Georgia Department of Transportation

InRoads to HEC RAS for Bridge Hydraulics

****InRoads Select Series 2****

Training Guide

Office of Design Policy & Support

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Revisions

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Date	Revision Number	By	Section	Description
02-01-13	1.0	CB-HC	ALL	ALL
04-30-15	1.1	CB-HC	Introduction-3	Revised document Hyperlinks to reference/open the associated GDOT TravelSmart Web Page links.

InRoads to HEC RAS for Bridge Hydraulics

Introduction

The objective of this Lab is to generate data and reports from InRoads for use in the HEC-RAS (Hydrologic Engineering Center - River Analysis System) software. The minimum data required to perform these steps is an InRoads Surface (.dtm) and an InRoads Geometry file (.alg). These two files should be requested directly from the Designer.

Before Starting…

The instructions in this Lab are to be performed in conjunction with a training data set named InRoads to HEC RAS Labs.exe. The InRoads to HEC RAS Labs.exe is a WinZip Self Extracting executable file that will unzip and place sample training files on the user's computer in a folder named *C:\InRoads to HEC RAS Labs*.

The training dataset may be found and downloaded to the user's desktop from the GDOT web page:

http://www.dot.ga.gov/PS/DesignSoftware/InRoads

Once the file is downloaded to the user's desktop, the InRoads to HEC RAS Labs.exe file should be double clicked and unzipped accepting the defaults.

You are now ready to begin Lab 1.

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Lab 1
Start InRoads and Set Project Defaults

Objective

After the required files have been obtained from the Designer, a Folder Structure needs to be set up for InRoads. The recommended Folder Structure for InRoads is a Project Folder (which is named for the PI # of the Project – *Example:* **1234567**) located as a sub-folder under **C:\InRoads Data** – *Example:* **C:\InRoads Data\1234567**). This Project Folder will contain the individual InRoads Data Files. The two InRoads data files the bridge hydraulics engineer will work from are:

1. **PI#.DTM** ------ (Digital Terrain Model File) – contains Surface data
2. **PI#.ALG**------- (Geometry File) – contains Geometric Point, Horizontal and Vertical data

Additional InRoads data files that are used by Photogrammetry, Survey and/or Design are:

4. **PI#.IRD** ------- (Roadway Design File) – contains the cross sectional roadway design.
5. **PI#.RWK**------ (Project File) – contains project data for InRoads files in ASCII format
6. **PI#.ITL**-------- (InRoads Template File) – contains InRoads Templates for cross-sections
7. **PI#.SDB**------- (Drainage File) – contains the InRoads Storm and Sanitary data
8. **PI#.FWD** ------ (Survey File) – contains Field Survey data

It is highly recommended to backup the Project Folder (which contains these individual data files) after each work session to your Group Account on the GDOT Server if you are a GDOT Employee (or to an appropriate Business Server if you are a GDOT Consultant).

The objective of **Lab 1** is to:

- Create a Project Folder
- Start InRoads
- Set the InRoads Project Defaults
- Set Design Default Preferences
- Set the InRoads "Locks"
- Add the Application and Variable Manager Add-Ins

Lab1A Create a Project Folder & Copy Lab Project Files

In this section of the Lab you will be creating a folder or directory. This folder is where your projects and all of your InRoads project data files will be located. The newly created InRoads project directory will be (**C:\InRoads Data\PI#)**. This is the recommended file structure for InRoads projects. (For this tutorial only -- you will also copy the "InRoads to HEC RAS Labs" folder to this location.)

1.	From the desktop, double-click on the **My Computer** icon. *This will open the My Computer dialog box. This is your computer's file manager. Via this dialog box, you may view the content of your computer's various hard-drives.*
2.	Double-click on the **C:** directory (also referred to as folder or drive). *This will open the **C:** directory box, listing the contents of the **C:** drive.*
3.	If the **C:** directory does not contain a folder named **InRoads Data** -- create the folder. *Creates folder **InRoads Data** under the **C:** drive.*

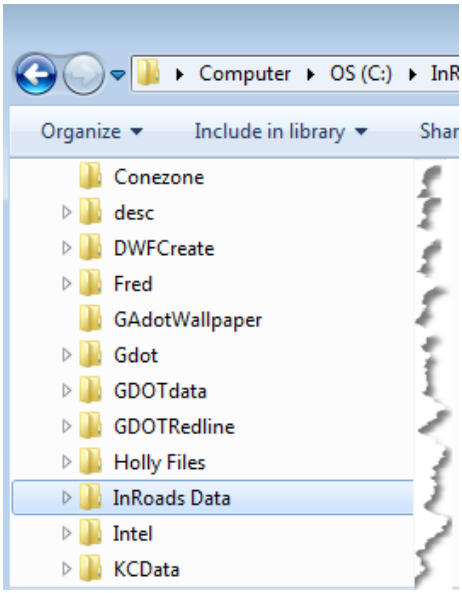


Figure L1-1 InRoads Project Folder In **C:** directory

4.	Using Windows Explorer, create a new folder under **InRoads Data** and name it **1234567**. This is the project folder you will use for the Lab Lessons (**C:\InRoads Data\1234567).** *Creates folder **1234567** under **C:\InRoads Data**.*
5.	Using Windows Explorer, copy the folder **InRoads to HEC RAS Labs** from **C:** to (**C:\InRoads Data\1234567)**. *Places the **InRoads to HEC RAS Labs** in **C:\InRoads Data\1234567***

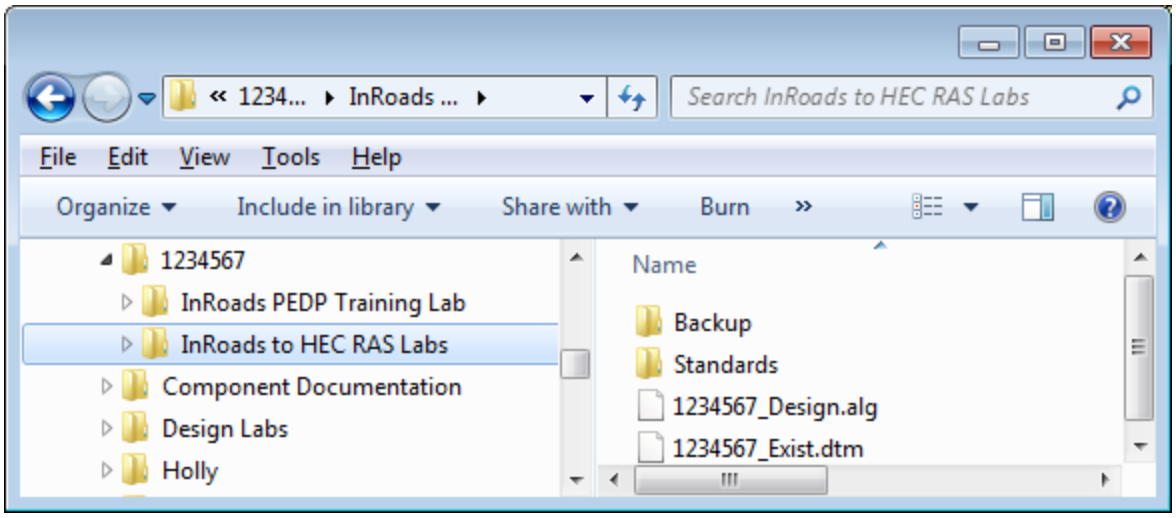


Figure L1-2 Folder **InRoads to HEC RAS Labs** in the **C:\InRoads Data\1234567** folder

6.	Close the **Explorer** window by clicking on the in the upper right-hand corner of the window. *This will close the **Explorer** window.*

Lab1B Start InRoads

In this section of the Lab you will be opening **MicroStation V8i Select Series 2** in the 'GDOT Corporate Workspace' and **InRoads Suite V8i Select Series 2.** You will also select a "seed" file to use for the "Working" DGN file. This "Working" DGN file is used to display the temporary and/or permanent graphics in **InRoads**. **MicroStation** is opened first and then **InRoads** is opened from the MicroStation Menu bar.

7. From the desktop, double-click on the **GDOT MicroStation V8i SS2 (x86)** icon.

Double click on the icon labeled **GDOT MicroStation V8i SS2 (x86)**

- When the **MicroStation Manager** dialog box opens – navigate to the **C:\InRoads Data\1234567\InRoads to HEC RAS Labs\Standards** folder and select the "**GDOT 3D Working File.dgn**". (Creation of the 'GDOT 3D Working File.dgn' is documented in the ***Design Guidelines***). Click **Open**.

- Now open InRoads from within MicroStation by selecting **InRoads ▶ InRoads Suite (SELECTseries 2) V8i 08.11.07.566** from the [MicroStation Menu].

*After the **MicroStation** Splash Screen appears, the **MicroStation Manager** dialog (See Figure L1-3) will open so that you can select a "**Working**" DGN file. Once **InRoads** and **MicroStation** are up and running, your desktop should look similar to that of Figure L1-4 and Figure L1-5.*

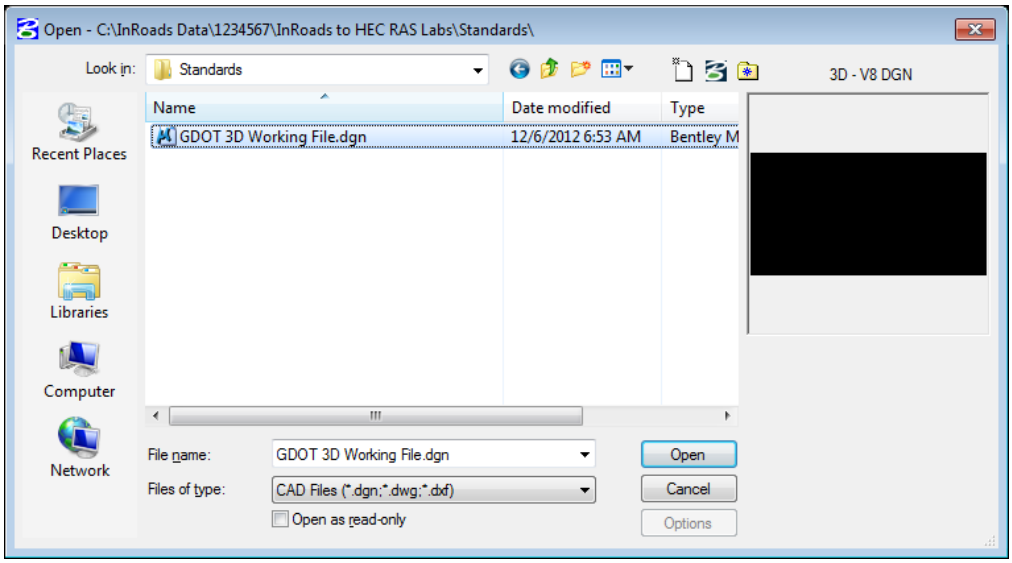


Figure L1-3 Starting **MicroStation V8i and InRoads Suite**

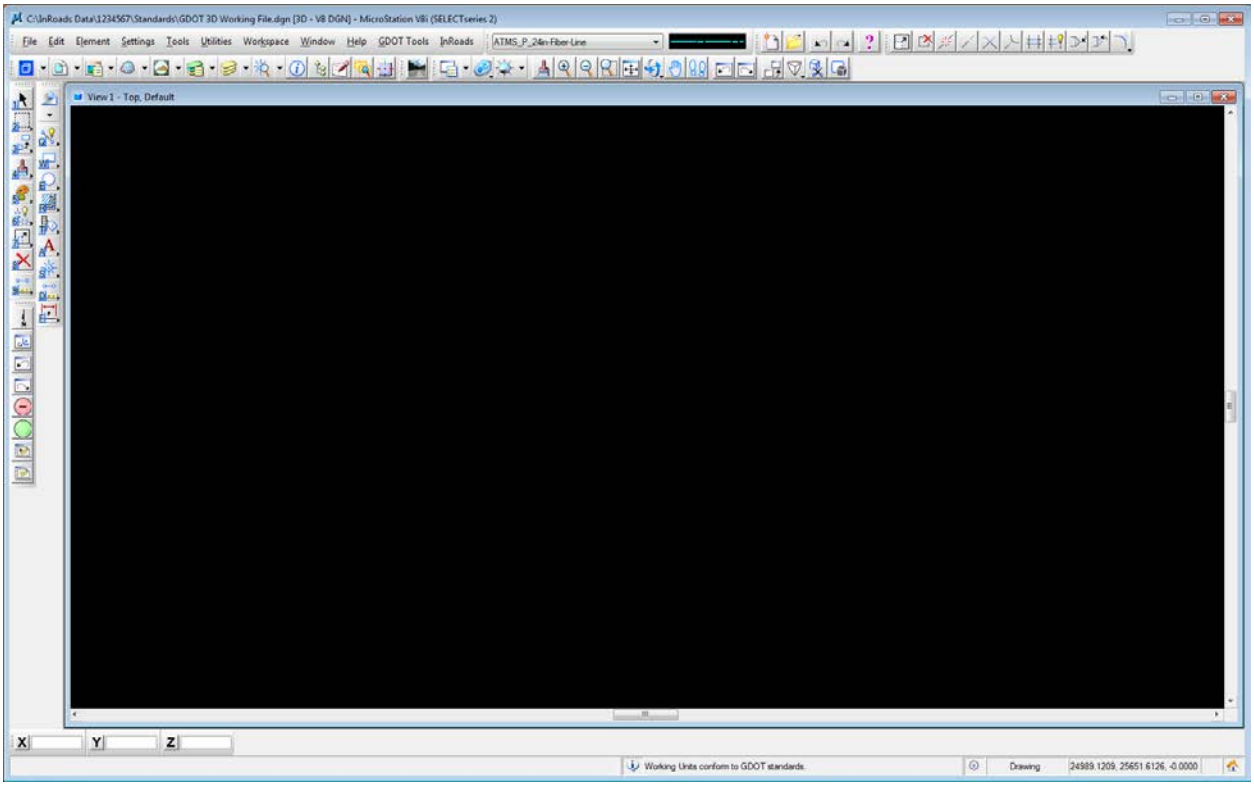


Figure L1-4 Main **MicroStation V8i** Window

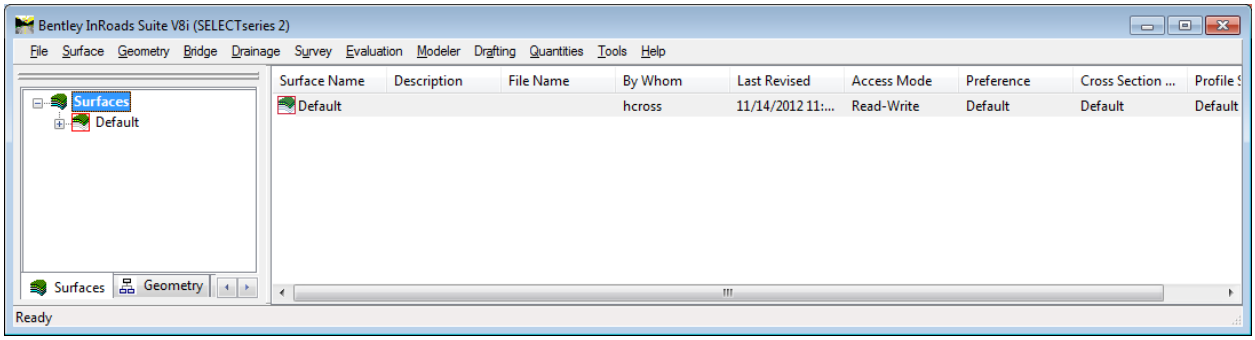
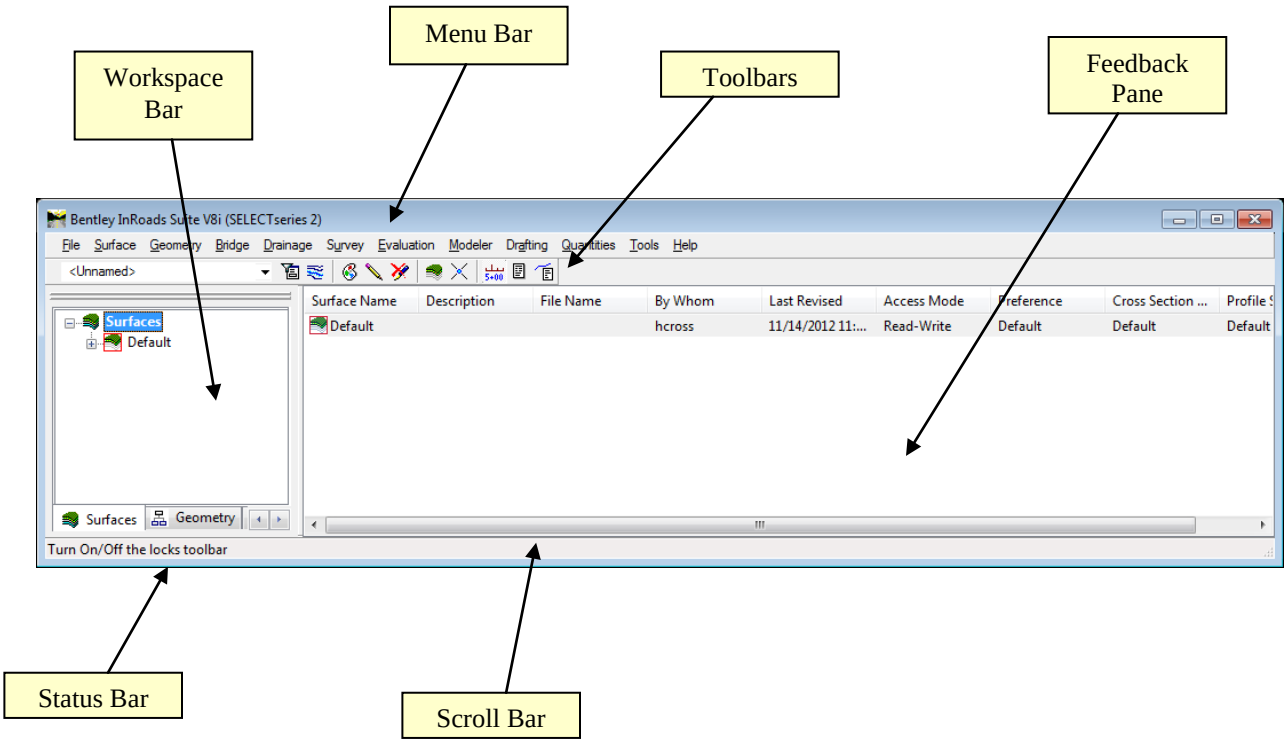


Figure L1-5 Main **InRoads V8i** Window

8.	As mentioned previously - you will be working in <u>both</u> the **InRoads Design Software** and the **MicroStation CADD Software**. The **InRoads Software** is the database in which the Design data is created and processed. The **MicroStation CADD Software** is used for the viewing and manipulation of graphics derived from **InRoads**. Please review the **diagram** depicted below for a brief overview of the InRoads Explorer Interface: *Details the components of the InRoads Explorer Interface.*



- **Workspace Bar** – Contains all of the InRoads Project Data information
- **Menu Bar** – Contains the pull-down menus to access InRoads commands
- **Toolbars** – Contains default and customized toolbars to access InRoads commands
- **Feedback Pane** – Contains details of selected Project Data from the Workspace Bar
- **Scroll Bar** – Enables the user to view more of the InRoads Explorer Interface. (The Scroll Bar may not be visible if the InRoads Interface is already viewed to extents).
- **Status Bar** – Contains InRoads messages and prompts (Please note: InRoads may direct you to locate something graphically in MicroStation -- some of these prompts may display in the MicroStation Status Bar instead). It is very important that the user review both the InRoads and the MicroStation Status Bar for prompts and information.

Lab1C Set InRoads Project Defaults

The **InRoads Project Defaults** setting allows you to define the "default folder locations" for projects. A ***Project Default*** configuration can then be saved for each project so that multiple projects can be accessed. This configuration allows you to easily navigate between projects. Once the Project Folder locations are saved in the Configuration, the projects can be accessed by selecting the appropriate Project Configuration Name. The Project Defaults also contains the location for selecting the standard GDOT InRoads Preference File (**GDOT_Standard V8i_SS2.xin**).

9.	Click **File►Project Defaults** from the InRoads pull-down menu. *The Set Project Defaults dialog box appears. Each Project will require an individual setup as detailed in the following steps.*
10.	Click **New** and enter **1234567_Bridge** in the **New Configuration** dialog box. Then click **OK**. *The New Configuration dialog box will appear. After entering in the Project Name and clicking OK – a new configuration will be created that is named 1234567_Bridge.*
11.	Under the **Default Preferences** section - Click in the **Preferences (*.xin):** field and then click the **Browse** button to navigate to the following file: **C:\InRoads Data\1234567\InRoads to HEC RAS Labs\Standards\GDOT_Standard V8i_SS2.xin**. Select the **GDOT_Standard V8i_SS2.xin** file and click **Open**. *The **GDOT_Standard V8i_SS2.xin** file is added as the Project Preference File.*
12.	Under the **Default Directory Paths** Section - Click in the **Project Default Directory:** field and then click the **Browse** button to navigate to the folder: **C:\InRoads Data\1234567\InRoads to HEC RAS Labs\.** Next - click **Open**. *The Current Configuration for the 1234567 project will now default to the following path: **C:\InRoads Data\1234567\InRoads to HEC RAS Labs\.***

13.	Under the **Default Directory Paths** Section – copy and paste the following text into each entry field shown below: **C:\InRoads Data\1234567\InRoads to HEC RAS Labs** • Report Directory: **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Projects (*.rwk): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Surfaces(*.dtm): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Geometry Projects:(*.alg): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Template Libraries:(*.itl): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Roadway Design: (*.ird): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Survey Data: (*.fwd): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Drainage: (*.sdb): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Quantity Manager: (*.mdb): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs ** • Site Modeler Projects: (*.gsf): **C:\InRoads Data\1234567\InRoads to HEC RAS Labs **
14.	Under the **Default Directory Paths** Section - Click in the **Style Sheet (*.xsl):** field and then click the **Browse** button to navigate to the folder: **C:\InRoads Data\Style Sheets\GDOT**. Next - click **Open**.
15.	The **Project Defaults** should now correspond to the screen capture depicted in *Figure L1-6* (as shown below). Verify to ensure that your 1234567 Project Defaults match the inputs in the screen capture.

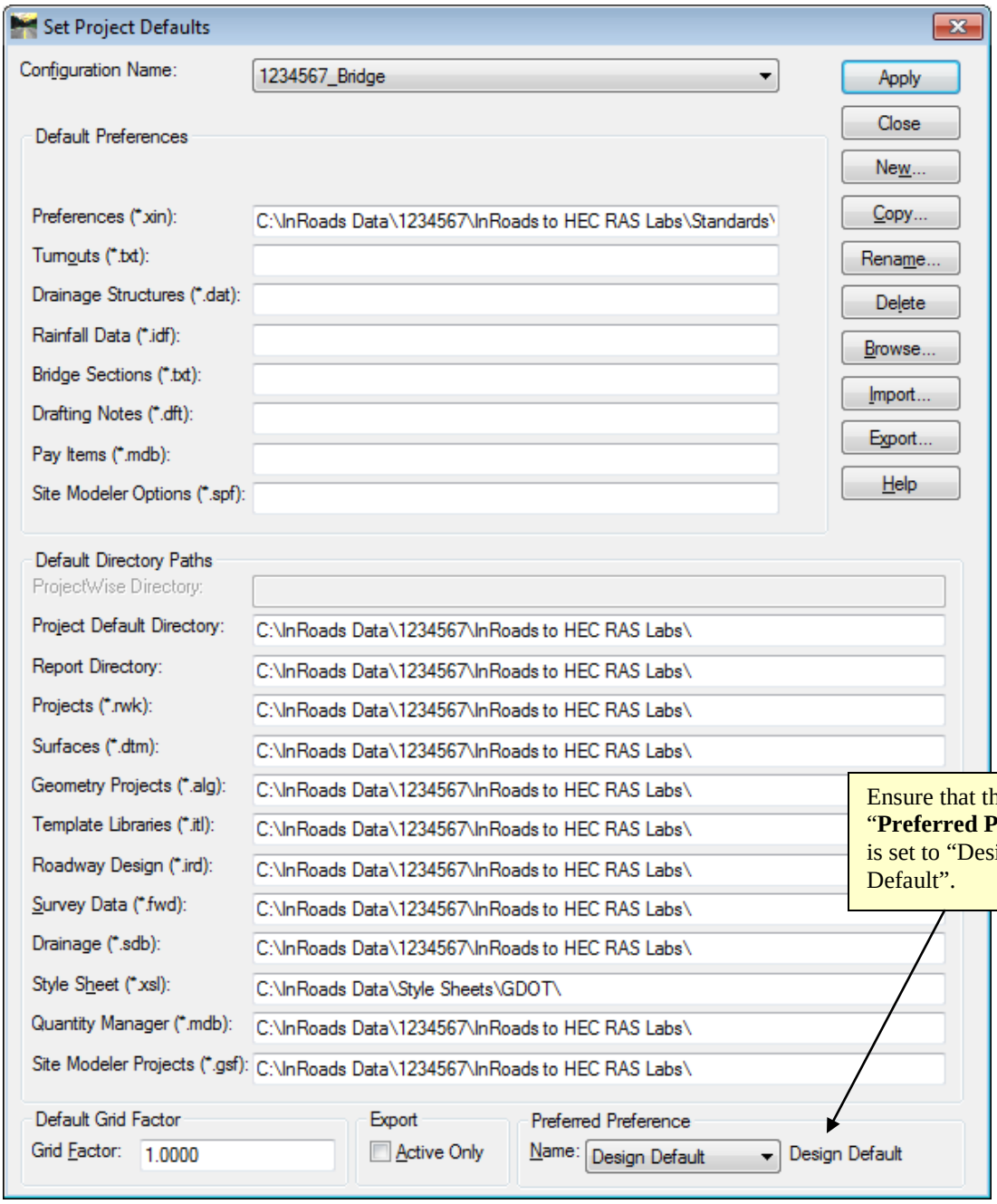
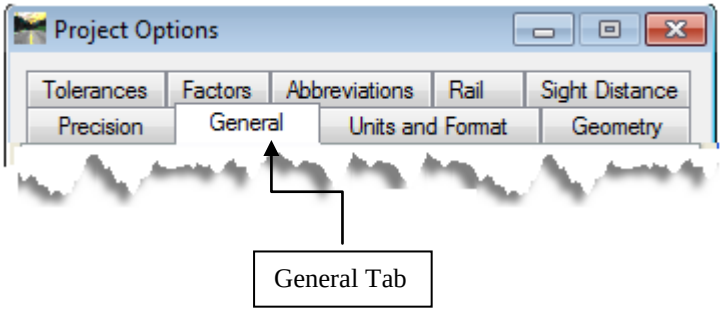
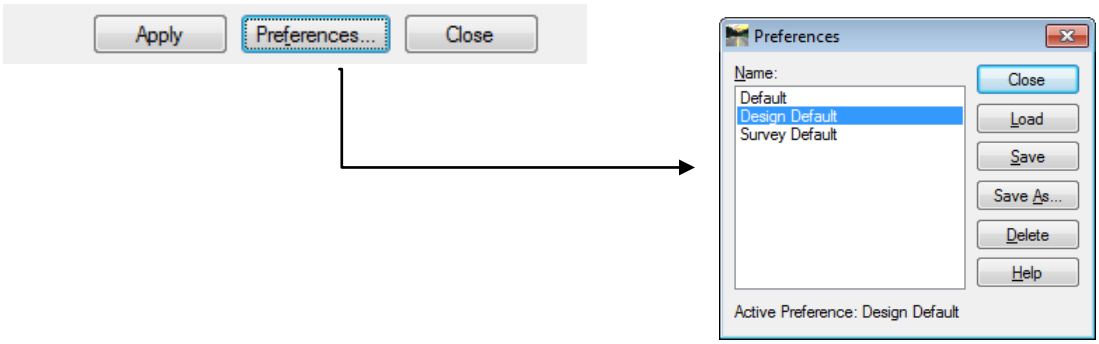


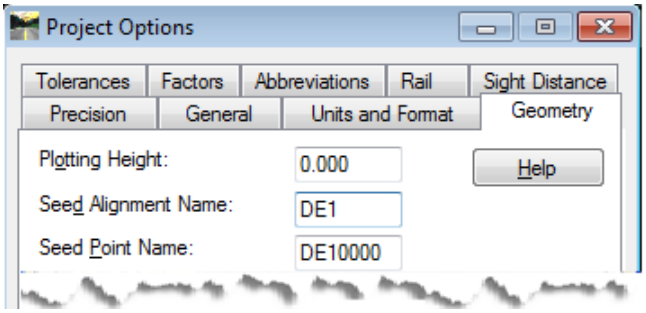
Figure L1-6 Set Project Defaults

16.	Click **Apply** and then click **Close**. The **Set Project Defaults** dialog box will close and the settings for this configuration of Project **1234567_Bridge** will be the default settings until the configuration is changed to another Project. This folder location will also be the default folder when **File ▶ Save** and **File ▶ Close** are used.

Lab1D Set Design Default Preferences

The **Design Default** Preferences must be loaded in InRoads in order to conform to standards for the processing of Design Projects. This is a very important step to ensure that standards are followed for any Design data that will be processed. The **Design Default** Preference loads the Precision Settings, Tolerances, Units and Formats, etc. Once the **Design Default** Preference is loaded – the project will retain these settings each time the project is accessed.

17.	Click **File▶ Project Options** from the InRoads pull-down menu to access the **Project Options** dialog box. *The Project Options dialog box appears.*
18.	In the **Project Options** dialog box - click on the **General** Tab.  *The General Tab dialog box appears.*
19.	In the **General Tab** dialog box click the command button named **Preferences…** (Located at the bottom of the dialog box).  *The Preferences dialog box will open.*
20.	In the **Preferences** dialog box – select **Design Default**. Then click **Load** and then click **Close**. *The **Design Default** Preference will be loaded. This will load the appropriate data for ALL of the tabs in the Options dialog box. The individual tabs (Tolerances, Geometry, Units and Format, etc.) will automatically be configured for use in Design. These individual tab options will NOT need to change. Once the **Design Default** Preference is loaded – the project will retain these settings each time the project is accessed.*

21.	**Important Information:** In the **Project Options** dialog box - click on the **Geometry** Tab.  Notice in the image at right, the **Seed Alignment Name:** and **Seed Point Name:** default settings of ***DE1*** and ***DE10000***. These values were set when the **Design Default** Preference was loaded in the preceding step. These settings are of particular importance to the Designer. Alignments must have a **DE** prefix. Points must also have a **DE** prefix as well as numbering starting at **10000**. In order for survey enhancements to be properly added during the design phase of a project, it is essential that Designers pay particular attention to this setting. **DE** stands for design.
22.	**Click** back to the **General** Tab. The **Design Default** Preference should now correspond to the screen capture depicted in *Figure L1-7* (as shown below). Verify to ensure that the **Project Options** dialog box for Project 1234567 matches the inputs in the screen capture. *The Project Options are verified for accuracy.*

Ensure that the "**Refresh Command Settings on Preference Change**" is checked:

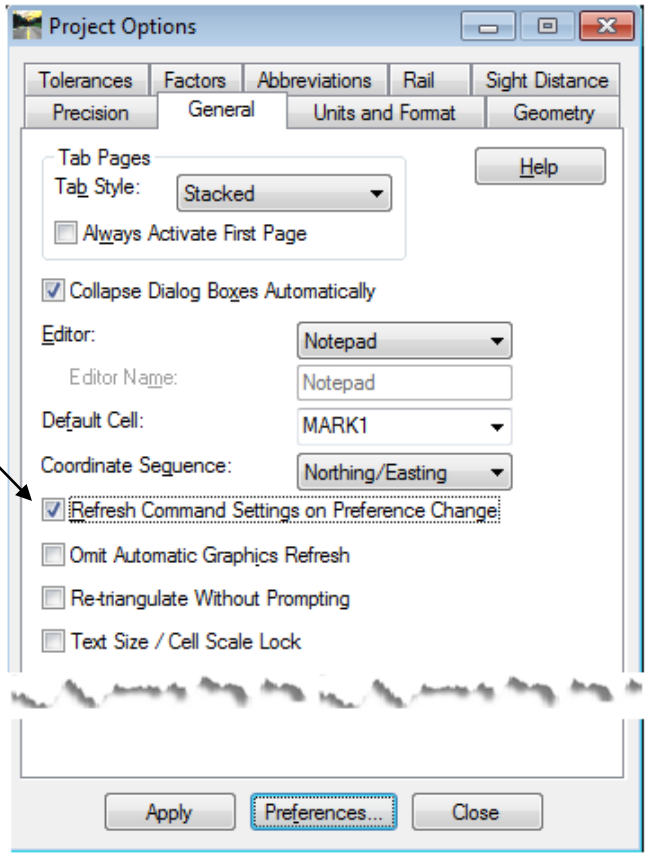


Figure L1-7 Design Default Settings

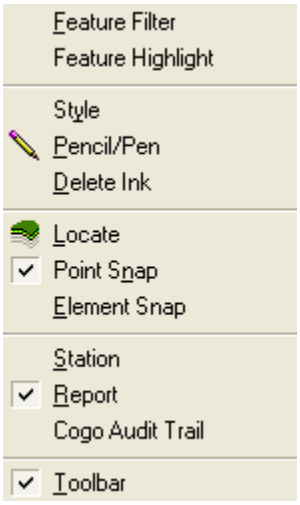
23.	Click **Apply** and then click **Close**. *The Project Options dialog box will close and the Design Default Preference for this configuration of Project 1234567 will be the default settings until the configuration is changed to another Project.*

Lab1E Set InRoads "Locks"

InRoads contains several "Locks" which are used by many InRoads commands to control different aspects of the selection and viewing of data as well as the reporting of data. There are basically two types of "Locks" – On/Off "Locks" and Switch "Locks". (Switch "Locks" contain different modes but one mode is always active and the user can switch between modes). Both types of "Locks" can be changed by the user as the situation dictates during the course of the database generation. These locks affect many commands – so it is very important that the user understand the use of these locks.

The following Lab contains a brief overview of some of the InRoads "Locks". These "Locks" must be set according to the following Lab --- (**Lab1E**) ---- for the use in upcoming Labs. This is a very important step to ensure that the "Locks" are set accordingly.

24.	Click **Tools►Locks** from the InRoads pull-down menu. *This command accesses the available InRoads "Locks". Each time a "Lock" is changed – the pull-down menu will close and the user must click on **Tools►Locks** again to access the Locks pull-down.*
25.	Ensure that the following locks are selected/unselected as appropriate: Feature Filter _____ Unchecked Feature Highlight __ Unchecked Style _____ Unchecked Pencil/Pen _____ Set to Pencil Delete Ink _____ Unchecked Locate _____Set to Features Point Snap _____ Checked Element Snap _____Unchecked Station _____ Unchecked Report _____ Checked Cogo Audit Trail __ Unchecked Toolbar _____ Checked *The InRoads "Locks" are set accordingly.*



26.	Following is a brief overview of the "Locks": **Feature Filter** displays or obscures Surface Features based on a filter (also controls Survey Style Filter) **Feature Highlight** highlights the feature in plan view when selected from a list **Style** determines if a dialog box is displayed for a surface command or cross sections **Pencil/Pen** controls the redisplaying of Graphics **Delete Ink** allows redisplayed graphics to replace graphics in pen mode **Locate** controls if Locate Buttons snaps to Graphics or Features **Point Snap** controls the ability to snap to points in Geometry Project **Element Snap** controls the ability to snap to elements in Geometry Project **Station** controls the Stationing as it pertains to Cross Sections **Report** controls if Report is displayed or not displayed in a dialog box **Cogo Audit Trail** controls the reporting of coordinate geometry results to a text file **Toolbar** displays or turns off the Locks Toolbar *Describes a "brief" overview of the InRoads "Locks".*

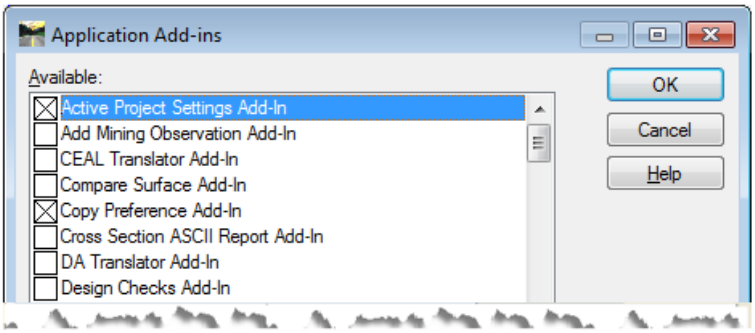
Lab1F Add Application and Variable Manager Add-Ins

InRoads contains several Application and Variable Manager "Add-Ins" which must be selected and added to the InRoads Program in order to access the standard GDOT customized menu applications/translators for Survey. Once the Application and Variable Manager Add-Ins are selected – the settings are written to registry keys in the user's profile. This ensures that each time InRoads is accessed in the user profile -- these settings will already be available. These add-ins will only need to be added once and will then be accessible in all of the InRoads Modules and InRoads Projects.

The following Lab contains a brief overview of the InRoads "Application and Variable Manager Add-Ins". These "Application and Variable Manager Add-Ins" must be set according to the following Lab --- (**Lab1F**) ---- for their use in upcoming Labs. This is a very important step to ensure that the "Add-Ins" are set accordingly.

27. The Application Add-Ins will be selected:

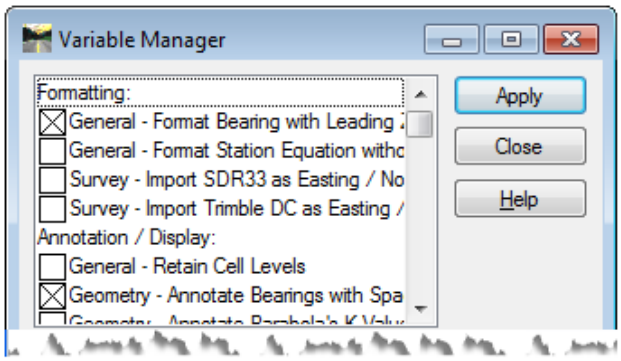
Click **Tools▶Application Add-Ins** from the InRoads pull-down menu and the following dialog box will appear:



Select the following Application Add-Ins by clicking an ☒ by the appropriate Add-In:

- ☒ Active Project Settings Add-In
- ☒ Copy Preference Add-In
- ☒ Display Superelevation in Plan Add-In
- ☒ Global Scale Factors Add-In
- ☒ Horizontal and Vertical Elements Add-In
- ☒ Hydrology and Hydraulics Add-In
- ☒ Import AMSA Add-In
- ☒ Import SRV Add-In
- ☒ Lot Layout Add-In
- ☒ Multiple Horizontal Element Regression Analysis Add-In
- ☒ Multiple Vertical Element Regression Analysis Add-In
- ☒ Named Symbology Tools Add-In
- ☒ Remove User Data Add-In
- ☒ Traverse Edit Add-In
- ☒ Variable Manager Add-In

The InRoads "Application Add-Ins" are selected accordingly.

28.	Click **OK** to accept the settings and to close out of the dialog box. *The Application Add-Ins dialog box will close and the selected Application Add-Ins will be available for use.*
29.	Next the Variable Manager Add-Ins will be selected: Click **Tools▶Variable Manager** from the InRoads pull-down menu and the following dialog box will appear:  Select the following Variable Manager Add-Ins by clicking an ☒ by the appropriate Variable: ☒ General - Format Bearing with Leading Zero Option ☒ Geometry - Annotate Bearings with Spaces ☒ Geometry - Alphanumeric Names in Create/Edit Alignment by Cogo Points *The InRoads "Variables" are selected accordingly.*
30.	Click **Apply** to accept the settings and then click **Close** to close out of the dialog box. *The Variable Manager dialog box will close and the selected Variables will be available for use.*
31.	 This concludes Lab 1. Do not proceed until the Instructor directs you to do so.

Lab 2
The InRoads Surface and Geometry File

Objective

The objective of Lab 2 is to open and learn about the InRoads 1234567_Exist.dtm Surface file and the InRoads 1234567_Design.alg geometry file.

Lab 2A Open the 1234567_Design.alg and 1234567_Exist.dtm

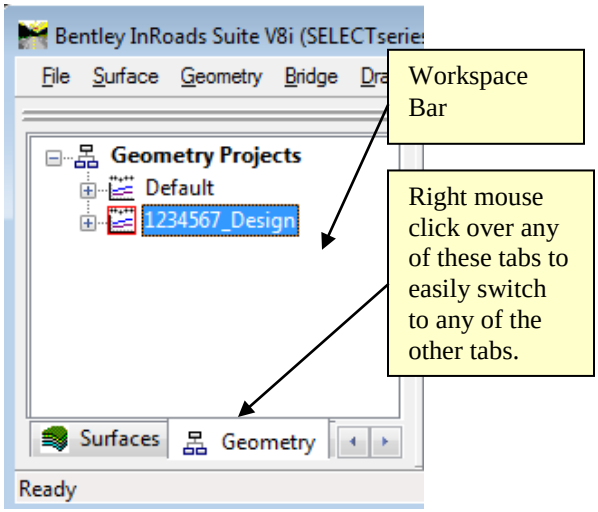
32. **Open the 1234567_Design.alg Geometry File.**

- In InRoads, select **File ► Open**
- Navigate to **C:\InRoads Data\1234567\InRoads to HEC RAS Labs**
- Highlight **1234567_Design.alg**
- Click **Open** and then click **Cancel**.

The 1234567_Design.alg file is opened.

33. **Make the InRoads Geometry tab the active tab**

- In InRoads, Right mouse click over any of the tabs in the Workspace Bar and select **Geometry**.
- Verify your view matches that shown in *Figure L2-1* and that the **Geometry** tab is the active tab showing the Geometry Projects.



****HINT:** Another way to open the Geometry File is to Right Mouse click over Geometry Projects in the Workspace bar.

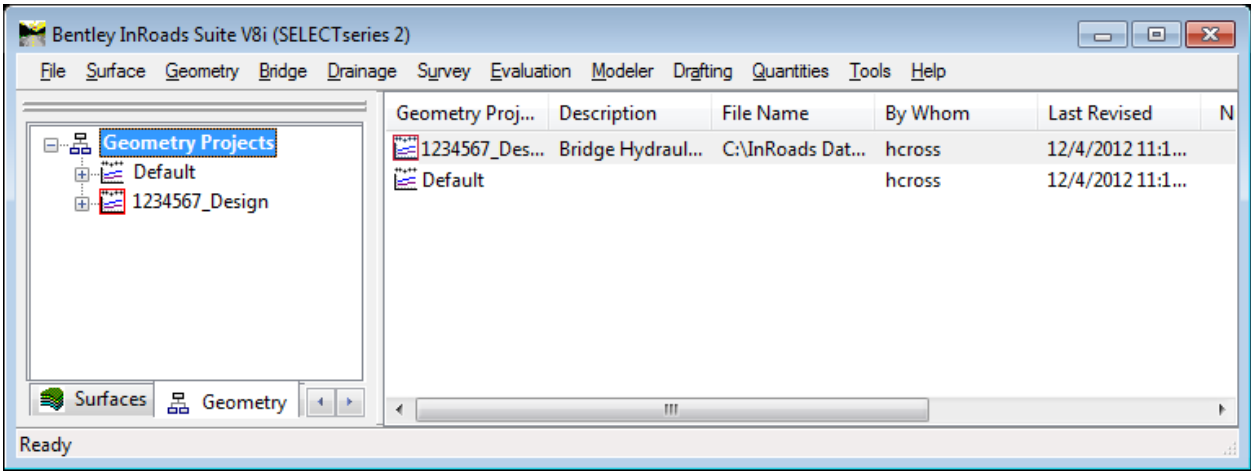
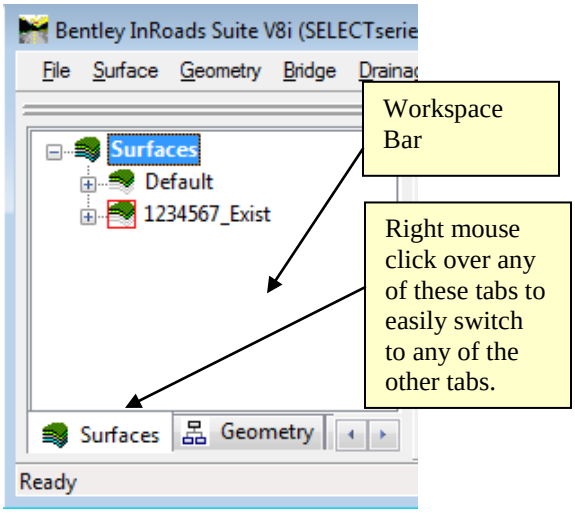


Figure L2-1 Main InRoads Window

34.	**Open the 1234567_Exist.dtm Surface.** • In InRoads, select **File ► Open** • Navigate to **C:\InRoads Data\1234567\InRoads to HEC RAS Labs** • Highlight **1234567_Exist.dtm** • Click **Open** and then click **Cancel**.
35.	**Make the InRoads Surface tab the active tab** • In InRoads, Right mouse click over any of the tabs in the Workspace Bar and select **Surfaces**. • Verify your view matches that shown in *Figure L2-2* and that the **Surfaces** tab is the active tab showing the **Surface(s)** listed.



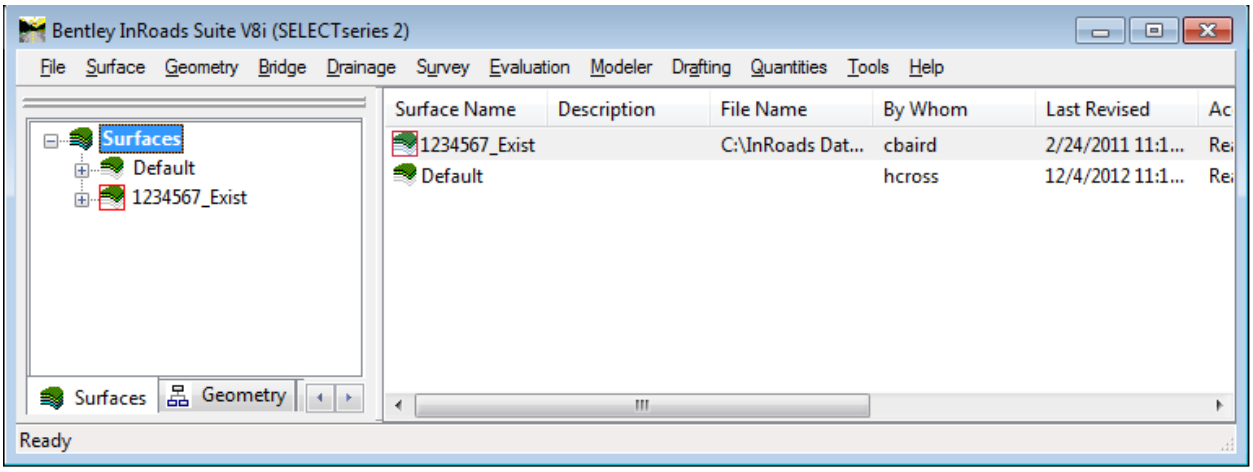
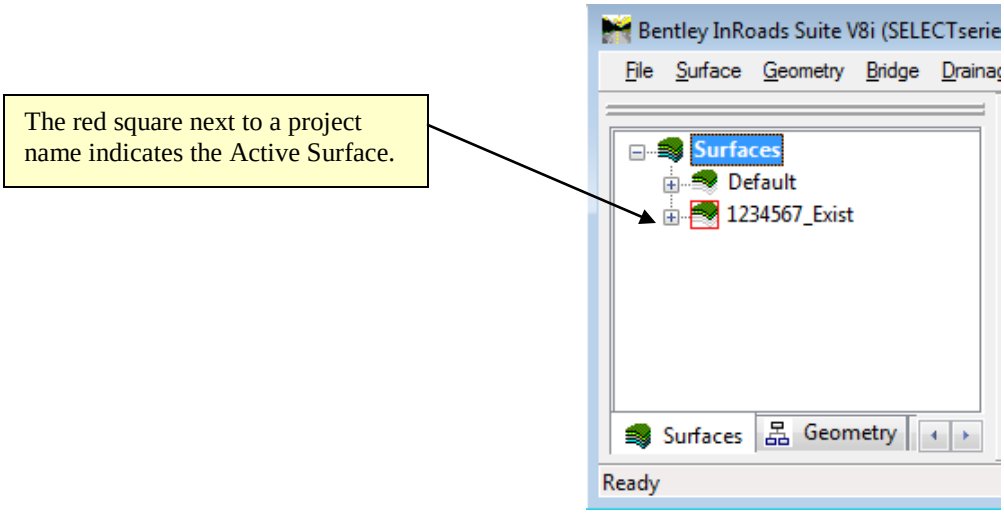


Figure L2-2 Main InRoads Window

Lab 2B Setting the Active Surface/Project

When working with more than one Surface/Project, it is important that you keep in mind which project is Active. This Lab will discuss setting the Active Surface and Active Project and how to determine which Surface/Project is Active.

36. In the InRoads Workspace Bar the Active Surface has a red square next to it as shown here.



37. **Make the Default Surface the Active Surface**

- In InRoads, Select **Surface ► Active Surface**. The **Active Surface** dialog opens.
- Highlight **Default** in the **Active Surface** dialog as shown in *Figure L2-3*.
- Click **Apply** & **Close**.

A Default Project will always exist in the InRoads Workspace Bar. This is internal to InRoads and is required. The Default project should never be used to design a project.

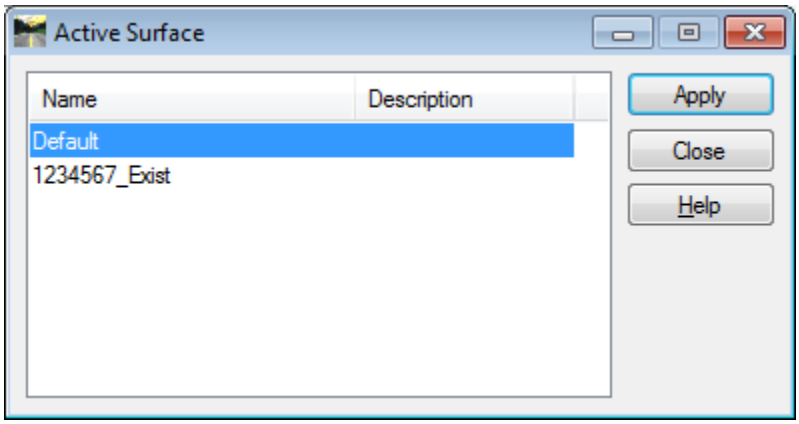
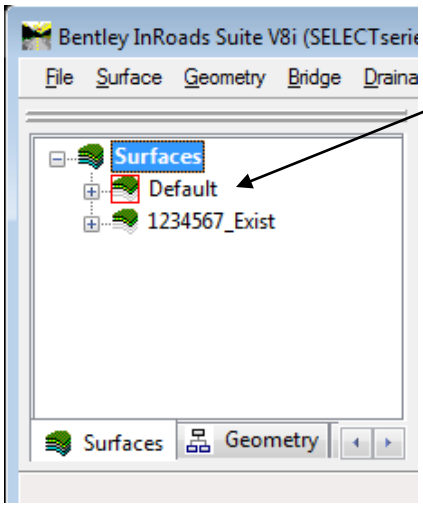


Figure L2-3 Active Surface

38. Look in the InRoads Workspace Bar. The **Default Surface** should now be the Active Surface as demonstrated by the red square as shown here.

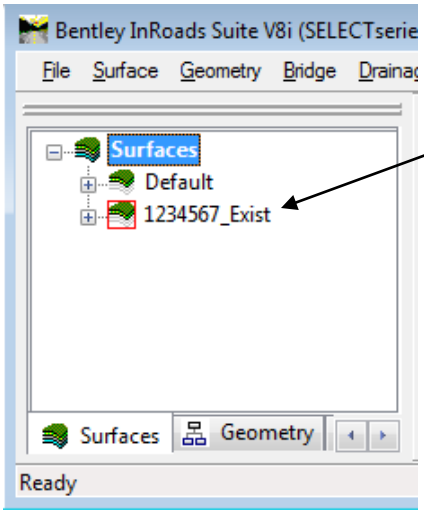


The red square next to a project name indicates the Active Surface.

**** HINT**: You may Right Mouse click over the project name and click '**Set Active**' to set the Active Surface also.

Either the Active Surface command or right mouse clicking may be used to set the active Surface.

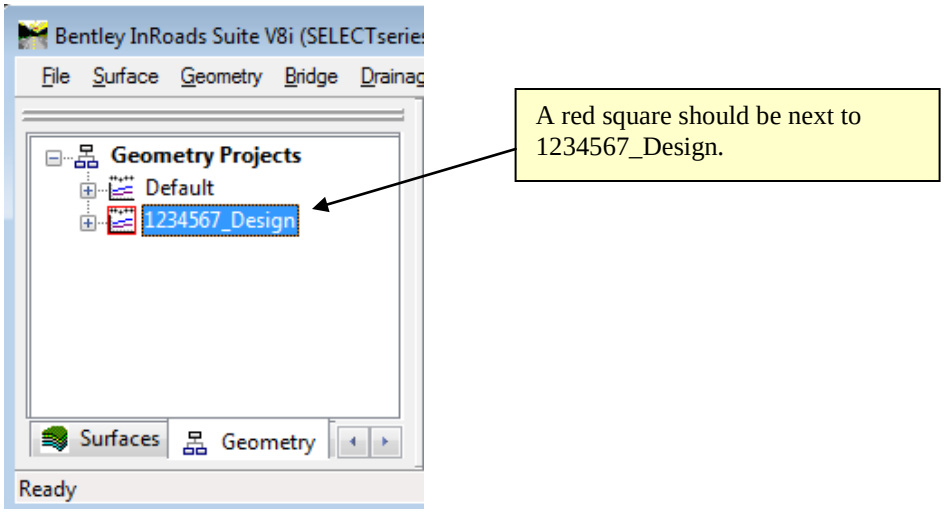
39. Before continuing, make the **1234567_Exist Surface** the Active Surface.



A red square should be next to 1234567_Exist.

The 1234567_Exist Surface is made the Active Surface.

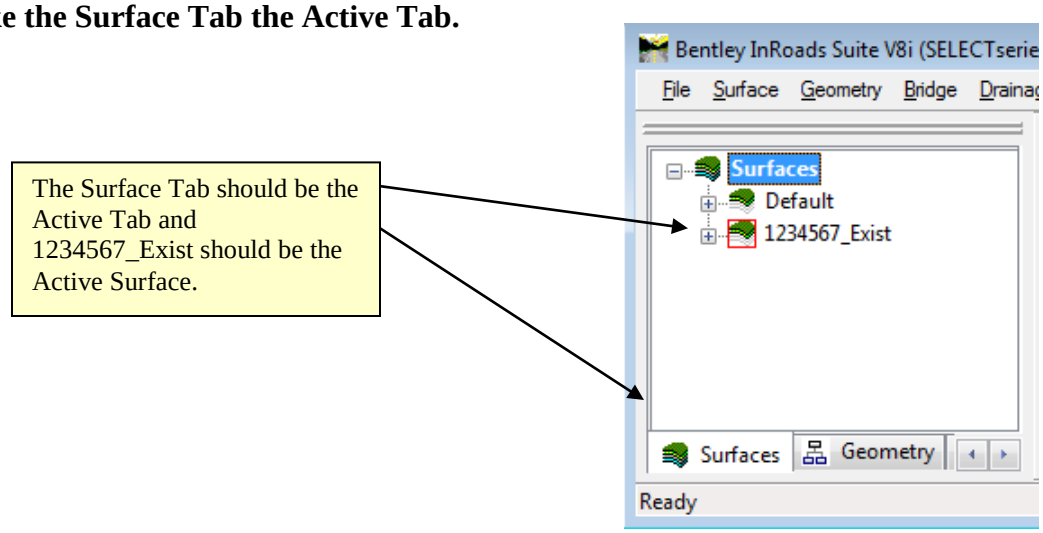
40.	The Active Geometry Project is set the same way as the Active Surface. Make the Geometry Tab the Active Tab and ensure a Red Square is shown next to 1234567_Design as depicted here.



Lab 2C The InRoads Surface (.DTM)

The InRoads Surface (.DTM) is where the triangulated data as well as all of the Surface Features are located. A Surface Feature is a collective term and may refer to either a survey chain or point and may be either a 2D or 3D object. Examples of Surface Features are random terrain points, existing edge of pavement lines, topo break lines, stream banks and stream centers. Each Surface Feature is assigned a Feature Style. Examples of Feature Styles are TOPO_E_DSC for a stream center, TOPO_E_DHWM for a high water mark and TOPO_E_TEAP for existing edge of asphalt pavement. Lists of all the Feature Styles used by GDOT may be found in the InRoads Design Guidelines available on the R.O.A.D.S. website.

41. **Make the Surface Tab the Active Tab.**



42. **View All Surface Features.**

- In InRoads, select **Surface ► View Surface ►Features**.
- In the **View Features** dialog use the pull down menu and ensure the Surface is set to **1234567_Exist**.
- Right mouse click in the **Features:** window and choose **Select All**.
- Verify your **View Features** dialog matches that shown in *Figure L2-4* and all the Features are highlighted in blue.
- Click **Apply**. Be patient, viewing may take a moment.
- Click **Close**.
- In MicroStation, click the **Fit View** button as shown here.

- Verify your view in MicroStation matches that shown in *Figure L2-5*.

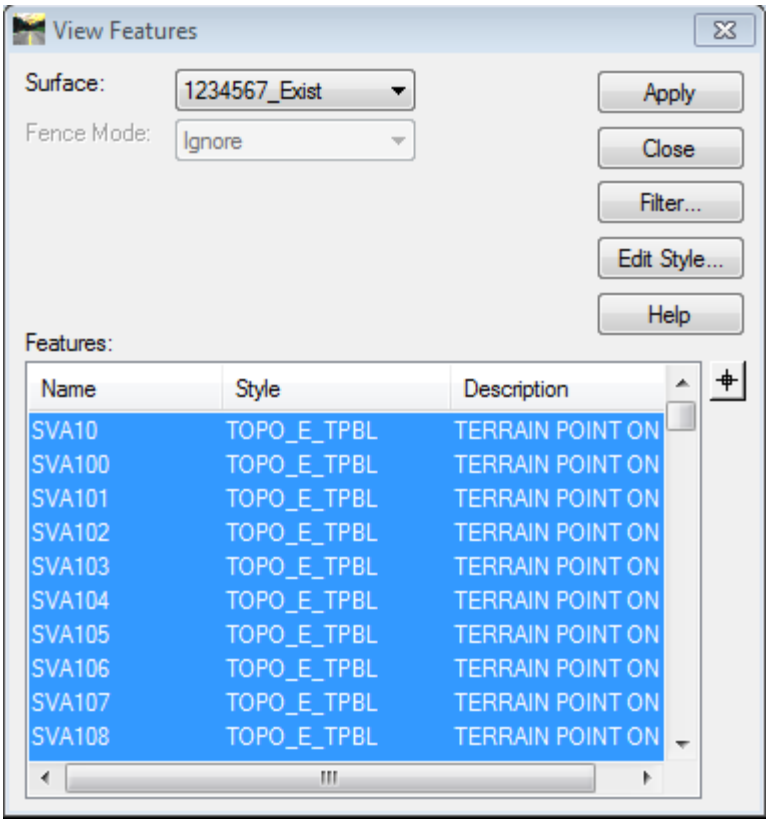


Figure L2-4 View Features dialog

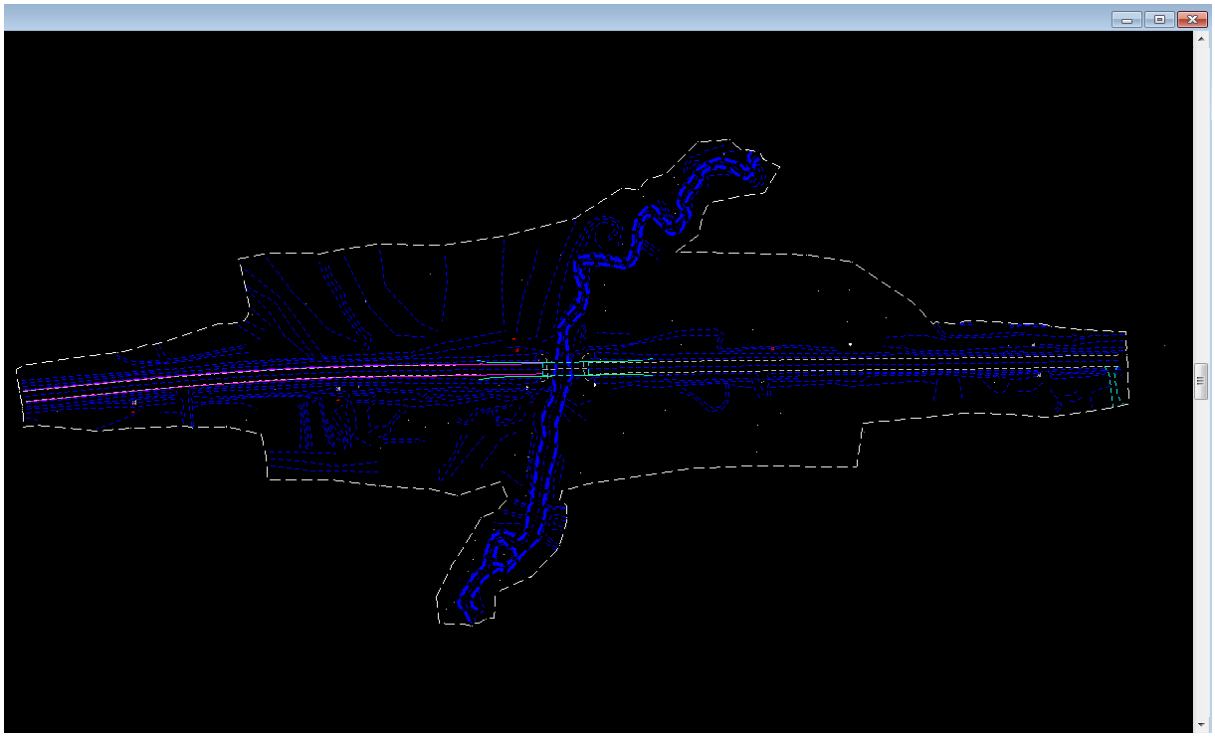


Figure L2-5 MicroStation View Window

43.	• In MicroStation, select the **Window Area** tool  **Window Area** • Window into the area depicted in *Figure L2-6*. • Verify your view is similar to that shown in *Figure L2-7*.

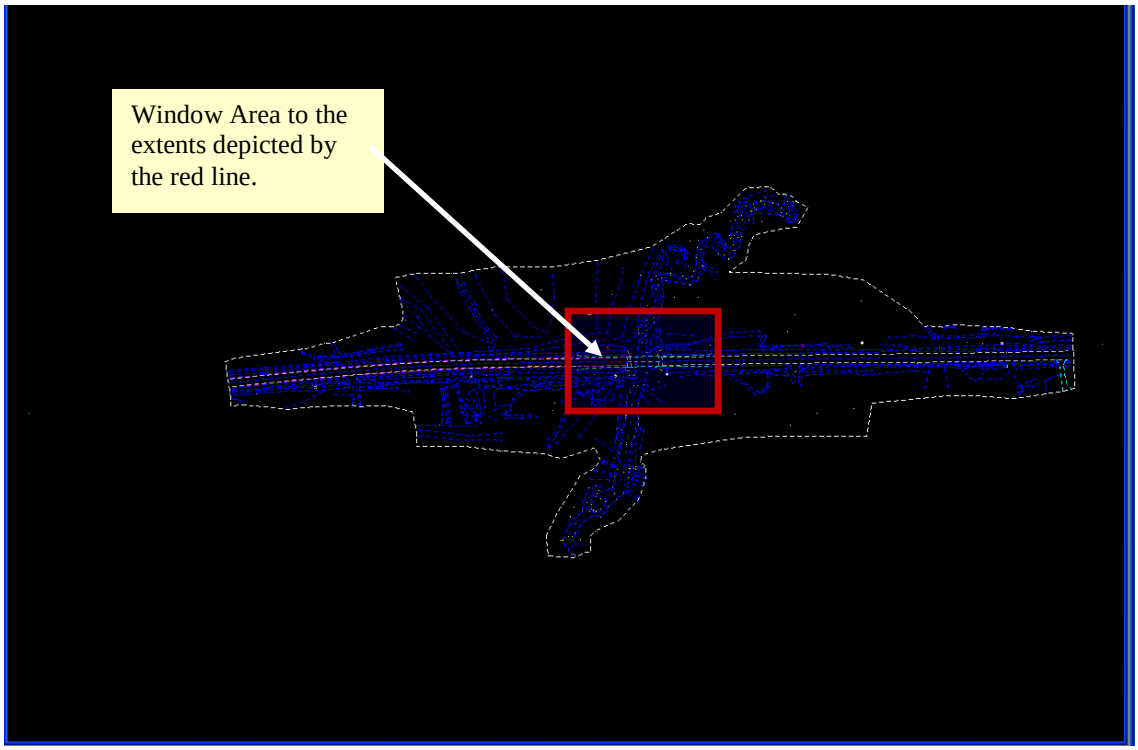


Figure L2-6 MicroStation View Window

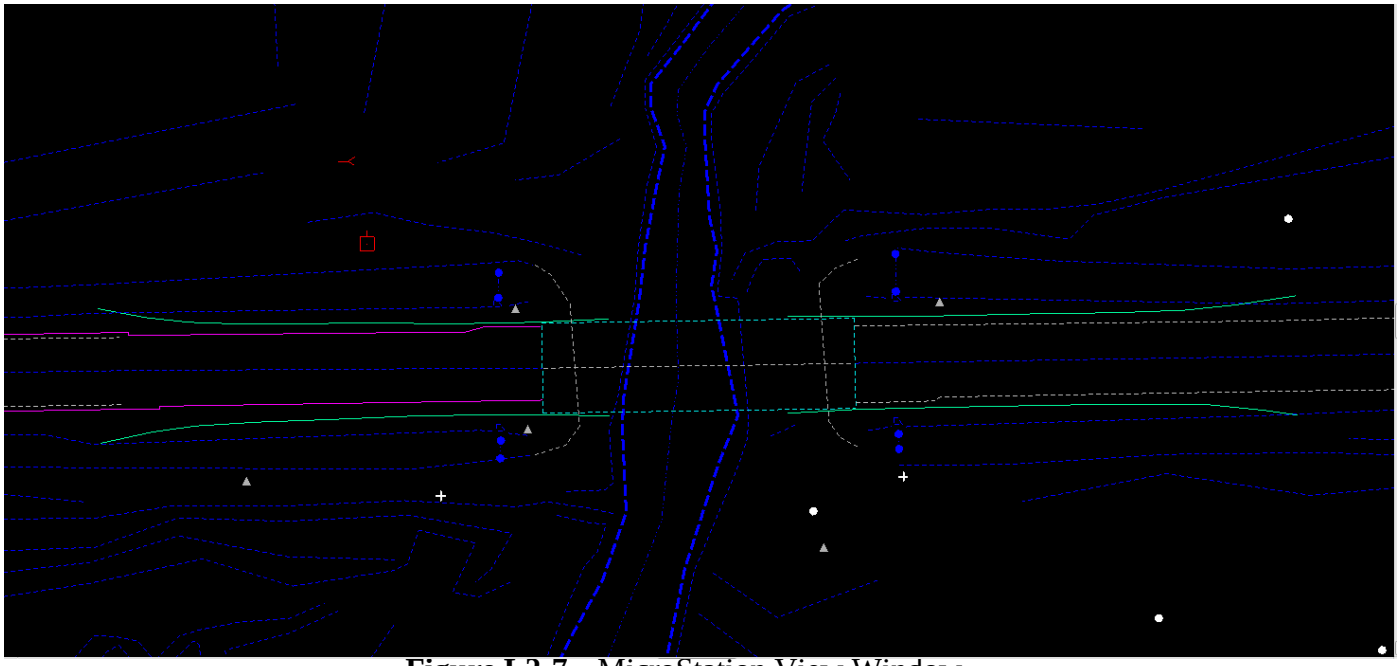
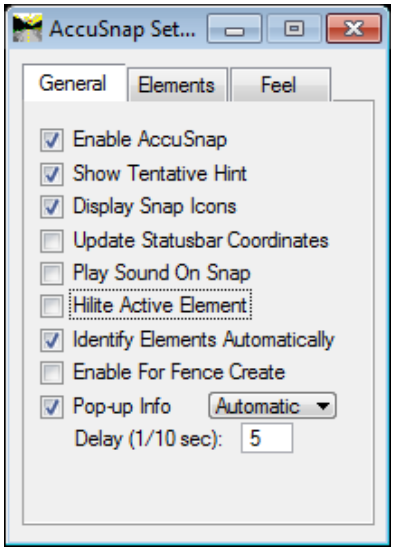
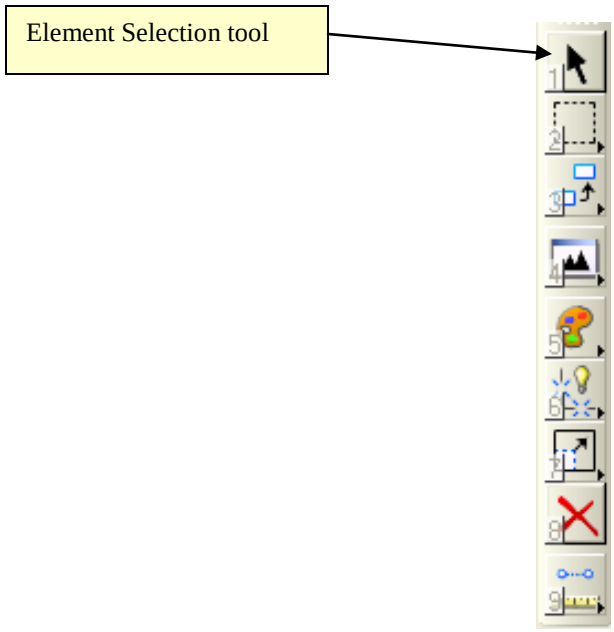


Figure L2-7 MicroStation View Window

44.	**InRoads contains a function called Pop-up that is similar to 'Data Tips' in CAiCE** • In the [MicroStation Menu] -- Select **Settings ▶ Snaps ▶ AccuSnap** • The **AccuSnap Settings** dialog box will appear. Ensure that your settings correspond to the screen capture depicted below:  • Close the **AccuSnap Settings** dialog box by clicking the ☒ in the upper right-hand corner of the window.

45.	• In MicroStation, click the **Element Selection** tool button. 
46.	Information about elements in InRoads can be displayed using the **Element Selection** tool and **Snapping** to elements in MicroStation. • In MicroStation, with the **Element Selection** tool selected, **Snap** to the stream identified in *Figure L2-8* and verify the element information is displayed as shown in *Figure L2-9*.

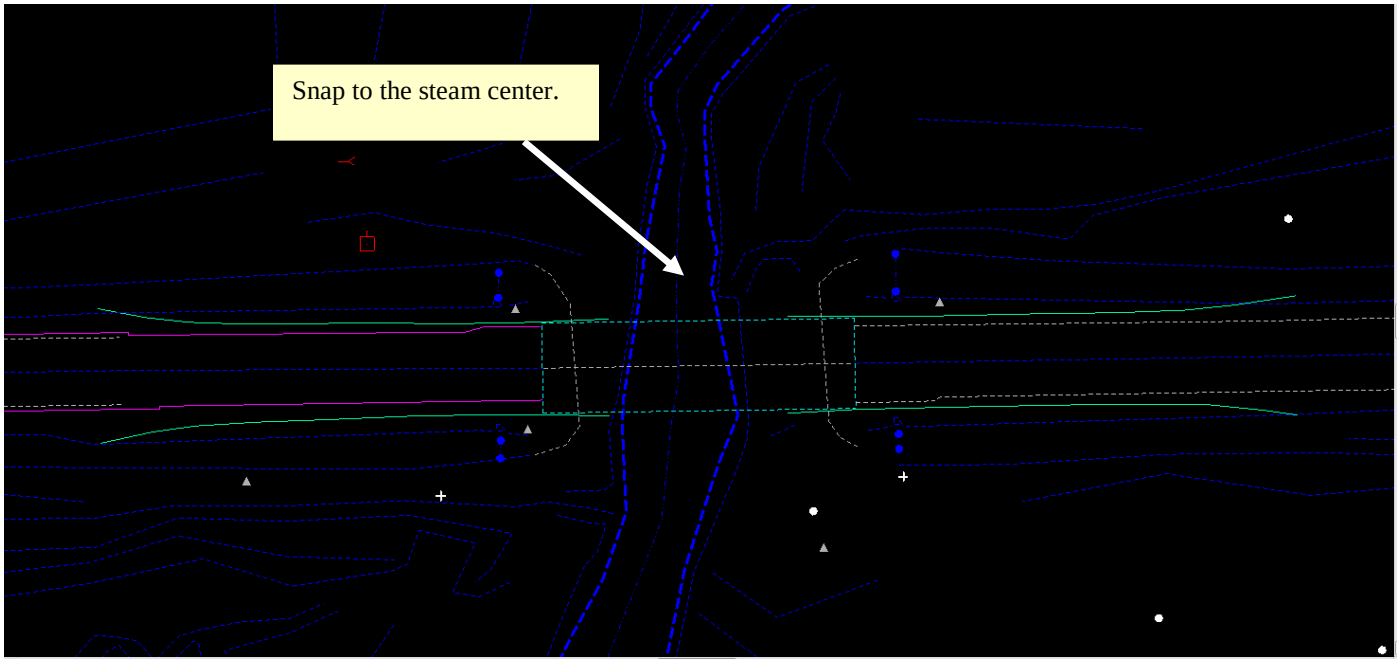
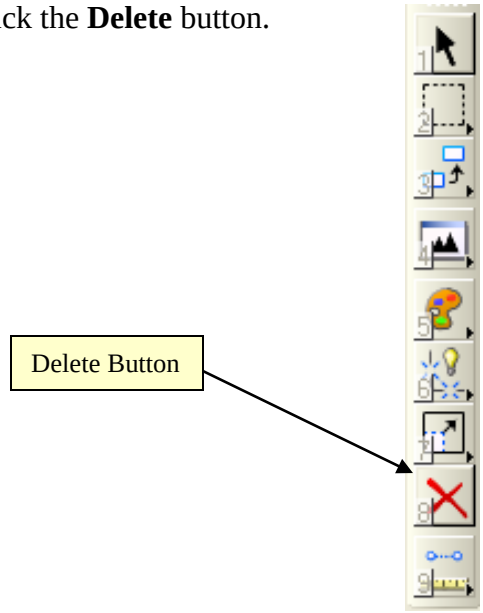


Figure L2-8 MicroStation View Window

Figure L2-9 MicroStation View Window

47. **Clear the MicroStation View Window.**

- In MicroStation**,** select **Edit ► Select All**. All of the elements in MicroStation should turn purple.
- In MicroStation Click the **Delete** button.



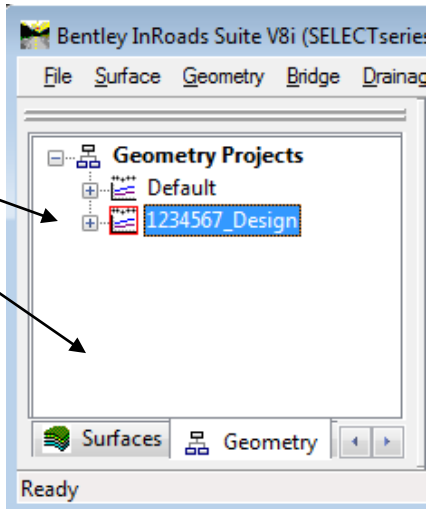
This clears the MicroStation View Window of all Graphics.

Lab 2D The InRoads Geometry File (.ALG)

The InRoads Geometry File (.ALG) is where geometric data is stored including centerlines, property, and other horizontal alignments. It is also the repository for vertical alignments and cogo points.

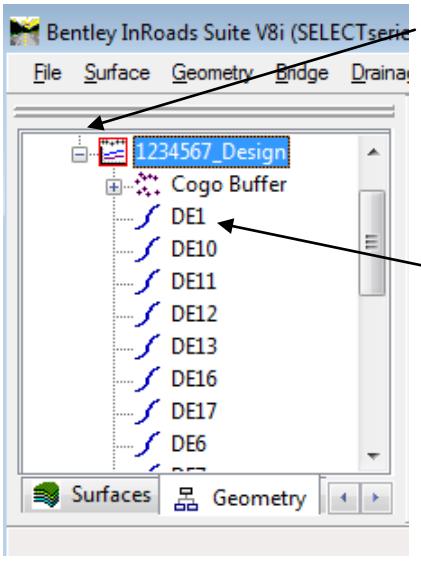
48. **Make the Geometry Tab the Active Tab**.

The Geometry Tab should be the Active Tab and 1234567_Design should be the Active Project.



49. **Horizontal Alignments are set active the same way projects are.**

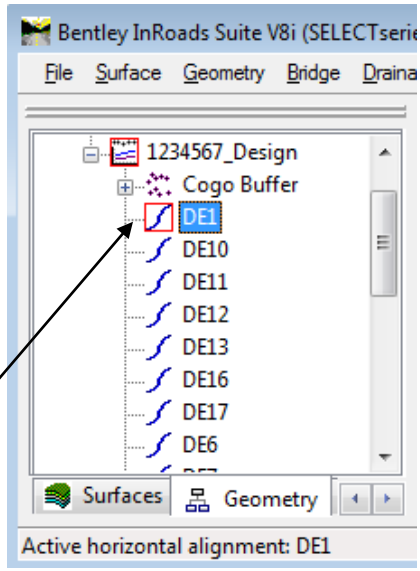
- Follow **Steps 1-3** in the yellow boxes.



1. Click the plus (+) next to **1234567_Design** to expand the project.

2. Right mouse click over **DE1** and select **Set Active**.

3. Verify Alignment **DE1** has a red square next to it identifying it as the Active Alignment.



50.	The **View Horizontal Annotation** dialog is where Alignments and Cogo Points are selected for Viewing. Open the **View Horizontal Annotation** dialog. • In InRoads, select **Geometry ► View Geometry ►Horizontal Annotation**. The **View Horizontal Annotation** dialog opens as shown in *Figure L2-10* and *Figure L2-11*.

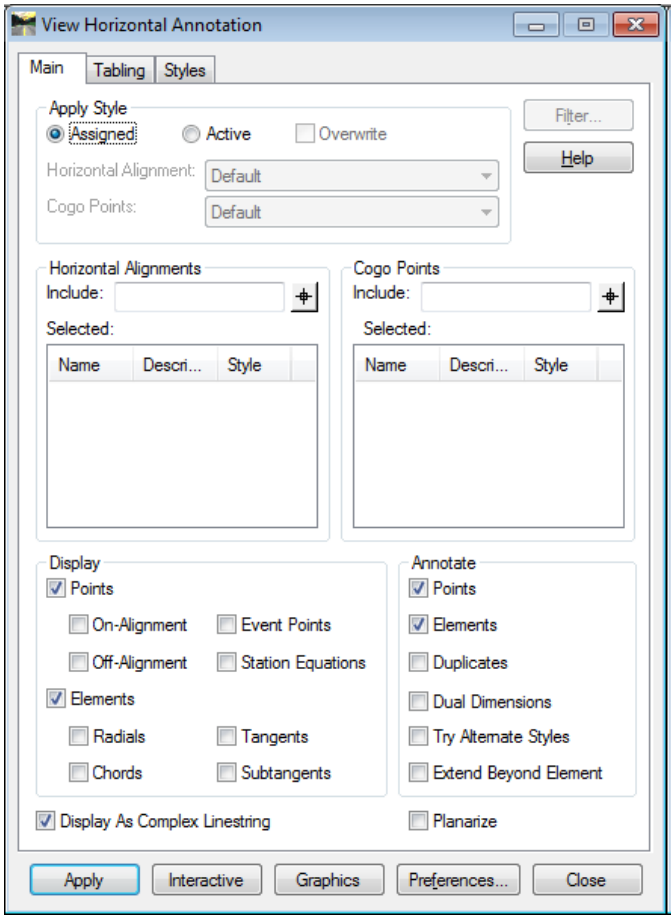


Figure L2-10 View Horizontal Annotation

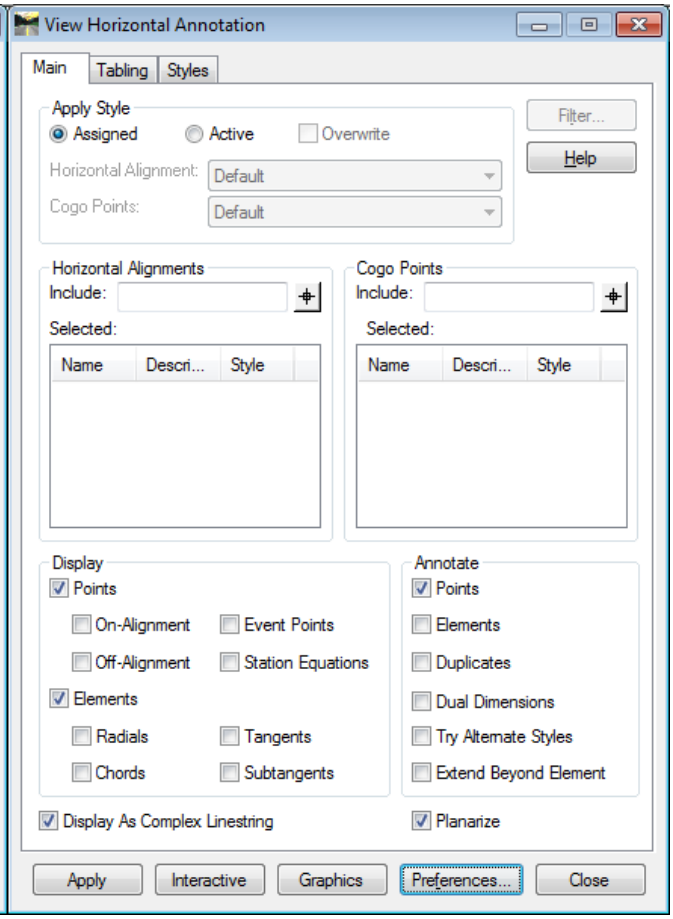


Figure L2-11 View Horizontal Annotation

51.	InRoads uses **Preferences** to Save Settings and Load Settings that are frequently used. GDOT has set up Preferences for several commands in InRoads including the **View Horizontal Annotation** command. • In the **View Horizontal Annotation** dialog, click the **Preferences** button. • Select the Preference named **NO BEARING & DISTANCE**. • Click **Load** and **Close**. • Compare *Figures L2-10* and *L2-11* to see the settings that were loaded by the **NO BEARING & DISTANCE** Preference.

52.	Horizontal Alignments and Cogo Points may be manually keyed into their respective **Include:** fields and they may also be selected by using the **Filter** button. • Notice the **Filter** button is currently grayed out. • Activate the **Filter** button by left clicking in the **Horizontal Alignments** **Include**: field. • Click the **Filter** button. The **Geometry Selection Filter** opens as shown in *Figure L2-12*.

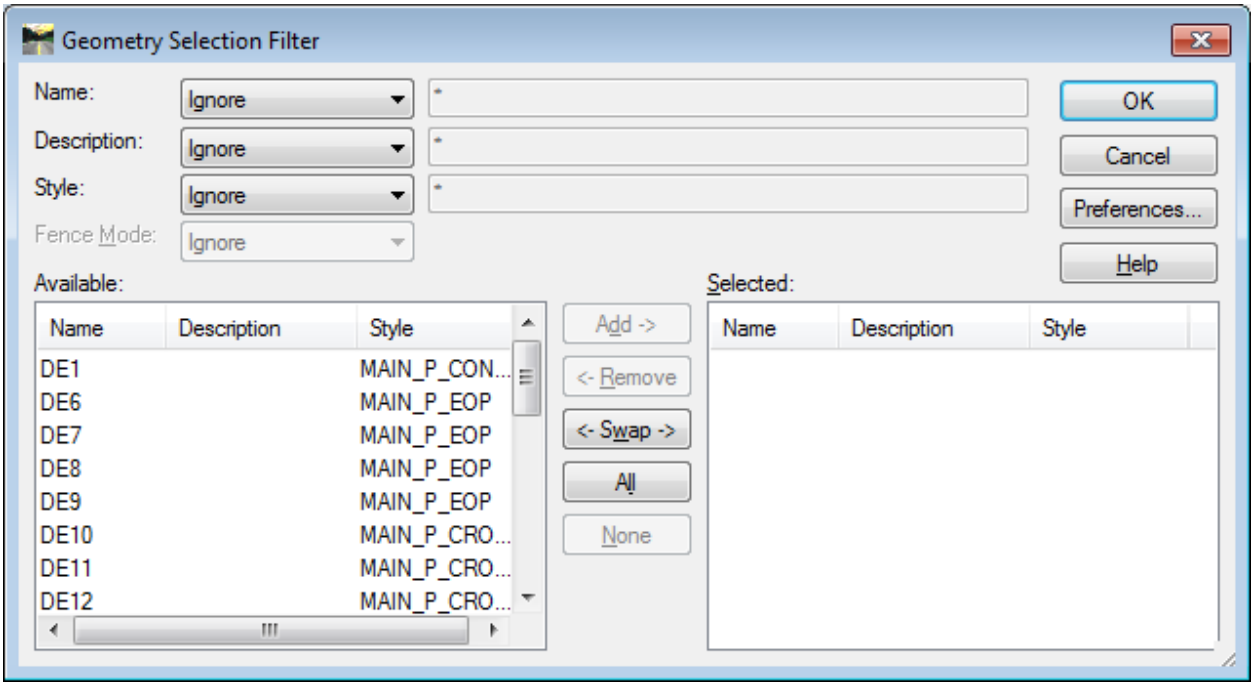


Figure L2-12 Geometry Selection Filter

53.	The **Geometry Selection Filter** is where you move items from the **Available:** field to the **Selected:** field for viewing. • Highlight Alignment **DE1** and click the **Add ->** button. • Verify the **Selected:** field has been populated with Alignment **DE1** as shown in *Figure L2-13*. • Click **OK**.

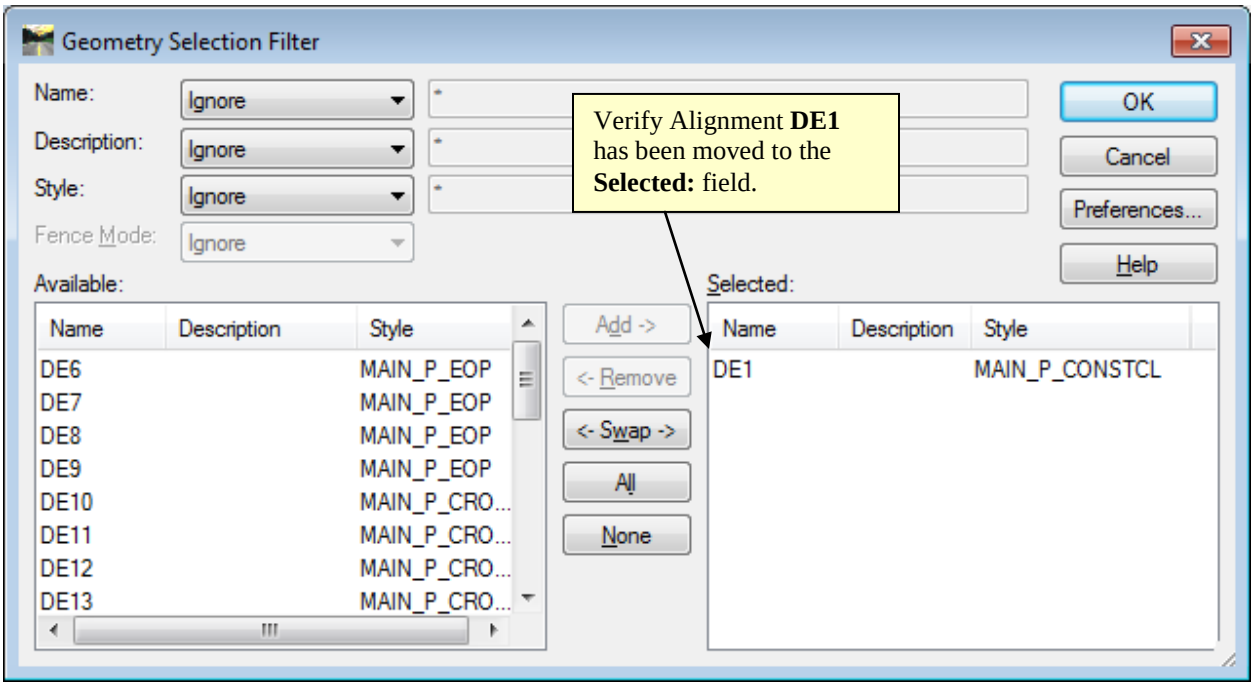


Figure L2-13 Geometry Selection Field

54.	The **View Horizontal Annotation** dialog has now been populated with the Horizontal Alignment **DE1**. • Verify your entries match those shown in *Figure L2-14.* • In the **View Horizontal Annotation** dialog, click **Apply** & **Close**.

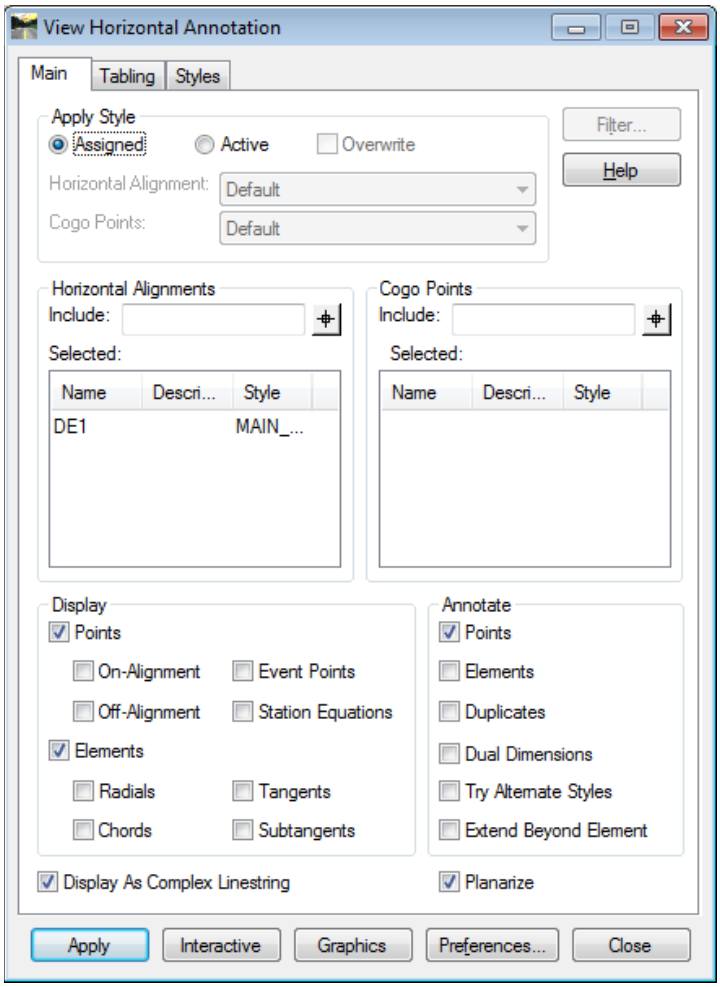


Figure L2-14 View Horizontal Annotation

55.	• In MicroStation, click the **Fit View** button as shown here.  **Fit View** • Verify your view in MicroStation matches that shown in *Figure L2-15*.

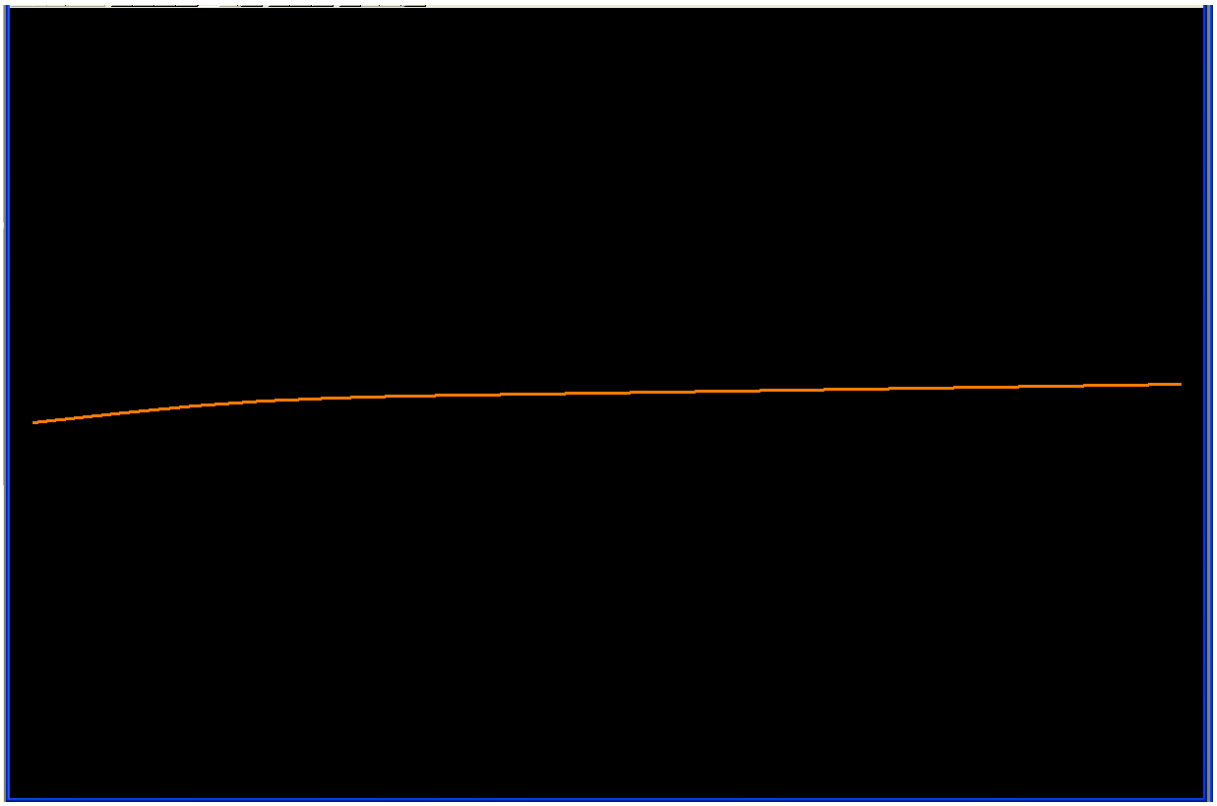


Figure L2-15 MicroStation View Window

56.	Annotate Alignment **DE1** with Stationing. • In InRoads, select **Geometry ►View Geometry ► Stationing**. • Click the **Preferences** button. • Select the Preference named **CONSTCL**. Click **Load** and then click **Close**. • Click **Apply** & **Close**. • Verify your view matches that shown in *Figure L2-16* and that Alignment **DE1** has been stationed.

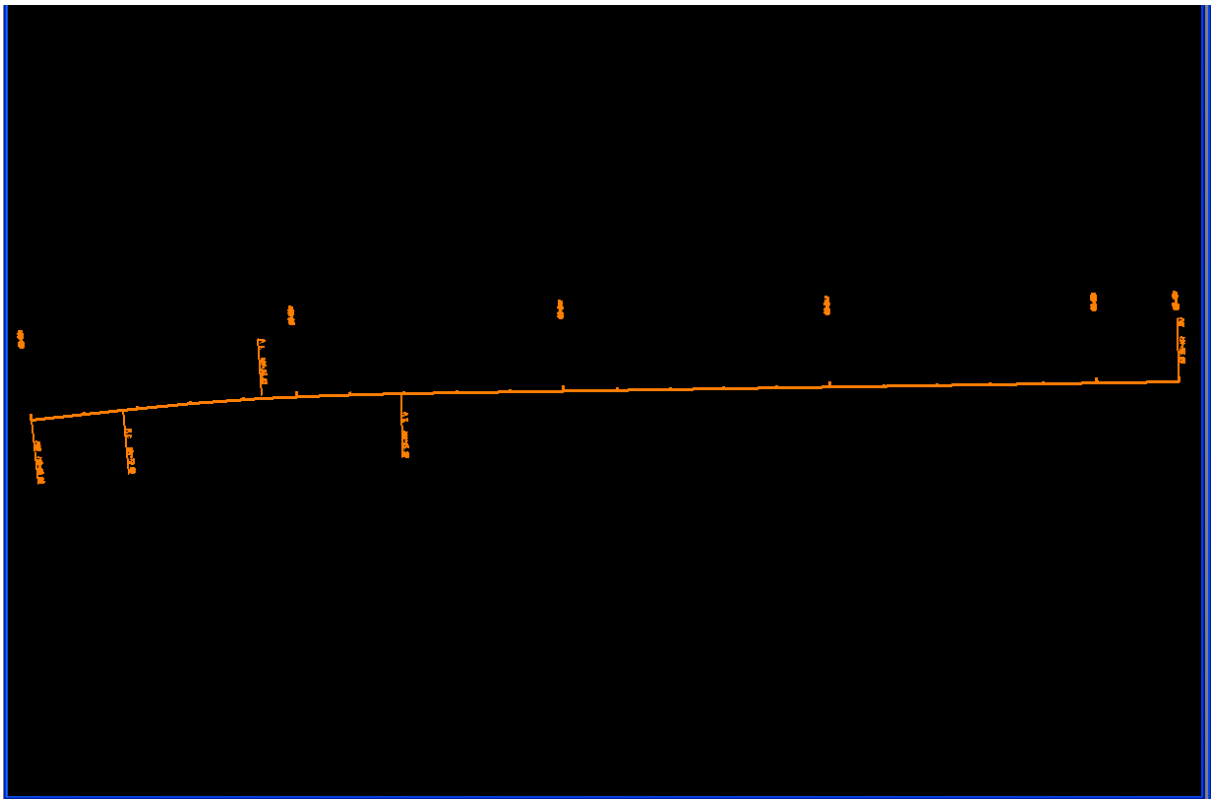


Figure L2-16 MicroStation View Window

57.	• Do <u>not</u> clear the MicroStation View. **Lab 3** will begin with this view.
58.	 This concludes Lab 2. Do not proceed until the Instructor directs you to do so.

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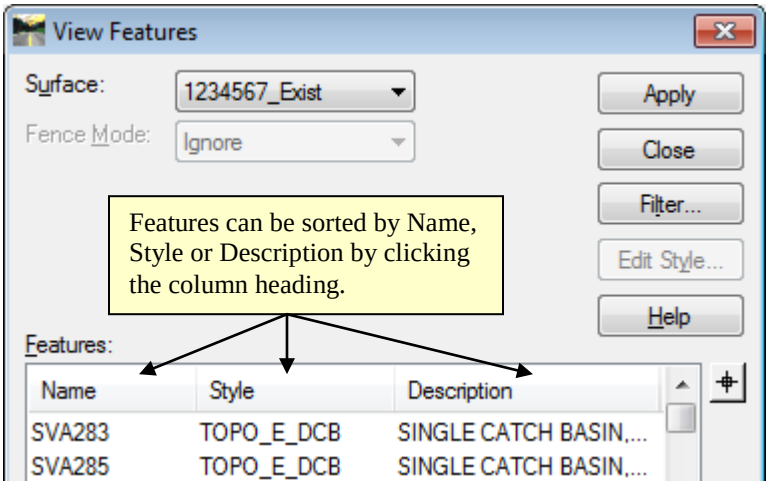
Lab 3
Create Cross Section Report for HEC-RAS in Comma Delimited .TXT Format

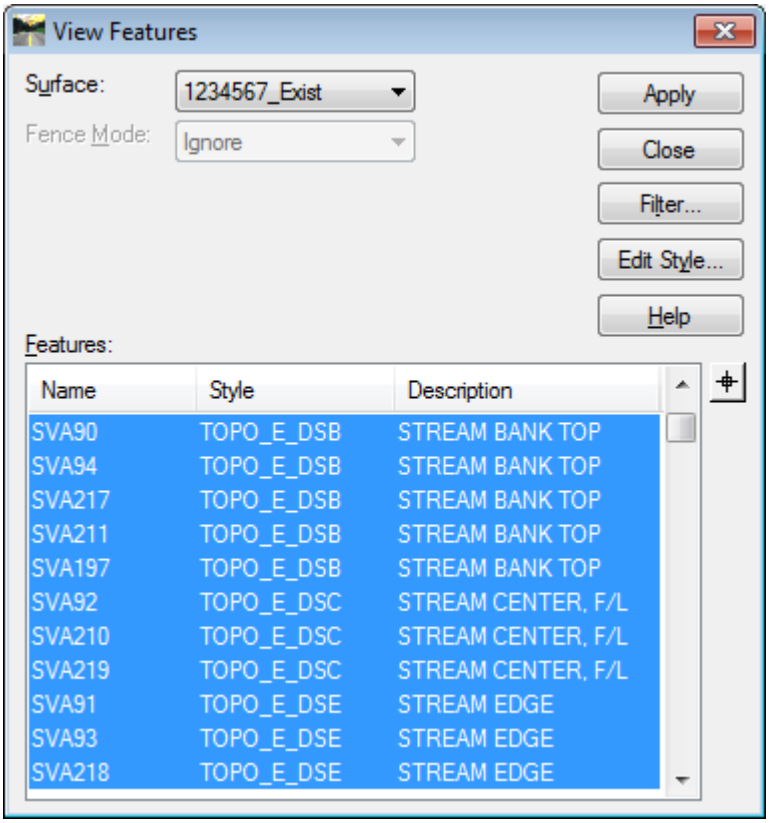
Objective

The objective of Lab 3 is to create offset Parallel Alignments from the Roadway Centerline through a Stream Center and to generate a comma delimited text file for importing Cross Sectional geometric data into HEC-RAS.

59.	Open the **View Features** dialog. • In InRoads, select **Surface ► View Surface ► Features**.
60.	Deselect all the Features in the **View Features** dialog. • Right Mouse click in the **Features:** window and choose **Select None** from the pop up. None of the Features should now be highlighted in blue.
61.	Sort the Features by Style. • In the **View Features** dialog, click the **Style** heading until the Feature Style **TOPO_E_DCB** is at the top as shown here. 

62. Select and view the Features Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE**.

- In the **View Features** dialog, use a combination of the **CTRL** and/or **Shift** keys on the keyboard and the Left Mouse button to select the Feature Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE** as shown here.



- Click **Apply** and **Close**.
- Verify your view in MicroStation matches that shown in *Figure L3-1*.

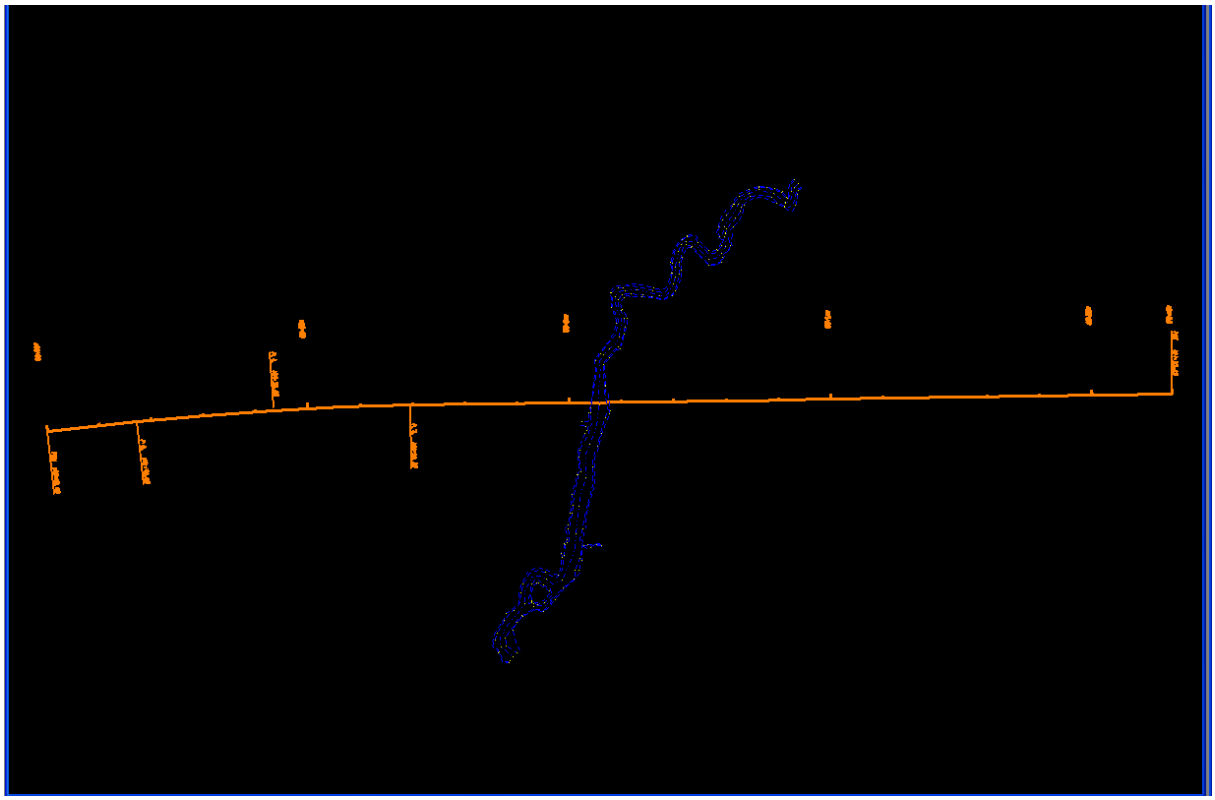


Figure L3-1 MicroStation View Window

63.	Create an Alignment parallel to **DE1** that is **50'** to the Right of **DE1** from Station 107+00 to Station 117+00. Name the Alignment **BH50RT**. • In InRoads, select **Geometry ► Utilities ► Parallel Horizontal Alignment…** • Match the settings shown in *Figure L3-2*. • Click **Apply** and **Close**. • Verify the Alignment **BH50RT** was drawn as shown in *Figure L3-3*.

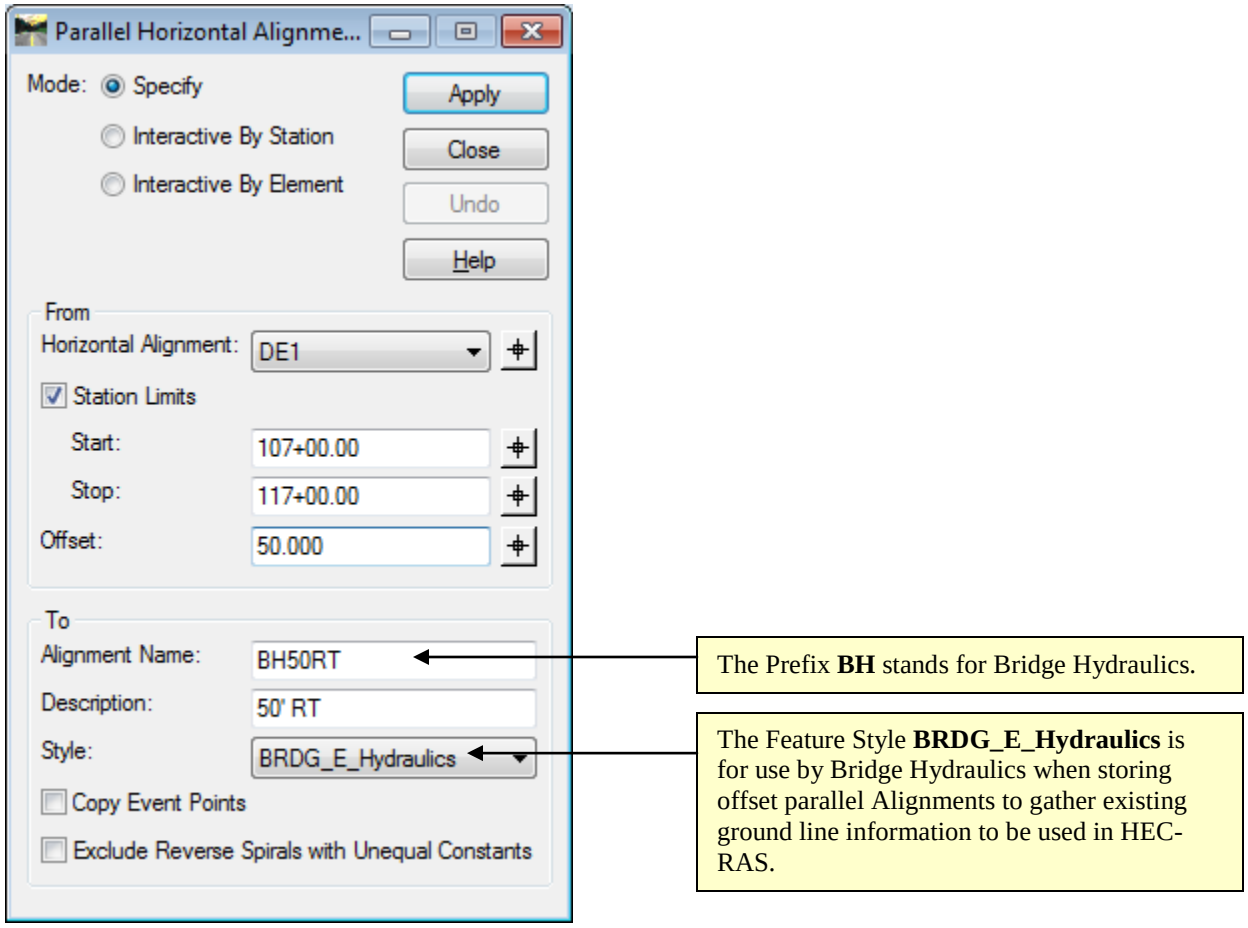


Figure L3-2 Parallel Horizontal Alignment

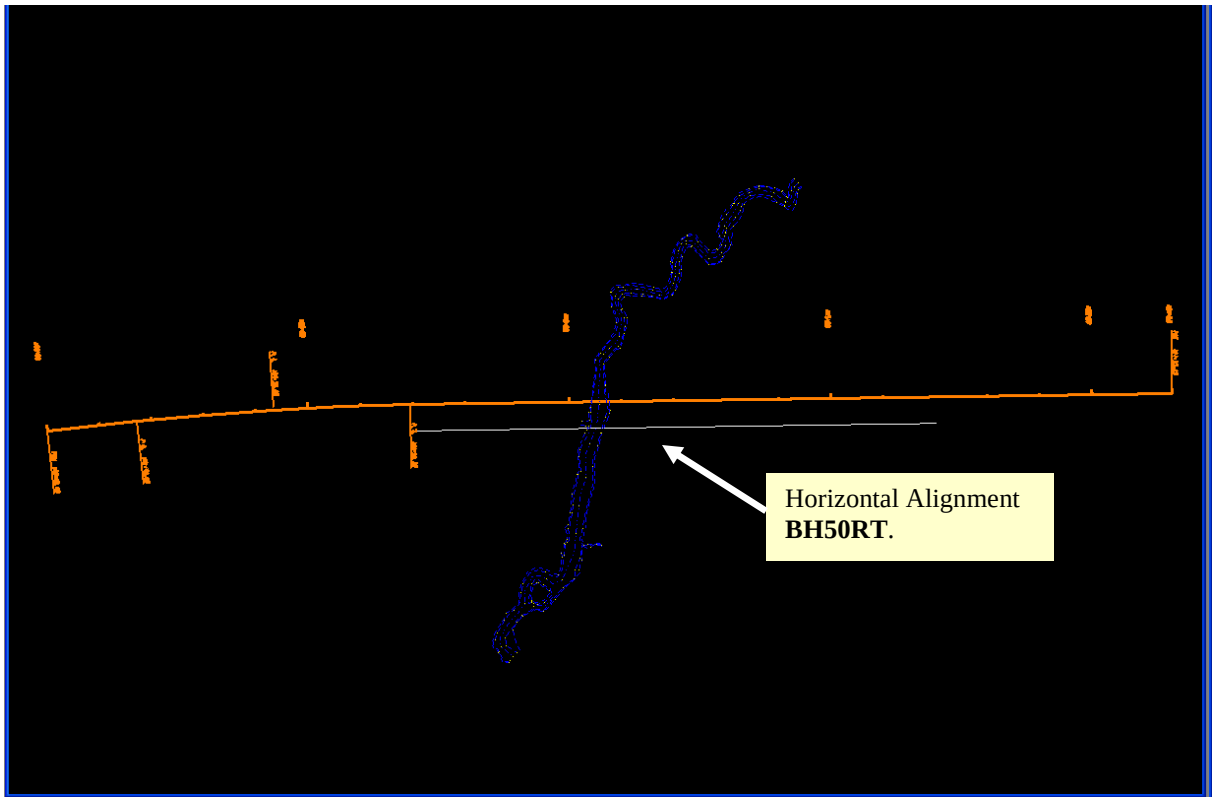


Figure L3-3 MicroStation View Window

64.	Create an Alignment parallel to **DE1** that is **50'** to the left of **DE1** from Station 107+00 to Station 117+00. Name the Alignment **BH50LT**. • In InRoads, select **Geometry ► Utilities ► Parallel Horizontal Alignment…** • Match the settings shown in *Figure L3-4*. • Click **Apply** and **Close**. • Verify the Alignment **BH50LT** was drawn as shown in *Figure L3-5*.

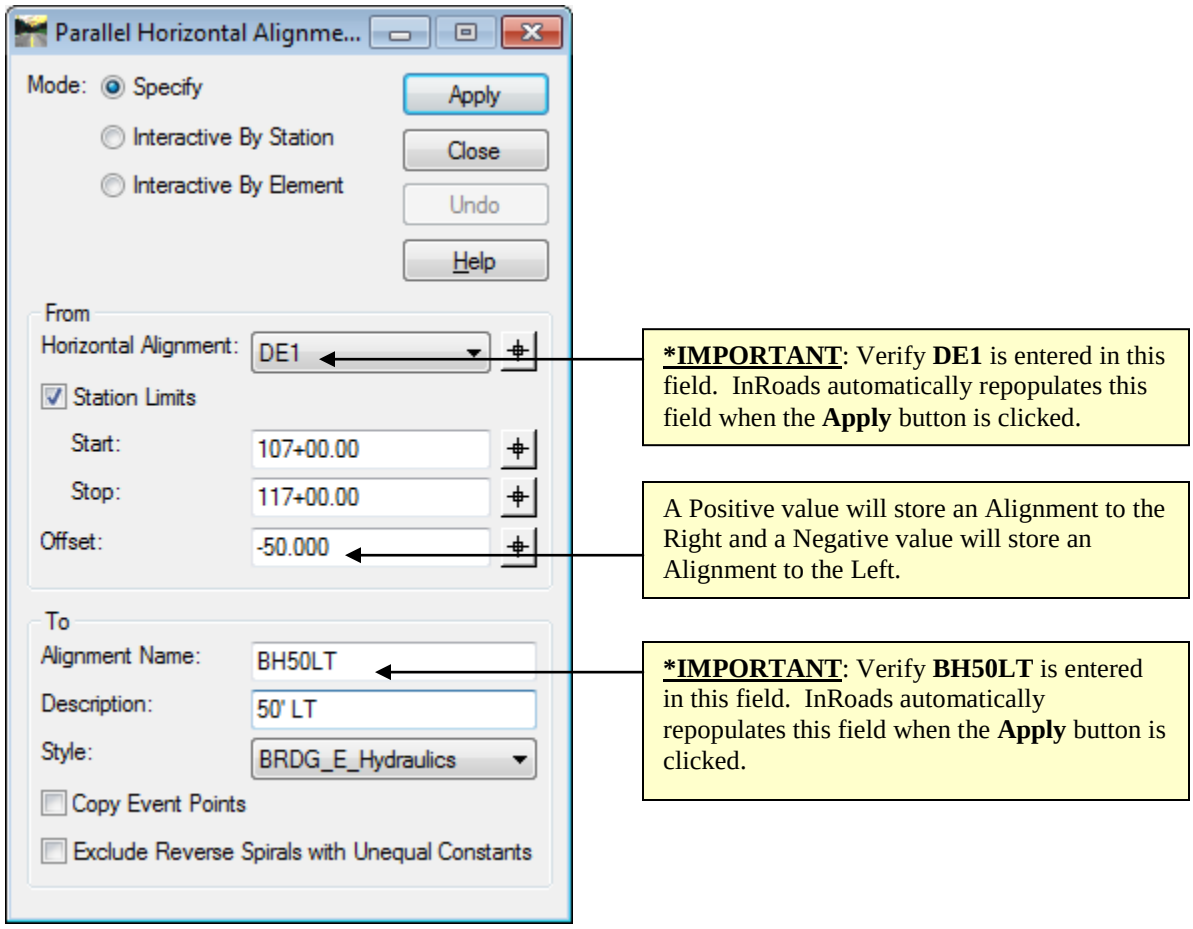


Figure L3-4 Parallel Horizontal Alignment

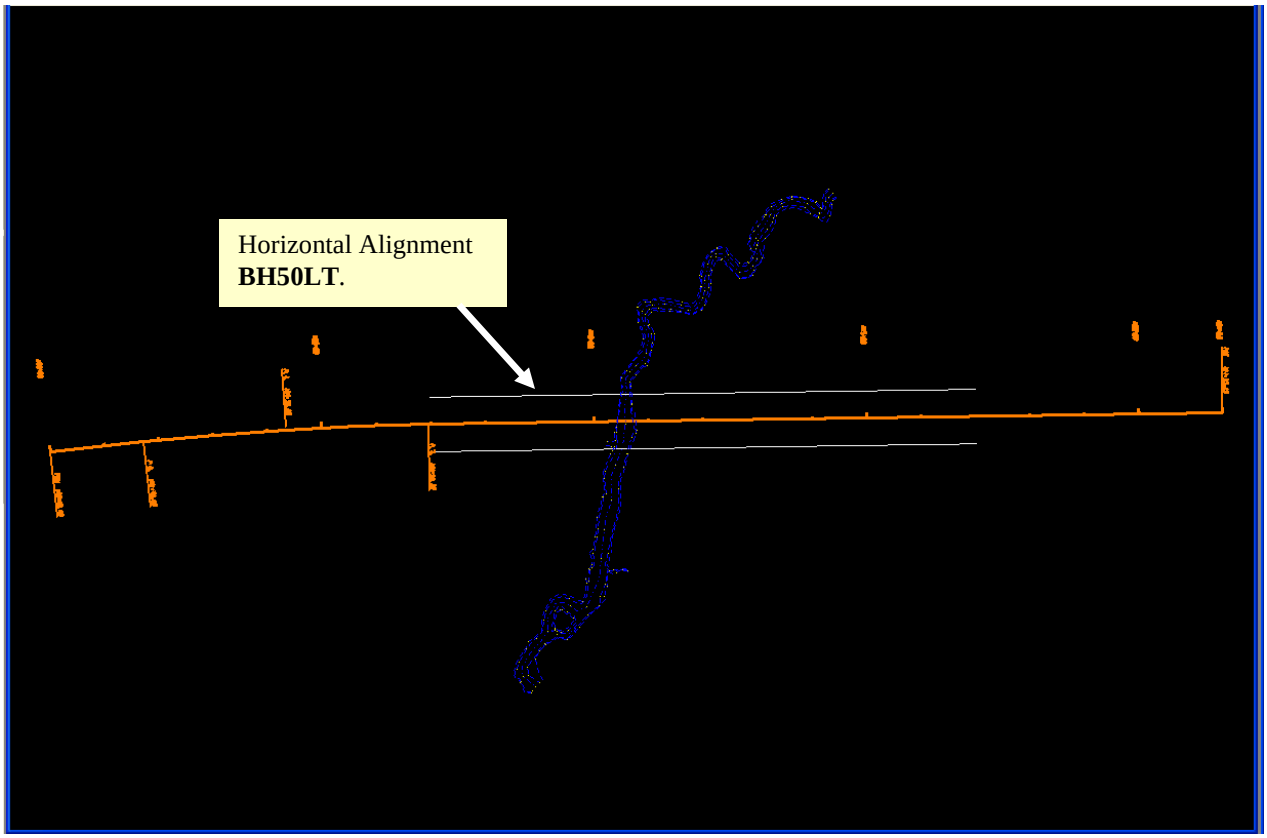


Figure L3-5 MicroStation View Window

65.	**Save the InRoads Geometry File** Even though the Alignments have been stored – the data has not yet been saved. InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Geometry Project – Save the Project and its associated modifications or changes. • Select **File►Save► Geometry Project** from the **InRoads Menu**.
66.	Before a Report can be generated for import into HEC-RAS, a ground line profile must be created and placed as a Feature into the Surface for each Alignment. Open the **Create Profile** dialog. • In InRoads, select **Evaluation ►Profile ► Create Profile**. The **Create Profile** dialog opens as shown in *Figure L3-6*.

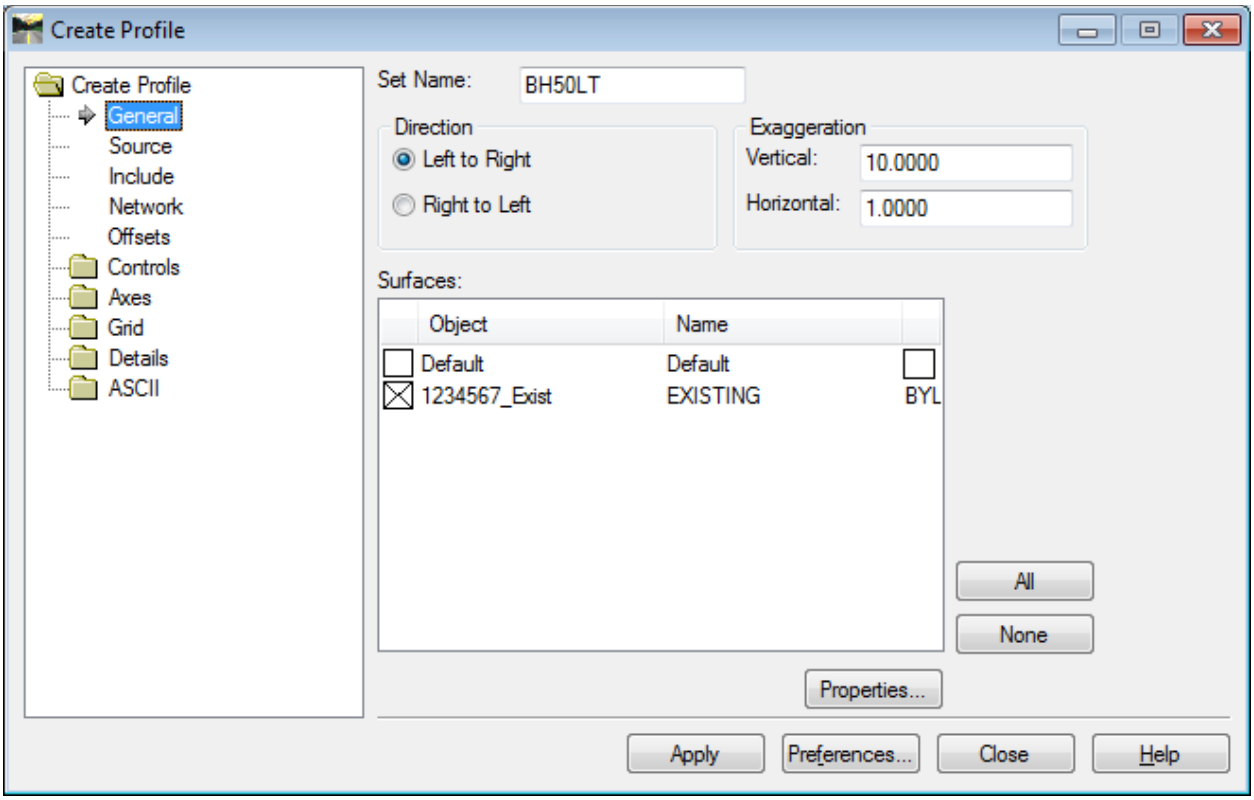


Figure L3-6 Create Profile

67.	Create a Profile for Alignment **BH50RT**. • Click the **Preferences** button and **Load** the Preference **50h_10v_SHEETS**. • In the **Create Profile** dialog, make the **Source** leaf the active leaf and match the settings shown in *Figure L3-7*. • Click **Apply**. • Notice in the bottom left corner of the MicroStation window you are prompted to **> Identify Location**. Left click in the general vicinity identified by the '**X**' in *Figure L3-8*. • The **Create Profile** dialog reappears and the Profile was drawn in MicroStation. • **Close** the **Create Profile** dialog and verify the existing ground profile for **BH50RT** was drawn in MicroStation as shown in *Figure L3-9*.

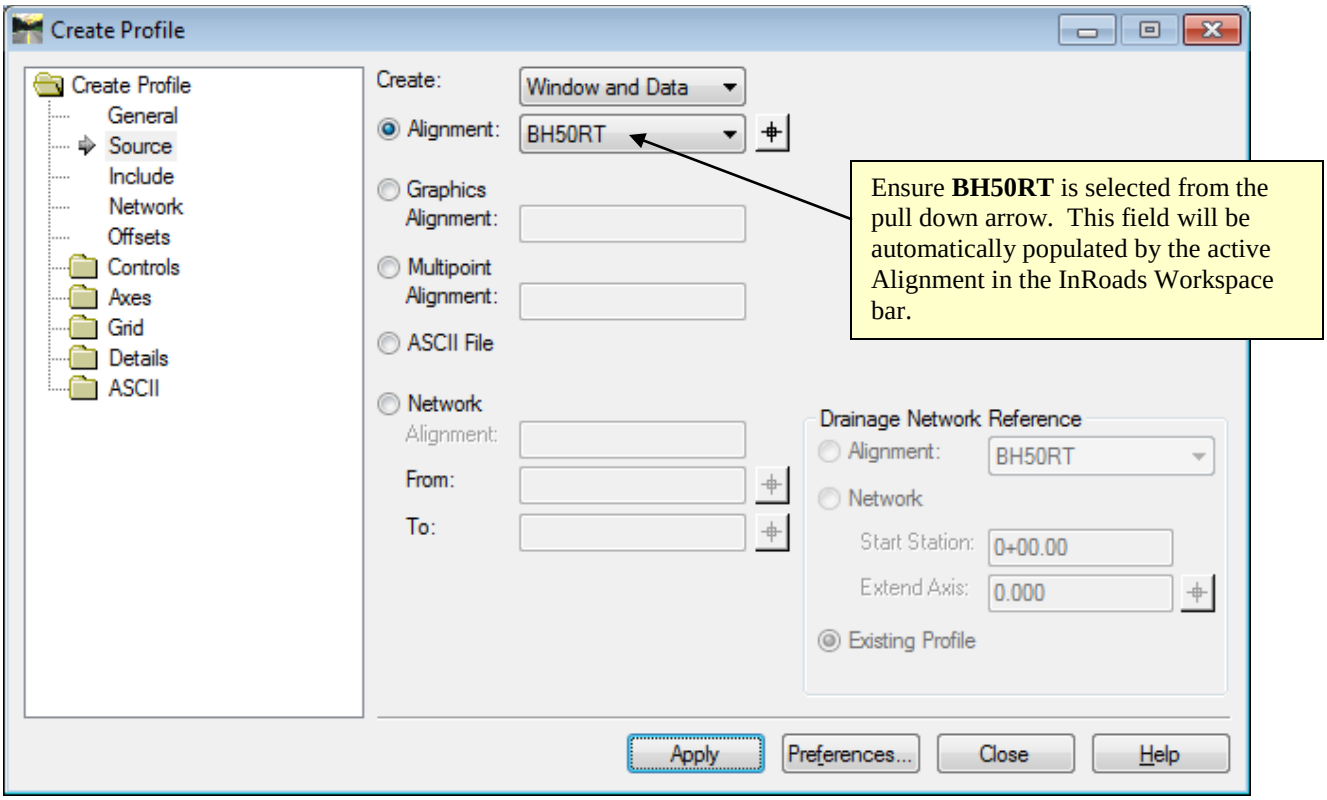


Figure L3-7 Create Profile

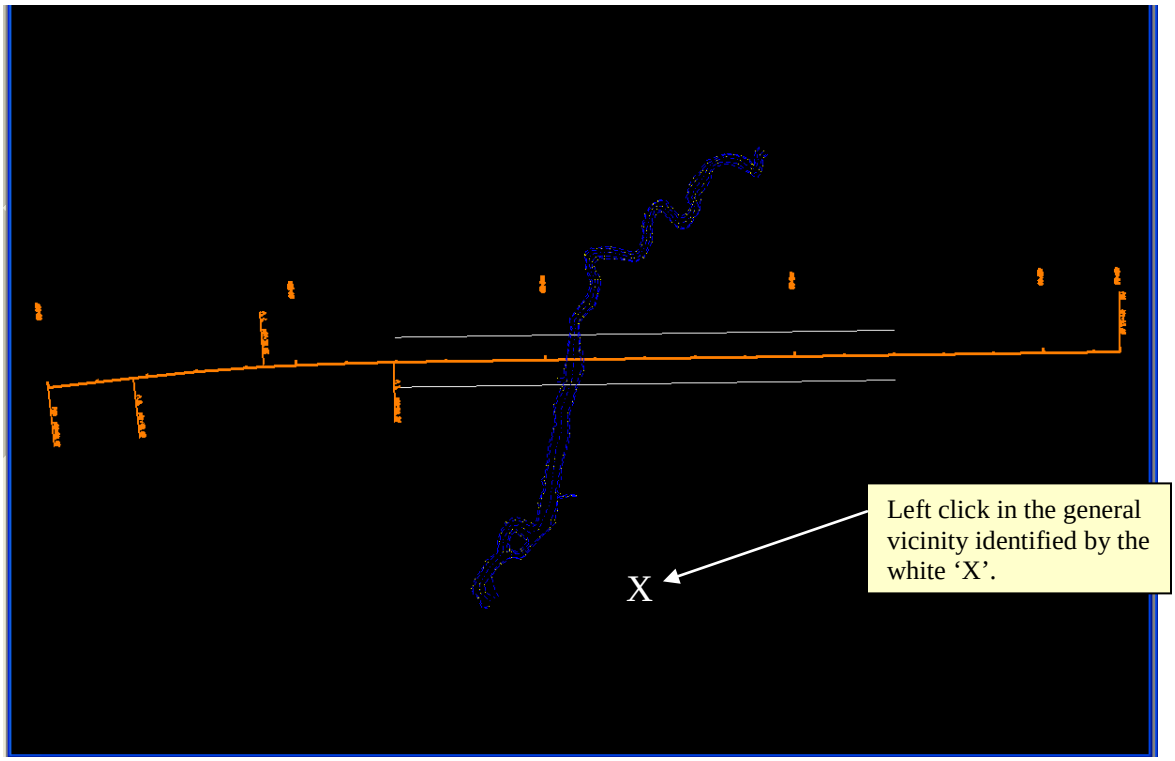


Figure L3-8 MicroStation View Window

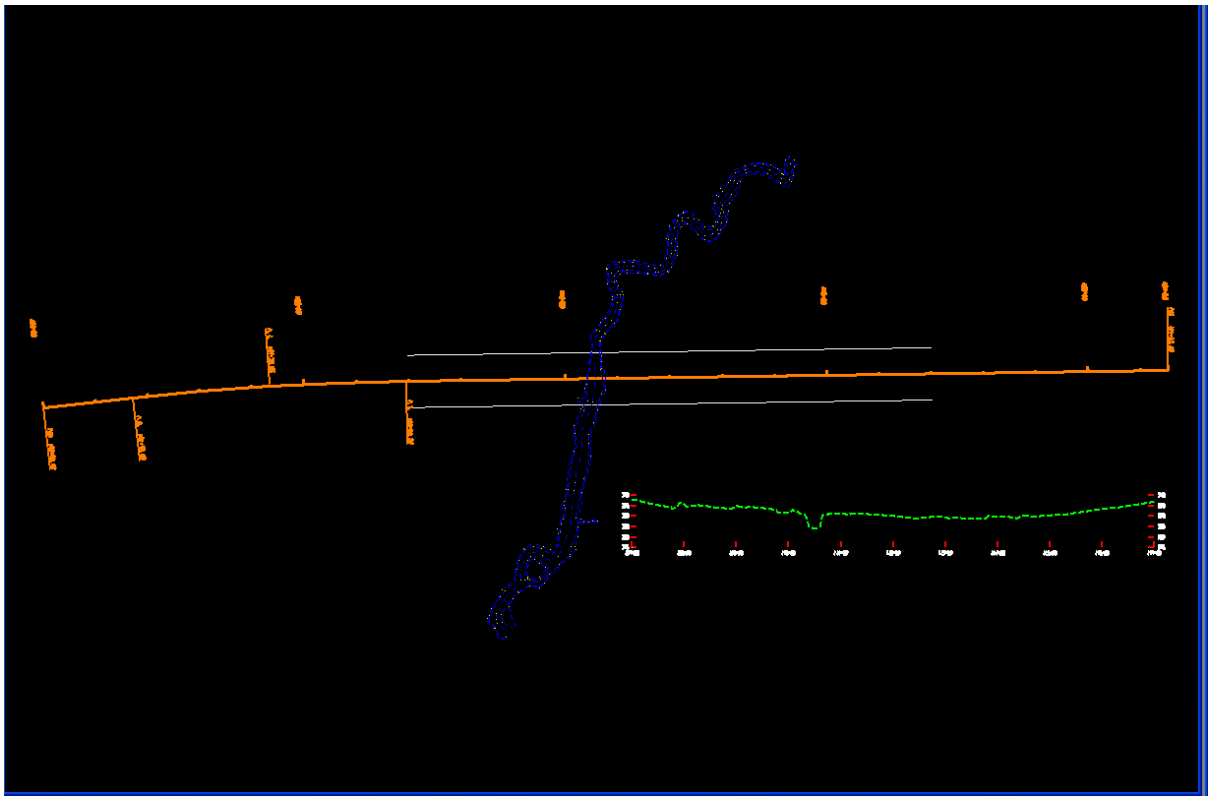


Figure L3-9 MicroStation View Window

68.	Create a Profile for Alignment **BH50LT**. • Select **Evaluation ► Profile ► Create Profile**. • Click the **Preferences** button and **Load** the Preference **50h_10v_SHEETS**. • In the **Create Profile** dialog, make the **Source** leaf the active leaf and match the settings shown in *Figure L3-10*. • Click **Apply**. • Notice in the bottom left corner of the MicroStation window you are prompted to **> Identify Location**. Left click in the general vicinity identified by the '**Y**' in *Figure L3-11*. • The **Create Profile** dialog reappears and the Profile was drawn in MicroStation. • Close the **Create Profile** dialog and verify the existing ground profile for **BH50LT** was drawn in MicroStation as shown in *Figure L3-12*.

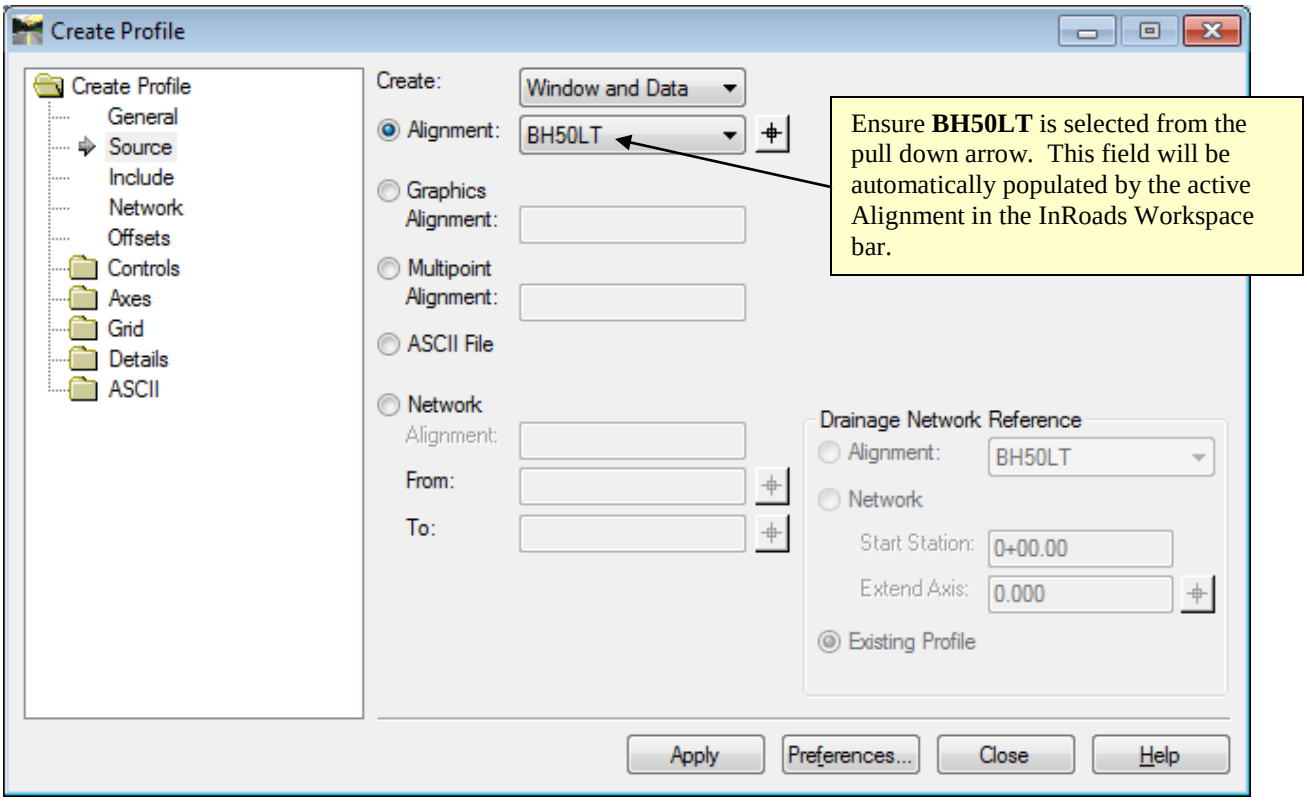


Figure L3-10 Create Profile

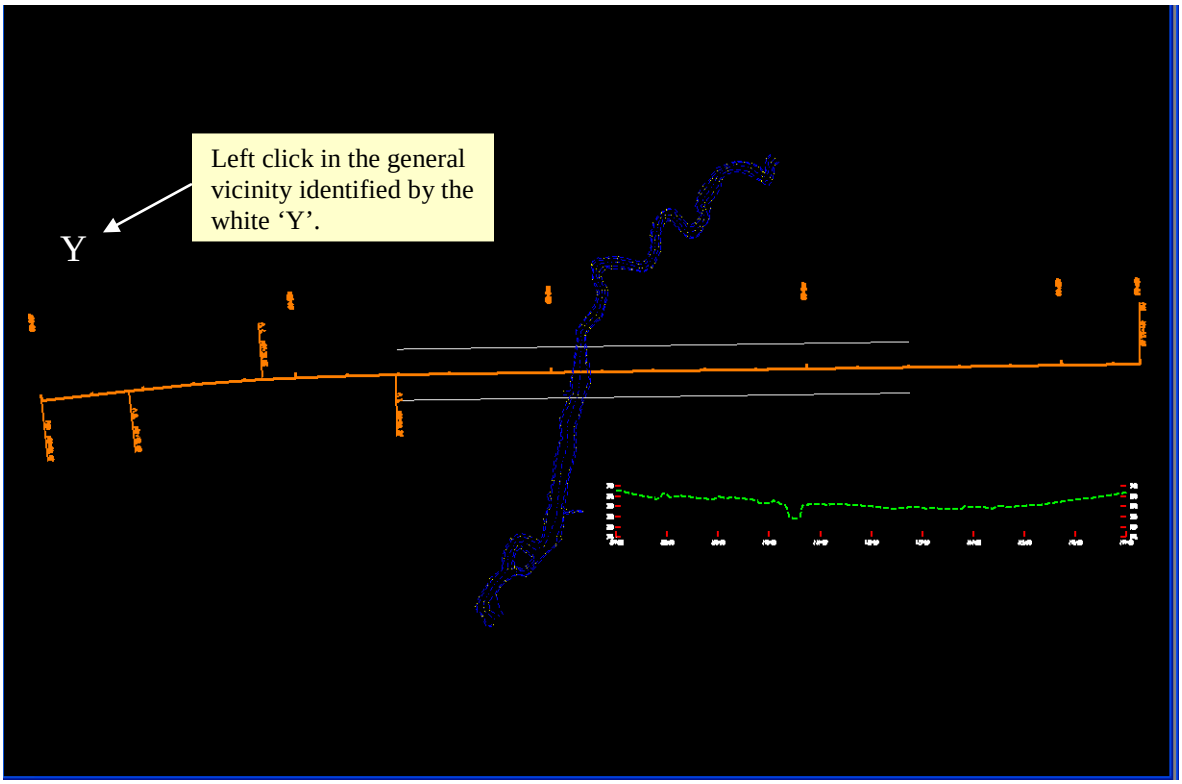


Figure L3-11 MicroStation View Window

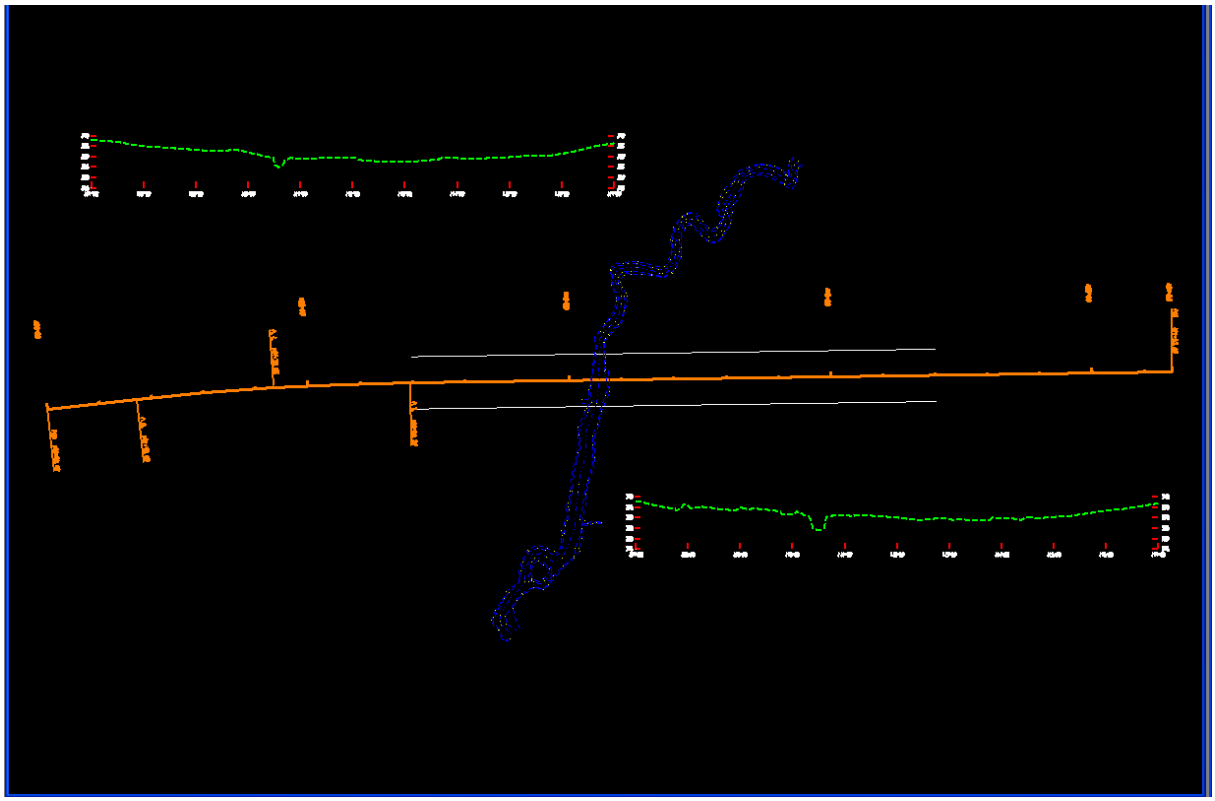


Figure L3-12 MicroStation View Window

69.	Add the newly created Profile for **BH50RT** to the Surface **1234567_Exist.dtm** as a Feature. • Select **Evaluation ► Profile ► Profile to Surface**. • In the **Profile to Surface** dialog, match the settings shown in *Figure L3-13*. • Click **Apply** but do **not** close the **Profile to Surface** dialog.

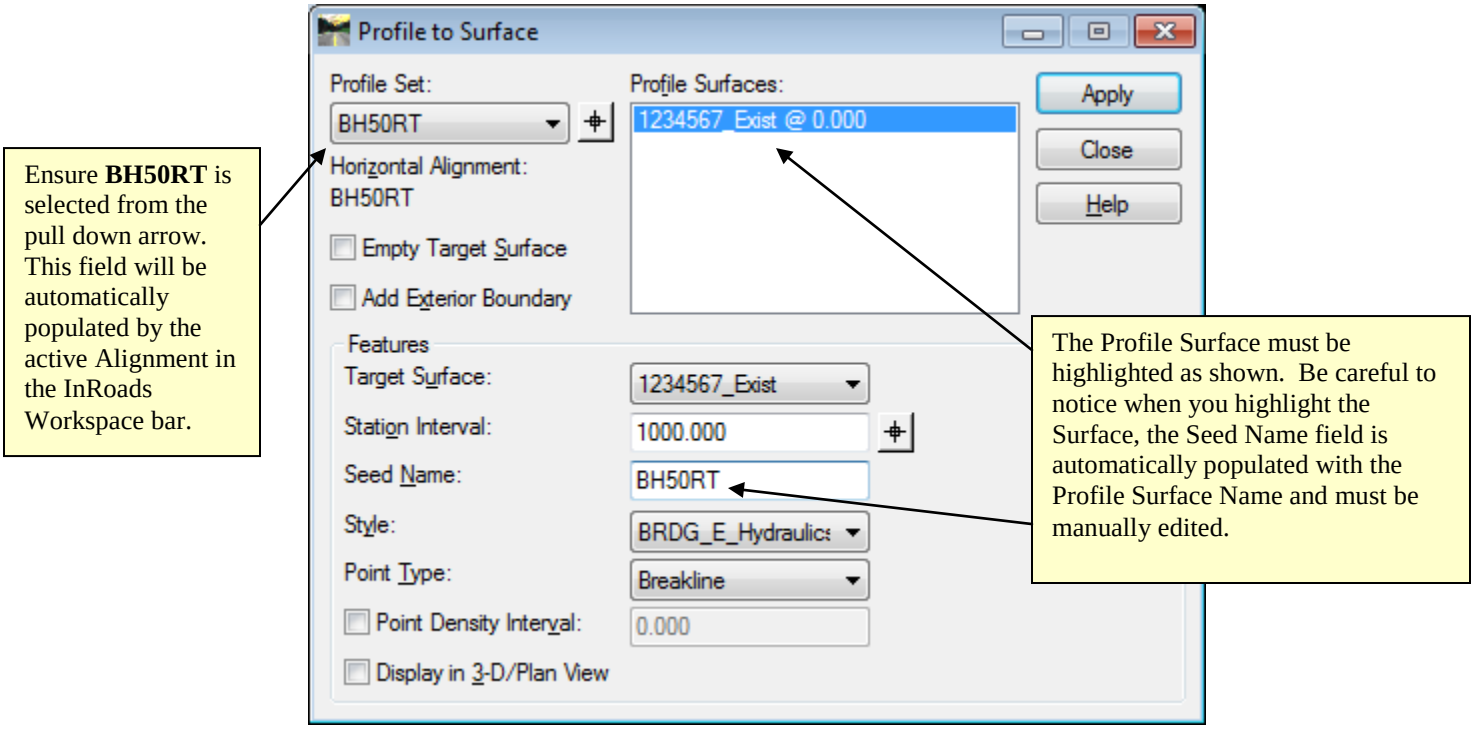


Figure L3-13 Profile to Surface

70.	Add the newly created Profile for **BH50LT** to the Surface **1234567_Exist.dtm** as a Feature. • In the **Profile to Surface** dialog, match the settings shown in *Figure L3-14*. • Click **Apply** & **Close**.

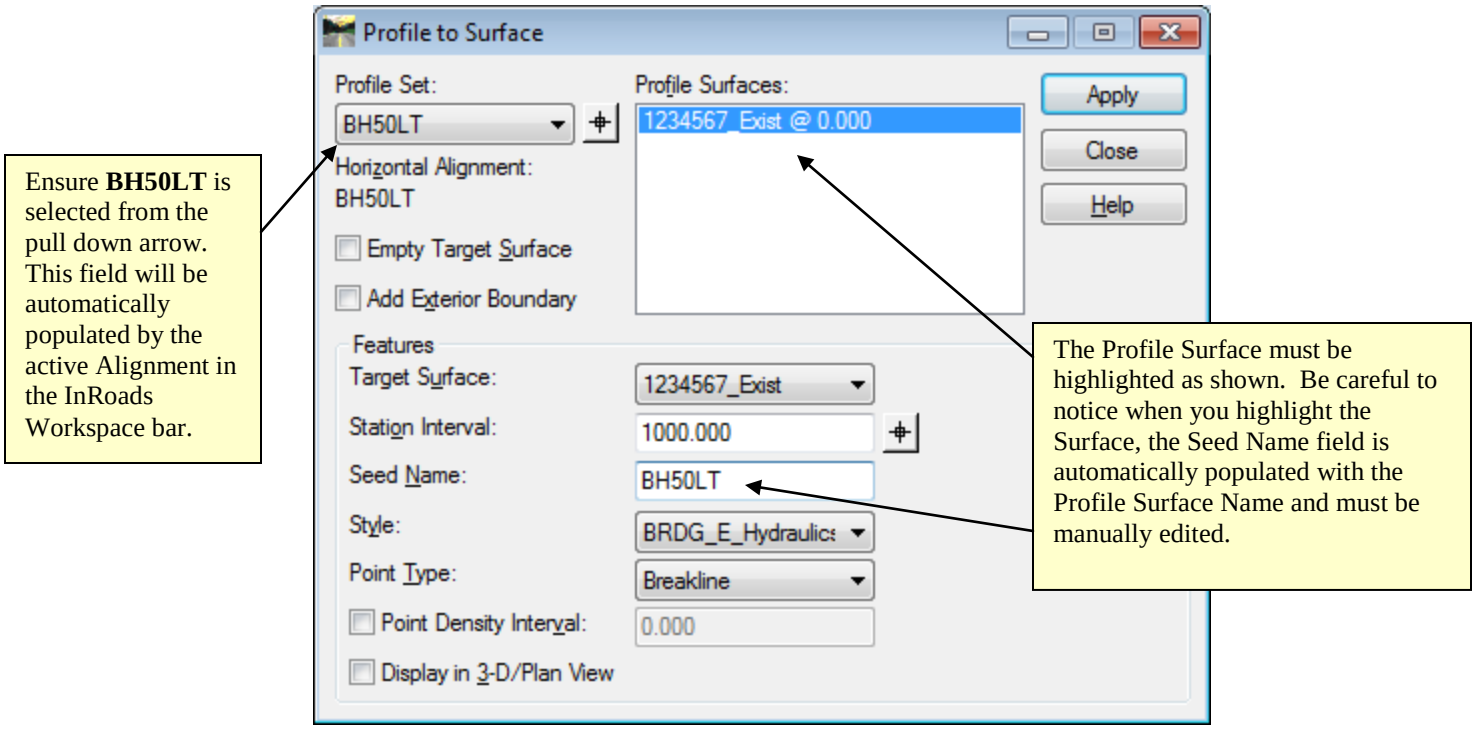


Figure L3-14 Profile to Surface

71.	The reason we added the Profiles **BH50RT** and **BH50LT** as Features to the Surface is that this is the best method to generate a Report from InRoads that will provide a Station and Offset from a different Horizontal Alignment. Verify the Features **BH50RT** and **BH50LT**were added to the Surface. • Select **Surface ► Feature ► Feature Properties**. • Verify the features **BH50RT** and **BH50LT** are listed in the **Feature Properties** dialog as shown in *Figure L3-15*. Click the **Name** column heading as necessary to find the Features. • **Close** the **Feature Properties** dialog.

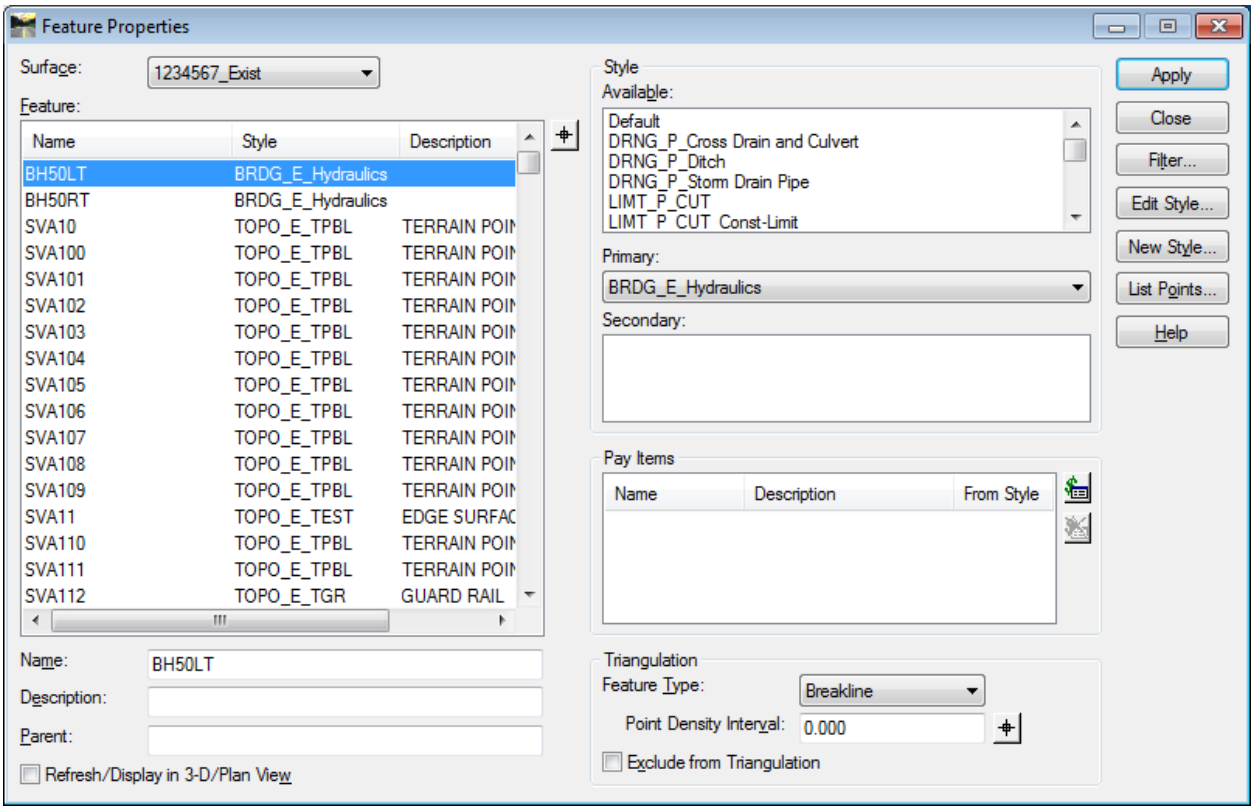


Figure L3-15 Feature Properties

72.	**Save the InRoads Surface File** Even though the Features have been added to the Surface – the data has not yet been saved. InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Surface – Save the Surface and its associated modifications or changes. • Select **File►Save► Surface** from the InRoads Menu.
73.	Create a Station/Elevation comma delimited text file (.txt) of **BH50RT** for use in importing Cross Section Geometric data into HEC-RAS. • Select **Tools ► XML Reports ► Clearance**. • Select the **General** leaf and match the settings shown in *Figure L3-16*. • Select the **Features** leaf and match the settings shown in *Figure L3-17*. • Click **Apply**. The **Bentley Civil Report Browser** opens. • Select the .XSL Style Sheet named: **GDOT HEC RAS Cross Section Geometry Report.xsl** • Verify your view matches that shown in *Figure L3-18*. • In the **Bentley Civil Report Browser**, select **File ► Save As**. • Save the Report as **BH50RT.txt**

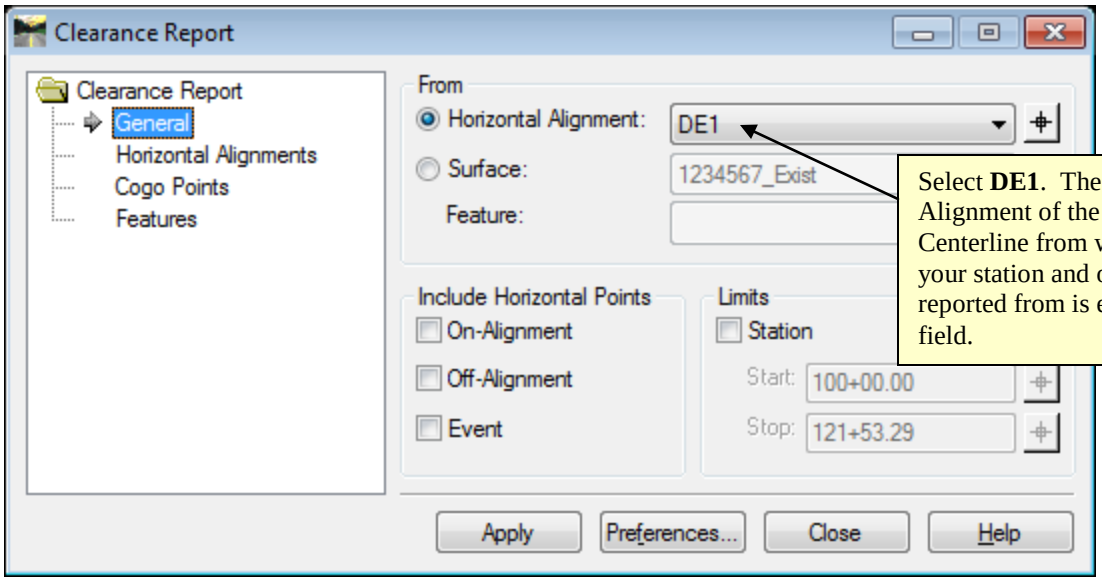


Figure L3-16 Clearance Report

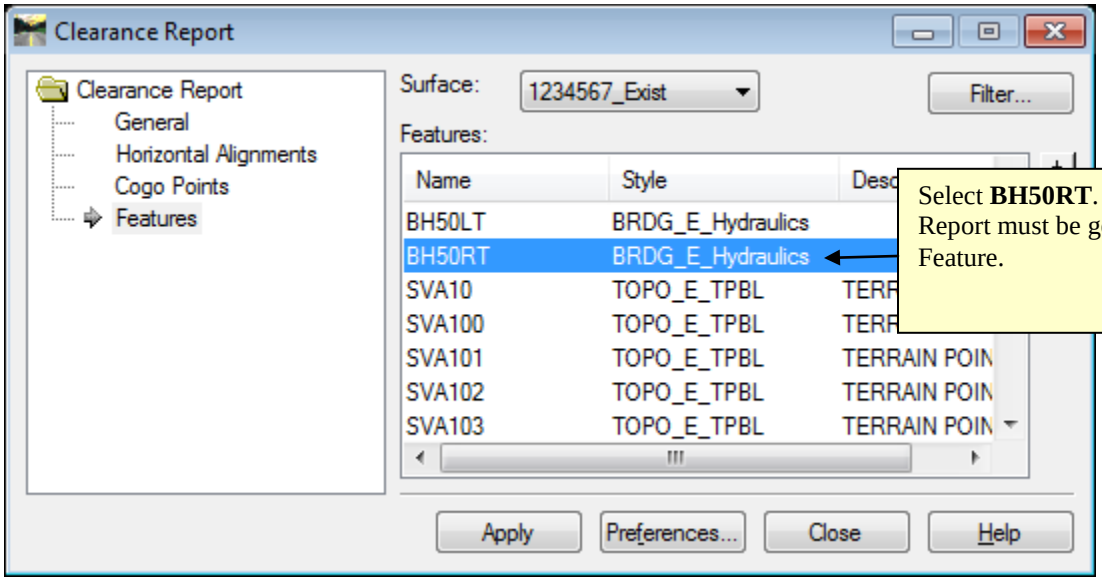


Figure L3-17 Clearance Report

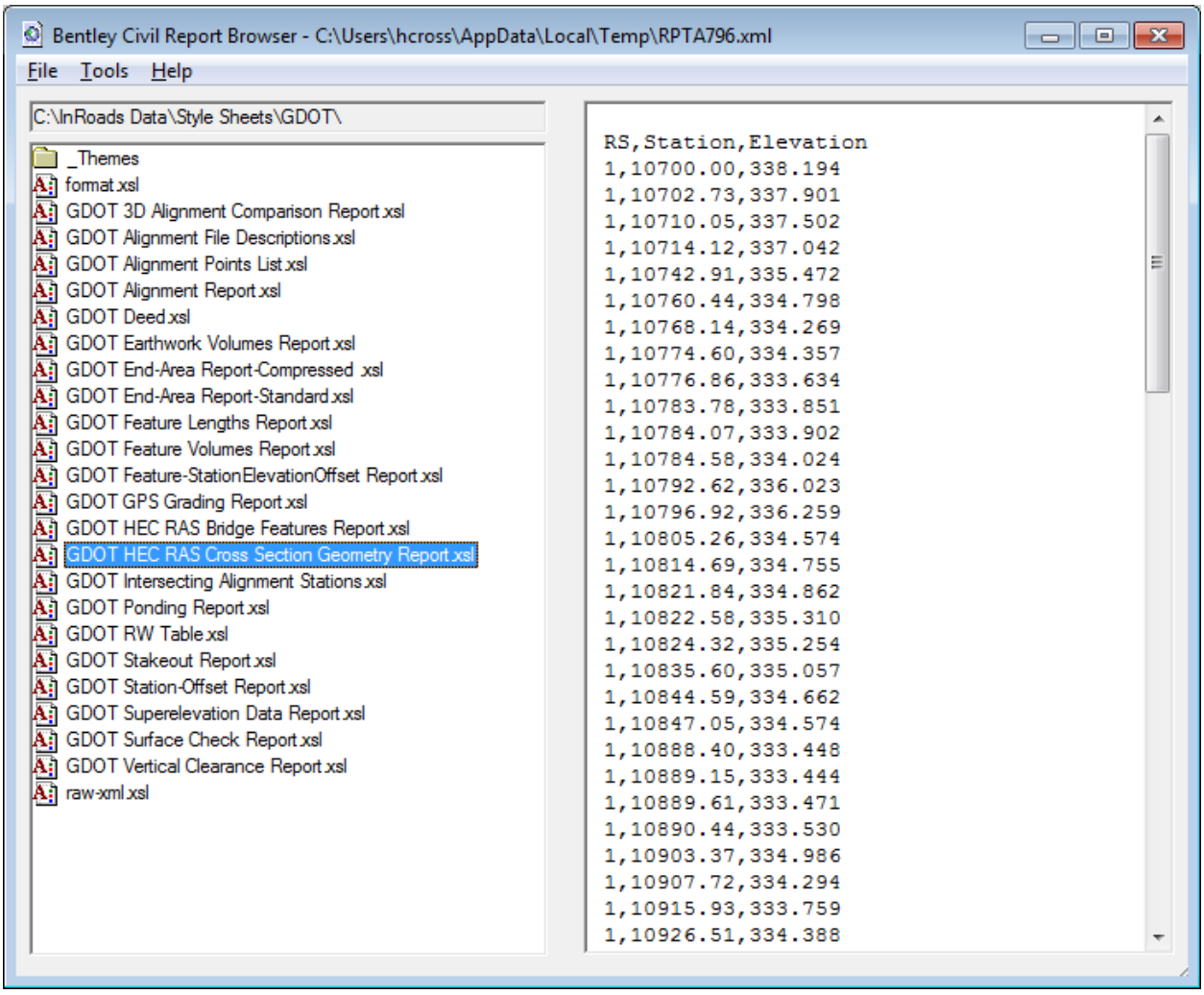


Figure L3-18 Bentley Civil Report Browser

74.	Create a Station/Elevation comma delimited text file (.txt) of **BH50LT** for use in importing Cross Section Geometric data into HEC-RAS. • **Close** the **Bentley Civil Report Browser.** • If not still open, open the **Clearance Report** dialog, Select **Tools ► XML Reports ► Clearance**. • Select the **General** leaf and match the settings shown in *Figure L3-19*. • Select the **Features** leaf and match the settings shown in *Figure L3-20*. • Click **Apply**. The **Bentley Civil Report Browser** opens. • Select the .XSL Style Sheet named: **GDOT HEC RAS Cross Section Geometry Report.xsl** • Verify your view matches that shown in *Figure L3-21*. • In the **Bentley Civil Report Browser**, select **File ► Save As**. • Save the Report as **BH50LT.txt**

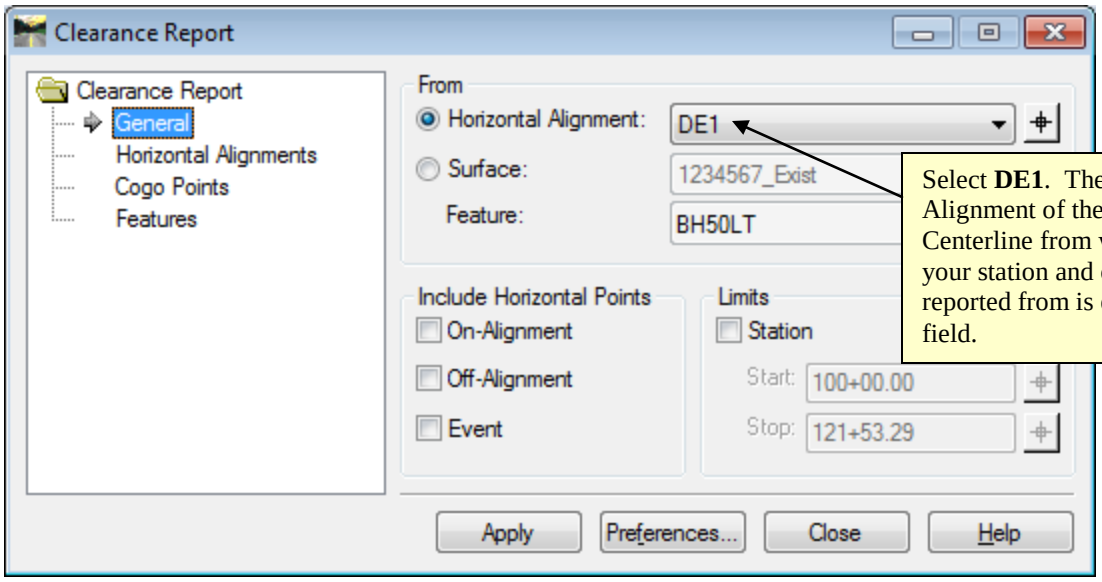


Figure L3-19 Clearance Report

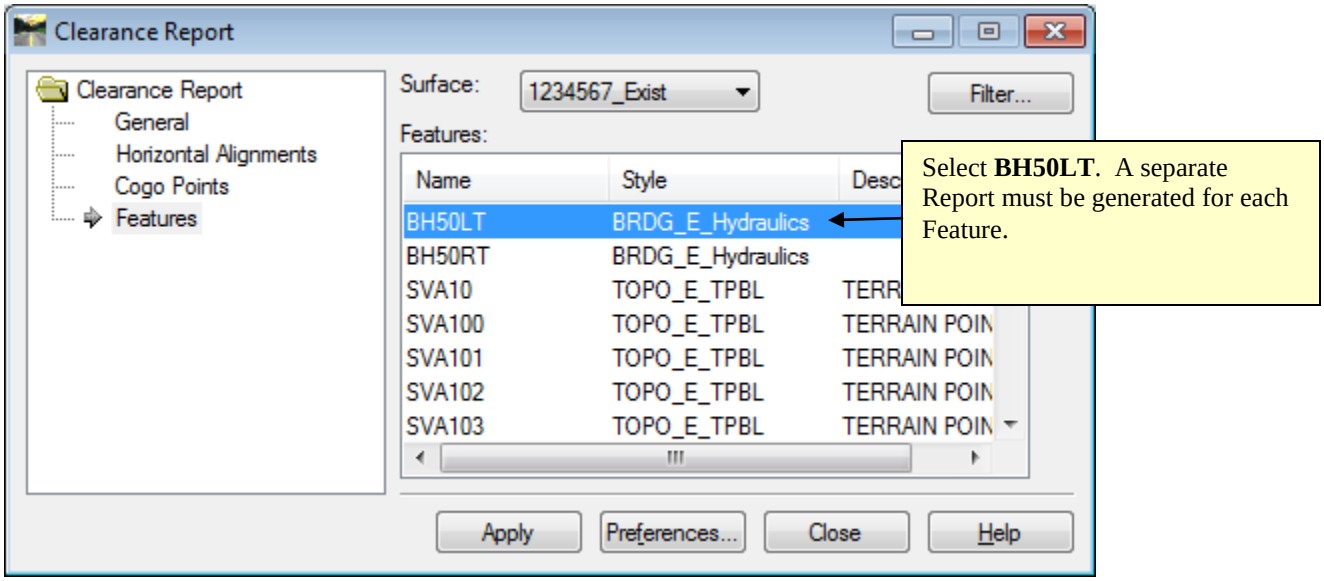


Figure L3-20 Clearance Report

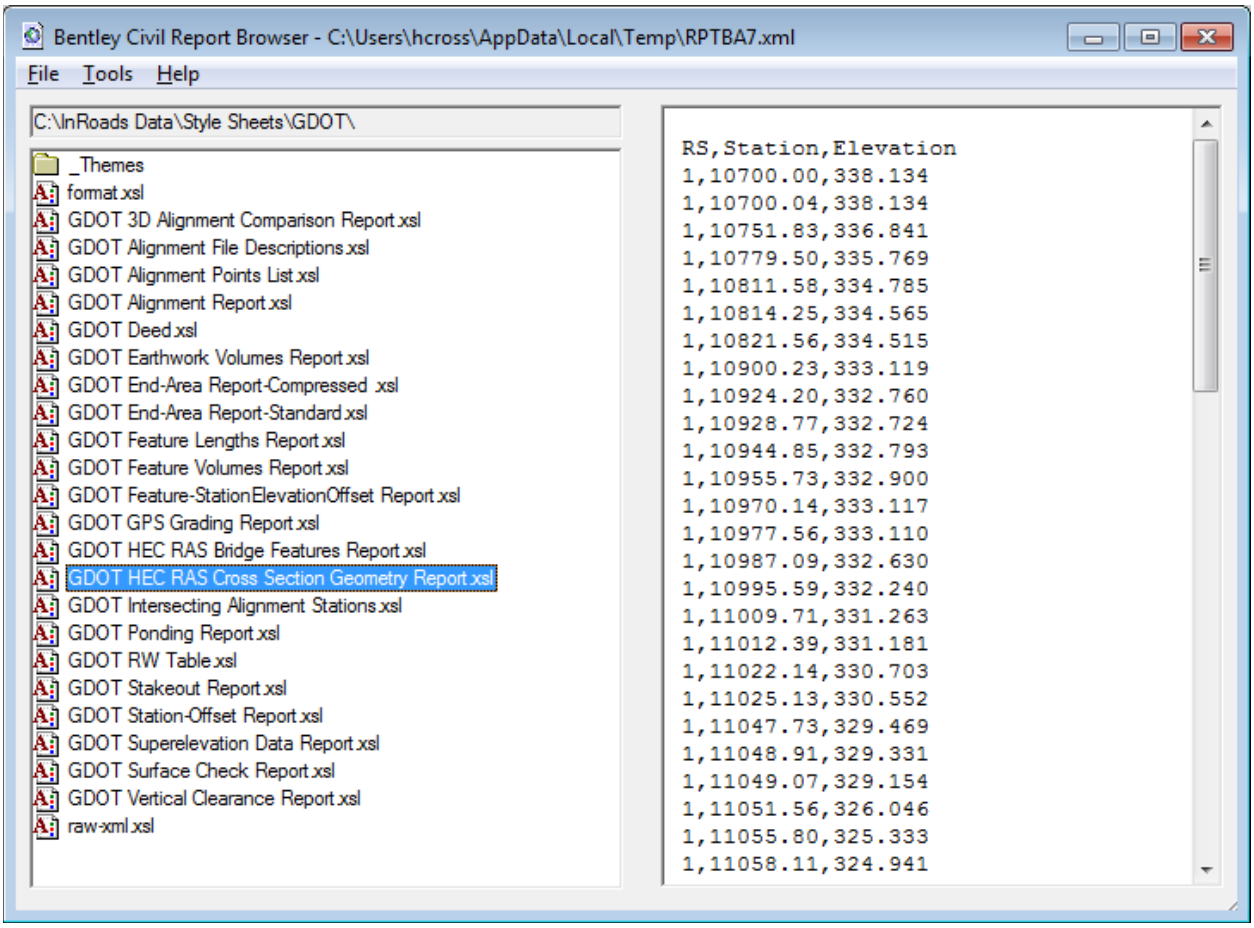


Figure L3-21 Bentley Civil Report Browser

75.	• **Close** the **Bentley Civil Report Browser.** • **Close** the **Clearance Report** dialog.
76.	The Text files **BH50RT.txt** and **BH50LT.txt** which were just created can now be imported into HEC-RAS. • Open HEC-RAS and **Open** or **Create** a new HEC-RAS Project.

77. Import **BH50RT.txt** into HEC-RAS.

- In HEC-RAS, select **Edit ► Geometric Data**…
- In the **Geometric Data** dialog, select **File ► Import Geometry Data ► CSV (comma separated value) Format**…
- Navigate to **BH50RT.txt** located in *C:\InRoads Data\1234567\InRoads to HEC RAS Labs*.
- Select **BH50RT.txt** and click **OK**.
- Select **Station-Elevation Format** then click **OK**.
- Click **Next**.
- Check the **Import Stream Lines** check box.
- Click **Next**.
- Click the **Create RS in feet** button.
- Key-in **50.00** in the **Import As RS** key-in field as shown here.

	Import File River	Import File Reach	Import File RS	Import As RS	Import Status	Import Data
1	River 1	Reach 1	1	50.00	new	☑

- Click **Finished – Import Data**.
- Click the **Edit and/or Create Cross Section** button 

in HEC-RAS to view the Cross Sections.

78. Import **BH50LT.txt** into HEC-RAS.

- In the **Geometric Data** dialog, select **File ► Import Geometry Data ► CSV (comma separated value) Format**…
- Navigate to **BH50LT.txt** located in *C:\InRoads Data\1234567\InRoads to HEC RAS Labs*.
- Select **BH50LT.txt** and click **OK**.
- Select **Station-Elevation Format** then click **OK**.
- Click **Next**.
- Uncheck the **Import Stream Lines** check box.
- Change the **Merge Mode** to **Append Upstream**.
- Click **Next**.
- Click the **Create RS in feet** button.
- Key-in **-50.00** in the **Import As RS** key-in field as shown here.

	Import File River	Import File Reach	Import File RS	Import As RS	Import Status	Import Data
1	River 1	Reach 1	1	-50.00	new	☑

- Click **Finished – Import Data**.
- Click the **Edit and/or Create Cross Section** button 

in HEC-RAS to view the Cross Sections.

79.	• **Close** HEC-RAS.
80.	 This concludes Lab 3. Do not proceed until the Instructor directs you to do so.

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Lab 4
Create Cross Section Report for HEC RAS in .GEO Format

Objective

The objective of Lab 4 is to create a Stream Centerline in the InRoads ALG Geometry file from the InRoads DTM Surface and generate an InRoads .geo file containing Cross Sectional geometric data along a Stream Centerline for import into HEC-RAS.

81.	Clear MicroStation of all Screen Graphics. • In MicroStation, select **Edit ►Select All**. • In MicroStation, click the **Delete** button,  .
82.	View Horizontal Alignment **DE1**. • In InRoads, make the Geometry Tab the Active Tab. • Right Mouse click over **DE1** and choose **View** from the popup menu. • In MicroStation, click the **Fit View** button  .
83.	Annotate Alignment **DE1** with Stationing. • In InRoads, select **Geometry ► View Geometry ► Stationing**. • Load the **Preference** named **CONSTCL**. • Click **Apply** and **Close**. • Verify your view matches that shown in *Figure L4-1*.

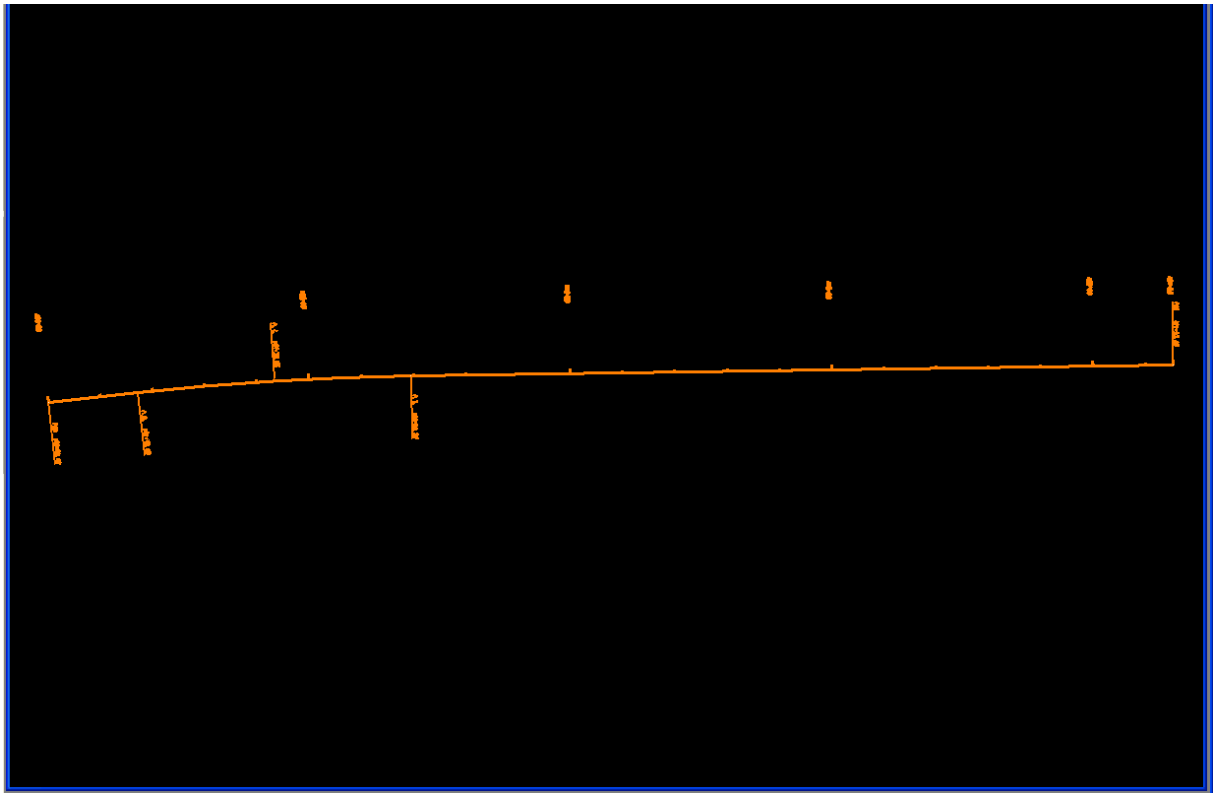
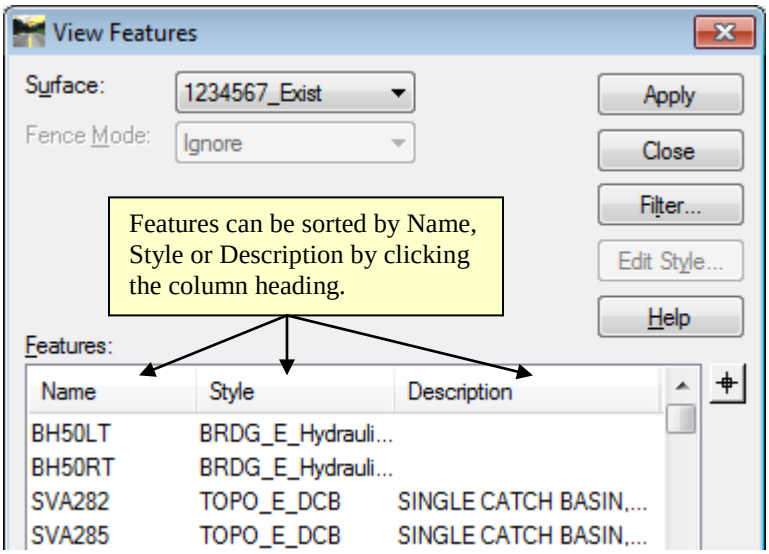


Figure L4-1 MicroStation View Window

84.	Open the **View Features** dialog. • In InRoads, select **Surface ► View Surface ► Features**.
85.	Deselect all the Features in the **View Features** dialog. • Right Mouse click in the **Features:** window and choose **Select None** from the popup menu. None of the Features should now be highlighted in blue.
86.	Sort the Features by Style. • In the **View Features** dialog click the **Style** heading until the Feature Style **TOPO_E_DCB** is near the top as shown here. 
87.	Select and view the Features Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE**. • In the **View Features** dialog, use a combination of the **CTRL** and/or **Shift** keys on the keyboard and the Left Mouse button to select the Feature Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE** as shown in *Figure L4-2*. • Click **Apply** and **Close**. • Verify your view in MicroStation matches that shown in *Figure L4-3*. • Close the **View Features** dialog.

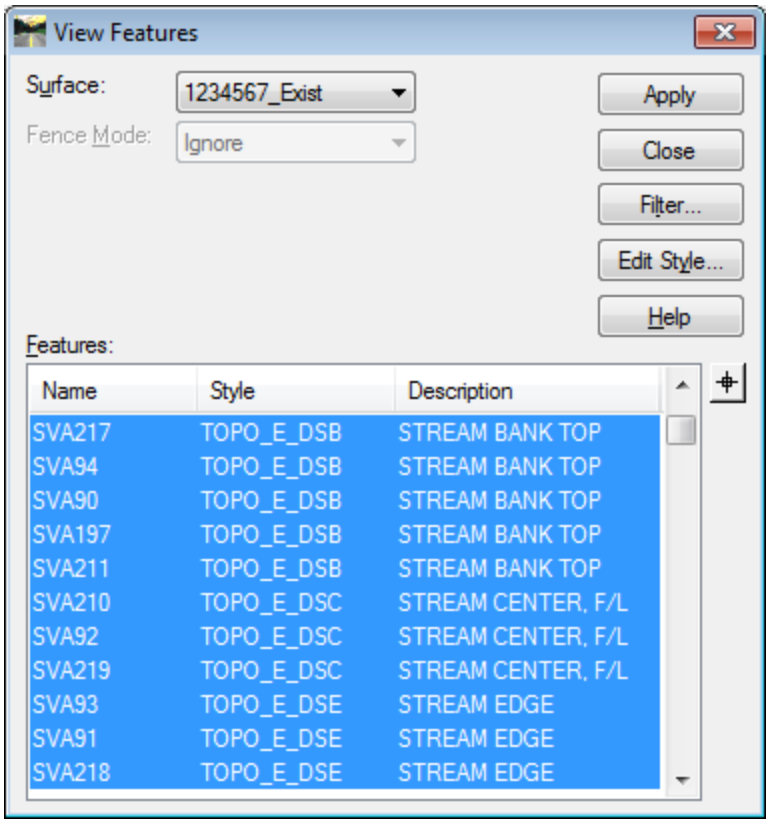


Figure L4-2 View Features

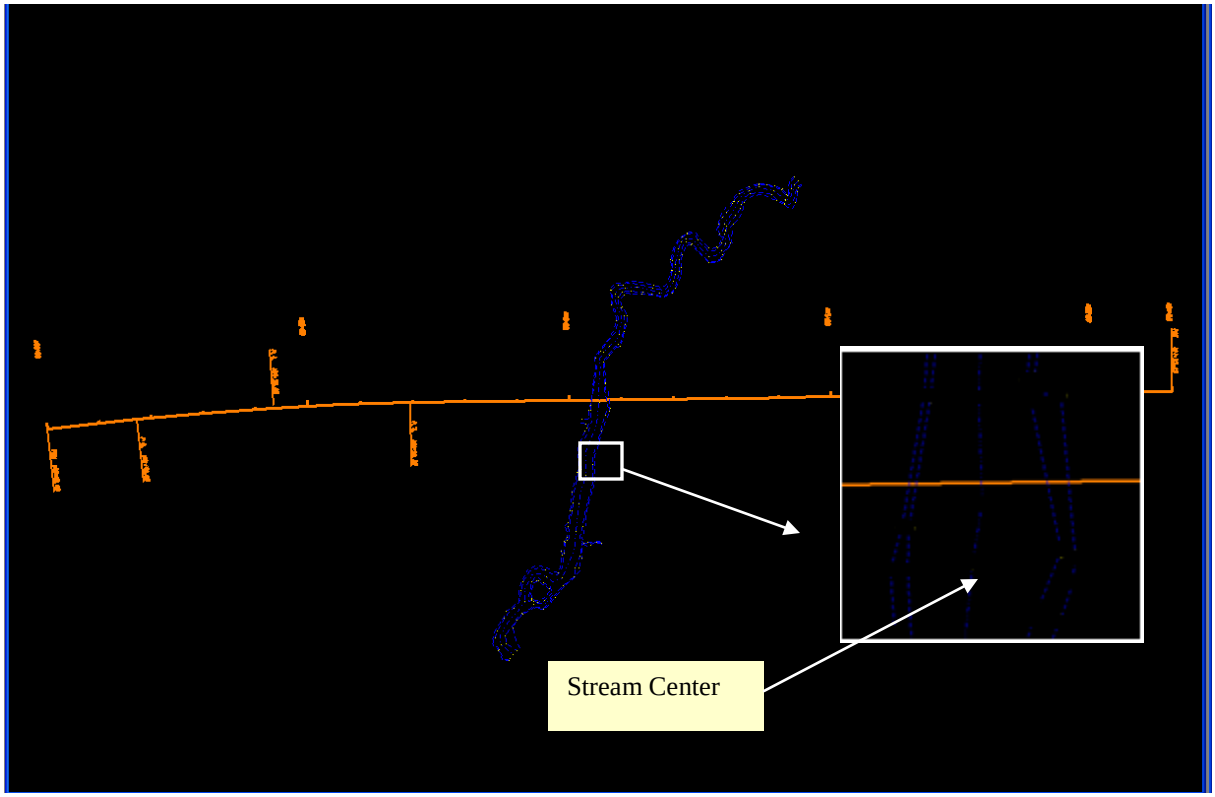


Figure L4-3 MicroStation View Window

88.	Create a Stream Centerline Alignment in the InRoads Geometry File (ALG) from the Stream Centerline in the InRoads Surface File (DTM). • In InRoads, select **File ► Import ► Geometry**. The **Import Geometry** dialog opens. • Ensure the **From Graphics** Tab is the Active Tab. • Match the entries shown in *Figure L4-4* and then go to **Step 89**.

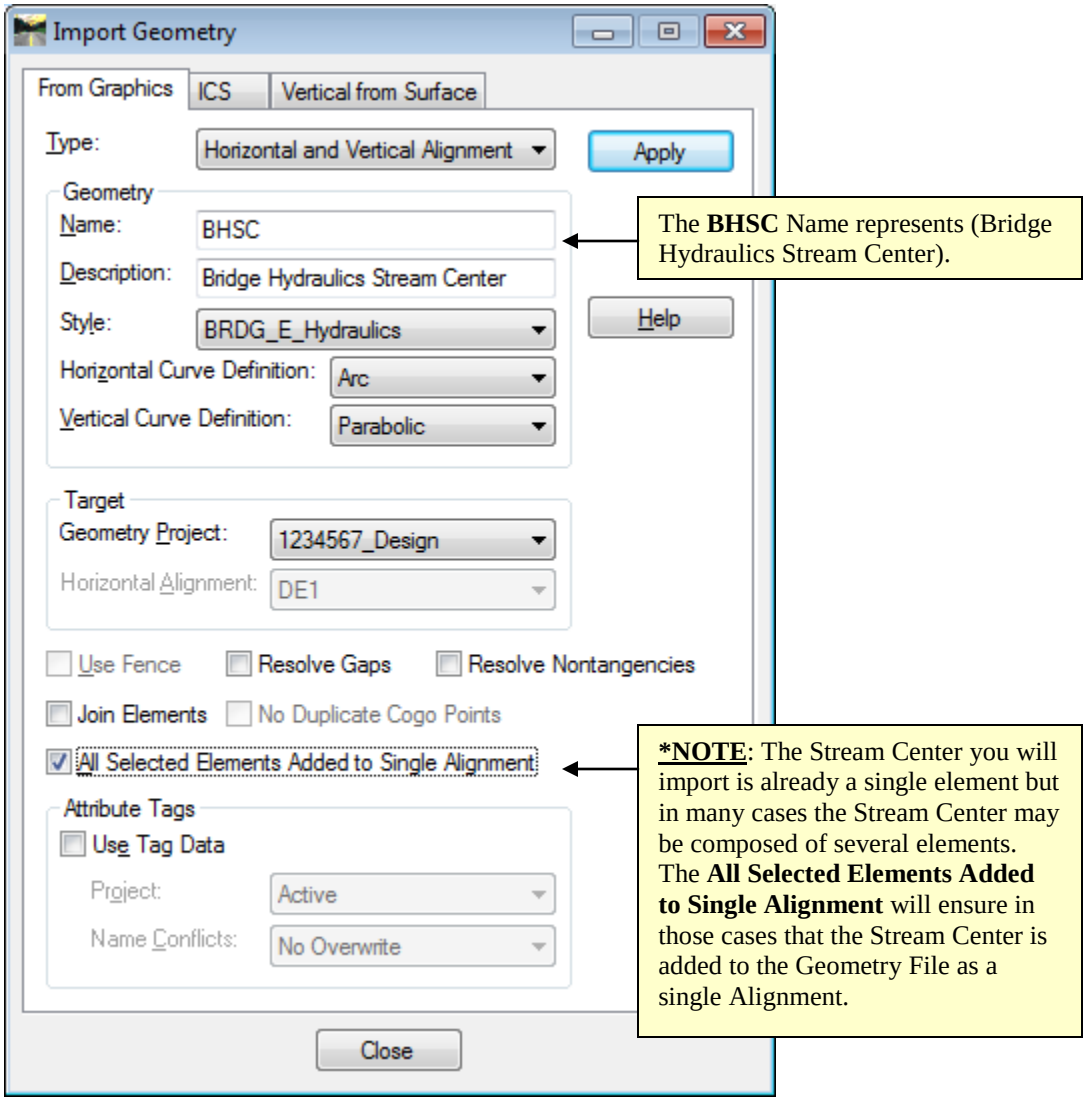


Figure L4-4 Import Geometry

89.	Continue creating the Stream Centerline Alignment in the InRoads Geometry File (ALG). • In the **Import Geometry** dialog, Click **Apply**. The **Import Geometry** dialog disappears and you are prompted in the lower left corner of the MicroStation Window to **>Identify element**. • Left Click on the Stream Center. It will highlight in purple as shown in *Figure L4-5* and you are prompted in the lower left corner of the MicroStation window to **>Accept/Reject**. • Left click in a blank part of the MicroStation window to accept or Right Mouse click to reject and select a different element. • Notice in the bottom left corner of the MicroStation window you are prompted to **< Identify element**. • Since there are no further elements representing the Stream Center, Right Mouse click in a blank part of the MicroStation window to complete the operation and return to the **Import Geometry** dialog. If there had been more elements representing the Stream Center, you would select and accept them until all elements had been selected and then Right Mouse click to complete the operation and return to the **Import Geometry** dialog. • **Close** the **Import Geometry** dialog.

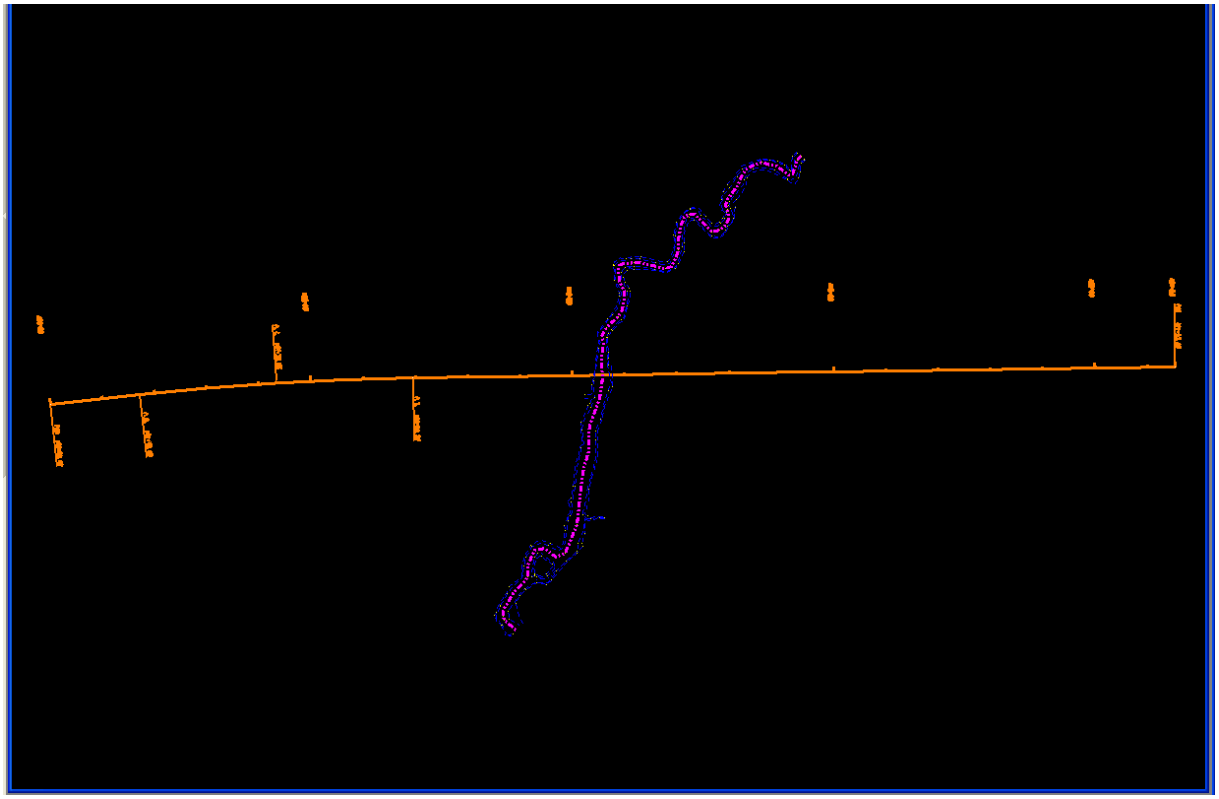
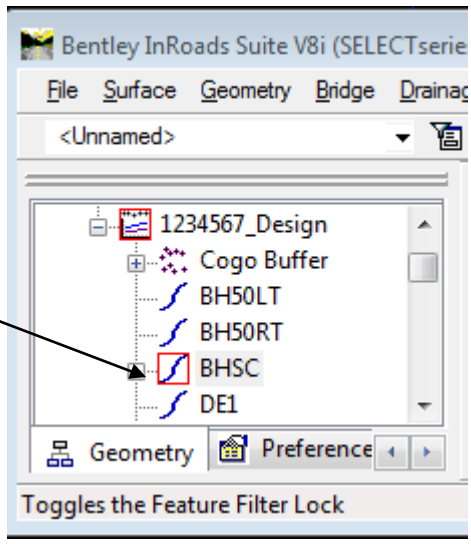


Figure L4-5 MicroStation View Window

90. Verify the Stream Centerline Alignment **BHSC** has been imported into the InRoads Geometry Project.

- In InRoads, make the **Geometry** Tab the Active Tab in the InRoads Workspace Bar.
- Verify **BHSC** exists in the Workspace Bar as shown here:
- Right Mouse click over **BHSC** and select **Set Active**.
- Verify Alignment **BHSC** has a Red Square next to it identifying it as the Active Alignment.

BHSC is shown in the Workspace Bar. It should also be the Active Alignment as depicted by the Red square. The plus (+) sign in front of the Alignment lets you know a Vertical Alignment is associated with the Horizontal Alignment.



91. View Alignment **BHSC**.

- Right Mouse click over Alignment **BHSC** and choose **View** from the popup Menu. **BHSC** is drawn as a solid white line in MicroStation.

92. **Save the InRoads Geometry File**

Even though the Alignment has been stored – the data has not yet been saved. InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Geometry Project – Save the Project and its associated modifications or changes.

- Select **File ▶ Save ▶ Geometry Project** from the **InRoads Menu**.

93.	• In MicroStation, **Window Area** as shown in *Figure L4-6*. • Verify your view is similar to that shown in *Figure L4-7*.

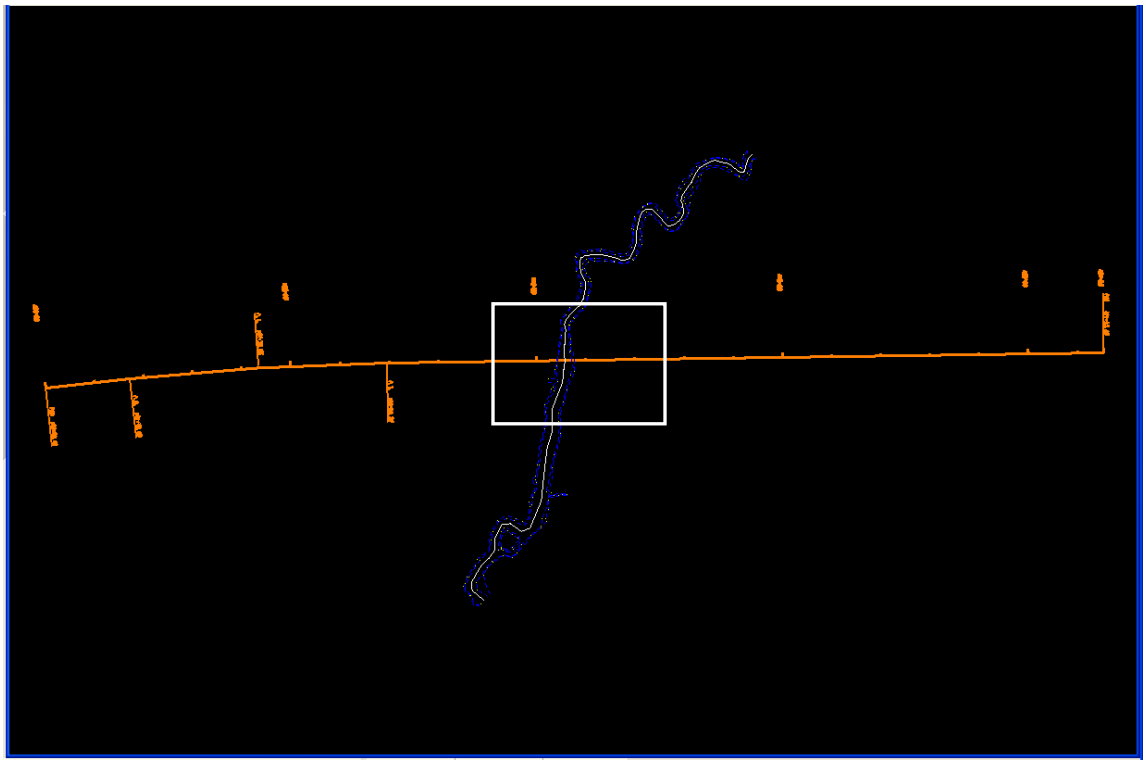


Figure L4-6 MicroStation View Window

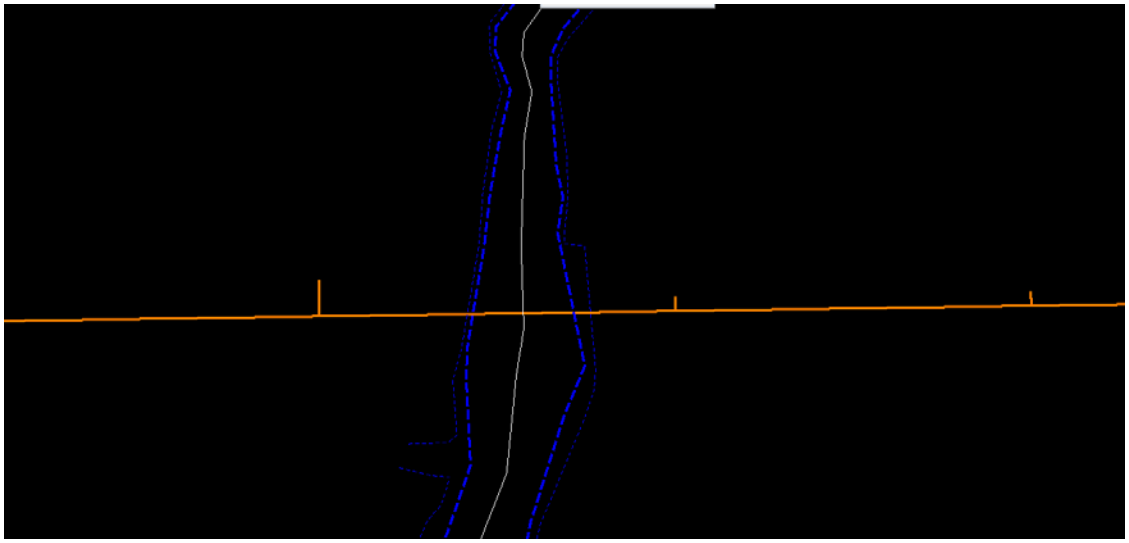


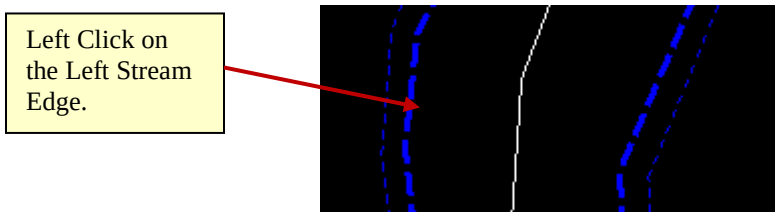
Figure L4-7 MicroStation View Window

94. The **Generate Water Surface Data** command is used in InRoads to generate a Cross Sectional Geometric data file along the Stream Centerline Alignment for use in HEC-RAS. Open the **Generate Water Surface Data** dialog.

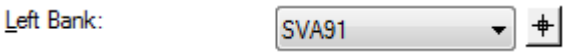
- Select **Evaluation ► Hydrology and Hydraulics ► Generate Water Surface Data**…

95. The **Generate Water Surface Data** dialog – **Step 1**.

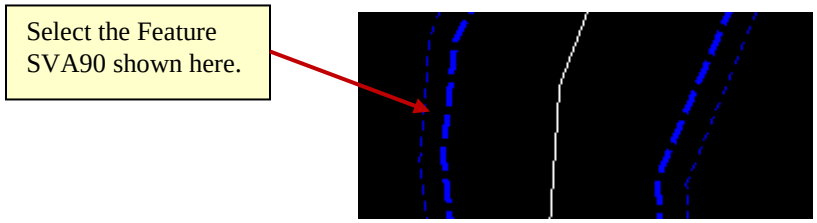
- The **Banks** field is where Features in the DTM are selected that represent the Left and Right Stream Banks and Overbanks. These Features are not always picked up by Survey, none the less a selection is required in InRoads. This particular Project contains features in the DTM representing the Left and Right Stream Edges and Left and Right Stream Banks which we will use as the Left and Right Banks and Overbanks respectively.
  - Click the **Locate Button** ( ) to the right of the **Left Bank:** selection field.
  - The **Generate Water Surface Data** dialog disappears and you are prompted in the bottom left corner of the MicroStation window to **> Select Feature**.
  - Left Click on the Feature representing the Left Stream Edge shown here:



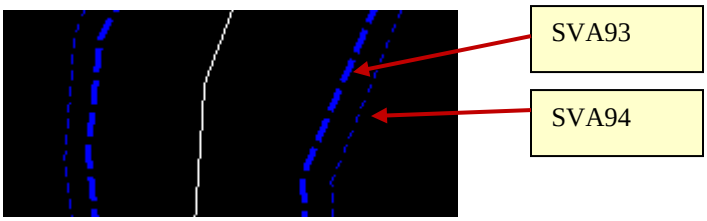
  - The Feature highlights purple and you are prompted in the bottom left corner of the MicroStation Window to **>Accept/Reject SVA91**.
  - Left Click in a blank part of the MicroStation window to accept and return the Feature to the **Generate Water Surface Data Left Bank:** selection field as shown here:



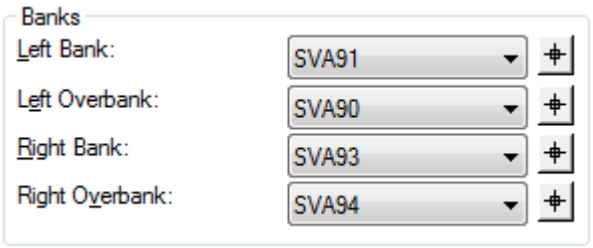
  - Click the **Locate Button** ( ) to the right of the **Left Overbank:** selection field and select the Feature **SVA90** identified here:



- Use the **Locate Button** for the **Right Bank:** (**SVA93**) and **Right Overbank:** (**SVA94**) identified here:

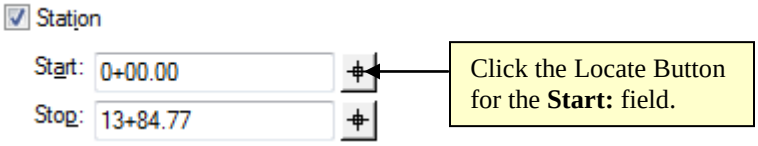


- Verify the **Banks** selection fields are populated as shown here.



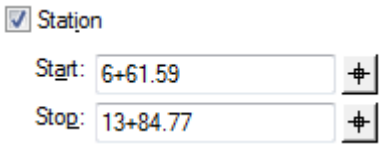
96. The **Generate Water Surface Data** dialog – **Step 2**.

- In the **Source** field select the **Alignment** Radio button.
  - In the **Interval:** key-in field, enter a value of **10.000**. The **Interval:** field defines the frequency that Cross Sections will be created. A value of **10.00** means Cross Section data will be created every 10 feet along the Stream Centerline Alignment.
- In the **Offsets** field, key-in a **Left:** value of **-100.000** and a **Right:** value of **100.000**.
- Place a check in the **Station** check box.
  - In the **Start:** field click the **Locate Button** ( ) to the right of the entry field.

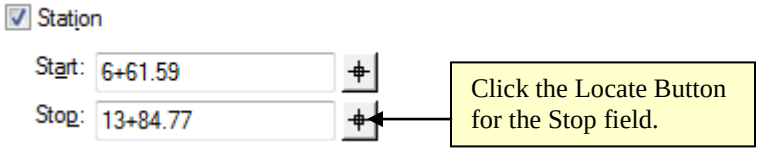


  - The **Generate Water Surface Data** dialog disappears and you are prompted in the bottom left corner of the MicroStation **Window to > Identify start station**.
  - In the MicroStation window, move your mouse cursor up and down the Stream Alignment and notice the white line that extends from your cursor to the Stream vertices.

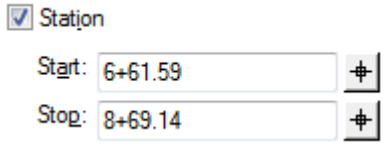
- Notice also as you move your cursor along the Stream Alignment, in the bottom middle of the MicroStation window you are provided with the Station and Offset of the vertices.
- Move your cursor until the Station **6+61.59** is shown in the bottom middle of the MicroStation window and Left click. You are returned to the **Generate Water Surface Data** dialog and **6+61.59** is now entered in the entry field for the Station **Start:** as shown here.



- In the **Stop:** field click the Locate Button ( ) to the right of the entry field.



- The **Generate Water Surface Data** dialog disappears and you are prompted in the bottom left corner of the MicroStation **Window to > Identify stop station**.
- Move your cursor until the Station **8+69.14** is shown in the bottom middle of the MicroStation window and Left click. You are returned to the **Generate Water Surface Data** dialog and **8+69.14** is now entered in the entry field for the Station **Stop:** as shown here.



- Place a check in the **Display Section Lines** check box.

97. The **Generate Water Surface Data** dialog – **Step 3**.

- Verify your entries match those shown in *Figure L4-8*.
- Click **Apply**.
- In the **Save As** window, ensure HEC-RAS geometry file (*.geo) is selected as the type and key-in a filename of **1234567 HEC-RAS.geo**
- Click **Save**. The .geo file is created and the Cross Section scan lines are drawn in MicroStation as shown in *Figure L4-9*. (**PLEASE NOTE:** The line symbology is based on the Active Level, so the color/linestyle may not exactly match the *Figure L4-9* screen capture as shown below).
- **Close** the **Generate Water Surface Data**.

98.	**Save the InRoads Surface File** Even though the information has been added to the Surface – the data has not yet been saved. InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Surface – Save the Surface and its associated modifications or changes. • Select **File ▶ Save ▶ Surface** from the InRoads Menu.
99.	**Save the InRoads Geometry File** Even though the Alignment has been stored – the data has not yet been saved. InRoads retains the data in temporary memory but does not save the data on the fly. Whenever a change has been made to an InRoads Geometry Project – Save the Project and its associated modifications or changes. • Select **File ▶ Save ▶ Geometry Project** from the **InRoads Menu**.

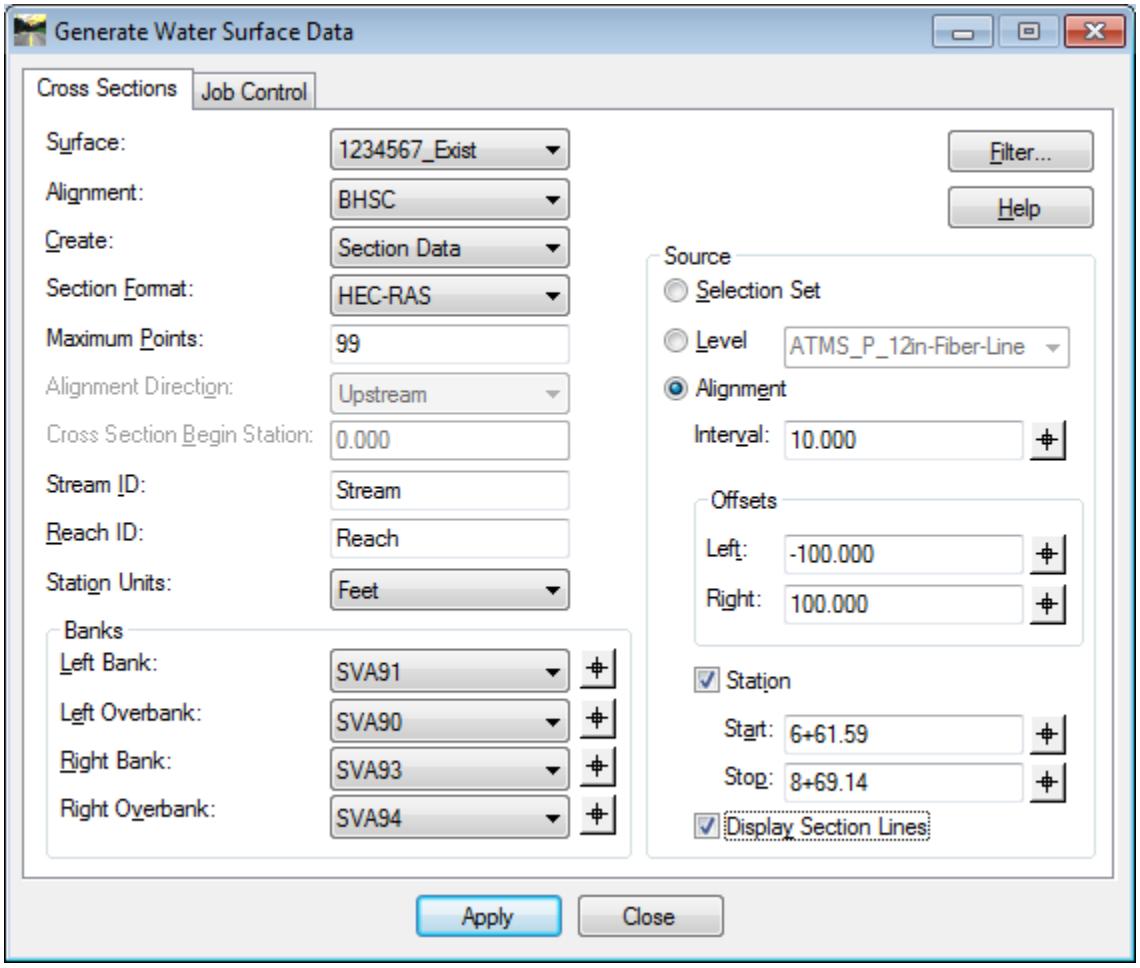


Figure L4-8 Generate Water Surface Data

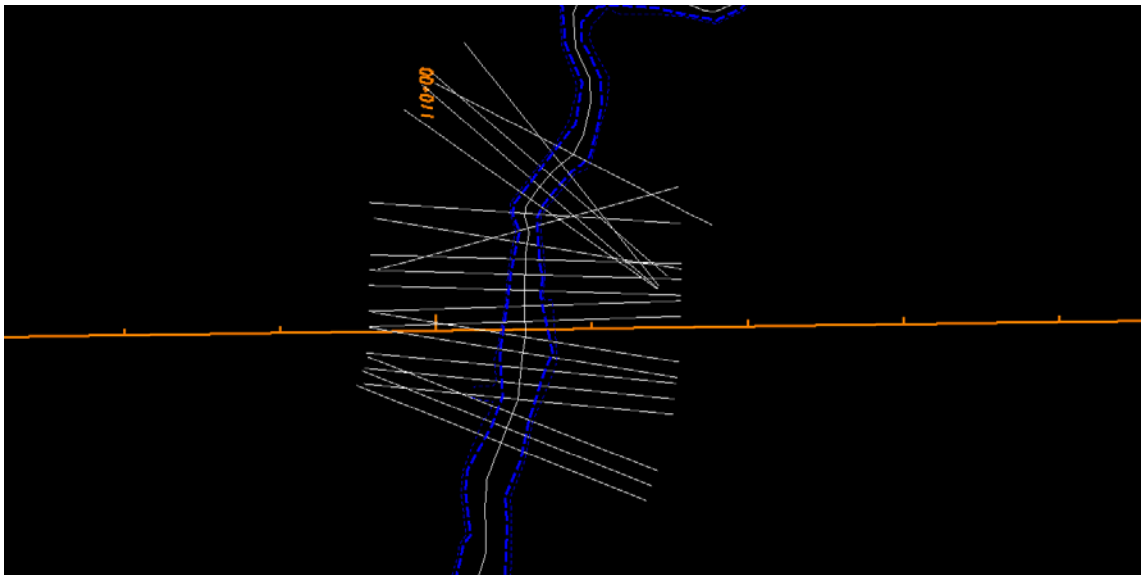


Figure L4-9 MicroStation View Window

100.	Import the **1234567 HEC-RAS.geo** file into HEC-RAS. • Open HEC-RAS and create a new Project. • In HEC-RAS, select **Edit ► Geometric Data** • In the **Geometric Data** dialog, select **File ► Import Geometry Data ► GIS Format** • Navigate to *C:\InRoads Data\1234567\InRoads to HEC RAS Labs* • Highlight the file **1234567 HEC-RAS.geo** created in the previous steps. • Click **OK**. • Click **Next**. • Ensure **Import Stream Lines** is checked. • Click **Next**. • Click **Finished – Import Data**. • Click the **Edit and/or Create Cross Section** button  in HEC-RAS to view the Cross Sections • Review your data.
101.	 This concludes Lab 4. Do not proceed until the Instructor directs you to do so.

Lab 5
Create Bridge Station and Offset Report for HEC RAS

Objective

The objective of Lab 5 is to generate a Station & Offset report of the existing Bridge Corners, Bridge Gutter Lines and Bridge Center Lines to the proposed Roadway Centerline for use in HEC-RAS.

102.	Clear MicroStation of all Screen Graphics. • In MicroStation, select **Edit ►Select All**. • In MicroStation, click the **Delete** button.
103.	View Horizontal Alignment **DE1**. • In InRoads, make the Geometry Tab the Active Tab. • Right Mouse click over **DE1** and choose **View** from the popup menu. • In MicroStation, click the **Fit View** button.
104.	Annotate Alignment **DE1** with Stationing. • In InRoads, select **Geometry ► View Geometry ► Stationing**. • **Load** the **Preference** named **CONSTCL**. • Click **Apply** and **Close**. • Verify your view matches that shown in *Figure L5-1*.

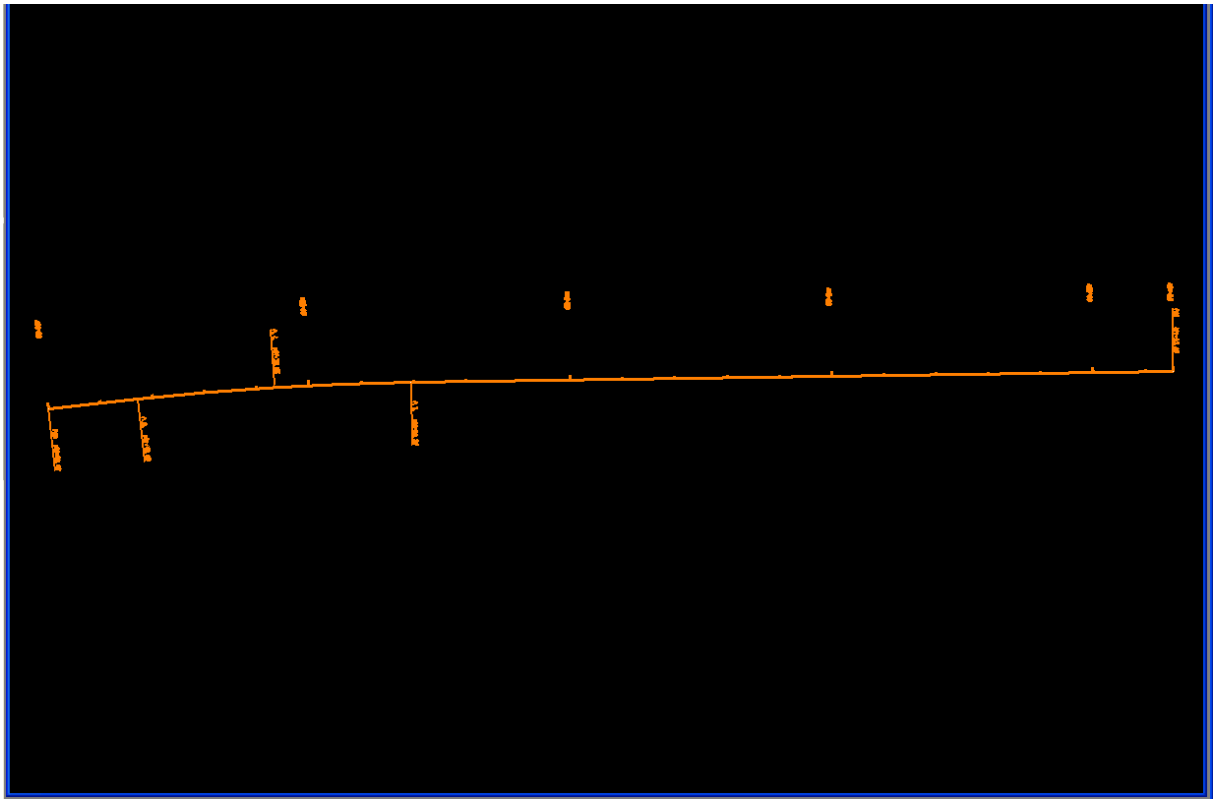
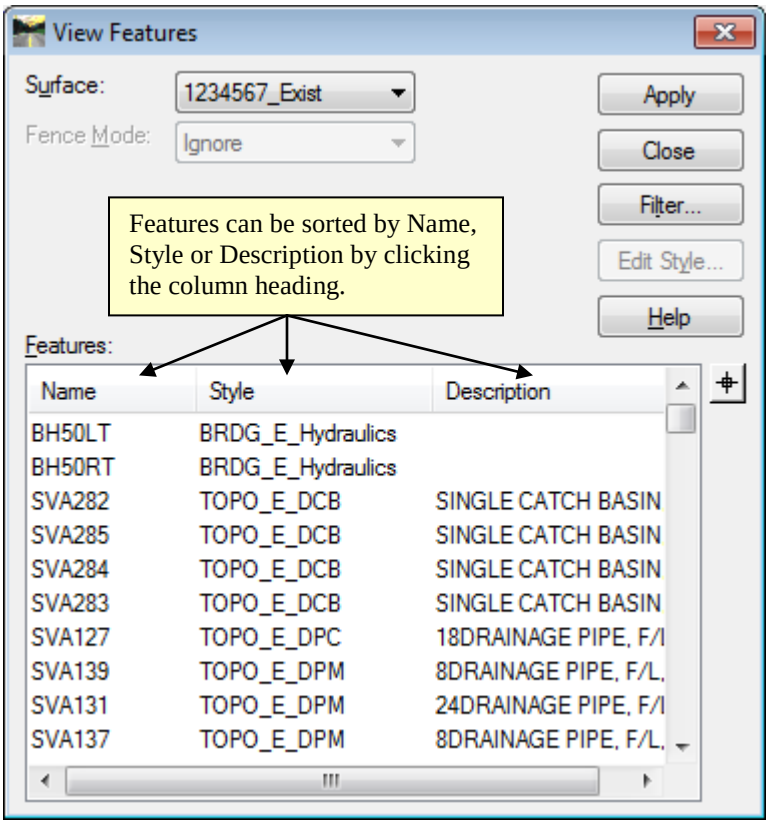


Figure L5-1 MicroStation View Window

105.	Open the **View Features** dialog. • In InRoads, select **Surface ► View Surface ► Features**.
106.	Deselect all the Features in the **View Features** dialog. • Right Mouse click in the **Features:** window and choose **Select None** from the popup. None of the Features should now be highlighted in blue.
107.	Sort the Features by Style. • In the **View Features** dialog click the **Style** heading until the Feature Style **TOPO_E_DCB** is near the top as shown here. 

108.	Select and view the Features Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE**. • In the **View Features** dialog, use a combination of the **CTRL** and/or **Shift** keys on the keyboard and the Left Mouse button to select the Feature Styles **TOPO_E_DSB**, **TOPO_E_DSC** and **TOPO_E_DSE** as shown in *Figure L5-2*. • Click **Apply** but do **Not** close the **View Features** dialog. • Verify your view in MicroStation matches that shown in *Figure L5-3*.

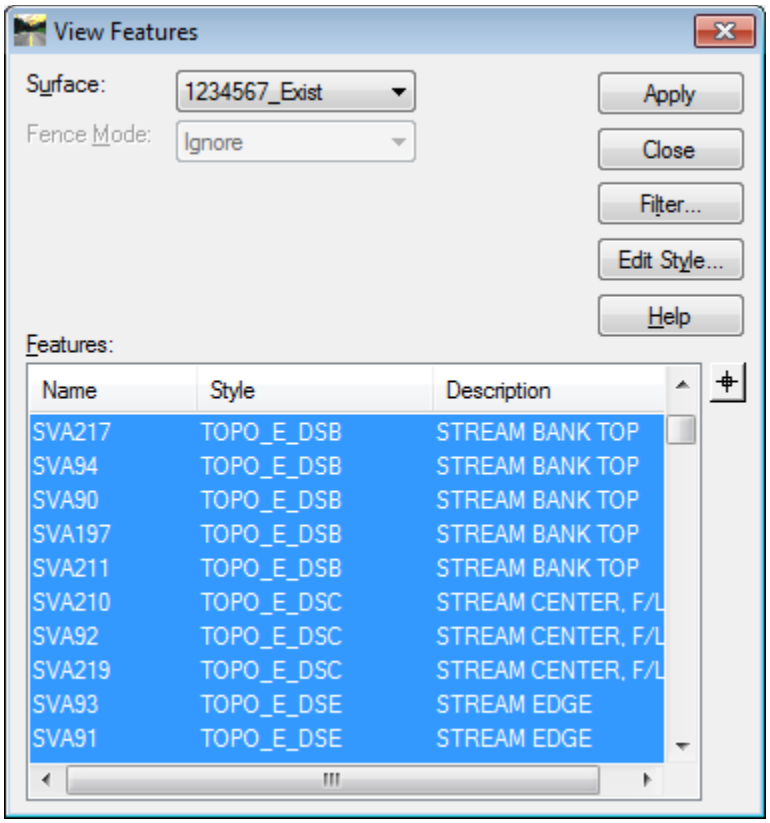


Figure L5-2 View Features

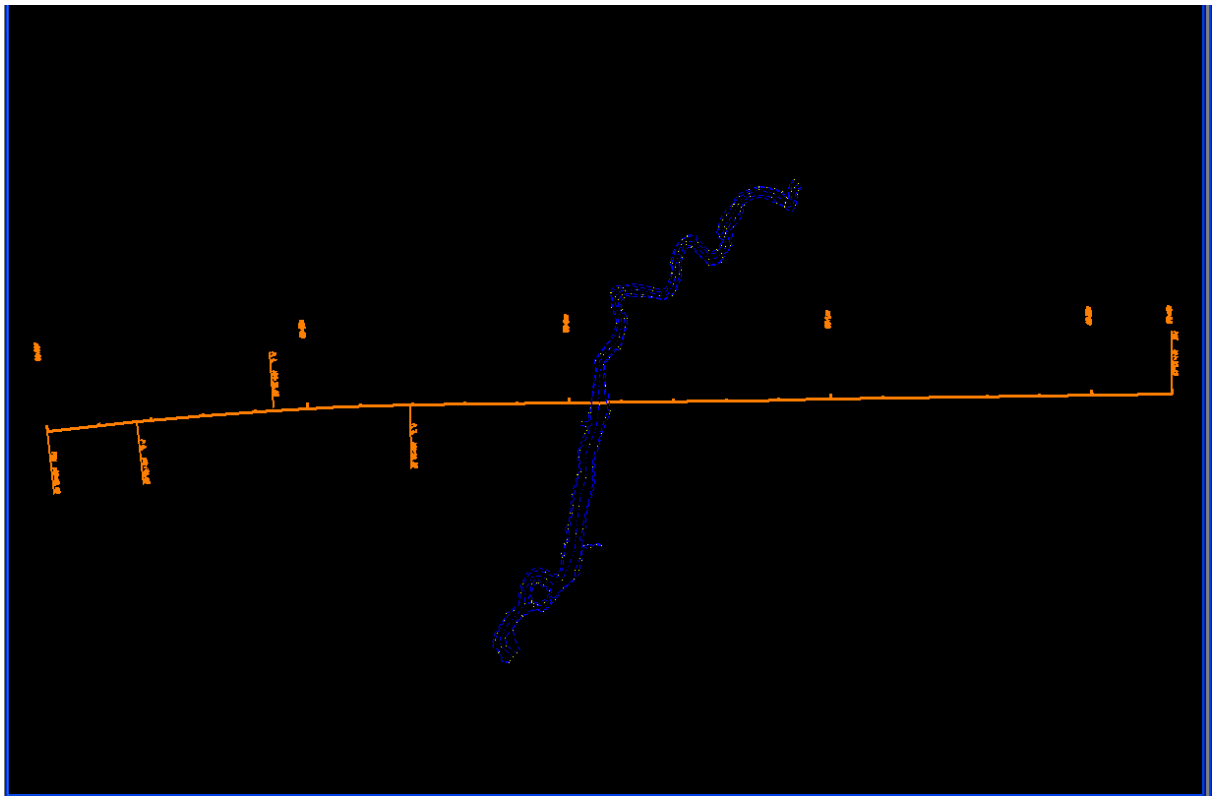


Figure L5-3 MicroStation View Window

109.	Select and view the Features Styles **TOPO_E_TBCL**, **TOPO_E_TBGL** and **TOPO_E_TBRDGCOR**. • In the **View Features** dialog, use a combination of the **CTRL** and/or **Shift** keys on the keyboard and the Left Mouse button to select the Feature Styles **TOPO_E_TBCL**, **TOPO_E_TBGL** and **TOPO_E_TBRDGCOR** as shown in *Figure L5-4*. • Click **Apply** and **Close**. • Verify your view in MicroStation matches that shown in *Figure L5-5*.

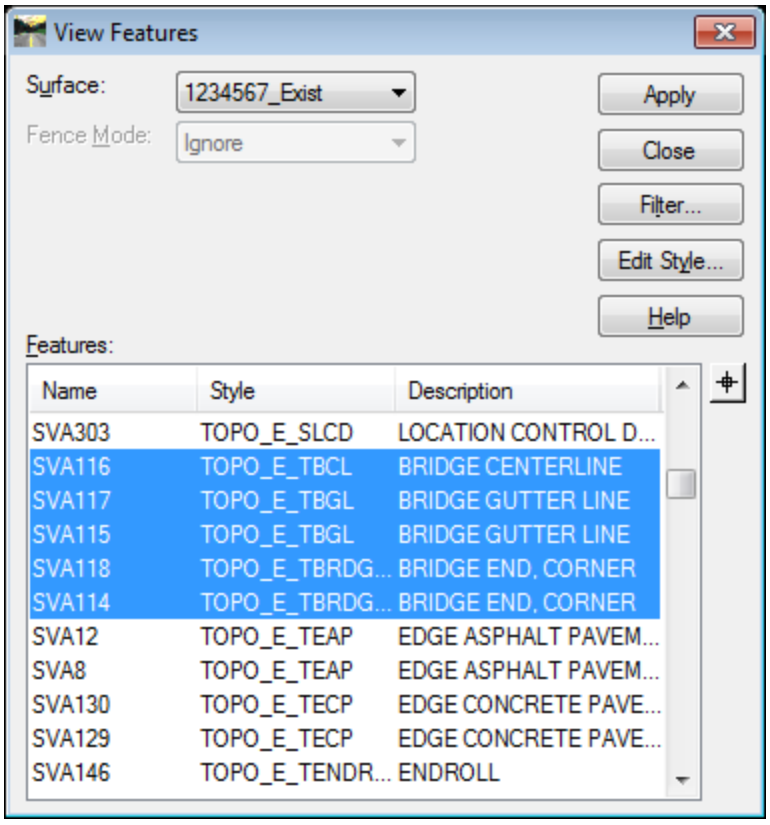


Figure L5-4 View Features

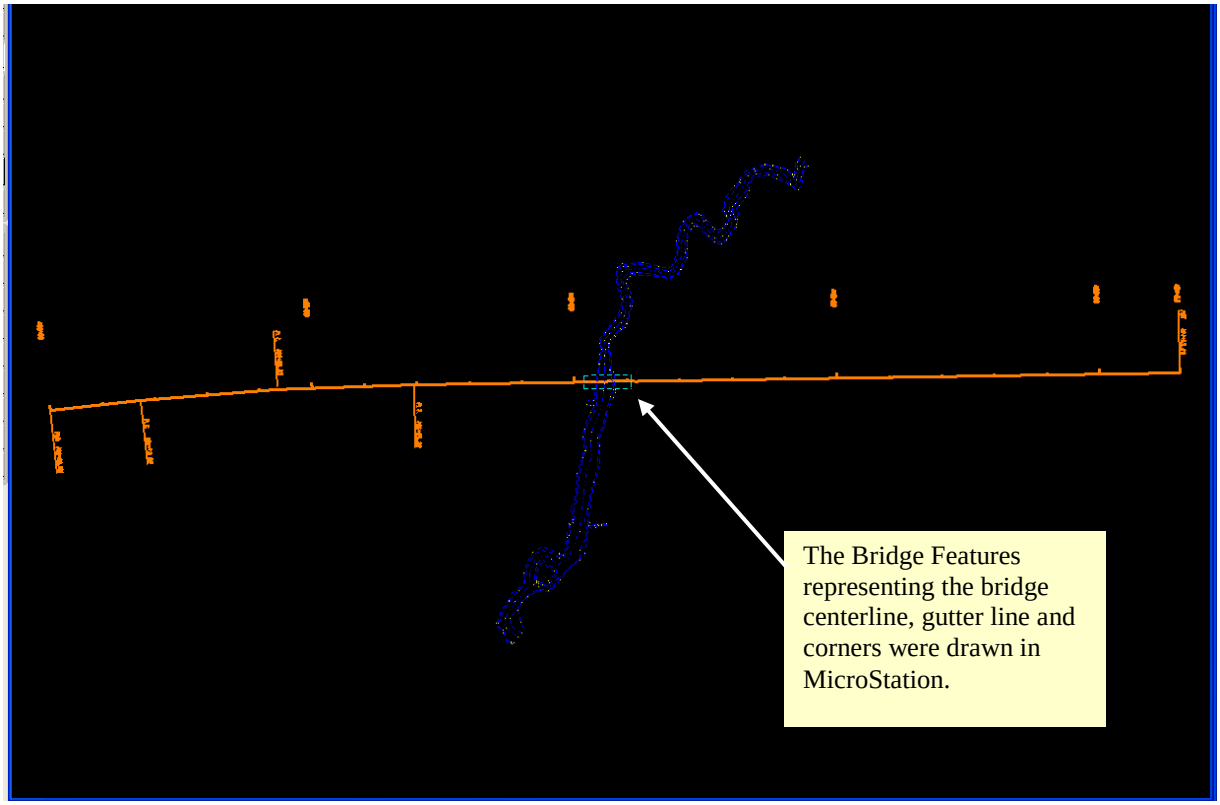


Figure L5-5 MicroStation View Window

110.	**Zoom into the Bridge.** • In MicroStation, Use the **Window Area** tool to zoom into the area identified by the White Square in *Figure L5-6*.  **Window Area** • Verify your view matches that shown in *Figure L5-7*.

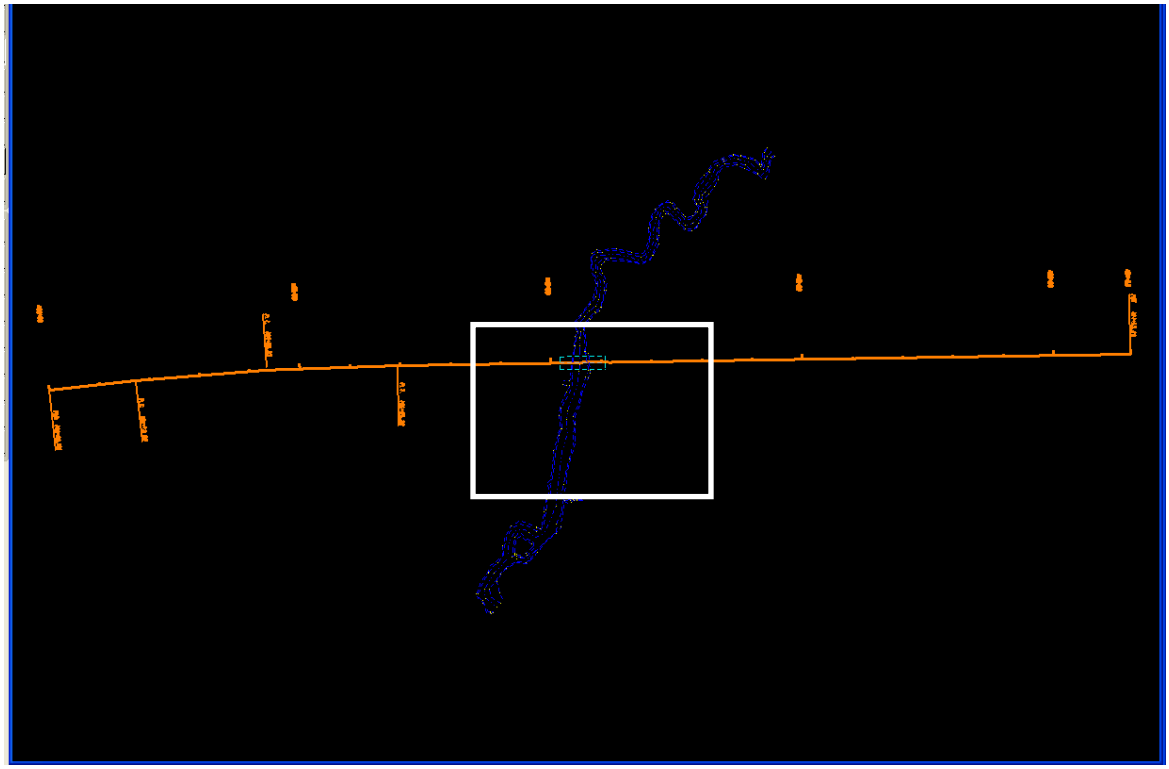


Figure L5-6 MicroStation View Window

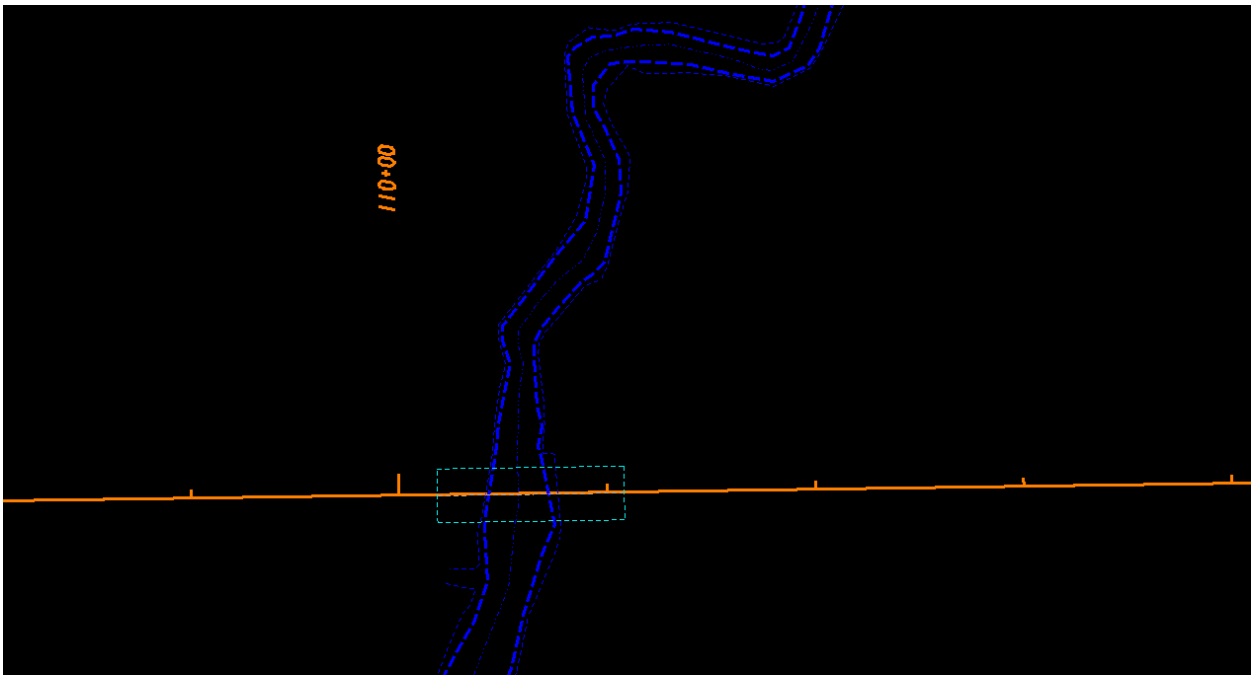


Figure L5-7 MicroStation View Window

111.	**Annotate the Bridge Features** • In InRoads, select **Surface ► View Surface ► Annotate Feature**. • Click the **Preferences** button. • Select the Preference named **Bridge Hydraulics**. This Preference loads viewing settings that attempt to minimize text overlap and improve the annotation of the Bridge Features. • Click **Load** and **Close**. • Right Mouse click in the **Features:** window and choose **Select None**. • Sort the Features by Style. • Select the Features **TOPO_E_TBCL**, **TOPO_E_TBGL** and **TOPO_E_TBRDGCOR.** • Verify your selections match those shown in *Figure L5-8*. • Click **Apply** & **Close**. • Verify the Features were annotated as shown in *Figure L5-9*.

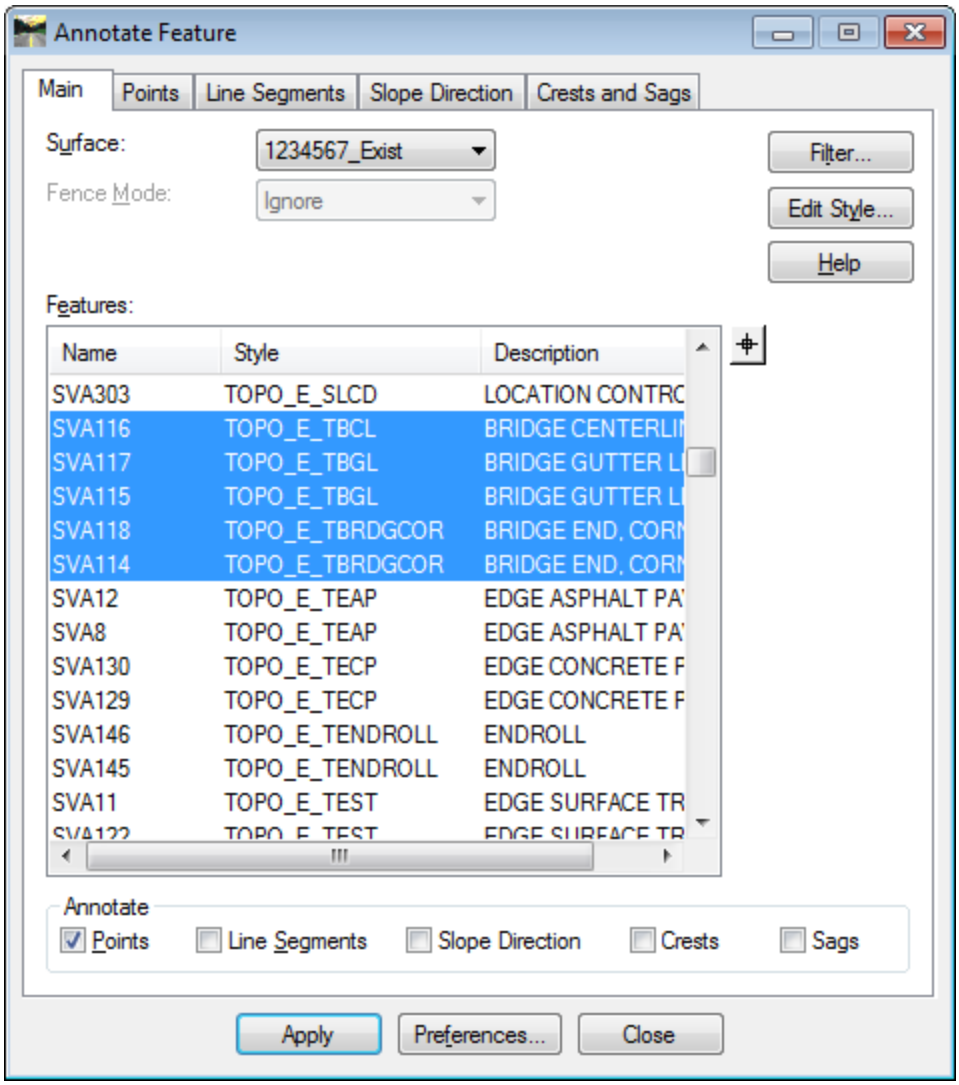


Figure L5-8 Annotate Feature

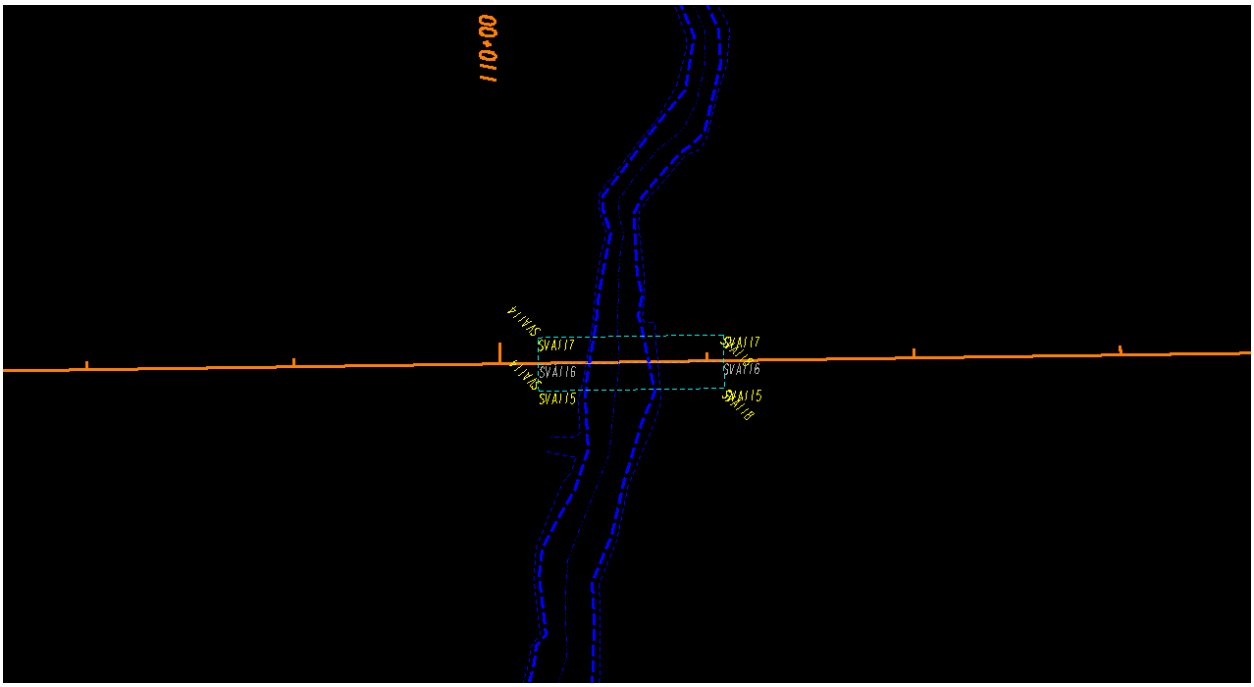


Figure L5-9 MicroStation View Window

112.	Generate a Station & Offset Report from the Roadway Centerline, **DE1**, to the Surface Features **TOPO_E_TBCL**, **TOPO_E_TBGL** and **TOPO_E_TBRDGCOR** representing the existing bridge center line, bridge gutter lines, and bridge corners for use in HEC-RAS. • In InRoads, select **Tools ► XML Reports ► Clearance**. • Make the **General** leaf active and choose the Horizontal Alignment **DE1** representing the roadway centerline from the pull down arrow. • Ensure your entries match those shown in *Figure L5-10*. • Make the **Features** leaf active and select the Features **TOPO_E_TBCL**, **TOPO_E_TBGL** and **TOPO_E_TBRDGCOR.** • Ensure your selections match those shown in *Figure L5-11*. • Click **Apply**. The **Bentley Civil Report Browser** opens. • Select the Style Sheet **GDOT HEC RAS Bridge Features Report.xsl** • Verify your Report provides the information shown in *Figure L5-12*.

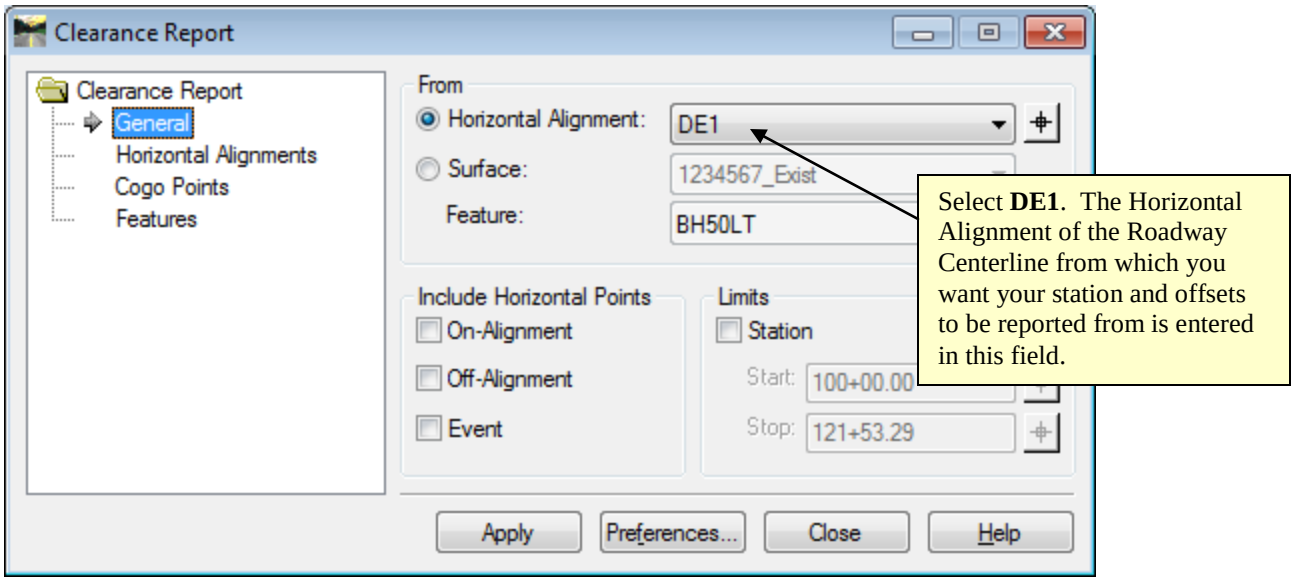


Figure L5-10 Clearance Report

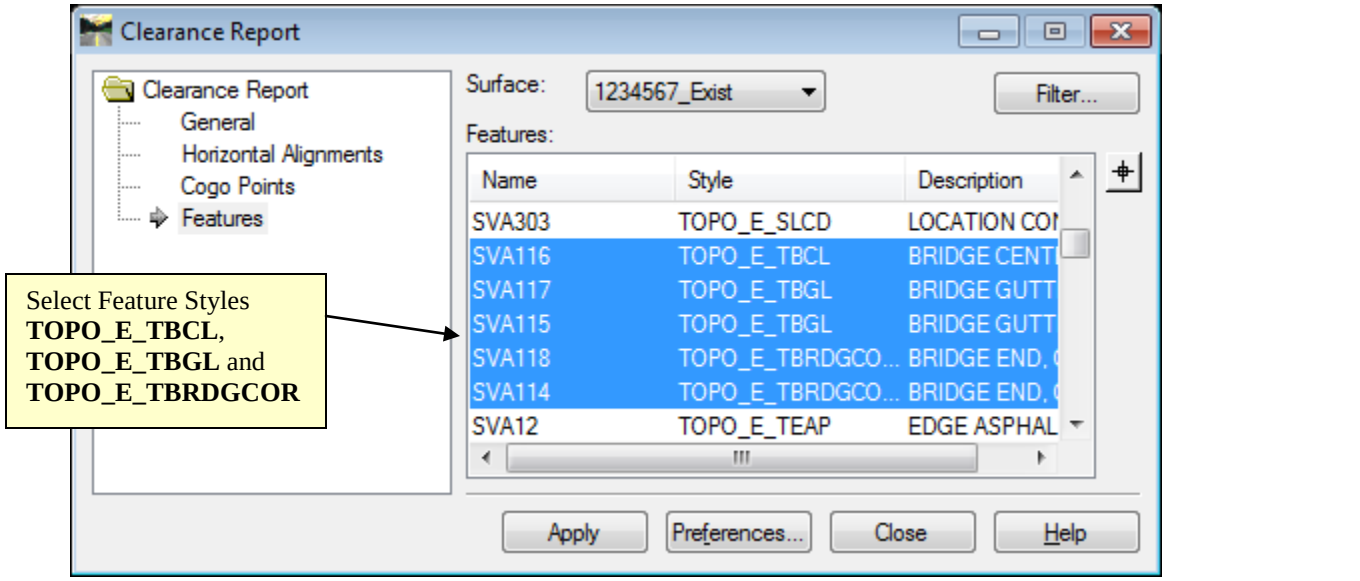


Figure L5-11 Clearance Report

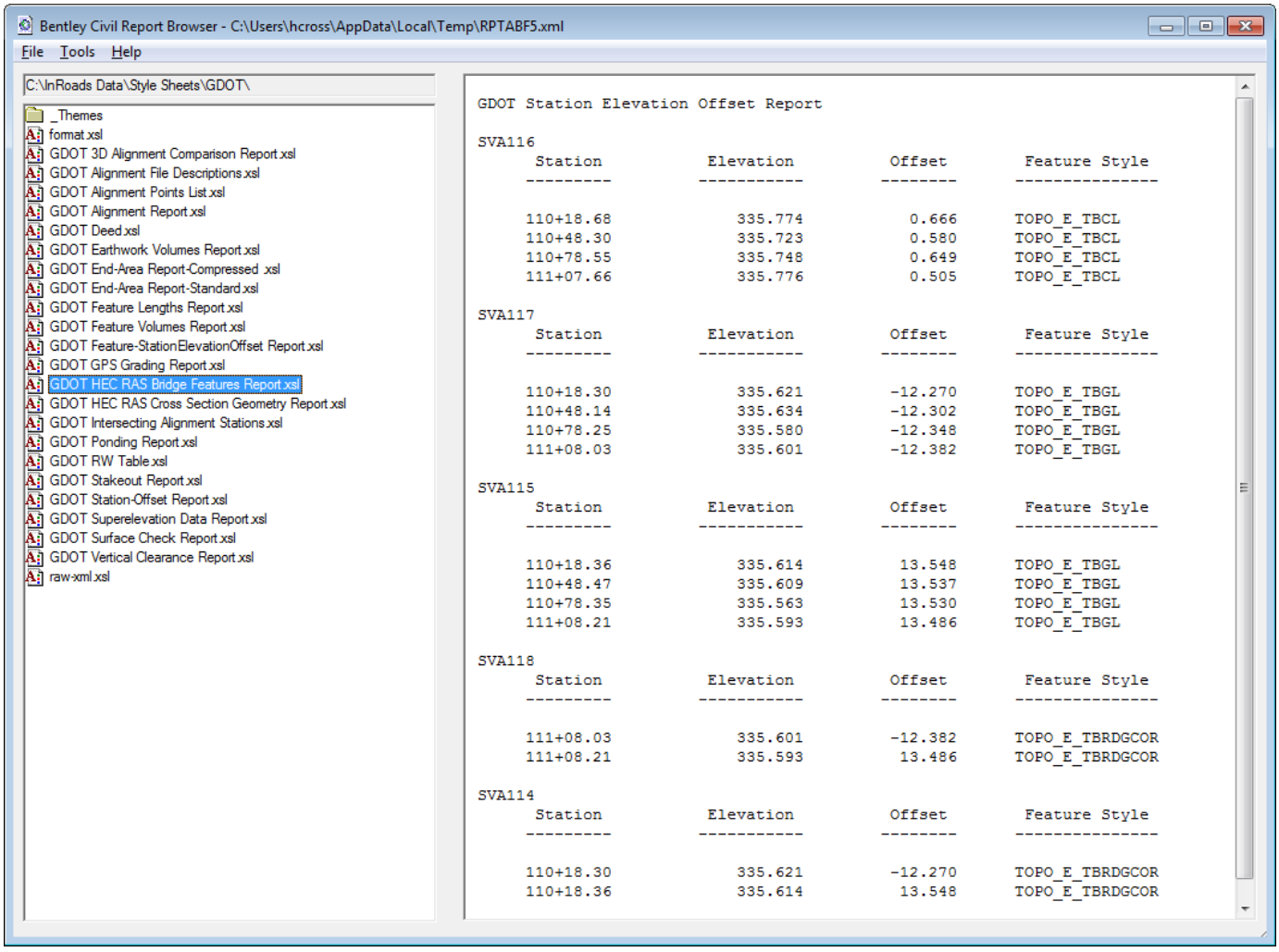


Figure L5-12 Bentley Civil Report Browser

113.	Save the Report as **Bridge Points.txt.** • In the **Bentley Civil Report Browser**, select **File ► Save As**. • Set the **Save as type:** to Text File (*.txt) • Key-in a **File name:** of **Bridge Points.txt.** • Verify your entries match those shown in *Figure L5-13.* • Click **Save**. The file **Bridge Points.txt** has been created and saved in the folder *C:\InRoads Data\1234567\InRoads to HEC RAS Labs*. • **Close** the **Bentley Civil Report Browser**. • **Close** the **Clearance Report** dialog. • The Report Data may now be used for the manual entry of the Bridge Data into HEC-RAS.

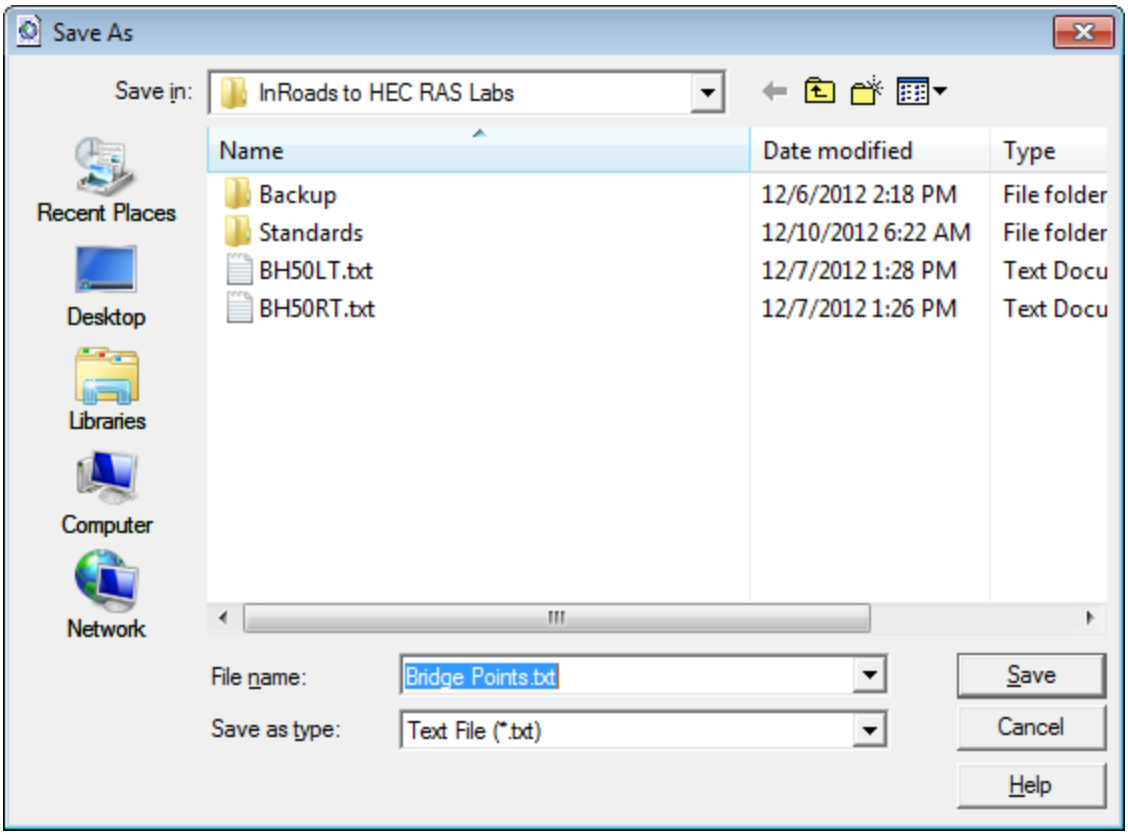


Figure L5-13 Save As

114.	**Save the InRoads Surface File** Whenever a change has been made to an InRoads Surface – Save the Surface and its associated modifications or changes. • Select **File ▶ Save ▶ Surface** from the InRoads Menu.
115.	**Save the InRoads Geometry File** Whenever a change has been made to an InRoads Geometry Project – Save the Project and its associated modifications or changes. • Select **File ▶ Save ▶ Geometry Project** from the **InRoads Menu**.
116.	STOP This concludes Lab 5 and the InRoads to HEC RAS for Bridge Hydraulics Labs.