Chapter 6

Corridor Modeling Overview

6.1 Objectives

- Create Corridor
- Assign Multiple templates to one corridor
- Create new templates from existing templates

6.2 Corridor Modeling Overview

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.

Corridor Modeling tools aggregate a variety of civil data. The geometry is created with the Horizontal and Vertical Geometry tools, while the existing ground is defined by a MicroStation mesh or Civil Terrain Model. Plan view elements, such as edges of pavement, shoulders, curbs, etc. can be 2D or 3D. Superelevation information is defined within a design file using standards or imported data. Templates are utilized from one or more template libraries.

Reference files can be used extensively with Corridor Modeling. On a simple project, the data may be all in one file; larger projects may have geometry in one file, plan view graphics in a second, terrain in another, superelevation in a fourth and the actual model in a fifth. All files can reference the others, to present a complete picture of the project.

When working with Corridor Modeling, you can draw in 2D or 3D. When using 2D (such as for plan-view graphics), a 3D view is automatically created and maintained. For example, when a vertical geometry element is initially defined for a horizontal geometry element, the Default-3D model is created, if there isn't one already. The 3D baseline (combination of horizontal and vertical element) is drawn into the 3D model. As template drops are added, and progressed, they are added to the 3D model automatically.

When starting to create a corridor, basic information can be used. A single template can be used, along with preliminary geometry and a high level terrain model. As the design progresses, more detail can be added. Instead of a single template drop, perhaps more templates better define the roadway. Transitions can be added to smoothly move from one template to another. There may be multiple roadways all interconnected using the target aliasing tools. All the while, as changes are made, the corridor model is updating, so you see up-to-the minute results. Simple projects may not require all the tools, and a basic corridor model may be sufficient. But all the tools are available to handle basic to complex, small-scale to large-scale projects.

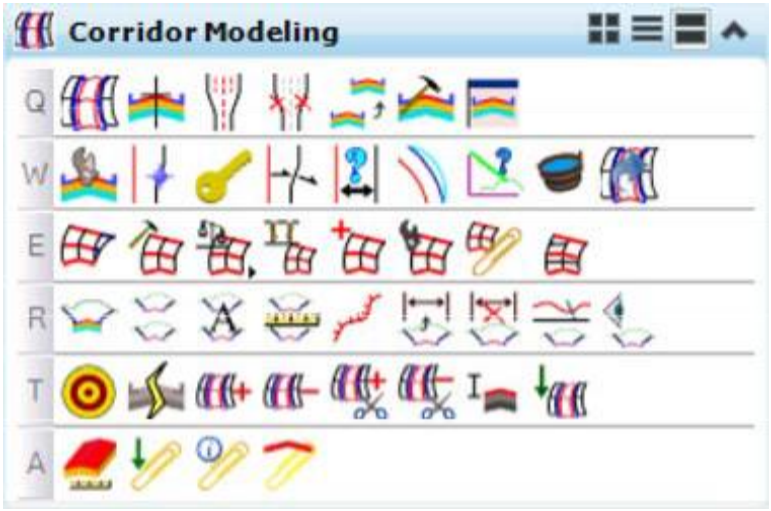
6.3 Prerequisites

The following are minimum requirements to use Corridor Modeling.

- One Civil horizontal element and one Civil vertical element, generally the centerline and profile of the design roadway
- One template stored in a template library

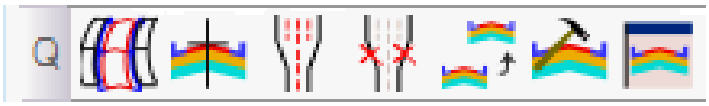
A terrain model is not required for corridor modeling. If the template includes end conditions and no terrain model is defined, the software generates as much of the model as possible, but will not complete the end condition that ties to ground and no error message is given.

6.4 Corridor Modeling Tools



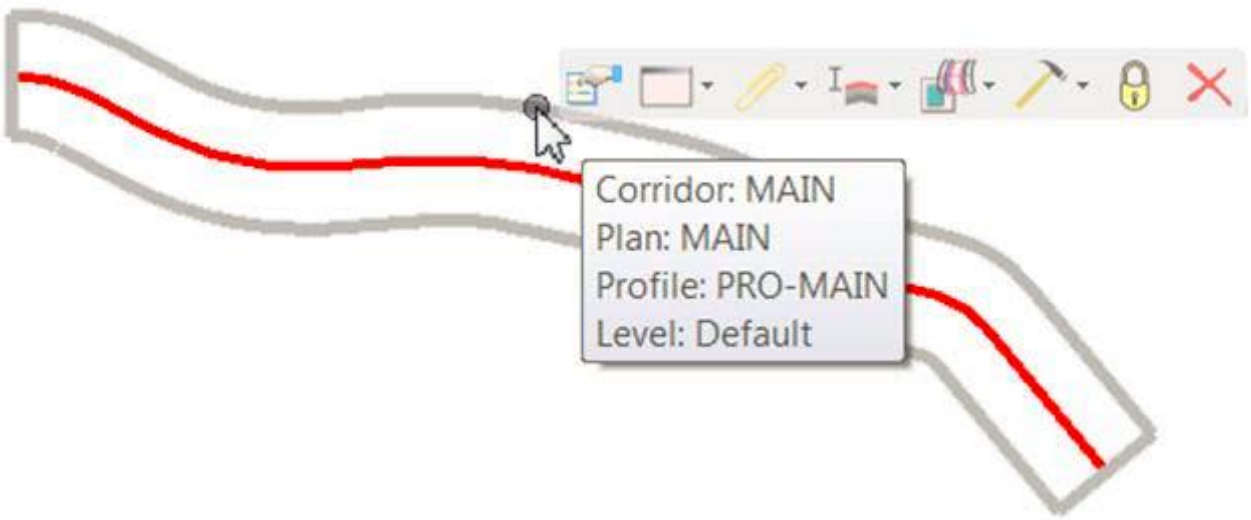
6.4.1 Corridor Creation Tasks

The first toolbox is used when beginning design on a corridor and includes tools for creating corridors, template drops, and transitions; along with various tools for working with the template library.



 **Create Corridor** - The Create Corridor tool is the initial step in corridor design; names the corridor and identifies the geometry. No processing of templates is done within this tool; rather it's a set-up step prior to template work.

A closed shape is drawn to represent the corridor (using the full length of the civil geometry element). Station ranges to better define the corridor are utilized in the next step, template drops. When hovering over a corridor, two pop-up displays are visible:



- *Quick Properties* - displays the corridor name, horizontal geometry element (Plan), vertical geometry element (Profile), and Level of the corridor
- *Context sensitive menu* with tools applicable to corridors

After the corridor is created/drawn, the software automatically advances to the *Create Template Drop* tool.

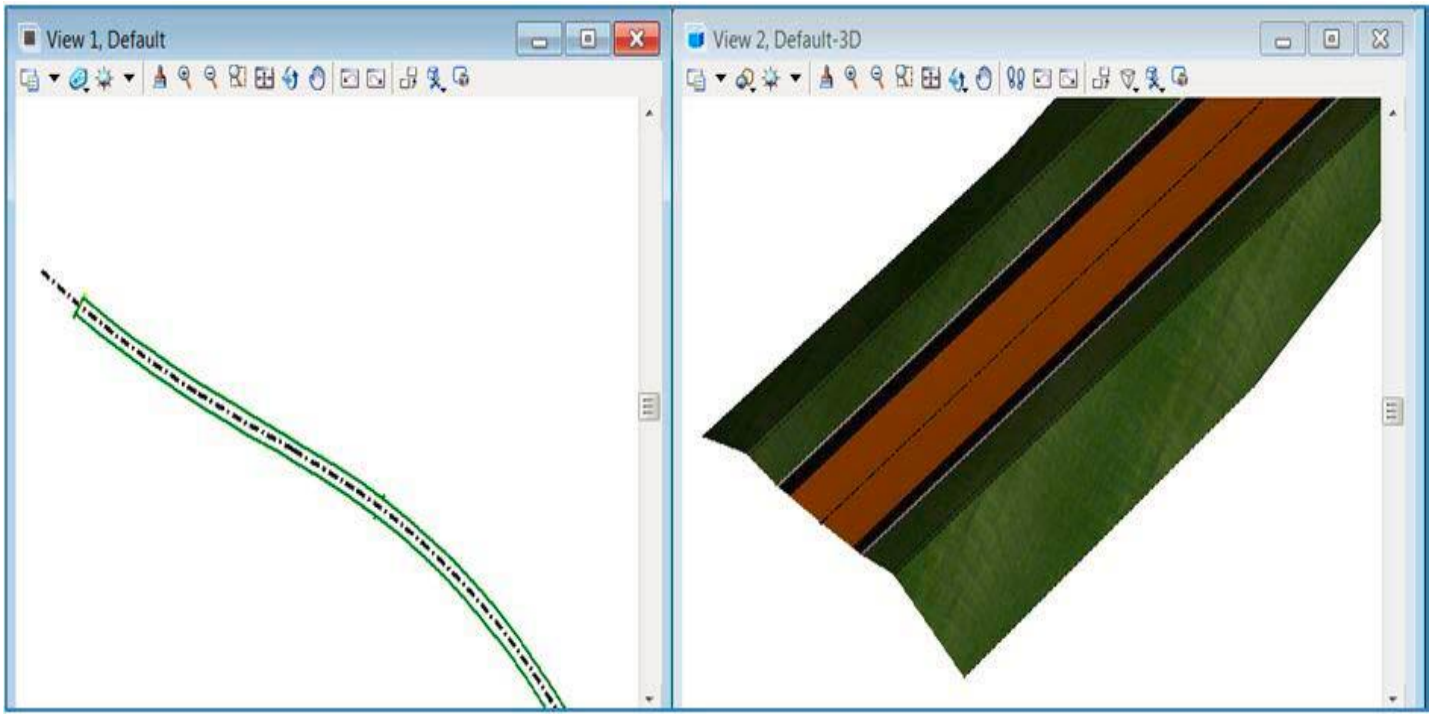
Create Template Drop - defines what the cross sections of the roadway look like for that portion of the road based on user-defined station range. A project may comprise of a single template drop or multiple template drops. Often, transitions are used between two template drops, rather than an abrupt change from one template to another.

Careful consideration should be given for the *Drop Interval* used for a corridor, although it can be changed at any time. It specifies the distance between each processing of the template (in master units). Generally, this value is equal to or less than (but still a multiple) of the desired interval for the final cross sections, since cross section stations should be coincident with processing stations. It is not necessary to set the interval so small that it encompasses all desired cross section stations, as stations with particular project interest can be added to the model with the use of the Key Station tool. If the model is to be used in construction, the smaller the interval, the more detailed the model, but will require more processing time.

Note Drop Intervals are impacted by the *Design Stages*.

- *Minimum Transition Before Drop* and *Minimum Transition After Drop* are inputs in the Create Template Drop tool. If they are non-zero, then a transition drop is created at the beginning/end of the template drop with a length greater than or equal to the value entered. The actual length is determined by how far it is between the new drop and the drop before/after the new drop. If there isn't enough space to meet the minimum, then the previous/next drop is shortened to accommodate the transition. If there is no previous/next drop, then no transition drop is created.

After completing the prompts, the corridor is automatically processed and can be viewed in both 2D and 3D views. The corridor can be rendered, if desired.



The symbology is based on the feature definitions within the template. The *Project Explorer* is also updated with the corridor information, including template drops, components and features.

Create Template Drop Workflow

Select the **Create Template Drop** tool. This tool is automatically invoked at the end of the Create Corridor tool, but you can use it independently of the Create Corridor tool.

Select the Corridor wherein the template drop will be added.

1. **Select Template** - Select the template from the pull-down list of recently used templates, or select **<Alt> <Down>** on the keyboard to open the active template library and select the template. Data point to accept the template and move to the next prompt.
2. **Start Station** - Graphically define the start station or enter the value in the edit field. Data point to accept and move to the next prompt. The Start station can be locked by **<Enter>** after keying in the station or selecting **<Alt>**. Selecting **<Alt>** again unlocks the field.
3. **End Station** - Graphically define the end station or enter the value in the edit field. Data point to accept and move to the next prompt. The End station can be locked by **<Enter>** after keying in the station or selecting **<Alt>**. The template is copied to the new station range. Selecting **<Alt>** again unlocks the field.
4. **Drop Interval** - specifies the distance between each processing of the template (in master units). Generally, this value is equal to or less than (but still a multiple) of the desired

interval for the final cross sections, since cross section stations should be coincident with processing stations. Note that this is impacted by the *Design Stages*.

 **Create Transition -** A transition is created between templates of different names, as templates generally don't instantaneously change from one template to another. This tool creates the transition by selecting the two templates drops which are adjacent to it. It does not define how to transition between the template drops, which is done in the Edit Transition tool.

If the drop interval is not the same in the two template drops, the drop interval of the lower stationed template drop is utilized. However, this can be changed in the Transition Properties.

Create Transition Workflow

1. Select the Create Transition tool.
2. Select the first template drop adjacent to the transition. It does not matter the order in which the two template drops are selected.
3. Select the second template drop adjacent to the transition. The transition is created (and the corridor has automatically processed).

 **Edit Transition -** Modifies the previously created transition between two template drops.

Edit Transition Workflow

Editing a transition is a two-step process.

1. Connect the backbone points of the first template to the backbone points of the second template, as desired. Unconnected points are shown as thick (+) symbols; connected points are thin (+) symbols. End conditions are not shown. End condition transitions are handled through end condition exceptions.
2. Edit the transition components.

The color of the transition indicates the state of the transition.

- **Red** - indicates that none of the backbone points of the first template connect to the backbone points of the second template.
- **Yellow** - indicates that some of the backbone points are connected (initially this is done attaching points that have the same name.
- **Light Blue** - indicates that not all of the points are connected, but you have reviewed and/or edited the transition at least once.

- **Dark Blue** - indicates that all of the points on both templates are connected.

 **Copy Template Drop** - As an alternate to creating and modifying a template drop, this tool copies an existing template drop to a newly defined station range along the same baseline reference.

The Copy Template Drop tool can be used as an alternate to creating and modifying a template drop, as the tool copies an existing template drop to a newly defined station range along the same baseline reference within the same corridor.

Copy Template Workflow

1. Select the **Copy Template Drop** tool.
2. **Locate Template Drop** - Select the previously created template that you want to copy to a different location.
3. **Start Station** - Graphically define the start station or enter the value in the edit field. Data point to accept and move to the next prompt. The Start station can be locked by **<Enter>** after keying in the station or selecting **<Alt>**. Selecting **<Alt>** again unlocks the field.
4. End Station - Graphically define the end station or enter the value in the edit field. Data point to accept and move to the next prompt. The End station can be locked by **<Enter>** after keying in the station or selecting **<Alt>**. The template is copied to the new station range. Selecting **<Alt>** again unlocks the field.

 **Create Template** - Opens the current template library to add a new template, delete or modify an existing template.

 **Display Template -** Draws the selected template from the current template library at the user-defined data point in the drawing file using the active MicroStation symbology. All end conditions are drawn and there is no annotation. The drawing is useful as a starting point for documentation of the template library.

6.4.2 Corridor Modification Tasks

This toolbox contains tools for manipulation of a previously created corridor and associated template drops. These tools enable you to refine the model by adding more detailed information to respond to project-specific requirements and constraints.

 **Edit Template Drop** - Opens the current template library and displays the template with the selected template drop. While the dialog is the template library interface, keep in mind that the editing is only being done to the template within the template drop, not the actual template library. Therefore, if any changes are made, the template associated with the template drop is no longer in

sync with the template library. For project specific circumstances, this may be required. The tools and options within the edit template drop function identically to those in the template library, except the File tools are not available.

If the changes are needed in the template library, use the Create Template tool.

To update the template associated with the template drop to match the template in the template library, use the Synchronize with Library tool. When this tool is used, the template from the template library overwrites the template associated with the template drop, so all changes are lost with no warning given.

Edit Template Drop Workflow

1. Select the **Edit Template Drop** tool.
2. **Locate the Template Drop**. Select the template drop whose template needs editing. The *Editing Roadway Design Template Drop* dialog (whose interface is identical to the Template Library dialog) opens with the current template.
3. Edit as needed. Click **OK** to close the dialog. You do not have to File > Save to save your edits (most File functions are ghosted out).

 **Create Point Control** These are used to override the normal locations of one or more points and or components in a cross section. Examples of this include lane widening, staying within the right-of-way, maintaining a particular slope for a ditch, and superelevation.

An example would be a ramp is merging into the main road. The ramps left edge is vertically controlled by the main road right edge of pavement. The ramps left edge is horizontally controlled by the main road right edge from 0+00 to 1+00, and then it is controlled by a horizontal alignment named rampLeft.

Station Limits (Start/Stop) - specifies the start and stop stations for the control.

Control Description - allows you to enter a description of the control.

Point - allows you to select the point to be controlled. Select from the list or identify the point in the cross-section using the locate button. The selected point is highlighted in plan/cross section and profile or superelevation views as applicable.

Mode - allows you to select the control mode: Horizontal, Vertical, or Both.

Control Type - specifies the type of control.

If the *Mode* is **Horizontal** or **Both**, valid control types are *Linear Geometry*, *Feature Definition*, or *Corridor Feature*.

If the *Mode* is **Vertical**, valid control types are *Linear Geometry*, *Feature Definition*, *Corridor Feature*, *Superelevation*, *Elevation Difference*, *Elevation and Grade*.

The selection combo boxes and/or field displayed depends on the selected Mode and Control Type.

Type - Linear Geometry If the type is Linear Geometry, a Horizontal Offsets combo box is displayed. If the mode is Both, a Vertical Offsets combo box is also displayed.

Type - Feature Definition If the type is Feature Definition, a Feature Definition and Range text field is displayed.

Type - Corridor Point For all modes, Corridor and Reference Feature combo boxes are displayed. These options allow you to set up the control of one corridor's points(s) from another corridor's point(s).

Targeting another corridor's point cannot be done simultaneously with Target Aliasing of that same corridor. If Target Aliasing has been defined, the Corridor Point is not available for selection within the Point Control dialog. This produces a recursive situation, making the corridor point control unavailable for selection until that Target Aliasing is removed.

Type – Superelevation This option displays a Superelevation control line combo box, and a Reference Point combo box. Superelevation control lines are stored in the roadway design, not on the alignment. The reference point is the pivot point (feature) about which the point will rotate.

Type - Elevation Difference This option displays Horizontal and Vertical alignment combo boxes. The vertical alignment represents a vertical difference value to be applied to the points' current elevation.

Type - Elevation and Grade This option displays an Elevation field, and a Grade field. The control sets elevation of the point at the start station to the elevation specified. The slope of the point's line is then at the grade specified until the end station is reached.

Priority - determines the order of controls on a point. This value applies only when there are conflicting controls on a point. Where there is a conflict, the control with the lower priority is applied (that is, lower numbers are applied first).

Use as Secondary Alignment - specifies that horizontal point controls are also used as secondary alignments. This option is available only when working with a 2D entity. If you are using a 3D object, the software skips the secondary alignment option.

Horizontal Offsets (Start/Stop) - specifies the start and stop horizontal offset controls for the corridor. If the values are different, then the value applied at a given station is calculated using a linear algorithm.

Vertical Offsets (Start/Stop) - specifies the start and stop vertical offset controls for the corridor.

 **Create Key Station** - The Create Key Station tool is useful to add stations that are not coincident with the template interval, when a special circumstance of the project occurs and it's desirable to include the station in processing.

Create Key Station Workflow

1. Select the **Create Key Station** tool.

2. **Locate Corridor** - Select the corridor for station addition. A display line dynamically running perpendicular to the baseline reference is visible.
3. **Station** - Define the key station by dynamically moving the display to the desired location (and data point) or by keying in the station, **<Enter>** and **data point** to accept. The key station is added to the *Key Station* list, and the corridor is automatically reprocessed to include the new station.

 **Create Secondary Alignment** - Sets parameters for secondary alignments, which are used to modify the direction of cross section processing. Requirements include corridor selection, secondary alignment definition, beginning and ending station (in cases where only part of the alignment element is to be used) and beginning and ending offsets.

 **Create Parametric Constraints** - Sets up constraint value overrides for specified station ranges.

 **Create Curve Widening** - Applies horizontal controls to points to move them farther from the centerline at each curve of the controlling alignment.

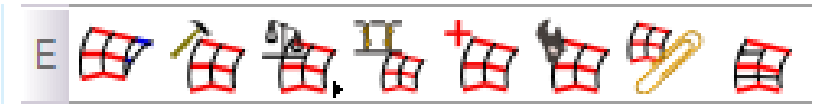
 **Create End Condition Exception** - Defines end condition exceptions, which are used to modify the behavior of an end condition solution without requiring the use of additional template drops.

 **Corridor Objects** - One-stop viewing of data relating to corridor objects. Excellent for managing your corridor data, as it encompasses template drops, key stations, parametric constraints, point controls, various references and end condition exceptions all within one dialog.

 **Process Corridor** - Processes the corridor to ensure that it is up to date.

6.4.3 Superelevation Tasks

This toolbox contains tools for creating, calculating, and editing superelevation lanes. Tools are also supported for importing excel (CSV) data and reporting.



 **Create Superelevation Sections** - Adds a superelevation sections (generally one per curve set) for the specified station range on the baseline reference.

 **Create Superelevation Lanes** - Creates color-filled lanes based on width and offsets from the baseline reference, as a precursor to superelevation calculations.

Calculate Superelevation - Calculates station and superelevation transitions rates based on a preferences or rules file (*.sep,*.srl). The values are augmented to the superelevation lanes, edit manipulators are created, and the color fill is recolored based on the cross slopes.

Import Superelevation - Optionally, imports data from a CSV file.

Assign Superelevation to Corridor - Associates superelevation with a corridor, so the pavement reflects the superelevation stations / cross slopes, rather than the pavement cross slope defaults in the template.

Insert Superelevation Station/Cross slope - Insert an individual station / superelevation transition (cross-slope) into a previously created and calculated superelevation lane.

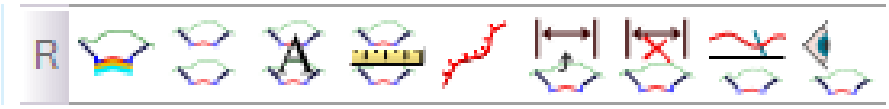
Superelevation Editor - Opens the superelevation editor allowing the user to edit the calculated superelevation in a tabular format.

Superelevation Report - Creates a superelevation XML report and opens the Bentley Civil Report Browser.

Superelevation in Plan - Automatically generates annotation for superelevation station information in plan view.

6.4.4 Corridor Cross-Sections Tasks

This toolbox contains tools to display, draw, and annotate cross sections.



Open CrossSection View - Using the specified baseline reference to a corridor, or any Civil horizontal geometry, creates a dynamic cross section view in the user-selected MicroStation view. The corridor interval is used for the cross section interval. The specialized view has exaggeration feature, cross section scrolling, and ability to place temporary dimension lines. These sections are not used as a basis for drawn cross sections or sheets.

Create Cross Sections - Extracts multiple cross sections and draws them in a matrix pattern. These sections are subsequently used for cross section sheets and earthwork calculations. The display configuration and layout is controlled by an .xin file. This is covered in detail in *Chapter_09 Cross Sections and Labeling*.

Annotate Cross Sections - Placed with the Create Cross Sections tool.

 **End Area Volume** - Calculates the end-area volumes to compute cut, fill, and net volumes using a series of cross sections extracted along a previously defined alignment.

 **Edit Station** - Allows the user to edit the cross section instance at a station.

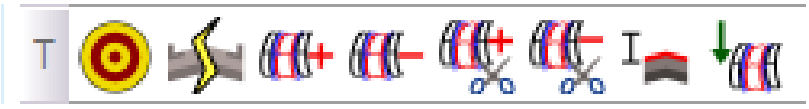
 **Show Place Dimension** - Places display text (width, slope) into the dynamic cross section view, based on two data points. Multiple show place dimension elements can be placed in a single cross section view.

 **Remove Temporary Dimension** - Removes dimensions in the dynamic cross section view that were placed with the Show Place Dimension tool.

 **Locate Station Via Datapoint** - Places a data point (in plan view) with this tool to view a dynamic cross section at a station not included on the list.

 **Cross Section Viewer** - Windows in on specified cross sections in a model. Using Cross Section Viewer, you can view a single cross section, or you can view in succession each cross section in a model.

6.4.5 Corridor Miscellaneous Tasks



 **Define Target Aliasing** - Aliasing allows you to target other corridor surfaces or features or to set up a prioritized target list for end condition solutions on surfaces, features and alignments. This means that on a large job where the existing surface may have been broken up into more than one surface, you don't need to be concerned about where those breaks occur, and you don't need to create a different template for each existing surface. Use target aliasing to find the proper solution.

In any situation where the active surface is the target, the software looks for the mainline corridor surface and uses whichever is closer because you have turned on that option. If the **Use Closest** option is not set, then it would search for the surfaces in the order they are displayed, and it would stop as soon as a solution was found.

Target Aliasing cannot be defined with a corridor that targets that particular corridor with a Corridor Point Control. This produces a recursive situation, making the corridor unavailable for Target Aliasing until that corridor point control is removed.

Target lists end-condition targets for the current corridor.

does not list feature definition targets.

Surface or Corridor	lists all the available aliases for the current target. If the target is a surface, it displays a list of alternate surfaces and corridors. If the target is a feature, then the list displays available surface features and corridor points. If the target is an alignment, it displays a list of available alignments.
Aliases	lists the aliases for the current target. The order of the list indicates the priority of the target aliases.
Add, Remove, Move Up, Move Down	activates as items are selected. The left and right buttons allow you to move items between lists. More than one item can be selected and moved. The up and down buttons allow you to change the priority of a single item in the alias list by moving up or down in the list.
Use Closest	Ignores the order of the aliases, when checked on. The solution seeks the closest alias that satisfies the solution (end condition).

Define Target Aliasing Target Workflow

1. Select the **Define Target Aliasing** tool.
2. Select the corridor. This opens the Target Aliasing dialog.
3. Use the *Add*, *Remove*, *Move Up*, *Move Down*, and *Use Closest* to set the Target Aliasing.

 **Synchronize Template** - Updates a template within a template drop with the template of the same name from the current template library. Any changes previously made to the template in the template drop are overwritten with no warning.

 **Add Corridor Reference** - The *Add Corridor Reference* tool adds graphical elements to the corridor processing. This must be done even if the feature is targeted in the template, otherwise the elements will not process. It enables only those elements associated with a particular corridor to be processed, rather than all elements of a particular feature definition. This speeds up processing, and eliminates processing of unwanted elements of the same feature definition. The elements can be selected within the tool, or a selection set can be created prior to commencing the tool.

Add Corridor Reference Workflow

1. Select the **Add Corridor Reference** tool.
2. Select the Corridor.
3. Select the **First Reference Element** - select the graphical element to be added as a reference. Continue selecting until all elements are referenced, then reset to exit tool.

 **Remove Corridor Reference** - The *Remove Corridor Reference* tool removes graphical elements from the corridor processing, but does not delete the element. The elements can be selected within the tool, or a selection set can be created prior to commencing the tool.

Remove Corridor Reference Workflow

1. Select the **Remove Corridor Reference** tool.
2. Select the Corridor.
3. Select the **First Reference Element** - select the graphical element to be removed as a reference. Continue selecting until all elements are referenced, then reset to exit tool.

 **Add Clipping Reference** - allows you to remove areas of overlap when working with multiple corridors in a single surface. For example, in a corridor intersected by a crossing roadway, clipping would be used to remove all overlapped features within the intersection.

Add Clipping Reference Workflow

1. Select the **Add Clipping Reference** tool.
2. Select the corridor to be clipped.
3. *Locate Clipping Reference* - select elements until all are defined, then reset to complete. The corridor is processed and the clipping reference is added.

 **Remove Clipping Reference** - Removes the clipping reference, reprocesses the corridor, restoring the clipping area to its previous state prior to clipping.

Remove Clipping Reference Workflow

1. Select the **Add Clipping Reference** tool.
2. Select the Corridor where the clipping is to be removed.
3. *Locate Clipping Reference* - select elements until all are defined, then reset to complete. The corridor is processed and the clipping reference is removed.

 **Overlay Vertical Adjustment** - At each processed station, this command determines the ideal PGL point based on the input criteria and the distance from the top of the template to the existing ground. Each existing ground vertex in the cross section will be tested by measuring the vertical distance between that ground point and the top of the template.

Geometry and corridor must be in the same DGN file for this command to operate.

This command is not available when the geometry is in a reference file because the command creates a vertical alignment and the corridor must reprocess to determine criteria for the vertical alignment.

 **Import IRD** - Imports (SELECTseries 2) and prior versions of corridors contained in Roadway Designer (IRD) files.

Import IRD Workflow

Recommendations and limitations:

1. Select the IRD file that contains the corridors to import.
2. Select the corridor to import and data point to accept.
3. If the selected corridor contains no missing dependencies, the corridor is imported. Otherwise, a *Missing Corridor Dependencies* report displays.
4. If the *Missing Corridor Dependencies* report displays, select **No** to cancel the import or select **Yes** to continue the import process. **Note**: The report can be saved to a text file for later reference.
5. If the import is canceled, resolve missing dependencies and then re-import the corridor.

Missing Dependencies

If a corridor is selected to be imported and it contains corridor objects with missing dependencies, a missing dependencies report displays before the corridor is imported into the design file. The report dialog allows the import to be continued or canceled by selecting Yes or No. This allows missing dependencies to be resolved before a corridor is imported.

A corridor may contain one or more corridor objects. **Corridor objects** include *template drops*, *secondary alignments*, *key stations*, *parametric constraints*, *point controls*, *end condition exceptions* and *target aliases*. Some of these object types depend on other entities in the design model. They include secondary alignments, point controls, and target aliases. If one of these objects depends on an entity that does not exist in the design model, its dependency is missing.

Example, a secondary alignment object depends on a horizontal alignment. If a corridor is imported that contains a secondary alignment whose horizontal alignment is "*Side Street 1*", the horizontal geometry named "*Side Street 1*" must exist in the design model. If it does not, that secondary alignment is missing its dependency and cannot be imported. To resolve the missing dependency the alignment "*Side Street 1*" could be imported using the Import Geometry command or one of the horizontal geometry commands could be used to create "*Side Street 1*".

Corridor object dependencies are always matched by name. They are not matched by GUID or object ids. Example: If a point control is a corridor feature point control, the corridor and the corridor feature must exist in the design model in order to import the point control. There must be a corridor in the design model whose name matches the corridor name stored in the point control, and that corridor must contain a feature whose name matches the feature name stored in the point control.

Recommendations and Limitations

- It is recommended that best practice rules for creating corridors be followed when importing corridors.
- Only one corridor at a time can be imported using Import IRD.
- In order to import a corridor, its baseline horizontal and profile geometry must exist in the design file or an attached reference file.
- When a corridor is imported its end conditions will always target the active terrain model, but corridors may be imported without an active Terrain Model. In that case, end conditions will target nothing.
- When importing corridors that contain secondary alignments, the ALG that contains the secondary alignment geometry must reside in the same directory as the IRD. This is because the secondary alignment geometry is a dependency that must exist in the design model and the dependency match is made by the name of the geometry. The ALG file must be accessed to look up the name of the geometry.
- In order to import a Target Alias at least one of its dependencies must exist in the design model. Missing aliases will not be imported. Example, if a target aliases a terrain model and a corridor, but only the corridor exists in the design model. The target will be imported and the corridor alias will be imported, but not the terrain model alias. If neither the terrain model nor the corridor exists then neither the target nor any aliases will be imported.

Managing Corridor Data

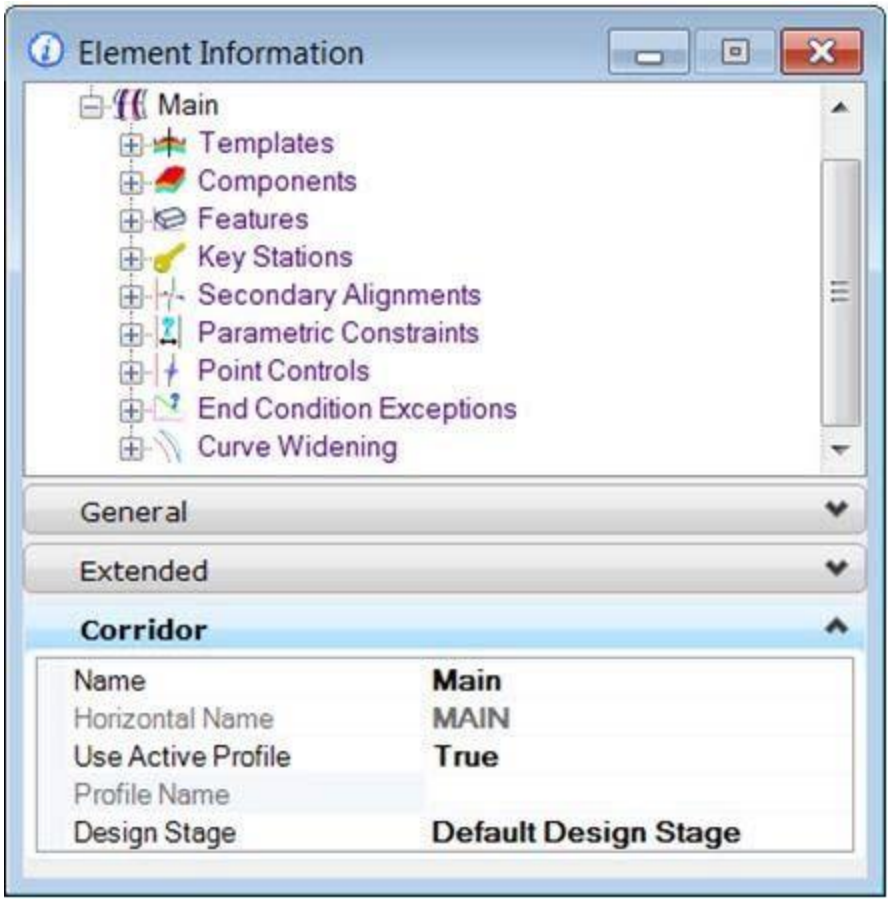
Several tools can be used to help manage the corridor model data. Depending on the tool selected, the data may be read-only or may be manipulated. These include:

Element Info

- Properties
- Corridor Objects - view and manage all the input objects in the corridor in one location
- Project Explorer - see all corridor information in one place
- Design Stages

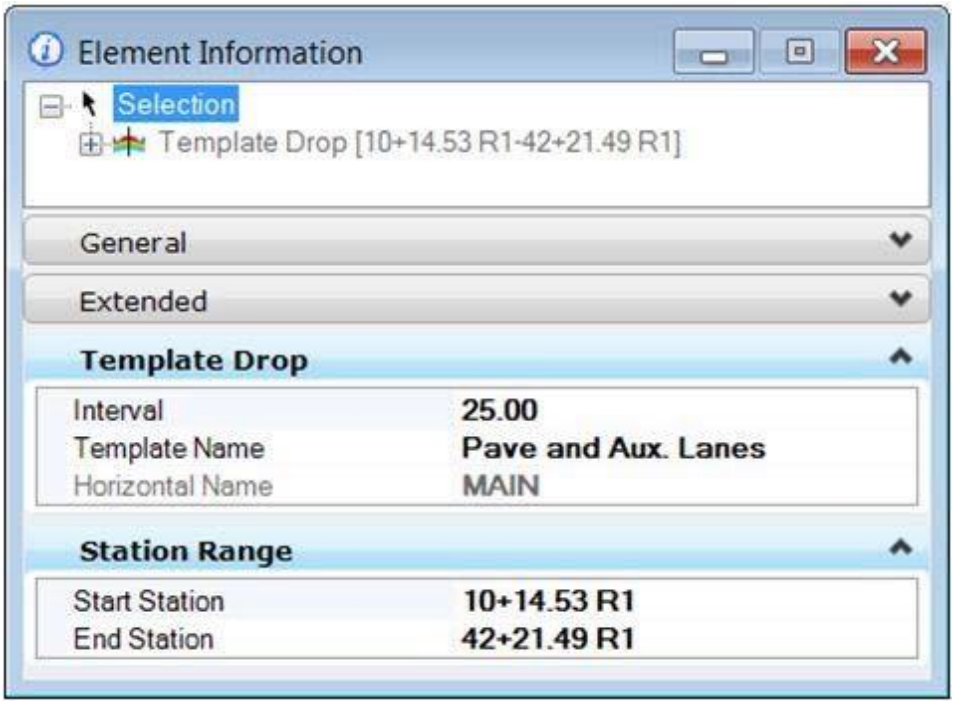
Element Info

Clicking on the corridor border opens the Element Information with most of the same information found in the Project Explorer Corridor. It includes the corridor tree, symbology, Corridor Info (Name, Alignment Name, Profile Name, and Design Stage).



The dialog changes as the tree is navigated, based on the current highlighted item in the tree. Much of the information can be edited, which is automatically reflected in the corridor model.

If a Template Drop is selected, the Element Information dialog reflects the template drop information, which can be edited.



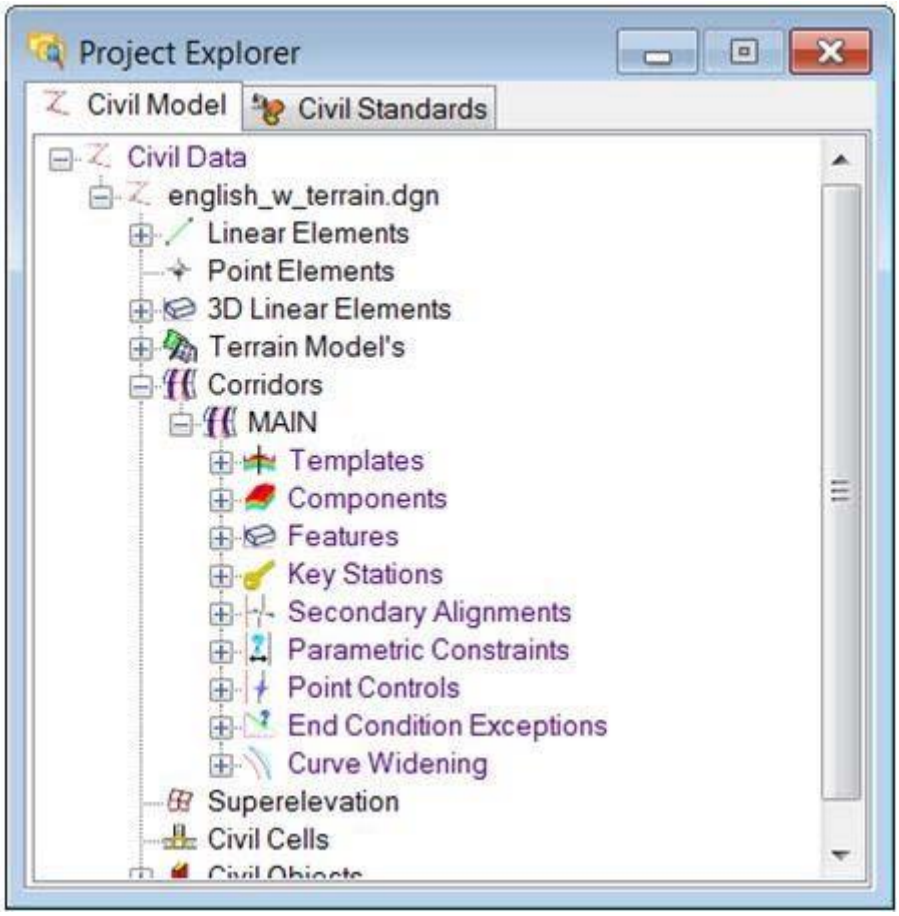
Properties - is similar to Element Information, as the displayed data reflects the type of element selected. For example, the data displayed when a corridor is selected is different than when a template drop is selected.

The Properties tool is accessed via the context sensitive menus. When a corridor is selected, the display shows names and design stages.

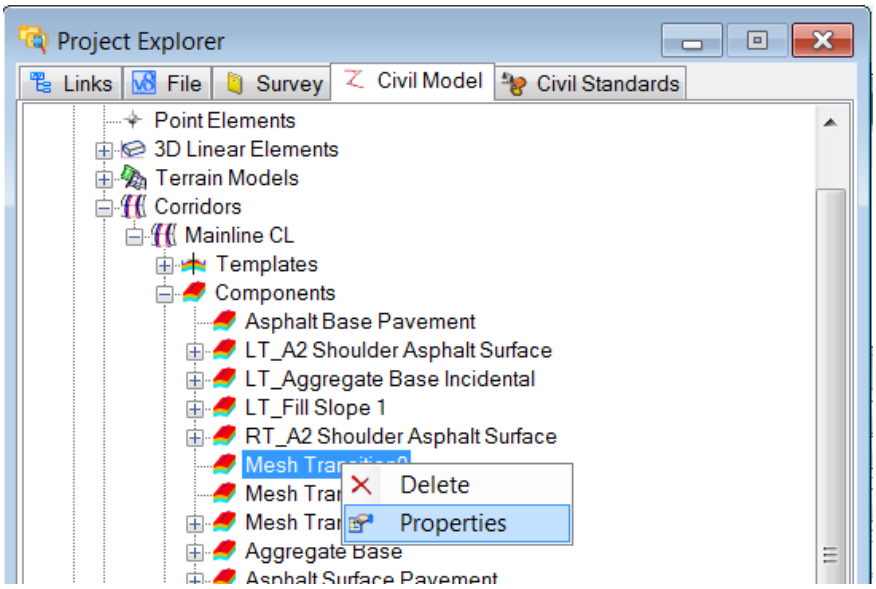
Corridor Objects - Allows you to view and manage all the input objects in the corridor in one location.

Project Explorer

The Project Explorer located in *Tools>Project Navigation>Links>Project Explorer* is another location where corridor model data is organized and displayed. As the design progresses, the information is continually created / updated automatically. The information is located under the **Civil Model** tab.



Each corridor (and associated data) is listed separately. As the tree is navigated, additional data is exposed. In addition, right-click context sensitive menus are available for common tasks and information.

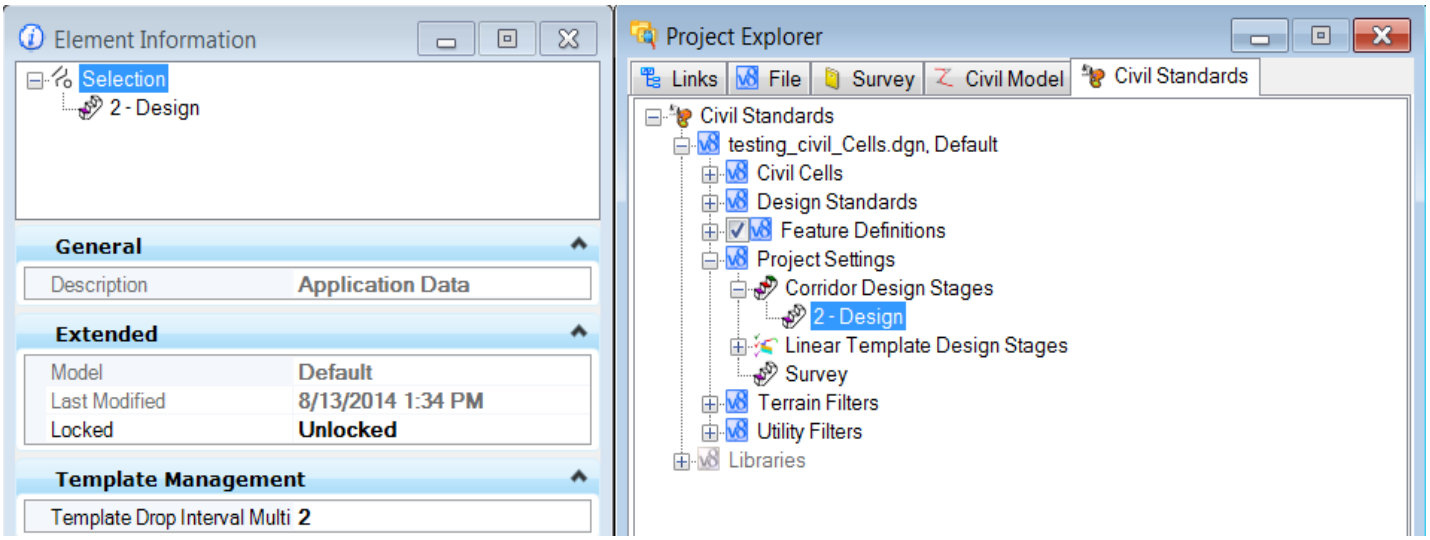


Project Settings

Project Settings can be located under the **Civil Standards** tab in the Project Explorer.

Template Management

The Template Drop Interval Multiplier can be accessed by opening the *Element Information* tool, and expanding *Project Settings* in the **Project Explorer** window, then expand the Corridor Design Stages and selecting the stage to show *Template Management*.



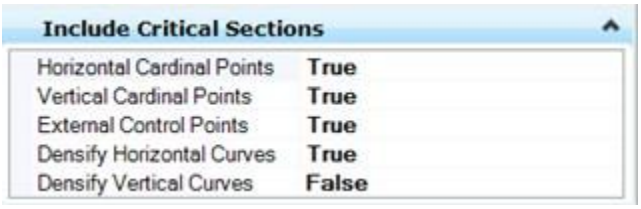
The Template Drop Interval Multiplier is used in conjunction with the Interval Drop specified when the template drop was created. Its purpose is to enable designers to use larger intervals for preliminary work and easily shorten the interval as the design is refined. To determine the interval used for processing, the Interval Drop is multiplied by the Template Drop Interval Multiplier and the result is used.

MoDOT uses the following multipliers:

Stage	Multiplier	Resultant Processing	Description
Preliminary	40	200	As corridor is determined, areas of impacts and issues can be reviewed.
Design	20	100	Used for general design work, until high level of accuracy is required towards the end of the project.
Final	5	25	Used for cross section sheets with 25 or 50 feet between sections.

Include Critical Sections

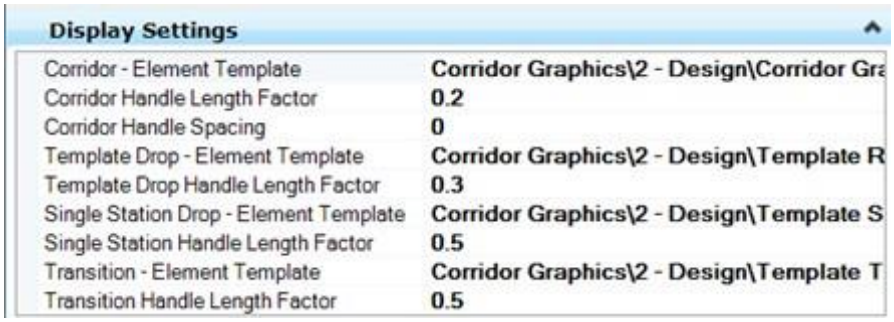
This information is also located in the *Element Information* tool when the Corridor Design Stage is selected in the *Project Settings* of **Project Explorer**.



Option	Description
Horizontal Cardinal Points	When set to True, the location of cardinal points of the active horizontal alignment (PC, PT, CS, etc.) are used to compute a point or template drop interval location.
Vertical Cardinal	Points When set to True, the location of cardinal points of the active vertical alignment (VPC, VPT, VPI, etc.) are used to compute a point or template drop interval location.
External Control Points	When set to True, the location of horizontal and/or vertical point controls are used compute a point or template drop interval location.
Densify Horizontal Curves	When set to true, the processing along horizontal curves is at a closer interval. This option utilizes the CIVIL_DEFAULT_CURVE_STROKING configuration variable value, with extra points being computed based on the chord offset from the horizontal curve. The value defines the chord height used to calculate the extra points. If configuration variable is not set or Densify Horizontal Curves is set to False, the value defaults to 0.01.

Display Settings

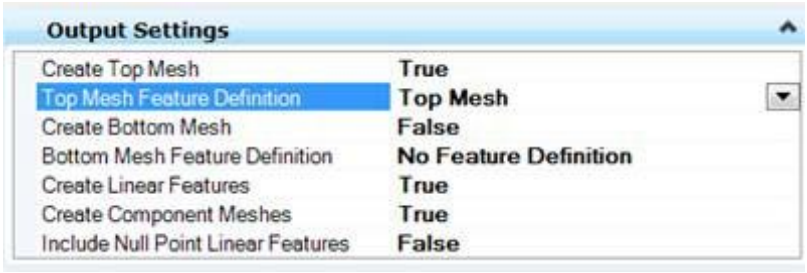
This information is also located in the *Element Information* tool when the Corridor Design Stage is selected in the *Project Settings* of **Project Explorer**.



Option	Description
Corridor - Element Template	Element template utilized to draw the corridor boundary in the Create Corridor tool. As a best practice, place the graphics for the boundaries in a construction class to allow for easily turning them off / on as needed.
Corridor Handle Length Factor Template Drop Handle Length Factor Single Station Handle	The Length Factors are a ratio of the handle length to the width of the corridor. So 1.0 would make the handle as long as the width of the corridor at that point.
Corridor Handle Spacing	The handle spacing either is set to a physical distance as shown or set to zero. If you set to zero you will get 11 handles per corridor regardless of its length. Any non-zero value is used as a distance between handles measured in master units along the horizontal alignment.
Template Drop Element Template	Element template utilized to draw the template drop boundary in the Create Template Drop tool. As a best practice, place the graphics for the boundaries in a construction class to allow for easily turning them off / on as needed.
Transition Element Template	Element template utilized to draw the transition boundary in the Create Transition tool. As a best practice, place the graphics for the boundaries in a construction class to allow for easily turning them off / on as needed.

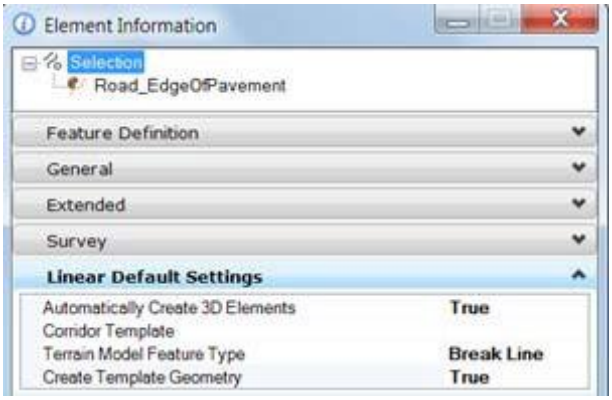
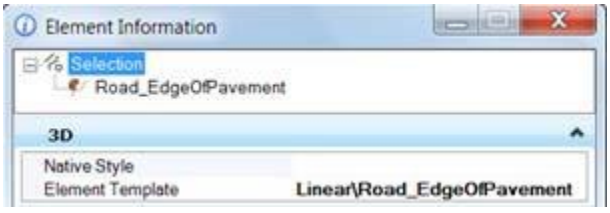
Output Settings

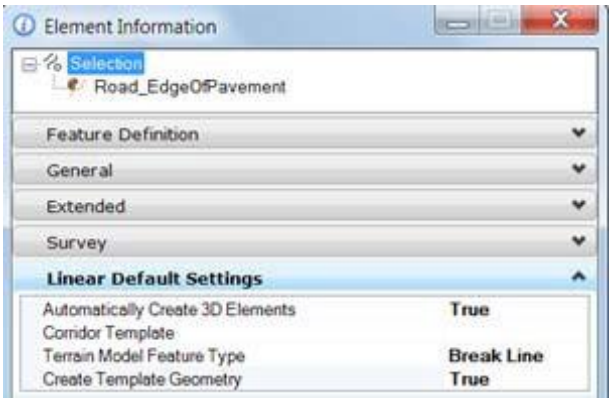
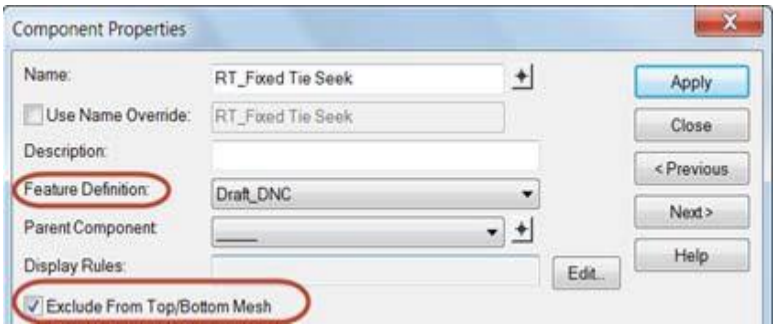
This information is also located in the *Element Information* tool when the Corridor Design Stage is selected in the *Project Settings* of **Project Explorer**.



For all options, when set to False, no elements, features, or meshes are drawn.

Option	Description
Create Top Mesh Top Mesh Feature Definition	When set to True, a mesh is created for each component in the corridor (based on its template) which has Exclude From Top / Bottom Mesh toggled OFF. The mesh is drawn using the specified Feature Definition.  If Create Top Mesh is set to False, no Top Mesh Feature Definition
Create Bottom Mesh Bottom Mesh Feature Definition	When set to True, a mesh is created for each component in the corridor (based on its template) which has Exclude From Top / Bottom Mesh toggled OFF. The mesh is drawn using the specified Feature Definition. If Create Bottom Mesh is set to False, no Bottom Mesh Feature Definition can be selected.

Create Linear Features	When set to True, 3D linear features are drawn based on Feature Definitions. First, review the Point Properties within the template:  Then review the corresponding Feature Definition.  If the Create Template Geometry setting is set to True, then the linear feature is drawn, based on the 3D settings. 

Create Linear Features Continued	 If the Create Template Geometry setting is set to True, then the linear feature is drawn, based on the 3D settings. 
Create Component Meshes	When set to True, a mesh is created for each component in the corridor (based on its template) which has Exclude From Top / Bottom Mesh toggled On. The mesh is drawn using the specified Feature Definition in the Component Properties. 
Include Null Point Linear Features	When set to True, linear features for null points are drawn, basis on the same criteria as Create Linear Features.

6.5 Group Exercise: Creating a Corridor – Road1

Setting up the Design files

1. Within the **J2P0200*data_06*** folder, open the file: **Plan_J2P0200.dgn**
2. Create a new file named **Corridors_J2P0200.dgn** based on the 2D seed file ***pw:\CADD_Standards\Seed Files\Design - English\i_project_2d_PowerGEOPAK.dgn***. This new file will hold the proposed corridor.
3. Reference in the following files:

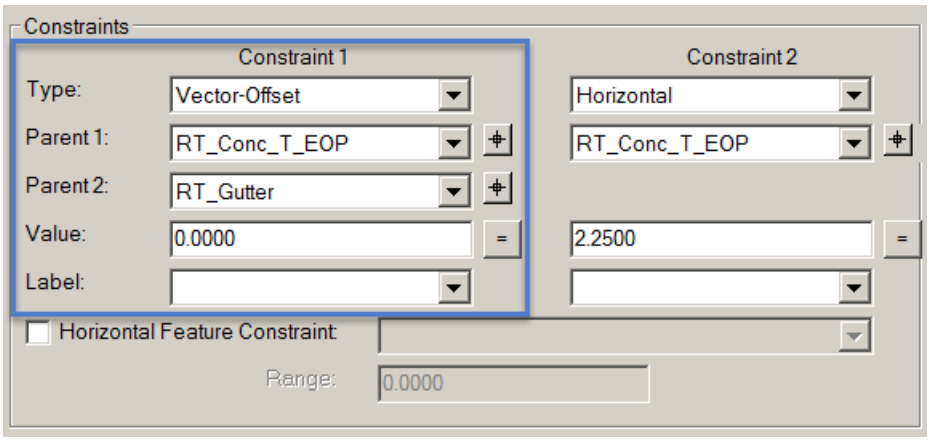
   Terrain_J2P0200_Existing.dgn
   Civil_Geometry_J2P0200.dgn.

4. Data point on the perimeter of the Terrain Model and select the **Set As Active Terrain Model** icon form the pop up menu.

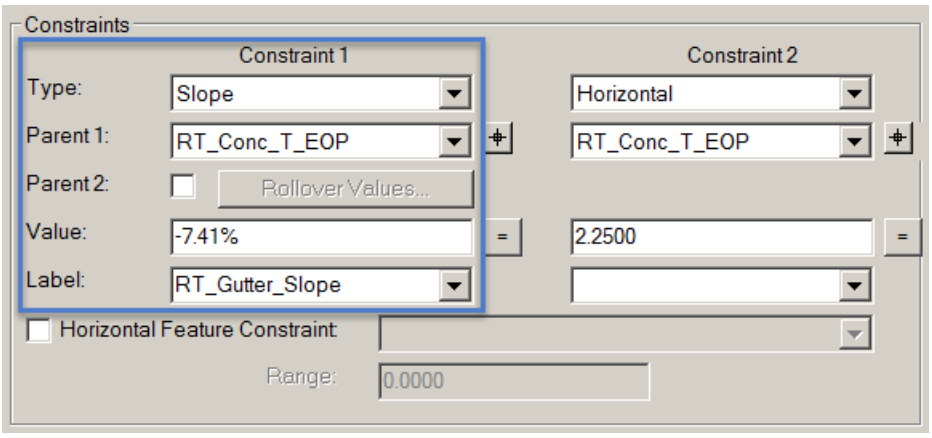
Setting up the project template Library

5. From *Corridor Modeling* task group of the Civil Tools task menu, select **Create Template.**  Or press the <**F8**> key to open the Create Template dialog.
6. Select file open and navigate to the the project diretory and open the project template library: **J2P0200.itl**.
7. Expand the **Concrete Pavement w/ Shoulders** folder in the *Templates* folder.
8. Within this folder expand the **A2 Shoulders Agg Base** folder.
9. Right click on the **Concrete Pavement 2 Lane w/ Agg Base Option 3** template and select **Copy**.
10. Expand the **J2P0200** folder and right click on the **Road1** folder then select **Paste**.
11. Expand the **Concrete Pavement w/ C&G** folder.
12. Right click on **2 Lanes Type A C&G w/ Agg Base** and select **Copy**.
13. Expand the **J2P0200** folder and right click on the **Road1** folder and select **Paste.**
14. Once the **2 Lanes Type A C&G w/ Agg Base** is pasted in the **Road1** folder we are going to modify the 2 gutter flowline points named **RT_Curb_Surf_Flowline** & **LT_Curb_Surf_Flowline**. The project parameters call for the gutters not to super elevate with the roadway.

15. Below is the original Point Constraint for **RT_Curb_Surf_Flowline**.



16. Change to a **Slope** Constraint to **-7.41%** and add a Parametric Label of **RT_Gutter_Slope.**

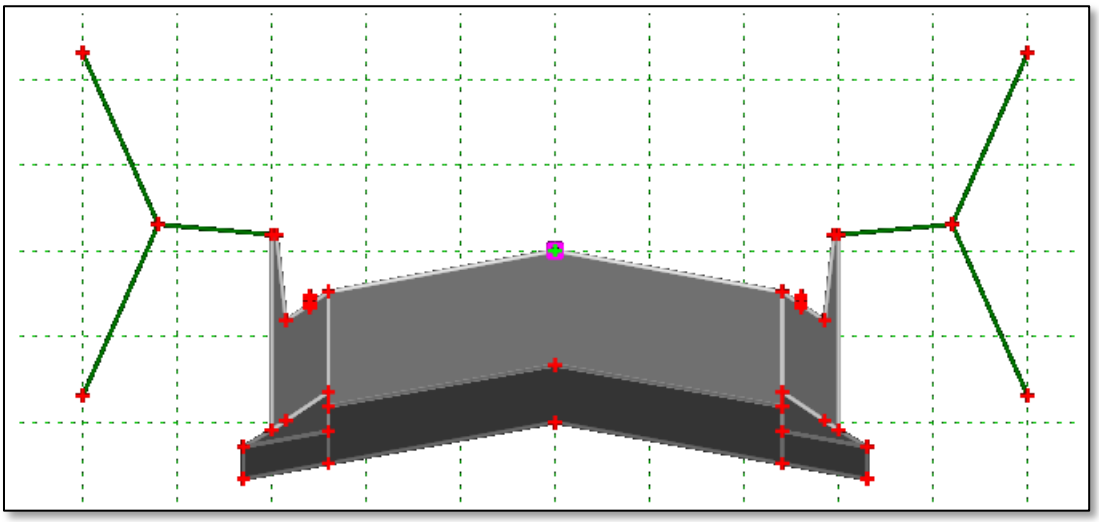


17. Select apply to update the template.

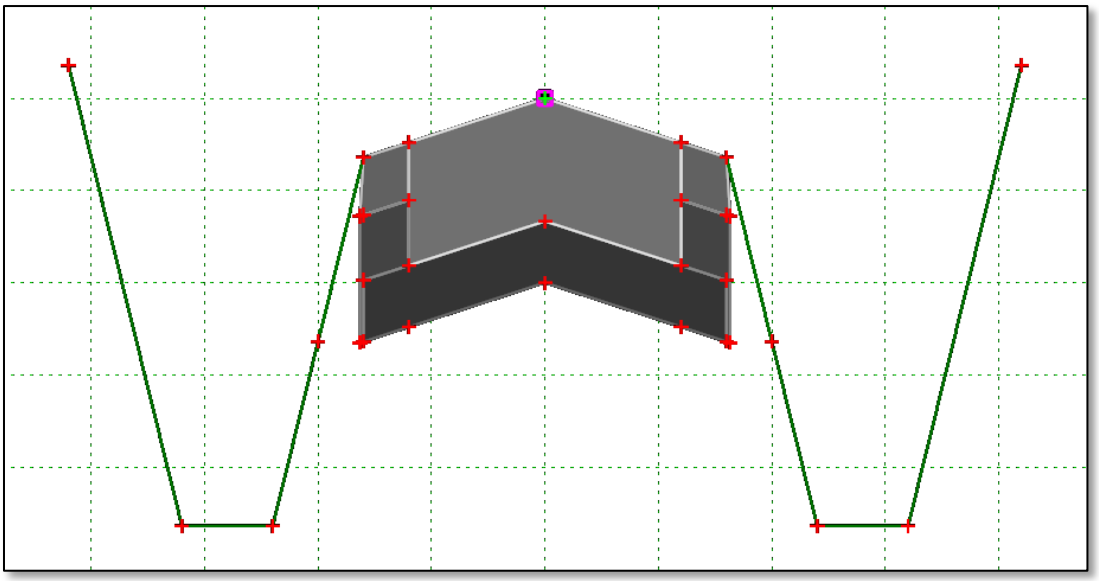
18. Edit the same flow line point on the left side.

19. Review the new ***Road1*** templates by double clicking the name in the list. Turn the Display Point names On/Off. Select **Test** to verify the end condition functionality.

2 Lanes Type A C&G w/ Agg Base



Concrete Pavement 2 Lane w/ Agg Base Option 3



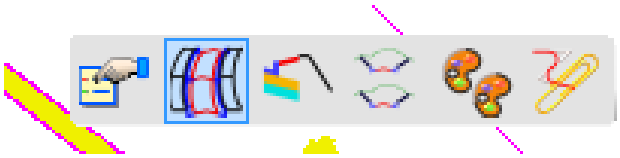
20. Select **File> Save** to save the changes to the project **J2P0200.itl**.

21. **Close** the *Create Template* dialog.

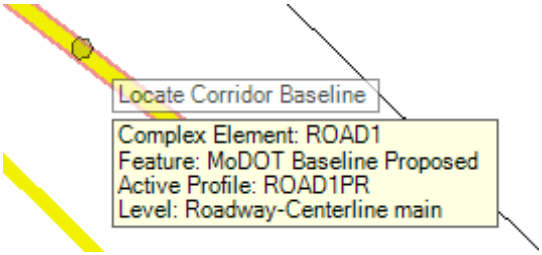
Setting up the Corridor

22. From *Corridor Modeling* task group, select **Create Corridor**. 

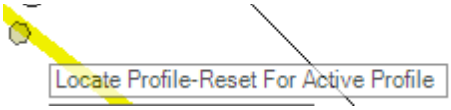
    Create Corridor command is also available from the context sensitive pop-up menu presented when hovering over a selected horizontal civil geometry element.



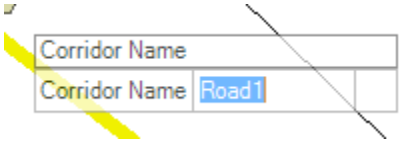
23. When prompted to *Locate Corridor Baseline*, data point on **Road1**.



24. Right-click to reset to select the active profile.



25. Name the Corridor **Road1**.



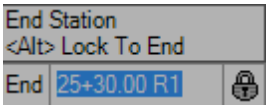
26. **Data point** to accept.

27. Select **<Alt> + Down** to pick a template or use the **Create Template Drop** dialog box.

28. Expand the project folder ***J2P0200*** and ***Road1*** folders. Select the **2 Lanes Type A C&G w/ Agg Base** template. Click **OK** to dismiss the dialog and **data point** in the view to accept the choice of template.

29. When prompted to enter the *Start Station*, select the **<Alt>** key to lock the Start Station to the start and **data point** in the view to accept it.

30. When prompted to enter the *End Station*, key in **25+30** and **Tab** to lock the value. **Data point** in the view to accept the end station.



31. When prompted for the *Interval*, key in **5** and **Tab** to lock the value and **data point** to accept the value.

32. Key in **0** (if it doesn't default to 0) for the *Minimum Transition Before Drop* and *Minimum Transition After Drop*, **data point** after each until the corridor processes. This applies the template to the *Road1* corridor for the stationing identified.

33. Select **<Alt> + Down** to pick another template or use the **Create Template Drop** dialog box.

34. Expand the folder *J2P0200* and the *Road 1* folder and select **Concrete Pavement 2 Lane w/ Agg Base Option 3** template. Click **OK** to dismiss the dialog and **data point** in the view to accept the choice of template.

35. When prompted to enter the *Start Station*, key in **25+30** and **Tab** to lock the value. **Data point** in the view to accept the start station.

36. When prompted to enter the *End Station*, select the **<Alt>** key to lock the End Station to the end and **data point** in the view to accept it.

37. When prompted for the *Interval*, key in **5** and **Tab** to lock the value and **data point** to accept the value.

38. Key in **0** (if it doesn't default to 0) for the *Minimum Transition Before Drop* and *Minimum Transition After Drop*, **data point** after each until the corridor processes. This completes the template drop for *Road1* by applying the template to the stationing identified. The corridor will process and display in both the 2D view and the 3D Isometric view.

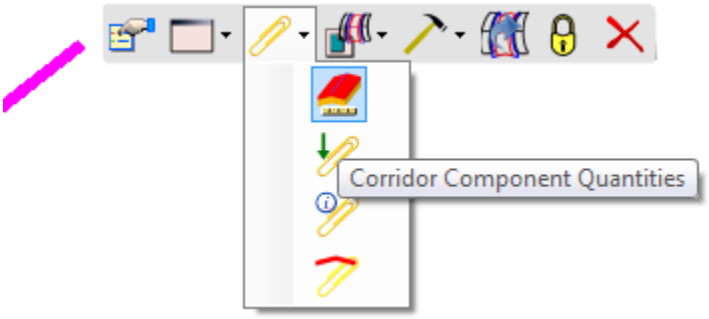
39. Select <**F4**> to close the Create Template Drop tool down.

40. Press **<F6>** key to setup the 3D view.

    Hint: If you don't see end conditions then the original ground terrain model was not active.

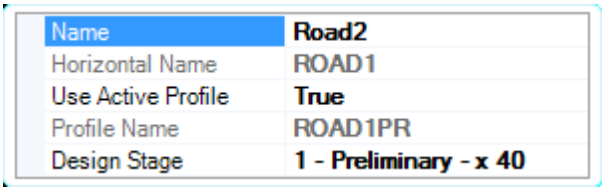
Review the model and the effect of Design stages

41. Select the corridor by picking one of the handles.
42. Select the *Corridor Component Quantities* option from the *Corridor Reports* pop-up.

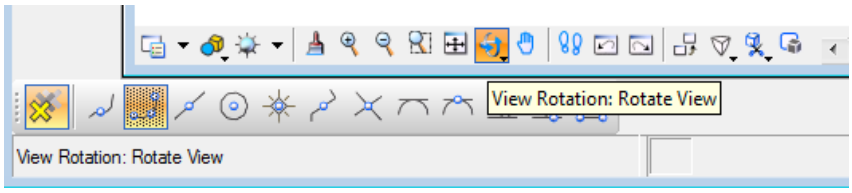


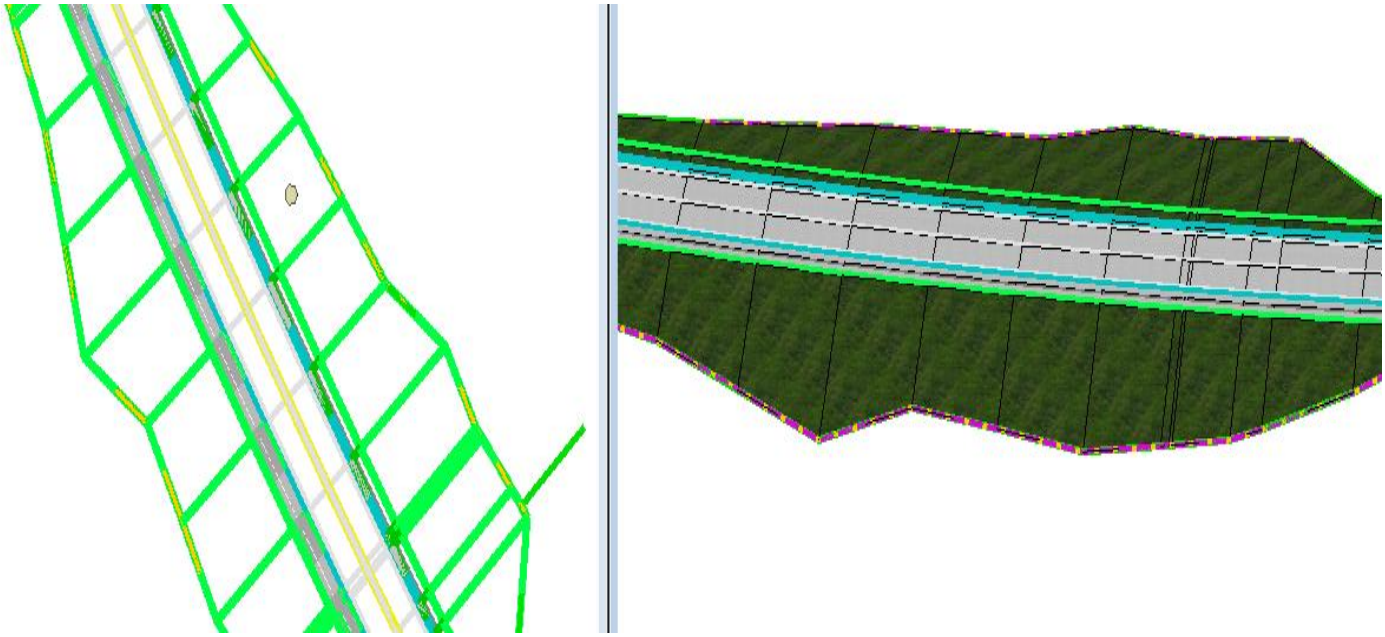
43. Key in some unit cost values.
44. Select **Report**.
45. Review the reports available. Close the *Report Browser*.
46. Display the pop-up menu again and select **Properties**.

47. Select and explore the options for *Design Stage*.



48. Use the *View Rotation* tool to rotate the view to see 3D effects on the *Road1* corridor.

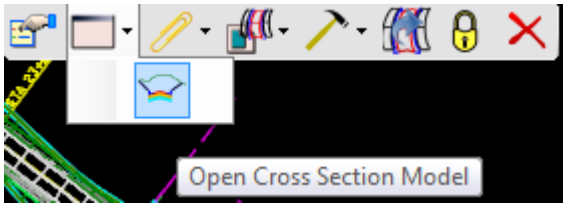




Set up Dynamic Cross sections

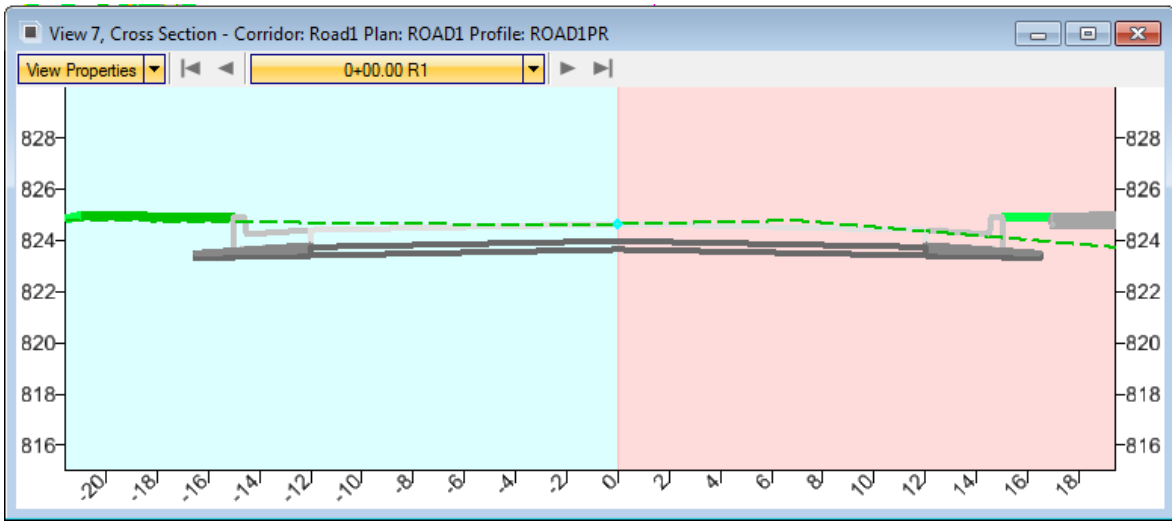
49. From *Corridor Modeling* task group, select **Open Cross Section View**. 

    Open Cross Section View command is also available from the context sensitive pop-up menu presented when hovering over a corridor handle.



50. When prompted to *Locate Corridor or Alignment*, identify the corridor by selecting a grab handle on the corridor.

51. When prompted to *Select or open View*, select a view not in use and **data point** in the view. This will present the first Cross Section of the corridor. To Navigate up and down the corridor use the arrow indicators at the top of the view. To navigate within in the view, use the mouse wheel; rolling the wheel forward zooms in, rolling back zooms out. Depressing the wheel and moving the mouse pans the view.

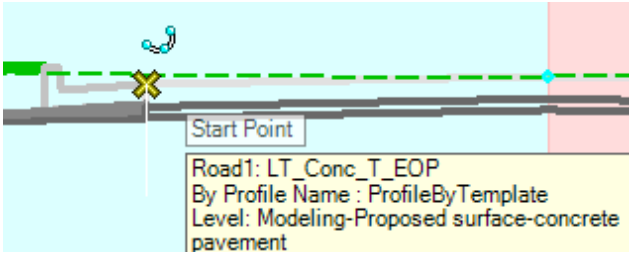


Since superelevation will be changing the slopes, having feedback to the slope at each station is useful, the next steps describe how to place a dimension line from the edge of pavement to the center line on each side of the road.

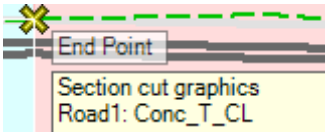
52. Select **Show Place Dimension**.  Located in the *Corridor Modeling* tools in the *Civil Tools* tasks.

53. Select the **Cross Section** view.

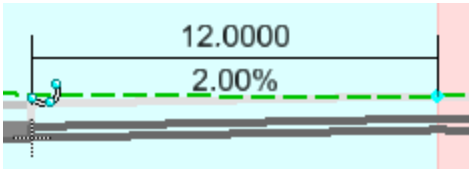
54. At the *Start Point* prompt, identify the left EOP named **LT_Conc_T_EOP**, **data point** to accept.



55. At the *End Point* prompt, identify the centerline point named **Conc_T_CL, data point** to accept.

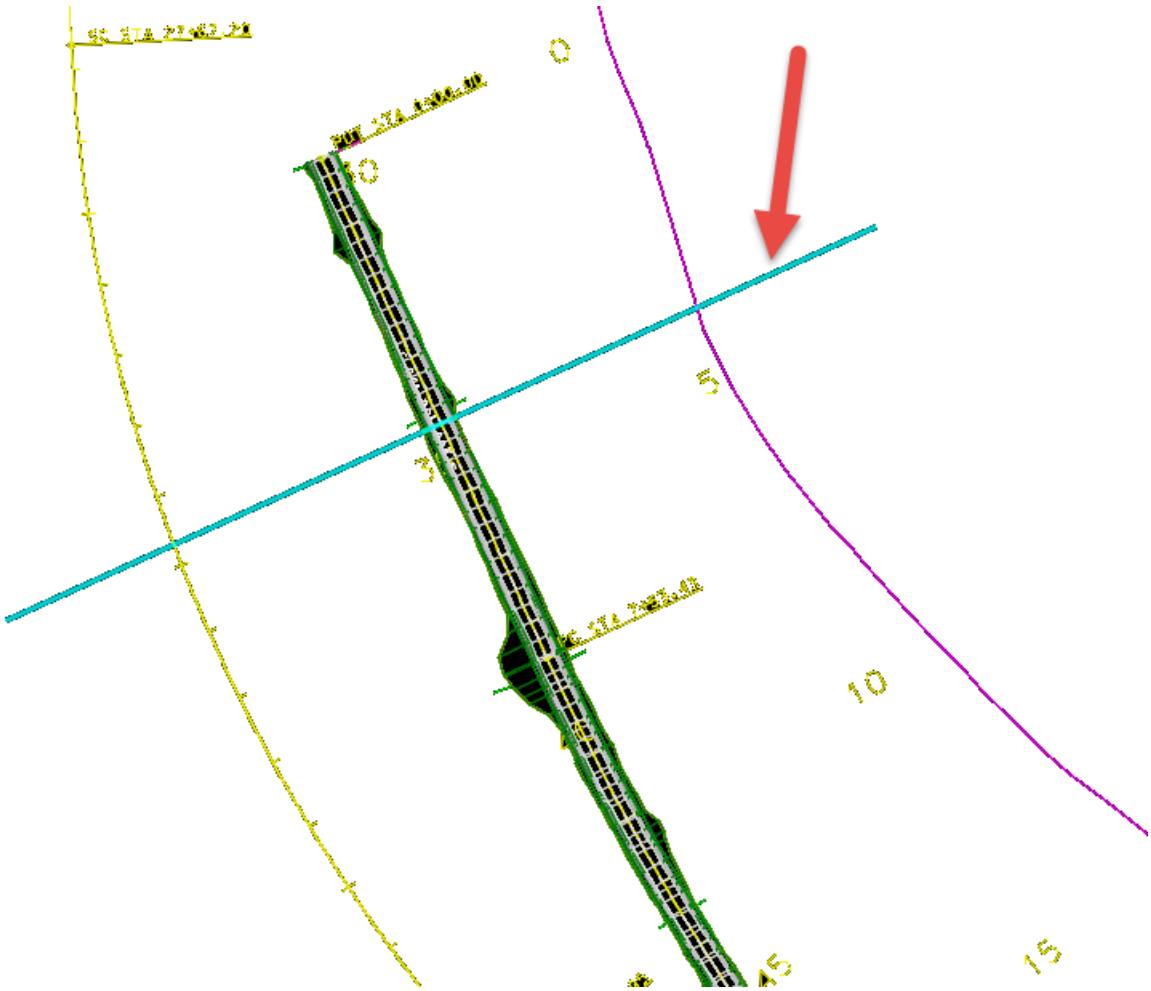


56. Place the dimension height above or below the component in a location that will be easy to read, **data point** to accept the location.



Note: This places the same dimension on all cross sections.

Note: The blue line on the alignment represents the location of the cross-section.



57. **Close** *View 7*.

58. **Save Settings** on the design file. The corridor is stored as MicroStation data; no .ird file is created.

    Important! If you delete the graphics, you delete the corridor and both the 2D and the 3D display.

    Note: The User might notice there is no superelevation applied to the corridor, this is covered in the next chapter.

59. Select **File > Update Server Copy**.

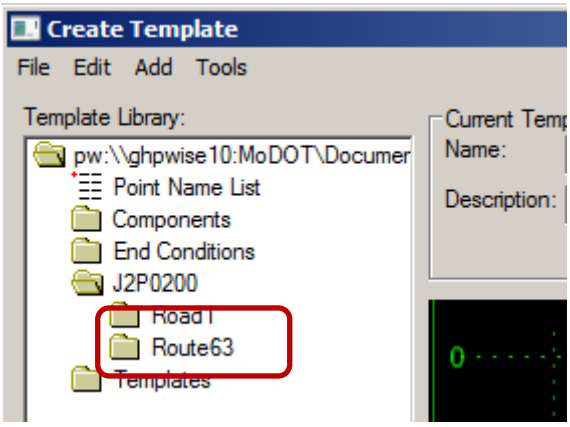
6.6 Individual Exercise: Creating a Corridor for Route63

1. Continue working in **Corridors_J2P0200.dgn.**

2. From *Civil Tools* task menu under *Corridor Modeling*, select **Create Template**. 

3. Select **File > Open** and navigate to the location of the project template file **J2P0200.itl** and open the file.

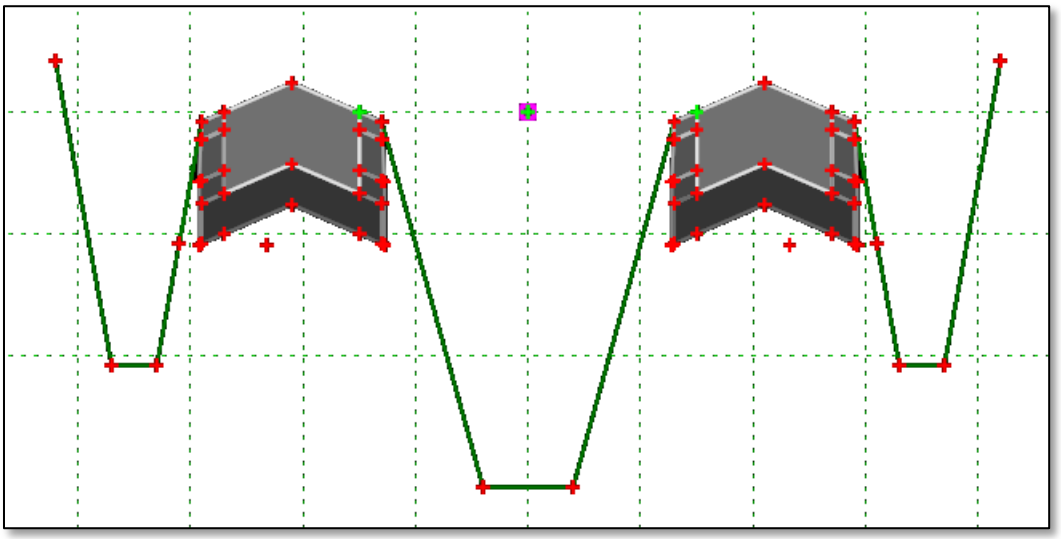
4. In **Create Template** dialog right-click on the ***J2P0200*** folder, select **New > Folder** and create a folder called **Route63**.



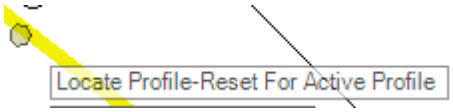
5. Expand the ***Templates > Concrete Pavement w/ Shoulders*** folder.

6. Expand the ***A3 Shoulders Agg Base*** folder.

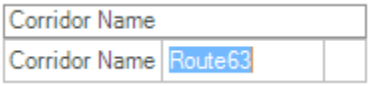
7. Right click on the ***Concrete Pavement 4 Lane Divided w/ Agg Base Option 3*** template and select **Copy**.



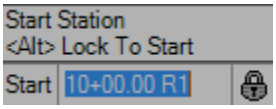
8. Right click on the **Route63** folder and select **Paste**.
9. Test the template by clicking **Test**.
10. **Save** your changes to the **J2P0200.itl** and then close the *Create Template* dialog.
11. From ***Corridor Modeling*** task group, select **Create Corridor** 
12. When prompted to *Locate Corridor Baseline*, data point on **Route63**.
13. Right-click to reset to select the *Active Profile*.



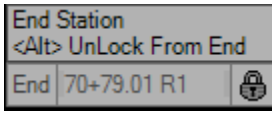
14. Name the corridor **Route63**.



15. **Data point** to accept.
16. Select **<Alt> + Down** to pick a template or use the **Create Template Drop** dialog box.
17. Expand the folder *J2P0200* and the *Route63* folder.
18. Select the **Concrete Pavement 4 Lane w/ Agg Base Option 3** template. Click **OK** to dismiss the dialog and **data point** in the view to accept the choice of template
19. When prompted to enter the *Start Station*, key in **10+00 R1**, **Tab** to lock the station, and **Data point** in the view to accept.



20. When prompted to enter the *End Station*, select the **<Alt>** key to lock the End Station to the end and **data point** in the view to accept it.



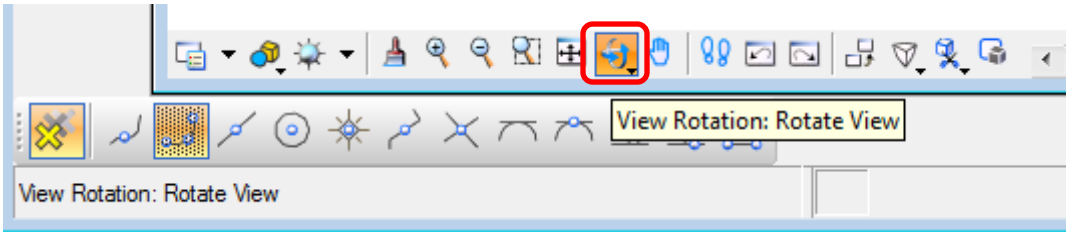
21. When prompted for the *Interval*, key in **5** and **Tab** to lock the value.
22. Key in **0** (if it doesn't default to 0) for the *Minimum Transition Before Drop* and *Minimum Transition After Drop*, **data point** after each until the corridor processes. The corridor will process and display in both the 2D view and the 3D Isometric view. This applies the template to the *Route63* corridor.

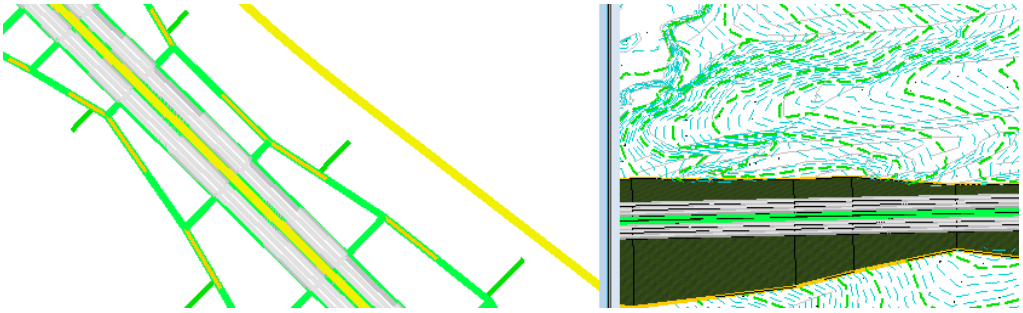
23. Select <**F4**> to close the Create Template Drop tool down.

24. From the *Properties* pop-up menu, select and explore different design stages.

25. If the 3D View is not open select <F6> key to open a 3D view of the corridors.

26. Using the *View Rotation* tool, rotate the view to see 3D effects of *J2P0200 Route 63* corridor.





Set up Dynamic Cross sections

27. Select **Open Cross Section View**  from the *Corridor Modeling* task group, to review the dynamic cross sections.

28. When prompted to *Locate Corridor or Alignment*, identify the **Route63** corridor by selecting a grab handle on the corridor.

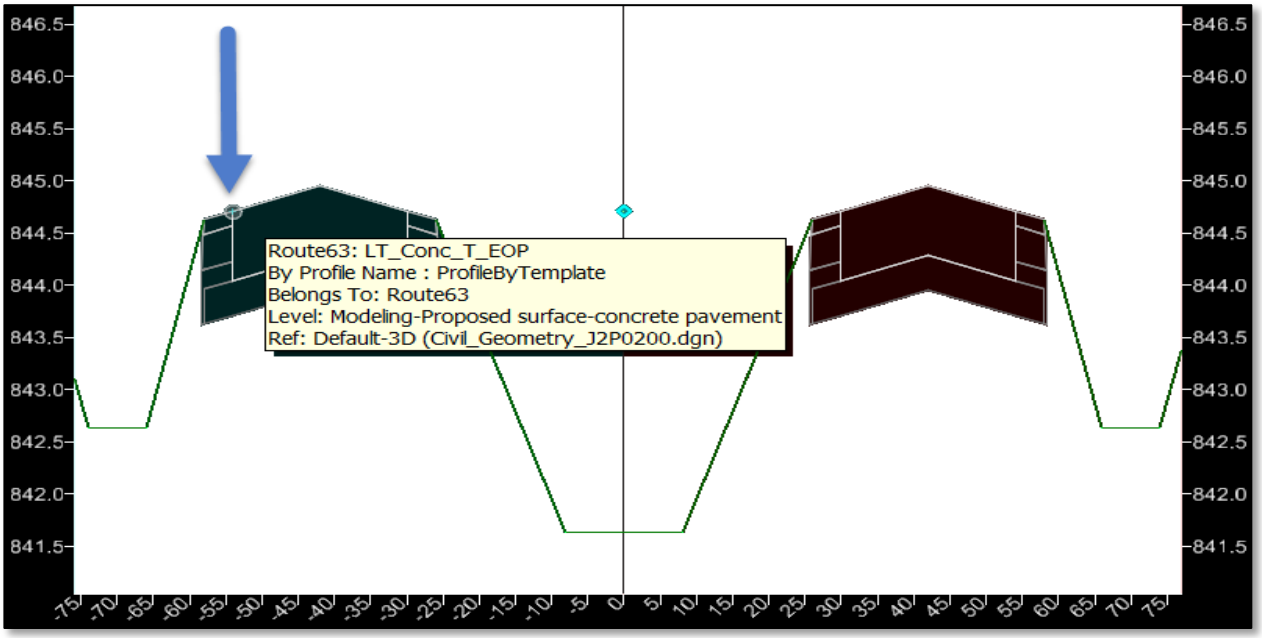
29. When prompted to *Select or Open View*, select a view not in use, (View 8) and **data point** in the view. This will present the first Cross Section of the corridor. To navigate up and down the corridor, use the arrow indicators at the top of the view. To navigate within in the view, use the mouse wheel; rolling the wheel forward zooms in, rolling back zooms out. Depressing the wheel pans the view.

Since superelevation will be changing the slopes, having feedback to the slope at each station is useful, the next steps describe how to place a dimension line from the edge of pavement to the center line on each side of the road.

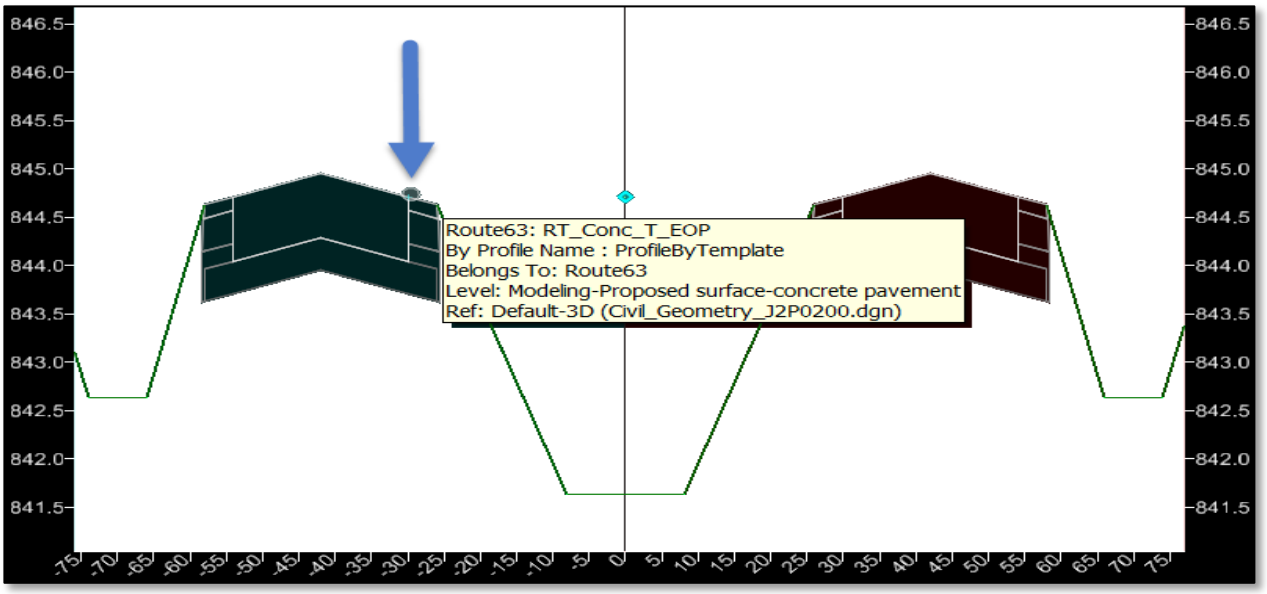
30. Select **Show Place Dimension**  from the *Corridor Modeling* task group.

31. Select the Cross Section view.

32. At the *Start Point* prompt, identify the **left** **EOP** named **LT_Conc_T_EOP**.

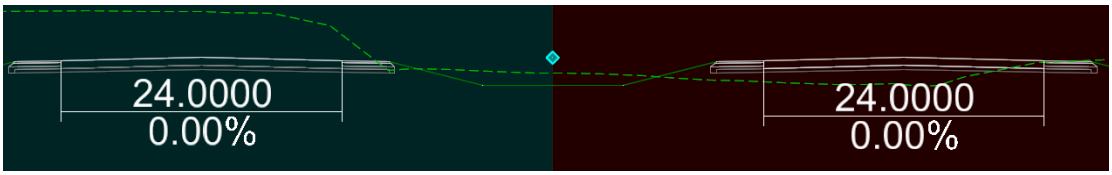


33. At the *End Point* prompt, identify the **right** **EOP** named **RT_Conc_T_EOP**.



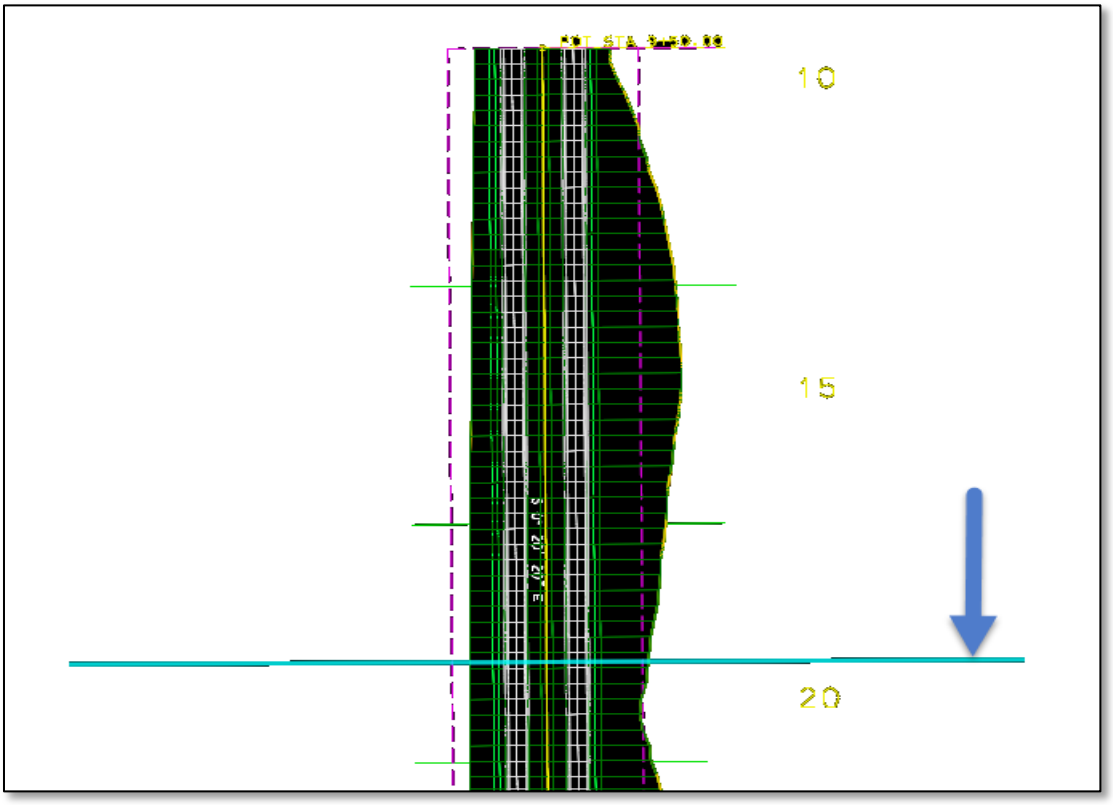
34. Place the dimension height above or below the component in a location that will be easy to read, **data point** to accept the location.

35. Do this for both the North bound and the South bound lanes of *Route 63*.



Note: This places the same dimension on all cross sections.

Note: The blue line on the alignment represents the location of the cross-section.



36. **Close** View 8.

37. **Compress** and **Save Settings** on the design file. The corridor is stored as MicroStation data; no .ird file is created.

Important! If you delete the graphics, you delete the corridor and both the 2D and the 3D display.

Note: The User might notice there is no superelevation applied to the corridor, this is covered in the next chapter.

38. Select **File > Update Server Copy**.