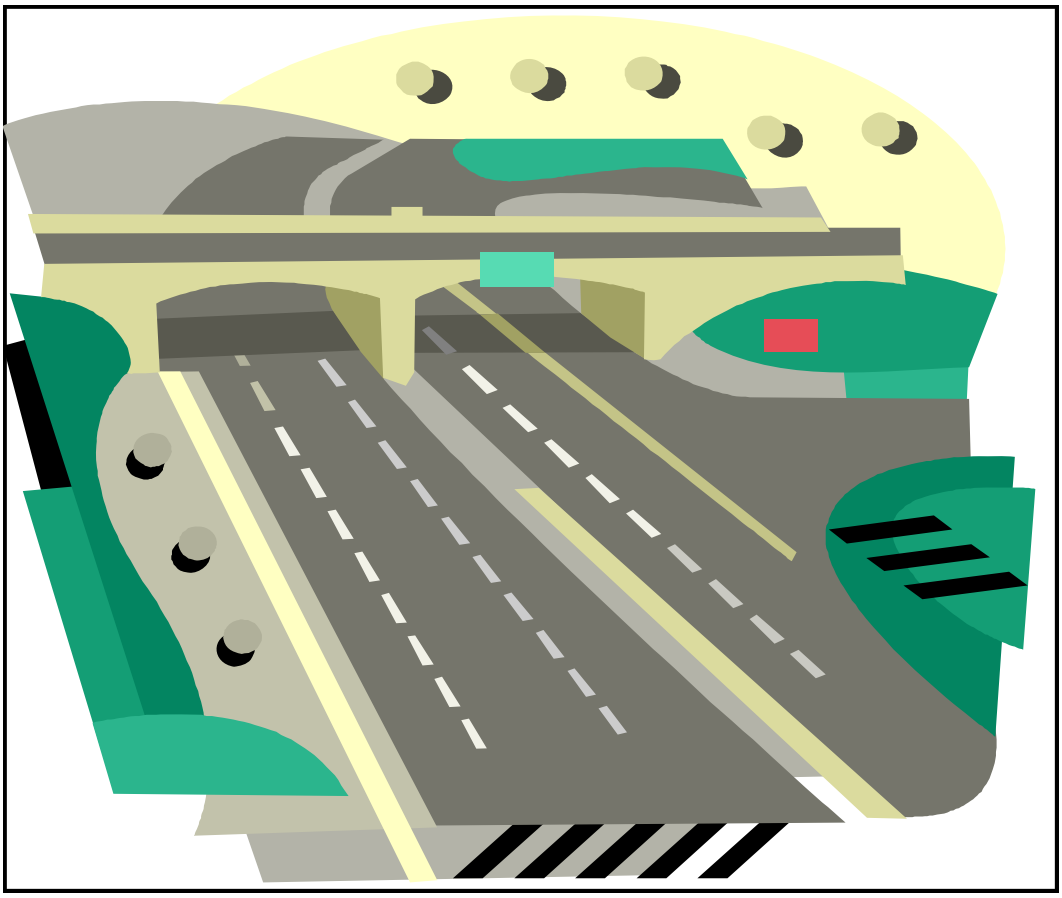
HORIZONTAL ALIGNMENTS AND CROSS SECTIONS



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NEW YORK STATE DEPARTMENT OF TRANSPORTATION

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Course Prerequisites

The following is a list of requirements that must be met by a student before entering class:

- √ Should have MicroStation experience.
- √ Should have a basic understanding of the InRoads environment.
- √ Should have a basic knowledge of design criteria for creating horizontal alignments.

Introduction

In this class we will learn multiple ways of creating a horizontal alignment and the steps required to achieve an accurate alignment. The alignments will be used to create cross sections.

Chapter 1
Horizontal Alignments

Introduction...

This chapter will demonstrate the multiple tools available to create an accurate and precise horizontal alignment.

* A Geometry Project can also be created by going to **File > New** or type **Ctrl + N**

Type AZ=0, tag view and turn depth lock on.

Turn on pencil and write lock.

Horizontal alignments are used to describe a roadway's horizontal geometry. In InRoads, horizontal alignments are stored in a geometry file with an *.alg extension. COGO points, vertical alignments and superelevation alignments are also stored in the geometry file.

Horizontal alignments can be created utilizing many different methods. It is very important that the designer know what the alignments will be used for in construction as well as design before alignment creation.

Create an InRoads Workfile in MicroStation

For this class open the design file 123456_fea_rwy_tmp.dgn.

Open InRoads

Go to **DOT Apps > Inroads**

Set the Project Defaults

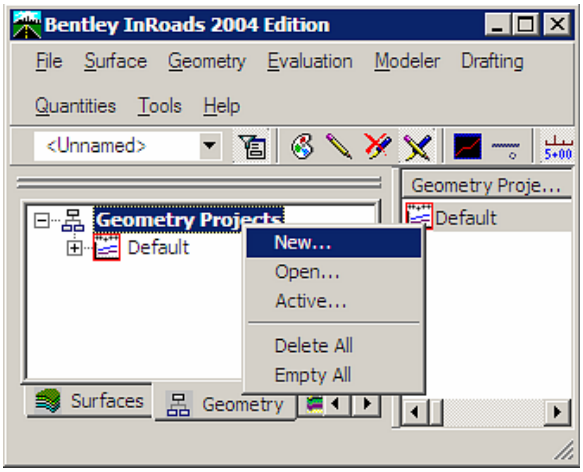
Set to **ny_highway_design** and set ProjectWise default folder to your student folder.

Create or load the geometry project

For this class open 123456_dat_rwy_a.alg

* A Geometry Project is a file that will contain all of the horizontal and vertical alignments along with the superelevation associated with the alignments.

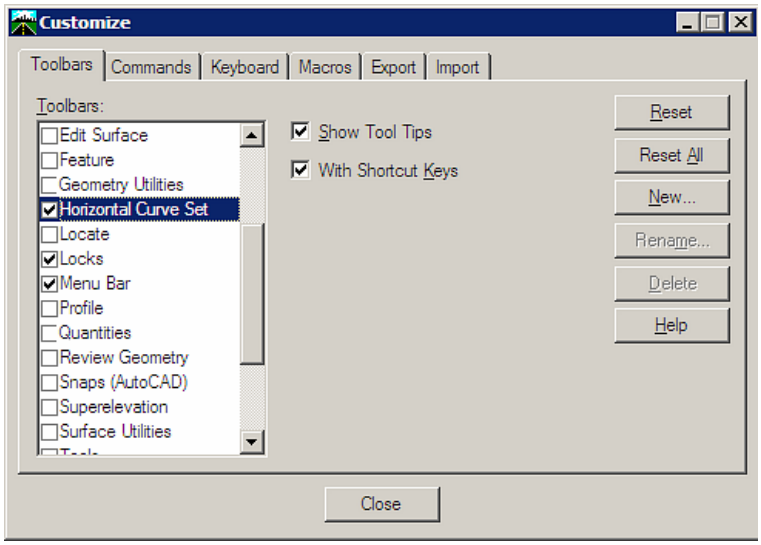
Right click on the words **Geometry Projects** in the InRoads dialog box and go to **Open**

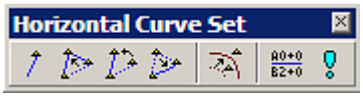


Geometry Toolbars

For ease of locating the geometry commands, right click in the menu portion of the InRoads dialog box and choose **Customize.**

Under Toolbars, choose View Geometry and **Horizontal Curve Set .** The toolbars will automatically appear in the view window. Make sure the **Locks** toolbar is displayed also.





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View Geometry

View Active Horizontal

It is recommended that you work with **pencil lock on** as well as **write lock on**. Pencil lock automatically cleans up the graphics from previous work and redisplays.

Now whenever you would like to display the active alignment in the design file, you can right click on the alignment in the InRoads dialog box and **go to view** or

go to **Geometry > View Geometry > Active Horizontal** or

<D>  the first icon on View Geometry toolbar

* This will display the alignment line in the design file.

View Horizontal Annotation

Go to **Geometry > View Geometry > Horizontal Annotation** or

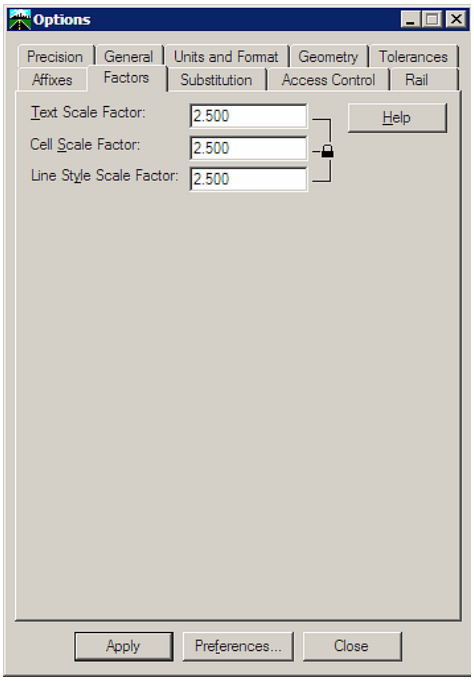
<D>  the third icon on View Geometry toolbar

The View Horizontal Annotation dialog box will display.

Since this dialog box does not have preferences for different scales; the scale of the annotation is controlled by a scale factor.

The scale factor is set under **Tools > Options > Factors.** With the lock on, change the factor to 2.5. All the factors should now be 2.5.

<D> Apply and **Close**

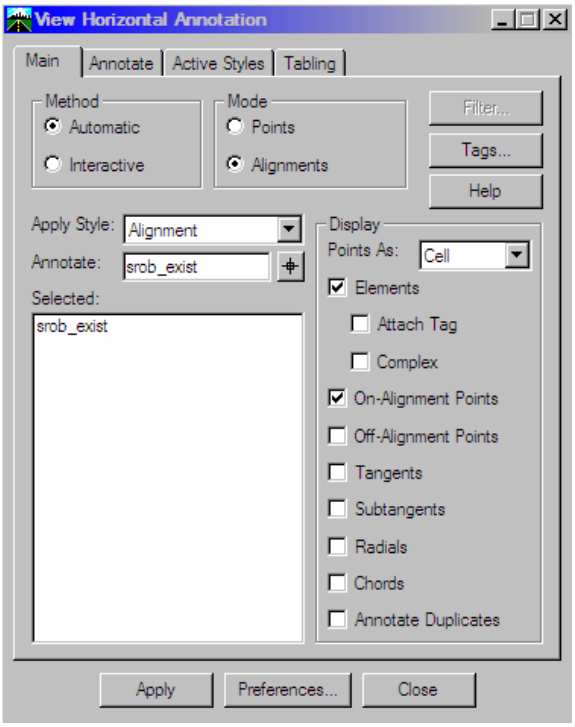


Set **Method** to **Automatic**. This annotates the alignments automatically.

Mode: Alignment. This toggle on will display geometry and attribute information associated with the geometry of the alignments.

Apply Style: Alignment. This will display the style associated with the alignment for display. If you choose Active, the alignment will be displayed using the active style set under the Active Styles tab.

Annotate: SRobexist. The name of the alignment can be typed in or you can use the input button and choose the alignment graphically.



Selected: displays the alignment you have selected.

Display Points As: leave as the default setting of **Cell**

Toggle on **Elements**. This will display lines and curves.

Toggle on **On-Alignment Points**. This will display all the cardinal points on the alignment.

The rest of the toggles will remain off.

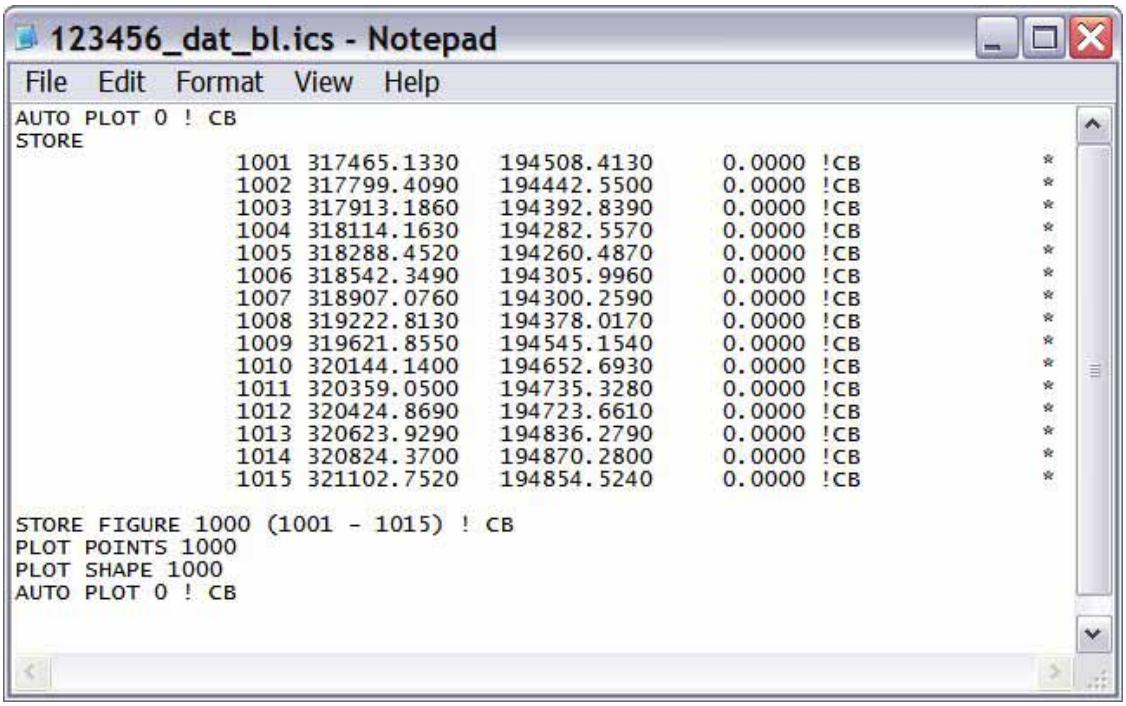
Tag **Apply**. The alignment and the alignment points will display in the design file. The bearing and tangent lengths will also display. To turn these off, turn Elements off under the Annotate tab.

Create Horizontal Alignment from ICS

If you have the northing and easting coordinates for an alignment, for example, from record plans that you want in the Geometry Project or you need right of way for your project from old CEAL reports, type the coordinates into an ICS file. The ICS file will give you a permanent record of the coordinates and allows for easy review and editing before the alignment is created in the project.

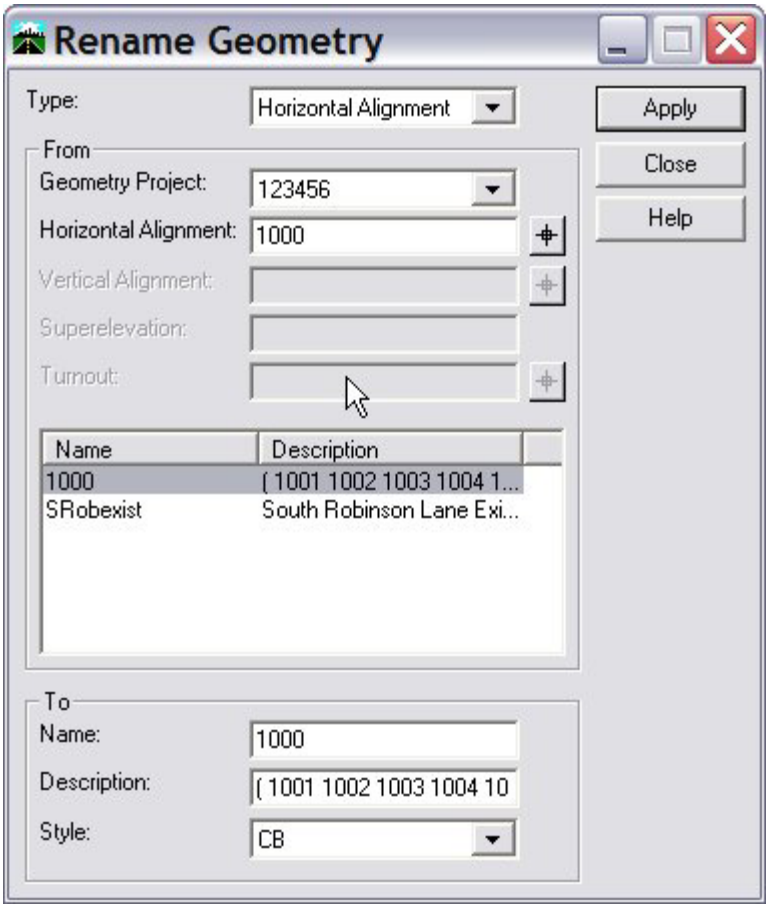
An ICS file can be imported into the Geometry Project and then displayed in the design file. A sample of an ICS file is shown.

To import the ICS file into your Geometry Project, you must make your Geometry Project active. Then go to **File > Import > Geometry**.



The alignment can be renamed by going to **Geometry > Rename Geometry**.

The dialog box that displays allows you to change the name, description and/or the style of the highlighted alignment.



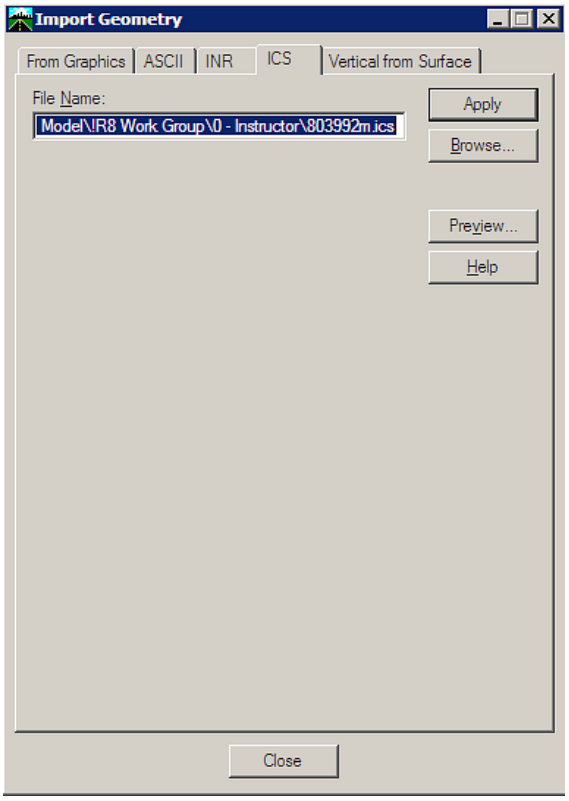
Tag on the **ICS Tab** at the top of the **Import Geometry** dialog box.

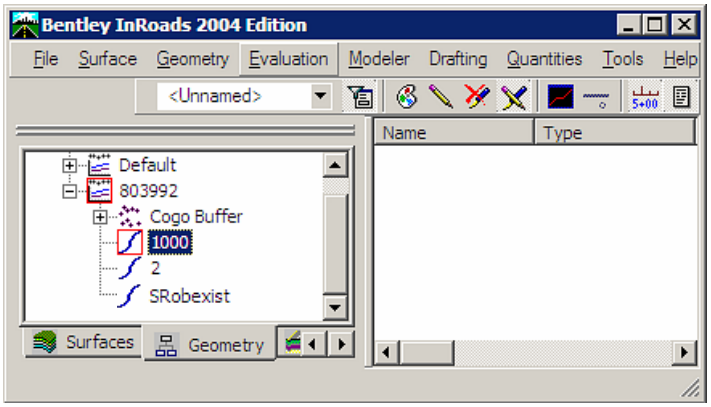
File Name: Place your cursor in this box and tag on **Browse**. Select the directory and the name of the file you want to import.

Tag on **Apply**. If you have report lock on, a report of the imported ICS file will appear on the screen.

Close the dialog box.

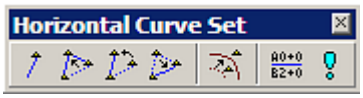
The new alignment from the ICS file will appear under the Geometry Project in the InRoads window.





The alignment can be displayed with **View Active Horizontal** or **View Horizontal Annotation**

Create a New Horizontal Alignment with Horizontal Curve Set Commands

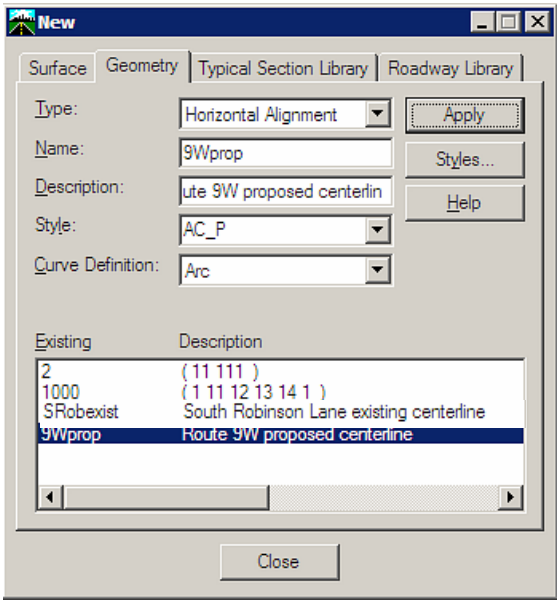


To create a new horizontal alignment, go to **File > New** or

type **Ctrl +N** or

right click on the words **Geometry Projects** in the InRoads dialog box and choose **New**

Select the **Geometry Tab** at the top of the dialog box.



Type: Horizontal Alignment

Name: 9Wprop

Description: Route 9W proposed centerline

Style: AC_P

Curve definition: Arc. For Arc Definition the degree of curve is defined as the central angle which subtends a 100-foot (or 100-meter) arc. For Chord Definition the degree of curve is defined as the central angle which subtends a 100-foot (or 100-meter) chord.

Tag Apply. Close dialog box

Save Geometry Project.

Tag on the first icon, **Add PI** of the Horizontal Curve Set dialog box. 

This command creates horizontal points of intersection. You are prompted to identify the end of the alignment. You can define the new PI by keying in coordinates or by selecting the point graphically. If you key-in, use the key-in dialog box to type in the northing and easting coordinates (ne=northing,easting). As you continue to add intersection points, you are prompted to identify the point. When the last PI is placed, hit the reset button to end the command.

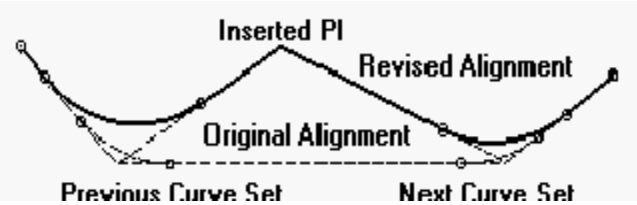
Key In:

Northing	**Easting**
317666.9630	194472.8010
317820.2080	194449.8700
318210.0007	194250.9996
318532.5173	194319.0026
318911.1771	194308.5961

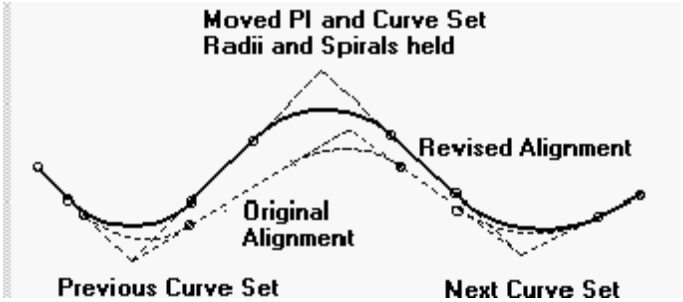
If the Write lock is on, the solution is written to the drawing file; if the Write lock is off, the solution is displayed as temporary graphics.

The second icon on the Horizontal Curve Set palette is **Insert PI.** 

This command places a point of intersection between two existing PIs or curve sets in the active horizontal alignment.

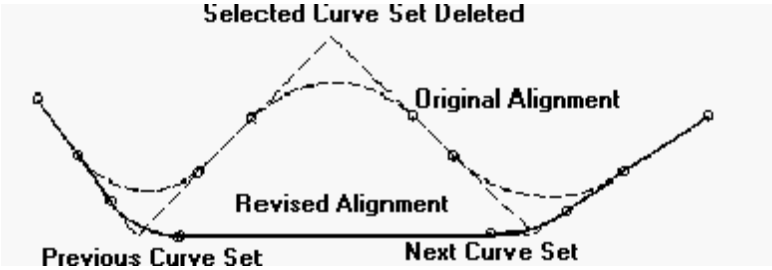


When you choose the command, you are prompted to identify the tangent where you want to insert a PI. The specified tangent and its associated curve sets are highlighted, and you are prompted to accept or reject your selection. Accept the element, and the alignment is dynamically attached to the cursor. You can then specify the location of the new PI by keying in coordinates, or by selecting the new point graphically. After you define the location of the inserted PI you must accept or reject the overall solution. Once the solution is accepted, the original tangent is deleted and two new tangents are added. Any neighboring curve sets are recomputed.



The third icon on the palette is **Move PI.** 

This command repositions a PI and associated curve sets. When you choose this command, you are prompted to identify the PI to be moved. The selected PI (tentatively selected) and associated curves/tangents are highlighted and you are prompted to accept or reject the selection. Once accepted the alignment is dynamically attached to the cursor. The new location can be identified by key in or graphically. If the solution is accepted the PI and any associated curves are recomputed. At this moment, there are no curves associated with this alignment but when there are curves in place and the PI is dynamically attached to the cursor, the prompt will notify you when the curves overlap



The fourth icon on the palette is **Delete PI.** 

This command removes a point of intersection and any associated curves. When you choose this command, you are prompted to identify element. When you choose the PI, the PI is immediately deleted graphically and you are prompted to accept or reject the overall solution. The PI is deleted if you accept the solution and if you reject the solution, the PI reappears graphically. If there is a curve set associated with the PI, the curve is deleted also and the previous and next curve are recomputed by maintaining the previous and next PI. The radii of the previous and next curve are maintained.

The fifth icon on the palette is **Define Curve.** 

This command defines new curves and modifies existing curve sets on a horizontal alignment

To find the required length of spiral, we will need to know the following from our Design Criteria. For purposes of this lab:

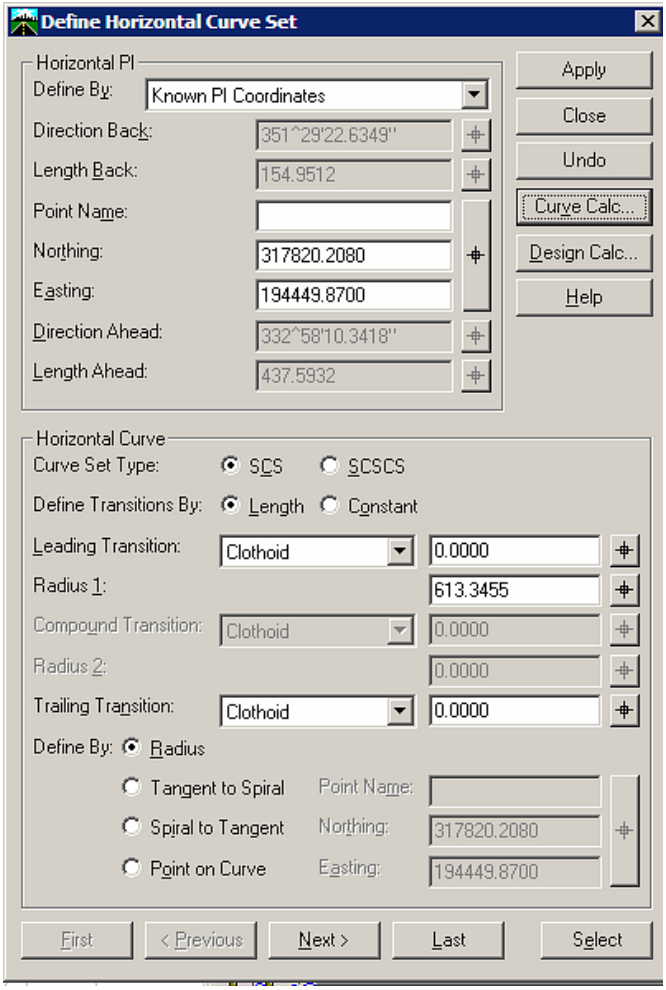
Assumed design speed = V_d = 90 km/h
Min. Radius of curve = R = 336
$E_{(max)}$ = 6%
The proposed roadway will be 2 lanes

From Table 5-5 of the Highway Design Manual, the length of the Superelevation Runoff is 46m.

Define By: Known PI Coordinates

This specifies the method by which the PI is determined. There are five options to choose from:

Known PI Coordinates - the tangents of the PI of the active horizontal alignment will highlight in your design file and the coordinates will appear in the Northing/ Easting boxes. If the wrong tangents are highlighted, you can tag on the previous, next or select tabs at the bottom of this dialog box to highlight another PI. The coordinates of the PI can also be keyed in or use the quick select button and tag the PI. Highlight the first set of tangents.



Direction and Distance from Previous PI - specifies the direction of the back tangent and the length of the back tangent.

Direction and Distance from Next PI - specifies the direction of the ahead tangent and the length of the ahead tangent.

Directions from Previous and Next PIs - specifies the direction of the back tangent and the direction of the ahead tangent.

Distances from Previous and Next PIs - specifies the length of the back tangent and the length of the ahead tangent.

Horizontal Curve:
Define by: Radius.
NYSDOT recommends that horizontal alignments be designed with spiral curves. However, to fit existing conditions/alignments, simple curves (non-spirals) may sometimes be used.

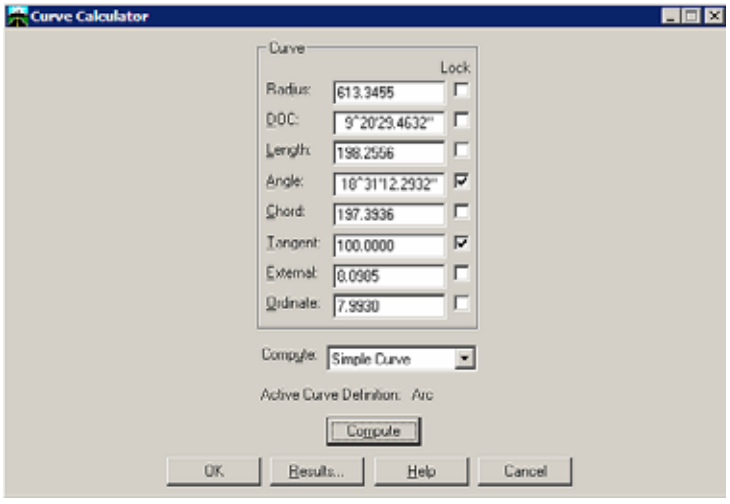
Curve Calculator Tab.

This command computes parameters of a circular curve based on two known parameters.

For example, if you wanted to determine the length and radius of a curve based on the deflection angle and tangent length, you would define the two parameters and toggle on the **Lock** option for both. When you select **Compute**, the software will compute all the other parameters based on the two parameters you defined. You can change the defined parameters and recompute until you are satisfied with the results.

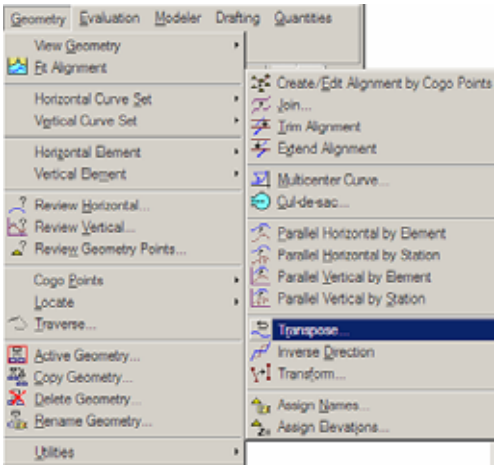
If you would like a print of the results, tag on the **Results Tab** and a dialog box will appear with the data from the computations. This report can be printed or saved as a file to your directory.

If you are satisfied with the results and want to use the data for your curve, tag on the **OK Tab**. The **Curve Calculator** dialog box will disappear and the radius will automatically appear in the **Radius 1** box of the **Define Horizontal Curve Set** dialog box. Tag **Apply** to initiate the command.



Place a radius of **600m** for the first curve and a radius of **450m** with **50m** spirals for the second curve and a radius of **750m** for the last curve by making sure the correct tangents are highlighted and keying in the radii

If an alignment is placed in the wrong direction, the **Transpose** command will reverse all the data in the selected horizontal alignment.



The alignment should look similar to the figure at the left.

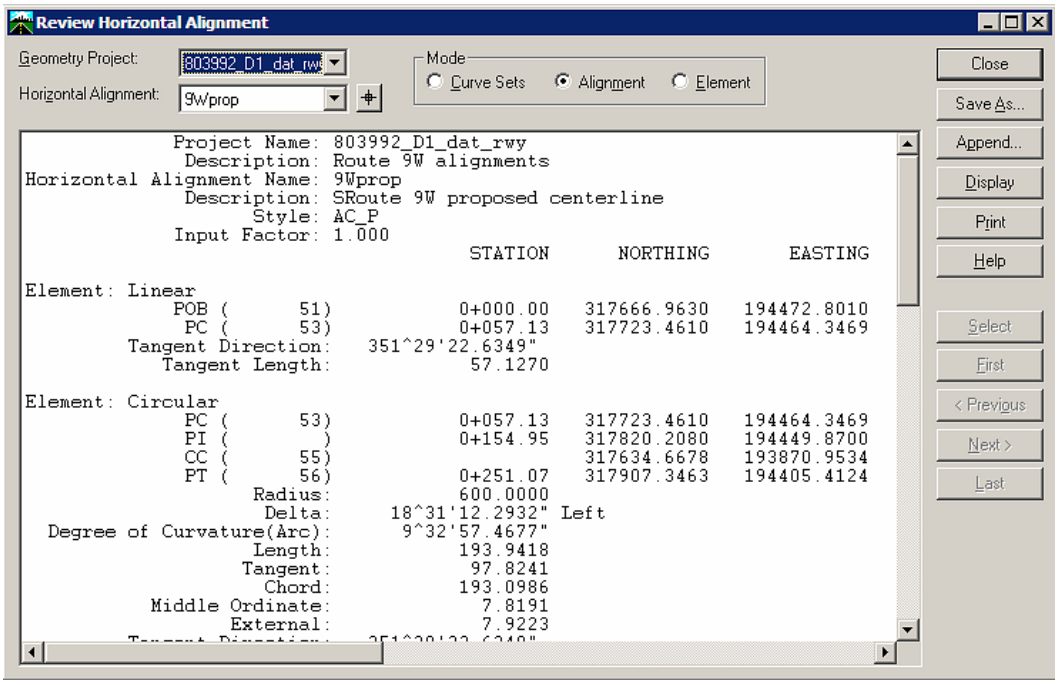
The **Design Calculator Tab** displays a dialog box. It is not recommended that you use this dialog box to calculate your parameters. You should use AASHTO and manually calculate your curves.

Close the dialog box.

Save the Geometry Project.

Review Horizontal Alignment

To review the horizontal alignment data, go to **Geometry > View Horizontal** or **right click on 9Wprop** in the InRoads window and select **Review.** A Review Horizontal Alignment dialog box will appear with the active alignment data.



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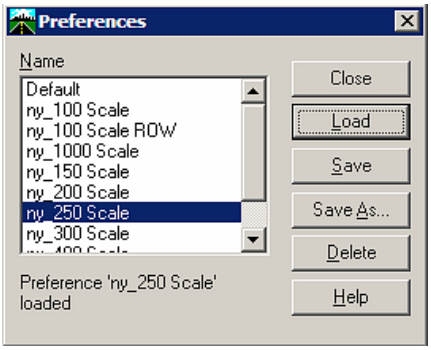


Select the **ny_250Scale** preference

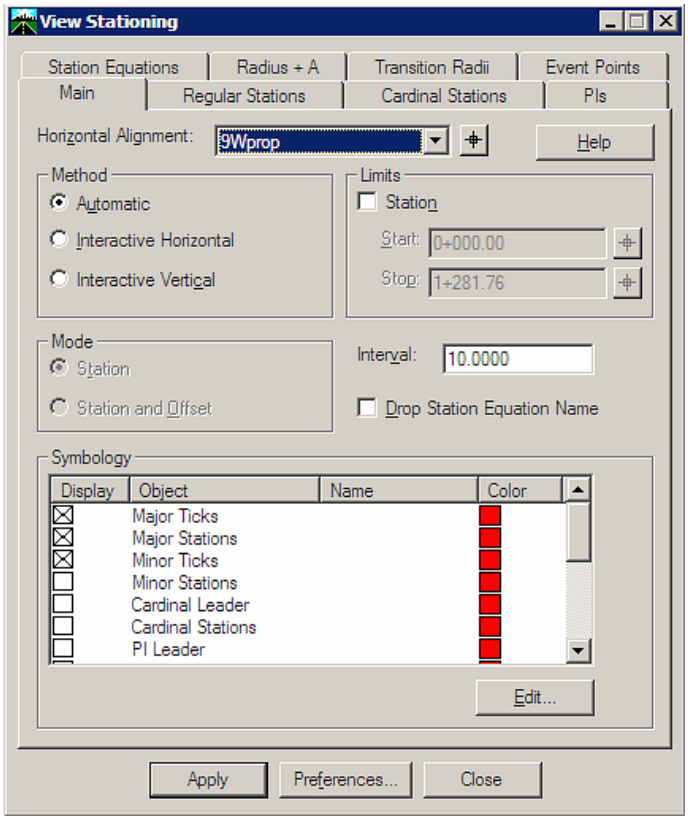
Stationing Horizontal Alignment

The horizontal alignment has automatically established stationing in the direction of its creation. The stationing begins at a station of 0+000 and ends at 1+281.76, as noted in the Review Horizontal Alignment.

To view the stationing in the graphics file, go to **Geometry > View Geometry > Stationing** or

<D> on the **View Stationing** icon (third icon) in the **View Geometry** Toolbar.

The **View Stationing** dialog box appears with the **Main Tab** active.



Horizontal Alignment: 9Wprop

This box specifies the horizontal alignment to display the stations of. The alignment selected in this box is the active alignment. If you change the alignment, the new alignment will become the active alignment.

Method: Automatic

This is the setting that we use. The stations are automatically established along the horizontal alignment. We have established preferences associated with this method to assure the horizontal alignment stationing is displayed according to standards.

* **Refer to Using InRoads Data** class manual for in depth explanation of this dialog box.

<D> Apply

The stations will automatically display on the active horizontal alignment. All the other tabs at the top of the dialog box are automatically set when you choose a preference.

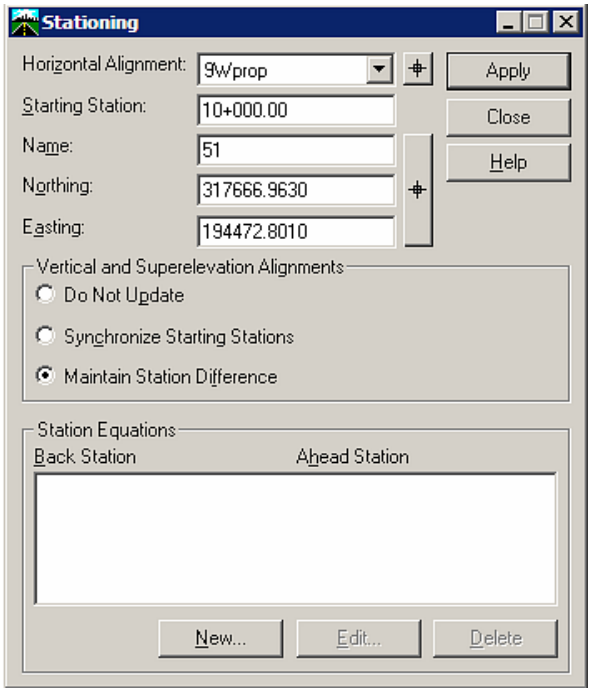
Redefine Stations

It is a good design practice to begin alignments with a station of 10+000. This allows for room to extend the beginning of the alignment without affecting the stationing on the remainder of the alignment.

To change the beginning station and to attach an identifying prefix to the stationing, choose the **sixth icon** (stationing) on the **Horizontal Curve Set** palette

or go to **Geometry > Horizontal Curve Set > Stationing**.

The Stationing dialog box will appear.



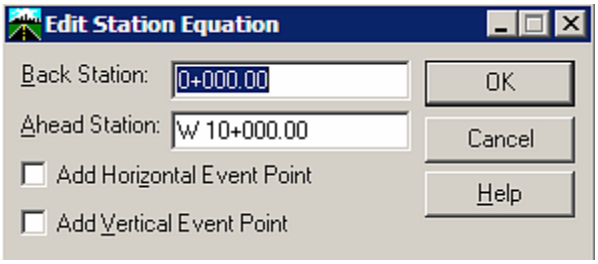
Horizontal Alignment: 9Wprop. By default the active alignment will appear in this box. You have the option of choosing a different alignment by tagging on the arrow.

Starting Station: 10+000. By default the station that will appear here is the first station of the alignment. In this case, the box originally had 0+000.000. Change the station to 10+000 and tag Apply. Now if you display the stationing, the first station will display as 10+000 and all subsequent stations will have changed.

Northing / Easting: The coordinates of the first point on the active alignment appear in these boxes by default

Vertical and Superelevation Alignments: Do Not Update Since there is only a horizontal alignment, you do not need to update. If you had a vertical alignment associated with this alignment and you choose not to update, the horizontal alignment stationing will change but the vertical will not. The stationing between the horizontal and vertical will be different.

Synchronize Starting Stations - when selected, the stationing of the vertical alignment changes to correspond to the stationing of the horizontal alignment. This is recommended when you are changing the stationing of a horizontal alignment that has a vertical. The stationing should be the same for both alignments.

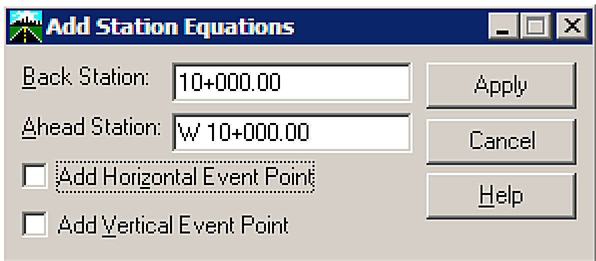


* The station equations can be edited by highlighting the equation and **<D> Edit.** The **Edit Station Equation** dialog box will display. Change the stations and **OK**. The change will be made.

The station equation can be deleted by highlighting the equation and **<D> Delete**

Maintain Station Difference - when selected, the stationing is changed but the distance relationship between the start of the horizontal and the start of the vertical is maintained.

Station Equations - this area is used to add a prefix to the stationing. To add a prefix to the stationing, click on **New**. The Add Station Equations dialog box appears.



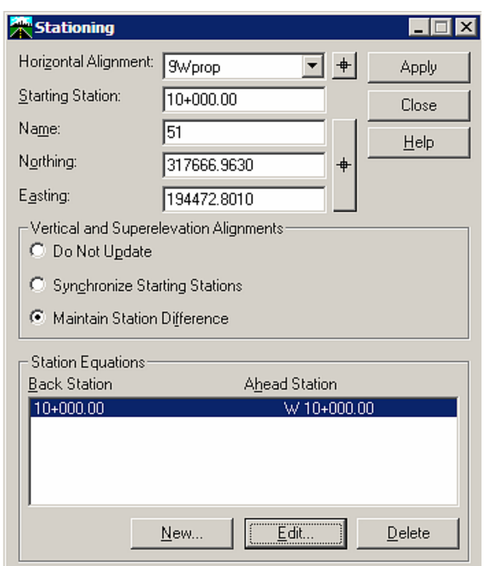
Back Station: 10+000.000. Specifies the back station; the station you want o change.

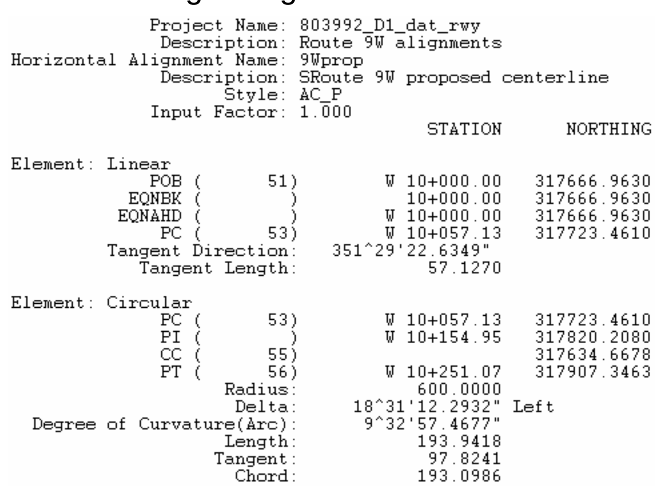
Ahead Station : W 10+000.000. Specifies the ahead station. You must specify a name for the station equation.

The **Add horizontal/Add Vertical Event Point** does not apply in this case. This is only when you have event points and you are changing the stationing.

Tag Apply. Cancel dialog box.

The Station Equations will appear in the Stationing dialog box.





```
            Project Name: 803992_D1_dat_rwy
             Description: Route 9W alignments
Horizontal Alignment Name: 9Wprop
             Description: SRoute 9W proposed centerline
                   Style: AC_P
            Input Factor: 1.000
                                     STATION       NORTHING

Element: Linear
             POB (      51)       W 10+000.00    317666.9630
           EQNBK (        )         10+000.00    317666.9630
           EQNAHD (       )       W 10+000.00    317666.9630
              PC (      53)       W 10+057.13    317723.4610
      Tangent Direction:    351^29'22.6349"
         Tangent Length:               57.1270

Element: Circular
              PC (      53)       W 10+057.13    317723.4610
              PI (        )       W 10+154.95    317820.2080
              CC (      55)                      317634.6678
              PT (      56)       W 10+251.07    317907.3463
                 Radius:              600.0000
                  Delta:     18^31'12.2932" Left
 Degree of Curvature(Arc):     9^32'57.4677"
                 Length:              193.9418
                Tangent:               97.8241
                  Chord:              193.0986
```

View stationing and you will see the stationing with the prefix. If you review the horizontal alignment report, you will see the station equation for the back and the ahead stations

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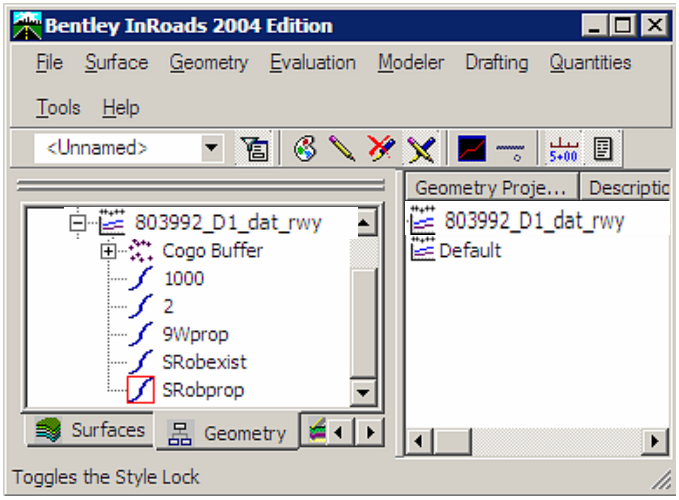
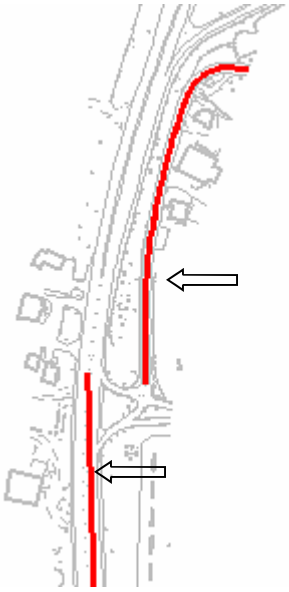


These alignments should now be in the project

Join Alignments

The two alignments that have been created, 9Wprop and SRobexist do not meet. An alignment must be created to join the two roadways.



Set AZ=0 and turn on depth lock.

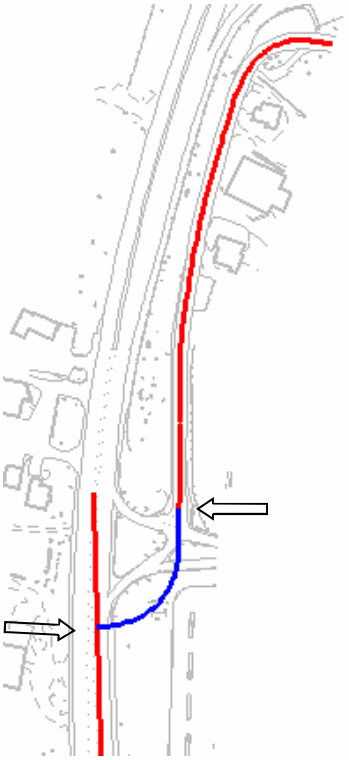
Change the active color.

Make a perpendicular line from the centerline of 9Wprop at the location of the lower arrow.

Place a line on top of the existing centerline of SRobexist at the location of the upper arrow.

Extend the two lines to intersect.

Place a fillet of **35** with **Truncate: Both**. **The lines must be planar for the fillet command to work**. If the lines are not planar, with depth lock on, place another line over those previously placed. Turn depth lock off and delete the line with an elevation using tentative.



Extend the line placed on the existing SRobexist alignment to meet the end of the existing alignment so that there is no overlap.

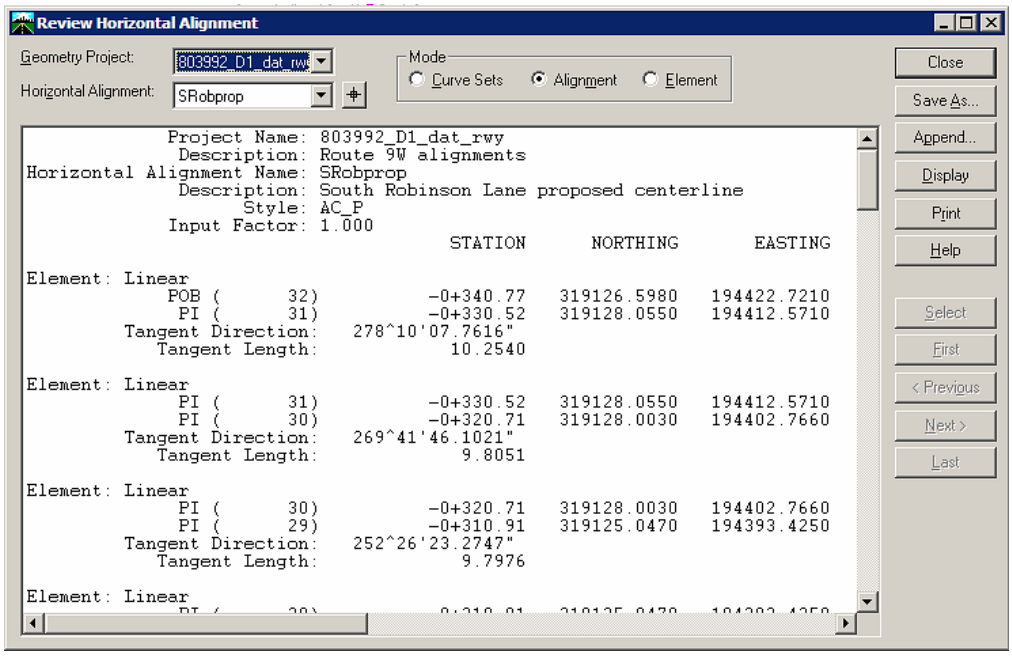
*

Chain **only** the newly placed graphics from left to right (between the two arrows)

Import the graphics for a horizontal alignment. Go to **File > Import > Geometry** and Select the **From Graphics** tab

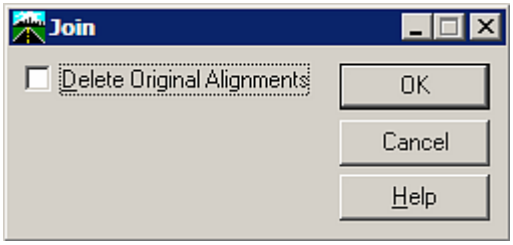
Name the alignment **SRobprop.**
Set the Style to **AC_P**.

*


Review Horizontal Alignment
Geometry Project:
803992_D1_dat_rwy
Horizontal Alignment:
SRobprop
Mode
Curve Sets
Alignment
Element
Close
Save As...
Append...
Display
Print
Help
Select
First
< Previous
Next >
Last
Project Name: 803992_D1_dat_rwy
Description: Route 9W alignments
Horizontal Alignment Name: SRobprop
Description: South Robinson Lane proposed centerline
Style: AC_P
Input Factor: 1.000
STATION NORTHING EASTING
Element: Linear
POB (32) -0+340.77 319126.5980 194422.7210
PI (31) -0+330.52 319128.0550 194412.5710
Tangent Direction: 278^10'07.7616"
Tangent Length: 10.2540
Element: Linear
PI (31) -0+330.52 319128.0550 194412.5710
PI (30) -0+320.71 319128.0030 194402.7660
Tangent Direction: 269^41'46.1021"
Tangent Length: 9.8051
Element: Linear
PI (30) -0+320.71 319128.0030 194402.7660
PI (29) -0+310.91 319125.0470 194393.4250
Tangent Direction: 252^26'23.2747"
Tangent Length: 9.7976
Element: Linear

To join the two alignments, SRobprop and SRobexist, go to **Geometry > Utilities > Join**.

The Join Dialog box appears.



This command connects alignments. You can join one alignment to another by selecting a linear element from the end of one alignment and then selecting the end of another alignment. Or, you can use the more complex and powerful method of joining alignments by defining an alignment to parallel.

Delete Original Alignments: Off When this is toggled on, the original alignments selected for joining are deleted after the new joined alignment is created.

Tag **OK**. The dialog box will disappear and the prompt **> Identify initial alignment** will appear in the lower left hand corner of the MicroStation window.

Data on the **SRobprop** alignment near the end that you want to join. The alignment will highlight and the prompt will change to **> Identify alignment to parallel/Skip**. Hit a reset at this point because we do not want to parallel the alignment. The prompt will change to **> Identify next alignment/Reset for new initial alignment**.

Data on the **SRobexist** alignment near the end you want to join. Both alignments will now be highlighted. The prompt changes to **> Accept/Reject**. Hit a data to accept. (If you need to reject, hit a reset button.) The prompt will now change to **> Identify initial alignment**. Hit the reset button until no prompts appear to get out of the command. The prompt will display **Successful Completion.** The dialog box never reappears.

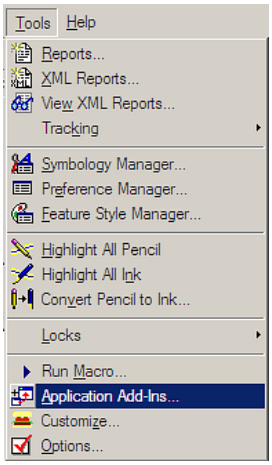
The initial alignment selected will become the new joined alignment. If there are vertical alignments associated with the horizontal alignments to join, the vertical will not become part of the new alignment. The 94resurf alignment remains unchanged since it was not the initial alignment. This alignment can be retained or deleted.

* Review the **SRobprop** alignment. The stationing will begin with a negative station. Redefine the beginning station to SR 0+000.

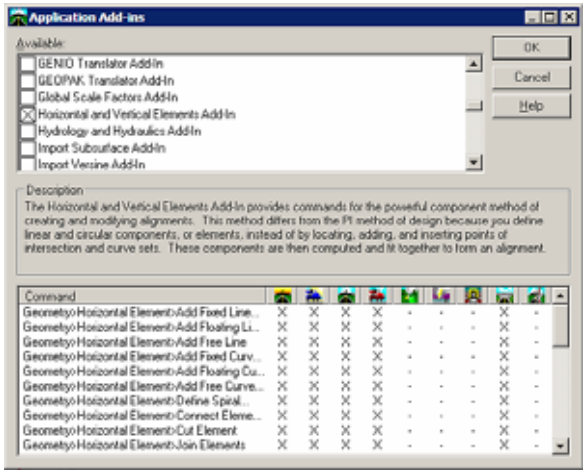
Save Geometry Project.

Horizontal Element Commands

Horizontal Element commands are used to modify horizontal alignments by adding, copying, editing, and deleting individual elements.



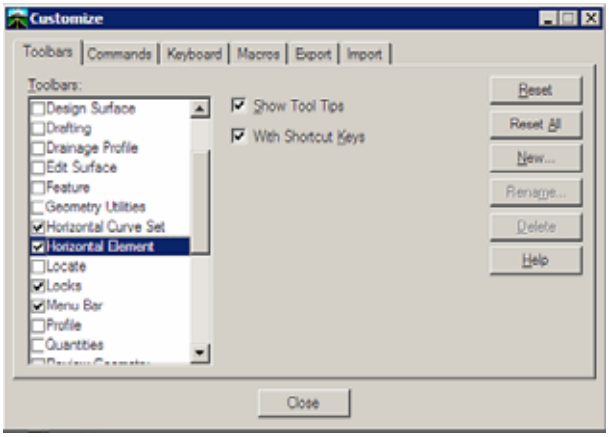
To display the Horizontal Element toolbar, go to **Tools > Application Add-Ins**



Choose **Horizontal and Vertical Elements Add-In. <D> OK**

Right click in the menu area of the SelectCAD dialog box and go to **Customize**.

Choose **Horizontal Element** and close the dialog box.



The **Horizontal Element toolbar** will display in the menu area of the SelectCAD window

The first several selections allow you to add either straight elements or curved elements in one of three ways: fixed, floating, or free.

Fixed

Used to place a horizontal linear or curved element in space.

Floating:

Used to attach an element onto an existing element: either a linear element onto a curved element or a curved element onto a linear element.

The system maintains tangency and coincidence between the two elements by adjusting the existing element.

Free

Used to attach an element between two existing elements: either a linear horizontal element between two existing non-linear horizontal elements or a curved horizontal element between two existing horizontal elements.

After placement, the elements to which you are attaching an element are adjusted to maintain tangency and coincidence between the elements.

*

**

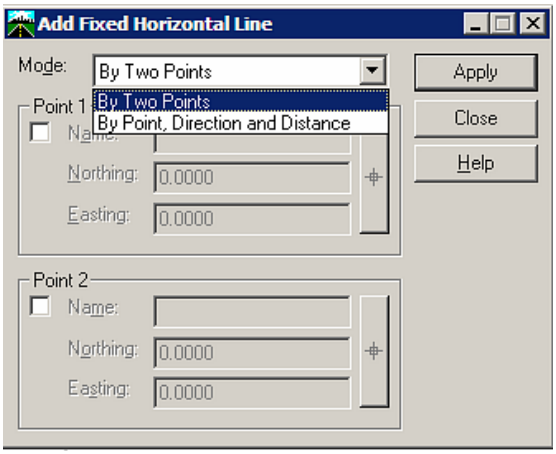
Add Fixed Line

*

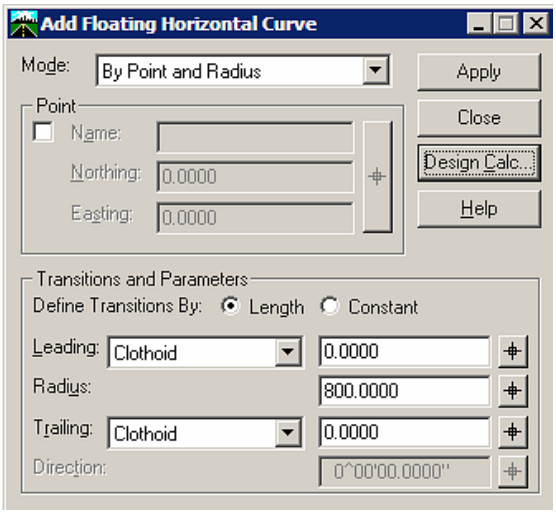
There are two modes in this pull-down menu. You can place a linear horizontal element between two points.

The points can be data points or can be specified as Northing and Easting pairs in the dialog box.

Or you can place a linear horizontal element by Point, Direction, and Distance



**



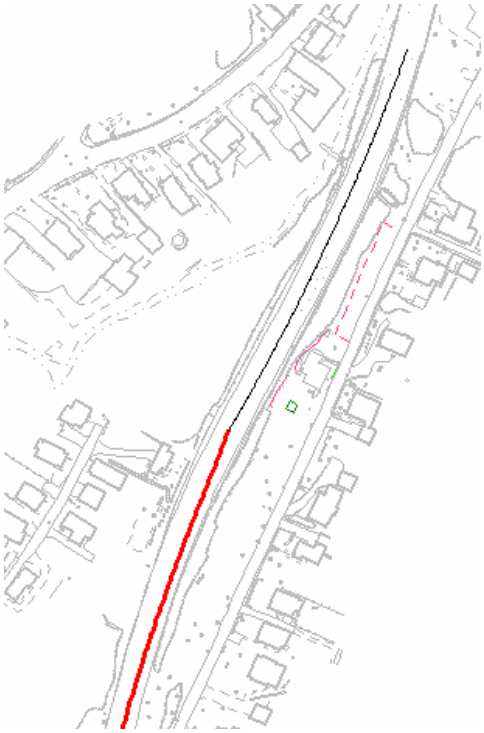
Add Floating Horizontal Curve

This command places a curved horizontal element that is defined by an existing horizontal element.

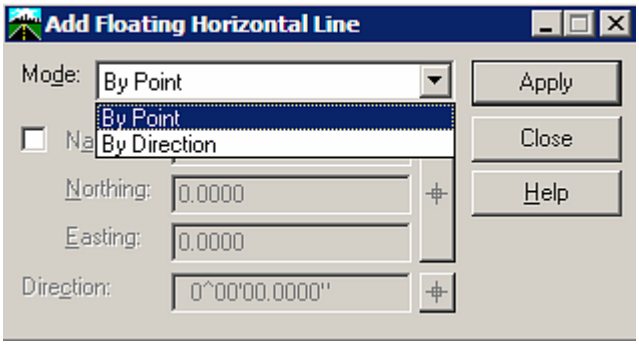
There are two modes in this pull-down menu. You can define a horizontal curve by Point and Radius. Or you can place a horizontal curve by Point and Direction. Then the system displays the element at the direction specified in the Direction field of the dialog box.

*

**

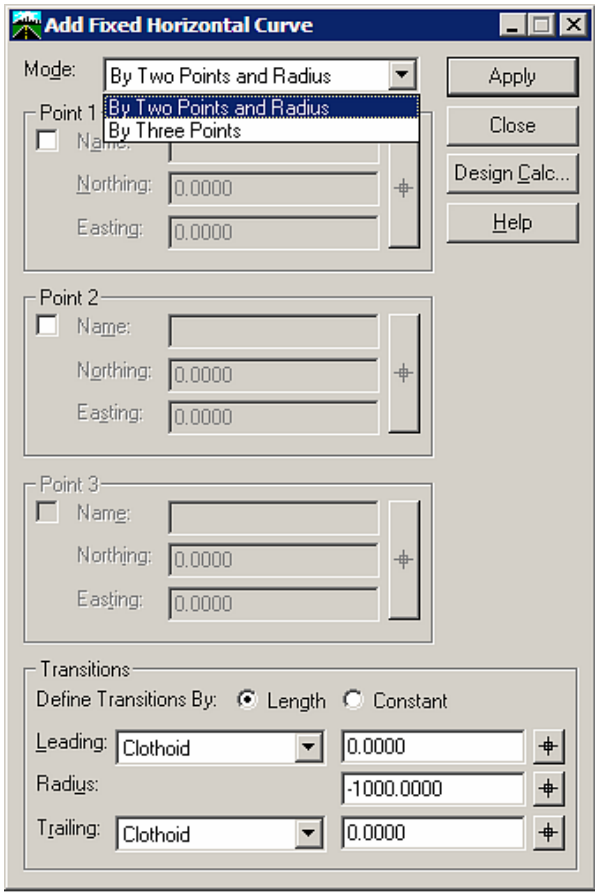


Add Floating Horizontal Line



* Use this command to attach a horizontal linear element onto an existing non-linear element. You can either place a floating line by point or place it by direction. The system maintains tangency and coincidence between the two elements by adjusting the existing element.

There are two modes in this pull-down menu. You can place a floating line by placing a point on the non-linear element you've selected. If you select the element near its start, the new line attaches to the start of the element. If you select the element on its end, the new line attaches to the end of the element. Or you can place a floating line by direction. Then, the system displays the element at the direction specified in the Direction field of the dialog box.



Add Fixed Horizontal Curve

**

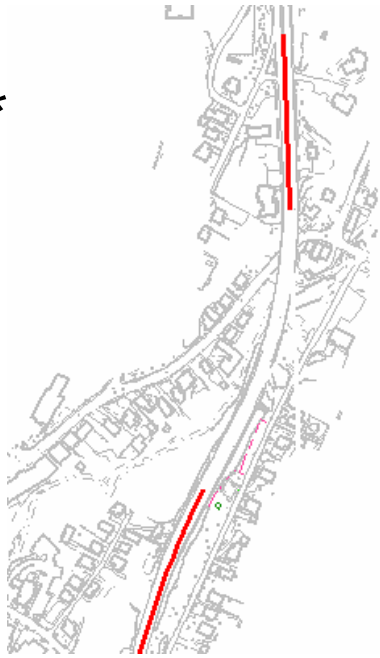
There are two modes in this pull-down menu. You can define a horizontal curve by two points (beginning and end) and a radius. The points can be data points or can be specified as Northing and Easting pairs in the dialog box. Or you can place a horizontal curve by 3 Points.

Length specifies that the Leading and Trailing key-in fields define transition length

A negative radius places a left curve and a positive radius places a right curve.

*

**



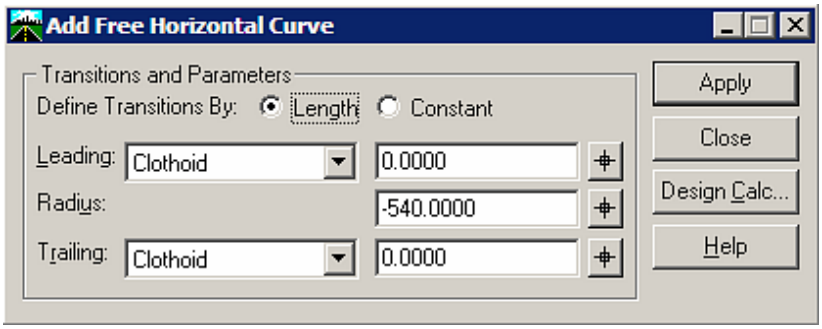
Add Free Line 

* Attaches linear horizontal element between two existing non-linear horizontal elements. There is no dialog box for this command. The prompts at the lower left corner of the MicroStation window guide you through the command.

** Add Free Horizontal Curve 

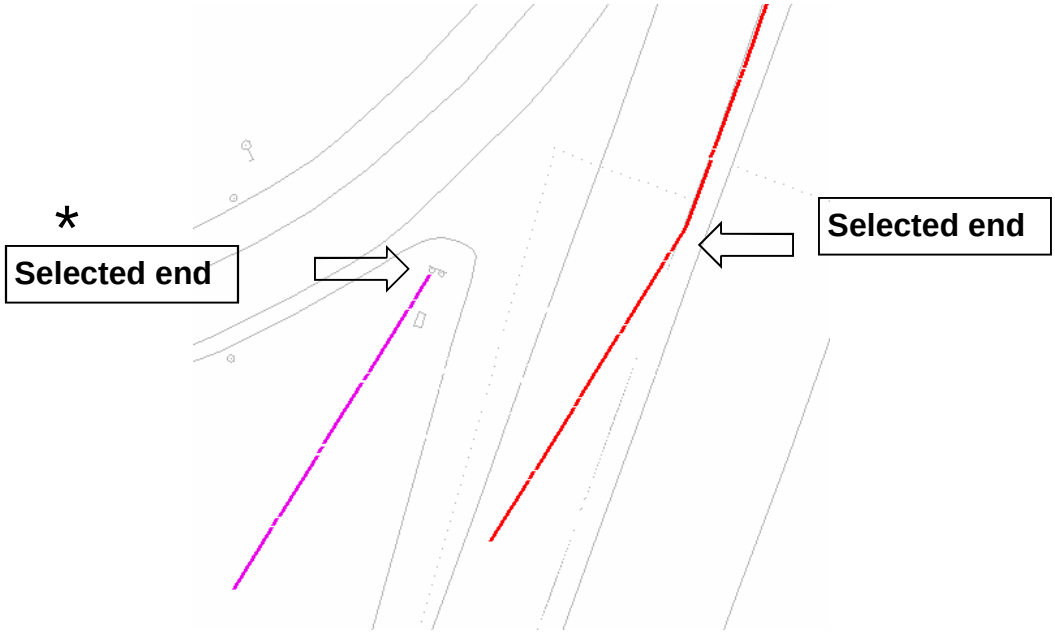
Define a transition curve between two existing horizontal elements (between a tangent and a curve, or between two curves).

The command prompts you to select the two elements by identifying each of them in graphics.



Define Spiral (Horizontal) 

This command ties together existing curves or tangents in the active horizontal alignment. After you select the two existing elements, the command defines the connecting spiral. The Replace and Fill All Gaps option automatically computes spirals in multiple gaps along an alignment.


*
Selected end
Selected end

Connect Elements 

*

This command allows you to connect an element that is not in line with an alignment or element.

The element will move to the alignment and connect the selected end of the element to the selected end of the alignment or element.

There is no dialog box for this command.

Cut Element 

This command will cut an existing horizontal element into two pieces. The pieces will still be joined where you placed the data point, but become two distinct elements

There is no dialog box for this command.

Join Elements 

This command to join two coincident, colinear elements to form a single new element. The system saves the combined element based on the first element selected.

There is no dialog box for this command.

Move Element 

This command moves an existing horizontal element to a specified location. You select the element with the first data point. You specify the new location with a second data point.

There is no dialog box for this command.

Copy Element

This command is used to copy elements from an existing alignment into the active alignments.

There is no dialog box. The command prompts display at the lower left of the MicroStation window as follows ;

Identify alignment - Specify the alignment either by identifying the alignment in graphics or by keying-in the alignment name.

Identify first element - Identify in graphics the first element to copy.

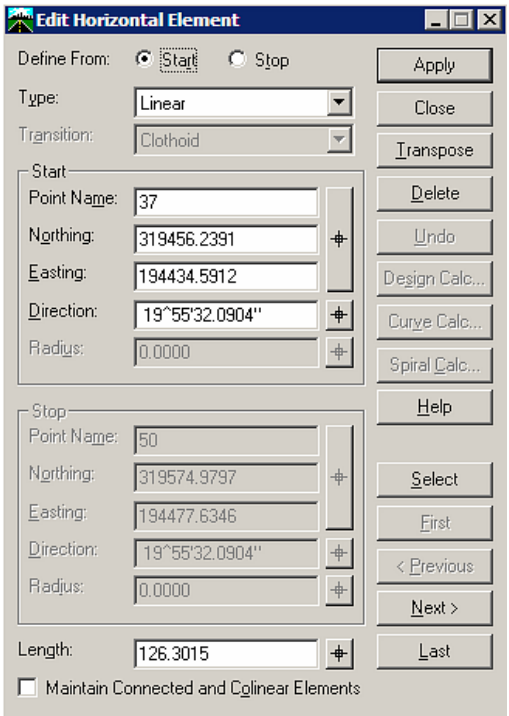
Identify last element - Identify in graphics the last element to copy. All consecutive elements from the first element to the last element will be copied.

Identify a point - Identify in graphics the point that represents the offset (if you intend to copy parallel), or key-in the offset, or reset to copy without any offset.

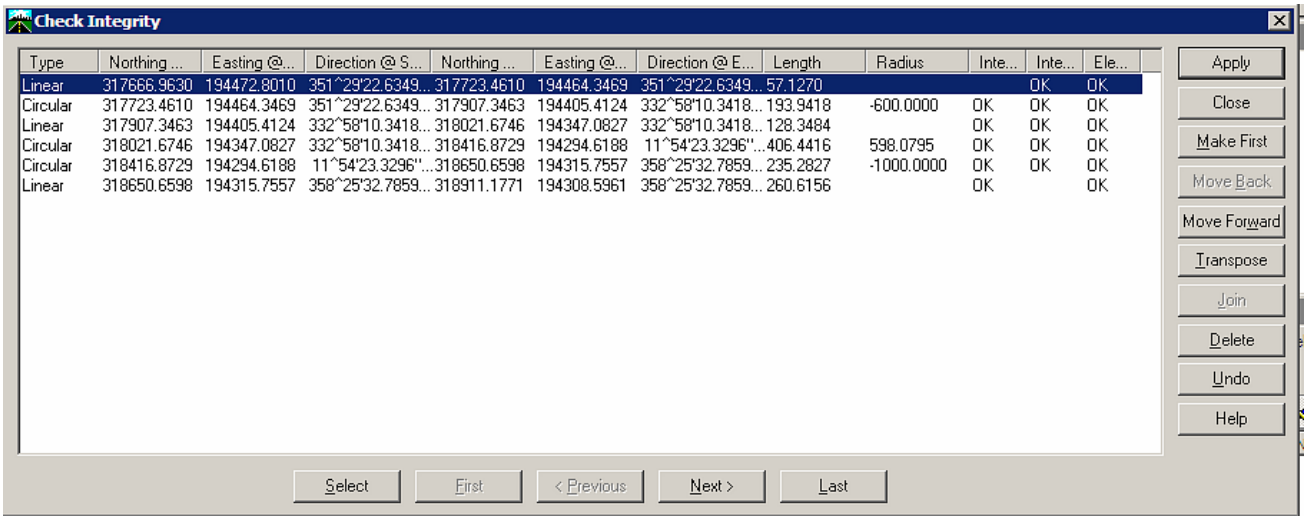
Accept/reject - Finally, accept or reject the solution.

Edit Element

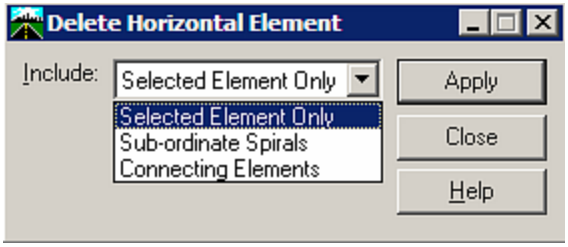
This command is used to edit an existing linear or circular horizontal element.



*


Check Integrity
Type | Northing ... | Easting @... | Direction @ S... | Northing ... | Easting @... | Direction @ E... | Length | Radius | Inte... | Inte... | Ele...
Linear | 317666.9630 | 194472.8010 | 351^29'22.6349... | 317723.4610 | 194464.3469 | 351^29'22.6349... | 57.1270 | | | OK | OK
Circular | 317723.4610 | 194464.3469 | 351^29'22.6349... | 317907.3463 | 194405.4124 | 332^58'10.3418... | 193.9418 | -600.0000 | OK | OK | OK
Linear | 317907.3463 | 194405.4124 | 332^58'10.3418... | 318021.6746 | 194347.0827 | 332^58'10.3418... | 128.3484 | | OK | OK | OK
Circular | 318021.6746 | 194347.0827 | 332^58'10.3418... | 318416.8729 | 194294.6188 | 11^54'23.3296''... | 406.4416 | 598.0795 | OK | OK | OK
Circular | 318416.8729 | 194294.6188 | 11^54'23.3296''... | 318650.6598 | 194315.7557 | 358^25'32.7859... | 235.2827 | -1000.0000 | OK | OK | OK
Linear | 318650.6598 | 194315.7557 | 358^25'32.7859... | 318911.1771 | 194308.5961 | 358^25'32.7859... | 260.6156 | | OK | | OK
Apply
Close
Make First
Move Back
Move Forward
Transpose
Join
Delete
Undo
Help
Select
First
< Previous
Next >
Last

Delete Element



This command is used to delete a selected horizontal element from the active horizontal alignment.

The elements can be deleted in three ways:

Selected Element Only

selects an element with your cursor. The element highlights.

Subordinate Spirals

selects a curve plus its subordinate spirals. A subordinate spiral abuts a circular arc and matches both the radius at the point of abutment and the signage (the hand of curve).

Connecting Elements

selects one element, then includes all elements connected to it.

Check Horizontal Integrity

*

Performs element to element checks. The order of the segments can be changed and deleted in this dialog box. The dialog box lists the element and all the information associated with the element. If the element has any discontinuities, nontangencies, mismatched radii and etc. , it is listed in this dialog box.

If an element is placed in the wrong direction while creating the alignment, the element can be highlighted and **<D> Transpose. <D> Apply** and the element will reverse direction.

An alignment report can be reviewed by right clicking on the alignment name and going to Review or an XML report can be created. Refer to **Using Inroads Data** for creation of XML reports.

Chapter 2
Cross Sections

Introduction...

This chapter will display cross sections to check the placement of the alignment and the use of cross section viewer

Create Cross Section File

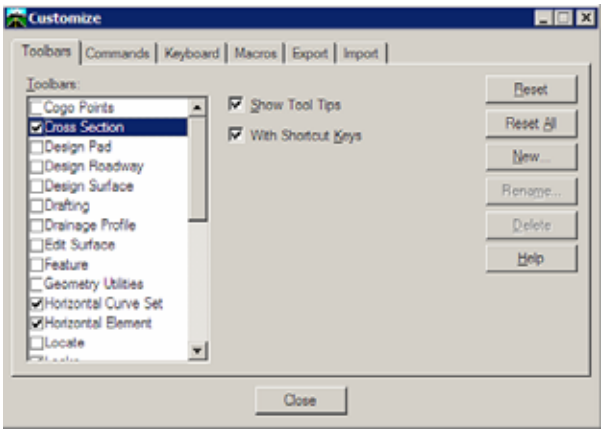
Create a new file to store your cross sections with a 3D highway seed file, and name it **PIN_D1_fea_rwy_xsc.dgn.**

Open this file. It is a good idea to reference your ***PIN.3dp*** file to your cross section file, so that your sections are close to your project, and not overlapping it. This way, you can go back and forth from your project area to your cross sections.

Make the **9Wprop** alignment active.

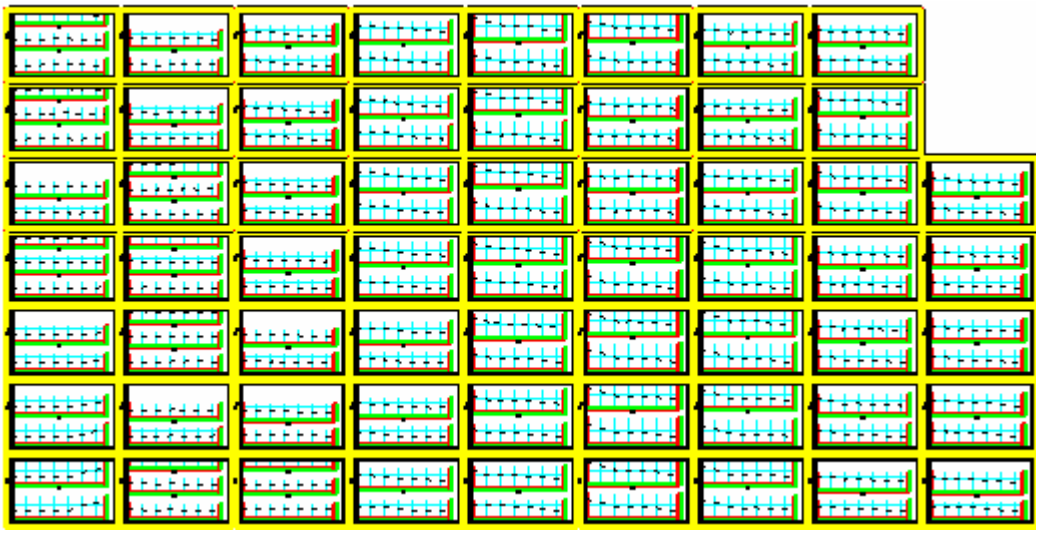
Right click in the menu area of InRoads and go to **Customize**.

Choose **Cross Section**

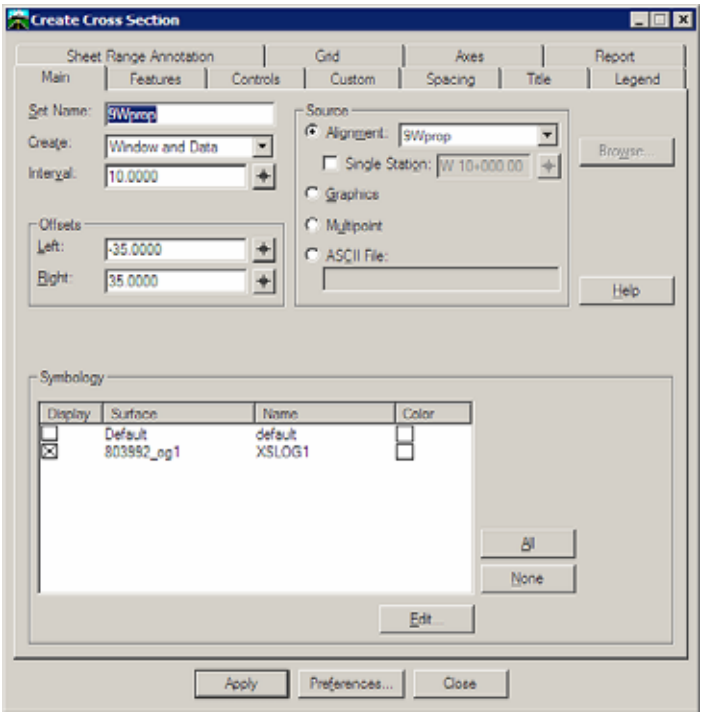


The Cross Section toolbar will display.

* Refer to the **Using InRoads Data** training manual for the procedure for displaying cross section.

** 

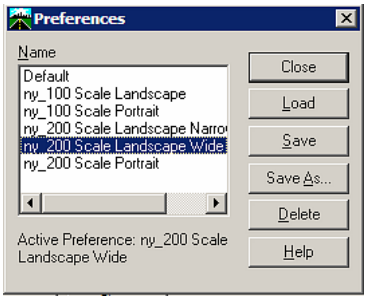
* **Create Cross Sections** 



Select the **ny_200Scale Landscape Wide** preference.

Display cross sections for the entire length of the alignment.

If you want to see where the cross sections are on the roadway, turn planarize on under the **Controls** tab.



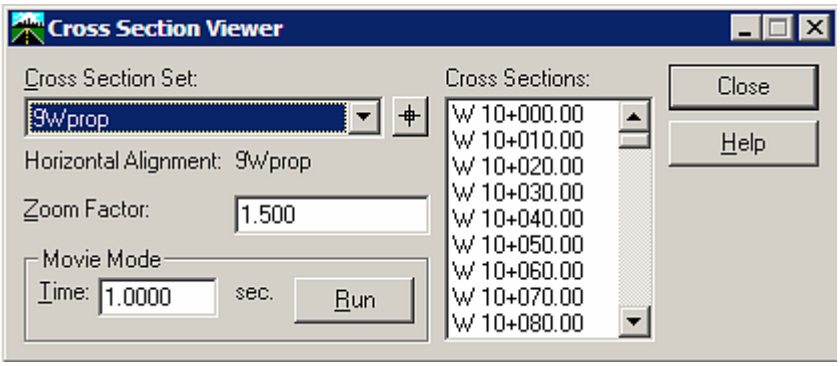
<D> Apply

<D> location in view

** The cross sections will display.

The cross section can be annotated if desired.

Cross Section Viewer 



Utilizing the cross section viewer, the user can view a single cross section or view each cross section in the set in succession, one at a time, for a specified time.

Cross Section Set: defines the cross section set to view. If there are multiple cross section sets, the set to view can be chosen from the drop down list.

Horizontal Alignment: displays the active alignment

Zoom Factor: defines the zoom factor for viewing the cross sections. A value greater than 1.0 will zoom out from the cross sections. A value less than 1.0 will zoom in toward the cross sections.

Movie Mode:

Time: specifies the time for viewing each cross section. Time can be entered in tenths of a second

Run: starts the movie mode for viewing the cross sections in succession

Cross Sections: lists all the cross sections in the set

Close: dismisses the dialog box. Upon reentry of the dialog box, the previous data will display.

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End