Workshop on the Bentley User Group Denmark meeting 2006

Introduction to InRoads Roadway Designer

Hands-on class sponsored by the Bentley Institute

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LESSON NAME: WHAT HAS CHANGED

LESSON OBJECTIVE:

In this lesson the student will learn what changes have occurred in InRoads with respect to the Roadway Modeler and the new Roadway Designer. In short the Define Roadway, Superelevation and Roadway Modeler have been replaced with the new Roadway Designer.

On-Line Help Topic: Search on "Roadway Designer"

> ***EXERCISE: GETTING STARTED***

This exercise will guide you through the steps to get started

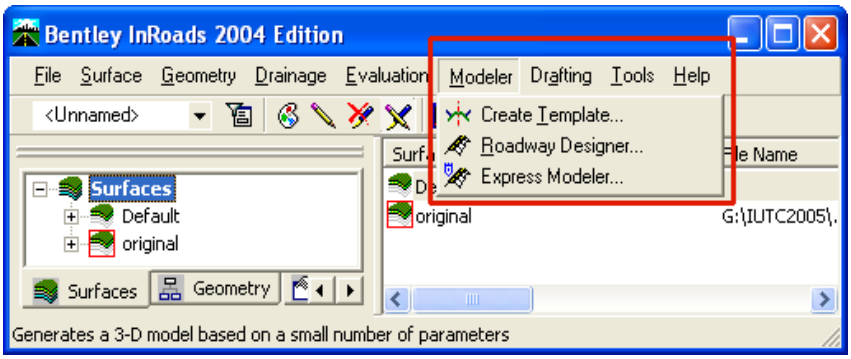
1. Go to **Start>Programs>Bentley>InRoads Group v8.8>InRoads**.
2. When the MicroStation Manager appears select the file

   C:\BE Data\Civil\C1TNC106/data/C1TNC106.dgn and press **OK**.
3. When InRoads appear go to File>Open from the InRoads menu.
4. When the Open dialog appears select the file

   C:\BE Data\Civil\C1TNC106/data/C1TNC106.rwk and press **OK**.

   Opening the RWK file opened the following files.

   C1TNC106.alg
   C1TNC106.itl
   Original.dtm
   Civil.xin
5. Select Modeler from the InRoads menu. Notice that there are now only three options where there used to be many. The new options are Create Template, Roadway Designer and Express Modeler.



6. Select the **ESC** key to get rid of the menu.

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LESSON NAME: NAVIGATING THROUGH THE CREATE TEMPLATE COMMAND

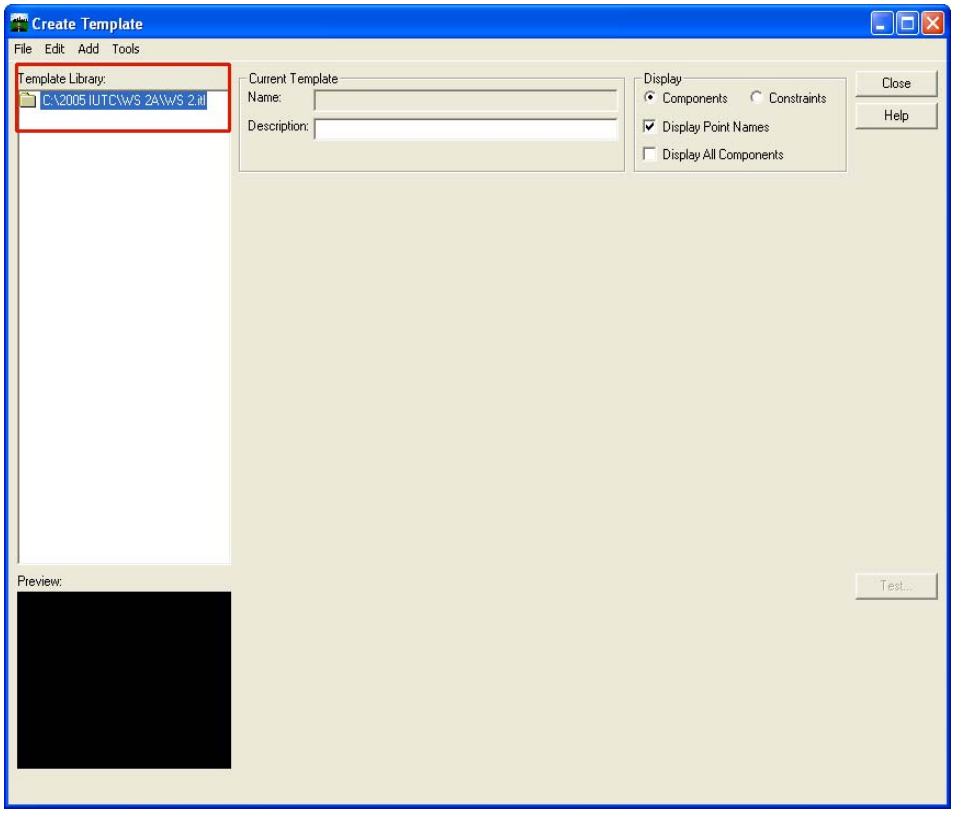
LESSON OBJECTIVE:

This lesson will take you through how you would navigate the Create Template command.
On-Line Help Topic: Search on “Create Template”

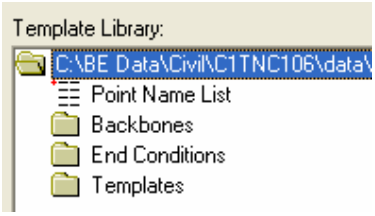
> ***EXERCISE: NAVIGATING TEMPLATES***

This exercise will take you through how templates are created and how the new Create Template command works.

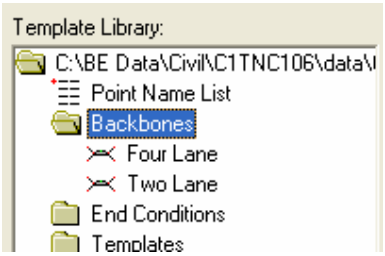
1. From the InRoads menu go to **Modeler>Create Template**.
2. When the Create Template command opens you will see in the left had pane what template library is loaded.



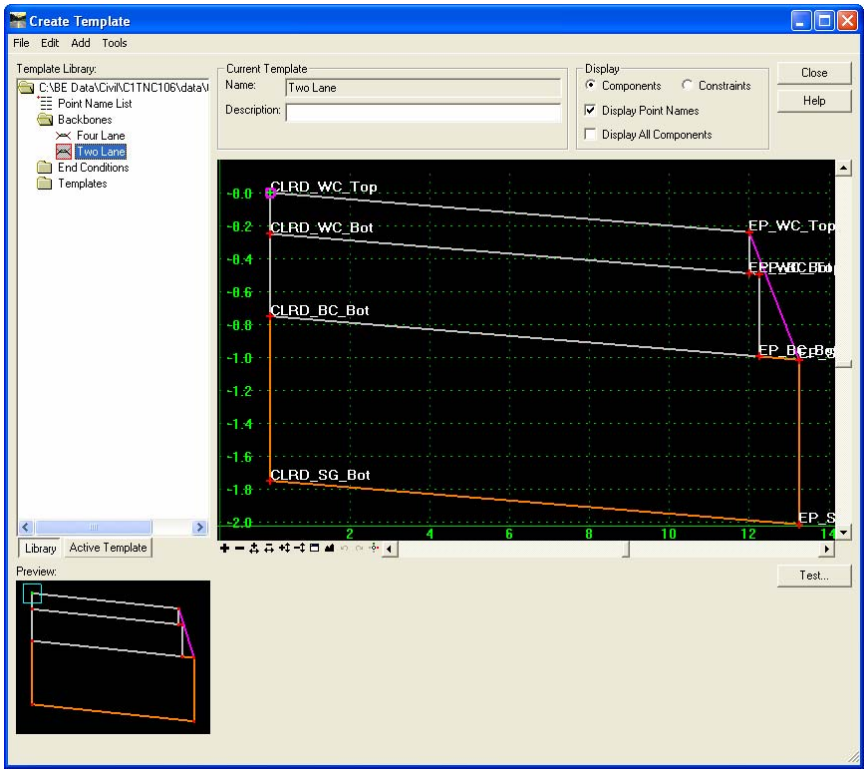
3. **Double click** on the library name to expand it. You should now see three folders called *Backbones, End Conditions*, and *Templates*.



4. **Double click** on the **Backbones** folder. You should now see two different backbones.



5. **Double click** on the backbone called **Two Lane**. You should now see the backbone in the right hand window.



6. **Double click** on the **End Condition Folder** and then double click on each end condition.

7. **Double click** on **Fill_With_Ditch** and select the **Test** button on the lower right side of the Create Template dialog.

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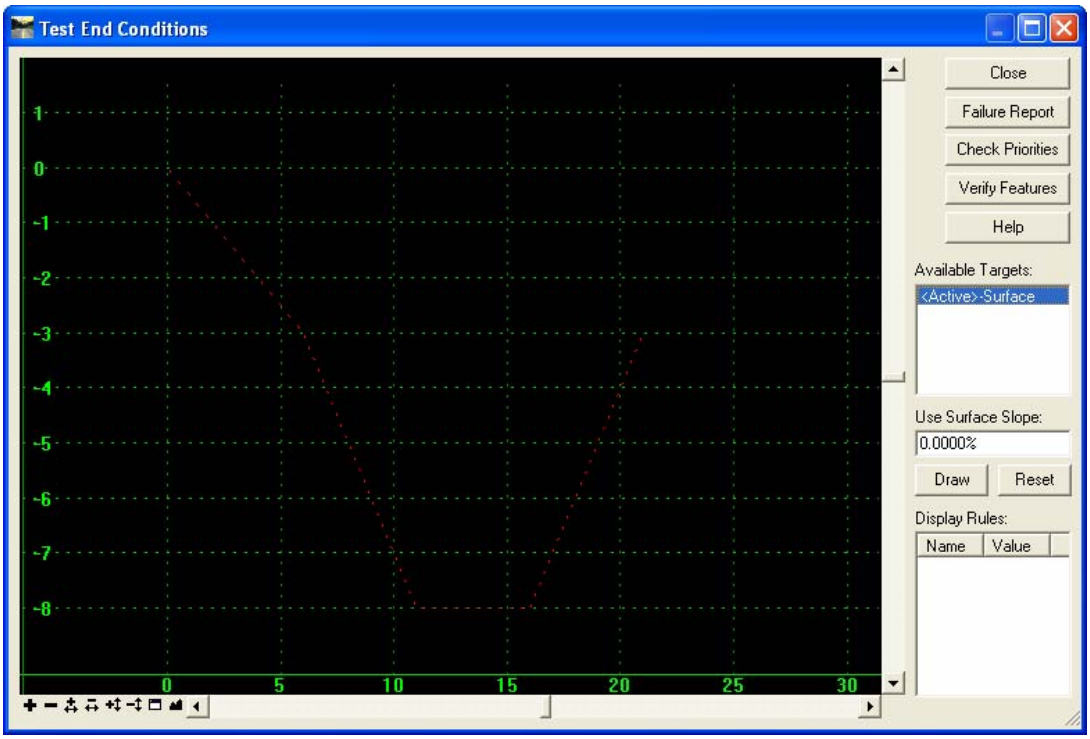
8. When the Test End Condition dialog appears enter ***-10%*** in the **Use Surface Slope** field.



9. Select the **Draw** button and move your cursor around in the window. Note what the end condition is doing.
10. Select **Reset**.
11. Change the **Use Surface Slope** field to ***10%*** and select the **Draw** button again and see how the end condition reacts.
12. **Close** the **Test End Conditions** dialog.

LESSON NAME: BUILDING TEMPLATES

LESSON OBJECTIVE:

This lesson will take you through how you would build a temple with the Create Template command.
On-Line Help Topic: Search on “Create Template”

> ***EXERCISE: BUILDING TEMPLATES***

This exercise will take you through how templates are built and how the new Create Template command works.

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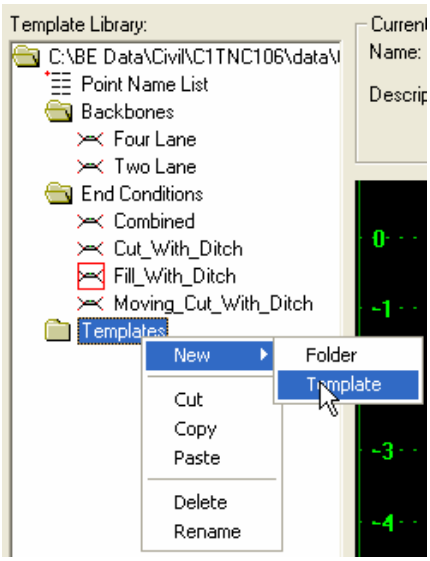
1. **Right click** on the **Templates** folder and select **New** and then **Template**.



2. When the template is created type in the name ***2Lane*** and then press the Enter key. You now have a template called 2Lane, however, it is an empty template.
3. From the menu on the **Create Template** dialog select **Tools>Dynamic Settings**
4. When the **Dynamic Settings** dialog appears set the **X** and **Y** Step to **0.1**. Leave this dialog up but move it over to the side.
5. From the menu on the **Create Template** dialog select **Tools>Options.**
6. When the **Options** dialog appears turn on the **Apply Affixes** and key in the following:

   Left Prefix: *L_*

   Right Prefix: *R_*

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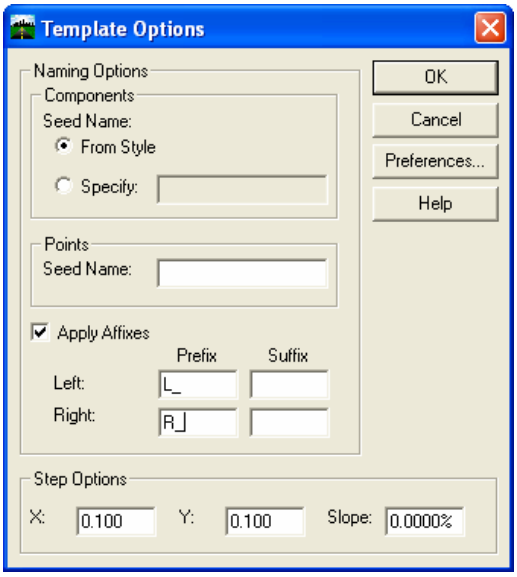
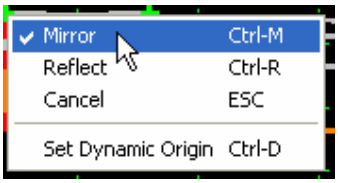


7. Select **OK**.
8. Drag the **Two Lane** template from the **Backbone** section of the **Template Library**.
9. While holding the left mouse button down **click the right mouse** button and select **Mirror** if it is not already checked.



10. Make sure the green cross hairs line up inside the small square and then let go of the left mouse button. Your new template should look like the following.

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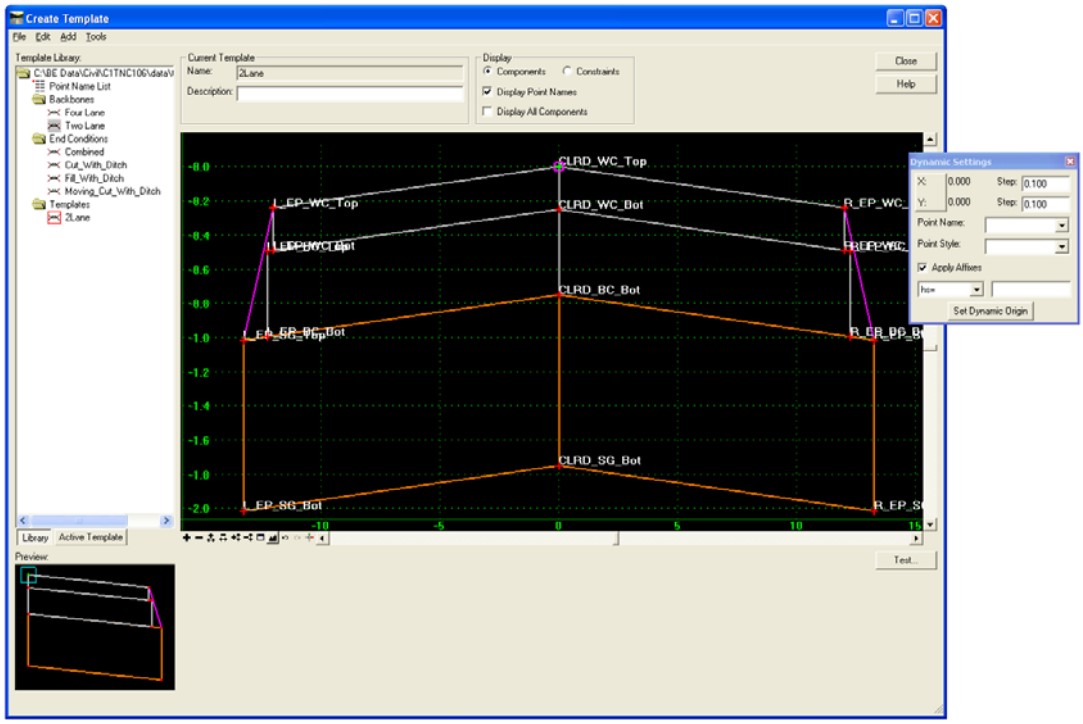
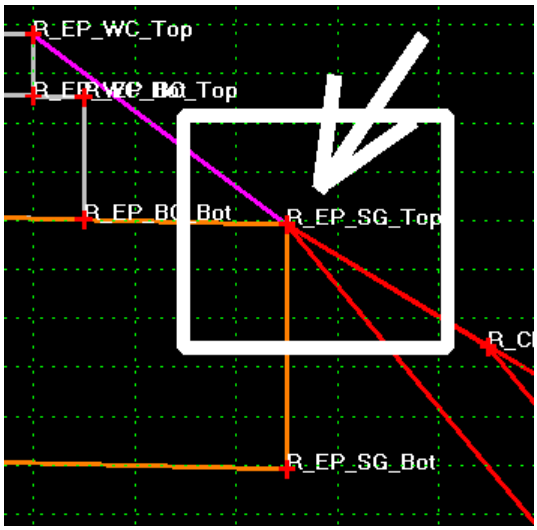


Hint If you make a mistake you can select Edit>Undo to back up.

11. Next drag and drop the **Combined** end condition onto the top right point of the subgrade.



12. Test the template.
13. **Right click** on the vertical lines between the left and right backbone and select **Merge Components**.

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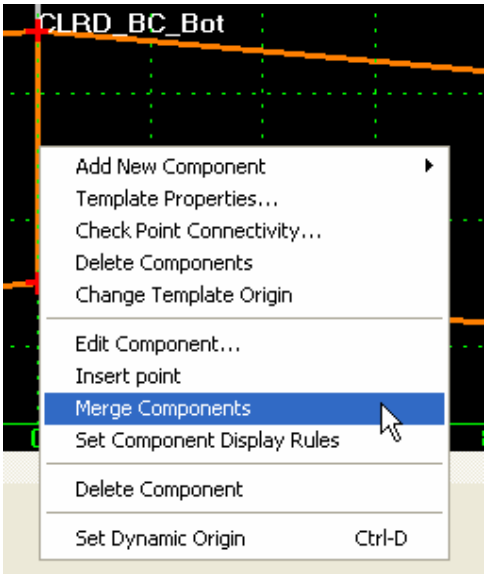


14. Now you have a finished template.
15. Create a **4Lane** template using the **Four Lane** backbone and the **Combined** end condition.

LESSON NAME: BUILDING A CORRIDOR

LESSON OBJECTIVE:

This lesson will take you through how to setup and apply the templates that you built to a corridor.

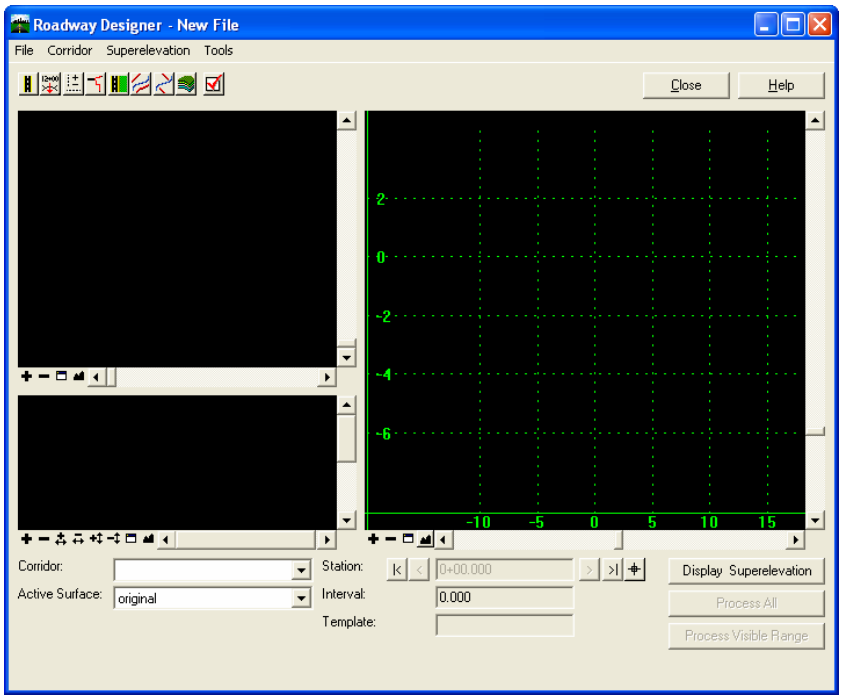
On-Line Help Topic: Search on “Roadway Designer”

> ***EXERCISE: BUILDING CORRIDORS***

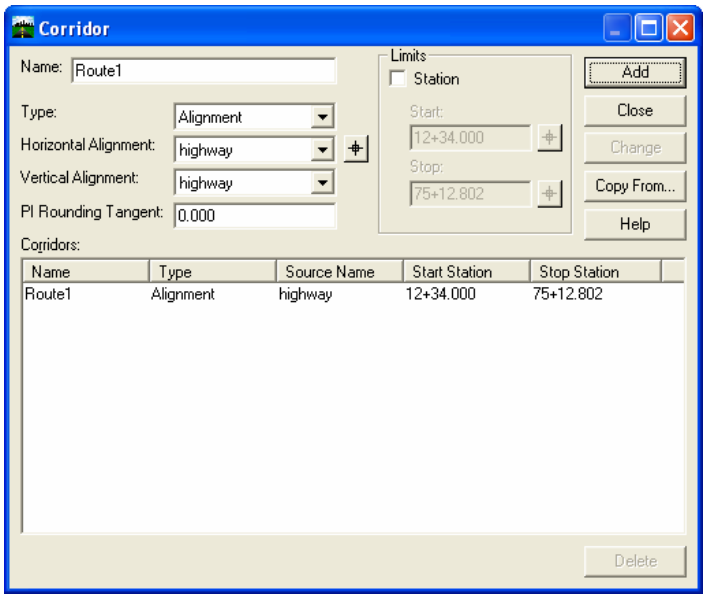
This exercise will take you through setting up a corridor in Roadway Designer.

1. From the InRoads menu go to **Modeler>Roadway Designer**.

When the Roadway Designer opens you will see three panes in the window. The top left pane is the plan view. The bottom left is the profile view. The right pane is the cross section view.



2. To create a corridor select **Corridor>Corridor Management** from the menu on the **Roadway Designer**.
3. Enter ***Route1*** in the **Name** field and select **Add**.



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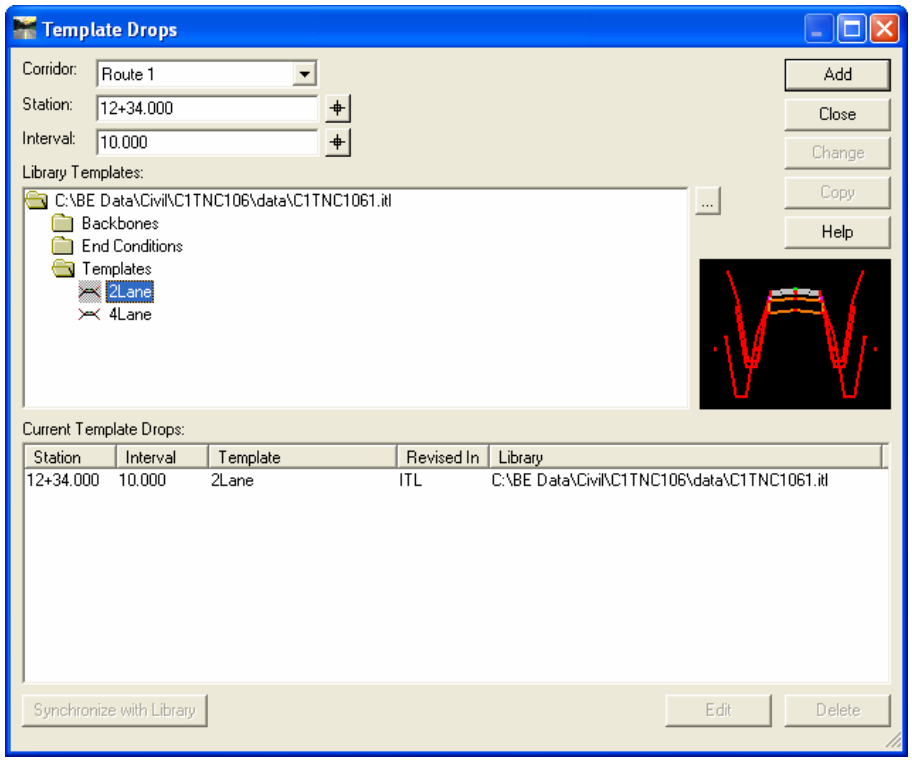
4. **Close** the **Corridor Management** dialog.
5. On the **Roadway Designer** dialog click the **Fit** on the plan and profile panes. You should now see the plan view of the alignment and the profile view of it.
6. To apply templates to the corridor go to **Corridor>Template Drops**.
7. Key in ***12+34*** in the **Station** field for the first station.
8. Set the **Interval** to ***10.00***.
9. Expand the **Library Templates** tree and highlight the **2Lane** template you created.
10. Select **Add**.



11. Key in station ***25+00*** and select the **2Lane** template again and select **Add**.
12. Add the following template drops:

    Station *30+00* **Template: *4Lane***

    Station *55+00* **Template: *4Lane***

    Station *60+00* **Template: *2Lane***
13. **Close** the **Template Drops** dialog.
14. Select the **Process All** button.

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LESSON NAME: TEMPLATE TRANSITIONS

LESSON OBJECTIVE:

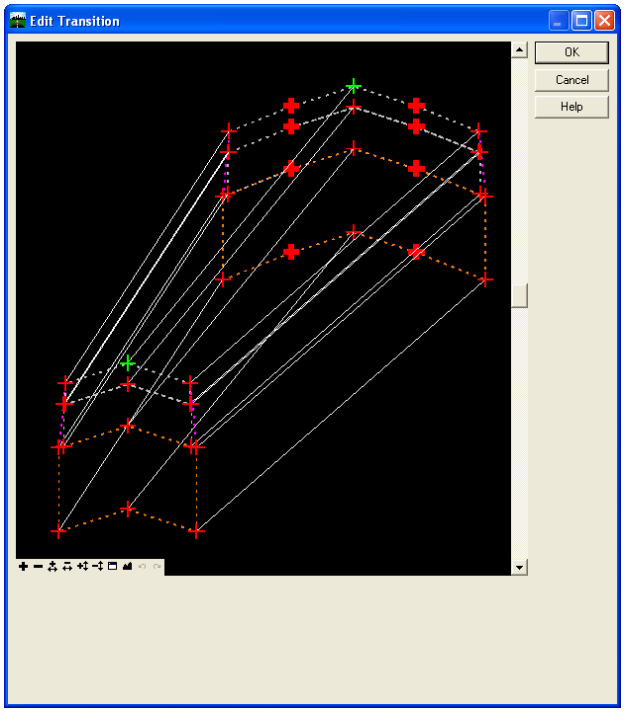
This lesson will take you through how to handle template transitions that you defined in the corridor.

On-Line Help Topic: Search on “template transitions”

> ***EXERCISE: TEMPLATE TRANSITIONS***

This exercise will take you through defining template transitions. The reason you will need to define transitions is because when transitioning between one template and a template that has more segments in it the Roadway Designer does not know how to connect the segments. This is because there may be more than one way to connect them.

1. From the **Roadway Designer** double click on the west yellow shape in the plan view. This will bring up the **Edit Transition** dialog.



2. To edit the transitions **click** on the bolded tic mark and then connect it to the desired transition location by clicking on it.

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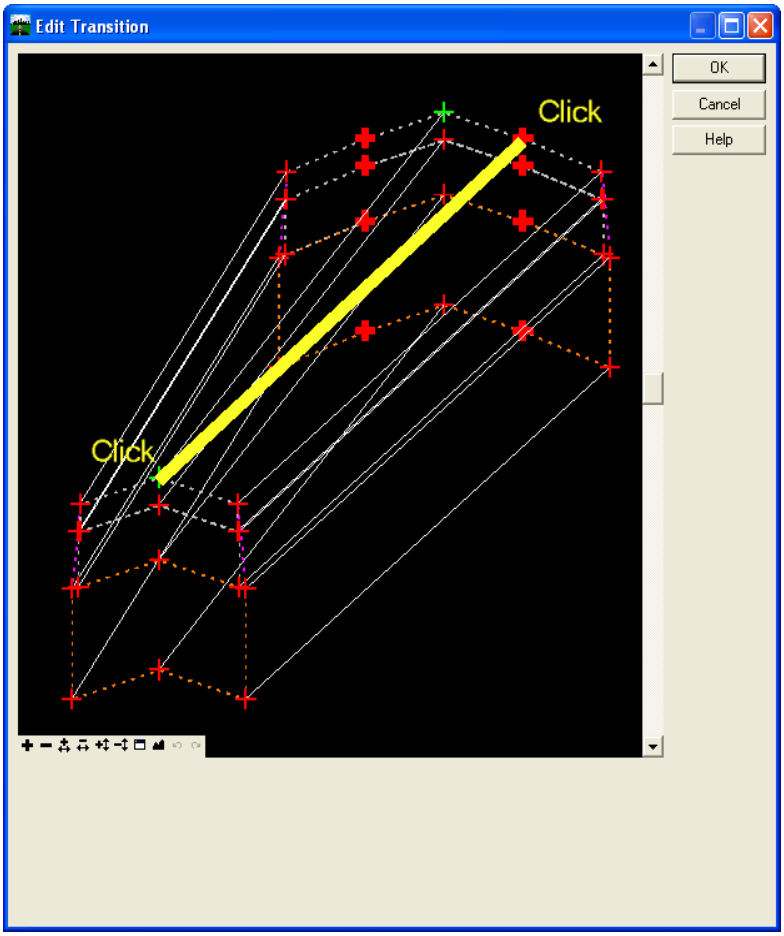

3. Finish defining the transitions.
4. Select **OK**.
5. Now you see the cross section view that is half way trough the transition.
6. At the bottom of the **Edit Transition Midpoint** dialog you will see a slider bar. Try moving the bar to the left and right. Is anything happening?

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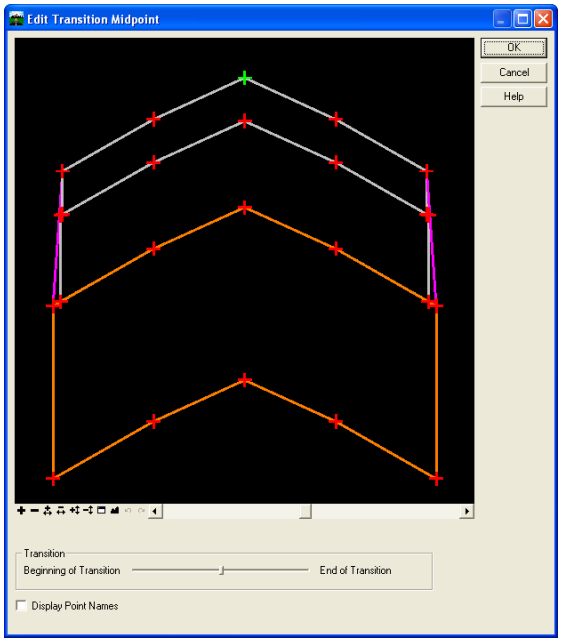
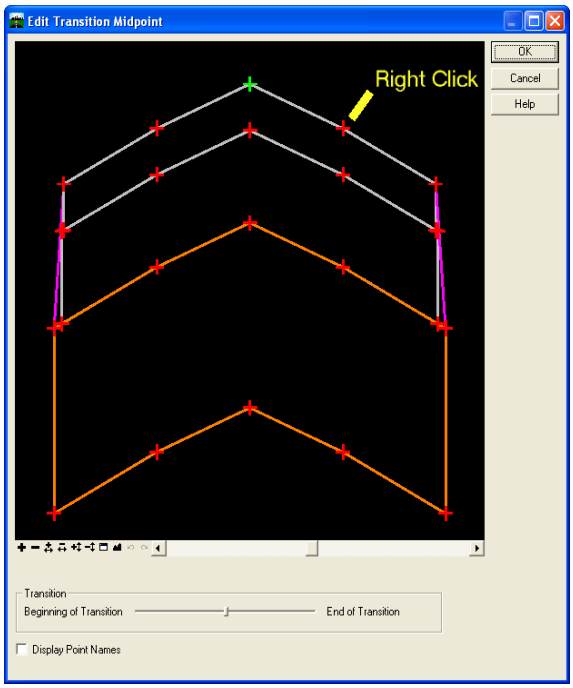
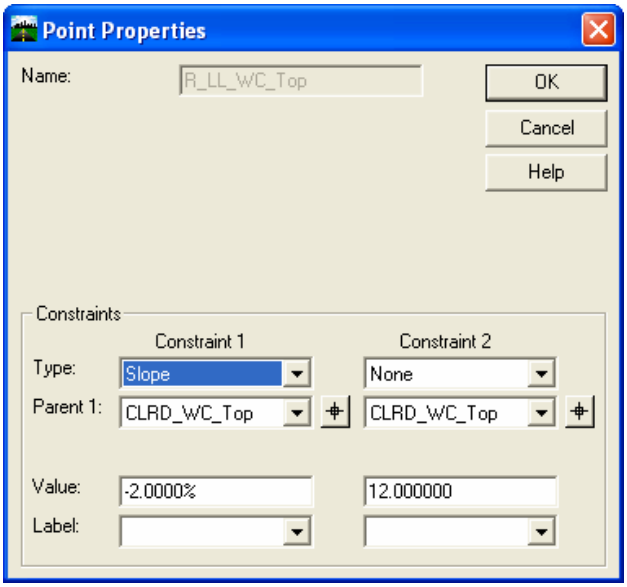


7. The reason nothing is happening is because of the constraints on the template points. To modify the constraints **right click** on the right lane line point and select **Edit point**.



8. In the **Point Properties** dialog set the **Constraint 2** to **None**.



9. Select **OK**.
10. Try sliding the **Transition** bar again. What is happening?
11. Correct the constraint on the left lane line point.
12. When completed click **OK** on the **Edit Transition Midpoint** dialog.
13. Correct the west transition with the same steps as above.

LESSON NAME: EXAMINING THE CORRIDOR

LESSON OBJECTIVE:

This lesson will take you through how to navigate through the corridor.
On-Line Help Topic: Search on “Roadway Designer”

> ***EXERCISE: CORRIDOR NAVIGATION***

This exercise will take you through the navigation tools in the Roadway Designer.

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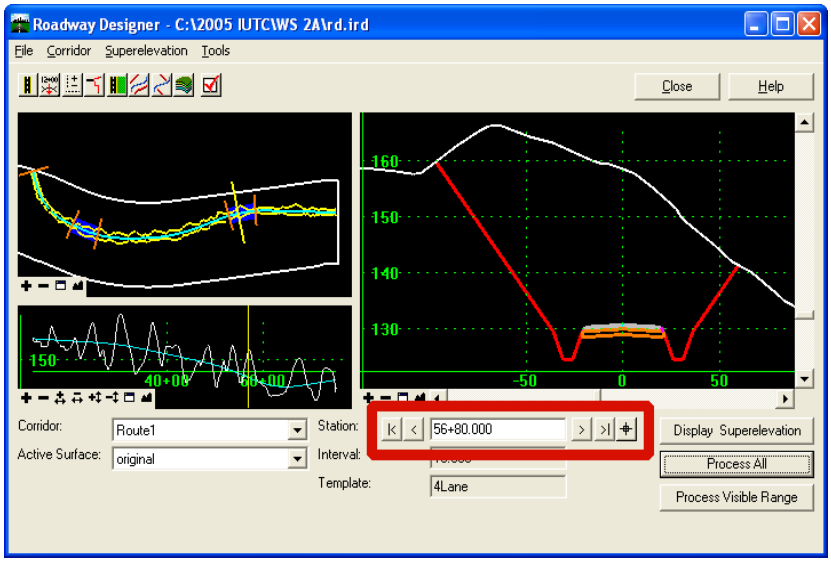
1. From the **Roadway Designer** click on the Process All button.
2. At the bottom of the Roadway Designer dialog there is a station value with advancing arrows on either side of it.



3. Clicking on the arrows move along the stations.
4. Notice in the plan view and the profile view there is a yellow line across the alignment and the profile. This line represents where the cross section view is.
5. Double click in the plan view. Notice that the line moved to the place on the alignment that was orthogonal to your double click.
6. Try the same in the profile view.
7. Now using your left mouse button click and hold on the yellow line in the plan view and drag it along the alignment.
8. Try the same in the profile view.

LESSON NAME: SUPERELEVATION

LESSON OBJECTIVE:

This lesson will take you through how to setup superelevation.
On-Line Help Topic: Search on “Superelevation”

> ***EXERCISE: SUPERELEVATION***

This exercise will take you through defining and setting up superelevation.

1. On the **Roadway Designer** click the **Display Superelevation** button on the bottom right of the dialog.

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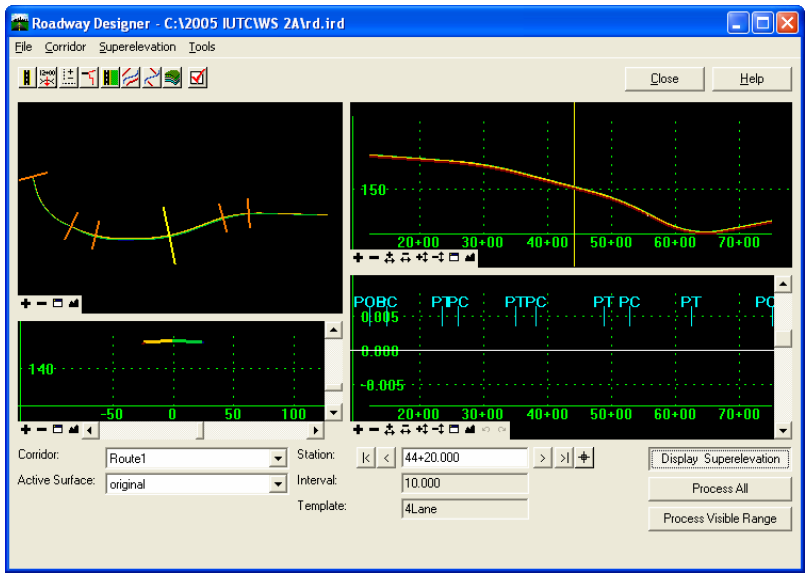
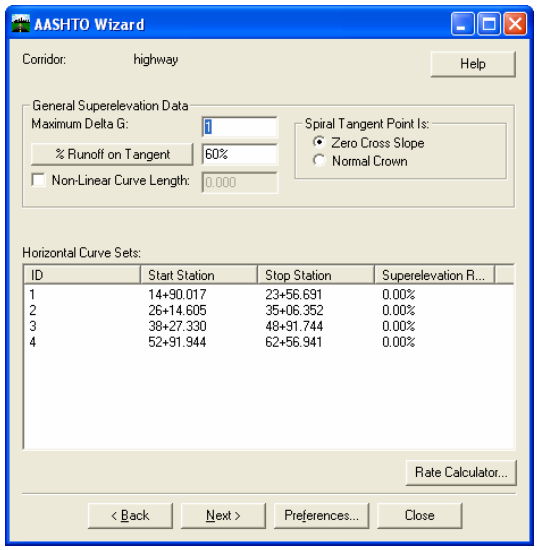
2. The top left pane is the plan view. The bottom left pane is the cross section view. The top right pane is the profile view and the bottom right pane is the superelevation diagram.



3. To set up super elevation we must first calculate the superelevation rates. **Right click** on the superelevation diagram pane and select **Create Superelevation Wizard>AASHTO**. This will bring up the **AASHTO Wizard**.



4. First we need to compute the rates. **Click** the **Rate Calculator** button.
5. When the **Rate Calculator** appears **Edit** each record and set the design speed to **55**.

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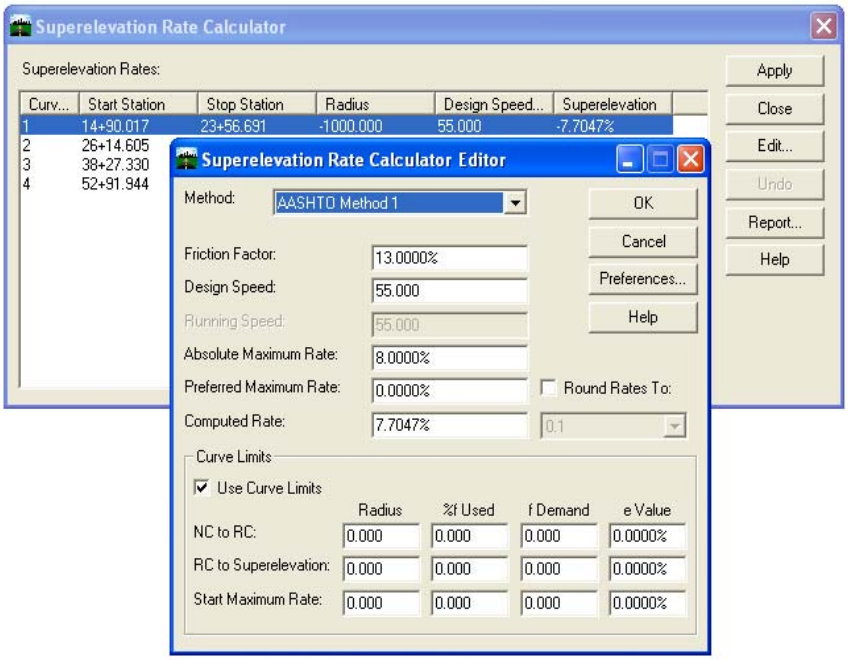

6. When editing is complete select **Apply** and then **Close**. You will be returned to the **AASHTO Wizard**.
7. **Move the yellow navigation line** to somewhere where the **2Lane** template exists.
8. Select **Next**.
9. Select **Add**.
10. When the **Add SuperElevation Section** dialog appears select the button beside the **Crown Point** field and select the crown point in the cross section view.
11. Do the same for the **Left Range Point** and **Right Range Point** by selecting the edges of pavement.
12. Turn on the **Station** toggle and key in the ***12+34*** for the **Start** and ***25+00*** for the **Stop**.

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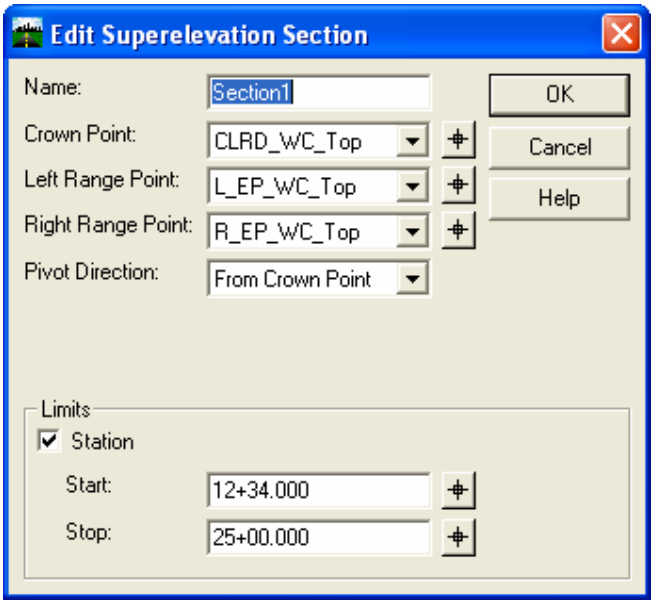

13. **Move the yellow navigation line** somewhere where the **4Lane** template exists.
14. Repeat the process for identifying the points and set the station range to **25+00** through **60+00**.
15. **Move the yellow navigation line** somewhere where the **2Lane** template exists.
16. Repeat the process for identifying the points and set the station range to **60+00** to **75+12.802**. Don't forget to move the yellow navigation line to the 2Lane section.
17. Your **Superelevation Section Definitions** should look as follows:

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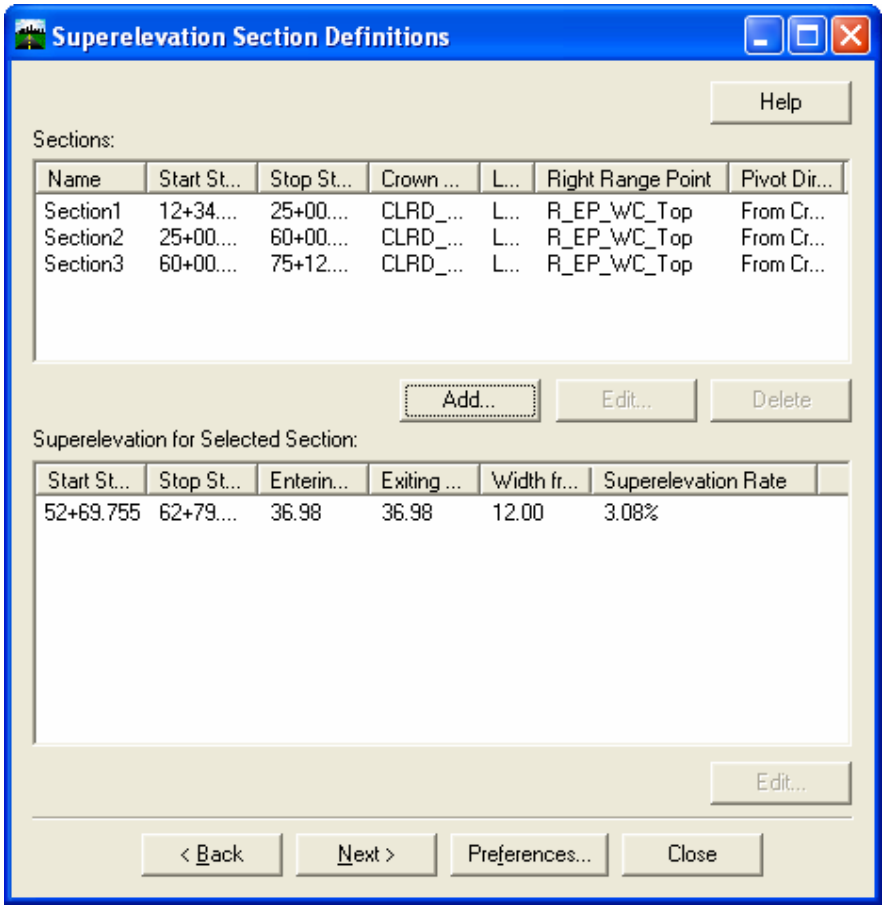

18. Select **Next**.
19. Select **Finish**.
20. Select **Process All**.
21. Spend some time navigating through the panes and looking at the model. Notice in the plane view that the cross slope is denoted by colors.

LESSON NAME: GENERATING A SURFACE MODEL

LESSON OBJECTIVE:

This lesson will take you through how to generate a surface from your roadway design.
On-Line Help Topic: Search on “Create Surface”

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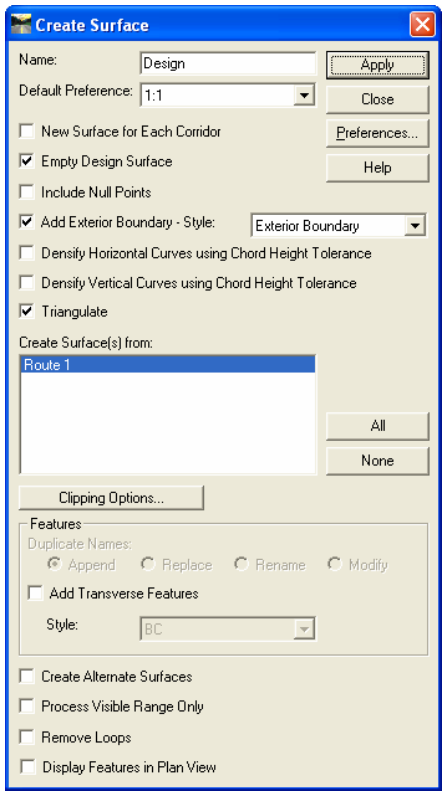
> ***EXERCISE: CREATE SURFACE***

This exercise will take you through defining and setting up the Create Surface command.

1. On the **Roadway Designer** click the **Corridor>Create Surface**.
2. Set or enter the following values:

Name:	***Design***
Empty Design Surface:	***On***
Add Exterior Boundary:	***On***
Style:	***Exterior Boundary***
Triangulate:	***On***



3. Click **Apply**.
4. Click **Close**.
5. **Collapse** the **Roadway Designer**.
6. From the **InRoads menu** select **Surface>View Surface>Features**.
7. Set the **Surface** to **Design.**
8. Click **Apply**.

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9. Click **Close**.
10. Using **MicroStation** examine the features displayed in the DGN file.

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