



OpenBridge Modeler

Deck Templates

Exercise Manual

Bureau of Bridges and Structures

CADD Support Group



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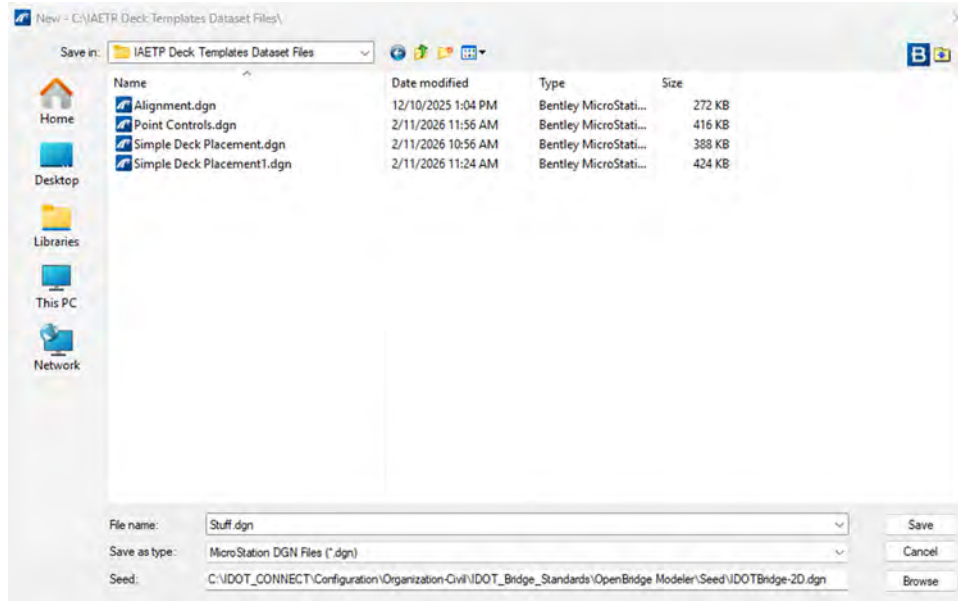
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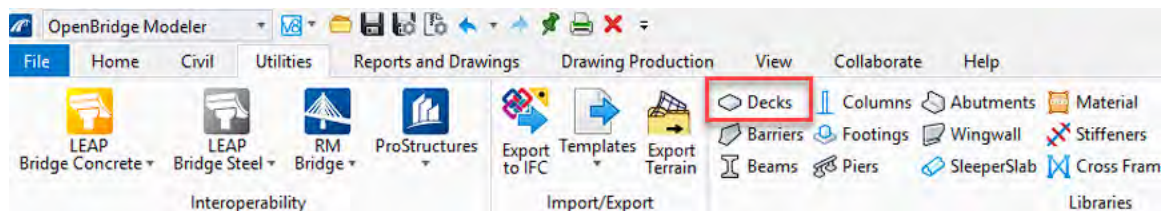
Chapter 1 – Basic Deck Template Creation

Templates can be created in different ways with or without variables. The first way we will look at for creating a template is in placing lines that create a closed shape, then using variables to define the points making up the template.

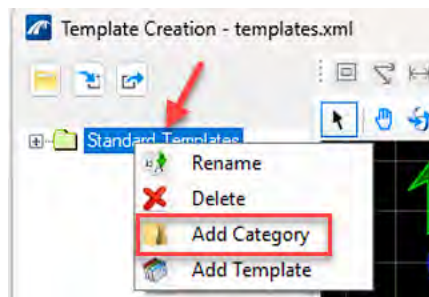
- 1) Create and open a new file in OpenBridge Modeler using the “IDOTBridge-2D.dgn” seed file (It does not matter what you name it).



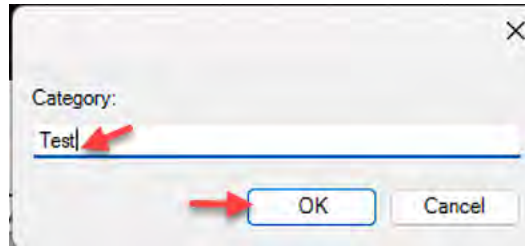
- 2) In the “OpenBridge Modeler” workflow, Select the “Utilities” tab, then “Decks” in the “Libraries” group.



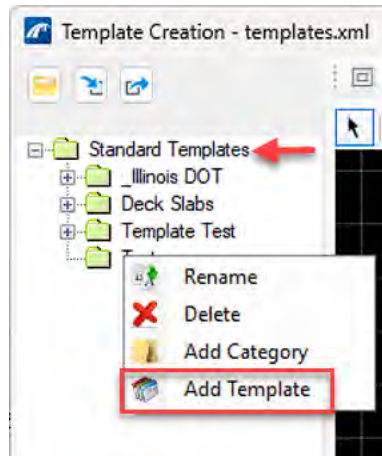
- 3) Right-click on the “Standard Templates” folder and select “Add Category”.



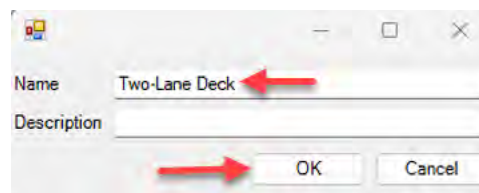
- 4) Give it a name, such as **“Test”** and click **“OK”**.



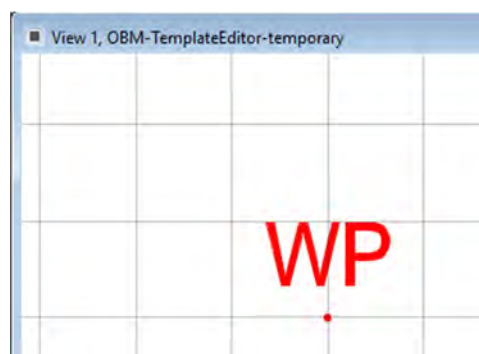
- 5) Expand the **“Standard Templates”** folder, right-click on the new **“Test”** category, and select **“Add Template”**.



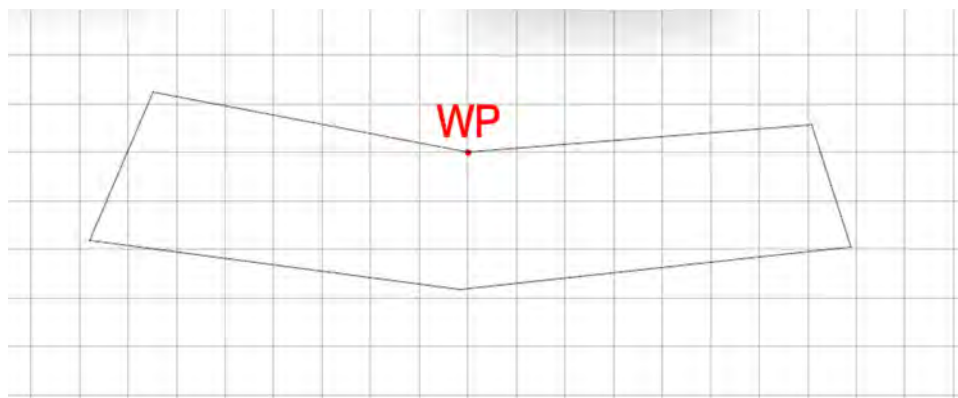
- 6) Give the template a name. In this case, we'll name it **“Two-Lane Deck”**, then select **“OK”**.



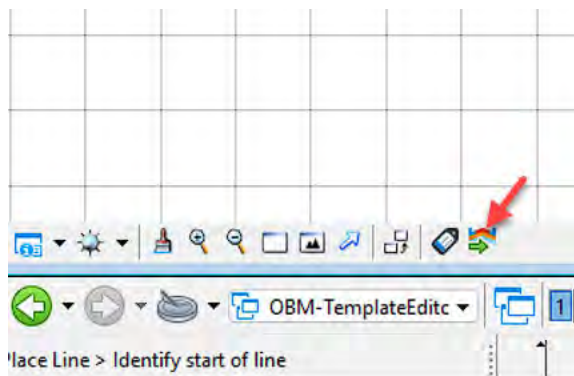
- 7) In an open view, pick a random data point. This view (**OBM-TemplateEditor-Temporary**) will be used for your template design.



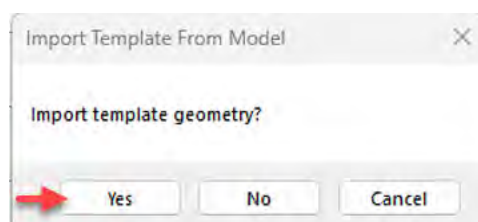
- 8) Using just the **“Place Line”** tool (not the **“Place SmartLine”** tool), create an exaggerated six-sided shape with the Working Point (**WP**) being the center top vertex.



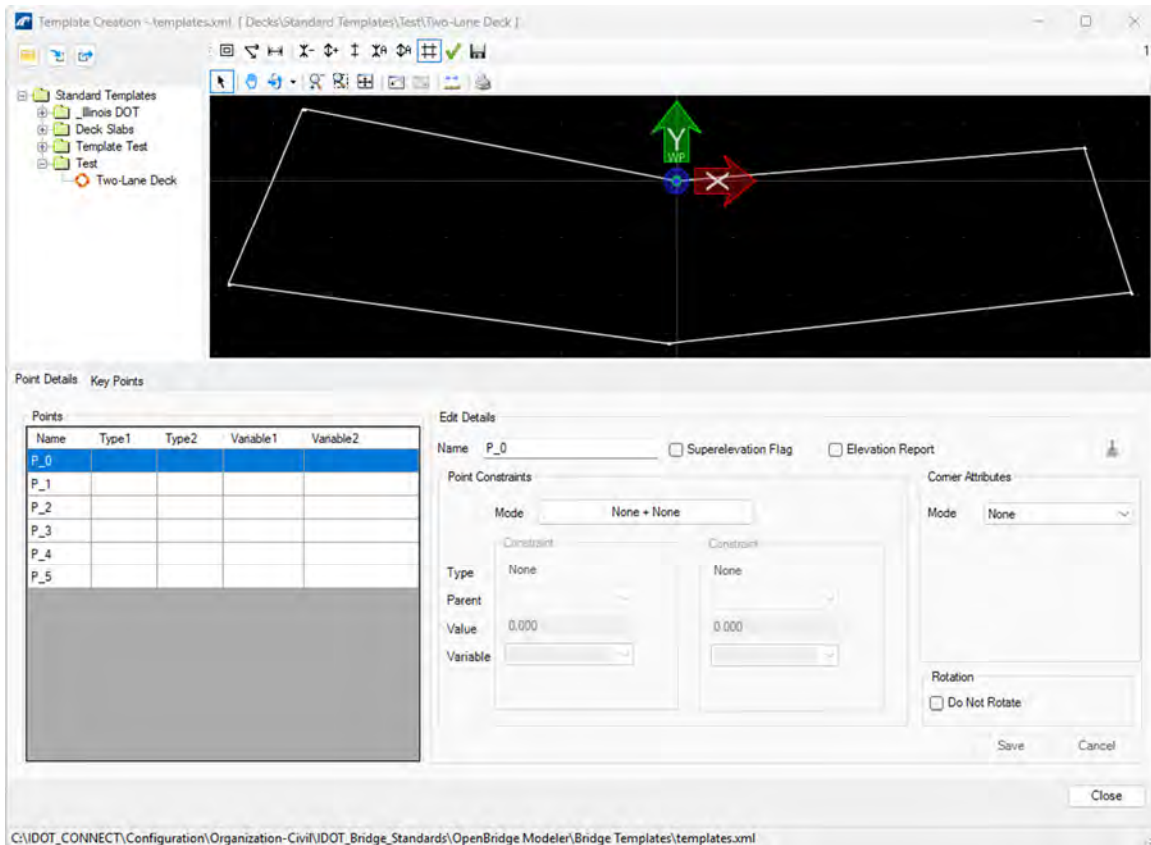
- 9) In the view controls for the window, click on **“Import Template from Model”** icon.



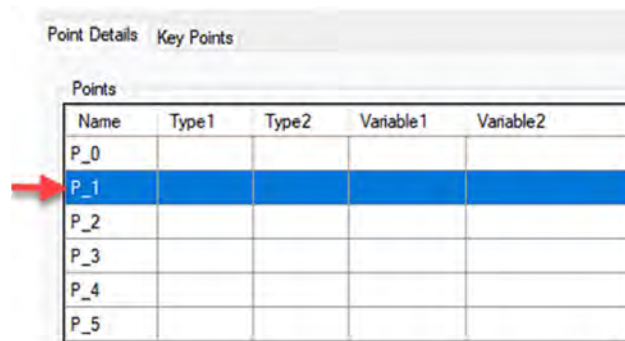
- 10) Select **“Yes”** when it asks, **“Import template geometry?”**



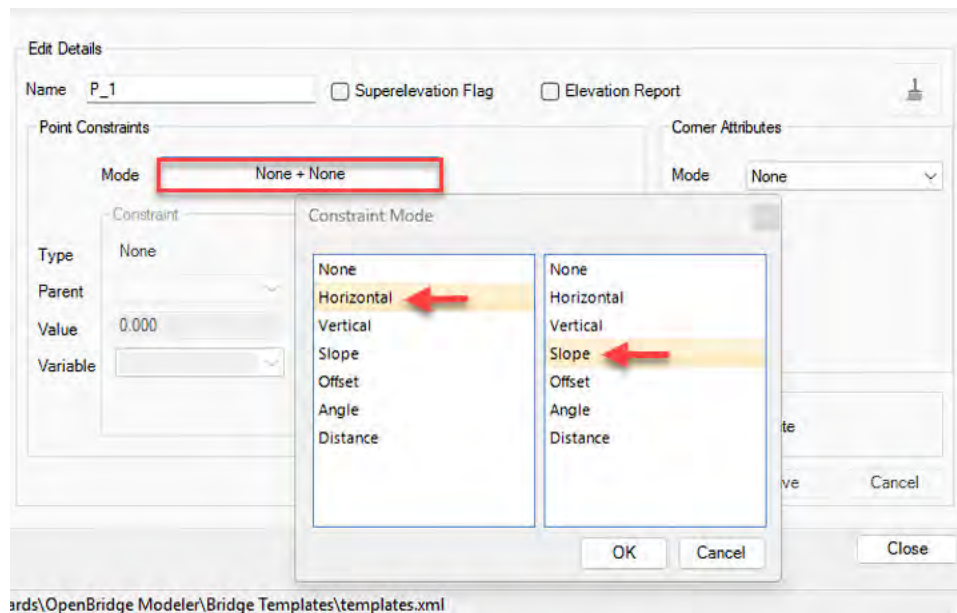
11) The “**Template Creation**” dialog should come up with your new template.



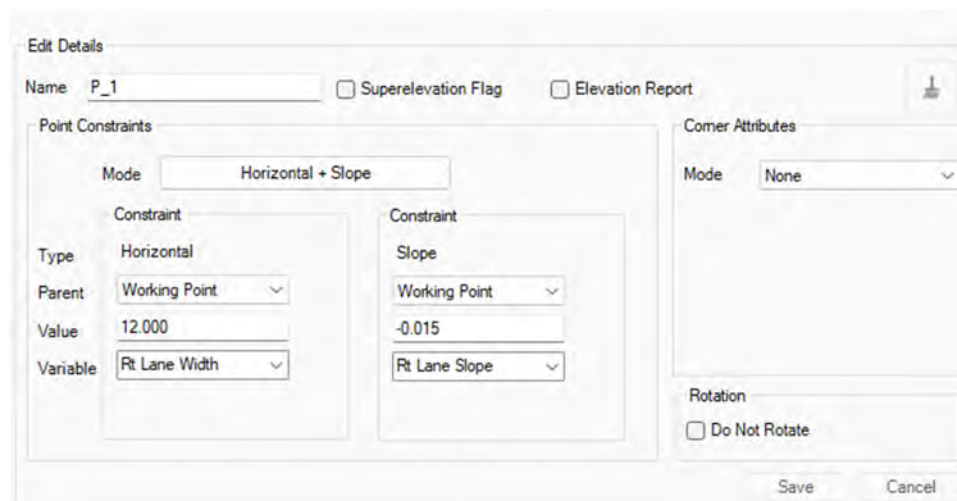
12) To define point “**P_1**”, select the point in the “**Point Details**” list.



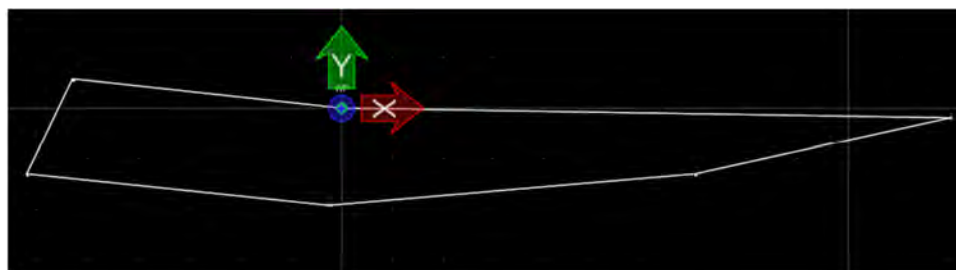
- 13) Change the “**Mode**” in the “**Edit Details**” group to “**Horizontal**” and “**Slope**” as shown, then click “**OK**”.



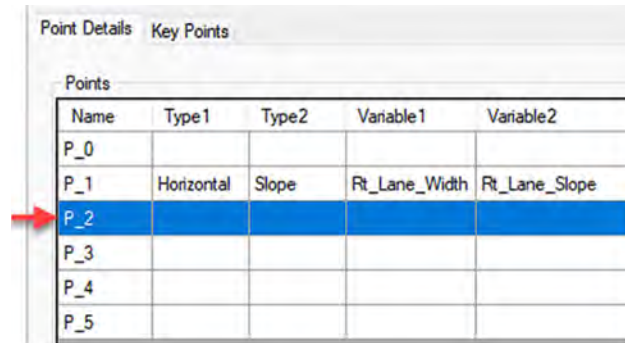
- 14) Change the horizontal constraint and the slope constraint values as shown, then click “**Save**”. (If you don’t click “**Save**”, it will not remember the values you entered).



- 15) You should see the template shape change as the different points are defined.

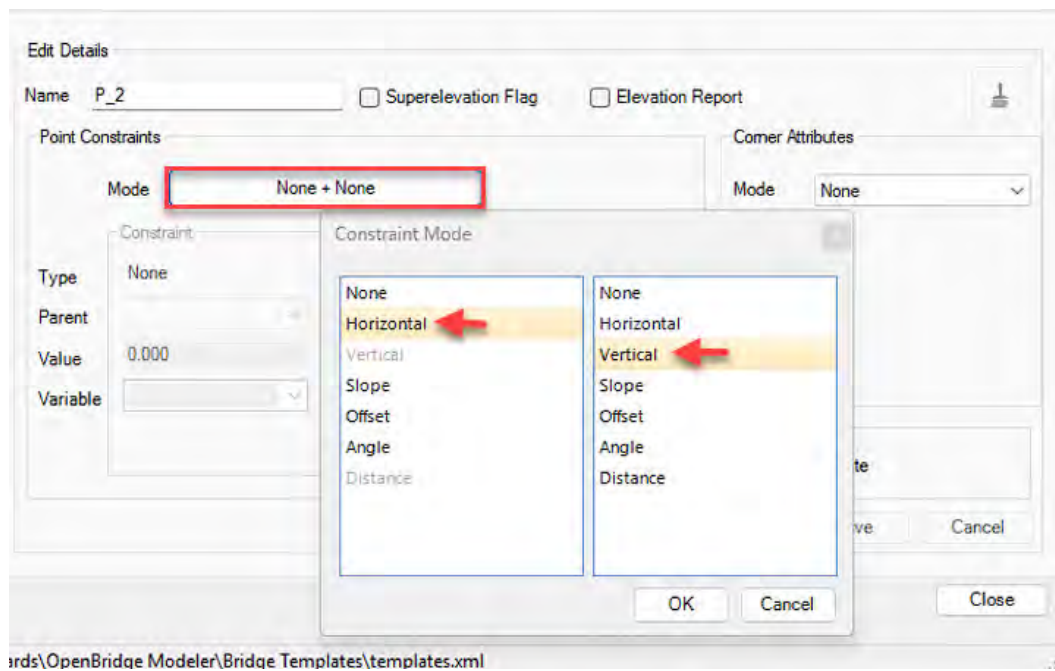


16) Select point “**P_2**” in the “**Point Details**”.

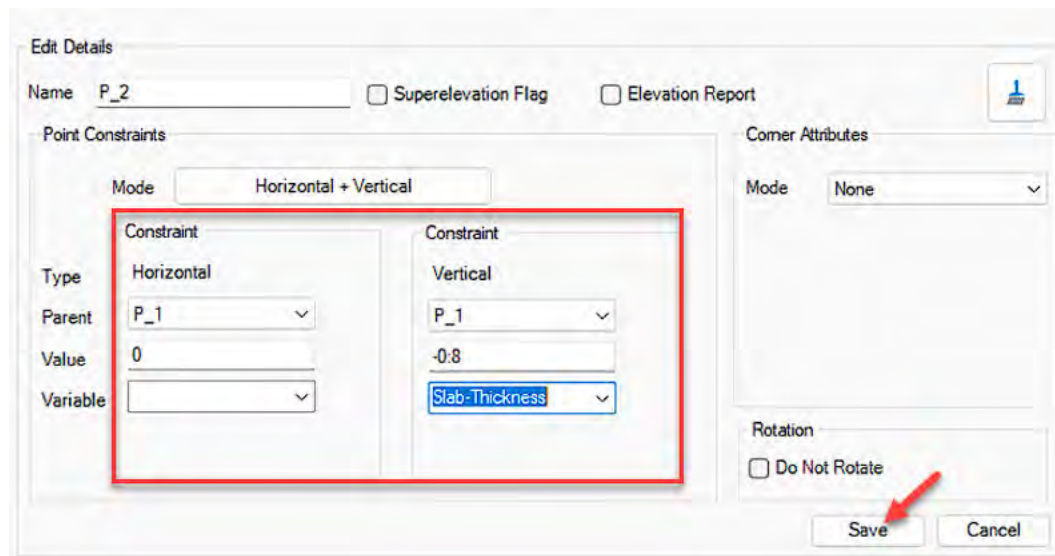


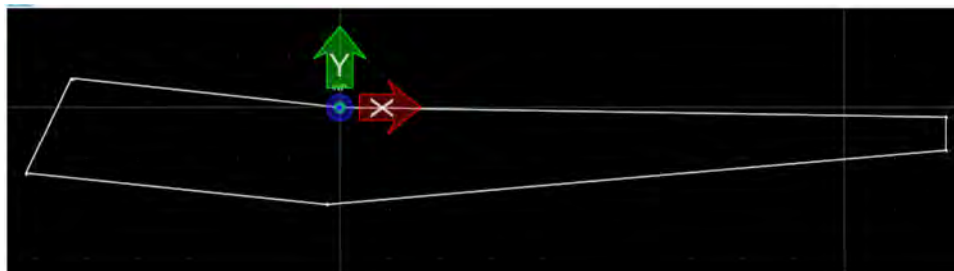
Name	Type1	Type2	Variable1	Variable2
P_0				
P_1	Horizontal	Slope	Rt_Lane_Width	Rt_Lane_Slope
P_2				
P_3				
P_4				
P_5				

17) Change the “Mode” from “**None + None**” to “**Horizontal**” + “**Vertical**”



18) Change the values as shown, then click “**Save**”.





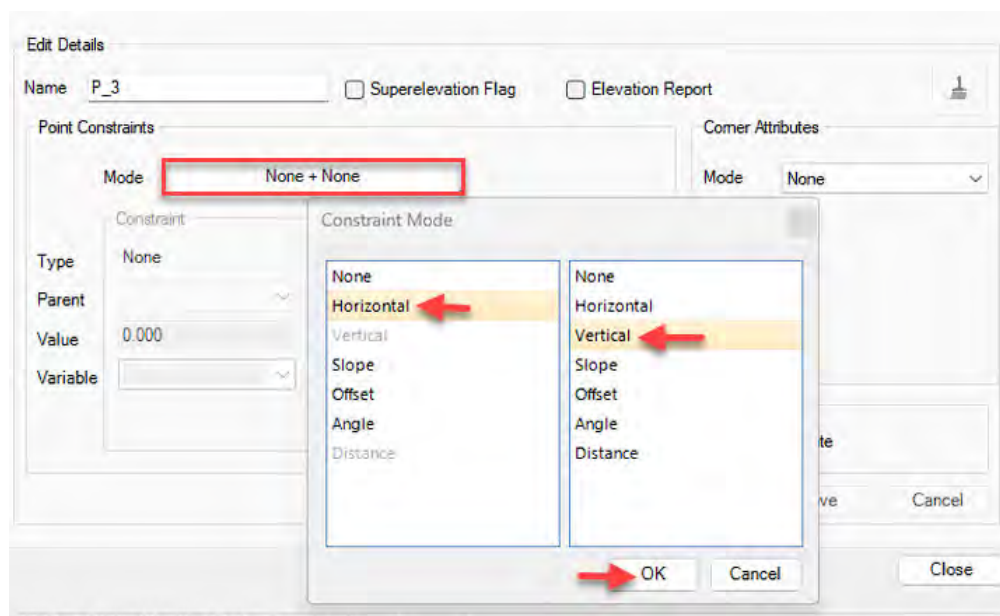
19) Select point “**P_3**” in the “**Point Details**”.

Point Details Key Points

Points

Name	Type1	Type2	Variable1	Variable2
P_0				
P_1	Horizontal	Slope	Rt_Lane_Width	Rt_Lane_Slope
P_2	Horizontal	Vertical		Slab-Thickness
P_3				
P_4				
P_5				

20) Change the “**Mode**” in the Point Constraints from “**None + None**” to “**Horizontal + Vertical**”, then “**OK**”.



21) Change the values of the constraints as shown and then click **“Save”**.

Edit Details

Name: P_3 ☐ Superelevation Flag ☐ Elevation Report

Point Constraints

Mode: Horizontal + Vertical

Type	Constraint	Parent	Value	Variable
Horizontal	Horizontal	Working Point	0.000	
Vertical	Vertical	Working Point	-0.667	Slab-Thickness

Corner Attributes

Mode: None

Rotation

☐ Do Not Rotate

Save Cancel

Close

22) The template should start to look like what we want.

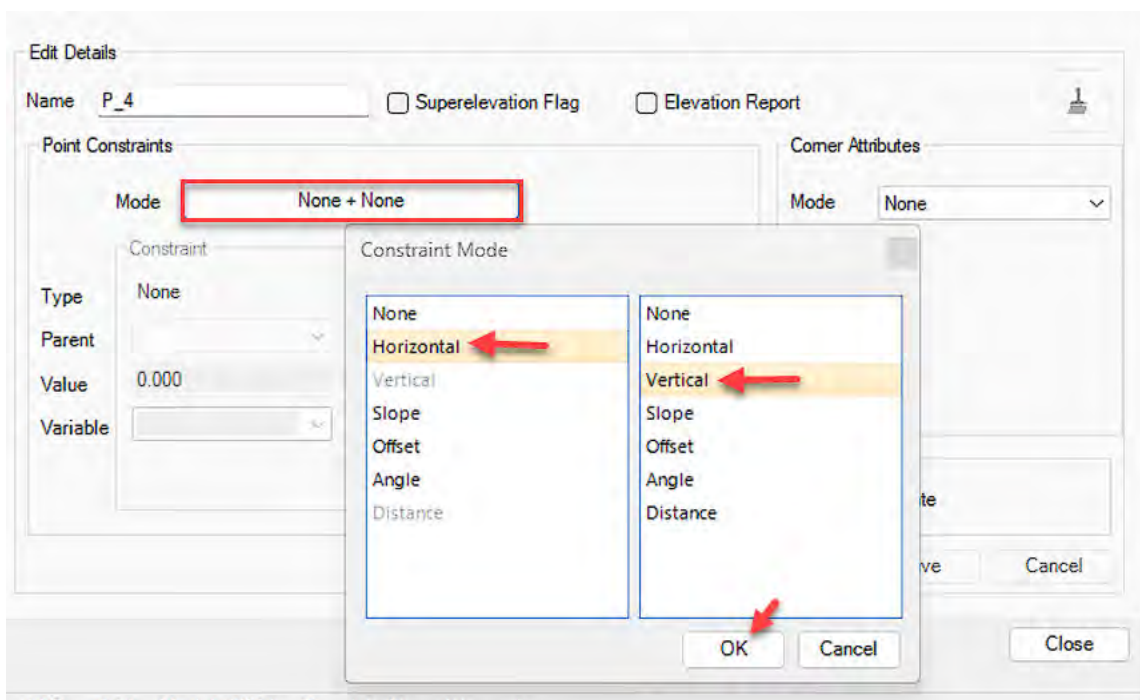


23) Select point **“P_4”** in the **“Point Details”**.

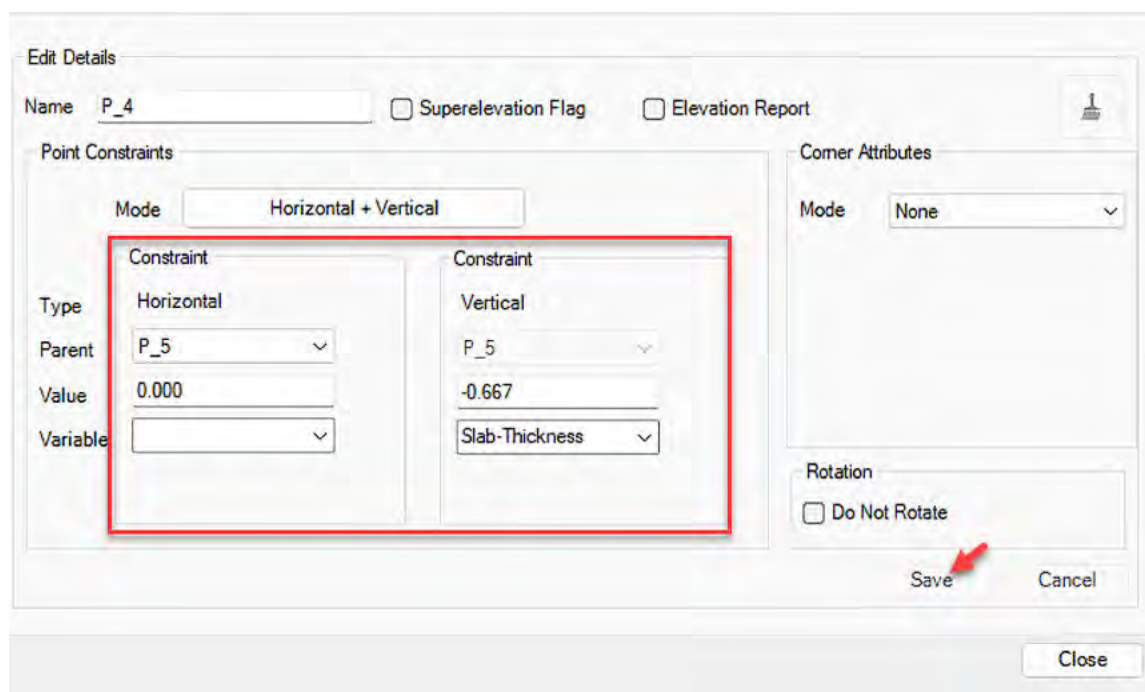
Point Details Key Points

Name	Type1	Type2	Variable1	Variable2
P_0				
P_1	Horizontal	Slope	Rt_Lane_Width	Rt_Lane_Slope
P_2	Horizontal	Vertical		Slab-Thickness
P_3	Horizontal	Vertical		Slab-Thickness
P_4				
P_5				

24) Change the “**Mode**” in the Point Constraints from “**None + None**” to “**Horizontal + Vertical**”, then “**OK**”.



25) Change the values of the constraints as shown and then click “**Save**”.





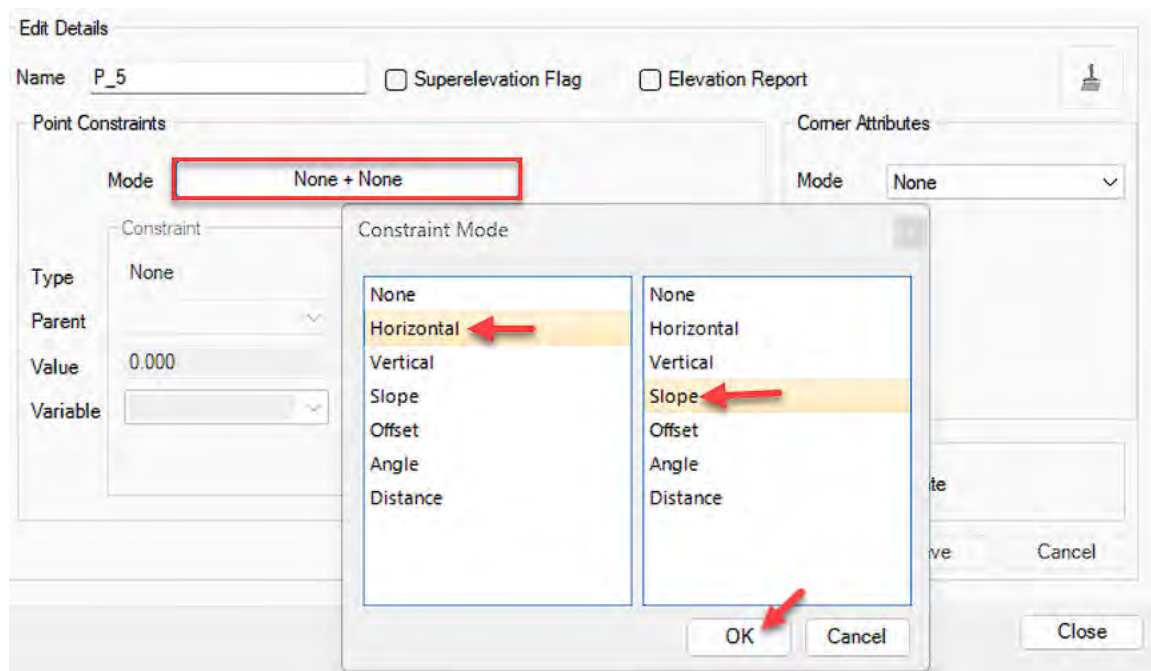
26) Select point “**P_5**” in the “**Point Details**”

Point Details Key Points

Points

Name	Type1	Type2	Variable1	Variable2
P_0				
P_1	Horizontal	Slope	Rt_Lane_Width	Rt_Lane_Slope
P_2	Horizontal	Vertical		Slab-Thickness
P_3	Horizontal	Vertical		Slab-Thickness
P_4	Horizontal	Vertical		Slab-Thickness
P_5				

27) Change the “**Mode**” in the Point Constraints from “**None + None**” to “**Horizontal + Slope**”, then “**OK**”.



28) Change the values of the constraints as shown and then click **“Save”**.

The 'Edit Details' dialog box for point P_5 is shown. It includes sections for 'Point Constraints' and 'Corner Attributes'. Under 'Point Constraints', the 'Mode' is 'Horizontal + Slope'. There are two constraint sections: 'Horizontal' and 'Slope'. Both are set to 'Working Point' as the parent, with values of -12.0.000 and 0.015 respectively. The variables are 'Lt Lane Width' and 'Lt Lane Slope'. The 'Corner Attributes' section shows 'Mode' as 'None' and 'Rotation' as 'Do Not Rotate'. The 'Save' button is highlighted.



29) Close the dialog.

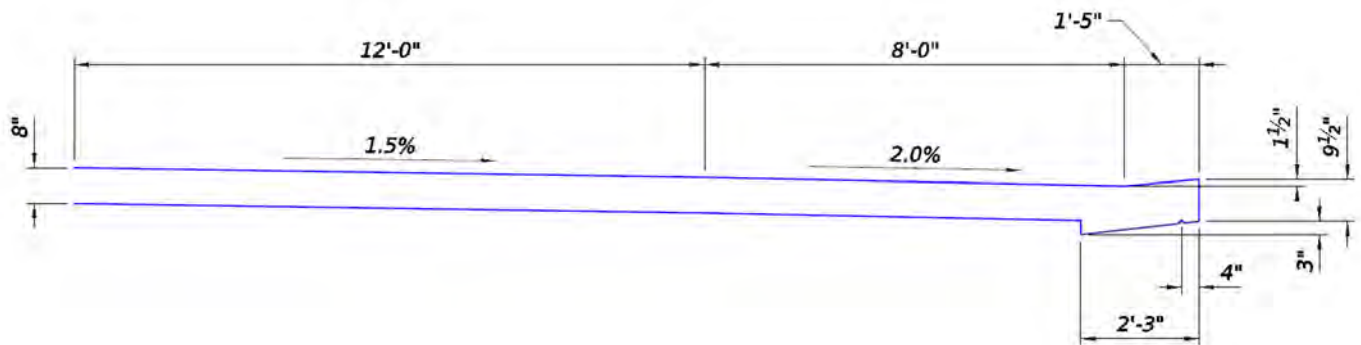
30) The template should be ready for use on a project.

It is generally a good idea to define your first point, save, then exit the Template Creation dialog. I have had mixed results in going through and defining all points, only for none of them being saved. Redefining a single point is far less frustrating than redefining all of them!

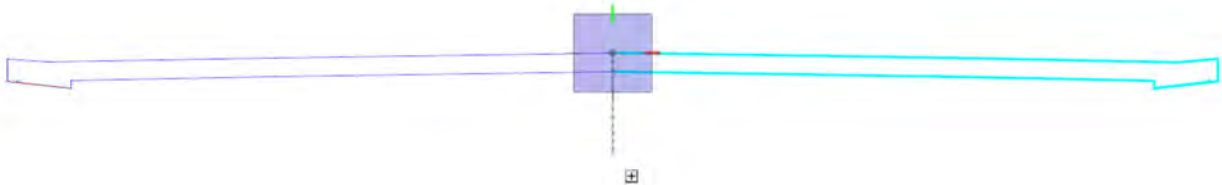
Chapter 2 – Advanced Deck Template Creation

Templates can be created in different ways with or without variables. The second way we will create a template is by physically modeling a needed deck full scale in a model and then importing it using the “**Template Creation**” tool.

- 1) In a 2D model, create half of a bridge deck using the following information (There is a $\frac{3}{4}$ " chamfer at the bottom of the deck, 4" in from the edge):



- 2) Mirror the section at the open end of the section.



In order for the points to be named the same as in this workbook, we will have to recreate the deck in the sequence that we want the points to be named. The first point of the first line placed will become “**P_0**” and the point numbers for the remainder of points will increase as they are encountered in a clockwise direction. Note that it does not matter what level is used for any of the elements placed during the template creation.

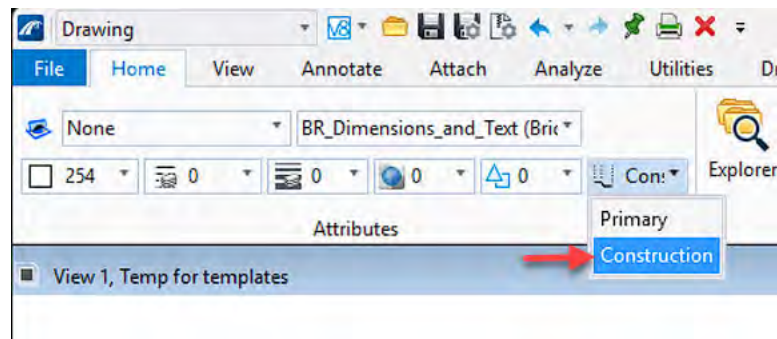
- 3) In the “**Home**” tab of the “**Drawing**” workflow, pick the “**Create Complex Shape**” command in the “**Groups**”.



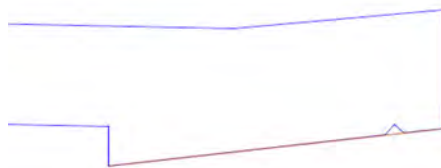
- 4) Using the “**Automatic**” method, pick a line on the section, pick an adjacent line, then accept.



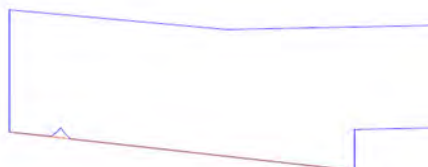
- 5) Pick the **“Place Line”** tool (not the **“Place SmartLine”** tool) and starting with the crown, pick each point, following around the deck in a clockwise direction. The last point will be the crown again.
- 6) Delete the complex shape previously created, being careful not to delete the individual lines that were just created.
- 7) Change the **“Element Attributes”** to **“Construction”**. This can be found in the **“Attributes”** group under the **“Home”** tab of the **“Drawing”** workflow.



- 8) Draw a line along the bottom of the deck that will run from the edge of the right beam flange location to the outside edge of deck (in that order). You can use a different color if you like, but it won't really matter.

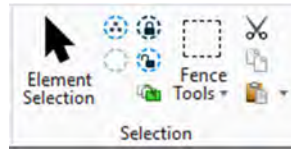


- 9) Draw a line along the bottom of the deck that will run from the edge of the left beam flange location to the outside edge of deck (in that order).

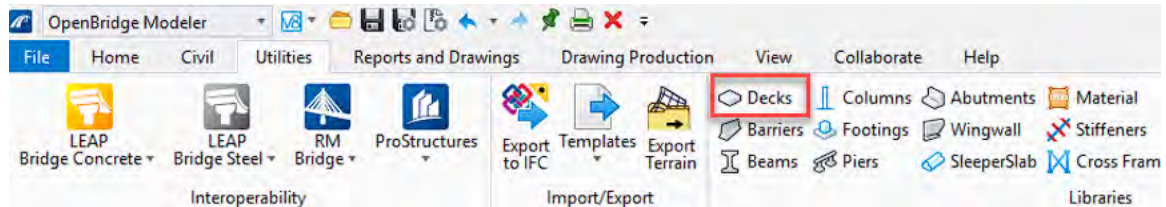


10) Change the “**Element Class**” back to “**Primary**”.

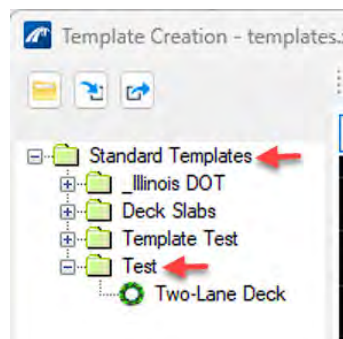
11) Using the “**Element Selection**” tool, select the entire deck, then copy to clipboard.



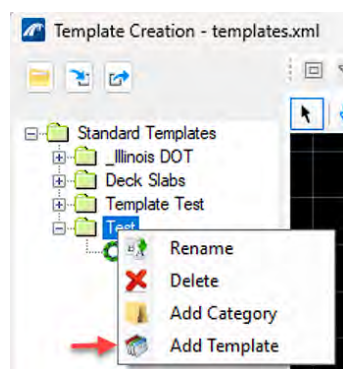
12) In the “**OpenBridge Modeler**” workflow, select the “**Utilities**” tab, then “**Decks**” in the “**Libraries**” group.



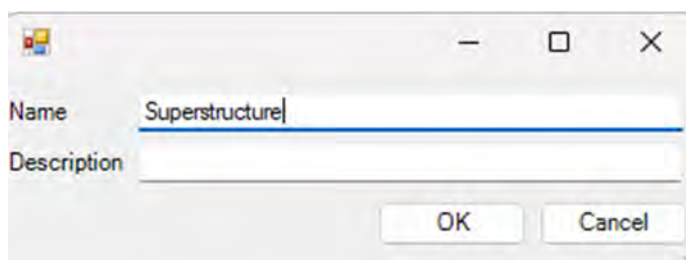
13) Expand “**Standard Templates**” folder and then the “**Test**” subfolder.



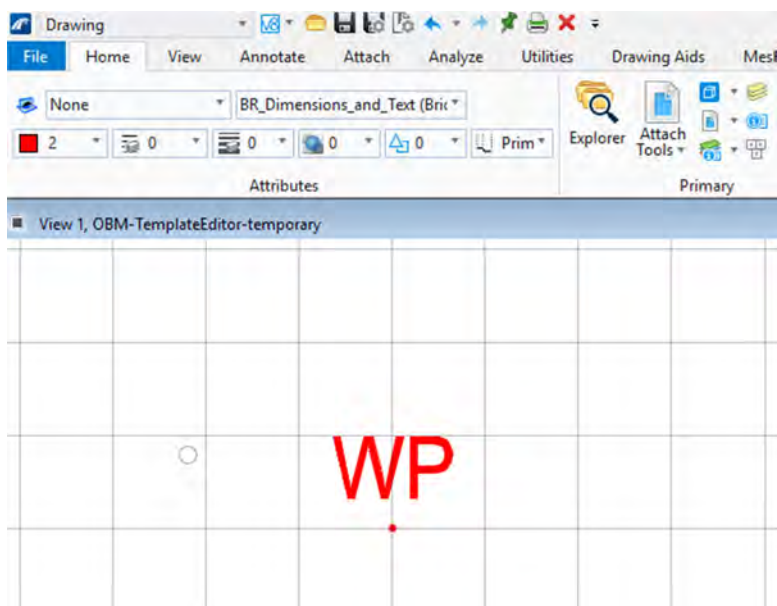
14) Right-click on the “**Test**” folder and select “**Add Template**”.



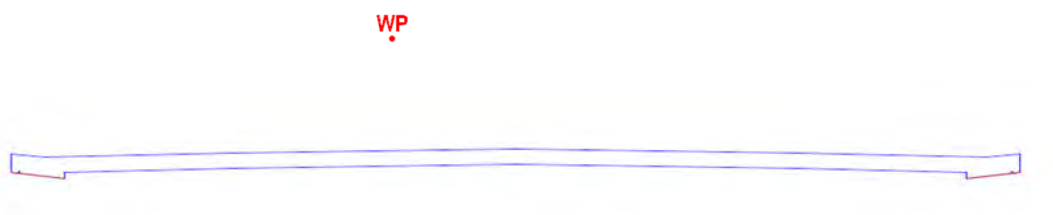
- 15) Give the new template a name, such as “**Superstructure**”. You can give it a description, but that is not necessary.



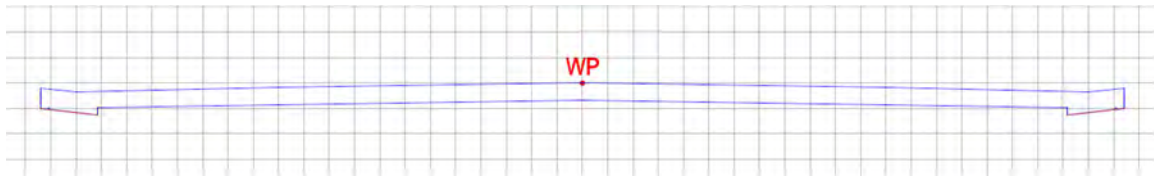
- 16) Pick a data point in an open view to open the Template Editor window (It does not matter which view you select).



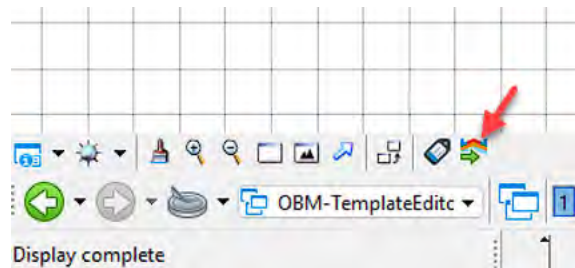
- 17) Paste the clipboard contents into this window.



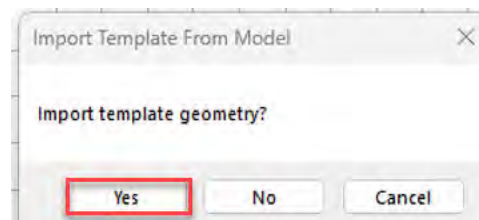
- 18) Move the deck so the crown at the center, top of the deck is at the Working Point (WP). Note that the working point has the coordinates of $xy=0,0$ in the model.



- 19) Select the “**Import Template from Model**” icon in the view controls.

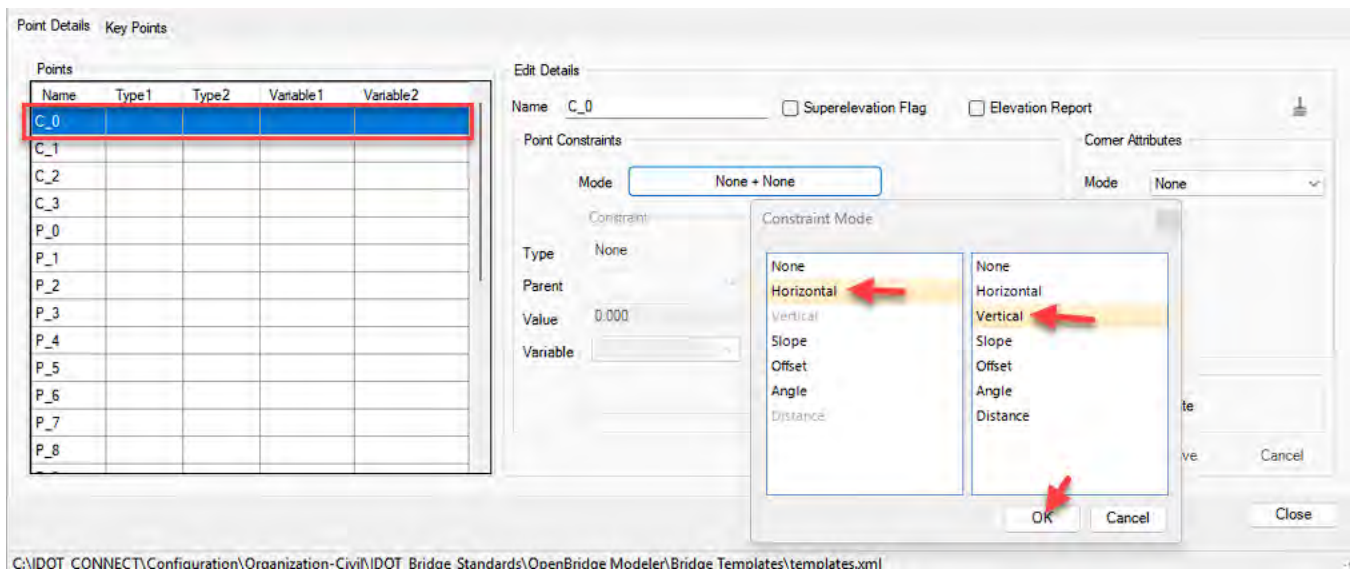


- 20) Select “**Yes**” when it asks if you want to import template geometry.

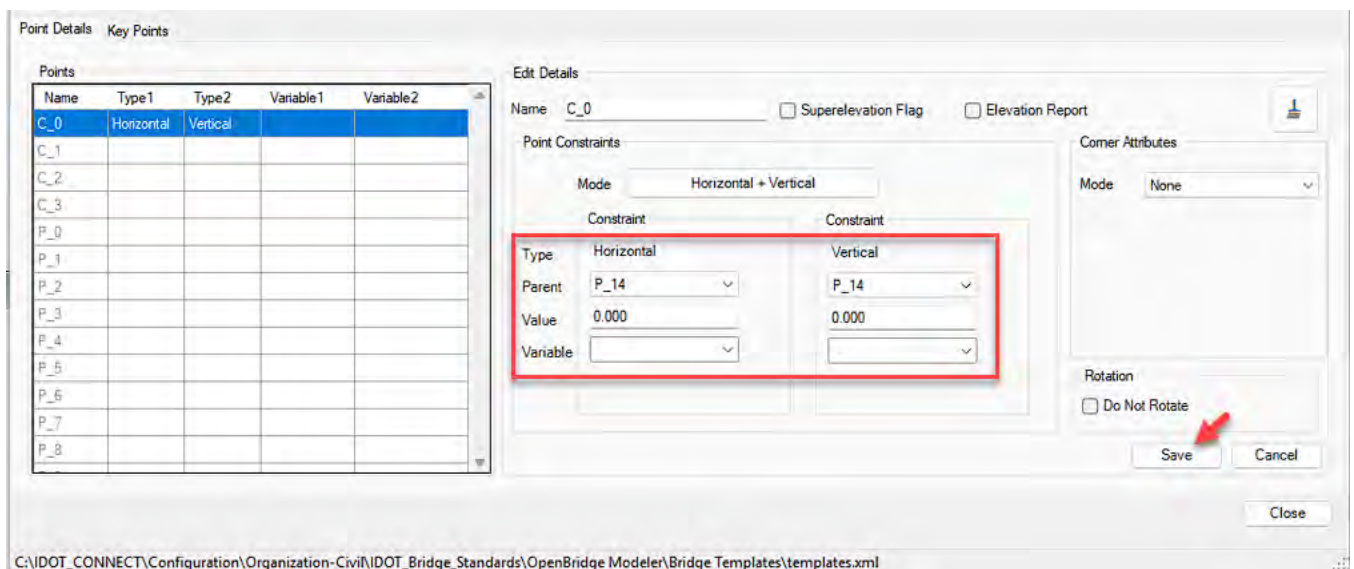


You should note that the two construction class elements have been assigned point names of “**C_0**” through “**C_3**”. The primary class elements have all been named “**P_0**” through “**P_21**”. Initially, we will associate the construction points with the section’s template points. (*Remember that you should save the first point, exit the Template Creation dialog, then return to it to ensure that it is saving your data*).

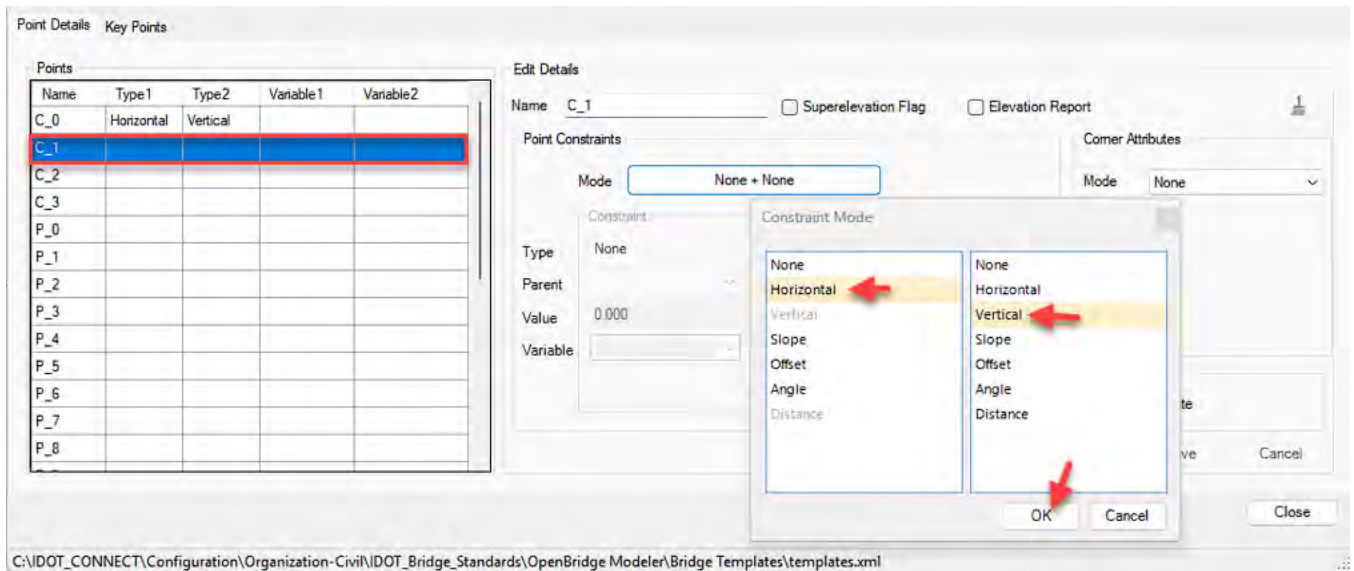
21) Select “**C_0**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



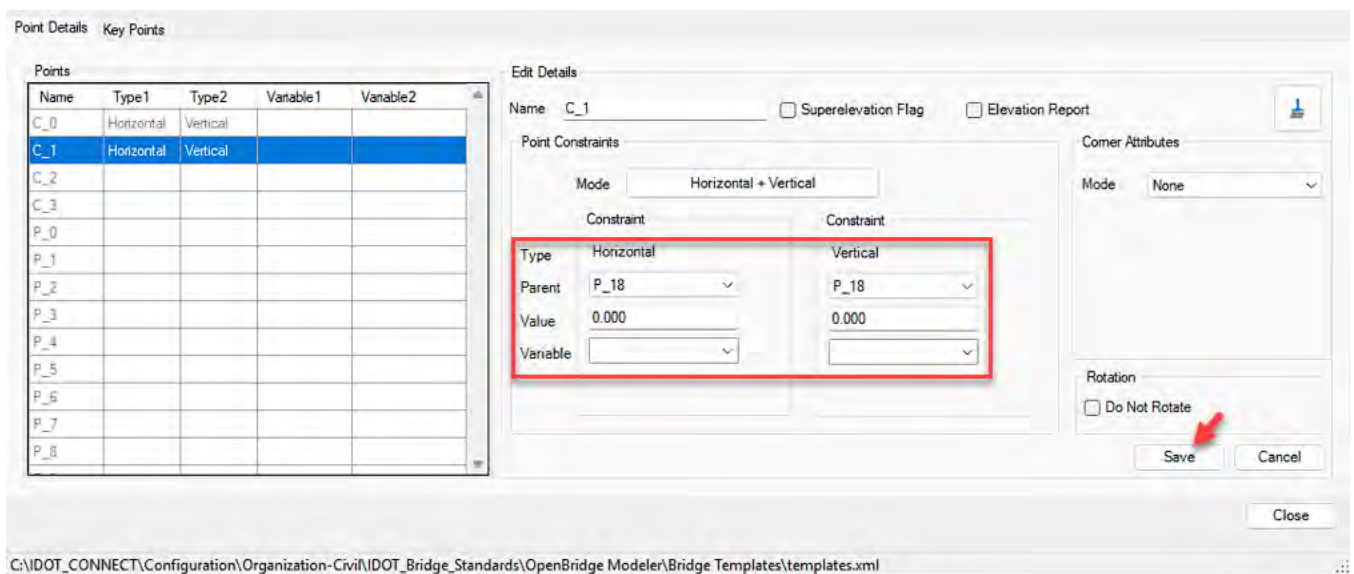
22) Set the values as shown below, then click “**Save**”.



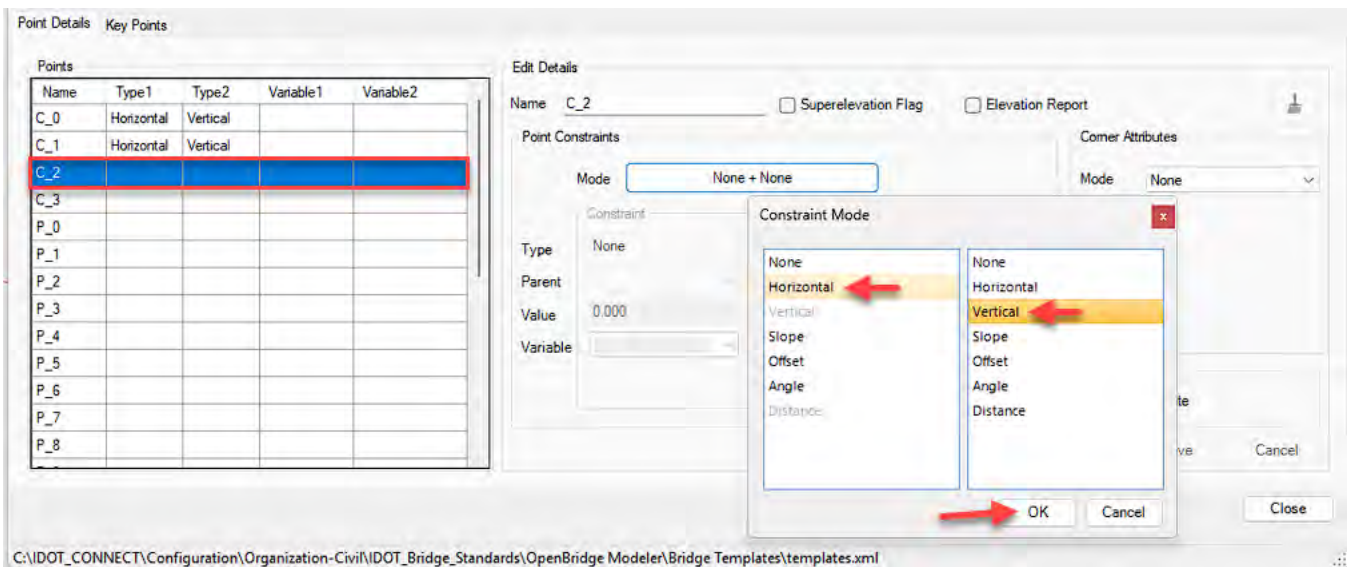
23) Select “**C_1**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



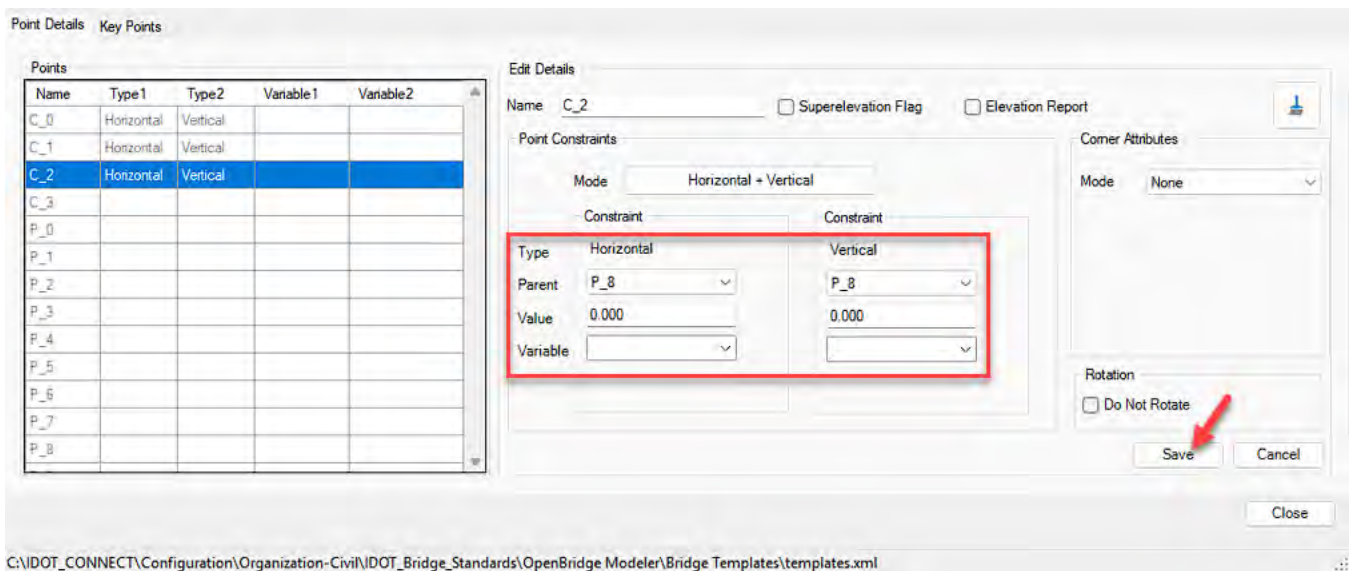
24) Set the values as shown below, then click “**Save**”.



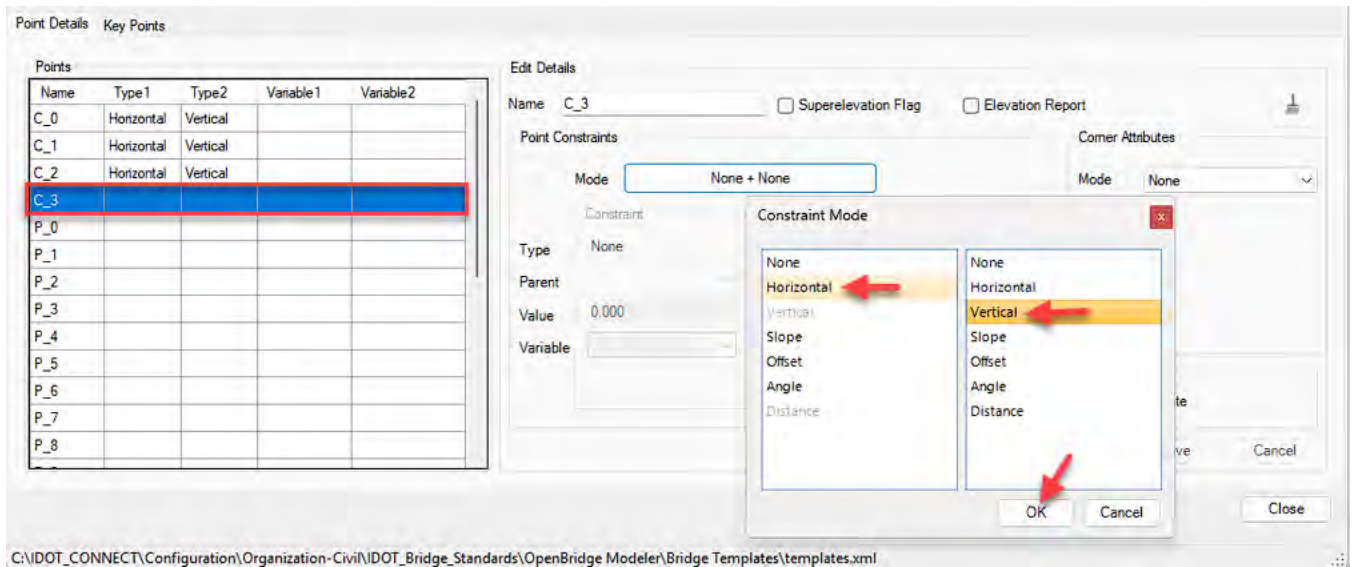
25) Select “**C_2**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



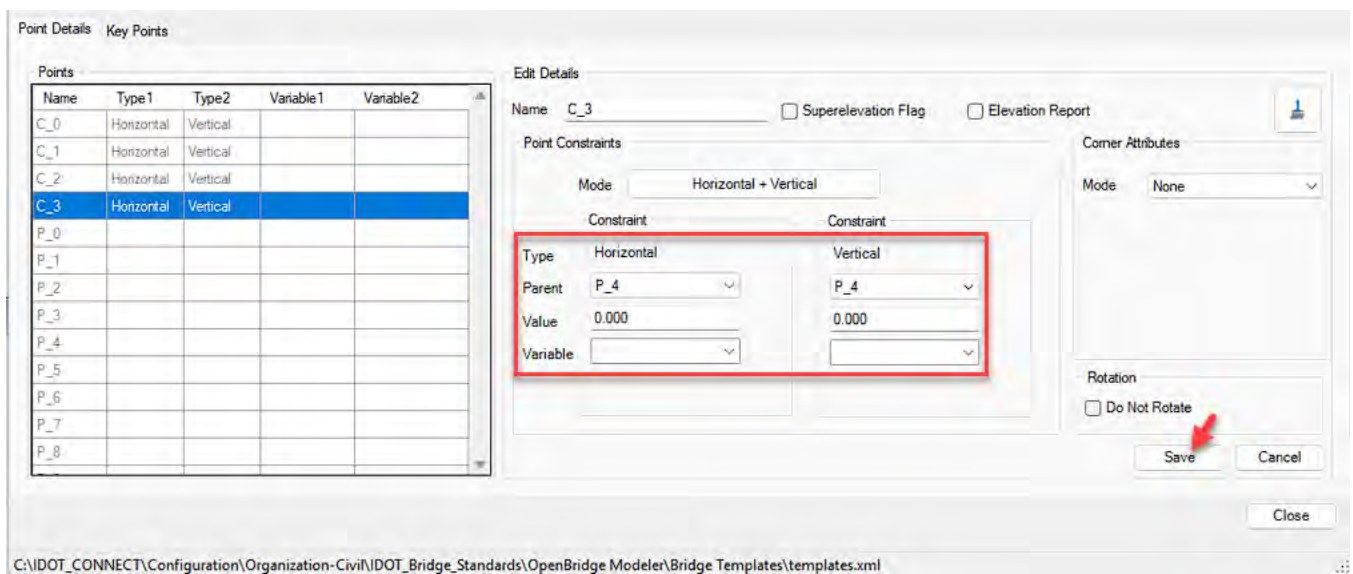
26) Set the values as shown below, then click “**Save**”.



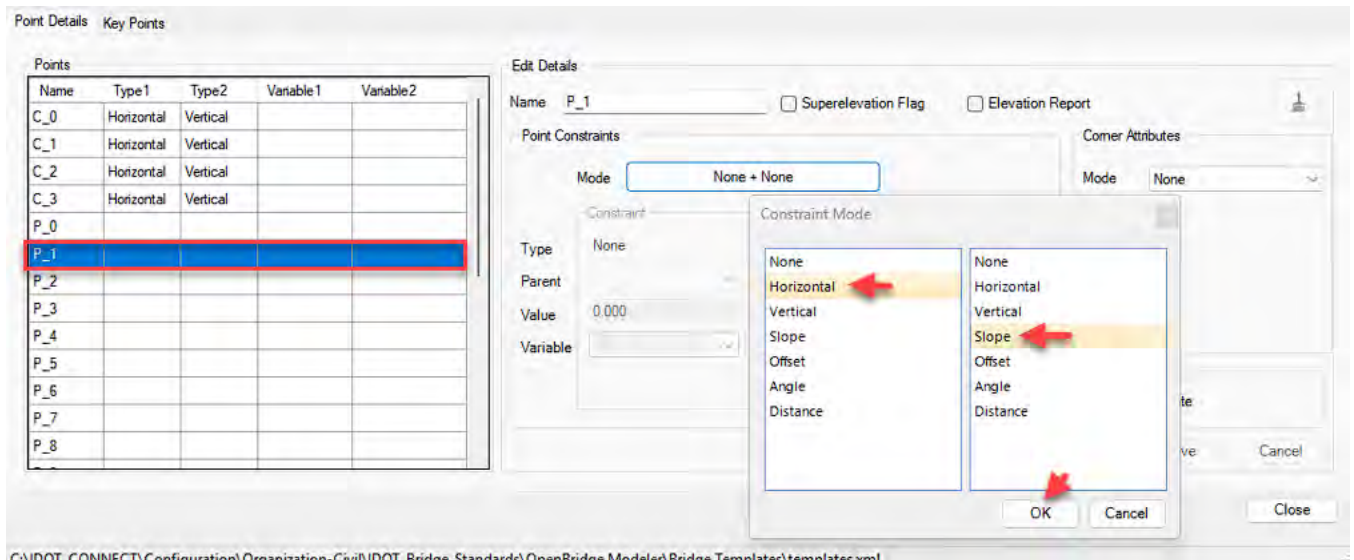
27) Select “**C_3**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



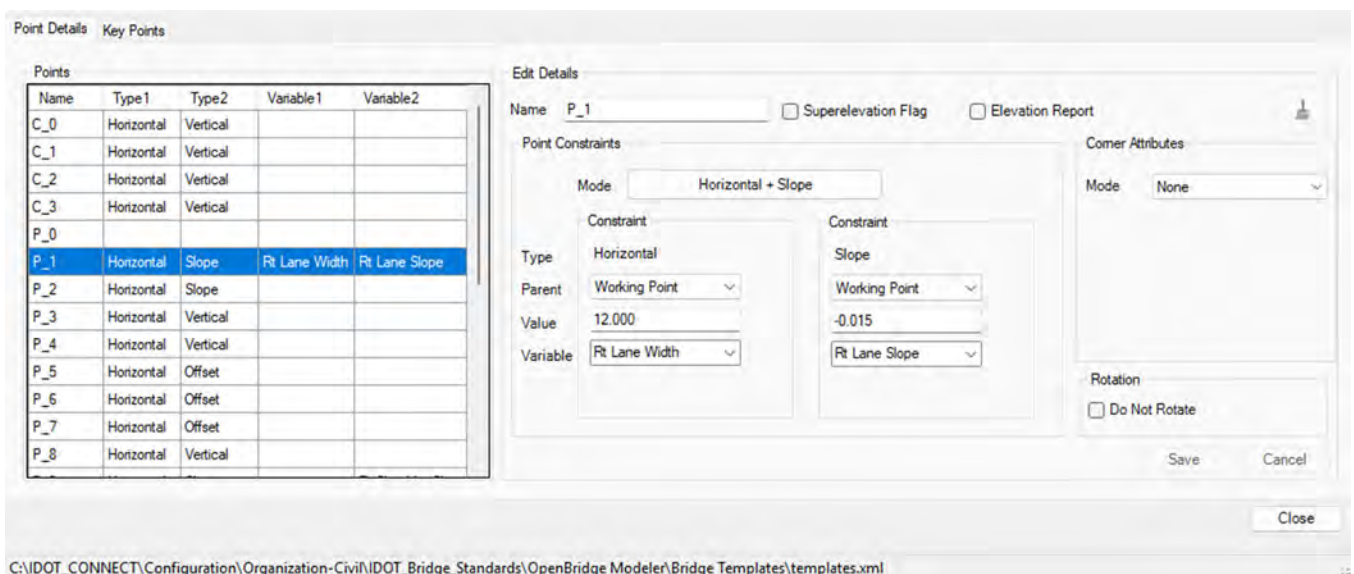
28) Set the values as shown below, then click “**Save**”.



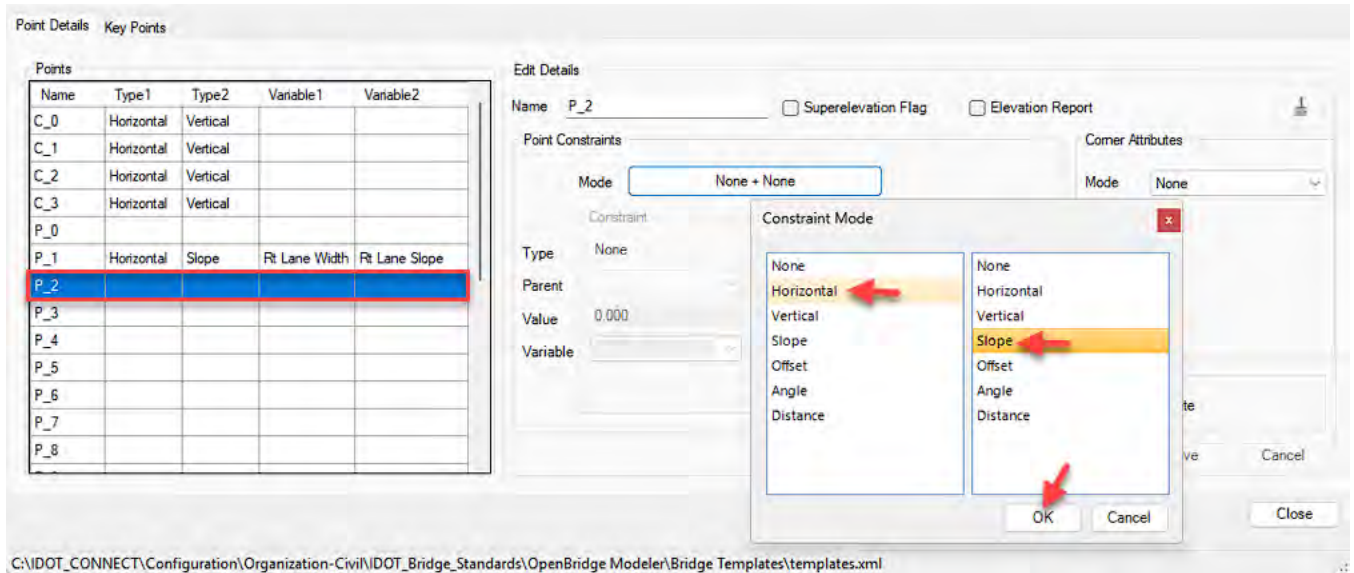
29) Select “**P_1**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



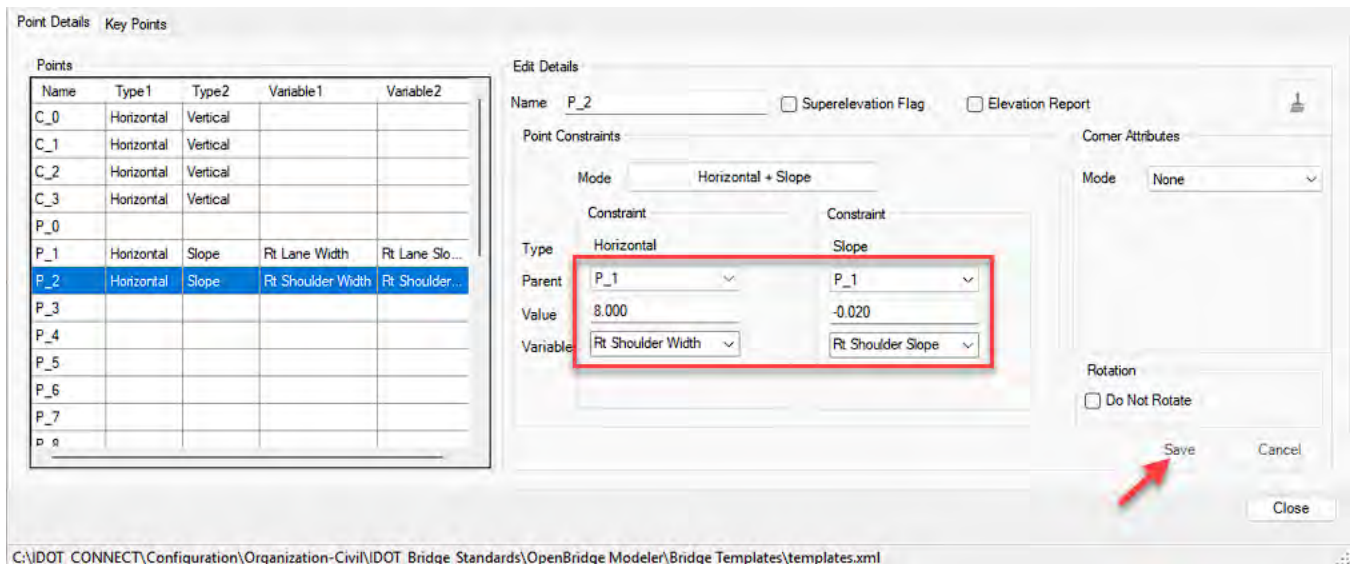
30) Set the values as shown below, then click “**Save**”.



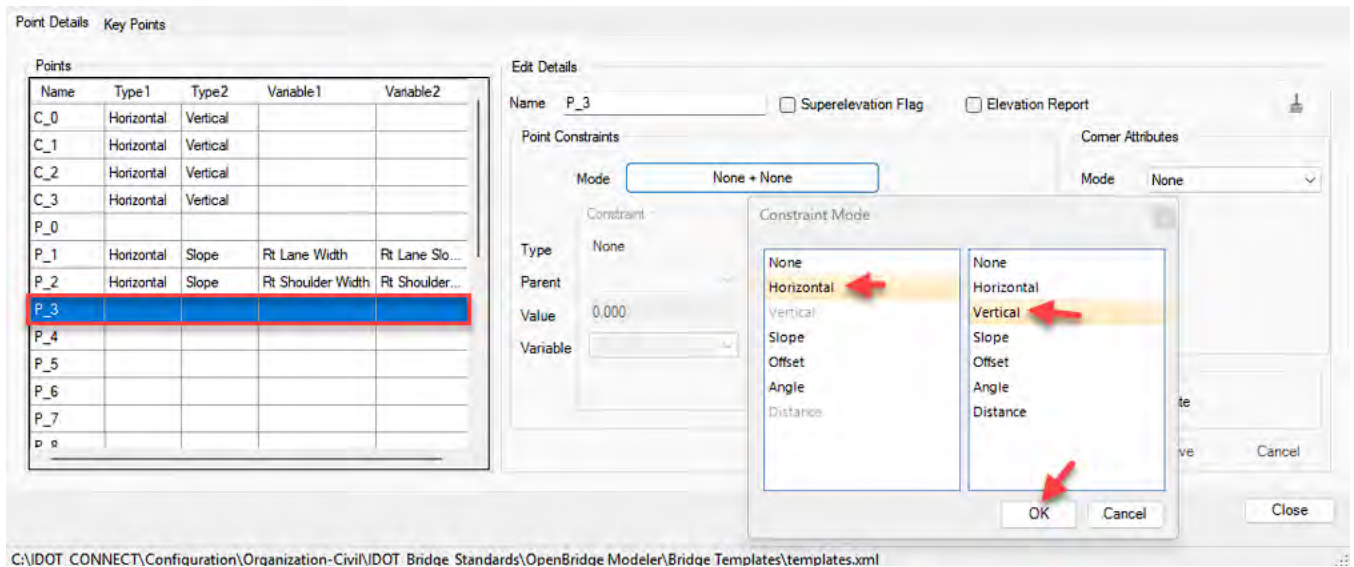
31) Select “**P_2**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



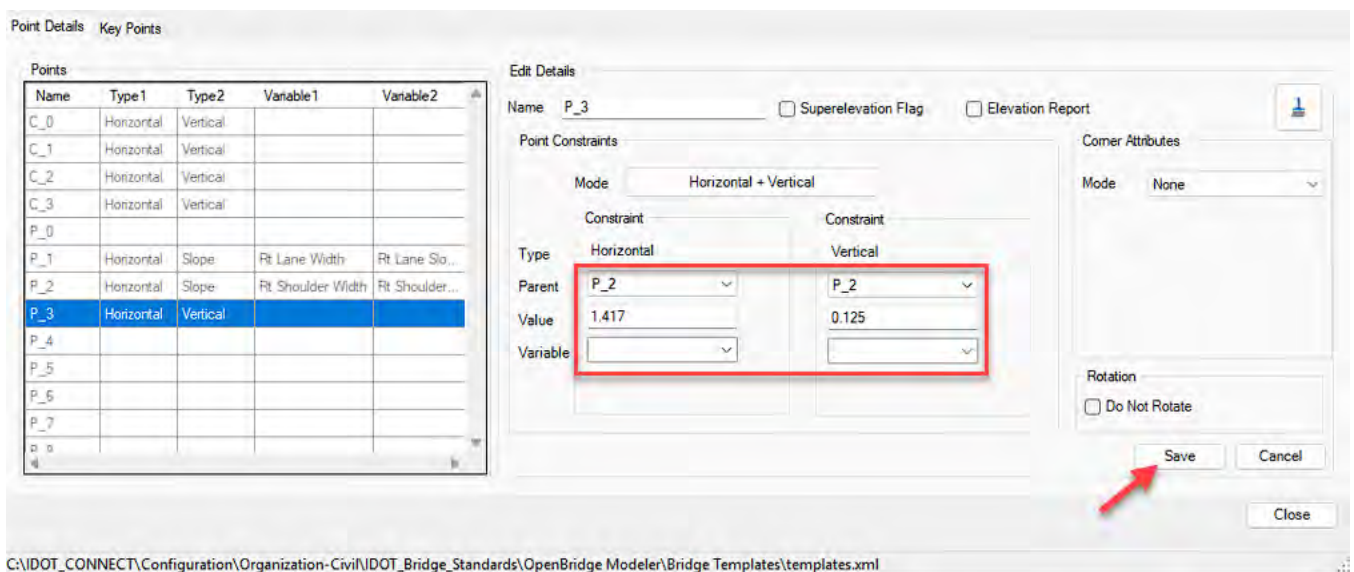
32) Set the values as shown below, then click “**Save**”.



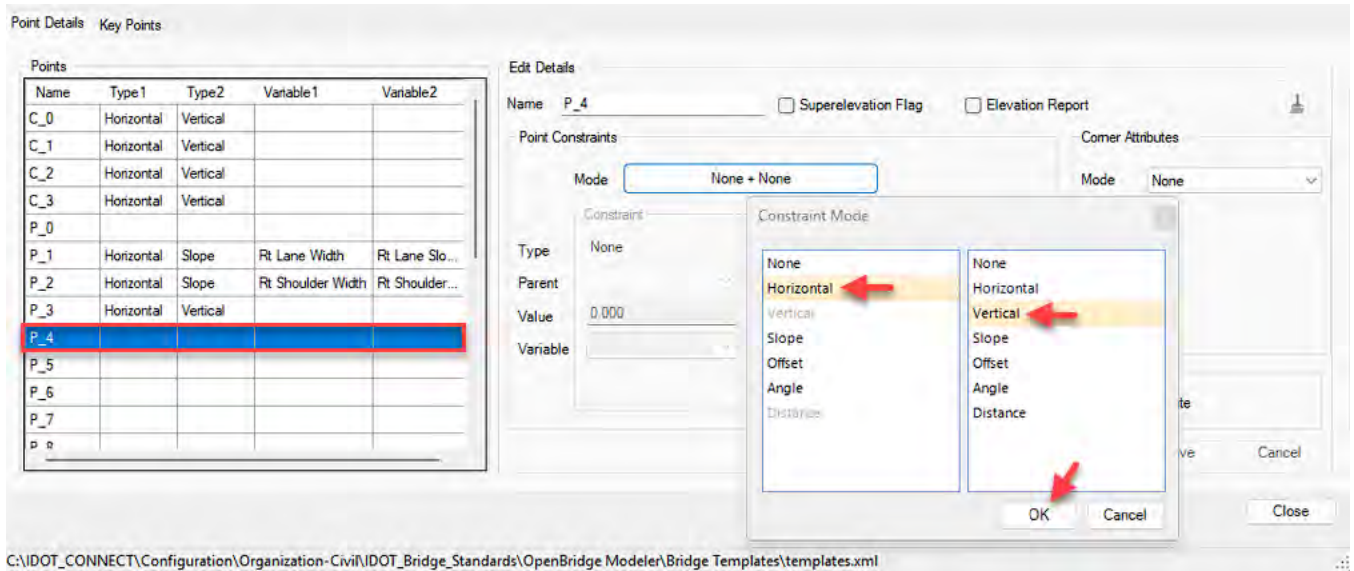
33) Select “**P_3**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



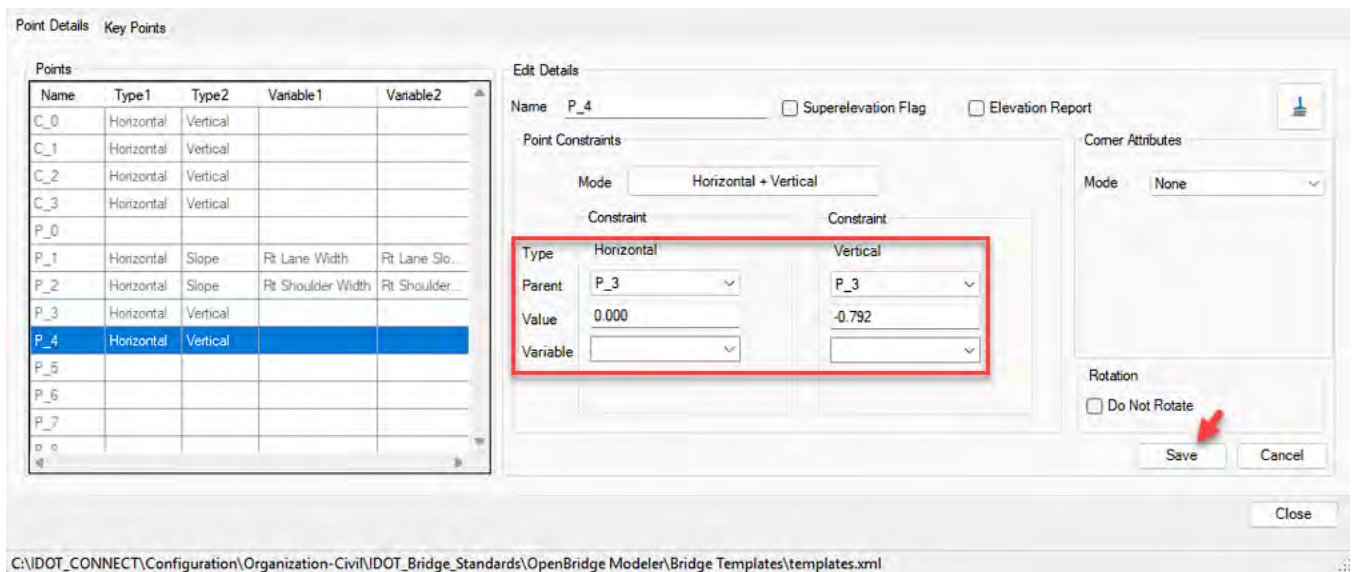
34) Set the values as shown below, then click “**Save**”.



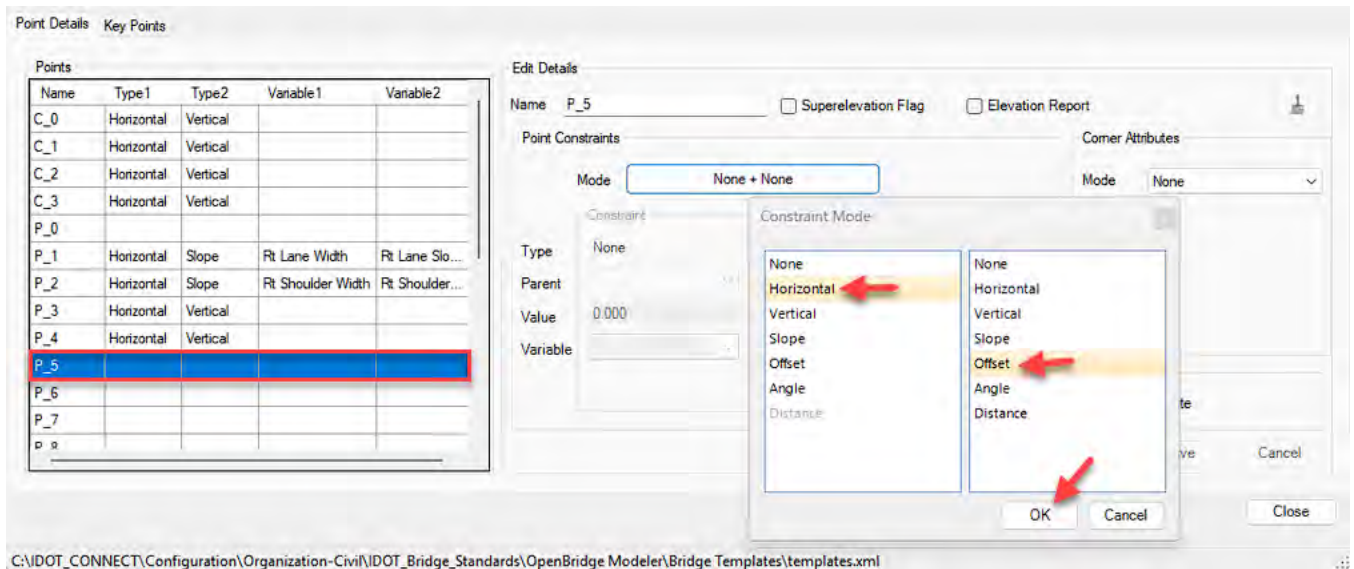
35) Select “**P_4**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



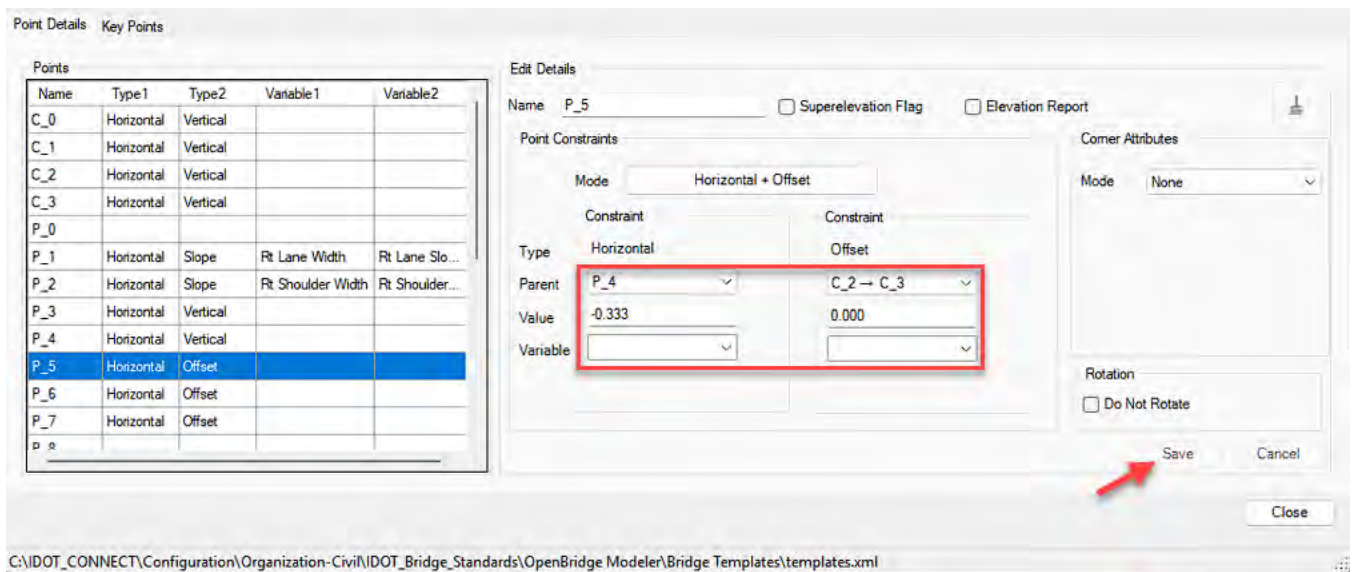
36) Set the values as shown below, then click “**Save**”.



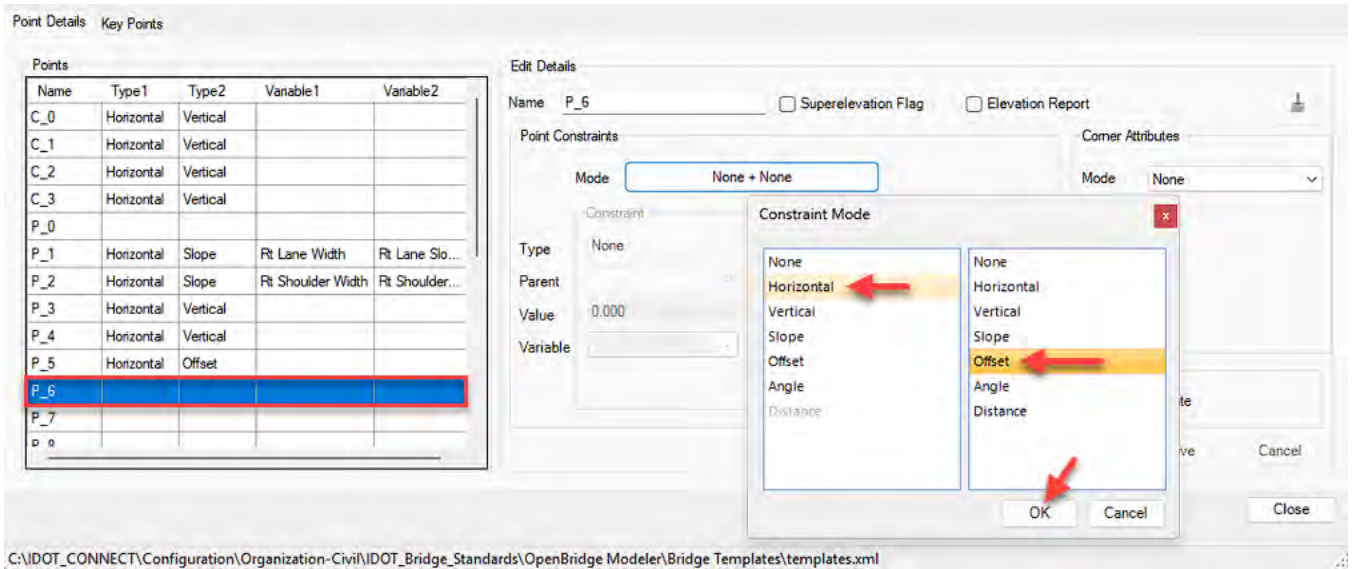
37) Select “**P_5**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



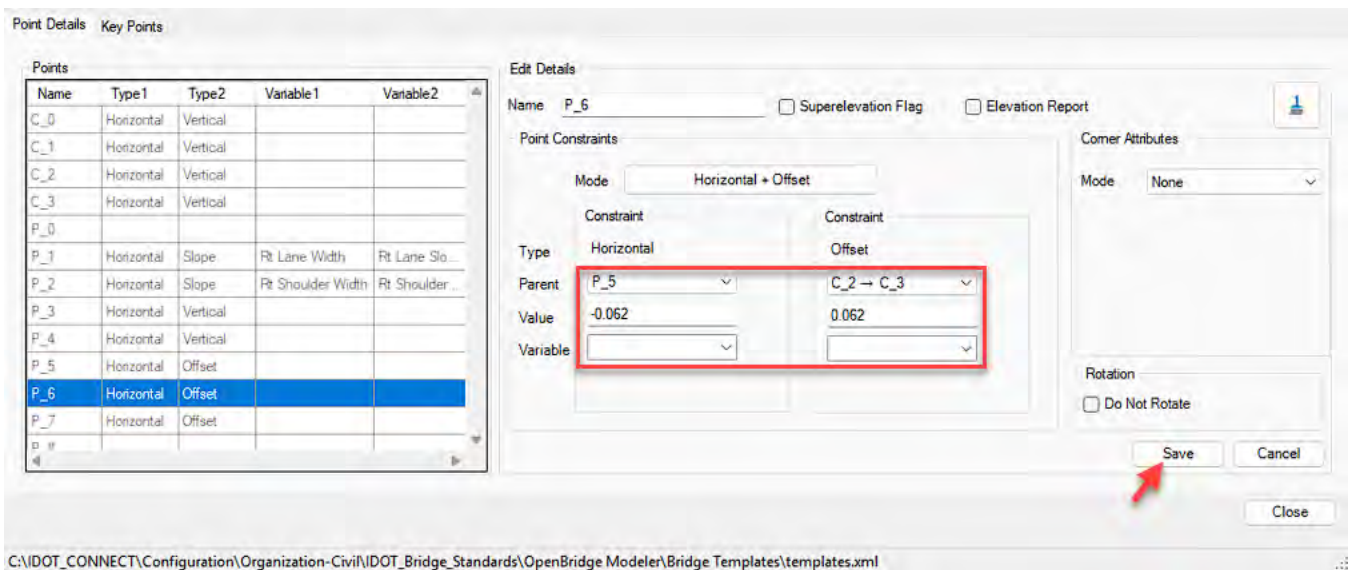
38) Set the values as shown below, then click “**Save**”.



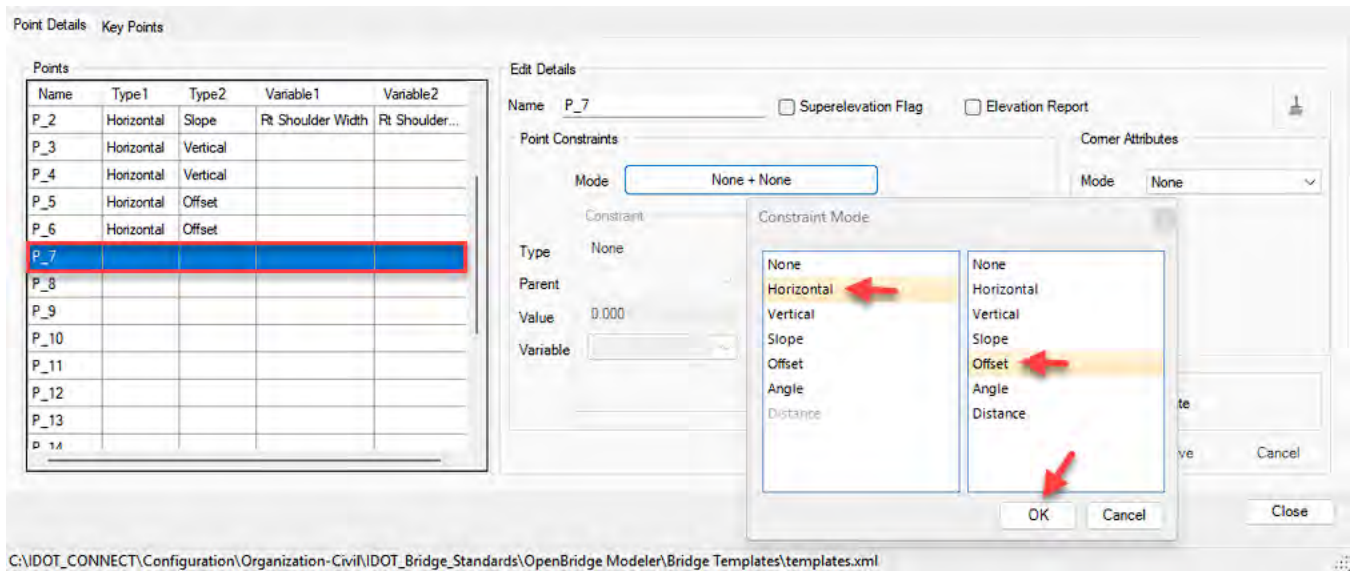
39) Select “**P_6**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



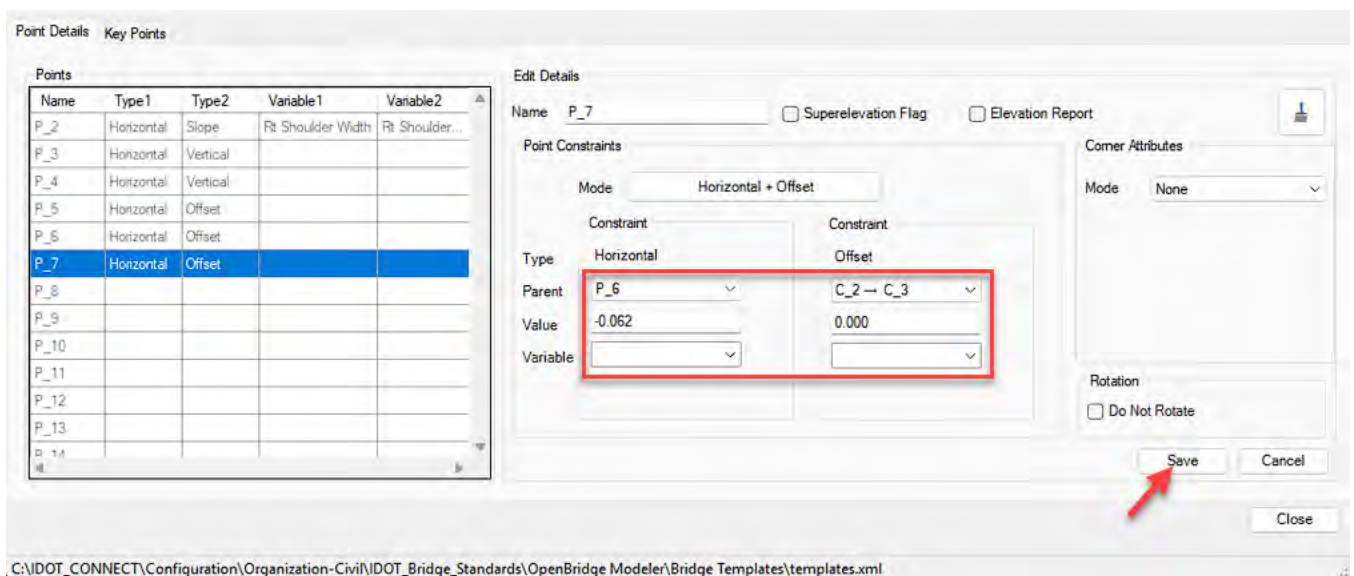
40) Set the values as shown below, then click “**Save**”.



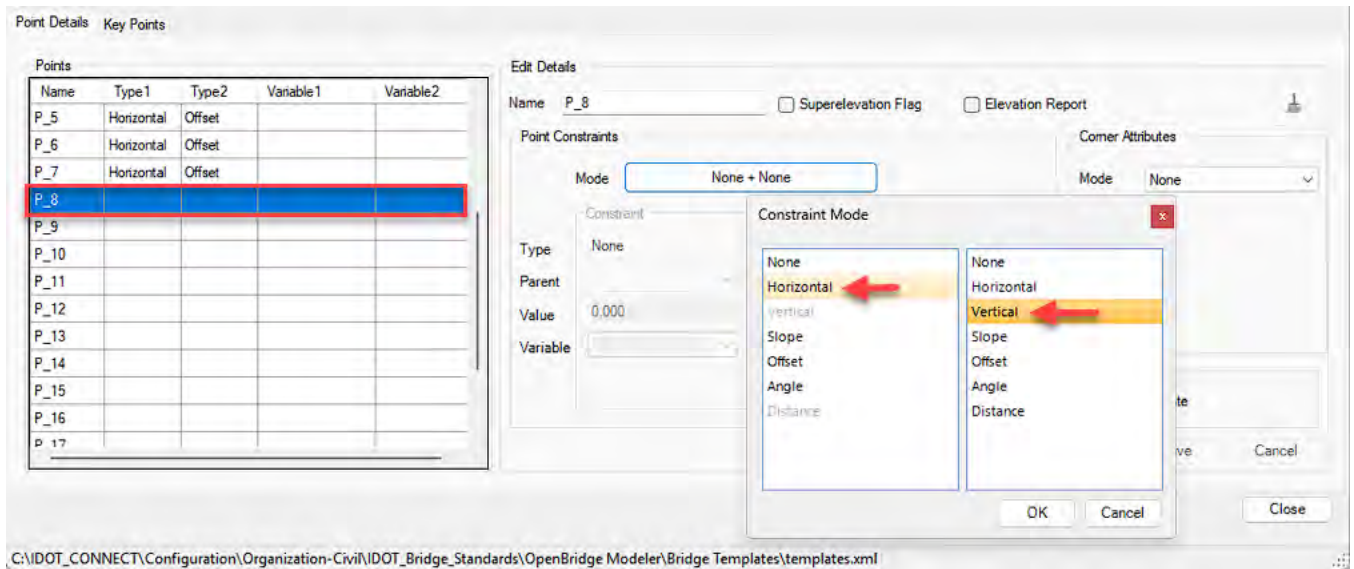
41) Select “**P_7**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



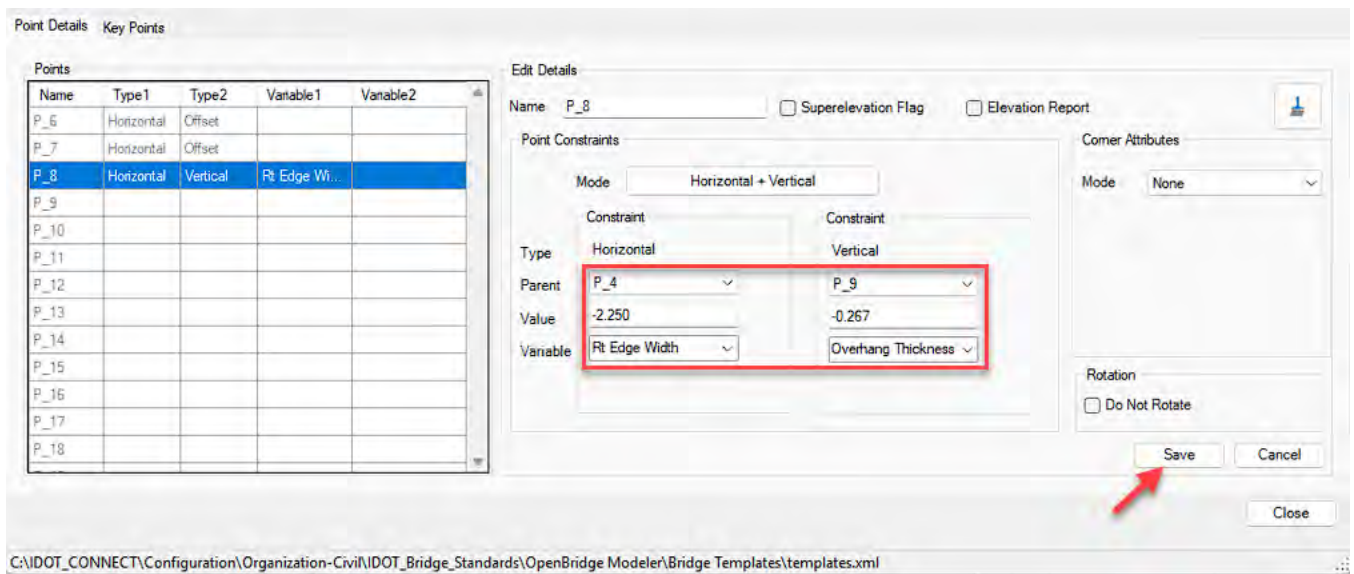
42) Set the values as shown below, then click “**Save**”.



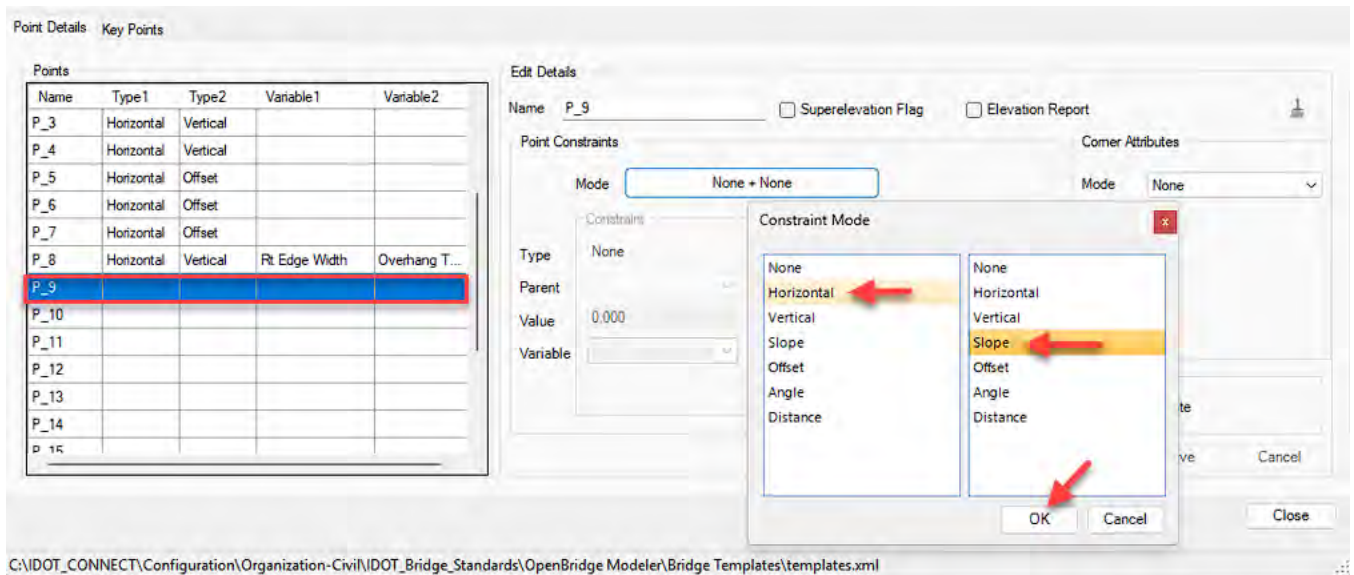
43) Select “**P_8**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



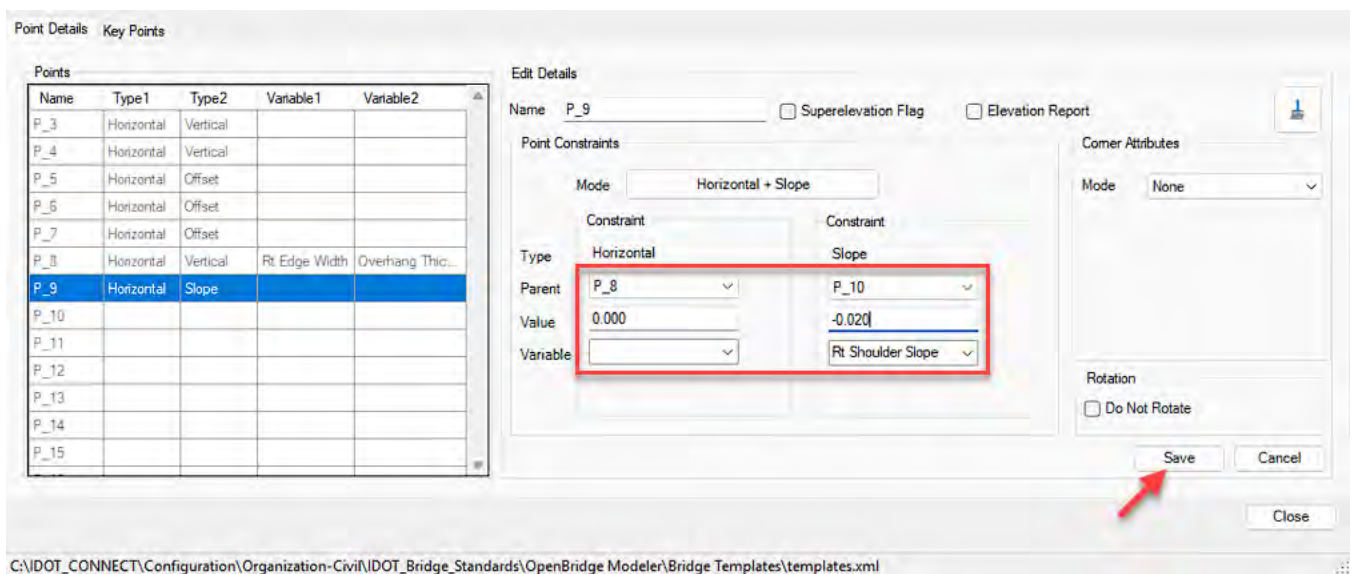
44) Set the values as shown below, then click “**Save**”.



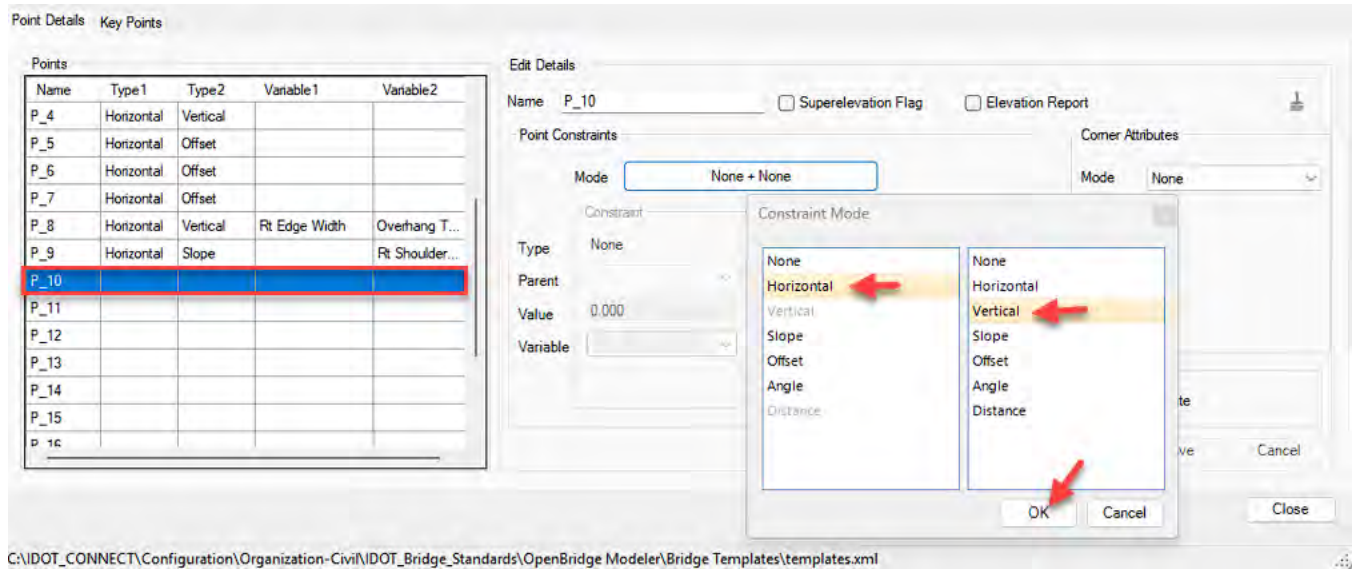
45) Select “**P_9**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



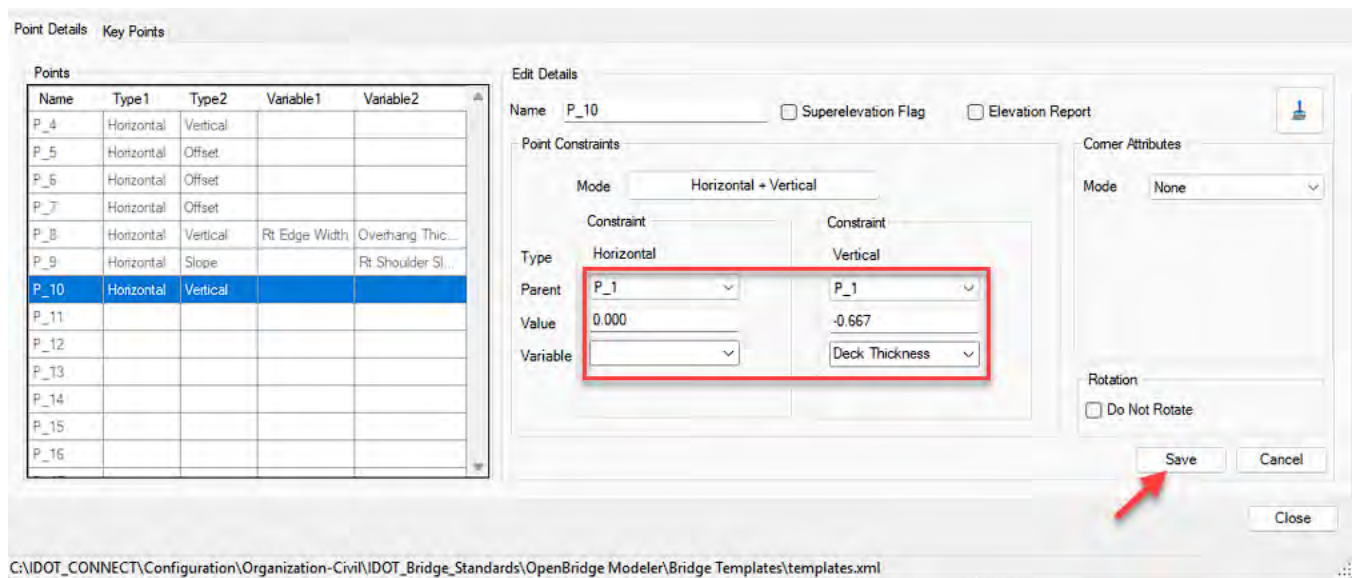
46) Set the values as shown below, then click “**Save**”.



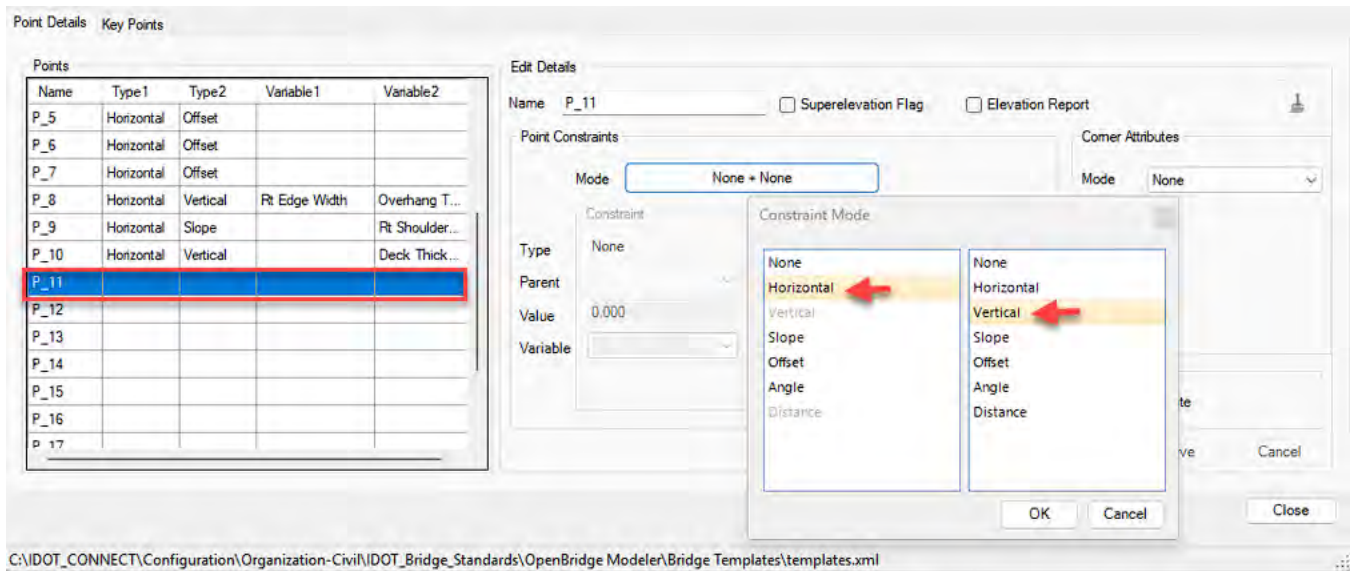
47) Select “**P_10**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



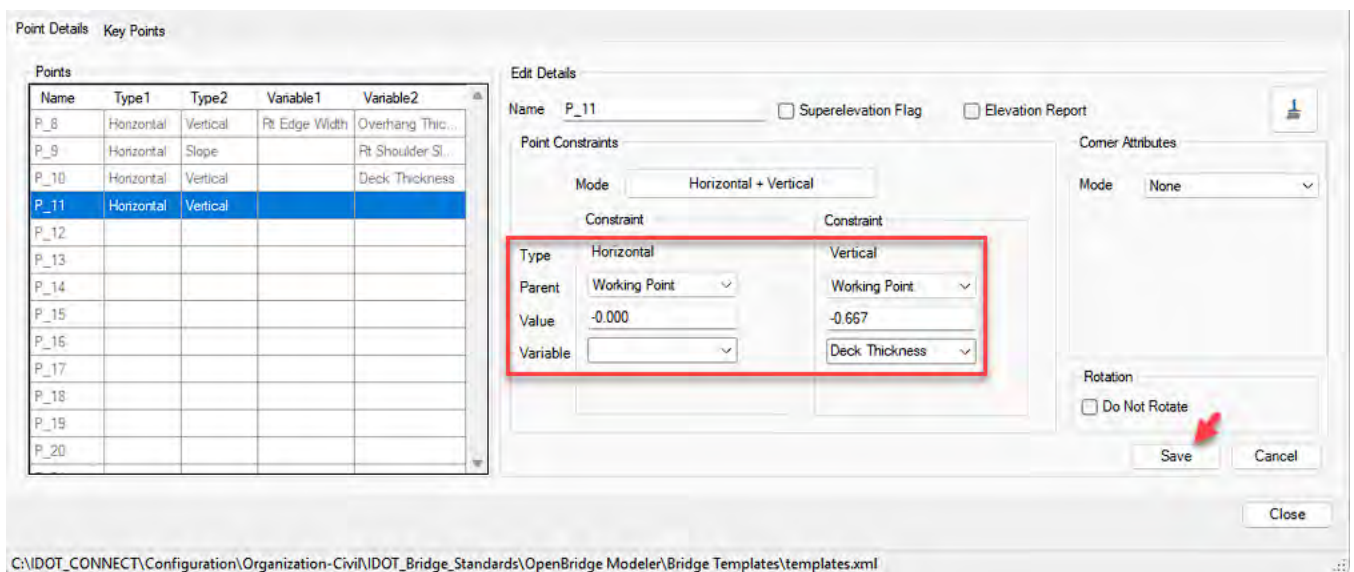
48) Set the values as shown below, then click “**Save**”.



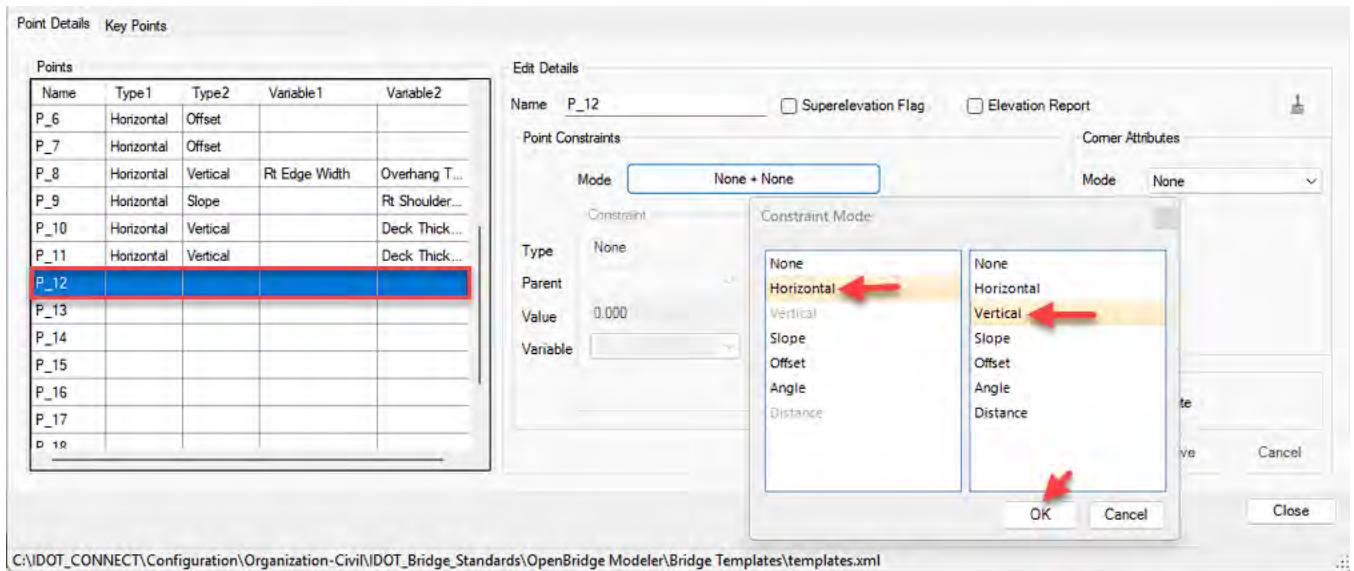
49) Select “**P_11**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



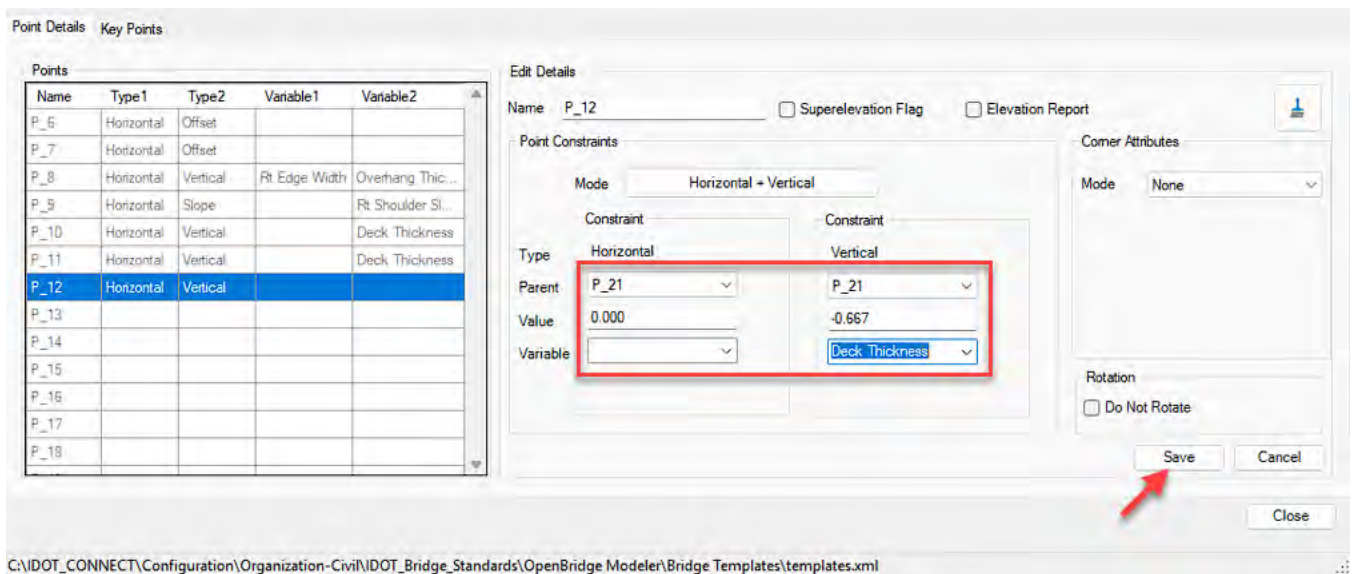
50) Set the values as shown below, then click “**Save**”.



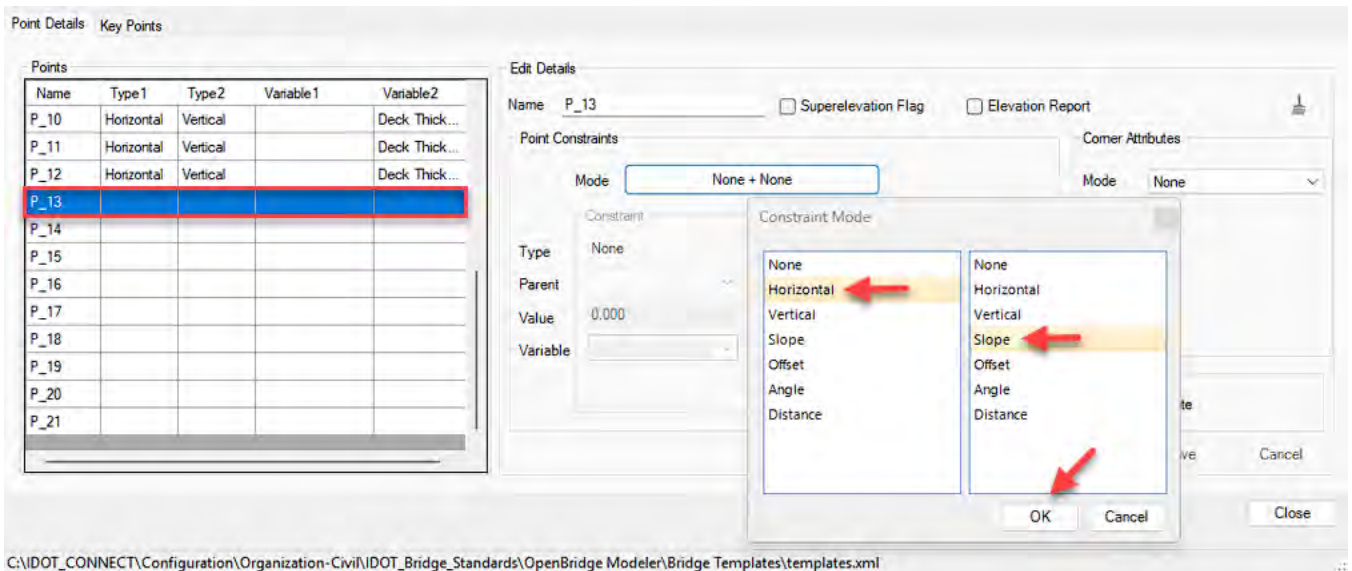
51) Select “**P_12**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



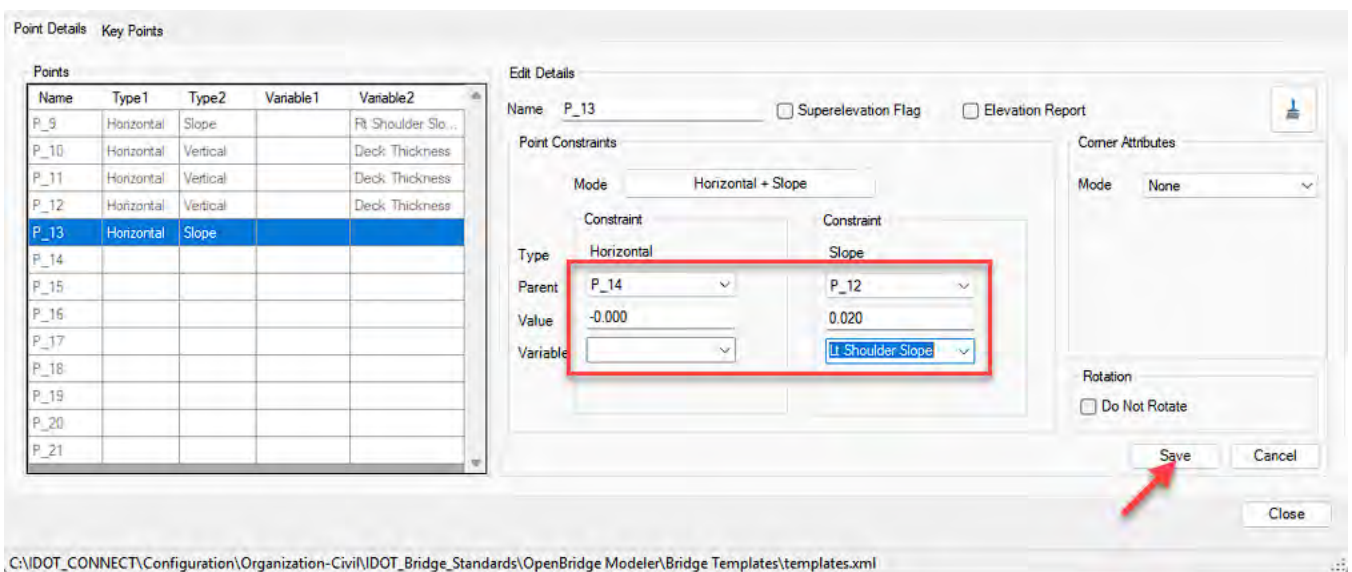
52) Set the values as shown below, then click “**Save**”.



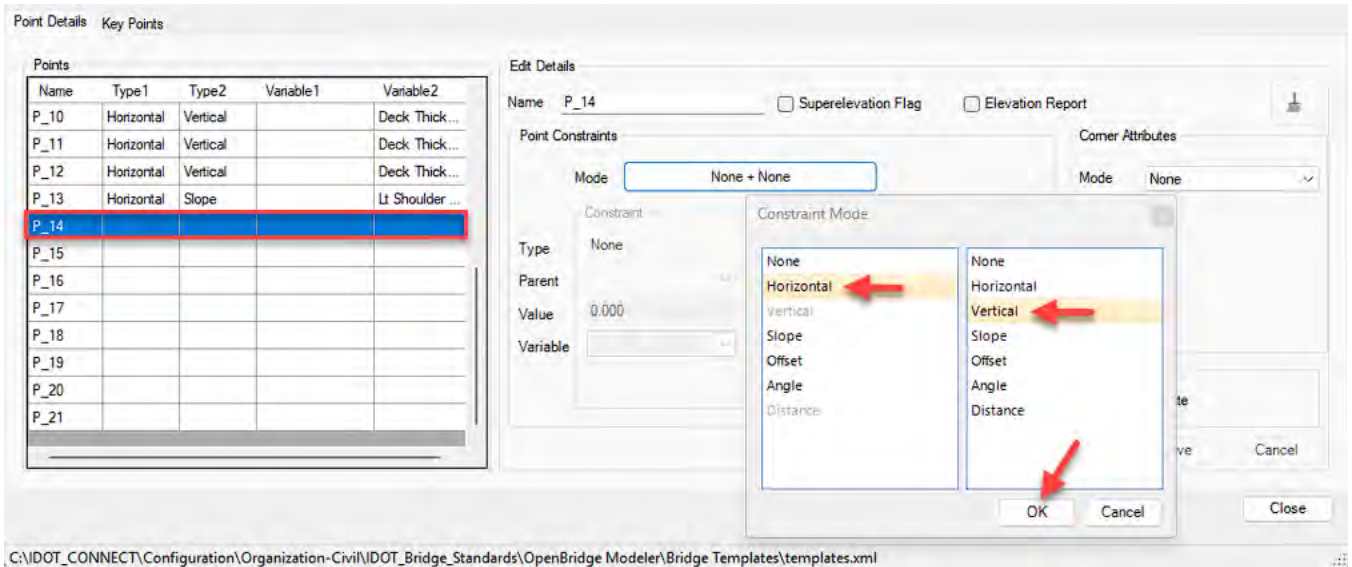
53) Select “**P_13**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



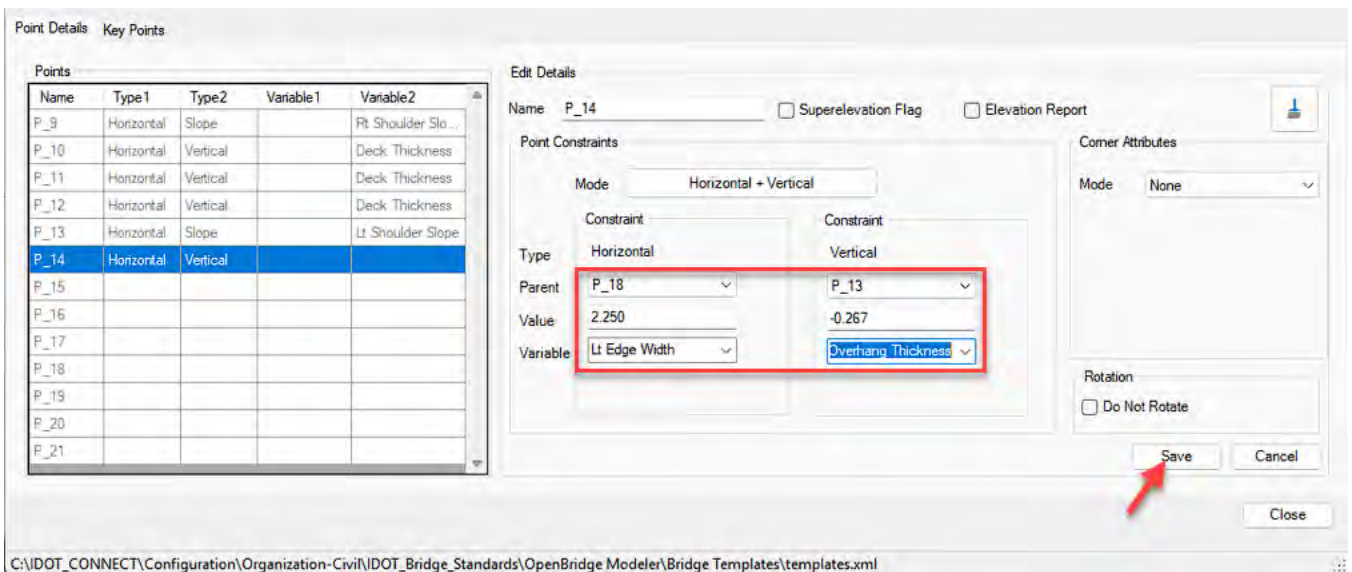
54) Set the values as shown below, then click “**Save**”.



55) Select “**P_14**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.

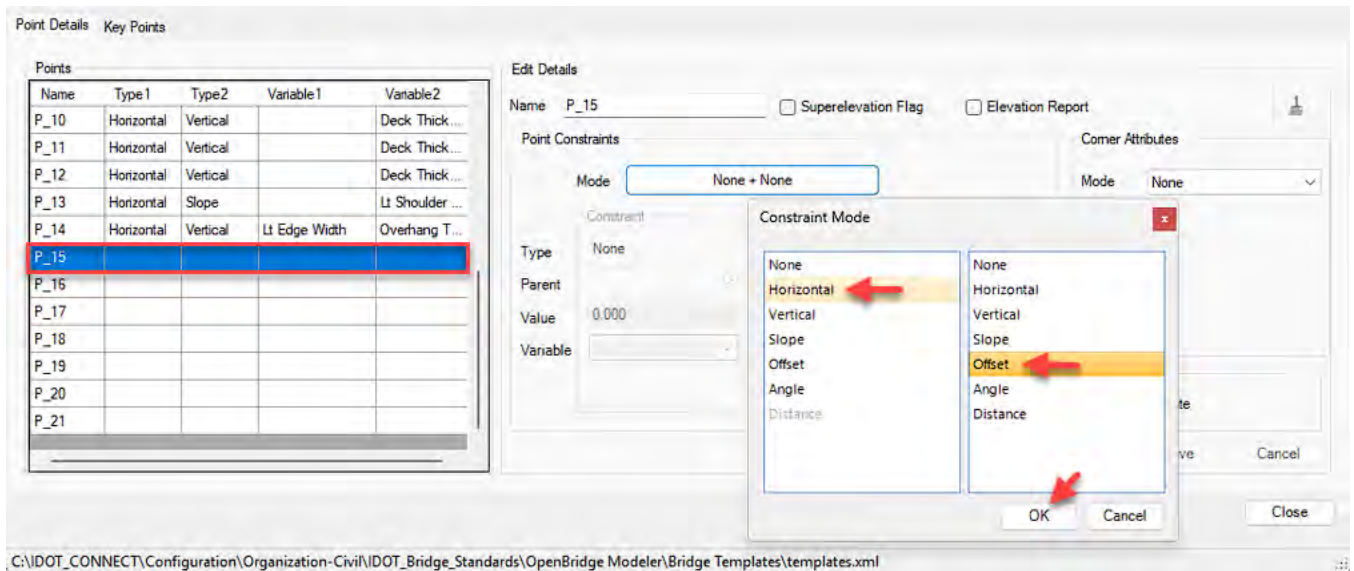


56) Set the values as shown below, then click “**Save**”.

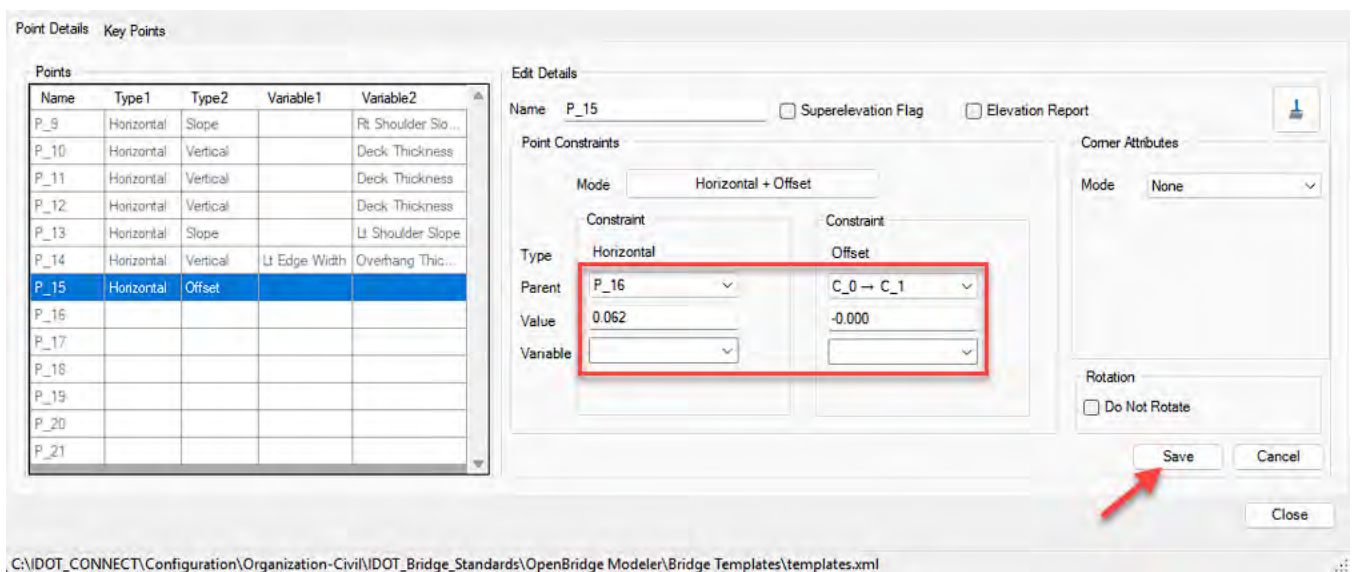


Note that on the left side of the section, we are defining the points in a clockwise direction. It can be done in the opposite order if desired. You could define the points from the Working Point in a clockwise direction for the right side and then define the points on the left from the Working Point in a counterclockwise direction. Either way is acceptable.

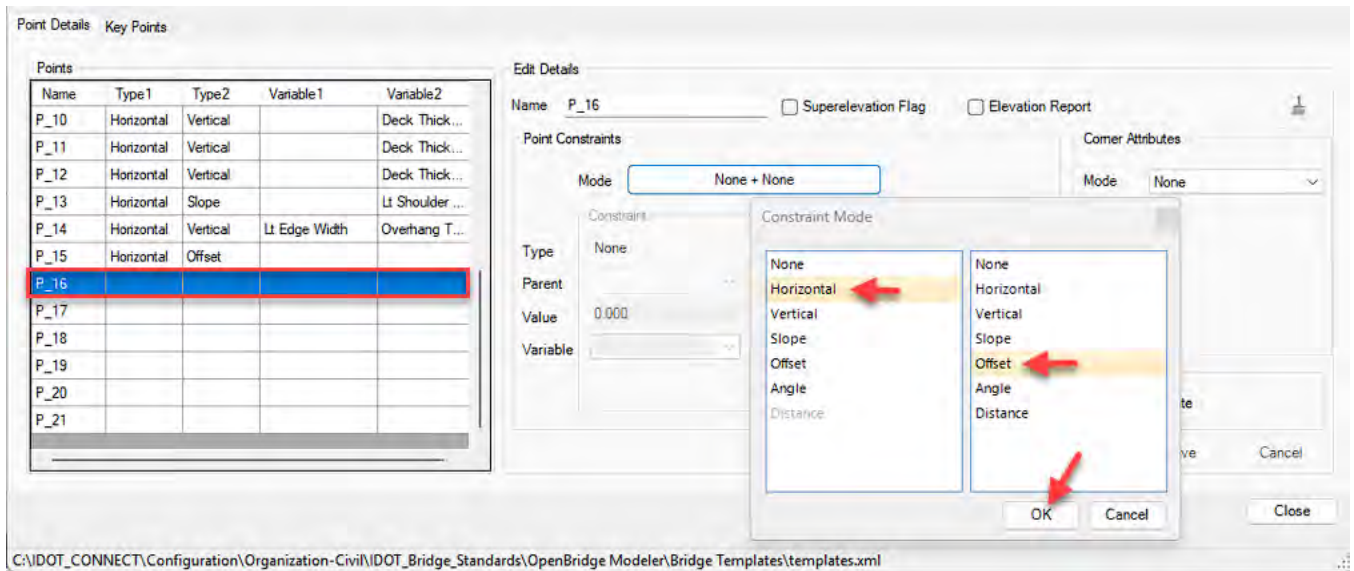
57) Select “**P_15**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



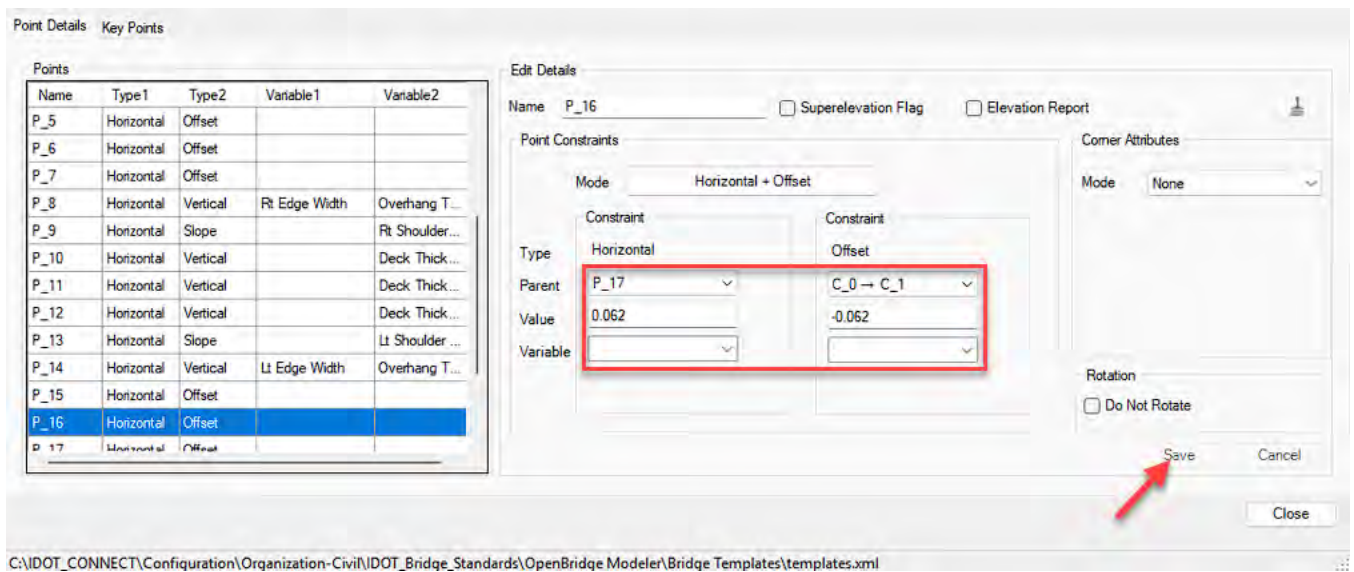
58) Set the values as shown below, then click “**Save**”.



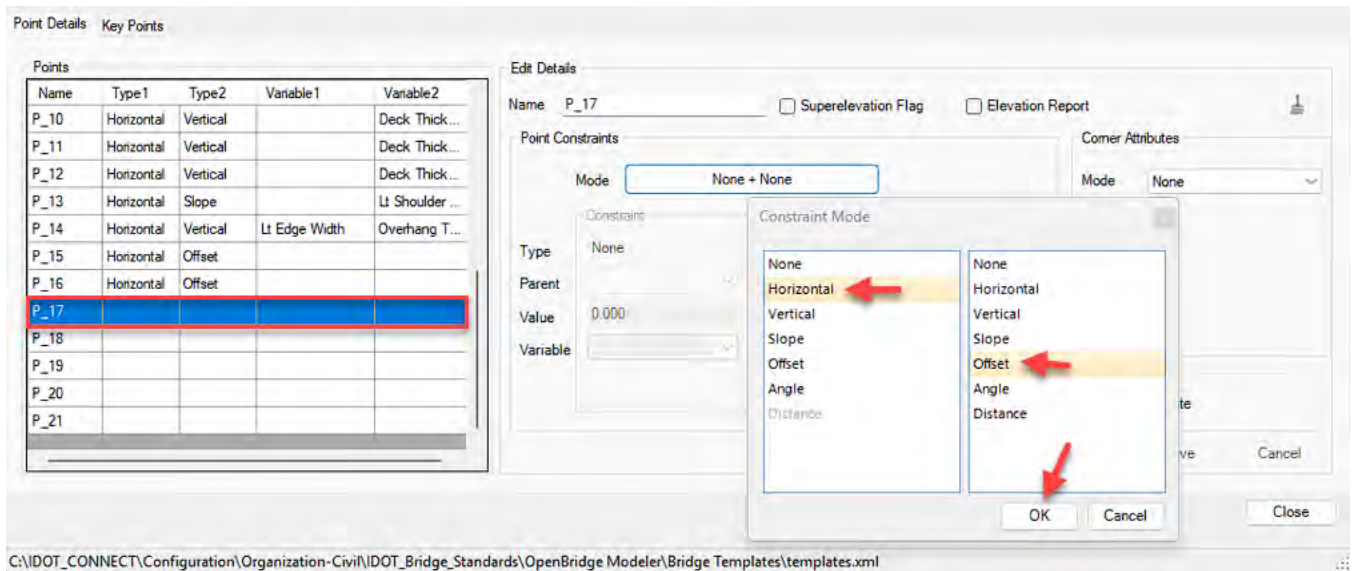
59) Select “**P_16**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



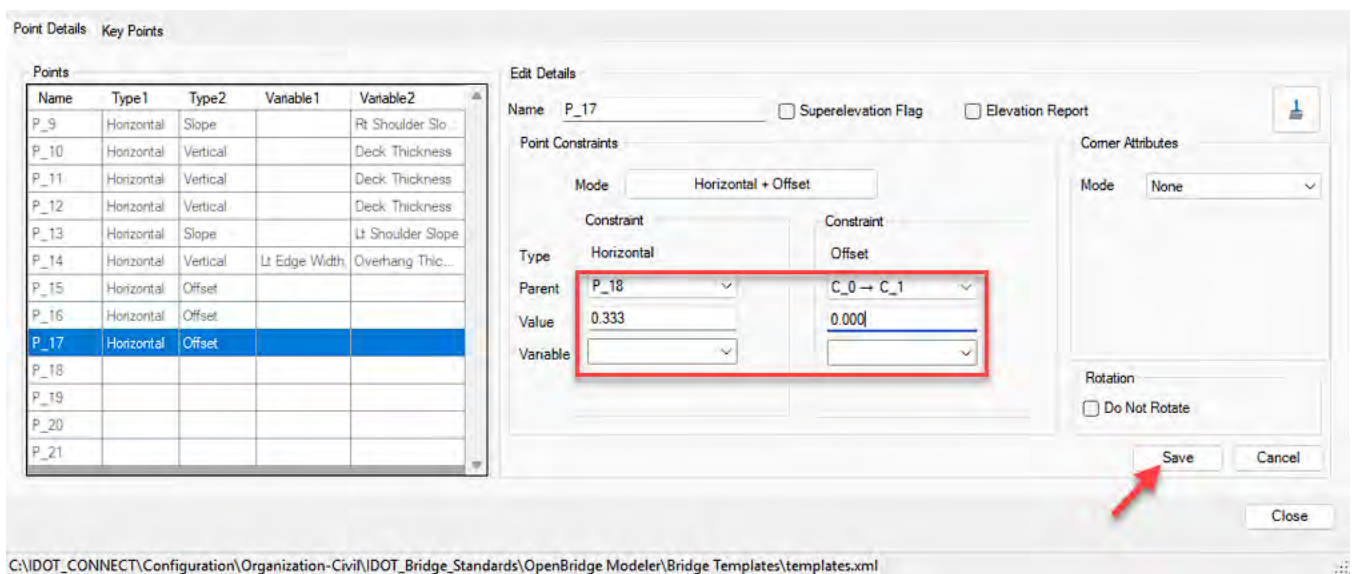
60) Set the values as shown below, then click “**Save**”.



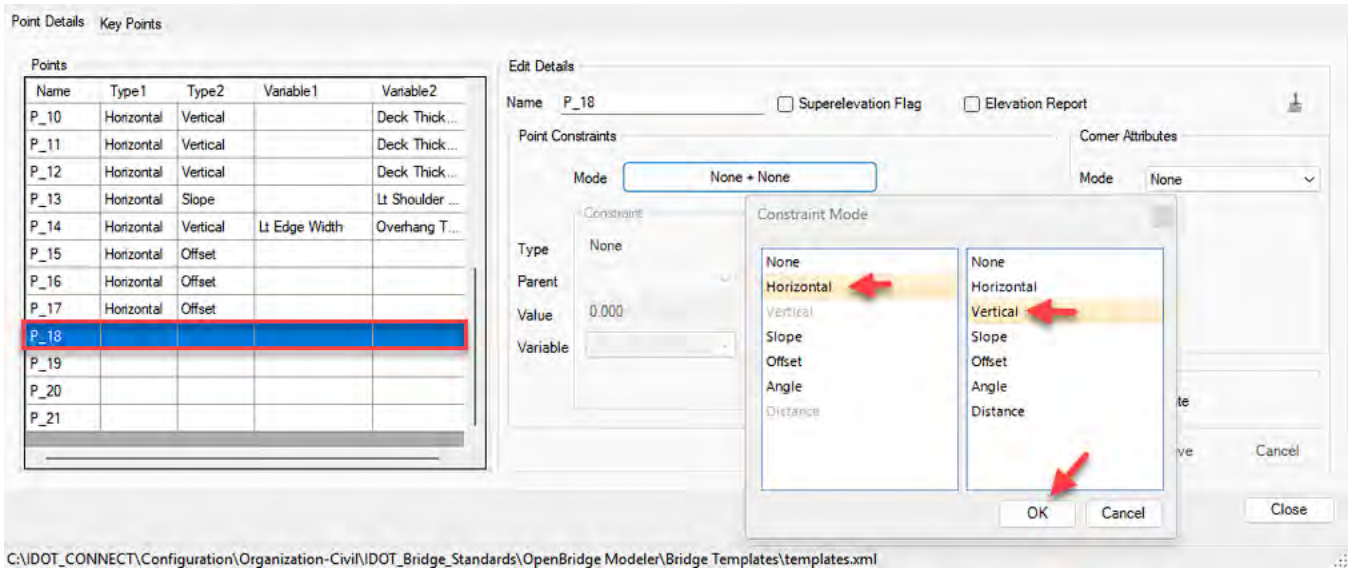
61) Select “**P_17**”, set the point constraint mode to “**Horizontal + Offset**” and then “**OK**”.



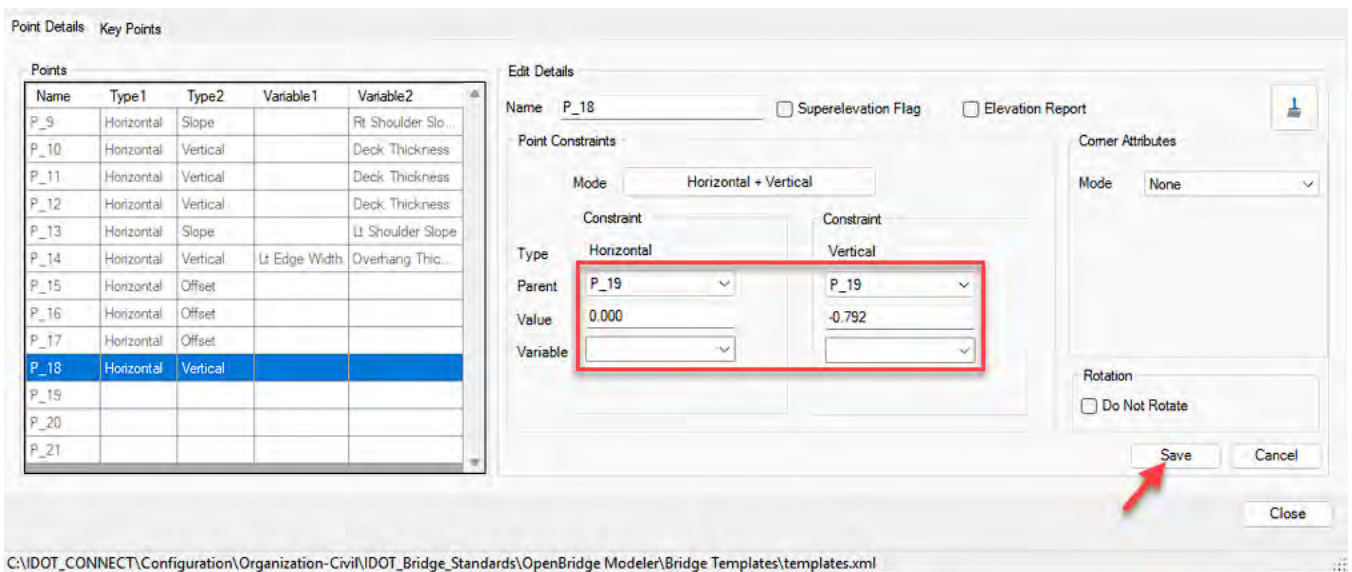
62) Set the values as shown below, then click “**Save**”.



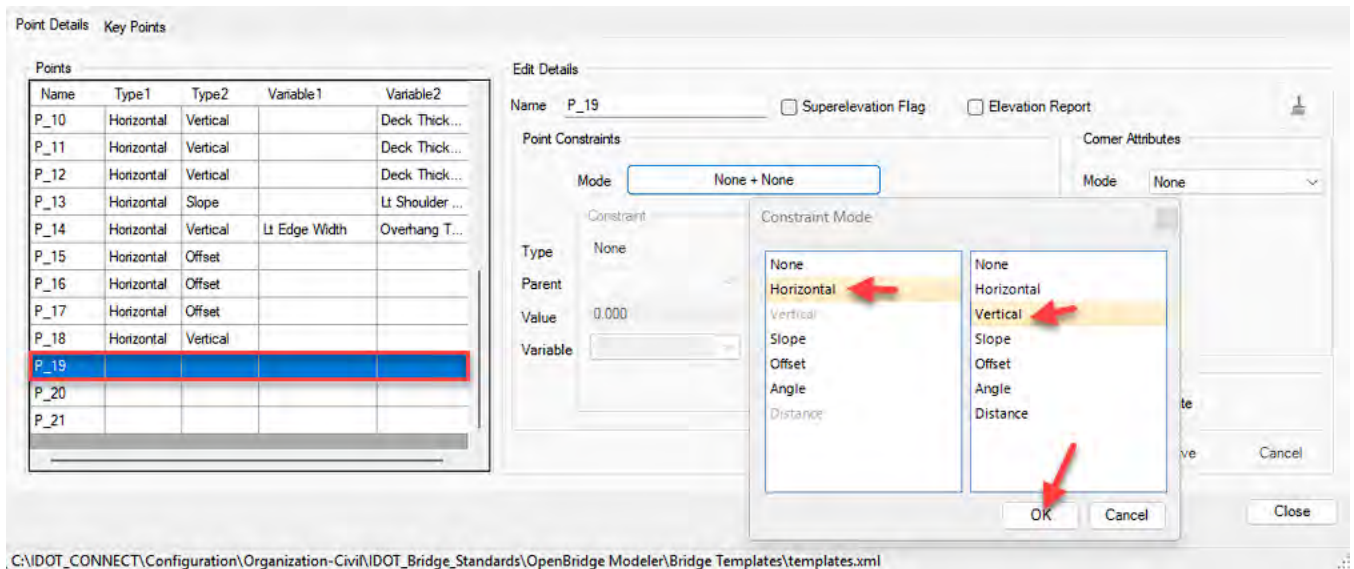
63) Select “**P_18**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



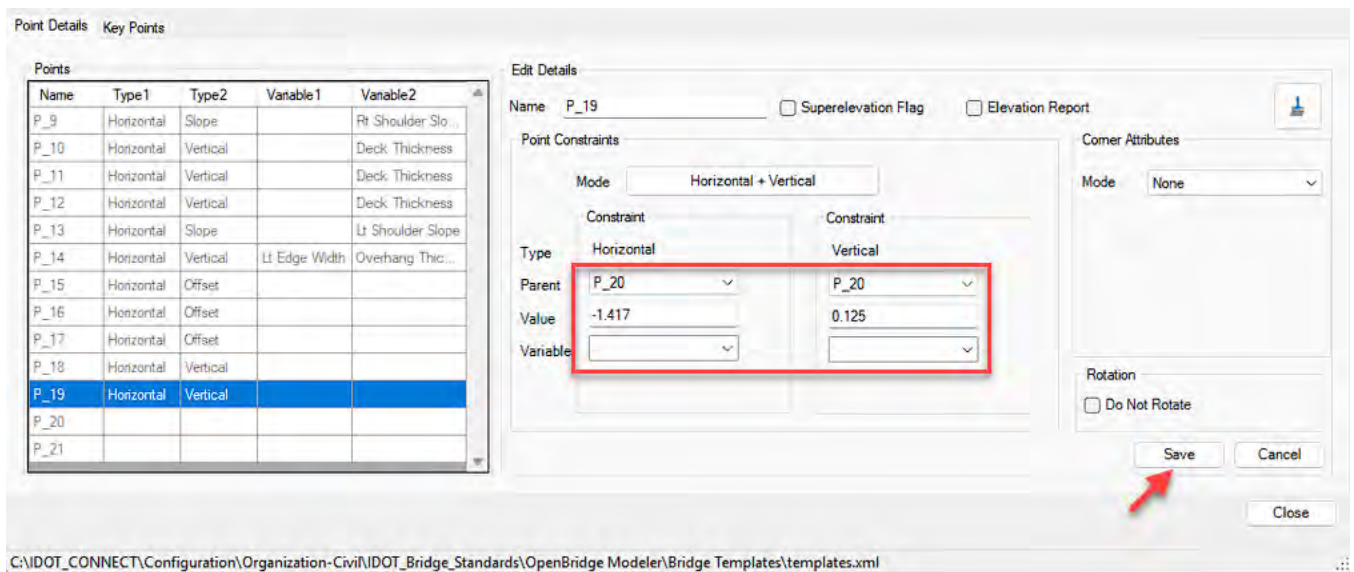
64) Set the values as shown below, then click “**Save**”.



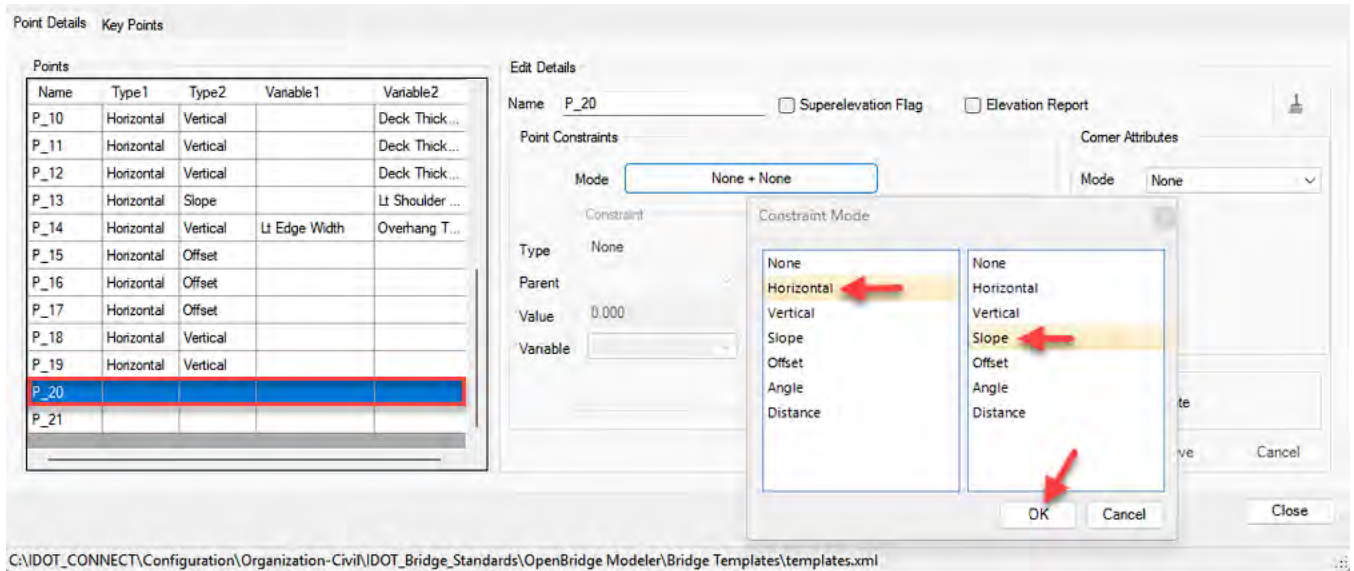
65) Select “**P_19**”, set the point constraint mode to “**Horizontal + Vertical**” and then “**OK**”.



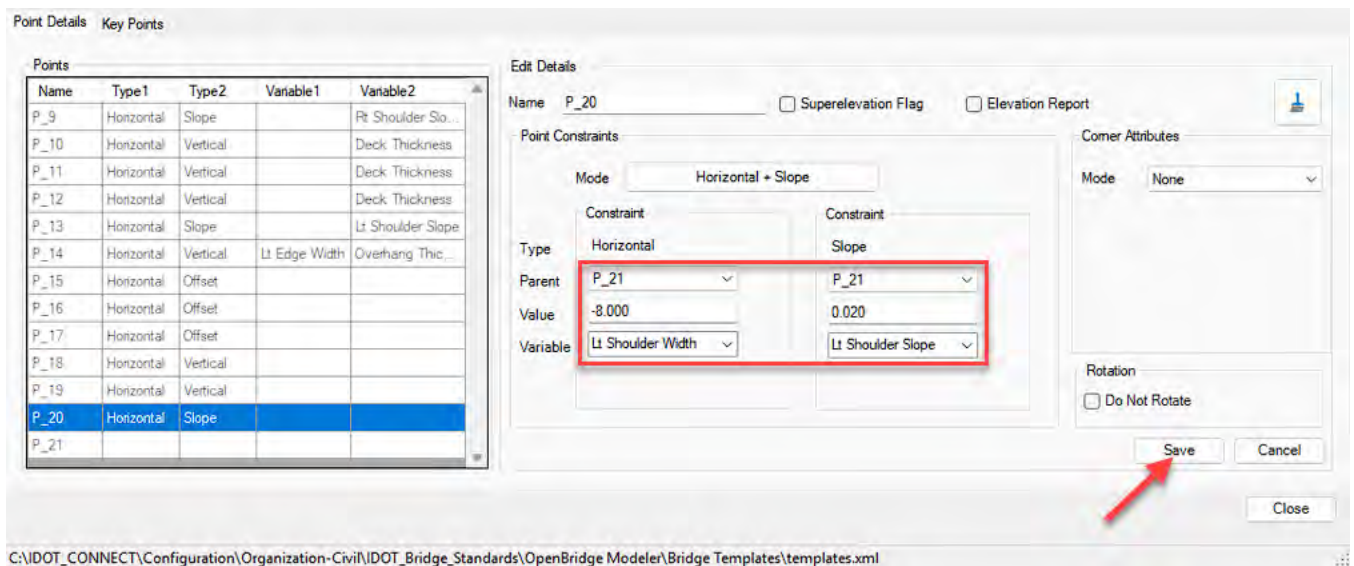
66) Set the values as shown below, then click “**Save**”.



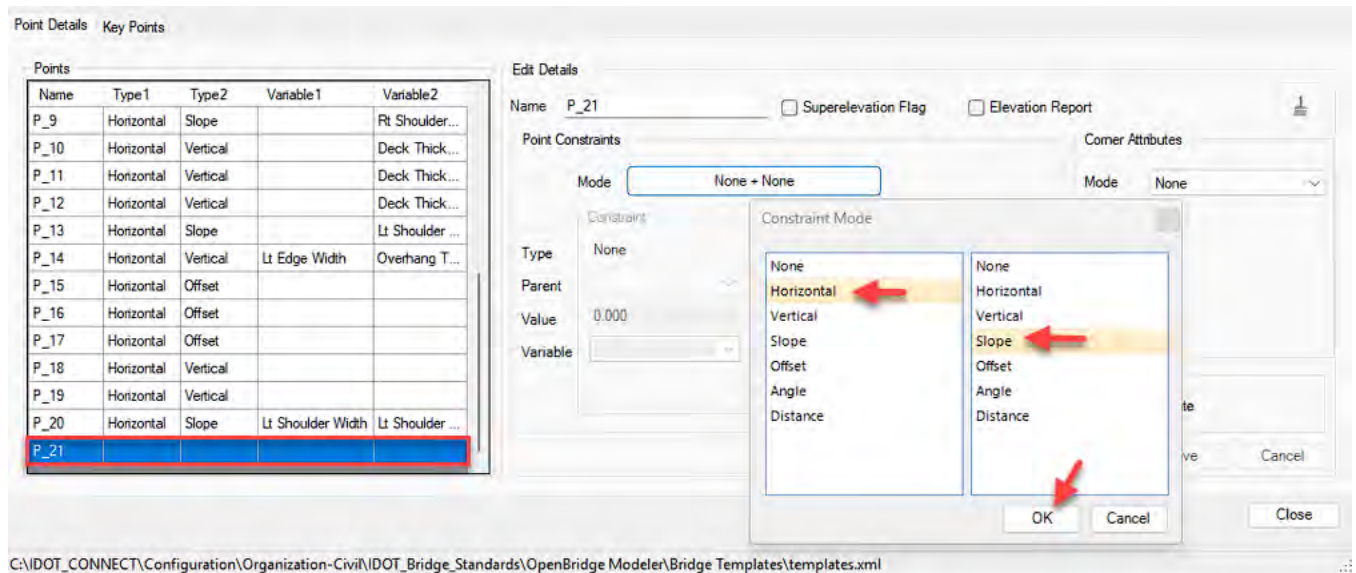
67) Select “**P_20**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



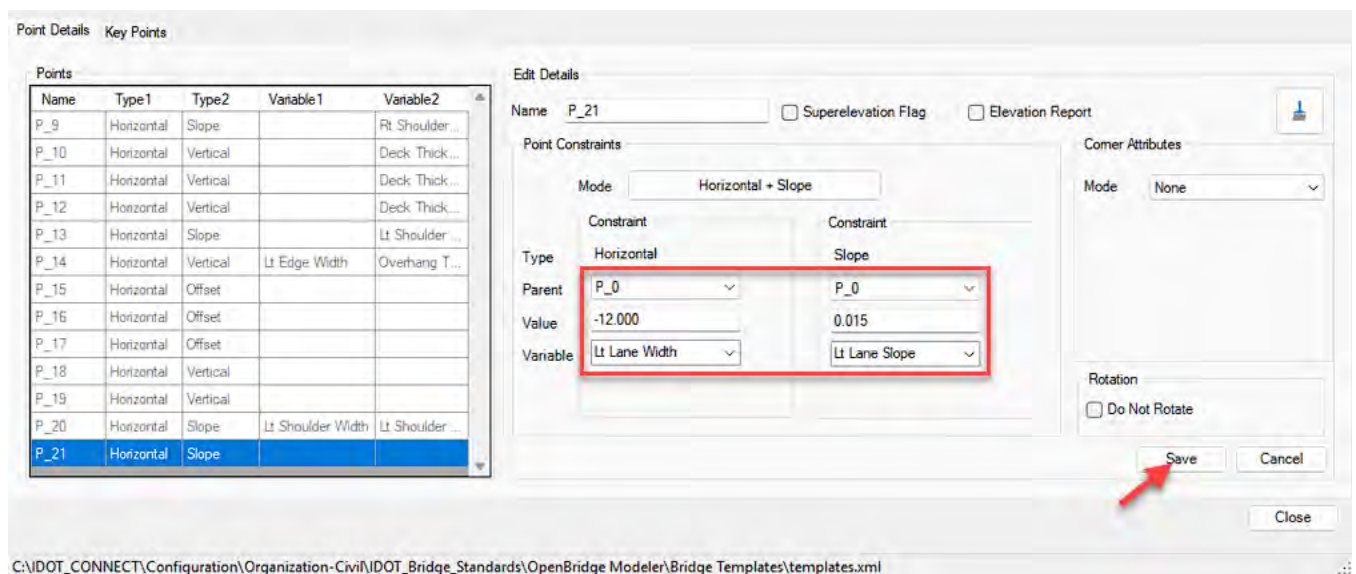
68) Set the values as shown below, then click “**Save**”.



69) Select “**P_21**”, set the point constraint mode to “**Horizontal + Slope**” and then “**OK**”.



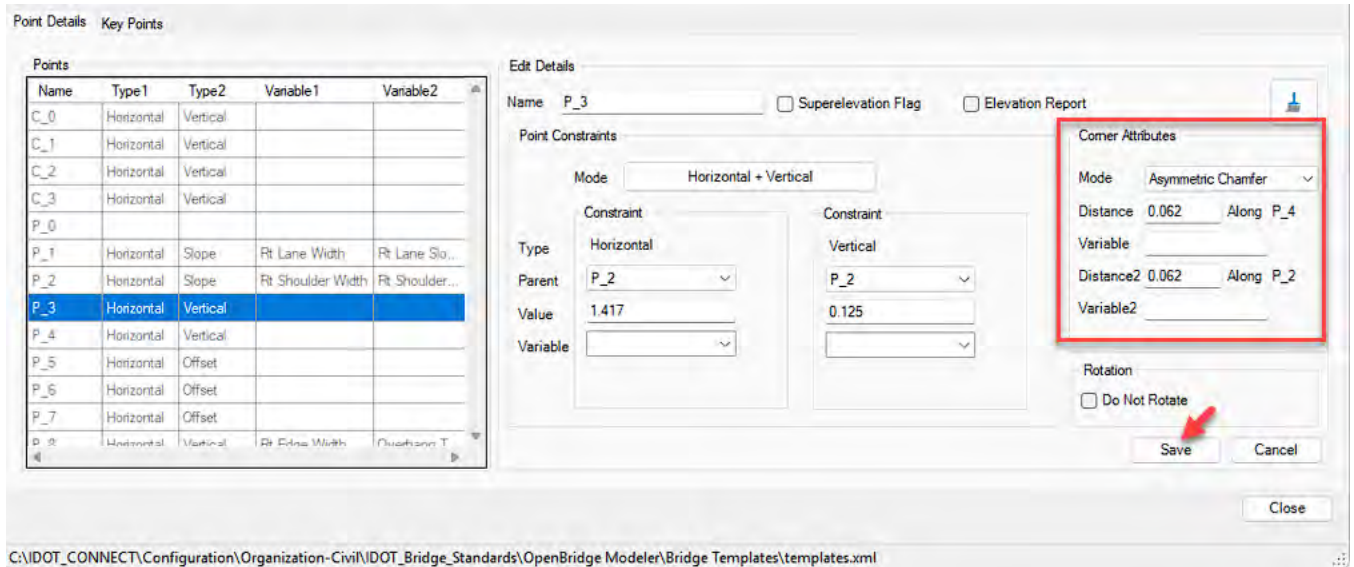
70) Set the values as shown below, then click “**Save**”.



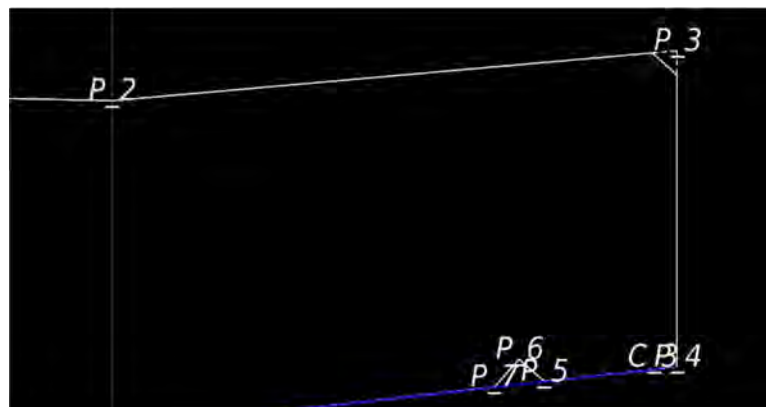
There is a way to add $\frac{3}{4}$ " chamfers to the outside top and bottom of the deck template. They can be added as follows:

71) Return to the “**Template Creation**” dialog and open the Superstructure deck template.

72) Select point “**P_3**” and change the “**Corner Attributes**” as shown and then “**Save**”.



73) This retains the point (in this case “**P_3**” and places the desired chamfer without additional data points.



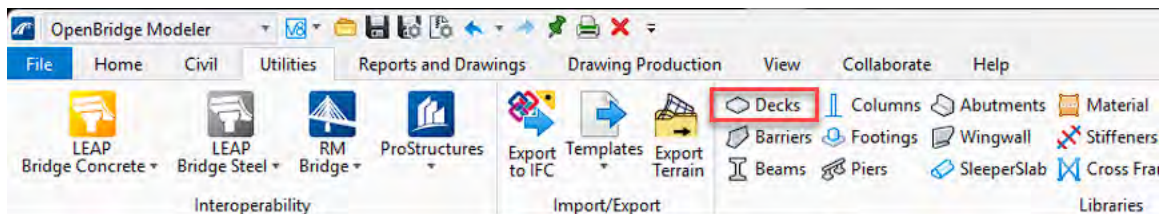
74) Make the same changes to points “**P_4**”, “**P_18**”, and “**P_19**”.

75) You may now close the Template Creation dialog. Your template is ready to use or modify for use on a project.

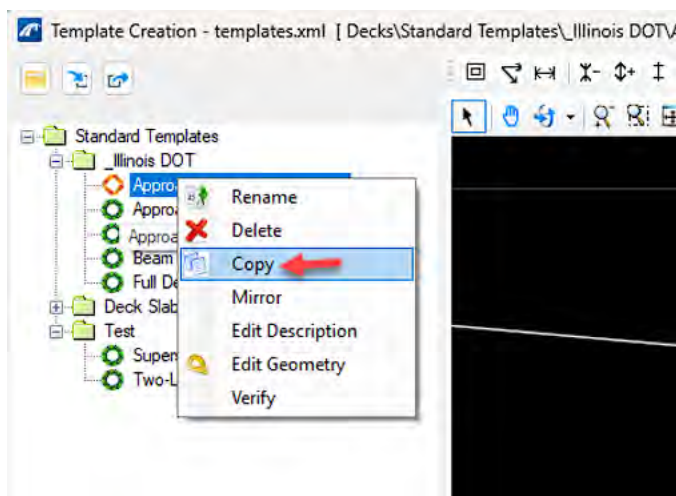
Chapter 3 – Modifying Existing Templates

Decks templates may also be copied and/or modified for use on a specific project.

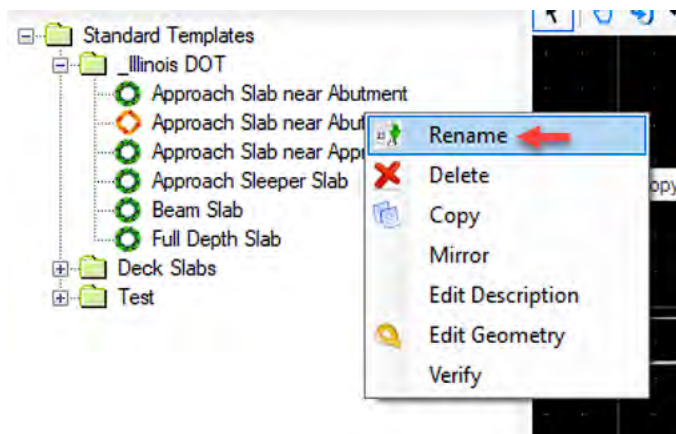
- 1) From the “**Utilities**” group of the OpenBridge Modeler workflow, pick the “**Deck**” tool.



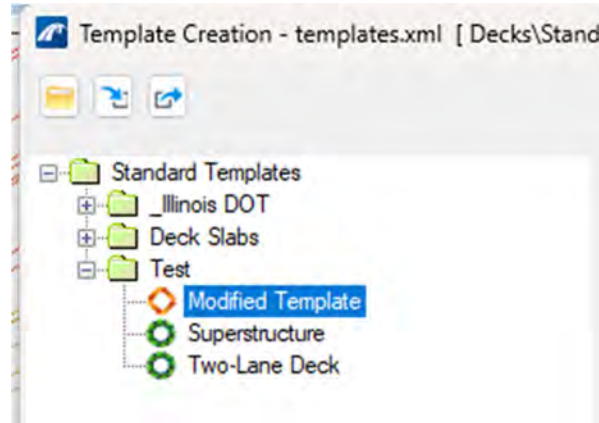
- 2) Expand the “**_Illinois DOT**” folder/category.
- 3) Right-click on the “**Approach Slab near Abutment**” template and select “**Copy**”.



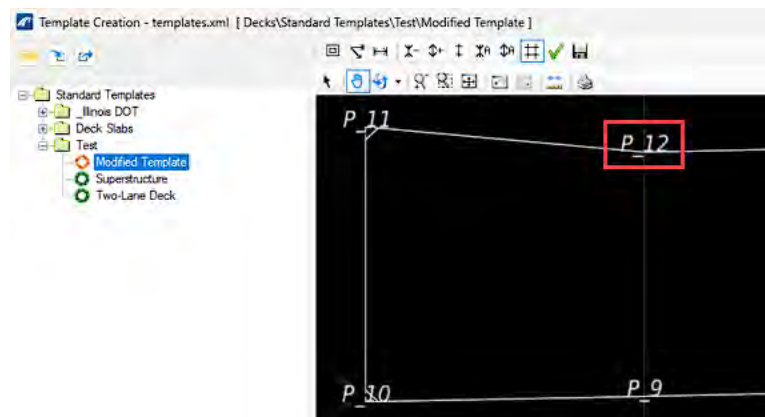
- 4) Right-click on the copy and rename to “**Modified Template**”.



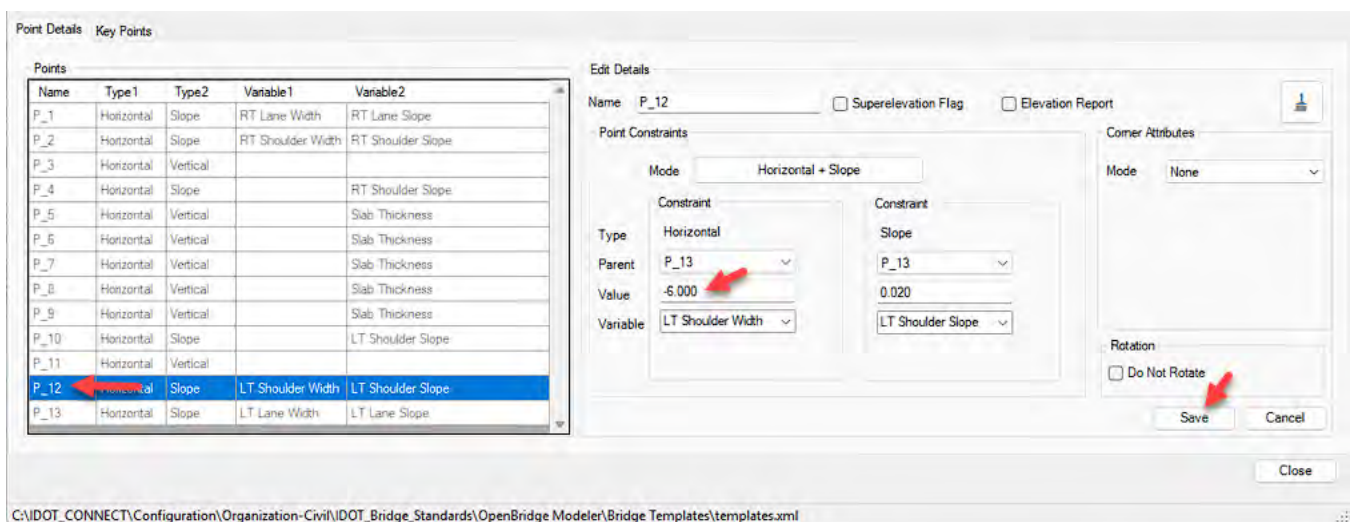
- 5) Pick and drag that template to the “**Test**” folder.



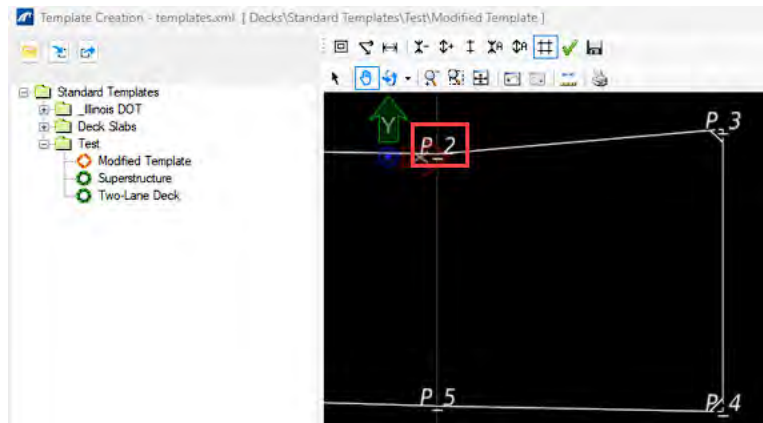
- 6) We will change the shoulder widths from 8.000 feet to 6.000 feet. Zoom into the left side of the template to identify the point for the left edge of shoulder.



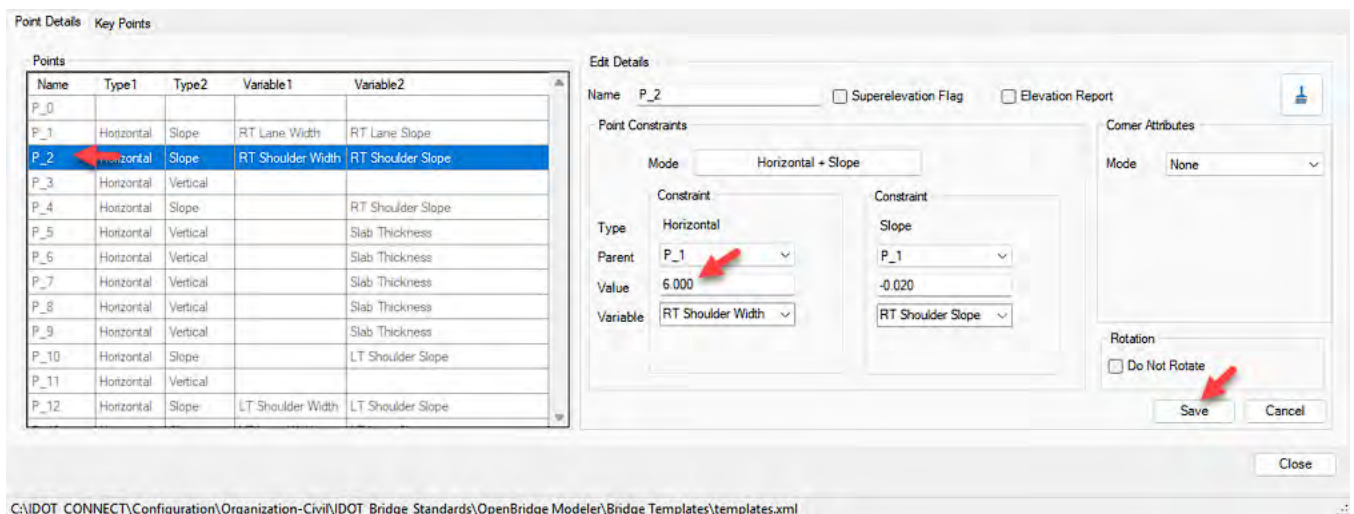
- 7) Select the Point “**P_12**” in the “**Point Details**” tab, change the horizontal constraint to “**-6.000**”, and “**Save**”.



- 8) Zoom into the right side of the template to identify the point for the right edge of shoulder.



- 9) Select the Point “P_2” in the “Point Details” tab, change the horizontal constraint to “6.000”, and “Save”.

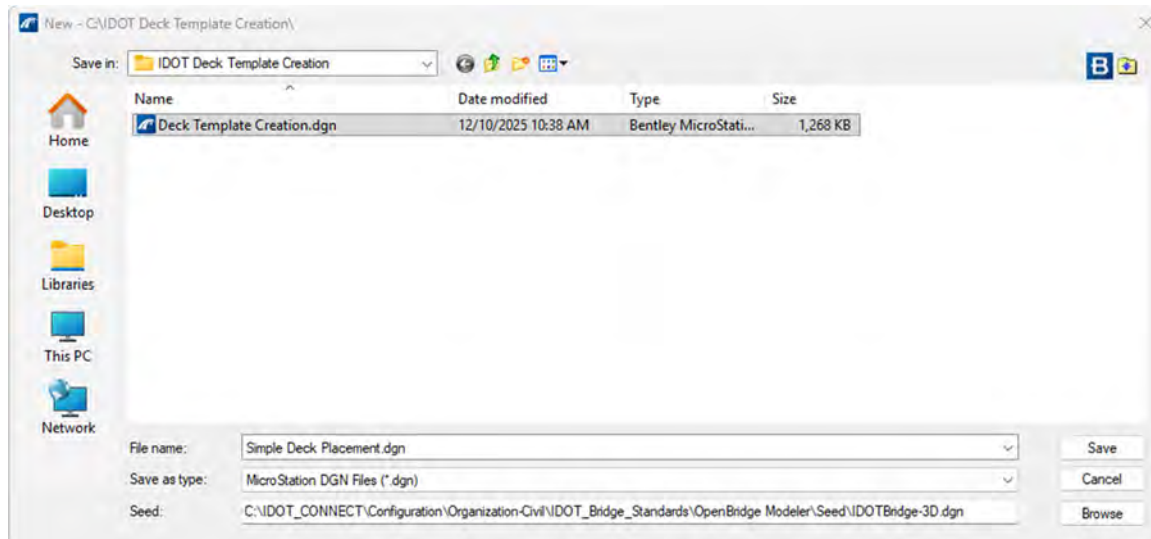


- 10) Close the dialog. You can now use the template.

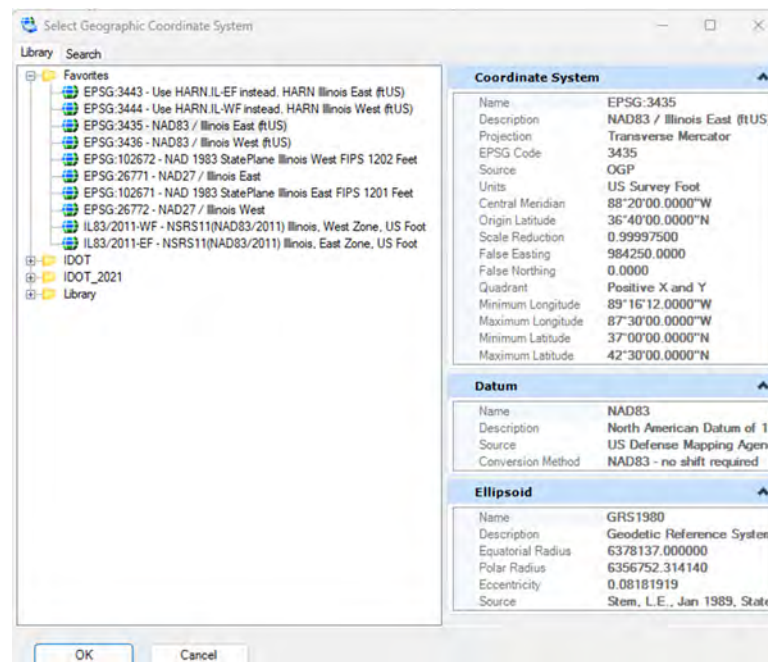
Chapter 4– Deck Placement Methods

Decks may be placed either by creating or editing a template specifically for a project (as we did in the first three chapters), or by making use of “**Variable Constraints**” in conjunction with an existing deck template. The first we will look at is making use of a created or edited template.

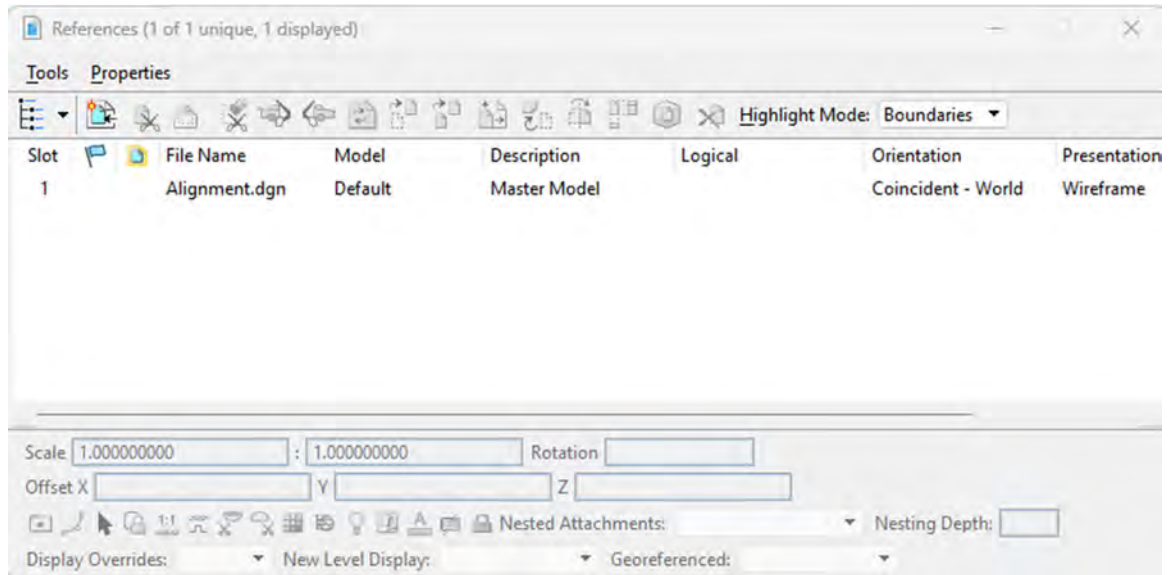
- 1) Create a new file and name it “**Simple Deck Placement**” (Make sure you use the seed file, “**IDOTBridge-3D.dgn**”).



- 2) Set the Geographic Coordinate System to “**EPSG:3435-NAD83/Illinois East ft (US)**”.



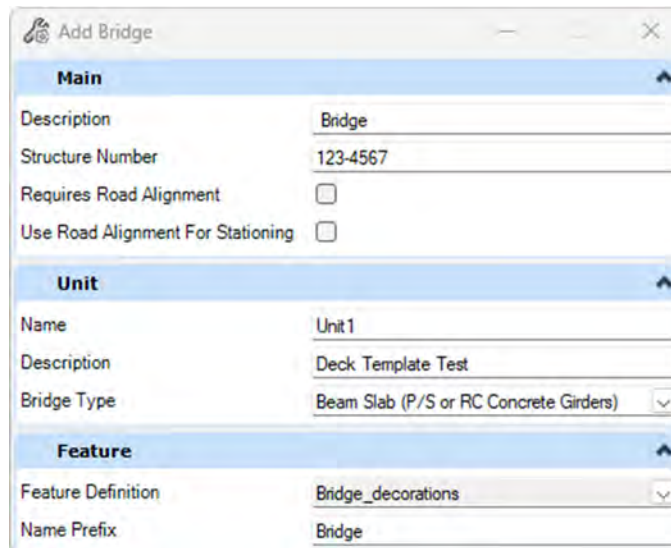
- 3) Reference the file named, “**Alignment**”.



- 4) To see the stationing, change your scale to something that makes it legible, such as 1"=50'. This can be found in the “**Reports and Drawings**” tab of the OpenBridge Modeler workflow.



- 5) Pick the command, “**Add Bridge**”.
- 6) Fill in with whatever data you like.

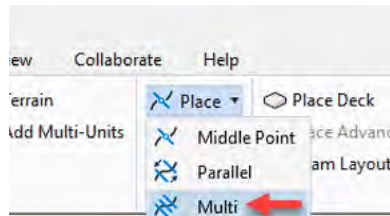


Main	
Description	Bridge
Structure Number	123-4567
Requires Road Alignment	☐
Use Road Alignment For Stationing	☐

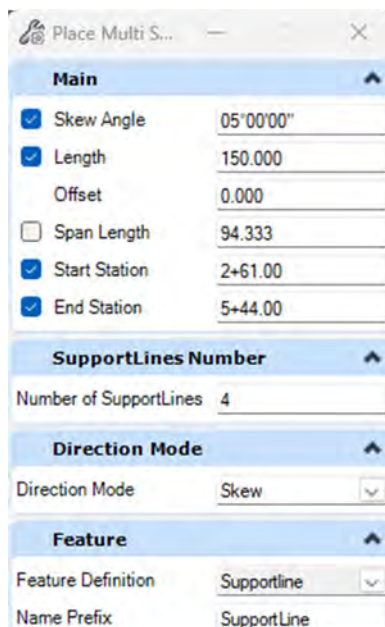
Unit	
Name	Unit1
Description	Deck Template Test
Bridge Type	Beam Slab (P/S or RC Concrete Girders)

Feature	
Feature Definition	Bridge_decorations
Name Prefix	Bridge

- 7) Select the alignment, then left-click to accept.
- 8) Select the “**Place Multi**” support line tool.



- 9) Complete dialog as shown:



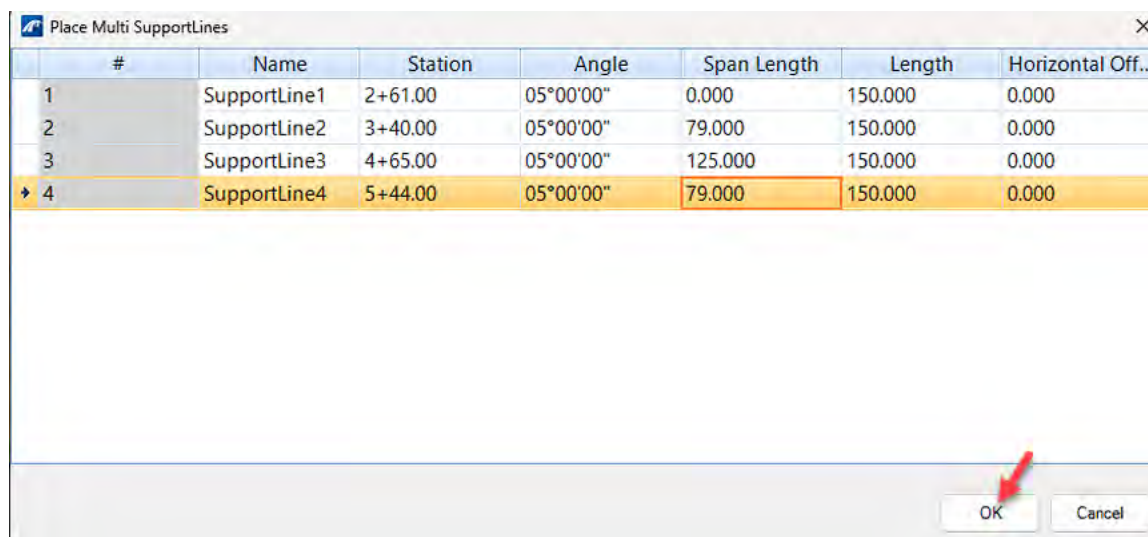
Main	
☒ Skew Angle	05°00'00"
☒ Length	150.000
Offset	0.000
☐ Span Length	94.333
☒ Start Station	2+61.00
☒ End Station	5+44.00

SupportLines Number	
Number of SupportLines	4

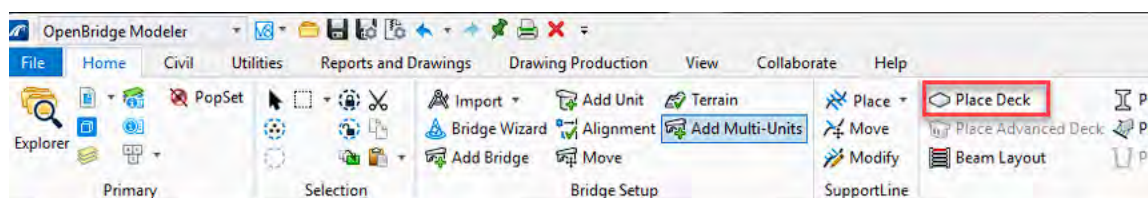
Direction Mode	
Direction Mode	Skew

Feature	
Feature Definition	Supportline
Name Prefix	SupportLine

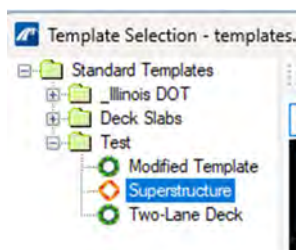
- 10) Left-click to accept each entry until the **“Place Multi SupportLines”** dialog appears. Adjust data until it appears as shown, then pick **“OK”**.



- 11) In the **“Home”** tab of the OpenBridge Modeler workflow, select **“Place Deck”**.



- 12) Select one of the templates that we have already created, such as **“Superstructure”**.



13) Modify the data in the **“Place Deck”** dialog as shown:

Deck	
Template Name	Superstructure
Start Station Offset	1.000
End Station Offset	-1.000
Horizontal Offset	0.000
Vertical Offset	0.000
Add Constraints	☐
Chord Tolerance	0.100
Max Dist Between Sections	3.281
Analytical Deck	☐

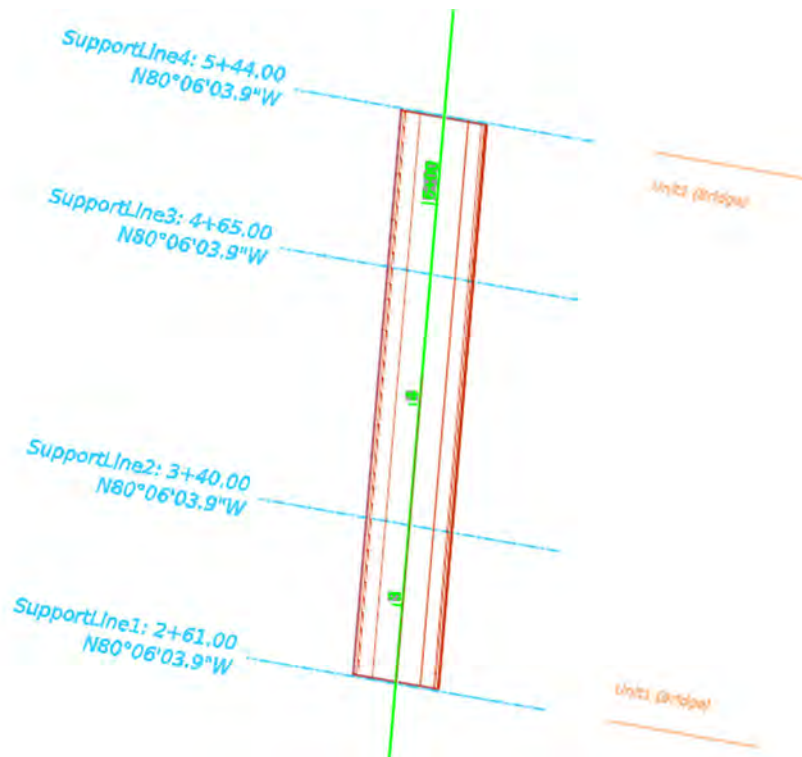
Deck Breakbacks	
Left Start Breakback Distance	0.000
Right Start Breakback Distance	0.000
Left End Breakback Distance	0.000
Right End Breakback Distance	0.000

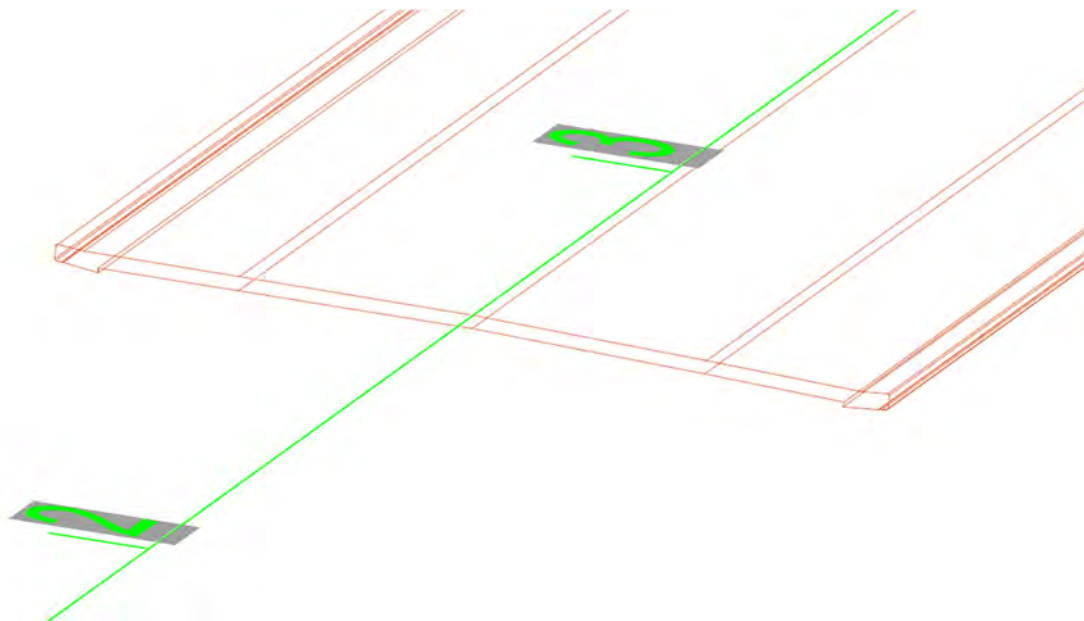
Material	
Deck Material	Concrete Supersti

Feature	
Feature Definition	Deck
Name Prefix	Deck

14) Select **“SupportLine1”** (make sure that it actually selects it), then select **“SupportLine4”**

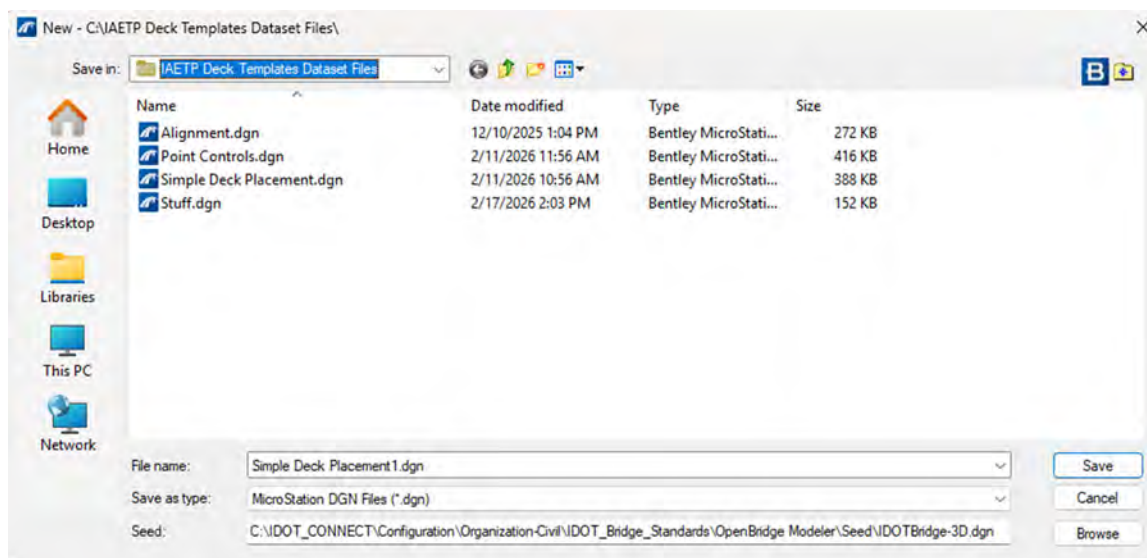
15) Left-click once more to place deck.



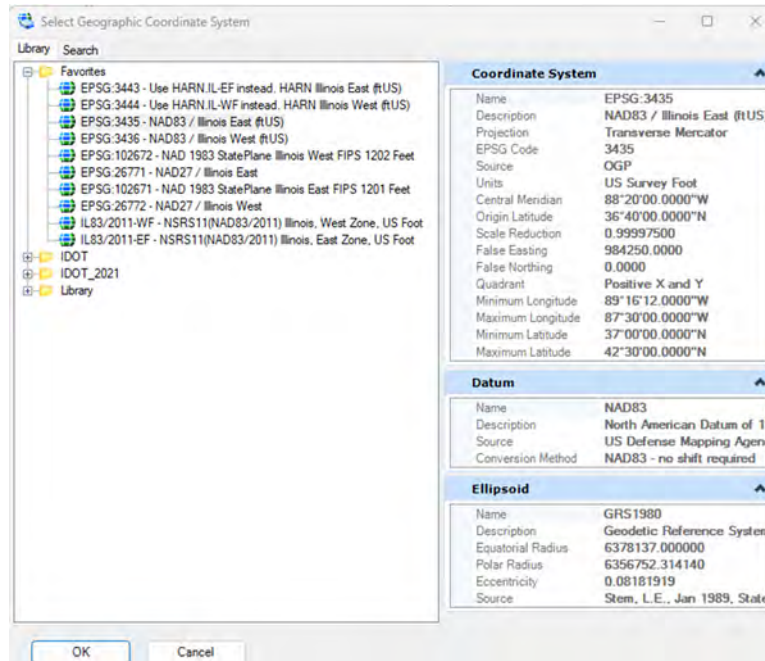


The second way of placing a deck is in using an existing template and utilizing “**Variable Constraints**” to control the variables as opposed to setting the variable values within the template itself. That can be done as follows:

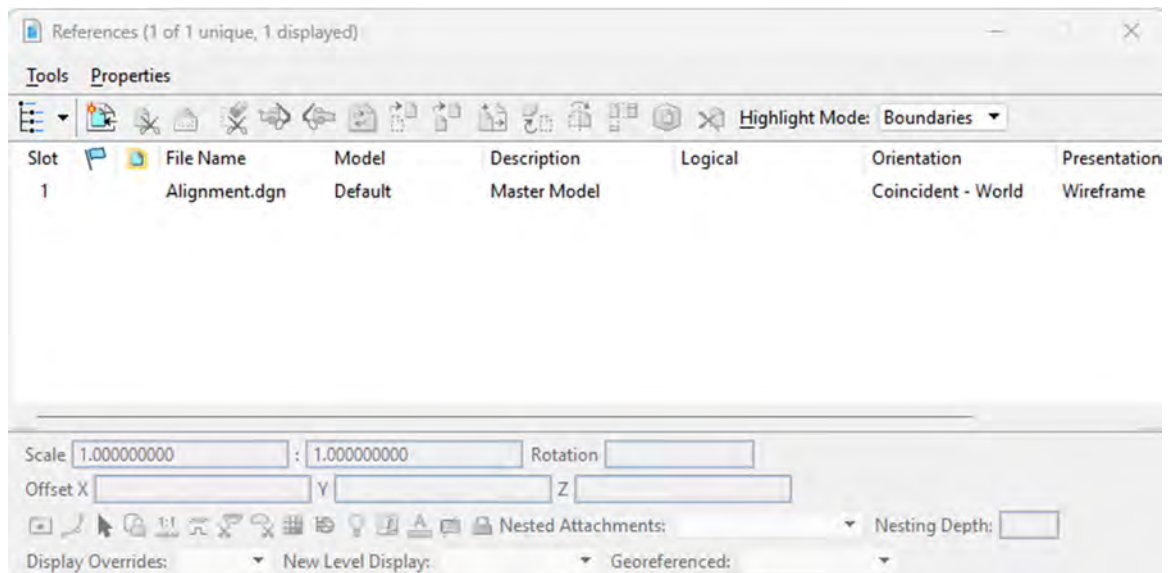
- 16) Create a new file and name it “**Simple Deck Placement 1**” (Make sure you use the seed file, “**IDOTBridge-3D.dgn**”).



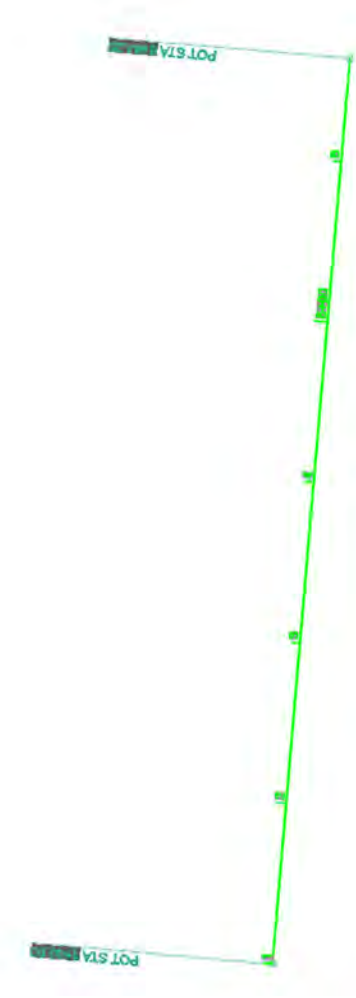
17) Set the Geographic Coordinate System to “**EPSG:3435-NAD83/Illinois East ft (US)**”.



18) Reference the file named, “**Alignment**”.



- 19) To see the stationing, change your scale to something that makes it legible, such as 1"=50'. This can be found in the **"Reports and Drawings"** tab of the OpenBridge Modeler workflow.



- 20) Pick the command, **"Add Bridge"**.

21) Fill in with whatever data you like.

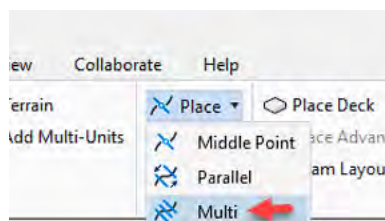
Main	
Description	Bridge
Structure Number	123-4567
Requires Road Alignment	☐
Use Road Alignment For Stationing	☐

Unit	
Name	Unit1
Description	Deck Template Test
Bridge Type	Beam Slab (P/S or RC Concrete Girders)

Feature	
Feature Definition	Bridge_decorations
Name Prefix	Bridge

22) Select the alignment, then left-click to accept.

23) Select the **“Place Multi”** support line tool.



24) Complete dialog as shown:

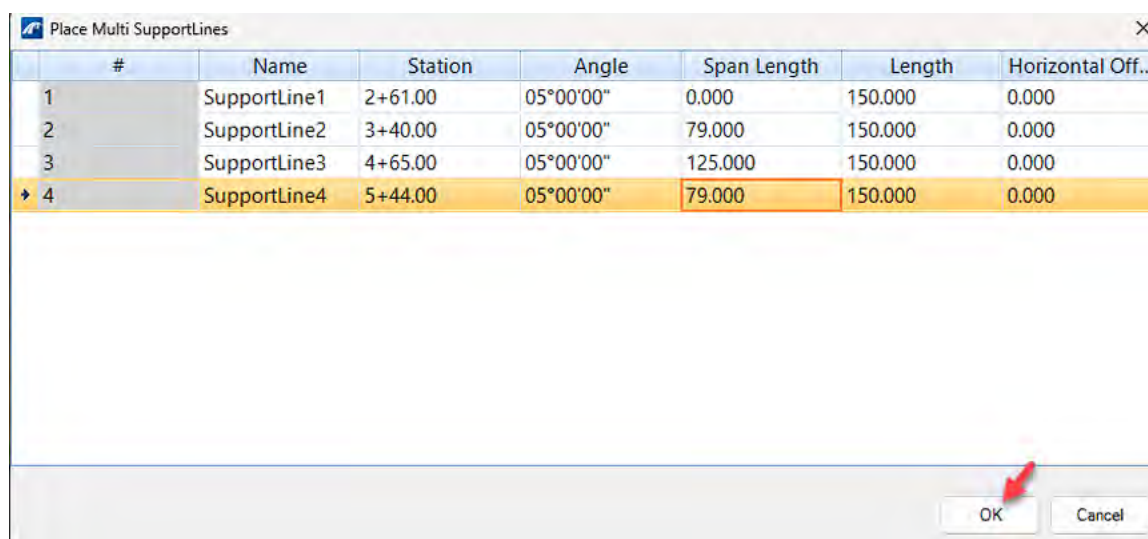
Main	
☒ Skew Angle	05°00'00"
☒ Length	150.000
Offset	0.000
☐ Span Length	94.333
☒ Start Station	2+61.00
☒ End Station	5+44.00

SupportLines Number	
Number of SupportLines	4

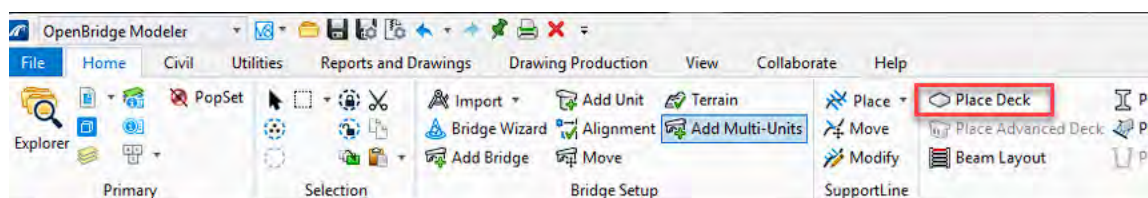
Direction Mode	
Direction Mode	Skew

Feature	
Feature Definition	Supportline
Name Prefix	SupportLine

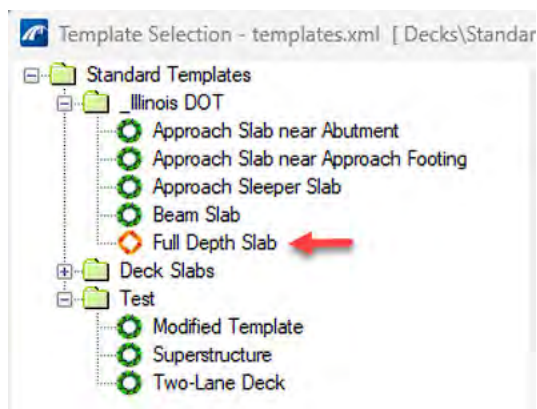
- 25) Left-click to accept each entry until the **“Place Multi SupportLines”** dialog appears. Adjust data until it appears as shown, then pick **“OK”**.



- 26) In the **“Home”** tab of the OpenBridge Modeler workflow, select **“Place Deck”**.



- 27) Select one of the templates already provided in the **“Illinois DOT”** category, such as **“Full Depth Slab”**.



28) Complete the “**Place Deck**” dialog as shown, making sure that you select the “**Add Constraints**” toggle.

Deck	
Template Name	Full Depth Slab
Start Station Offset	1.000
End Station Offset	-1.000
Horizontal Offset	0.000
Vertical Offset	0.000
Add Constraints	☒
Chord Tolerance	0.100
Max Dist Between Sections	3.281
Analytical Deck	☐

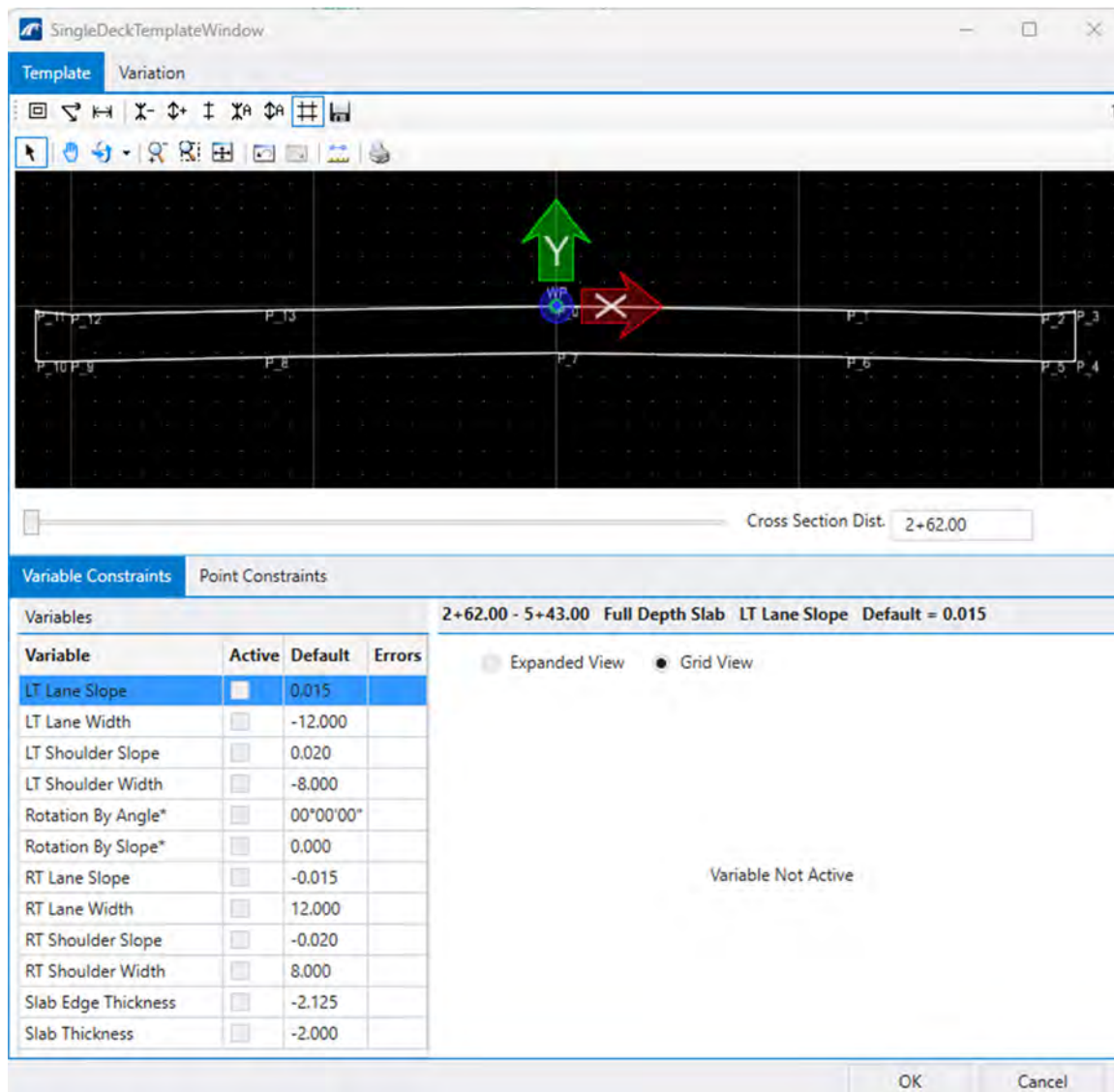
Deck Breakbacks	
Left Start Breakback Distance	0.000
Right Start Breakback Distance	0.000
Left End Breakback Distance	0.000
Right End Breakback Distance	0.000

Material	
Deck Material	Concrete Supersti

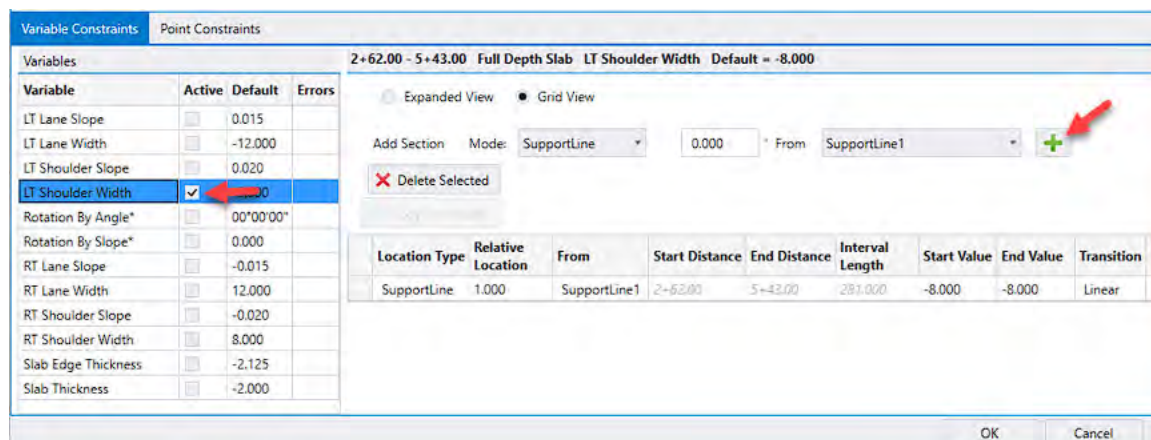
Feature	
Feature Definition	Deck
Name Prefix	Deck

29) Again, select “**SupportLine1**”, select “**SupportLine4**”, then accept.

30) A different dialog will show up, titled **“SingleDeckTemplateWindow”**.



31) In the **“Active”** column, select the **“LT Shoulder Width”**, then pick the green plus sign.



32) Change the “**Start Value**” and “**End Value**” to “**-10.000**”.

Variable	Active	Default	Errors
LT Lane Slope	☐	0.015	
LT Lane Width	☐	-12.000	
LT Shoulder Slope	☐	0.020	
LT Shoulder Width	☒	-8.000	
Rotation By Angle*	☐	00°00'00"	
Rotation By Slope*	☐	0.000	
RT Lane Slope	☐	-0.015	
RT Lane Width	☐	12.000	
RT Shoulder Slope	☐	-0.020	
RT Shoulder Width	☐	8.000	
Slab Edge Thickness	☐	-2.125	
Slab Thickness	☐	-2.000	

Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	287.000	-10.000	-10.000	Linear

33) In the “**Active**” column, select the “**RT Shoulder Width**”, then pick the green plus sign.

Variable	Active	Default	Errors
LT Lane Slope	☐	0.015	
LT Lane Width	☐	-12.000	
LT Shoulder Slope	☐	0.020	
LT Shoulder Width	☒	-8.000	
Rotation By Angle*	☐	00°00'00"	
Rotation By Slope*	☐	0.000	
RT Lane Slope	☐	-0.015	
RT Lane Width	☐	12.000	
RT Shoulder Slope	☐	-0.020	
RT Shoulder Width	☒	8.000	
Slab Edge Thickness	☐	-2.125	
Slab Thickness	☐	-2.000	

Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	287.000	8.000	8.000	Linear

34) Change the “**Start Value**” and “**End Value**” to “**10.000**”.

Variable	Active	Default	Errors
LT Lane Slope	☐	0.015	
LT Lane Width	☐	-12.000	
LT Shoulder Slope	☐	0.020	
LT Shoulder Width	☒	-8.000	
Rotation By Angle*	☐	00°00'00"	
Rotation By Slope*	☐	0.000	
RT Lane Slope	☐	-0.015	
RT Lane Width	☐	12.000	
RT Shoulder Slope	☐	-0.020	
RT Shoulder Width	☒	8.000	
Slab Edge Thickness	☐	-2.125	
Slab Thickness	☐	-2.000	

Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	287.000	10.000	10.000	Linear

35) In the “**Variable**” column, select the “**Slab Thickness**”, then pick the green plus sign.

Variable Constraints | Point Constraints

2+62.00 - 5+43.00 Full Depth Slab Slab Thickness Default = -2.000

Expanded View | Grid View

Add Section Mode: SupportLine 0.000 From SupportLine1 +

Delete Selected

Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	381.000	-2.000	-2.000	Linear

OK Cancel

36) Change the “**Start Value**” and “**End Value**” to “**-2.500**”.

Variable Constraints | Point Constraints

2+62.00 - 5+43.00 Full Depth Slab Slab Thickness Default = -2.000

Expanded View | Grid View

Add Section Mode: SupportLine 0.000 From SupportLine1 +

Delete Selected

Copy To Variable

Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	381.000	-2.500	-2.500	Linear

OK Cancel

37) In the “**Variable**” column, select the “**Slab Edge Thickness**”, then pick the green plus sign.

Variable Constraints | Point Constraints

2+62.00 - 5+43.00 Full Depth Slab Slab Edge Thickness Default = -2.125

Expanded View | Grid View

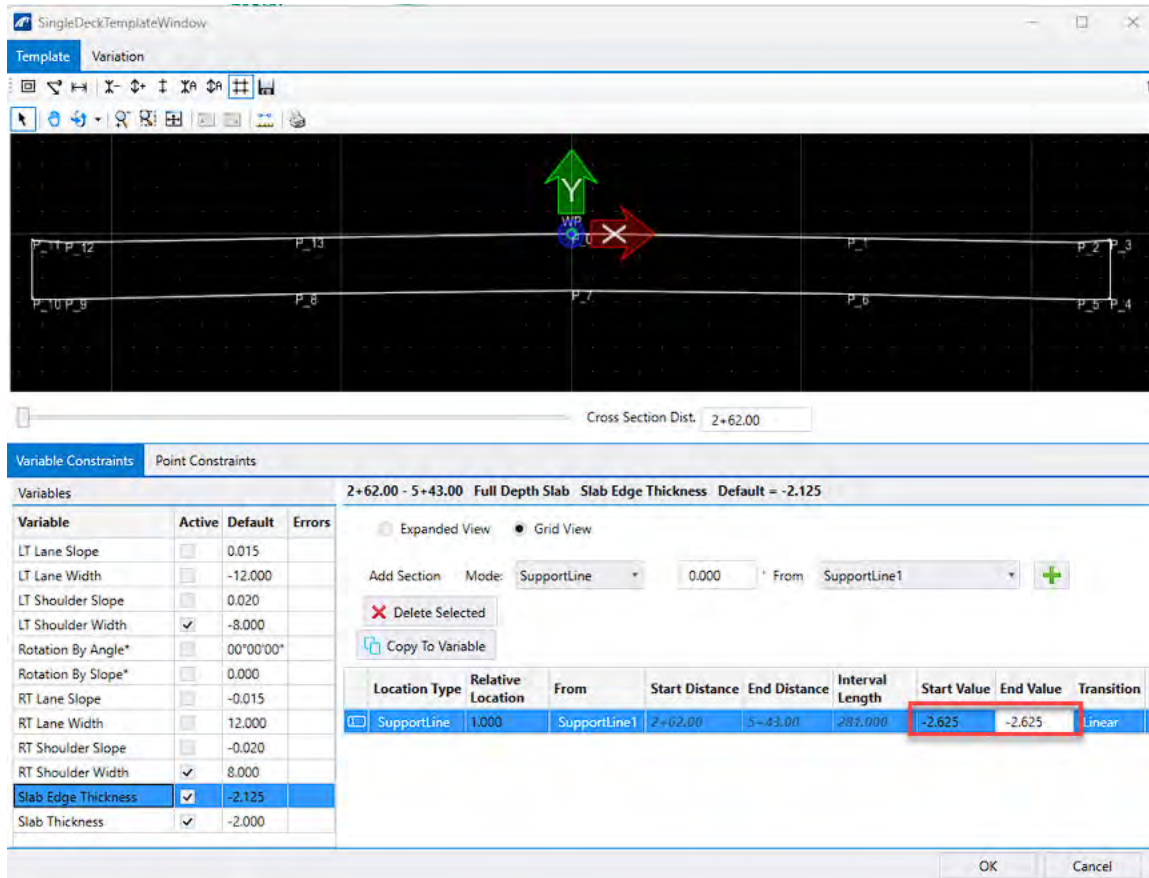
Add Section Mode: SupportLine 0.000 From SupportLine1 +

Delete Selected

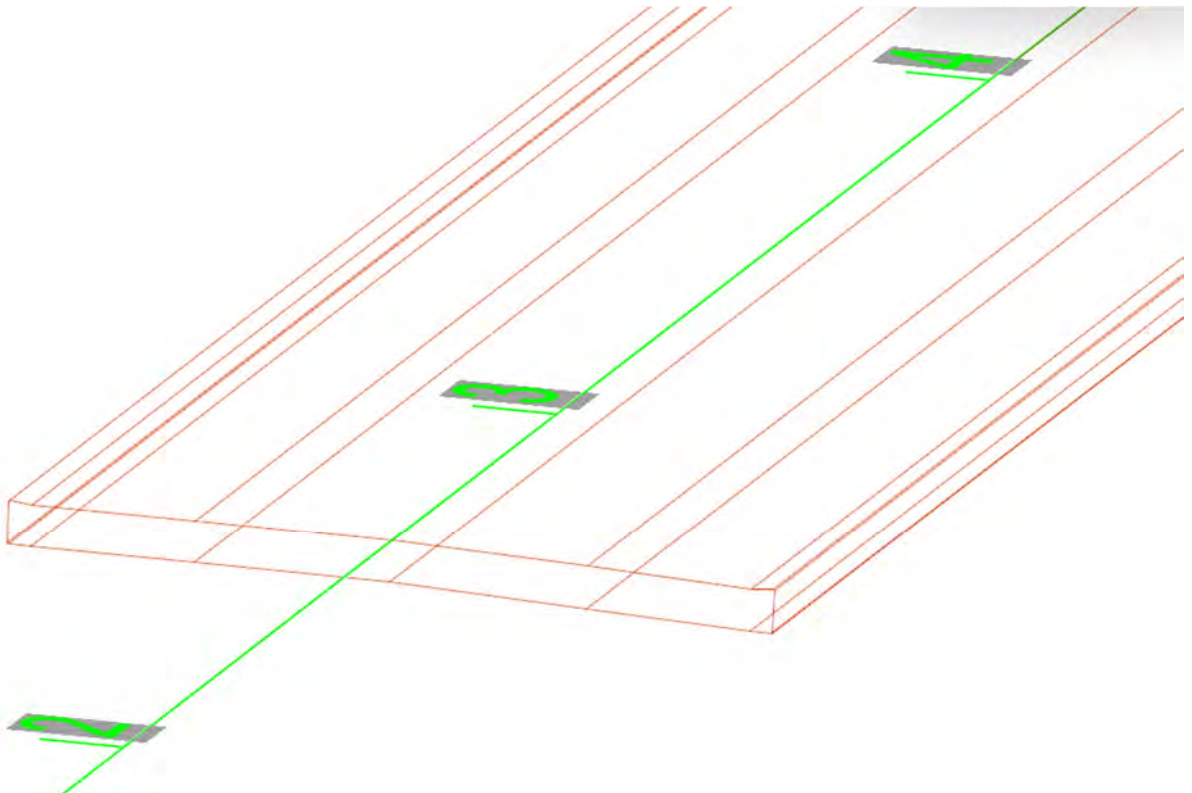
Location Type	Relative Location	From	Start Distance	End Distance	Interval Length	Start Value	End Value	Transition
SupportLine	1.000	SupportLine1	2+62.00	5+43.00	381.000	-2.125	-2.125	Linear

OK Cancel

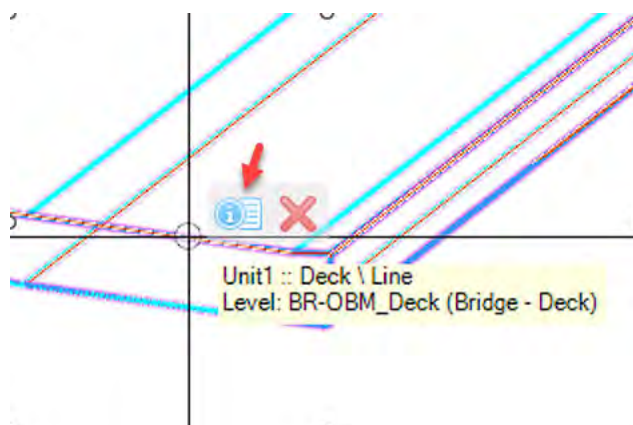
38) Change the “**Start Value**” and “**End Value**” to “**-2.625**”. The template should appear as shown:



39) Select “**OK**”



- 40) If any additional changes are needed to the deck, using the selection tool, pick any point on the deck, move your cursor away, then return to the deck. A context menu should appear where you can pick the “**Properties**” tool.



- 41) Just select the “...” that appears next to the “**Variable Constraint**” below. (Note that any settings that are not greyed out may be changed. This includes the Variable Constraints or even the template itself).

Bridge Name	Bridge
Bridge Description	Bridge
Bridge Structure #	123-4567
State Element Number	12
NBI Element Number	12

Name	Deck
Description	
Template	Full Depth Slab
Analytical Deck	False
Start Station	2+62.00
End Station	5+43.00
Start Station Offset	1.000'
End Station Offset	-1.000'
Horizontal Offset	0.000'
Vertical Offset	0.000'
Chord Tolerance	0.328'
Max Dist Between Sec	3.281'
Variable Constraint	SELECT to Edit
Point Control	SELECT to Edit
Top Surface Area	13165.201 Sq.'

Left Start Breakback D	0.000'
Right Start Breakback	0.000'
Left End Breakback Di	0.000'
Right End Breakback I	0.000'

Volume	32947.951 Cu.'
Surface Area	27994.227 Sq.'

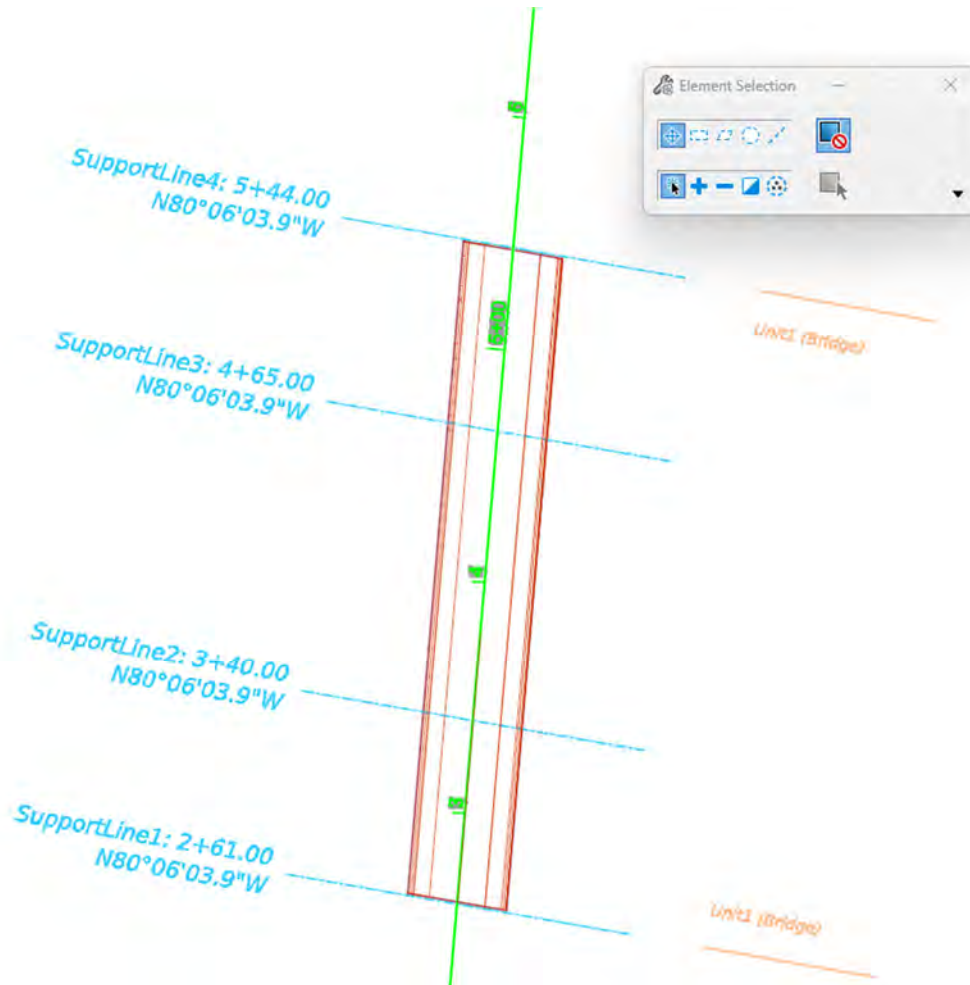
Feature Definition	Deck
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Deck Material	Concrete Superstructure (-
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Chapter 5– Point Controls

There are times when you may need to create a taper to define the outside of a deck or maybe even a beam chord for a curved bridge. In order to accomplish this using templates, civil line elements must be created in order to associate point(s) in the deck template to civil lines defining a desired path.

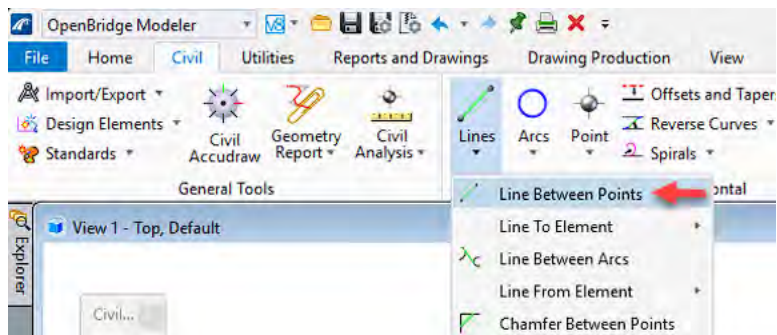
- 1) Open the file, "**Point Controls.dgn**".
- 2) Move to a "**Top**" view.



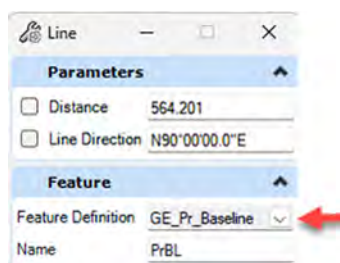
- 3) Make sure your "**Civil AccuDraw**" is on and activated.



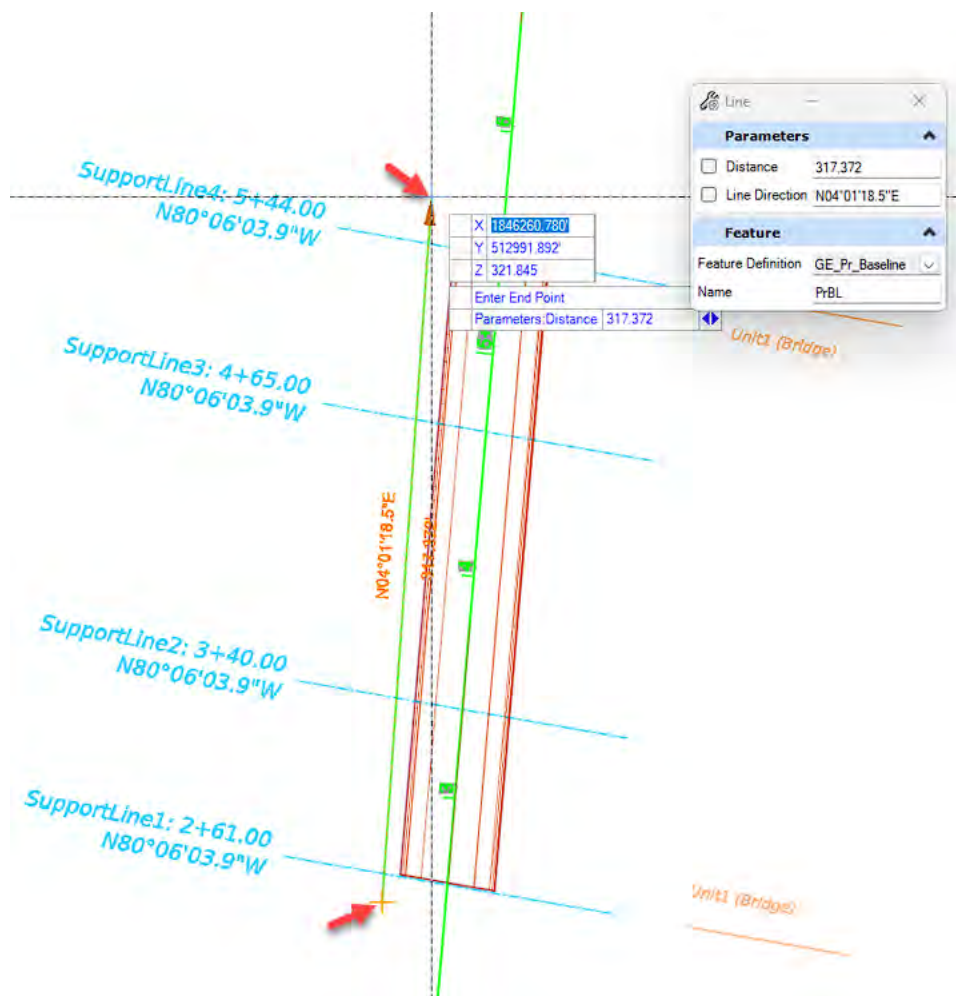
- 4) From within the **"Civil"** tab of the **"OpenBridge Modeler"** workflow, select the **"Line Between Points"** tool.



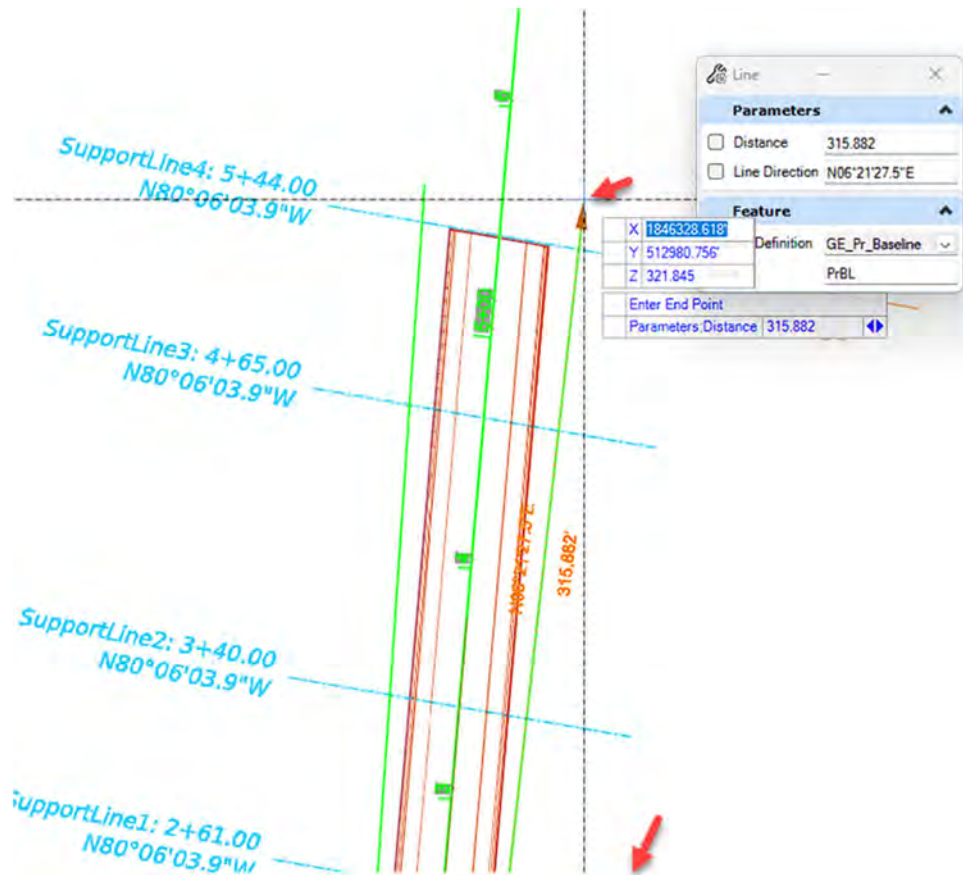
- 5) Select the **"Feature Definition"**, **"GE_Pr_Baseline"**.



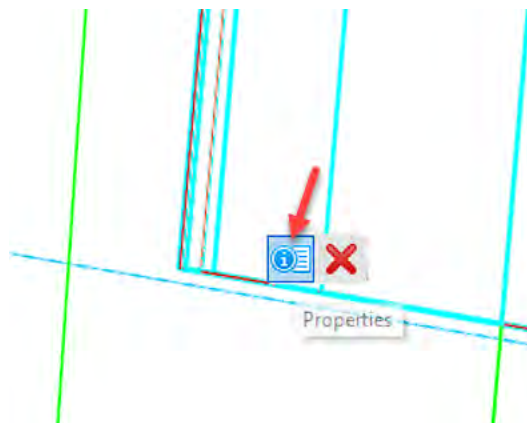
- 6) Create a random line to the left of the deck starting before **"SupportLine1"** and ending beyond **"SupportLine4"**.



- 7) Create another one to the right of the placed deck, again starting before “**SupportLine1**” and ending after “**SupportLine4**”.



- 8) Using the selection tool, select a point on the deck, move away, and then return to the deck for the “**Properties**” context menu to become available.



- 9) Select **“Point Control”**, then the three dots that appear to the right of it.

Bridge Name	Bridge
Bridge Description	Bridge
Bridge Structure #	123-4567
State Element Number	12
NBI Element Number	12

Name	Deck
Description	
Template	Superstructure
Analytical Deck	False
Start Station	2+62.00
End Station	5+43.00
Start Station Offset	1.000'
End Station Offset	-1.000'
Horizontal Offset	0.000'
Vertical Offset	0.000'
Chord Tolerance	0.328'
Max Dist Between Sec	3.281'
Variable Constraint	SELECT to Edit
Point Control	SELECT to Edit ...
Top Surface Area	12040.774 Sq.'

Left Start Breakback C	0.000'
Right Start Breakback	0.000'
Left End Breakback Di	0.000'
Right End Breakback I	0.000'

Volume	8236.105 Cu.'
Surface Area	24728.246 Sq.'

Feature Definition	Deck
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Deck Material	Concrete Superstructure (
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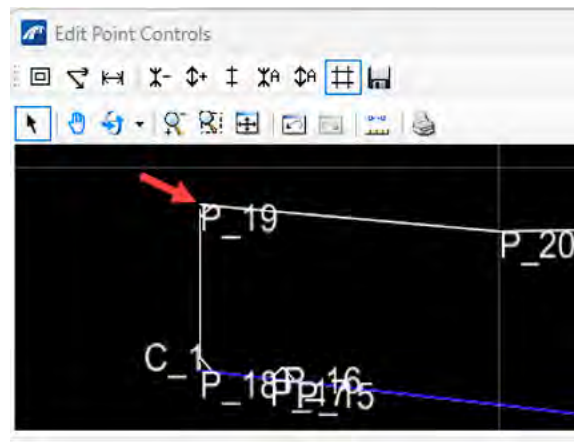
- 10) The **“Edit Point Controls”** dialog will appear.

Edit Point Controls
1

Point Name	Direction	Path
P_0	None	~
P_1	None	~
P_2	None	~
P_3	None	~
P_4	None	~
P_5	None	~
P_6	None	~
P_7	None	~
P_8	None	~
P_9	None	~

Select
Apply
Close

- 11) Zoom into the left edge of deck to determine the point determining the outside of deck. In this case, it is **"P_19"**.



- 12) Click in the **"P_19"** row to make it active, then click the down arrow at the right, selecting the value of **"Horizontal"**.

Point Name	Direction	Path
P_15	None	
P_16	None	
P_17	None	
P_18	None	
P_19	None	
P_20	Horizontal	
P_21	Vertical	
C_0	Both	
C_1	None	
C_2	None	

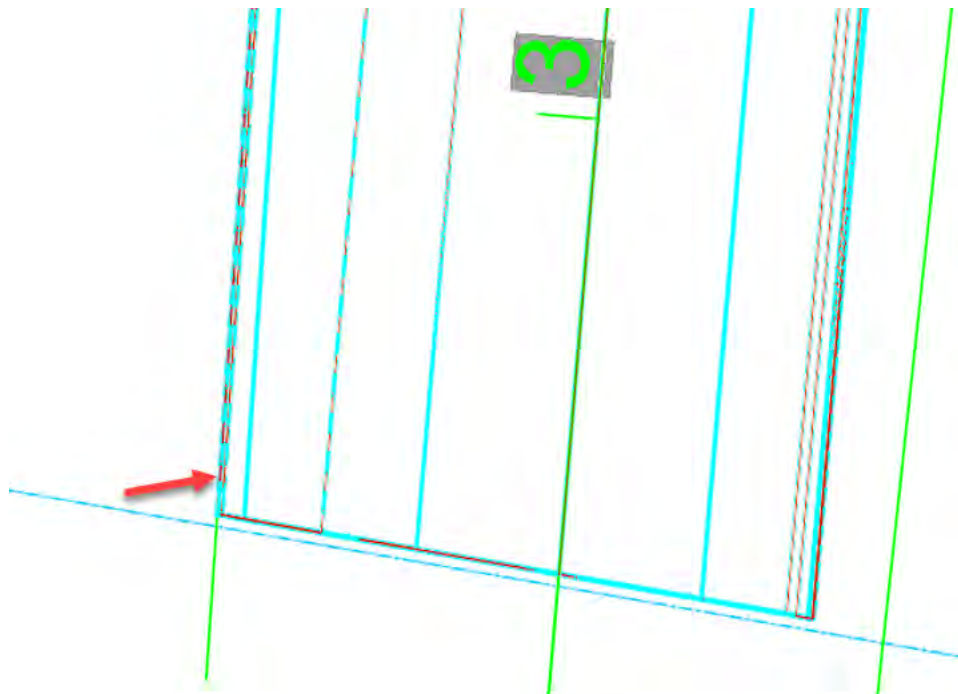
Select Apply Close

- 13) Click **"Select"** at the bottom of the dialog, then pick any point on the civil line you created to the left of the bridge deck. The **"Path"** column is then populated with a name.

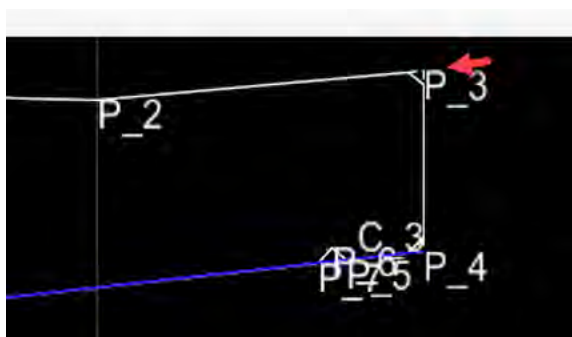
Point Name	Direction	Path
P_15	None	
P_16	None	
P_17	None	
P_18	None	
P_19	Horizontal	PrBL
P_20	None	
P_21	None	
C_0	None	
C_1	None	
C_2	None	

Select Apply Close

14) Click **“Apply”** (The left edge of deck shifts such that it follows the left civil line).



15) Zoom into the right side of the deck within the dialog to identify the point for the right edge of deck. In this case, it is **“P_3”**.



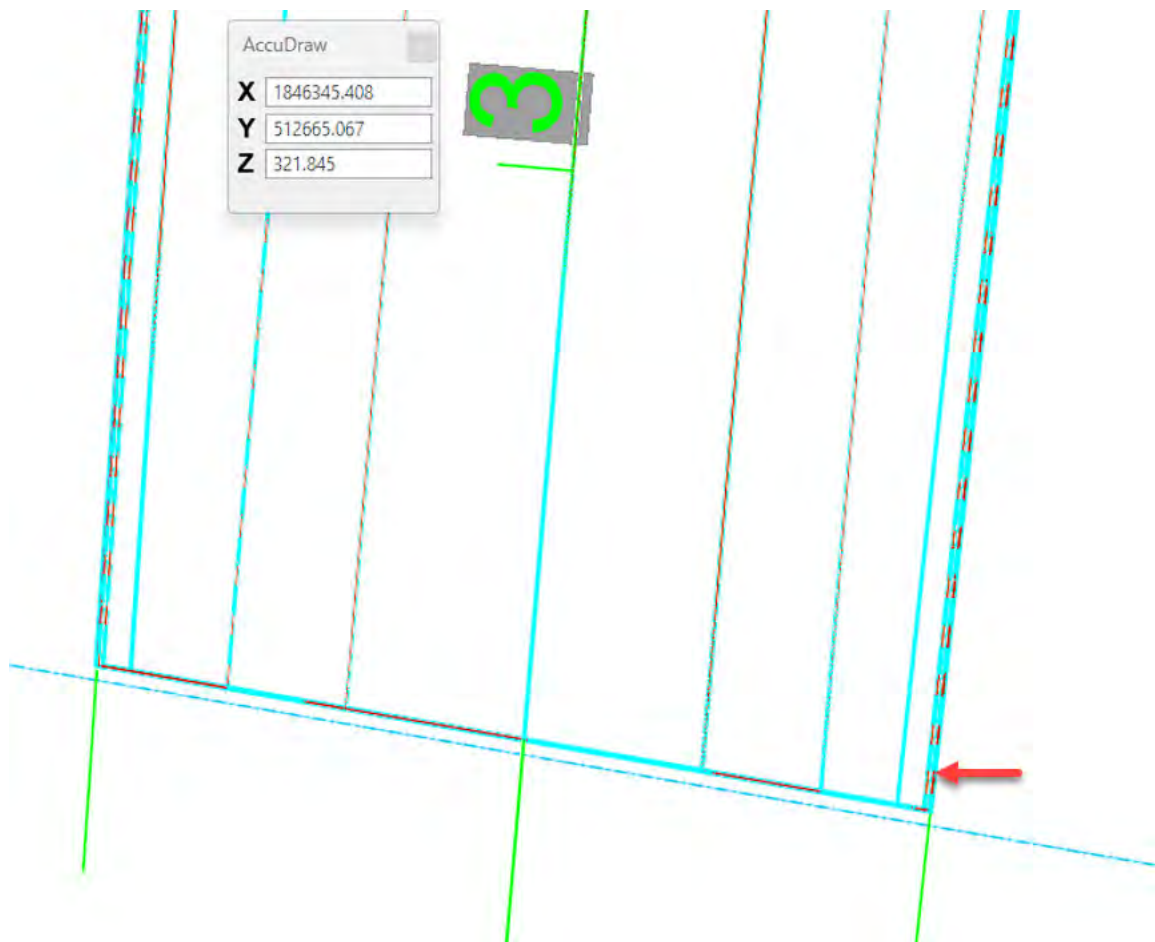
16) Click in the **“P_3”** row to make it active, then click the down arrow at the right, selecting the value of **“Horizontal”**.

Point Name	Direction	Path
P_0	None	
P_1	None	
P_2	None	
P_3	None	
P_4	Horizontal	
P_5	Vertical	
P_6	Both	
P_7	None	
P_8	None	
P_9	None	

- 17) Click **“Select”** at the bottom of the dialog, then pick any point on the civil line you created to the right of the bridge deck. The **“Path”** column is then populated with a name.

Point Name	Direction	Path	
P_0	None		
P_1	None		
P_2	None		
P_3	Horizontal	PrBL1	☒
P_4	None		
P_5	None		
P_6	None		
P_7	None		
P_8	None		
P_9	None		

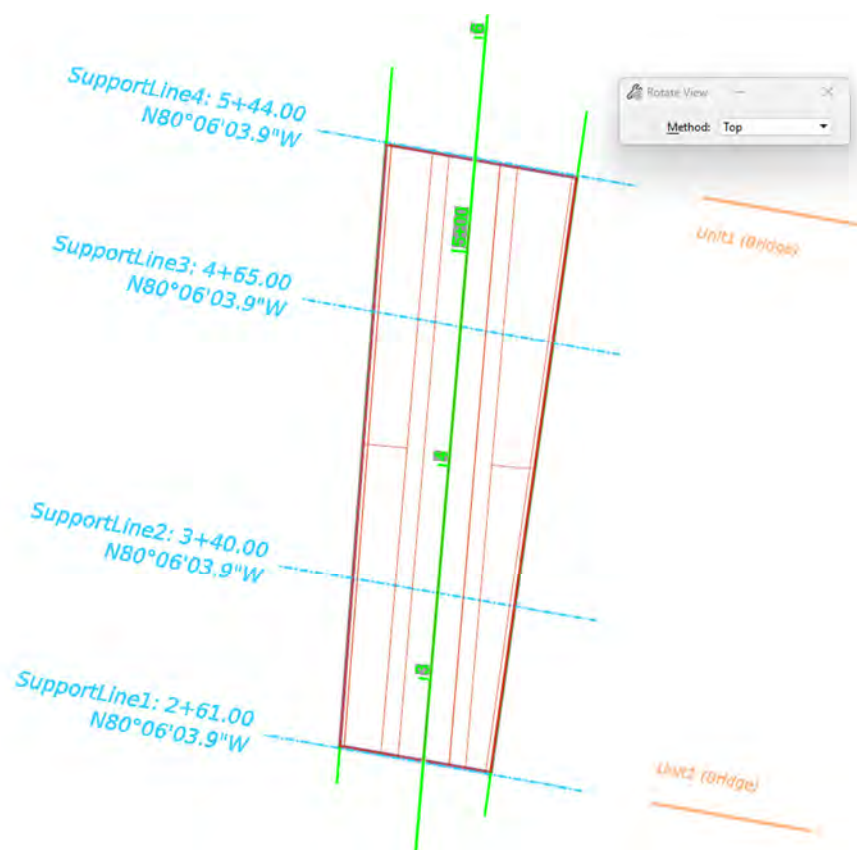
- 18) Click **“Apply”**, then **“Close”** (The right edge of deck shifts such that it follows the right civil line).



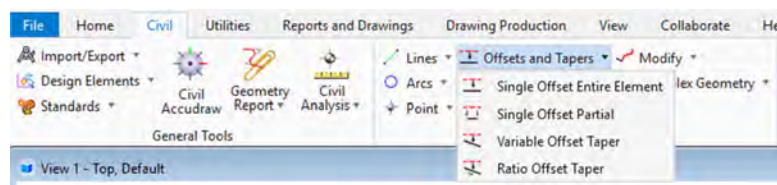
- 19) If you rotate the view, you’ll notice that the deck is not doing what is desired. While the outer deck is following the desired constraints, the curb line did not move so that it maintained the 1’-5” constant distance from the outside of the deck.



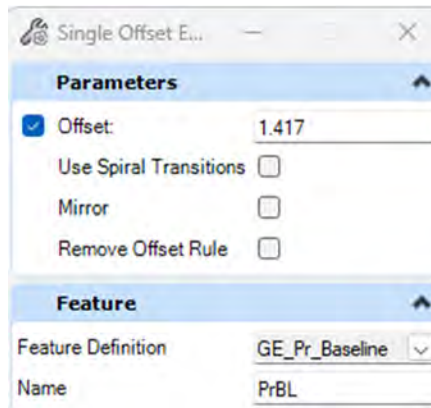
20) Return to a “**Top**” view.



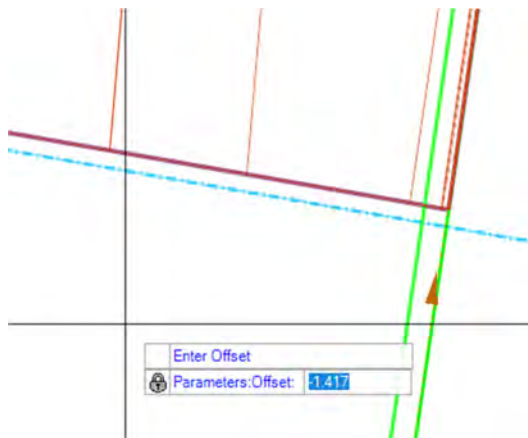
21) From the “**Civil**” tab of the “**OpenBridge Modeler**” workflow, select the “**Single Offset Entire Element**”.



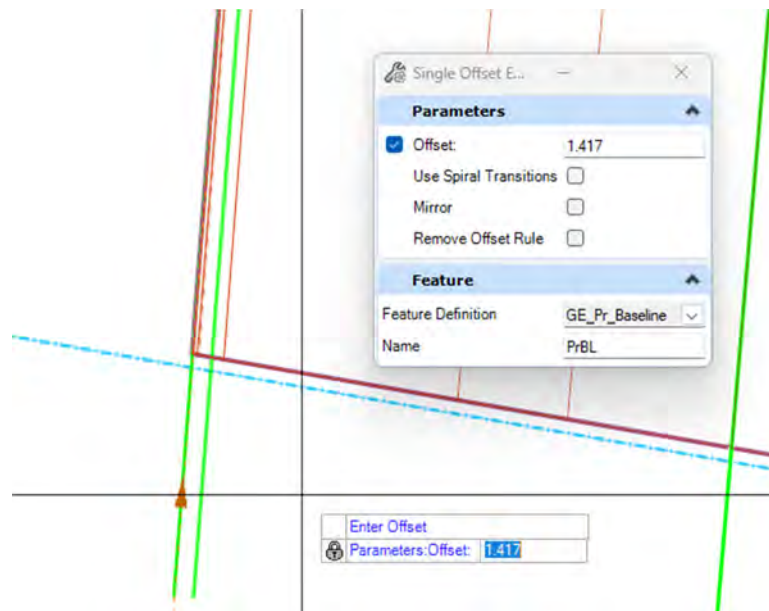
22) Change the settings as shown:



23) Pick the previously created civil line to the right of the centerline, select a point to its left, then accept.



24) Repeat for the left side of the deck, copying the element to the right.



25) Select the deck, bump the mouse, then select ***“Properties”***.



26) Select the “...” next to ***“Point Control”***.

Bridge Name	Bridge
Bridge Description	Bridge
Bridge Structure #	123-4567
State Element Number	12
NBI Element Number	12

Name	Deck
Description	
Template	Superstructure
Analytical Deck	False
Start Station	2+62.00
End Station	5+43.00
Start Station Offset	1.000'
End Station Offset	-1.000'
Horizontal Offset	0.000'
Vertical Offset	0.000'
Chord Tolerance	0.328'
Max Dist Between Sec	3.281'
Variable Constraint	SELECT to Edit
Point Control	SELECT to Edit
Top Surface Area	22626.522 Sq.'

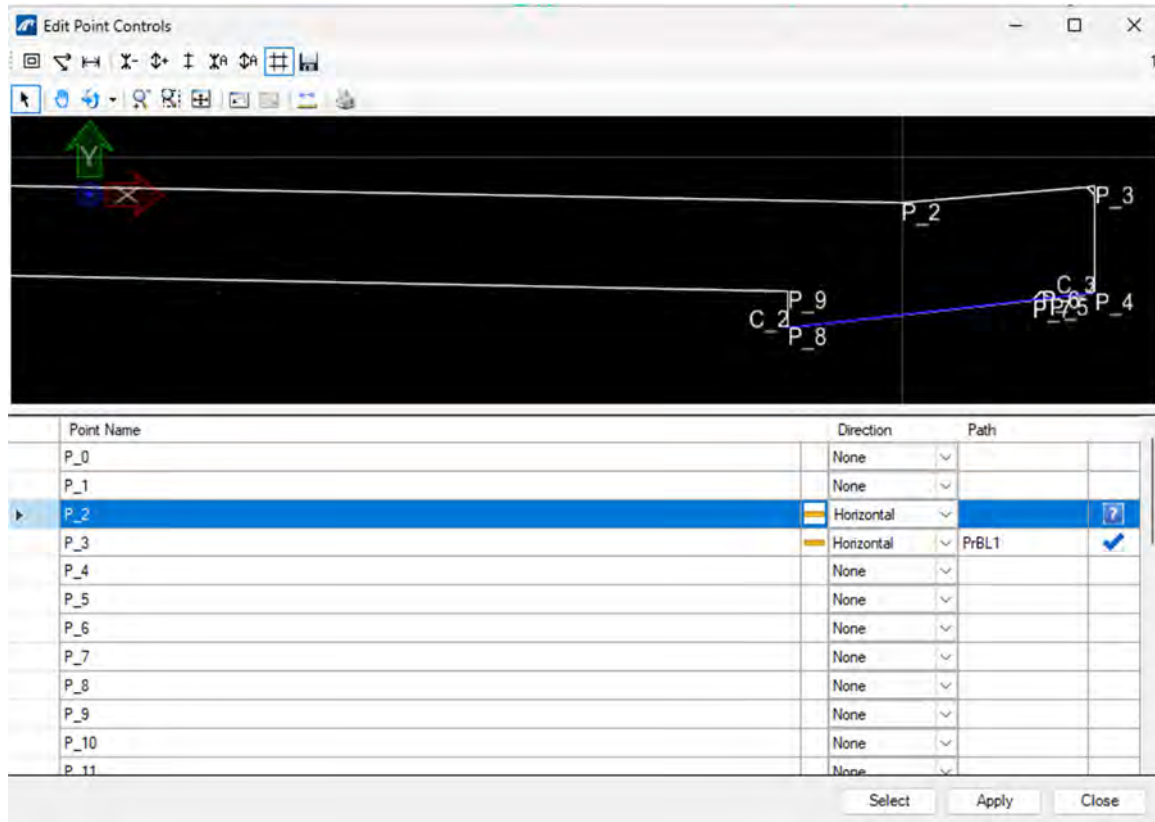
Left Start Breakback C	0.000'
Right Start Breakback	0.000'
Left End Breakback Di	0.000'
Right End Breakback I	0.000'

Volume	17815.469 Cu.'
Surface Area	46012.451 Sq.'

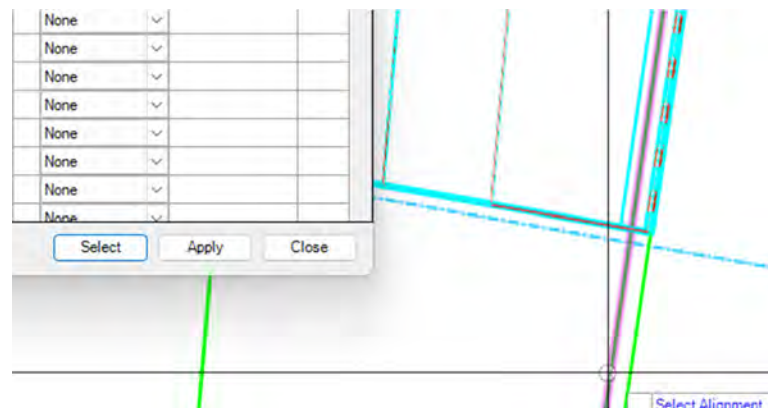
Feature Definition	Deck
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Deck Material	Concrete Superstructure (
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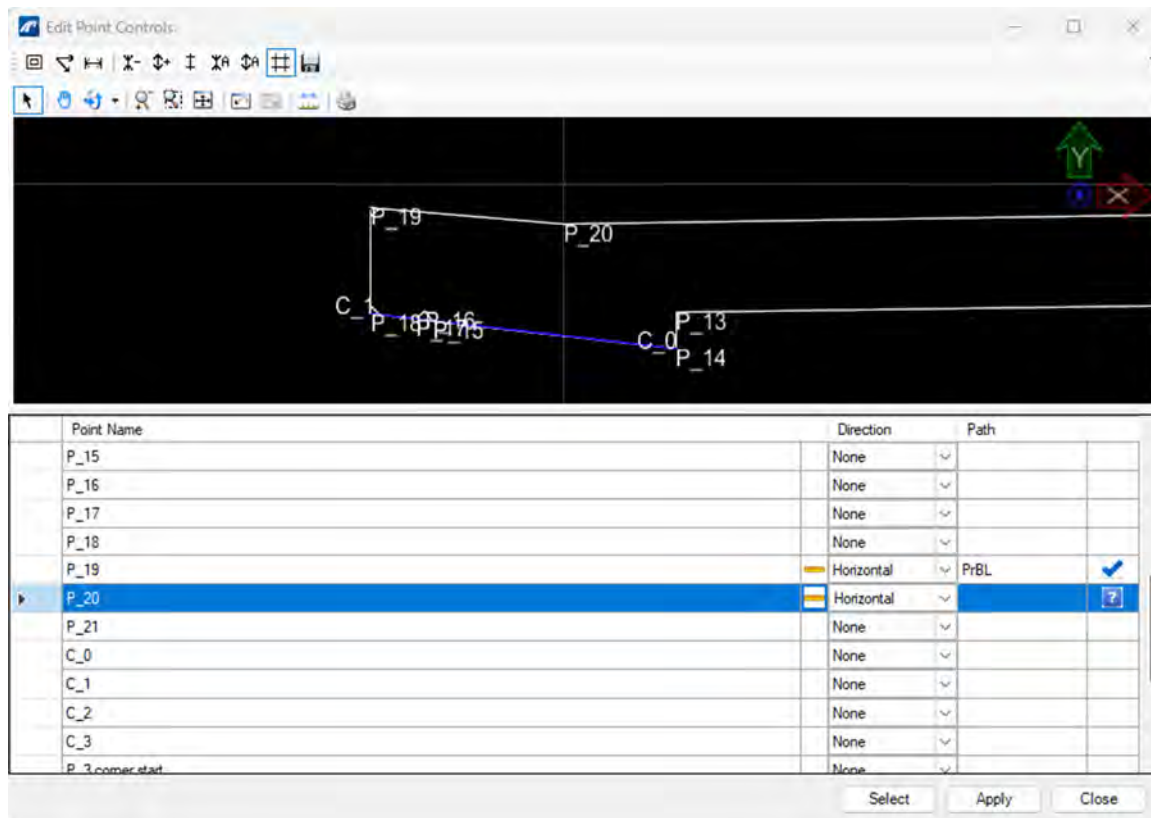
27) Pick point “**P_2**”, set the direction to “**Horizontal**”, then pick “**Select**”.



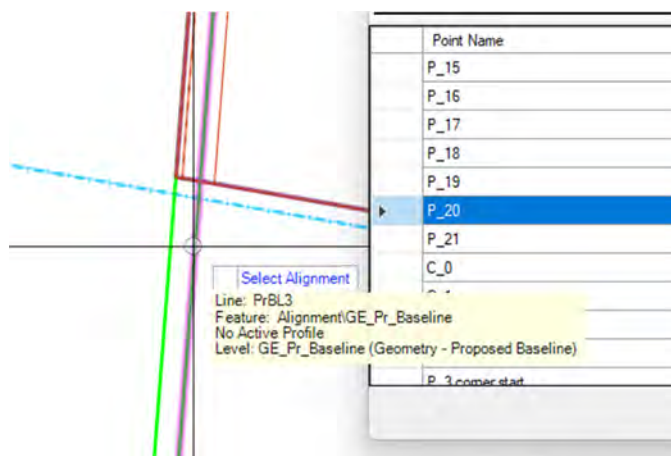
28) Pick the inner right civil line that we created and then “**Apply**”.



29) Pick point “**P_20**”, set the direction to “**Horizontal**”, then pick “**Select**”.



30) Pick the inner left civil line that we created and then “**Apply**”.



31) The curb line now is the required distance of **1'-5"** from the edge as expected.

