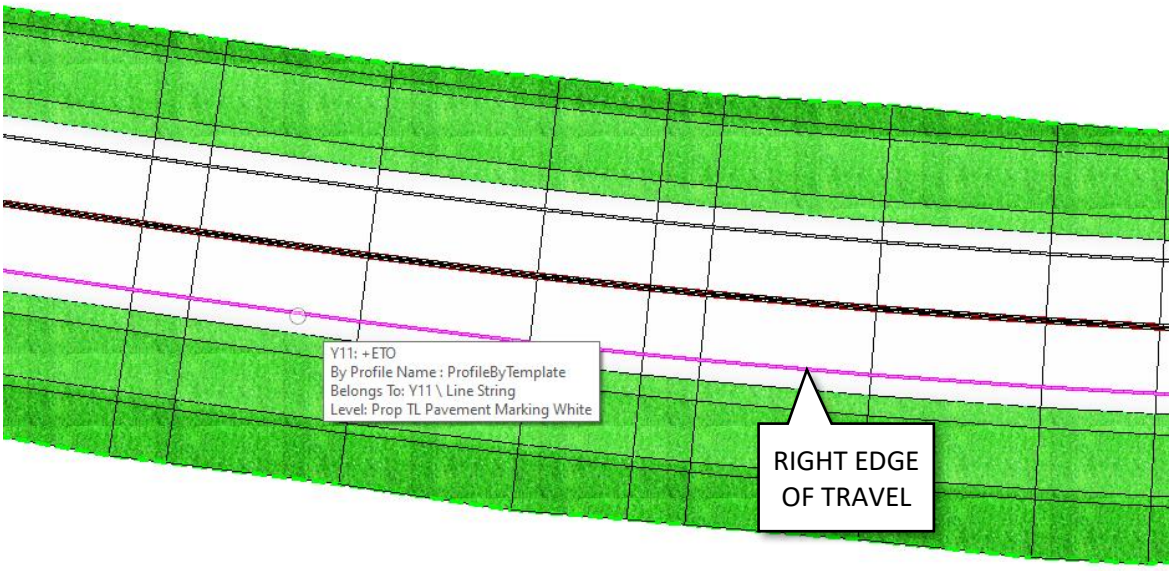


M. Instead of selecting **Dynamic** from the **Rotate View** dialog dropdown, this time select the **Top** method instead.

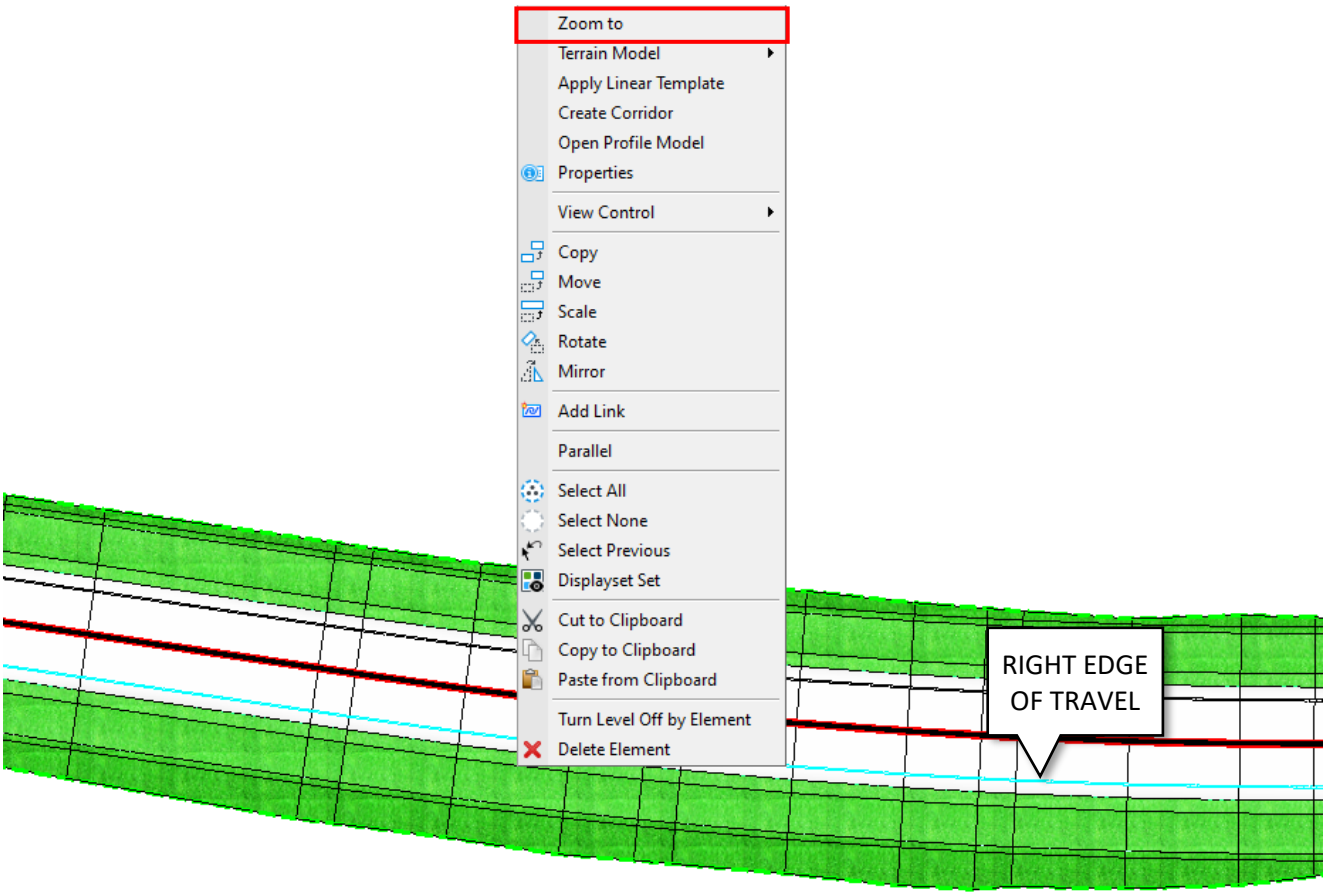


N. Notice the **Top** perspective view in **3D** is the same as a standard **2D** view. This can be helpful to re-orient yourself after rotating a view in **3D**.

O. Hover your mouse over the **Right Edge of Travel** or any other linear element that belongs to the **Y11** corridor.



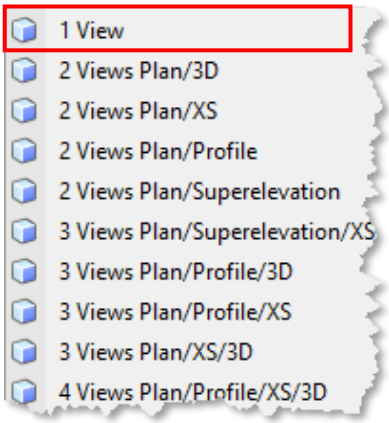
P. Next, right-click directly over the **Right Edge of Travel** (or other linear element) and select the **Zoom To** option from the context menu as shown below.



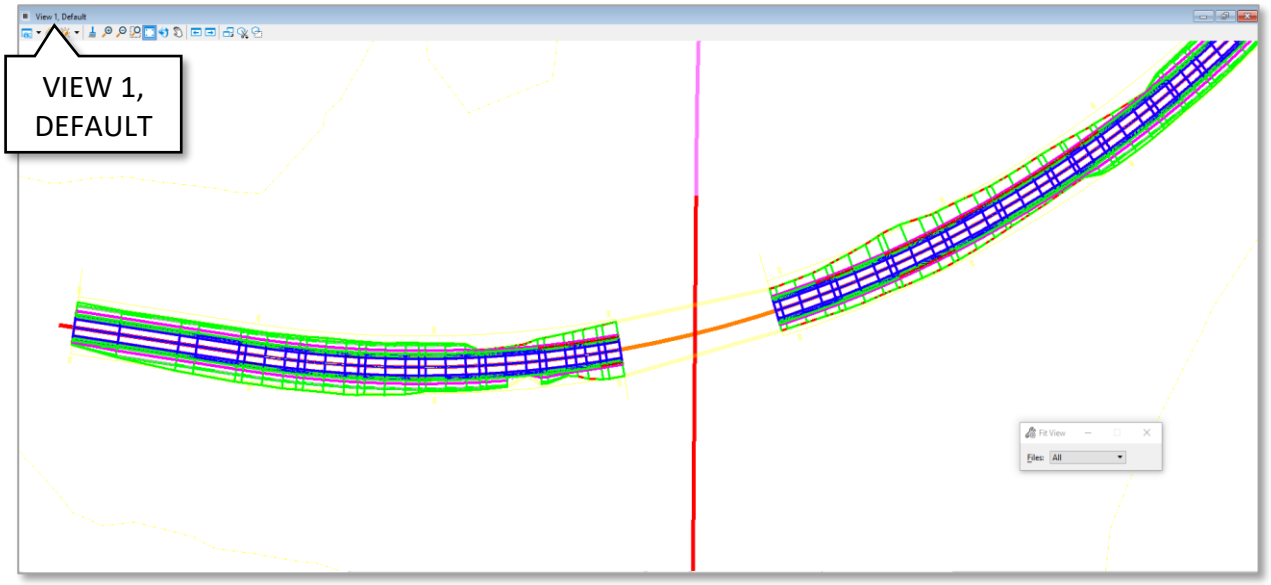
Q. Notice that the entire **Y11** corridor is now displayed in the **View 2, Default-3D** window. This is due to the intent of the **Zoom To** tool. When executed, the command zooms to the full extents of the corridor that the selected linear element (Right Edge of Travel) belongs to. In this instance, that would be corridor **Y11**. The **Zoom To** tool can be very helpful, specifically if the corridor (CMD) file contains multiple corridors.

Note: The **Zoom To** command works in both 2D and 3D plan views.

R. You can easily return to the standard **View 1, Defaut** window at any time by selecting the **1 View** option from the **View Control** menu. To reiterate, the **View Control** menu is accessed by right-clicking on the screen and holding for a few moments.



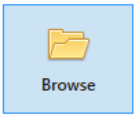
S. After selecting the **1 View** option from the **View Control** menu, all windows will close with the exception of the **View 1, Default** window. If the **View 1, Default** window is not open when the **1 View** option is selected, it will be opened and take focus.



Note: In addition to 2D and 3D plan views, you can also access additional views from the **View Control** menu. Additional views include the Cross-Section, Profile, and Superelvation Views.

14. Model the Y11 Bridge

A. Click the **Browse** button **(File > Browse)** and path to the **Module 5 (Initial Corridor Modeling)** folder and open the R-2635C_RDY_CMD_BRIDGE.dgn file.

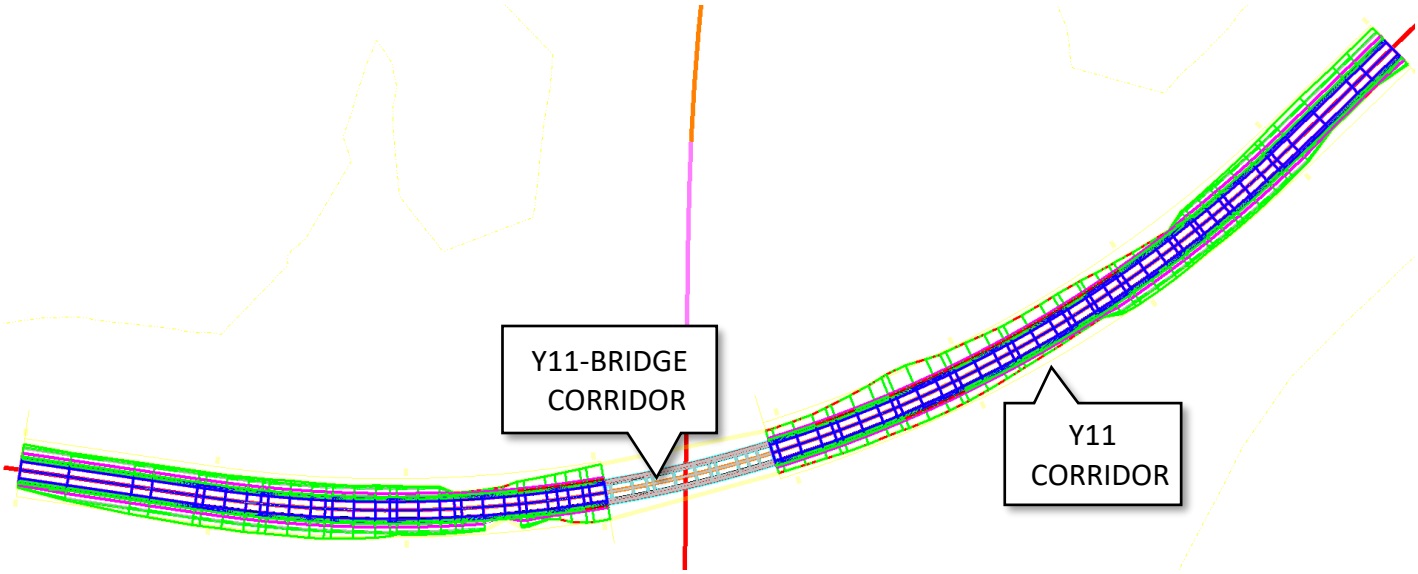


Note: All reference files required to model the Y11 Bridge should already be attached.

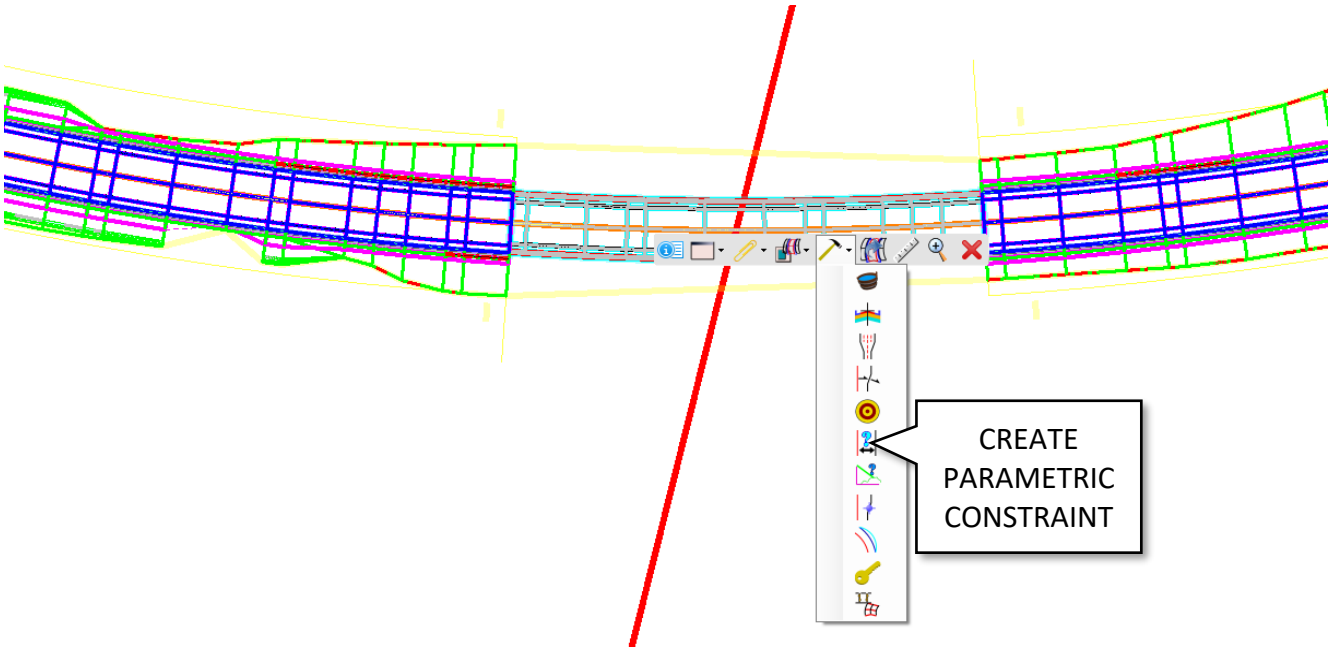
B. Zoom-in near the **Y11** alignment.
C. Click the **New Corridor** button **(Corridors > Create > New Corridor)**.

D. Set the **Create Corridor** dialog parameters as follows:
   - **Feature Definition** = **Design - A50 (Corridor > NCDOT > Design - A50)**
   - **Name** = **Y11-Bridge**
E. The **Create Template Drop** dialog should load automatically. Set the parameters as follows:
   - **Start** = **19+35.00**
   - **End** = **22+00.00**
   - **Drop Interval** = **5.0000**
   - **Template** = **Y11_TMPLT- Bridge Undivided 1+1**

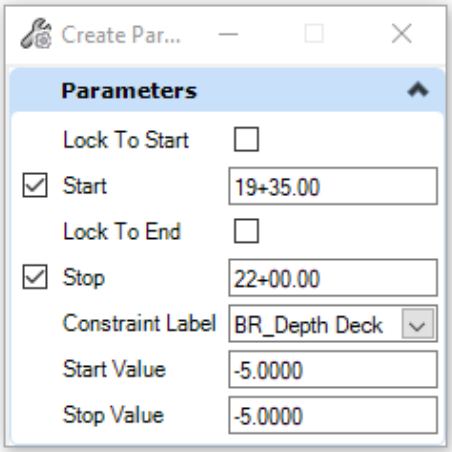
F. Left click through the prompts and the **Y11-Bridge** corridor will be created as shown below.



G. Select the **Y11-Bridge** corridor and hover for a moment. Notice the **Corridor tools** menu displays as shown below. From select the **Create Parametric Constraint** tool from the menu.

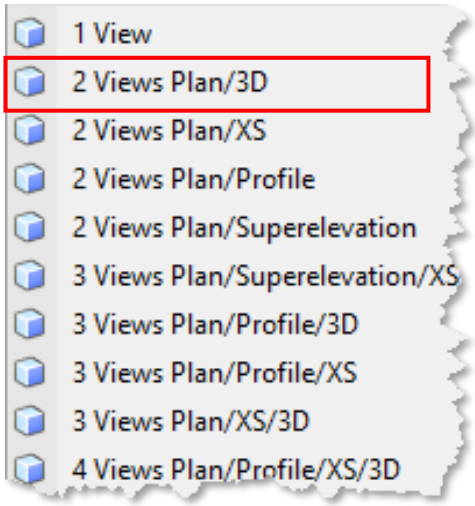


H. The **Create Parametric Constraint** dialog will load as shown below.

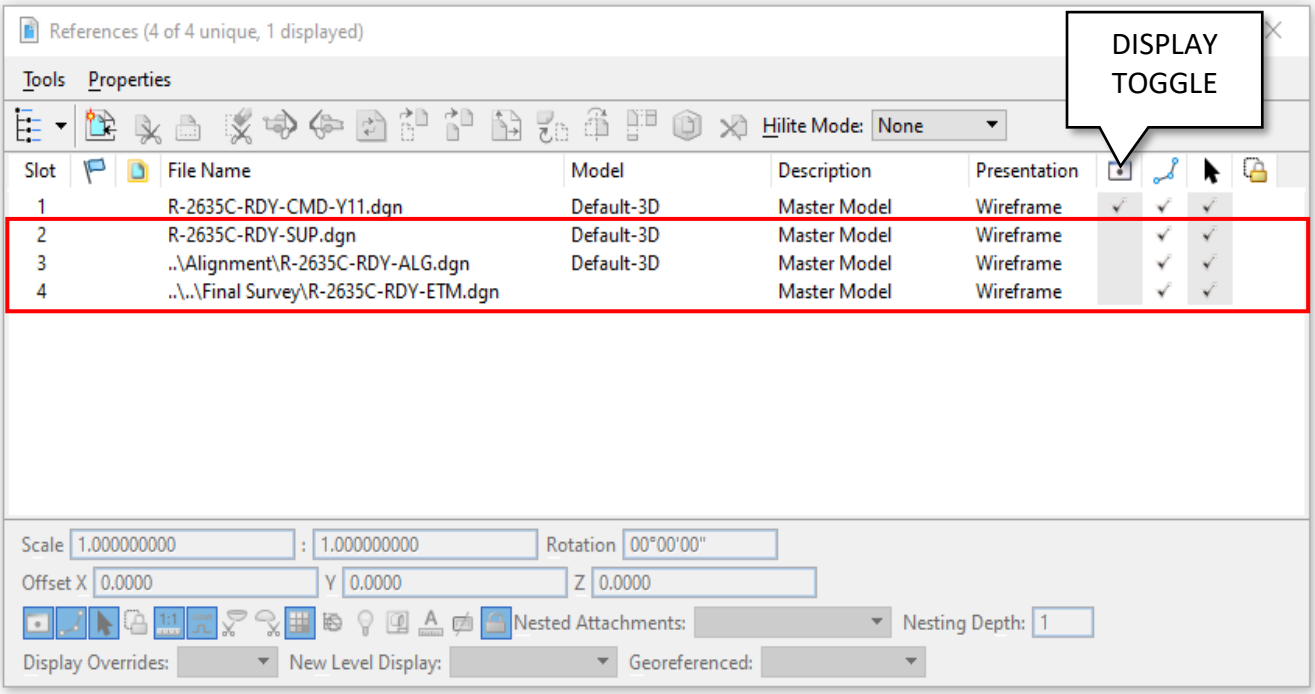


I. Set the following parameters in the **Create Parametric Constraint** dialog.
- **Start** = **19+35.00**
- **Stop** = **22+00.00**
- **Constraint Label** = **BR_Depth Deck**
- **Start Value** = **-5.000**
- **Stop Value** = **-5.000**

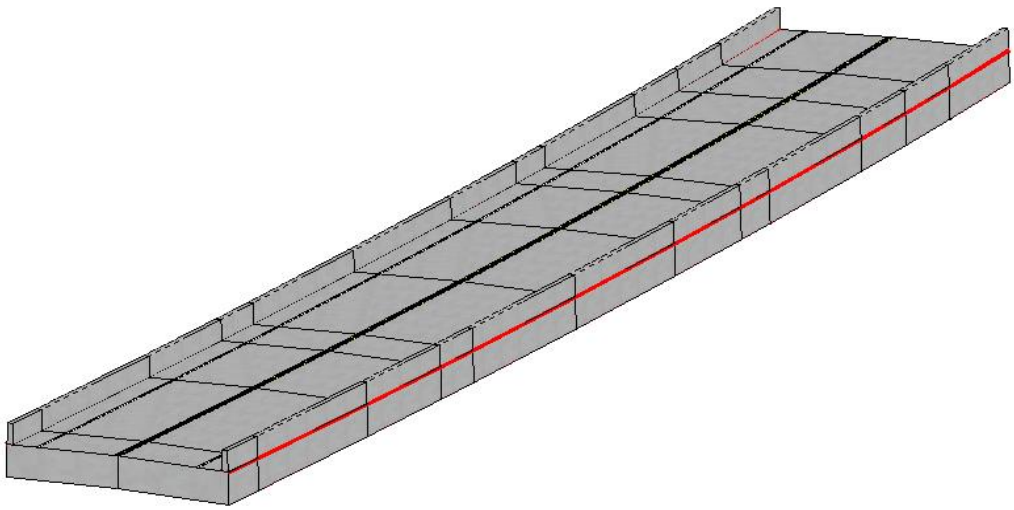
J. Now, open the **View 2, Default-3D** window in addition to the already opened **View 1, Default** window using the **2 Views Plan/3D** option like you did previously.



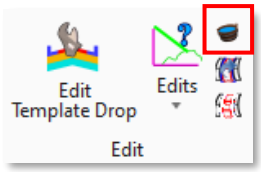
K. Once the **View 2, Default-3D** window opens, close the **View 1, Default**, maximize the **View 2, Default-3D** window and toggle off the display of the following reference files using the **References** dialog **(Corridors > Primary > References)** as shown below.



L. Then zoom in close to the **Y11** bridge model and rotate the view like shown below.

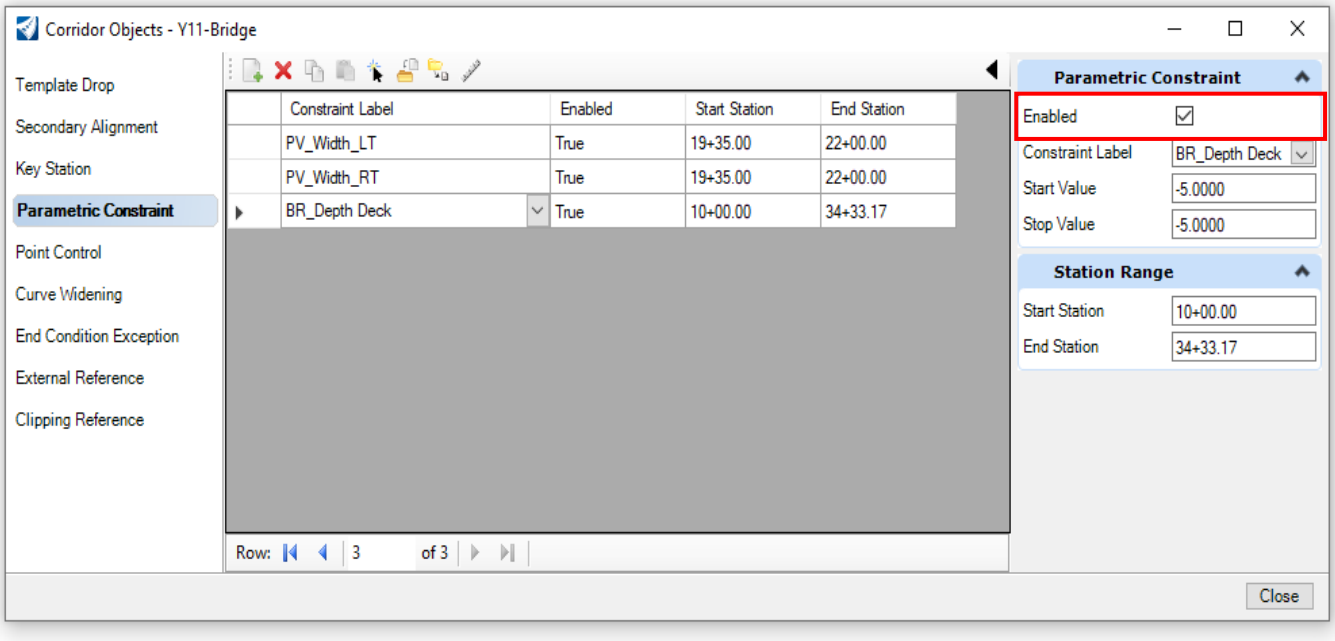


M. Next, click the Corridor Objects button **(Corridors > Edit > Corridor Objects)**.

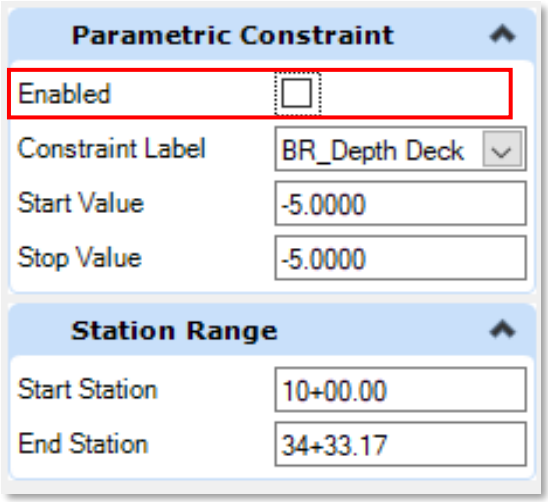


N. As directed by the prompt, click the **Y11** Corridor and the **Corridor Objects** dialog will load.

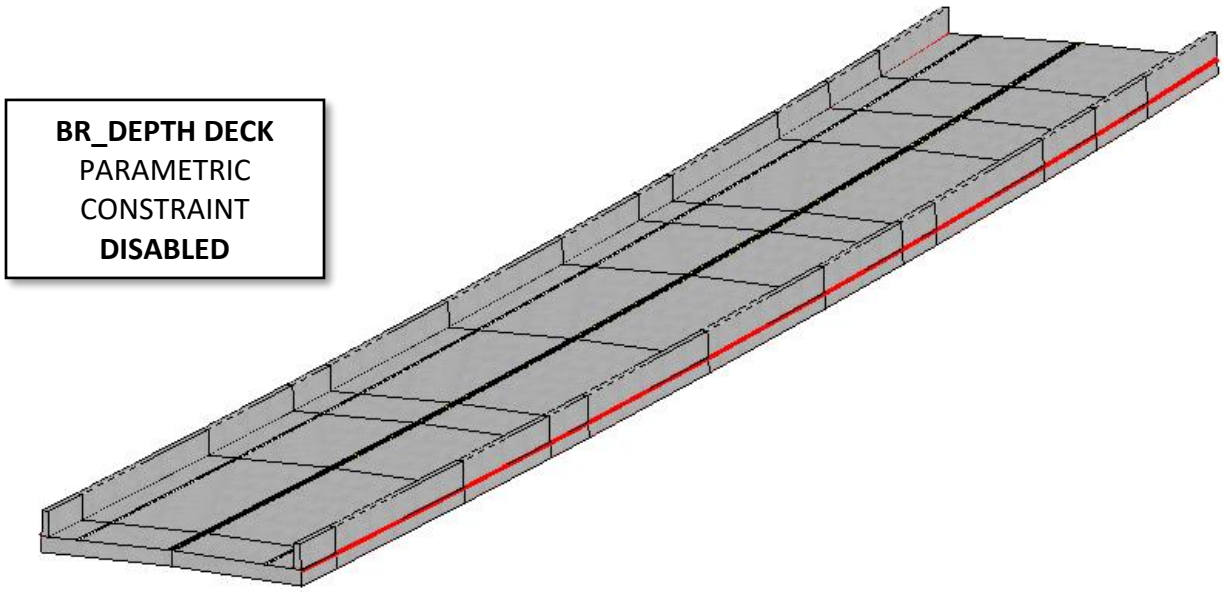
O. Click on the **Parametric Constraint** row and then select the **BR_Depth Deck** constraint at the bottom of the list. The **BR_Depth Deck** Parametric Constraint properties are then displayed to the right. Notice the **Enabled** box option is checked on by default.



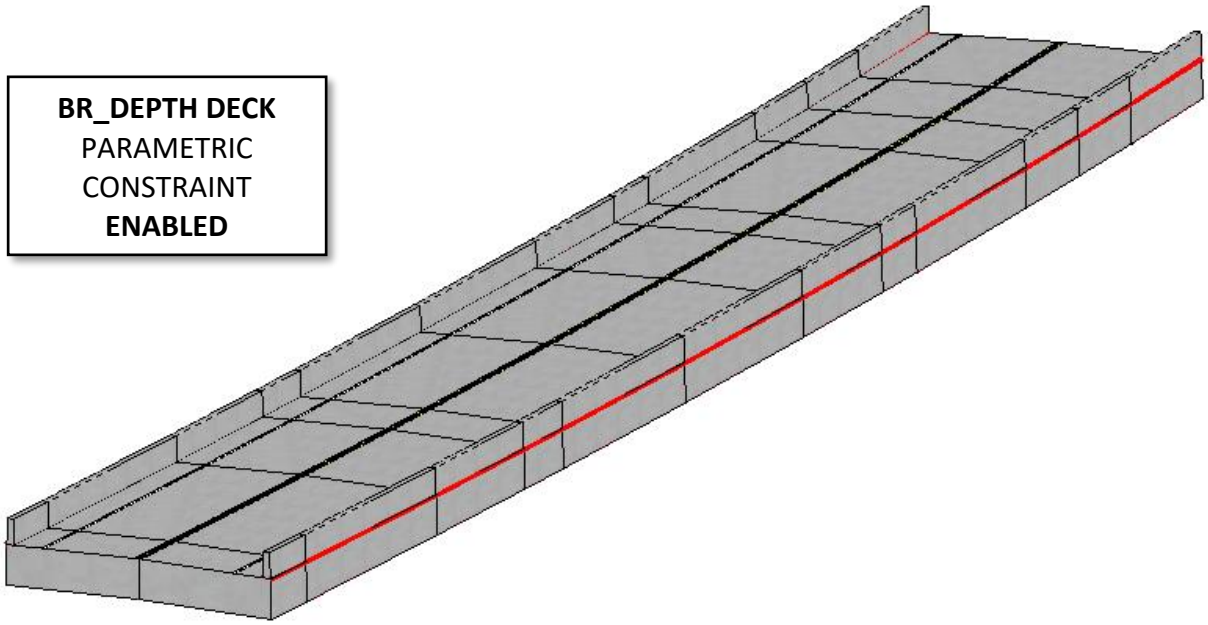
P. Unchecking the **Enabled** option will disable the **BR_Depth Deck** constraint as shown below.



Q. Pay attention to the Y11 bridge model shown in the **View 2, Default-3D** window and then disable the **BR_Depth Deck** constraint. Watch as the bridge depth reverts back to its default depth of 2’.



R. Finally, re-enable the **BR_Depth Deck** constraint and notice the bridge depth is restored to 5’.



15. Assign Superelevation to the Y11 Corridor

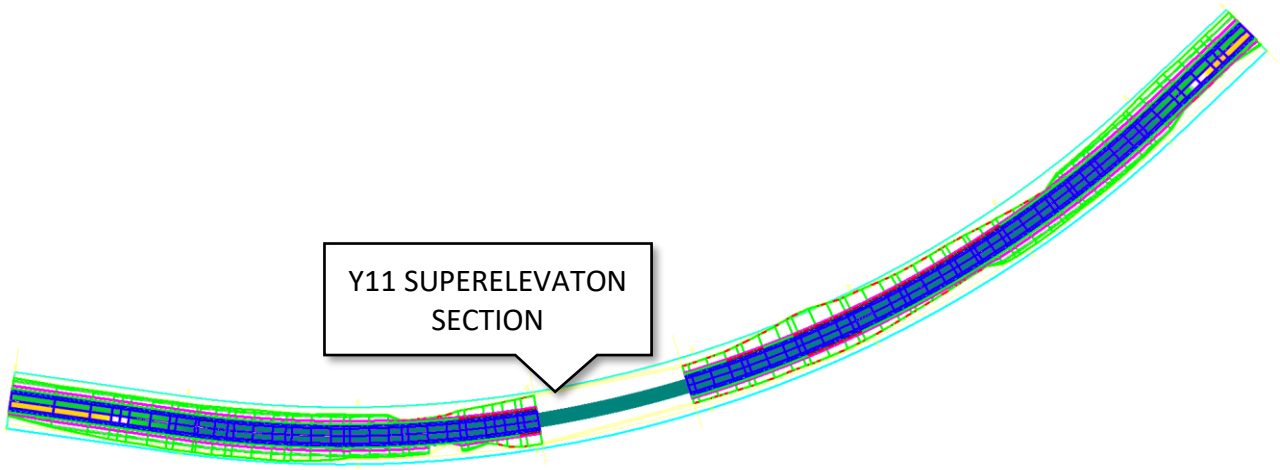
A. Click the Browse button **(File > Browse)** and path to the **Module 6 (Initial Corridor Modeling)** folder and open the R-2635C_RDY_CMD_Y11.dgn file.

B. Attach the R-2635C_RDY_SUP.dgn to your Corridor (CMD) file using the **References** dialog **(Corridors > Primary > References)**.

C. Zoom-in near the **Y11** corridor and notice that the **Y11 Superelevation Section** as shown below.

D. Click the **Assign To Corridor** button **(Corridors > Superelevation > Calculate > Assign To Corridor).**

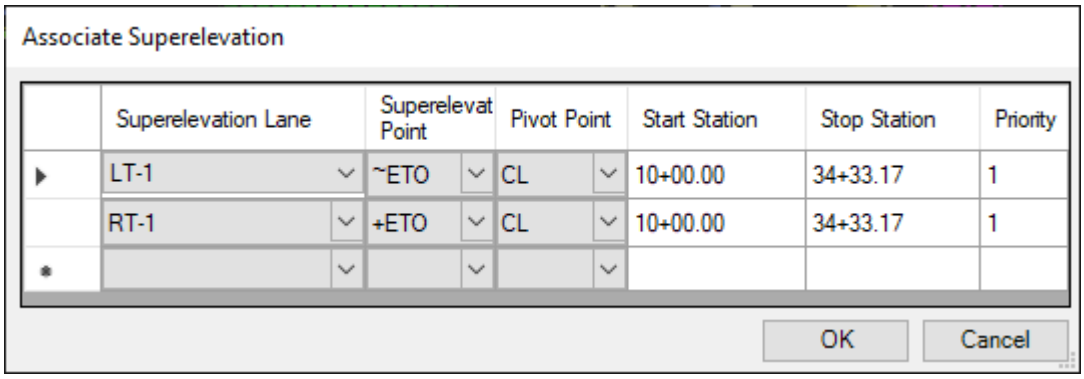
E. Follow the **Locate First Superelevation Section** prompt and select the **Y11 Superelevation Section** as shown below.



Hint: If there are several lines and you are uncertain which to choose. Hover over each line for a moment and a description will display and this can be helpful. Right-click while hovering cycles the display of elements which are on top of each other

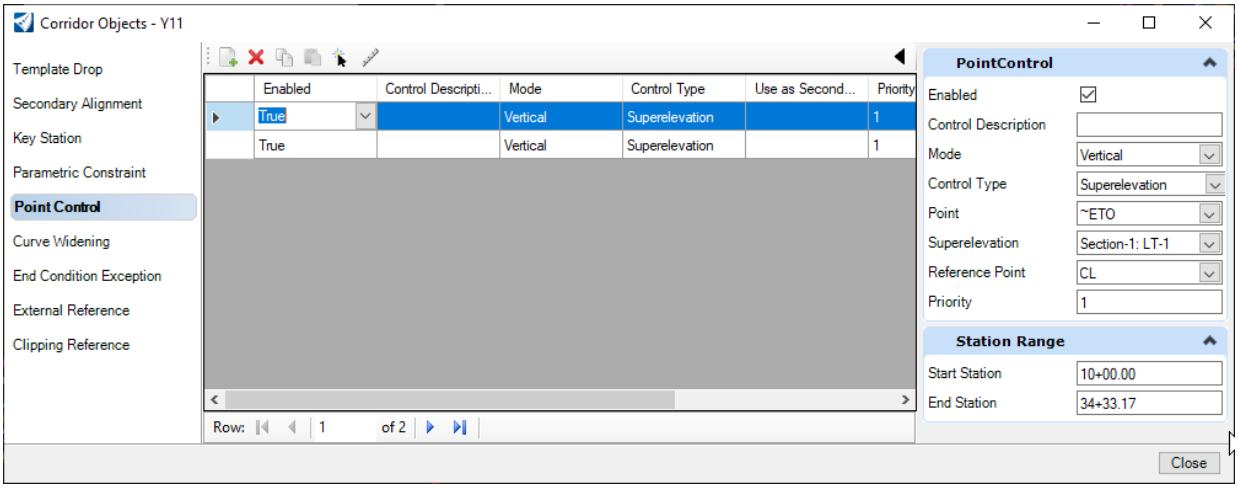
F. Right-click (reset) to accept the **Y11 Superelevation Section**. Then locate the **Y11 Corridor** as prompted.

G. After selecting the **Y11 Corridor**, the **Associate Superelevation** dialog will be displayed as shown below. **Superelevation Sections** are a special **Point Control Type** that can be used to set template pavement cross slope. The **Associate Superelevation** dialog is used to assign **Superelevation Point Controls** to a corridor.



H. Click the **OK** button and the superelevation will be assigned to the **Y11 Corridor**.

I. The **Y11 Corridor** superelevation point controls can be viewed by loading the **Corridor Objects** dialog **(Corridors > Edit > Corridor Objects)** and selecting the **Point Control** row as shown below.



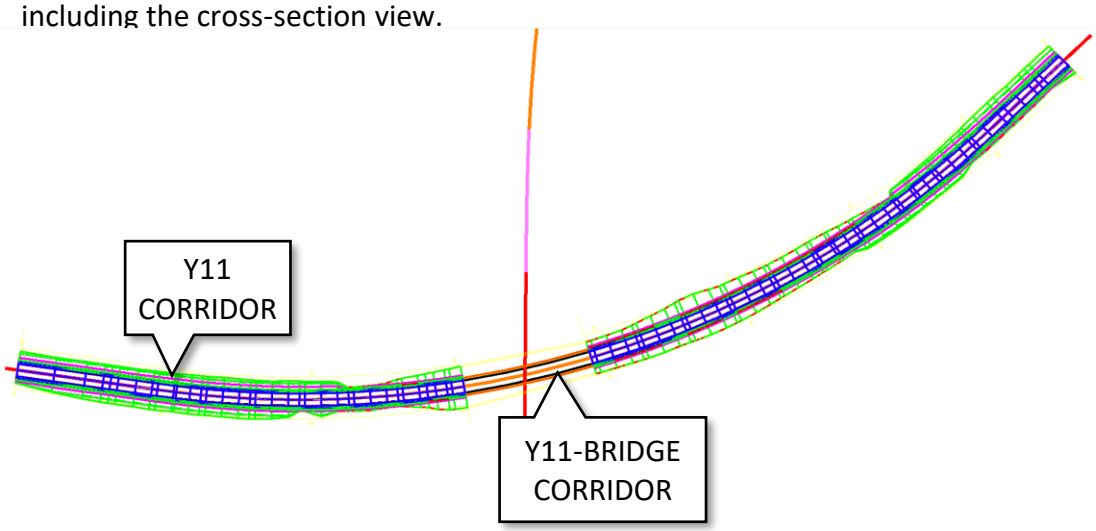
J. Following these same steps, apply the **Y11** superelevation to the **Y11 Bridge Corridor** as well. For detailed information on superelevation see the **NCDOT Superelevation** module.

16. Create Dynamic Cross-Sections for the Y11 Corridor

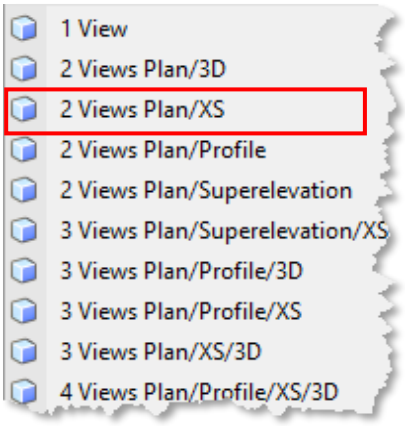
A. Click the Browse button **(File > Browse)** and path to the Module 5 (Initial Corridor Modeling) folder and open the R-2635C_RDY_CMD_Y11.dgn file.

B. Click the References button **(Corridors > Primary > References)** and attach the R-2635C_RDY_CMD_BRIDGE.dgn file.

C. Zoom-in near the **Y11** corridor and notice that the **Y11-Bridge** corridor is now visible as well. It not only visible in the **View 1, Default** window. It will also be visible in all other views as well, including the cross-section view.

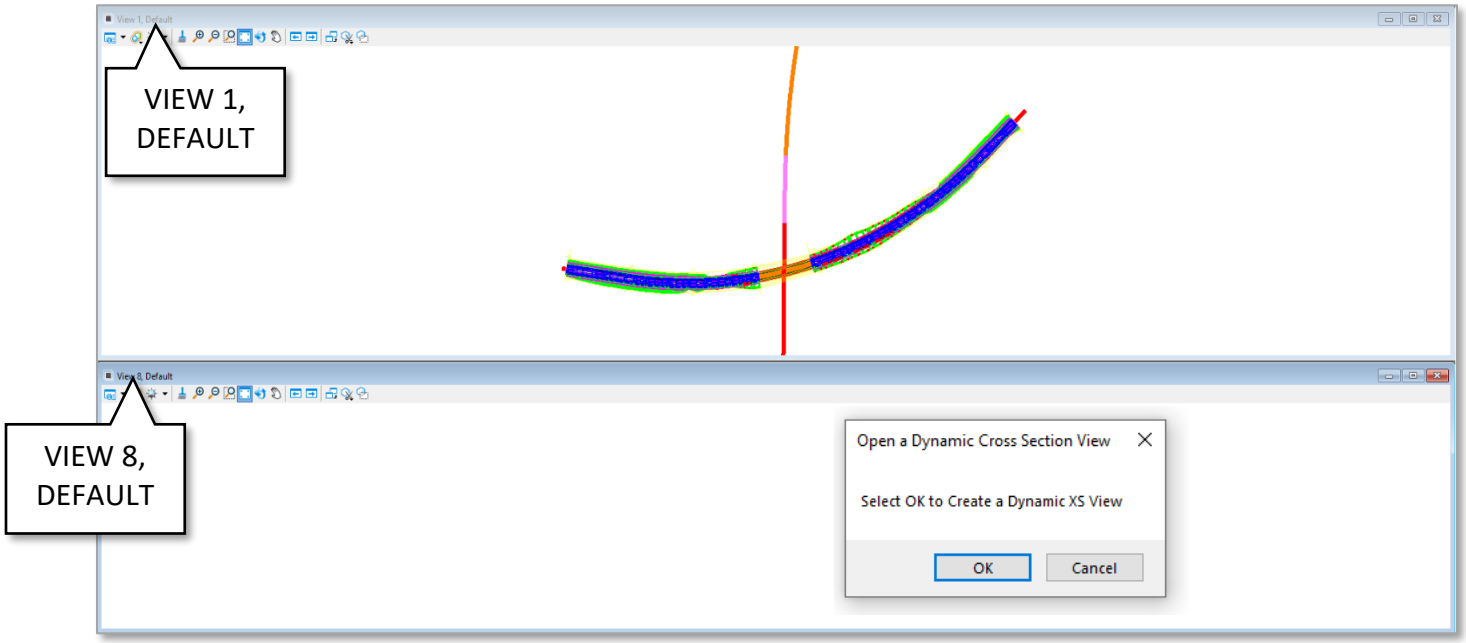


D. Next, select the **2 Views Plan/XS** option from the **View Control** menu. The **View Control** menu is accessed by right clicking within the **View 1, Default** window and then holding for a few moments. This will open the **Dynamic Cross Section** view.



Note: You can also access the **Dynamic Cross Sections** by selecting the clicking the **Open Cross Section View** **(Corridors > Review > Dynamic Sections > Open Cross Sections)**.

E. After selecting the **2 Views Plan/XS** option, the **View 8, Default** window will open beneath the **View 1, Default** window and you will be prompted to **Select OK to Create a Dynamic XS View**.



F. Hit the **OK** button and you will be prompted to **Locate Corridor or Alignment**. When given the options to **Locate Corridor or Alignment** when creating **Dynamic Cross-Sections** please consider the following:

Dynamic Cross-Sections based on Alignment

- Faster to navigate than Corridor based Cross-Sections
- Interval can be easily adjusted as needed for purposes of review
- Temporary Dimensioning and some other corridor specific data not available
- Excellent for quick review, specifically with regards to larger projects

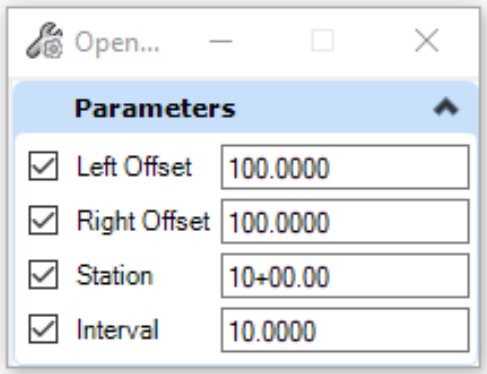
Dynamic Cross-Sections based on Corridor

- Temporary Dimensioning and other corridor specific data available
- Interval based on a combination of template drop and design stage
- Requires more processing, making navigation slower than Alignment based Cross-Sections
- Excellent for detailed review of superelevation, slopes, widths, etc.

G. Click on the **Y11 Alignment** in this scenario because you have multiple corridors associated with it. This option will create **Dynamic Cross Sections** for both the **Y11** Corridor and the **Y11-Bridge** Corridor.

Note: Some cross-section visual attributes and functionality are not available when using the alignment method to create dynamic cross-sections. This will be covered later within the module.

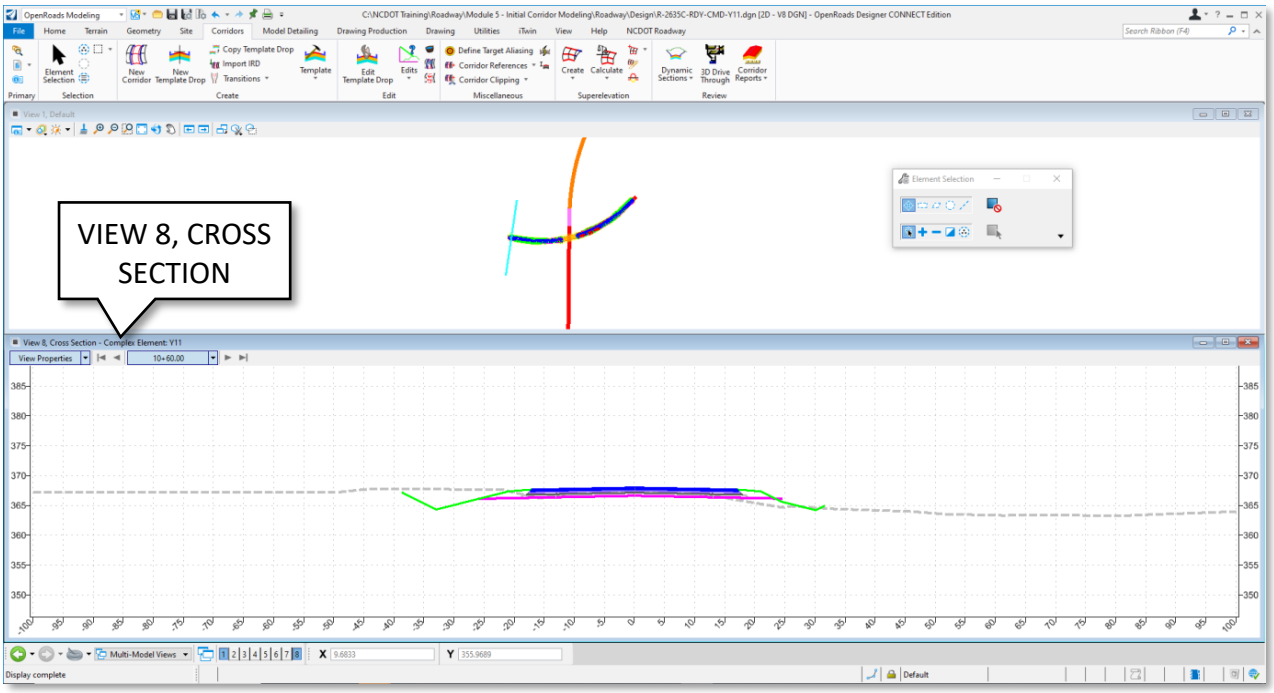
H. After selecting the **Y11** alignment the **Open Cross Sections** dialog will open as shown below.



I. Set the **Open Cross Sections** dialog parameters as follows:
- **Left Offset** = **100**
- **Right Offset** = **100**
- **Station** = **10+00.00**
- **Interval** = **10**

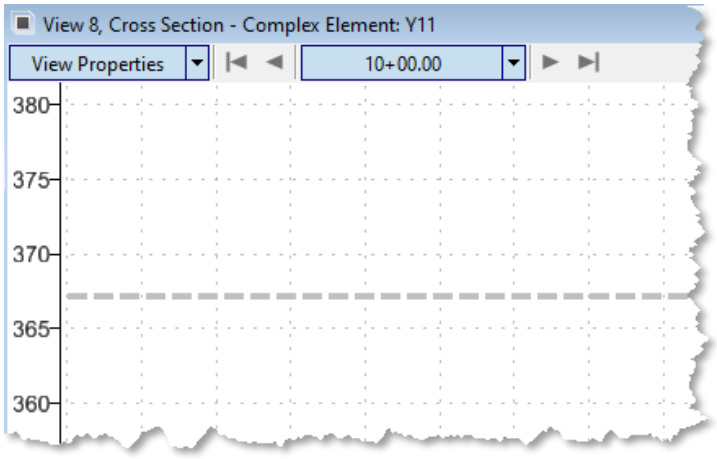
Hint:
As you click through the prompts, be aware of the left and right offset parameters. The **100'** offset is dependent on which side of the alignment you click. Notice that the **100** becomes **-100** when you move your curser to the left side of the alignment. As you move back to the right side the parameter becomes **100** again.

J. Finally, you will be prompted to **Select or Open View**. Click in the **View 8, Default** window at the bottom of your screen because its already been opened. The Dynamic Cross Sections for Y11 will be displayed as shown below. Notice that the **View 8, Default** window now reads **View 8, Cross Section** instead.

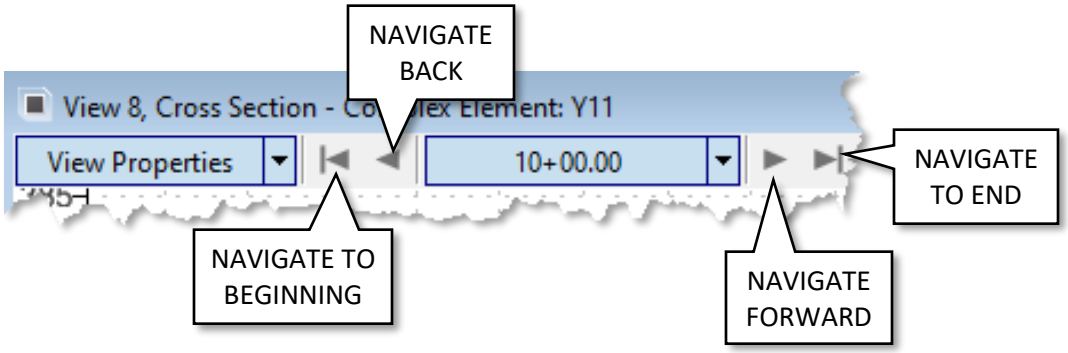


17. Navigate the Y11 Dynamic Cross-Sections

A. Notice the **View Properties** and **Stationing** menu displayed in the top left corner of the **View 8, Cross Section** window as shown below.

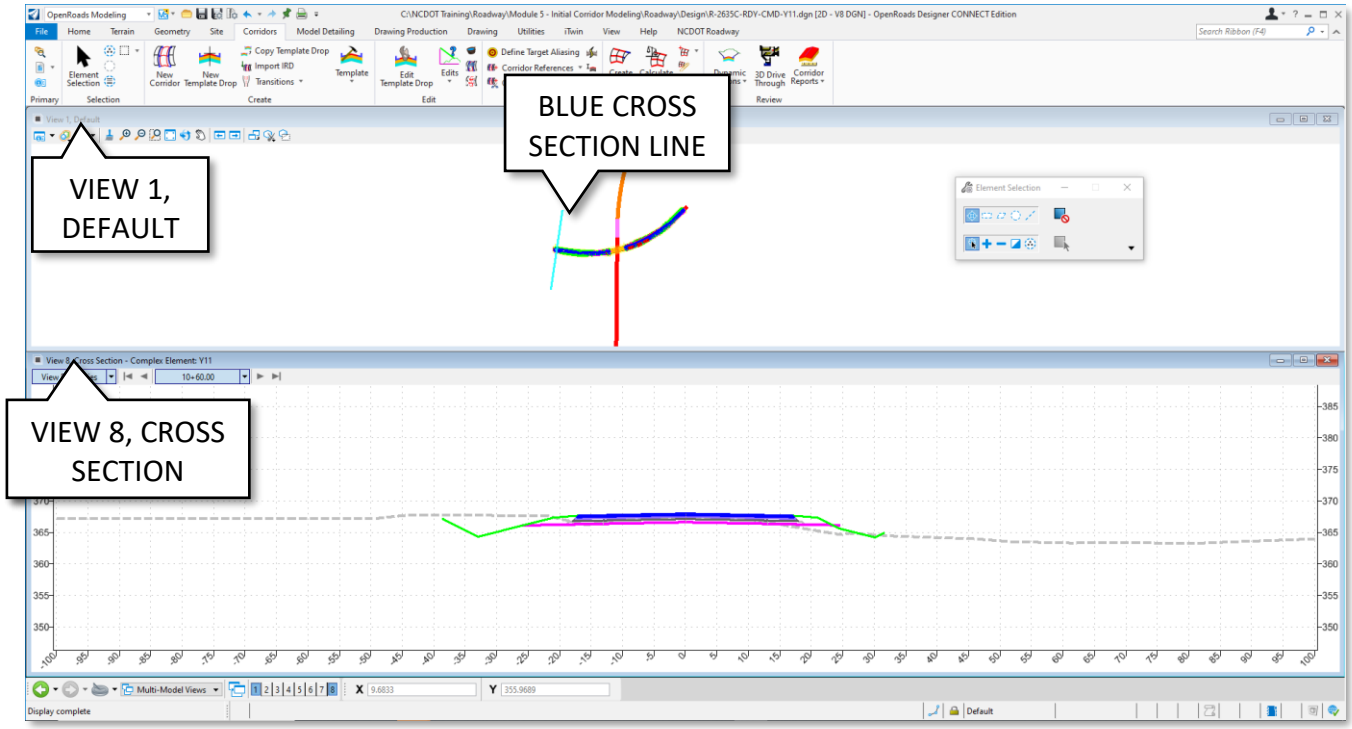


B. The arrows shown on either side of the **Stationing** menu are used to navigate the cross sections. Spend a few moments navigating the cross sections using these arrows.

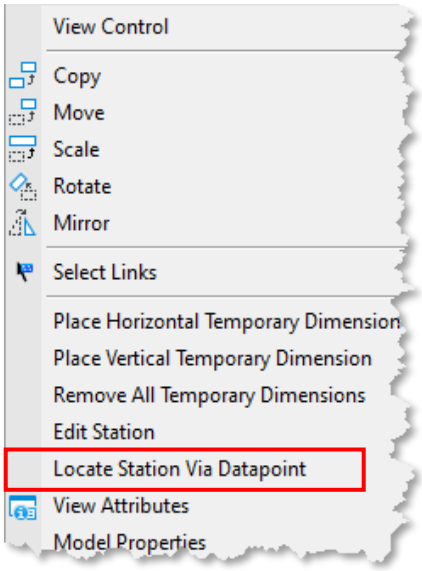


C. Each time you click the **Navigate Forward** or **Navigate Back** buttons, the stationing increases or decreases by an interval of **10**. The navigation increment is dependent upon the template drop increment. If you were to change the template drop interval to **50'**, the navigation interval would reflect this change.

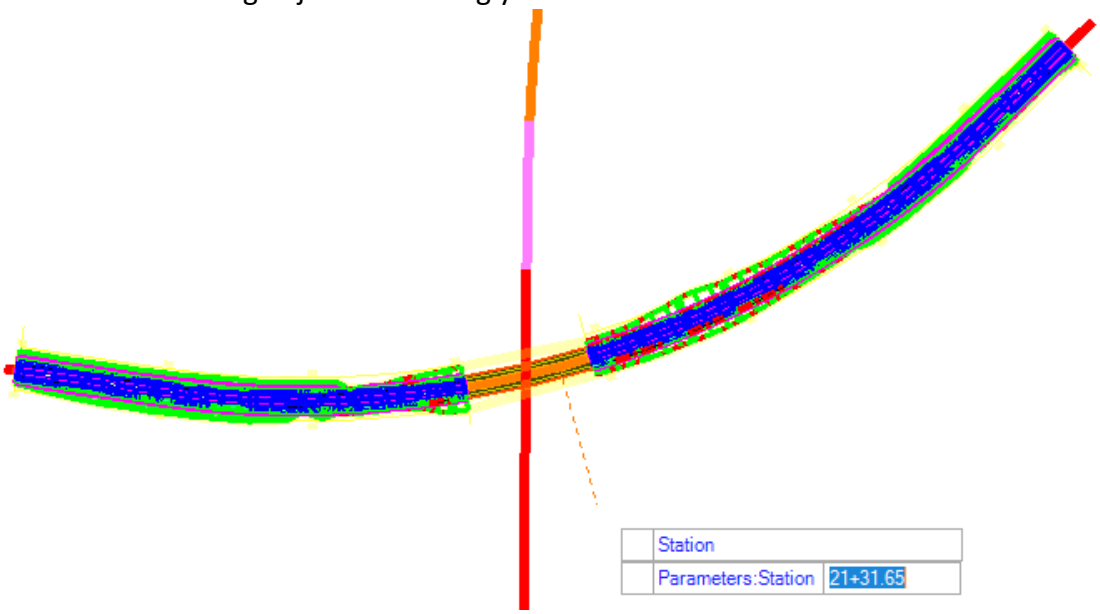
D. As you navigate the **Y11** cross sections, a blue line is displayed in the **View 1, Default** plan view as shown below. This line represents the **Y11** cross section in the plan view. As you navigate the **Y11** cross sections in **View 8**, the blue cross section line moves to the station shown in the cross section.



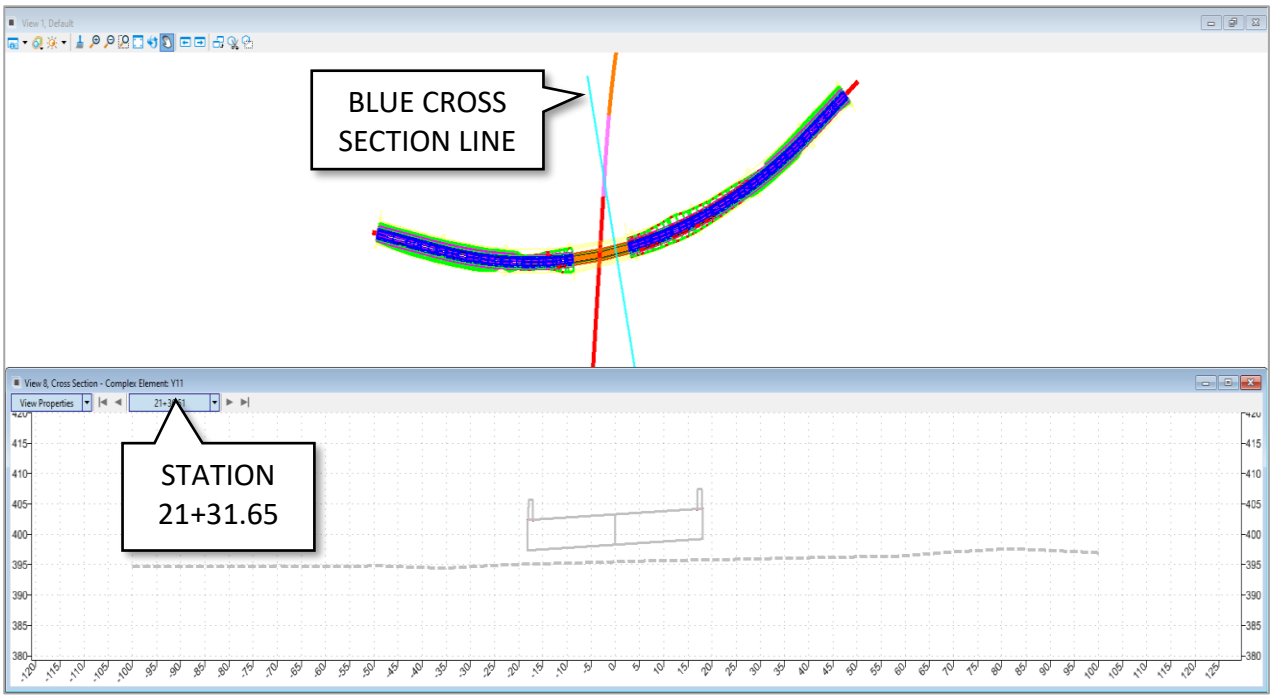
E. Now right click in the **View 8, Cross Section** view and select the **Locate Station Via Datapoint** option as shown below.



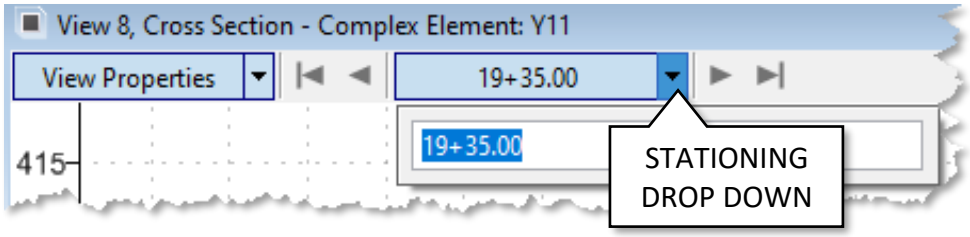
F. Click the **View 1, Default** window when prompted to **Select Plan or Profile View**. Notice the orange dashed line and its accompanying stationing dialog as shown below. As you move back and forth the stationing adjusts accordingly.



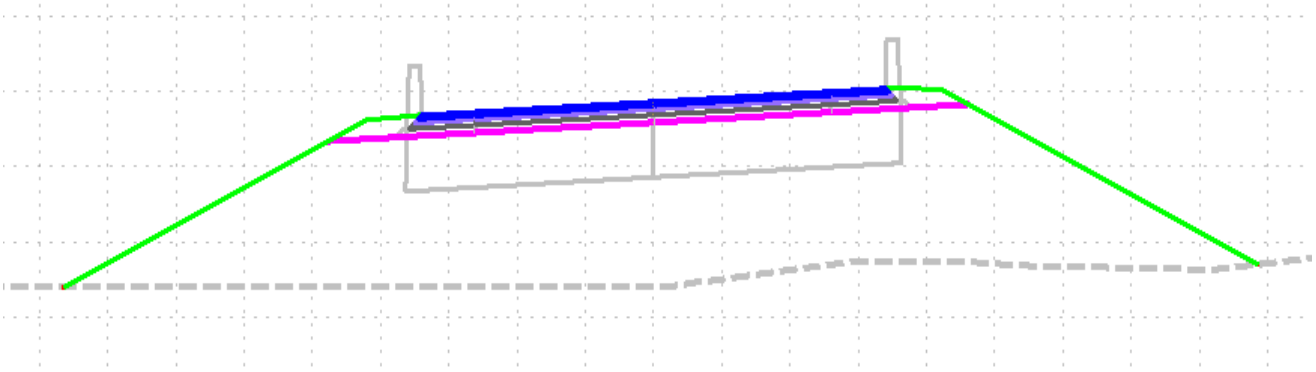
G. Now, left click near station **21+30 +/-** and the corresponding cross-section displays in the **View 8, Cross section** window beneath.



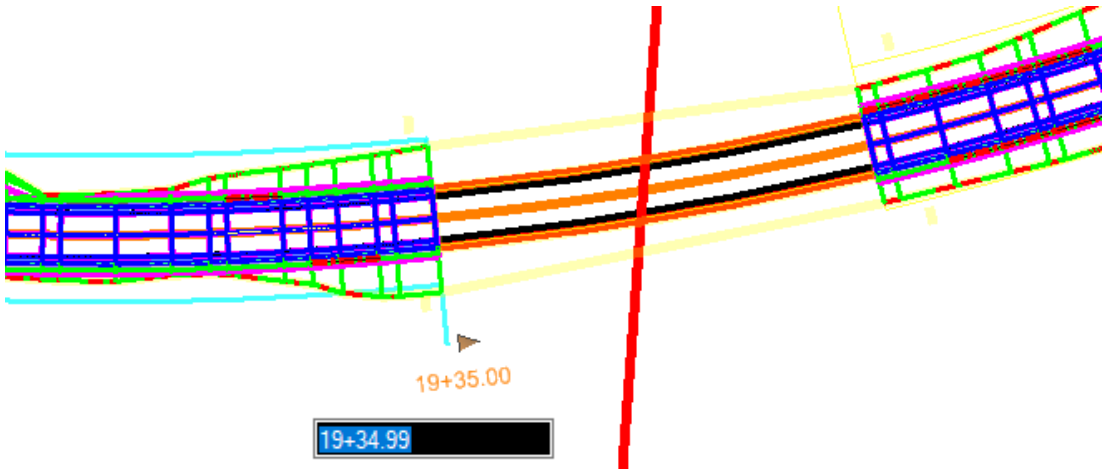
H. You also have the option to key-in at specific station in the cross-section view. Click the stationing dropdown arrow and key in **19+35.00** and hit the enter button as shown below.



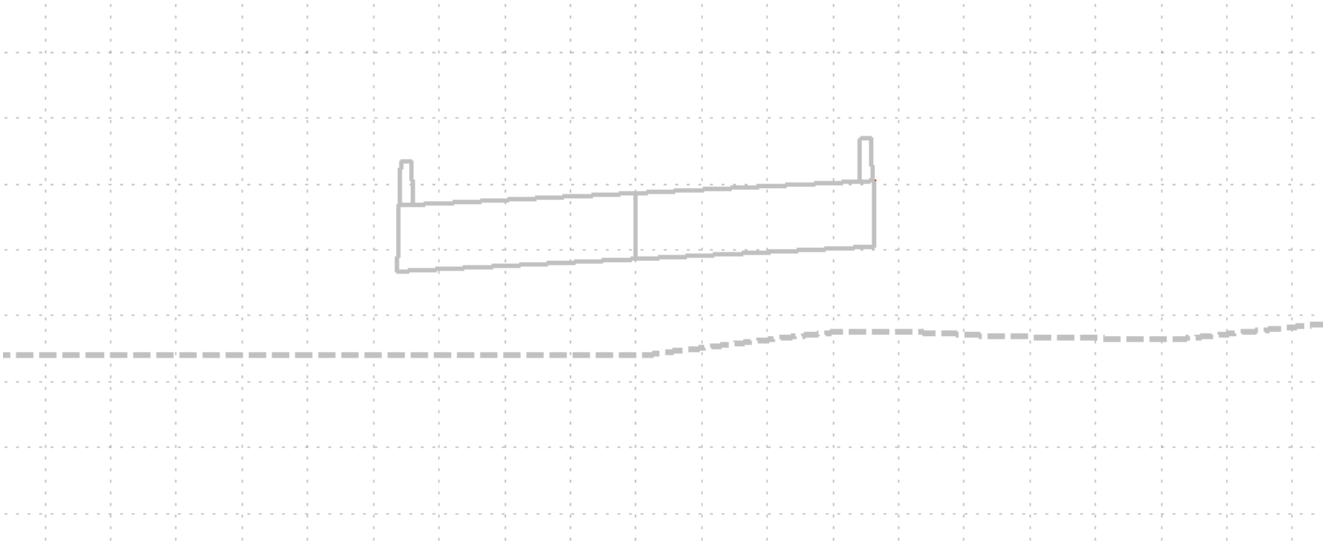
I. Station **19+35.00** was the begin bridge station you may recall. Notice the cross-section view at this station as shown below. Both the bridge and standard roadway sections are displayed on top of one another. This is because the **Y11_**UF - 1+1 Lanes **- LDS****S Template Drop** and the **Y11_TMPLT - Bridge Dual Lane Template Drop** share this station, which causes this conflict.



J. This can be resolved by changing the **Y11_UF - 1+1 Lanes - LDSS Template Drop** end station as previously described. Click on the end station and key-in **19+34.99** as shown below.



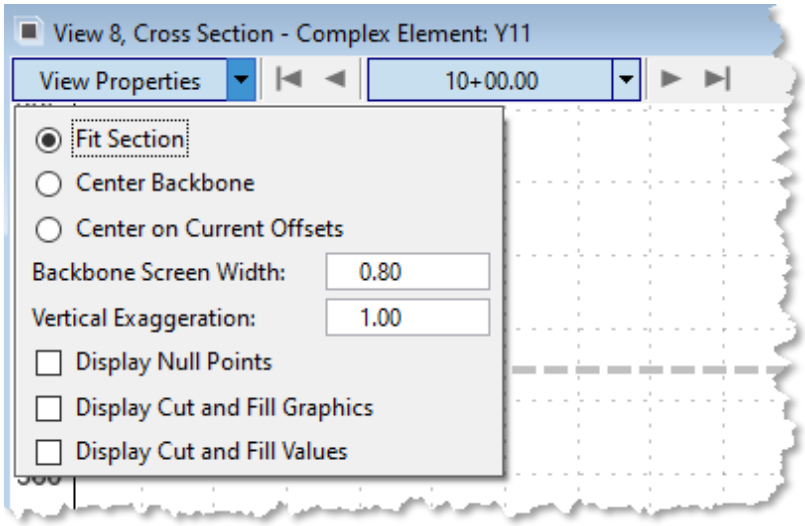
K. This change resolves the conflict between the two (2) conflicting template drops as shown below in the cross-section view.



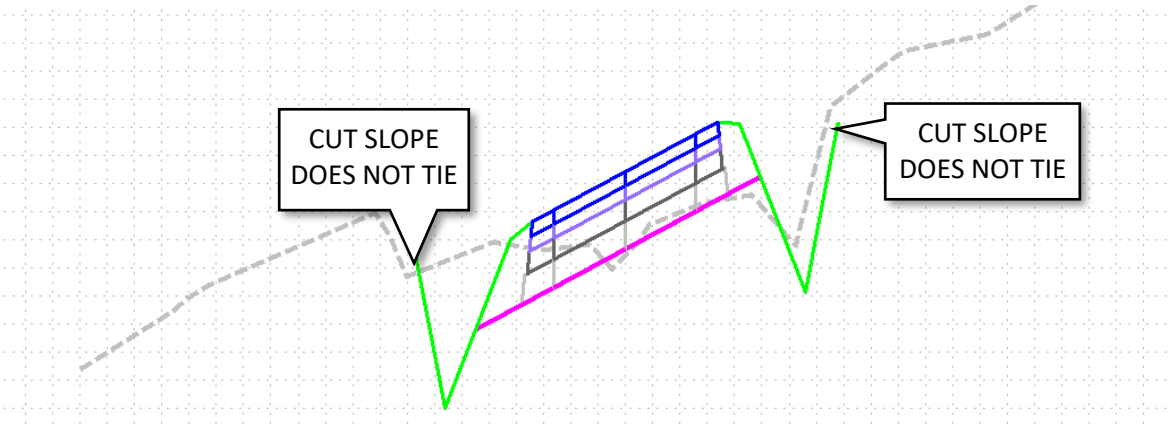
L. Resolve the end bridge conflict as well, using the same technique. Changing the **Y11_UF - 1+1 Lanes - LDSS Template Drop** begin station from 22+00.00 to **22+00.01**.

18. Adjust the Visual Display of the Y11 Dynamic Cross-Sections using the View Properties Dialog

A. The **View Properties** menu contains tools that can be used to adjust how the **Dynamic Cross Sections** are displayed. Click the **View Properties** and a dialog will open as shown below.



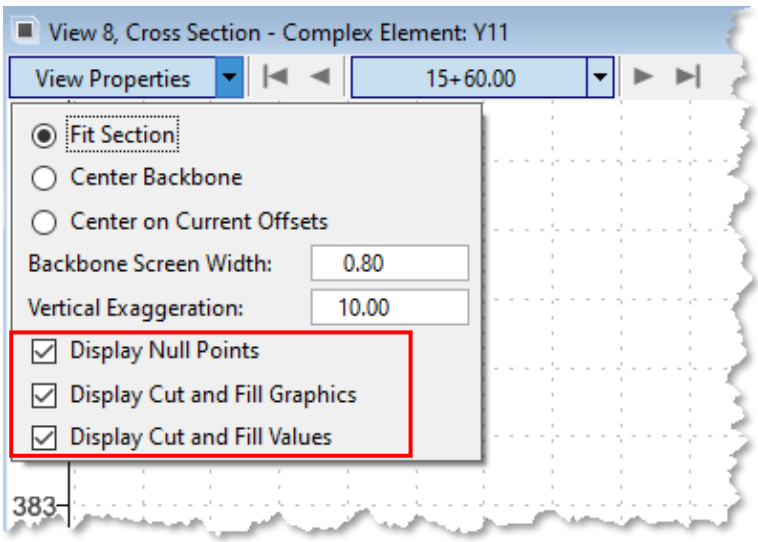
B. Key-in station **15+60.00** into the stationing dropdown and then change the **Vertical Exaggeration** option in the **View Properties** dialog from 1.00 to **10.00.** Notice that the cross sections are now vertically exaggerated as shown below.



C. Because the **Vertical Exaggeration** is set to **10.00**, it's easy to see that the cut slopes are not actually tying to the existing surface as they should and can be very useful when vertical precision is needed. Slopes may not tie properly when a specific station does not match the template drop interval.

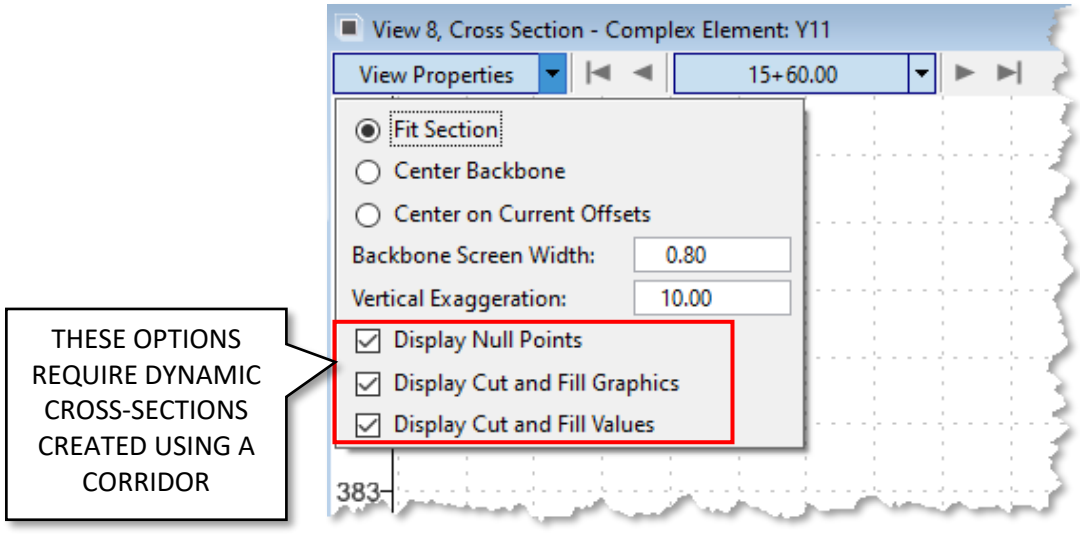
Note: The slopes can be fixed by selecting the **Final** design stage. This will be demonstrated further along as you continue working through the module.

D. Click on the bottom three (3) **View Properties** options as shown below and then scroll through the **Y11 Dynamic Cross-Sections.**



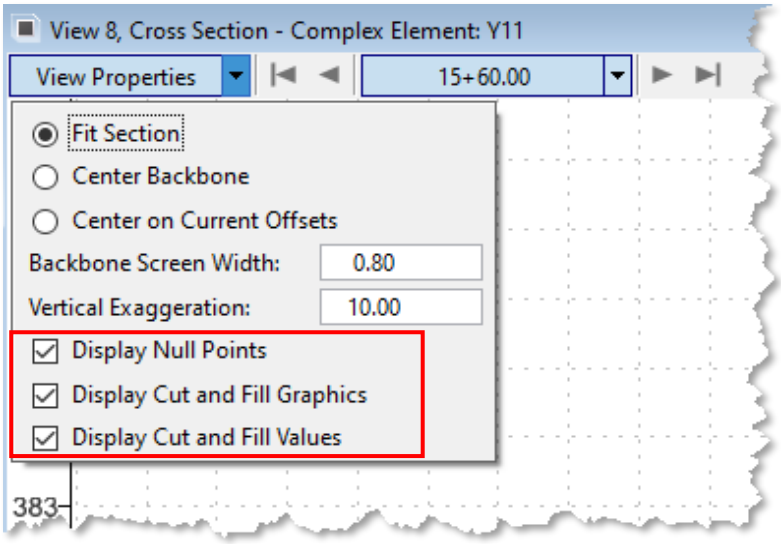
E. As you scroll through you will notice that nothing has changed and that the options did not take effect.

F. To resolve this, you will need to re-create the **Y11 Dynamic Cross-Sections**, only this time choosing the **Y11-Corridor** instead of the **Y11** alignment when prompted to **Locate Corridor or Alignment.** For specifics, see the previous steps.

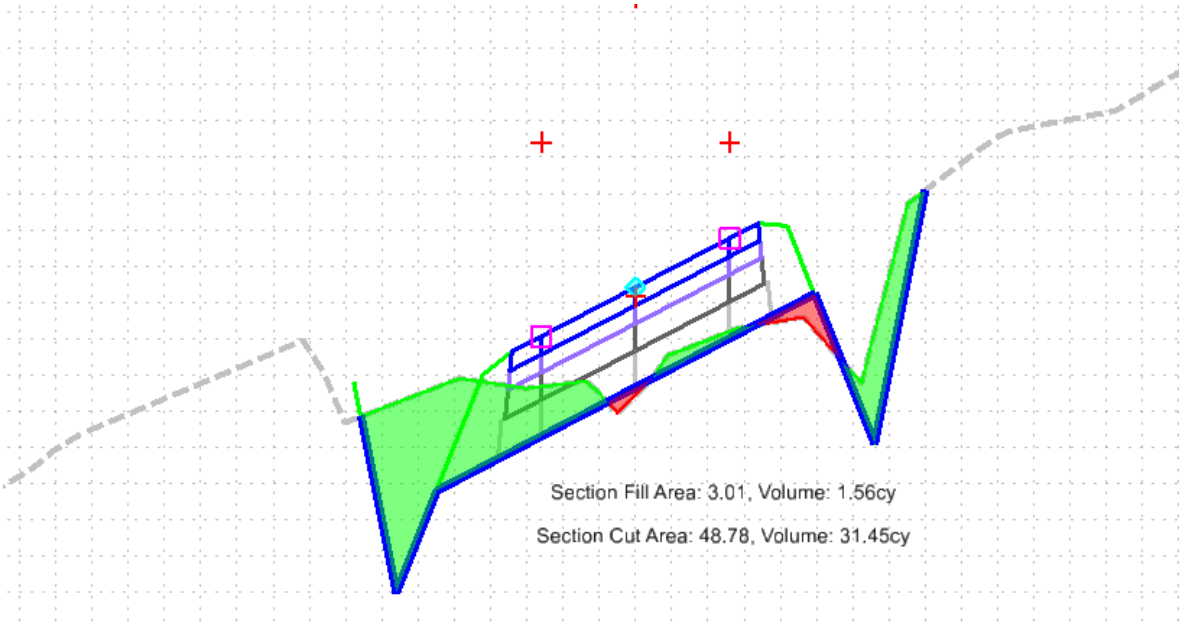


Note: The bottom three (3) options can only be enabled when the **Dynamic Cross-Sections** are created using a corridor.

G. After recreating the **Y11 Dynamic Cross-Sections**, re-enable the bottom three (3) options as shown below.

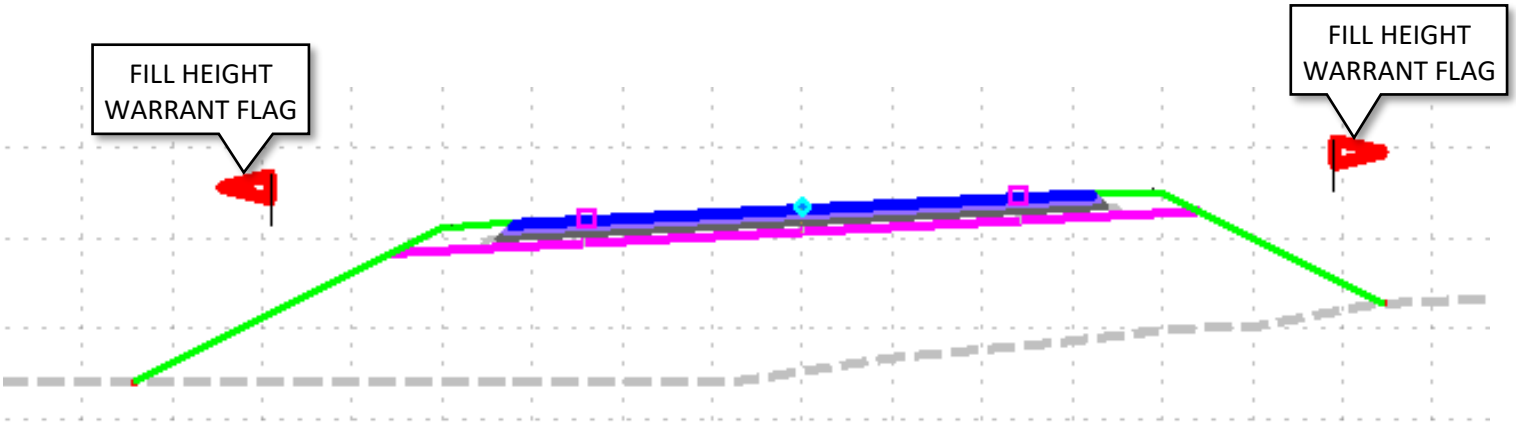


H. As you begin scrolling through the **Y11 Dynamic Cross-Sections** notice the additional information that is now visible as shown below.



Note: The earthwork data shown below the cross-section itself is for information only and will not be displayed in the cross-section sheets.

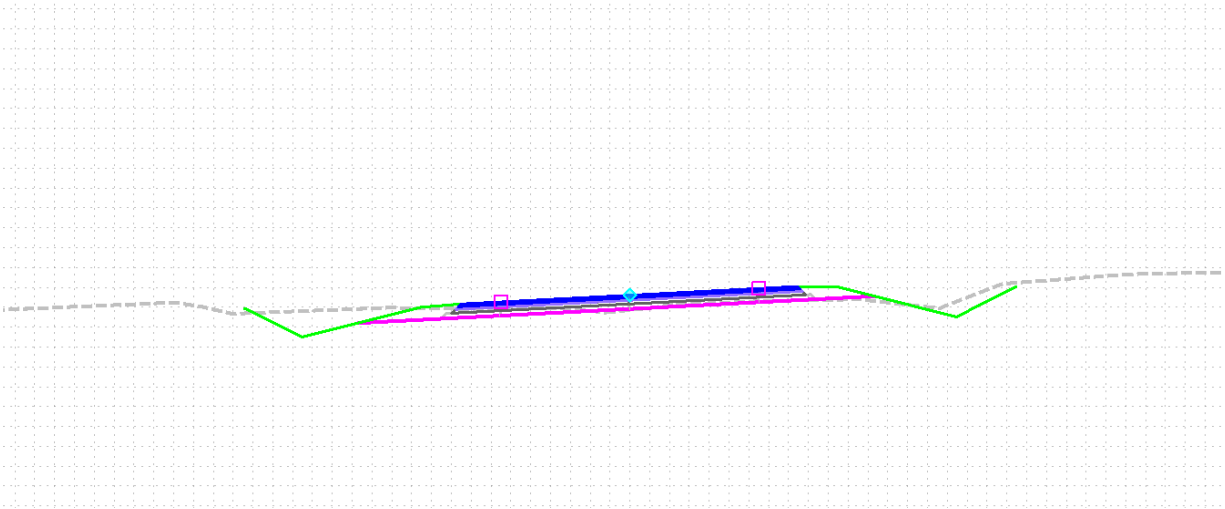
I. Next, navigate to station **18+60.00** and notice the red flags on either side of the cross-section as shown below. These flags are a visual attribute that is only available when the dynamic cross-sections are created using the corridor as opposed to the alignment. These flags are triggered by the guardrail fill height warrant and are intended to alert the designer that guardrail may be necessary. Like the earthwork information these flags are for informational purposes only and will not be displayed in the cross-section sheets.



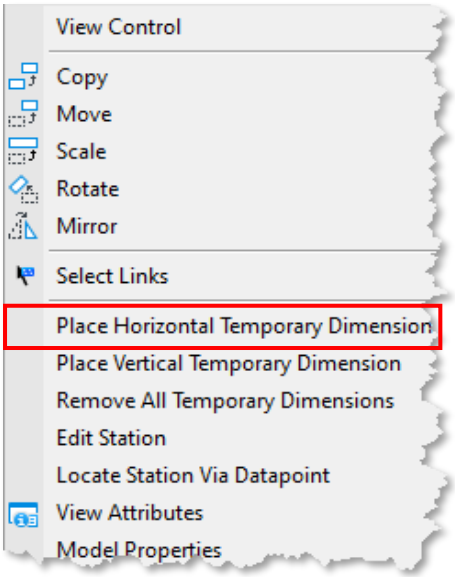
J. As you continue scrolling through the **Y11 Dynamic Cross-Sections,** notice that the bridge cross-sections are skipped. The bridge sections are not visible because the bridge template drop is associated with the **Y11 Bridge Corridor** and not the **Y11 Corridor** itself. If you recall, there was a break in the **Y11 Corridor** to accommodate a separate **Y11 Bridge Corridor**. In order to display the bridge limits while in the **Y11 Dynamic Cross-Sections**, manually key in a specific station within the bridge limits or Create Dynamic Cross-Sections using the **Y11 Alignment** as opposed to using the corridor itself.

19. Display Temporary Dimensions in the Y11 Dynamic Cross-Sections View

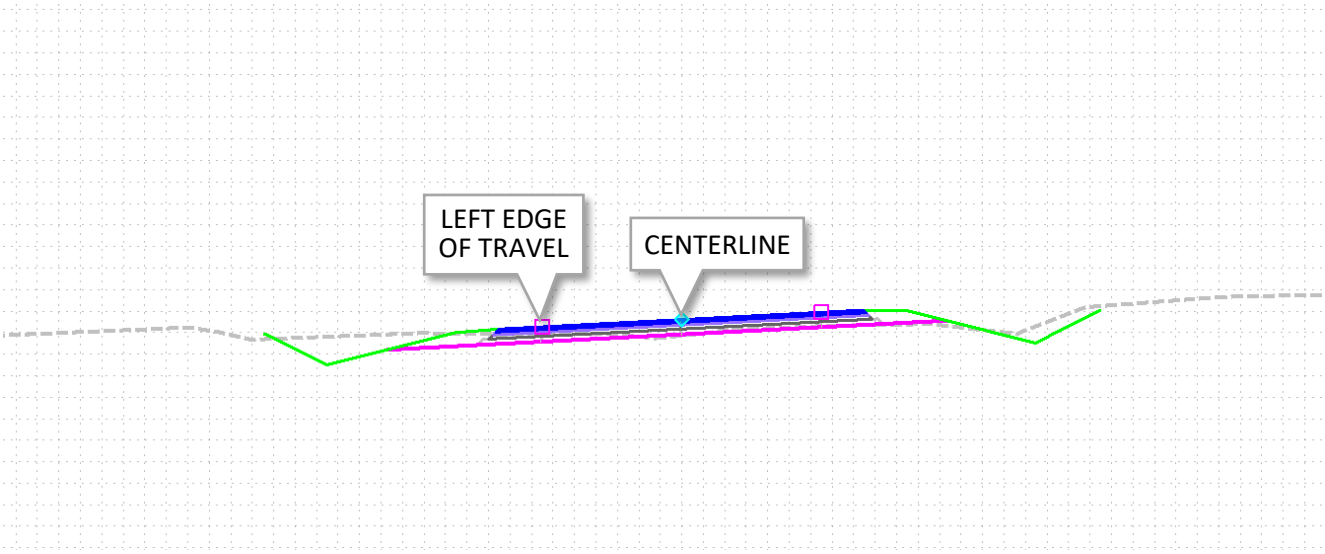
A. Use the **View Properties** dialog to eliminate the vertical exaggeration and additional visual options that were described in the previous step to revert back to the default presentation as shown below.



B. Next, right click in the **View 8, Cross Section** view and select the **Place Horizontal Temporary Dimension** option from the context menu as shown below.

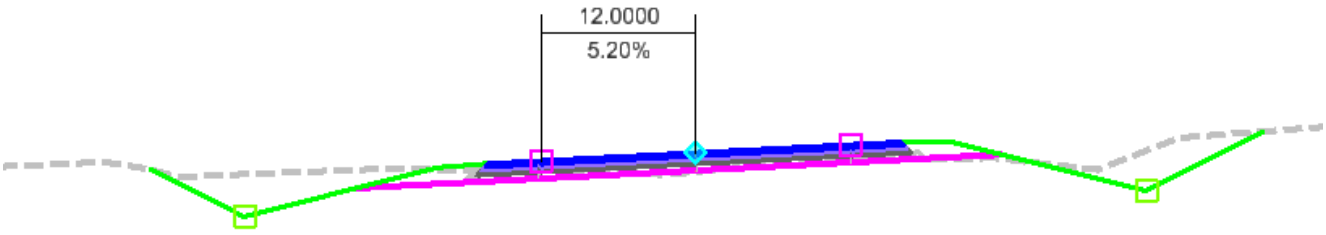


C. After selecting the **Place Horizontal Temporary Dimension** option, you will be prompted for a **Start Point** and then an **End Point**. For the **Start Point** snap to the **~EOT** (left edge of travel) point and for the **End Point** snap to the **CL** (centerline) point as shown below.

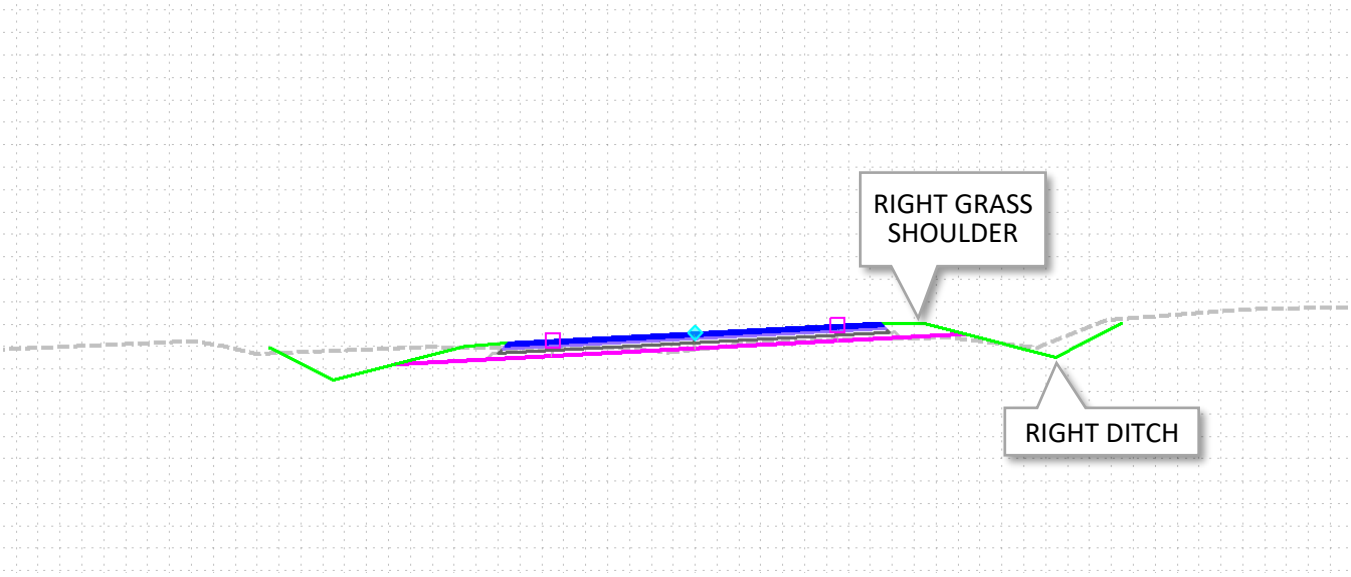


D. After snapping to these points, you will then be prompted for a **Dimension Height.** Move your cursor up and down and notice the dimension lines extending from the two (2) dimension points move as well.

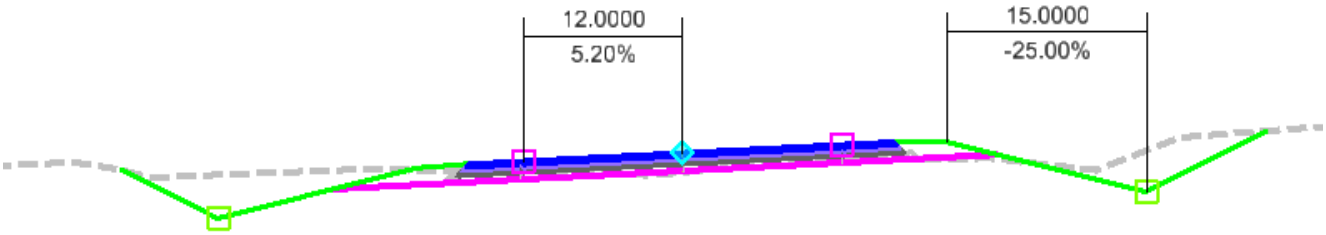
E. Adjust this height to your preference and then click the screen to place the temporary dimension as shown below.



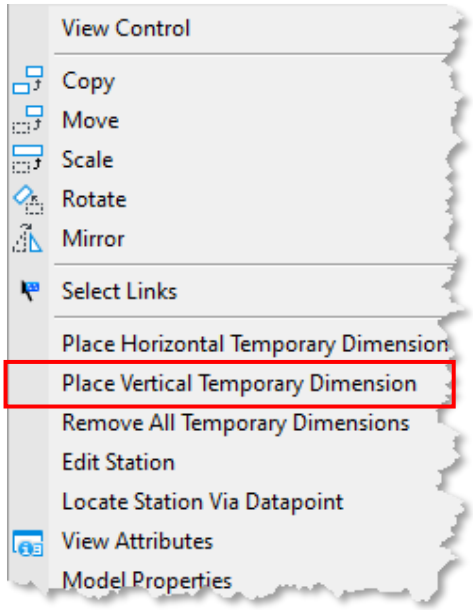
F. Next, follow the same process as previously described to label the right cut slope using the **+GSO_N** (right grass shoulder outside normal) point and the **+DBF** (right ditch base front) point as shown below.



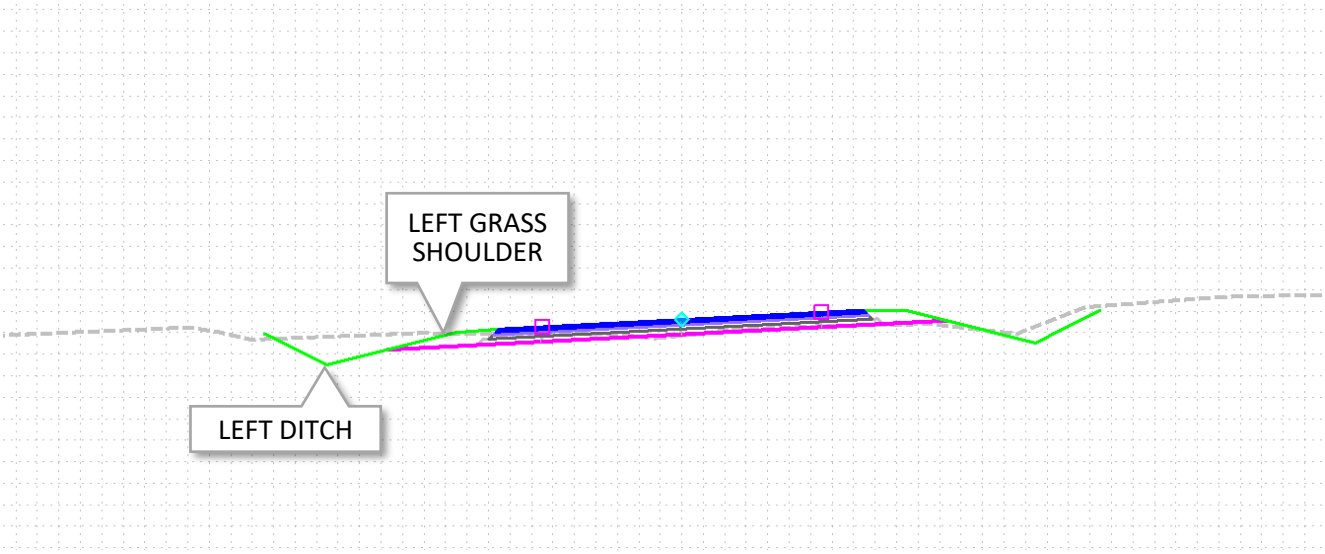
G. After adding the right cut slope dimension, your cross-section should be displayed as shown below.



H. In addition to **Horizontal Temporary Dimensioning**, you also have the ability to dimension vertical points as well. Vertical dimensioning can be added in the same way. To do so, right click in the **View 8, Cross Section** view and select the **Place Vertical Temporary Dimension** option from the context menu as shown below.

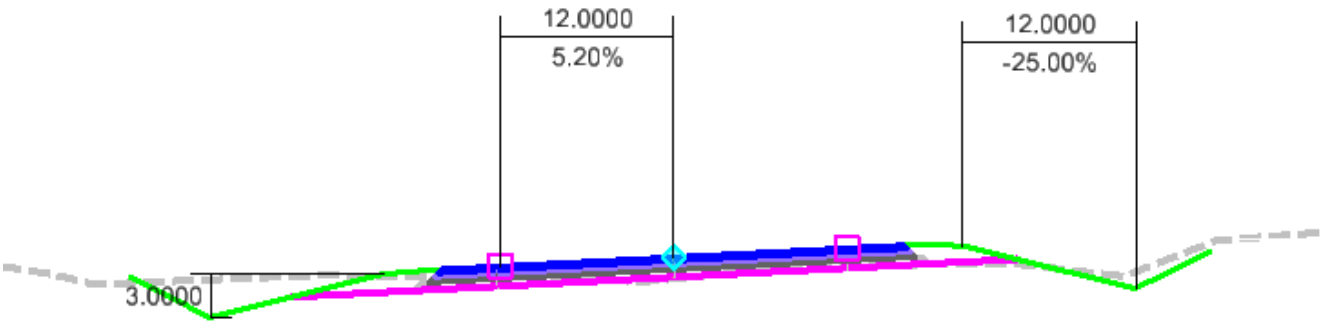


I. Next, follow the same process as previously described to label the depth of the left ditch using the **~GSO_N** (left grass shoulder) point and the **~DBF** (left ditch) point as shown below.



J. After snapping to these points, you will then be prompted for a **Dimension Height.** Move your cursor left and right and notice the dimension lines extending from the two (2) dimension points move as well.

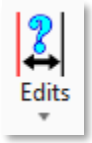
K. Adjust this height to your preference and then click the screen to place the temporary dimension as shown below.



Note: The dimensioning is only temporary and is to be used for information only. Temporary dimensioning will not be displayed in the cross-section sheets. For detailed information on sheet annotation see the **NCDOT Sheeting** module

L. Finally, begin scrolling through the **Y11 Dynamic Cross-Sections** and notice that the dimensioning adjusts accordingly.

20. Adjust the Ditch Widths using a Parametric Constraint



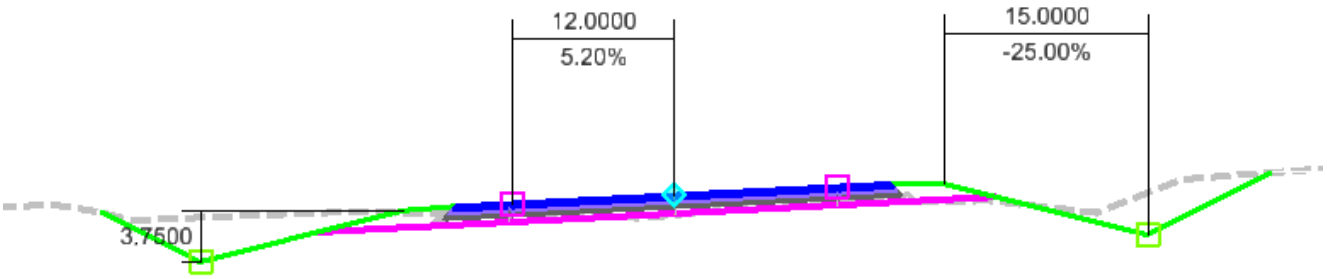
A. Click the Create Parametric Constraint **(Corridors > > Edit > Edits > Create Parametric Constraint)** button.

B. Select the **Y11** Corridor when prompted to **Locate Corridor**.

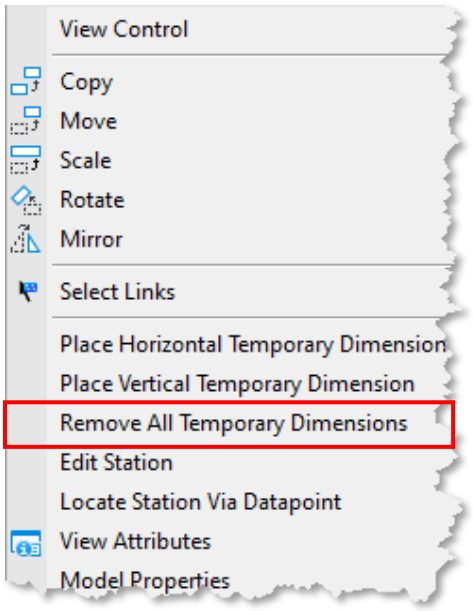
C. Set the following parameters in the **Create Parametric Constraint** dialog when it loads.

- **Start** = **10+00.00**
- **Stop** = **34+33.17**
- **Constraint Label** = **SS_Width_Ditch**
- **Start Value** = **15.000**
- **Stop Value** = **15.000**

D. Notice that the temporary dimensioning is dynamically updated based on the ditch width change as shown below.

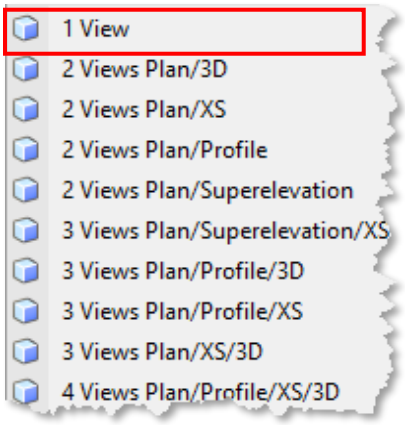


E. To remove the temporary dimensioning, right click in the **View 8, Cross Section** view and select the **Remove All Temporary Dimension** option from the context menu as shown below.

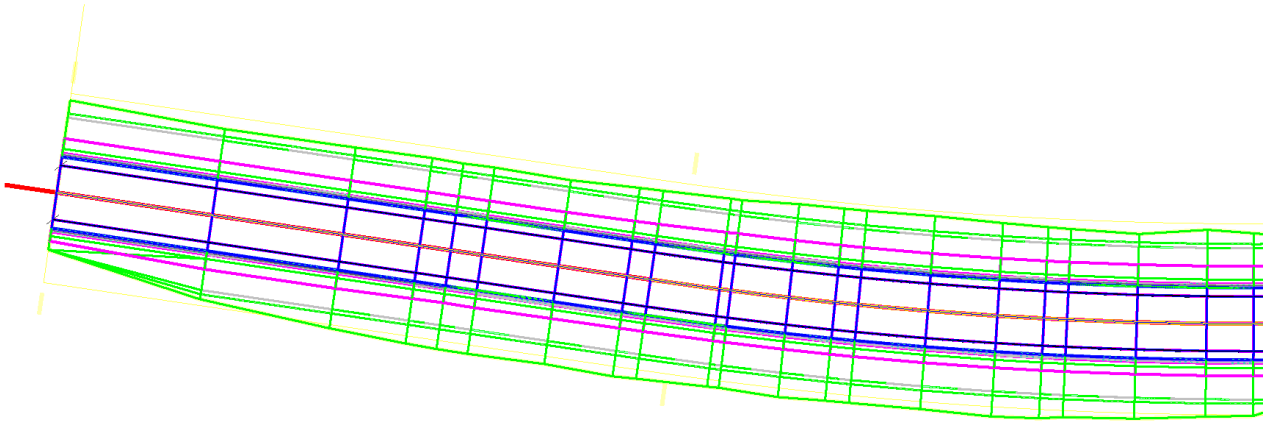


21. Using a Parametric Constraint, add a 125' Lane Taper at the beginning of the Y11 Corridor

A. Right click in the **View 8, Cross Section** view and select the **1 View** option from the **View Control** menu as shown below.

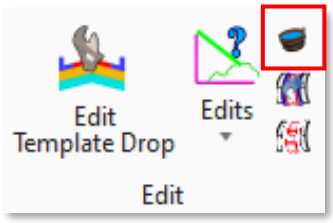


B. After selecting the **1 View** option, the **View 8, Cross Section** view will be closed and the **View 1, Default** view will open. Zoom in near the beginning of the **Y11 Corridor** as shown below.

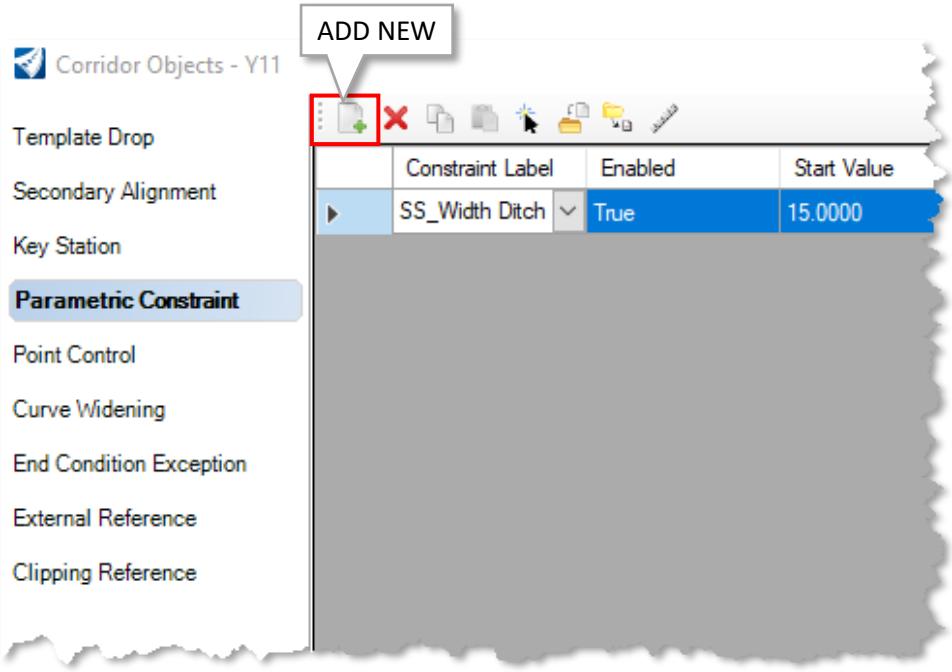


C. Next, click the **Corridor Objects** button ("The Bucket") **(Corridors > Edit > Corridor Objects).**

D. As directed by the prompt, click the **Y11** Corridor and the **Corridor Objects** dialog will load.

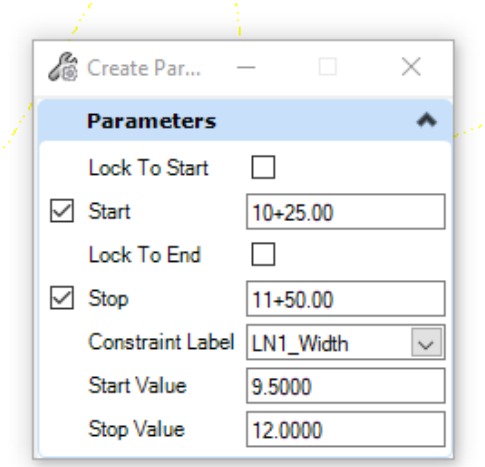


E. Click on the **Parametric Constraint** row and click **Add New** button as shown below.

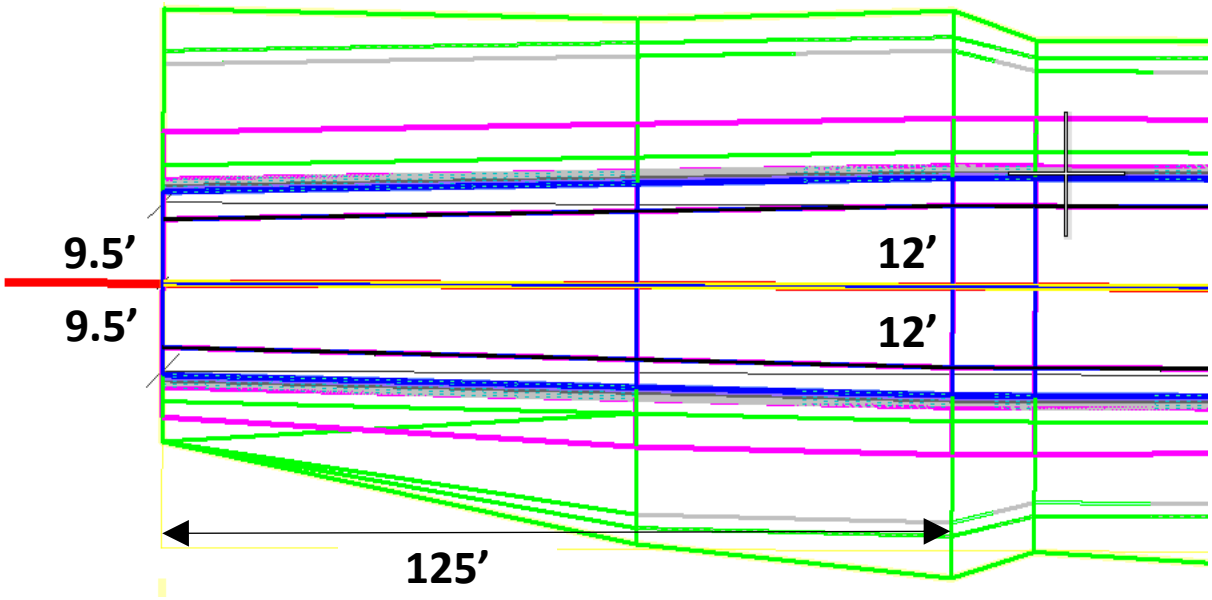


F. Once the **Create Parametric Constraints** dialog loads, set the following parameters and click through the prompts shown below.

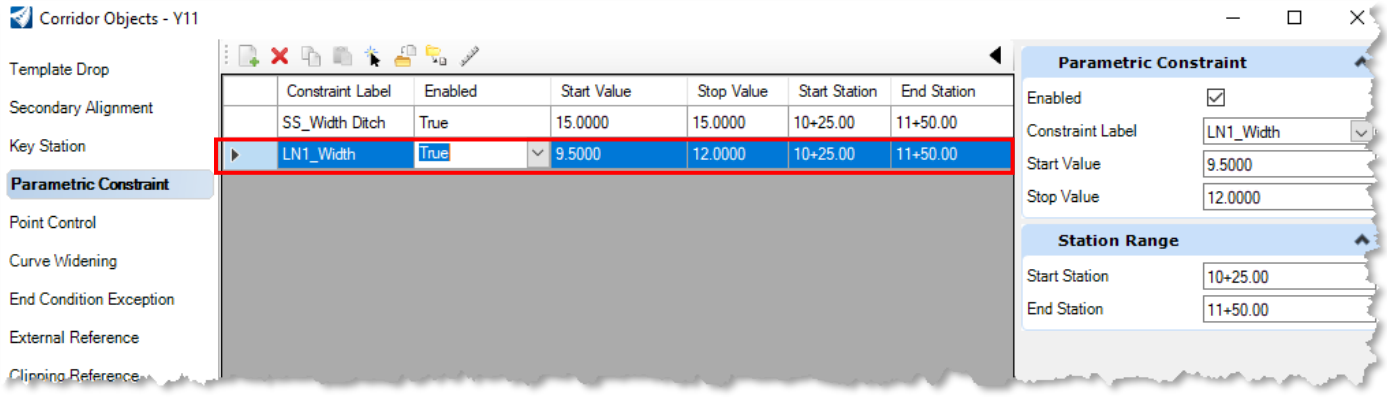
- **Start** = **10+25.00**
- **Stop** = **11+50.00**
- **Constraint Label** = **LN_Width**
- **Start Value** = **9.5000**
- **Stop Value** = **12.0000**



G. The **LN_Width** (pavement width) start and stop values change from **9.5** to **12** over a **125'** distance creating a **125' lane taper**, allowing the proposed **12'** lanes to tie back to an existing **9.5'** lane condition as shown below.



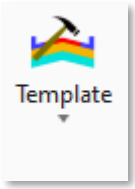
H. Notice that the **LN_Width** variable is now listed under the **Parametric Constraint** row of the **Corridor Objects** ("The Bucket") dialog as shown below. **Corridor objects** including **Parametric Constraints** can quickly and easily be managed from this dialog.



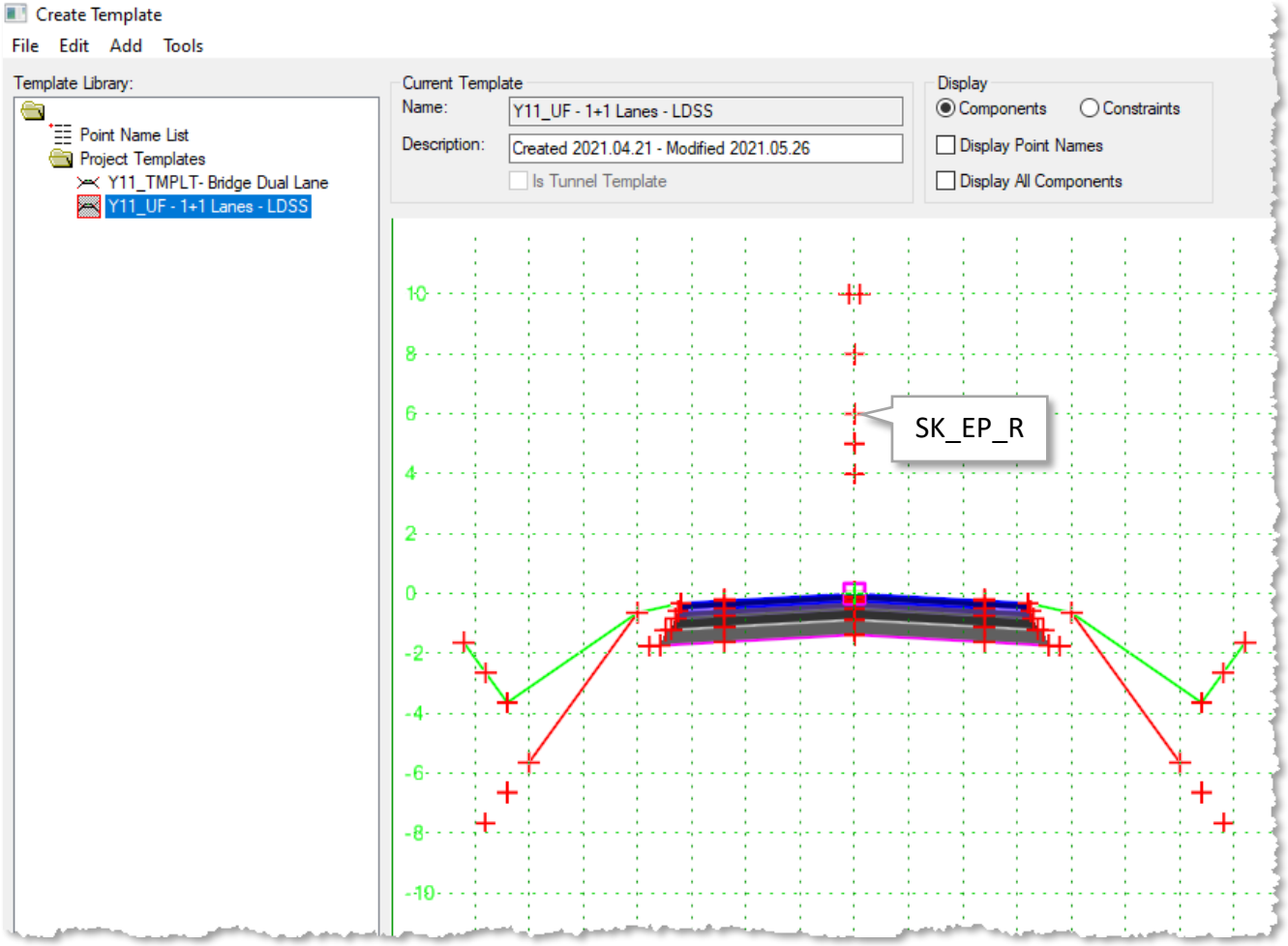
Hint: "The Bucket" could be considered a one-stop shop for corridor management.

I. Following the same steps just described, add an additional parametric constraint to do the same for the end of the corridor as well.

22. Adjust the Y11 Corridor to Display Overlay and Widening of Existing Pavement

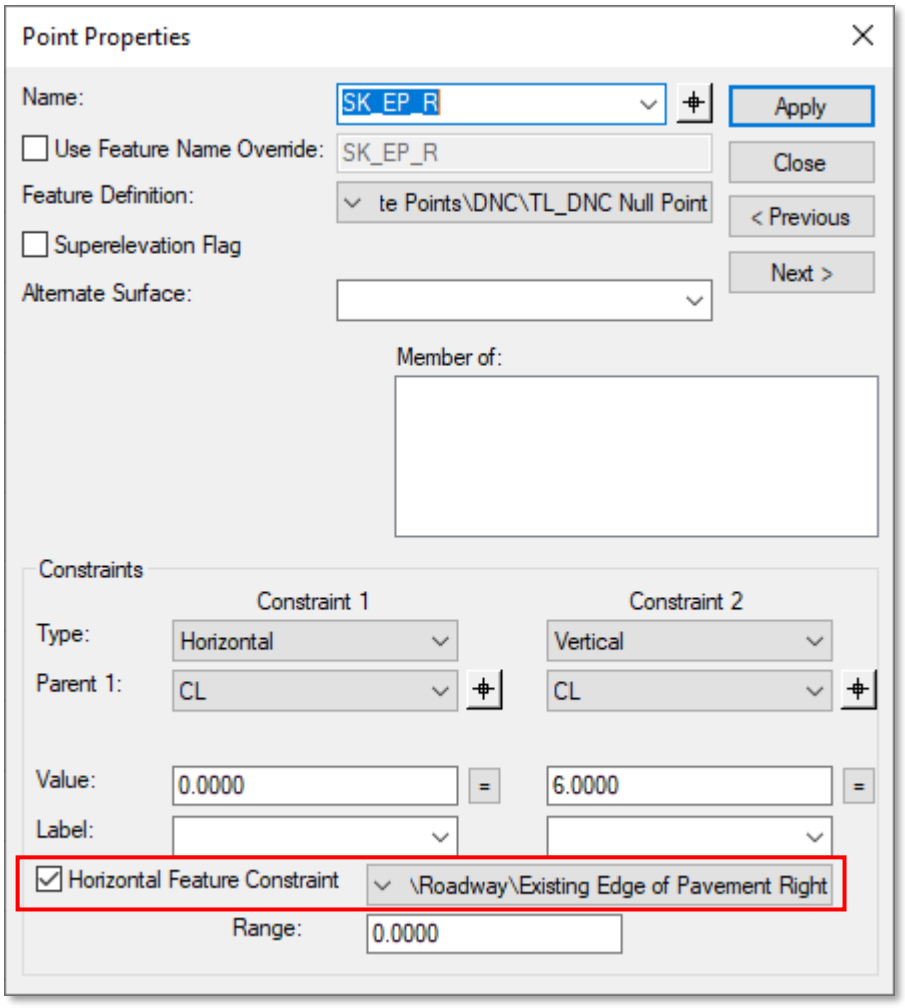


A. Click the **Create Template** button **(Corridors > Create > Template > Create Template)** to open the **Create Template** dialog. Then double click on the Y11_UF - 1+1 Lanes - LDSS **SK_EP_R** null point as shown below.

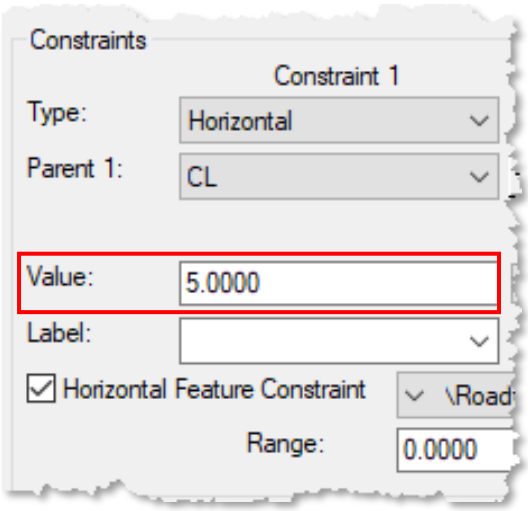


Note:
If the NCDOT_Roadway_R-2635C (Training).itl does not open by default, you may need to path to it manually.

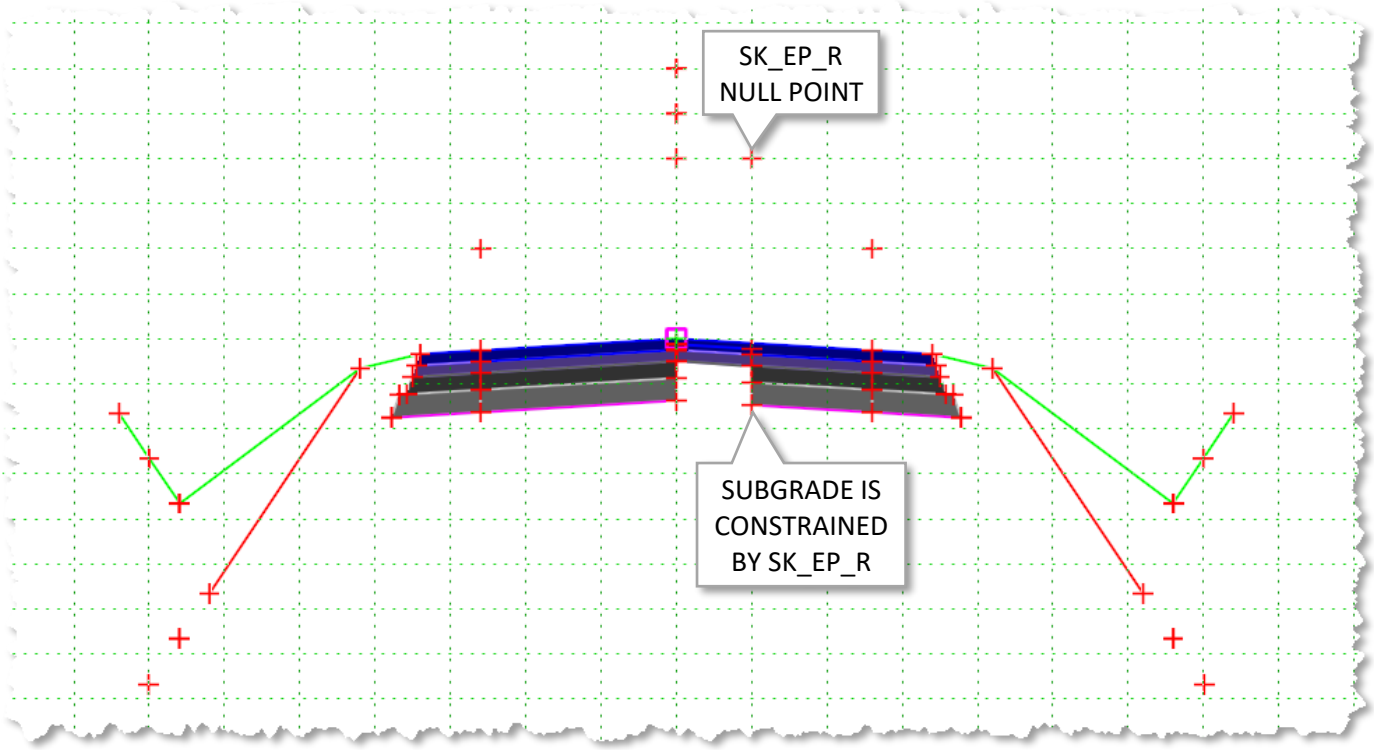
B. Notice the **Horizontal Feature Constraint** box has been checked and the feature is set to **Existing Edge of Pavement Right.** This means that the **+SK_EP_R** null point will search for an **Existing Edge of Pavement Right** linear feature. If located, the default horizontal value will be overridden by it.



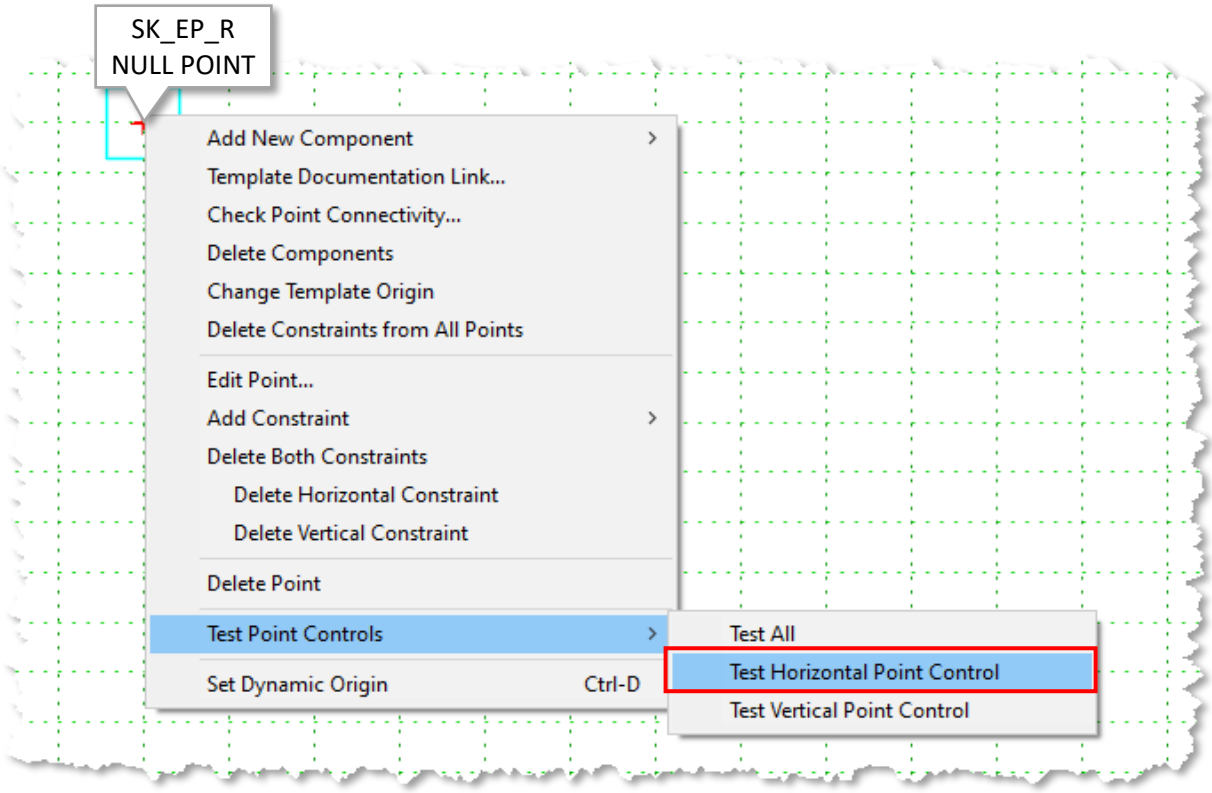
C. Change the **Horizontal** (Constraint 1) value to **5.0000** as shown below and then close out of the **Point Properties** dialog.



D. Notice that the template subgrade follows the **SK_EP_R** null point as shown below. This is because the subgrade is constrained by the **SK_EP_R** null point.

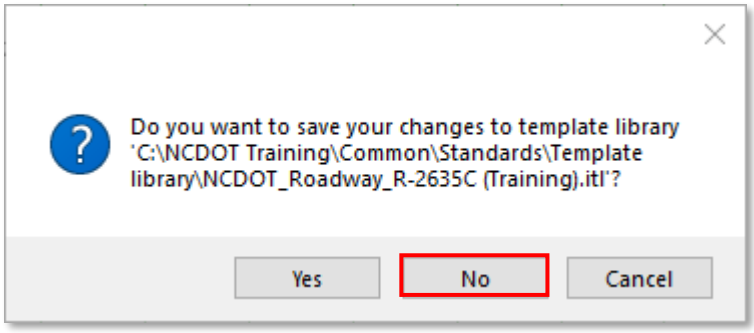


E. To better demonstrate this child-parent relationship, right-click on the **SK_EP_R** Null Point and select the **Test Horizontal Point Control** option as shown below. Now as you move your curser from side to side notice that the subgrade follows along. The **Test Horizontal Point Control** option simulates how the template will react when an existing edge of pavement line is located by the **SK_EP_R** null point.



Note: The **~SK_EOP** null point works the same way, only for the left side.

F. Close out of the **Create Template** dialog and select the **No** option when asked if you would like to save your changes to the template library.



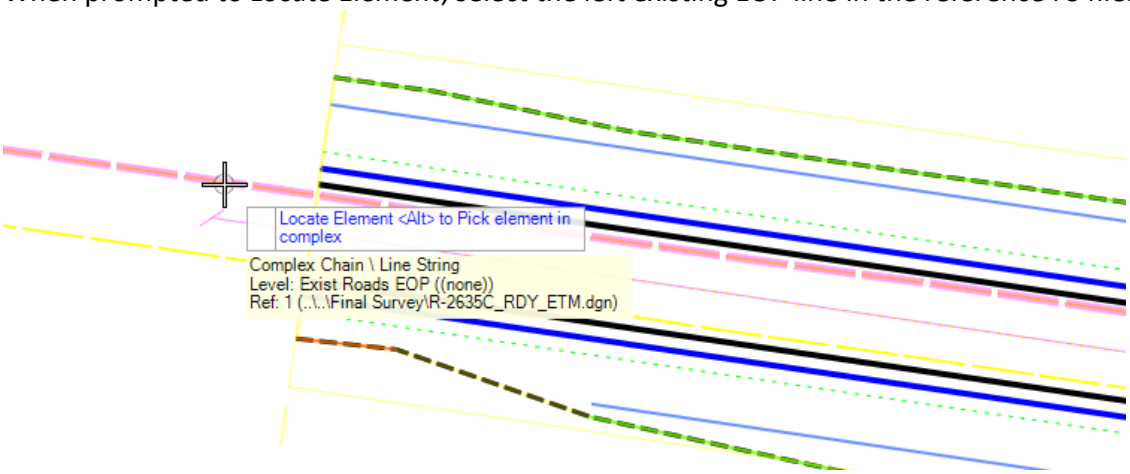
23. Defining Existing EOP Feature Lines for Pavement Wedging and Widening

A. Open the file R-2635C_RDY_EOP_EXIST.dgn.

A. Click on the **Single Offset Partial** command **(Geometry > Horizontal > Offsets and Tapers)**.

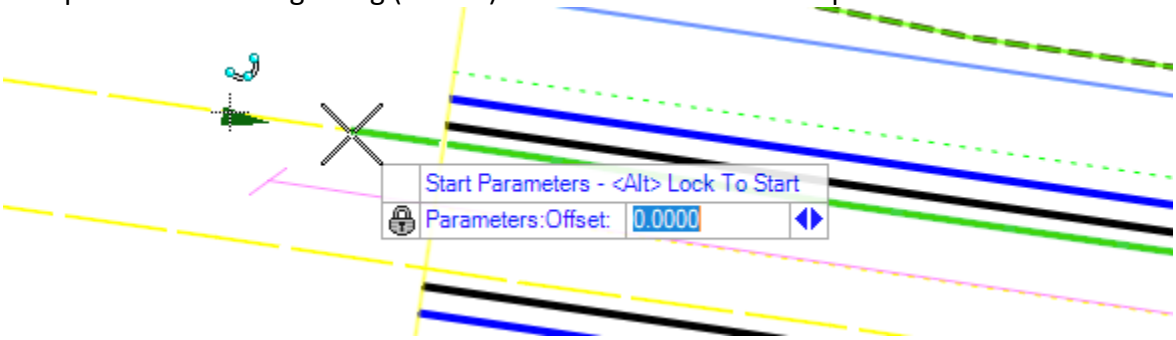
B. Change the Feature Definition to **Existing Edge of Pavement Left (Linear > Roadway > Existing > Roadway).**

C. When prompted to *Locate Element*, select the left existing EOP line in the reference FS file.

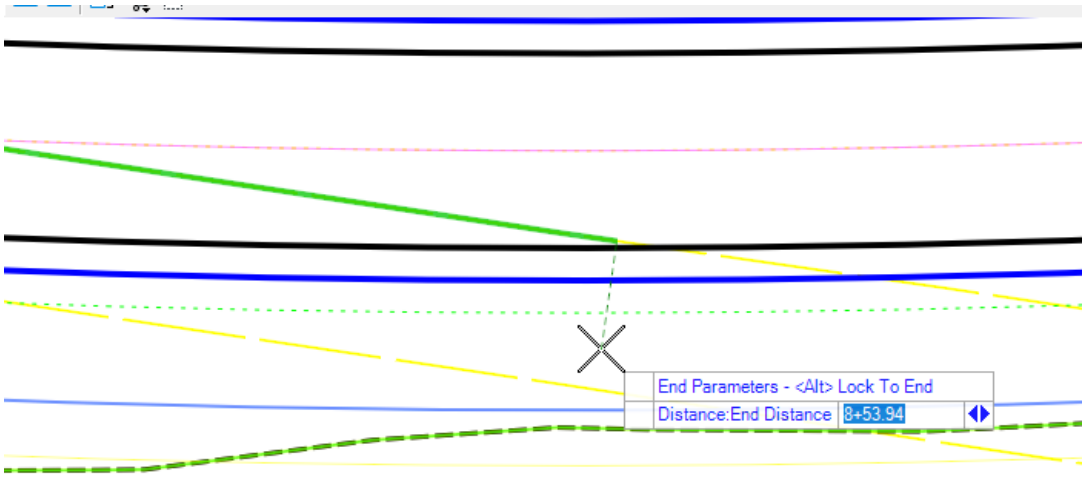


D. Type **0.0000** as the offset value and **Enter** to lock this value.

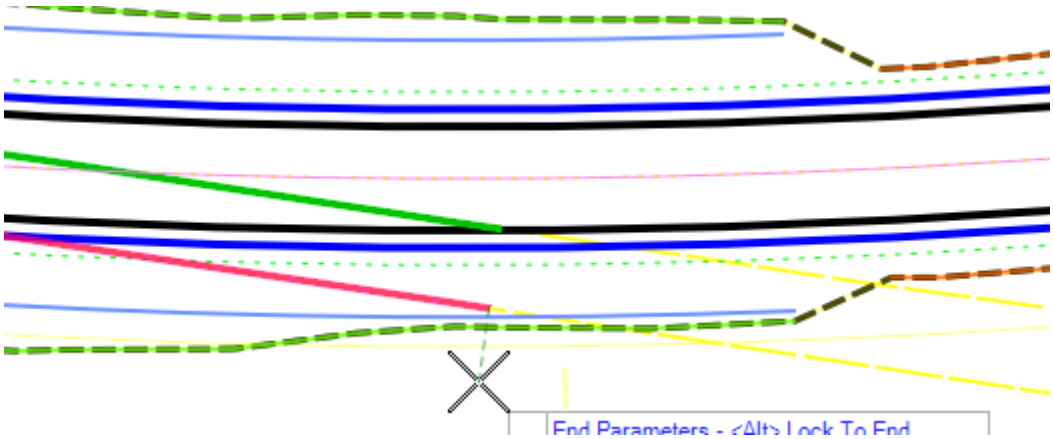
E. Datapoint near the beginning (before) the corridor for the start point.



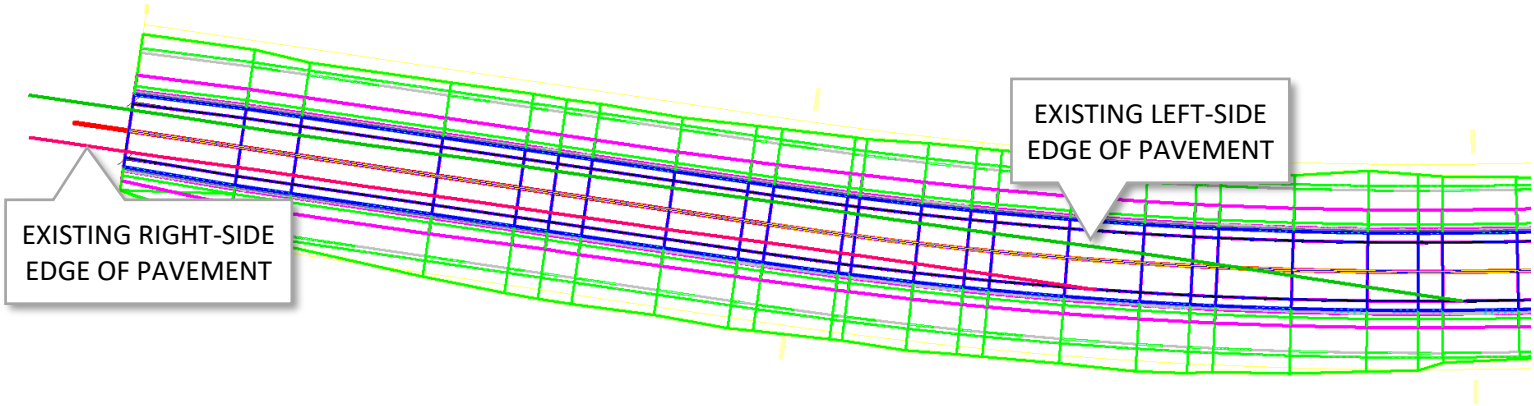
F. The end point should be near the intersection of the proposed EOT.



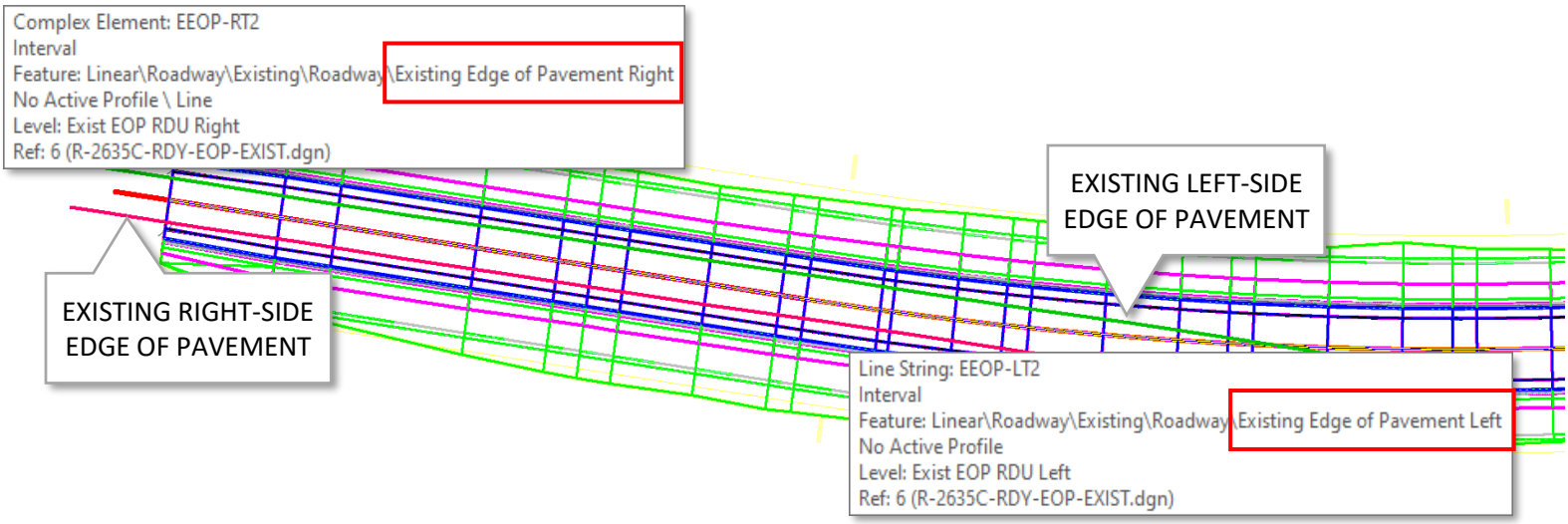
G. Change the Feature Definition to **Existing Edge of Pavement Right (Linear > Roadway > Existing > Roadway).**
H. When prompted to *Locate Element*, select the right existing EOP line in the reference FS file.
I. Type **0.0000** as the offset value and **Enter** to lock this value.
J. Datapoint near the beginning (before) the corridor for the start point.
K. The end point should be near the left existing EOP feature line created in the previous steps.



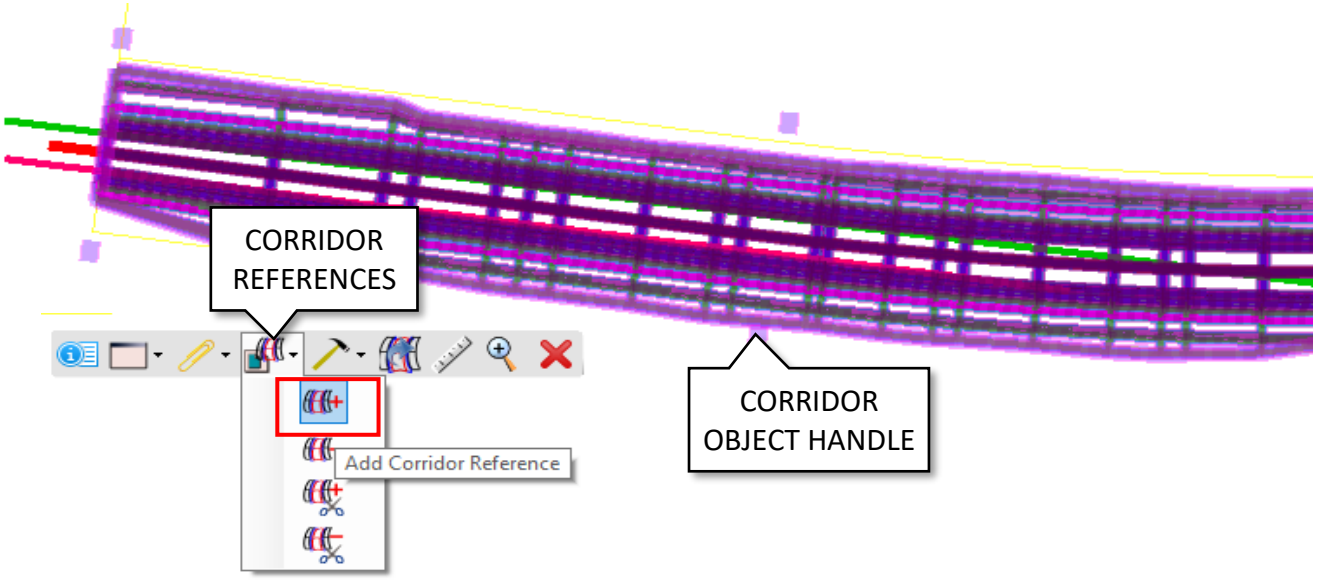
L. **Close** this file and **Open** the file R-2635C_RDY_CMD_Y11.dgn.
M. Next, attach the R-2635C_RDY_EOP_EXIST.dgn to the **Y11** Corridor (CMD) file using the **References** dialog **(Corridors > Primary > References)**.
N. In the **View 1-Default** window, zoom in closely to the **Y11** corridor as shown below and notice the two new lines that are now visible. The green line represents the existing left-side edge of pavement and the magenta line represents the existing right-side edge of pavement.



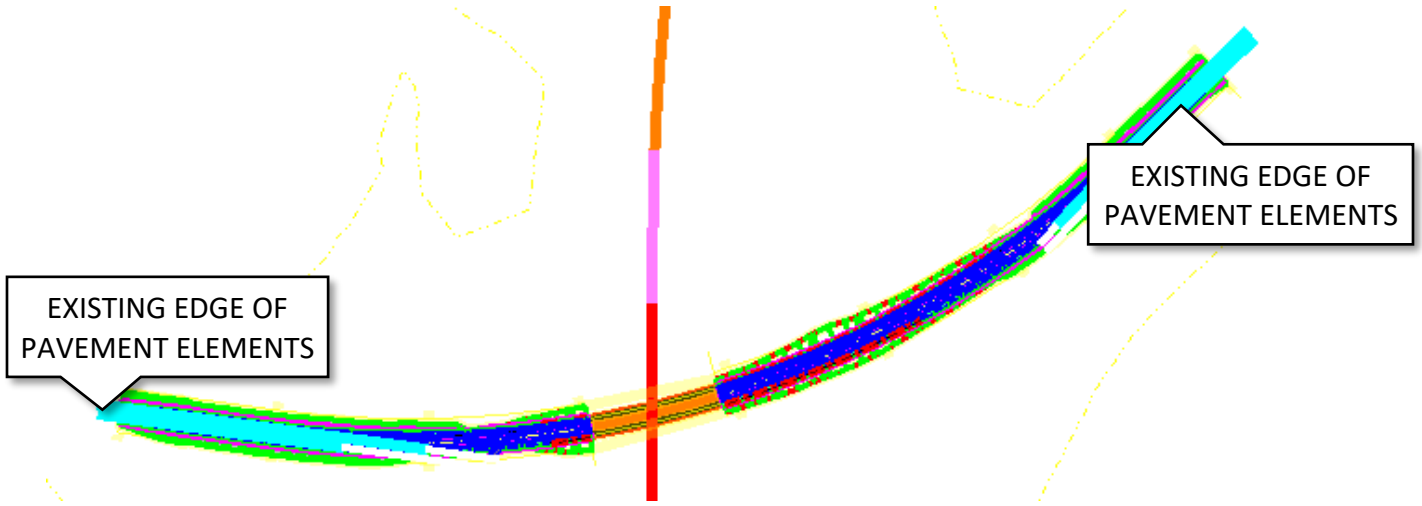
O. Hover your mouse over the two (2) edges of pavement to display the element information for each as shown below. Pay attention to the **Feature** attribute of each. Notice that the feature names match the **Horizontal Feature Constraints** of the two (2) **SK_EP** null point targets.



P. Click on one of the **Y11 Corridor Object Handles** and hover for a few moments to display the **Corridor Menu**. From the **Corridor References** dropdown select the **Add Corridor Reference** icon as shown below.



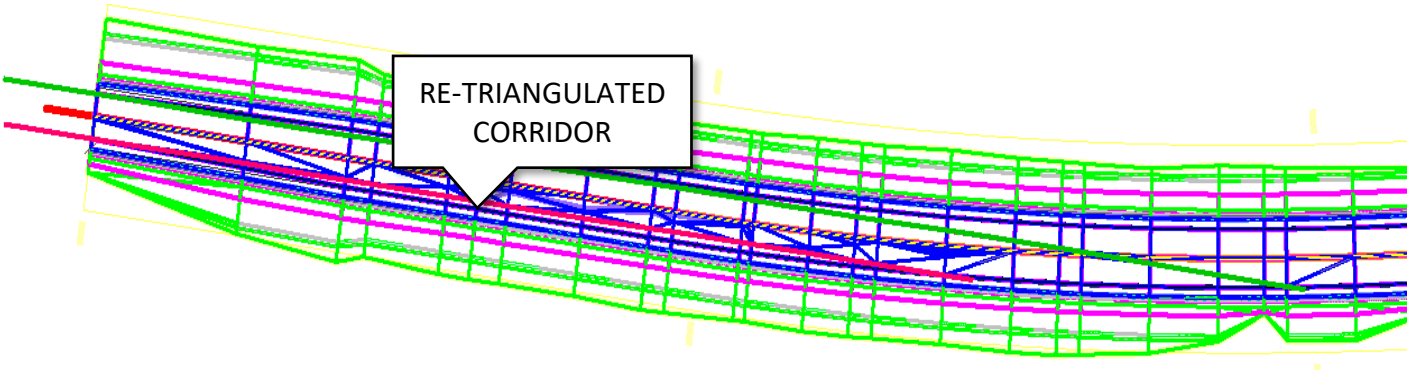
Q. Following the prompts, select the four (4) **Existing Edge of Travel** elements located at the beginning and end of the **Y11** corridor that are highlighted in turquoise, as shown below. Then, reset (right-click) to complete.



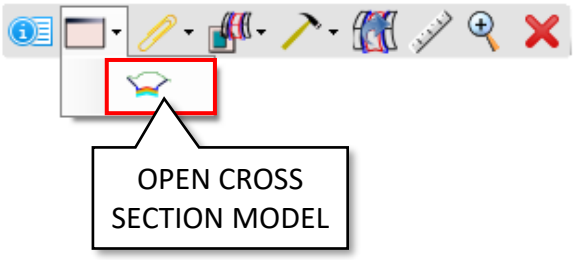
Notes:

- For the **SK_EP** null points to target elements, they must first be added as added as **Corridor Reference** elements. See previous steps for specifics on adding **Corridor References**.
- **Corridor Reference** data for can be accessed at any time using the "bucket".

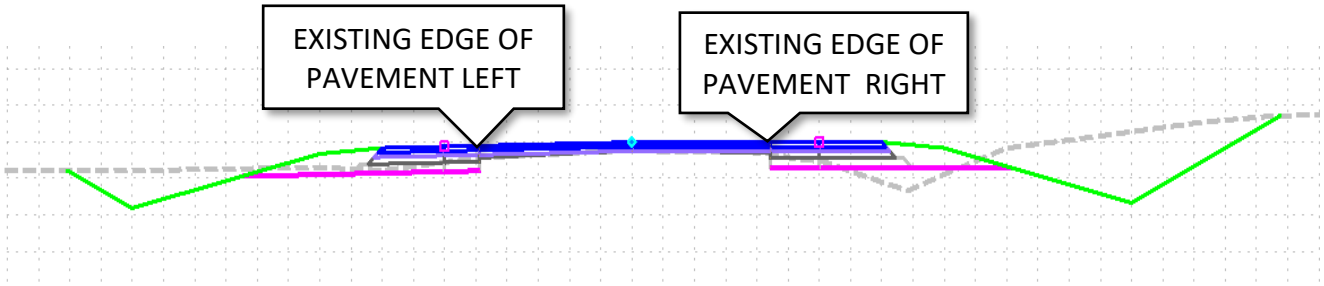
R. Notice below, that the corridor re-triangulates after adding the existing edge of travel elements to the **Y11** corridor as **Corridor Reference** elements.



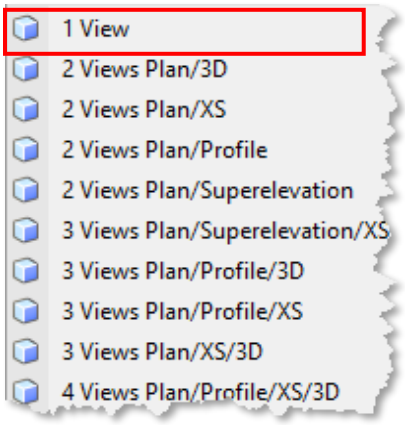
S. To help visualize the corridor overlay/widening , load the **Corridor Menu** once again only this time select the **Open Cross Section Model** option from the **Corridor View** dropdown as shown below. This will close the **View 1-Default** window and open the **Y11** Cross section view.



T. As you navigate through the dynamic cross-sections notice the change as displayed below.

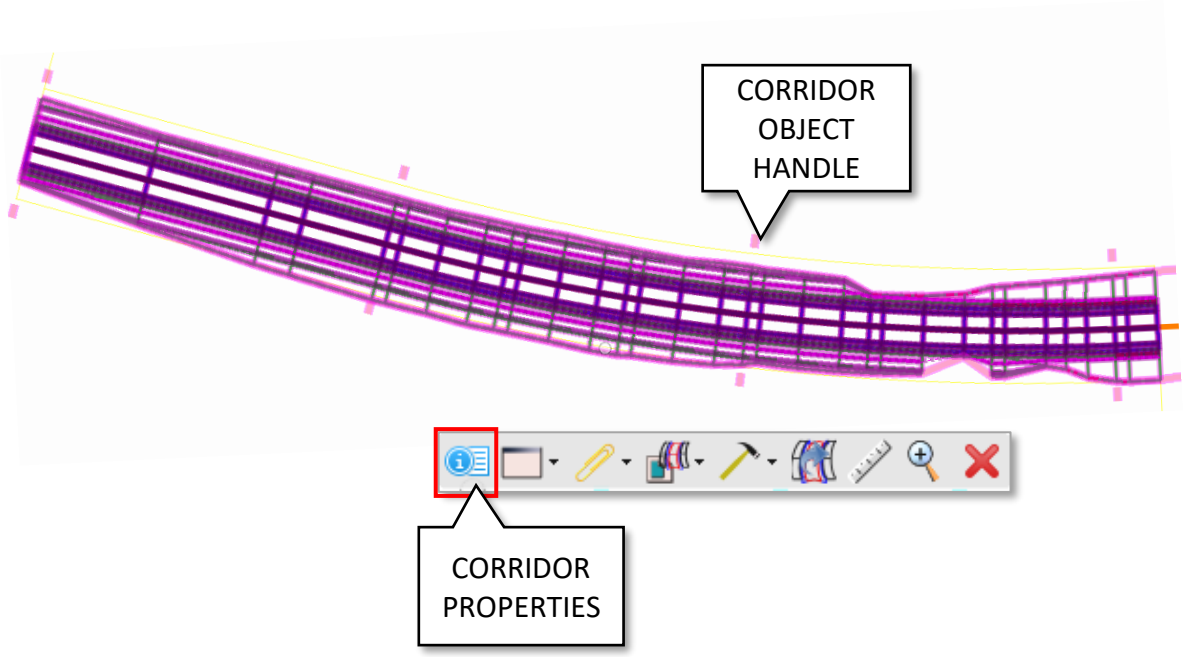


U. Right click in the **View 8, Cross Section** view and select the **1 View** option from the **View Control** menu to close out of the dynamic cross-section view and open the **View-1-Default** window.

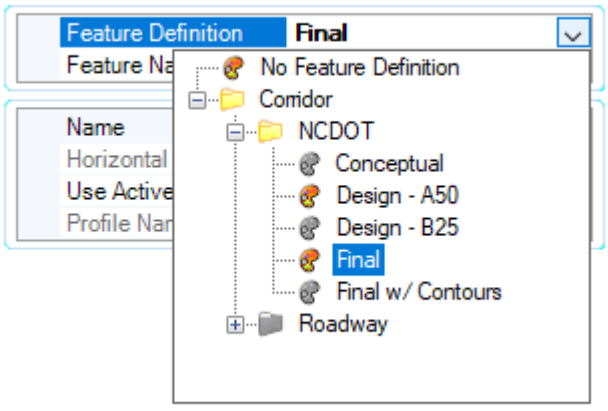


24. Change the Design Stage Feature Definition from Design - A50 to Final

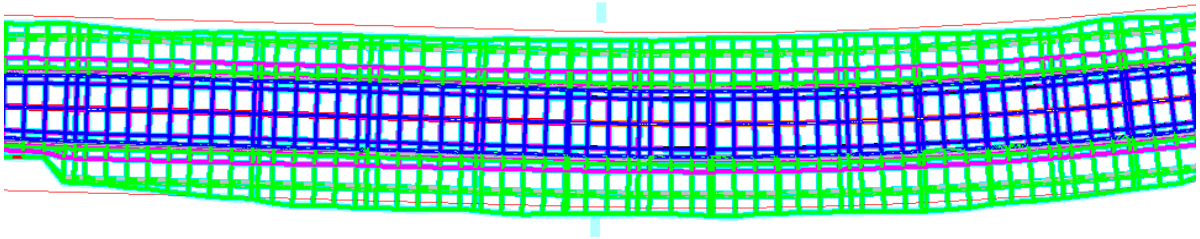
A. In the **View 1-Default** window, zoom in closely to the **Y11** corridor and click on one of the **Corridor Object Handles** and hover for a few moments to display the **Corridor Menu**. From the **Corridor Menu** select the **Corridor Properties** icon as shown below.



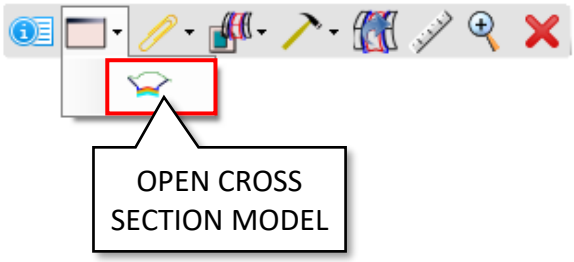
B. From the **Corridor Properties** dialog, change the **Feature Definition** from **Design - A50** to **Final** as shown below. This will set the **Design Stage** to **Final**.



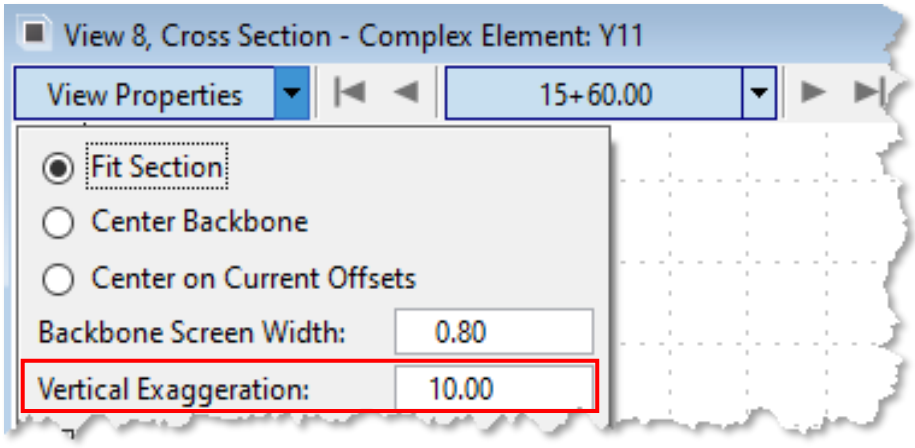
C. Notice how the **Y11** Corridor appears much denser as shown below. This is because the **Design Stage** properites for **Final** feature create a more detailed and higher quality model.



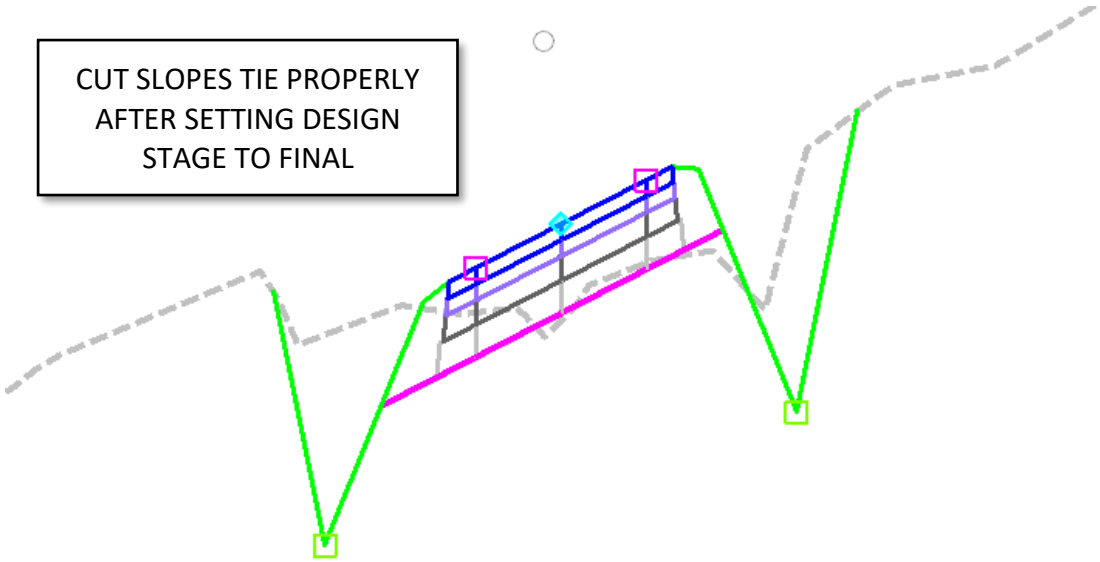
D. Now, load the **Corridor Menu** once again and select the **Open Cross Section Model** option from the **Corridor View** dropdown as shown below.



E. Set the **Vertical Exageration** to **10** using **View Properties** dialog.

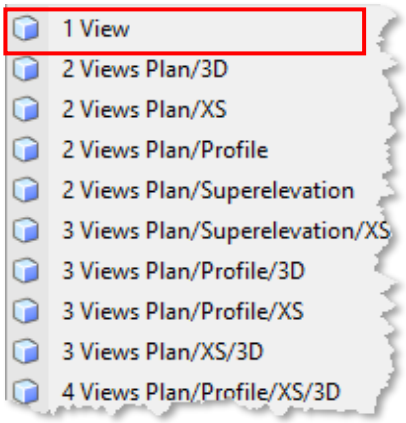


F. Then navigate to station **15+60.00** as shown below. Notice that the cut slopes now tie on both sides where previously they did not. This is because the **Design Stage** has been set to Final (5' intervals), there is now a template drop at **15+60.00** which results in a much more accurate and higher quality model.

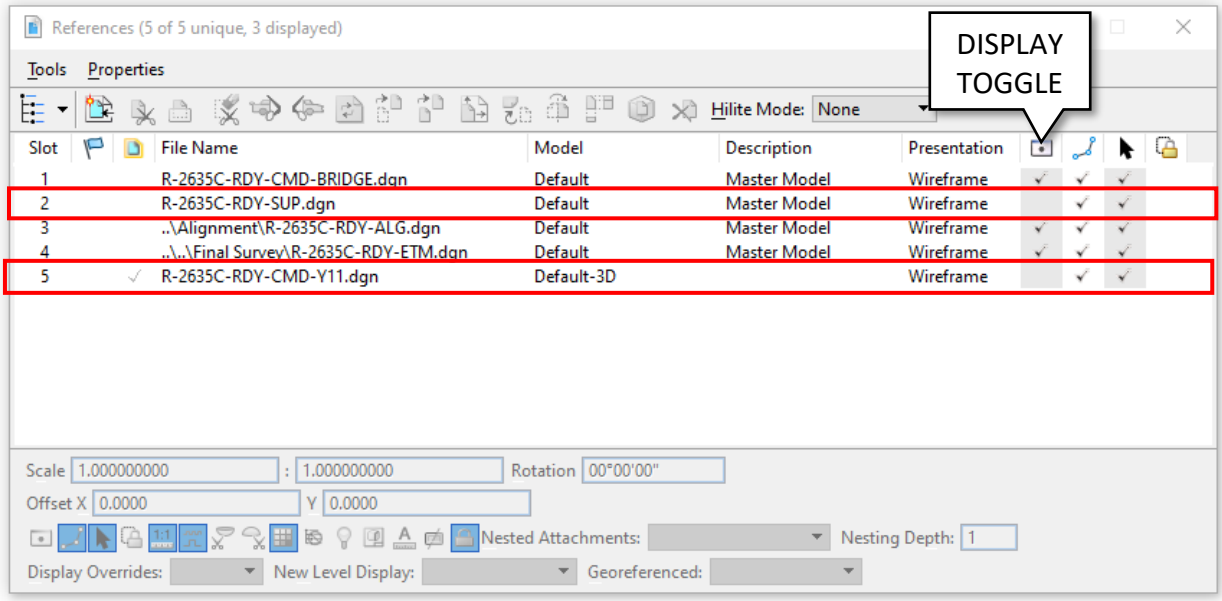


25. Turn Reference Files and Construction Class Elements off and Display 2D Design Linework

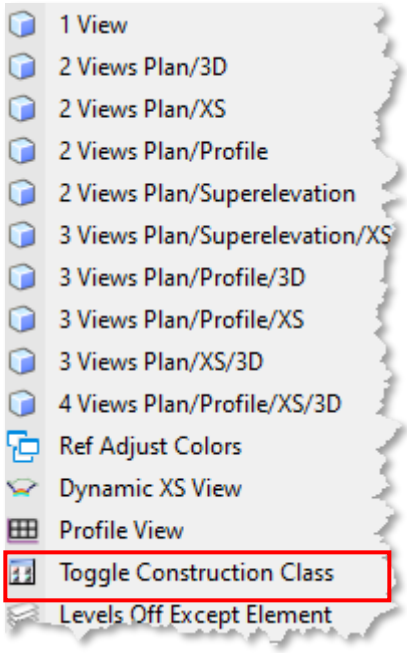
A. Right click in the **View 8, Cross Section** view and select the **1 View** option from the **View Control** menu as shown below.



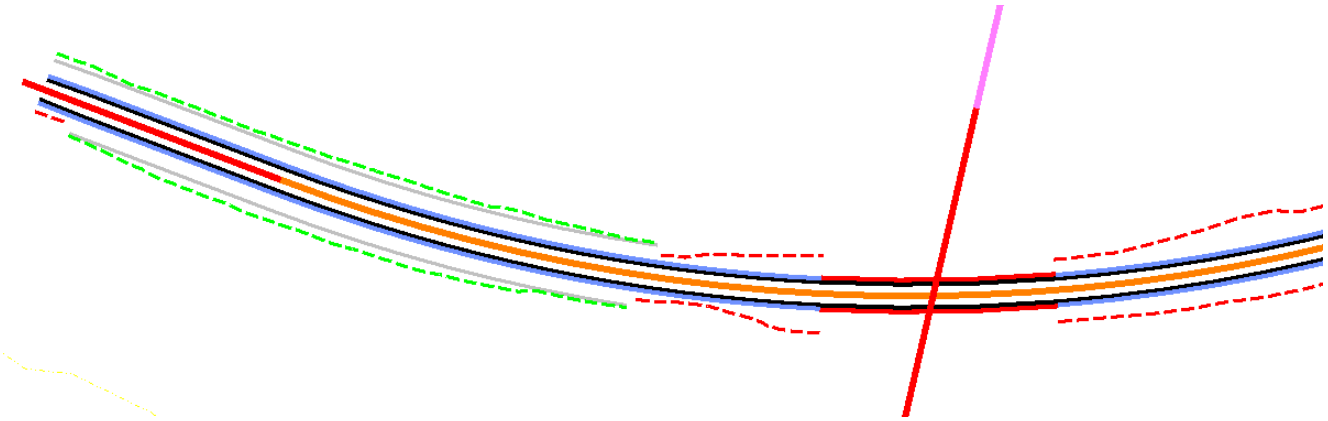
B. Once the **View 1, Default** window opens, toggle off the display of the following reference files using the **References** dialog **(Corridors > Primary > References)** as shown below.



C. Finally, select the **Toggle Construction Class** option from the **View Control** menu as shown below.



D. Notice the 2D linework as shown below. In this workflow, lines used for plans production are not drafted in the traditional sense but are displayed directly from the 3D model.



Note: Not all plans production linework can be produced using the model. This is only the first step in the design/modeling process. More detailed modeling will be necessary as the design progresses. See the NCDOT **Intermediate** and **Detailed Modeling** modules for specifics.

Pop Quiz

1. How does the Corridor Feature Defintion “Design – A50” get its 50’ template drop interval?

   A. Create the Corridor using 50’ template drop interval only.
   B. Create the Corridor using 5’ template drop interval only.
   C. Create the Corridor using 5’ template drop interval and a multiplier of “10”.
   D. It is automatically set at 50’ interval.

2. What utility is commonly used to define the existing EOP feature definition for the templates to display pavement wedging and widening?

   A. Microstation Place Line
   B. Microstation Copy Parallel
   C. ORD Line Between Points
   D. ORD Single Offset Partial

3. How are paved shoulder tapers performed in Corridor Modeling?

   A. Parametric Constraints
   B. Point Control
   C. Target Feature Definitions
   D. All of the Above

4. Because a 2D design seed was used, the Corridor Modeling (CMD) file contains a 2D design model only because we only work in 2D.

   A. True
   B. False

5. The EOT, paved shoulder, curb and gutter lines must be drawn in the DSN manually like SS2.

   A. True
   B. False

Answers and explanation on the next page.

1. C – The final template drop interval is derived from the Corridor Template Drop interval (should always be “5” when creating a corridor) multiplied by a factor (multiplier) set in feature definition.

2. D – Unlike Microstation, ORD tools can assign feature definitions. The Single Offset Partial utility ensure the creation of the element is traced over the original (offset of zero). This command works on both Microstation and Civil Geometry elements.

3. D – All of the listed options can be used to change the paved shoulder width in the template and 3D model.

4. B – a Default-3D design model is automatically created and referenced to the Default (2D) design model when the existing ground terrain is made active or the vertical alignment is made active in the 2D design model.

5. B – The templates in ORD are now setup to automatically generate the tradition 2D DSN plan elements, such as the EOT, paved shoulder, and Curb and Gutter lines (and slope stakes), in the 2D design model CMD file.