

Tekla Structures 2026

Bridge Creator User Guide

Version 1.0

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1. Introduction to Bridge Creator

Bridge Creator is a comprehensive tool for modeling complex, double-curved bridge structures and civil engineering geometry within Tekla Structures. By leveraging alignment data and customizable cross sections, you can generate accurate, constructible models that adapt to intricate road geometry. Bridge Creator is an essential tool at any stage of the project for bridge engineers, detailers, and contractors who need to bridge the gap between civil design and structural detailing.

For example, bridge designers can import LandXML alignments or use Tekla construction lines to define the primary bridge path with high precision. Detailers can instantly create and modify deck profiles, abutments, and girders that follow road or rail curves, including complex transitions like superelevations or variable depths. Because the tool allows you to constrain components to specific points on a cross section, you can ensure that all structural elements, from beams, deck finishes to tension cables, maintain their correct spatial relationship throughout the extrusion.

You can modify and update the generated geometry in the model as design requirements evolve, ensuring the bridge always matches the latest alignment or cross section data. Additionally, you can save your configurations as Presets for efficient reuse and consistency across different projects.

Bridge Creator is organized into three primary design layers:

- Use the General tab to establish the bridge alignment, define station ranges, and manage the key cross sections that drive the overall geometry.
- Use the Components tab to place and constrain structural members, such as beams, piles, bearings or parapets, ensuring they accurately follow the bridge's curvature.
- Use the Tension cables tab to model complex post-tensioning paths that adapt to the cross section of the structure.

2. Quick Main Interface Overview

The Bridge Creator main UI is divided into eight key areas, allowing you to define everything from road alignment to specific cross section geometry. For detailed information refer to the [General tab](#) section.

The screenshot shows the 'Bridge creator' window with the 'General' tab selected. The interface is divided into eight key areas, numbered 1 through 8:

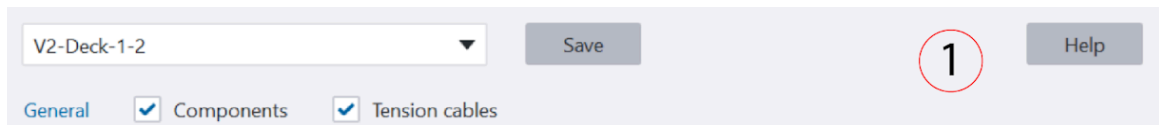
- 1**: Project name dropdown (V2-Deck-1-2) and Save button.
- 2**: Alignment section with checkboxes for 'Alignment file' and 'Main reference line' (CL-Pianco (1380.000m - 2504.810m)), and buttons for 'Read alignment' and 'More'.
- 3**: Key sections section with radio buttons for 'Manual input' and 'Station library', and a table of sections.
- 4**: Section preview area showing a cross-section diagram and a 'Chainage' dropdown (1561.75m) with a 'Step' of 1.000 and a 'Keep preview' checkbox.
- 5**: Creation section with fields for Name (DECK), Class (5), Phase (8), Material (C50/60), Cast unit (Cast in place), and buttons for 'Create', 'OK', 'Apply', 'Modify', 'Get', and 'Cancel'.
- 6**: Chainage/Station section with radio buttons for 'Manual input' and 'Station library', and fields for Start (Deck-St2: 1531.75m), End (Deck-St3: 1570.60m), Length (0.000m), Interval (0.20m), and Polygon count (530).
- 7**: Cross section creation section with checkboxes for 'Cross section' (No), 'Construction lines' (No), and fields for Start (0.000m), End (0.000m), Interval (0.000m), Phase (0), and Class (0).
- 8**: Bottom navigation bar with buttons for 'Create', 'OK', 'Apply', 'Modify', 'Get', and 'Cancel'.

CHAINAGE/STATION	NAME	ORIENTATION	SKEW	CUT
1561.75m	Deck1	Vertical	90.0°	☐
1531.75m	Deck1	Vertical	90.0°	☐
1570.60m	Deck2	Vertical	90.0°	☐
1574.65m	Deck2	Vertical	90.0°	☐
1559.00m	Deck1	Vertical	90.0°	☐

General tab interface

2.1 Header

Manage your workflow by loading Presets, Saving current configurations, or accessing Help. Switch between the General, Components, and Tension cables tabs to access different design layers.

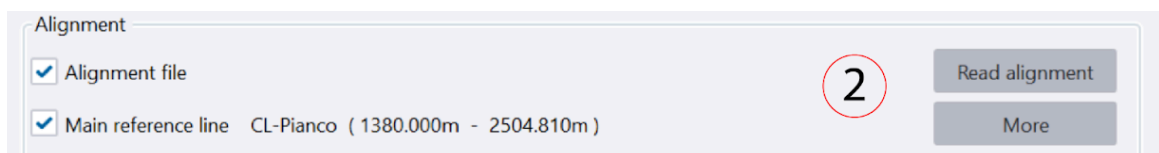


Header when General tab is selected

2.2 Alignment

To define the spatial path of your bridge or perform geometric analysis on your alignment, use the Alignment area. Clicking the [Read alignment](#) button opens a new dialog where a LandXML file, a Bridge Creator Feature line, or a Tekla construction line can be selected and used as road alignments. This allows you to define the road alignment path using external civil engineering data or physical lines already present in the Tekla model. Additionally, clicking the [More](#) button opens a detailed dialog for advanced alignment settings, providing a workspace to handle external data conversion and perform geometric analysis on your alignment.

The image below shows the interface after a road line has been loaded, displaying the main reference line name along with its start and end stations.



Alignment selection

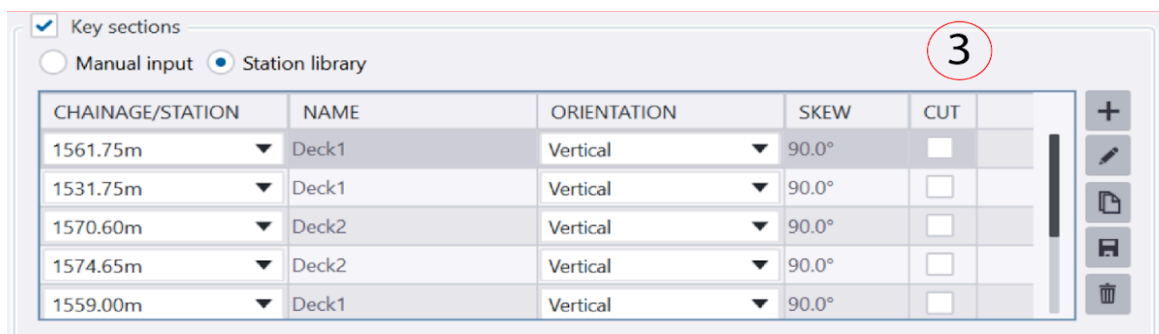
2.3 Key Sections

Manage the cross sections used for the extrusion of the bridge object within the Key sections area. This table allows you to define specific parameters for each entry, such as Chainage/Station to assign chainage values and Name to identify or rename the cross-sections. You can also set the Orientation to define the vertical or perpendicular position relative to the alignment, while the Skew field allows for the skewing of the cross-section and the Cut field, when selected, enables the section to act as a skew cut.

The sidebar action buttons provide comprehensive control over the entries in the table. Use the [Add](#) button to insert a new cross-section. The Edit button opens the [Edit cross section dialog](#) for modifying geometry, while the Copy and Delete buttons allow for duplicating or removing selected sections. Finally, the Save button enables you to export cross section configurations into a user [library](#) for use in future projects.

The Manual input and Station library radio buttons determine how chainage values are entered into the table. Selecting Manual input allows you to type specific chainage values directly into the Chainage/Station column for each cross section entry. Alternatively, selecting Station library enables a dropdown menu in the table, allowing you to choose from predefined stations that were previously created or imported in the [Manage station library dialog](#).

Using the Station library option is highly recommended for complex projects to ensure that cross sections are perfectly aligned with critical points like abutments or piers. If you switch back to Manual input, any stations selected from the library will remain, but you gain the flexibility to adjust their numerical values or add custom chainages that do not exist in the library.



Key sections

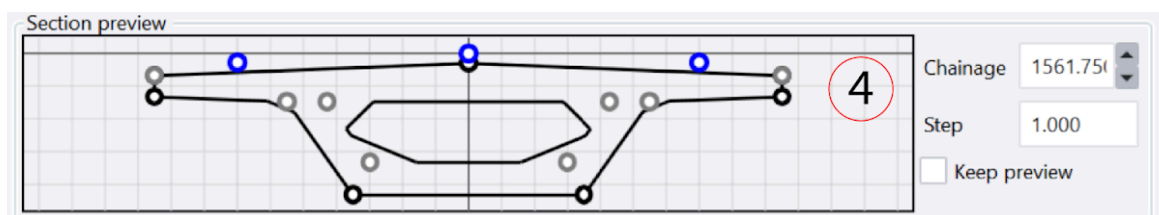
☐ Manual input ☒ Station library

CHAINAGE/STATION	NAME	ORIENTATION	SKEW	CUT
1561.75m	Deck1	Vertical	90.0°	☐
1531.75m	Deck1	Vertical	90.0°	☐
1570.60m	Deck2	Vertical	90.0°	☐
1574.65m	Deck2	Vertical	90.0°	☐
1559.00m	Deck1	Vertical	90.0°	☐

Key sections table

2.4 Section Preview

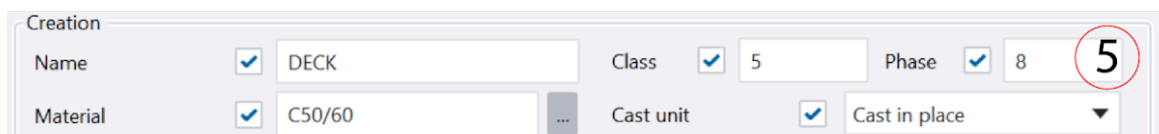
Manage the real-time visualization of the cross sections at a specific Chainage/Station using the Section preview area. Define the Step value and use the arrows to navigate between different chainages along the alignment to visualize the geometry in the Section preview canvas or directly in the model. By selecting the Keep preview checkbox, temporary cross sections will accumulate in the model each time the step arrow is pressed, allowing multiple cross sections to be displayed simultaneously. When Keep preview is unselected, only one temporary cross section is displayed at a time, updating to the current station as you navigate.



Cross section preview

2.5 Creation

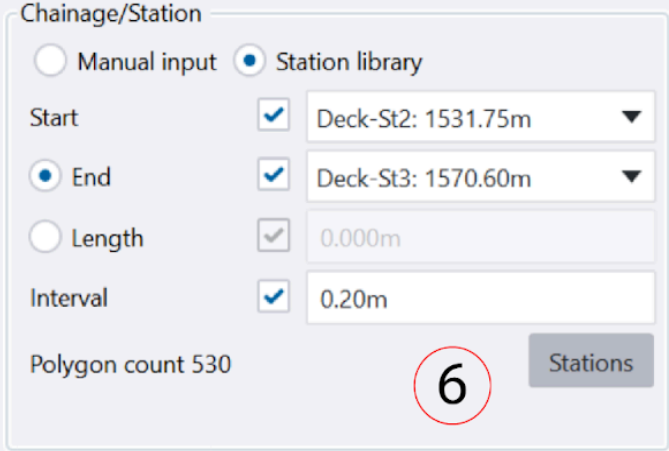
Set the basic Tekla Structures attributes for the generated object, including Name, Material, Class, Phase, and Cast unit type.



Creation attributes

2.6 Chainage/Station

Define the extrusion range by specifying the longitudinal limits of the bridge object. Use Manual input to enter specific Start and End or Length values. Alternatively, you can select presets from the Station library; note that these values must be defined in a dedicated user [station library dialog](#) before they can be used. You can also set the triangulation Interval and view the total Polygon count for the extrusion. Clicking the [Stations](#) button opens the dedicated dialog to define and manage these project stations.



The image shows a software dialog box titled "Chainage/Station". It contains several options and input fields. At the top, there are two radio buttons: "Manual input" (unselected) and "Station library" (selected). Below these, there are four rows of settings, each with a checked checkbox and a corresponding input field or dropdown menu. The first row is "Start" with a dropdown menu showing "Deck-St2: 1531.75m". The second row is "End" with a dropdown menu showing "Deck-St3: 1570.60m". The third row is "Length" with a text input field showing "0.000m". The fourth row is "Interval" with a text input field showing "0.20m". At the bottom left, it says "Polygon count 530". At the bottom right, there is a button labeled "Stations". A red circle with the number "6" is drawn around the "Stations" button.

Option	Value
Start	Deck-St2: 1531.75m
End	Deck-St3: 1570.60m
Length	0.000m
Interval	0.20m

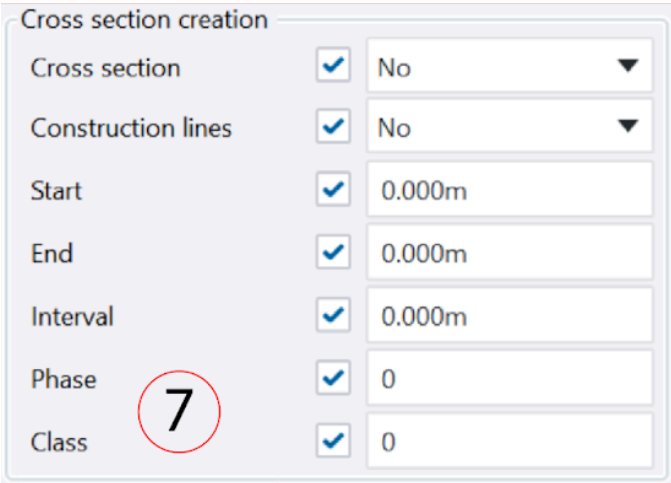
Polygon count 530

Stations

Chainage/Station parameters

2.7 Auxiliary Geometry

Use this area to generate auxiliary geometry along the alignment, providing a fast way to create support geometry along the main extrusion. By using the Cross section and Construction lines dropdowns, you can choose to place the cross sections as thin slices or Tekla construction lines as separate model objects. You can specify a unique Start and End station for these auxiliary elements and adjust the Interval to set how frequently this auxiliary geometry is generated. Finally, assign a specific Phase and Class to these generated items to easily distinguish them from the primary bridge components within the model.



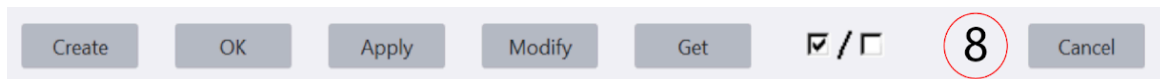
Cross section creation		
Cross section	☒	No
Construction lines	☒	No
Start	☒	0.000m
End	☒	0.000m
Interval	☒	0.000m
Phase	☒	0
Class	☒	0

Auxiliary geometry parameters

2.8 Footer

The Create button generates the object in the model while keeping the dialog open for further adjustments; however, it should only be used when the object is created for the first time, as clicking it when an object already exists will create a new object on top of the existing one. The OK button closes the tool without applying any changes. If you want to keep changes without updating the model object at that instance, you must use the Save button to recover them later, as pressing OK will cause all unsaved changes to be lost. The Apply button sets the current interface settings as the tool's default values; after double-clicking an existing object, using Get, or manually editing fields, pressing Apply ensures these settings remain active even if Bridge Creator is closed and reopened, persisting until the Tekla Structures model itself is closed. Modify updates an existing object based on new settings, provided the object is selected in the model.

Get populates the UI with data from a selected object in the model. The Select All / Unselect All toggle allows you to quickly enable or disable all property checkboxes to control which attributes are used during a Modify command. Finally, Cancel discards any changes and closes the application.



Footer when General tab is selected

3. General Tab (UI)

The Bridge Creator main UI is divided into eight key areas, allowing you to define everything from road alignment to specific cross section geometry.

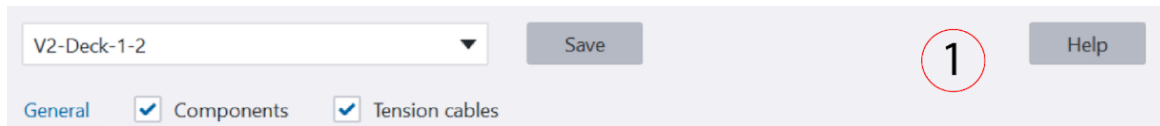
The screenshot shows the 'Bridge creator' window with the 'General' tab selected. The interface is divided into eight key areas, numbered 1 through 8:

- Area 1:** Project name dropdown (V2-Deck-1-2), Save button, and Help button.
- Area 2:** Alignment section with checkboxes for 'Alignment file' and 'Main reference line' (CL-Pianco (1380.000m - 2504.810m)), and buttons for 'Read alignment' and 'More'.
- Area 3:** Key sections section with radio buttons for 'Manual input' and 'Station library', and a table of sections.
- Area 4:** Section preview area showing a cross-section diagram, with Chainage (1561.75) and Step (1.000) controls, and a 'Keep preview' checkbox.
- Area 5:** Creation section with fields for Name (DECK), Class (5), Phase (8), Material (C50/60), and Cast unit (Cast in place).
- Area 6:** Chainage/Station section with radio buttons for 'Manual input' and 'Station library', and fields for Start, End, Length, Interval, and Polygon count (530).
- Area 7:** Cross section creation section with checkboxes for 'Cross section', 'Construction lines', 'Start', 'End', 'Interval', 'Phase', and 'Class'.
- Area 8:** Bottom toolbar with buttons for Create, OK, Apply, Modify, Get, and Cancel, along with a 'Show/Hide' icon.

CHAINAGE/STATION	NAME	ORIENTATION	SKEW	CUT
1561.75m	Deck1	Vertical	90.0°	☐
1531.75m	Deck1	Vertical	90.0°	☐
1570.60m	Deck2	Vertical	90.0°	☐
1574.65m	Deck2	Vertical	90.0°	☐
1559.00m	Deck1	Vertical	90.0°	☐

General tab interface

3.1 - Header



Header when General tab is selected

The header provides global controls to manage your design workflow and navigate through the different layers of bridge definition.

- **Presets:** Use the dropdown menu to load existing configurations or type a name to create a new one, allowing for quick reuse of standard project settings.
- **Save:** Clicking the Save button stores your current interface configurations for later recovery; this is a critical step, as closing the tool with OK will otherwise discard unsaved changes.
- **Help:** Access the Help button to open the documentation and technical guidance for the Bridge Creator tool.
- **Design Tabs:** Switch between the General, Components, and Tension cables tabs to access distinct layers of the bridge design, from primary alignment settings to structural member definition and post-tensioning details.

3.2 - Alignment



Alignment selection

The image below shows the interface after a road line has been loaded, displaying the main reference line name along with its start and end stations.

Use this section to define the spatial path of your bridge or to perform geometric analysis on your existing alignment data. When an alignment is loaded, the name of the main line and its start and end stations are displayed in the center of this area.

- **Read Alignment:** Clicking the [Read alignment](#) button opens a new dialog where a LandXML file, a Bridge Creator Feature line, or a Tekla construction line can be selected and used as road alignments. This allows you to define the road alignment path using external civil engineering data or physical lines already present in the Tekla model.
- **More:** Clicking the [More](#) button opens a detailed dialog for advanced alignment settings, providing a workspace to handle external data conversion and perform geometric analysis on your alignment.

3.2.1 Read alignment Dialog

The screenshot shows the 'Read alignment' dialog box. It has a title bar with standard window controls. The main area is divided into several sections. At the top, there's a section for file selection with an 'Alignment file' text box containing '\RESOURCES\RoadatPianco5.xml', a 'Browse' button, and a 'Pick' button. Below this is a 'Reference models' dropdown menu. The next section is titled 'Lines' and contains a table with columns: 'REFERENCE LINE', 'ACTIVE', 'NAME', 'START', and 'END'. The table has three rows: the first row is checked in the 'REFERENCE LINE' and 'ACTIVE' columns, with 'NAME' 'CL-Pianco', 'START' '1399.902m', and 'END' '1758.249m'; the second row has 'NAME' 'R1', 'START' '1397.473m', and 'END' '1755.820m'; the third row has 'NAME' 'L1', 'START' '1402.331m', and 'END' '1760.678m'. To the right of the table is a 'Preview' checkbox. Below the table is a 'Location by' dropdown menu set to 'Ponte-Pianco-Brazil'. Underneath are input fields for 'Offset' with sub-fields for 'X', 'Y', and 'Z', each with a unit 'mm' and a 'Pick' button. Below that are 'Scale' and 'Rotation' fields, each with a 'Pick' button. At the bottom are 'OK' and 'Cancel' buttons. Red circles with numbers 1 through 4 highlight specific elements: 1 points to the 'Alignment file' text box, 2 points to the 'Lines' table, 3 points to the 'Offset' input fields, and 4 points to the 'OK' button.

REFERENCE LINE	ACTIVE	NAME	START	END
☒	☒	CL-Pianco	1399.902m	1758.249m
☐	☒	R1	1397.473m	1755.820m
☐	☒	L1	1402.331m	1760.678m

Read alignment interface

By clicking the Read alignment button on the main user interface, the Read alignment dialog opens. This is where you define the primary geometric data source for your bridge.

1. Alignment Definition:

- **Browse:** Use this button to select your LandXML file. Note that Bridge Creator reads this file directly, so it is best practice to keep these files saved in the Model\ReferenceModels or similar folder for better change management.
- **Pick:** Alternatively, use the Pick function to select one or more alignment lines directly from the model when using existing Tekla construction lines or Bridge Creator feature lines as your project geometry.
- **Reference Models:** Use this dropdown to select alignment data already referenced in your Tekla model. If your LandXML file is already referenced, this is the most efficient method; it saves time spent locating the file manually and prevents errors caused by potentially selecting the wrong external file.

2. **Lines table:** This table displays all available strings from the loaded file or any selected lines from the model.
 - **Preview checkbox:** Toggle this checkbox to visualize the selected line in the 3D model; if importing a LandXML file, ensure you change the Location by setting from "Model origin" to the correct Project base point, whereas if you are reading centerlines directly from the model, you should keep the Location by as Model origin.
 - **Reference Line:** Select exactly one line to serve as the primary "centerline" for your bridge.
 - **Active:** Check this box for any additional lines needed for cross-section definitions. Only active lines will be available later in the workflow, specifically within the [Edit cross section dialog](#).
 - **Name, Start, End:** These cells display the specific attribute names alongside the start and end stations for all loaded lines.
3. **Coordinate Transformation:**
 - **Location by:** Use the Location by dropdown menu to select a predefined Project base point for accurate alignment placement when working with LandXML files, or maintain the Model origin setting when loading lines directly from the model, as these are typically already positioned near the model origin.
 - **Offset, Scale, Rotation:** You may manually adjust the Offset, Scale, and Rotation to tweak the position of the lines. Use this feature with caution, as the correct placement of the alignment should be set up within the Project base point definition.
4. **Execution Buttons:**
 - **OK:** Confirms your selections and returns to the main Bridge Creator dialog with the reference line and any active lines successfully loaded.
 - **Cancel:** Closes the dialog without saving changes.

Below are three different scenarios for when a road line is loaded: importing a LandXML file, loading an existing reference model, or selecting Tekla construction lines or Bridge Creator feature lines directly from the model.

Read alignment

Alignment file: .\RESOURCES\RoadatPianco5.xml [Browse] [Pick]

Reference models: [Dropdown]

Lines [Preview]

REFERENCE LINE	ACTIVE	NAME	START	END
☒	☒	CL-Pianco	1399.902m	1758.249m
☐	☒	R1	1397.473m	1755.820m
☐	☒	L1	1402.331m	1760.678m

Location by: Ponte-Pianco-Brazil [Dropdown]

Offset X: 0.00 mm Y: 0.00 mm Z: 0.00 mm [Pick]

Scale: 1 : 1 Rotation: 0.00 [Pick]

[OK] [Cancel]

Read alignment when a LandXML file is loaded

Read alignment

Alignment file: [Empty] [Browse] [Pick]

Reference models: Export 101 LandXML [Dropdown]

Lines [Preview]

REFERENCE LINE	ACTIVE	NAME	START	END
☒	☒	CL_101	1380.000m	2504.810m

Location by: Ponte-Pianco-Brazil [Dropdown]

Offset X: 0.00 mm Y: 0.00 mm Z: 0.00 mm [Pick]

Scale: 1 : 1 Rotation: 0.00 [Pick]

[OK] [Cancel]

Read alignment when loading an existing reference model

Read alignment

Alignment file Browse Pick

Reference models

Lines ☐ Preview

REFERENCE LINE	ACTIVE	NAME	START	END
☒	☒	CL-Pianco	1380.000m	2504.810m
☐	☒	Road 1 2.01 R. O. shoulder 1 Line	0.000m	379.750m
☐	☒	Road 1 -1.01 L. Lane 1 Line	0.000m	380.220m
☐	☒	Road 1 1.01 R. Lane 1 Line	0.000m	379.780m
☐	☒	Road 1 -2.01 L. O. shoulder 1 Line	0.000m	380.250m

Location by

Offset X mm Y mm Z mm Pick

Scale Rotation Pick

OK Cancel

Read alignment when selecting lines from the model

Change Management:

While it is not common practice for road designers to change line names when issuing a new version of a LandXML file, it is essential to confirm that key lines retain their original names to avoid errors during the change management process.

If the road design changes, simply replace the old LandXML file in your model folder with the new version, or reload it as a reference file within the model. After updating the file, double-click the affected Bridge Creator component and click Modify. Assuming the road line names remain unchanged, the extrusion and all associated objects will update automatically.

Downstream Availability

The chosen Reference line and all lines marked as Active will automatically appear as selectable options within the [Edit cross section dialog](#). You can return to the Read alignment interface at any time to activate additional lines if necessary.

Furthermore, when starting with an Empty section from the [default library](#), all selected active lines are automatically populated in the table within the Edit cross section dialog. However, when using a Predefined cross section, the road lines must be remapped, and in many cases, new road lines must be manually inserted into the table to establish the correct geometric relationships.

3.2.2 Manage Alignments Dialog

Clicking the More button on the main user interface opens the Manage alignments dialog. This interface is the central hub for converting external geometric data into native Bridge Creator feature lines and performing analytical queries. It is divided into two primary sections: the Import tab for geometry conversion and the Manage tab for stationing analysis and layout generation.

3.2.2.1 Import Tab

Manage alignments

Import Manage

Alignment file Pick Browse

Reference models

Convert Class ☒ 11 Phase ☒ 1 ☒ Preview

START	ACTIVE	NAME	START	END
☒	☒	CL-Road	1000.000m	2037.595m
☐	☐	L1	0.000m	630.368m
☐	☐	Line_BLACK_DashedLine	0.000m	616.142m

Location by

Offset X mm Y mm Z mm

Scale Rotation

Cancel

Manage Alignments - Import tab when selecting lines from the model

The Import tab allows you to convert LandXML alignment lines or Tekla construction lines into native Bridge Creator feature lines. Converting LandXML data is essential for performing analytical queries on your alignment via the Manage tab. Furthermore, transforming Tekla construction lines into road alignments ensures more stable modeling and easier selection during the design process, while preventing critical errors such as the accidental deletion of construction lines from the model.

1. **Tab Selection:** Ensure the Import tab is active at the top of the dialog.

2. **Alignment Source:** Select the geometry you wish to convert using one of the following methods:
 - **Browse:** Locate and load an external LandXML file directly from your computer. When using this method, ensure the Location by field is set to the appropriate Project base point for accurate placement.
 - **Pick:** Select existing Tekla construction lines directly from the 3D model for conversion. When using this method, keep the Location by setting as Model origin, as these lines are already positioned within the model's coordinate system.
 - **Reference Models:** If a LandXML file is already attached to your Tekla model as a reference, select it from this dropdown menu. This is the most efficient method, as it saves time and ensures you are working with the validated project files. Remember to set the Location by field to the Project base point to maintain coordinate alignment.

3. **Conversion Settings & Table:** Once a source is selected, the available strings appear in the table.
 - **Pre-Conversion Editing:** You can customize the Name and Start station of any line by clicking directly within those cells in the table. This step is critical because, in some cases, converted construction lines default to a start station of zero. For example, when importing 3D road lines into a model via Grasshopper plugin, these lines will assume zero as the start station upon conversion, even though many road lines do not actually begin at zero. Another common scenario is when lines are trimmed in CAD prior to being imported into Tekla; in such instances, the Start value must be edited manually to reflect the correct stationing. Note that the End value may not update immediately in the table, but it will be calculated automatically following the conversion.

It is important to name road lines according to project standards for better data management. When converting Tekla construction lines, do not leave the names as default; Bridge Creator will not function correctly if multiple road lines share the same name. If you do not have access to a specific project naming convention, a recognized best practice is to name the main reference line CL-Name_of_the_road, then use prefixes such as L1, L2 for lines on the left-hand side

and R1, R2 for lines on the right-hand side. This organized naming structure significantly simplifies the process during cross-section editing, as it clearly identifies the position of all lines relative to the centerline.

- **Class and Phase:** Define these attributes before converting to keep your model organized.
- **Preview:** Toggle Preview to visualize the line in the 3D model. If converting from a LandXML file, you must select the correct base point first, or the preview will appear at real-world coordinates.
- **Convert:** Select one line and click Convert. This creates the Bridge Creator feature line in your model. Repeat for all the lines that need to be converted. When converting LandXML lines, you must select the proper Project base point before conversion, otherwise, the feature line will be generated at real-world coordinates, potentially far from your model origin.

4. **Coordinate Transformation:**

- **Location by:** Use the Location by dropdown menu to select a predefined Project base point for accurate alignment placement when working with LandXML files, or maintain the Model origin setting when loading lines directly from the model, as these are typically already positioned near the model origin.
- **Offset, Scale, Rotation:** You may manually adjust the Offset, Scale, and Rotation to tweak the position of the lines. Use this feature with caution, as the correct placement of the alignment should be set up within the Project base point definition.

5. **Cancel:** Closes the dialog without performing any further actions. Because conversion happens instantly when the Convert button is pressed, there is no "OK" button required for this dialog.

Manage alignments

Import Manage

Alignment file

Reference models

☒ Preview

Class ☒ 11 Phase ☒ 1

START	ACTIVE	NAME	START	END
☒	☒	CL_101	1380.000m	2504.810m

Location by

Offset X mm Y mm Z mm

Scale Rotation

Manage Alignments - Import tab when loading an existing LandXML reference model

Pro-Tip for Best Results

Always set your Location by to a project base point when using LandXML files, or to the model origin when using Tekla construction lines, before clicking Preview or Convert. This ensures your new feature lines are displayed or created at the correct coordinates near the model origin as intended.

3.2.2.2 Manage Tab

The screenshot shows the 'Manage alignments' dialog box with the following components:

- 1**: The 'Manage' tab is selected at the top of the dialog.
- 2**: The 'Pick' and 'Get all' buttons are located below the tab.
- 3**: The 'Tools' section contains buttons for 'Get chainage from point', 'Get data from chainage', 'Draw chainage on alignment', and 'Project point on alignment'. It also includes input fields for 'Start' (0.000m), 'End' (0.000m), 'Chainage input' (0.000m), and 'Interval' (0.000m).
- 4**: The 'Result' section includes checkboxes for 'Zoom to result' (checked), 'Create layout point' (checked), 'Create construction points' (unchecked), and 'Create construction line' (unchecked). There is also a 'Layout point' dropdown menu set to 'standard'.
- 5**: The 'Cancel' button is located at the bottom right of the dialog.

NAME	START	END
CL-Pianco	1380.000m	2504.810m

Manage Alignments - Manage Tab Overview

The Manage tab provides analytical tools to query stationing data and generate support layout geometry based on selected alignments.

- 1. Tab Selection:** Ensure the Manage tab is active at the top of the dialog.
- 2. Alignment Information**
 - **Pick:** Select a Tekla construction line or Bridge Creator feature line from the model to display its data in the table.
 - **Get all:** Populate the table with all available Bridge Creator feature lines currently in the model.

- **Highlight selected in model:** When multiple lines are listed, check this box to visually identify which line is currently highlighted in the table.

3. Tools

- **Area of interest:** Define a specific Start and End station to limit the tool's operations. If these are left at zero, the tool will process the entirety of the chosen road line.
- **Get chainage from point:** This tool identifies the station value of a specific point along an alignment and displays it in the Result box. If the Create layout point option is active, a layout point containing this station data is placed in the model.
 - **Selection Process:** After clicking the Get chainage from point button, follow these steps to ensure accuracy:
 - **Select the Point:** Choose the specific point along the alignment (e.g., an intersection).
 - **Select the Alignment:** Click the road alignment you wish to query.
 - **Best Practices for Intersections:** This tool is commonly used to identify stationing where two roads intersect:
 - **View Orientation:** Switch to a top plane view (Ctrl + P) and use wireframe rendering (Ctrl + 1) to see the lines clearly.
 - **Selection:** Zoom in near the intersection and use the Snap to intersection tool to select the exact point, then select the target road.
 - **Multi-Road Layout:** If you require station information for both intersecting roads, repeat the process by selecting the same point again but choosing the second road as the alignment.
 - **3D Verification:** When viewing in 3D, you will see two distinct layout points—one for each road—each containing the stationing information specific to that alignment.

- **Get Data from Chainage:** This tool generates geometric objects along an alignment based on specified stationing values. The type of object created depends on which checkboxes are selected: Create layout point, Create construction points, or Create construction lines.
 - **Placing Multiple Objects:** To place multiple objects at a regular interval along a portion of the alignment:
 - **Input:** Define the Start and End stations for your area of interest, but keep the Chainage input field set to 0.
 - **Objects:** Choose from layout point, construction point or construction line
 - **Interval:** Define the desired Interval value for object placement.
 - **Results:** Multiple objects will be placed in the model and the Result box will display the coordinates of the last object created.
 - **Placing a Single Object:** To place a single object at a specific location:
 - **Input:** Enter a value directly into the Chainage input field.
 - **Objects:** Choose from layout point, construction point or construction line
 - **Logic:** When a value is present in the Chainage field, the Area of Interest and Interval settings are ignored.
 - **Results:** One object will be placed in the model and the Result box will display the coordinate of the object created.
 - **Visualization Settings**
 - **Zoom to result:** If this box is selected, the model view will automatically zoom to the location of the latest object created.
 - **Result Box display:** Note that the values displayed in the Result box are always relative to the final object generated during the action.

- **Draw chainage on alignment:** This tool visualizes station labels and interval markers directly along the alignment in the model.
 - **Area of Interest:** If the Start and End values are kept at zero, labels will be displayed along the entire alignment. Otherwise, labels will only appear between the defined stations.
 - **Station Labels and Ticks:** By default, the tool is configured to place a tick mark every 1 meter and a station label every 10 meters (or every 5 feet with a label every 50 feet for imperial units).
 - **Persistent vs. Temporary:** Unlike layout points, these visual aids are temporary. Redrawing the model view will clear the displayed stations from the screen until the option is triggered again.
 - **Safety Feature:** The Create construction points option is disabled by default for this function to prevent the accidental accumulation of multiple overlapping points in the model.
 - **Project point on alignment:** This tool identifies the station value of a specific point located away from an alignment by calculating its perpendicular projection onto that alignment. The resulting station value is displayed in the Result box. If the Create layout point option is active, a layout point containing this station data is placed directly on the selected road at the exact perpendicular intersection point.
 - **Selection Process.** To project a point onto an alignment, follow these steps:
 - **Select the Point:** Choose the source point in the model that is not along the alignment.
 - **Select the Alignment:** Click the target road alignment to which the point will be projected.
 - **Outcome:** The software calculates the shortest distance (perpendicular) to the alignment to determine the stationing and coordinates for the result.
4. **Result and Object Creation**
- **Result box:** Displays coordinate or station data even when physical objects are being created in Tekla.

5. **Zoom to result:** Automatically zooms the model view to the last object created by the tool.
 6. **Create layout point:** Generates one or more Tekla layout points at the calculated stations. Use the Layout point dropdown to select the specific type.
 7. **Create construction points:** This option generates Tekla construction points at the calculated stations when Draw chainage on alignment is triggered. Use this feature with caution to avoid creating multiple objects superimposed on one another.
 8. **Create construction line:** Generates one or more Tekla construction lines perpendicular to the alignment at the calculated stations.
-
5. **Cancel:** Closes the dialog. Because all actions occur immediately when the specific tool buttons are pressed, an "OK" button is not required.

Pro-Tip for Data Analysis

Use the Area of Interest to avoid cluttering your model. By narrowing your focus to a specific bridge span, you can display chainages or generate layout points or construction lines only where they are needed for geometry verification.

3.3 - Key Sections

☒ Key sections

☐ Manual input ☒ Station library

3

CHAINAGE/STATION	NAME	ORIENTATION	SKEW	CUT
1561.75m ▼	Deck1	Vertical ▼	90.0°	☐
1531.75m ▼	Deck1	Vertical ▼	90.0°	☐
1570.60m ▼	Deck2	Vertical ▼	90.0°	☐
1574.65m ▼	Deck2	Vertical ▼	90.0°	☐
1559.00m ▼	Deck1	Vertical ▼	90.0°	☐

+
✎
📄
🗑️

Key sections table

The Key sections area defines the specific geometry and cross-sectional profiles used to generate the bridge object along the alignment. If only one key section is defined, the bridge geometry is constrained to the road lines based solely on that single profile throughout the extrusion. However, when multiple key sections are defined at specific stations, you can create complex transitions and variations; for example, adding superelevation key sections allows Bridge Creator to calculate the correct interpolation for the deck rotation. Similarly, to extrude a deck with variable depth, two or more key sections with different vertical values must be placed at specific stations to achieve the desired taper.

Station Input Methods

- **Manual input / Station library:** These radio buttons determine how chainage values are entered into the table and function identically to those in the [Chainage/Station](#) area.
 - **Manual input:** Allows you to type specific chainage values directly into the Chainage/Station column for each cross section entry.
 - **Station library:** Enables a dropdown menu in the table, allowing you to choose from predefined stations that were previously created or imported in the [Manage station library dialog](#).

Using the Station library option is highly recommended for complex projects to ensure that cross sections are perfectly aligned with critical points like abutments or piers. If you switch back to Manual input, any stations selected from the library will remain, but you gain the flexibility to adjust their numerical values or add custom chainages that do not exist in the library.

Table Column Definitions

- **Chainage/Station:** This is the exact station where the cross section definition exists.
 - **Placement Rule:** For non-variable extrusions, this station can be placed before, during, or after the extrusion range.
 - **Critical Requirement:** The station value must intersect all necessary active alignment lines. If your secondary lines (e.g., curbs) only exist between station 400 and 600, placing your Key Section at station 300 will fail to "grab" those lines, resulting in incorrect geometry. For better results set the Key Section station to match the start of your extrusion to ensure all lines are properly captured.
- **Name:** You may use the default name or enter a logical one. Assigning clear names is highly recommended if you plan to save these definitions into a [cross section library](#) for future use.
- **Orientation** (Vertical/Perpendicular): Controls how the start and end faces of the extrusion are cut.
 - **Vertical:** Cuts the object with a plane vertical to global coordinates (XZ or XY).
 - **Perpendicular:** Cuts the object with a plane perfectly perpendicular to the longitudinal and vertical alignment of the main road line.
- **Skew:** Defines the angle of the cross section relative to the main alignment.
 - Unlike a traditional bridge skew, this setting rotates the cross-section plane itself. This field should generally be left at its default value of 90.0° unless a specific non-perpendicular section is required, or when using an empty section to apply a skew cut to the extrusion.
- **Cut:** The Cut checkbox is used to create precise skew cuts at the ends of an extrusion, such as an 85 degree bridge skew. When selected, Bridge Creator generates Tekla cuts at the exact station and angle defined for that cross section entry.
 - **Procedure:** To create a skewed cut at the start or end of an extrusion, follow these steps:
 - **Extend the Extrusion:** Start your extrusion slightly beyond the required limit to ensure the cut has enough material to remove. For a cut at Station 100, start the extrusion a few meters earlier (e.g., at Station 98).

Note: If the corners of the extrusion appear "empty" after the cut is applied, reduce the start station further (e.g., to 5 meters before the cut) to provide more volume for the operation.

- **Insert an Empty Station:** Add an Empty section from the default [cross section library](#).
- **Define the Station:** Enter the exact station where the cut is required in the Chainage/Station column.
- **Apply the Angle:** Enter the required skew angle in the SKEW column.
- **Enable the Cut:** Select the Cut checkbox for this entry.
- **Repeat for the End:** To cut the end of the extrusion, repeat this process by placing another Empty section with the Cut box checked, ensuring the extrusion itself ends a few meters after this final cut station.
- Bridge Creator will automatically generate Tekla cuts at the defined angles and exact stations of the Empty sections where the Cut box was selected.

Pro-Tip for Alignment Intersection

Always verify your Key section placement using the Section preview. If the preview canvas looks empty or distorted, check that your chosen station falls within the range where all your "Active" alignment lines are defined in the LandXML or Bridge Creator feature lines in the model.

Side Bar Buttons

The side bar located to the right of the Key sections table contains the commands for creating, editing, and managing your cross section definitions.



Add Button

Opens the [Manage cross section library](#) dialog box. This allows you to import existing section definitions from the default or your saved libraries.

**Edit Button**

Opens the [Edit cross section](#) dialog box for the selected row. Use this to modify the geometric nodes and variables of an existing section.

**Copy Button**

Duplicates the selected cross section from the table. The new instance will appear with its Chainage/Station value reset to 0.000. This is a significant time-saver when creating multiple similar sections along an alignment.

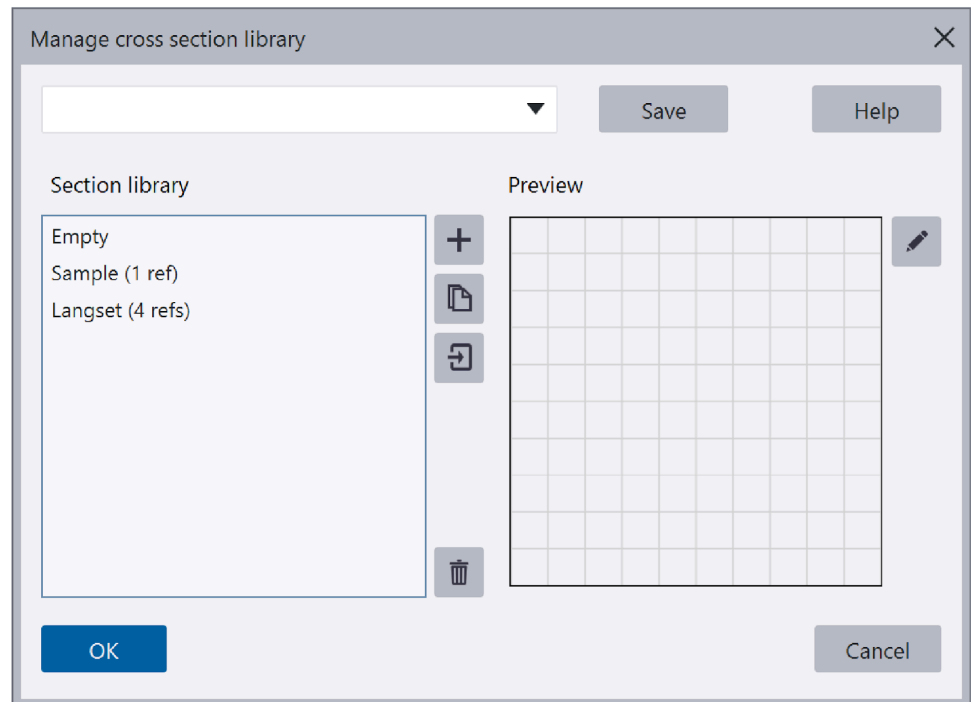
**Save Button**

Saves the selected cross section into a cross section library for future use in other projects. Ensure you have assigned a logical name to the section in the table before saving to make it easily identifiable in the library later.

**Delete Button**

Permanently removes all currently selected cross sections from the table.

3.3.1 - Manage Cross Section Library Dialog



Manage cross section library with default cross sections

The Manage cross section library dialog is used to store, organize, and import cross section definitions across different projects.

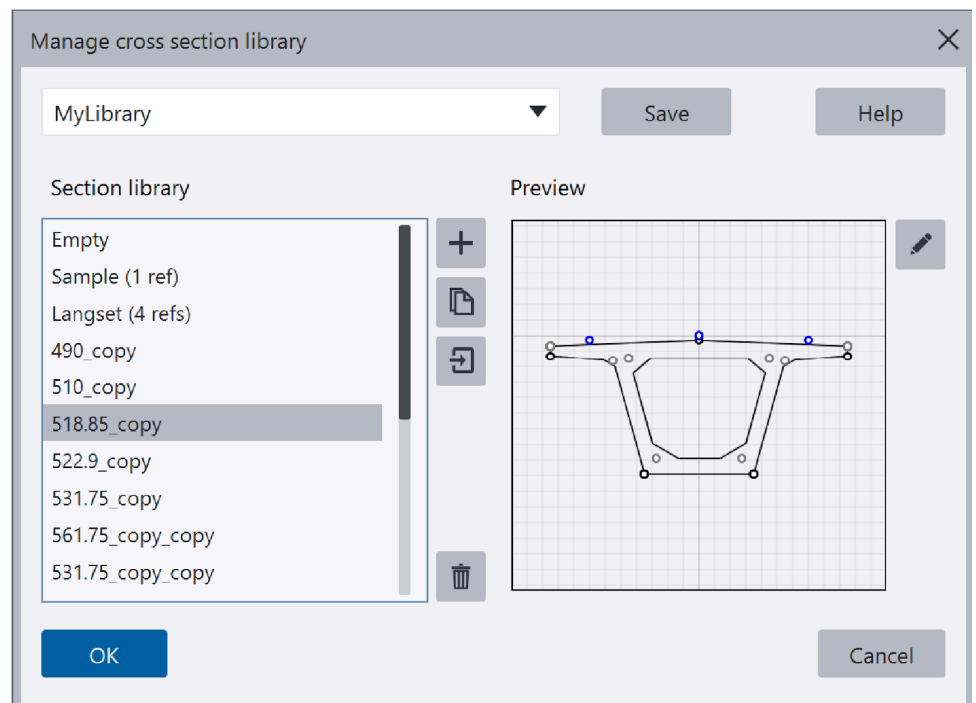
Library Management

- **Library Selection:** Use the dropdown menu at the top to load an existing library. To create a new library, type a name into the field and press Enter.
- **Save:** Saves the current library including name edits, additions, and deletions as an XML file that will be stored in the model's attributes folder. You must click Save for these changes to be permanently stored in your cross section library.
- **Help:** Provides a direct link to the Bridge Creator technical support page.

Section Library Table

This table lists all sections available within the loaded library. By default, three standard templates are always provided:

- **Empty:** Used to start a new section from scratch or to define skew cuts. It automatically includes all main and active alignment lines selected in the Read alignment dialog.
- **Sample (1 ref):** A basic template featuring a deck and one reference road line.
- **Langset (4 refs):** A complex template featuring a deck with four reference road lines.



Manage cross section library when a cross section is selected

- **Selecting from a loaded library:** When a custom library is loaded, its saved sections appear in the list below the three default cross-section options. Simply select a section and click OK to add it to your Key sections table in the main interface.
- **Name editing:** By clicking a cross section cell within the table, the user can change its name. Remember to click the Save button to update these changes in your library, as name edits will not be stored automatically.

Sidebar Commands



Add Button

Adds a new Empty cross section to the end of the library list.



Copy Button

Creates a duplicate of the selected cross section. The new instance is renamed with the suffix “_copy” and placed at the bottom of the list.



Import Profile Button

Opens the [Import profile](#) dialog, allowing you to import an existing Tekla profile and convert it into a native Bridge Creator cross section. See technical note below.



Delete Button

Deletes the selected rows from the library list.

Technical Note

Every boundary point of an imported profile is constrained to the 0,0 origin. While useful for quick imports, it is highly recommended to manually build a native Bridge Creator section instead. Native sections allow for "smart" point-to-point constraints, which are more scalable and easier to modify.

Preview and Advanced Editing

- **Preview:** The canvas on the right provides a quick 2D visualization of the section selected in the library table.



Edit Button

Opens the [Edit cross section](#) dialog. This allows you to create or update library sections without needing to import them into your current project first. See best practice below.

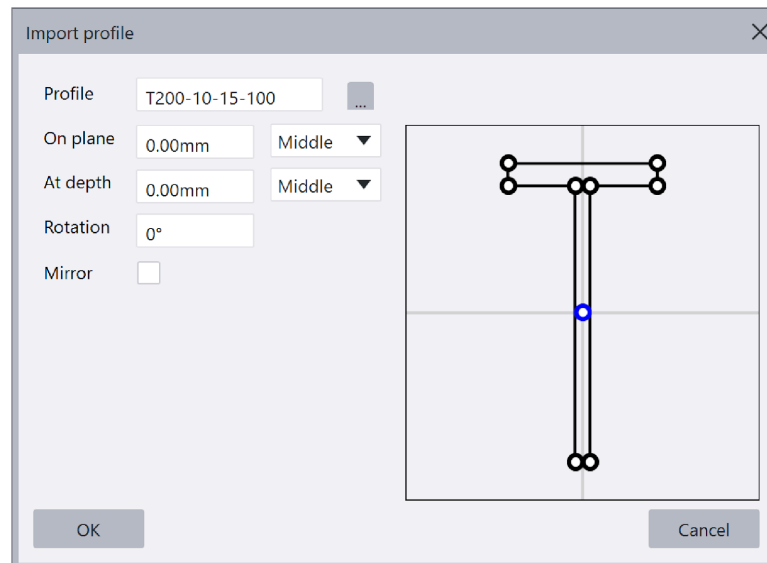
Best Practice

Only use this button for library maintenance. If you intend to use and edit a section in your current model, it is more efficient to import it to the Key sections table and manage it from the Main UI.

Execution Buttons:

- **OK:** Closes and moves the selected cross section to the Key section table of the main interface.
- **Cancel:** Closes the dialog without saving changes.

3.3.1.1 - Import Profile Dialog



Import profile dialog

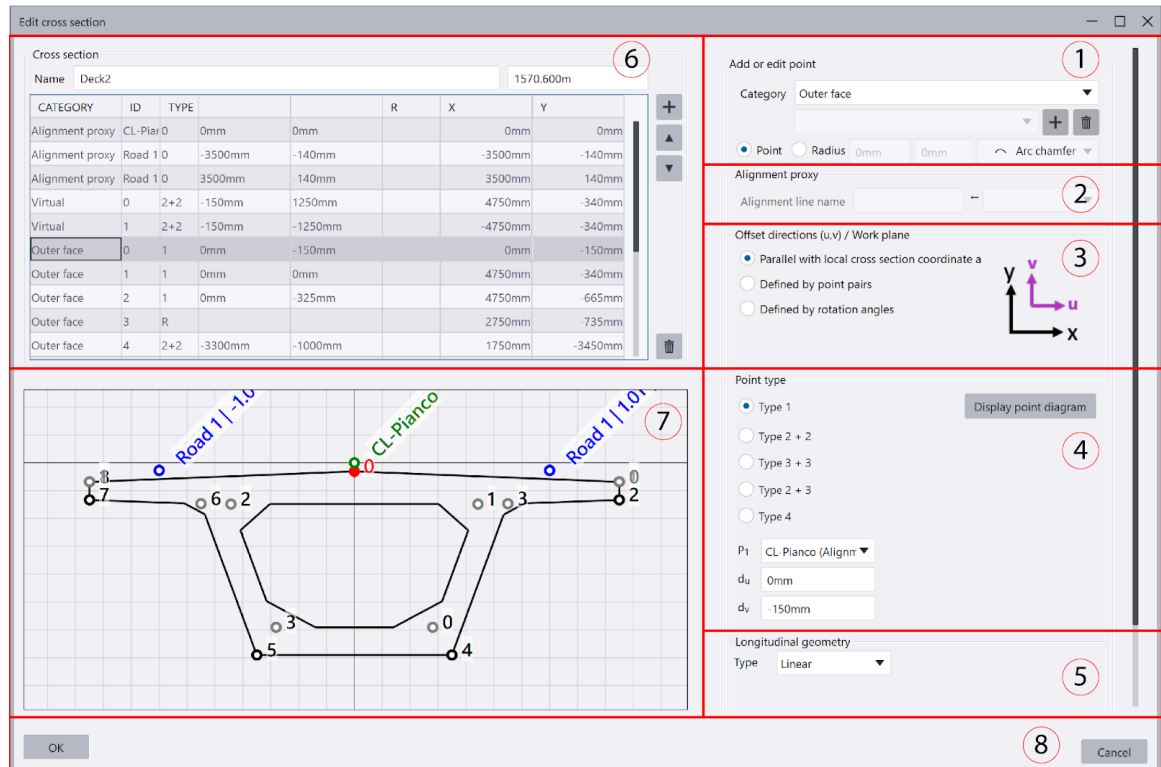
Clicking the Import Profile button  in the [Manage cross section library](#) dialog opens the Import profile dialog. Here, you can select a Tekla profile and adjust its orientation using the following settings:

- **Profile Selection:** Click the selection button  to browse the Tekla profile catalog and choose the desired shape.
- **On plane / At depth:** These settings control the 2D placement and offset of the profile relative to the insertion point.
- **Rotation / Mirror:** Use these fields to rotate or flip the profile's orientation before it is converted into a Bridge Creator cross section.
- **OK / Cancel:** Click OK to confirm the import and convert the profile, or Cancel to close the dialog without making changes.

Technical Note

Every boundary point of an imported profile is constrained to the 0,0 origin. While useful for quick imports, it is highly recommended to manually build a native Bridge Creator section instead. Native sections allow for "smart" point-to-point constraints, which are more scalable and easier to modify.

3.3.2 - Edit Cross Section Dialog

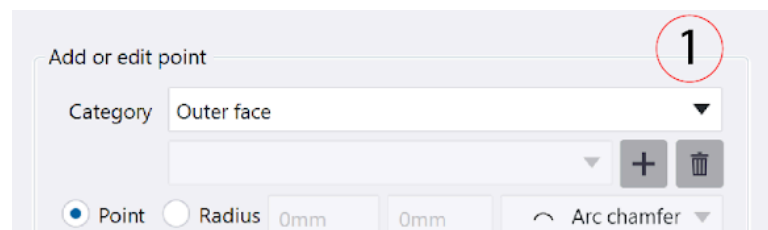


Edit cross section interface

The Edit cross section dialog is the primary engine for defining the geometric logic and point dependencies of your bridge.

3.3.2.1 - Add or Edit Point

Point Categories



Add or edit point

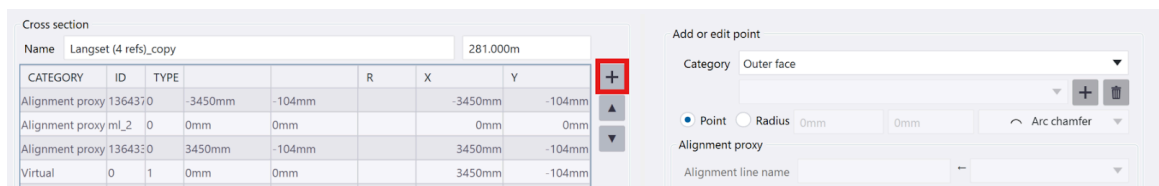
The Category defines the specific type of point within the section. It can be a Proxy point for mapping road lines, an Outer face point for defining the exterior outline of the section, an Inner face point for

creating voids or openings inside the section, or a Virtual point, which is useful as a reference or support point.

Alignment Proxy

These points serve as the connection between your road alignment data and the bridge cross section. They represent the road alignment lines previously imported in the [Read Alignment](#) Interface. These are not geometry points; they are external reference points that provide the "source" coordinates for your bridge logic.

- **Function:** These are reference points used to anchor your geometry to the road's path.
- **Nature of the Point:** It is important to note that these are not geometry points; they are external reference points that provide the "source" coordinates for your bridge logic.
- **Selector Behavior:** When the Alignment Proxy point type is active in the selector menu, the full list of alignment lines you previously chose during the import process becomes automatically available in the Alignment Proxy Selector on the right side.
- **Adding to the Table:** To incorporate a point into your cross section, select the desired line from the dropdown menu and click the  button located on the right side of the Cross section table. Alternatively, you can select an existing proxy line within the table and use the  button to duplicate it as many times as necessary. Once duplicated, change the line associated with the selected row by using the dropdown selector in the Alignment proxy area. You can also map the specific line name in this section; for further details, refer to the [Alignment proxy loading and mapping](#) section.



Cross section

Name: Langset (4 refs)_copy 281.000m

CATEGORY	ID	TYPE		R	X	Y
Alignment proxy	1364370	-3450mm	-104mm		-3450mm	-104mm
Alignment proxy/ml_2	0	0mm	0mm		0mm	0mm
Alignment proxy	1364330	3450mm	-104mm		3450mm	-104mm
Virtual	0	1	0mm		3450mm	-104mm

Add or edit point

Category: Outer face

☒ Point ☐ Radius 0mm 0mm 

Alignment proxy

Alignment line name

Add Proxy, Outer and Virtual points

Notes

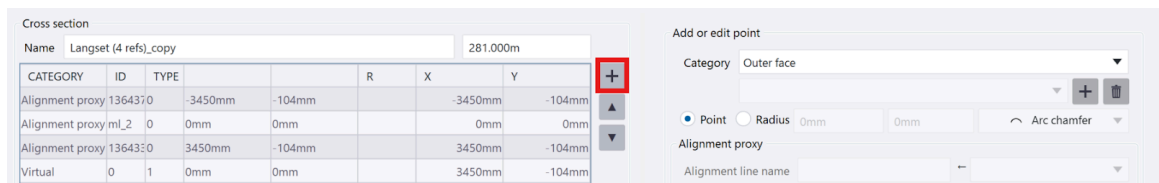
If an alignment line you need is missing from the selector, you must go back to the [Read Alignment](#) dialog and ensure it is checked in the original LandXML import list.

See more about Alignment proxy points at [Alignment proxy loading and mapping](#).

Virtual Points

These are non-graphical support points used to build the logical framework of a cross section without creating physical geometry. They act as "invisible scaffolding" to help organize complex point dependencies and the placement of components. They are highly effective as anchors for beams or components. By constraining multiple face points to a single virtual point, you can update the entire section's behavior by adjusting only that one anchor.

- **Nature of the Point:** These are not geometry points and will not appear in the final model or in any generated drawings.
- **Function as Anchors:** They are highly effective as anchors for beams or other bridge components. While a virtual point is constrained to a road alignment line or a standard cross section point, the components placed in the Components tab can, in turn, be constrained to these virtual points.
- **Centralized Control:** One of the primary advantages of virtual points is the simplification of edits. By constraining Outer or Inner face points to a single virtual point, you can update the part of the section's behavior by adjusting only that one virtual point rather than editing every individual face point.
- **Adding to the Table:** To use one of these points, select the desired line from the dropdown and click the Add button  located on the right side of the Cross section table.



Cross section

Name: Langset (4 refs)_copy 281.000m

CATEGORY	ID	TYPE		R	X	Y
Alignment proxy	1364370	-3450mm	-104mm		-3450mm	-104mm
Alignment proxy	ml_2	0	0mm		0mm	0mm
Alignment proxy	1364350	3450mm	-104mm		3450mm	-104mm
Virtual	0	1	0mm		3450mm	-104mm

Add or edit point

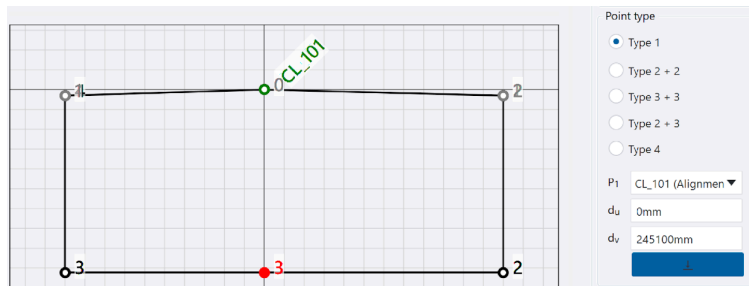
Category: Outer face

Point ☒ Radius ☐ 0mm 0mm Arc chamfer ☐

Alignment proxy

Alignment line name

Add Proxy, Outer and Virtual points



Point configuration and geometry

- Use  button to switch dv (y) from relative distance to absolute coordinate. When active the button will display in blue. This capability is unique to virtual points. See image above showing a virtual point constrained to the road centreline and with an elevation of 245.1m. As a result, Outer face points 2 and 3 will undergo a longitudinally horizontal extrusion, whereas the top Outer face points will be extruded according to their longitudinal constraints with the road alignment.

Drafting Note

Use virtual points to "group" logic. If you have several points that must move together when a specific structural clearance changes, anchor them all to a single virtual point to make future design iterations faster and error-free.

Horizontal Extrusion and Level Constraints

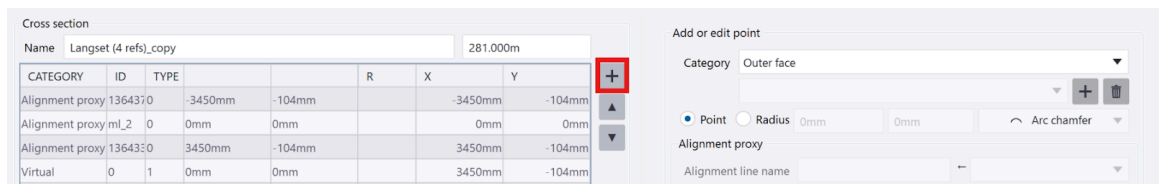
When a point is constrained to a road line, its elevation will automatically follow the road line's vertical profile. This behavior makes it impossible to extrude a surface—such as the soffit of a foundation—at a constant, fixed level to create a perfectly horizontal plane. To achieve a horizontal extrusion, first add a Virtual point constrained to the main road line. In the dv field, type the specific elevation value you require for the horizontal plane and click the button directly below the dv field to lock that elevation. Finally, constrain your Outer face points to this Virtual point. As a result, these points will be extruded at a constant height along the elevation specified in the virtual point's dv field, regardless of the road line's vertical changes.

Outer Face Points

These are physical geometry points that define the external boundaries of your bridge extrusion. A group of three or more

Outer Face points creates a section. Note that there can be only one group of Outer Face points per section, and the point count must remain identical across all key sections to avoid geometric errors.

- **Defining a Section:** A group of three or more Outer Face points collectively creates a section.
- **Single Group Limit:** There can be only one group of Outer Face points per section.
- **Constraint Logic:** Just like other geometry points, each outer face point must be constrained to another point and positioned using du (x) and dv (y) offsets.
- **Adding to the Table:** To use one of these points, select the desired line from the dropdown and click the Add button  located on the right side of the Cross section table.



CATEGORY	ID	TYPE	R	X	Y
Alignment proxy	1364370	-3450mm	-104mm	-3450mm	-104mm
Alignment proxy/ml_2	0	0mm	0mm	0mm	0mm
Alignment proxy	1364330	3450mm	-104mm	3450mm	-104mm
Virtual	0	1	0mm	3450mm	-104mm

Add Proxy, Outer and Virtual points

- **Point Consistency:** The number of Outer Face points must remain identical across all key sections used to define a single object.
Example: If the starting key section of a deck is defined using 10 points, every subsequent key section (such as mid-span or end-span) must also be defined with exactly 10 points.
- **Error Handling:** If the number of points varies between key sections, an alert message will be displayed after clicking the Create button to prevent geometric errors. If there are superimposed points within the cross section an alert message will be displayed identifying those points.
- **Efficient Cross-Section Creation:**
Follow these strategies to streamline the creation of complex geometry within the Cross section table:
 - **Workflow for Outline Creation:** After placing the first Outer face point in the table, it is often faster to duplicate that point and modify the settings for the

next one. Repeat this process until the entire section outline is complete.

- **Clockwise vs. Counter-Clockwise:** When you duplicate a point, the newest instance is automatically highlighted in the table. This simplifies the workflow when creating points in a clockwise direction. However, if you are creating points counter-clockwise, remember to manually select the previous point after each duplication is the newest point created.
- **Inserting Intermediate Points:** To add a point between two existing entries, select the point immediately preceding the intended location and click the Copy button. Then, update the settings for the new entry.
- **Managing Point Order:** If the sequence of points becomes disorganized and distorts the cross-section geometry, use the Up and Down arrows to reorder the rows in the table. Use the Preview canvas as a visual guide to ensure the geometry is rendered correctly as you adjust the order.

Inner Face Points

These geometry points are used to create openings or voids, such as hollow box girders or drainage holes. Unlike Outer Face points, you can have multiple separate groups of inner points, each identified by a unique "Internal Face" name (e.g., "Void-A", "Void-B").

- **Grouped by Internal Face:** Unlike Outer Face points, you can have multiple separate groups of inner points. These are organized and grouped by a unique Internal Face name.
- **Multiple Voids:** This naming system allows you to define several independent voids within a single section.

Example: You can name one internal face "Void-A" and add 3 or more inner points to define its shape. You can then create another internal face named "Void-B" and add 3 or more points to define a second, separate void.

- **Constraint Logic:** Just like other geometry points, each inner point must be constrained to another point and positioned using du (x) and dv (y) offsets.

- **Point Consistency:** The rule for matching point counts applies here as well; if "Void-A" has 4 points in the start key section, it must have exactly 4 points in every other key section for that object.

- **Workflow for Creating Inner Face Groups**

To create voids or openings within your section, follow this workflow to define one or more groups of Inner face points:

- **Initialize the Group:** Use the Category dropdown menu to select Inner face.
- **Name the Group:** Once selected, the field directly below the category becomes active; type a unique name for your void group here.
- **Create the First Point:** Define the point type and constraints within the Point type group, then click the Add button **+** on the left of the group field name. The first point of the group will appear in the table.

Cross section

Name Langset (4 refs)_copy 281.000m

CATEGORY	ID	TYPE		R	X	Y
Alignment proxy	1364370		-3450mm	-104mm		-3450mm
Alignment proxy	ml_2 0	0mm	0mm			0mm
Alignment proxy	1364350		3450mm	-104mm		3450mm
Virtual	0 1	0mm	0mm			3450mm

Add or edit point

Category Inner face

A

Point Radius 0mm 0mm Arc chamfer

Alignment proxy

Alignment line name

Add Proxy, Outer and Virtual points

- **Duplicate and Define Points:** Select the newly created point from the table and this time click the **+** button on the left of the table as many times as necessary to duplicate the points needed for that specific group. You can then modify the coordinates and constraints for each point individually to shape the void.

Cross section

Name Langset (4 refs)_copy 281.000m

CATEGORY	ID	TYPE		R	X	Y
Alignment proxy	1364370		-3450mm	-104mm		-3450mm
Alignment proxy	ml_2 0	0mm	0mm			0mm
Alignment proxy	1364350		3450mm	-104mm		3450mm
Virtual	0 1	0mm	0mm			3450mm

Add or edit point

Category Inner face

A

Point Radius 0mm 0mm Arc chamfer

Alignment proxy

Alignment line name

Add Proxy, Outer and Virtual points

- **Add Additional Groups:** To create a separate inner face group (e.g., a second void), close the

Edit cross section dialog by pressing Ok button for the changes to be applied and reopen it.

- **Repeat for New Voids:** Repeat the process, ensuring you provide a different name in the Inner face group field to keep the openings distinct.

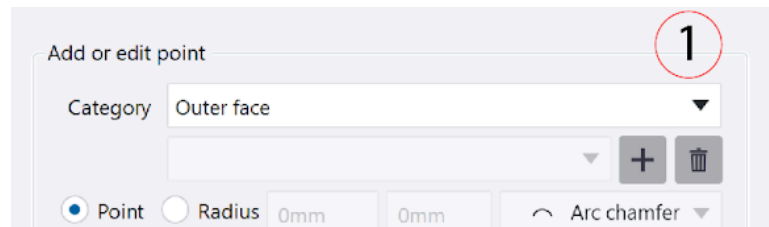
Important: Creating and Managing Voids

Follow these best practices to ensure your internal openings are geometric and easy to modify:

Creating a Circular Void: To generate a perfect circle, place four points at the quadrants (top, bottom, left, and right). Apply the Arc chamfer type to the top and bottom points to achieve the circular shape.

Efficient Constraints: Ideally, every Inner face group should be constrained to a single Virtual point. This allows you to reposition the entire void group simply by editing the coordinates or constraints of that one virtual point, rather than modifying each point individually.

Applying Chamfers



Add or edit point

After defining the points for an Outer face or Inner face outline, you can modify any corner point into a chamfered edge.

- **Select the Point:** Click on the specific point in the cross-section editor that requires a chamfer.
- **Enable Radius:** Change the selection from Point to Radius to activate the chamfer properties.

Chamfers

- **Choose a Chamfer Type:** Select one of the six available options from the dropdown menu: Arc chamfer, Tangent arc chamfer, Line chamfer, Square chamfer, Square parallel chamfer, or Rounding chamfer.
- **Enter Values:**
 - For Rounding, Arc, or Tangent arc chamfers, enter a single value in the left-hand field.
 - For Line, Square, or Square parallel chamfers, enter values in both input fields to define the dimensions.

Note

You can revert a chamfer back to a sharp corner at any time by selecting the Point radio button, or switch back to a chamfer by re-selecting Radius.

3.3.2.2 - Alignment Proxy

The screenshot shows a software interface for managing cross sections. On the left, a table titled 'Cross section' lists various alignment proxies. The 'ID' column contains 'L1_136437', which is highlighted with a red box. On the right, the 'Add or edit point' panel is visible, showing a dropdown for 'Alignment line name' with 'L1_136437' selected and highlighted by a red box.

CATEGORY	ID	TYPE	R	X	Y
Alignment proxy	L1_136437	-3450mm	-104mm	-3450mm	-104mm
Alignment proxy	ml_2	0	0mm	0mm	0mm
Alignment proxy	136433	0	3450mm	-104mm	3450mm
Virtual	0	1	0mm	0mm	3450mm
Outer face	0	1	1400mm	0mm	-4850mm

Alignment proxy load and mapping

Alignment line name field (Left): Allows you to define a custom alias for a selected road line (e.g., "L1_road line name"). Upon importing, the name in this field is what will be used in all geometric logic and point dependency tables.

- **Default Behavior:** When a line is chosen using the right-side selector, the original name of the road line automatically populates the alias field.
- **Customization:** You may choose to keep this default name or enter a custom name to better identify the line's function within the project (e.g., "L1_road line name").
- **Import Result:** Upon importing the line to the table, the name currently visible in this field, whether the original or a user-edited version, is the one that will be used in all geometric logic and point dependency tables.
- **Line Selector:** Used to select a string from the collection of lines imported during the Read Alignment process. If a line is missing, you must ensure it is active in the [Read alignment](#) dialog.

Reusing and Updating Library Cross Sections

When reusing a cross section from the library, you must update the reference geometry to match your current project.

Updating Alignment Proxies

Edit the section and replace the old road lines in the Alignment proxy list with the new lines previously activated in the Read alignment dialog.

- **Caution:** The number of Proxy lines often differs between sections. If a library section relies on more lines than your current project provides, points constrained to non-existent lines will lose their reference, potentially distorting the geometry.

- **Example:** Missing Shoulder Lines

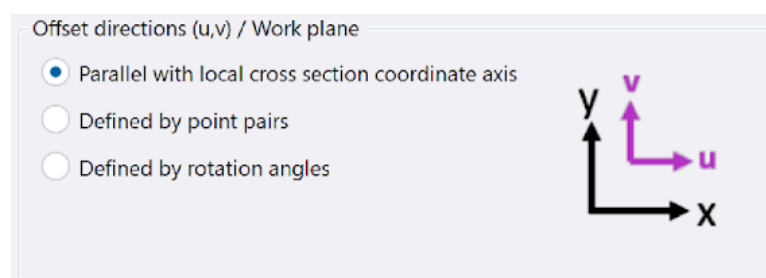
Consider a library section designed with three references: a centerline, a left shoulder, and a right shoulder. If your new project only utilizes a centerline, deleting the old shoulder lines will cause any Outer or Inner face points constrained to them to lose their positioning, resulting in unintended deformations of the cross section profile.

Best Practice: To prevent geometry failure when road lines change.

- **Intermediate Constraints:** Instead of constraining outer points directly to road lines, add a Virtual point for the left side and another for the right side.
- **Mapping:** Constrain these Virtual points to the respective road lines (left/right shoulders).
- **Final Attachment:** Constrain your Outer face points to these Virtual points.
- **The Benefit:** If you encounter a project without shoulder lines, you do not need to fix every individual outer point. You simply update the two Virtual points by defining a manual offset and applying the required superelevation. Your cross section will then render correctly using the new logic without further manual adjustments.

3.3.2.3 - Offset Directions (u,v) / Work Plane

Parallel with local cross section



Offset directions and Work plane when parallel with local coordinate axis

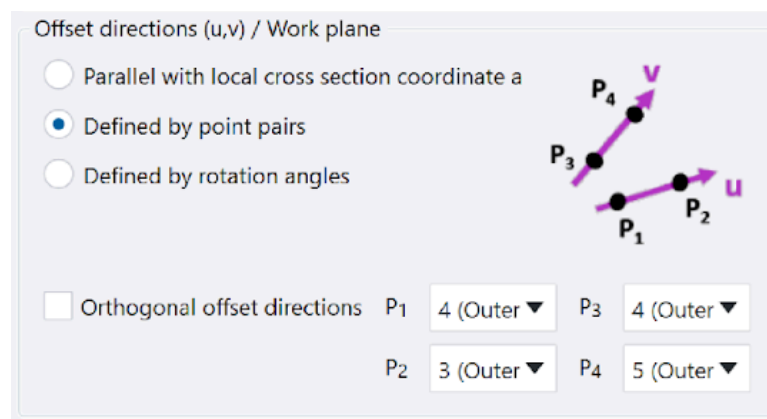
Locks the point's offset directions to the standard 2D Cartesian coordinate system (u and v are identical to x and y).

- **Terminology:** While structural designers typically use x and y, road and civil design often use u and v. In Bridge Creator, these are treated as identical for this setting.

- **Alignment:** The u or x axis corresponds to the 0° horizontal, and the v or y axis corresponds to the 90° vertical.
- **Geometry:** The angle between the two axes is fixed at 90°, ensuring that horizontal and vertical offsets are perfectly perpendicular to one another.
- **Application:** Use this when your offsets are standard "left/right" and "up/down" measurements relative to the cross section's origin.

Defined by point pairs

This setting allows the orientation of the work plane to be determined by existing geometry rather than a fixed horizontal and vertical grid. Instead of using the global coordinate system, the x and y axes are defined by the slope or direction between selected pairs of points.



Offset directions and Work plane when defined by point pairs

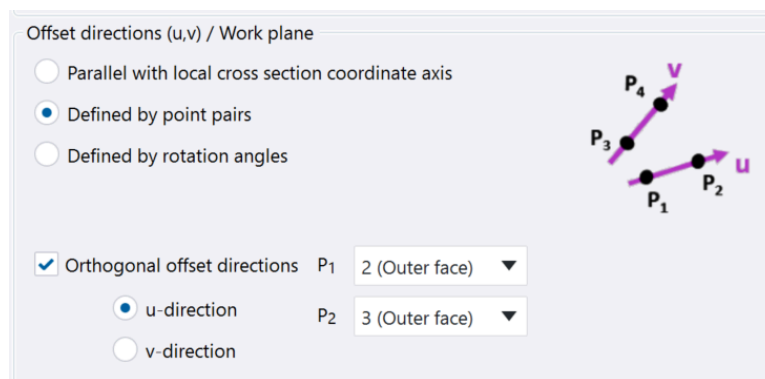
“Orthogonal offset directions” box unchecked:

When the Orthogonal offset directions box is unchecked, the software allows for a "decoupled" coordinate system where the u and v axes can be defined independently of one another.

- **U-Axis Definition:** The orientation of the u-plane (or x-axis) is established by selecting two points, P1 and P2. The axis follows the specific slope of the line created between these two points.
- **V-Axis Definition:** The orientation of the v-plane (or y-axis) is defined independently by selecting a second pair of points, P3 and P4.
- **Decoupled Relationship:** Because the orthogonal constraint is removed, the axes do not have to maintain a 90-degree relationship. This provides maximum flexibility for complex

geometry where horizontal and vertical features are not perpendicular.

- **Practical Application:** For example, you can set the u-axis to follow the slope of a top deck surface (P1 to P2) while setting the v-axis to follow the vertical face of an internal haunch (P3 to P4).
- **Geometric Result:** This configuration allows a point to move laterally along the deck's slope while its vertical offset is calculated relative to a non-perpendicular feature, such as a skewed haunch or an inclined web.

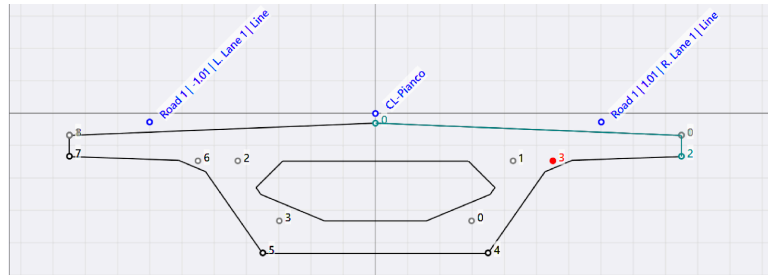


Defined by point pairs when Orthogonal offset directions box checked

“Orthogonal offset directions” box checked:

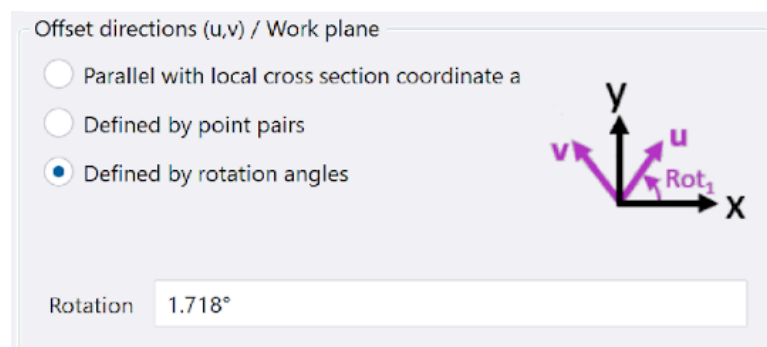
When the Orthogonal offset directions box is checked, the software locks the coordinate system into a strict 90-degree relationship. This ensures the u and v axes remain perfectly perpendicular to one another, creating a custom work plane. Instead of requiring two separate pairs of points to define the plane, you only need one pair (P1 and P2) to establish the orientation for the entire grid.

- **Axis Priority:** By selecting either the u-direction or v-direction radio button, you determine which primary axis follows the slope of the selected point pair.
- **U-Direction Mode:** The line created by P1 and P2 defines the horizontal plane. The vertical plane is then automatically established at a fixed 90-degree angle from that horizontal reference.
- **Deck Application:** Use the u-direction when you want a point to move perfectly along the slope of the top deck (P1 to P2), with its corresponding "vertical" movement maintained exactly perpendicular to that deck surface.



P3 U and V planes highlighted in the preview canvas

- **Visual Logic:** Selecting a point in the canvas highlights it in the table. The selected point, its parent points, and its active work plane will all be displayed in green.
- **V-Direction Mode:** The line created by P1 and P2 defines the vertical plane. The horizontal plane is then automatically generated 90 degrees from that vertical reference.
- **Web Application:** Use the v-direction when a point needs to move along the face of a sloped web (P1 to P2). Any lateral "horizontal" movement will then be calculated 90 degrees from the web's slope.



Offset directions and Work plane when defined by rotation angles

Defined by rotation angles

When this option is selected, the work plane is established using numerical input rather than point-to-point references.

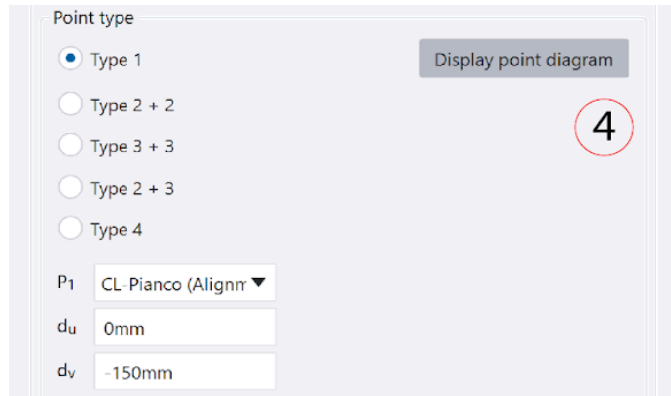
- **Manual Tilt Control:** This option allows you to manually tilt the work plane by entering a specific numerical value. Use this setting when you require a 90-degree coordinate system rotated to a specific angle that differs from the default horizontal or vertical axes.
- **Axis Orientation:** The rotation value entered in the field directly determines the angle of the u (or x) axis. The v (or y)

direction is automatically locked at a fixed 90-degree angle relative to this rotated axis, ensuring a perfectly square grid.

- **Smart Input for Slopes (%):** To simplify bridge modeling, the input field supports percentage values for cross-falls and slopes. By entering a percentage followed by the % symbol (e.g., "2%") and pressing Enter, the tool automatically calculates and converts that slope into the corresponding geometric degree value.
- **Practical Application:** This feature is highly effective for setting up a work plane that matches a road cross-fall when specific alignment lines are unavailable. By entering a value like "2.5%", the u-axis tilts to match the deck slope exactly, while the v-axis remains perfectly perpendicular to the pavement surface.

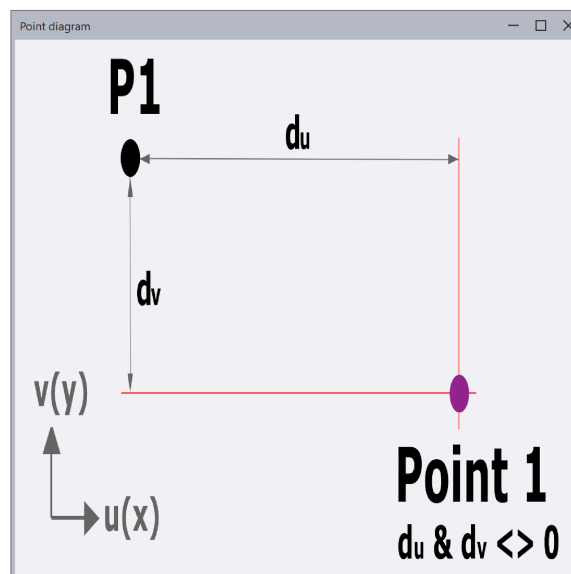
3.3.2.4 - Point Type Group

Point Type 1



Point type 1 constraint logic

Point Type 1 is the most straightforward point type in Bridge Creator. It defines a new point based on its relative distance from a single parent reference point, P1.



Point type 1 diagram

How it Works

- **The Constraint (P1):** The new point is entirely dependent on its parent, P1. If P1 moves due to a change in the alignment or a modification to a previous point in the table, this point will shift automatically to maintain its relative position.

- **The Offsets:** The position is defined by two values:
 - du (x): The horizontal distance from P1.
 - dv (y): The vertical distance from P1.
- **Logical Requirement:** For this point to be distinct from its parent, the values for du (x) and dv (y) must not both be zero. If both were set to zero, the new point would simply sit on top of P1.

Coordinate Alignment

- The direction of the du (x) and dv (y) offsets depends on the selected Work Plane:
 - **Parallel to Axis:** du (x) is strictly horizontal and dv (y) is strictly vertical.
 - **Defined by Point Pairs/Rotation:** du (x) follows the primary rotated axis, and dv (y) follows the axis perpendicular to it.

Deck Application

This type is perfect for features with fixed dimensions. For example, once you have the corner of a slab defined, you can use a Type 1 point to place a drip notch or a curb edge by entering fixed du (x) and dv (y) values.

Tip

Think of Point Type 1 as an "anchored offset." It ensures that no matter how the bridge alignment shifts, the structural part you are modeling keeps its exact shape and size relative to its anchor point.

Point Type 2+2

Point type

☐ Type 1
 ☒ Type 2 + 2
 ☐ Type 3 + 3
 ☐ Type 2 + 3
 ☐ Type 4

P1
 P2

d_u
 d_v

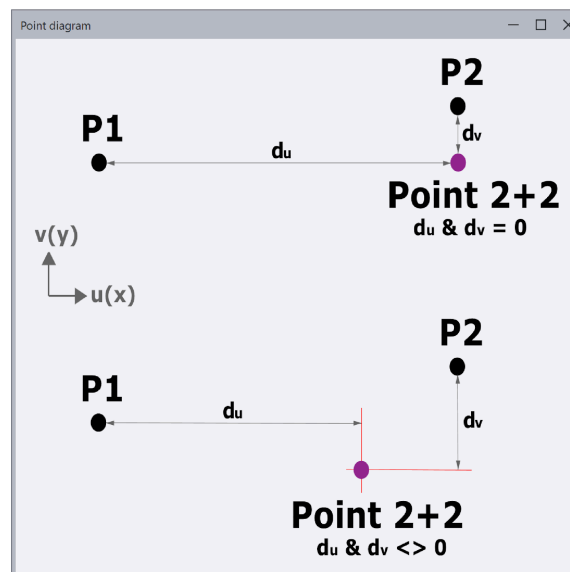
Longitudinal geometry

Type

Display point diagram

Point type 2+2 constraint logic

Point Type 2+2 is used to create a new point by calculating the intersection of coordinates derived from two separate reference points, P1 and P2.



Point type 2+2 diagram

How it Works

Unlike Type 1, which relies on a single anchor, Type 2+2 splits the horizontal and vertical logic between two parent points:

- **The Constraints:** The new point is constrained by both P1 and P2.
- **Horizontal Definition:** The $du(x)$ position of the new point is calculated relative to P1.
- **Vertical Definition:** The $dv(y)$ position of the new point is calculated relative to P2.

Logical Variations

Depending on your design requirements, there are two primary ways to use this point type:

- **Standard Intersection** ($du(x) \& dv(y) = 0$):
 - If both offset values are set to zero, the new point will sit exactly at the horizontal coordinate of P1 and the vertical coordinate of P2.
 - Deck Example: If P1 is the deck edge and P2 is a point on the top surface, this creates a point exactly level with P2 but aligned horizontally with the edge.
- **Offset Intersection** ($du(x) \& dv(y) \neq 0$):
 - The new point is placed at a specific $du(x)$ distance from the vertical line passing through P1, and a specific $dv(y)$ distance from the horizontal line passing through P2.
 - This creates a dynamic intersection that maintains specific clear distances from two different structural elements simultaneously.

Tip

Use Point Type 2+2 whenever a point's location is "half-governed" by one part of the bridge and "half-governed" by another. It is the perfect tool for defining internal corners or clearance points where horizontal and vertical constraints come from different sources.

Point Type 3+3

Point type

☐ Type 1
 ☐ Type 2 + 2
 ☒ Type 3 + 3
 ☐ Type 2 + 3
 ☐ Type 4

Display point diagram

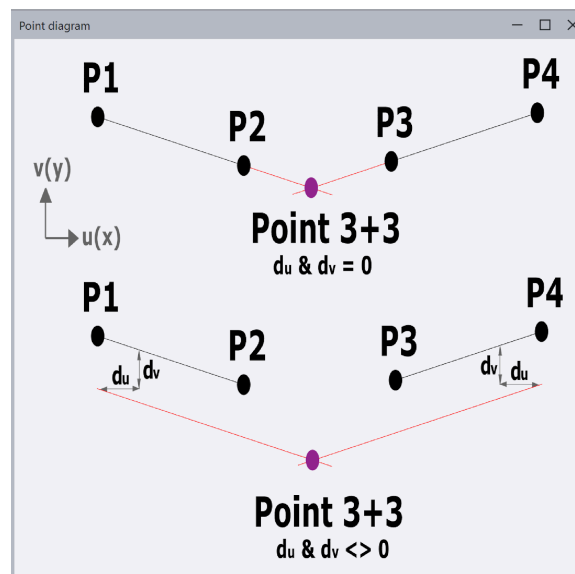
P₁ 2 (Outer face) P₃ 2 (Outer face)
 P₂ 5 (Outer face) P₄ 4 (Outer face)
 d_u -2000mm d_u 0mm
 d_v 0mm d_v 150mm

Longitudinal geometry

Type Linear

Point type 3+3 constraint logic

Point Type 3+3 is used to create a new point by calculating the intersection of two imaginary lines, each defined by the slope between two reference points.



Point type 3+3 diagram

How it Works

This point type uses four parent points (P1, P2, P3, P4) to determine the trajectories of two intersecting lines:

- **Line A (Left Side):** The slope is defined by the line passing through P1 and P2.
- **Line B (Right Side):** The slope is defined by the line passing through P3 and P4.
- **The Intersection:** The new point is placed where these two slopes meet in space.

Logical Variations

- **Direct Intersection** ($du(x) \& dv(y) = 0$):
 - The new point is placed exactly at the mathematical intersection of the two lines defined by the point pairs.
 - Deck Example: This is commonly used to find the theoretical "V" or low point of a deck cross-fall by projecting the slopes from the left and right gutters.
- **Offset Intersection** ($du(x) \& dv(y) \neq 0$):
 - Once the theoretical intersection is found, the new point can be shifted by a specific $du(x)$ and $dv(y)$ distance.
 - The $du(x)$ and $dv(y)$ offsets are applied relative to that calculated intersection point.

Key Geometric Advantage

Point Type 3+3 is extremely powerful because it is fully dynamic. If any of the four reference points (P1 through P4) change position, for example, if a road alignment causes the deck slope to steepen, the intersection point will automatically recalculate its position to maintain the geometric logic.

Tip

Use Point Type 3+3 for complex valley or ridge details where the exact coordinate depends on variable slopes rather than fixed distances. It ensures your bridge geometry remains valid even as alignments and cross-falls change.

Point Type 2+3

☐ Type 1
 ☐ Type 2 + 2
 ☐ Type 3 + 3
 ☒ Type 2 + 3
 ☐ Type 4

Display point diagram

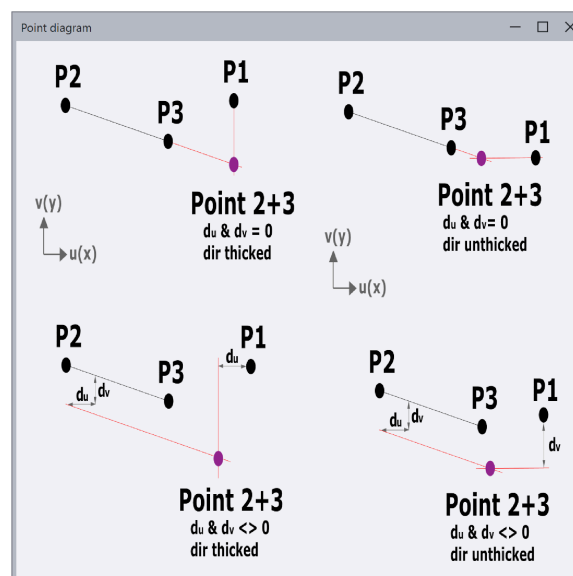
P₁ 2 (Outer face) ▼
 P₂ 2 (Outer face) ▼
 d_u -2000mm
 P₃ 4 (Outer face) ▼
 dir ☐
 d_u 0mm
 d_v 150mm

Longitudinal geometry

Type Linear ▼

Point type 2+3 constraint logic

Point Type 2+3 is a hybrid logic that creates a new point at the intersection of a fixed coordinate and a sloped trajectory. It is primarily used to align a point horizontally with an existing reference while ensuring its vertical position follows a specific slope.



Point type 2+3 diagram

How it Works

This point type uses three parent points to define its location:

- **Horizontal Constraint** (P1): Determines the du (x) position of the new point.
- **Slope Trajectory** (P2 and P3): Defines the line (and its gradient) along which the point must lie.

The "Dir" (Direction) Toggle

The behavior of the intersection changes significantly depending on whether the dir checkbox is checked or unchecked:

- **Dir Checked** (Default Path):
 - The intersection is calculated using a strictly vertical line passing through P1.
 - Application: This is standard for finding the height of a point at a specific horizontal offset, such as finding the elevation of a pier centerline relative to a sloped deck surface.
- **Dir Unchecked** (Orthogonal Path):
 - The intersection is calculated using a line passing through P1 that is perpendicular (90°) to the slope defined by P2 and P3.
 - Application: Use this when a point needs to be "squared" to a sloped element.

Offset Logic

- **Standard Intersection** (du (x) & dv (y) = 0): The point sits exactly at the intersection of the slope and the reference line.
- **Offset Intersection** (du (x) & dv (y) <> 0): After the intersection is found, the point is moved by the specified du (x) and dv (y) distances relative to that intersection.

Tip

Use Point Type 2+3 when you need to project a point onto a slope. If you want the point to move straight up and down, leave dir checked. If you want it to move perfectly square to the slope, uncheck dir.

Point Type 4

Point type

☐ Type 1
 ☐ Type 2 + 2
 ☐ Type 3 + 3
 ☐ Type 2 + 3
 ☒ Type 4

P₁ 2 (Outer face) ▼
 Display point diagram

P₂ 3 (Outer face) ▼

d_u -2000mm

d_v 0mm

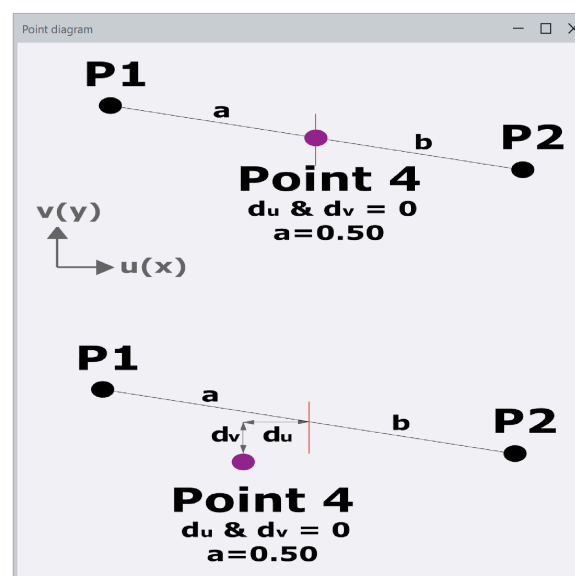
a 0.50 b 0.50

Longitudinal geometry

Type Linear ▼

Point type 4 constraint logic

Point Type 4 creates a new point along the line connecting two existing points, P1 and P2. It is primarily used to place a new point at a specific percentage or ratio between two given points.



Point type 4 diagram

How it Works

This point type uses a ratio-based logic to determine the initial position:

- **The Constraints:** The new point is constrained by the segment between P1 and P2.
- **The Ratio (a):** You define a value "a" (and its inverse "b") to set the position along the line.
 - A value of $a = 0.50$ places the theoretical point exactly at the midpoint (50%) between P1 and P2.
 - A value of $a = 0.00$ would place it at P1, while $a = 1.00$ would place it at P2.

Offset Logic

- **Standard Interpolation** ($du(x) \text{ \& } dv(y) = 0$): The new point sits exactly on the line connecting the two parent points.
- **Offset Interpolation** ($du(x) \text{ \& } dv(y) \neq 0$): After the ratio-based position is calculated on the line, the point is shifted by the specified $du(x)$ and $dv(y)$ distances.

Deck Application

If you need to place a point at an exact mid way between two other points, you select both P1 and P2. By setting $a = 0.50$, the new point stays centered even if the width between the parent points changes along the road alignment.

3.3.2.5 - Longitudinal Geometry

Interpolation Method Definitions

When building bridge geometry between two Key Sections (P_1 and P_2), Bridge Creator uses interpolation to determine the position of cross section points at every triangulation interval. While Linear is the default, five advanced parabolic and exponential methods are available to create smooth, non-linear transitions.

Requirements for Non-Linear Interpolation

- **Key Sections:** At least two key sections are required to apply these methods.
- **Application:** You must select the longitudinal geometry type and define its specific parameters for each point in the first key section.
- **Direction:** The interpolation rule always calculates the geometry moving towards the next Key Section.
- **Reversed Interpolation:** Every method has a "reversed" version that applies the formula in the opposite direction, allowing for mirrored geometric results.

Linear (Default)

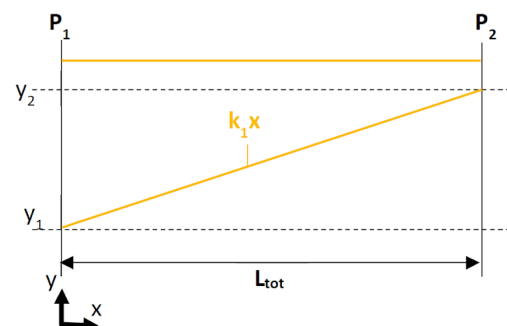
This is the standard behavior where the tool creates a straight-line transition between corresponding points in P_1 and P_2.

- **Input:** None.



$$f(x) = y_1 + k_1x$$

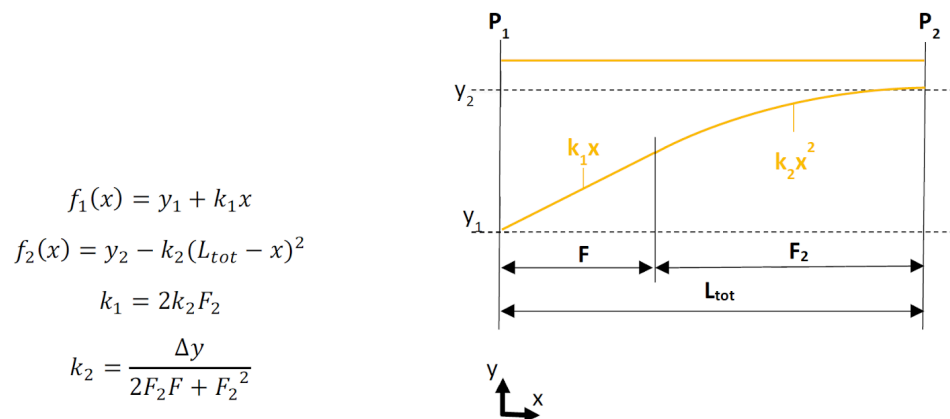
$$k_1 = \frac{\Delta y}{L_{tot}}$$



P2F: Linear to Polynomial

This method creates a smooth transition by maintaining a constant slope until a specified point (F), then transitioning into a polynomial curve. The extrema (peak/valley) of the curve is located at P₂.

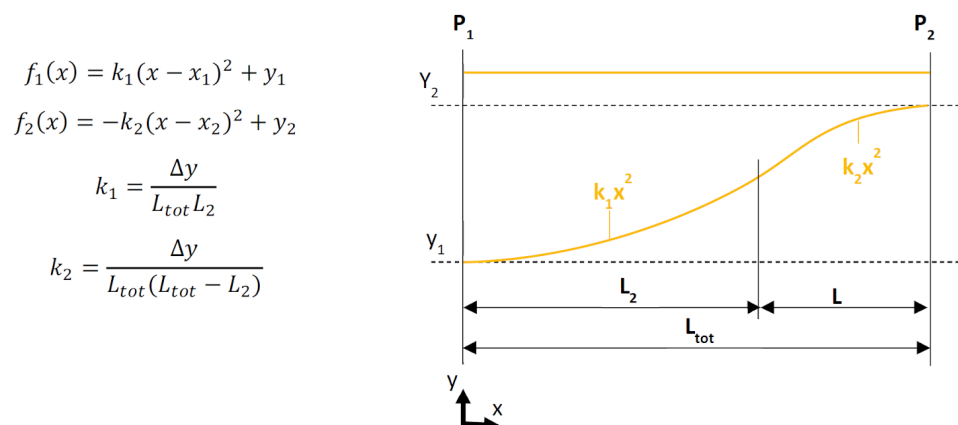
- **Input:** F (The distance from P₁ where the polynomial curve begins).



P2L: Polynomial

Polynomial interpolation creates a perfectly smooth transition between key sections by ensuring the slopes are equal at the intersection point (L). The extrema of the functions are located at both P₁ and P₂.

- **Input:** L (The distance from P₁ where the two curves meet).



P2V: Linear Angle to Polynomial

This method creates a smooth transition by maintaining a specific linear angle (v) from P_1 before transitioning into a polynomial curve. The extrema of the final curve is located at P_2 .

- **Input:** F , L , and v (The linear angle).



$$f_1(x) = k_1x + y_1; k_1 = \tan(v)$$

$$f_2(x) = Ax^2 + Bx + C + y_1$$

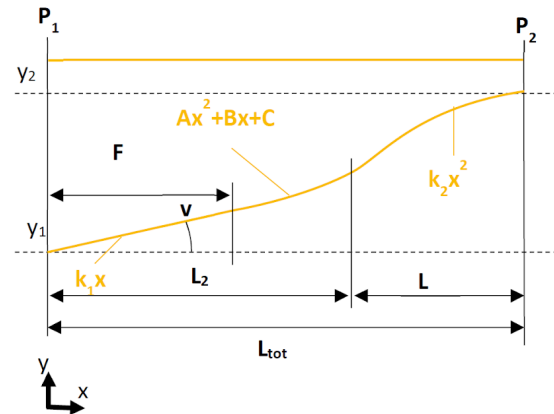
$$f_3(x) = y_2 - k_2(L_{tot} - x)^2$$

$$A = \frac{\Delta y - \frac{1}{2}k_1(L_{tot} + L_2)}{(F^2 + L_2L_{tot} - FL_{tot} - FL_2)}$$

$$B = k_1 - 2AF$$

$$k_2 = \frac{AL_2 + \frac{1}{2}B}{(L_{tot} - L_2)}$$

$$C = k_1F - AF^2 - BF$$



P3: 3rd Degree Polynomial

A 3rd-degree polynomial creates a smooth transition between key sections using a single mathematical function (Ax^3+Bx^2+C).

- **Input:** Two of the three parameters (A , B , or C).

Note: This formula is calculated using meters as the unit of measurement to ensure useful geometric values.

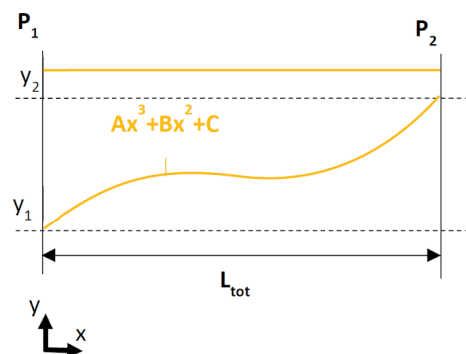


$$f(x) = Ax^3 + Bx^2 + C + y_1$$

$$A = \frac{\Delta y - B * L_{tot}^2 - C * L_{tot}}{L_{tot}^3}$$

$$B = \frac{\Delta y - A * L_{tot}^3 - C * L_{tot}}{dDeltaStNo^2}$$

$$C = \frac{\Delta y - AL_{tot}^3 - BL_{tot}^2}{L_{tot}}$$



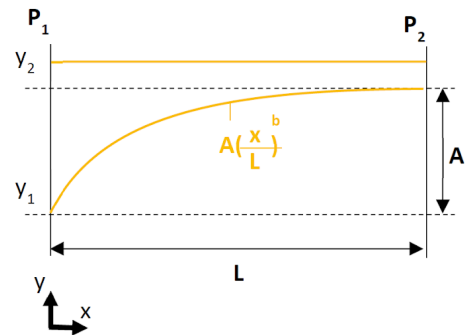
PN: Exponential

Exponential interpolation utilizes a single function $(A(x/L)^D)$ to create a smooth transition. The extrema of the function is located at P_2.

- **Input:** b (The exponential factor).



$$f(x) = y_2 - A\left(\frac{x}{L}\right)^b$$



Technical Considerations

Vertical Interpolation: These non-linear methods only interpolate the vertical component of the point.

Precision: The factor input for these calculations supports up to 5 decimal places for high-precision engineering.

Varying Sections: You can create varying sections from corner to corner, provided each section contains the exact same number of defined points.

3.3.2.6 - Cross Section Table

6

Cross section							
Name		Deck2 1570.600m					
CATEGORY	ID	TYPE			R	X	Y
Alignment proxy	CL-Piar 0		0mm	0mm			0mm
Alignment proxy	Road 1 0		-3500mm	-140mm		-3500mm	-140mm
Alignment proxy	Road 1 0		3500mm	-140mm		3500mm	-140mm
Virtual	0	2+2	-150mm	1250mm		4750mm	-340mm
Virtual	1	2+2	-150mm	-1250mm		-4750mm	-340mm
Outer face	0	1	0mm	-150mm		0mm	-150mm
Outer face	1	1	0mm	0mm		4750mm	-340mm
Outer face	2	1	0mm	-325mm		4750mm	-665mm
Outer face	3	R				2750mm	-735mm
Outer face	4	2+2	-3300mm	-1000mm		1750mm	-3450mm

Cross section table

This table displays the specific data for every point in your section.



Add Button

Creates a new row. To add a point between others, select the point immediately before the desired location and click +.



Navigation Arrows

Use the arrows to reorder points on the table.

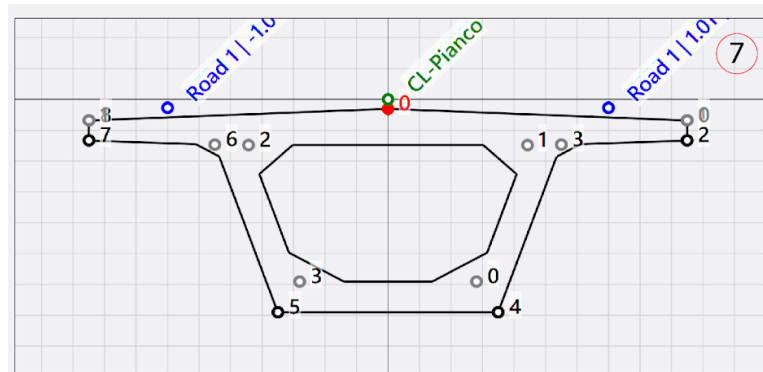


Delete Button

Removes the selected rows from the table.

3.3.2.7 - Preview Canvas

Preview Canvas

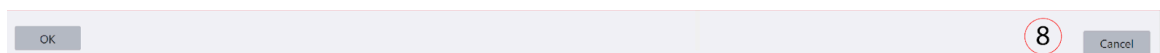


Cross section preview

The preview box provides visual validation during section creation.

- **Navigation:** Zoom with the mouse wheel, pan by dragging the middle mouse button, and reset with a right-click.
- **Visual Logic:** Selecting a point in the canvas highlights it in the table. The selected point, its parent points, and its active work plane will all be displayed in green.

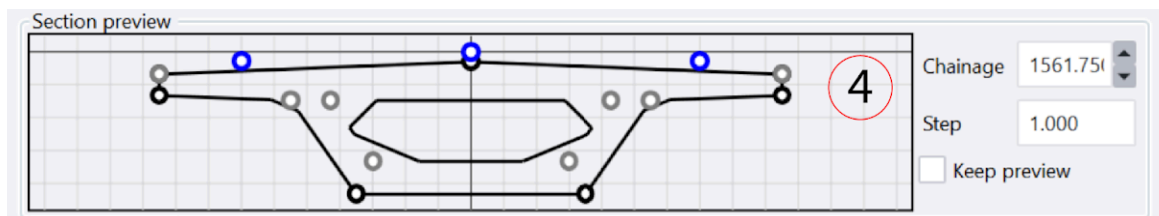
3.3.2.8 - Footer



Edit cross section footer

- **OK:** Closes and saves the data. If points are superimposed (clashing), an alert message will identify the specific IDs to prevent geometric errors.
- **Cancel:** Closes the dialog without saving any changes.

3.4 - Section Preview



Cross section preview

The Section preview area provides a real-time visual validation of your bridge geometry. This allows you to inspect cross sections at specific stations along the alignment before final generation.

- **Preview canvas:** The left-hand side of this section displays a 2D profile of the cross section. Selecting a row from the Key sections table above will immediately update the canvas to show that specific section's geometry. This is particularly useful for projects with varying sections, as it allows you to quickly identify definitions without opening the cross section editor.
- **Chainage:** This field displays the exact station currently being previewed in the model.
- **Step:** Define the increment value for station navigation.
- **Up/Down Arrows:** Use these arrows to navigate through the bridge geometry. As you toggle the arrows, the cross section preview updates in the Tekla model at the corresponding station intervals defined by the Step value.
- **Keep preview:** By default, the model preview is temporary and updates as you move. If you check this box, the temporary cross sections remain visible in the model. These will persist until you either redraw the model view or uncheck the box and use the up/down arrows again.

Pro-Tip for Complex Geometry

Use the Section preview to verify transitions between different key sections. By setting a small Step value and scrolling through the alignment, you can ensure that interpolation and varying dimensions are behaving as expected throughout the entire length of the bridge.

3.5 - Creation

The screenshot shows a 'Creation' panel with the following fields and values:

Field	Value
Name	DECK
Class	5
Phase	8
Material	C50/60
Cast unit	Cast in place

Creation attributes

The Creation section is where you define the primary structural attributes and organizational metadata for the bridge object.

Naming and Material

- **Name:** Enter the structural name of the object. Note: You no longer need to manually define the shape name; Bridge Creator now automates this process.
- **Material:** Click  to open the standard Tekla material library. The available material options will automatically update based on the specific Environment (e.g., US Imperial, US Metric) you selected when opening Tekla Structures.

Model Organization

- **Class:** Assign a class number to control the object's color and for filtering purposes in the model.
- **Phase:** Assign the object to a specific construction phase to keep the model organized and to assist in construction sequencing.

Production Type

- **Cast unit:** Use the dropdown menu to define the production method.
 - **Cast in place:** For concrete poured directly on-site.
 - **Precast:** For structural elements manufactured off-site and transported to the project.

Pro-Tip for Project Setup

Consistently filling out the Class and Phase fields during the creation stage significantly simplifies downstream tasks like generating reports, creating filtered views, and managing complex BIM data.

3.6 - Chainage/Station

Chainage/Station

☐ Manual input ☒ Station library

Start ☒ Deck-St2: 1531.75m ▼

☒ End ☒ Deck-St3: 1570.60m ▼

☐ Length ☒ 0.000m

Interval ☒ 0.20m

Polygon count 530

6

Stations

Chainage/Station parameters

The Chainage/Station section defines the extrusion limits and geometric resolution of the bridge object. There are three primary methods for establishing the start and end points along the centerline.

Extrusion Input Methods

- **Manual Input (Start & End):** Manually type the specific station values for both the beginning and the end of the extrusion.
- **Manual Input (Start & Length):** Define a starting station and select the Length radio button to enter the total longitudinal dimension. This is ideal for components requiring a specific fixed length, as the tool automatically calculates the end station for you.
- **Station Library:** Select the Station library radio button to pull predefined values directly from your project's library. Click the dropdown in the Start or End fields to view and select the station name and value you previously defined.

Geometric Settings

- **Interval:** Define the spacing for triangulation along the alignment.
 - **Accuracy:** The minimum allowable value is 0.11m for maximum output precision.
 - **Best Practice:** For long or complex geometries, use a larger interval (e.g., 2m or 5m) during the design phase to increase processing speed. Once the geometry is finalized, reduce the interval to 0.11m for the final high-accuracy output.

Extrusion Information

- **Polygon count:** Displays the total number of triangles within the extrusion. If this value exceeds 25,000, processing and model performance may slow down significantly.

Library Management

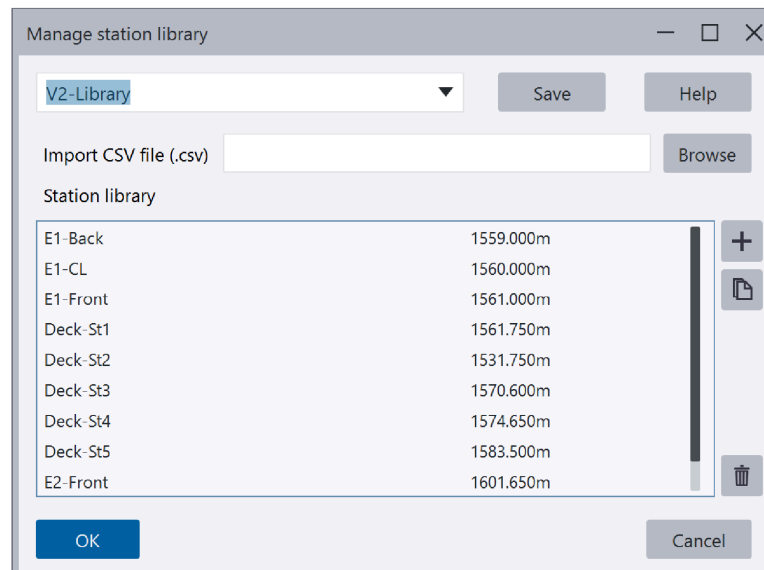
- **Stations Button:** Opens the Station Library dialog box, where you can add, edit, or delete predefined project stations. This editor will be covered in detail in the following section.

Pro-Tip for Performance

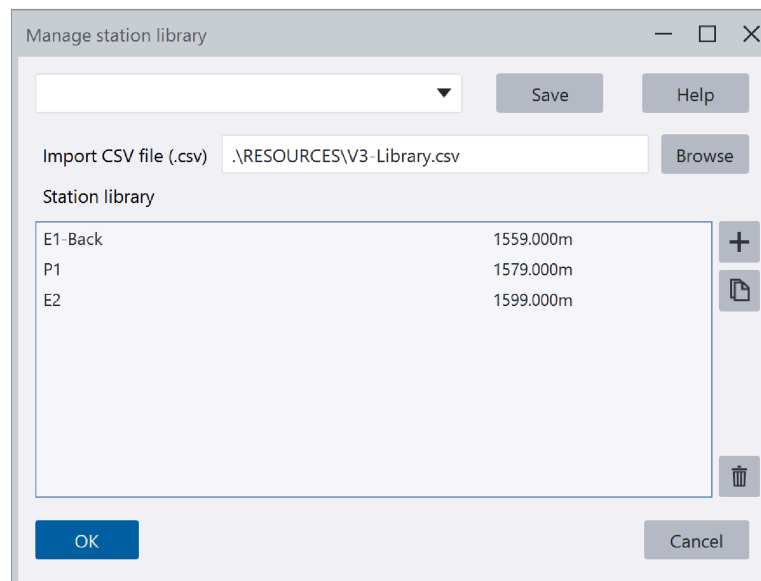
Always monitor your Polygon count when decreasing the Interval. If your bridge is exceptionally long, consider breaking it into smaller segments (Creation phases) to keep the polygon count per object manageable and maintain model responsiveness.

3.6.1 - Manage Station Library Dialog

The Manage station library dialog allows you to create and manage predefined station points (chainages) that can be reused across multiple bridge components.



Manage station library dialog when the table is manually populated by the user



Manage station library dialog when a CSV file has been loaded

Library Management

- **Preset Dropdown:** Use this menu to select and load existing station libraries.
- **Save:** After creating a new library or modifying an existing one, enter a name and click Save. This generates an XML file within the model's attributes folder to store your data.
- **Help:** This button links directly to the official Tekla support page for Bridge Creator.

Importing External Data

- **Import CSV file:** Use the Browse button to import station data from a CSV file.
- **Format Requirements:** The file must follow the specific syntax: Station_Name,Station_Value (e.g., E1-CL,87332.500).
- **File Cleanup:** Ensure there are no extra spaces or line breaks at the end of the CSV file to prevent import errors.

Station Table Editor

This area allows for manual creation and editing of stations.



Add Button

Creates a new blank row in the table.



Copy Button

Duplicates the selected row to speed up the process of editing similar station names and values.



Delete Button

Removes the selected rows from the library.

Closing the Dialog

- **OK:** Closes the dialog and applies the current library. If you have unsaved changes, an alert will appear giving you the option to return and save or continue without saving.
- **Cancel:** Closes the dialog immediately without saving changes or displaying an alert.

Best Practices & Troubleshooting

Save Frequently: It is good practice to save changes as you go to avoid accidental data loss.

Define Early: Always finalize your library before creating extrusions in the model. If a library is modified after an object is created, that object may lose its station references.

Restoring References: If an object loses its library reference, you must select the object in the model, click Get in the main interface, reload the updated library, and then click Modify to store the new library data within the object component.

3.7 - Auxiliary Geometry

Cross section creation		
Cross section	☒	No
Construction lines	☒	No
Start	☒	0.000m
End	☒	0.000m
Interval	☒	0.000m
Phase	☒	0
Class	☒	0

Auxiliary geometry parameters

The Cross section creation area allows you to generate temporary or permanent geometric references along the bridge alignment. These "slices" are essential for downstream detailing and as visual aids when working with complex deck curvatures in 2D drawings.

Toggle Selection

- **Cross section:** Use this dropdown to create physical cross section geometry in the model. This is typically generated as a thin plate representing the exact outline of the deck at that specific station.
- **Construction lines:** Toggle this option to generate Tekla construction lines that follow the outer boundary of the cross section.

Range and Spacing

- **Start / End:** Define the specific station range where these support sections or lines should be generated.
- **Interval:** Set the longitudinal spacing between each generated cross section or set of construction lines.

Organization

- **Phase / Class:** To maintain a clean and organized model, you can predefine the Phase and Class for these objects. This ensures they are easily filtered or hidden when they are no longer needed as references.

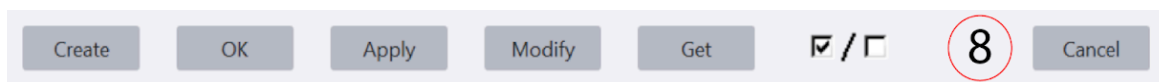
Use Cases for Cross Section Creation

Complex Curvature: When a deck follows a tight horizontal or vertical curve, these slices provide precise reference points that standard modeling tools may miss.

Drawing Production: These sections are ideal for creating "slices" of the deck to represent the cross section in structural drawings without needing to cut a view through the entire 3D bridge object.

Detailing Support: Provides clear geometric boundaries for placing secondary components or reinforcement in complex transition areas.

3.8 - Footer



Footer when General tab is selected

The footer contains the primary commands for creating, updating, and managing your bridge components within Tekla Structures.

- **Create:** Generates a new Bridge Creator component containing your defined extrusion, beams, and tension cables.
 - **Important:** Only use this button the first time an object is created.
 - **Warning:** If you click Create on an object that already exists in the model, the tool will generate a duplicate object directly on top of the original.
- **Modify:** Applies changes to an object that has already been created in the model. Ensure the target object is selected in the 3D view before clicking Modify to update its geometry or properties.
- **Get:** Loads the properties of an existing object into the Bridge Creator interface. Select an object in the model and click Get to view its settings.
 - **Alternative:** You can also double-click an existing Bridge Creator object in the model to automatically load its properties into the interface.
- **Apply:** Copies the currently selected properties from the interface to other selected objects in the model.

- **Selection Toggles:** Use the Select all or Unselect all toggles  /  next to the property fields to precisely define which attributes (e.g., material, class, or stationing) should be copied.
- **OK:** Closes the Bridge Creator application. This button simply exits the tool and does not trigger any creation or modification of model objects.
- **Cancel:** Closes the application immediately. No changes made in the interface will be saved or applied to the model.

Pro-Tip for Property Management

Use the Apply button in combination with the property checkboxes to quickly standardize your bridge project. For instance, if you need to update only the Material and Class across multiple spans, uncheck everything else before clicking Apply to ensure your stationing and geometry remain untouched.

4. Components Tab (UI)

The Components tab is used to insert and manage secondary structural elements, such as beams and custom Tekla components, which are anchored to the bridge cross section or alignment lines.

The screenshot shows the 'Bridge creator' window with the 'Components' tab selected. The interface is divided into several sections:

- Top Bar:** Includes a dropdown menu for 'V2-Finishes-Left', a 'Save' button, and a 'Help' button (1).
- General/Components/Tension cables:** Checkboxes for 'General', 'Components' (checked), and 'Tension cables' (checked).
- Component List:** A list of components including 'Parapet-Above-Pier-L', 'Parapet-Above-Pier-Start-L', 'Long Bottom L' (selected), 'Parapet-Above-Pier-End-L', 'Long Top L', and 'Parapet-Block-1' (2).
- Properties Panel:**
 - Name:** 'Long Bottom L' (4).
 - Beam type:** 'Polybeam'.
 - Part name:** 'PARAPET'.
 - Profile:** 'PCTRI170*170*120*30'.
 - Material:** 'Misc_Undefined'.
 - Cast unit:** 'Cast in place'.
 - Phase:** '12'.
 - Class:** '13'.
 - Numbering:**
 - Part numbering:** '0' (5).
 - Assembly numbering:** '0'.
 - Chainage/Station:**
 - Start:** '1482.920m'.
 - End:** '1661.330m'.
 - Interval:** '5.000m'.
 - Interval option:** 'Along the arc'.
 - Elevation:**
 - Start:** 'Auto' (6).
 - End:** 'Auto'.
 - Position:**
 - On plane:** 'Middle' (7).
 - Rotation:** 'Top'.
 - At depth:** 'Front'.
 - Handles:**
 - Point 1:** '0 Outer face' (8).
 - Point 2:** 'Along next'.
- Preview:** A 3D view of the component 'Long Bottom L' (3) showing its position relative to the bridge structure.
- Bottom Bar:** Includes buttons for 'Create', 'OK', 'Apply', 'Modify', 'Get', a checkbox, and a 'Cancel' button (9).

Components tab interface when a beam is selected

Bridge creator

V2 Finishes Left Save Help

General ☒ Components ☒ Tension cables

NAME	Name	Component	Preset
Parapet-Above-Pier-L	Parapet-Above-Pier-L	Parapet-Above-Pier	
Parapet-Above-Pier-Start-L			
Long Bottom L			
Parapet-Above-Pier-End-L			
Long Top L			
Parapet-Block-1			

Chainage/Station

Start: 1521.000m **Elevation**: Auto

End: 1625.000m **Elevation**: Auto

Interval: 51.700m

Interval option: Along the arc

Flexible spacing: None

Exclude space: Last

Position

On plane: Left 0.000mm

Rotation: Top 0.00°

At depth: Front 0.000mm

Handles

Point 1: 0 Outer face

Point 2: Along reversed

Diagram

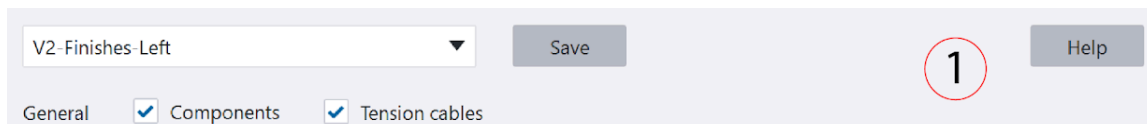
Diagram showing a bridge layout with points 0, 1, 2, 6, and 7. A road is labeled "Road 1 / -2".

Buttons

Create OK Apply Modify Get ☒ / ☐ Cancel

Components tab interface when a component is selected

4.1 - Header



For Header see [General Tab](#)

4.2 - Components Table

NAME	
Parapet-Above-Pier-L	
Parapet-Above-Pier-Start-L	
Long Bottom L	
Parapet-Above-Pier-End-L	
Long Top L	
Parapet-Block-1	

Beams and Components table

Table Display

Displays all components and beams once they have been added to the list. Selecting an object in this table updates the right-hand panel to show that object's specific settings.



Add Component Button

Opens the Select component dialog to choose an existing Tekla custom component.



Add Beam Button

Opens the Select profile dialog to select a Tekla profile for addition to the table.



Copy Button

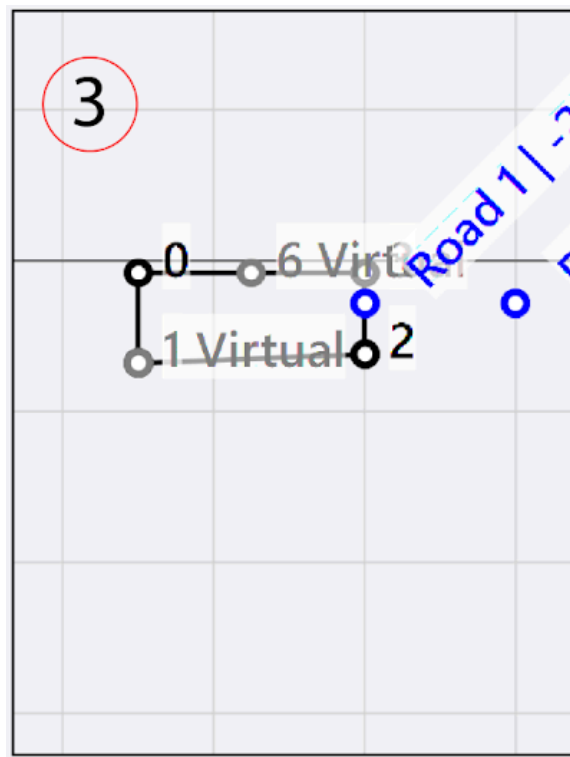
Duplicates a selected component or beam instance in the table.



Delete Button

Removes the selected rows from the table.

4.3 - Cross Section Preview



Cross section preview canvas

The Cross section preview area acts as a visual guide to assist you in identifying the geometry of the cross section without having to exit the current menu or reopen the cross section editor.

Point Identification

It provides a real-time visualization that allows you to identify all existing points within the cross section.

Constraint Support

This is particularly useful when placing a beam or component, as these elements must be constrained to one or two specific points.

4.4a - Main Attributes for Beams

Name	Long Bottom L	4
Beam type	Polybeam	▼
Part name	PARAPET	
Profile	PCTRI170*170*120*30	...
Material	Misc_Undefined	...
Cast unit	Cast in place	▼
Phase	12	
Class	13	

Beam parameters

When a Tekla beam is selected from the table, the attribute area displays settings specifically for beam integration:

Name

The identifier displayed in the component table. Use clear names to easily identify parts, as bridge models often contain many secondary objects.

Beam type

- **Beam**

Places individual beam segments between start and end values based on the defined interval.

- **Polybeam**

Places a single polybeam with multiple vertices based on the interval between the start and end stations.

Part name

The standard Tekla attribute name assigned to the object.

Profile

The assigned Tekla profile; click  to browse the catalog.

Material

The object material; click  to open the material library.

Cast unit type

- **Cast in place**

Define the production method as Cast in place.

- **Precast**

Define the production method as Precast.

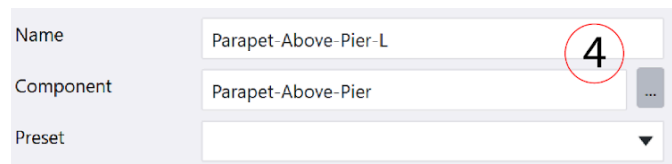
Phase

Defines which construction phase the object belongs to.

Class

Defines the class assigned to the object.

4.4b - Main Attributes for Components



Name	Parapet-Above-Pier-L
Component	Parapet-Above-Pier
Preset	

Component parameters

When a custom Tekla component is selected from the table, the attribute area displays settings specifically for component integration:

Name

This is the identifier that appears in the components table on the left side of the interface. Use clear names to easily identify parts, as bridge models often contain many secondary objects.

Component

Displays the specific Tekla component name currently in use. Clicking  opens a dialog to browse and load a different Tekla component into the tool.

Preset

This dropdown is available for Tekla components that have pre-saved attribute files. Users can select the desired preset here to automatically apply specific component settings.

4.5 - Numbering (Beams only)

Numbering		
Part numbering		0 5
Assembly numbering		0

Beam numbering attributes

Part numbering

Operates as a traditional Tekla part numbering attribute.

Assembly numbering

Operates as a traditional Tekla assembly numbering attribute.

4.6 - Chainage/Station

Chainage/Station		Elevation
Start	1482.920m	Auto 6
End	1661.330m	Auto
Interval	5.000m	
Interval option	Along the arc	

Beam and Component placement parameters

Start

Defines the starting station for the object placement.

Start Elevation

Allows a specific elevation to be forced at the starting point.

End

Defines the ending station for the object placement.

End Elevation

Allows a specific elevation to be forced at the ending point.

Interval

Defines the spacing for the placement of objects along the alignment.

Interval option

- **Along the arc**

Calculates placement based on the curved length of the alignment.

- **Along the chord**

Calculates placement based on the straight distance between interval points.

Flexible spacing

Can be set to None, First, Middle, Last, or First and last.

Exclude space

Can be set to None, First, or Last.

4.7 - Position

Position		
On plane	Middle ▼	-132.500mm 7
Rotation	Top ▼	0.00°
At depth	Front ▼	0.000mm

Beam and Component positioning parameters

On plane

Controls the lateral position of the object relative to its handles.

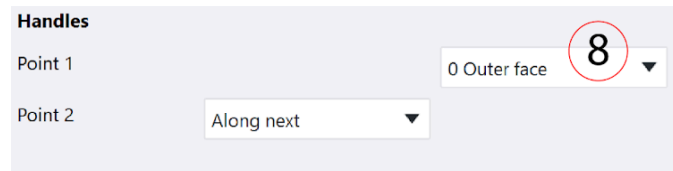
Rotation

Controls the rotation of the object profile.

At depth

Controls the vertical position of the object.

4.8 - Handles



Handles

Point 1 0 Outer face **8**

Point 2 Along next

Beam and Component handles parameters

Objects must be constrained to points defined in the cross section.

Point 1

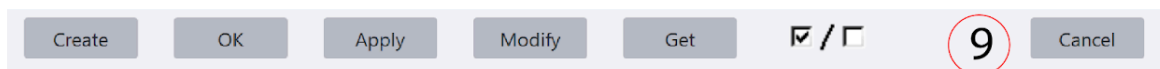
Select the primary anchor point from the cross section points.

Point 2

Define the second handle orientation using the following options:

- **None**
No second handle is defined.
- **Point**
Manually select a second cross section point from the selector.
- **Along Next / Previous**
Automatically places the handle at the next or previous point along the alignment path.
- **On Plane Next / Previous**
Anchors the handle to a vertical plane automatically generated at the next or previous station.

4.9 - Footer



Create OK Apply Modify Get ☒ / ☐ **9** Cancel

For Footer see [General Tab](#)

5. Tension Cables Tab (UI)

The Tension Cables tab is used to define and place post-tensioning cables along the bridge alignment, constrained to specific cross section geometry.

The screenshot shows the 'Bridge creator' window with the 'Tension cables' tab selected. The interface is divided into several sections:

- Top Bar (1):** Contains a dropdown menu set to '08-PT-Cables', a 'Save' button, and a 'Help' button.
- General Tab (2):** A list of cable names (CABLE-1 to CABLE-6) and a large empty area for drawing.
- File Section (4):** Includes fields for 'File' (.\RESOURCES\TensionCableSample (1).xlsx), 'Cable' (#TensionCable_1), 'Name' (CABLE-1), 'Profile' (D100), 'Material' (Misc_Undefined), 'Phase' (5), and 'Class' (3).
- Numbering (5):** Fields for 'Part numbering' and 'Assembly numbering', both set to 0.
- Chainage/Station (6):** A 'Start' field set to 2.000m.
- Handles (7):** A 'Point 1' dropdown set to '0 Outer face'.
- Component Start (8):** Fields for 'Name' (Anchor-A), 'Preset' (dropdown), and 'Offset' (-0.250m).
- Component End:** Fields for 'Name' (anchor), 'Preset' (dropdown), and 'Offset' (-0.200m).
- Diagram (3):** A grid-based diagram showing a rectangular cable layout with points labeled 0, 1, 2, 3, and 4. A blue line segment is labeled 'CL-8'.
- Bottom Bar (9):** Contains buttons for 'Create', 'OK', 'Apply', 'Modify', 'Get', a checkbox, and 'Cancel'.

Tension cables tab interface

5.1 - Header



For Header see [General Tab](#)

5.2 - Tension Cables Table

NAME	
CABLE-1	
CABLE-2	
CABLE-3	
CABLE-4	
CABLE-5	
CABLE-6	

Tension cables table

Table Display

Displays all cables currently defined once they have been added to the list. Selecting a cable in this table updates the settings on the right-hand side of the dialog accordingly.



Add Button

Adds a new cable entry to the table from an Excel (.xls) file that was previously loaded.



Copy Button

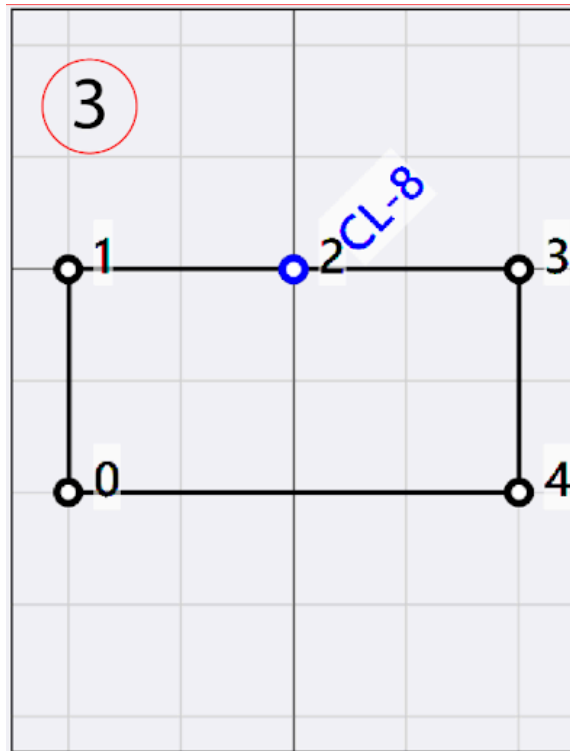
Creates a new instance of a selected cable from the table.



Delete Button

Removes the selected rows from the table.

5.3 - Cross Section Preview



Cross section preview canvas

Cross Section Preview Canvas

Displays the cross section associated with the cables. This can be a standard deck cross section or a "dummy" profile, allowing the cables to remain independent of the deck component if desired. This preview is critical because it allows you to choose the specific cross section point that serves as the anchor for the cables. For example, if the cable path is defined relative to the alignment's centerline, selecting Point 2 will ensure all cables are positioned relative to that specific point.

5.4 - Cable Attributes

File	.\\RESOURCES\\TensionCableSample (1).xlsx	Browse
Cable	#TensionCable_1	4
Name	CABLE-1	
Profile	D100	...
Material	Misc_Undefined	...
Phase	5	
Class	3	

Tension cable parameters

File Browse

Used to load an Excel (.xlsx) file containing the cables' data.

Tension Cable File Specifications

	A	B	C	D
1	SampleinputforTensionCables;FirstLine=3			
2	Chainage	X	Y	Chainage
3	#TensionCable_1			
4	9.866	1.63	0.48	9.866
5	11.666	1.63	0.11	11.666
6	11.766	1.63	0.11	11.766
7	11.866	1.63	0.11	11.866
8	18	1.63	0.11	18
9	22	1.63	0.11	22
10	24.612	1.63	0.11	24.612
11	24.712	1.63	0.11	24.712
12	24.812	1.63	0.11	24.812
13	25.812	1.63	0.22	25.812
14	26.612	1.63	0.48	26.612
15	#TensionCable_2			
16	6.558	1.63	0.48	6.558
17	9.666	1.63	0.11	9.666
18	9.766	1.63	0.11	9.766
19	11.331	1.44	0.11	11.331
20	12.874	1.25	0.11	12.874
21	12.974	1.25	0.11	12.974
22	23.503	1.25	0.11	23.503
23	23.603	1.25	0.11	23.603
24	25.146	1.44	0.11	25.146
25	26.711	1.63	0.11	26.711
26	26.811	1.63	0.11	26.811
27	28.12	1.63	0.11	28.12
28	29.92	1.63	0.48	29.92

***Tension cables spreadsheet
(.xlsx) example***

Coordinate System and Offsets

The input is interpreted as an offset relative to a curve or alignment as follows:

- **X coordinate:** Interpreted as the horizontal (sideways) offset within the current cross-section. The positive direction is to the right relative to the positive direction of the alignment.
- **Y coordinate:** Interpreted as the offset in the global vertical direction (Global Z). The positive direction is upward along the z-axis (0, 0, 1).

Input Coordinate Logic

Maintain equal values in columns A and D. This is required because the underlying logic was originally designed to process global coordinates in the format (X, Y, Z, Chainage).

The start chainage should be considered relative to a local point on the alignment. The actual start chainage for the tension cable is defined directly within Bridge Creator. Consequently, the local chainage values provided in this input will be added to the base start chainage specified in the Bridge Creator interface.

Column and Row Constraints

- **Input Columns:** Only columns A, B, C, and D are read by the file-processing logic. All other columns in your spreadsheet can be used for calculations or notes without affecting the import.
- **Multiple Cables:** Multiple cables can be added to a single file, but there must be no empty rows within the data set. The logic interprets an empty row as the end of the file; content below the first empty row will be ignored. This does not apply to rows above the defined FirstRow index.

Cable Dropdown

Displays the list of all available cables after the Excel file is successfully loaded.

Name

The identifier for the cable as displayed in the table.

Profile

Defines the Tekla profile for the cable (e.g., a circular profile like D75 or a duct profile); click  to open the profile catalog.

Material

The object material; click  to open the material dialog.

Phase

Defines which construction phase the cable belongs to.

Class

Defines the class assigned to the cable.

5.5 - Numbering

Numbering		
Part numbering		0 5
Assembly numbering		0

Tension cable numbering parameters

Part numbering

Defines the prefix and start number for the Tekla part numbering attribute.

Assembly numbering

Defines the prefix and start number for the Tekla assembly numbering attribute.

5.6 - Chainage/Station

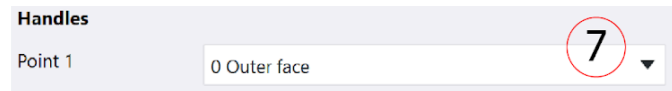
Chainage/Station	
Start	2.000m 6

Tension cable start chainage parameter

Start

Defines the starting station of the cable along the alignment.

5.7 - Handles



Tension cable handle parameter

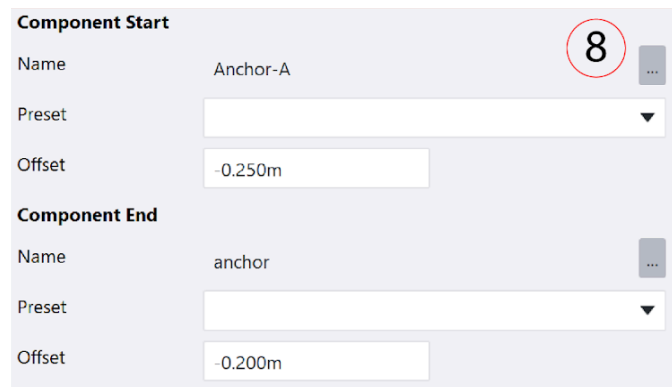
Point 1

Select the specific point the cable should be associated with within the cross section.

Selection

Users typically choose the top center, but are free to select any available point from the cross section.

5.8 - Components Input



Tension cable start and end components input parameters

Component Start Name

Used to load a Tekla component that will be constrained to the start of the cable; click  to select the component.

Start Preset

Selects the pre-saved attribute file (preset) for the loaded start component, if one exists.

Start Offset

Provides small longitudinal adjustments for the placement of the start component. The cable's start station remains independent of this

offset, which only controls the placement of the component (e.g., a cable anchor).

Component End Name

Used to load a Tekla component constrained to the end of the cable; click  to select the component.

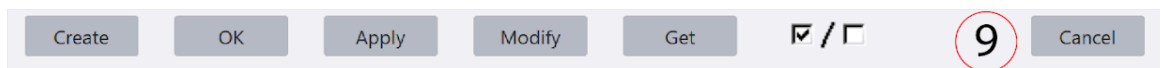
End Preset

Selects the pre-saved attribute file (preset) for the loaded end component.

End Offset

Provides small longitudinal adjustments for the placement of the end component. The cable's start station remains independent of this offset, which only controls the placement of the component (e.g., a cable anchor).

5.9 - Footer



For Footer see [General Tab](#)