LAB 9 - Additional Exercises

Lab 9.1 - Locks

Section Objectives:

♦ View surface triangles using Pencil lock with different Preferences.
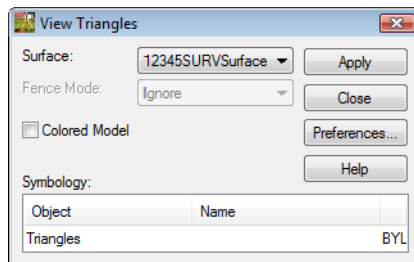
Locks Toolbar

1. Open a new working MicroStation model file.

2. Open an InRoads Surface.

3. Verify both the Feature Filter Lock and Style Lock are toggled **OFF**. The Locks are toggled OFF when the button appears darker.


4. From the InRoads pull down menu select,
   Surface > View Surface > Triangles. The *View Triangles* dialog will appear.


5. **<D>** the **Apply** button. The *View Triangles* dialog will minimize as the triangles are generated. The dialog will reappear when it is finished.

   Note: The triangles displayed are not using the correct element attributes for color and level. Using the Pencil mode will erase the current displayed triangles and redisplay the correct element attributes for existing triangles.

6. **<D>** the **Preferences…** button. The *Preferences* dialog will appear.
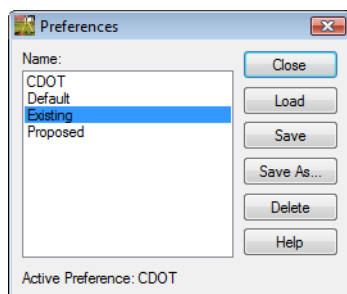
7. Select the **Existing** preference.

8. **<D>** the **Load** then **Close** buttons.
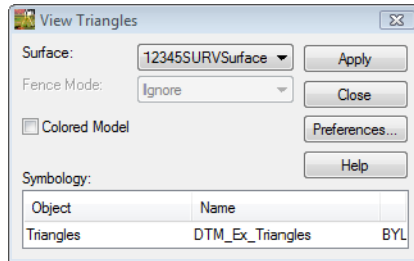
9. **<D>** the **Apply** button.

> *Note:* Notice how the old triangles are "erased" and the new triangles are redrawn using the loaded existing preference.

Section Summary:

♦ In this lab we viewed surface triangles using Pencil lock with different Preferences.

Lab 9.2 - Advanced Locks

Section Objectives:

♦ In this lab the difference between Pencil and Pen lock will be shown.

These are only generalized steps to guide you. Ask your instructor if you have any questions.
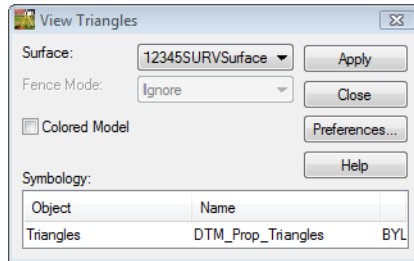
1. Using MicroStation **Delete**. Delete all triangles from the DGN file.

2. Toggle the Write lock from **Pencil** mode to **Pen** mode.

3. Display the triangles using **Preference Existing**.
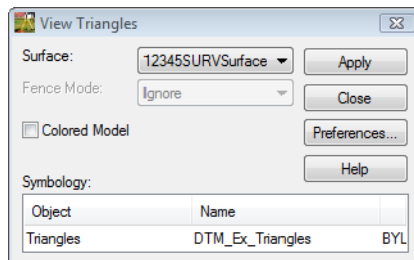
4. Redisplay the triangles using **Preference Proposed**.

Note: You should end up with two sets of triangles. Pen mode can be used for other display operations such as perimeter and contours.

When you have finished:

5. Using MicroStation **Delete** button. Delete all triangles from the DGN file.

6. From the MicroStation pull down menu select,
    File > Compress > Design

7. Verify your Locks toolbar is set back to **Pencil** mode.

Section Summary:

♦   In this lab Pen lock was demonstrated using View Triangles command.

Lab 9.3 - Global Scale Factor

InRoads annotation (text, cells, and linestyles) is controlled with configurable scale settings. In the case of contour labeling, text size is driven by 2 factors. The text size specified in the **View Contours** dialog box and the active settings (multiplier) defined through the use of a Global Scale Factor.

Section Objectives:

♦   In this lab the text scale factor will be changed to show how to modify text sizes when displaying contour labels.

♦   In this lab the Global Scale factor Add-in will be added to the Tools pull down menu for easier access to the scales.

1.   Open a new working MicroStation model file.

2.   Open an InRoads Surface.

3.   From the pull-down menu select, **File > Project Options**. The InRoads *Options* dialog will appear.
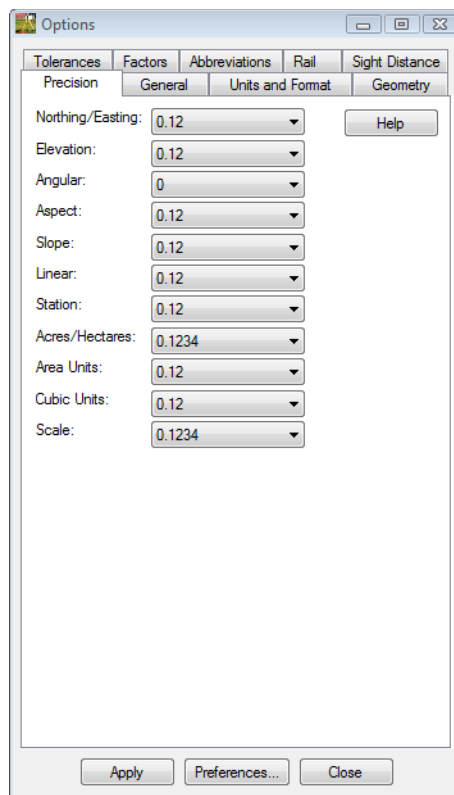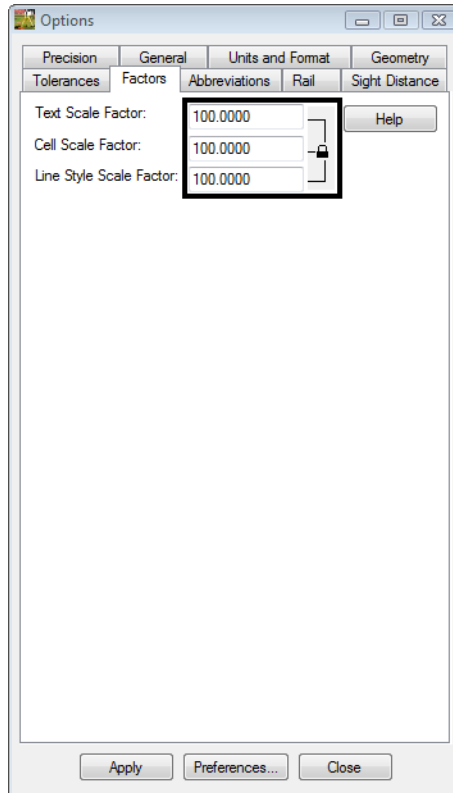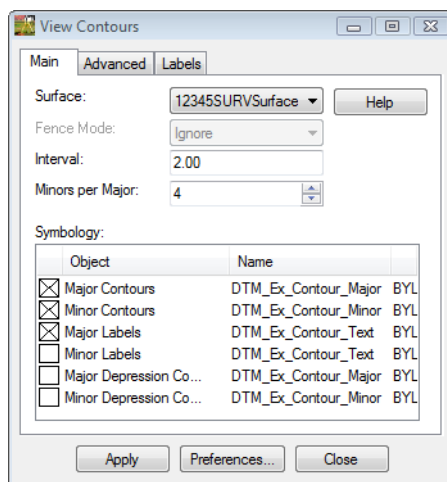
4.   **<D>** the **Factors** tab.
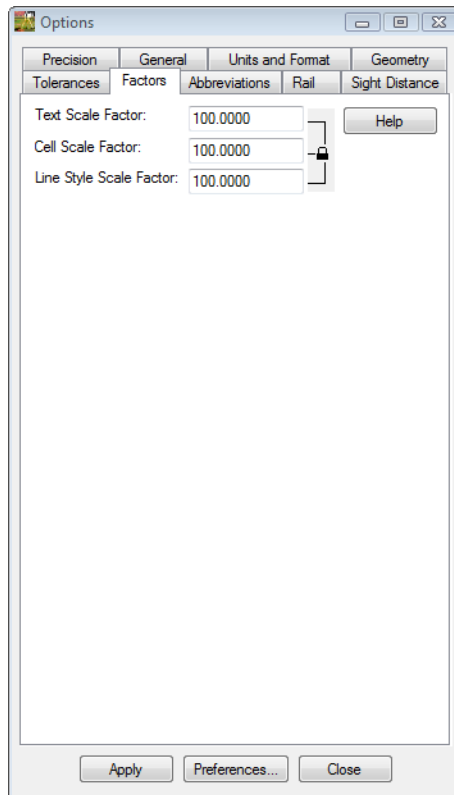
Note: The values shown here will be applied to all commands that display text, cells, or line styles.

5. Set the **Text**, **Cell** and **Line Style** Scale Factors to *100*

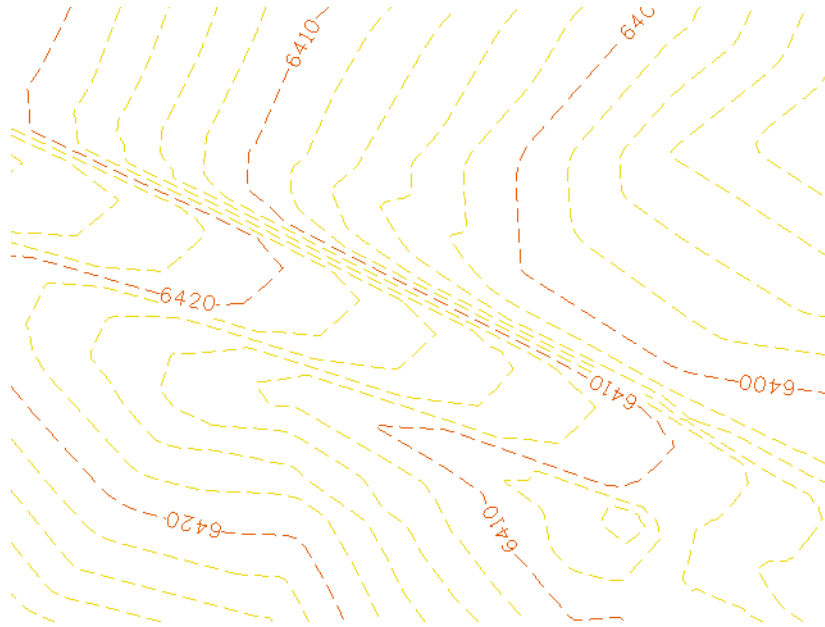6. **<D>** the **Apply** then **Close** buttons.

7. From the pull-down menu select,
    Surface > View Surface > Contours. The *View Contours* dialog will appear.


8. Verify the active Surface: *12345SURVSurface01*

9. Load the **CDOT** Preference

10. **<D>** the **Apply** button. The *View Contours* dialog will temporarily minimize as the surface is processed and the contours are generated the dialog will reappear when the contours have been generated.
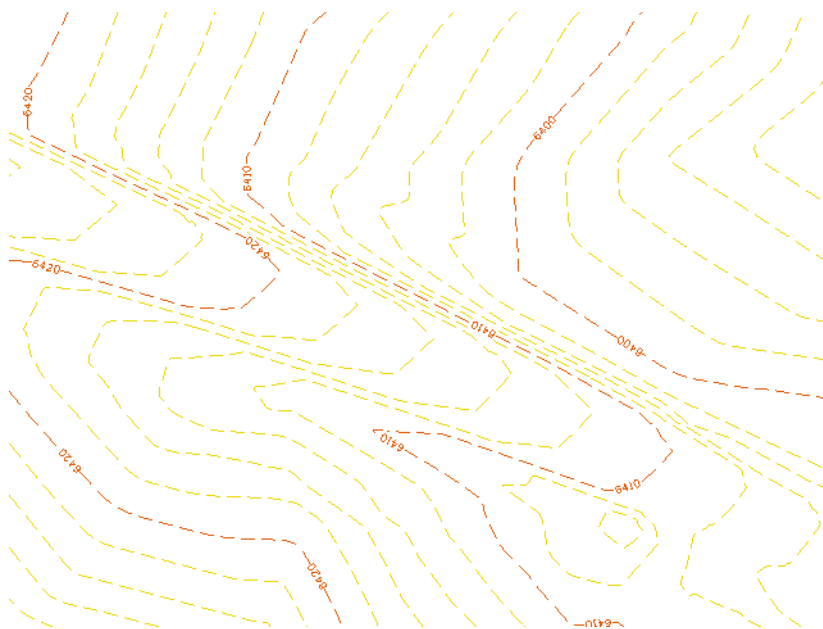
11. Review your results.

12. From the pull-down menu select, **File > Project Options**. The InRoads *Options* dialog will appear.

13. **<D>** the **Factors** tab.

14. Set the **Text**, **Cell** and **Line Style** Scale Factors to *50*
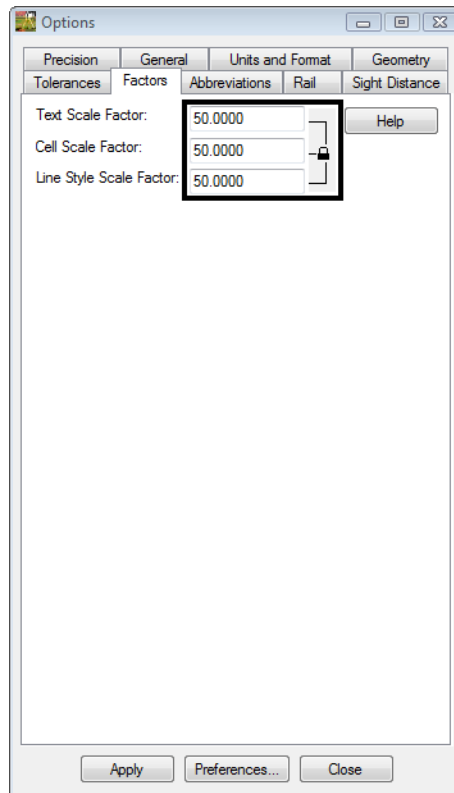
15. **<D>** the **Apply** then **Close** buttons.

16. **<D>** the **Apply** button in the *View Contours* dialog. Notice the change in the annotation size.


The Global Scale Factor dialog is frequently used. It can be added to the interface for easy access.

17. From the pull down menu select, **Tools > Application Add-Ins**, the *Applications Add-ins* dialog will appear.
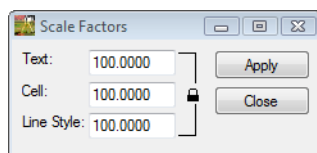
18. Check **ON** *Global Scale Factor Add-In*.
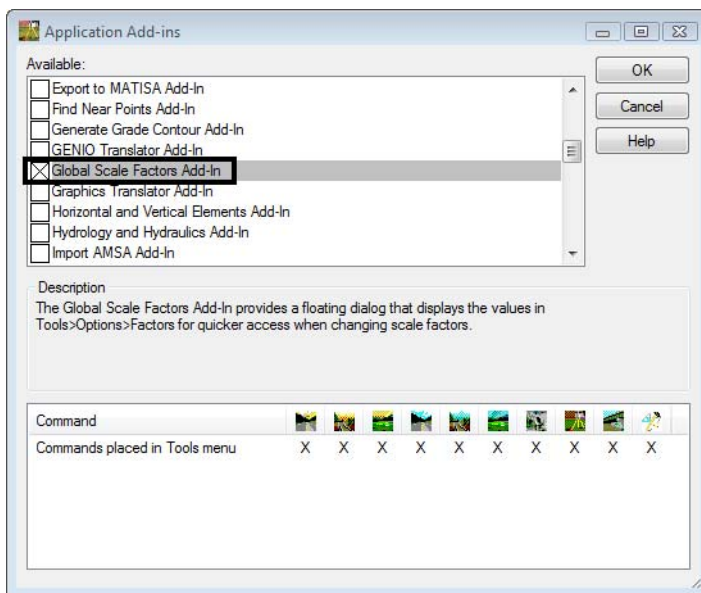
Note: The Description section of the dialog will give details where to find the added command in the pull down menus.

19. **<D>** the **OK** button. The *Application Add-ins* dialog will close.

20. From the pull down menu select, **Tools > Global Scale Factors...** The *Global Scale Factors* dialog will appear.
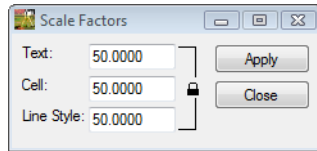
Note: The *Scale Factors* dialog can remain open saving space and time.

21. Key-in the **Text**, **Cell**, and **Line Style** Scale Factors dialog to *100*

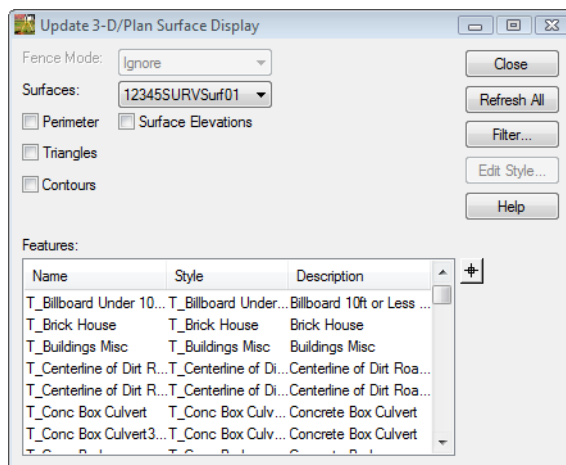

22. **<D>** the **Apply** button.

Section Summary:

♦   In this lab the text scale factor was changed to show how to modify text sizes when displaying contour labels.

♦   In this lab the Global Scale factor Add-in was added to the Tools pull down menu for easier access to the scales.

Lab 9.4 - View Surface Display Constrained

Most surface display commands have the option to display within the limits of a fence place in a MicroStation model.

Section Objectives:

♦   In this lab a MicroStation fence will be placed in the file to constrain the triangles inside the fence.

1. Open a new working MicroStation model file.

2. Open an InRoads Surface.

3. From the InRoads pull down menu select, **Surface > Update 3-D/Plan Surface Display**. The *Update 3-D/Plan Surface Display* dialog will appear.


4. Verify *12345SURVSurface01* is the active surface.

5. Check **ON** *Perimeter* box.

6. Check **ON** *Contours* box.

7. **<D>** the **Apply** buttons. The Contours and Perimeter graphics will be displayed to the design file.

8. Using MicroStation view commands window into a portion of the surface.
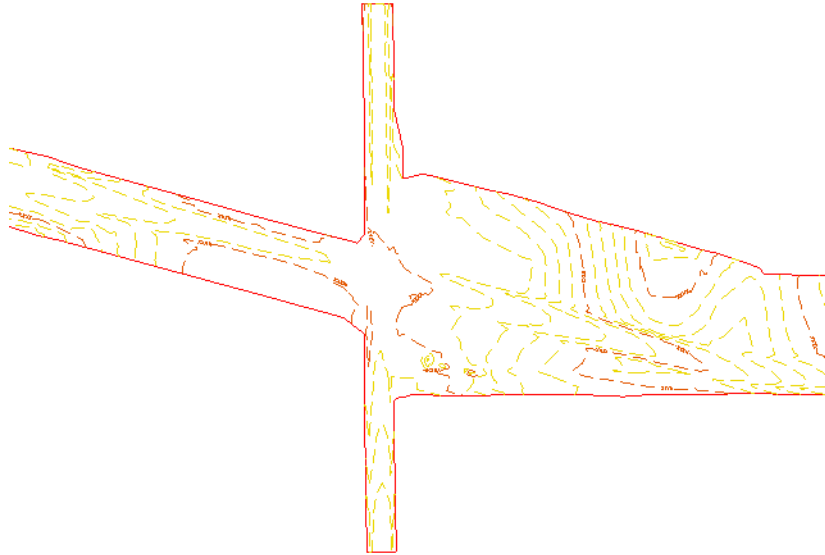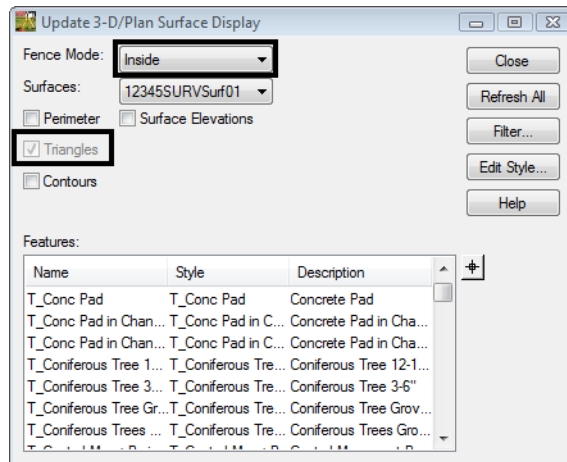

9. From the MicroStation Main toolbar **<D>** the **Place Fence** button.

10. From the Tool Settings dialog select *Fence Type:* **From View**
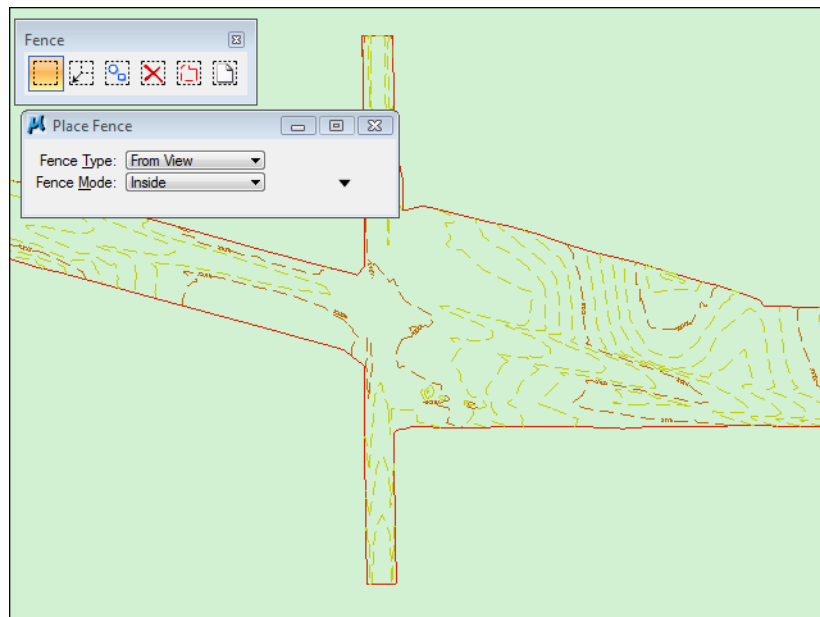
11. **<D>** a point in **View 1**. The Fence will appear around the edge of the view border.

12. From the InRoads pull down menu select, **Surface > Update 3-D/Plan Surface Display**. The *Update 3-D/Plan Surface Display* dialog will appear.

       Note: Notice this time *Fence Mode* became active and the mode is set to ***Inside***.

13. The triangles will display inside the fence.

14. Using MicroStation view commands zoom out from the triangles and review your result
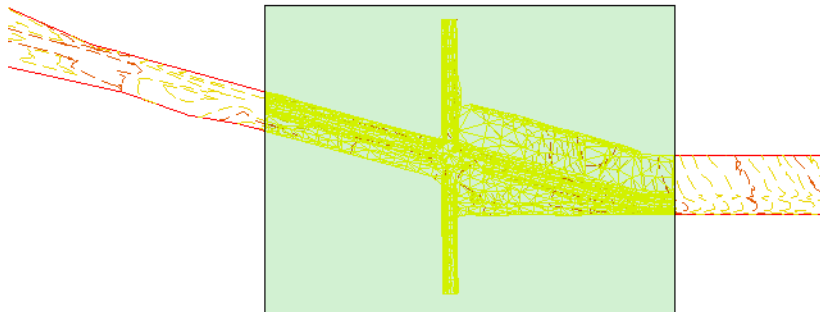
15. **<D>** the **Close** button in the *Update 3-D/Plan Surface Display* dialog.

Section Summary:

♦ In this lab a MicroStation fence was be placed in the file to constrain the triangles inside the fence.
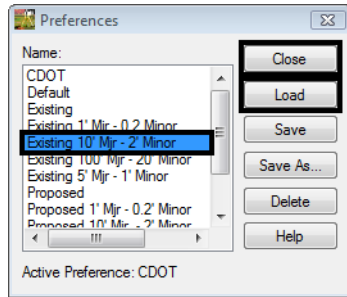
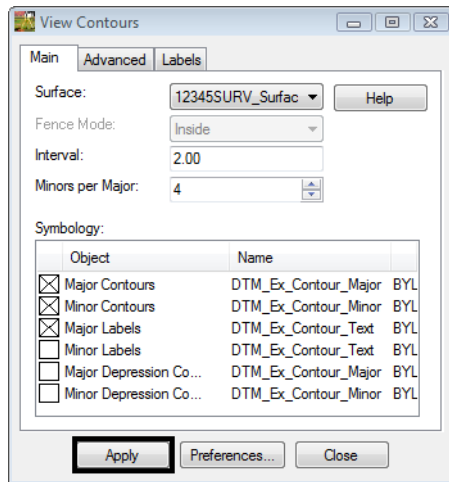# Lab 9.5 - View Contour Settings

Section Objectives:

♦   Use different Preferences will be used to display contours.

♦   Change settings in the Advanced tab of the View Contours dialog to view contours smooth or between an elevation range.

♦   Change settings in the Labels tab of the View Contours dialog to view contour labels at different intervals and display options.

1.   Open a new working MicroStation model file.

2.   Open an InRoads Surface.

3.   Using MicroStation **Delete** button. Delete all Contours in the drawing.

4.   From the pull-down **Surface > View Surface > Contours**. The *View Contours* dialog will appear.

5.   Verify the active *Surface: 12345SURV_Surface_Existing*
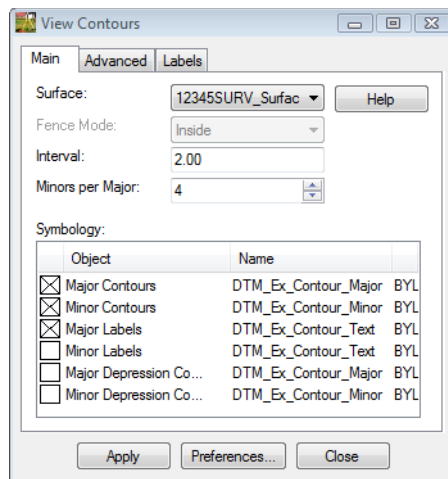
6. **<D>** the **Preferences…** button. The *Preferences* dialog will appear.
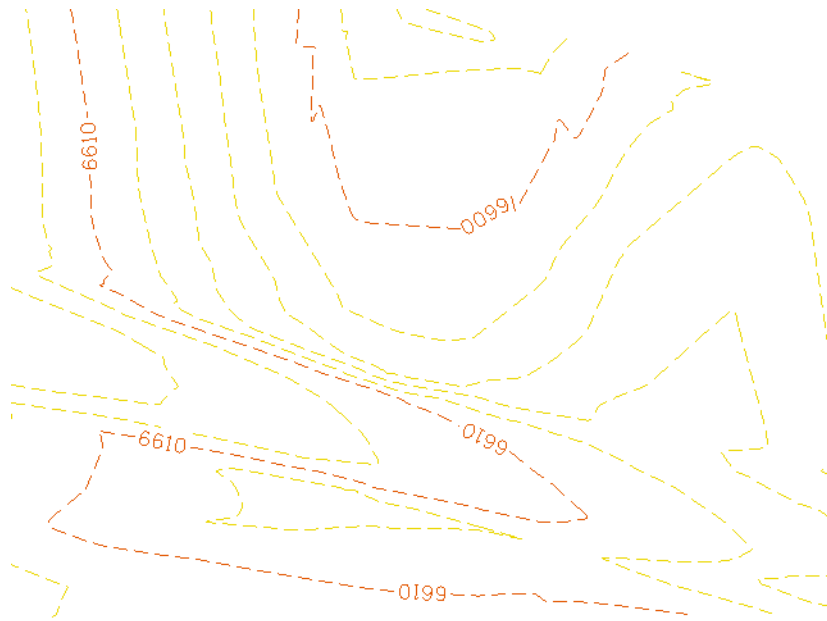

7. Select the preference **Existing 10'Mjr – 2' Minor**.

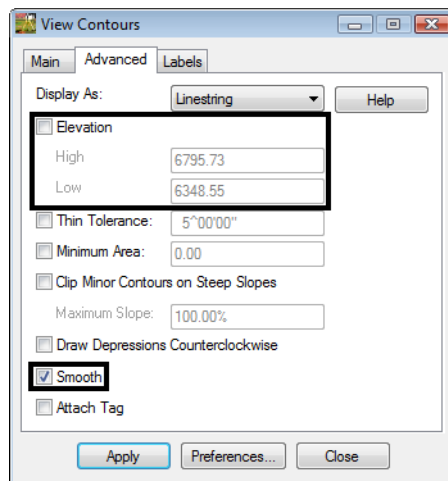8. **<D>** the **Load** then **Close** buttons.

   Note: Notice the change in the Interval and Minors per Major settings.

9. **<D>** the **Apply** button.

10. Review your results.


11. **<D>** the **Advanced** tab in the *View Contours* dialog.

12. Check **OFF Smooth** in the *View Contours* dialog.

13. **<D>** the **Apply** button and review your results.

14. Check **ON Elevation** in the *View Contours* dialog.

15. Set the *Elevation High* and *Low* values that will work with the loaded surface.

16. **<D>** the **Apply** button and review your results.

17. **<D>** the **Labels** tab in the *View Contours* dialog.

18. Continue to display contours using different settings in the *Major Labels* and *Minor Labels* sections.

♦ Precision

♦ Orientation

♦ Spacing

♦ Prefix

♦ Suffix
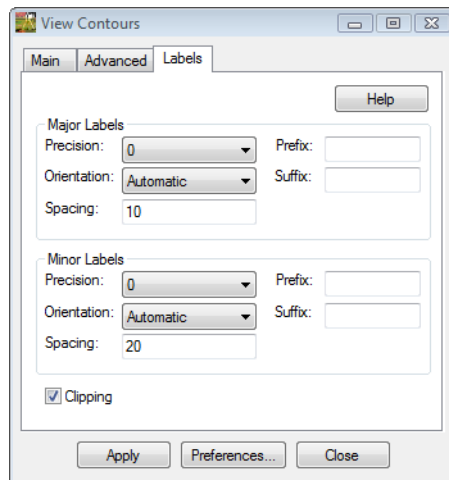
Note: Ask your instructor if you have a question on any of these settings.

When you have finished:

19. Reload the Preference **Existing 10'Mjr – 2' Minor**.

20. Redisplay the contours.

Section Summary:

♦ In this lab different Preferences were used to display contours.

♦ In this lab changes in the Advanced tab were made to view contours smooth or displayed between an elevation range defined by the user.

♦ In this lab change settings in the Labels tab were made to view contour labels at different intervals and display options.
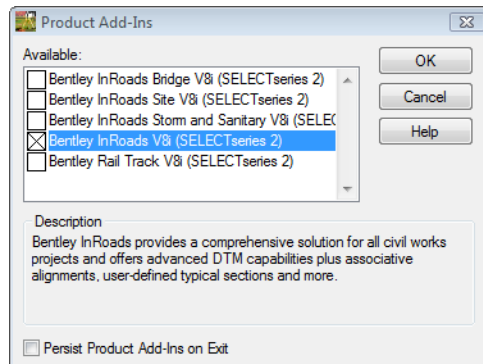
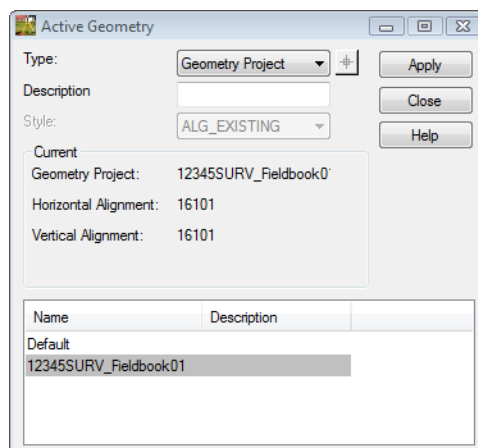# Lab 9.6 - Profiles from existing alignments

Section Objectives:

♦ Create a Profile from an existing horizontal alignment to create a profile to help evaluate the existing surface.

1. Open a new working MicroStation model file.

2. Open an InRoads Surface.

3. Open an InRoads Geometry Project.

   InRoads Survey only allows for multipoint profiles. To create profiles from an existing alignment InRoads needs to be activated.

4. From the InRoads pull down menu select **Tools > Product Add-ins**. The *Product Add-ins* dialog will appear.
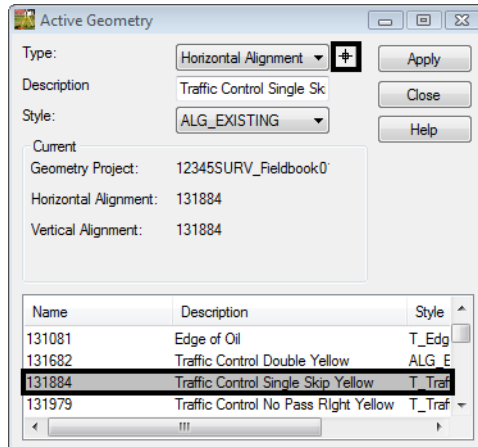

5. Select the **Bentley InRoads V8i** application and select the **OK** button. InRoads application will be added to the InRoads Survey interface.

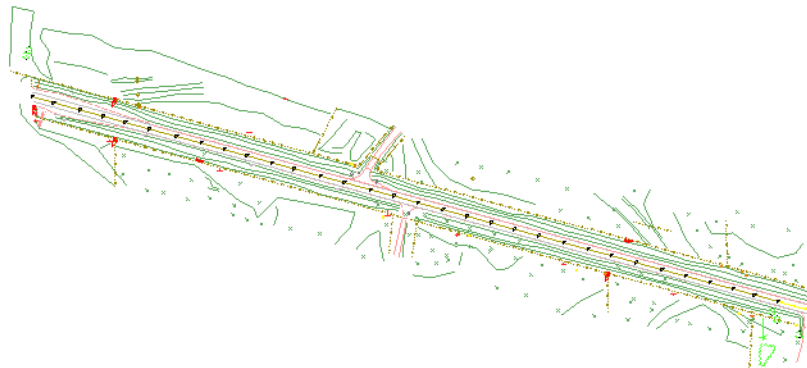6. From the InRoads pull down menu select **Geometry > Active Geometry**. The *Active Geometry* dialog will appear.

7. Select the *Type:* **Horizontal Alignment**

8. **<D>** the **Target** ⊞ button. The Active Geometry dialog will minimize allowing you to select the centerline in the MicroStation view.

9. **<D>** the centerline of the road. The centerline of road will highlight and the *Active Geometry* dialog will reappear.
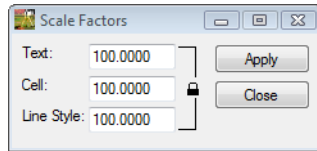

10. **<D>** the **Apply** then **Close** buttons. The Horizontal Alignment name will be active.

11. From the InRoads pull down menu select, **Geometry > Fit Alignment**.

12. **<R>** for the active alignment in the MicroStation View.

13. From the pull down menu select, **Geometry > View Geometry > Active Horizontal**

>   *Note:*   The above graphic is where the profile will be extracted.

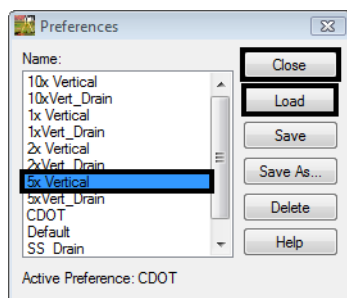14. From the pull down menu select, **Tools > Global Scale Factors…** The *Scale Factors* dialog will appear.

15. Key-in the scale factor **100**

16. **<D>** the **Apply** then **Close** buttons.

17. From the InRoads pull down menu select **Evaluation > Profile > Create Profile**. The *Create Profile* dialog will appear.
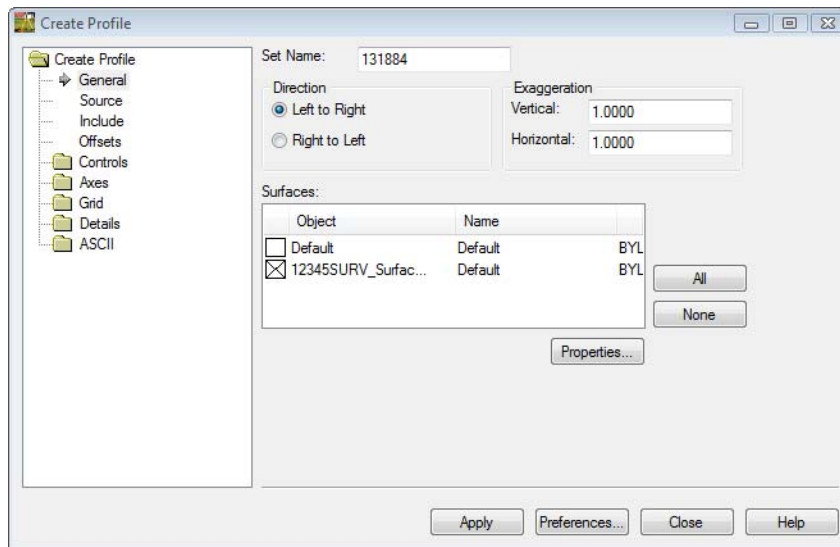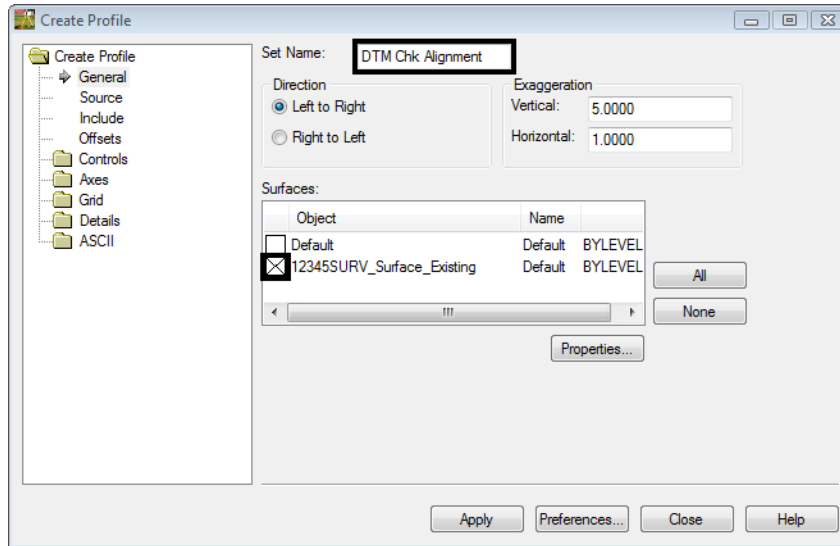
18. **<D>** the **Preferences…** button. The *Preferences* dialog will appear.
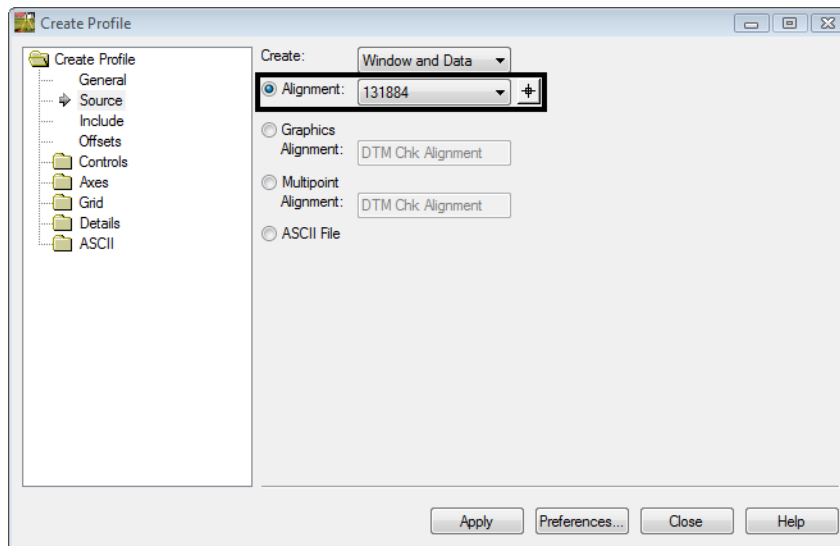
19. Select the preference name **5x Vertical**.

20. **<D>** the **Load** then **Close** buttons.

21. On the Create Profile dialog **Create Profile > General** leaf
    Set Name: DTM Chk Alignment

22. Verify *12345SURV_Surface_Existing* is checked in the *Surfaces* section.


23. On the Create Profile dialog **Create Profile > Source** leaf*.*

24. Set the Radio button to **Alignment**

25. **<D>** the **Apply** button. The dialog will minimize allowing you to select the location of the profile in the MicroStation view.

26. **<D>** a location in the MicroStation view to draw the profile. The *Create Profile* dialog will reappear and the Profile is generated.

27. Review your results.
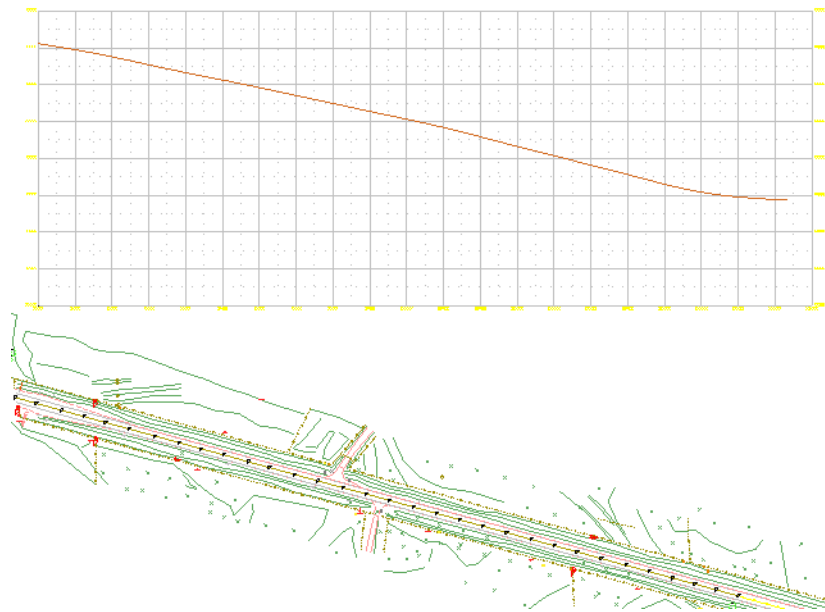
28. Continue to generate profiles along the remainder of the centerline.

When finished:

29. Using MicroStation **Delete** button. Delete all DTM Check profiles.

Section Summary:

♦ In this lab a profile was created from an existing horizontal alignment to help evaluate the existing surface.
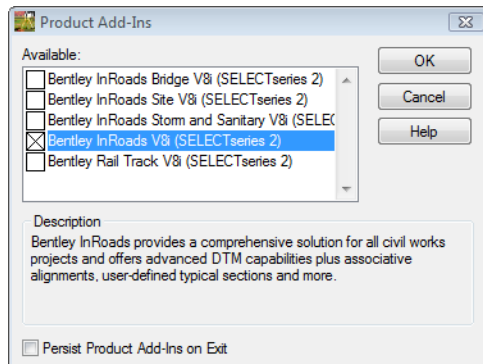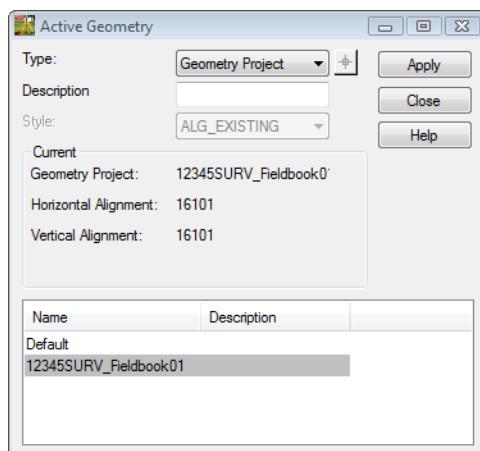
Lab 9.7 - Cross Sections

Section Objectives:

♦ Create a Cross Section set from an existing horizontal alignment to help evaluate the existing surface.

1. Open a new working MicroStation model file.

2. Open an InRoads Surface.

3. Open an InRoads Geometry Project.

   InRoads Survey only allows for multipoint profiles. To create profiles from an existing alignment InRoads needs to be added. Skip to steps 4 and 5 if InRoads is already activated.

4. From the InRoads pull down menu select **Tools > Product Add-ins**. The *Product Add-ins* dialog will appear.
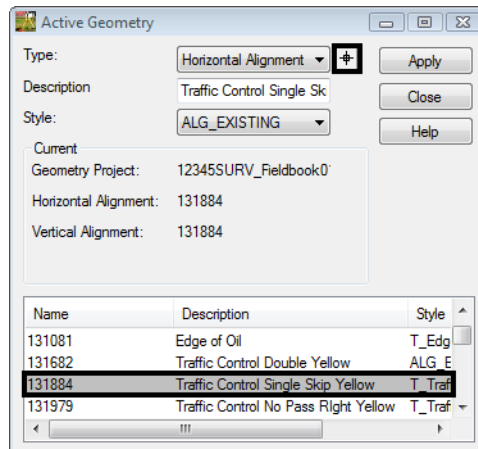
5. Select the **Bentley InRoads V8i** application and select the **OK** button. InRoads application will be added to the InRoads Survey interface.

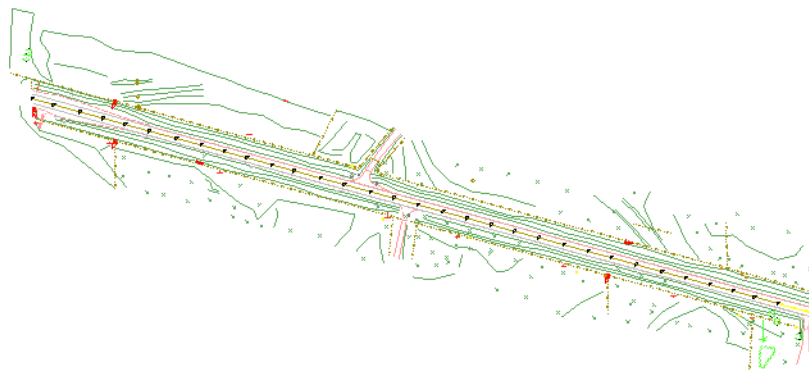6. From the InRoads pull down menu select **Geometry > Active Geometry**. The *Active Geometry* dialog will appear.

7. Select the *Type:* **Horizontal Alignment**

8. **<D>** the **Target** ⊞ button. The Active Geometry dialog will minimize allowing you to select the centerline in the MicroStation view.

9. **<D>** the centerline of the road. The centerline of road will highlight and the *Active Geometry* dialog will reappear.

10. **<D>** the **Apply** then **Close** buttons. The Horizontal Alignment name will be active.

11. From the InRoads pull down menu select, **Geometry > Fit Alignment**.

12. **<R>** for the active alignment in the MicroStation View.

13. From the pull down menu select, **Geometry > View Geometry > Active Horizontal**

        Note: The above graphic is where the profile will be extracted.

14. From the pull down menu select, **Tools > Global Scale Factors…** The *Scale Factors* dialog will appear.

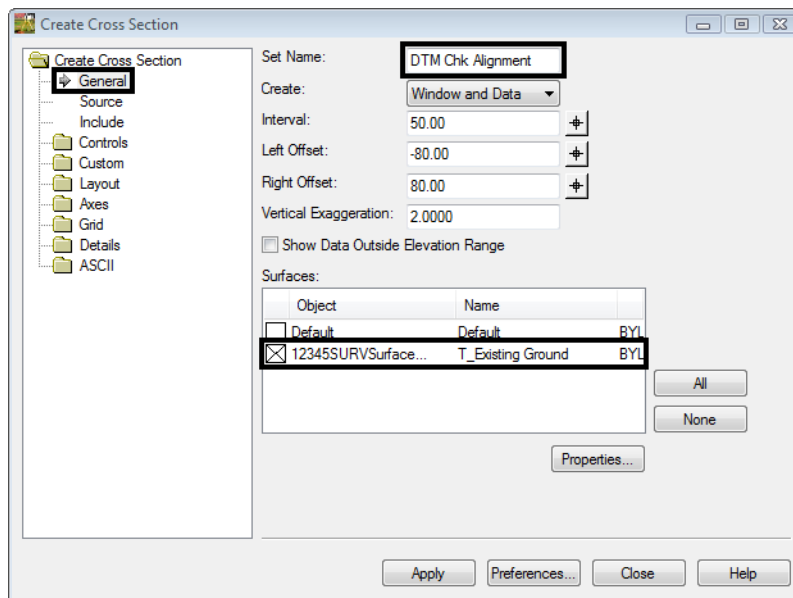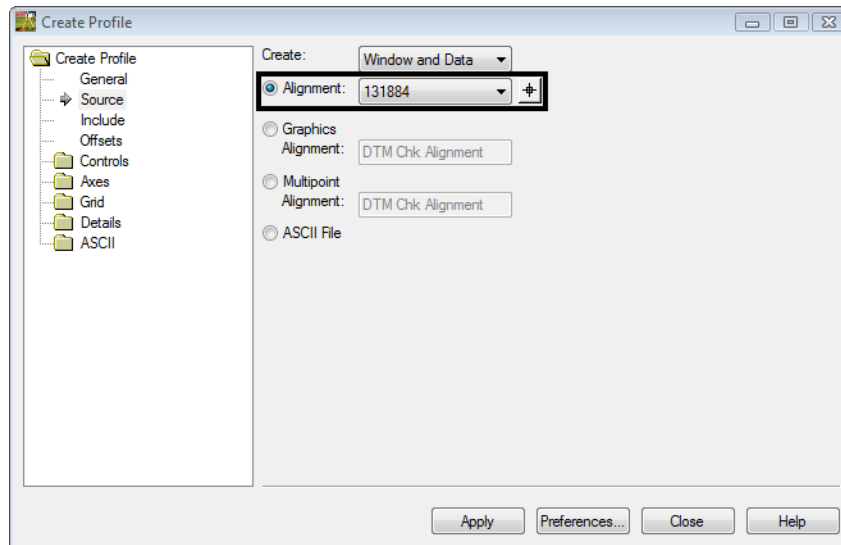15. Key-in the scale factor **50**

16. **<D>** the **Apply** then **Close** buttons.

17. On the Create Cross Section dialog **Create Cross Section > General** leaf
    *Set Name: **DTM Chk Alignment***

18. Verify ***12345SURV_Surface_Existing*** is checked in the *Surfaces* section.

19. On the Create Cross Section dialog **Create Cross Section > Source** leaf*.*

20. Set the Radio button to **Alignment**.

21. **<D>** the **Apply** button. The dialog will minimize allowing you to select the location of the profile in the MicroStation view.

22. **<D>** a location in the MicroStation view to draw the profile. The *Create Cross Section* dialog will reappear and the cross sections will be generated.

23. Review your results.
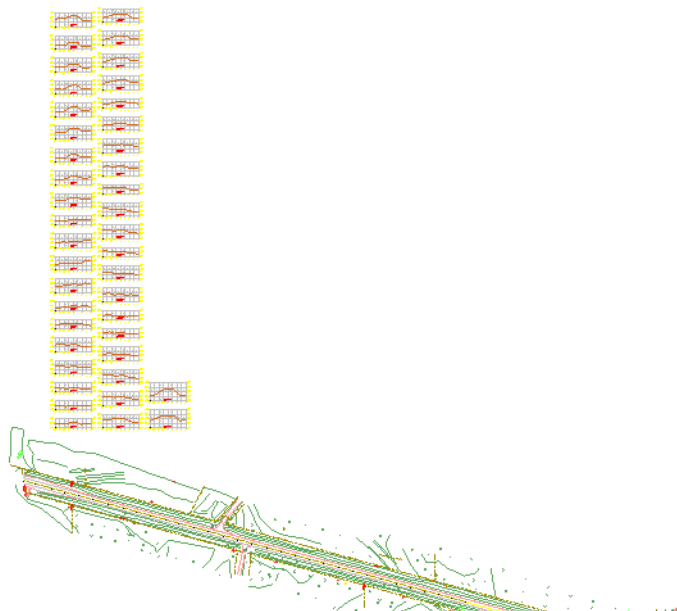
Section Summary:

♦   In this lab a cross section set was created from an existing horizontal alignment to help evaluate the existing surface.

Lab 9.8 - Survey

Survey Feature Filters

The geometry project *12345SURVGeometry01* contains horizontal and vertical alignments for every linear item that was surveyed. Additionally the Cogo buffer contains points for every survey shot collected. While this may be desirable information, often it is desirable to work with a subset of the survey information such as pavement center lines, control lines, or other specific entities. Working with a subset of the information increases efficiency by working with a smaller data set and freeing-up additional computer memory for other operations. This can be accomplished by using Survey Feature Filters when exporting survey data (Fieldbook) to a geometry project.

Section Objectives:

♦   The goal is to have a geometry project that contains only the information important to establishing the centerline of the existing road.

♦   The use of survey style filters will assist in sorting the data.

1.   Open a new working MicroStation design file.

2.   Open an InRoads Survey Fieldbook.

3.   From the pull down menu select **Survey > Survey Style Filter**. The *Survey Style Filter* dialog will appear.
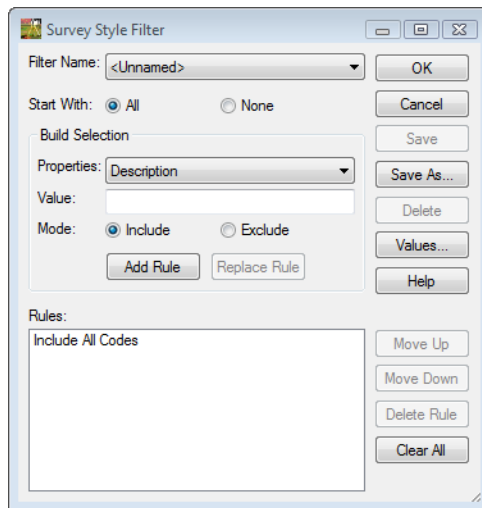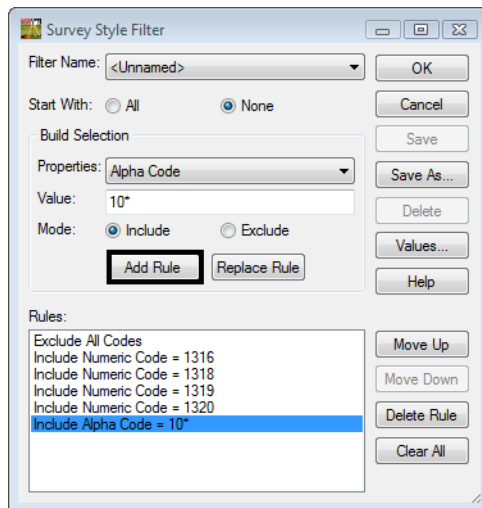
4. Toggle the radio button *Start With:* **None**

5. Select *Properties:* **Numeric Code**

6. Key-in the *Value:* **1316**

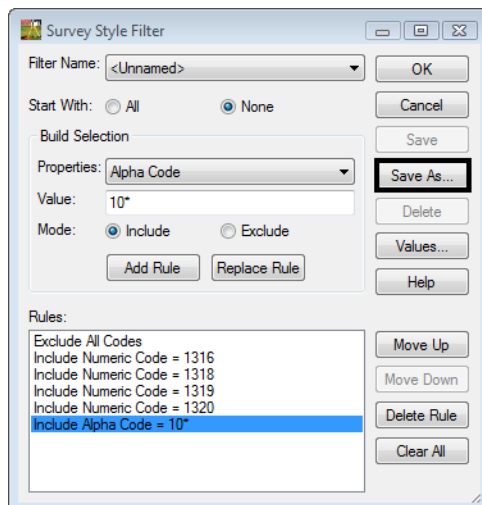7. Toggle the radio button *Mode:* **Include**
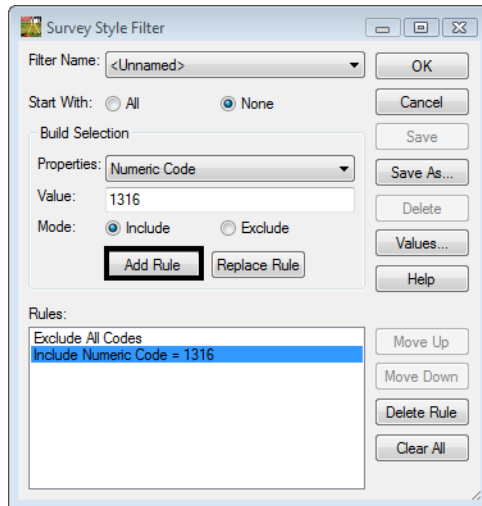
8. **<D>** the **Add Rule** button. The rule will be added to the Rules List.

9. Add additional numeric rules for:

    ♦   ***1318***
    ♦   ***1319***
    ♦   ***1320***
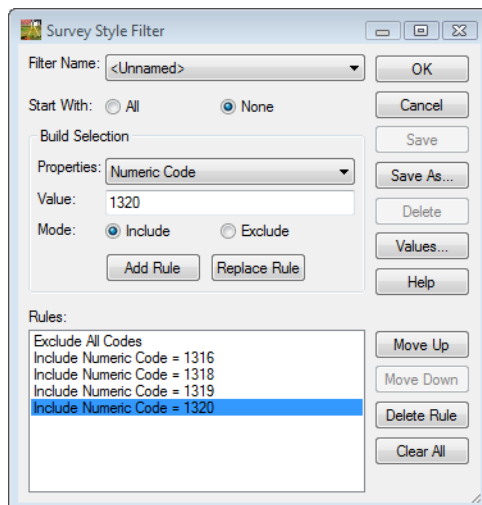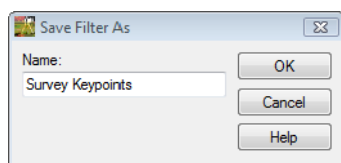
10. Select *Properties:* **Alpha Code**

11. Key-in the *Value:* **10***

12. Toggle the radio button *Mode:* **Include**

13. **<D>** the **Add Rule** button. The rule will be added to the Rules List.

14. **<D>** the **Save As** button. The *Save Filter As* dialog will appear.

15. Key-in the *Name:* **Survey Keypoints**

16. **<D>** the **OK** button in the *Save Filter As* dialog.

17. **<D>** the **OK** button. The *Survey Feature Filter* dialog will close.

> *Note:*   The Survey Feature Filter just built is for filtering information contained in a Survey Fieldbook and gets saved in the Survey Feature Table (fwf) file vs. in the InRoads Civil.ini file as Feature Filters do. Therefore, it gets applied within the Fieldbook and not in the InRoads Feature Filter interface. However the Filter Lock needs to be turned on in the InRoads Locks toolbar for it to be active.

18. On the Locks toolbar, toggle **ON** the **Feature Filter Lock**

Note: Notice that 2 things happen, the Fieldbook Data dialog will update to display only the data that passes the filter. Also the MicroStation display will only display survey data that passes the filter.
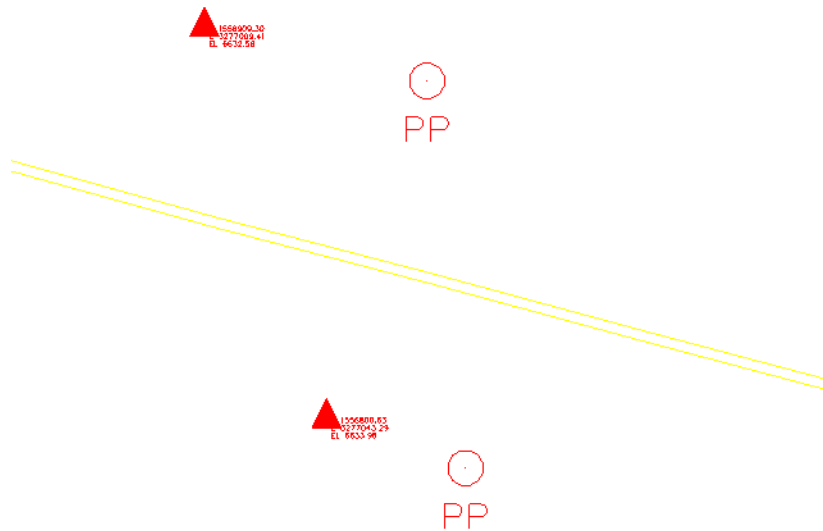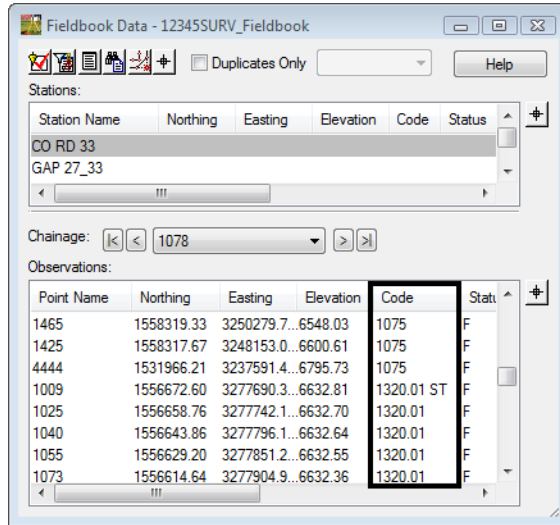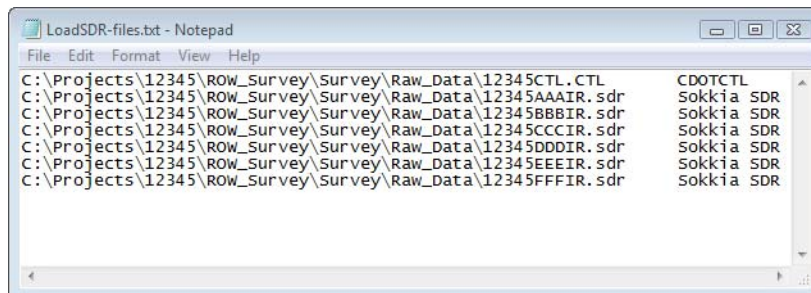

Section Summary:

♦ In this lab a survey style filter was created to only export data from the fieldbook to a Geometry Project that pertained to reestablishing the mainline.

Lab 9.9 - Importing multiple files

To speed up the process of importing multiple files you can create a Group file. This.is a simple text file that points to the file location and import wizard to use.   When it is available these are the steps for using Group Files on import.

Section Objectives:

♦ Import multiple Sokkia SDR files as one into InRoads Survey using a Group of files ASCII file.

1. From the pull-down menu, select **File > Import > Survey Data**. The *Import* dialog will open.

2. Change the drop-down arrow *Files of type:* **Group of Files (*.*)**

3. Path to the folder *C:\Projects\12345\ROW_Survey\Survey\Raw_Data*

4. Select the file *LoadSDR_files.txt* from the unfiltered list of files.

   ♦ The Group of files option is a handy way to load multiple files at one time. The file is a simple ASCII text file that shows the file location and import type. Below is a screen shot of the file opened in Notepad. This file would need to be created prior to using it on a different project.

5. In the *Import* dialog **<D>** the **Import** button.

6. **<D>** the **Close** button. All the files listed in the text file will be imported.

Section Summary:

♦ In this lab a Group of SDR files were imported at one time using an existing ASCII.

# Lab 9.10 - Metric Survey Data to Imperial Survey Data

Section Objectives:

♦ To convert an existing InRoads Survey fieldbook file units from Metric to US Feet.

1. Open a new working MicroStation model file.

2. Once MicroStation and InRoads Survey opens. From the InRoads pull-down menu, select **File > New.** The New dialog will appear.
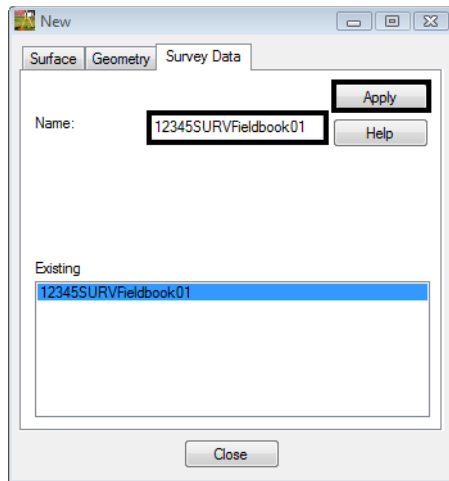
3. Select the **Survey Data** tab.

4. Key in the *Name:* **12345SURVFieldbook01**

5. Select the **Apply** button. The new fieldbook will appear below.

6. **<D>** the **Close** button.

7. From the Workspace bar the *12345SURVFieldbook01* should be active.

8. From the pull-down menu, select **File > Import > Survey Data**. The *Import* dialog will open.

9. Path to the *Look in: C:\Projects\12345\ROW_Survey\Survey\Raw_Data*

10. Verify the *Files of type:* **Sokkia SDR (*.sdr)**
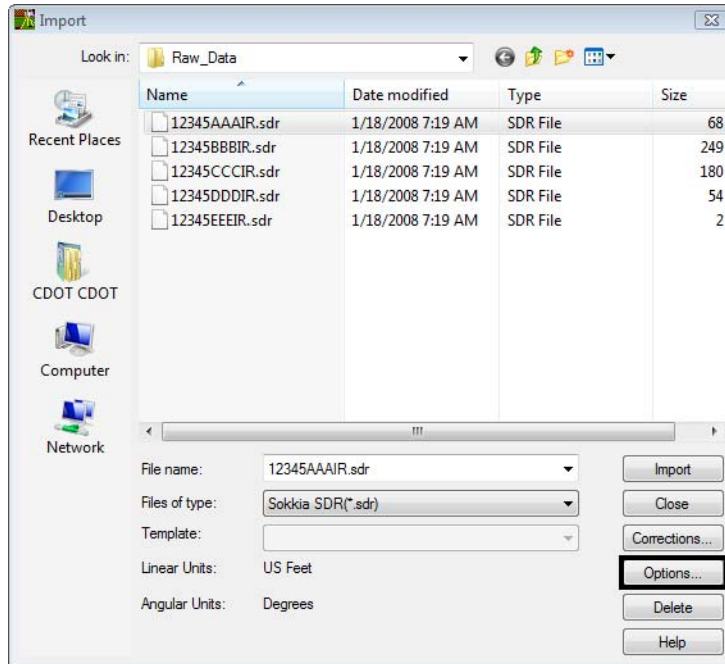
11. **<D>** the **Options** button.

12. Select the **Units** tab.

13. Change the *Linear Format Units:* **Meters**
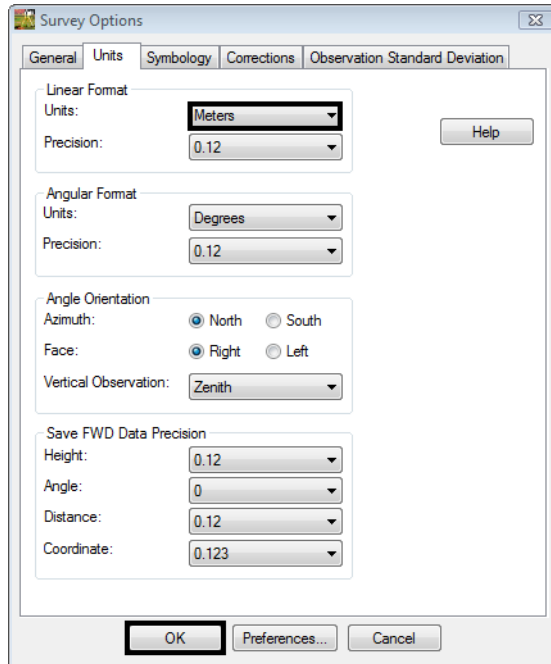
14. **<D>** the **OK** button. The *Survey Options* dialog will close.

15. In the Import dialog select the data collector file you will be importing.

16. **<D>** the **Import** then **Close** buttons.

17. From the pull-down menu, select **Survey > Fieldbook Data**. Take a minute to review the imported Survey control data that is now contained in the electronic Fieldbook.

18. From the pull-down menu, select **Tools > Survey Options** the *Survey Options* dialog will appear.

19. Select the **Units** tab.

20. Change the *Linear Format Units:* **US Feet**
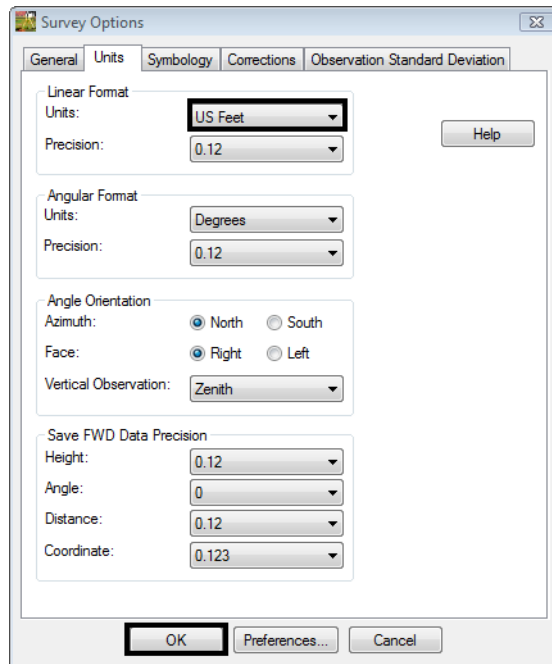
21. **<D>** the **OK** button. The *Survey Options* dialog will close.

22. From the pull-down menu, select **Survey > Fieldbook Data**. Take a minute to review the transformed Survey data that is now contained in the electronic Fieldbook.

Note: The file has now been converted to US Feet Units.

23. From the pull-down menu, select **File > Save > Survey Data** the *Save As* dialog will appear.

24. **<D>** the **Save** and **Cancel** buttons. The **Save As** dialog will close.

Section Summary:

♦ In this lab an existing Metric fieldbook file was converted to US Feet units.

Lab 9.11 - Exporting Survey Data to Sokkia SDR file

Exporting the fieldbook out to a SDR format would be required if you wanted to use the points and stake them out in the field.

Section Objectives:

♦ Create a Sokkia SDR file format file from the InRoads Survey fieldbook.

1. Verify the *12345SURV_Fieldbook* fieldbook you want to export is active. You can tell which fieldbook is active by the red box around the fieldbook button.

2. From the pull-down menu, select **File > Export > Survey Data**. The *Export* dialog will appear.

3. Change the directory to:
   C:\Projects\12345\ROW_Survey\InRoads\Field_Books

4. Select the down arrow for *Export as type:* review the available file formats available.

5. Select from the list *Export as type:* **Sokkia SDR33 (*.sdr)**

6. Key-in the new file name *12345SURV_Fieldbook.sdr*
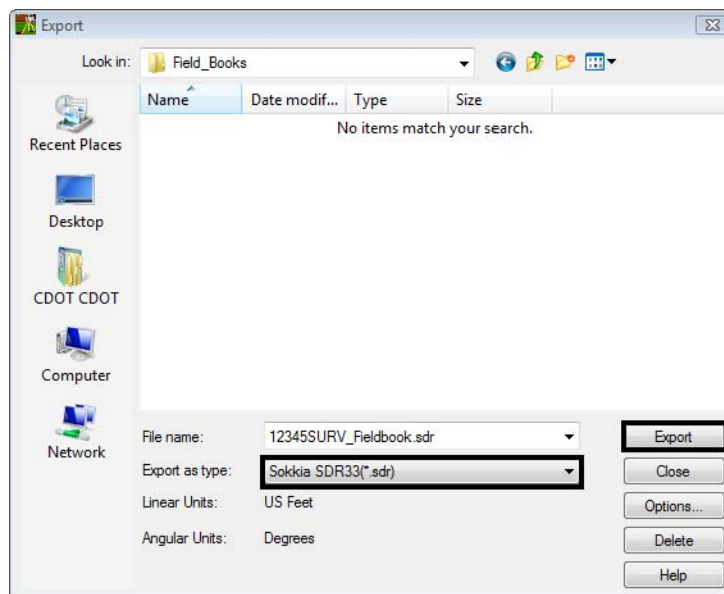
7. **<D>** the **Export** button. The *Export* dialog will close.

8. Open **Windows Explorer** *Windows + E*

9. Open and review the file in Notepad.
   C:\Projects\12345\ROW_Survey\InRoads\Field_Books\ 12345SURV_Fieldbook.sdr

Note: This file is ready to be uploaded into the data collector. If you need to import this file back into InRoads Survey for any reason you will need to add survey header information into file.

Section Summary:

♦ In this lab a Sokkia SDR file was created using the Export as type tool.

# Lab 9.12 - Exporting Survey Data using Text Export Wizard

Exporting the fieldbook out to another format would be required if you wanted to use the points and stake them out in the field.

Section Objectives:

♦   Create a customized exported ASCII file from the InRoads Survey Fieldbook using Text Export Wizard.

1. Verify the *12345SURV_Fieldbook* fieldbook you want to export is active. You can tell which fieldbook is active by the red box around the fieldbook button.

2. From the pull-down menu, select **File > Export > Survey Data**. The *Export* dialog will appear.

3. Change the directory to: *C:\Projects\12345\ROW_Survey\InRoads\Field_Books*

4. Select the down arrow for *Export as type:* review the available file formats available.

5. Select from the list *Export as type:* **Text File (*.*)**

6. Key-in the new file name *12345SURV_Fieldbook.txt*
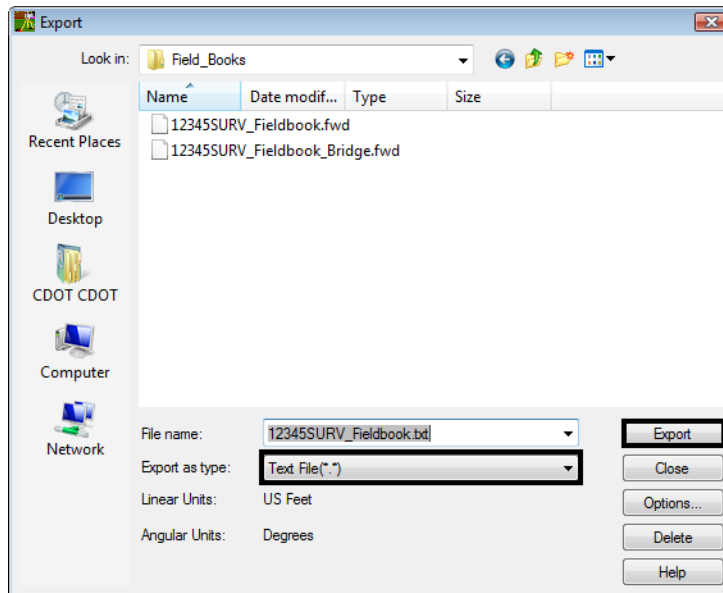
7. **<D>** the **Export** button. The *Export* dialog will close and the *Text Export Wizard* dialog will appear.
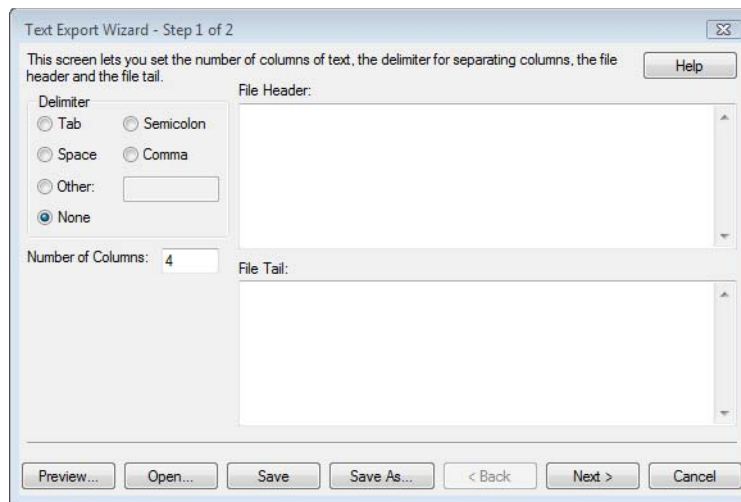

8. **<D>** the radio button **Comma**

9. Key-in *Number of Columns:* **7**

10. Key-in *File Header:* **CDOT Survey Training "Initials" "Date"**

11. Key-in *File Tail:* **Exported Fieldbook 12345SURV_Fieldbook.fwd**
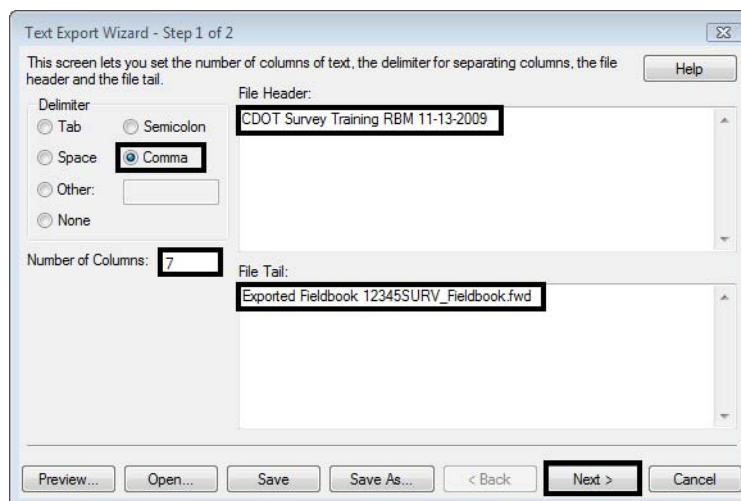
12. **<D>** the **Next >** button. The final *Step 2 of 2* dialog will appear.
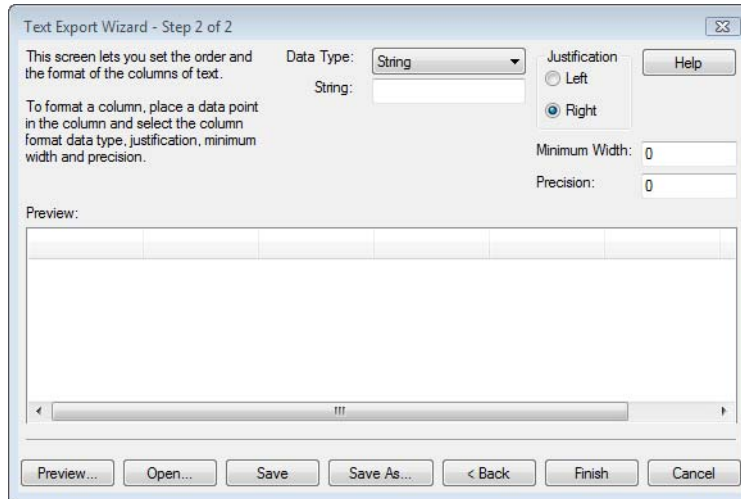
13. **<D>** the header of the **first column**. The column will highlight as shown below.

14. From the *Data Type* radio button select *String:* **Export**

15. In the *Justification* section of the dialog set the radio button to **Left**
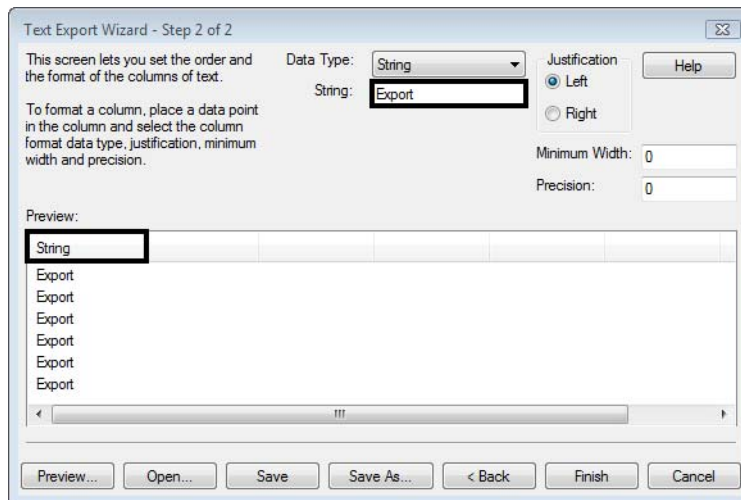
16. **<D>** the **second column** header then select **Point Name** from the Data Type radio button.

    ♦ *Justification:* **Left**

17. Select the third column header then select **Northing** from the Data Type radio button.

    ♦ *Justification:* **Left**
    ♦ *Precision: 2*

18. Select the fourth column header then select **Easting** from the Data Type radio button.

   ♦ *Justification:* **Left**
   ♦ *Precision: 2*

19. Select the fifth column header then select **Elevation** from the Data Type radio button.

   ♦ *Justification:* **Left**
   ♦ *Precision: 4*

20. Select the sixth column header then select **Code** from the Data Type radio button.

   ♦ *Justification:* **Left**

21. Select the seventh column header then select **Description** from the Data Type radio button.

   ♦ *Justification:* **Left**

22. **<D>** the **Save As** button. The *Save As* dialog will appear.

23. Key in *File name: ASCII Export.tew*
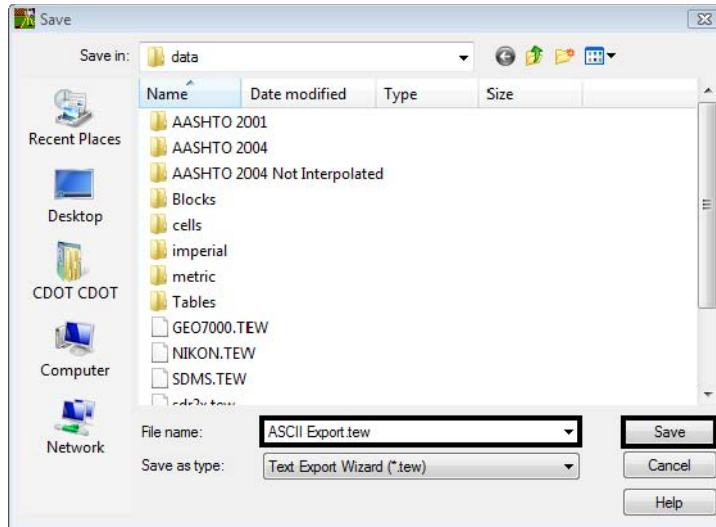
24. **<D>** the **Save** button. The *Save As* dialog will close.

25. The *Save Format to File Types* dialog will appear. Verify *Format Name: **ASCII Export***
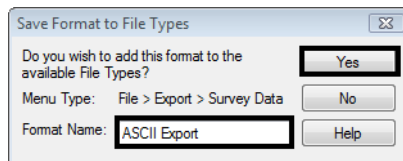

26. **<D>** the **Yes** button. The *Save Format to File Types* dialog will close and the *Step 2 of 2* dialog will reappear.

27. In the *Step 2 of 2* dialog **<D>** the **Cancel** button. The *Step 2 of 2* dialog will close.

28. From the pull down menu select, **File > Export > Survey Data**

29. In the Export dialog change the *Export as type: ASCII Export (*.txt)*

30. Path to the directory: *C:\Projects\12345\ROW_Survey\InRoads\Field_Books*
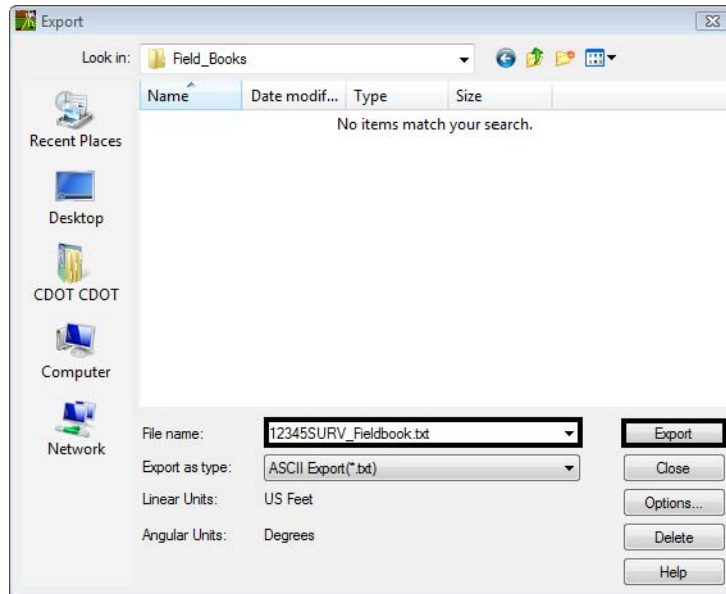
31. File name ***12345SURV_Fieldbook.txt***

32. **<D>** the **Export** button. The *Export* dialog will close.

33. Open *Windows Explorer* **Windows + E**

34. Open and review the file created in Notepad.
    C:\Projects\12345\ROW_Survey\InRoads\Field_Books\12345SURV_Fieldbook.txt
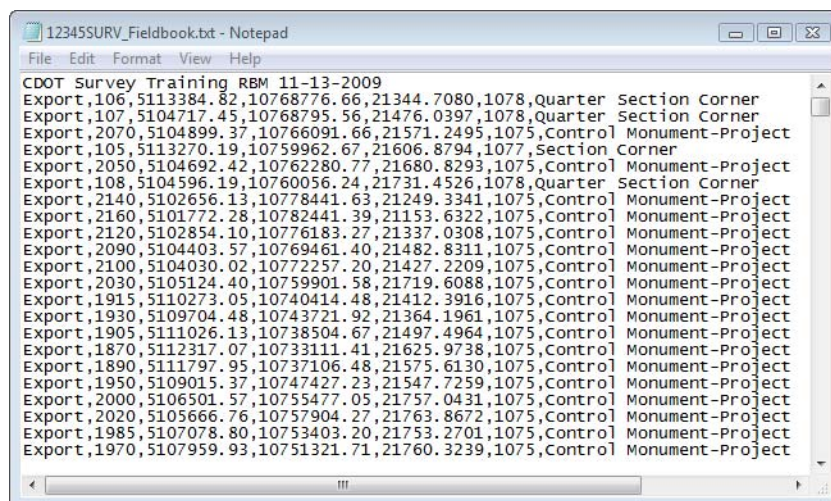
Section Summary:

♦ In this lab the Text Export Wizard was used to create a customized ASCII file from an open InRoads Survey Fieldbook.

Lab 9.13 - Exporting DC File from TGO

The workflows for exporting a DC file that will include the notes and attributes can be found on the CDOT CADD Library web page.

# Lab 9.14 - Merging InRoads Survey Fieldbook files

When a project is using more then one fieldbook for a particular job it is possible to merge those fieldbook files together.

Items to address prior to merging fieldbooks:

- ♦ There can not be duplicate point names between the fieldbooks.
- ♦ If you are using figure strings make sure they are not going to conflict with the figure strings in the other fieldbook.

Section Objectives:

- ♦ Merge two existing InRoads Survey Fieldbook files into one InRoads Survey Fieldbook file using the Import FWD tool.

1. Open a new working MicroStation model file.

2. Open an InRoads Survey Fieldbook.
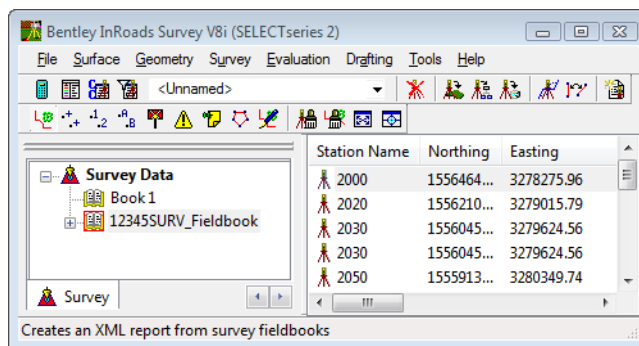
3. From the InRoads pull down menu select **File > Import > Survey Data** The *Import* dialog will appear.

4. Select the *Files of type:* **Field book (*.fwd)**

5. Select the fieldbook name you want to import.
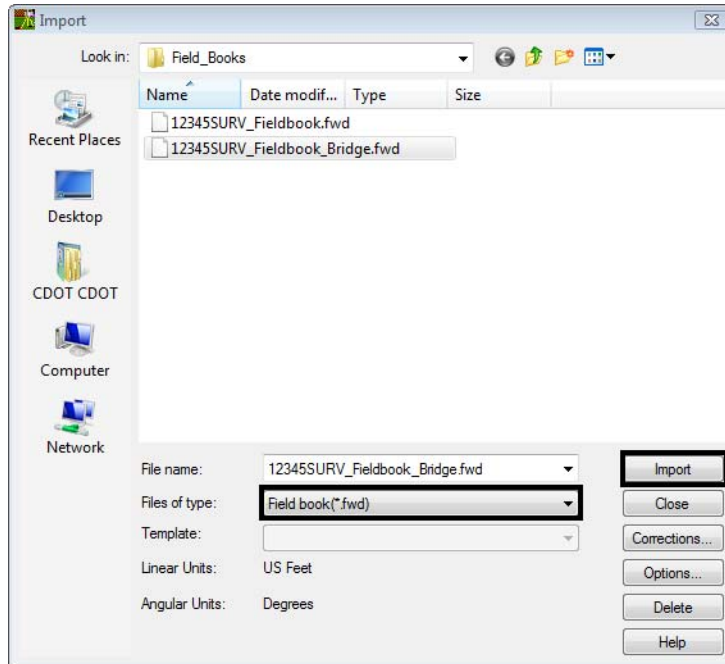
6. **<D>** the **Import** then **Close** buttons. The fieldbook files are now merged.

Section Summary:

♦ In this lab we merged two InRoad Survey Fieldbook files into one fieldbook file.