# OpenRoads Design:
Corridor modeling

Corridor Creation

A corridor model is created by applying a template to selected horizontal and vertical geometry.

Corridor models are created by choosing the **New Corridor** command from the **Corridors** tab, or by selecting an alignment and choosing the Create Corridor command from the pop-up menu. When the command is selected, the software will step you through a series of prompts. These prompts appear on the cursor and can also be defined using the **Tool Settings** dialog.
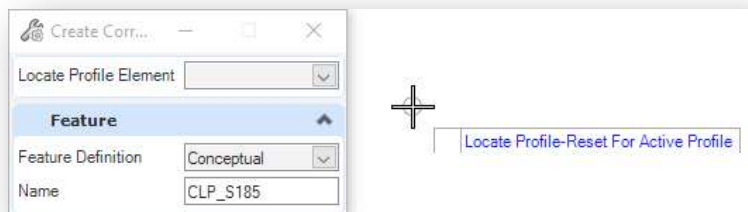
You are prompted to define the following parameters:

> **Locate Profile – Reset For Active Profile**
> Select the profile name from the drop-down list or issue a reset button to accept the **Active Profile** that is defined for the Horizontal Alignment.
>
> **Corridor Name**
> Define the name for the corridor. It is recommended that you use the same name as the horizontal alignment.
>
> **Feature Definition**
> The assigned Feature Definition defines a variety of parameters to control the template drop interval as well as which elements are drawn in the 3D model. (3D line strings, 3D components, surface meshes, etc.)
>
> The feature definitions can be reviewed in the **Civil Standards** tab of the *Project Explorer* dialog as shown below.
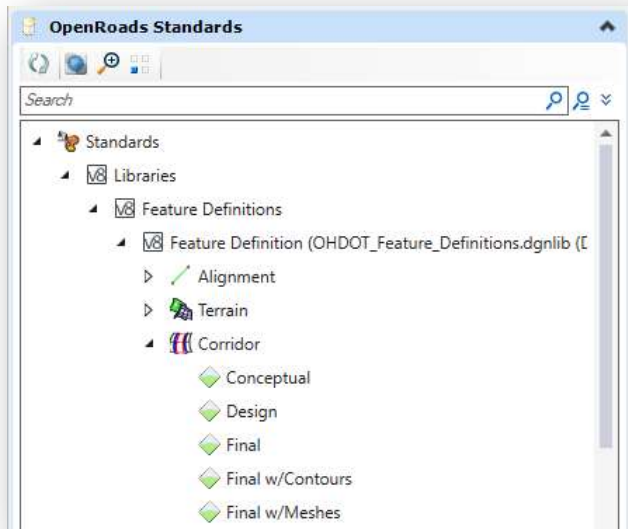
The feature definition assigned to a corridor can be changed at any time throughout the corridor modeling process.

Each Corridor feature definition is defined to provide more detailed modeling as you work from conceptual design to the final design. The settings for each Corridor feature definition are defined in the OHDOT standards and vary for each design stage.

Template Drop Interval Multiplier
When templates are applied to the horizontal and vertical geometry, the user is prompted to enter a template drop interval. ODOT recommends an interval of 5. The **Template Drop Interval Multiplier** parameter is used to specify a multiplier, which is applied to the initial template drop interval, to determine the actual interval of each template drop location according to the selected design stage. This is useful to speed up processing for early design stages where less detailed information is required. The ODOT design stages have been defined with the multiplier values shown in the table below.

Design Stage	Template Drop Interval Multiplier
Conceptual	5
Design	2
Final	1
Final w/Contours	1
Final w/Meshes	1

After defining the **Profile**, **Corridor Name**, and **Feature Definition**, you are prompted to define the **Template Drop** information as shown below.

The parameters can be defined in the *Crete Template Drop* window, as shown at left, or by dialogs floating on the cursor that will step you through the parameters.

Each parameter is defined below:

Lock to Start
Toggle this option on to lock the start of the corridor to the start of the horizontal alignment.

Start
Define the **Start** station for the corridor.

Lock to End
Toggle this option on to lock the end of the corridor to the end of the horizontal alignment.

End
Define the **end** station for the Corridor.

Drop Interval
This parameter is used to define the interval that the template will be applied to the corridor. We recommend a **Drop Interval** of **5** for ODOT projects.

Minimum Transition Before Drop / Minimum Transition After Drop
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.

Template
Define the template from the library to be applied to the alignment and profile. The ... button to the right of the template name is used to browse the template library to choose the desired template.

After defining the *Create Template Drop* parameters, the template is applied to the selected horizontal and vertical alignments to create the corridor.

- A 3-Dimensional model named **Design-3D** is automatically created in the active design file and referenced to the active model.
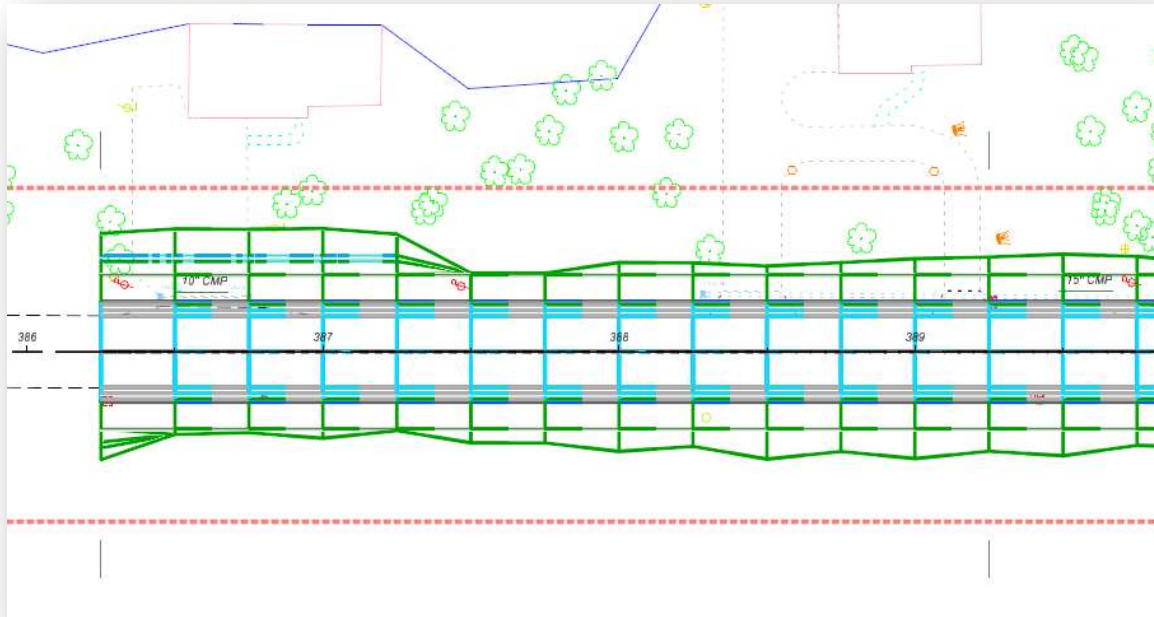

Note: The referenced graphics are not always desirable and can be turned off using the MicroStation Reference Attachment tools.

The 3d model of the corridor can be displayed by holding down the right-mouse button in the MicroStation view until the pop-up menu appears, and then choosing **View Control > 2 Views Plan/3D**.

In addition to the 3d graphics, 2d graphics are drawn in the active model as described below:

- 2-Dimensional graphics are drawn in the active model as defined by the features assigned to the individual points in the template. The ODOT feature definitions that are assigned to points on the surface of the template, such as the edge of pavement, shoulder, or ditches, are the only template features that draw these 2D plan graphics.

- Graphics representing the length of the corridor model and the template drop range are created in the active model. This graphic includes several "handles" at intervals along the length of the corridor that can be easily selected to identify the corridor model as shown below.
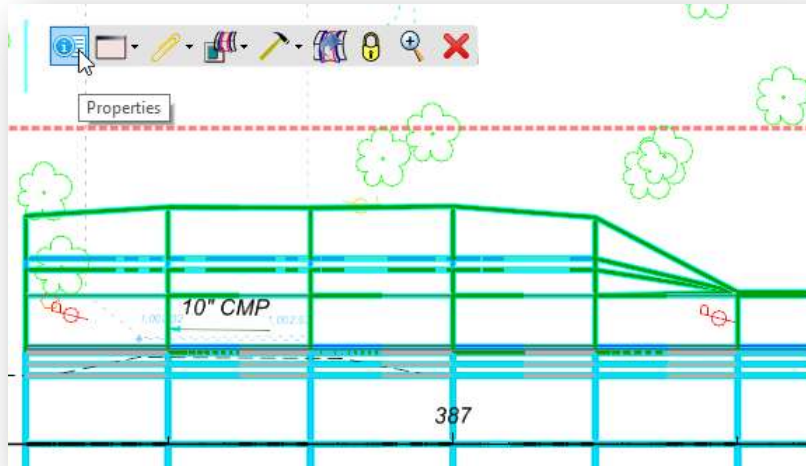
Corridor Handles

Template Range
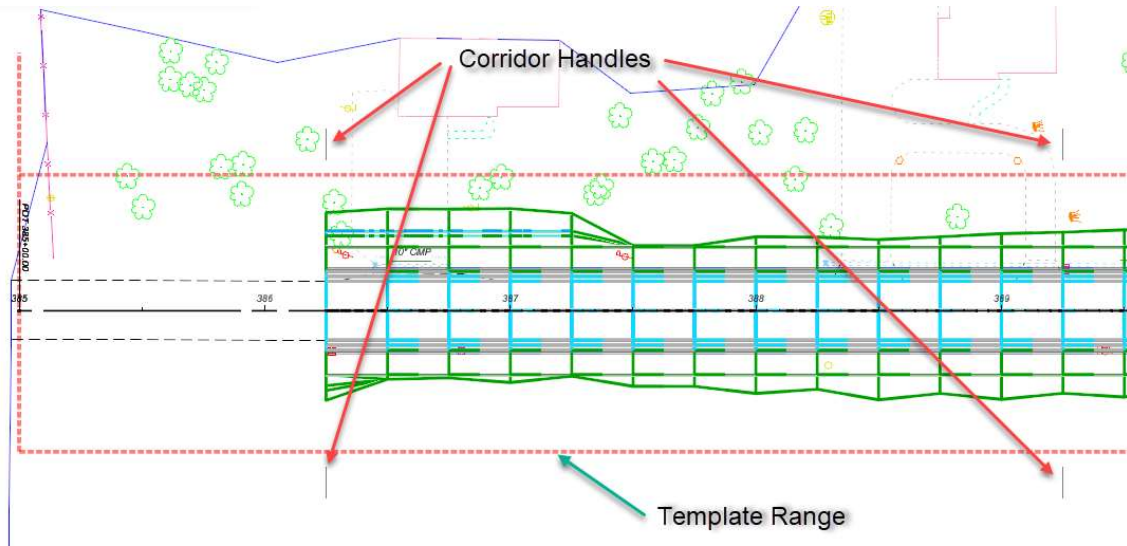
- The corridor is added to the **OpenRoads Model**, which can be reviewed in the *Project Explorer* dialog.
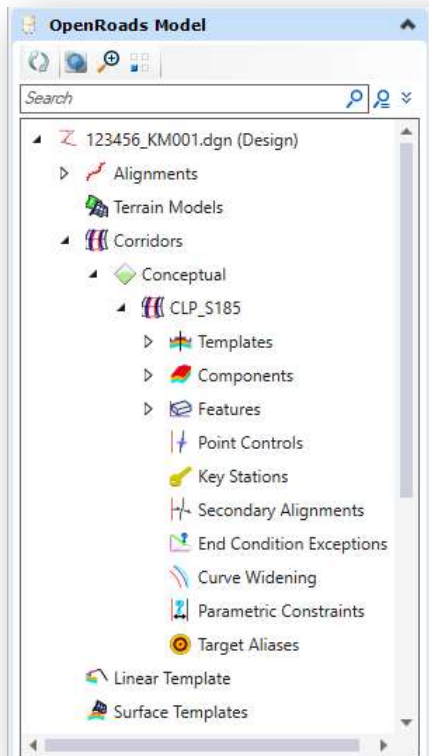
Corridor Editing Tools

Select one of the corridor handles, as shown below, to access a menu of common corridor commands.


The commands in the menu are grouped as follows:

- Properties
- Corridor Views
- Reports
- Corridor References
- Corridor Creation Tools
- Lock – Deactivate Rule
- Zoom To
- Delete

Commonly used commands are detailed in this training guide. For additional information, see the online help.

Corridor Properties

Select **Properties** from the corridor pop-up menu to access the dialog shown below.
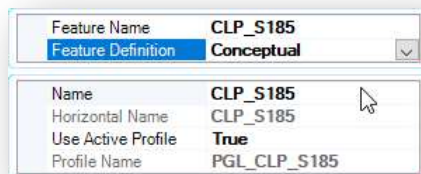
The corridor parameters shown above can also be edited in the ***Properties*** dialog when a corridor is selected.

Corridor Views

The **Corridor Views** icon has one command, **Open Cross Section Model**. This command is used to create a dynamic cross section view to review the model by scrolling through cross sections.

When selected, you are prompted to **Open or Select View** for the cross-section display. In the example below, View 2 was selected to display the dynamic cross sections.
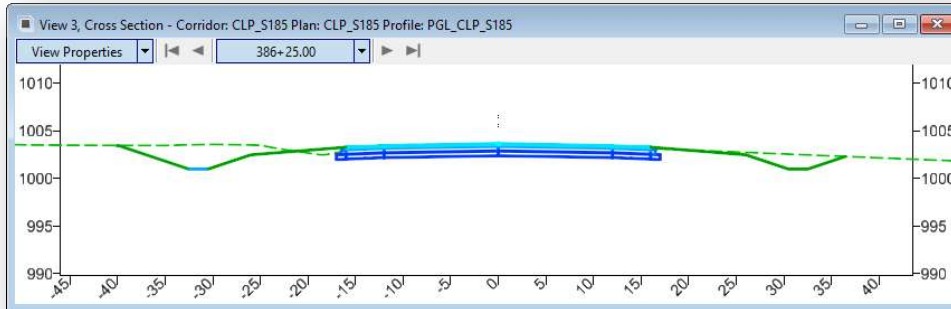

This dynamic view is a temporary display of the cross sections. The sections are not written to the design file using this command.
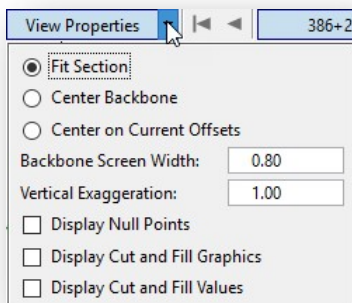
The **View Properties** contains parameters for adjusting the cross-section display, as shown at left.

Hold down the right mouse button in the cross-section view to access the pop-up menu shown at right. Five additional commands relevant to cross sections are available. See the online help for additional information.
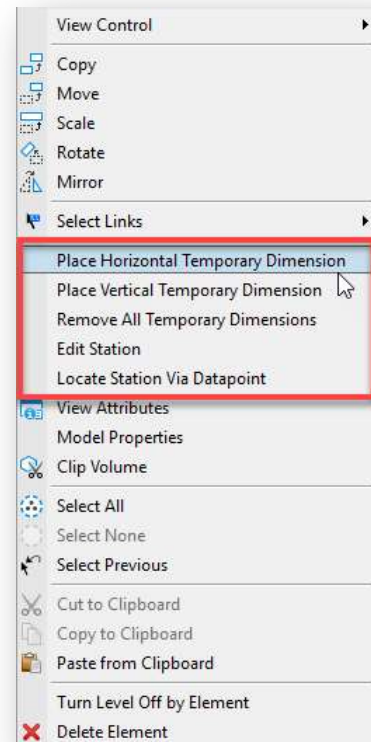
Reports

The **Reports** icon provides access to the following four reports:

- Corridor Component Quantities
- Design Input Report
- Results Report
- Milling Report

The **Corridor Component Quantities** report is used to generate a quick cost estimate for the selected corridor by assigning a unit cost for each component in the corridor templates.

The remaining reports are detailed in the online help.

Corridor References

The following four **Corridor References** commands are available:

Add Corridor Reference
This tool is used to add graphical elements to the corridor processing. This must be done when a **Feature** is targeted in the template definition. This enables the software to process only the identified elements, which speeds up processing. For example, if the template targets a right-of-way line, the right-of-way lines must be included as a Corridor Reference for the template to find the lines.

Remove Corridor Reference
This tool is used to remove graphical elements from the corridor processing.

Add Clipping Reference
This command is used to remove areas of overlap when working with multiple corridors. For example, in a corridor intersected by a crossing roadway, clipping is used to remove overlapping features within the intersection.

Remove Clipping Reference
This tool is used to remove any clipping references defied for a corridor.

Corridor Creation Tools

The **Corridor Creation Tools** menu contains commonly used corridor commands. The tools are listed below. These tools are detailed on the following pages.

Corridor Objects

Create Template Drop

Create Transition

Create Secondary Alignment

Define Target Aliasing

Create Parametric Constraint

Create End Condition Exception

Create Point Control

Create Curve Widening

Key Station

Assign Superelevation to Corridor

Corridor Objects

This option is a one-stop shop to view, create, and edit corridor objects. Most of the options contained in the **Corridor Creation Tools** can be accessed from this dialog as shown below.
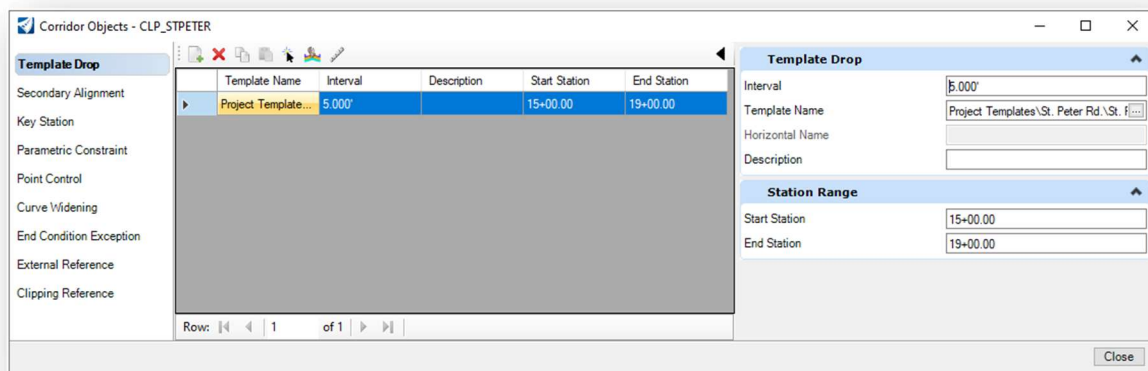
Create Template Drop

This tool is used to create a new template drop location on the corridor.

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 template drops which are adjacent to it. Once the transition location is created, it is up to the user to define how the transition is applied.

See the online help for more information.

Create Secondary Alignment

Secondary alignments are used to modify the direction of cross section processing. By default, at any given station, the cross section is created orthogonal to the main alignment. If a secondary alignment exists, then that portion of the cross section which lies outside the secondary alignment will be orthogonal to the secondary alignment instead of the main alignment.

See the online help for more information.

Define Target Aliasing

Target 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.

See the online help for more information.

Create Parametric Constraint

Parametric constraints can be used to change one or more labeled constraint values of a template while the template is being processed in the corridor modeler.
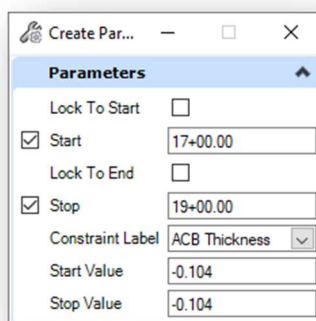
In the example at left, the **Constraint Label** "ACSC Thickness" is assigned in the template for the **Vertical** constraint of the Asphalt Concrete Surface Course point. The **Parametric Constraint** can be used to define a new value for a specified station range.

Create End Condition Exception

End Condition Exceptions are used to modify the behavior of an end condition solution without requiring the use of additional template drops. When an end condition exception is added, it must be edited to change its behavior. End condition exceptions come in two classes:

- **Overrides** allow you to replace or override the template drop end conditions on the left or right of the backbone. When you choose this option, you must edit the override to set up the new end condition. When the override exception is edited, the *Create Template* dialog is displayed allowing you to edit the end-condition.

- End condition **Transitions** are used where the end condition may change suddenly due to changes in the existing surface or other reasons, and you want the transition to be smooth over a specified station range rather than a sudden change over a short length.
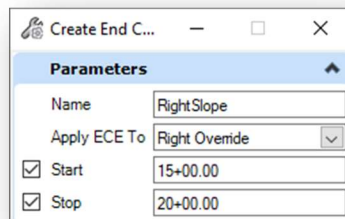
Create Point Control

Point controls 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, or maintaining a slope for a ditch.
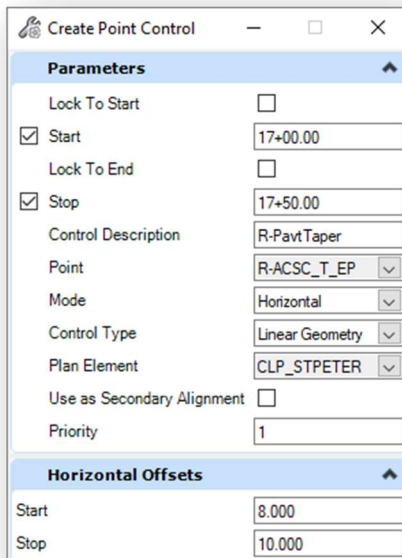
Create Curve Widening

Curve widening is used to automatically create and apply horizontal controls to widen lanes and/or edge of pavement lines around curves, moving them further away from the centerline at each curve of the controlling alignment. The tool is used in conjunction with an ASCII file (*.wid) which contains parameters to define the widening.

Curve widening is defined in the **Location and Design Manual, Volume 1 Roadway Design**, **Section 301.1.3 Travelled Way Widening on Highway Curves**.

ODOT does not provide curve widening tables currently. Use point controls to manually assign the station ranges and offsets for curve widening.

Key Station

This command is used to add stations that are not coincident to the template interval to the corridor processing. For example, a key station can be added at a drive or culvert location to ensure the template is processed at that station.
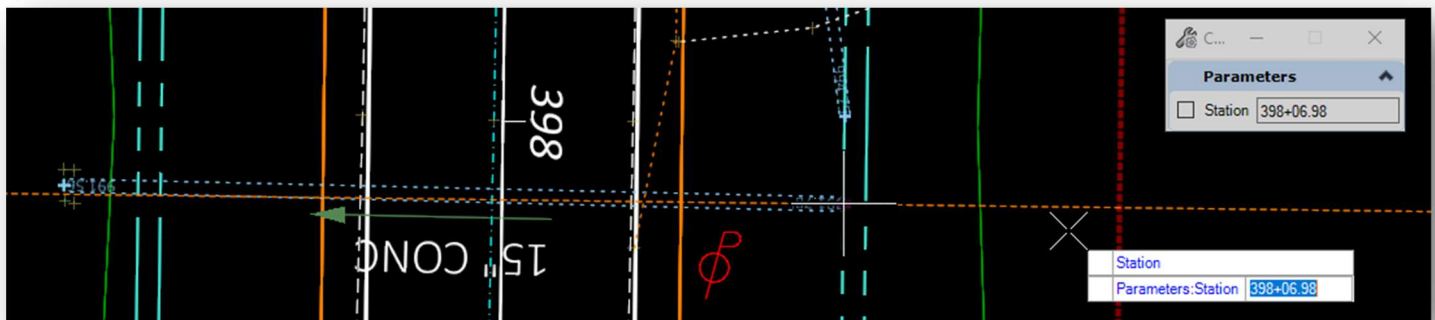
Assign Superelevation to Corridor

Superelevation is covered in another section of this training.

Processing Order for Point Overrides

As you can see, there are several ways in the corridor processing to override the template definition for various constraints using Parametric Constraints, Point Controls, and Horizontal Feature Constraints.

This is generally the order in which OpenRoads solves the location of points and components at each template drop:

1. Template is dropped, and points are placed according to the point constraints stored in the template.
2. Parametric constraints are applied as defined in the template, and in the corridor.
3. Horizontal Feature constraints are applied to move points if the feature is found in the specified range.
4. Point controls are applied to the assigned points, overriding the corresponding constraint, and all points that are constrained back to the point-controlled point will be recalculated.
5. Component display rules are solved based on the current position of all points.
6. End conditions are solved by extending designated segments along the specified slope to seek their targets.

Process Corridor

Select the corridor line to highlight corridor then pop out menu with appear. Then click the icon to reprocess the corridor.

Lock - Deactivate Rule

This command can be used to temporarily deactivate processing rules on the corridor. This is useful when making edits so that the corridor does not automatically update as the edits are made. Once the edits have been completed, the rules can be turned back on, and the corridor reprocessed.

Zoom To

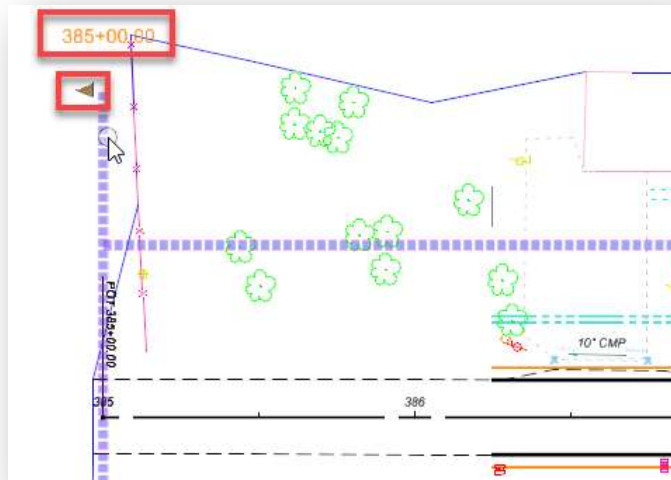Select the command to zoom to the full extents of the corridor.

Delete

Select this command to delete the corridor.

Template Drop Tools

Edit the Template Range

When the template range graphic is selected, the range can be edited by accessing rule that defines the template drop location.

The template range can be edited by selecting the station and editing the value of by selecting the arrow icon to dynamically mode the start (or end) of the template range.

Template Pop-Up Menu

Select the template range graphic and let the cursor rest on the element to access the pop-up menu shown below.
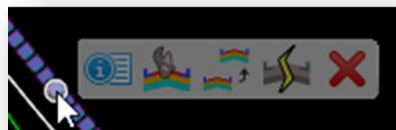
The following commands are available:

- Properties
- Edit Template Drop
- Copy Template Drop
- Synchronize with Library
- Delete

Properties

Interval	5.000'
Template Name	Project Templates\S.R. 18
Horizontal Name	
Description	
Start Station	385+00.00
End Station	438+84.37

Choosing **Properties** from the pop-up menu allows editing the parameters shown at left.

Edit Template Drop

When a template is applied to generate the corridor, the template definition is copied into the design file. The template definition can be edited in the design file, independent of the definition that is stored in the template library .itl file. Use this command to edit the template definition as applied to the corridor, not the template as defined in the library.

When the command is selected, the ***Editing Roadway Designer Template Drop*** dialog is opened. This tool is useful when you wish to make local changes to the corridor without editing the template library definition.

ODOT recommends making all changes to the template library and then using the **Synchronize with Library** command to apply the changes made in the library to the corridor model.

Copy Template Drop

This tool is used to copy a template drop to a new station range along the alignment by defining the beginning and ending station for the new template drop range.

Synchronize with Library

Select this tool to synchronize the local copy of the template that has been applied to the corridor with any changes that have been made to the template in the library .itl file.

Note: Synchronizing the template with the library will override and changes that may have been made to the corridor's template definition by using the **Edit Template Drop** command.

For consistency, ODOT recommends making changes to the template library and using the Synchronize with Library command to apply template changes to the corridor.

OpenRoads Software Version

This document was prepared using the following software version:

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Contacts

For any questions, suggestions, or problems with this document please contact the ODOT Office of CADD and Mapping Services by use of the following form on the ODOT website:

> https://odot.formstack.com/forms/cadd_servicerequest