2009 Roads and Bridges Conference

EW-2

Introduction to Roadway Designer (InRoads/GEOPAK)

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LESSON NAME: OPENING A PROJECT (INROADS USER)

LESSON OBJECTIVE:

In this lesson the student will learn to access an InRoads project in preparation for designing a model in Roadway Designer. Note, this lesson is for InRoads users only. For GEOPAK users, please proceed to the next lesson on the next page.

EXERCISE: GETTING STARTED (INROADS USER)

This exercise will guide you through the steps to get started

1. Go to **Start > Programs > Bentley > InRoads Group V8*i* (SELECTseries 1) > InRoads Suite**.
2. The instructor will provide the appropriate path location for this project. When the MicroStation Manager appears select the file:

   Plan.dgn and click **OK**.
3. When the InRoads Explorer appears, go to **File > Open** from the InRoads menu.
4. When the Open dialog appears select the InRoads project file:

   My_Project.rwk and click **OK**.

   Opening the *RWK* project file opens the following files:

   CMJOB001.alg
   Templates.itl
   Original.dtm
   Default_Styles.xin
5. Select **Modeler > Roadway Designer** from the InRoads Explorer menu to access Roadway Designer.

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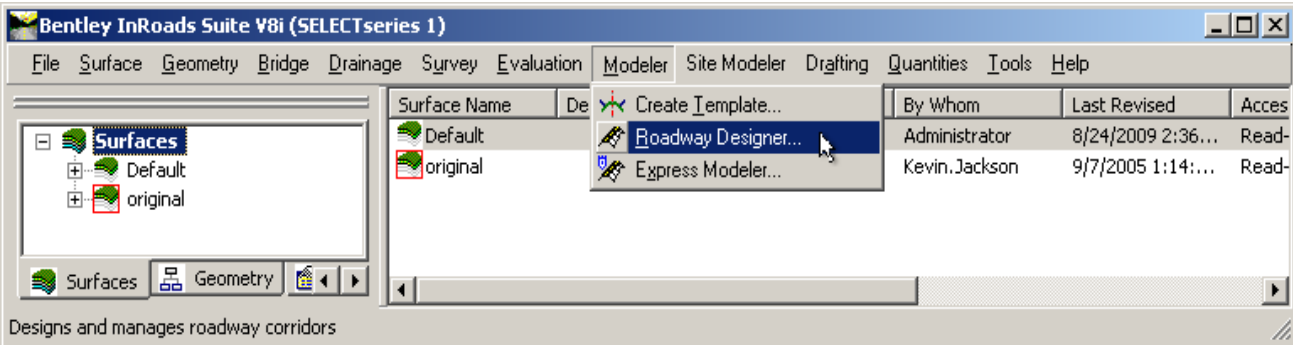
Bentley InRoads Suite V8i (SELECTseries 1)
File Surface Geometry Bridge Drainage Survey Evaluation Modeler Site Modeler Drafting Quantities Tools Help
Surfaces
Default
original
Surfaces Geometry
Surface Name
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Create Template...
Roadway Designer...
Express Modeler...
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8/24/2009 2:36...
Read-
Kevin.Jackson
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Read-
Designs and manages roadway corridors

LESSON NAME: OPENING A PROJECT (GEOPAK USER)

LESSON OBJECTIVE:

In this lesson the student will learn to access a GEOPAK Corridor Modeler project in preparation for designing a model in Roadway Designer. Note, this lesson is for GEOPAK users only.

EXERCISE: GETTING STARTED (GEOPAK USER)

This exercise will guide you through the steps to get started

1. Go to **Start > Programs > Bentley > MicroStation V8*i* > Bentley MicroStation V8*i* (SELECTseries 1).**
2. The instructor will provide the appropriate path location for this project. When the MicroStation Manager appears select the file:

   Plan.dgn and press **OK**.
3. Go to **Applications > GEOPAK > Road > Corridor Modeling**.
4. Select the GPK job number **001**
5. Choose **File > Load** from the Corridor Modeling dialogue.
6. Load the Corridor Modeler project file entitled **My_Project.rdp**.
7. Choose the **Open Roadway Designer** icon from the Corridor Modeling dialogue to access Roadway Designer.

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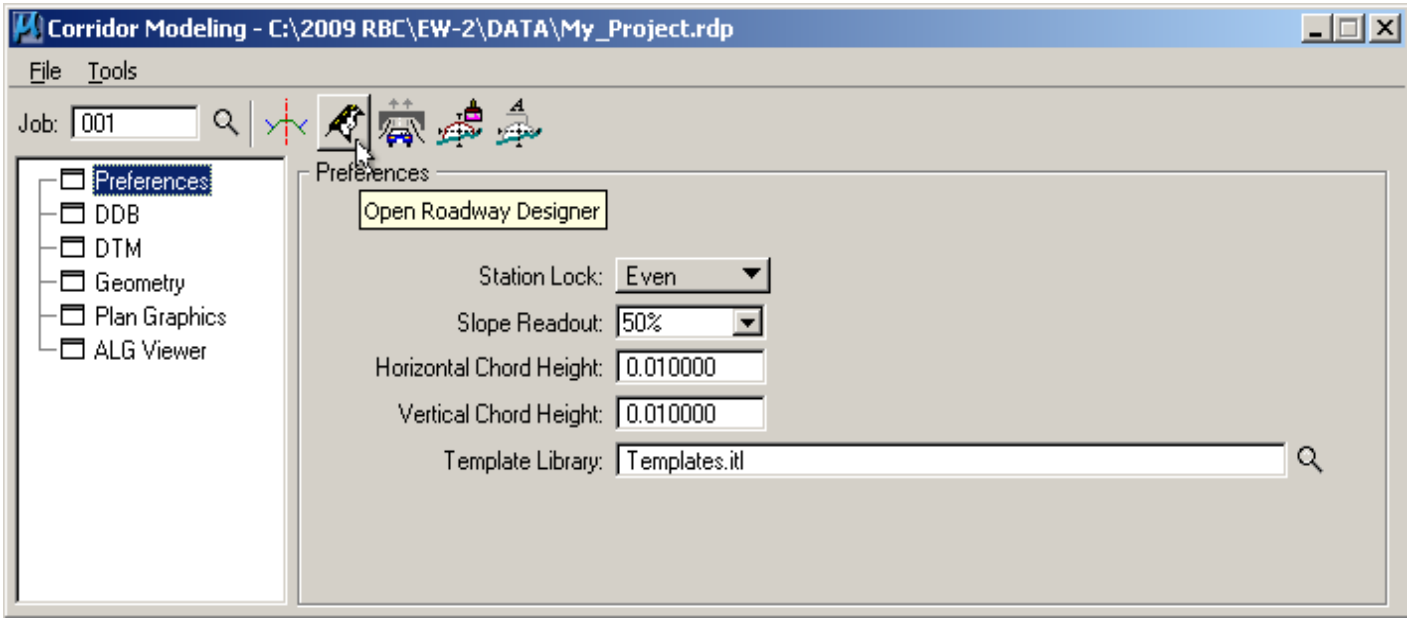

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LESSON NAME: BUILDING A CORRIDOR

LESSON OBJECTIVE:

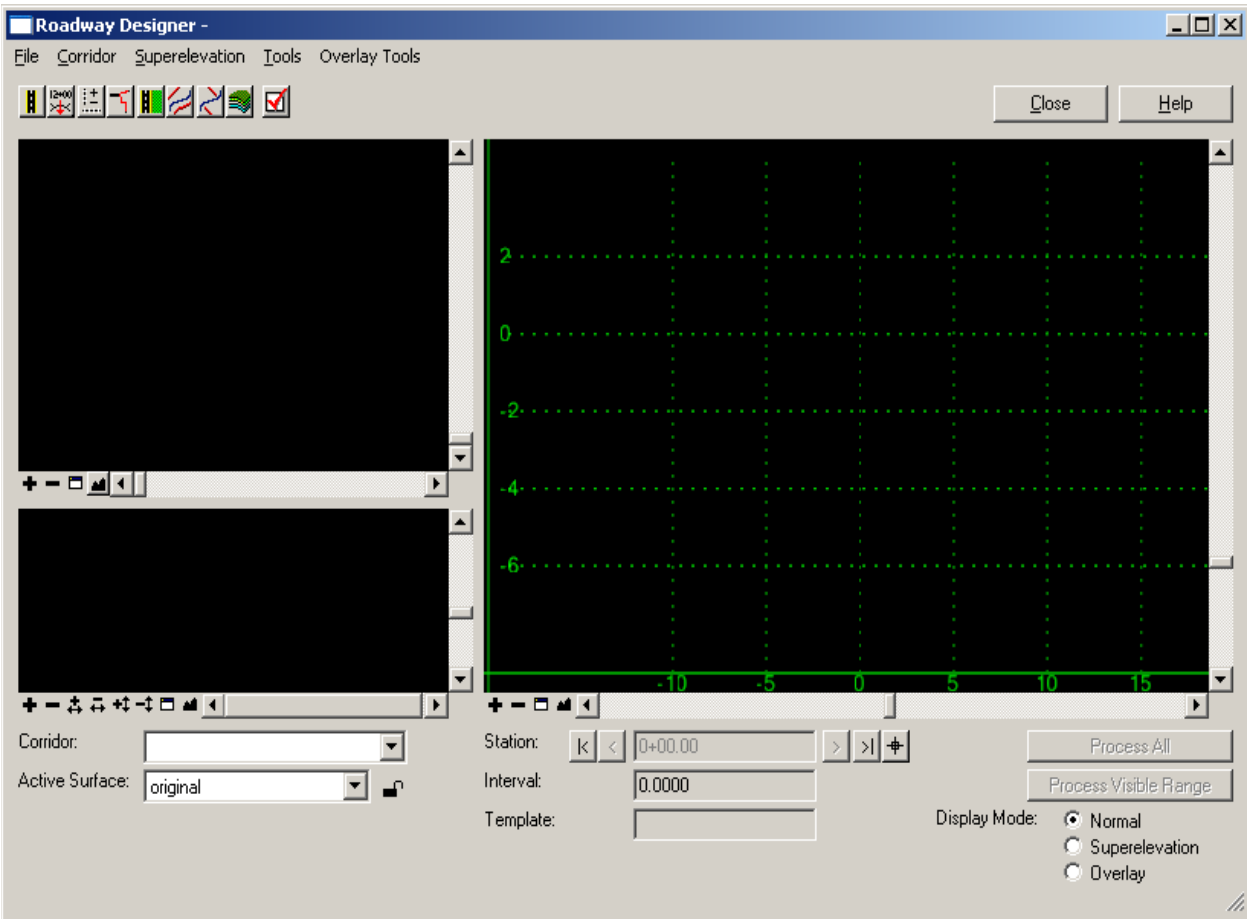
This lesson will take you through how to setup and apply templates to a corridor.

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. 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**.

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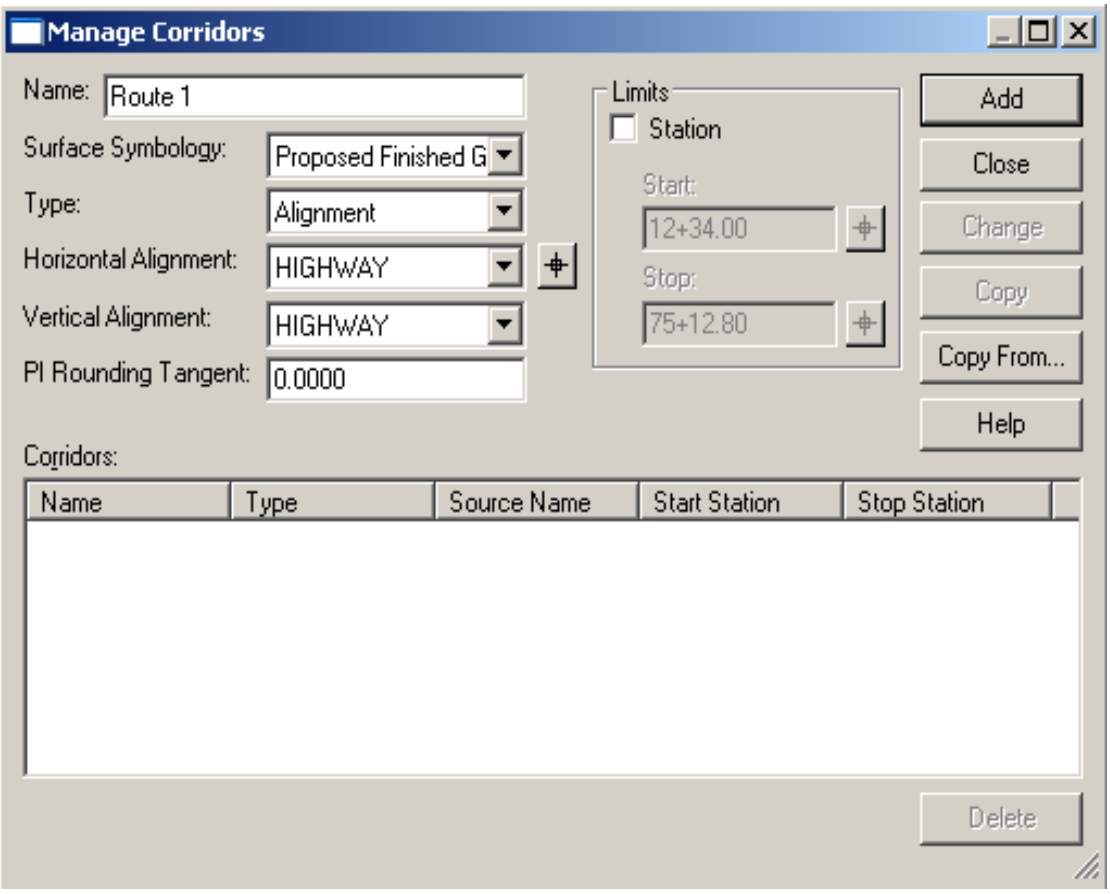
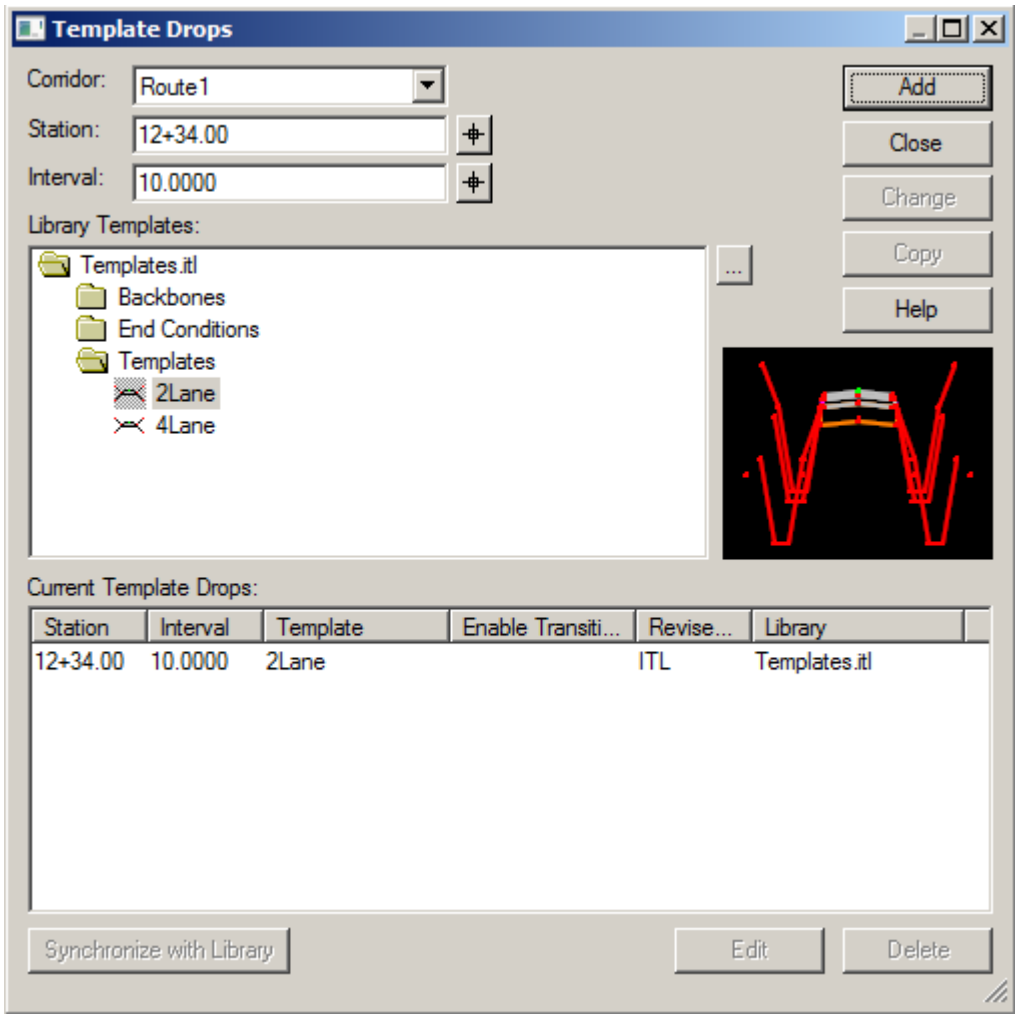
3. Select *Proposed Finished Grade* for the Surface Symbology. Key-in ***Route1*** in the **Name** field and click **Add**.



4. **Close** the **Corridor Management** dialog.
5. On the **Roadway Designer** dialog click the **Fit** on the profile pane. 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. Ensure that ***12+34*** is set for the **Station**.
8. Set the **Interval** to ***10.00***.
9. Expand the **Library Templates** tree and highlight the **2Lane** template.
10. Click **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.
15. In the Roadway Designer dialog select **File > Save** to save the Roadway Designer project file. Name the file **My_Project.ird**.

LESSON NAME: TEMPLATE TRANSITIONS

LESSON OBJECTIVE:

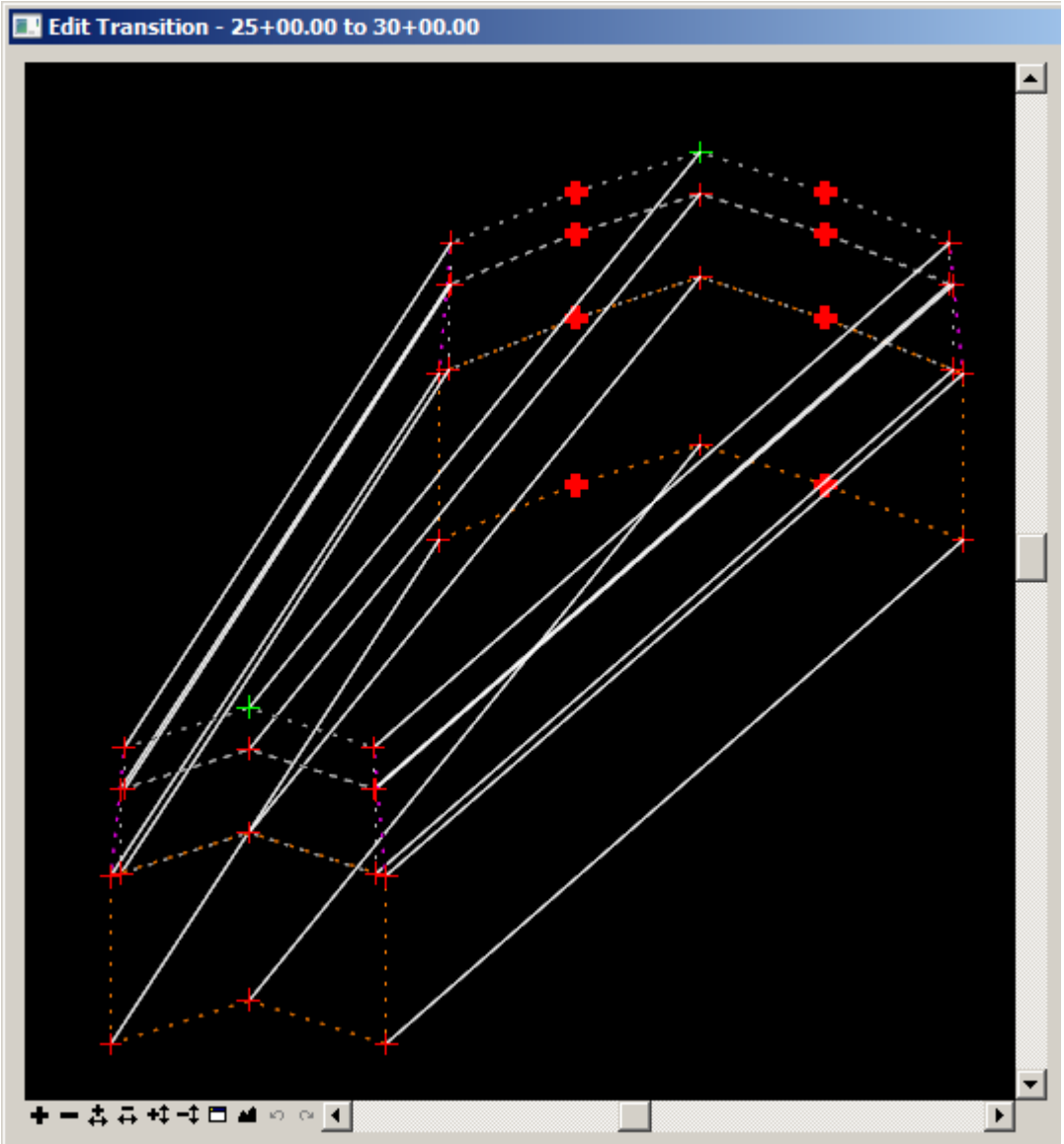
This lesson will take you through how to handle template transitions that you defined in the corridor.

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.

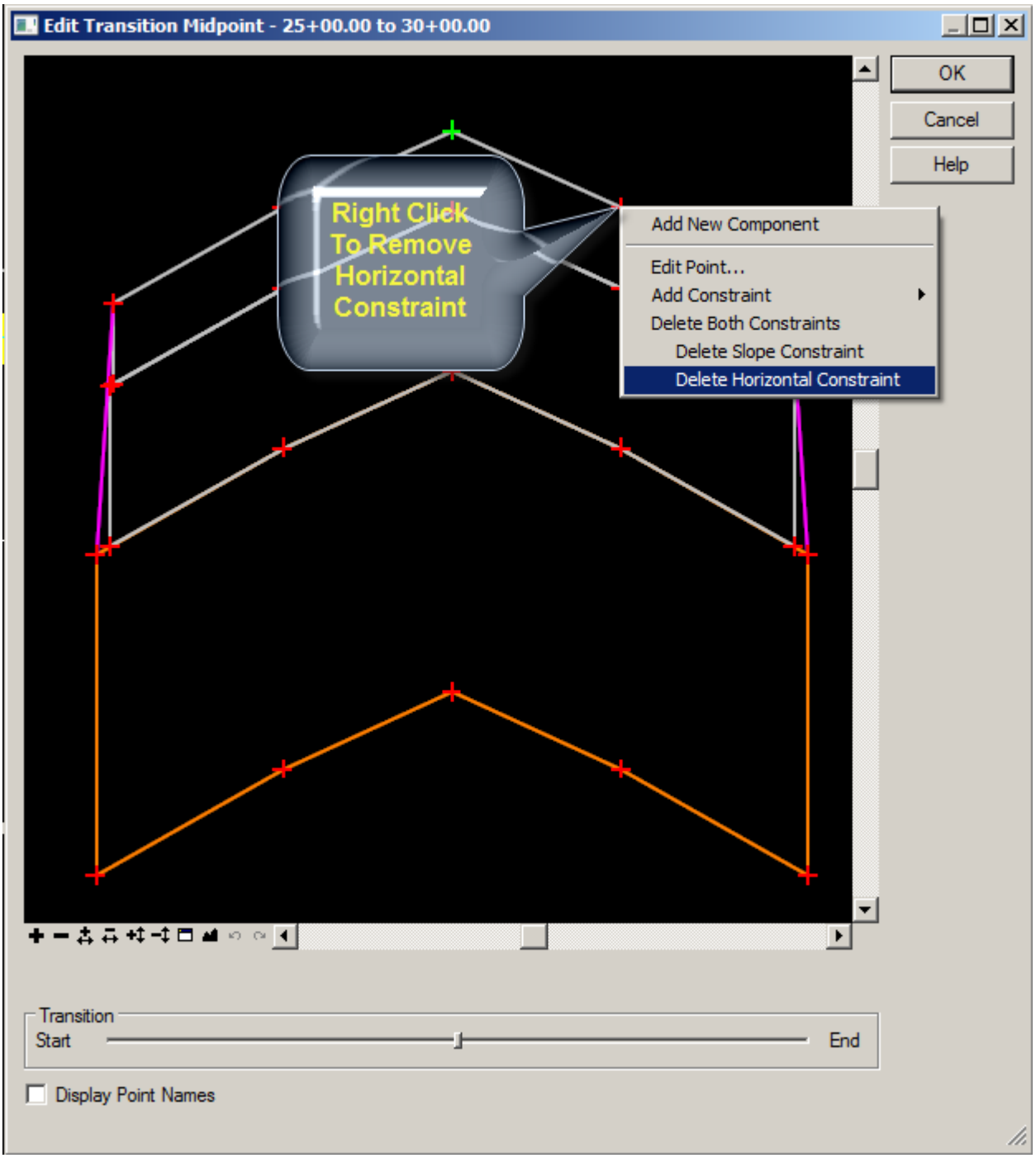
1. From the **Roadway Designer** double click on the west yellow shape in the plan view. This will bring up the **Edit Transition** dialog.



2. To edit the transitions **click** on the bolded tic mark and then connect it to the desired transition location by clicking on it (the center points of the first template).
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?

   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**.



7. Try sliding the **Transition** bar again. What is happening?

8. Correct the constraint on the left lane line point.
9. When completed click **OK** on the **Edit Transition Midpoint** dialog.
10. Correct the west transition with the same steps as above.
11. In the Roadway Designer dialog select **File > Save** to save the Roadway Designer project file updating from the previous save.

LESSON NAME: EXAMINING THE CORRIDOR

LESSON OBJECTIVE:

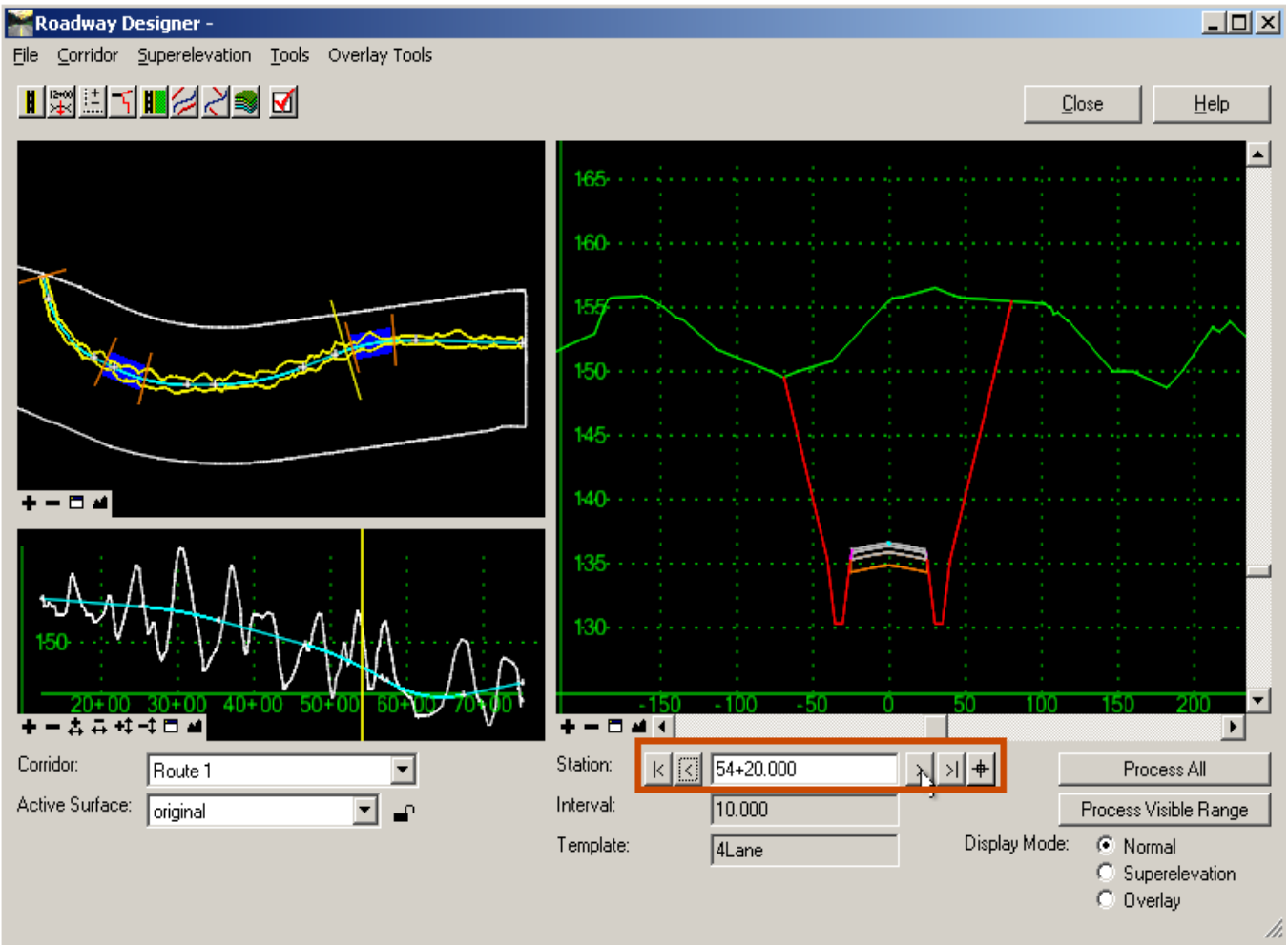
This lesson will take you through how to navigate through the corridor.

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

EXERCISE: CORRIDOR NAVIGATION

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

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.

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LESSON NAME: SUPERELEVATION (GEOPAK / INROADS USERS)

LESSON OBJECTIVE:

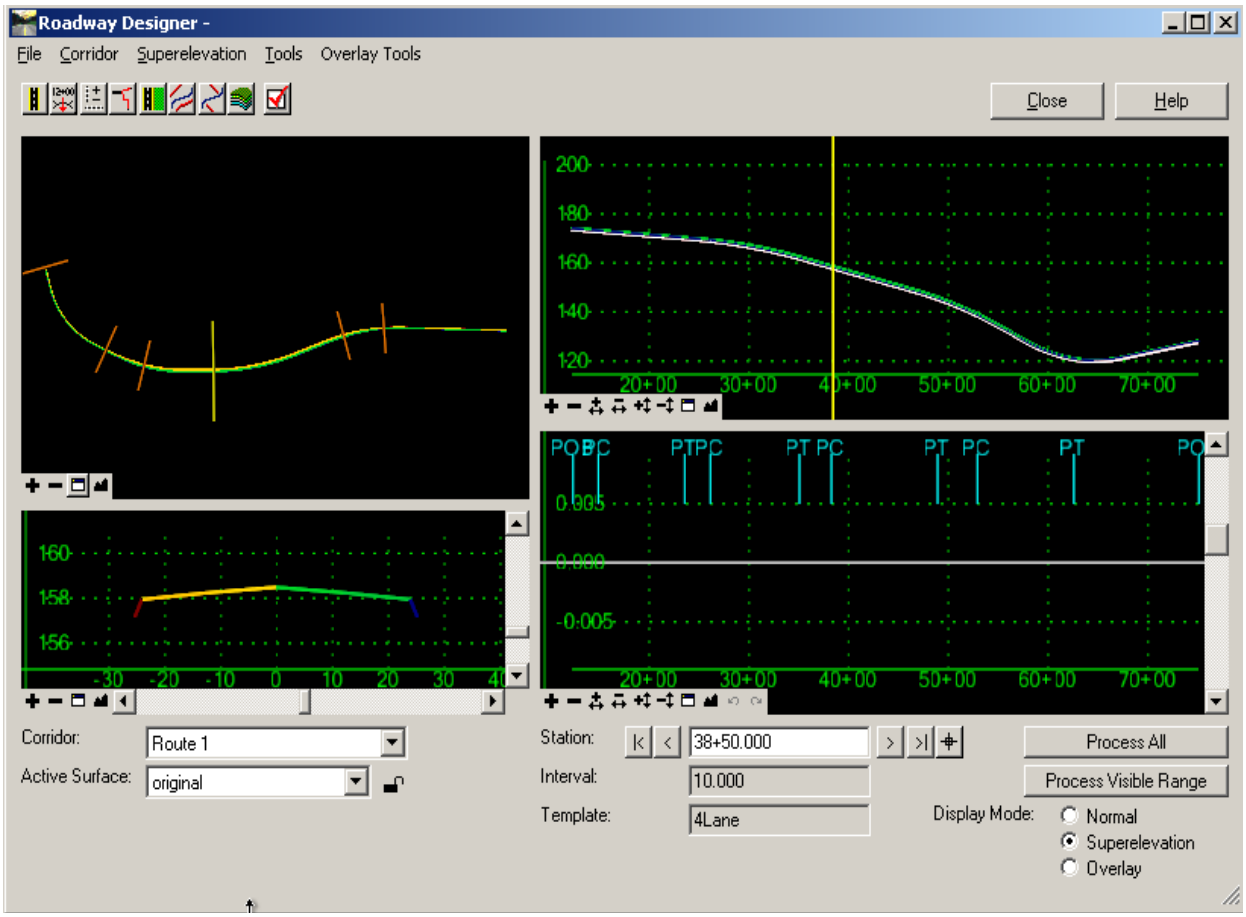
This lesson will take you through how to setup superelevation.

On-Line Help Topic: Search on “Superelevation”

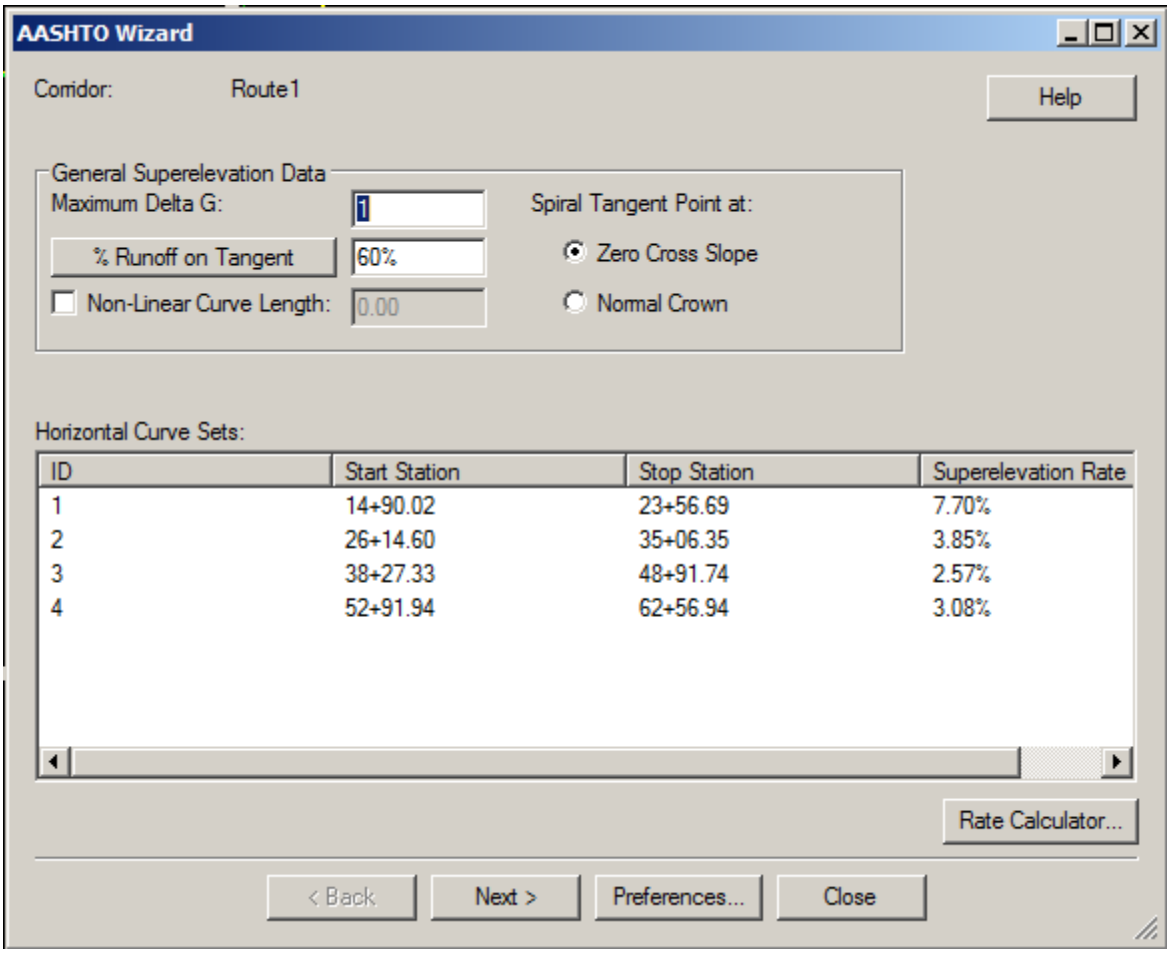
EXERCISE: SUPERELEVATION

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

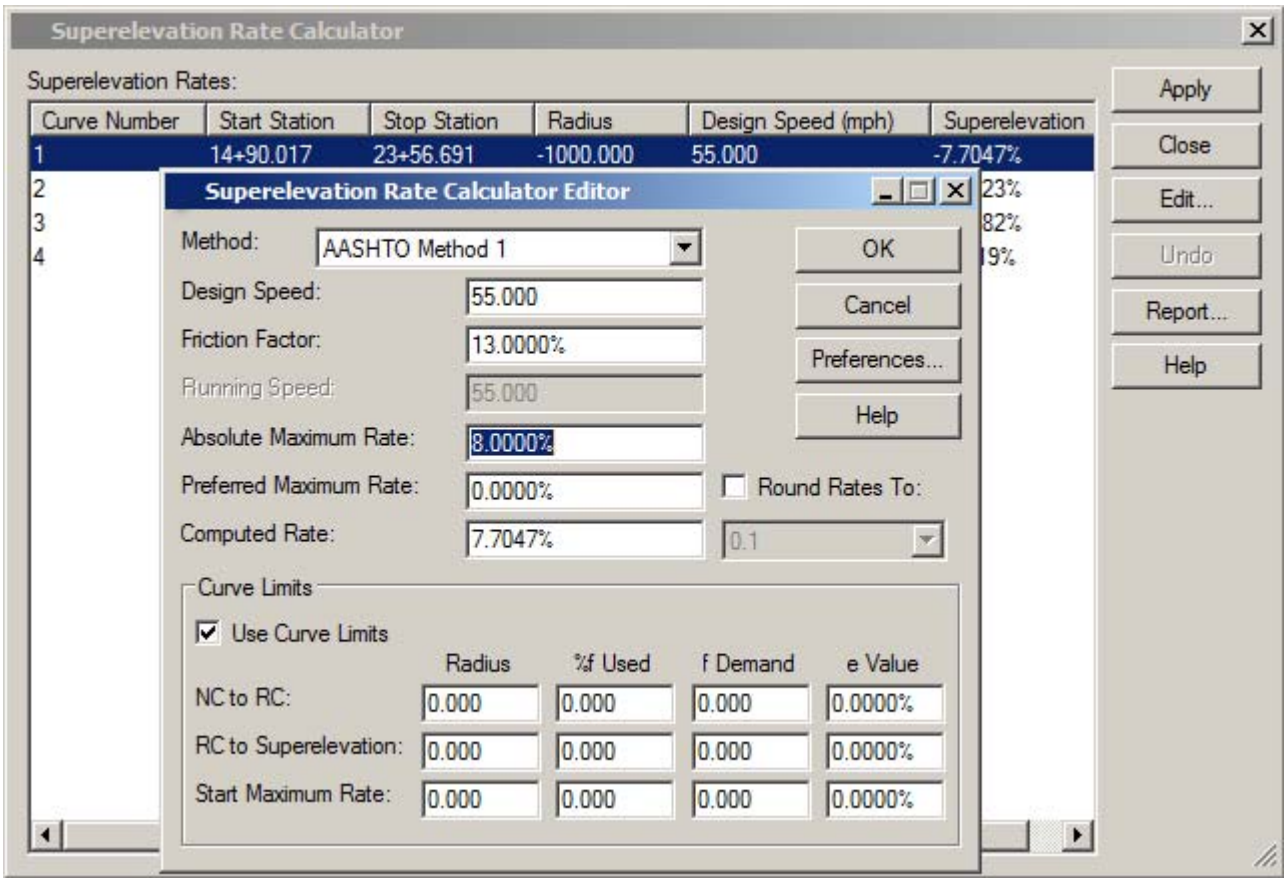
1. On the **Roadway Designer** click the Display Mode: **Superelevation** option in the on the bottom right of the dialog.
2. The top left pane is the plan view. The bottom left pane is the cross section view. The top right pane is the profile view and the bottom right pane is the superelevation diagram.



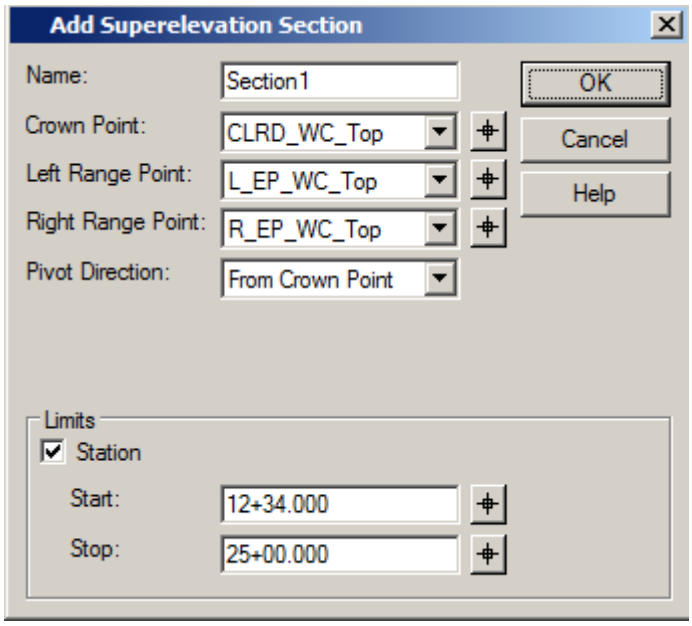
3. To set up super elevation we must first calculate the superelevation rates. **Right click** on the superelevation diagram pane and select **Create Superelevation Wizard > AASHTO**. This will bring up the **AASHTO Wizard**.



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**.



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**.



13. Click **OK** to add the first super elevation section.
14. **Move the yellow navigation line** somewhere where the **4Lane** template exists.
15. Repeat the process for identifying the points and set the station range to **25+00** through **59+99.99**.
16. **Move the yellow navigation line** somewhere where the **2Lane** template exists.
17. 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.

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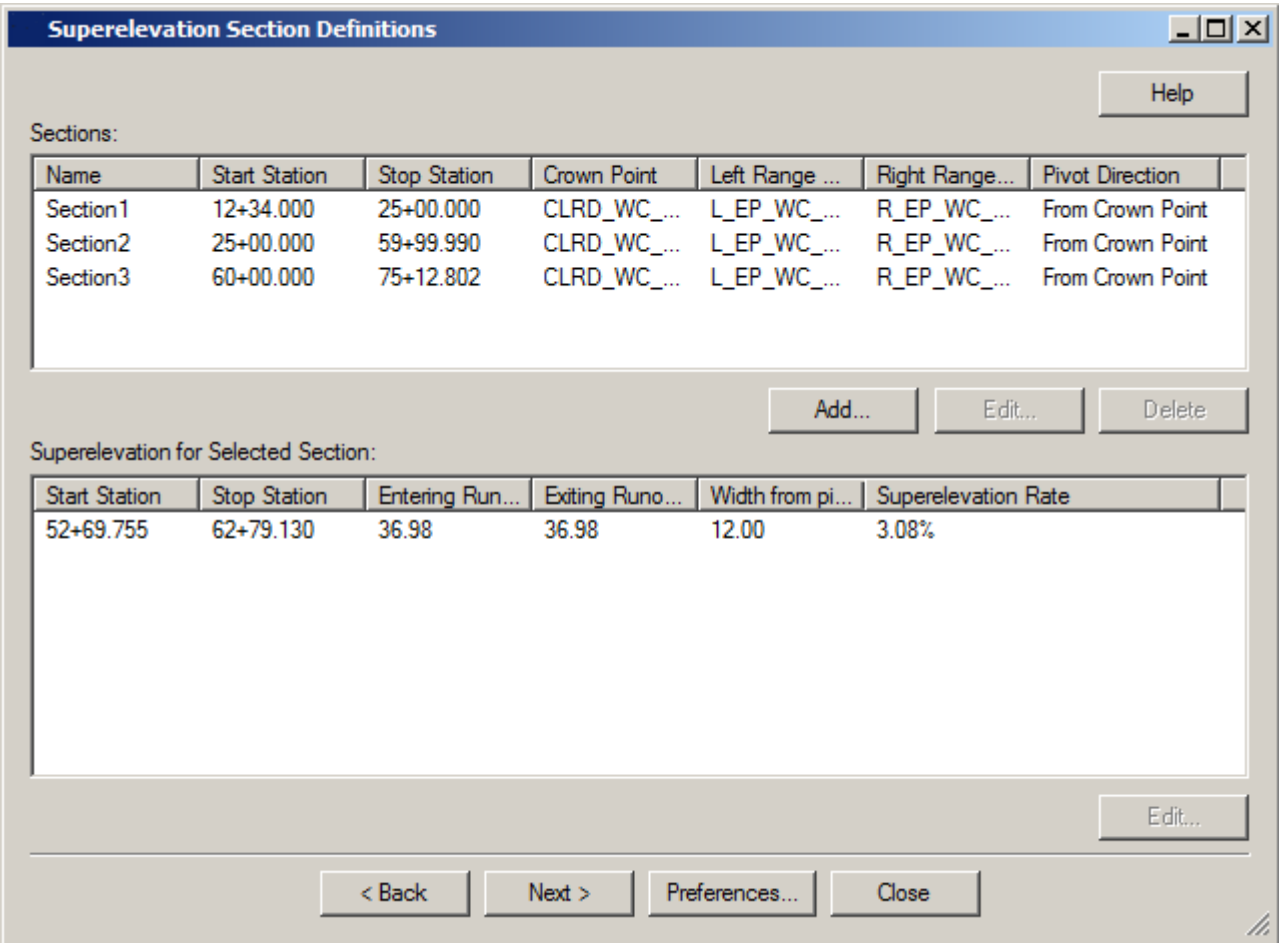

18. Select **Next**.
19. Select **Finish**.
20. Select **Process All**.
21. In the Roadway Designer dialog select **File > Save** to save the Roadway Designer project file updating from the previous save.
22. Spend some time navigating through the panes and looking at the model. Notice in the plan view that the cross slope is denoted by colors.

Note To GEOPAK Users: As an alternative to using the AASHTO superelevation Wizard, GEOPAK users can import a GEOPAK shapes input file to establish the super elevation control lines. The next exercise takes advantage of importing GEOPAK shapes input files as an alternative to the AASHTO Wizard. Regardless of which method is chosen by the GEOPAK user, only one method should be used for a project to avoid duplicate superelevation control lines.

Important: When using the AASHTO Wizard, additional options are available for editing the super elevation control lines once they are established. If however a GEOPAK user imports a shapes input file, they will be limited on their ability in accessing all of the available super elevation control line editing tools.

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LESSON NAME: SUPERELEVATION (ALTERNATIVE FOR GEOPAK USERS)

LESSON OBJECTIVE:

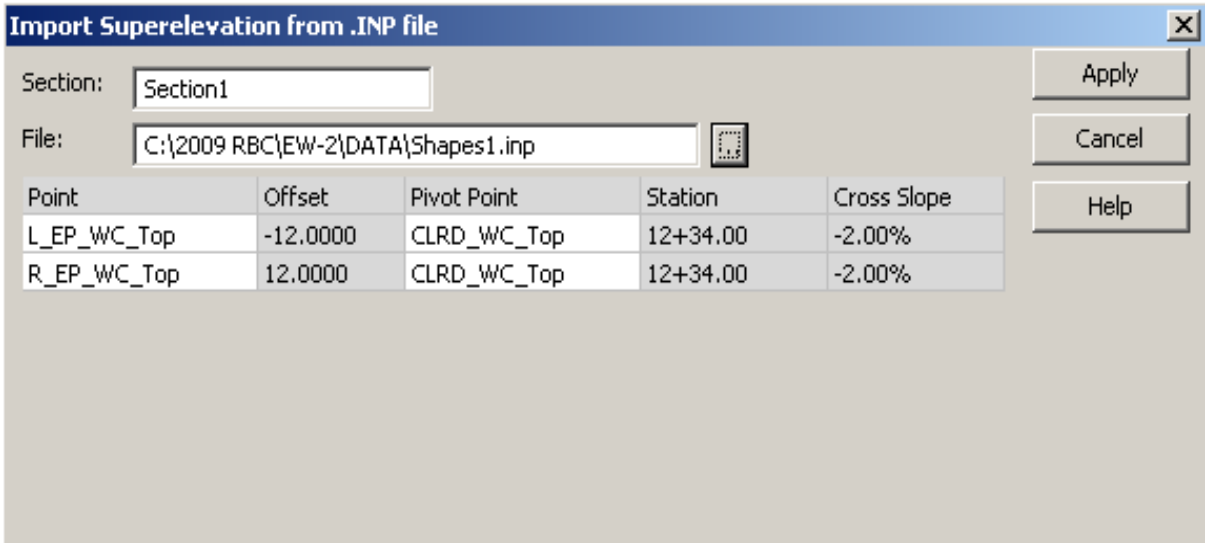
This lesson will take you through how to setup superelevation using GEOPAK Shapes Input files.

On-Line Help Topic: Search on “Superelevation”

EXERCISE: SUPERELEVATION

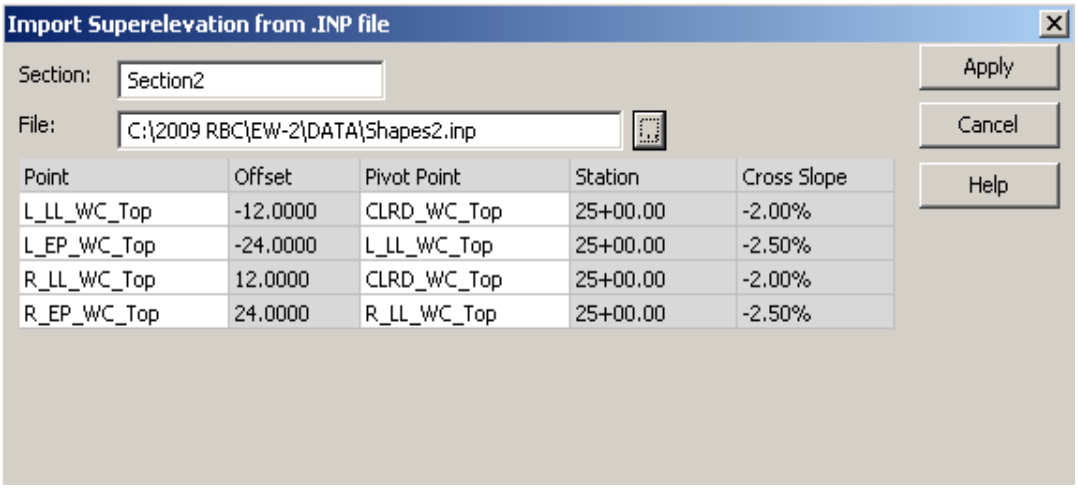
This exercise will take you through defining and setting up superelevation.

1. On the **Roadway Designer** click the Display Mode: **Superelevation** option in the on the bottom right of the dialog.
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 create superelevation control lines, we must import the GEOPAK input file input files. To do this, right-click in the superelevation diagram pane and select “**Import Superelevation from INP file**…”
4. In the *Section* field, type a descriptor entitled **Section1**.
5. In the *File* field choose the shapes file entitled **Shapes1.inp**.

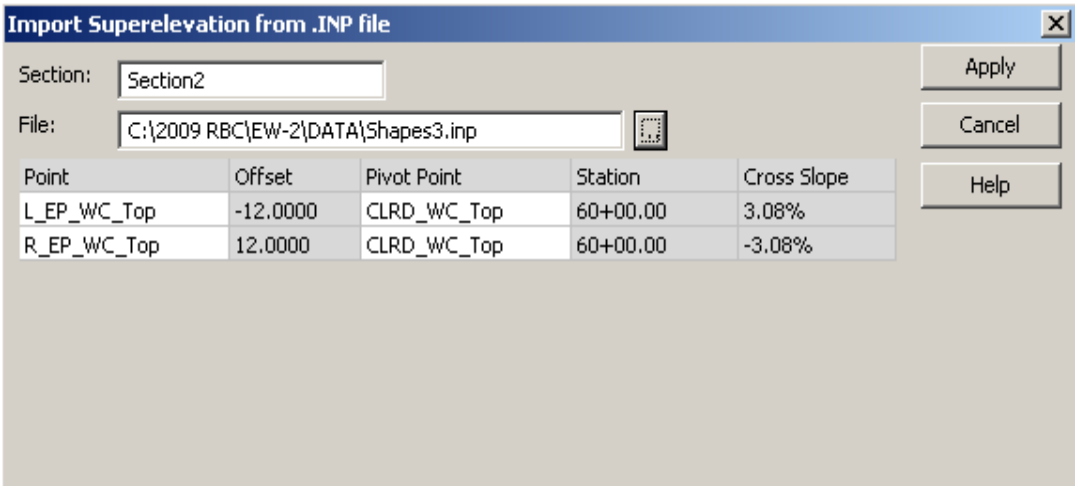


6. Click **Apply** to assign the superelevation control lines to the first portion of the project.

7. In the *Section* field type a descriptor entitled **Section2** and choose the shapes input file entitled **Shapes2.inp**.



8. Click **Apply** to assign the superelevation control lines to the second portion of the project.
9. In the *Section* field, type a descriptor entitled **Section3**.
10. In the *File* field choose the shapes file entitled **Shapes3.inp**.



11. Click **Apply** to assign the superelevation control lines to the third and final portion of the project.
12. Dismiss the Import "Superelevation from INP File" dialog.
13. Select **Process All** to apply the superelevation to the project.

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14. In the Roadway Designer dialog select **File > Save** to save the Roadway Designer project file updating from the previous save.
15. Spend some time navigating through the panes and looking at the model. Notice in the plan view that the cross slope is denoted by colors.

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LESSON NAME: GENERATING A SURFACE MODEL

LESSON OBJECTIVE:

This lesson will take you through how to generate a surface from your roadway design.

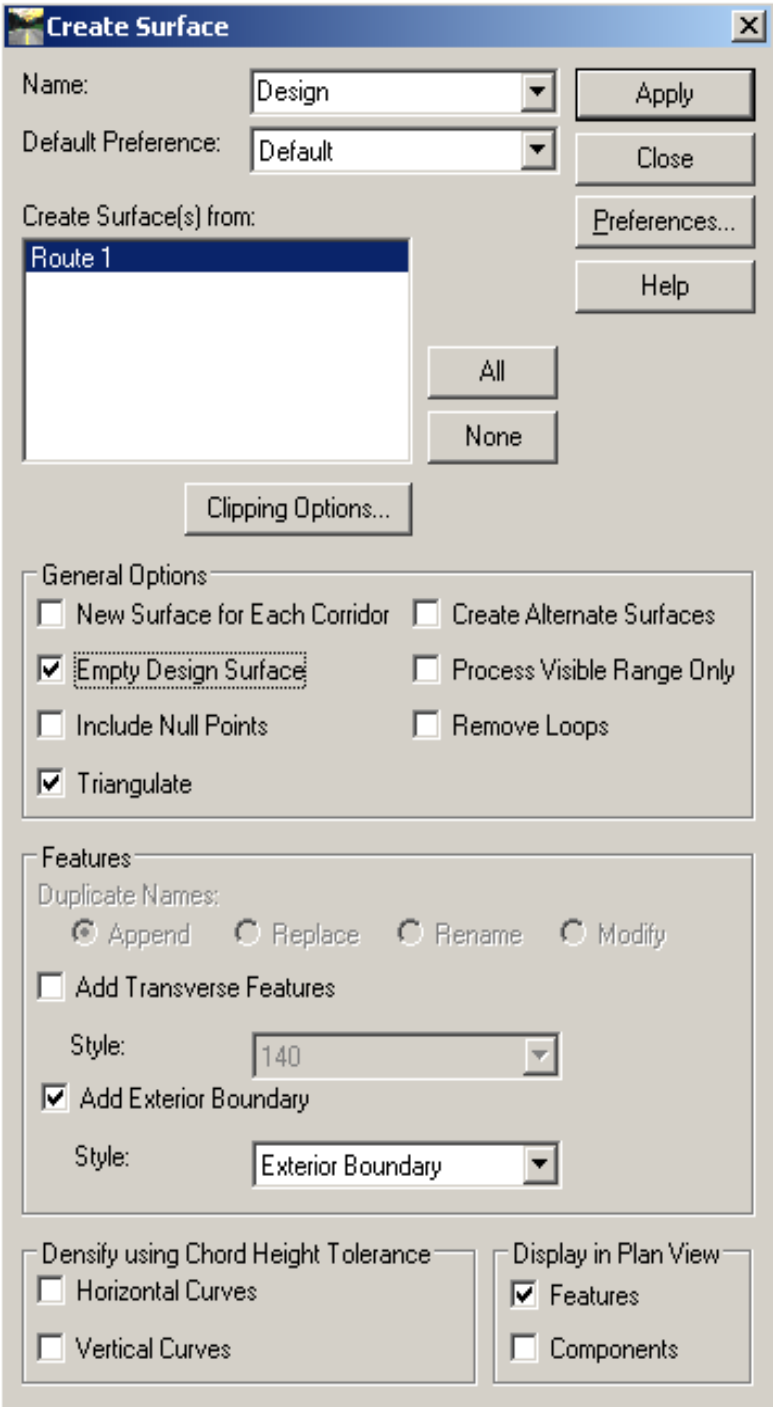
On-Line Help Topic: Search on “Create Surface”

EXERCISE: CREATE SURFACE

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

1. On the **Roadway Designer** select **Corridor > Create Surface**.
2. Set or key-in the following values:

Name:	***Design***
Empty Design Surface:	***On***
Add Exterior Boundary:	***On***
Style:	***Exterior Boundary***
Triangulate:	***On (InRoads Users Only)***
Display In Plan View:	***Features***



3. Click **Apply**.

4. Dismiss the **Results** dialogue.
5. Click **Close** on the Create Surface dialog.
6. **Collapse** the **Roadway Designer**.
7. Using **MicroStation** examine the features displayed in the DGN file.

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