

# LAB 4 - Geometry Management

This lab illustrates some of the common commands used to manage geometry for a project.

## Chapter Objectives:

- Copy a geometry project.
- Rename alignments.
- Transpose alignments.

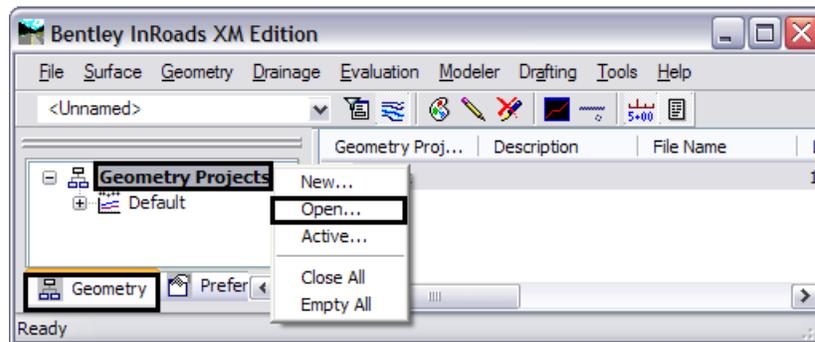
The following files are used in this lab:

- C:\Projects\12345\Design\Drawings\Reference\_Files\12345DES\_Model.dgn
- C:\Projects\12345\ROW\_Survey\InRoads\InRoads\12345SURV\_Fieldbook.alg

## Lab 4.1 - Copy a Geometry Project

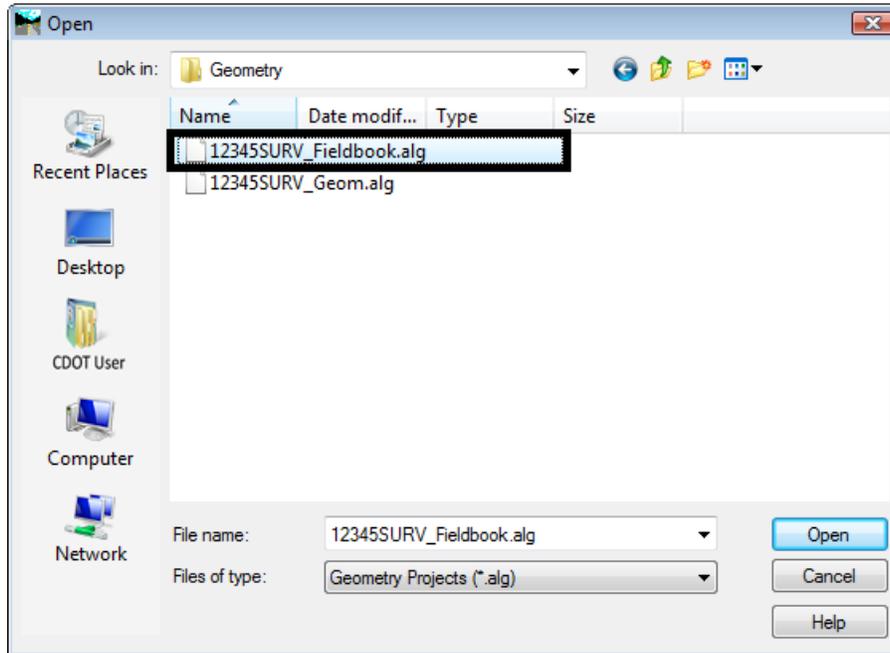
### Section Objectives:

- ◆ Access a Geometry Project created by the Survey/ROW discipline.
  - ◆ Save the renamed Geometry Project in the Design project folder (vs. the Survey folder).
  - ◆ Rename horizontal alignment names, add/modify descriptions, and review the geometry styles assigned to the alignments.
1. From the **Geometry** tab in the InRoads *Explorer* window, right-click on **Geometry Projects** and select **Open** from the shortcut menu.

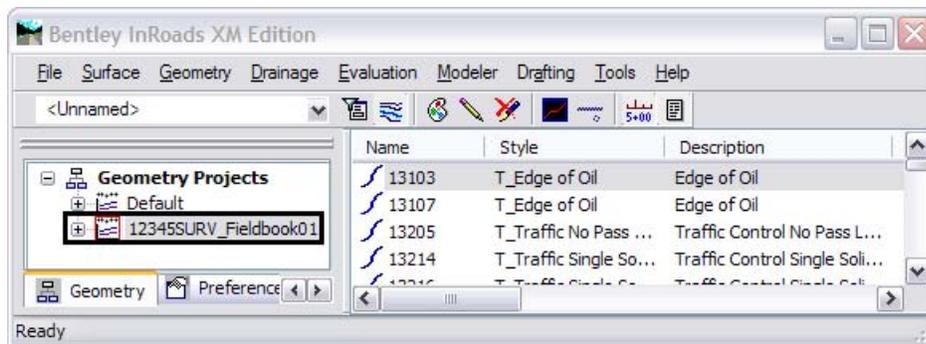


2. Navigate to the directory C:\Projects\12345\ROW\_Survey\InRoads\Geometry.

3. <D> the Geometry Project 12345SURV\_Fieldbook.alg.



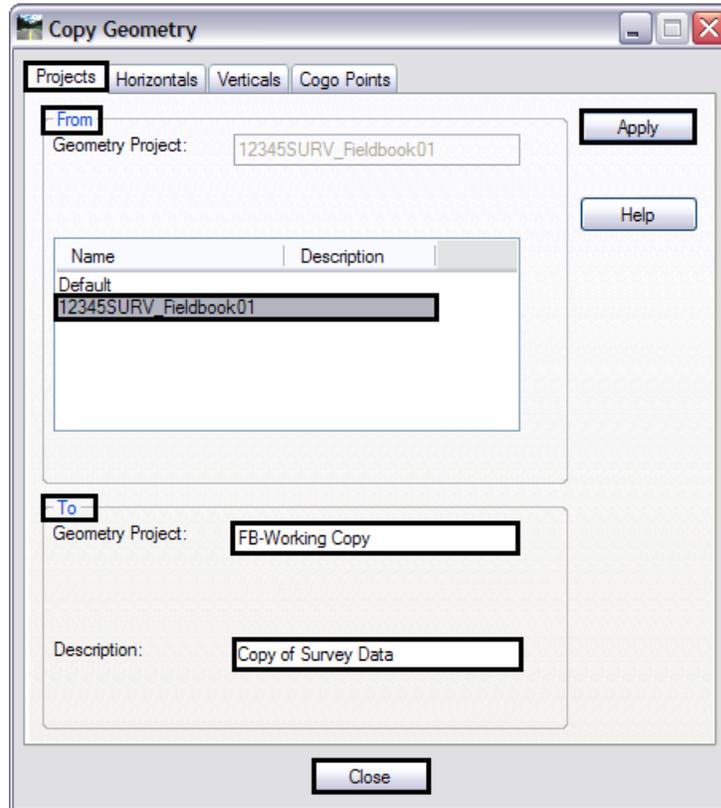
4. <D> Open then Cancel button. The *Open* dialog will close.



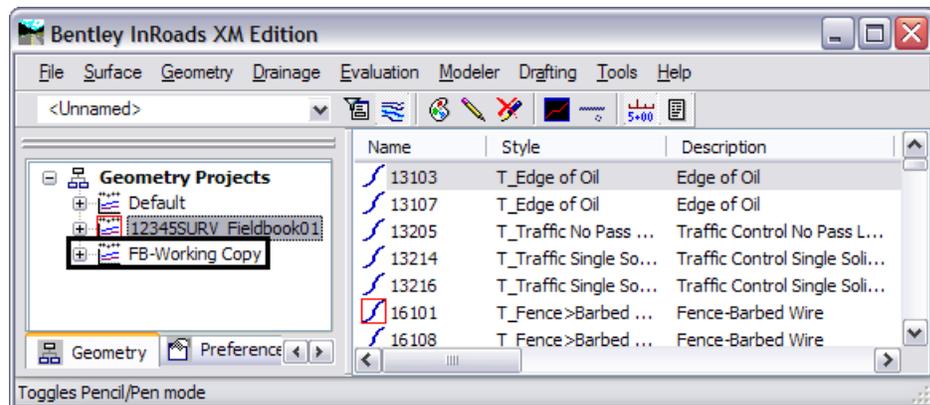
At this point, a 'copy' of the survey geometry project is loaded into memory. The following steps will rename the geometry project and save this copy in the Design discipline folder.

**Note:** Loading a file into InRoads makes it the active entity by default.

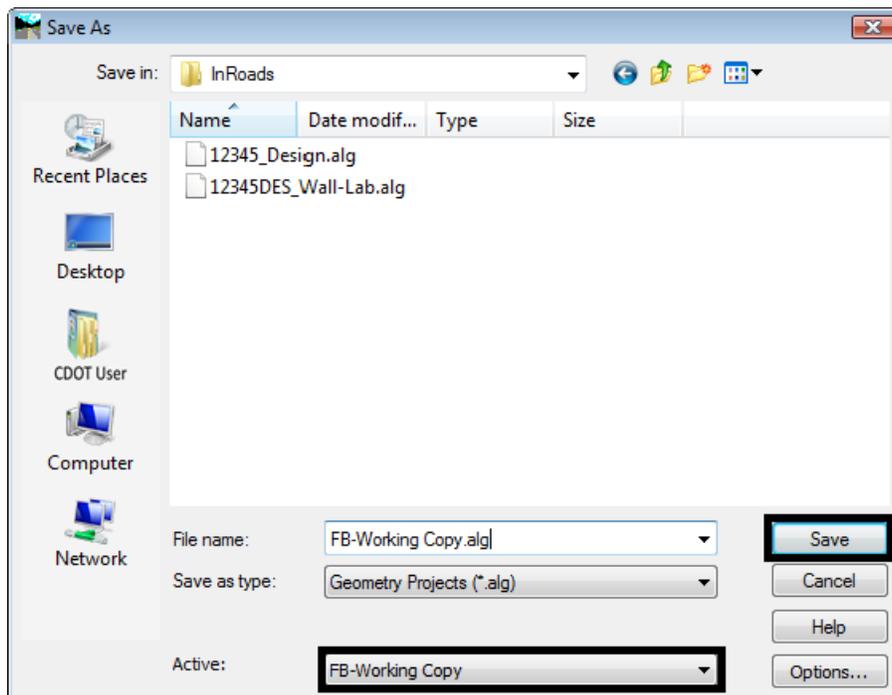
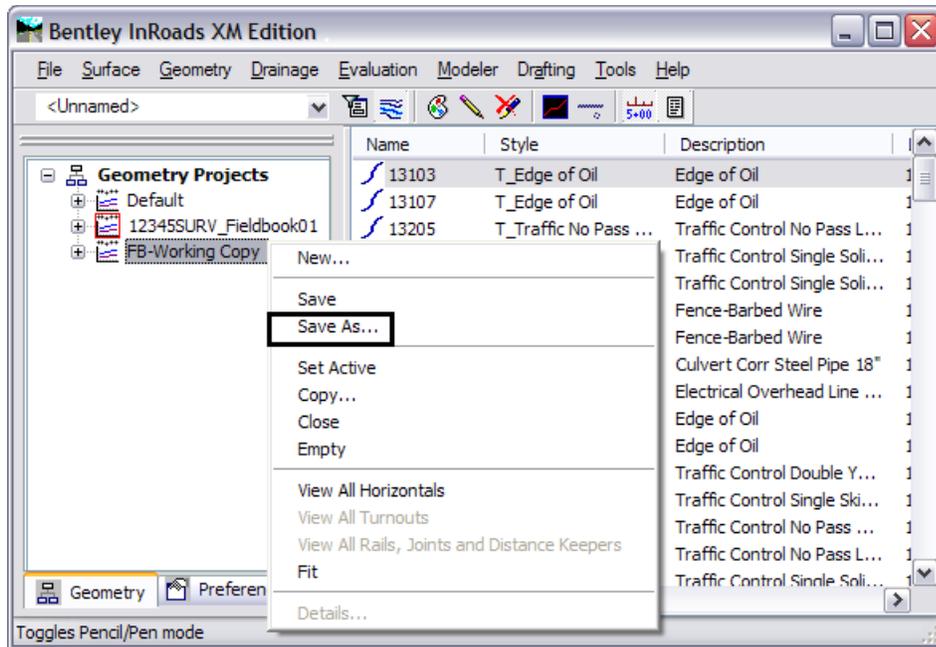
5. Select **Geometry > Copy Geometry**.



6. On the **Projects** tab, in the **From** section select 12345SURV\_Fieldbook01.
7. In the **To:** field key in **FB-Working Copy**.
8. In the **Description:** field key in **Copy of Survey data**.
9. <D> the **Apply** then **Close** buttons.
10. Verify the copy is created by checking the InRoads Explorer pane.



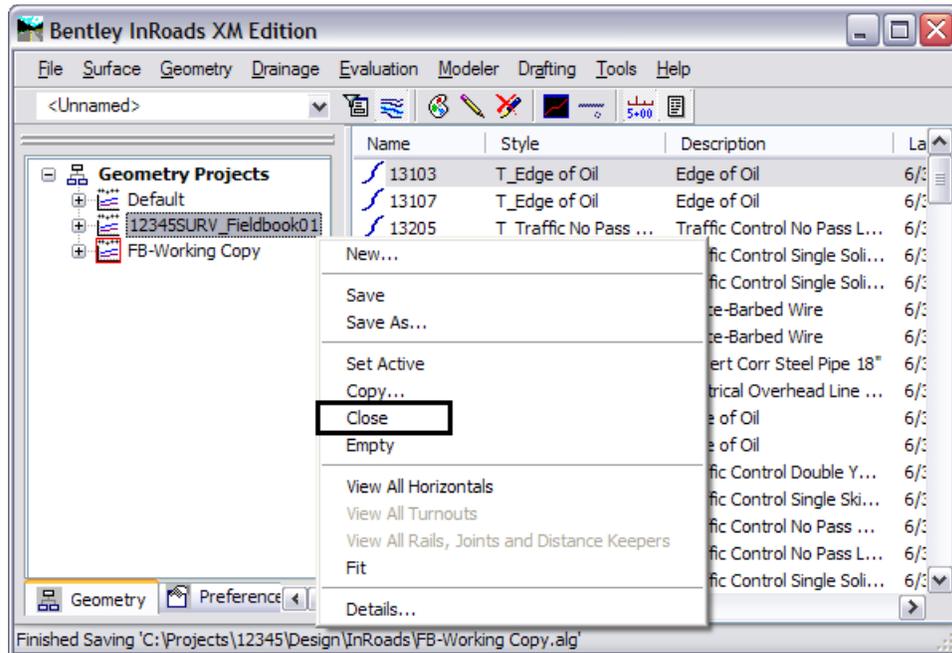
- In the InRoads explorer window, <R> on the **FB-Working Copy** geometry project and select **Save As...** from the shortcut list. The *Save As* dialog will appear.



- Navigate to the **C:\Projects\12345\Design\InRoads** folder. If necessary, use the drop-down arrow in the *Active* field and reselect the desired name to ensure the saved file name will match the active surface name.
- <D> the **Save** then the **Cancel** buttons. The *Save As* dialog will close.

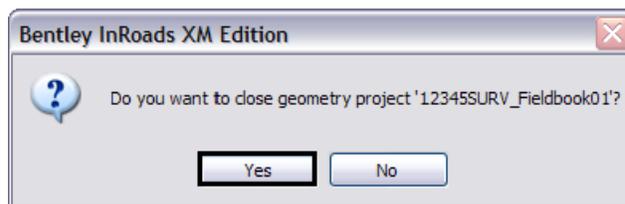
**Note:** Ensuring that the saved Geometry name in the project folder matches the Geometry name displayed in InRoads explorer will minimize confusion.

- The original geometry project generated by the survey staff is no longer required. In the InRoads explorer window, <R> on the geometry project name **12345SURV\_Fieldbook** and select **Close** from the fly-out menu.



**Note:** This will 'unload' the geometry project from memory. It does not delete any files from the hard drive.

- <D> Yes and verify the geometry project is removed from memory.



### Section Summary:

- Specialty groups using ROW/Survey geometry files should always make their own copy of the original data.

## Lab 4.2 - Renaming Alignments

In the case of the geometry project copied in the previous exercise, the horizontal alignment names (and geometry styles) were assigned when the survey fieldbook was exported based on the InRoads Survey feature table (FWF file). These attributes are assigned based on the feature coding assigned in the field. These names accurately reflect the coding used in the field, but could benefit from more intuitive naming.

### Section Objectives:

- ◆ Modify the alignment names assigned to some the roadway centerline shots, add descriptions, and assign appropriate Geometry Styles.

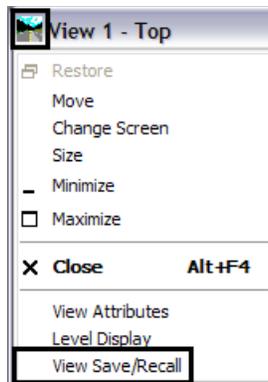
### Graphics clean-up

Before continuing with this lab, delete all visible graphics in your MicroStation file using the element selection tool or a fence. Note that you are deleting the graphical display of data, not the data itself. The graphics could be redisplayed using the InRoads display commands shown in previous sections.

**Note:** The screened topography and the training guides are either locked graphics or in an attached reference file, you will not be able to delete these graphics and will use them for orientation.

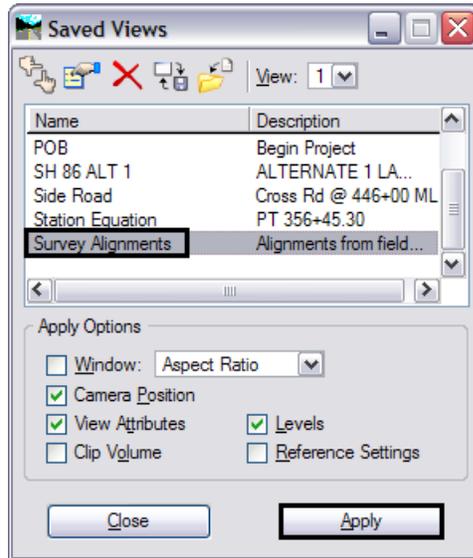
### Renaming Horizontal Alignments

1. Right click on the InRoads icon in the top left corner of the view window and choose **View Save/Recall** from the shortcut menu.

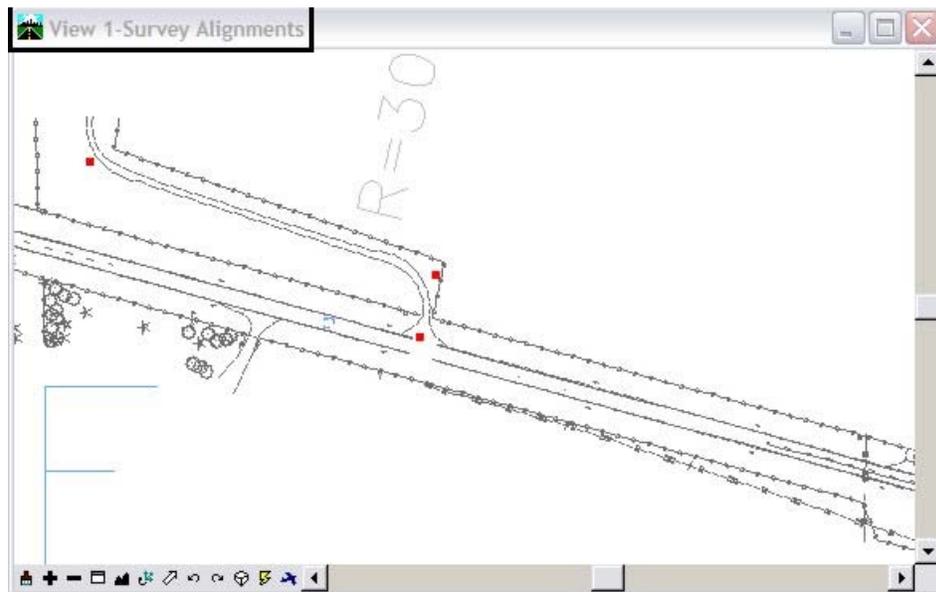


2. From the *Saved View* dialog box click on **Survey Alignments**.

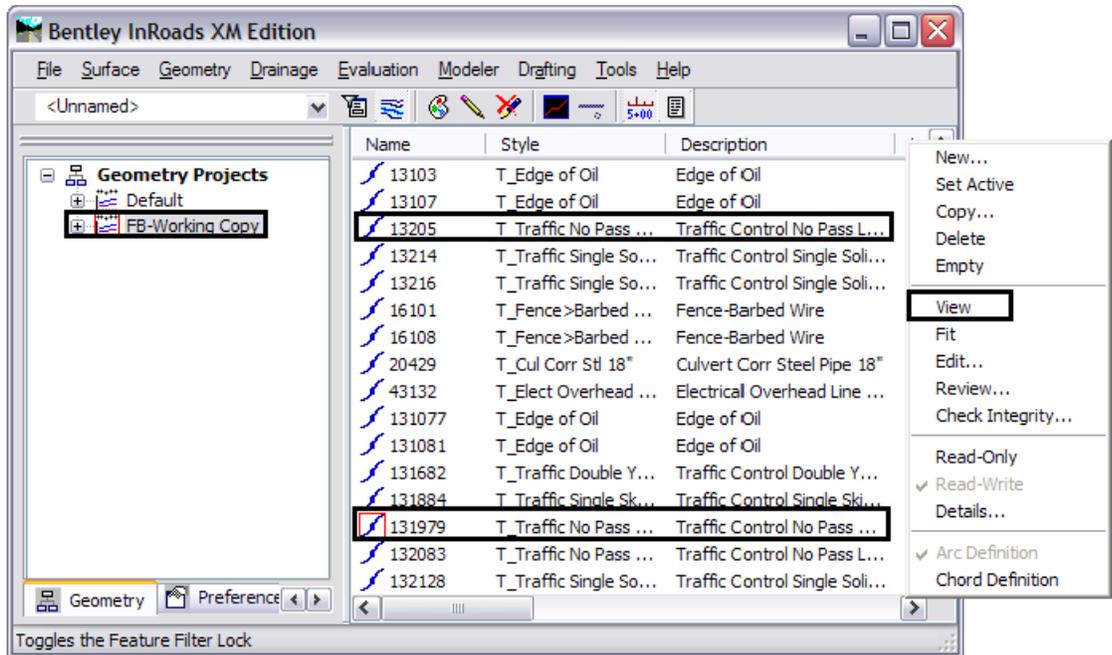
3. Click on **Apply** and then **Close**.



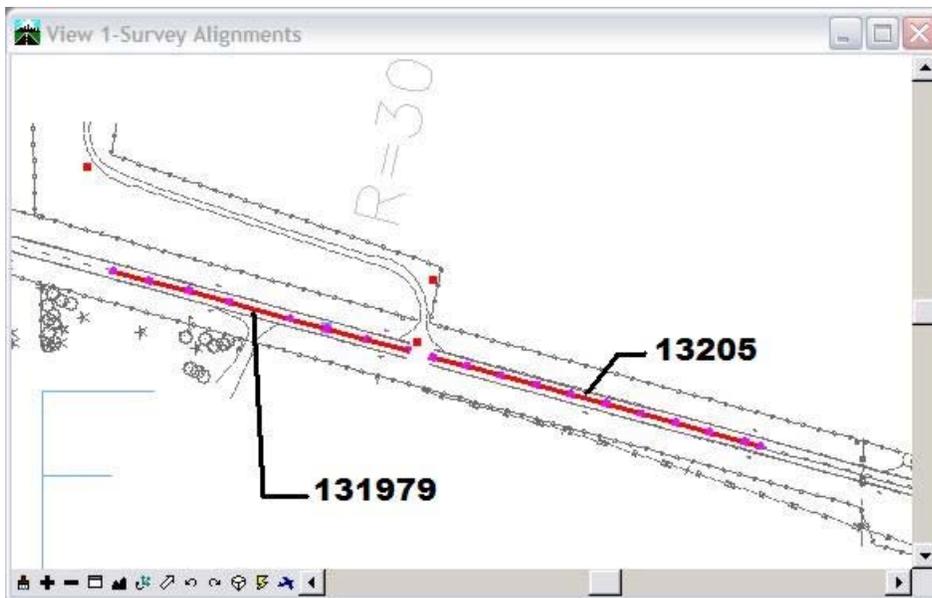
4. Verify that the view name includes Survey Alignments. The view window should look similar to the following image.



5. Display alignments 13205 & 131979 by right clicking on the alignment and choosing View from the shortcut window.

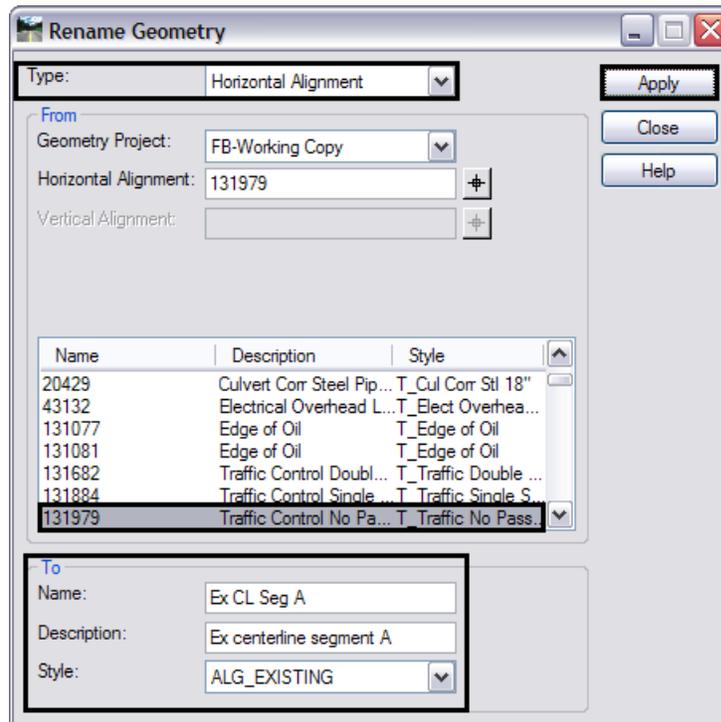


The the alignments should show up in the view window as shown below.

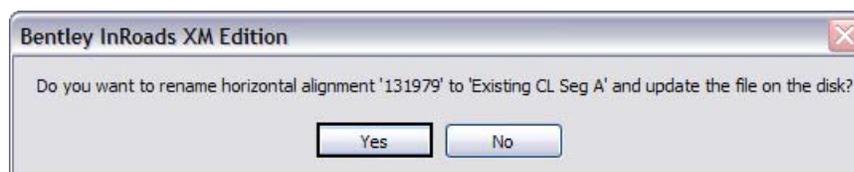


6. Select Geometry > Rename Geometry. The *Rename Geometry* dialog will appear.

7. From the **Type:** drop-down list select **Horizontal Alignment**.



8. In the **From** section, verify the **Geometry Project** is **FB-Working Copy**.
9. In the **From** section list locate and <D> on alignment **131979**.
- Note:** This alignment represents the centerline of existing pavement.
10. In the **To** section key in the **Name: Ex CL Seg A**.
11. In the **To** section key in the **Description: Ex centerline segment A**.
12. In the **To** section set the **Style: ALG\_EXISTING**
13. <D> the **Apply** button a confirmation dialog will appear.



14. <D> the **Yes** button.
15. **Rename** the centerline alignment 13205 as follows:

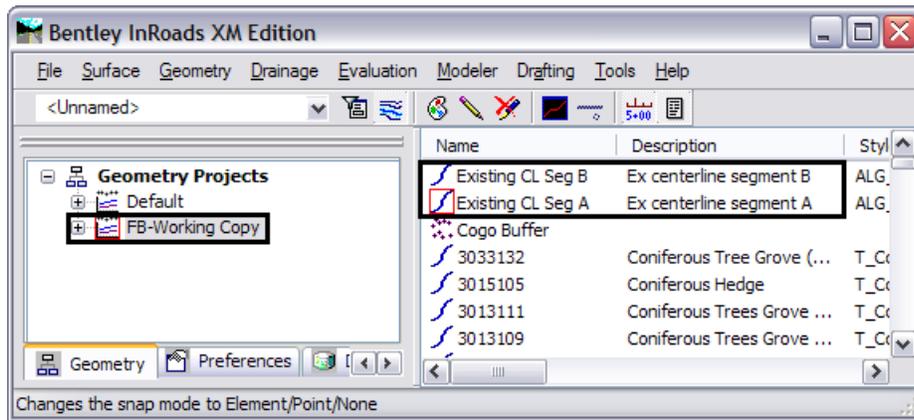
**Note:** You can use the dialog selection icon  to graphically identify the alignments for renaming.

- ◆ 13205

- ◆ Name: **Existing CL Seg B**
- ◆ Description: **Ex centerline segment B**
- ◆ Style: **ALG\_EXISTING**

**Important!** Profile or Cross Section sets that were created based on the original alignment names will lose their linkage to the alignment names after renaming of the alignments. Geometry renaming should be accomplished prior to the generation of Profile or Cross Section sets.

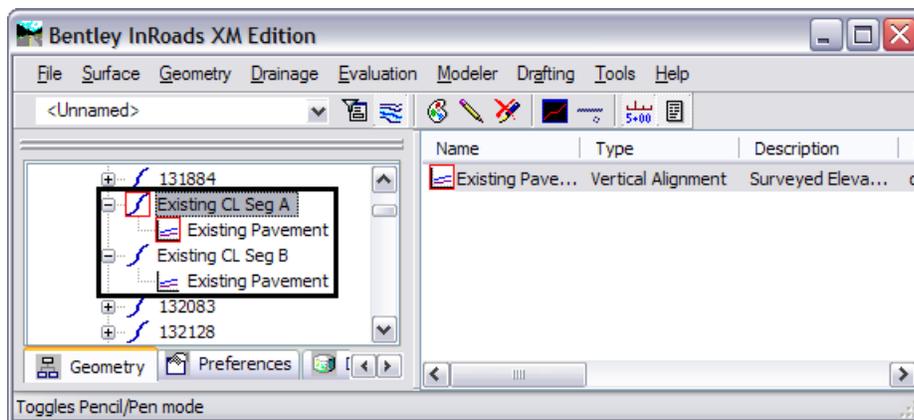
16. When done renaming the alignments **Close** the **Rename** dialog and check the InRoads explorer window to verify the results.



### Renaming Vertical Alignments

Two horizontal alignments have been renamed, a description has been added and the alignments are assigned an appropriate geometry style. Horizontal alignments are ‘parent’ alignments which can contain ‘child’ vertical alignments.

17. In the Workspace bar under the **Geometry** tab check the horizontal alignments for associated vertical alignments by expanding the + icon.



18. Select **Geometry > Rename Geometry**. The **Rename Geometry** dialog will appear.

19. From the **Type:** drop-down list select **Vertical Alignment**.

**Rename Geometry**

Type: Vertical Alignment

Apply

Close

Help

**From**

Geometry Project: FB-Working Copy

Horizontal Alignment: Existing CL Seg A

Vertical Alignment: 131979

Name	Description	Style
131979		

**To**

Name: Existing Pavement

Description: Surveyed Elevations

Style: ALG\_EXISTING\_Vert

20. In the **From** section verify the **Geometry Project** is set to **FB-Working Copy**.
21. In the **From** section verify the active **Horizontal Alignment** is set to **Existing CL Seg A**.
22. In the **From** section **Vertical Alignment** list locate and <D> on alignment **131979**.

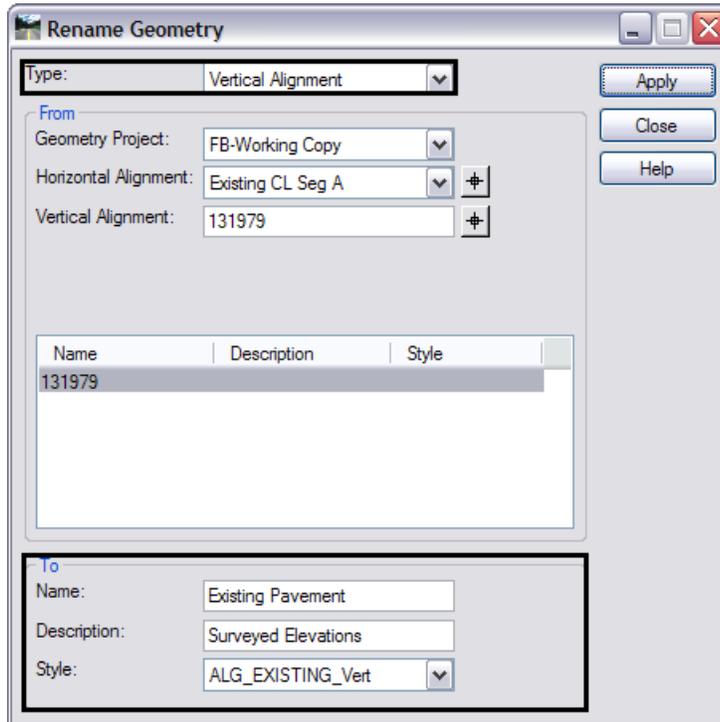
**Note:** This alignment represents the vertical elevations of existing pavement.

23. In the **To** section **key in** the **Name: Existing Pavement**.
24. In the **To** section **key in** the **Description: Surveyed elevations**.
25. In the **To** section set the **Style: ALG\_EXISTING\_Vert**.
26. <D> **Apply** then <D> **Yes** button.
27. Now set the active **Horizontal Alignment** to **Existing CL Seg B** to rename the vertical alignment associated with the horizontal alignment Existing CL Seg B.

**Note:** You can use the dialog selection icon  to graphically identify the alignments for renaming.

28. In the **To** section **key in** the **Name: Existing Pavement**.
29. In the **To** section **key in** the **Description: Surveyed elevations**.

30. In the **To** section set the **Style: ALG\_EXISTING\_Vert**.



**Rename Geometry**

Type: Vertical Alignment

Apply

Close

Help

From

Geometry Project: FB-Working Copy

Horizontal Alignment: Existing CL Seg A

Vertical Alignment: 131979

Name	Description	Style
131979		

To

Name: Existing Pavement

Description: Surveyed Elevations

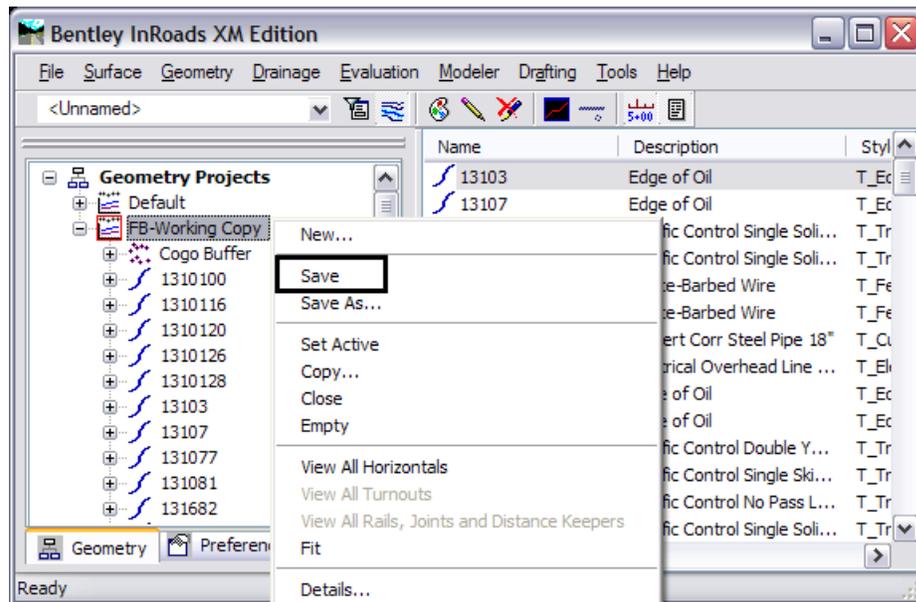
Style: ALG\_EXISTING\_Vert

31. <D> **Apply** then <D> **Yes** button.
32. <D> **Close** the **Rename Geometry** dialog.

These changes have been made in a copy of the geometry project that was exported from the survey fieldbook. In this copy, some key horizontal and vertical alignments have been renamed, described, and assigned appropriate geometry styles to conform to CDOT standards with a naming convention that is more intuitive.

This is a good time to save the Geometry Project to disk.

33. <R> on the geometry project **FB-Working copy** and select **Save As** from the fly-out menu.



34. This will overwrite the geometry project FB-Working Copy stored in the folder *C:\Projects\12345\Design\InRoads*.

### Section Summary:

- ◆ Rename Geometry is used to rename geometry, add or revise a description, and/or update the associated style.

## Lab 4.3 - Transposing Alignments

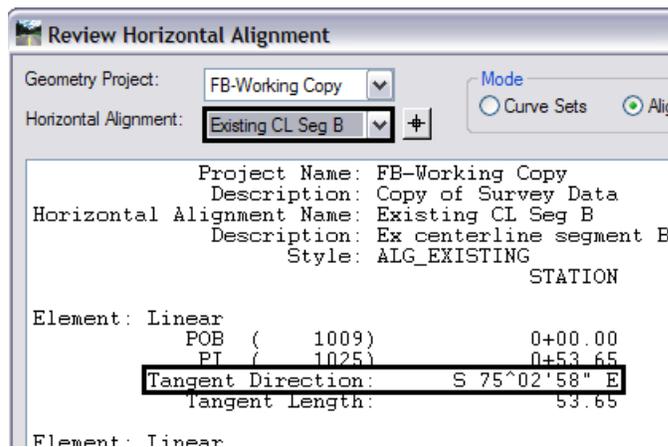
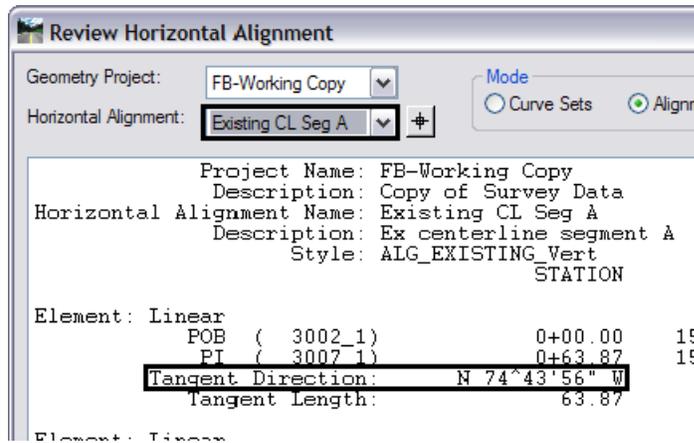
Transposing an alignment reverses the direction of that alignment. Tangent sections are reversed and left-hand curves become right-hand curves. The beginning stationing value is retained; however, any station equations previously defined are deleted. Associated vertical alignments are also reversed.

You may find the need to transpose an alignment if it was surveyed in a direction opposite from the direction you wish to design (up-stream vs. down stream). Other instances may be if you create an alignment by importing from graphics. InRoads will generate the alignment in the direction the MicroStation graphic was drawn which is not necessarily in the direction of 'up-station'. Or you may simply create an alignment in the wrong direction using any of the InRoads geometry commands.

### Section Summary:

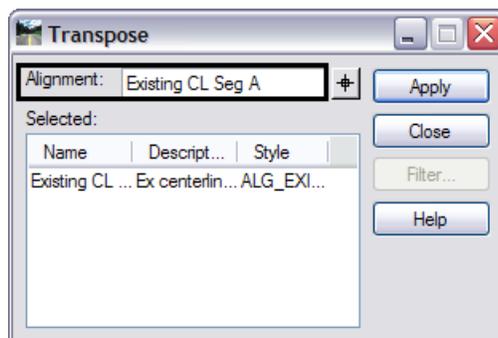
- ◆ Change the stationing direction using the Transpose command.
1. Use the review tools to evaluate both of the renamed horizontal alignments. What direction are the tangents running?

- ◆ You should notice that the alignment **Existing CL Seg A** runs northwest and that alignment **Existing CL Seg B** runs southeast.



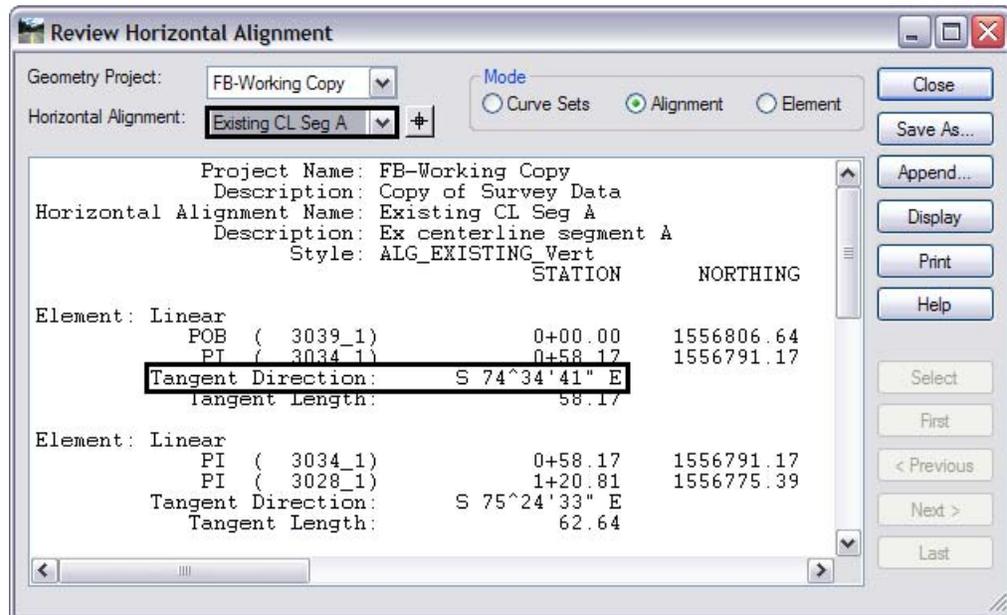
- ◆ Alignments created by exporting an electronic fieldbook assume the direction of the data collection.
- ◆ Both alignments should run in a Southeasterly direction.

2. Select **Geometry > Utilities > Transpose**.



3. Select alignment **Existing CL Seg A** for transposing <D> **Apply**.

4. **Review** the alignment to verify the transposition.



5. **Save** the geometry project **FB-Working Copy**.

### **Section Summary:**

- ◆ Always review geometry after making changes like Transpose to ensure that the command was completed as desired.

### **Chapter Summary:**

- Take care not to inadvertently edit or delete other group's work. Communication is the key to reducing data loss.
- Survey geometry has name meaningful to them, but possibly not to other groups. Rename your copy of survey's geometry data.
- The direction of an alignment can be changed using the transpose command. Set the alignment to the direction that makes the most sense for the design.

