OpenRoads Designer User Manual

U.S. Department of Transportation
Federal Highway Administration

Chapter 29

CONCEPTSTATION

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Chapter 29 ConceptStation

ConceptStation is a roadway modeling software. ConceptStation is intended for the conceptual design of a roadway for visualization and quantities take-off purposes. In ConceptStation, road models can be quickly drawn for feasibility and cost estimation purposes. For FLH projects, this software is primarily applicable to scoping efforts.

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29A – INTRODUCTION AND CAPABILITIES OF CONCEPTSTATION

ConceptStation is a roadway modeling software. This software is intended for the conceptual design of a roadway for feasibility, visualization, and cost analysis purposes. With this software, multiple road alignment layouts (alternatives) can be quickly modeled for feasibility and cost estimation.

For FLH projects, the ConceptStation software is primarily applicable to scoping efforts. Do NOT use ConceptStation for preliminary design (i.e., the 30% submittal).

The road modeling process for ConceptStation is similar to the OpenRoads Designer (ORD) software. In ConceptStation, an alignment/profile is drawn, and a Template (roadway cross section) is selected to create a 3D model of the roadway.

Overall, the modeling process for ConceptStation is simpler and more time efficient than ORD. However, ConceptStation contains fewer modeling tools and lacks functionality for advanced Template creation.

Modeling in ConceptStation is limited to roadways, intersections, bridges, roundabouts, and highway ramps. ConceptStation is NOT intended for modeling parking lots or irregularly-shaped features. The *Smart Line* tool can be used to draw the perimeter of a parking lot. However, it is not possible to grade or model end conditions on the *Smart Line* parking lot. For more information on the *Smart Line* tool, see *29K – Draw Smart Lines and Shapes*.

Aerial imagery and terrain elevation data are needed for modeling in ConceptStation. Aerial and terrain data can be automatically acquired and downloaded through ConceptStation servers. Alternatively, aerial and terrain data can be obtained from different a source and manually imported into ConceptStation.

Alignments, Profiles, Corridors, and Templates created in ConceptStation can be exported to ORD to further progress the design. See *29M – Export ConceptStation Elements to ORD*. Similarly, the ConceptStation file can be directly exported to LumenRT to create graphical renderings of the ConceptStation design. See *29C - The Backstage Menu*.

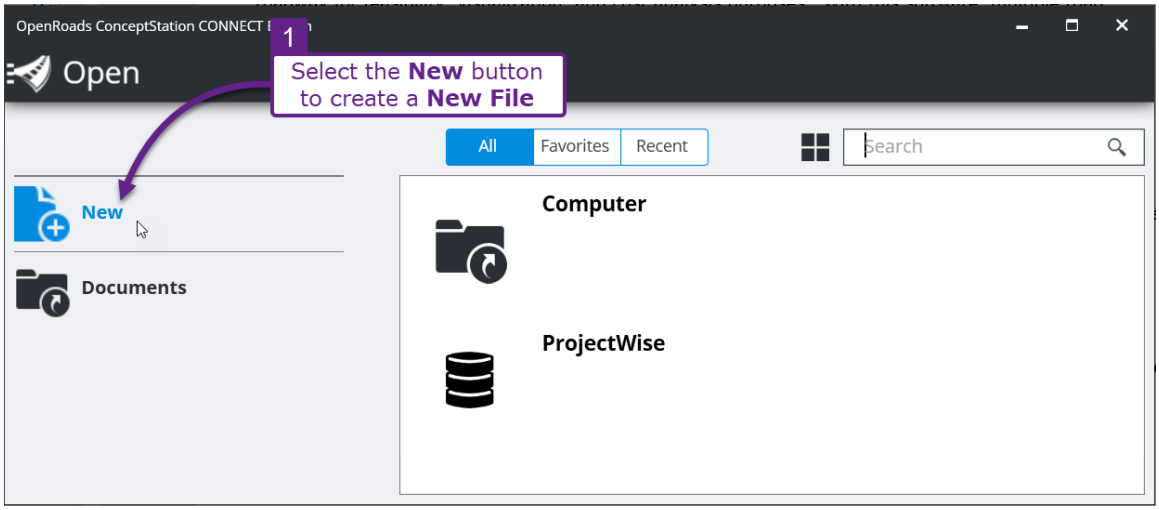
Also, linework and modeling elements created in ORD can be imported into ConceptStation. However, the elements from the ORD File are NOT editable. An imported ORD File behaves as a visual reference. ORD File elements can be traced over with ConceptStation elements, but ORD File Elements are NOT interactable. For more information, see *29B.2 Import ORD Elements into ConceptStation*.

29B – CREATE A NEW FILE AND ACQUIRE AERIAL/TERRAIN DATA

There are four important processes performed in the creation of a new ConceptStation File:

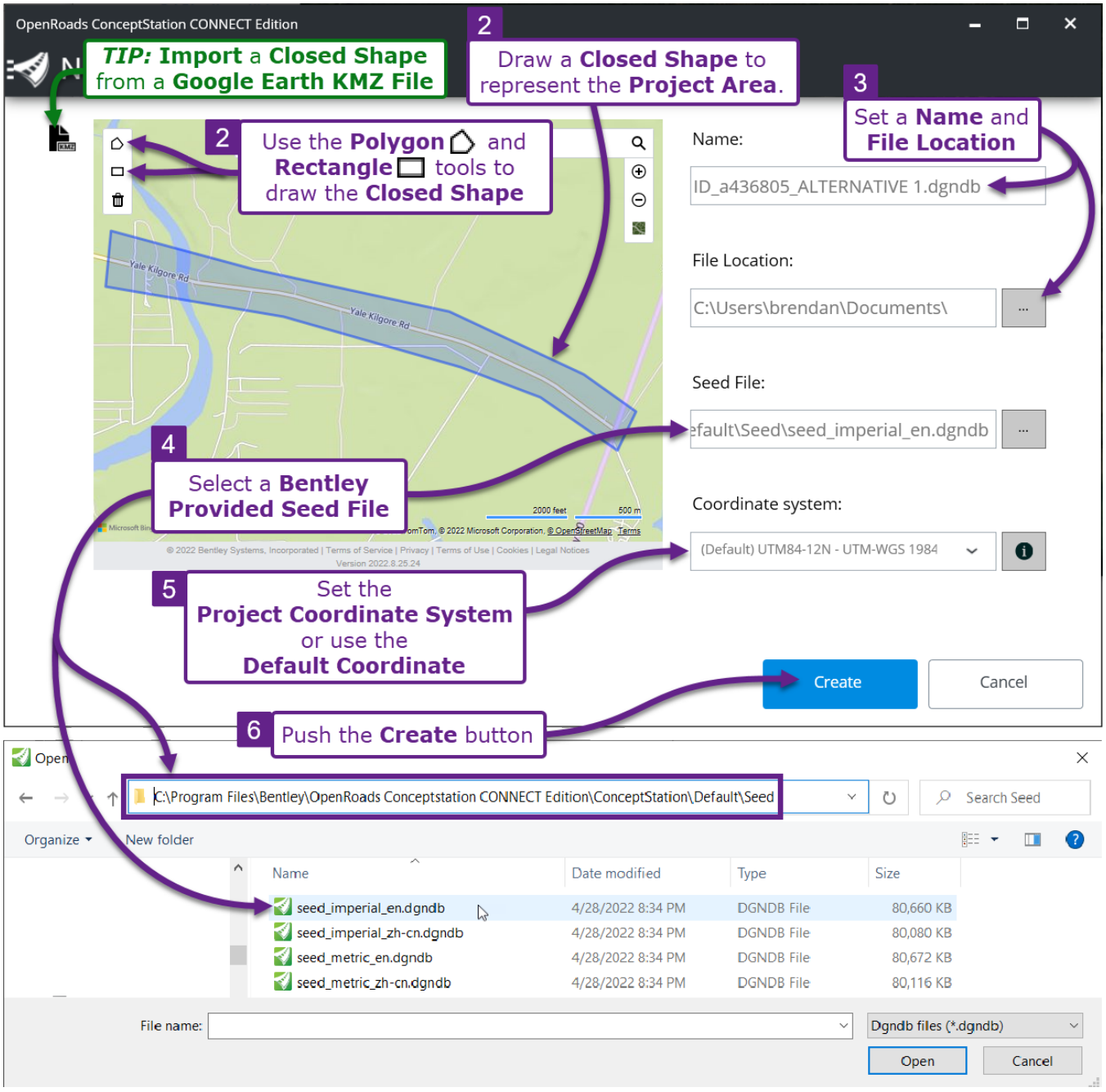
- Draw a **Closed Shape** on the location map to represent the Project Area. In conjunction with the **Coordinate System**, the Closed Shape determines the geographical position for the new ConceptStation file. Also, the Closed Shape is used to automatically acquire aerial and terrain data from the **GeoCoordination Services**.
- Select a **Seed File**. The Seed File determines the units (i.e., Feet or Meters) used for the new file. The Seed File also contains resources for ConceptStation modeling, such as Template and Material Libraries. ***NOTE:*** The FLH WorkSpace does NOT contain ConceptStation Seed Files. Default Seed Files provided by Bentley should be used. The file location for default Seed Files is shown in step 4.
- Select the **Project Coordinate System** or use the **Default Coordinate System**. The Default Coordinate System is acceptable if the GeoCoordination Services will be used to automatically acquire aerial and terrain data. If aerial and terrain data are to be manually imported, than the Project Coordinate System must match the Coordinate System used for the terrain file.
- In step 6, use the **GeoCoordination Services** to automatically acquire and import aerial and terrain data into ConceptStation. The GeoCoordination Services should be used if the project has NOT yet been surveyed. Alternatively, the **Import from Local Files** option can be used to manually import aerial and terrain files. Common terrain file formats can be imported, such as .tin, .xml, .dtm, and .dem. If the project has been surveyed and processed, then the Existing Ground Terrain Model can be exported from ORD as a .tin or .xml using the process shown in *23I – Existing and Proposed Surface in LandXML (.XML) Format*. The **Import from Local Files** process is demonstrated in *29B.1 Import Terrain and Aerial Data from Local Files*.

1	Open the ConceptStation software. Select **New** to create a new file.

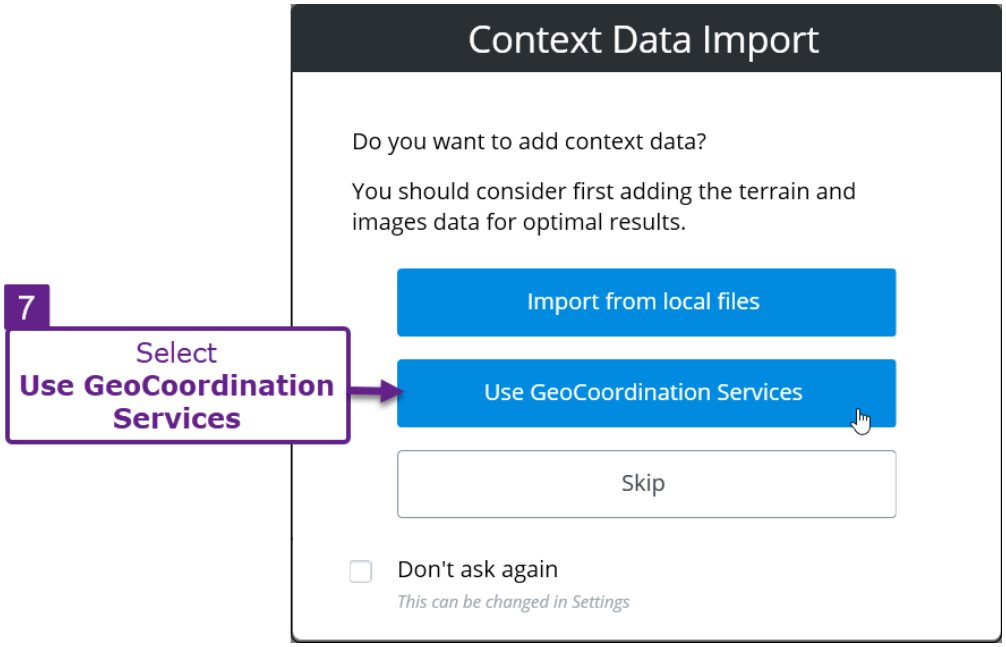


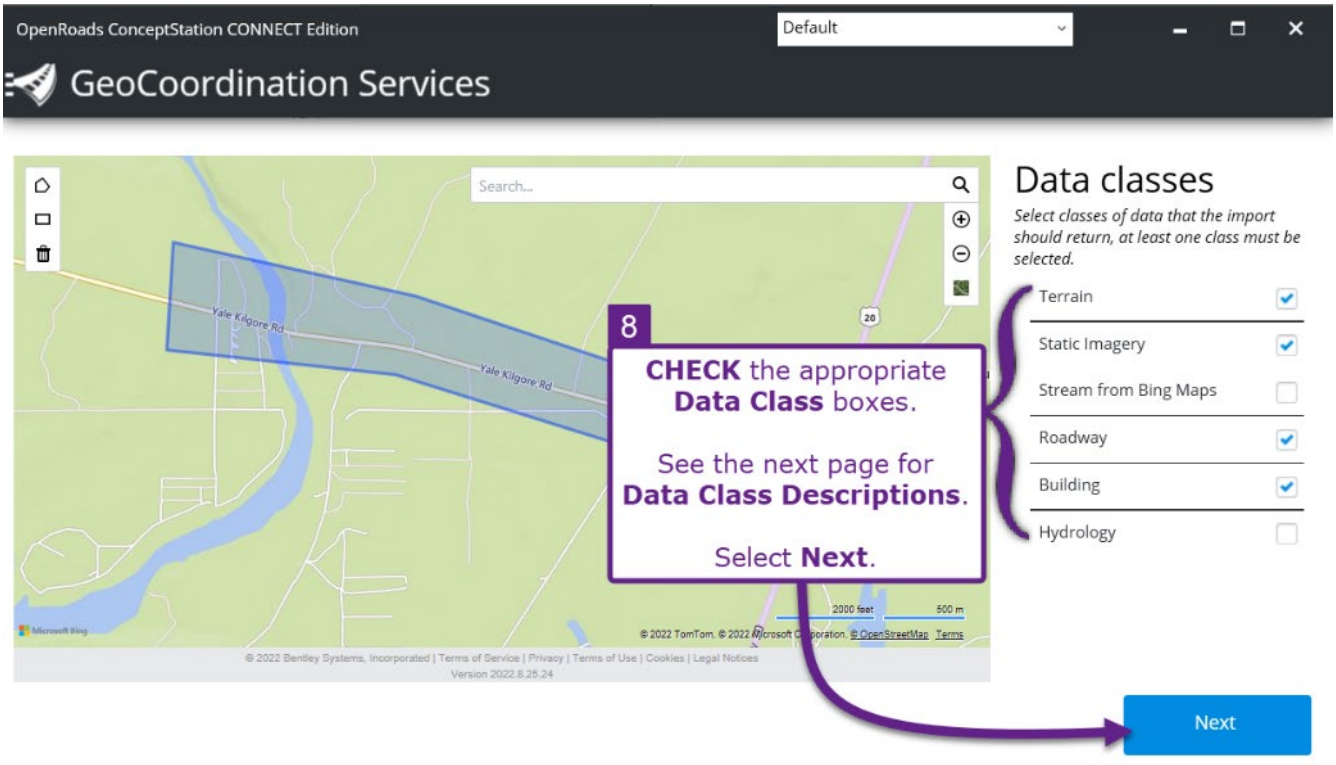
2	In the map, locate the project area and draw a **Closed Shape** around it. The Closed Shape should be slightly overestimated to provide enough space for the alignment and road corridor model. ***TIP:*** A Closed Shape can be drawn in Google Earth and saved as a KMZ File. Use the  button to import the KMZ and automatically-generate the Closed Shape for the project area.

3	Set a **Name** and **File Location** for the new ConceptStation File.
4	Select a **Bentley Provided Seed File**. The FLH WorkSpace does NOT contain ConceptStation Seed Files, so use a default Bentley Seed File. Select the "seed_imperial_en.dgndb" file from following location: C:\Program Files\Bentley\OpenRoads Conceptstation CONNECT Edition\ConceptStation\Default\Seed ***WARNING:*** If an imperial Seed File is NOT manually set, then the ConceptStation file will initially use metric units. However, the units can be changed to imperial in the **Settings** menu found through the Backstage Menu. See *29C.4 The Backstage Menu*.
5	Set the **Project Coordinate System** or use the **Default Coordinate System**. See the discussion on the previous page.

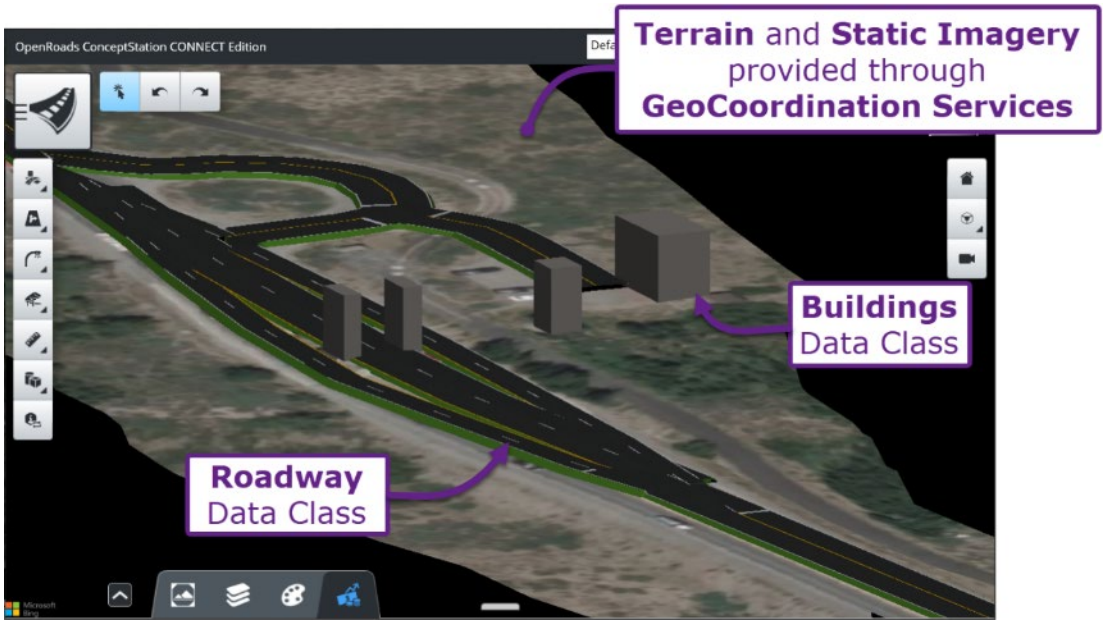


7	After the Create button is pushed, the **Context Data Import** menu is shown. The **Use GeoCoordination Services** option is used to automatically download aerial and terrain data from a Bentley server. ***NOTE:*** The quality and availability of data will vary based on the project location. Some locations may NOT have terrain or aerial data available. The **Import from Local Files** option is used to import aerial and terrain data acquired from a different source. The Import from Local Files process is shown in *29B.1 Import Terrain and Aerial Data from Local Files*.
8	Select which **Data Class** should be imported by the GeoCoordination Services. The available Data Classes are described on the next page.

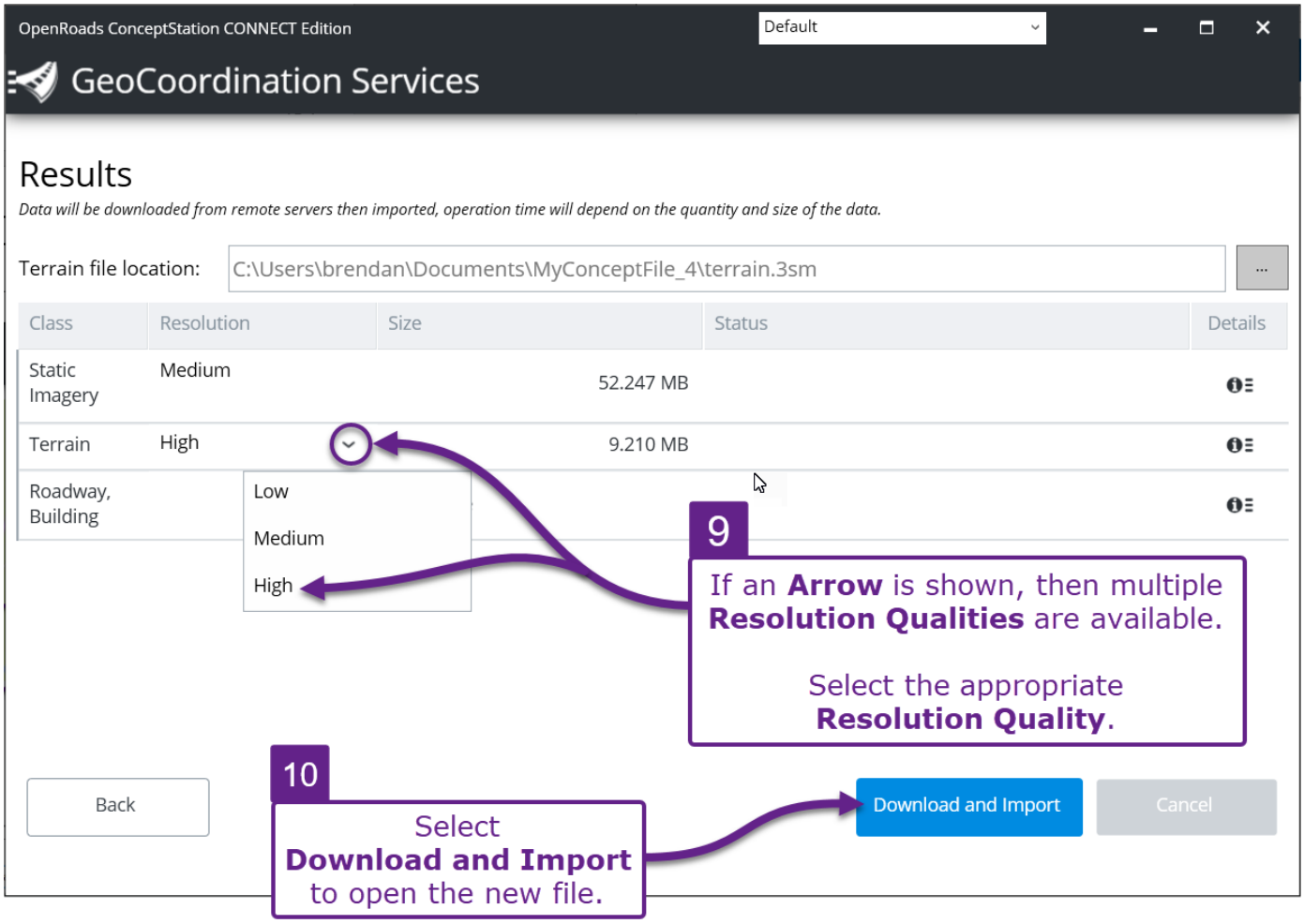




GeoCoordination Services Data Classes Options	
Data Class:	**Description:**
Terrain	If CHECKED, then terrain data is acquired from the GeoCoordination Services and filled in to the Closed Shape Area.
Static Imagery	If CHECKED, then aerial imagery data is acquired from the GeoCoordination Services and filled in to the Closed Shape Area. ***NOTE:*** Aerials can be provided through either "Static Imagery" or "Stream from Bing Maps". However, both options CANNOT be used at the same time.
Stream from Bing Maps	If CHECKED, then aerial imagery is provided from Bing Maps and overlaid onto the Terrain. ***BEST PRACTICE:*** When available, use Static Imagery data for aerial imagery. If high-quality Static Imagery is NOT available, then use the "Stream from Bing Maps" option.
Roadway	If CHECKED, then existing roadways within the Closed Shape area are automatically modeled. An Alignment and Corridor is automatically created for each existing road. These existing Alignments and Corridors are NOT editable. An example of the Roadway data class is shown below. ***WARNING:*** The automatically-generated roadway Corridors are generalized with best fit Templates. Commonly, the automatically-generated Corridors do NOT accurately represent the existing roadway geometry. Similarly, the roadway Corridors are commonly placed a few feet above existing grade and appear "floating". In general, the resulting existing roadway corridors are inaccurate.
Building	If CHECKED, then existing buildings, homes, and structures are automatically modeled. A generic, rectangular block is placed at each building location. An example of the Building data class is shown below.
Hydrology	If CHECKED, then existing hydraulic features, such as bridges and culverts are analyzed and automatically modeled in the ConceptStation File. ***WARNING:*** Commonly, the automatically-generated hydraulic features do NOT accurately represent the existing hydraulic geometry.



9	In the GeoCoordination Services menu, the available Static Imagery and Terrain are shown. If an arrow is shown in the **Resolution** column, then there are multiply quality levels available for download.
10	Press the **Download and Import** button to acquire the data and open the new ConceptStation file. ***WARNING:*** If the download is reported as failure, it may be attributed to network proxy and firewall settings set for your agency. Contact IT Personnel for more information.



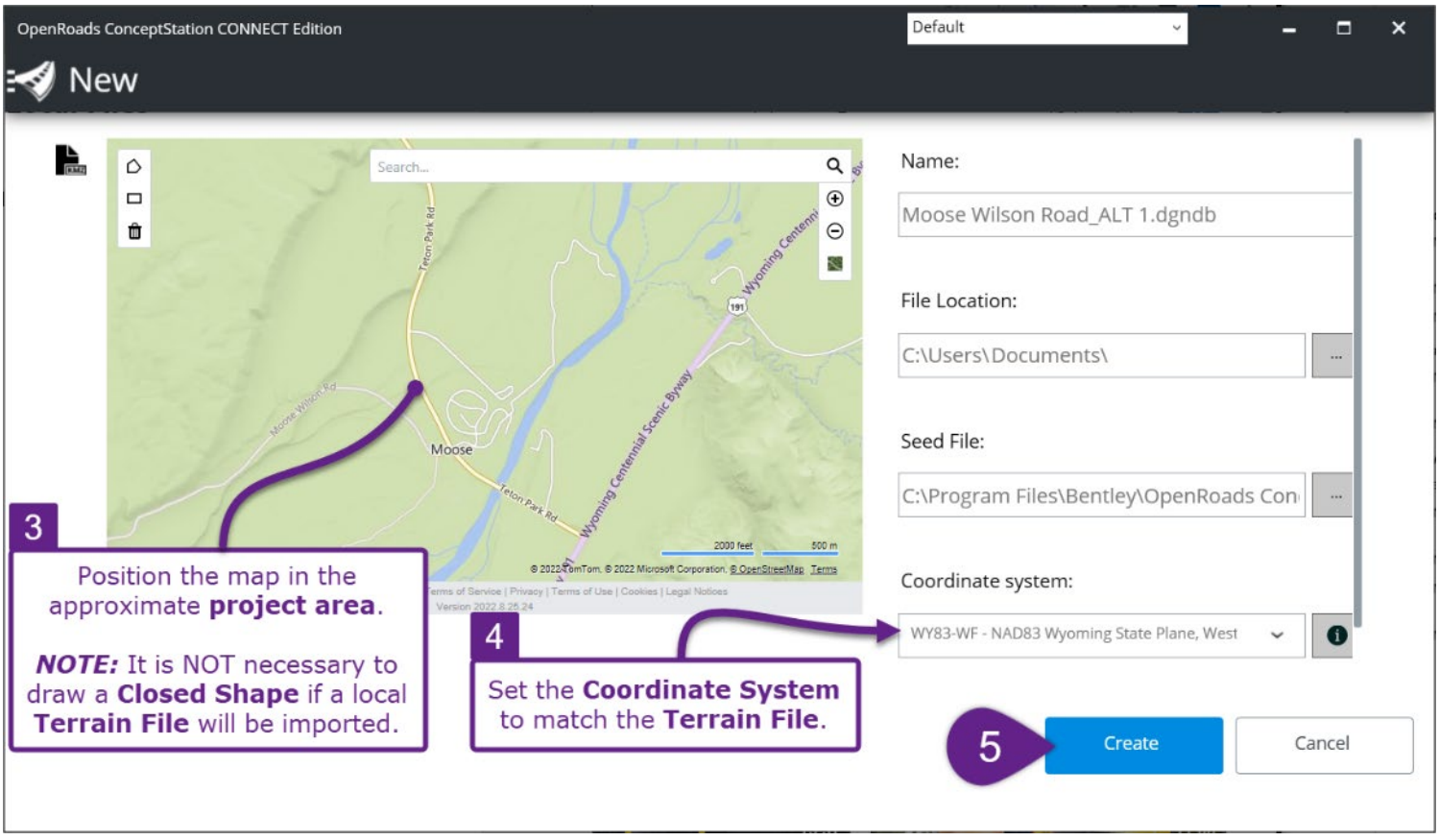
29B.1 Import Terrain and Aerial Data from Local Files

In creation of a new ConceptStation File, terrain and aerial data can be manually imported.

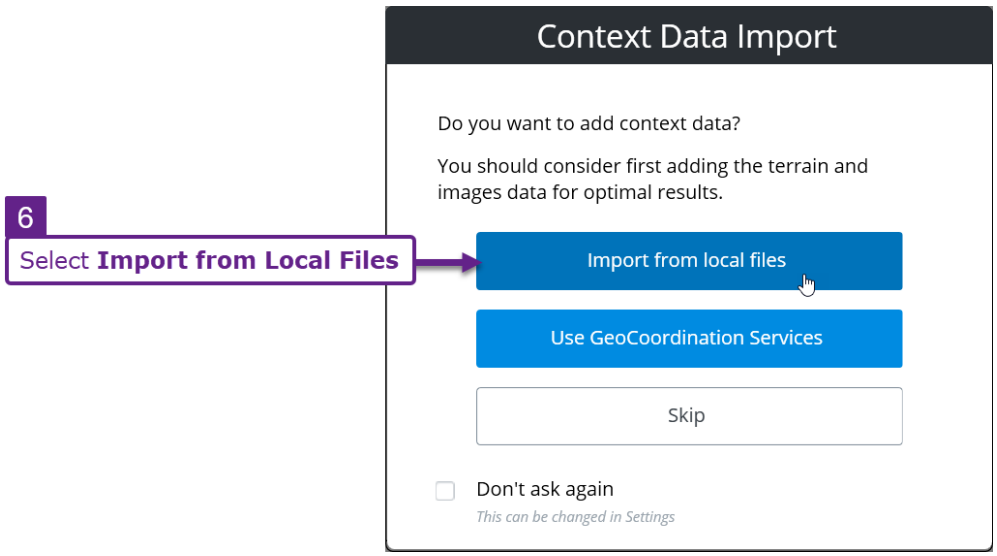
NOTE: It is NOT necessary to import an aerial file when importing a terrain file. If an aerial file is NOT imported, then a Bing Map is automatically draped onto the surface of the imported terrain file. If an aerial is to be imported, then aerial file must be georeferenced.

TIP: If the Existing Ground Terrain Model and Survey ORD File has been created for a project, then the Existing Ground Terrain Model can be exported from ORD as a .tin or .xml file using the process shown in *23I – Existing and Proposed Surface in LandXML (.XML) Format*.

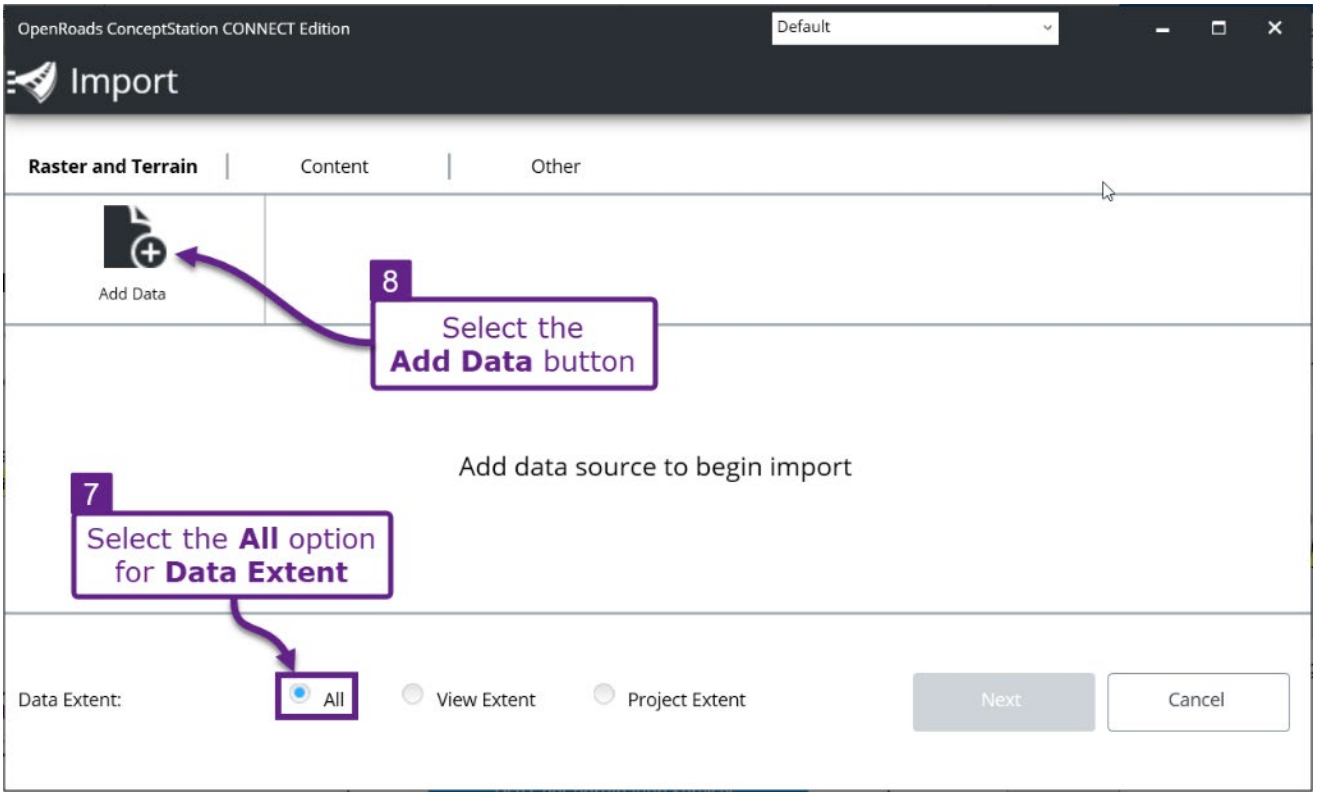
1	Create a new ConceptStation File. See steps 1 in *29B – Create a New File and Acquire Aerial/Terrain Data*.
2	Set the **Name**, **File Location**, and **Seed File** for the new ConceptStation File.
3	When manually importing a terrain file, it is NOT necessary to draw a **Closed Shape** to represent the project area. However, the map should be positioned to the approximate location of the project. In step 7, the boundary of the terrain file is configured to determine the project area.
4	Set the Project Coordinate System. ***IMPORTANT:*** The **Coordinate System** must match the Coordinate System of the terrain file. ***WARNING:*** If there is a mismatch between the two Coordinate Systems, then the terrain file will NOT be imported.
5	Select the **Create** button.



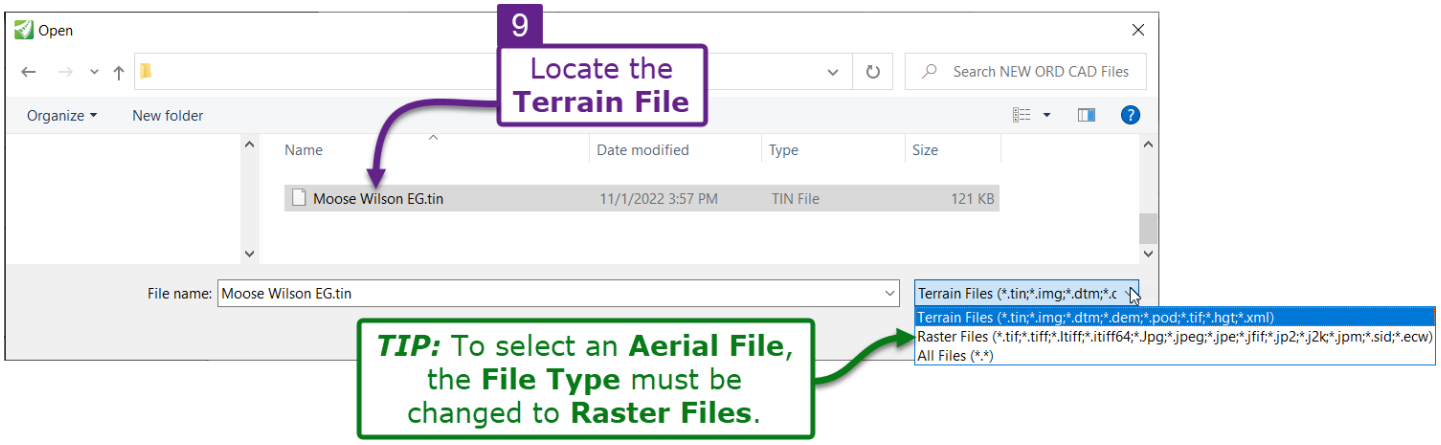
6	Select **Import from Local Files** in the Context Data Import menu.



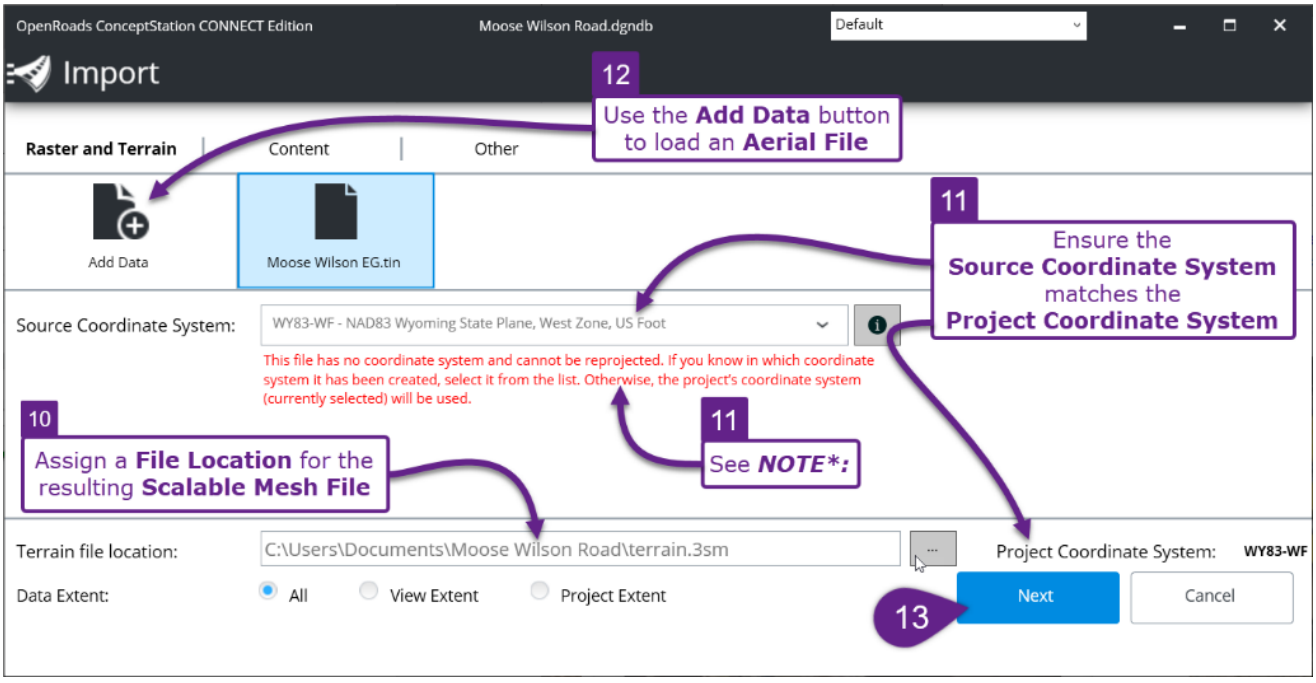
7	Set the **Data Extent** option to **All**. When this option is used, the entire terrain file is imported. If set to **View Extent**, then the map position set in step 3 determines the portion of the terrain file to be imported. Portions of the terrain file that are outside of the map extents are NOT imported. To use the **Project Extent** option, a Closed Shape must be drawn in step 3. Only the portion of the terrain file within the Closed Shape boundary is imported.
8	Push the **Add Data** button to load the terrain file.



9	Locate the terrain file. ***TIP:*** To select an aerial file, the **File Type** must be changed to Raster Files.



10	Assign a file location for the Scalable Mesh to be created. ***NOTE:*** The terrain file selected in step 9 is converted into a Scalable Mesh file type (.3sm) for use in ConceptStation.
11	Ensure the **Source Coordinate System** matches the **Project Coordinate System**. ***NOTE*:*** Commonly, a terrain file will NOT specify the (Source) Coordinate System in its data, which triggers the warning message shown in red text. If necessary, the Source Coordinate System (terrain file) can be reprojected into the Project Coordinate System (set in step 3). However, if the Source Coordinate System is set incorrectly, then the reprojection will NOT occur and no data will be imported.
12	Push the **Add Data** button to load the aerial file. ***NOTE:*** It is NOT necessary to load an aerial file. If an aerial file is NOT loaded, then a Bing Map will be automatically projected onto the terrain surface.
13	Push the **Next** button to process the terrain and aerial files.



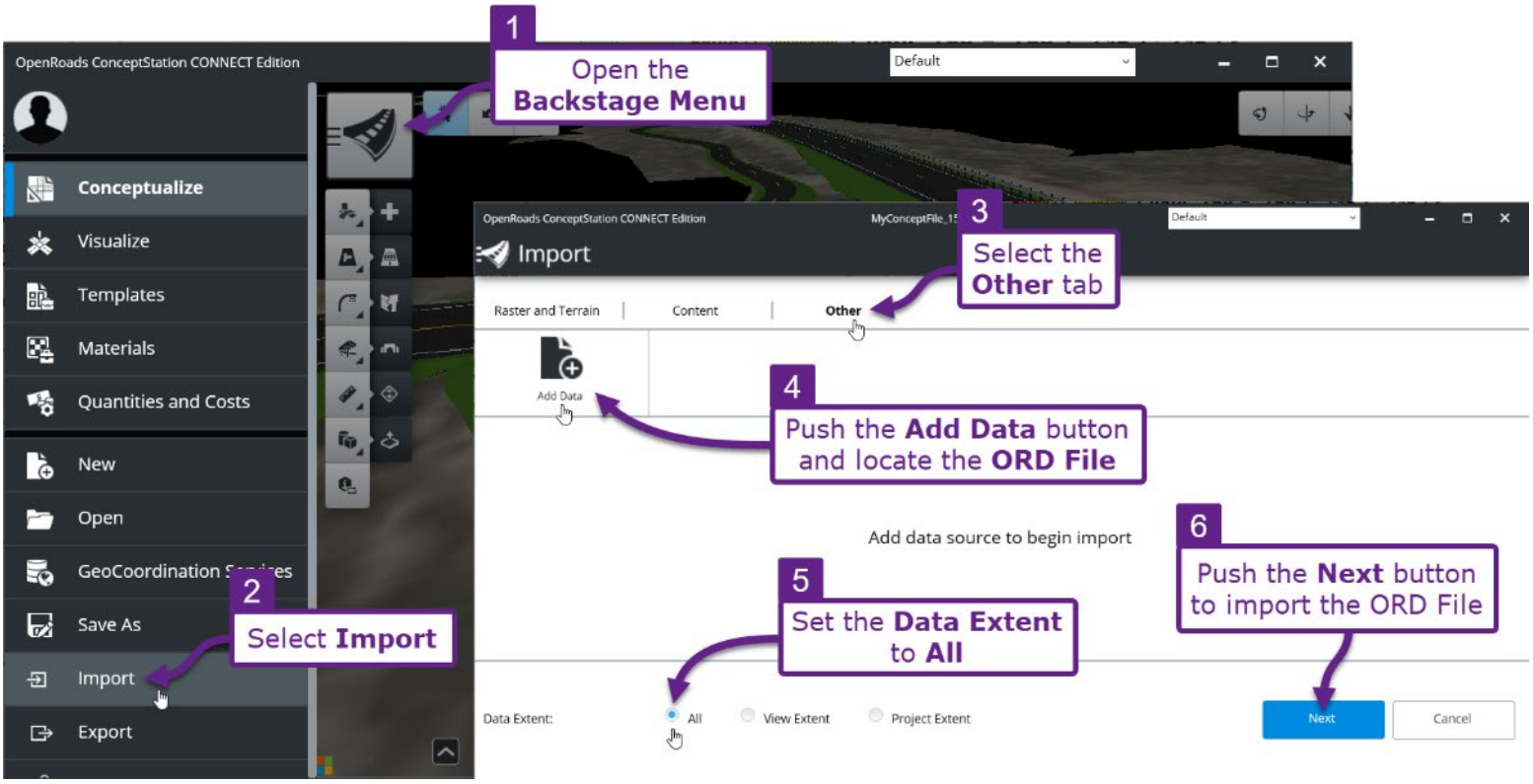
29B.2 Import ORD Elements into ConceptStation.

Any ORD File or MicroStation File with a .dgn file extension can be import into ConceptStation. However, the imported ORD File elements are NOT interactable. The ORD File behaves like a reference in ConceptStation.

Some situations where importing an ORD File may be useful include:

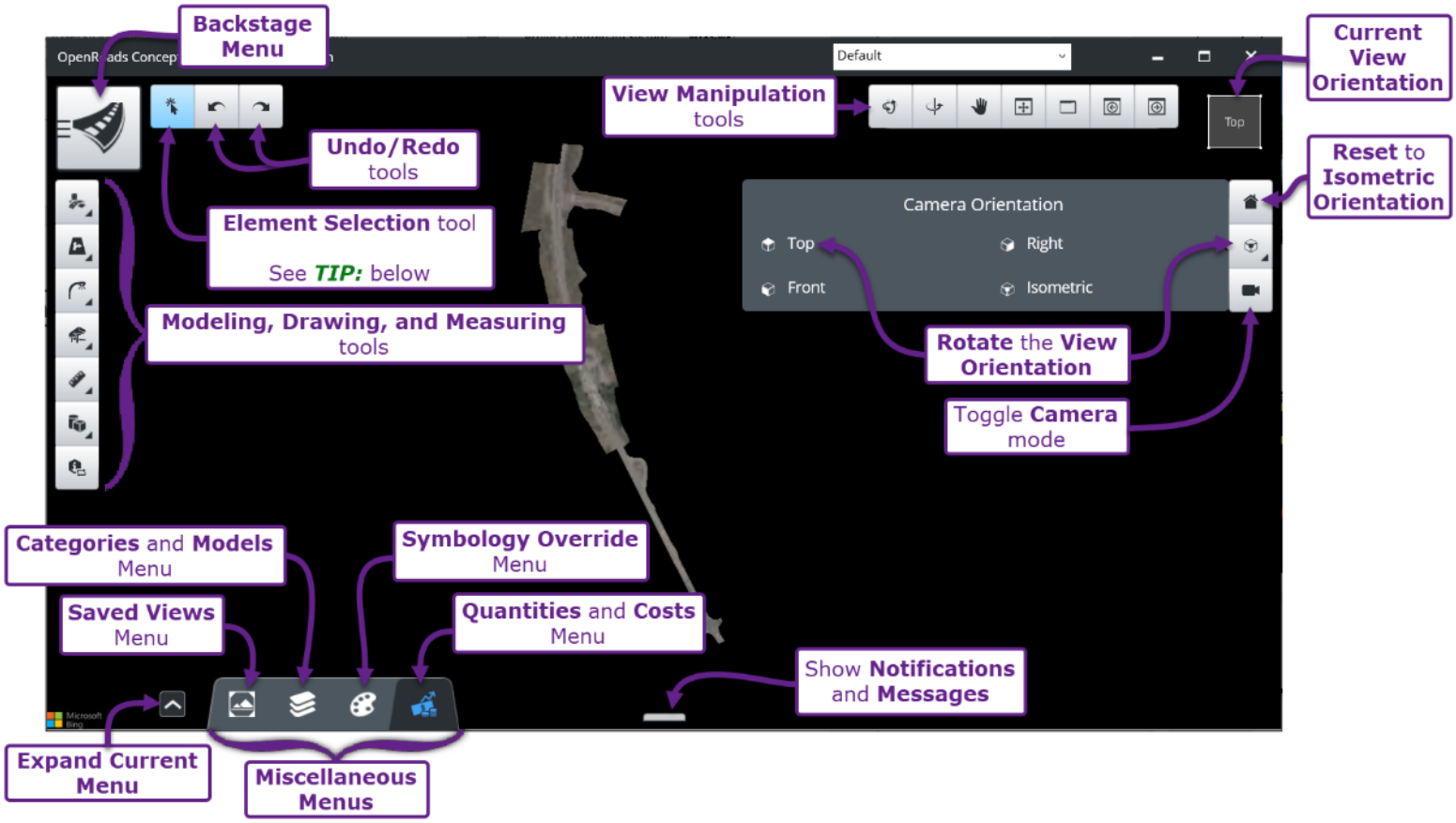
- Import the Survey ORD File to display utilities and other existing features in the ConceptStation File.
- Draw Alignments, Profiles, and other useful shapes in ORD. Import the ORD File into ConceptStation to trace the ORD Elements.

NOTE: If the imported ORD File contains a *2D Design Model*, the 2D Elements will be shown much higher than the ConceptStation terrain. The 2D Elements are NOT draped onto the ConceptStation terrain. 3D Elements from the *3D Design Model* should be placed on or near the ConceptStation terrain.



29C – OVERVIEW OF THE CONCEPTSTATION INTERFACE

The basic interface for the ConceptStation software is shown below.



Most tools in ConceptStation are found in the following locations:

- **View Manipulation Tools**: View Manipulation tools are shown at the top-right corner or the interface. View Manipulation tools are used to orbit, rotate, zoom, and pan the view window.
- **Modeling, Drawing, and Measuring Tools:** Modeling, Drawing, and Measuring tools are shown at the left-side of the interface. These tools are used for modeling roadways, bridges, intersections, and placing objects.
- **Miscellaneous Menus:** The Miscellaneous Menus are found at the bottom of the interface. For more information on each menu, see *29C.3 Miscellaneous Menus*.

TIP: The **Element Selection** button must be active to select an element. This tool can also be used to exit out of a command or clear the information boxes shown from the previously-used tool.

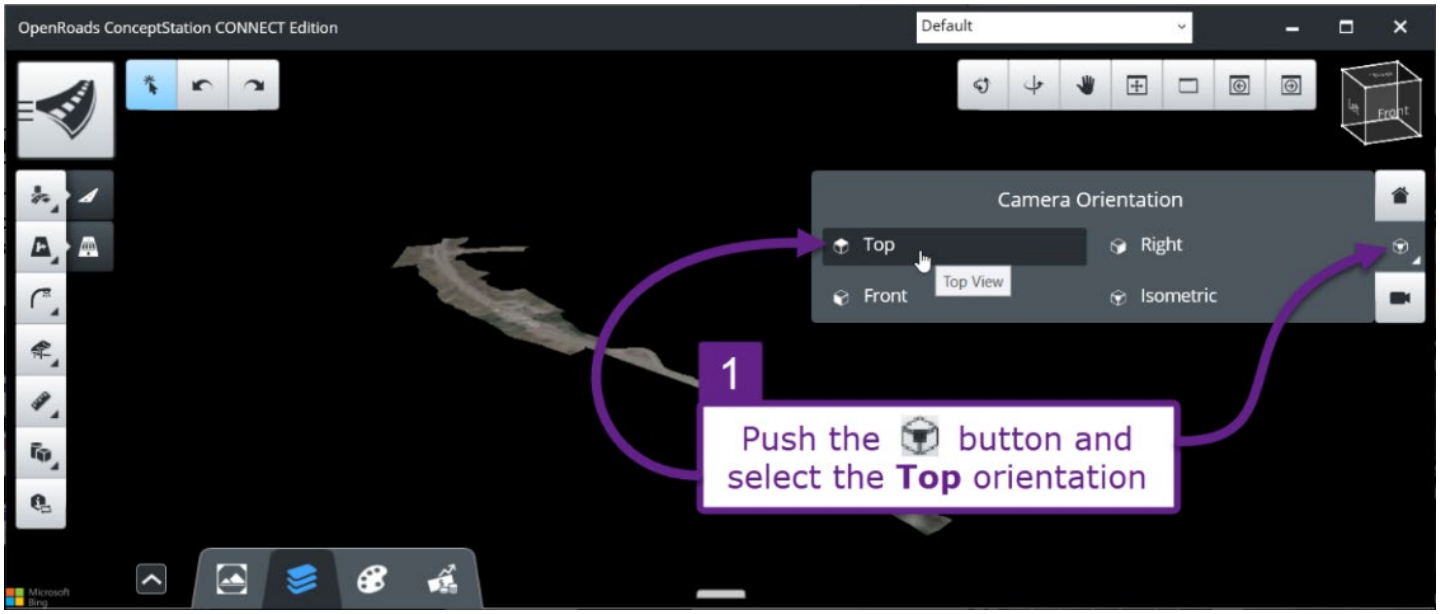
29C.1 View Manipulation Tools

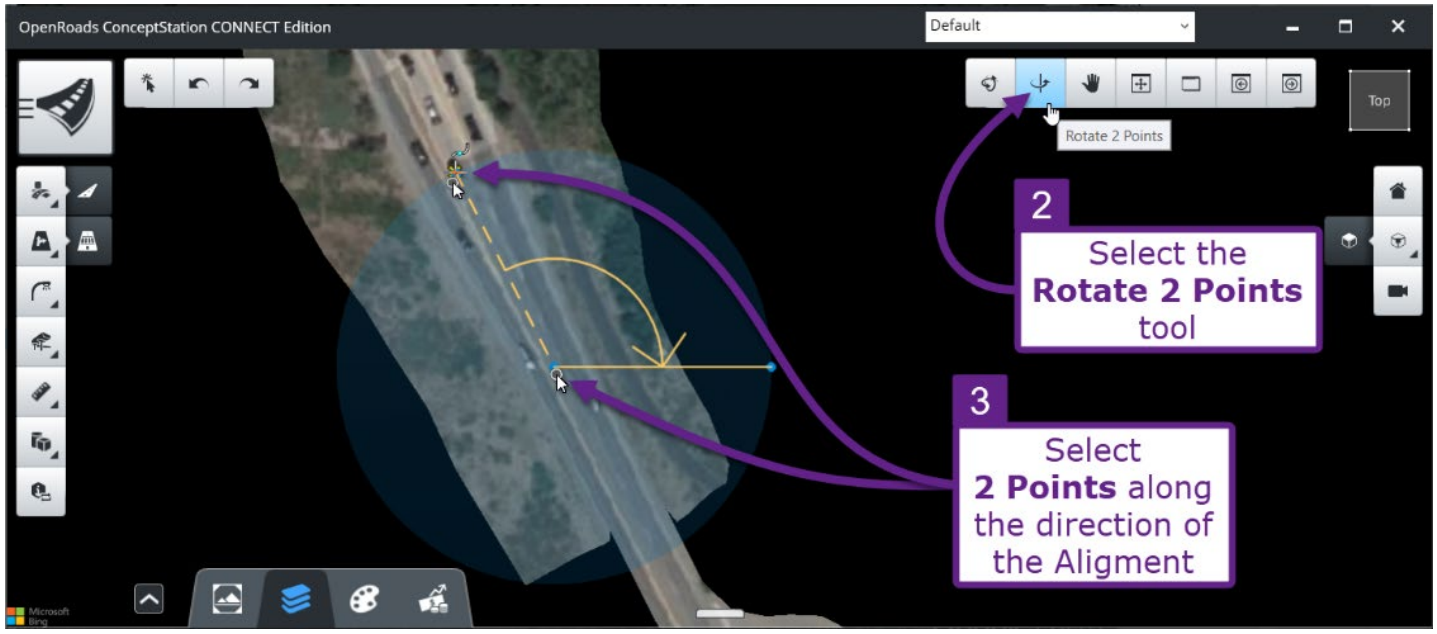
Navigating, rotating, and orbiting in ConceptStation is like manipulating the view perspective of a *3D Design Mode* in ORD.

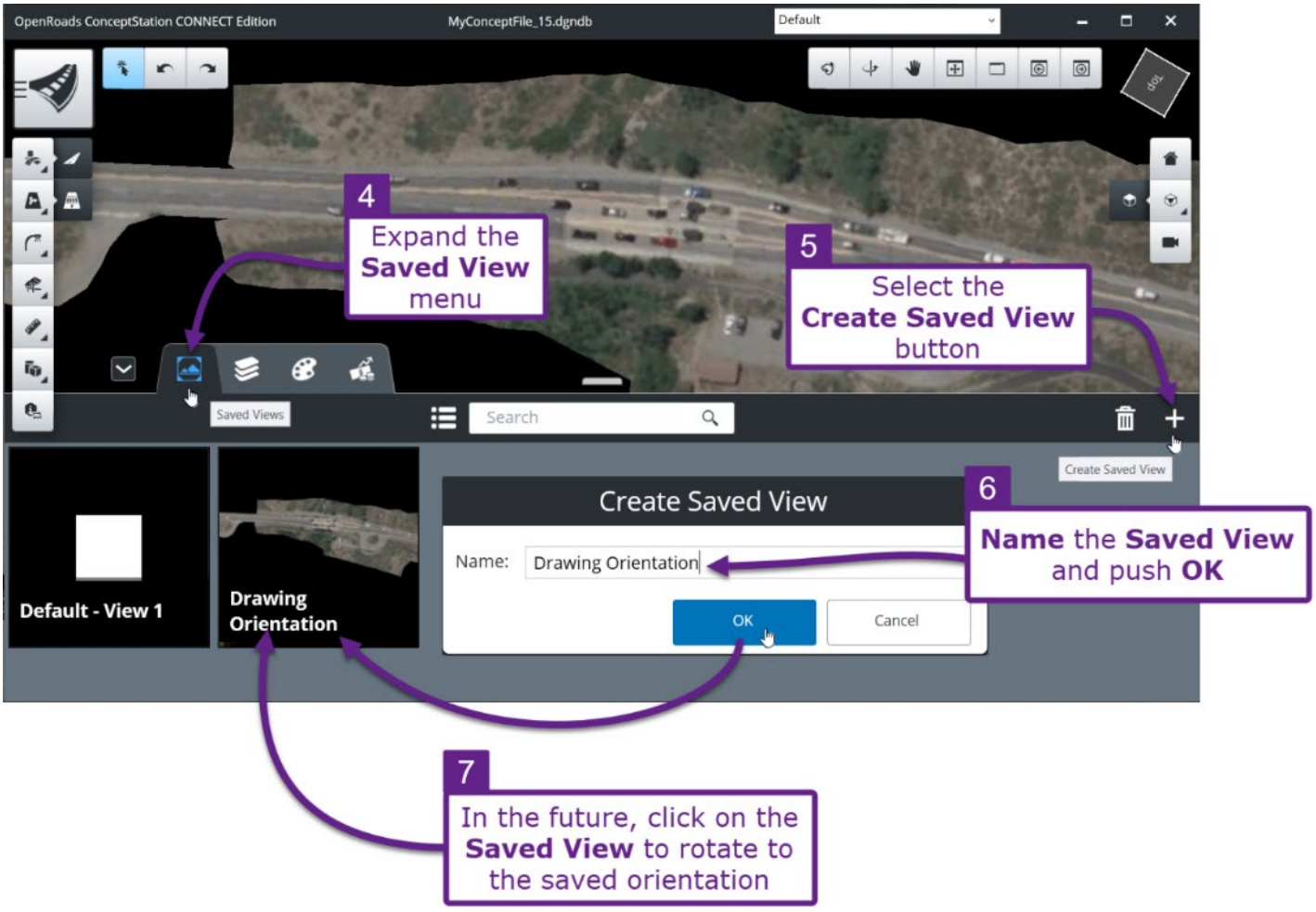
For example, mouse operations used in ORD apply in ConceptStation. Use the Mouse Scroll Wheel to zoom in/out. Hold down the Mouse Scroll Wheel to pan around the view. Hold down both the SHIFT Key and the Mouse Scroll Wheel to quickly orbit the view.

BEST PRACTICE: When creating alignments and element in ConceptStation it is recommended that drawing is performed from a **Top** orientation.

The procedure below demonstrates how to set the Top orientation, rotate the view (while remaining in the Top orientation), and save the view orientation for future drawing operation.

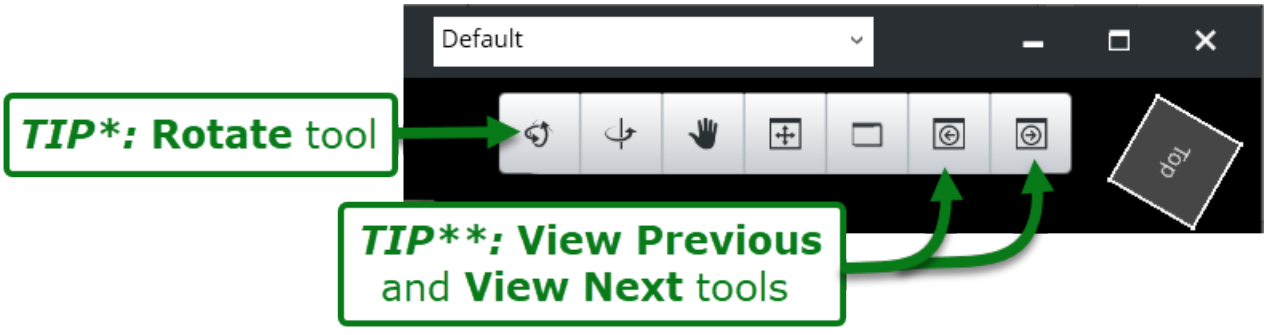






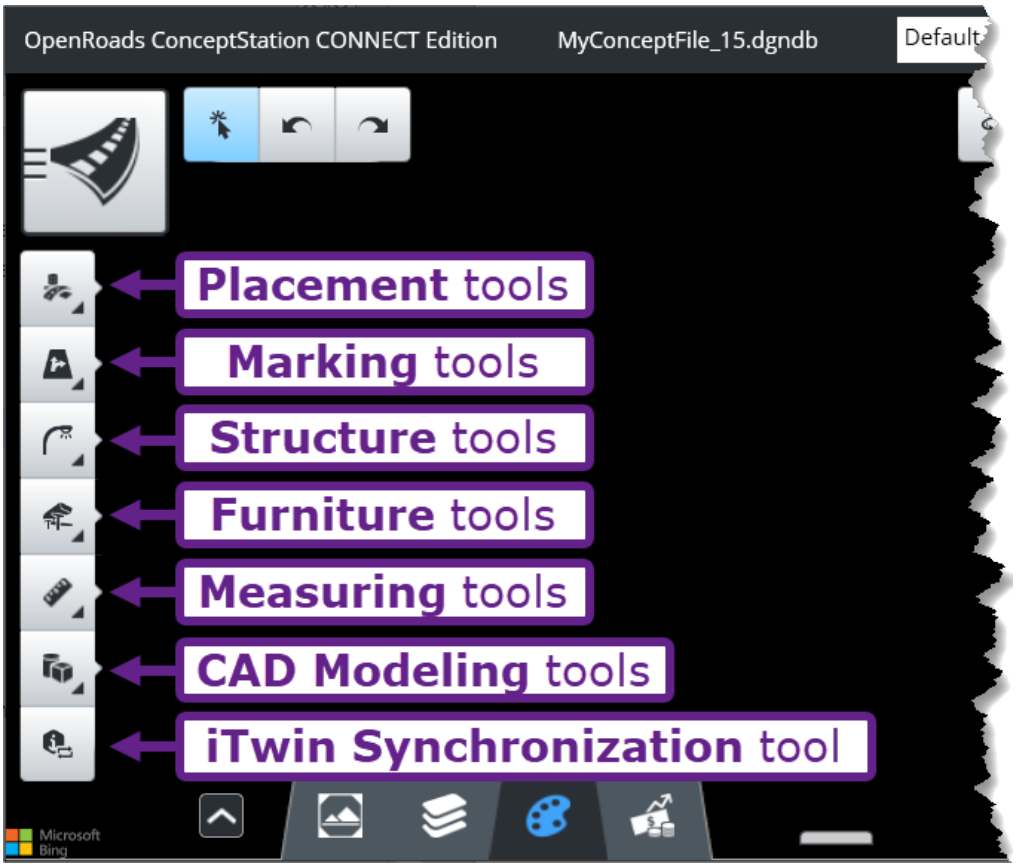
TIP*: Use the **Rotate** tool to orbit the view to a custom isometric orientation. Operation of this tool is identical to the *Rotate View* tool demonstrated in *1A.3.b.i Move Around and Orbit in the 3D Design Model*.

TIP**: Use the **View Previous** to undo the last, zoom, pan, or rotate operation. Use the **View Next** tools to redo the last View Previous operation.



29C.2 Modeling, Drawing, and Measuring tools

Modeling, Drawing, and Measuring tools are shown on the left-side of the ConceptStation interface.



Placement tools: Contains tools for roadway and intersection modeling. Placement tools are demonstrated in *29E – Create the Road Alignment, Profile, and Corridor* and *29F – Create an Intersection*.

Marking tools: Contains tools for editing and placing pavement markings. Marking tools are demonstrated in *29G – Create and Modify Pavement Markings*.

Furniture tools: In ConceptStation, the term "furniture" refers to roadside objects. Examples of "furniture" that can be placed in ConceptStation include signs, guardrails, fences, benches, fire hydrants, street lights, and traffic signals. Furniture tools are discussed in *29J – Place Furniture: Guardrails, Signs, Fences, and Objects*.

Structure tools: Contains tools for creating bridges, culverts, and tunnels. Structure tools are demonstrated in *29H – Create a Bridge* and *29J – Create a Culvert*.

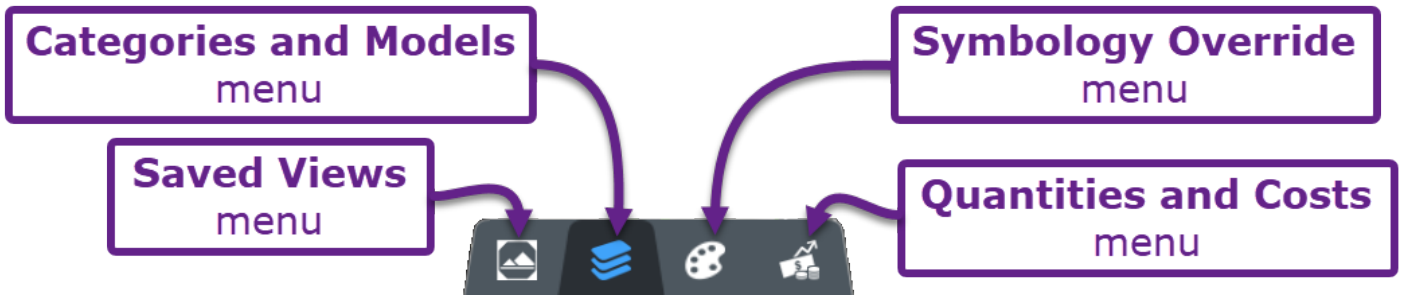
Measure tools: Contains various tools for measuring. These tools can be used to measure a length, report the coordinates and elevation at a point location, or measuring an area. The *Bridge Clearance* tool can be used to measure the clearance between the bottom of a bridge deck and an underpass road.

CAD Modeling tools: Contains tools for free-hand drawing generic lines (Smart Lines) and shapes. Closed Shape elements can be assigned a material for quantities calculations. Also, the *Extrude Smart Line* tool can be used to extrude a line or shape into a 3D element. CAD Modeling tools are discussed in *29K – Draw Smart Lines and Shapes*.

iTwin Synchronization tool: This tool is used to synchronize the ConceptStation File with the iTwin cloud platform. ***NOTE:*** FLH does NOT use the iTwin platform.

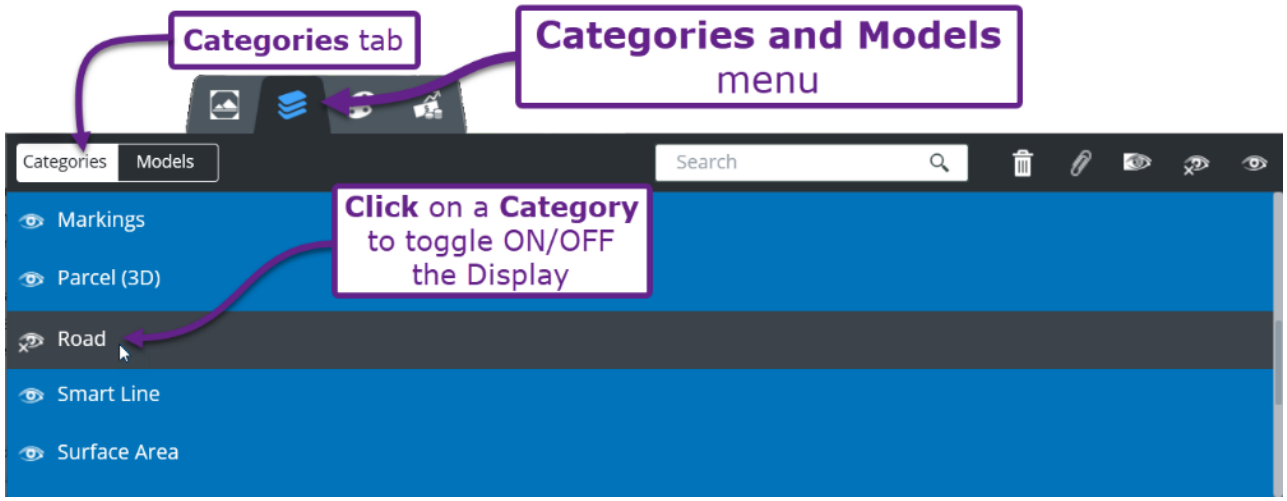
29C.3 Miscellaneous Menus

There are four menus shown at the bottom of the ConceptStation interface:

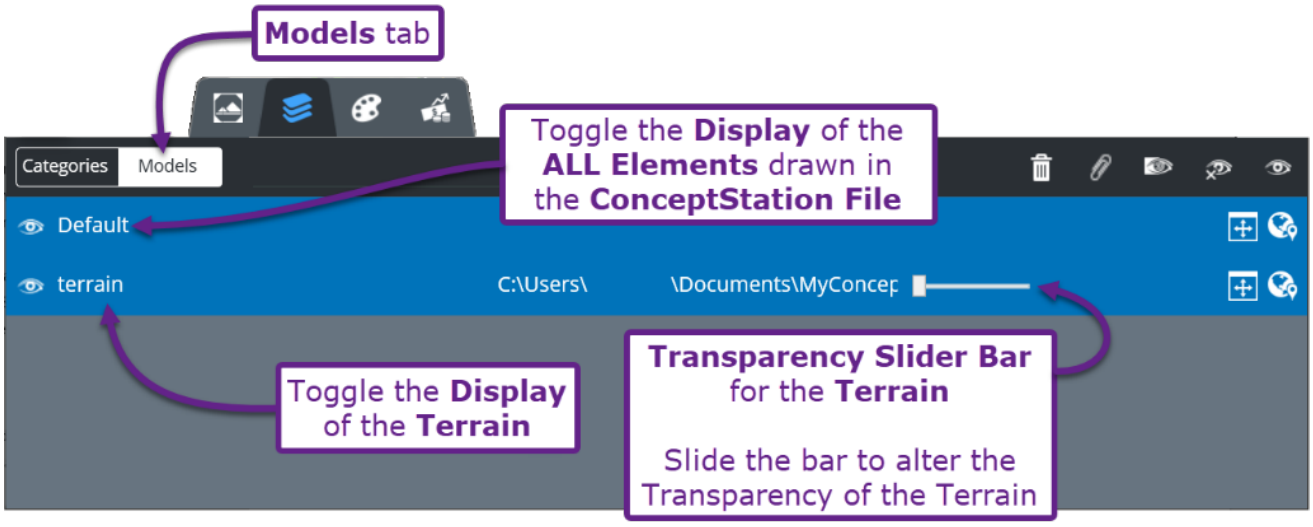


Saved View Menu: Used to create and activate Saved Views. Creation of a Saved View is demonstrated in *29C.1 View Manipulation Tools*.

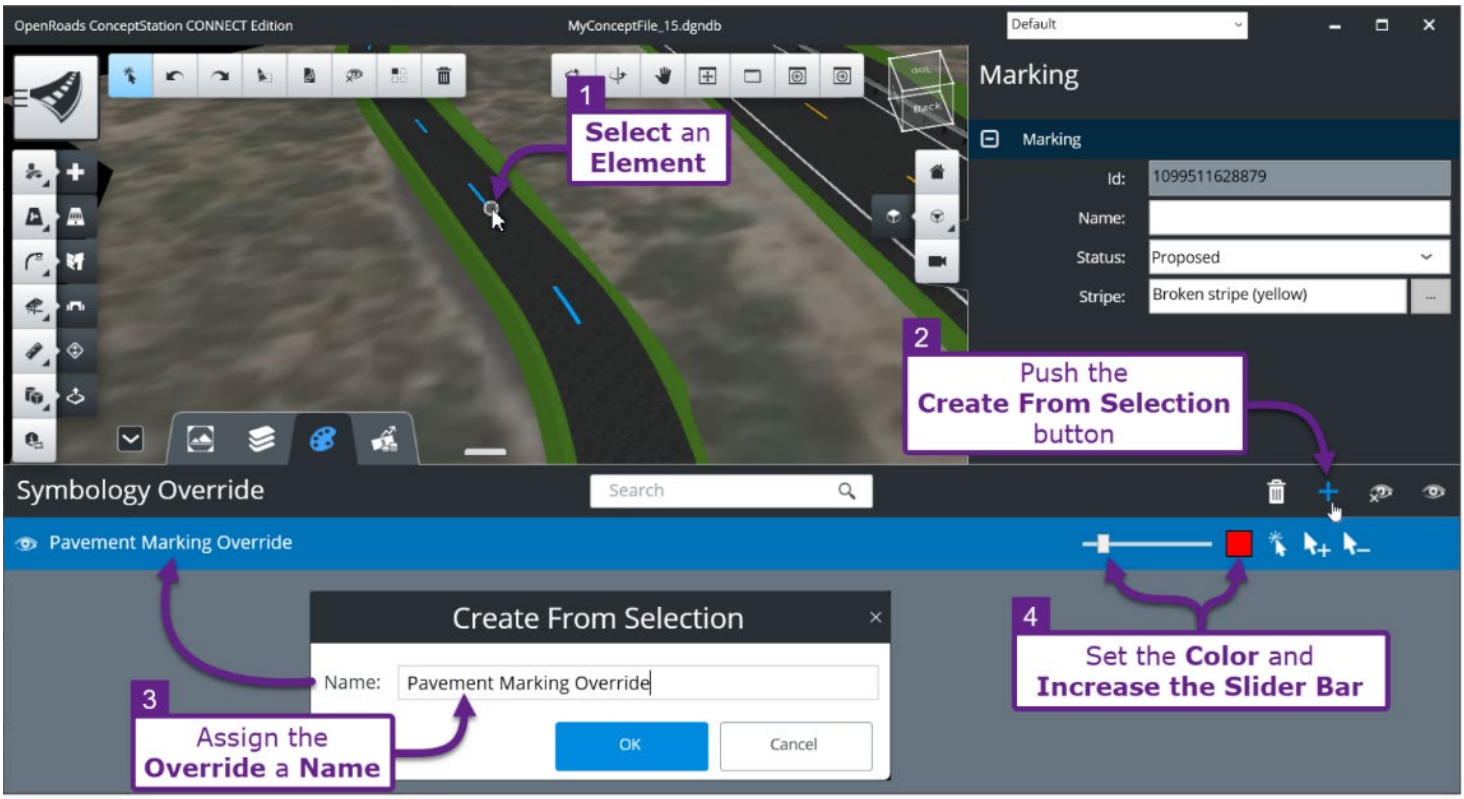
Categories and Models: This menu is separated into "Categories" and "Models". This menu operates similarly to the Level Display menu used in ORD. In ConceptStation, elements are assigned a "Category" type, instead of a Level. The display of ConceptStation Elements can be toggled ON/OFF by locating the corresponding Category.

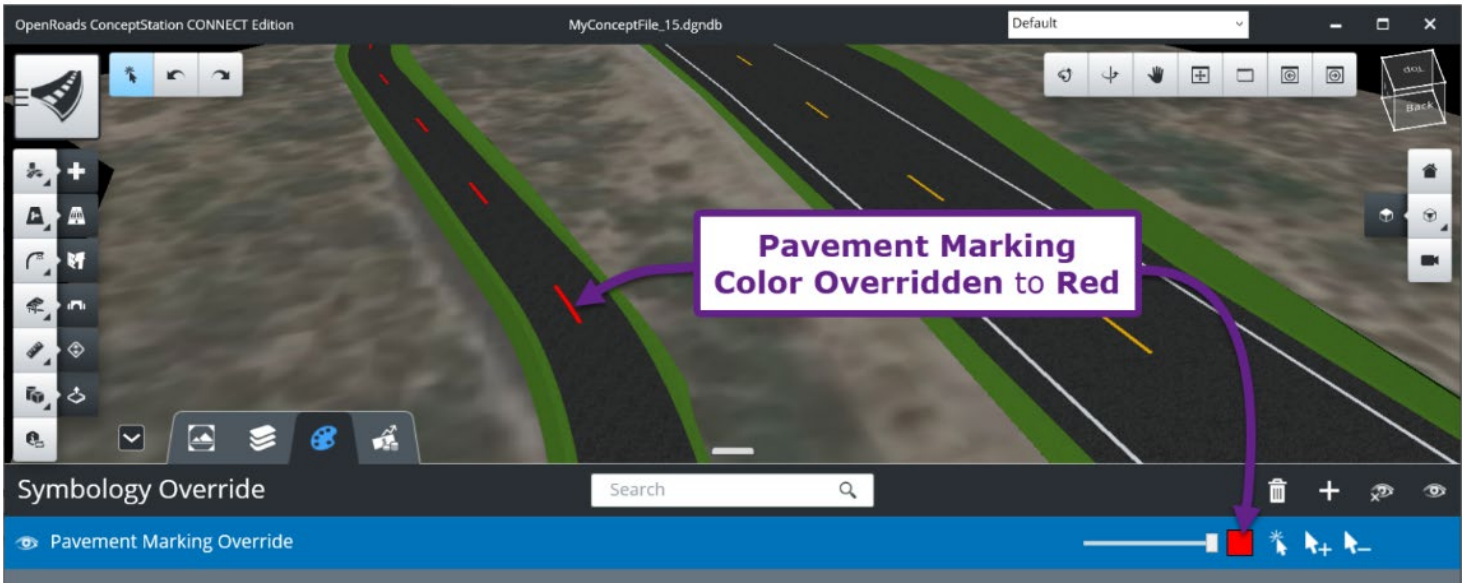


The "Models" tab is used toggle ON/OFF the display of the Terrain and "Default" models. The "Default" model represents all modeling and drawing elements created in the ConceptStation File.



Symbology Override: Through this menu, the color of an element can be overridden. This menu will be empty until Overrides are created. To create an override, select the element and press the **Create From Selection** button. Set a Color for the Override and increase the slider bar. After the slider bar is increased, the selected element will be shown with the override color.



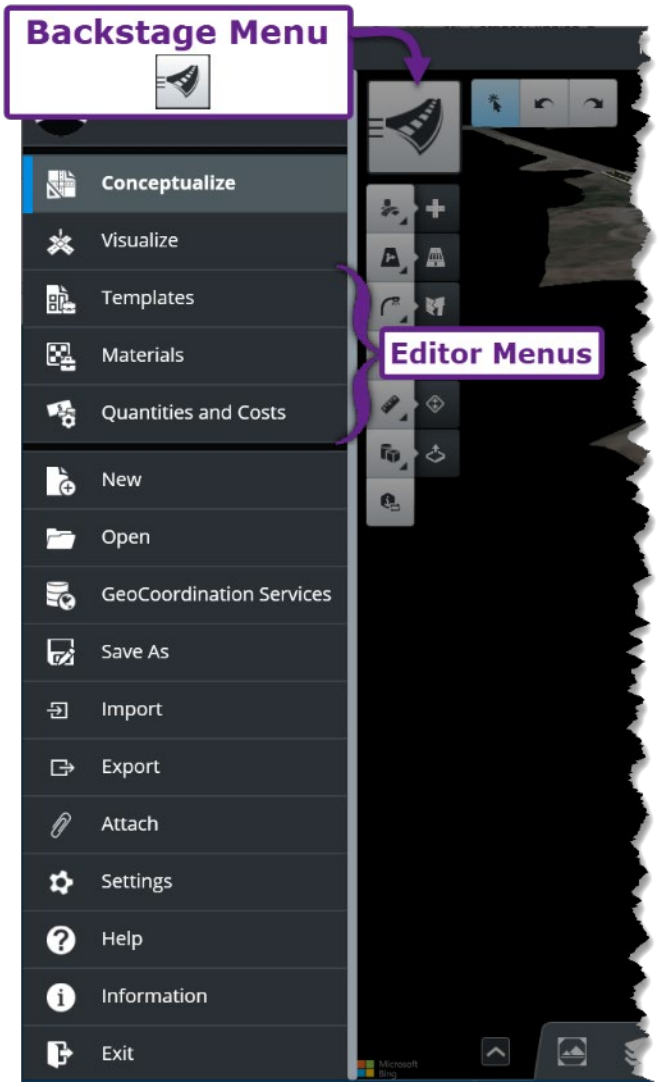


Quantities and Cost: Displays the materials quantities for the Roadway Models created in the ConceptStation File. This menu and the calculation of quantities and cost estimates is discussed in *29L – Calculate Quantities and Estimated Costs*.

29C.4 The Backstage Menu

The Backstage Menu is accessed with the  button in the upper-left corner of the ConceptStation interface.

The Backstage Menu is primarily used to access editor menus relevant to road modeling and cost estimating. Editor menus are found at the top of the Backstage Menu:



Conceptualize: The Conceptualize button is used to return to the ConceptStation model. For example, press the Conceptualize button to exit out of the **Templates** editor or **Quantities and Cost** editor.

Visualize: When the Visualize button is pressed, the ConceptStation file is exported to the LumenRT. For more information on LumenRT, see *Chapter 28 – LumenRT*.

Templates: Opens the Template Editor. For more information on the Template Editor, see *29D – Create and Edit Templates*.

Materials: Opens the Material Editor. Materials used in Road Corridor Modeling can be created and edited in the Material Editor.

Quantities and Cost: Opens the Quantities and Cost Editor. The Quantities and Cost Editor is used to change the unit costs for materials and elements used in the ConceptStation File. Also, Allowances used in the Cost Estimate can be changed from this editor. For more information, see *29L – Calculate Quantities and Estimated Costs*.

GeoCoordination Service: After initial creation of the file, the GeoCoordination Services menu can be re-opened to download additional Data Classes (i.e., Roadways, Buildings, Hydraulics).

Import: The Import menu is used to import terrain files, aerial rasters, and ORD Files. See *29B.1 Import Terrain and Arial Data from Local Files* and *29B.2 Import an ORD File for Reference*.

Export: The Export menu is used to export elements in the ConceptStation File into file types that can be imported into ORD. See *29M – Export ConceptStation Elements into ORD*.

Attach: The Attach tool is solely used to import Scalable Mesh elements into the ConceptStation File. Scalable Mesh elements contain a .3sm or .3mx file extension.

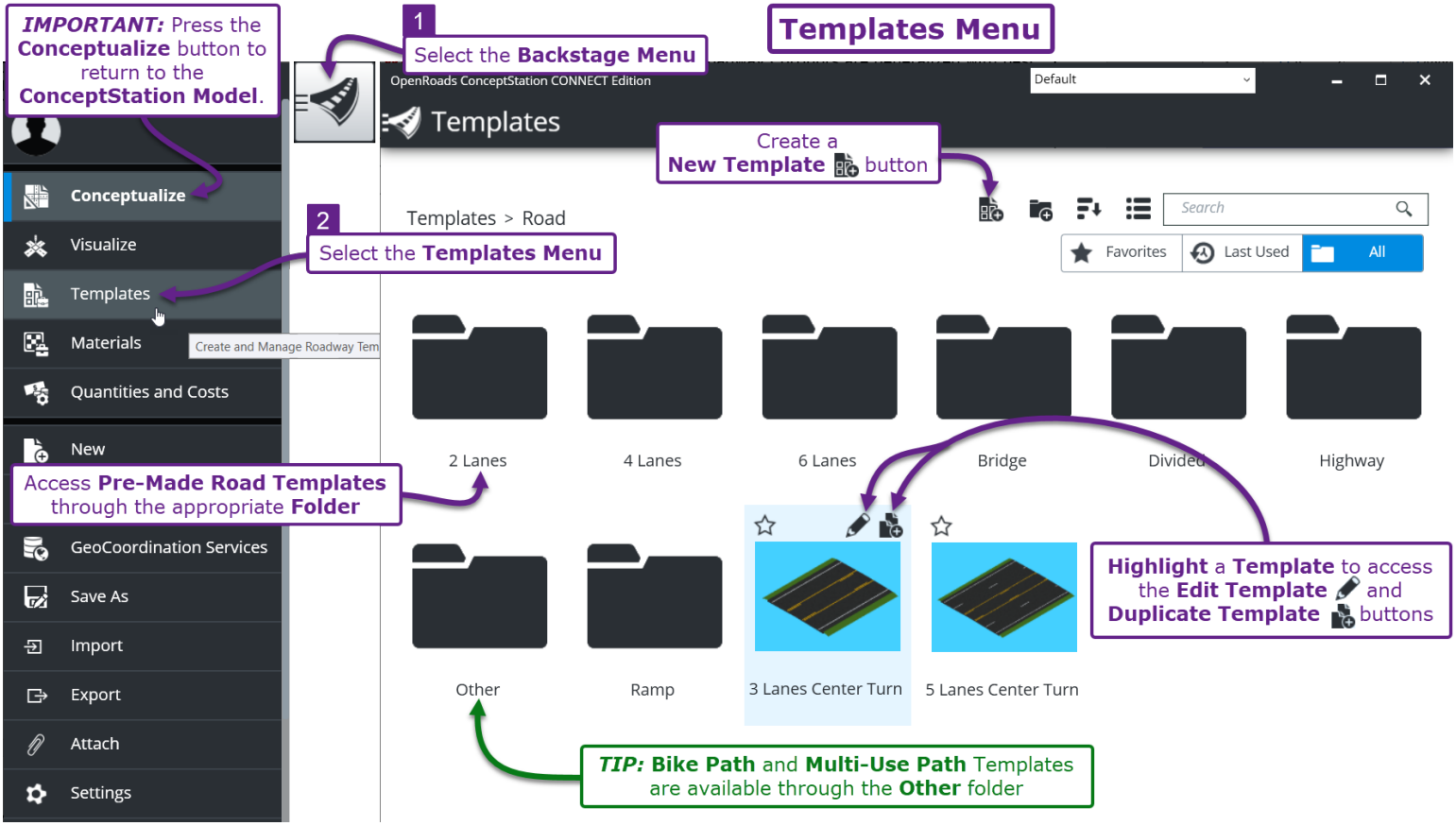
Settings: Controls general settings behavior for the ConceptStation File. ***TIP:*** The Units (i.e., meter and feet) can be changed in the Settings menu.

Information: Shows the Coordinate System and project location map used for the file.

29D – CREATE AND EDIT TEMPLATES

Templates are created and edited in the **Template Menu**, which is accessed through the **Backstage Menu.**

IMPORTANT: After editing a Template, return to the ConceptStation model by pushing the **Conceptualize** button in the Backstage Menu.



As shown above, the **Templates Menu** is separated into different **Folders**. Each Folder represents a different road lane configuration. There are also Folders available for Bridge and Ramp Templates.

TIP: The **Other** folder contains pre-made Templates for Bike Paths and Multi-Use Paths.

Template creation and editing in ConceptStation is much simpler than in ORD. In ConceptStation, Templates are created by assembling pre-made Components, such as a Pavement Lane or Curb. Simple edits can be made to the pre-made Components, such as changing the width and slope for a Component. However, it is NOT possible to create custom Components or edit the position of Points within a Component. Custom geometric shapes CANNOT be created in ConceptStation. Template creation and editing is limited to the provided Components in the ConceptStation Template Library.

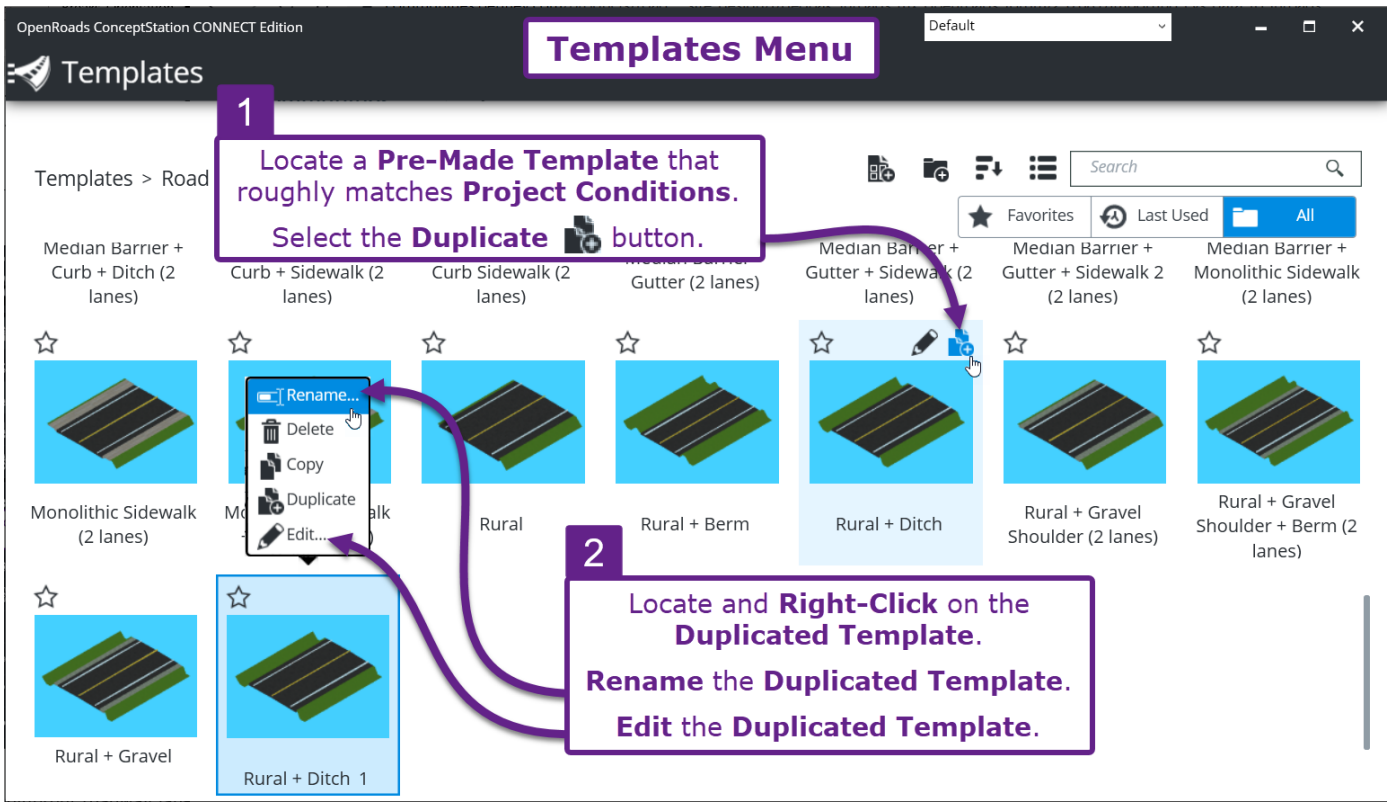
> ***NOTE:*** Guardrail CANNOT be modeled in the Template. However, guardrail can be manually drawn with the *Linear Furniture* tool. See *29J – Place Furniture: Guardrails, Signs, Fences, and Objects*.

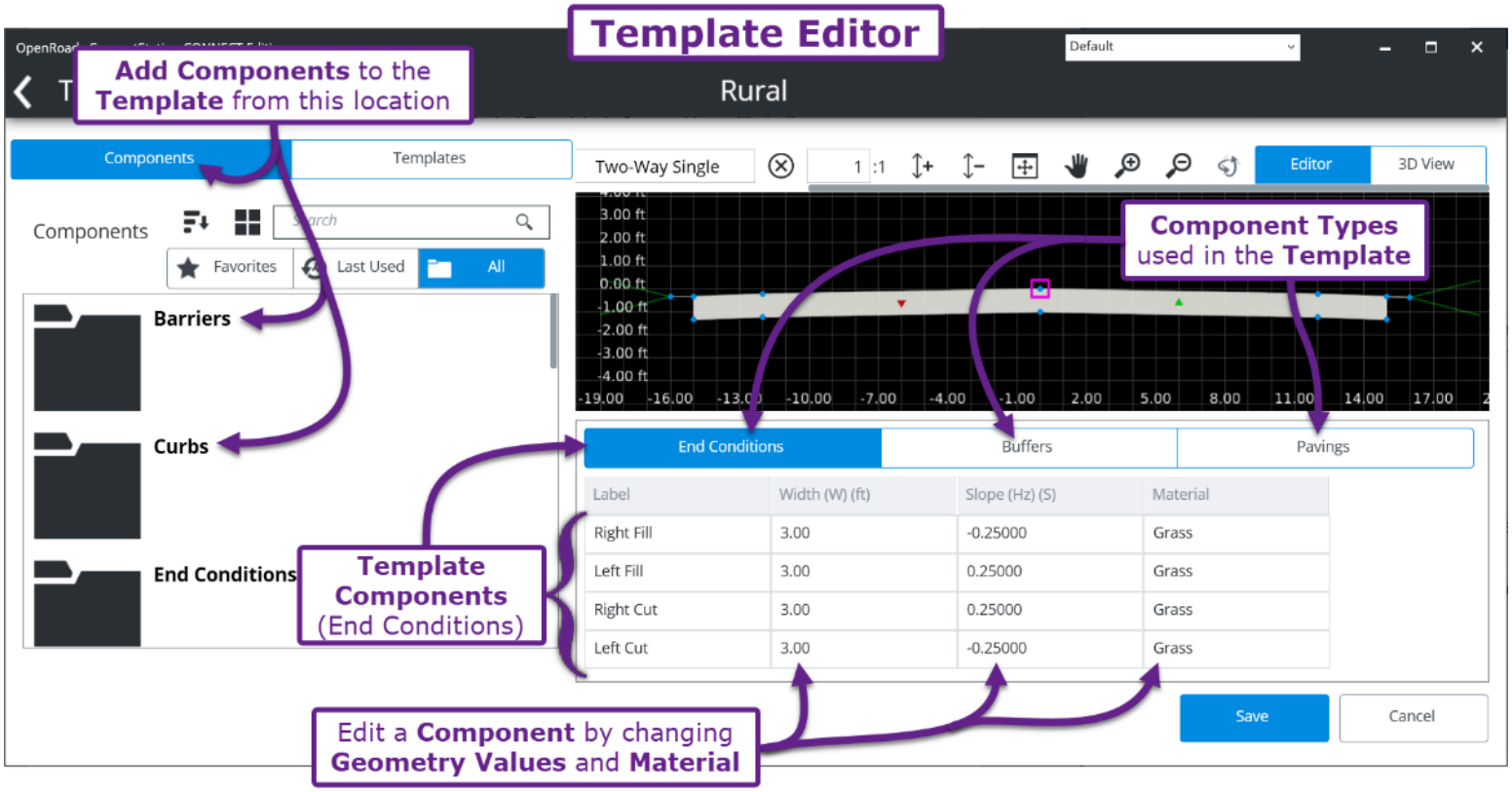
Creating a New Template vs Editing a Pre-Made Template: For simplicity, it is recommended that a pre-made Template from the ConceptStation Template Library is edited to meet project conditions. The ConceptStation Template Library contains a large selection of pre-made Templates with different Lane configurations, shoulders, and roadside features (i.e., curbs and barriers). From the ConceptStation Template Library, locate an appropriate pre-made Template and edit it.

29D.1 Edit a Pre-Made Template

Editing a pre-made Template is performed in the **Template Menu**. See the previous page for access to the Template Menu.

BEST PRACTICE: Do NOT directly edit a pre-made Template. Instead, use the **Duplicate Template** tool to create a copy of a Template. Rename the duplicated Template before making edits to it.



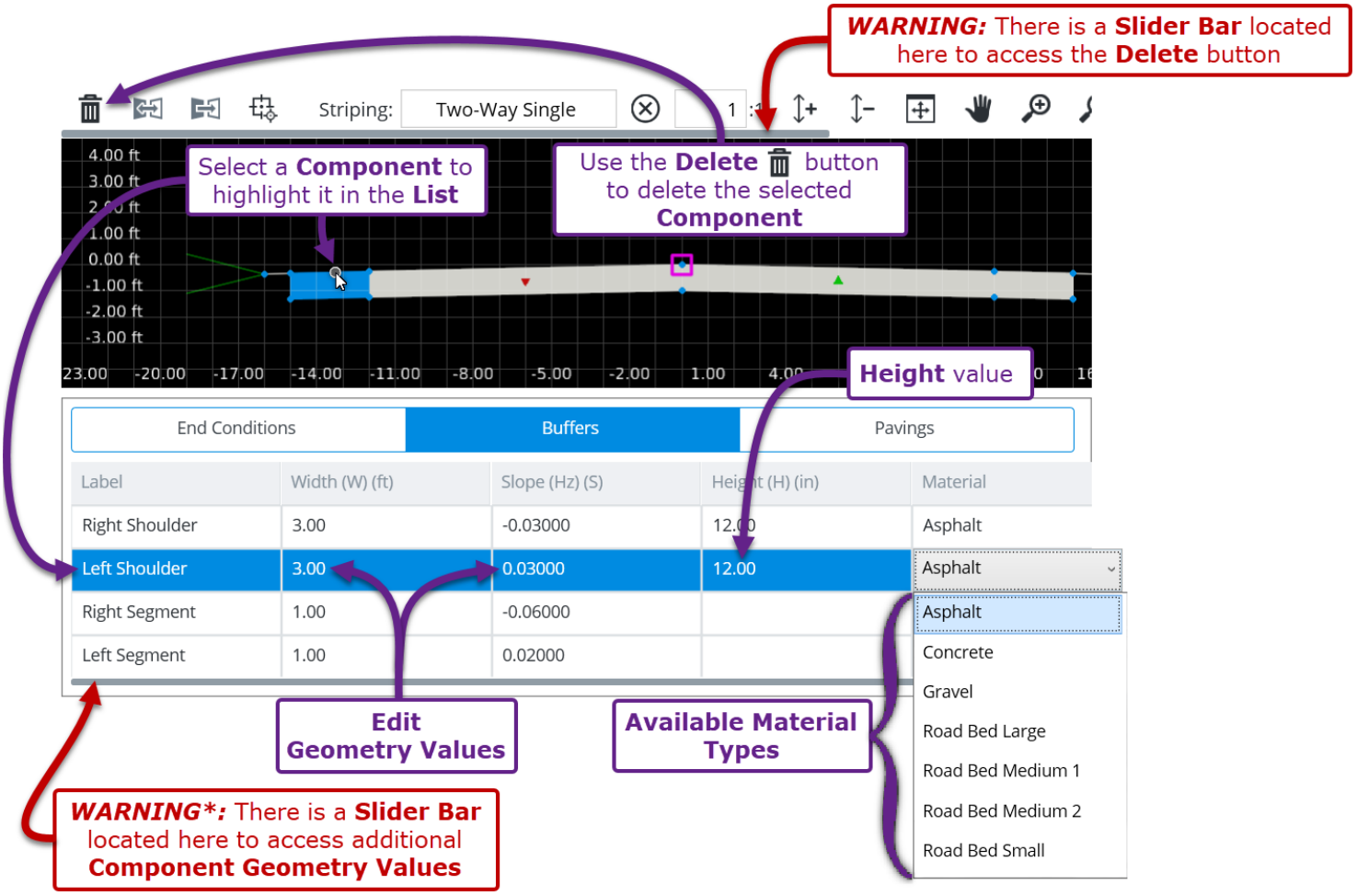


29D.2 Edit or Delete a Template Component

Select a Template Component graphic to highlight it in the list of Components. When selected, edit the Component by changing geometry values shown in the chart below.

Material: In quantities calculations, Template Components are summed together by Material type. Ensure each Template Component is set to an appropriate Material.

Height: The Height value represents the represents the thickness of the Component.



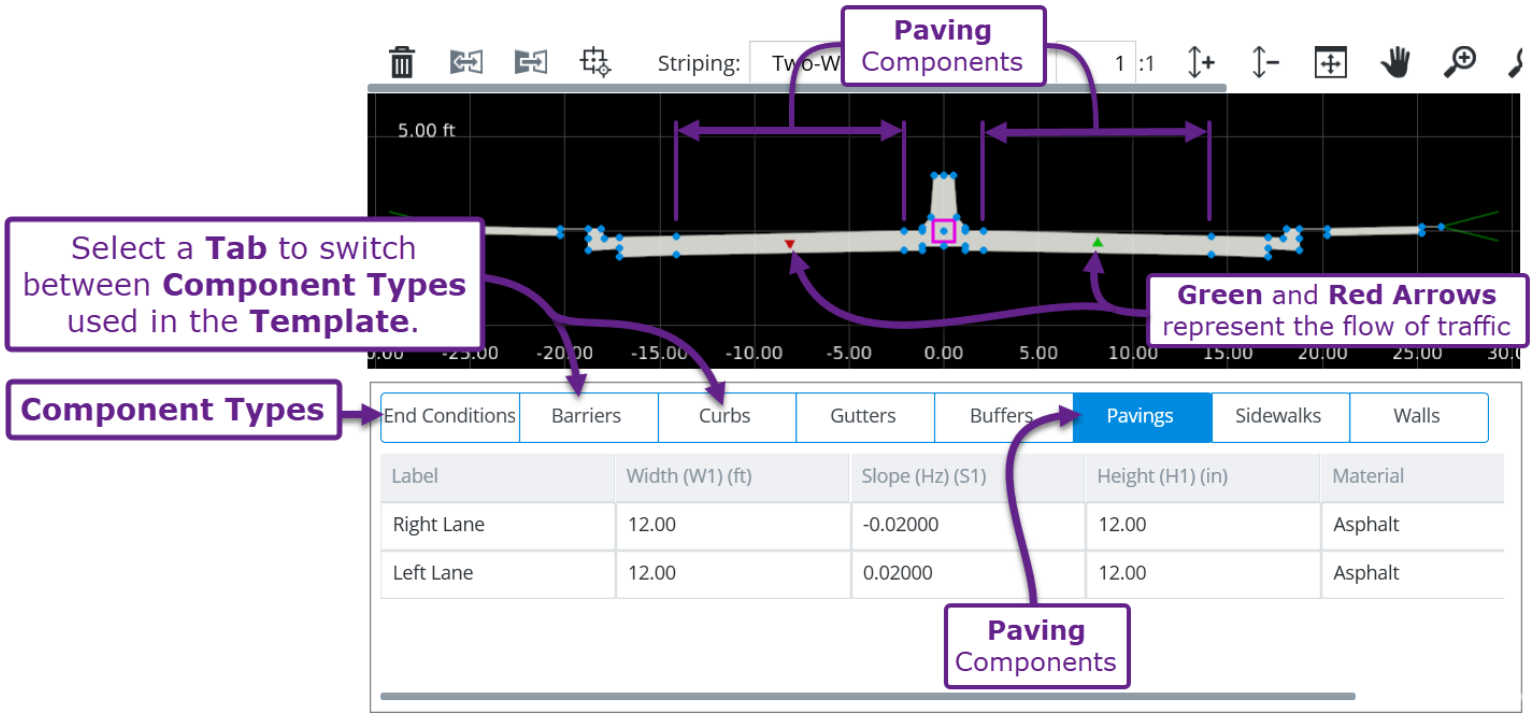
Delete a Component: To delete a Component, select it and press the Delete button.

NOTE: When a Component is deleted, all Components that are beyond it will also be deleted.

WARNING*: As shown above, there is a slider bar on the top bar where the Delete button is located. It may be necessary to adjust this slider bar to access the Delete button and other tools. Also, there is a slider bar at the bottom of the Template Component List. It may be necessary to adjust this slider bar to view additional geometry and material columns.

29D.3 Overview of Component Types

There are 8 types of Components available in ConceptStation:



Pavings: A "Paving" Component represents a lane of traffic in the roadway. A green or red arrow is shown at the centroid of a Paving Component. The arrow color represents the direction of vehicle traffic for the Paving Component. The green arrow signifies that traffic is flowing forward, in the direction of the Alignment. The red arrow signifies that traffic flows backwards relative to the direction of the Alignment.

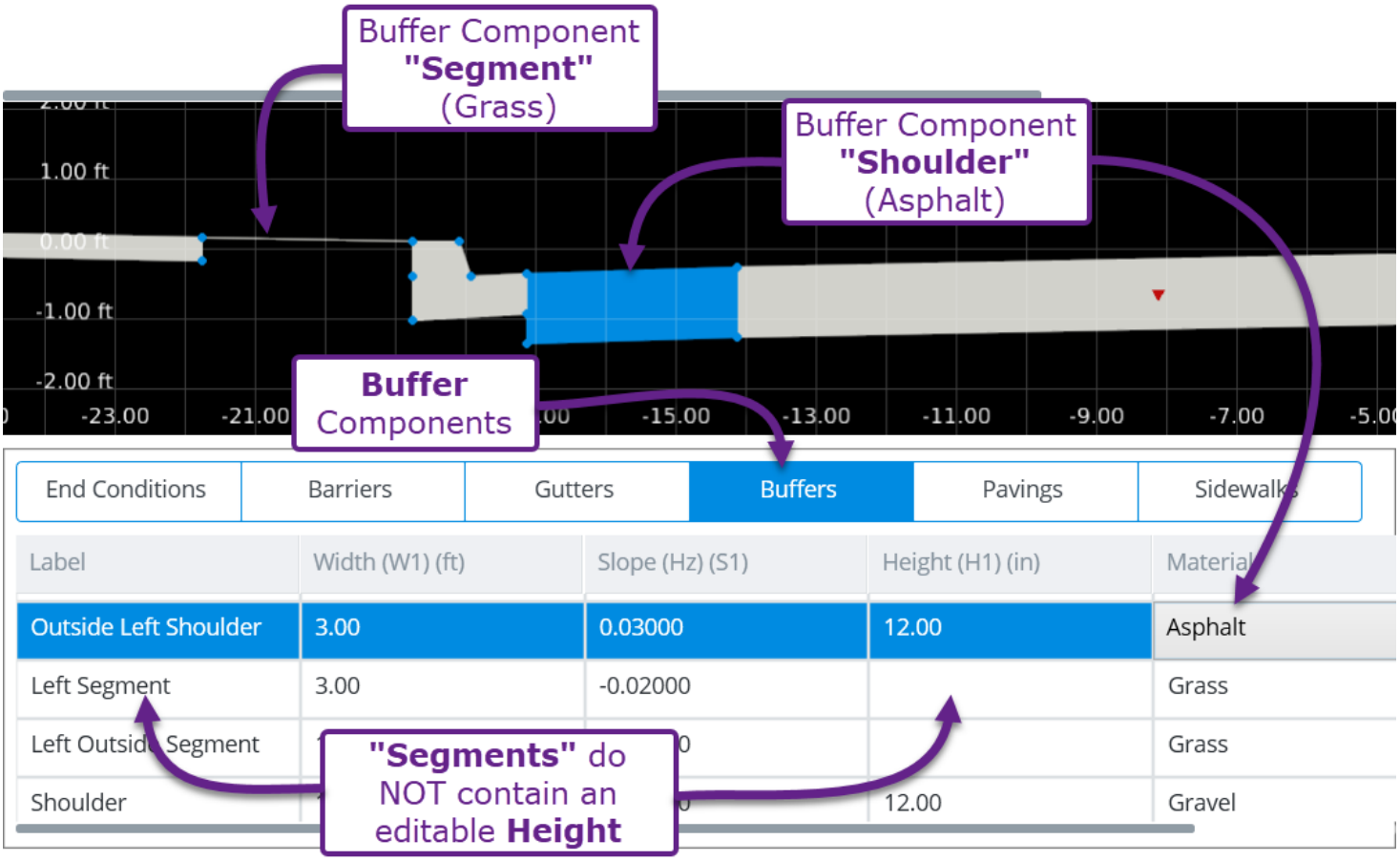
When using a pre-made Template, examine the Width, Slope, and Height for the Paving Components. The Height represents the thickness of the Paving Component.

> ***NOTE:*** The "Paving" Component Height includes both the pavement and underlying base course (i.e. aggregate) depth. There should NOT be separate components for the pavement layer and aggregate base course layer. For example, if the pavement section is 4-inches of asphalt over a 10-inch aggregate course base layer, then set the "Paving" Component Height to 14-inches.
>
> In quantities calculations, a volume is calculated for the "Paving" Component. The "Paving" Component includes both the pavement layer and aggregate base course. Hand-calculations must be used to separate pavement and aggregate base course volumes. For example, if the pavement section is 4-inches of asphalt over 10-inches of aggregate, then the percentage of asphalt is 28.57% (i.e., 4/14). To calculate the volume of asphalt, multiply the asphalt percentage by the total volume of the "Paving" Component.

Pavers in Road Modeling: When the Road model is created, "Paving" Components are automatically superelevated around curves. Superelevation rates and transitions are determined by the Road Class and Speed set in creation of the Road model. ***NOTE:*** Automatic superelevation of "Paving" Components CANNOT be disabled.

"Paving" Components set the automatic striping (pavement markings) configuration for the Road model. Centerline, shoulder, and lane edge markings directly follow the edges of "Paving" Components. For more information, see *29G – Create and Modify Pavement Markings*.

Buffers: "Buffers" are used to model Shoulders or a line Segment in the Template. If a Buffer Component is listed as a "Shoulder", then it will contain an editable Height value and appear as a rectangle. If listed as a "Segment", then the Component is planar and appears as a single line segment in the Template Editor. Segments are typically used to model grass areas in the Template.



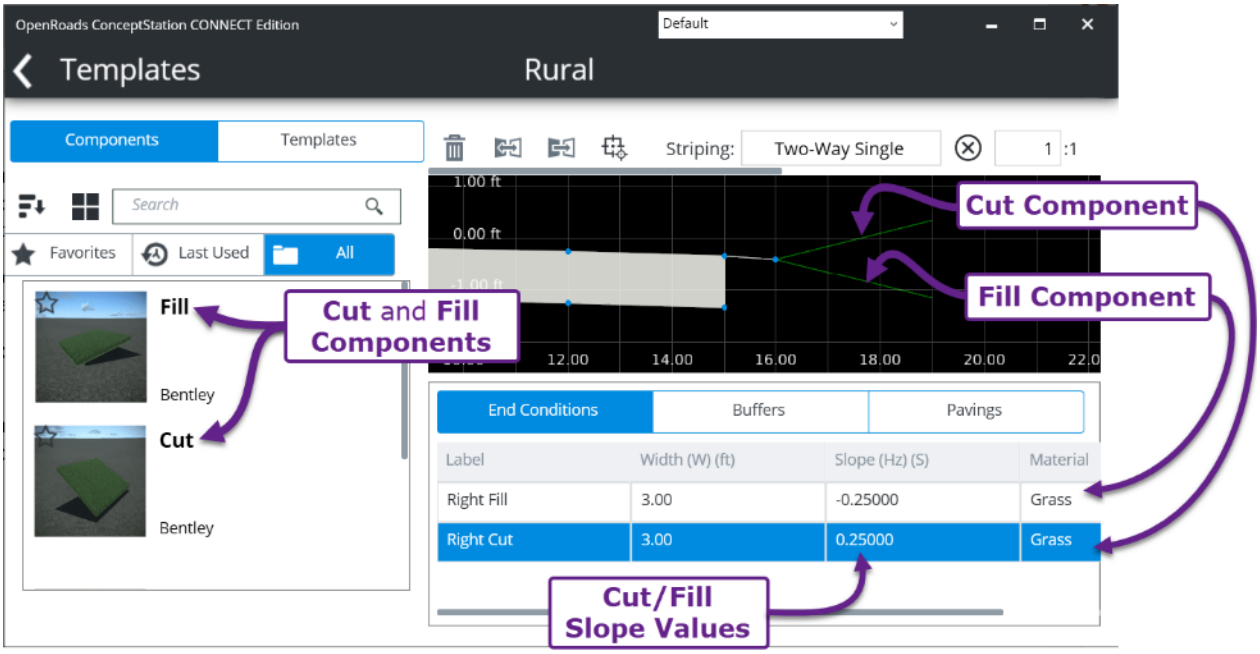
NOTE: Creation of custom Components is limited to placing pre-made "Shoulder" and "Segment" components. A "Shoulder" Component can be used to model a rectangular shape. A "Segment" Component can be used to model a single line segment. However, multiple "Segment" can be placed and assembled to form custom shapes. See *29D.4 Placing Pre-Made Components in the Template*.

IMPORTANT: "Shoulder" Components will NOT superelevate around curves. "Paving" Components are the only component type that automatically superelevate.

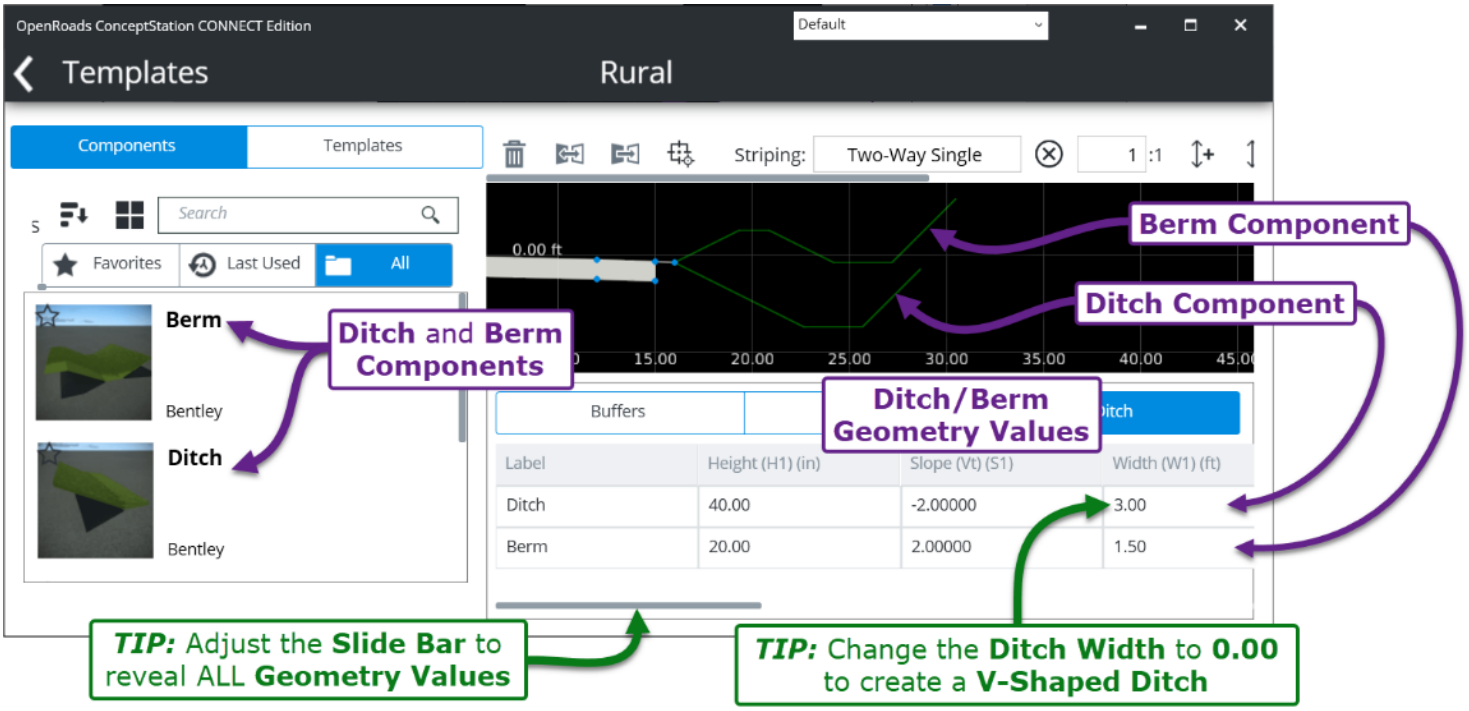
End Conditions: End Conditions are used to model the cut and fill slopes in the Template. End Conditions extend or contract as necessary to intercept the Terrain surface elevation. End Conditions in ConceptStation function similarly to End Conditions in ORD.

In ConceptStation, End Condition geometry is limited to four different pre-made components: **Cut**, **Fill**, **Ditch**, and **Berm**.

The **Cut** and **Fill** components are simple line vectors. Multiple line segments CANNOT be programmed into Cut and Fill components. Edits available to Cut and Fill components are limited to changing the slope.

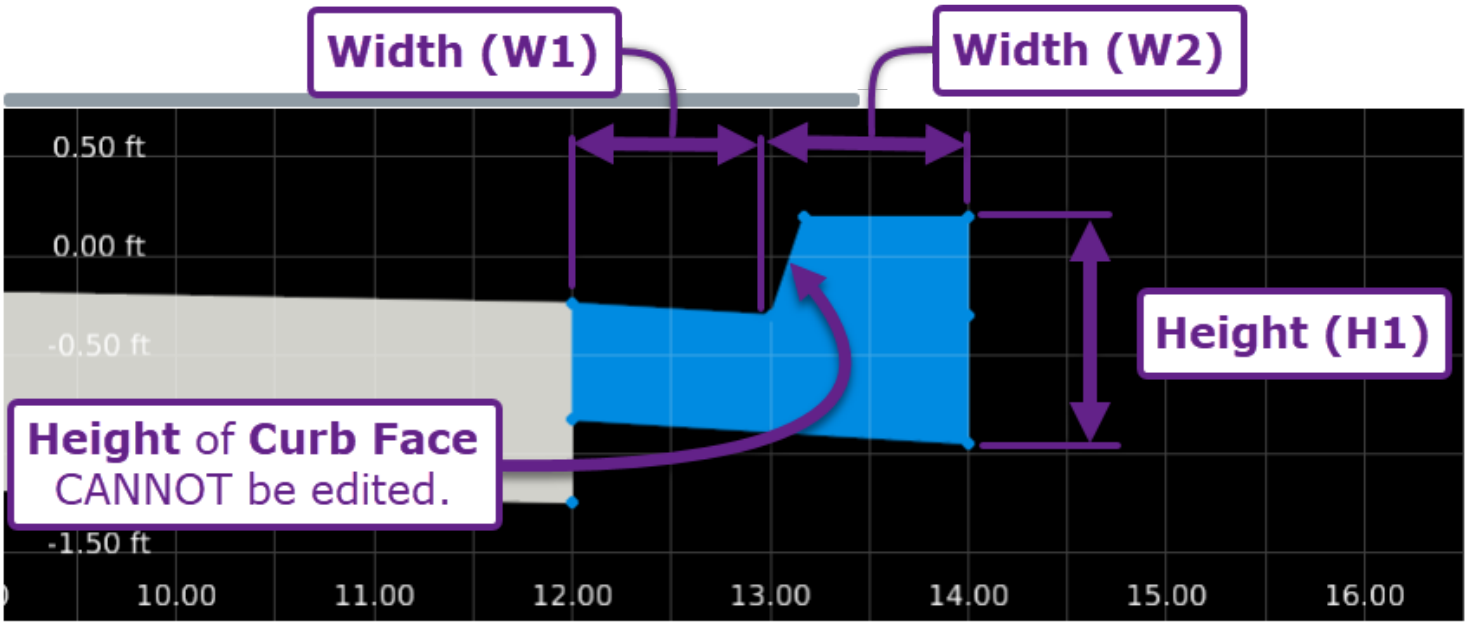


Ditch and **Berm** components consist of multiple line segments. For Ditch and Berm components, the width and slope of each line segment can be edited. The Height value controls the depth and height of the Ditch/Berm.



The remaining Component types include **Barriers**, **Curbs**, **Gutters**, **Sidewalks**, and **Walls**. These Component types offer limited options for editing.

For example, the **Gutter Type 1** component shown below can only be partially customized. The Curb Face height (as measured from flow line to top of curb) CANNOT be edited.



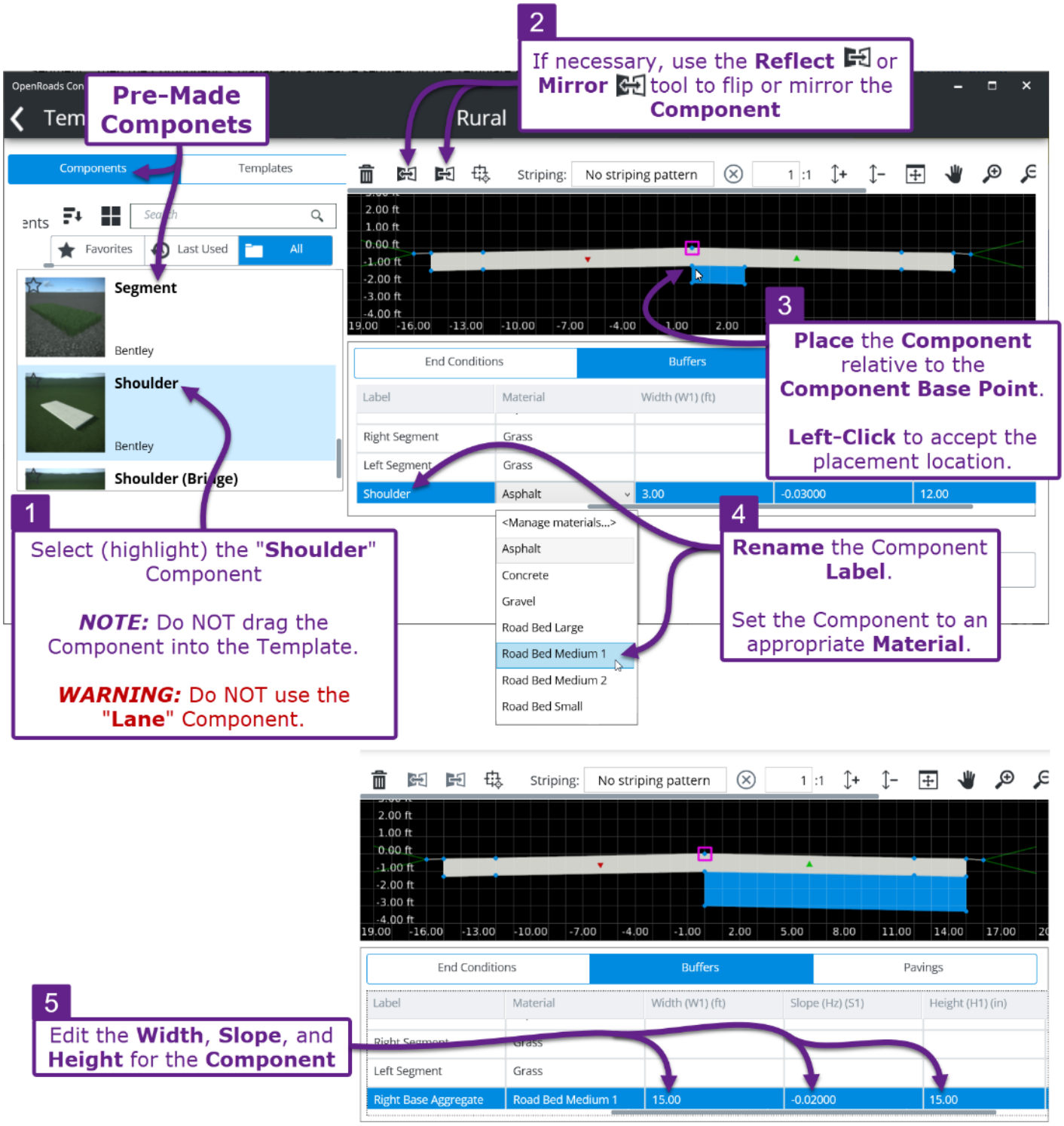
Gutters | Buffers | Pavings

Label	Height (H1) (in)	Width (W2) (ft)	Width (w1) (ft)
Gutter Type 1	7.00	1.00	1.00

29D.4 Placing and Creating Components for the Template

The ConceptStation Template Library contains pre-made Components that can be added to the Template. Pre-made Components are listed on the left-side of the Template Editor menu.

TIP: As shown in step 2, the **Reflect** and **Mirror** tools are used to flip or mirror the orientation of a Component before placement.



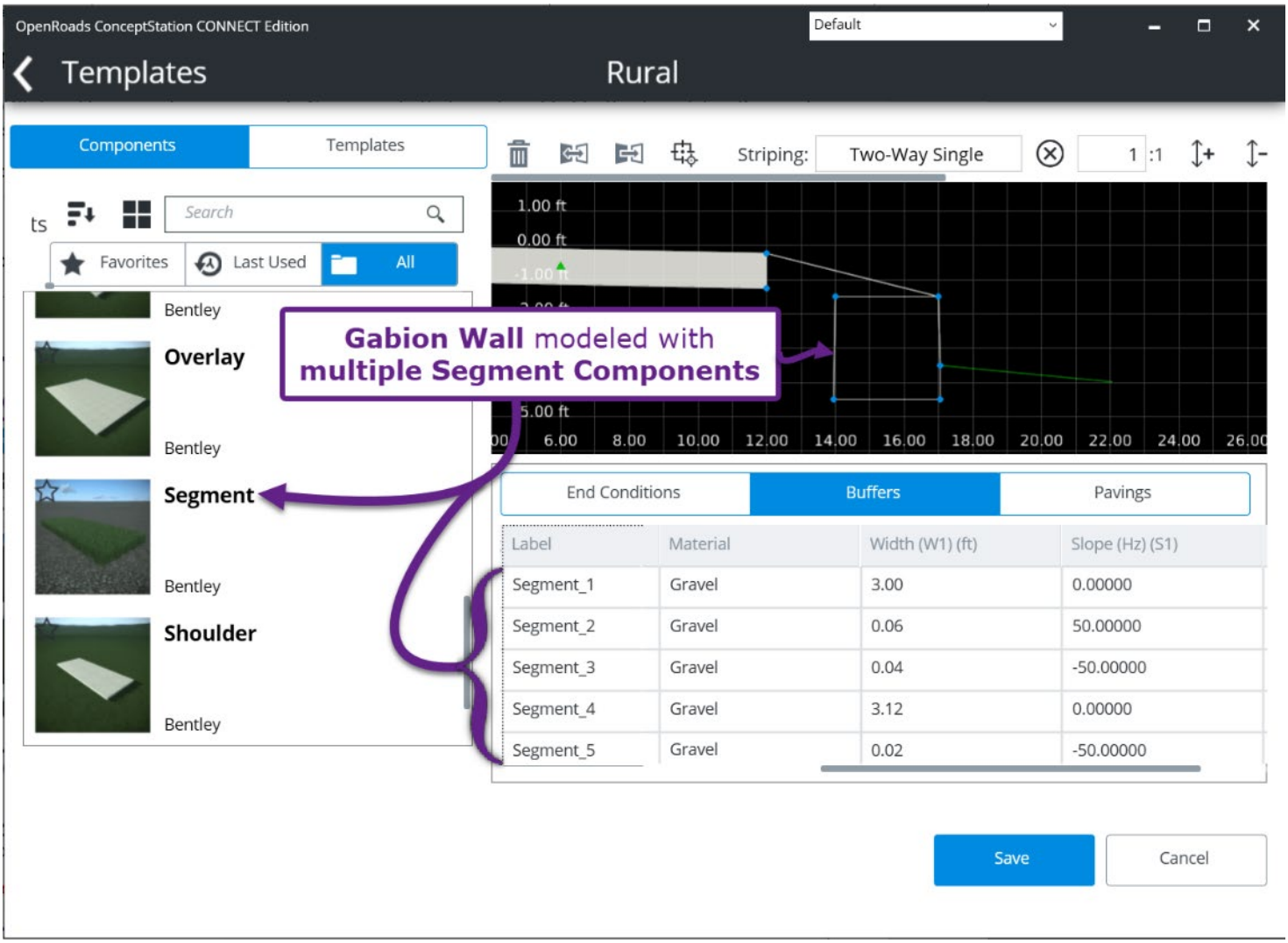
WARNING: "Lane" components can also be placed as a rectangular shape. However, "Lane" components are specifically intended to represent a traveled way surface. "Lane" components interact with automatic striping and superelevation functionality.

Creation of custom components is limited to “Shoulder” and “Segment” components.

“Shoulders” can ONLY be used to model components that are rectangular in shape.

To create custom geometry, “Segment” components can be placed and arranged to resemble a custom shape. However, in the calculation of quantities, the resulting assembly of “Segments” are NOT truly enclosed and will NOT produce a volume quantity.

For example, in the graphic shown below, a Gabion Rock Wall is modeled using several “Segment” components.

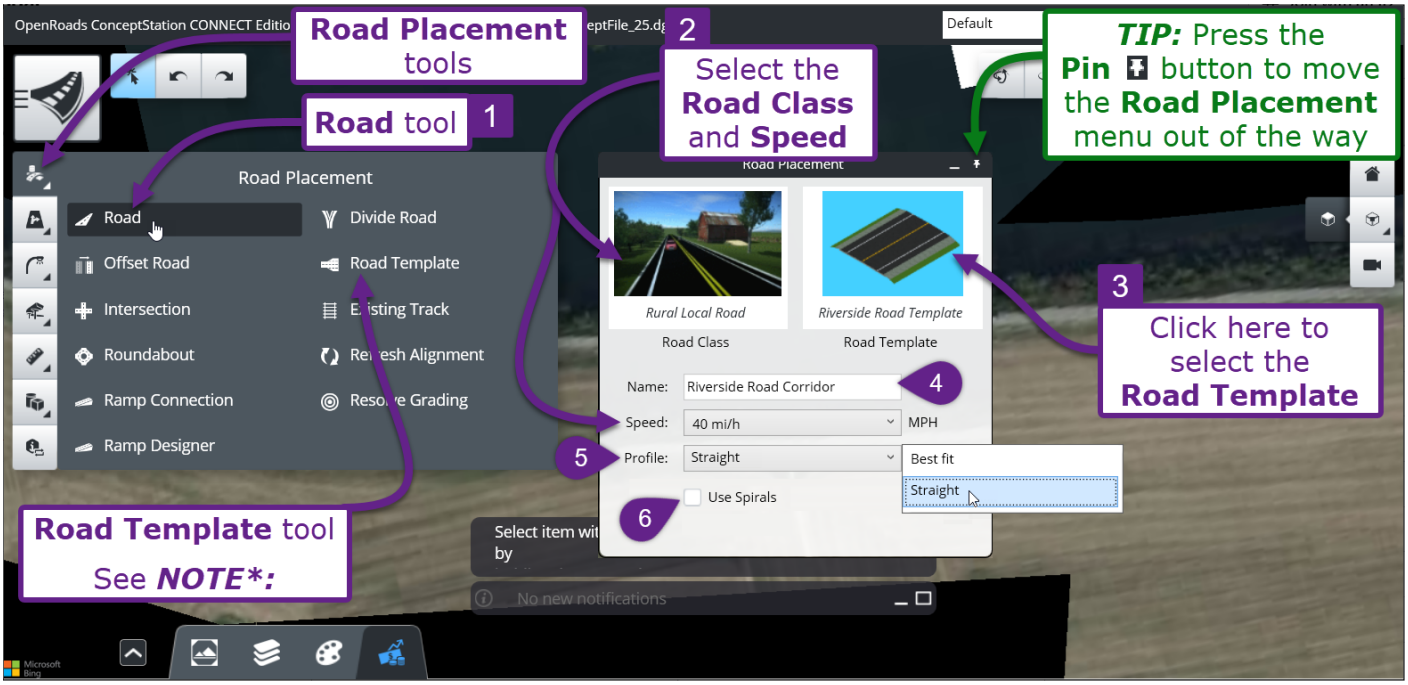


29E – CREATE THE ROAD ALIGNMENT, PROFILE, AND CORRIDOR

The **Road** tool is used to create an Alignment, Profile, and Corridor model. The following procedure demonstrates how to model mainline roads and intersecting approach roads. Joining the mainline road with an approach road into an intersection model is shown in *29F – Create an Intersection*.

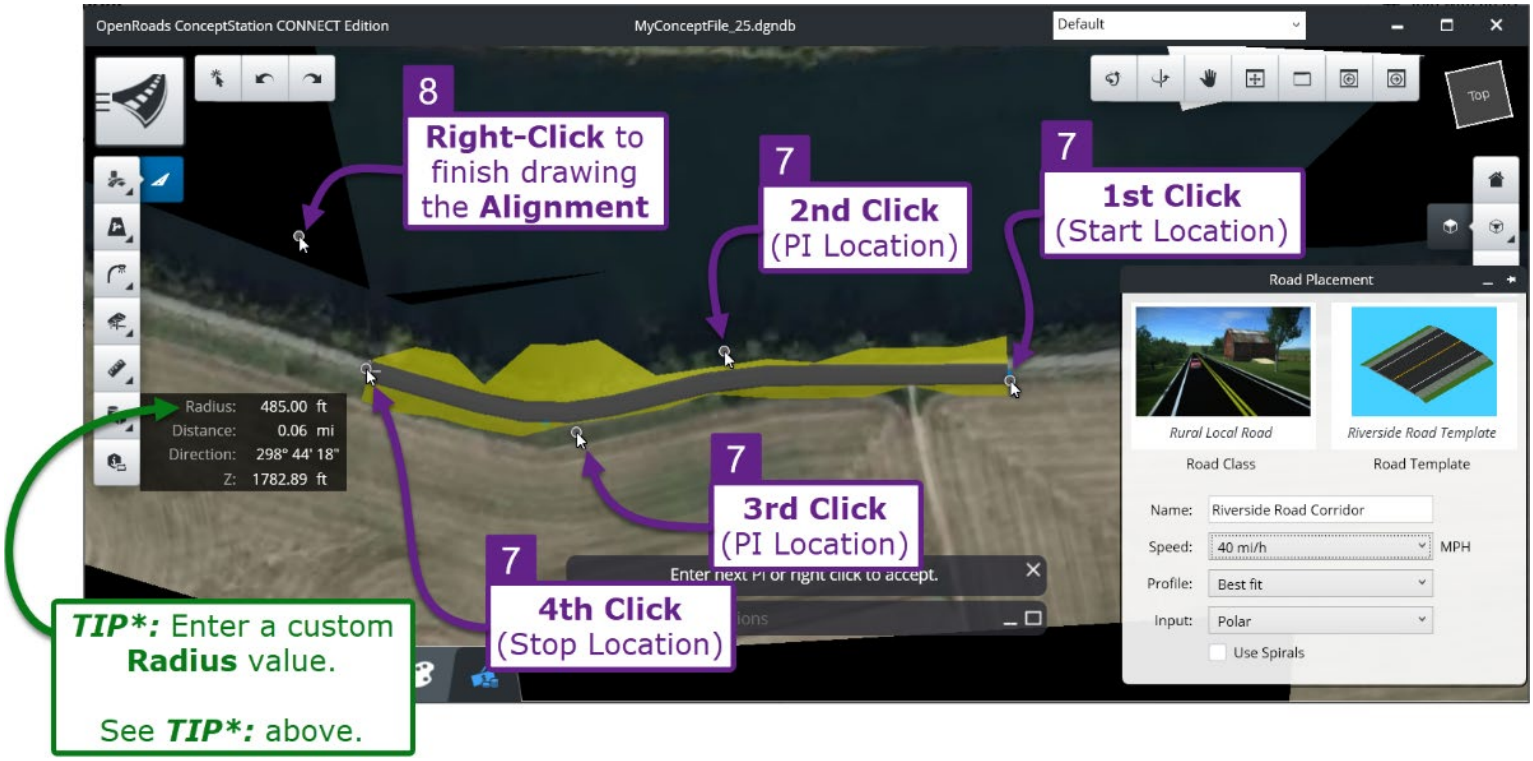
Before using the **Road** tool, create a Template. See *29D – Create and Edit Templates*.

> ***NOTE*:** The **Road Template** tool is NOT used to create Templates. This tool is used to add another Template to the Road Corridor over a specified station range. The *Road Template* tool is demonstrated in *29E.5 Use Multiple Templates in the Road Corridor Model*.



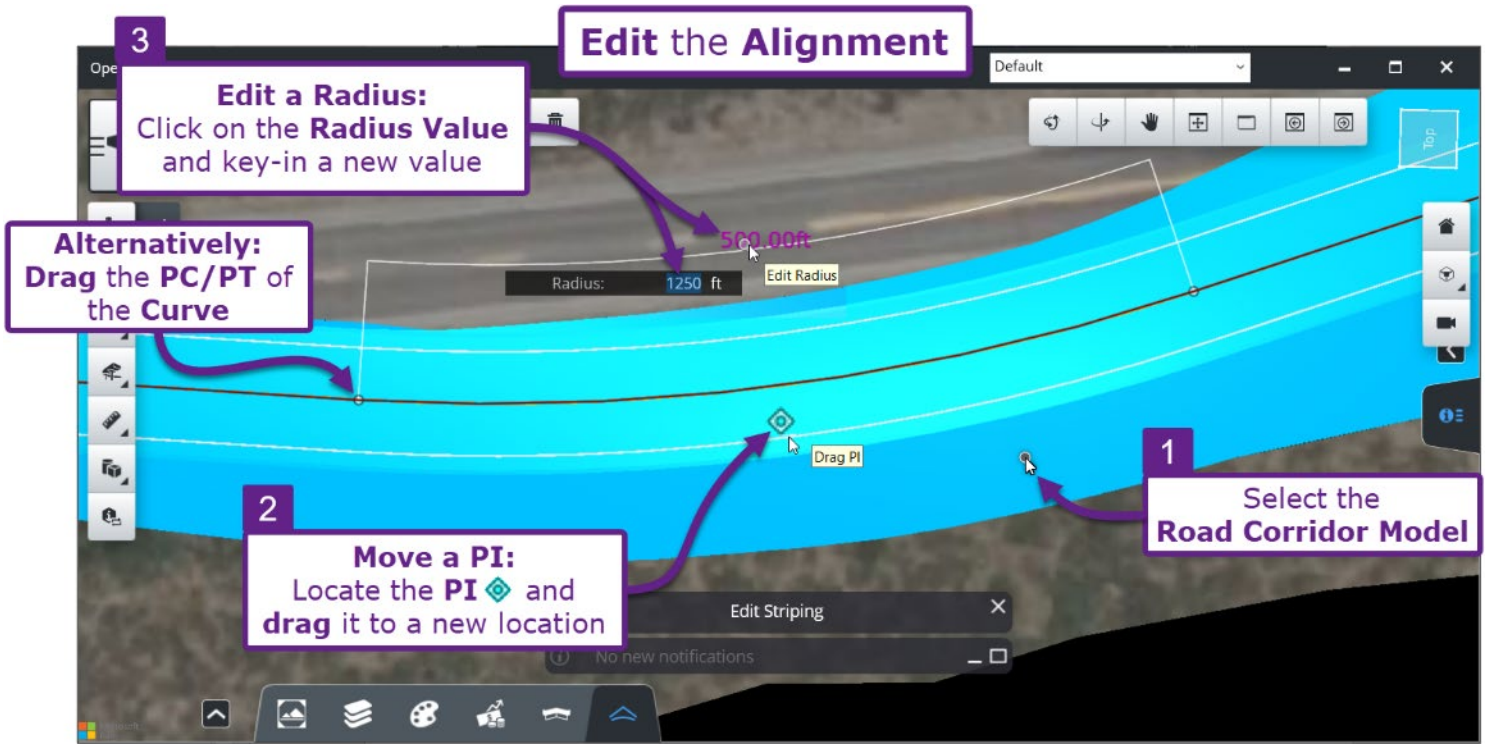
1	Select the **Road** tool. This tool is located with the **Road Placement** tools.
2	In the Road Placement menu, select the **Road Class** and **Speed**. These parameters determine the rates and transitions for the superelevation which is automatically applied to the "Paving" Components. For more information, see *29D.3 Overview of Component Types*.
3	Select the **Road Template**. For more information on ConceptStation Templates, see *29D – Create and Edit Templates*.
4	Set a **Name** for the Road.
5	**Profile:** The Profile option determines how the road Profile is initially created. If the **Best Fit** method is used, then the Profile will analyze the underlying existing ground terrain to automatically create a Profile. However, this option can produce irregular and odd results. Best Fit Profiles often require extensive edits to produce an acceptable engineering profile. The **Straight** method draws a straight profile line from beginning to end of the alignment. Regardless of the method selected, the Profile must be edited by adding and removing PVI and editing Vertical Curve Lengths. ***BEST PRACTICE:*** Use the **Straight** method for easier profile edits.

6	**Use Spirals:** If CHECKED, then spirals are automatically inserted before and after curves.
7	**Draw the Alignment** by selecting PI locations. Initially, the default radius value is determined by the **Road Class** and **Speed** selected in step 2. ***TIP*:*** A custom radius can be entered by pushing the ALT key to immobilize the Floating Input Box that shows the Radius, Distance, Direction, and Z. When the Floating Input Box is immobilized, click on the Radius value and key-in the desired radius.
8	After placing the last PI (Stop Location), **Right-Click** to accept the alignment.

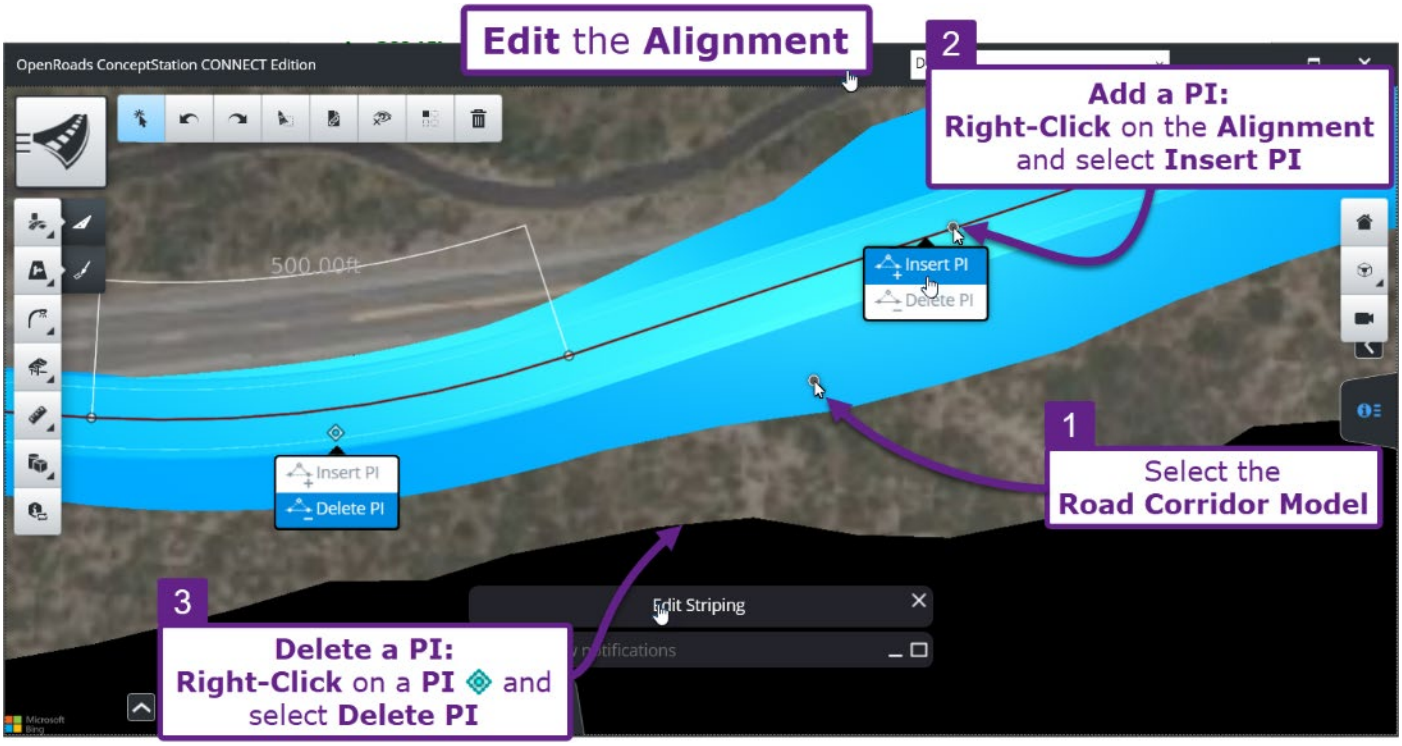


29E.1 Edit the Alignment

Select the Road Corridor Model to reveal and review PI locations and curve radii values in the Alignment. Move a PI by dragging it into a new location. Change a curve radius value by keying-in a new value.

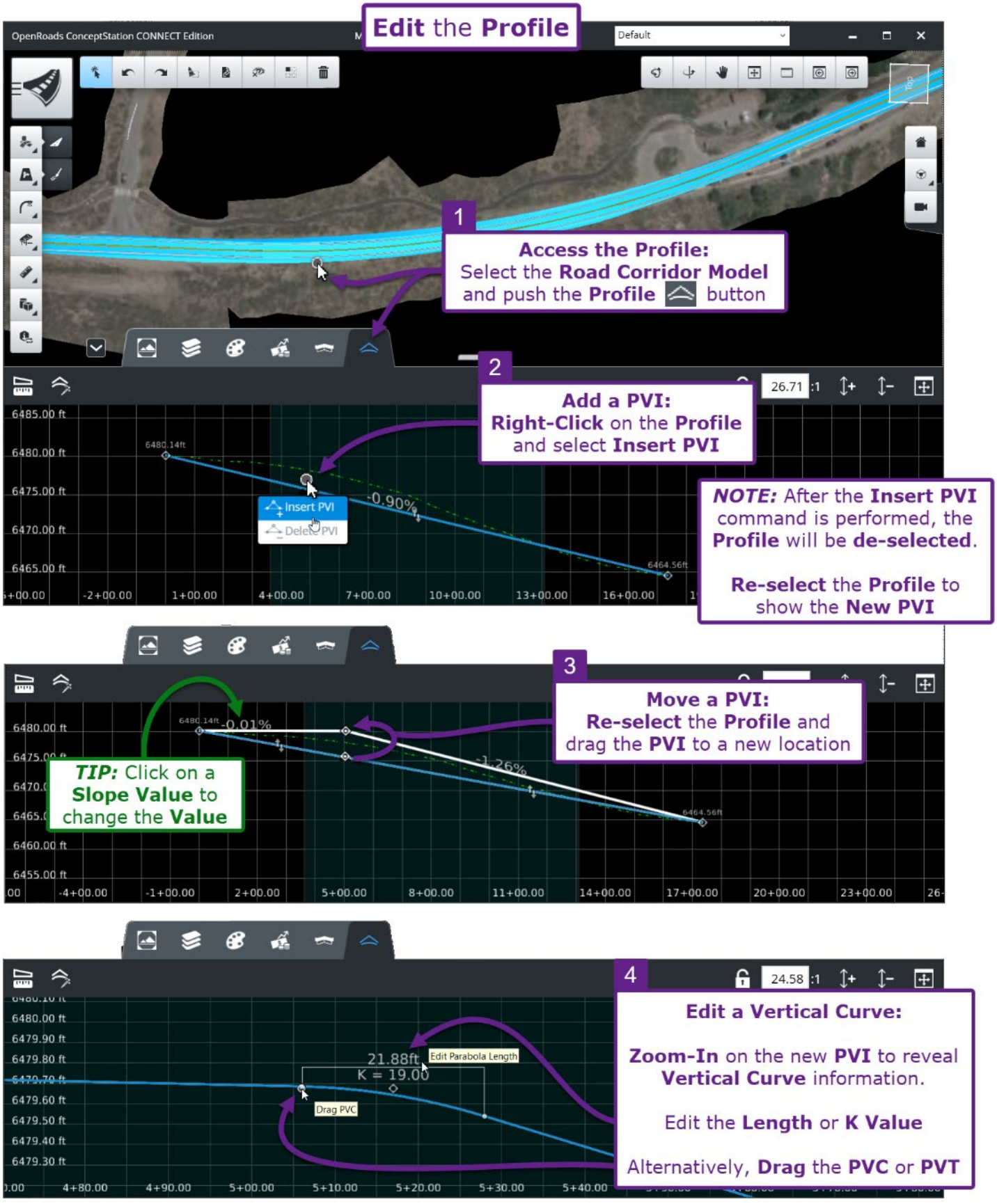


A PI can be added by right-clicking on the Alignment and selecting "Insert PI". To delete a PI, right-click on it and select "Delete PI".



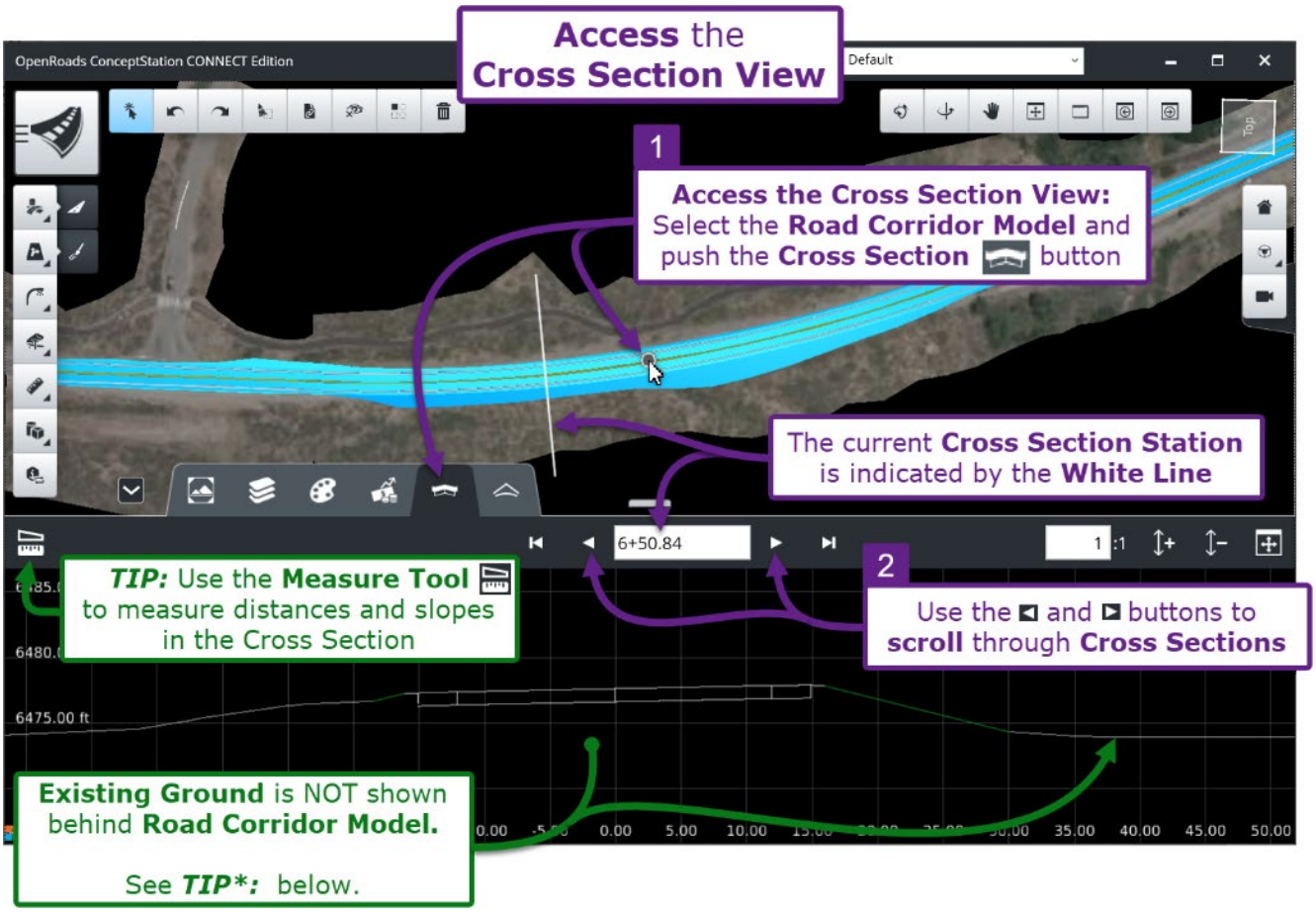
29E.2 Access and Edit the Profile

The Profile is accessed by selecting the Road Corridor Model pushing the **Profile** button. Adding and deleting PVIs is accomplished by right-clicking on the Profile.

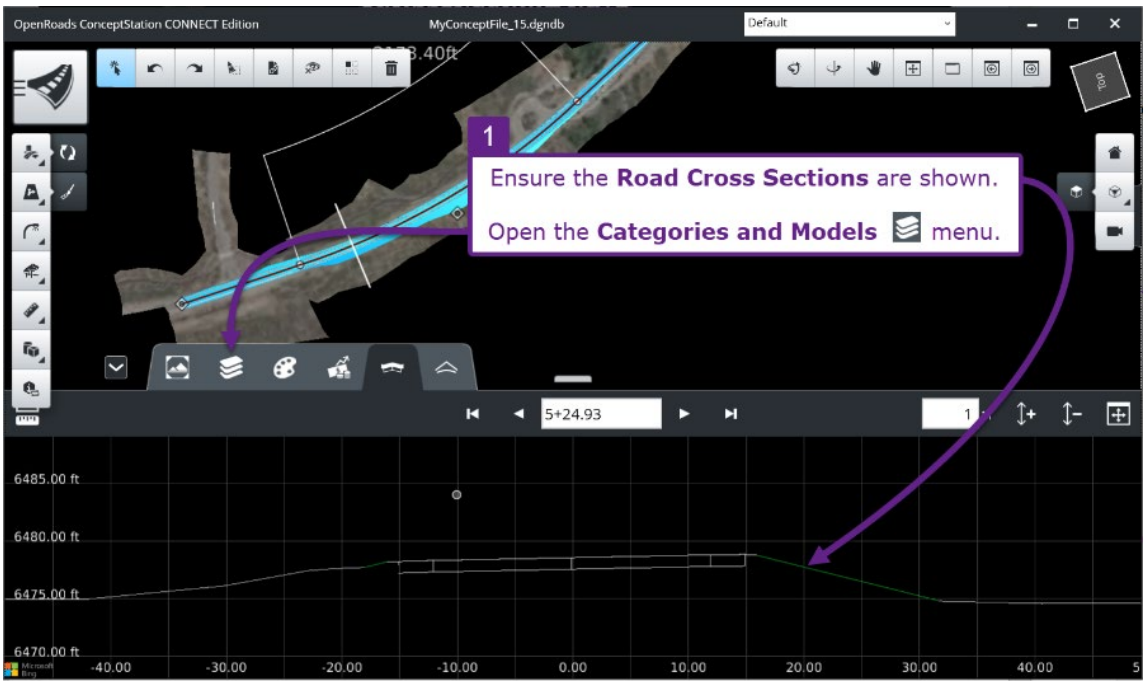


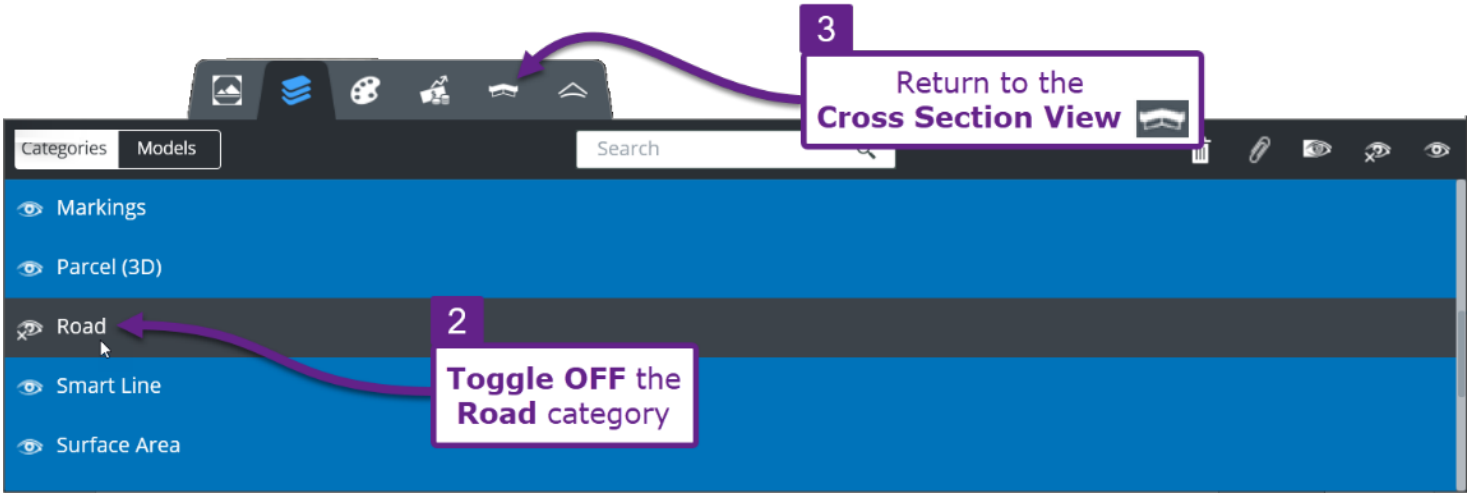
29E.3 Access the Road Cross Section View

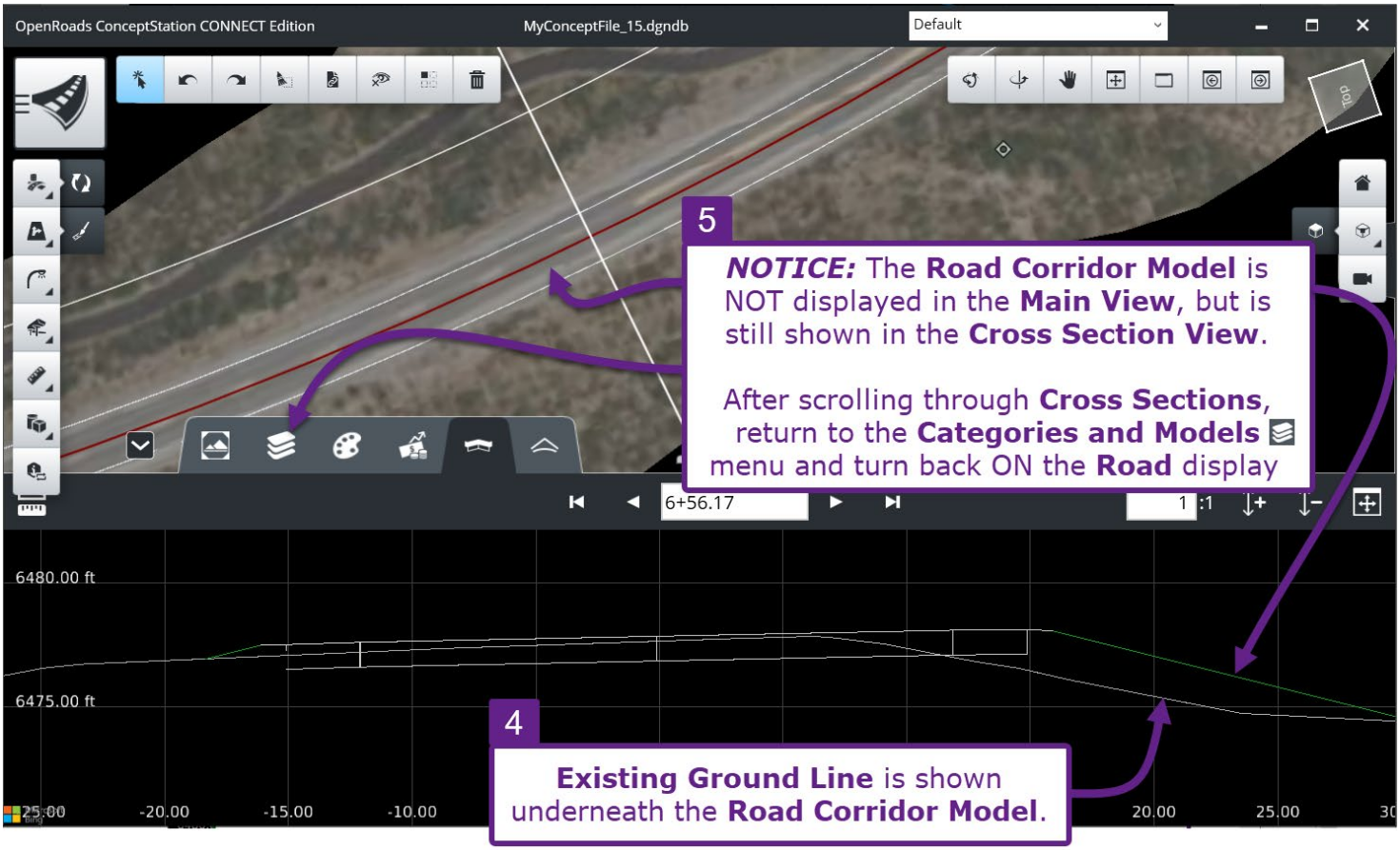
The Cross Section View is accessed by selecting the Road Corridor Model and pushing the **Cross Section** button.



TIP*: By default, the existing ground line is NOT shown under the Road Corridor Model. To show the existing ground line underneath the Road Corridor Model, the display of the **Road** category must be turned OFF in the **Categories and Models** menu:

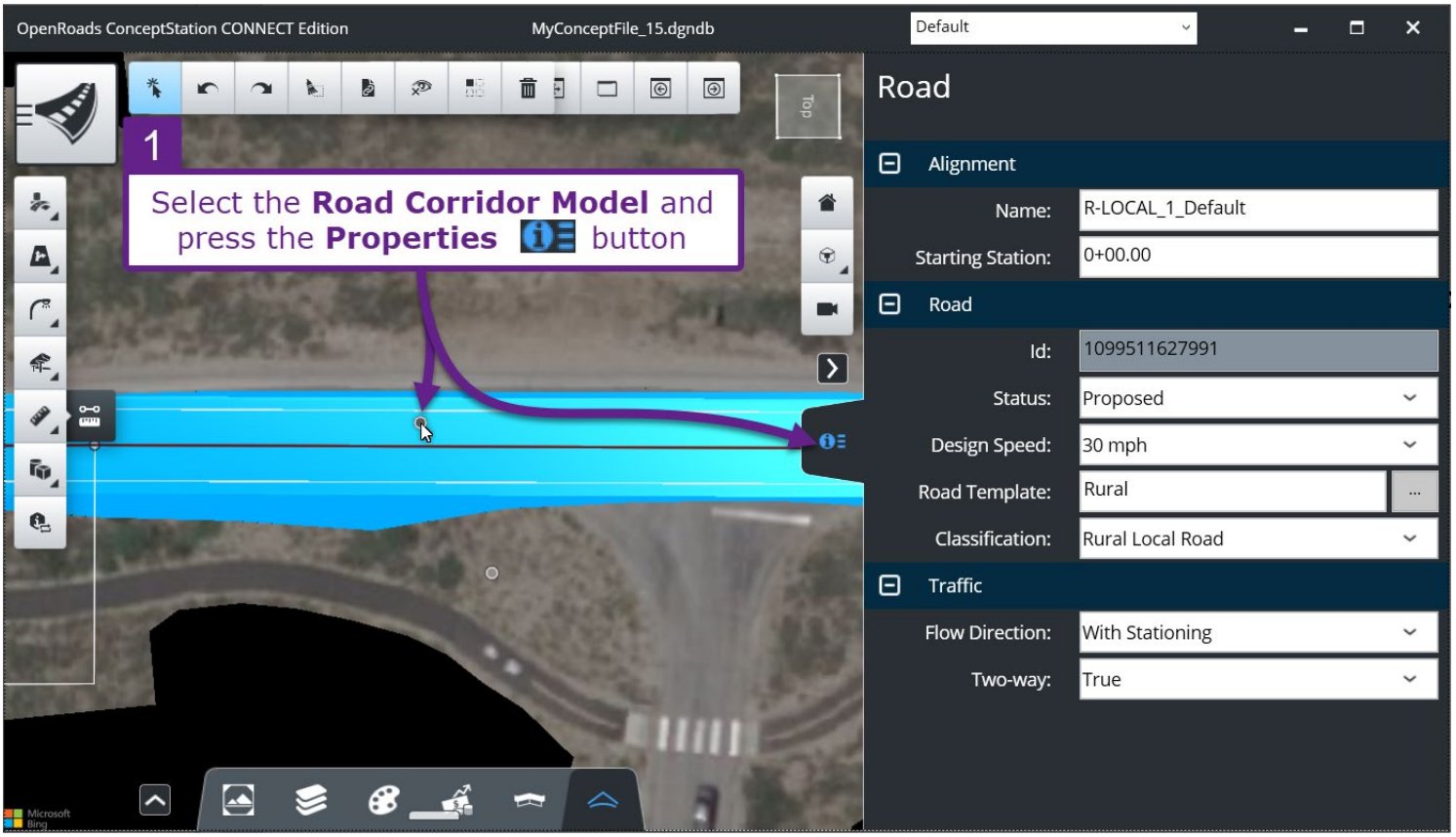



3
Return to the
Cross Section View
Categories
Models
Search
Markings
Parcel (3D)
Road
Smart Line
Surface Area
2
Toggle OFF the
Road category


OpenRoads ConceptStation CONNECT Edition
MyConceptFile_15.dgndb
Default
5
NOTICE: The Road Corridor Model is NOT displayed in the Main View, but is still shown in the Cross Section View.
After scrolling through Cross Sections, return to the Categories and Models menu and turn back ON the Road display
6+56.17
1 :1
6480.00 ft
6475.00 ft
4
Existing Ground Line is shown underneath the Road Corridor Model.
-20.00
-15.00
-10.00
20.00
25.00

29E.4 Set the Alignment Start Station and Change the Road Template

The Alignment Start Station, current Template, and other functional settings can be modified in the Properties Menu. To reveal the Road properties, select the Road and expand the Properties menu.



Starting Station: By default, a new Alignment will start at station 0+00. Set the **Starting Station** value to begin Alignment stationing at a custom value (i.e., 12+00).

Status: The Status for a Road can be set to Existing, Proposed, or Construction. The Status does NOT affect the modeling capabilities or appearance of the Road. The Status is primarily used to separate Existing, Proposed, and Construction quantities in cost estimation. When quantities and estimated cost are calculated, Proposed and Construction quantities will be separated. Existing quantities will NOT be calculated.

Design Speed: Changing the Design Speed will affect the automatically applied superelevation rates and transition lengths

Road Template: The Template currently used for the road is displayed in this location. A different Template can be swapped out by pushing the ... button.

Classification: Like Design Speed, the Classification will affect the automatically applied superelevation.

Flow Direction: Sets the direction of traffic relative to the Alignment direction. This setting affects the configuration of the automatically applied pavement markings.

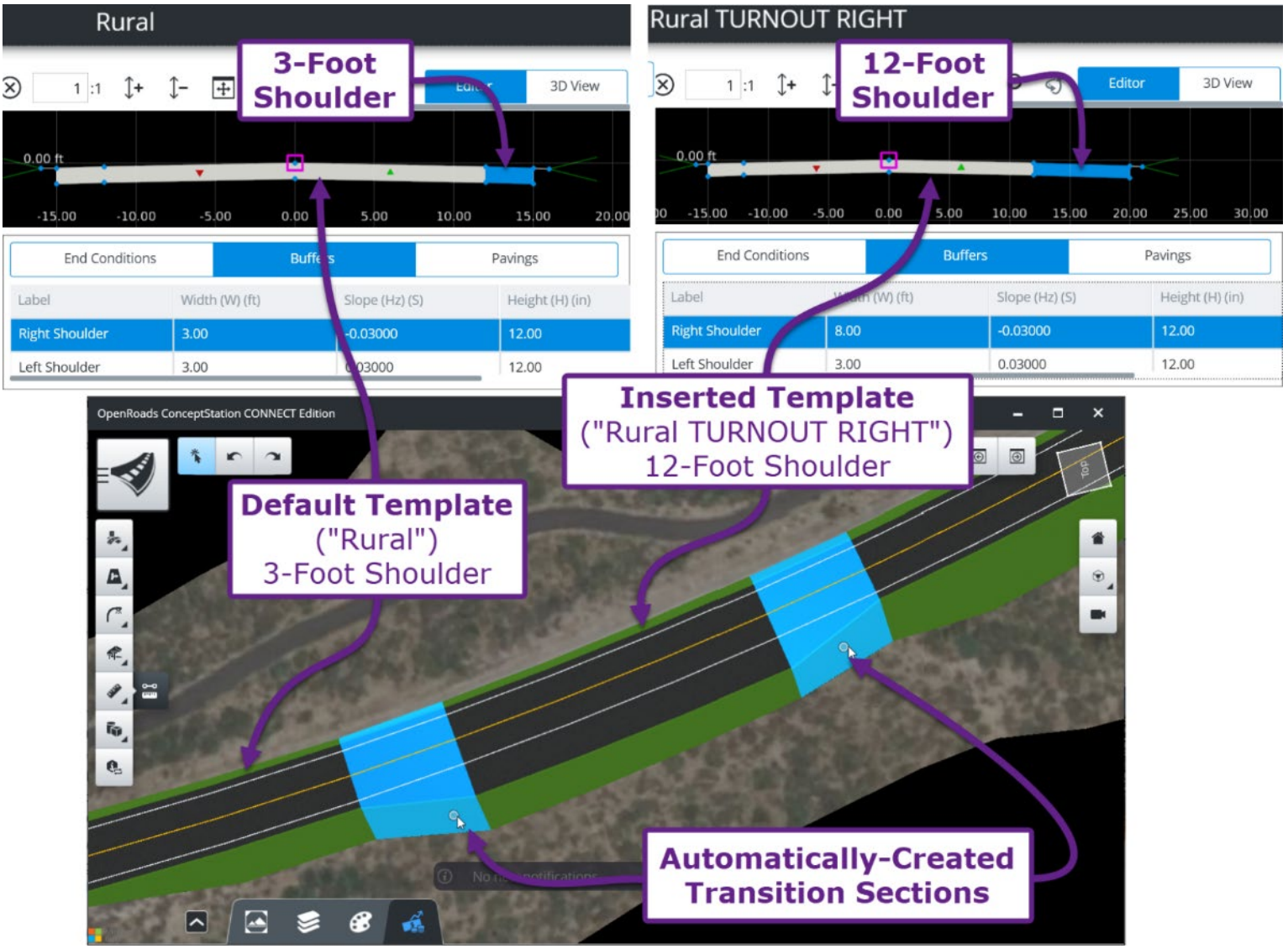
Two-Way: If set to False, then all traffic lanes are oriented in the same, one-way direction. If set to True, then two-way traffic is used based on the Template configuration. The Two-Way setting affects the configuration of the automatically applied pavement markings.

29E.5 Use Multiple Templates in a Road Corridor Model

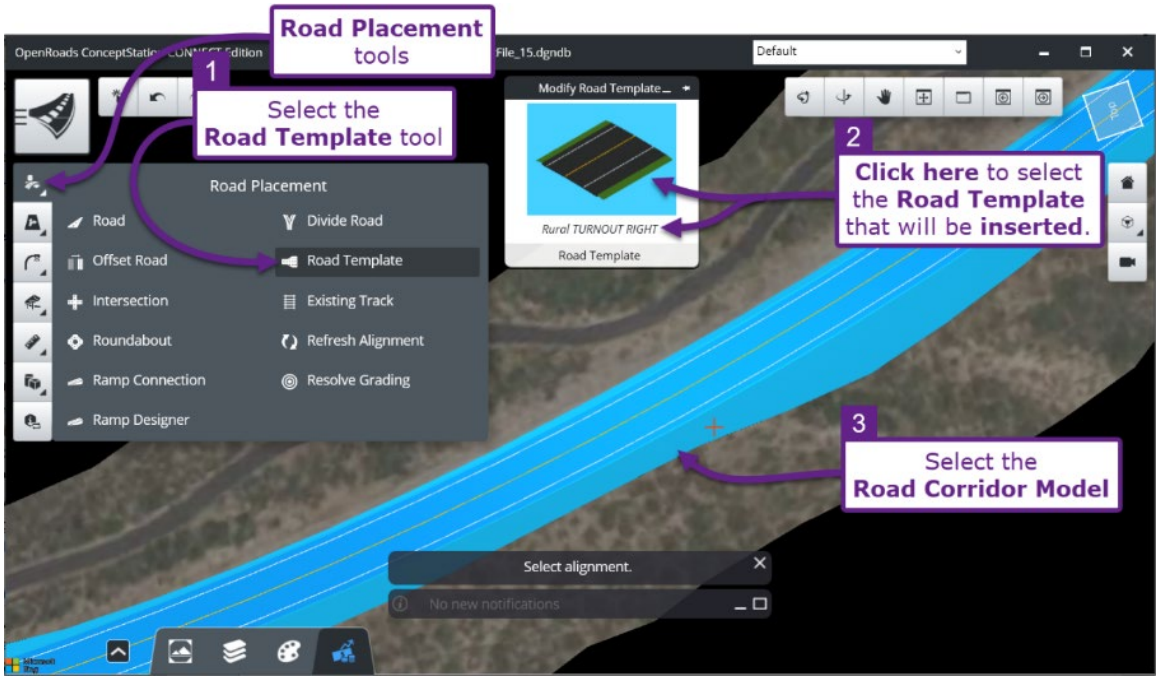
The *Road Template* tool is used to insert a different Template into the Road Corridor Model. With this tool, multiple Templates can be used in the same Road Corridor Model. Additionally, this tool automatically creates transition sections that are placed on both ends of the Inserted Template.

In this demonstration, the *Road Template* tool is used to model a turnout by inserting a Template with a widened shoulder. Creation of custom Templates is discussed in *29D – Create and Edit Templates*.

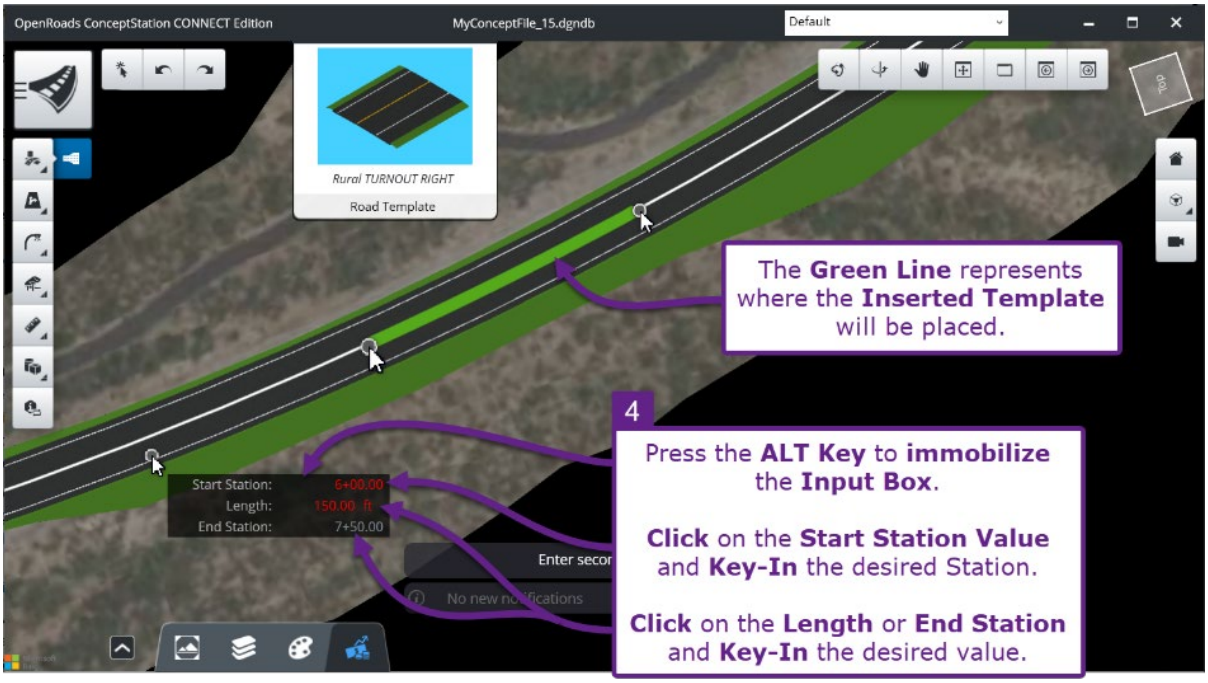
In this example, the Default Template, which was originally used to create the Road Corridor Model, contains a 3-foot shoulder width. The Inserted Template uses the same configuration, but contains a 12-foot shoulder section to model the turnout.



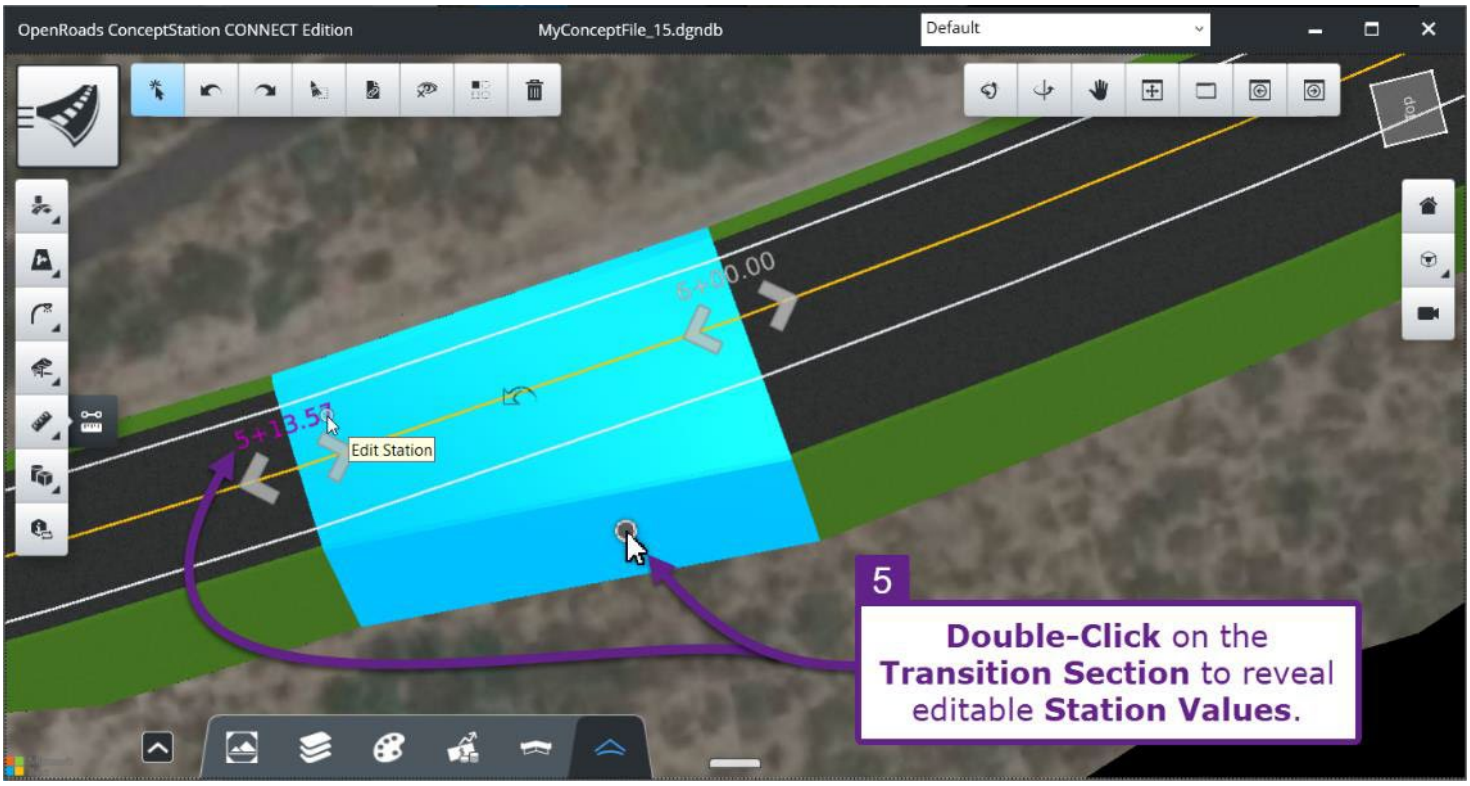
1	Select the **Road Template** tool. This tool is found with the *Road Placement* tools.
2	Select the **Template** that will be inserted into the Road Corridor Model.
3	Select the **Road Corridor Model**.



4	The exact station range for the Inserted Template can be set by pushing the ALT key to immobilize the **Floating Input Box**. When the floating box is immobilized, click on the Start Station value and key-in the desired value. Repeat this process for either the Length or End Station value. ***ALTERNATIVELY:*** The station range can be set graphically by clicking on the desired start and end point locations.



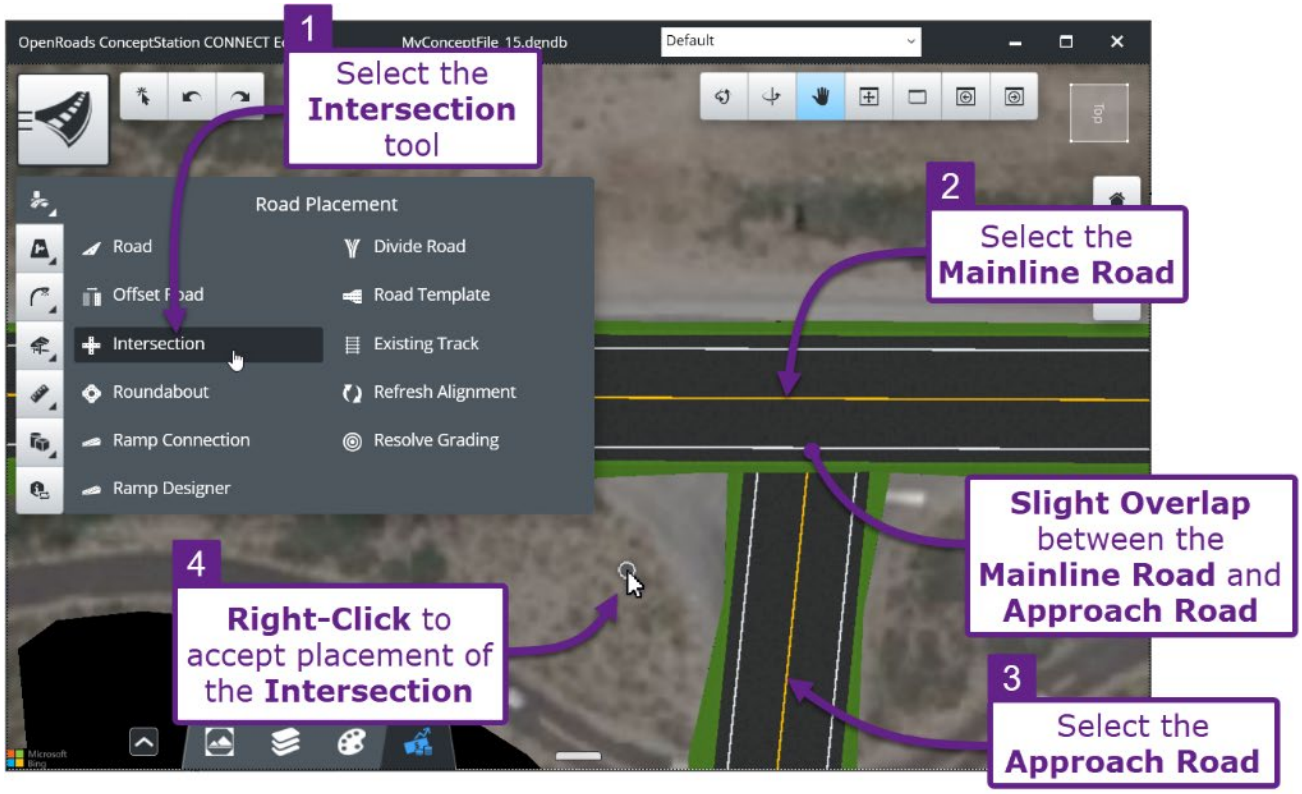
5	After the previous step, the **Inserted Template** and **Transition Sections** are created. Most likely, the station range for the Transition Sections will need to be edited. The station range for a Template Section is revealed by **double-clicking** on it. **Slowly** double-click to reveal editable station values and arrows. ***NOTE:*** If the double-click is too quick, then the entire Road Corridor Model will be selected.

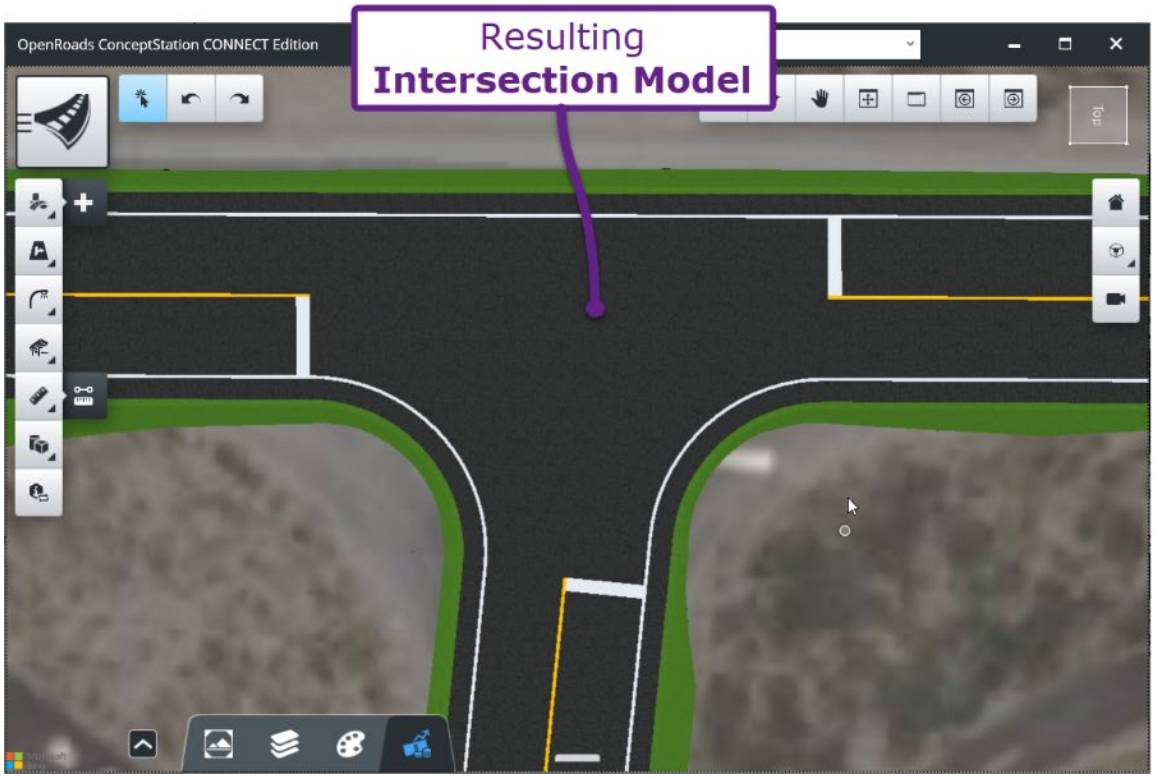


29F – CREATE AN INTERSECTION

Before creating an intersection, the Mainline Road and Approach Road must be created with the **Road** tool. The Mainline Road and Approach Road should be slightly overlapping.

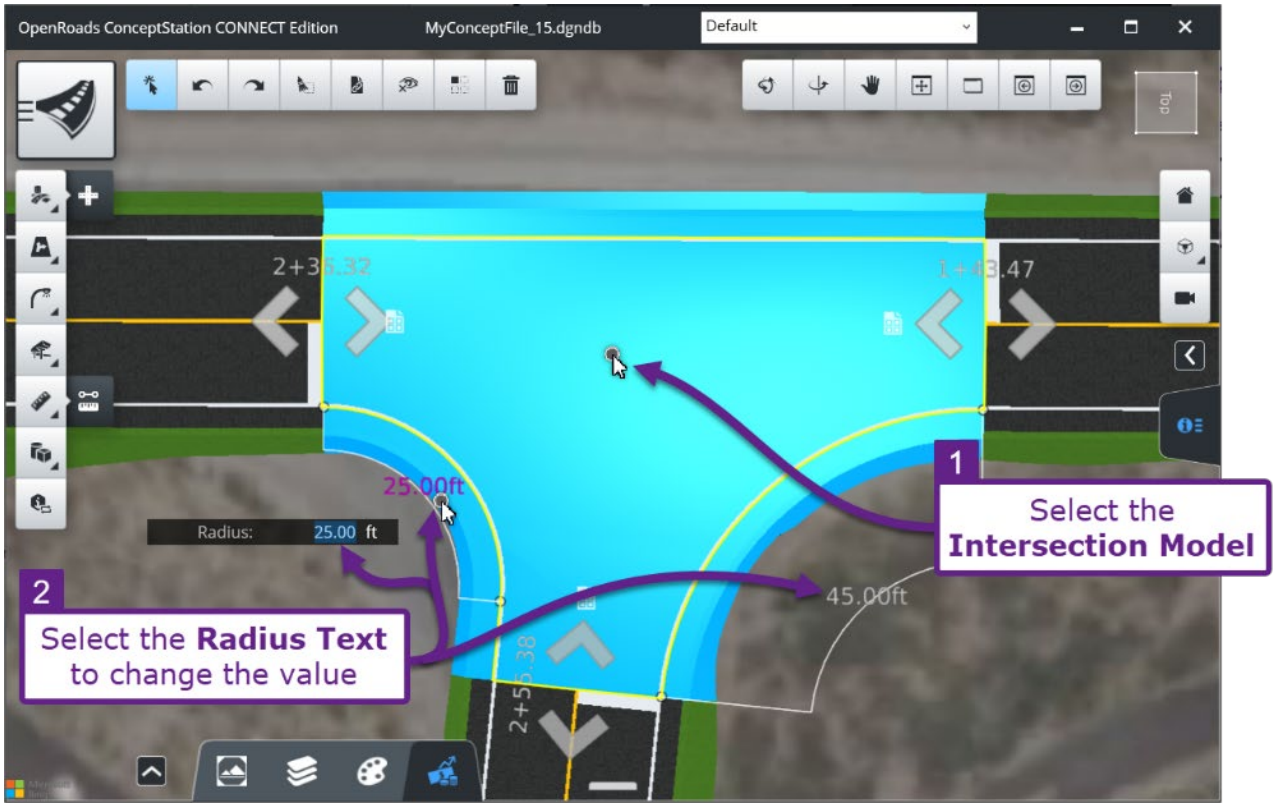
The **Intersection** tool is used to join the Mainline Road and Approach Road with an Intersection model.



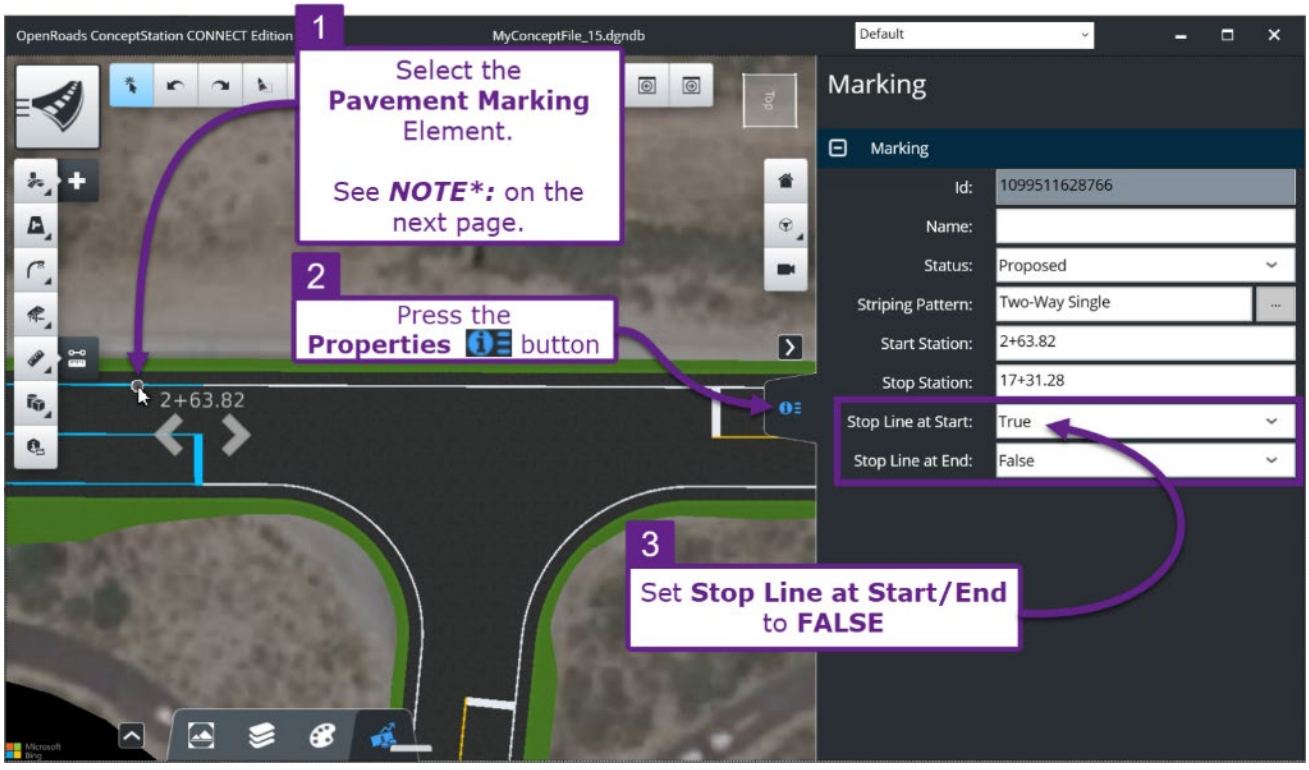


29F.1 Edit Intersection Radii and Pavement Markings

Edit Intersection Radii Values: Select the Intersection model to reveal editable text and arrows that control the radii for the intersection.

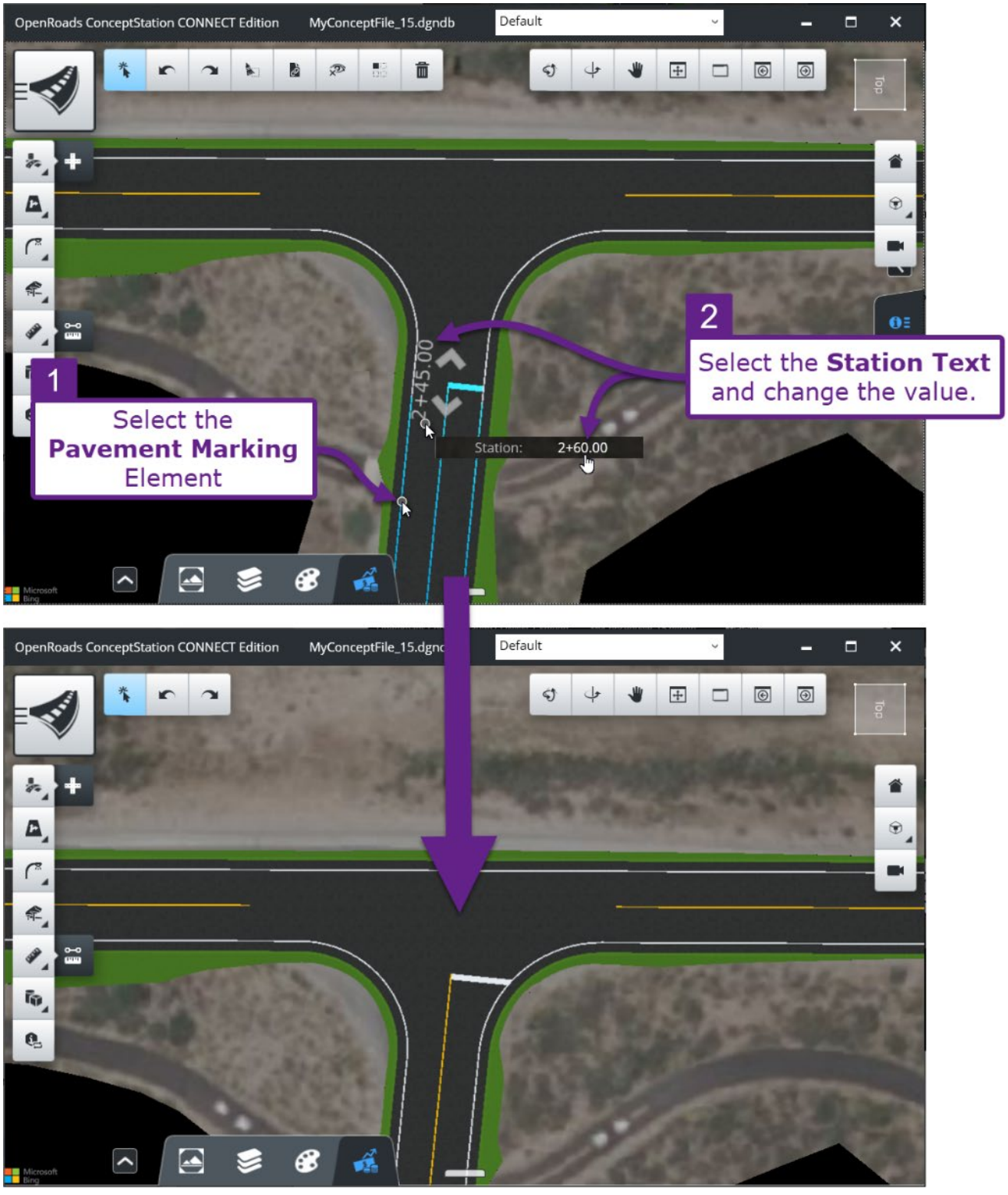


Remove Stop Bars: Stop Bars are built into the automatically-generated Pavement Marking elements. A Stop Bar is removed by selecting the Pavement Marking element and changing the "Stop Line at Start/End" settings to False in the Properties menu.

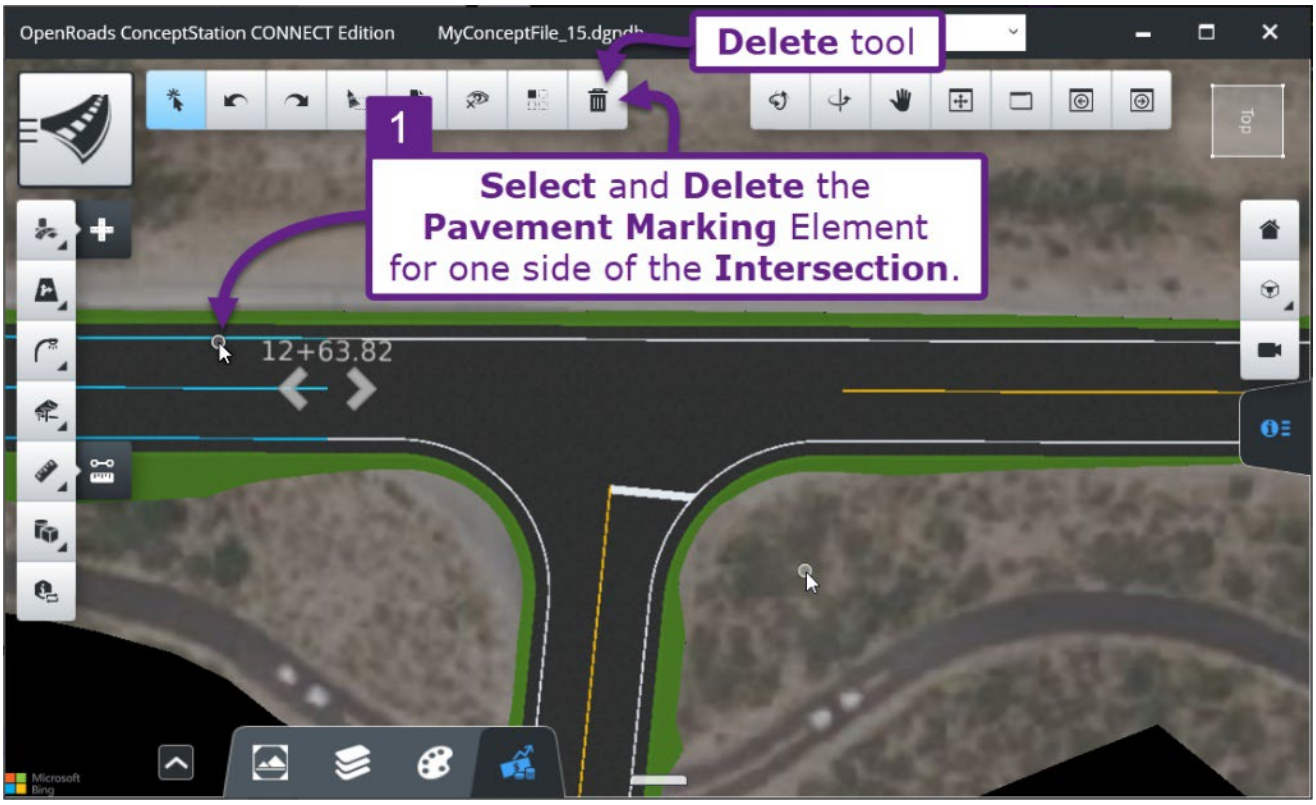


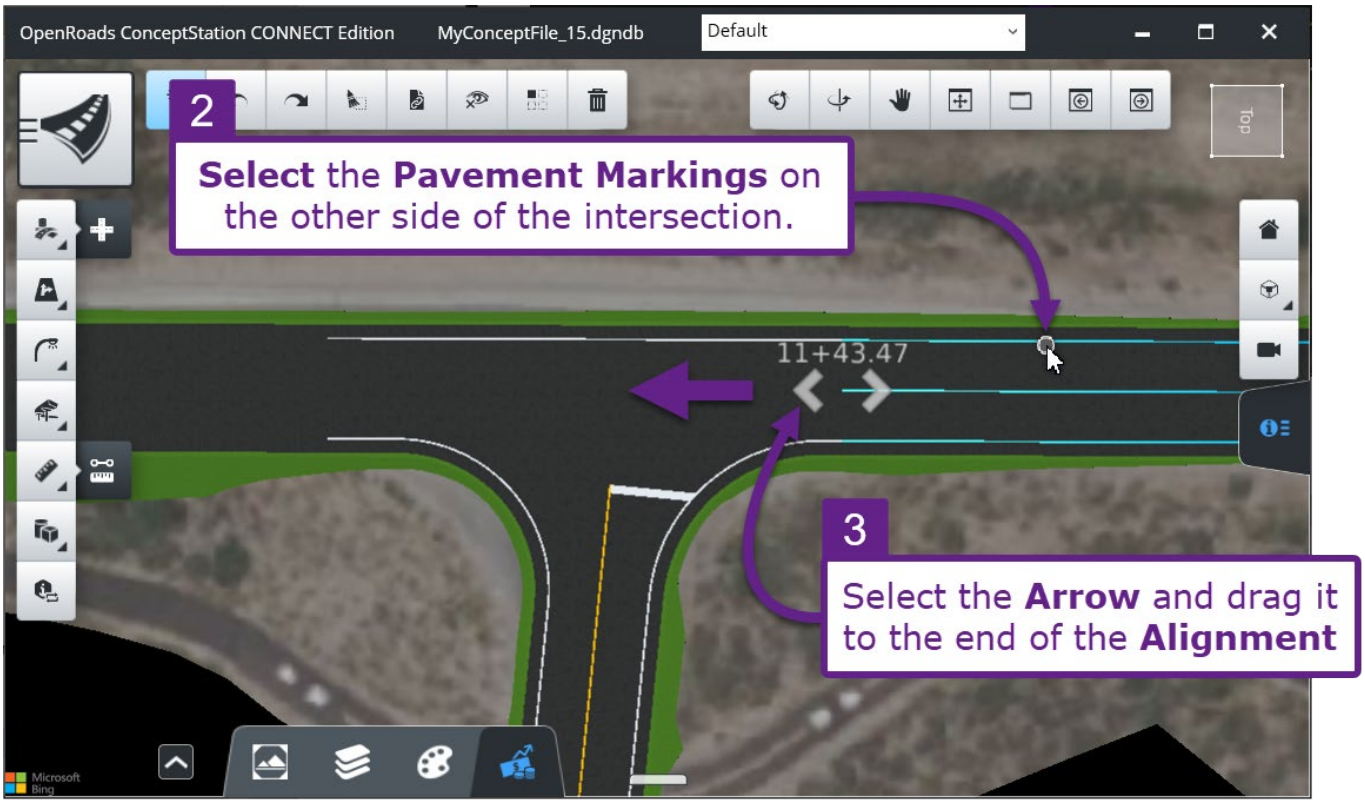
***NOTE*:** Pavement Markings and the Road Corridor Model are separate elements that overlap. If having difficulty selecting the Pavement Marking element, then hover the mouse cursor over a pavement marking and right-click to cycle between the Road Corridor Model and Pavement Marking elements. It may be necessary to right-click multiple times.

Reposition Stop Bars: Stop Bars are moved by selecting the Pavement Markings element to reveal editable station text and arrows. ***NOTE:*** Using the arrows to move the Stop Bar can be difficult because the arrows sporadically jump ahead or behind the mouse cursor. Instead, edit the station text to reposition the Stop Bar. This may require trial and error to determine the correct station for the Stop Bar.



Manipulate Pavement Markings through Intersection Area: The Pavement Markings for all legs of the intersection can be repositioned. To carry the Pavement Markings and centerline through the intersection, delete the Pavement Marking element on one side of the intersection. Then, select the Pavement Marking element on the other side of the intersection and drag it to the end of the Alignment.





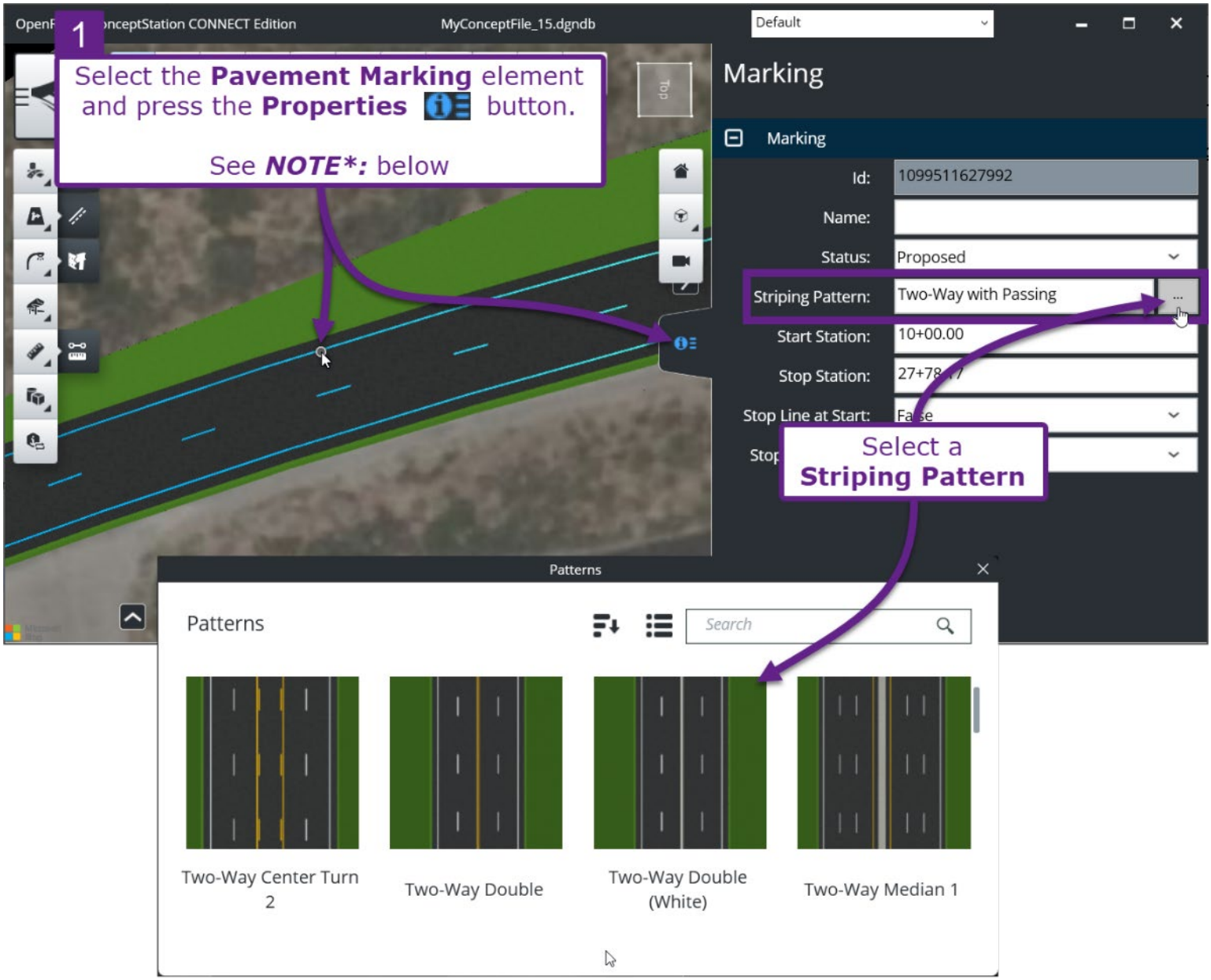
TIP: Change the Pavement Marking configuration with the **Striping Pattern** setting show in the Properties menu. To show a dashed yellow centerline marking, use the "Two-Way with Passing" striping pattern.

More information on Pavement Markings and Striping Patters is found in *29G – Create and Modify Pavement Markings*.

TIP: Pavement Markings can be manually drawn in the intersection with the *Street Marking*, *Linear Marking*, and *Transverse* tools. For more information, see *29G.2 Manually Create Pavement Markings*.

29G – CREATE AND MODIFY PAVEMENT MARKINGS

Pavement Markings are automatically-generated when a Road Corridor Model is created. To change the Pavement Marking configuration, select the Pavement Marking element and open the Properties menu. Change the **Striping Pattern** to the desired configuration.



NOTE*: Pavement Markings and the Road Corridor Model are separate elements that overlap. If having difficulty selecting the Pavement Marking element, then hover the mouse cursor over a pavement marking and right-click to cycle between the Road Corridor Model and Pavement Marking elements. It may be necessary to right-click multiple times.

TIP: To show a dashed yellow centerline marking, use the "Two-Way with Passing" pattern. Use the "Two-Way Double" pattern to show a double yellow centerline. Use the "Two-Way Single" pattern to show a solid yellow centerline. To show NO centerline, use the "Two-Way Center Turn 1" pattern.

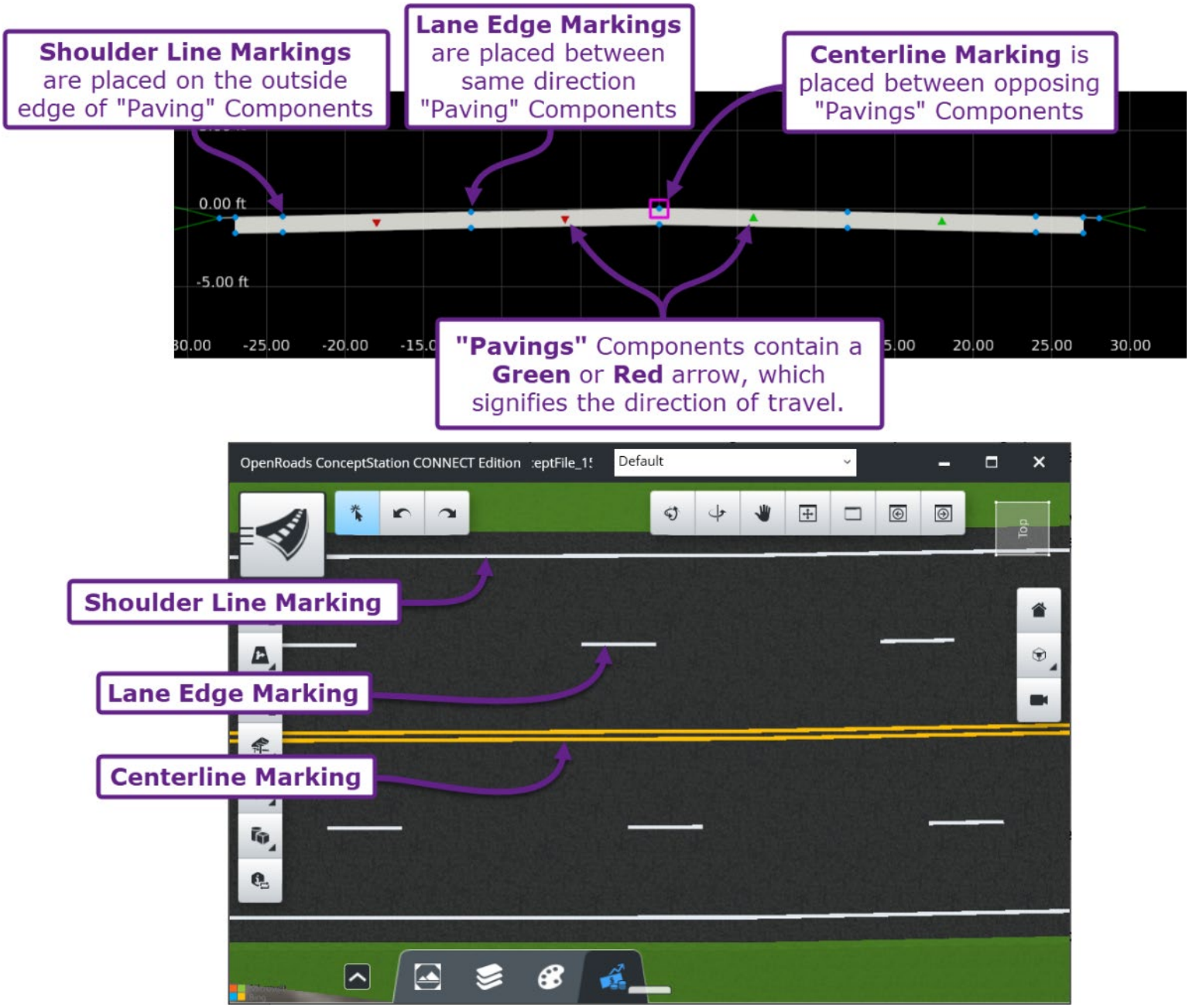
Striping Patterns CANNOT be edited. However, pavement markings can be manually drawn with the *Street Marking*, *Linear Marking*, and *Transverse* tools. See *29G.2 Manually Create Pavement Markings*.

Striping Patterns analyze the Road Template to place marking lines in the appropriate locations. Specifically, the "Pavings" components in the Road Template are analyzed. For more information on "Pavings" components, see *29D.3 Overview of Component Types*.

Centerline Markings are placed between opposing "Paving" components. The red and green arrows represent the direction of travel for a "Paving" Component.

Shoulder Line Markings are placed on the outside edge of a "Paving" component.

Lane Edge Markings are placed between two "Paving" components with the same direction of travel.

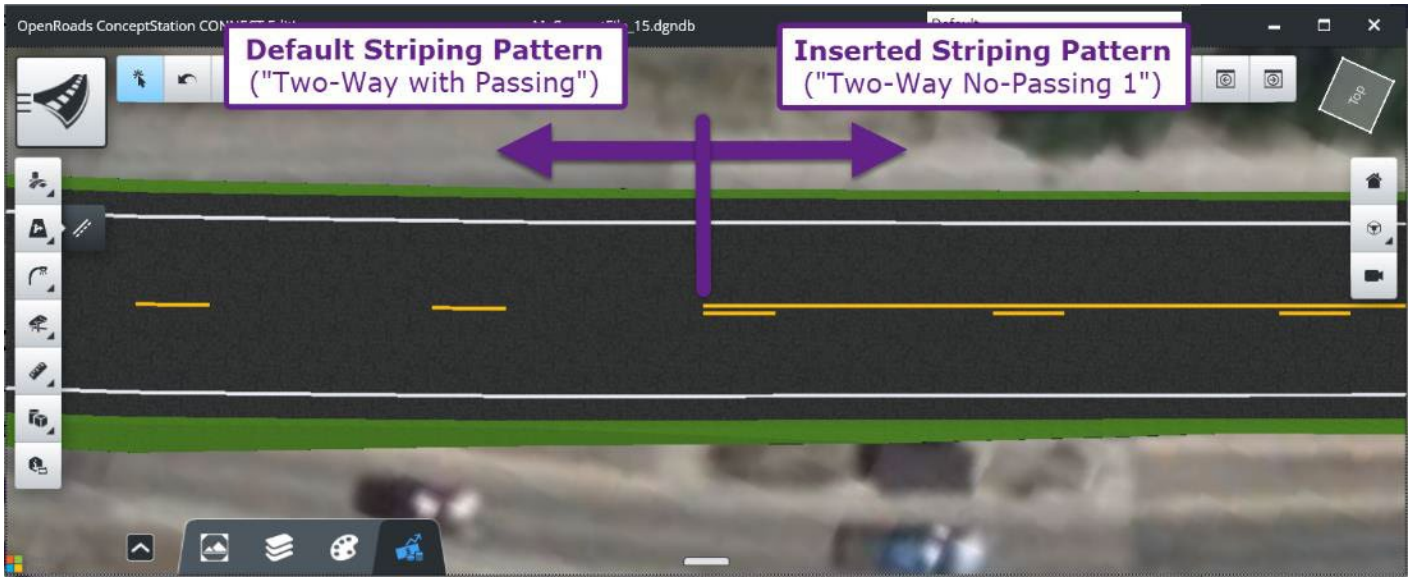


NOTE: If a two-lane Template is used in the Road Corridor Model, then the **Lane Edge Markings** will be omitted. Only **Centerline Markings** and **Shoulder Line Markings** are placed with two-lane Templates.

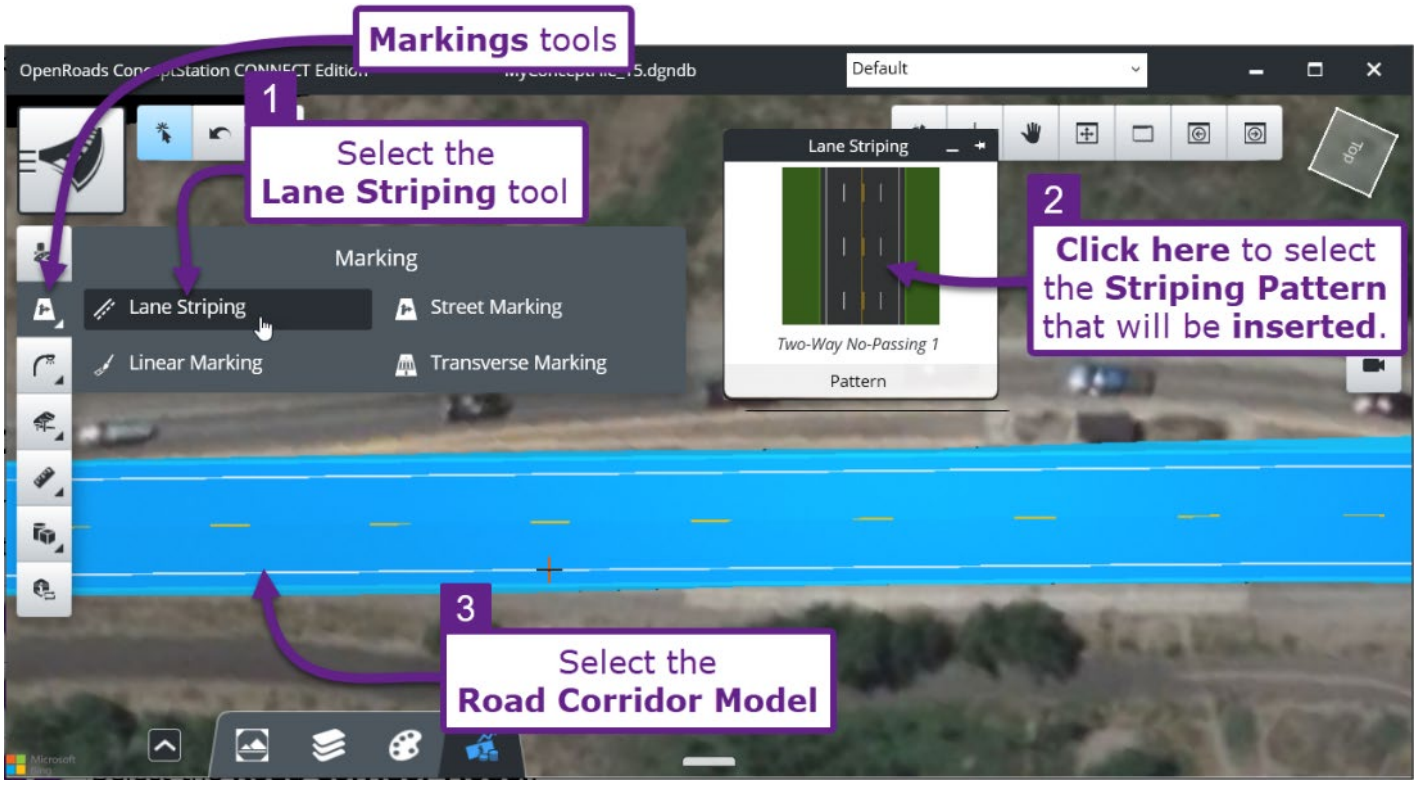
29G.1 Apply Multiple Striping Patterns to the Road Corridor Model

The *Lane Striping* tool is used to insert a different Striping Pattern for a portion of the road Alignment. With this tool, multiple Striping Patterns can be used in the same Road Corridor Model.

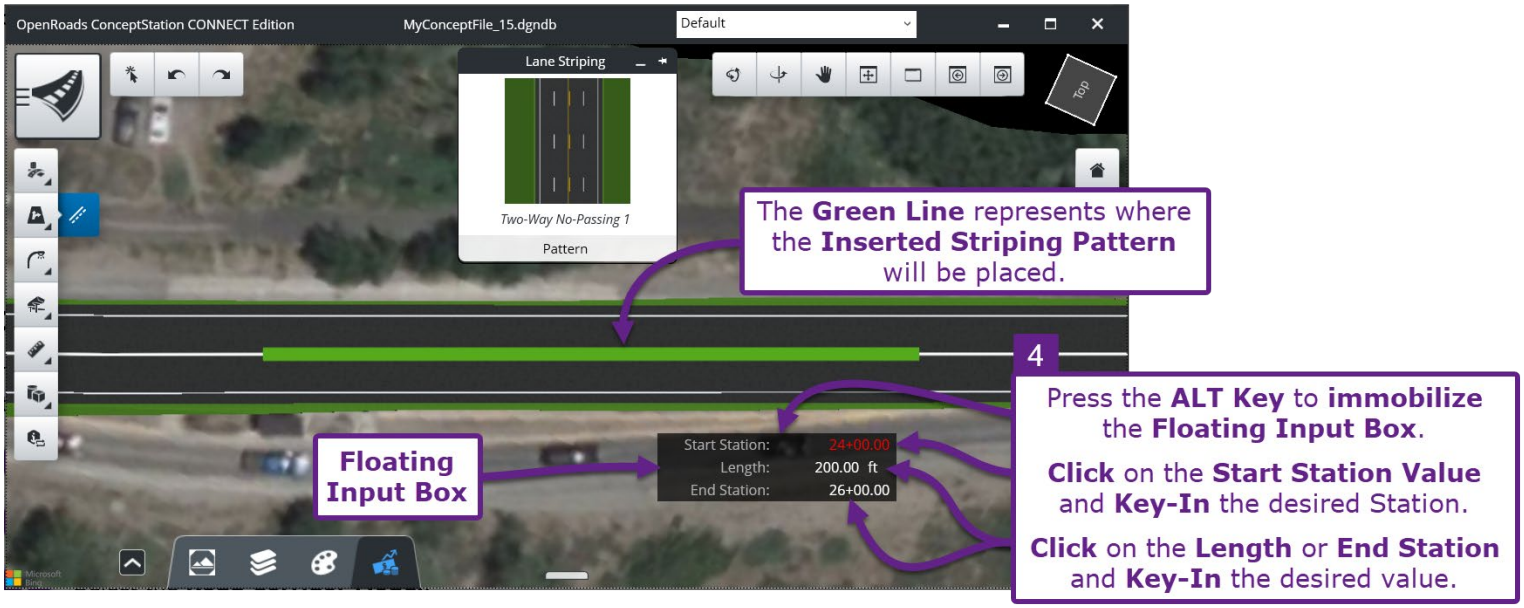
In this demonstration, the "Two-Way No-Passing 1" pattern will be inserted to designate a no passing zone for the left lane.



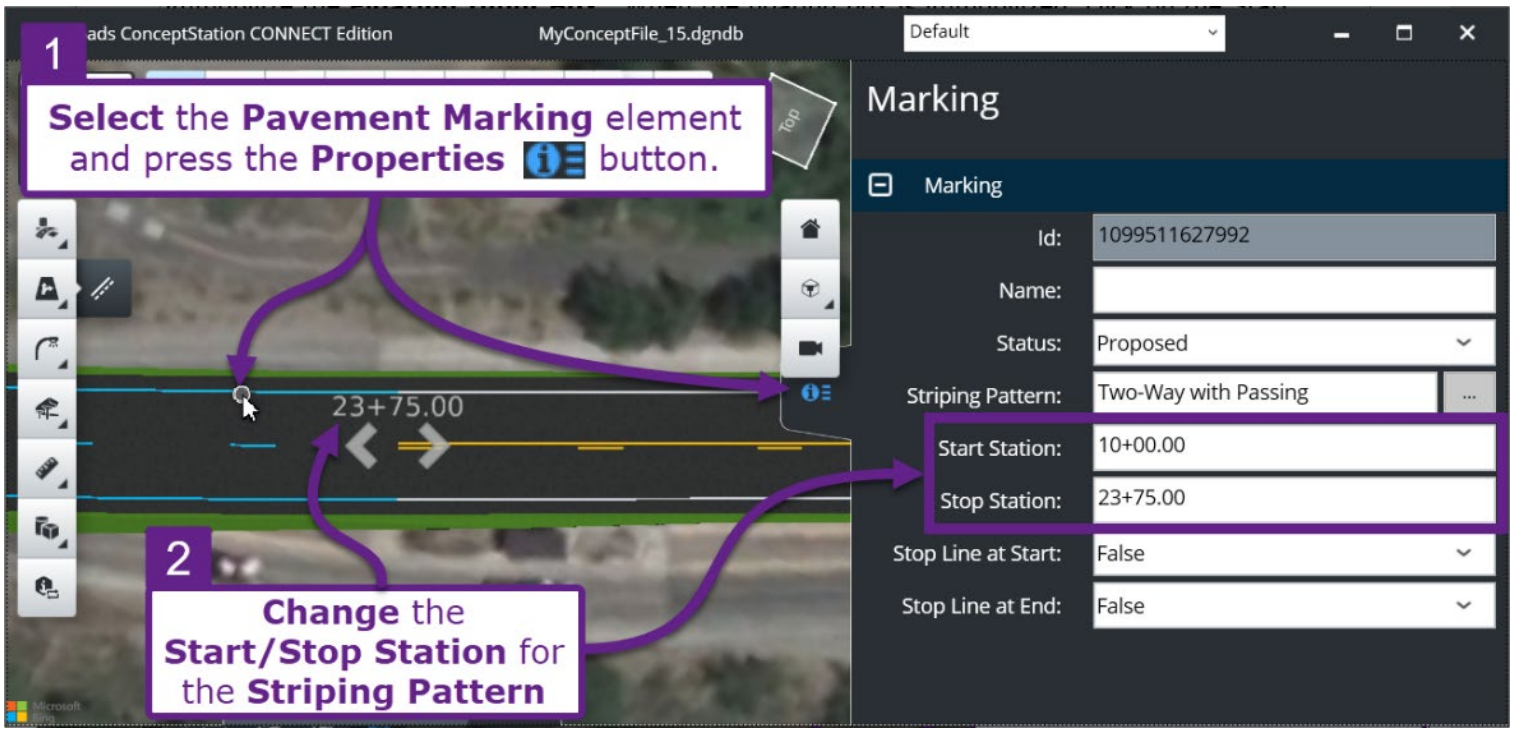
1	Select the **Lane Striping** tool. This tool is found with the *Markings* tools.
2	Select the **Template** that will be inserted into the Road Corridor Model.
3	Select the **Road Corridor Model**.



4	The exact station range for the inserted Striping Pattern can be set by pushing the ALT key to immobilize the **Floating Input Box**. When the floating box is immobilized, click on the Start Station value and key-in the desired value. Repeat this process for either the Length or End Station value. ***ALTERNATIVELY:*** The station range can be set graphically by clicking on the desired start and end point locations.

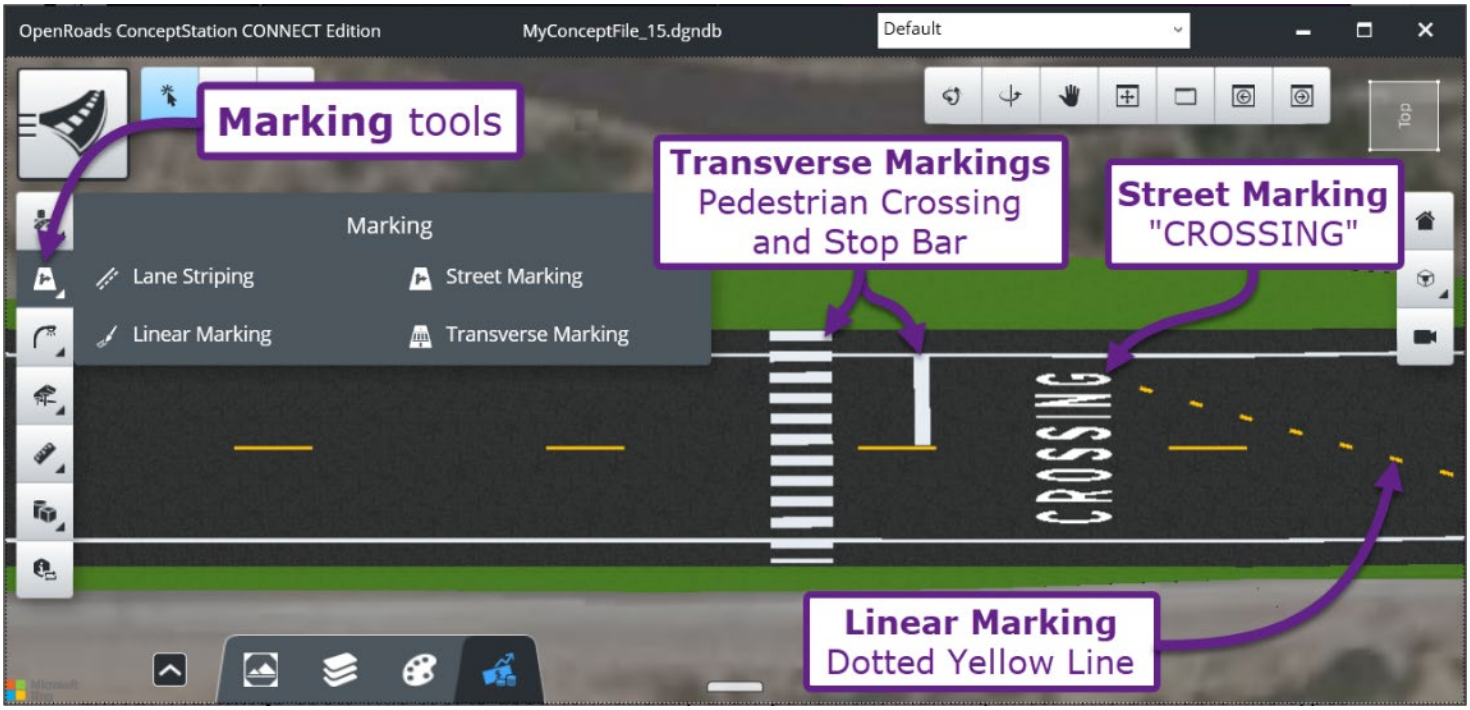


TIP: After placement, the station range can be changed by selecting the Pavement Marking element. Change the station range in the Properties menu or with the station text and arrows shown on the selected element.



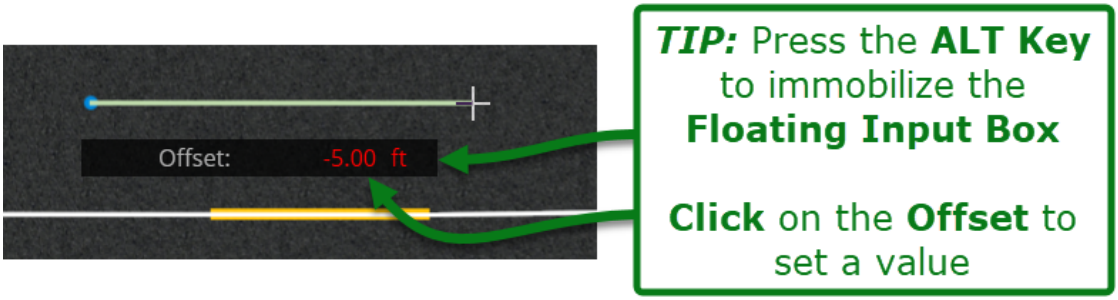
29G.2 Manually Create Pavement Markings

The *Linear Markings*, *Street Markings*, and *Transverse Markings* tool are used to manually create Pavement Markings.



Linear Markings tool: This tool is used to manually draw pavement marking lines. The available line types include solid, broken, dotted, and solid-double. With this tool, the marking line can be manually drawn or offset from the alignment. If the linear marking is offset from the alignment, the marking line will follow curves in the Alignment. ***NOTE:*** The width of a Linear Marking CANNOT be changed.

> ***TIP:*** When placing Linear Markings, press the ALT Key to immobilize the Floating Input Box by pressing the ALT key. When the Floating Input Box is immobilized, click on the **Offset** to set a value and lock it.



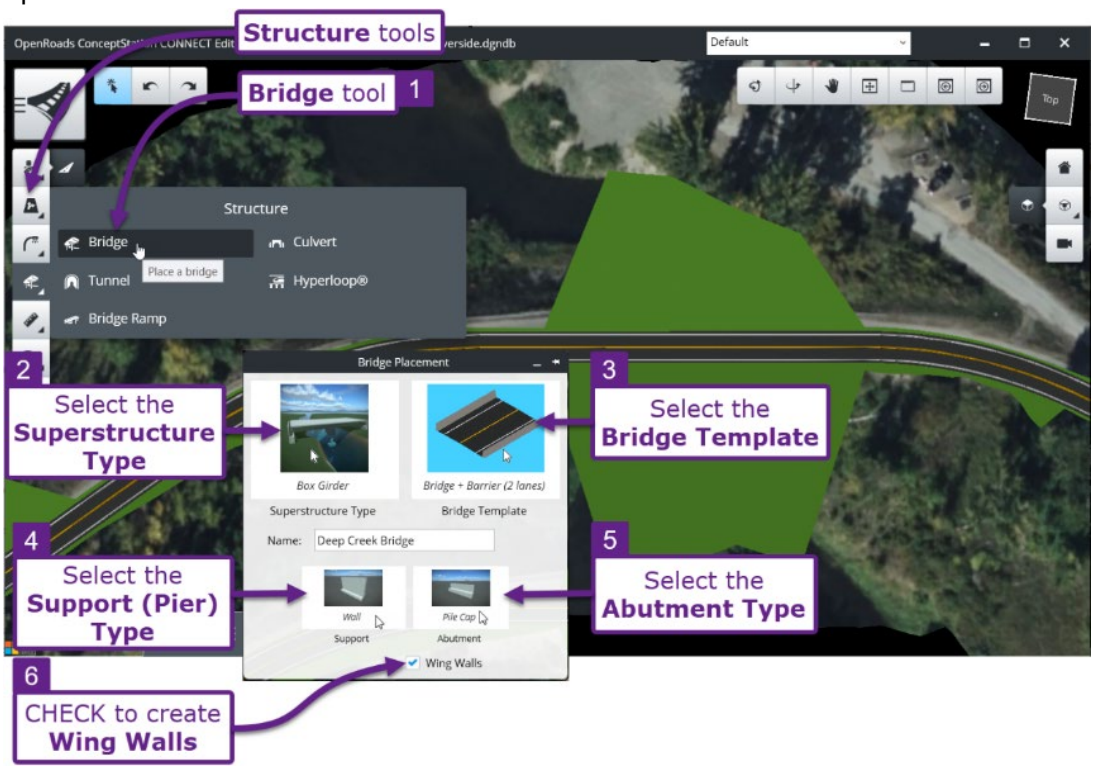
Street Markings tool: This tool is used to place common pavement marking symbols, such as turn arrows, thru arrows, accessibility parking, bike lane markings, and "SCHOOL" markings. ***NOTE:*** The size of a Street Marking CANNOT be changed.

Transverse Markings tool: This tool is used to place pedestrian crossings, bike crossings, and stop bar pavement markings. ***NOTE:*** The spacing and width of a Transverse Markings CANNOT be changed.

29H – CREATE A BRIDGE

The **Bridge** tool is used to place a bridge along the alignment of the Road Corridor Model. Before using this tool, a Road Corridor Model must be created. See *29E – Create the Road Alignment, Profile, and Corridor*.

Also, before using this tool, a Bridge Template should be created in the Template Editor. See *29D - Create and Edit Templates*. When creating the Bridge Template set the pavement section depths, lane and shoulders widths, and the barriers components to be used. Do NOT model the girder or superstructure geometry in the Bridge Template. The superstructure geometry is automatically determined by the Type selected in step 2.

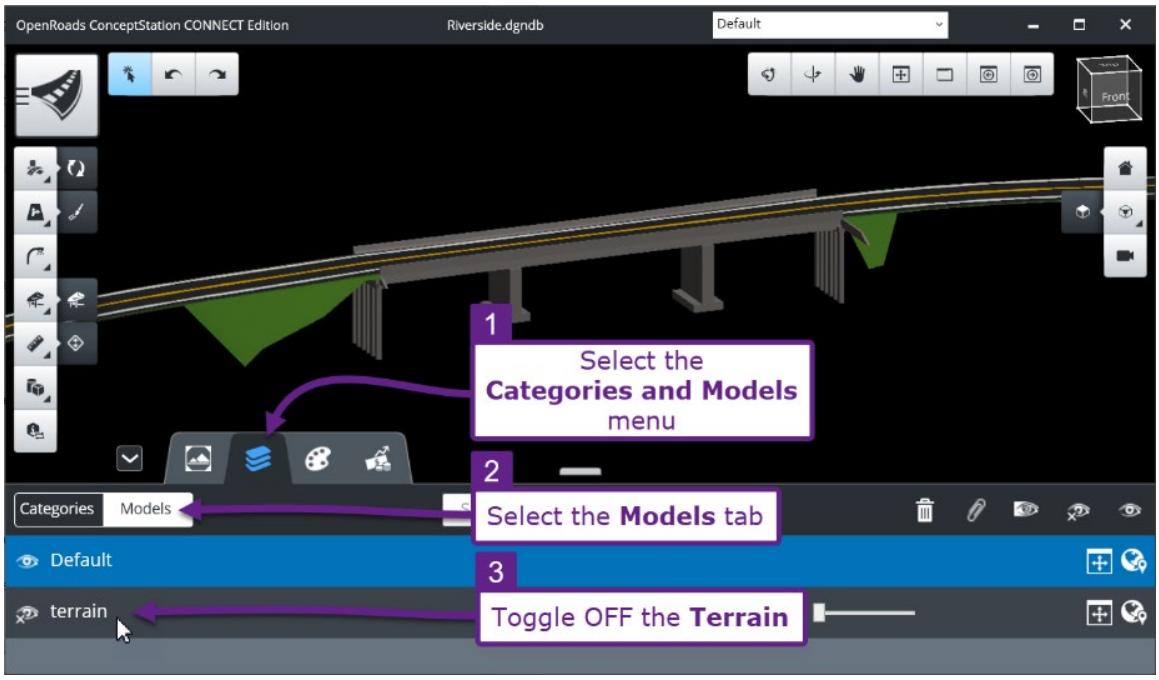


1	Select the **Bridge** tool. This tool is located with the **Structure** tools.
2	Select the **Superstructure Type**.
3	Select the **Bridge Template**.
4	Select the **Support (Pier) Type**. ***NOTE:*** Piers can be deleted, moved, rotated, and modified after bridge creation.
5	Select the **Abutment Type**. ***NOTE:*** Abutments can be rotated to the desired skew angle after creation. Initially, the Abutments will be set without a skew angle.
6	CHECK the **Wing Walls** box to create wing walls that stem from the abutment. If Wing Walls are NOT used, then road fill will be projected to the ground underneath the bridge. ***NOTE:*** After initial creation, Wing Walls may appear "floating" above the road fill slope. Wing Walls require properties edits for a realistic appearance. See *29H.1 Edit the Bridge.*

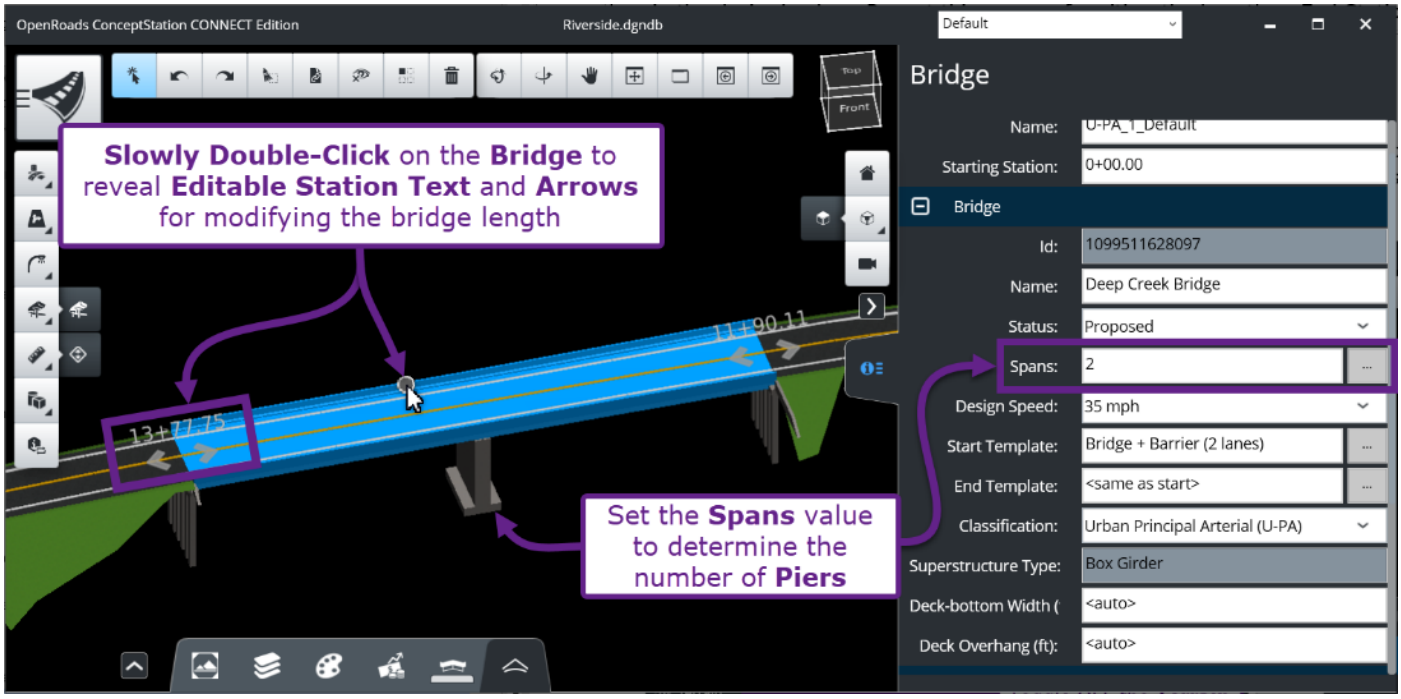
7	Select the Road Corridor Model.
8	Select the **Start Station** and **End Station** for the bridge. ***TIP:*** The exact station range for the bridge can be set by pushing the ALT key to immobilize the **Floating Input Box**. When the floating box is immobilized, click on the Start Station value and key-in the desired value. Repeat this process for either the Length or End Station value.

29H.1 Edit the Bridge

Commonly, the Terrain will cover up the abutments and wing walls, which makes these elements difficult to select for editing. When editing the bridge, it is recommended the display of the Terrain is toggled OFF. The display of the Terrain is toggled OFF in the **Categories and Models** menu, in the **Models** tab .

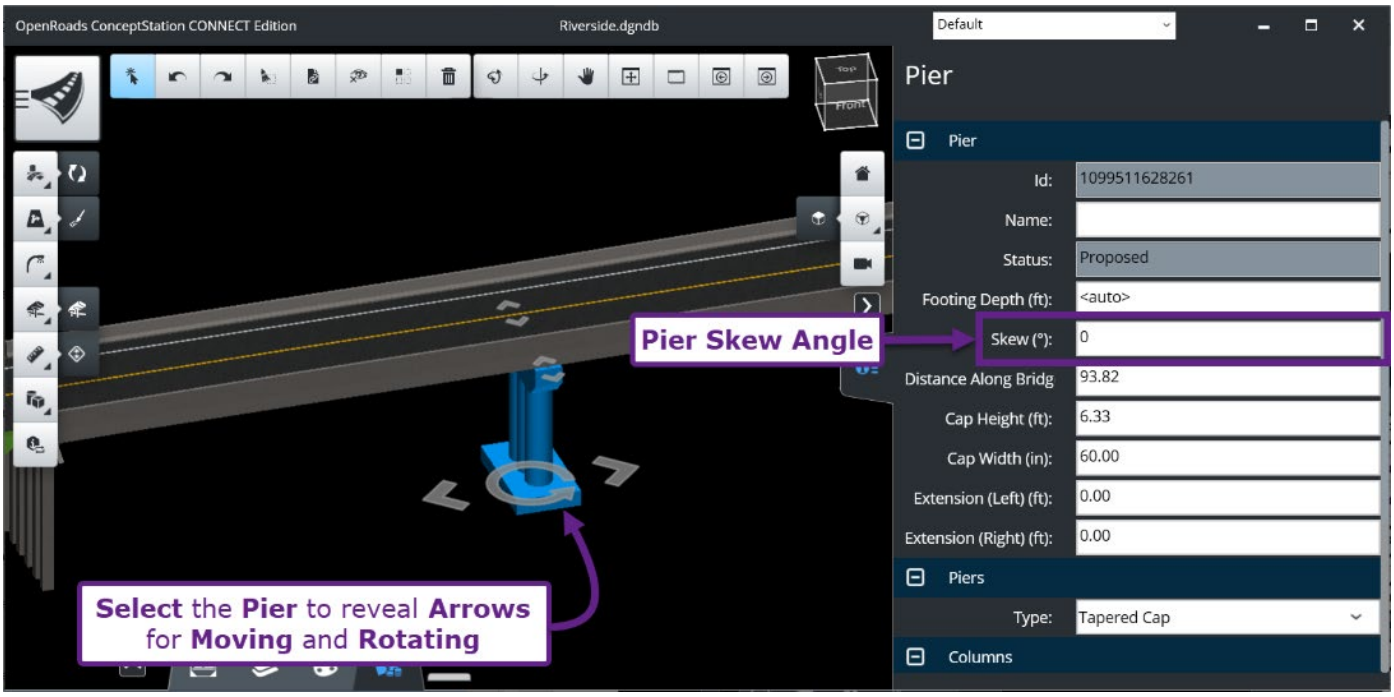


Modify the Length of the Bridge: To edit the station range and length for the bridge, **double-click** on the bridge section. **Slowly** double-click on the bridge section to reveal editable station values and sliding arrows. ***NOTE:*** If the double-click is too quick, then the entire Road Corridor Model will be selected.



Set the Number of Piers Used for the Bridge: In the Bridge properties (shown above), the **Spans** value determines how many piers are used. If the **Spans** value is set to 1, then NO piers will be used.

Move, Rotate and, Edit the Geometry for Piers: Select a Pier to reveal arrows for moving and rotating the piers. Alternatively, the skew angle for the pier can be changed in the properties. Also in the properties, there are options for editing the geometry of the Pier, such as footing depth and cap height.

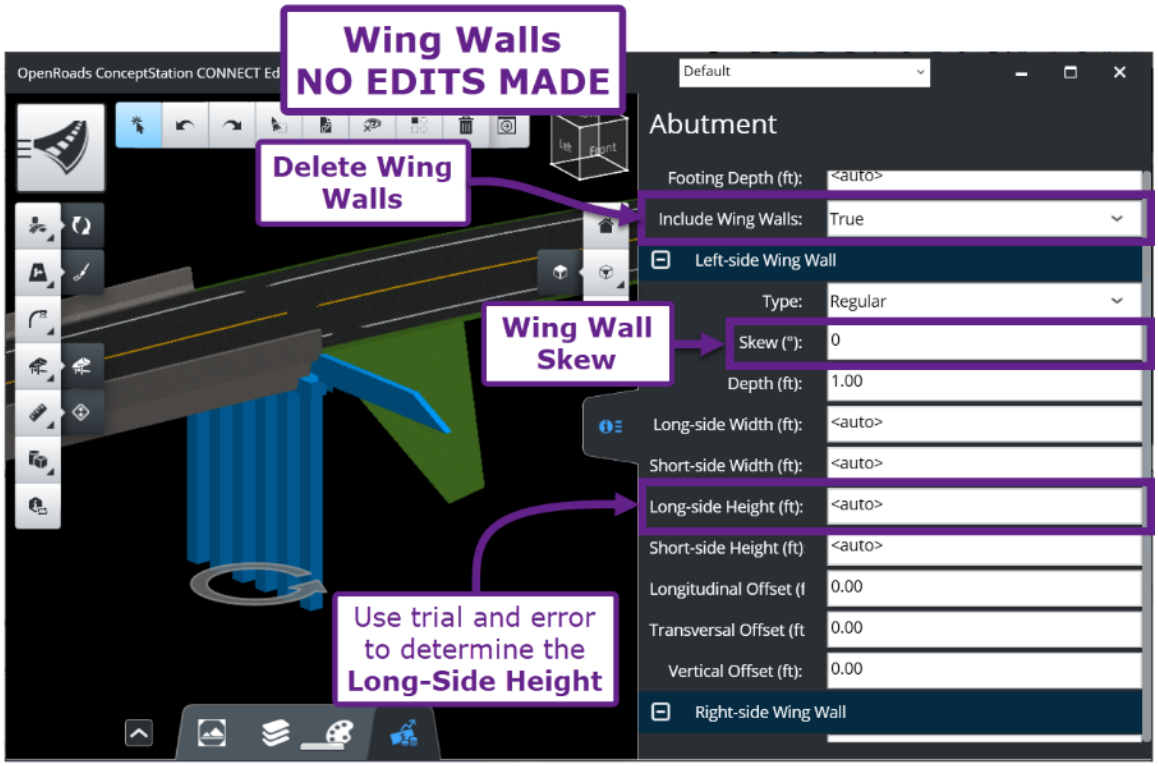


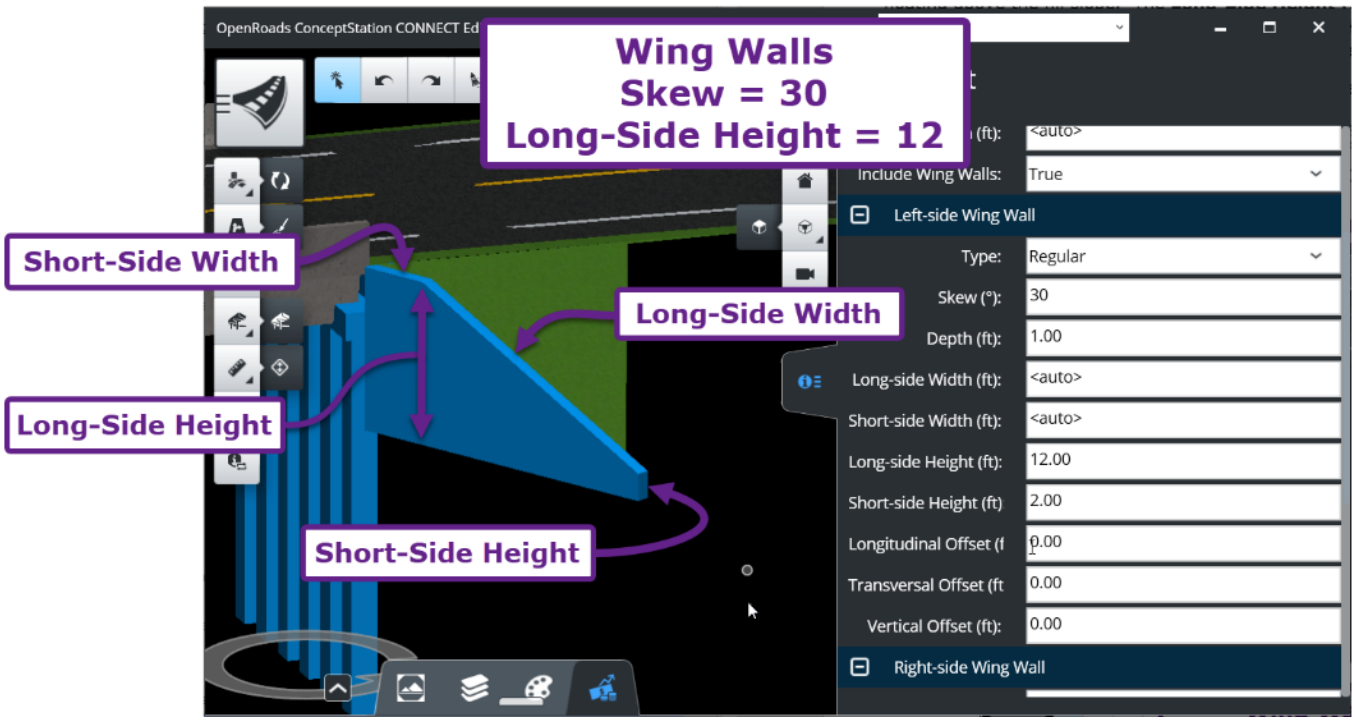
TIP: The skew angle for the **Abutments** can be changed in a similar manner. Select an **Abutment** to alter the skew angle in the properties.

Editing the Wing Walls: As shown below, when no edits are made to a Wing Wall, then it will appear floating above the fill slope. The **Long-Side Height (ft)** property must be modified to show the wing wall intersecting the fill slope. By default, the **Long-Side Height (ft)** property is set to "<auto>", but this setting can be changed to a numerical value. Use trial and error to determine the appropriate **Long-Side Height (ft)** value.

As shown below, the Short-Side Length (ft), Long-Side Width (Ft), and Short-Side Width (ft) properties also affect the geometry of the wingwall. The Depth (ft) property controls the thickness of the Wing Wall.

TIP: Use the **Skew** property to skew the wingwalls. Set the **Include Wing Walls** property to FALSE to delete the Wing Walls.

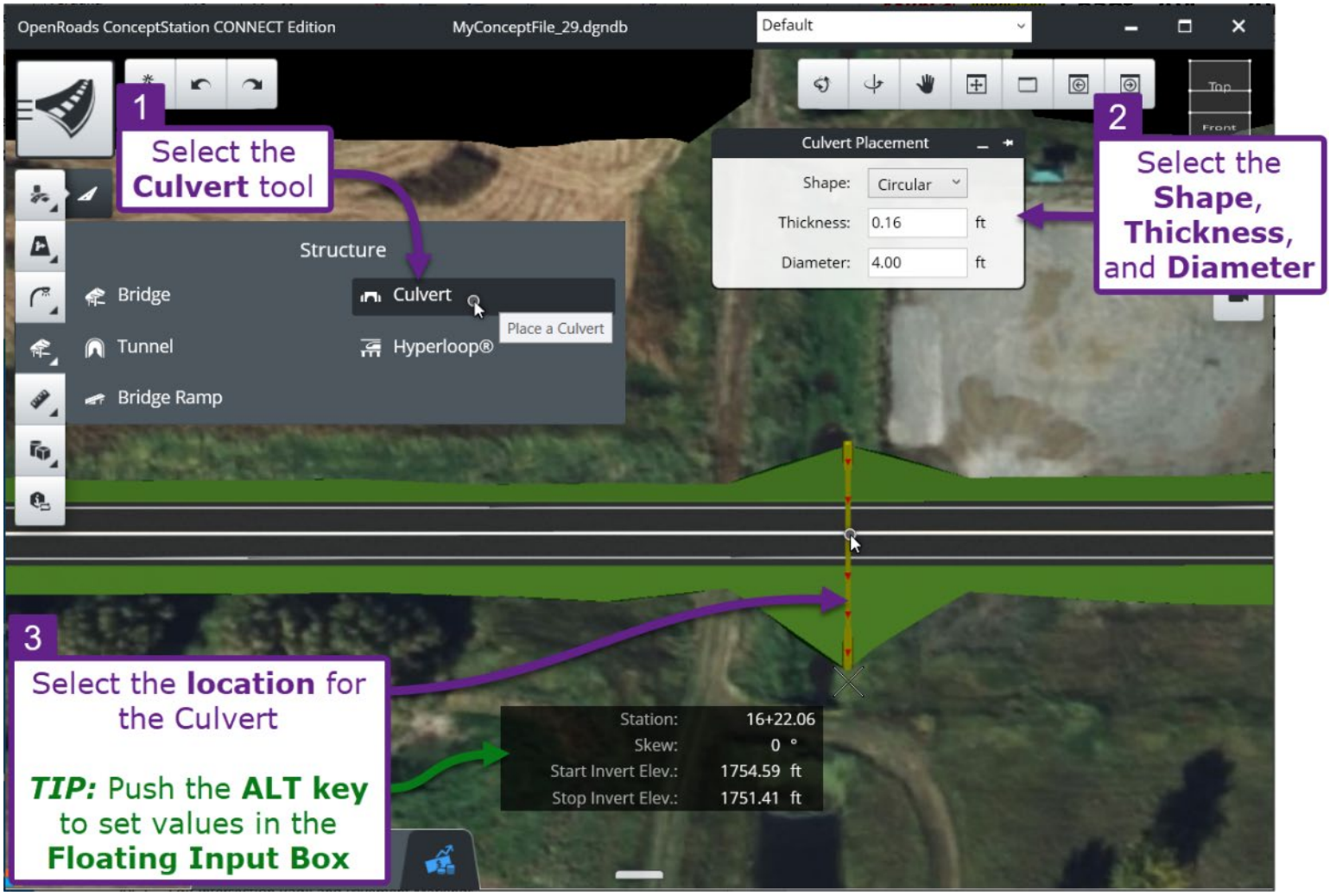




29I – CREATE A CULVERT

The **Culvert** tool is used to place a Culvert underneath the Road Corridor Model.

The diameter, skew, and inverts of the culvert can be manually set. However, the length of the culvert is automatically determined by the width of the Road Corridor Model at the selected location.



TIP: After placement, select the Culvert to change the diameter and skew values in the Properties menu.

29J – PLACE FURNITURE: GUARDRAILS, SIGNS, FENCES, AND OBJECTS

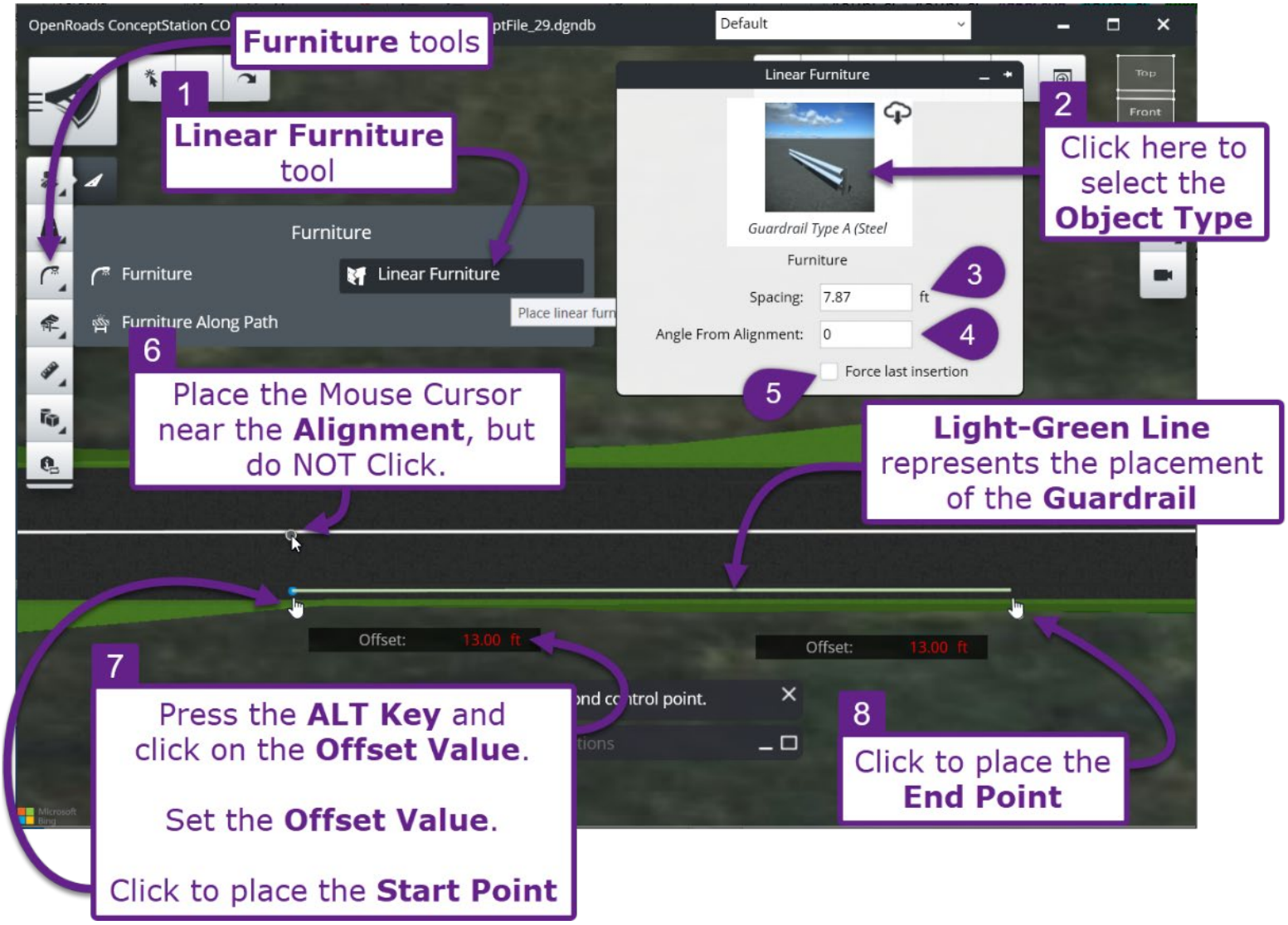
The Furniture tools are used to place roadside objects. There are three tools for placing Furniture:

Furniture tool: Used to place a variety of objects including signs, street lights, traffic signals, benches, fire hydrants, and traffic barrels.

Furniture Along Path tool: With this tool, a path is drawn and the selected object is placed at multiple interval locations along the path. For example, this tool can be used to place multiple street lights alongside the road alignment. This tool uses the same object library as the *Furniture* tool.

Linear Furniture tool: This tool is used to place guardrail and fence lines. The guardrail or fence line is created by offsetting an alignment. The guardrail or fence line will follow curves in the selected alignment.

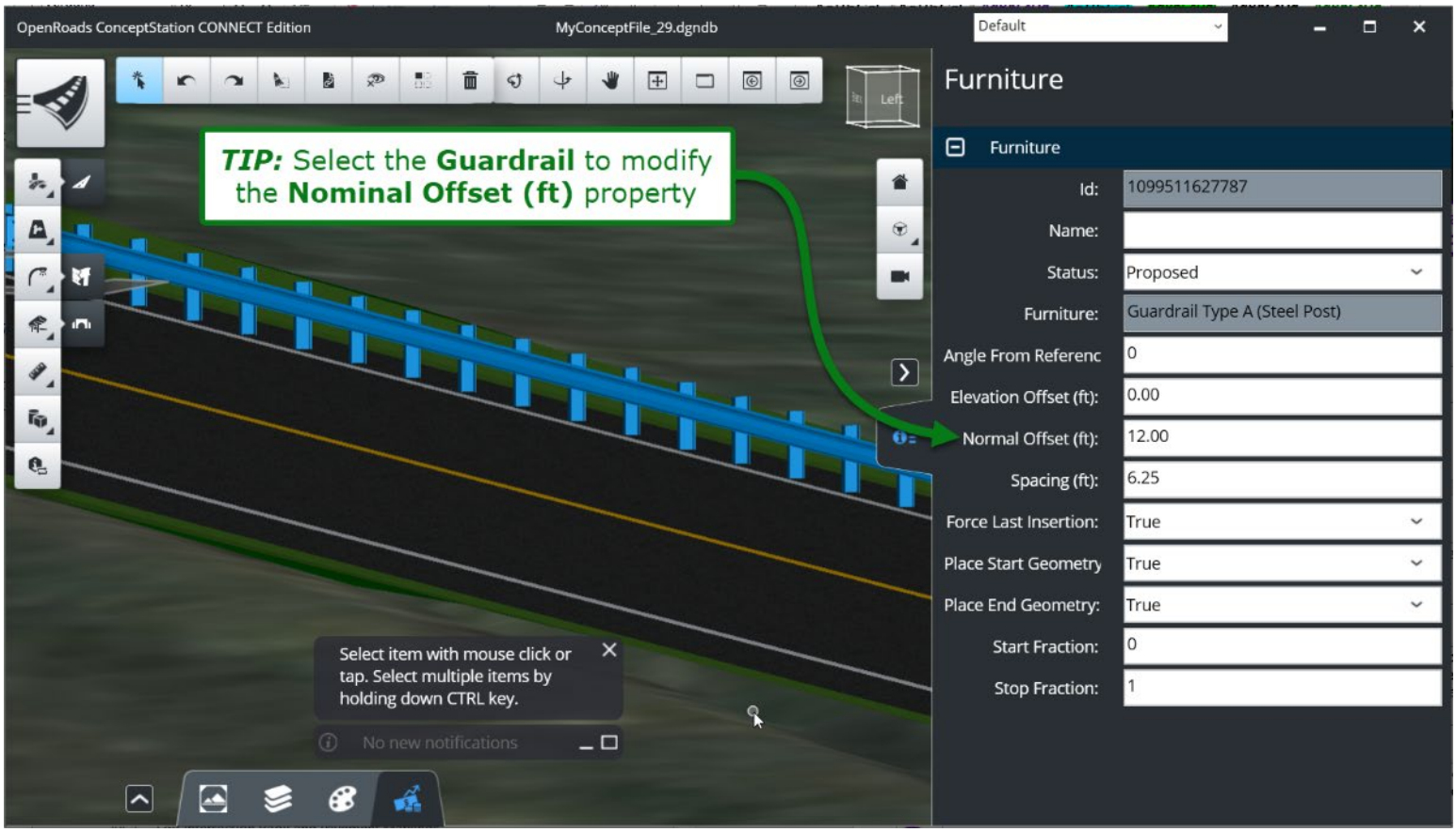
Placing guardrail with the **Linear Furniture tool** is demonstrated below:



1	Select the **Linear Furniture** tool.
2	Select the **Object Type** to be placed.

3	**Spacing:** For guardrails and fences, the Spacing value sets the distance between posts. ***NOTE:*** The default value corresponds with standard post spacing distances.
4	**Angle from Alignment:** If set to a value other than 0, then the guardrail and fence posts will be skewed. The angle of the guardrail face or fence face is NOT affected by this setting.
5	**Force Last Insertion:** The *Linear Furniture* tool CANNOT place a portion of a guardrail segment. If this box is CHECKED, then the guardrail will be slightly longer than specified, in order to place the full portion of the last guardrail segment. If UNCHECKED, then the guardrail will be slightly shorter than specified.
6	Hover the mouse cursor near the Alignment, but do NOT place the start point.
7	Press the **ALT** key to immobilize the Floating Input Box. When immobilized, click on the Offset value and key-in the desired value. Press the **Enter** key to lock the value. Place the mouse-cursor at the desired start point and click to accept.
8	Place the mouse-cursor at the desired end point and click to accept.

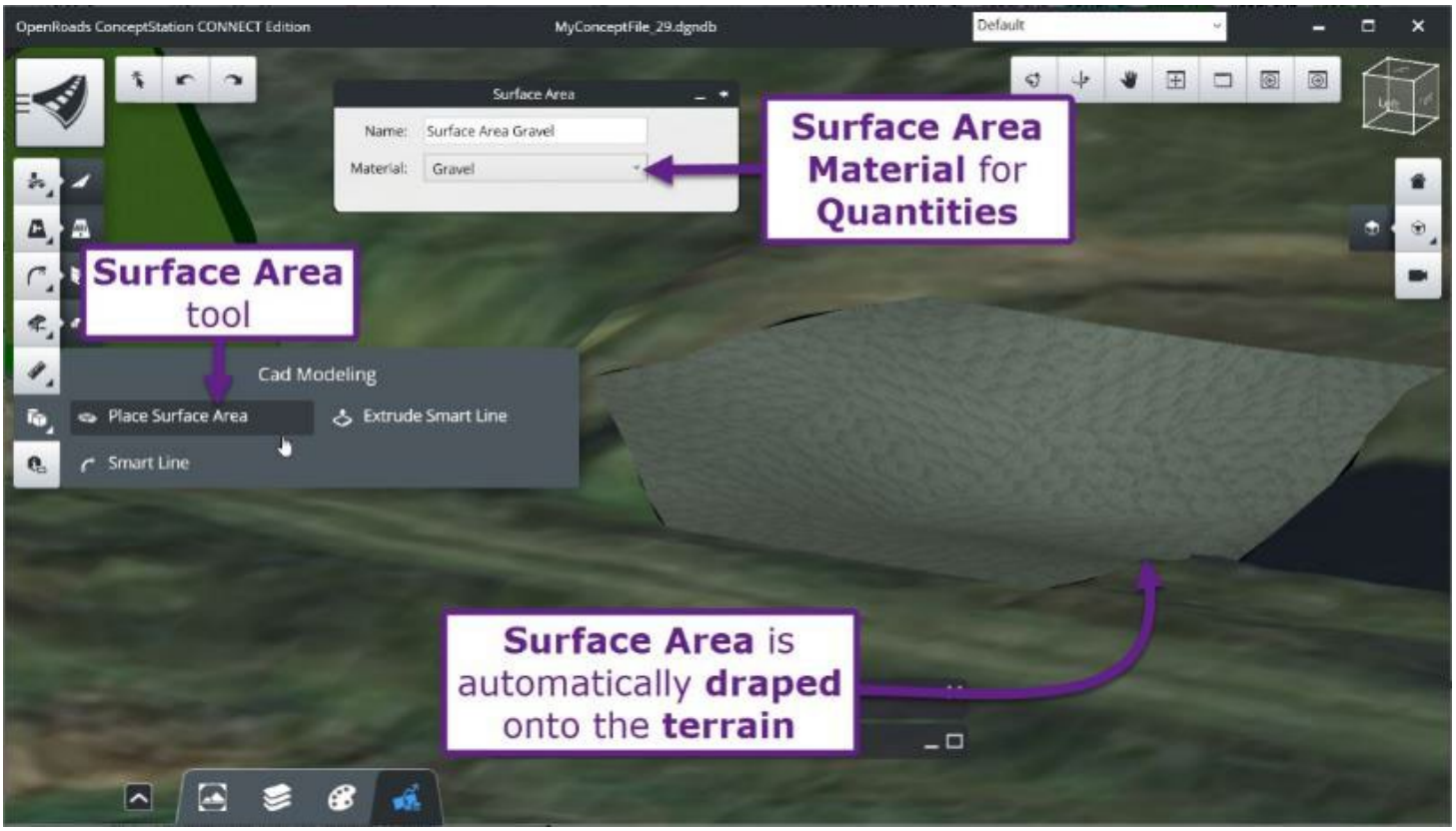
TIP: After placement, select the guardrail or fence object to view its properties. In the properties, the offset distance from the alignment can be changed.



29K – DRAW SMART LINES AND SHAPES

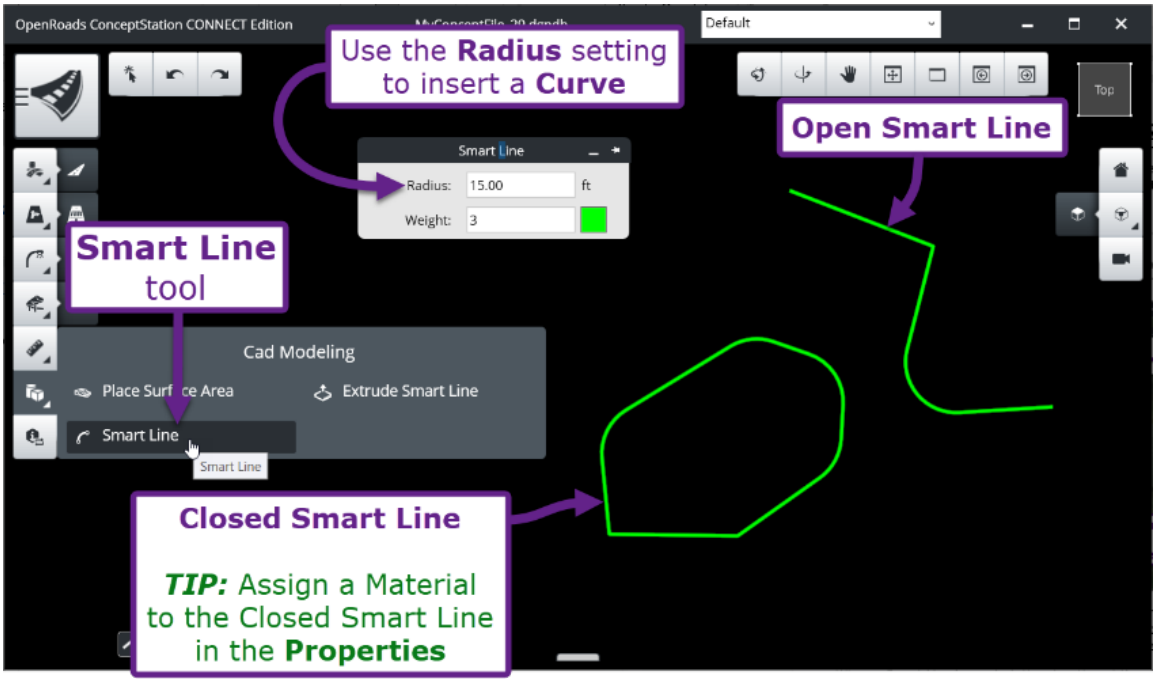
The CAD Modeling tools are used to draw Smart Lines and 2D areas. ***NOTE:*** The Smart Line or Surface Area tools can be used to draw out a parking line. However, pavement markings CANNOT be placed on the surface of a closed Smart Line or Surface Area.

Place Surface Area tool: This tool is used to draw a closed shape. The closed shape is draped onto the surface of the terrain. The resulting closed shape is composed of line segments. Curves CANNOT included in a closed shape drawn with this tool. The resulting Surface Area can be assigned a Material for quantities calculations. ***NOTE:*** Surface Areas CANNOT be extruded with the *Extrude Smart Line* tool.

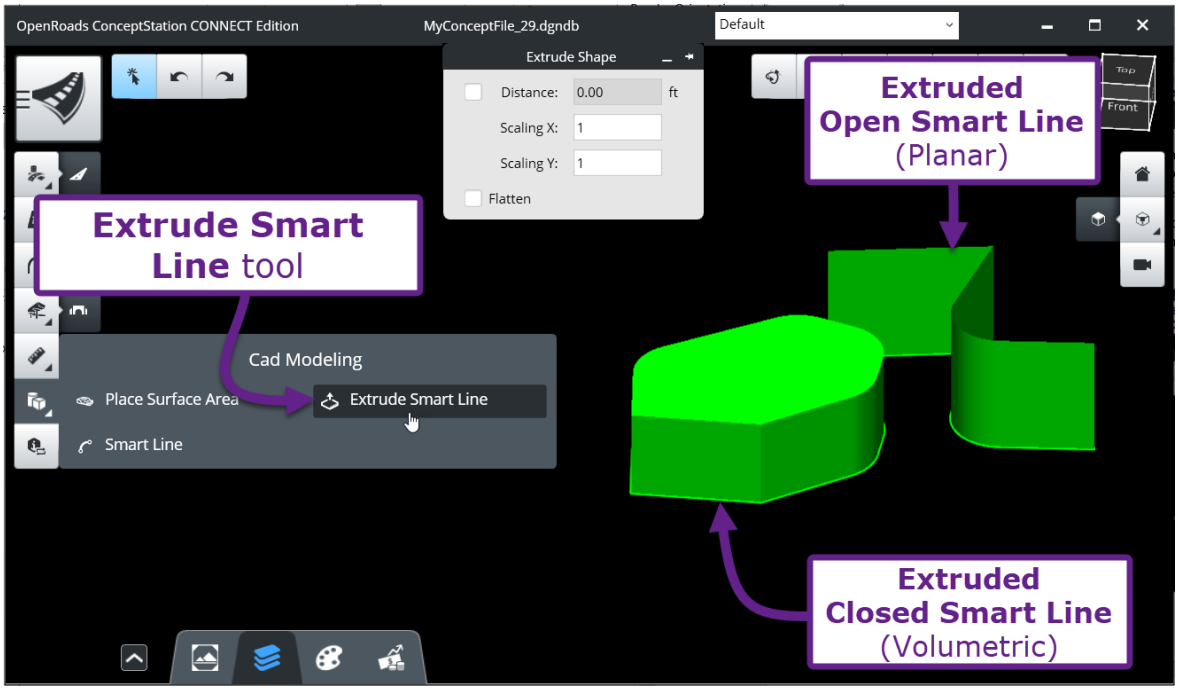


Smart Line tool: This tool is used to draw line strings. The line strings may be filleted with a radius to create line-curve-line segments. This tool can also be used to create a closed shape. If a closed shape is created, then a Material can be assigned to the closed Smart Line in the Properties menu. The Material will be included in quantities calculations.

When the Smart Line tool is used, the elevation of the start point is placed on the terrain surface. All other vertices are set to the start point elevation. As a result, some portions of the Smart Line may fall below the surface of the terrain and be covered up. ***BEST PRACTICE:*** To ensure a Smart Line is NOT covered up, place the start point of a Smart Line at a high point elevation on the Terrain.



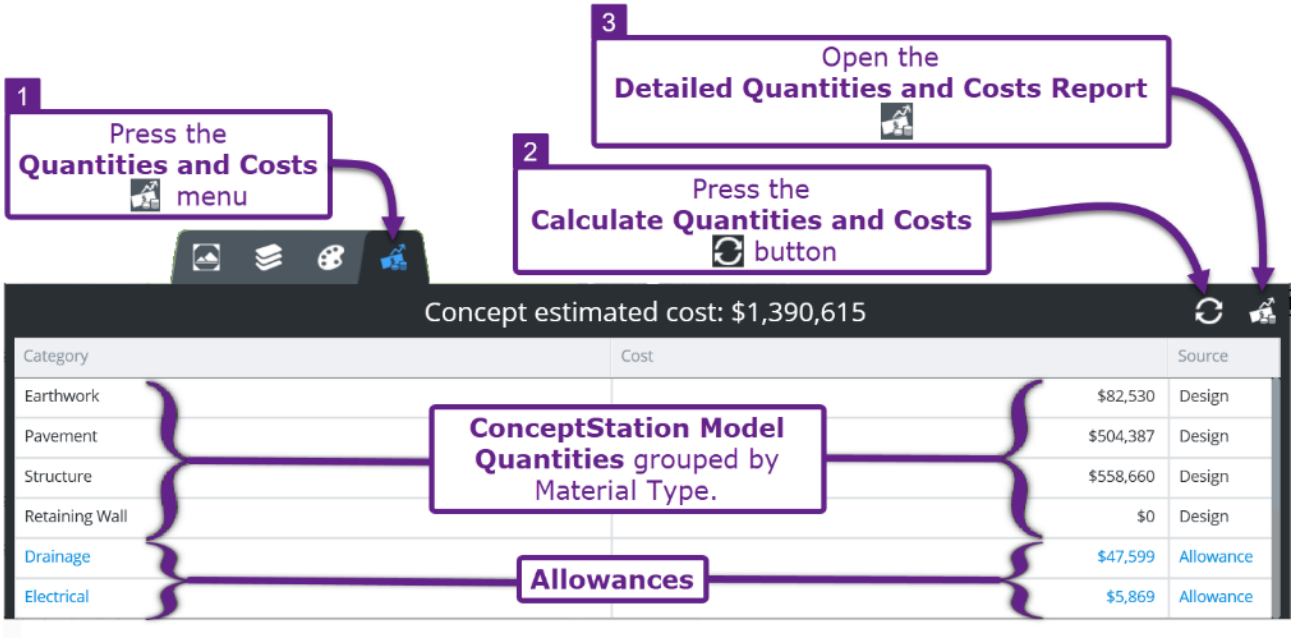
Extrude Smart Line: This tool is used to extrude an open or closed Smart Line element in the Z-direction. If an open Smart Line element is extruded, then a planar 3D element is created. The planar 3D element resembles a wall. If a closed Smart Line element is extruded, then a volumetric 3D element is created. ***NOTE:*** Surface Areas CANNOT be extruded with the *Extrude Smart Line* tool.



29L – CALCULATE QUANTITIES AND ESTIMATED COSTS

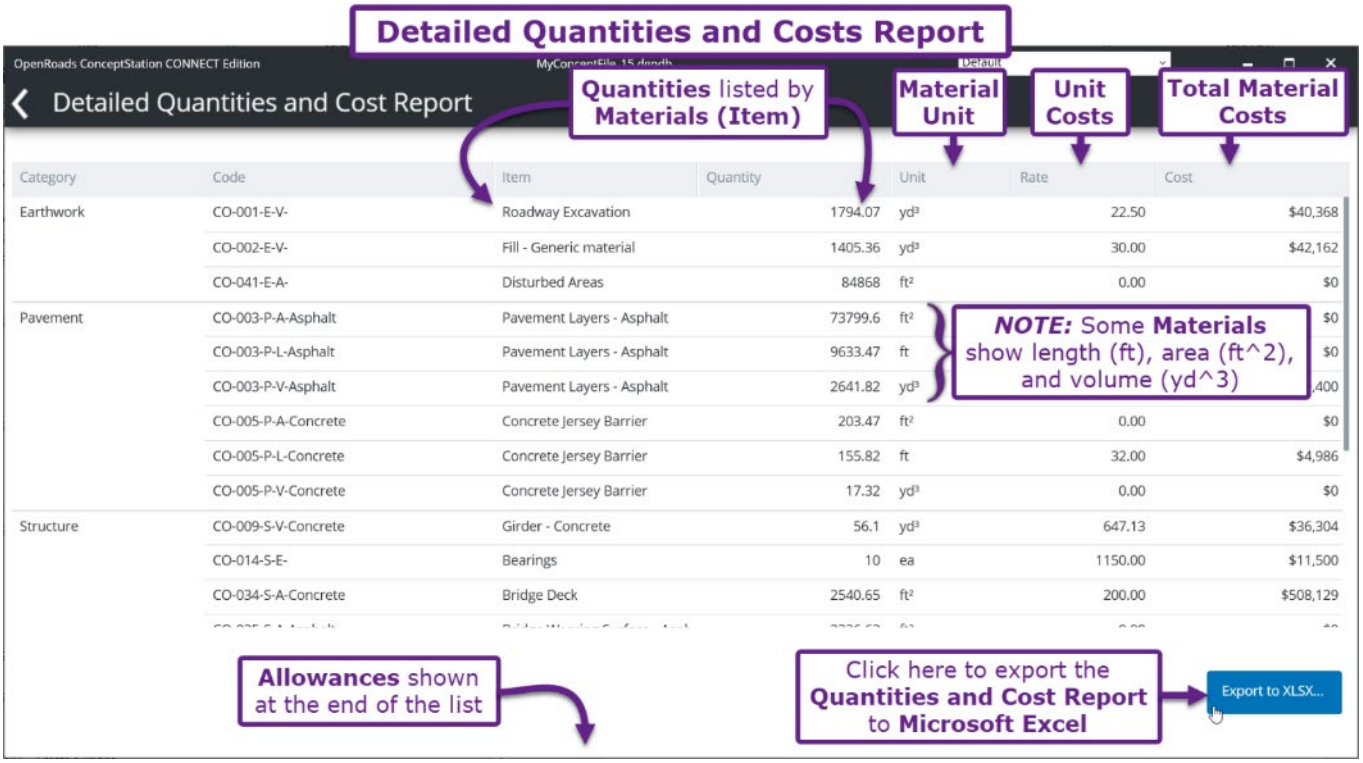
At any time, open the **Quantities and Costs** menu to calculate material quantities and costs.

When the this menu is initially opened, quantities and costs must be recalculated with the **Calculate Quantities and Costs** button.



The Quantities and Costs menu does NOT show material quantities. Open the **Detailed Quantites and Costs Report** to show a break down of quantities by material. The Detailed Quantities and Cost Report can be exported to Microsoft Excel for further analysis.

NOTE: Unit Costs rates and Allowance percentages are set in the **Quantities and Costs** editor shown on the next page.



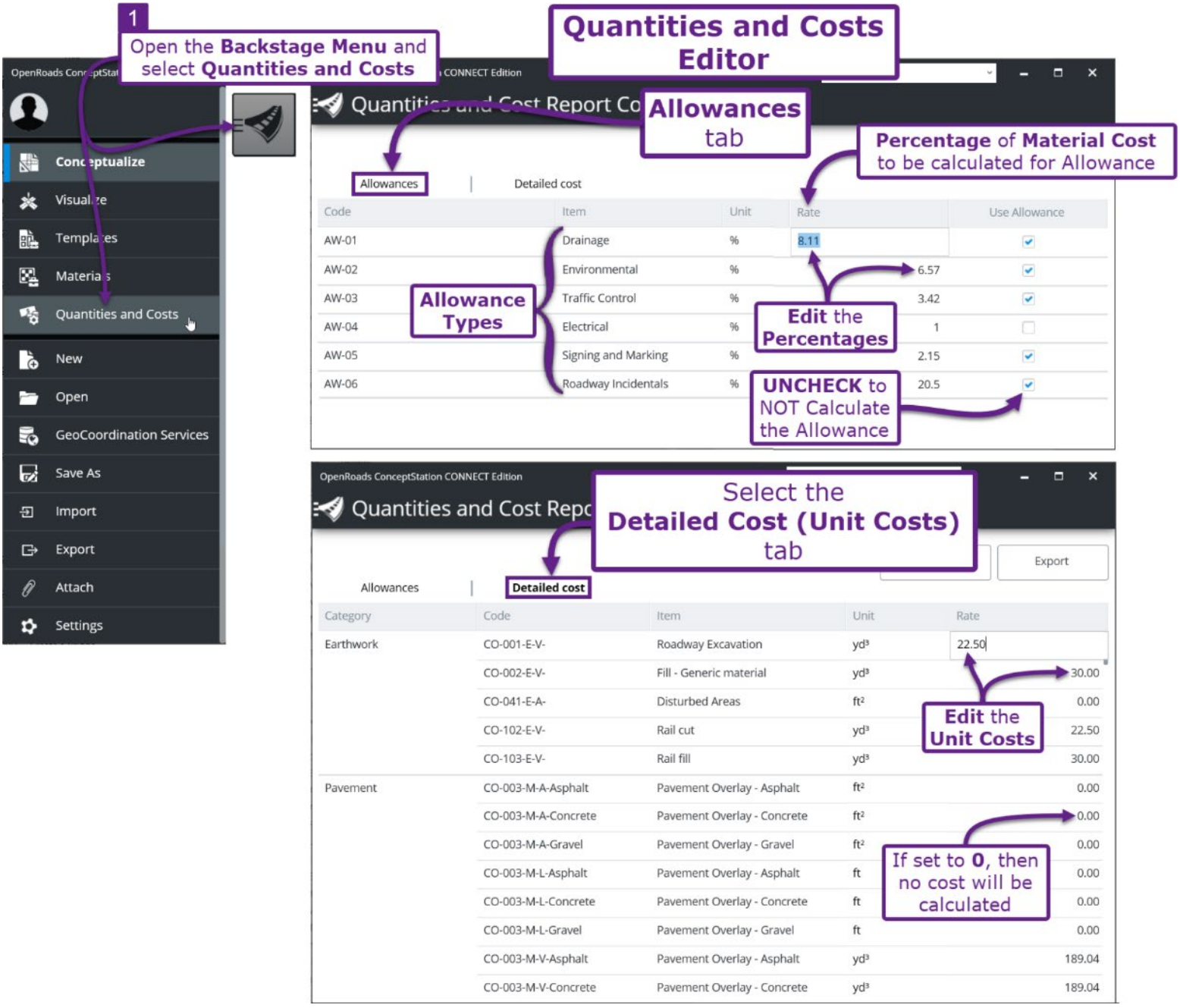
The **Quantities and Costs** editor sets the unit costs and allowance percentages used in the cost estimate. This editor is accessed in the Backstage Menu.

The Quantities and Cost Editor is divided into two tabs: **Allowances** and **Detailed Costs**.

Allowances: An Allowance is calculated by multiplying the total material costs by the allowance percentage. In the **Allowance Settings**, set the appropriate rate (percentage) for each allowance type.

> ***NOTE:*** Custom allowances CANNOT be added to to the cost estimate. To prevent an Allowance from calculating in the cost estimate, UNCHECK the "Use Allowance" box.

Detailed Costs: Select the Detailed Cost tab to edit the unit cost rate for each material used in cost estimate



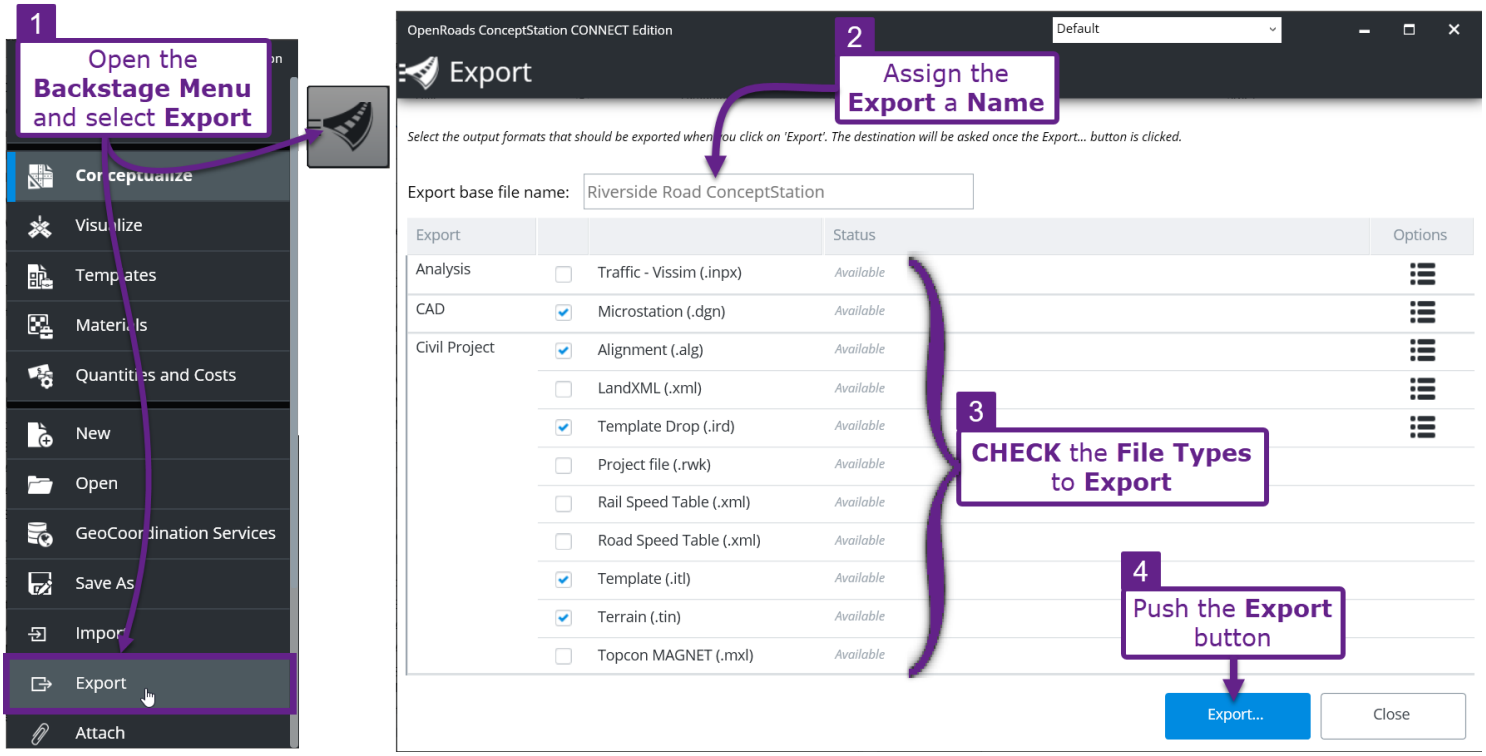
Code	Item	Unit	Rate	Use Allowance
AW-01	Drainage	%	8.11	☑
AW-02	Environmental	%	6.57	☑
AW-03	Traffic Control	%	3.42	☑
AW-04	Electrical	%	1	☐
AW-05	Signing and Marking	%	2.15	☑
AW-06	Roadway Incidentals	%	20.5	☑

Category	Code	Item	Unit	Rate
Earthwork	CO-001-E-V-	Roadway Excavation	yd³	22.50
	CO-002-E-V-	Fill - Generic material	yd³	30.00
	CO-041-E-A-	Disturbed Areas	ft²	0.00
	CO-102-E-V-	Rail cut	yd³	22.50
	CO-103-E-V-	Rail fill	yd³	30.00
Pavement	CO-003-M-A-Asphalt	Pavement Overlay - Asphalt	ft²	0.00
	CO-003-M-A-Concrete	Pavement Overlay - Concrete	ft²	0.00
	CO-003-M-A-Gravel	Pavement Overlay - Gravel	ft²	0.00
	CO-003-M-L-Asphalt	Pavement Overlay - Asphalt	ft	0.00
	CO-003-M-L-Concrete	Pavement Overlay - Concrete	ft	0.00
	CO-003-M-L-Gravel	Pavement Overlay - Gravel	ft	0.00
	CO-003-M-V-Asphalt	Pavement Overlay - Asphalt	yd³	189.04
	CO-003-M-V-Concrete	Pavement Overlay - Concrete	yd³	189.04

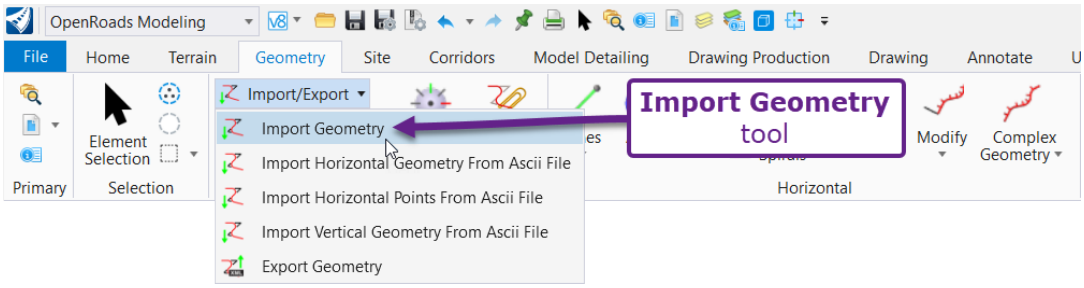
NOTE: The "Code" shown for an item CANNOT be changed. Similarly, the "Item" name and "Unit" CANNOT be changed.

29M – EXPORT CONCEPTSTATION ELEMENTS TO ORD

In the Backstage Menu, the **Export** option is used to convert ConceptStation modeling elements into specific file types that can be imported into ORD.



BEST PRACTICE: CHECK only the **Alignment (.alg)** file type. When this export option is used, Road Alignments in the file are packaged into an .alg file, which can be imported into ORD with the *Import Geometry* tool. The ConceptStation Alignment can be modified and used for Corridor creation in ORD. The ConceptStation Alignment can be assigned a Feature Definition is converted into a useful ORD Element.



Other export options are problematic when imported into ORD. For example, the ConceptStation Road Corridor model can be exported as a Template Drop (.ird). This file type creates a functioning Corridor when imported into ORD. However, the Corridor will NOT use FLH Feature Definitions. The exported Corridor will NOT meet FLH Drafting Standards and will require significant effort to change all Feature Definitions set in the Corridor Template.

The MicroStation (.dgn) export option converts the ConceptStation File into a .dgn that can be directly opened in ORD. However, all elements in the .dgn file are static and CANNOT be edited.

The Template (.itl) export option creates a Template Library file which can be loaded with the ORD Template Editor. However, the Templates in the ConceptStation Template Library file will NOT use FLH Feature Definitions or Template Point naming conventions.