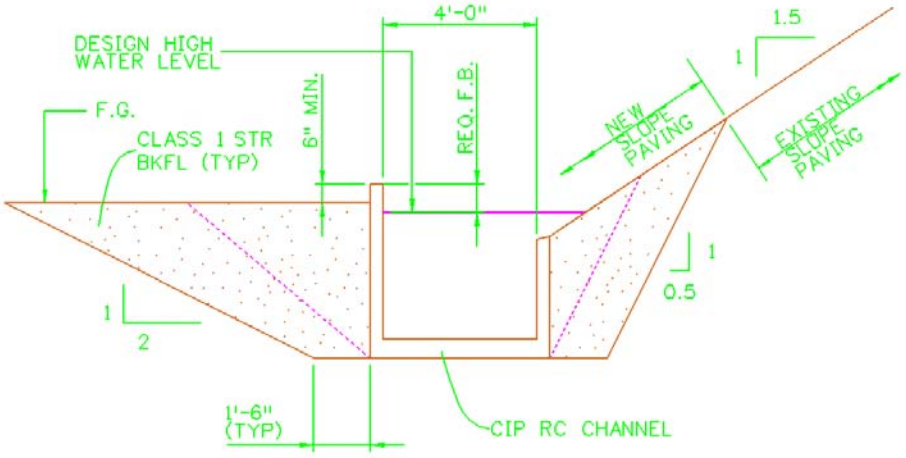
LAB 4 - Templates and Corridors

This lab demonstrates the use of templates and corridors to create a surface model (dtm) that can then be used to calculate earthwork and other quantities. This method of design is well suited for linear construction sites such as ditches/channels and walls.

In this exercise, a template is created that contains a cast-in-place reinforced concrete channel liner, the excavation required to build the liner, and backfill to complete the construction. Below is a sketch of the template.



TYPICAL SECTION

Note: The slope paving shown in the illustration above has been omitted for this lab.

Chapter Objectives:

- Build a template showing the excavation, channel liner, and slope paving.
- Create a corridor that follows an alignment.
- Review design data in Roadway Designer.
- Generate design surfaces from the template and corridor.

The following files are used in this lab:

- C:\Projects\12345\Bridge\Drawings\Reference Files\12345BRDG_Model-Drain.dgn
- C:\Workspace\Workspace-CDOT_XM\Standards-Global\InRoads\Preferences\CDOT_Civil.xin
- C:\Projects\12345\ROW_Survey\InRoads\DTM\12345_Drain
- C:\Projects\12345\Bridge\InRoads\12345_Drain.alg
- C:\Workspace\Workspace-CDOT_XM\Standards-Global\InRoads\Templates\CDOT_Template-Library.itl

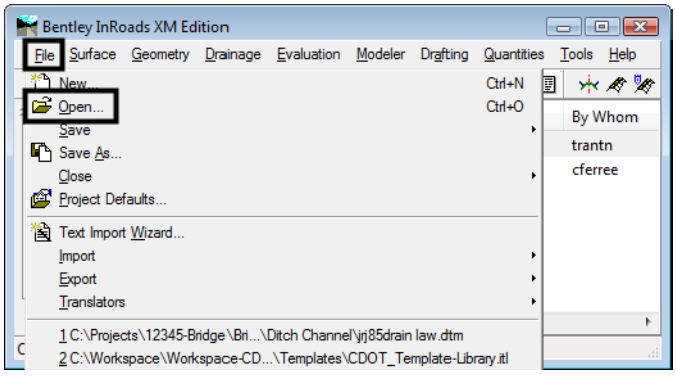
Lab 4.1 - Construct the Channel Liner

The ditch liner is a closed shape component that defines the design channel. The wall of the channel liner are 4 inches thick and the bottom is 6 inches thick. The left side rises 6 inches above the existing ground, while the right side is flush with the existing ground. This component is not included as part of the triangulated surface model because it does not define the area of excavation.

Section Objectives:

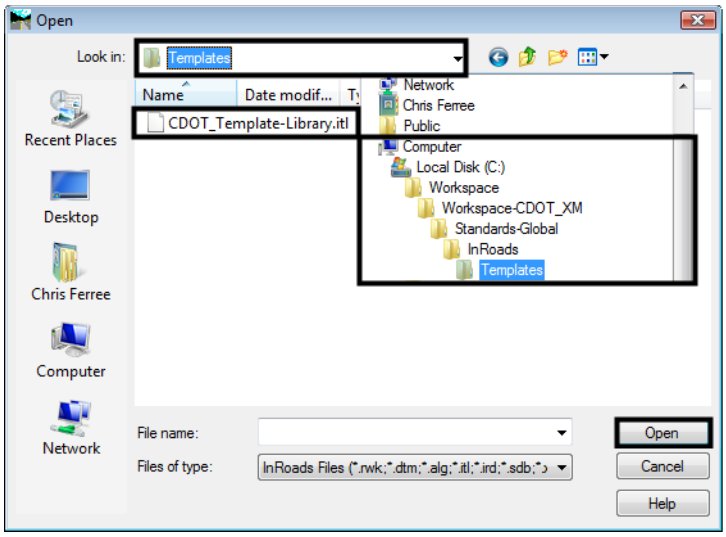
- Copy the standard template library into the project folder.
- Create a new template in the project template library.
- Construct a new channel liner component for the template.
- Edit point properties to define the shape of the liner.
- Edit the component properties to exclude the line from triangluation.

1. Start MicroStation and InRoads opening the ***12345BRDG_Model-Drain.dgn*** file.
2. In the main InRoads dialog box, verify that the ***CDOT_Civil.xin*** is loaded.
3. From the InRoads menu bar, select **File > Open**.



4. Navigate to the **C:\Projects\12345\ROW_Survey\InRoads\DTM** directory and open the **12345_Drain** file
5. Navigate to the **C:\Projects\12345\Bridge\InRoads** directory and open the **12345_Drain.alg** file.

6. Navigate to ***C:\Workspace\Workspace-CDOT_XM\Standards-Global\InRoads\Templates*** and open the **CDOT_Template-Library.itl** file.

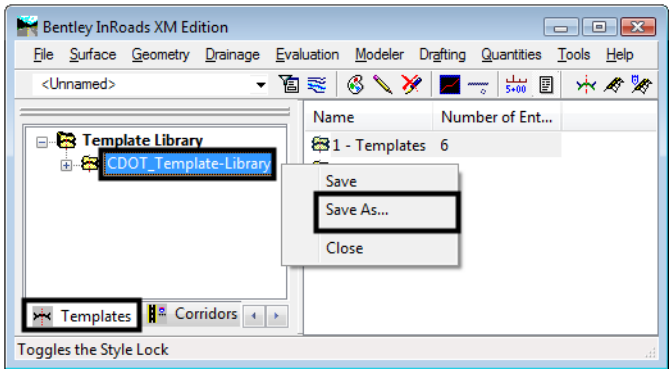


7. Navigate to ***C:\12345\ROW_Survey\InRoads\DTM*** and open **12345_Drain.**

8. **<D> Cancel** to dismiss the Open dialog box.

9. In the InRoads Explorer pane, **<D>** the **Templates** tab.

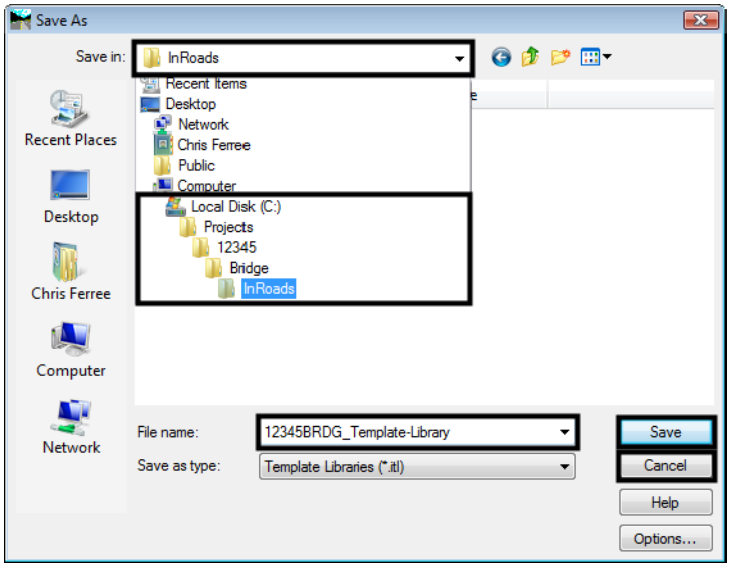
10. **<R>** on **CDOT _Template-Library** and select **Save As** from the right click menu.



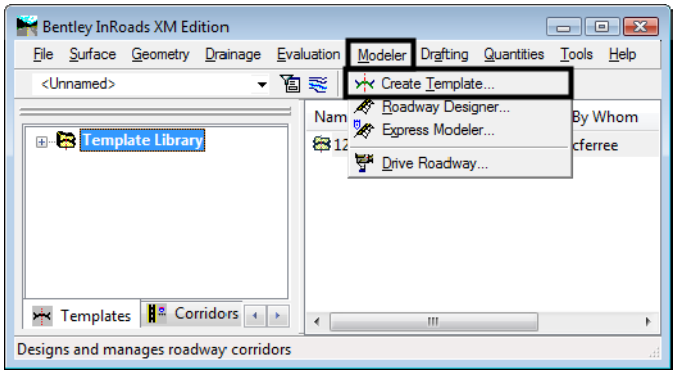
11. In the ***Save As*** dialog box, navigate to the ***C:\Projects\12345\Bridge\InRoads*** folder.

12. Key in ***12345BDRG_Templates.itl*** for the file name.

13. **<D> Save** then **<D> Cancel**.



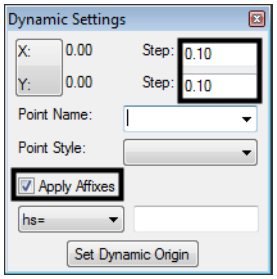
14. From the InRoads menu bar, select **Modeler > Create Templates**. This displays the Create Template dialog box.



15. From the Create Template menu bar, select **Tools > Dynamic Settings**.

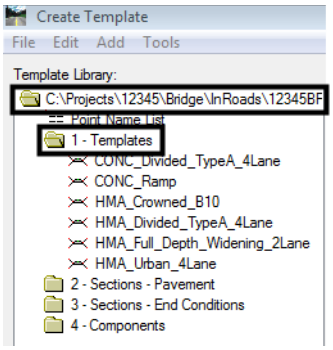
16. In the ***Dynamic Settings*** dialog box, key in ***0.10*** for both the "***X***" and "***Y***" ***Step***.

17. Toggle on **Apply Affixes**.

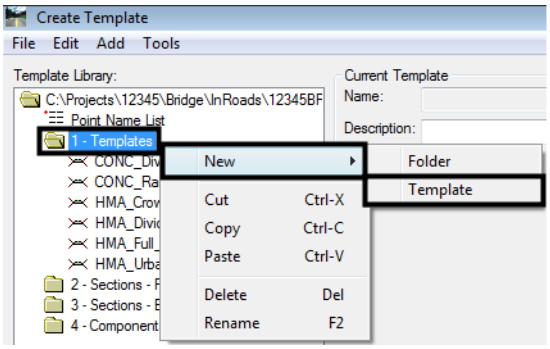


The Dynamic Settings dialog box is used to enter data while constructing a component.

18. In the Template Library Explorer area of the ***Create Template*** dialog box, expand the folders to show the contents of the ***1-Templates*** folder.



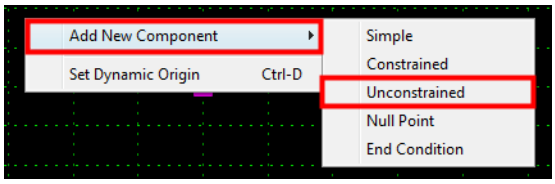
19. **<R>** on the **1-Templates** folder and select **New > Template** from the right click menu.



20. Key in ***12345_Channel-Liner*** for the template name.

Because the channel liner is a unique shape, there are no components in the library that can be used. Therefore, it will be built as a new component. The channel liner is first "sketched in" as an Unconstrained component. Then constraints are applied to the component points to define the proper shape.

21. **<R>** in the Template view and select **Add New Component > Unconstrained** from the right click menu.

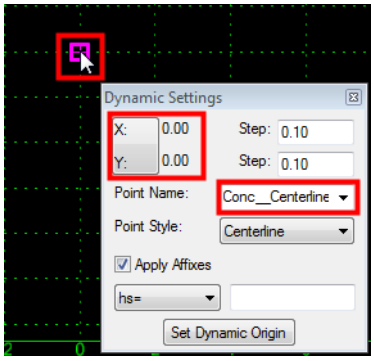


22. In the lower center of the dialog box, data fields are displayed that apply to the new component. In the ***Name*** field, key in ***Channel Liner***.

23. Select **D_CONC_Pvmt** from the ***Style*** drop down menu.

24. In the ***Dynamic Settings*** dialog box, **<D>** on the ***Point Name*** drop down arrow, and select **Conc_Centerline-Top** from the menu. This automatically sets the ***Point Style*** as well.

25. Move the cursor onto the ***Template Origin*** (the magenta square) so that the readout in the ***Dynamic Settings*** dialog box is ***X: 0.00 Y: 0.00***, then **<D>**.



26. In the ***Dynamic Settings*** dialog box, **<D>** in the ***Point Name*** field and key in ***Ditch-Bottom***.

27. Set the ***Point Style*** to **D-DITCH-Bottom**.

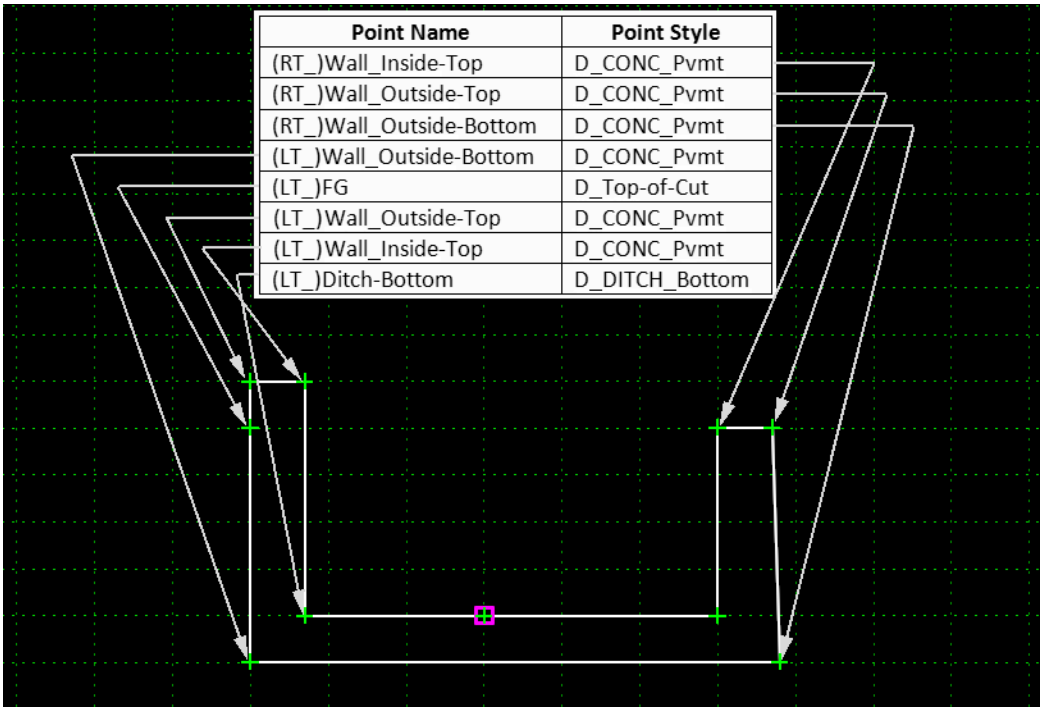
28. Move the cursor into the Template View to the right of the origin and **<D>** to place the ***RT_Ditch-Bottom*** point. The "***RT_***" is added to the name because ***Apply Affixes*** is on.

29. Key in ***Wall_Inside-Top*** for the next point.

30. Set the ***Point Style*** to **D_CONC_Pvmt**.

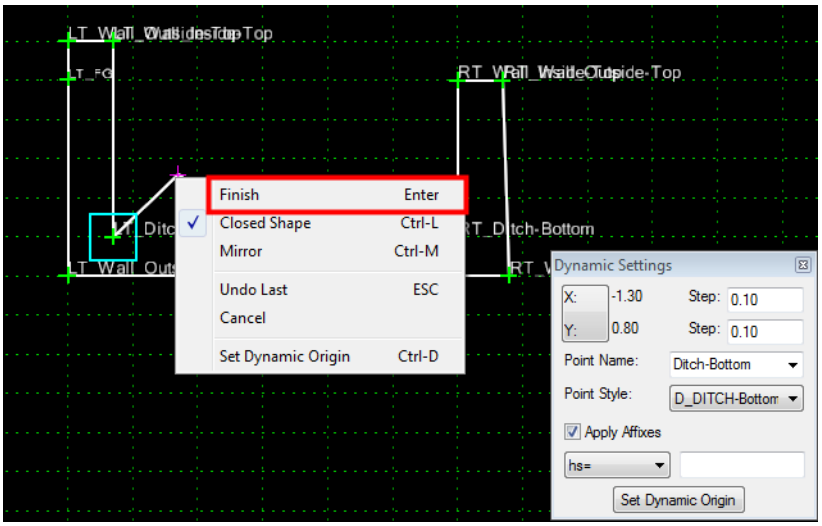
31. **<D>** above the ***RT_Ditch-Bottom*** point.

32. Use the diagram below to name and place the remaining points.



Point Name	Point Style
(RT_)Wall_Inside-Top	D_CONC_Pvmt
(RT_)Wall_Outside-Top	D_CONC_Pvmt
(RT_)Wall_Outside-Bottom	D_CONC_Pvmt
(LT_)Wall_Outside-Bottom	D_CONC_Pvmt
(LT_)FG	D_Top-of-Cut
(LT_)Wall_Outside-Top	D_CONC_Pvmt
(LT_)Wall_Inside-Top	D_CONC_Pvmt
(LT_)Ditch-Bottom	D_DITCH_Bottom

33. After the last point is placed, **<R>** in the Template View and select **Finish** from the right click menu.



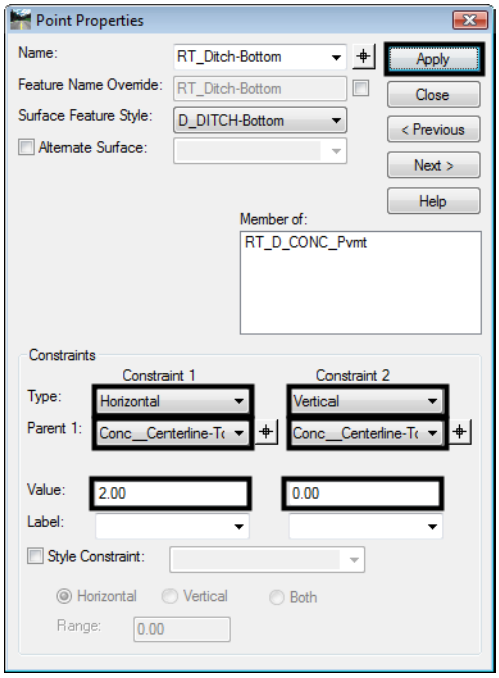
This completes the basic outline of the channel liner. Next, constraints are assigned to the point to form the exact shape desired.

34. **<D><D>** on the **RT_Ditch-Bottom** point. This displays the Point Properties dialog box.

35. In the ***Point Properties*** dialog box, set the ***Constraint 1 Type*** to **Horizontal**.

36. Set the ***Constraint 2 Type*** to **Vertical**.

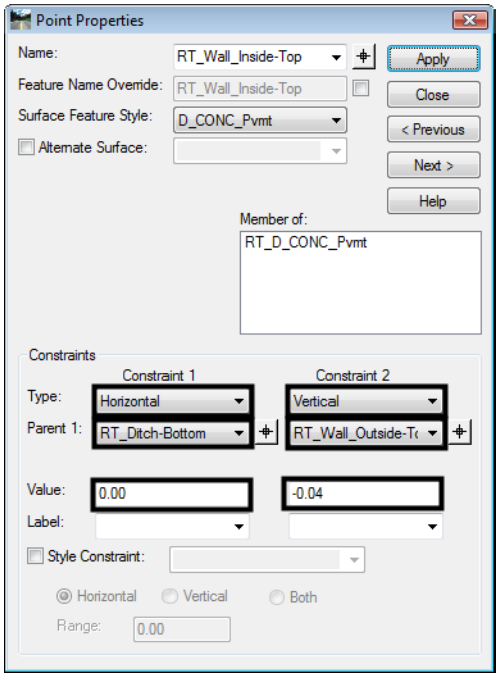
37. Set the ***Parent 1*** for both constraints to **Conc_Centerline-Top**.
38. Key in ***2.00*** for the ***Constraint 1 Value***.
39. Key in ***0.00*** for the ***Constraint 2 Value***.
40. **<D> Apply**.



The RT_Ditch-Bottom point symbol changes to red and the point move to be 2 feet to the right of the Conc_Centerline-Top point.

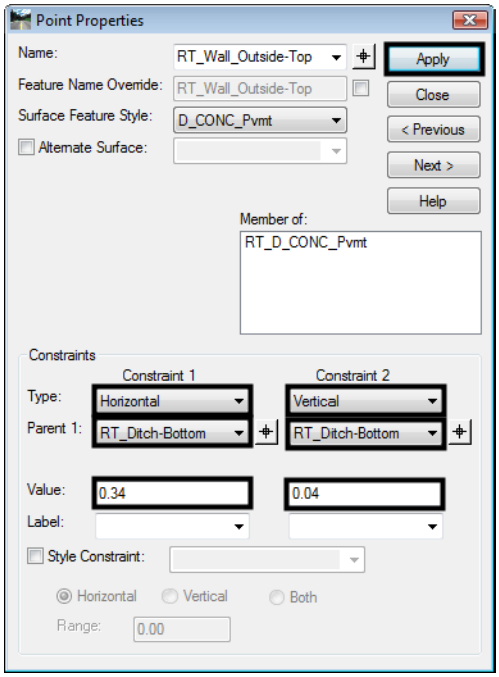
41. **<D> Next>** to move to the ***RT_Wall_Inside-Top*** point.
42. Set the ***Constraint 1 Type*** to **Horizontal**.
43. Set the ***Constraint 2 Type*** to **Vertical**.
44. Set the ***Parent 1*** for ***Constraint 1*** to ***RT_Ditch-Bottom***.
45. Set the ***Parent 2*** for ***Constraint 1*** to ***RT_Wall_Outside-Top***.
46. Key in ***0.00*** for the ***Constraint 1 Value***.
47. Key in ***-0.04*** for the ***Constraint 2 Value***.

48. **<D> Apply**.



49. **<D> Next>** to move to the ***RT_Wall_Outside-Top*** point.
50. Set the ***Constraint 1 Type*** to **Horizontal**.
51. Set the ***Constraint 2 Type*** to **Vertical**.
52. Set the ***Parent 1*** for both constraints to **RT_Ditch-Bottom**.
53. Key in ***0.34*** for the ***Constraint 1 Value***.
54. Key in ***0.04*** for the ***Constraint 2 Value***.

55. **<D> Apply**.



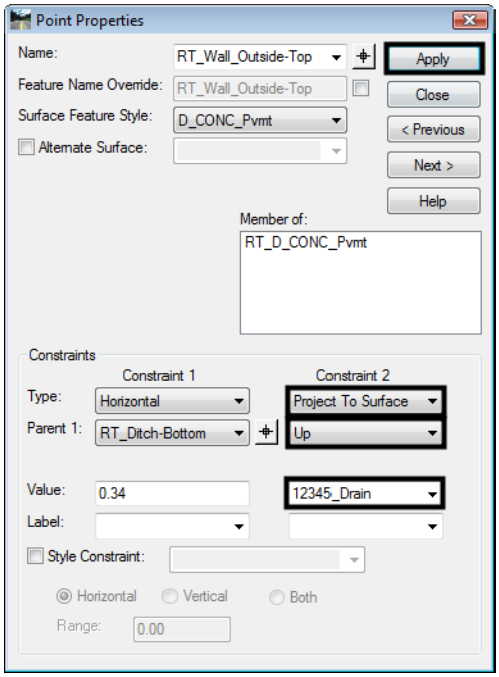
The Vertical constraint is temporary, in order to position the point. The final Constraint 2 is now set.

56. Set the ***Constraint 2 Type*** to **Project to Surface**.

57. Set the ***Parent 1*** for ***Constraint 2*** to **Up**.

58. Select **12345_Drain** for the ***Constraint 2 Value***.

59. **<D> Apply**.



60. **<D> Next>** to constrain the ***RT_Outside-Bottom*** point.
61. Set the ***Constraint 1 Type*** to **Horizontal**.
62. Set the ***Constraint 2 Type*** to **Vertical**.
63. Set the ***Parent 1*** for ***Constraint 1*** to **RT_Wall_Outside-Top**.
64. Set the ***Parent 1*** for ***Constraint 2*** to **RT_Ditch-Bottom**.
65. Key in ***0.00*** for the ***Constraint 1 Value***.
66. Key in ***-0.50*** for the ***Constraint 2 Value***.
67. **<D> Apply** then **<D> Next>** to constrain the ***LT_Outside-Bottom*** point.
68. Set the ***Constraint 1 Type*** to **Horizontal**.
69. Set the ***Constraint 2 Type*** to **Vertical**.
70. Set the ***Parent 1*** for both constraints to **LT_Ditch-Bottom**.
71. Key in -***0.34*** for the ***Constraint 1 Value***.
72. Key in ***-0.50*** for the ***Constraint 2 Value***.
73. **<D> Apply** then **<D> Next>** to constrain the ***LT_FG*** point.

This point will also have a temporary vertical constraint to position the point then it will be changed to a Project to Surface constraint.

74. Set the ***Constraint 1 Type*** to **Horizontal**.

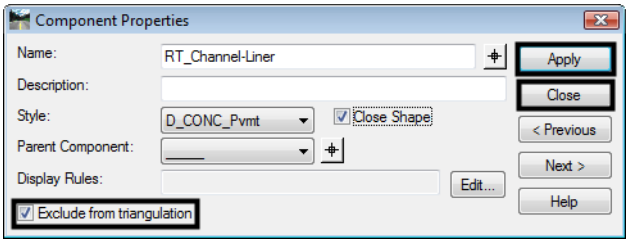
75. Set the ***Constraint 2 Type*** to **Vertical**.
76. Set the ***Parent 1*** for ***Constraint 1*** to **LT_Wall_Outside-Bottom**.
77. Set the ***Parent 1*** for ***Constraint 2*** to **LT_Ditch-Bottom.**
78. Key in ***0.00*** for the ***Constraint 1 Value***.
79. Key in ***0.00*** for the ***Constraint 2 Value***.
80. **<D> Apply**
81. Set the ***Constraint 2 Type*** to **Project to Surface**.
82. Set the ***Parent 1*** for ***Constraint 2*** to **Up**.
83. Select **12345_Drain** for the ***Constraint 2 Value***.
84. **<D> Apply** then **<D> Next>** to constrain the ***LT_Wall_Outside-Top*** point.
85. Set the ***Constraint 1 Type*** to **Horizontal**.
86. Set the ***Constraint 2 Type*** to **Vertical**.
87. Set the ***Parent 1*** for both constraints to **LT_FG**.
88. Key in ***0.00*** for the ***Constraint 1 Value***.
89. Key in ***0.50*** for the ***Constraint 2 Value***.
90. **<D> Apply** then **<D> Next>** to constrain the ***LT_Wall_Inside-Top*** point.
91. Set the ***Constraint 1 Type*** to **Horizontal**.
92. Set the ***Constraint 2 Type*** to **Vertical**.
93. Set the ***Parent 1*** for ***Constraint 1*** to **LT_Ditch-Bottom**.
94. Set the ***Parent 1*** for ***Constraint 2*** to **LT_Wall_Outside-Top.**
95. Key in ***0.00*** for the ***Constraint 1 Value***.
96. Key in -***0.04*** for the ***Constraint 2 Value***.
97. **<D> Apply** then **<D> Next>** to constrain the ***LT_Ditch-Bottom*** point.
98. In the ***Point Properties*** dialog box, set the ***Constraint 1 Type*** to **Horizontal**.
99. Set the ***Constraint 2 Type*** to **Vertical**.
100. Set the ***Parent 1*** for both constraints to **Conc_Centerline-Top**.
101. Key in -***2.00*** for the ***Constraint 1 Value***.
102. Key in ***0.00*** for the ***Constraint 2 Value***.
103. **<D> Apply**.

This completes the point editing for the channel liner component. To complete the component properties are edited. The component property to exclude the channel liner from triangulation will be turned on. This will allow the design surface to triangulate properly so that it represents the actual area of excavation on this project.

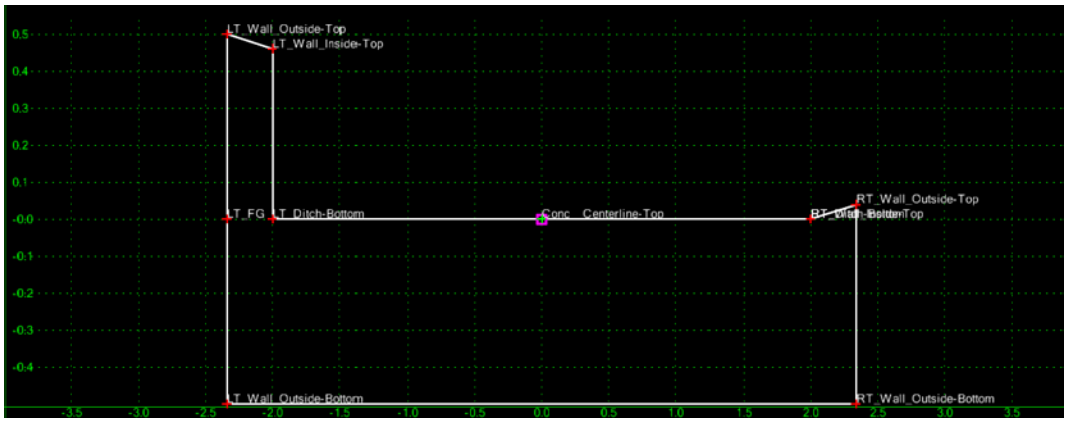
104. **<D><D>** on the line that makes up the channel liner. This displays the ***Component Properties*** dialog box for the channel liner.

105. In the ***Component Properties*** dialog box, toggle on **Exclude from triangulation**.

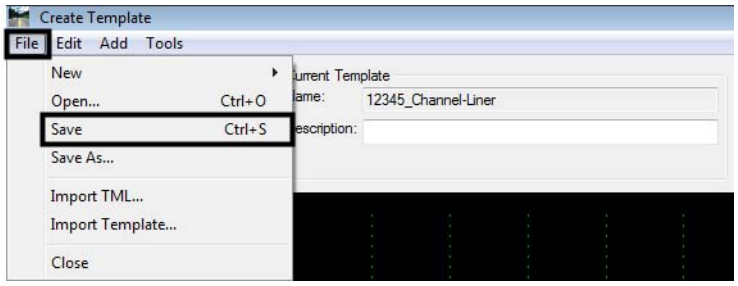
106. **<D> Apply** then **<D> Close**.



The channel liner points and component is still included in the dtm created later. They can still be included in the cross section display and have volume data calculated. However, the channel liner component will not affect the earthwork volume calculations.



107. Select **File > Save** from the Create Template menu bar.



Section Summary:

- Copying the standard template library is necessary because the standard template library is overwritten at login if it has been changed.

- Templates store the information used to create design dtms.
- A dtm can contain triangulated and untriangulated data.
- Point constraints locate points in relation to other points.
- The Project to Surface constraint is used to make the point follow the "target" surface.

Lab 4.2 - Create the Excavation Components

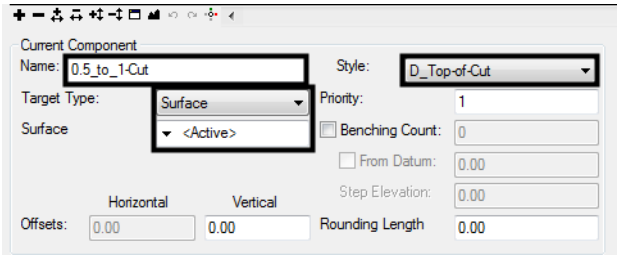
The Excavation components comprise the triangulated part of the template which will be used to compute earthwork volumes in a later lab. Two end condition components are used, the left one has a 2 to1 slope, the right one has a 0.5 to 1 slope.

Section Objectives:

- Build the two end condition components.
- Move a component to a new location.
- Test the template.

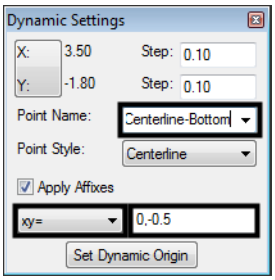
The first end condition component to be added is the right side end condition. It begins at the center bottom of the channel liner, runs to the RT_Wall_Outside-Bottom point, then up at a 0.5 to 1 slope to intercept the existing ground surface (12345_Drain).

1. **<R>** in the Template View of the Create Template dialog box and select **Add New Component > End Condition** from the right click menu.
2. In the ***Current Component*** area, Key in ***0.5_to_1-Cut*** in the ***Name*** field.
3. Set the ***Style*** to **D_Top-of-Cut**.
4. Verify that the ***Target Type*** is set to **Surface** and set the ***Surface*** to **12345_Drain**.



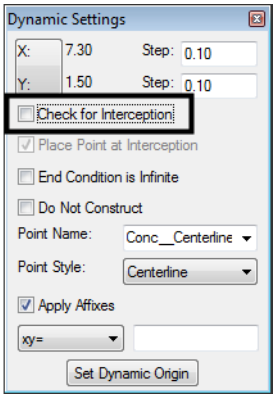
5. In the ***Dynamic Settings*** dialog box ***Point Name*** field, select **Conc_Centerline-Top**. Then edit the name to read ***Conc_Centerline-Bottom***.

6. Set the key in type to **XY=** and key in ***0,-0.5*** in the key in field. Then press the **Enter** key. This places the first point at the center bottom of the ditch liner.



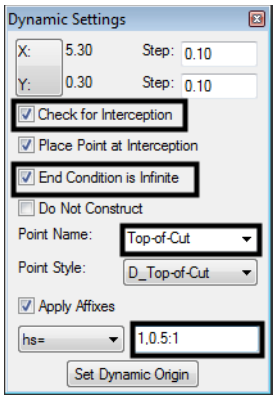
The next point is placed on top of the RT_Wall_Outside-Bottom point. The new point is merged with the existing point retaining the existing point's properties.

7. In the ***Dynamic Settings*** dialog box, toggle off **Check for Interception**.



8. Move the cursor into the Template View and place it over the ***RT_Wall_Outside-Bottom*** point.
9. When the point symbol turns white, **<D>** to place the new point.
10. In the ***Dynamic Settings*** dialog box, toggle on **Check fo Interception**.
11. Toggle on **End Condition is Infinite**.
12. In the ***Point Name*** field, select **Top-of-Cut** from the drop down menu.

13. Set the key in type to **HS=** (horizontal distance and slope)and key in ***1,1:0.5*** in the key in field. Then press the **Enter** key.



14. **<R>** in the Template view and select **Finish** from the right click menu.

15. This completes the right end condition.

The left side end condition is added similarly to the right side. However, it cannot be placed directly on top of the existing points. If it were placed on to the existing points, the software would interpret them as part of a single end condition and the template would not function properly.

Therefore, the left end condition will be built in an open area then moved to its proper location.

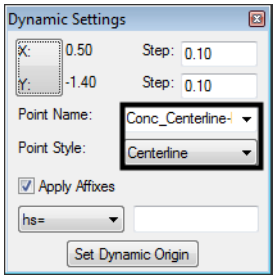
16. **<R>** in the Template View of the Create Template dialog box and select **Add New Component > End Condition** from the right click menu.

17. In the ***Current Component*** area, Key in ***2_to_1-Cut*** in the ***Name*** field.

18. Set the ***Style*** to **D_Top-of-Cut**.

19. Verify that the ***Target Type*** is set to **Surface** and set the ***Surface*** to **12345_Drain**.

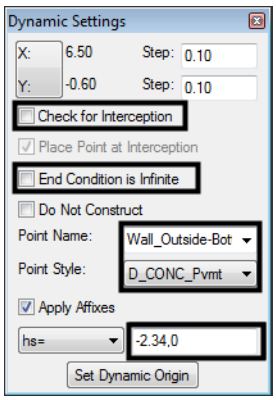
20. In the ***Dynamic Settings*** dialog box ***Point Name*** field, select **Conc_Centerline-Top**. Then edit the name to read ***Conc_Centerline-Bottom***.



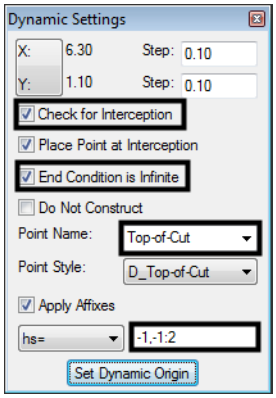
21. Move the cursor into an open area of the Template View, to the left of the origin, and **<D>** to place the new point.

22. In the ***Dynamic Settings*** dialog box, toggle off **Check for Interception** and **End Condition is Infinite**.

23. Key in ***Wall_Outside-Bottom*** for the ***Point Name***.
24. Select **D_Conc-Pvmt** for the ***Point Style***.
25. Verify that the key in type is set to **HS=** and key in ***-2.34,0*** in the key in field. Then press the **Enter** key. This creates the bottom under the channel liner.



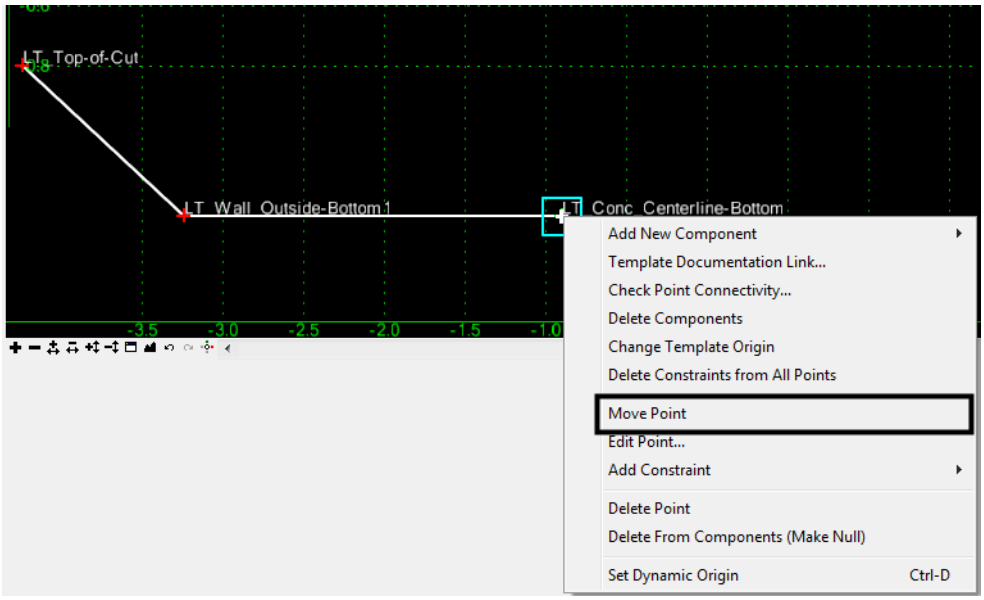
26. In the ***Dynamic Settings*** dialog box, toggle on **Check for Interception**.
27. Toggle on **End Condition is Infinite**.
28. In the ***Point Name*** field, select **Top-of-Cut** from the drop down menu.
29. Key in ***-1,-1:2*** in the key in field. Then press the **Enter** key.



30. **<R>** in the Template view and select **Finish** from the right click menu.

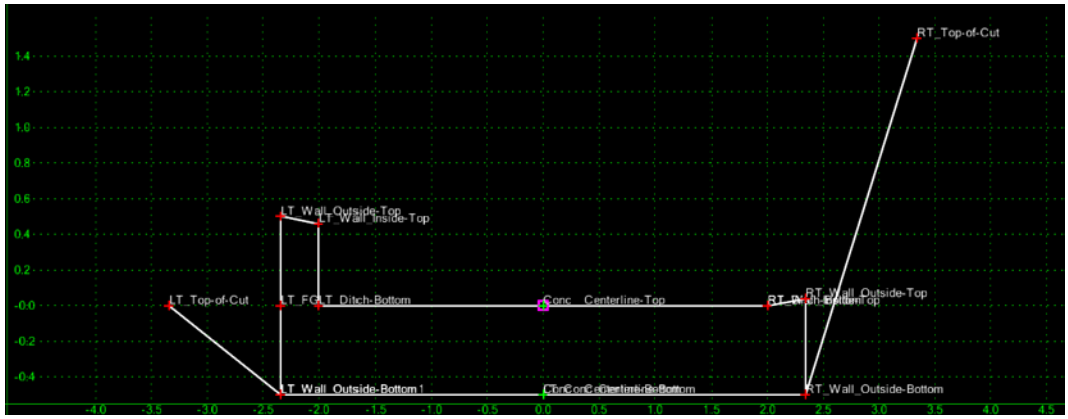
This completes the left end condition. Now it is moved to its proper location.

31. **<R>** on the **LT_Conc_Centerline-Bottom** point and select **Move Point** from the right click menu.



32. Move the cursor (and the component) on to the ***Conc_Centerline-Bottom*** point and **<D>** to move the left end condition to its proper location.

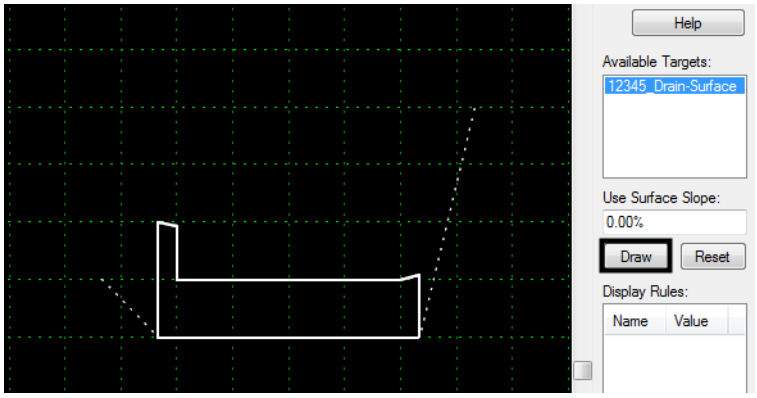
This completes this portion of the template. The illustration below shows the template at this stage.



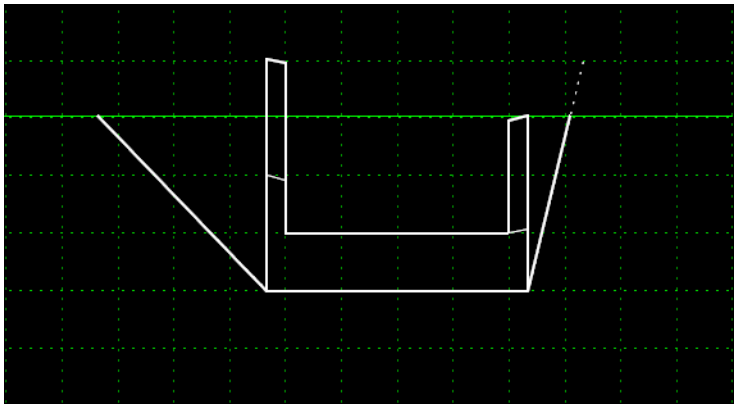
The template can now be tested to see how it will perform in a corridor.

33. **<D>** the **Test** button under the right corner of the Template View. This displays the ***Test End Conditions*** dialog box.

34. **<D>** the **Draw** button.



35. Move the cursor up and down in the view area. Notice that the walls of the liner and the cut slopes extend up to meet the ground line so long as it is above the inside bottom of the liner.



36. **<D> Close** to dismiss the ***Test End Conditions*** dialog box.

37. Select **File > Save** from the Create Template menu bar.

Section Summary:

- End conditions are special components that do not use a constraint to intercept a surface.
- End conditions that share a common starting point are considered a single component and only one of the lines will be used.
- To create two end conditions that start at the same point, the second component must be created in a different location then moved to the correct spot.
- Test templates with end conditions to be sure they behave as expected prior to using them in a corridor.

Lab 4.3 - Adding Backfill Components

The final components for the template are the backfill components. These are used to calculate the the volume of embankment material used to fill in the trench excavation behind the channel liner. These components will not be used to create the triangulated surface, but can still be displayed in cross sections and have volumes calculated for them.

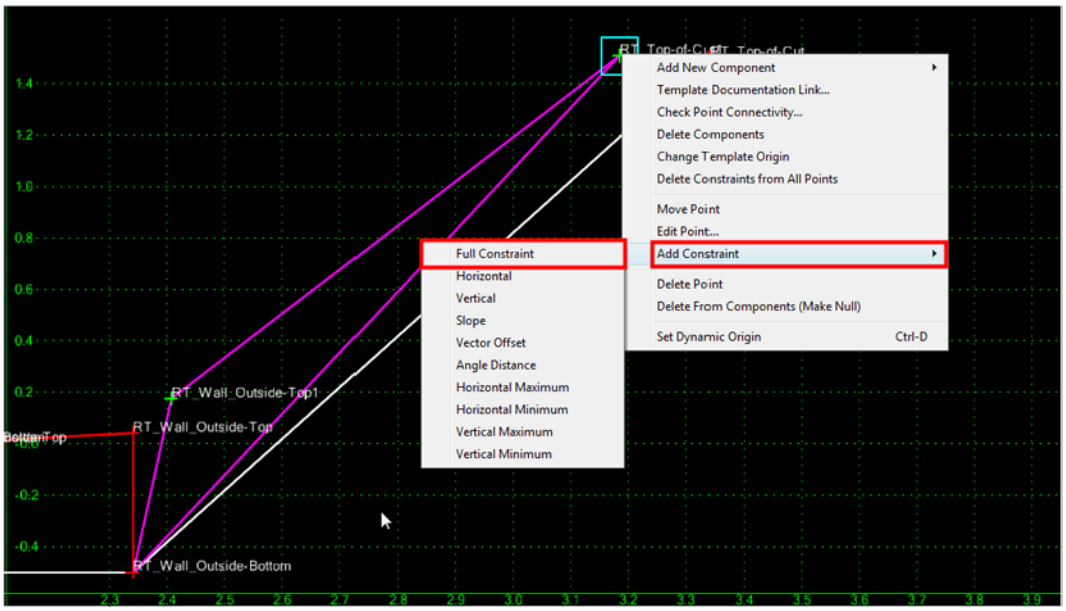
Section Objectives:

- Add Backfill components

1. **<R>** in the Template View of the Create Template dialog box and select **Add New Component > Unconstrained** from the right click menu.
2. In the ***Current Component*** area, key in ***Backfill*** for the ***Name***.
3. Select **D_SHOULDER-Embankment** for the ***Style***.

4. **<D>** on the ***RT_Wall_Outside-Bottom*** point.
5. In the ***Dynamic Settings*** dialog box, select **Top-of-Cut** for the ***Point Name***.
6. **<D>** in an open area near the ***RT_Top-of-Cut*** point.
7. In the ***Dynamic Settings*** dialog box, key in ***Wall_Outside-Top***.
8. Set the ***Point Style*** to **D_CONC_Pvmt**.
9. **<D>** in an open area near the ***RT_Wall_Outside-Top*** point.
10. **<R>** and select **Finish** from the right click menu.

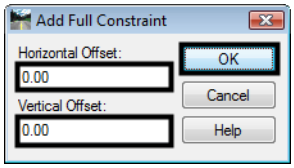
11. **<R>** on the **RT_Top-of-Cut1** point and select **Add Constraint > Full Constraint** from the right click menu.



12. **<D>** on the **RT_Top-of-Cut** point to identify it as the parent.

13. In the ***Add Full Constraint*** dialog box, key in ***0.00*** for the values of both the ***Horizontal Offset*** and ***Vertical Offset***.

14. **<D> OK**.



15. Repeat steps 11 through 14 for the **RT_Wall_Outside-Top1** point, using ***RT_Wall_Outside-Top*** as the parent.

Placing the backfill points directly on top of the existing points would cause the line between RT_Wall_Outside-Top and RT_Top-of-Cut to match the existing ground instead of creating a single segment between the two points.

The steps to create the left side backfill are the same as those above.

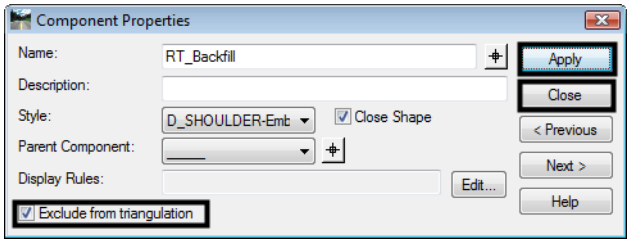
16. Repeat steps 1 through 15 for the left side, using the corresponding points from the left of the existing template.

The final step to complete the template is to exclude the backfill components from triangulation.

17. **<D><D>** on the **RT_Backfill** component line. This displays the ***Component Properties*** dialog box.

18. Toggle on **Exclude from triangulation**.

19. **<D>Apply** then **<D> Close**.



20. Repeat steps 11 through 13 for the **LT_Backfill** component.
21. Select **File > Save** from the Create Template menu bar.
22. **<D> Close** on the Create Template dialog dox to dismiss the window.

This completes the template. It is now ready to use to create a design surface model (dtm).

Section Summary:

- Points added on top of other points do not have to be defined in the dynamic Settings dialog box.
- Points added on top of other points are merged with the existing points and take on the properties already defined.

Lab 4.4 - Creating the Corridor for the Channel

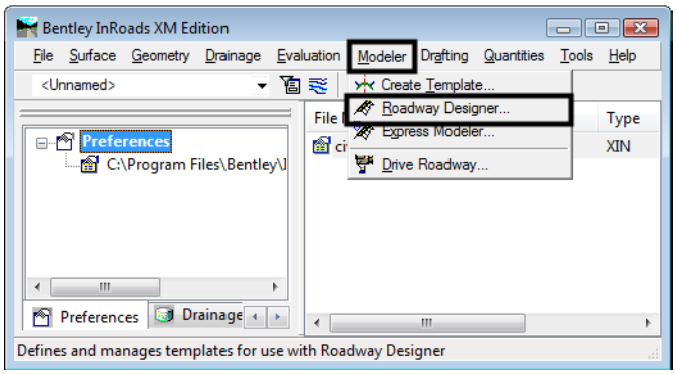
With the completed template and the horizontal and vertical alignments from a previous lab, a corridor can be defined that is used to create the design surface model. A corridor contains two basic parts: a path over the existing terrain, and a typical section of the design. In this example, a horizontal and vertical alignment define the path of the corridor and the template built above defines the typical section.

Section Objectives:

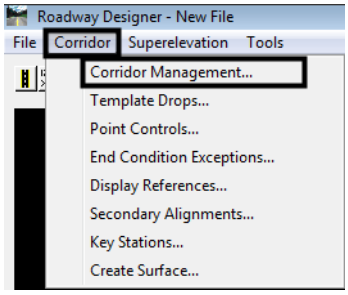
- Create a corridor base on a horizontal and vertical alignment.
- Add a template drop to the corridor.
- Review the corridor in Roadway Designer.
- Create a design surface from the corridor.

The first step in creating a design surface is to create the corridor.

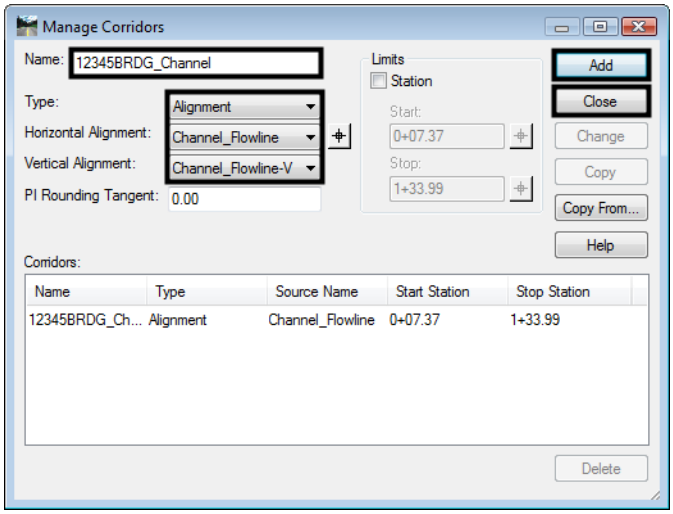
1. Select **Modeler > Roadway Designer** from the InRoads menu bar. This displays the ***Roadway Designer*** dialog box.



2. From the ***Roadway Designer*** menu bar, select **Corridor > Corridor Management** or select the corridor management button  from the button bar.

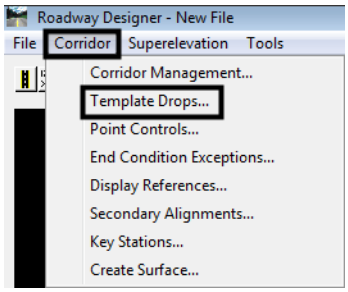


3. In the ***Manage Corridors*** dislog box, key in ***12345BRDG_Channel*** for the ***Name***.
4. Verify that the ***Type*** is set to **Alignment**.
5. Verify that **Channel _Flowline** is set for the ***Horizontal Alignment***.
6. **<D> Add** the **<D> Close** to dismiss the ***Manage Corridors*** dialog box.

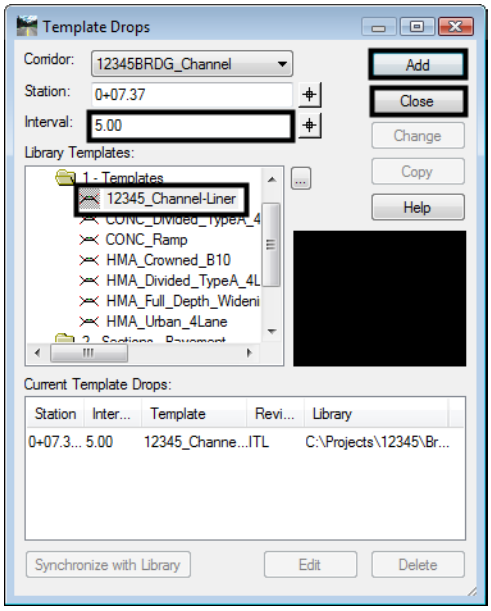


Next, the template drop is added to the corridor.

7. Select **Corridor > Template Drops** from the ***Roadway Designer*** menu bar of **<D>** the Template Drops button from the button bar.

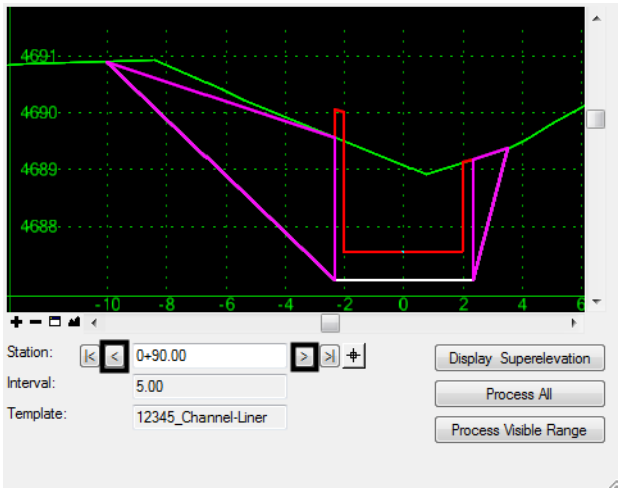


8. In the Template Drops dialog box, key in 5.00 for the Interval.
9. Expand the folder in the ***Library Templates*** area to show the contents of the **1-Templates** folder.
10. Highlight the **12345_Channel-Liner** template then **<D> Add**.
11. **<D> Close** to dismiss the ***Template Drops*** dialog box.



Notice that the template is now displayed in the template view of the Roadway Designer dialog box. The design can now be reviewed in Roadway Designer.

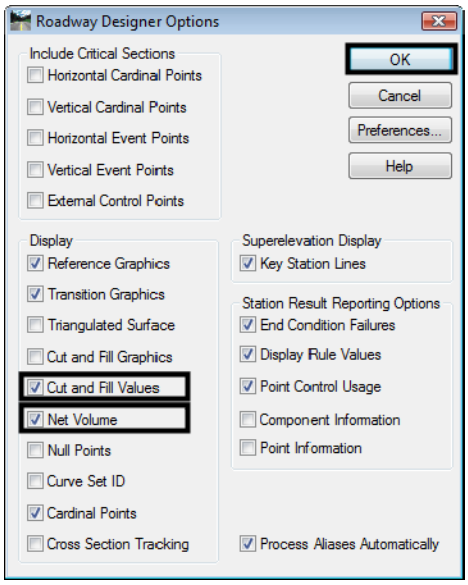
12. Use the station indicator arrows to move back and forth through the design corridor. The sideslopes should tie to the existing ground and the design channel flowline should be at or very near the existing flowline athe the beginning and end of the corridor.



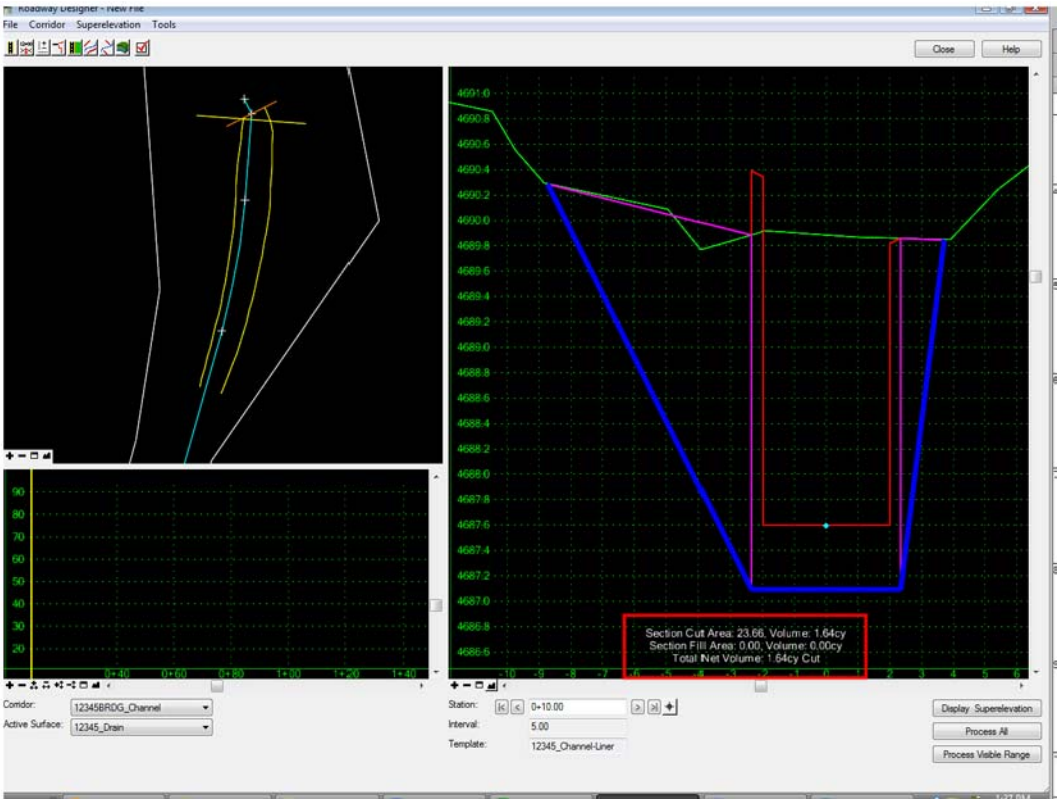
13. Select **Tool > Options** from the Roadway Designer menu bar. The Roadway Designer Options dialog box is used to turn on or off various design data displays.

14. Toggle on **Cut and Fill Values** and **Net Volume**.

15. **<D> OK**.

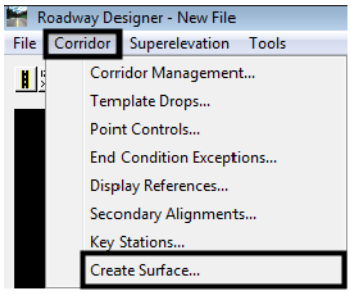


16. Scroll through the corridor again. Notice the cut and fill volume data displayed at the bottom of the template view.



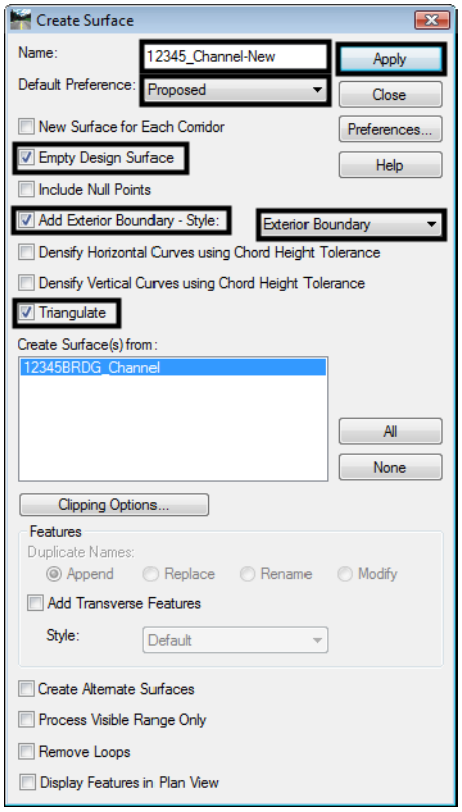
Finally, a surface (dtm) is created from the corridor. With a design surface, annotated cross sections can be created for plan sets and various volume reports can be generated.

17. Select **Corridor > Create Surface** from the Roadway Designer menu bar of **<D>** the create surface button from the button bar.



18. In the ***Create Surface*** dialog box, key in ***12345_Channel-New*** for the ***Name***.
19. Select **Proposed** for the ***Default Preference***.
20. Toggle on **Empty Design Surface**, **Add Exterior Boundary**, and **Triangulate**.
21. Select **Exterior Boundary** for the boundary's ***Style***.

22. **<D> Apply**. This creates the design surface.

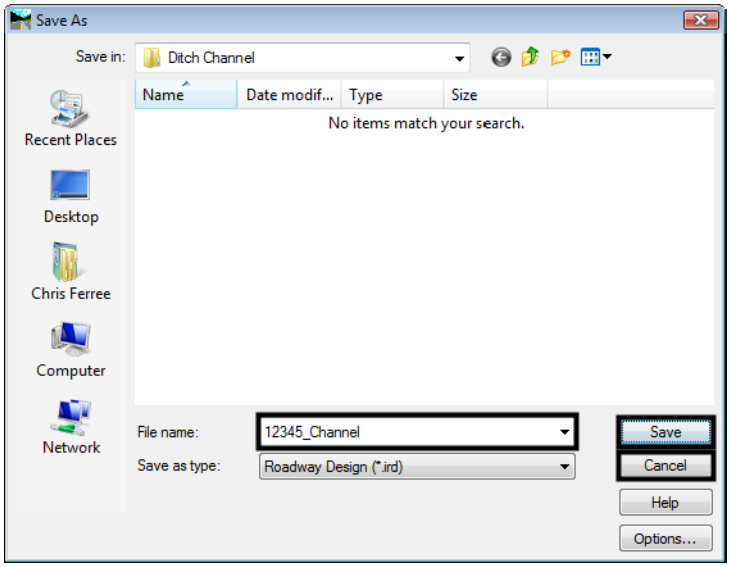


23. **<D> Close** to dismiss the ***Create Surface*** dialog bix.

24. Select **File > Save** from the ***Roadway Designer*** menu bar.

25. In the ***Save As*** dialog box, navigate to the **C:\Projects\12345\Bridge\InRoads** directory.

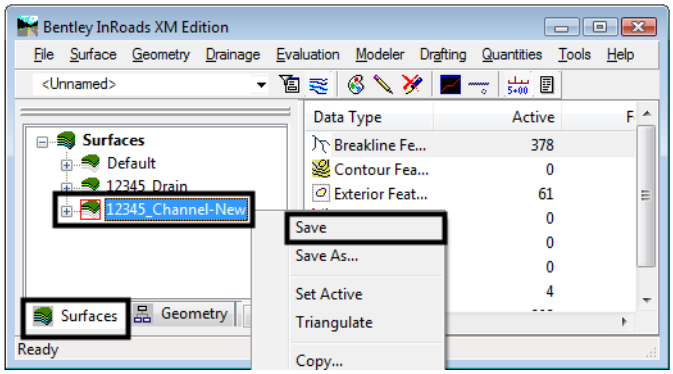
26. Key in ***12345_Channel*** for the ***File name***.



27. **<D> Close** on the ***Roadway Designer*** dialog dox to dismiss the window.

28. In the InRoads Explorer, **<D>** the **Surfaces** tab at the bottom.

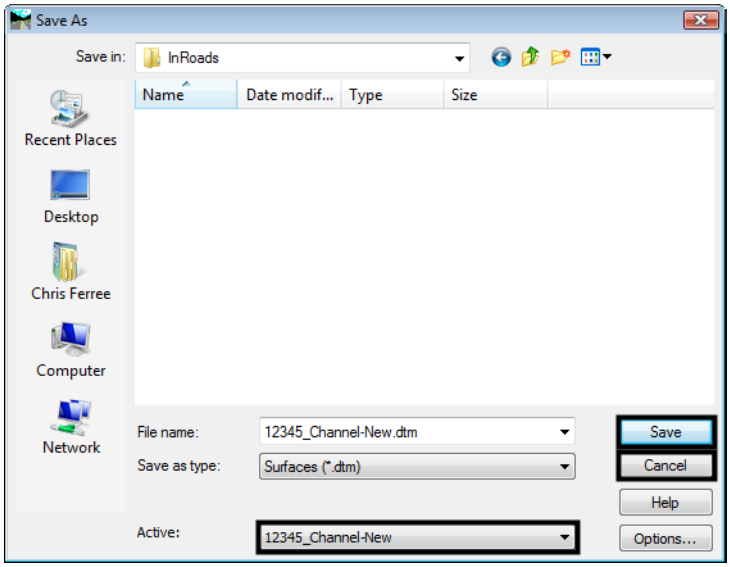
29. **<R>** on the **12345_Channel-New** surface and select **Save** from the menu.



30. In the ***Save As*** dialog box, navigate to the **C:\Projects\12345\Bridge\InRoads** directory.

31. Use the ***Active*** drop down menu and select **12345_Channel-New**. This places the surface's name in the ***File name*** field.

32. **<D> Save** then **<D> Cancel** to dismiss the dialog box.



The design surface is now ready for use generating cross sections, volumes, and reports.

Section Summary:

- Corridors are most commonly created along horizontal and vertical alignments.
- The origin of the template follows the corridor path (horizontal and vertical alignment or surface feature).
- Template Drops define which template is used and how often it is applied.
- Once the corridor and templated drops are defined, the design can be reviewed and edited in the Roadway Designer dialog box.
- A design surface (dtm), based on the corridor and templated drops, can be created from Roadway Designer.

Chapter Summary:

- Templates and corridors are used to create a design surface (dtm) of roughly parallel features.
- Templates define the “typical section” of the design surface.
- Templates are defined by points. Points are located using offsets from other points known as constraints.
- Acomponent is a series of related points that define the area of a specific material.
- Components are included in the design dtm, but do not have to make up the triangulated model.
- Corridors define the path, in relation to the existing ground, that the template will follow.
- The design model can be reviewed and edited in the Roadway Designer dialog box prior to creating a dtm.