



# ***Bentleyuser.dk Årsmøde 2010***

## ***Nordic Civil 2010***

**8.-10. November 2010, Munkebjerg Hotel, Vejle**

**Workshop - X15**

**Advanced Geometric Design for InRoads V8i**

**Presenter:** Kevin Jackson., Bentley Systems USA

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## LESSON NAME: SETUP GEOMETRY OPTIONS

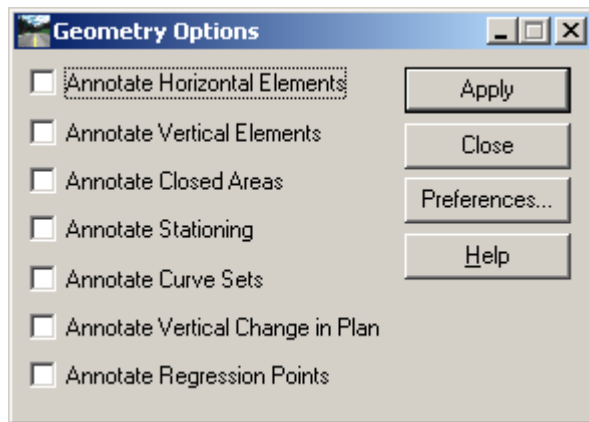
### LESSON OBJECTIVE:

This lesson will show how to setup the new Geometry Options during the design process.

### EXERCISE: SETTING UP THE NEW GEOMETRY OPTIONS

This exercise will guide you through the steps to get started

1. Load the file **road\_imperial.dgn**
2. Load the project file **Road.rwk**
3. Go to Geometry > View Geometry > Options ...



As create or edit alignments the software updates most annotation. Specifically the software updates the following:

- Horizontal Elements
- Vertical Elements
- Closed Areas
- Stationing
- Curve Sets
- Vertical Change in Plan
- View Horizontal & Vertical Regression Points

Whether or not annotation is updated during edits is based on the following:

- You must have an option to update the annotation that you want to annotate.
- You must have a means to control the annotation. In other words, while it may be appropriate to annotate an alignment with stationing, it may be inappropriate to annotate a boundary/parcel with stationing.

Check on the following check boxes to specify to update the associated annotation.

**Note:**

The appearance of the annotation is controlled by each Geometry > View commands preferences by using the alignment's style and view commands preference. Example, you have an alignment with a style called DESIGN CENTERLINE. If you checked on that you want to annotate the stationing then you must save a View Station preference called DESIGN CENTERLINE. If such a preference is defined then the software displays and annotates the stationing based upon the settings for DESIGN CENTERLINE. The software does not look at the settings for View Stationing that are in memory. The preference must exist on disk or the software silently skips the stationing annotation.

4. View the Perimeter Surface > View Surface > Perimeter ...

**LESSON NAME: USING THE NEW GEOMETRY VIEW OPTIONS**

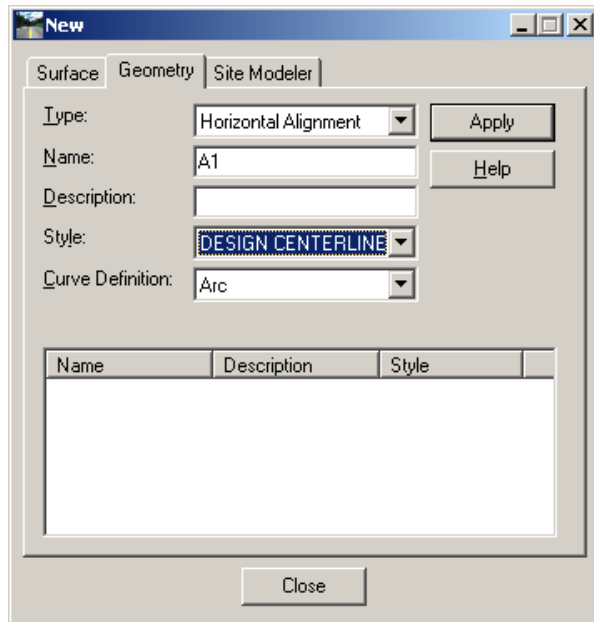
**LESSON OBJECTIVE:**

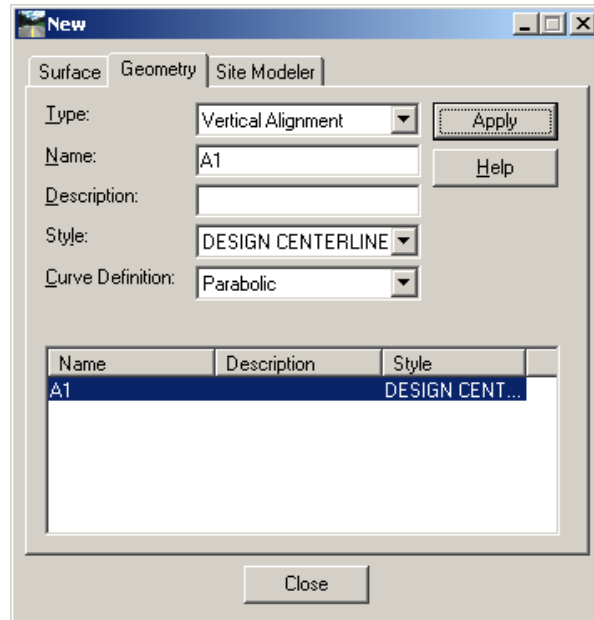
This lesson will show how to use the new Geometry Options

**EXERCISE: USING GEOMETRY > VIEW OPTIONS**

This exercise will guide you through the steps to use the new options

1. Create a new horizontal & vertical alignment





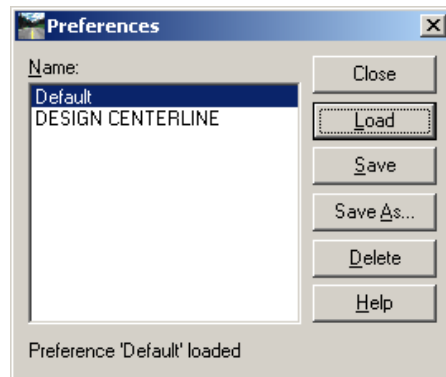
Close the dialog box

- Use the horiz. PI – Method or Element Method and design a simple horiz. alignment



Insert a horizontal curve

- Check Geometry > View Geometry > Stationing > Preference ...



There 2 preferences with different annotation settings.

## Default

**View Stationing**

View Stationing

- General
- Regular Stations
- Cardinal Stations
- Pls
- Station Equations
- Event Points
- Radius + A
- Transition Radii
- Vertical Stations

Data:

Object	Placement	Prefix	Suffix	Precision	Format	Name
<input checked="" type="checkbox"/> Station	In			0.12	ss+ss.ss	
<input type="checkbox"/> Northing				0.12		
<input type="checkbox"/> Easting				0.12		

Omit POB and POE       Swap Point Abbreviation and Station

Display On:  Multiple Lines     Single Line

Leaders:

Object	Length	Angle	Relative To	Name
Leader Line				Prop Horizontal
<input checked="" type="checkbox"/> Segment 1	3.000	90°00'00.000	Alignment	
<input type="checkbox"/> Segment 2	100.000	0°00'00.000	Alignment	

Apply    Preferences...    Close    Help

## DEFINE CENTERLINE

**View Stationing**

View Stationing

- General
- Regular Stations
- Cardinal Stations
- Pls
- Station Equations
- Event Points
- Radius + A
- Transition Radii
- Vertical Stations

Data:

Object	Placement	Prefix	Suffix	Precision	Format	Name
<input checked="" type="checkbox"/> Station	In			0.12	s+sss.ss	
<input type="checkbox"/> Northing				0.12		
<input type="checkbox"/> Easting				0.12		

Omit POB and POE       Swap Point Abbreviation and Station

Display On:  Multiple Lines     Single Line

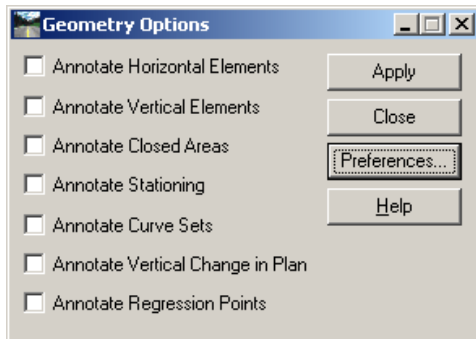
Leaders:

Object	Length	Angle	Relative To	Name
Leader Line				
<input checked="" type="checkbox"/> Segment 1	30.000	90°00'00.000	Alignment	
<input type="checkbox"/> Segment 2	100.000	0°00'00.000	Alignment	

Apply    Preferences...    Close    Help

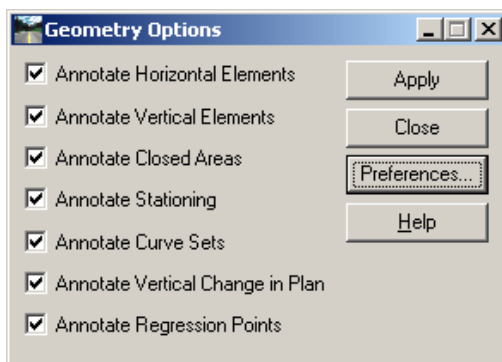
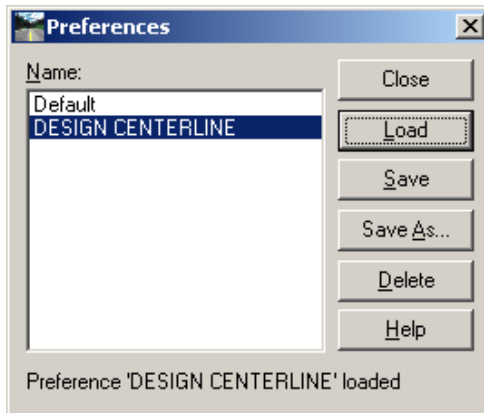
Close the dialog box.

Go to Geometry > View Geometry > View Options > ...



By Default all annotation is turned off.

Load a preference called DESIGN CENTERLINE



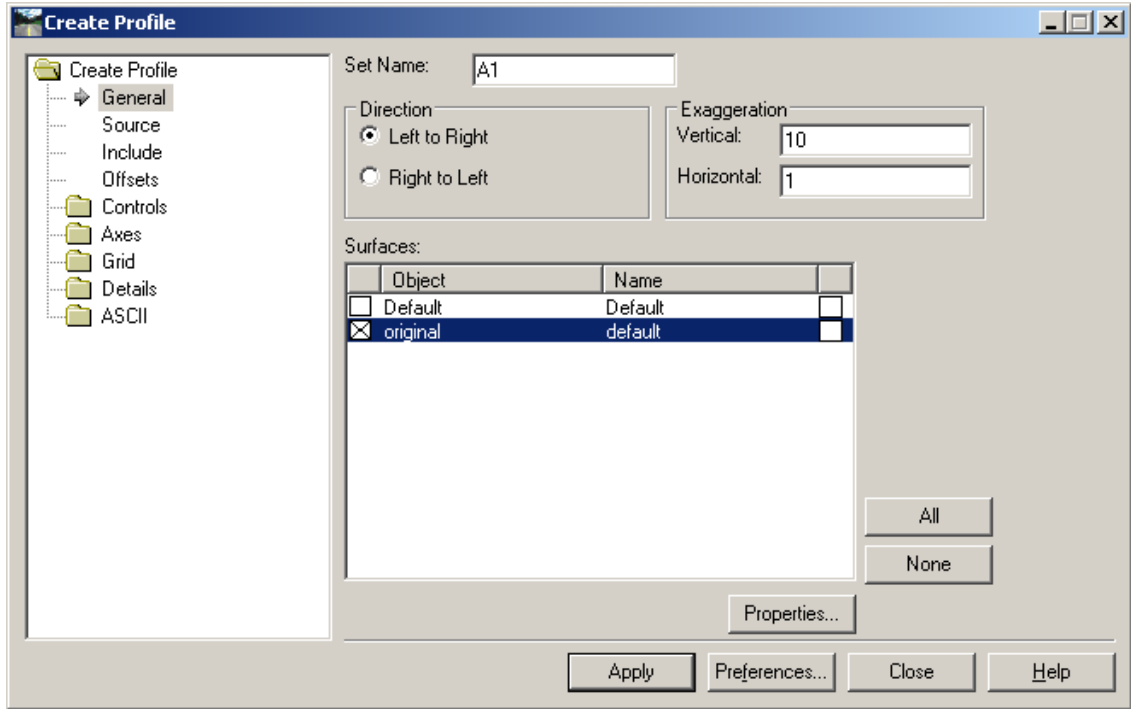
All Annotation is turned on for the design process.

Move on with the alignment creation

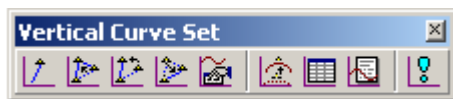


The software annotates during the design process all stationing values from the View Stationing settings.

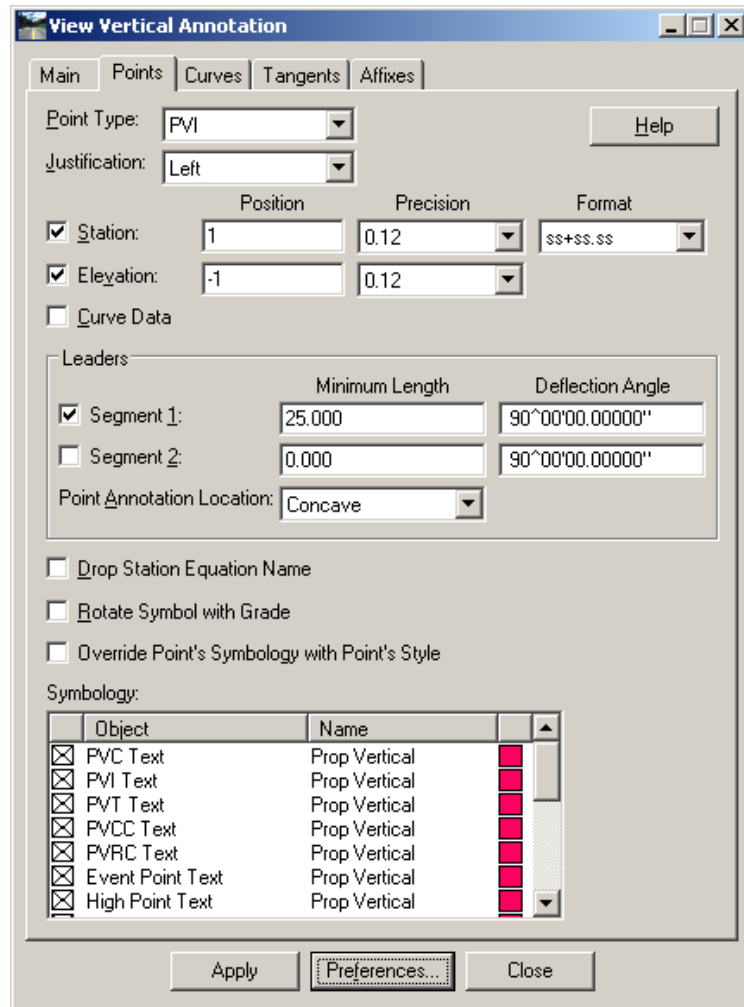
4. Create a profile turn the dtm on



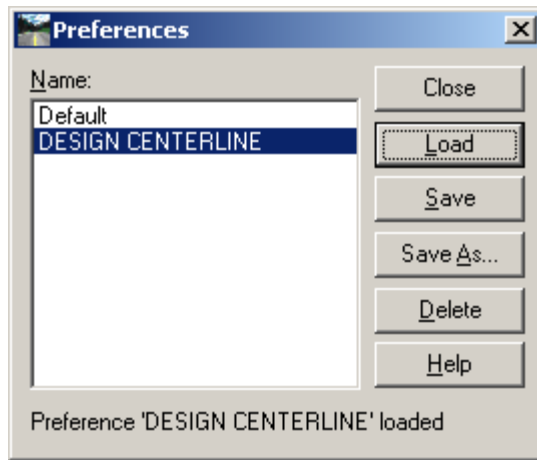
5. Use the vert. PI – Method or Element Method and design a simple vert. alignment



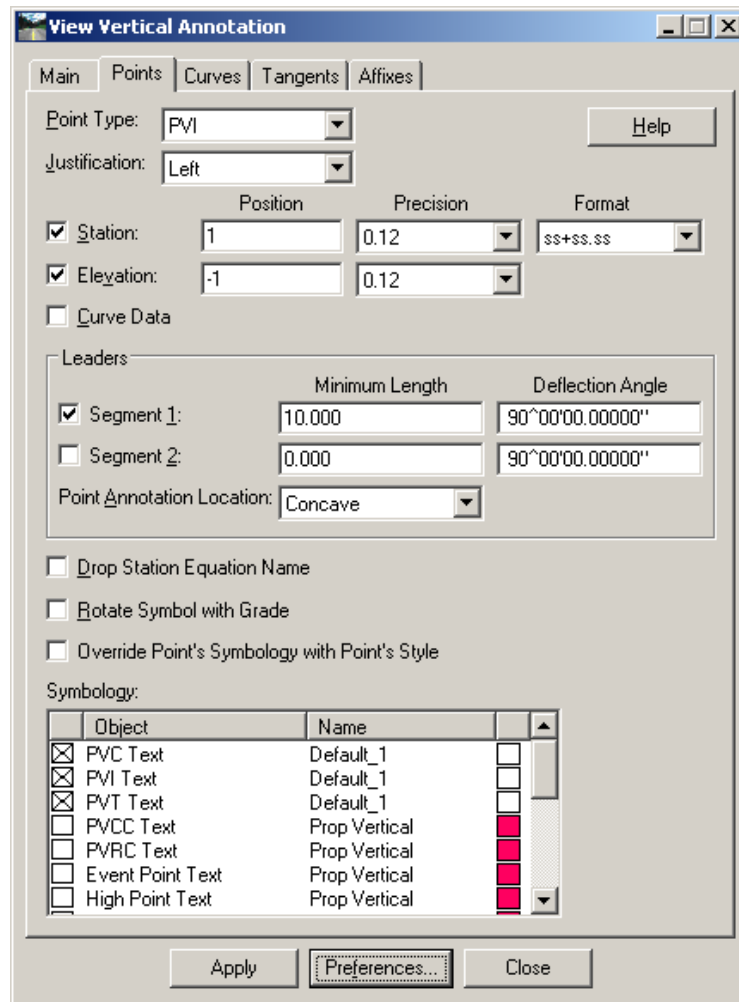
6. Annotate the vertical alignment Geometry > View Geometry > Vertical Annotation



There 2 different preferences for different annotation



Load the preference DESIGN CENTERLINE



- Use the different View Geometry Options by loading the different preferences and view the results during the design process

## LESSON NAME: USING THE DESIGN CALCULATOR

### LESSON OBJECTIVE:

This lesson will show how to work with the design calculator during the horizontal alignment creation.

### EXERCISE: SETTING UP THE NEW SIMPLIFIED GEOMETRY TOOLS

This exercise will guide you through the steps to get started with the Design Calculator

1. You need to have an active horizontal alignment
2. Go to Geometry > Horizontal Curve Set > Define Horizontal Curve ...

Define Horizontal Curve Set

Horizontal PI

Define By: Known PI Coordinates

Direction Back: 101.566093

Length Back: 698.761424

Point Name:

Easting: 4501252.561183

Northing: 5671247.929351

Direction Ahead: 144.689707

Length Ahead: 944.071143

Apply

Close

Undo

Rate Calc...

Design Calc...

Curve Calc...

Report...

Help

Horizontal Curve

Curve Set Type:  SCS  SCSCS

Leading Transition: Clothoid 60.000000

Radius 1: 10.610330 600.000000

Compound Transition: Clothoid 0.000000

Radius 2: 0.000000 0.000000

Trailing Transition: Clothoid 60.000000

Define By:  Radius

Tangent to Spiral Point Name:

Spiral to Tangent Easting: 4501011.189097

Point on Curve Northing: 5671253.868335

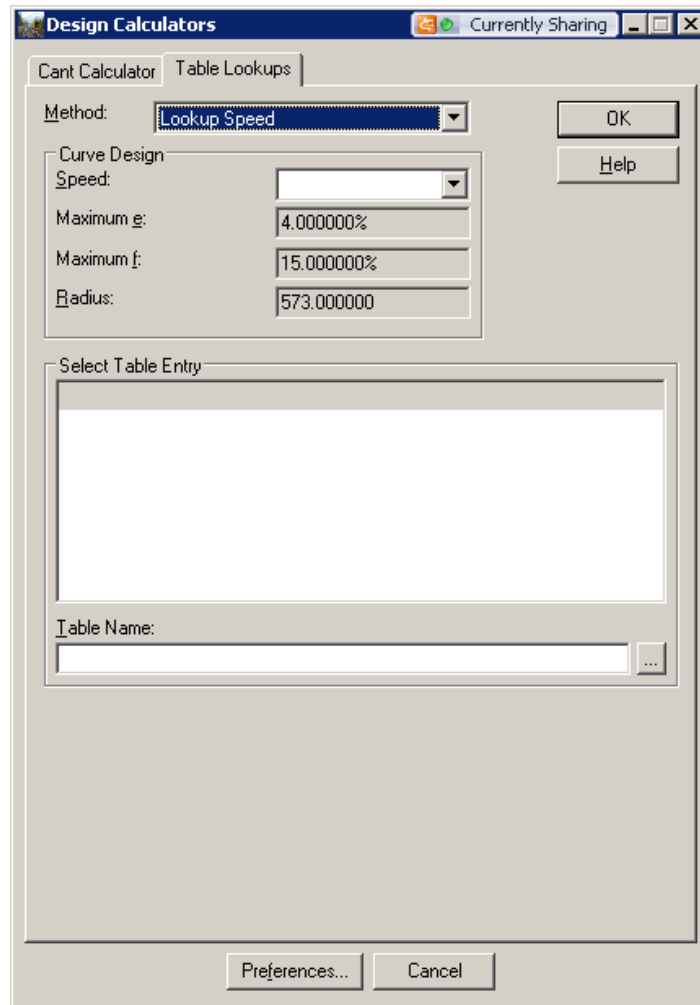
Angle up to PCC (PC to PCC) 0.000000

Angle after PCC (PCC to PT)

First < Previous Next > Last Select

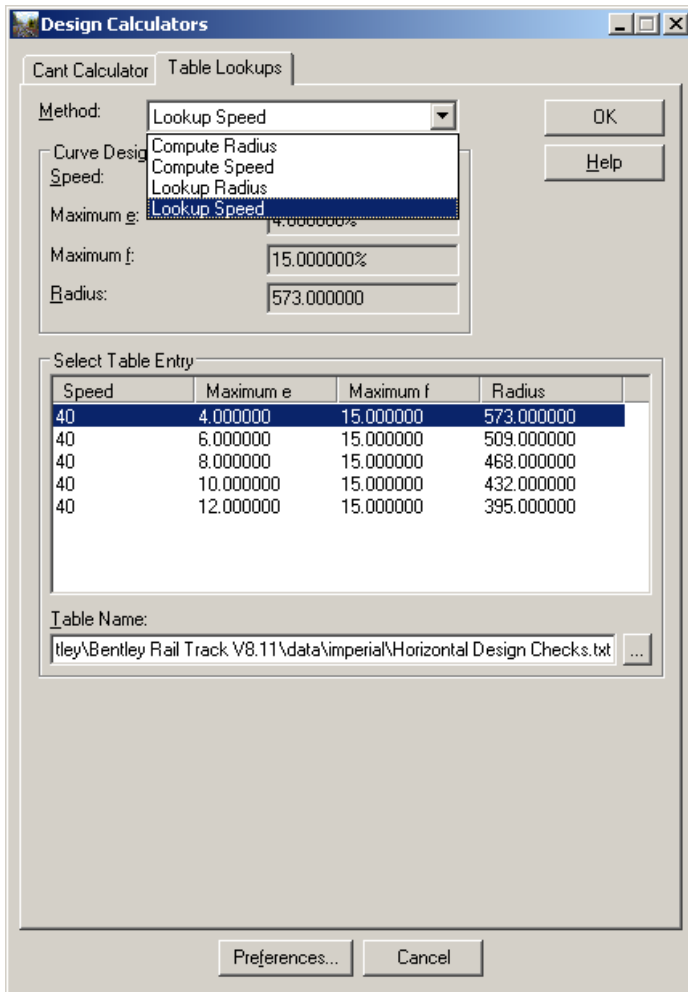
3. Use the Design Calculator

4. Use the Table Lookups

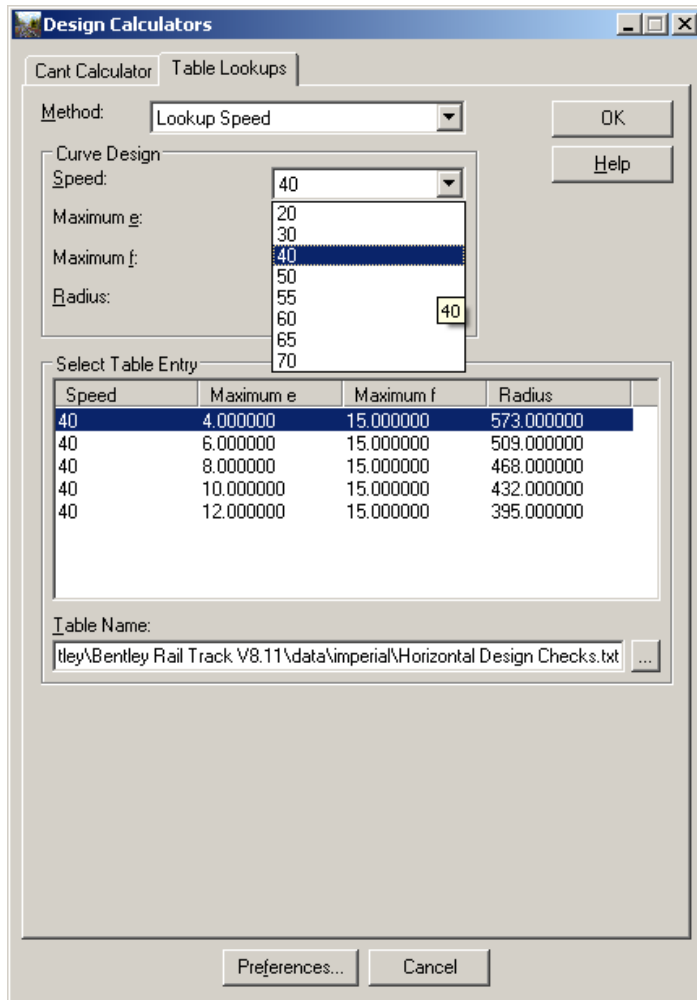


5. Select the Table name
6. You will find the table name in the product directory under ... \data\imperial\Horizontal Design Checks.txt or ... \data\metric\Horizontal Design Checks.txt

The user can now look for different design checks



Or can select different speeds.



Upon these values the software will calculate the required radius.

**Note:**

Clicking the Design Calc button on the Define Horizontal Curve Set dialog box activates this dialog.

The Table Lookups tab works as follows: After you have specified the Method field, key in any of the relevant values, then press the tab key to see the results of the computation. As you change the data in the dialog, the software automatically recomputes all parameters. Once you have settled on a calculation, click OK to post the Radius back to the parent dialog.



## Tab Options

### Method

defines the method for calculating the horizontal curve.

*Compute Radius* – computes the radius for horizontal curves using the following equations:

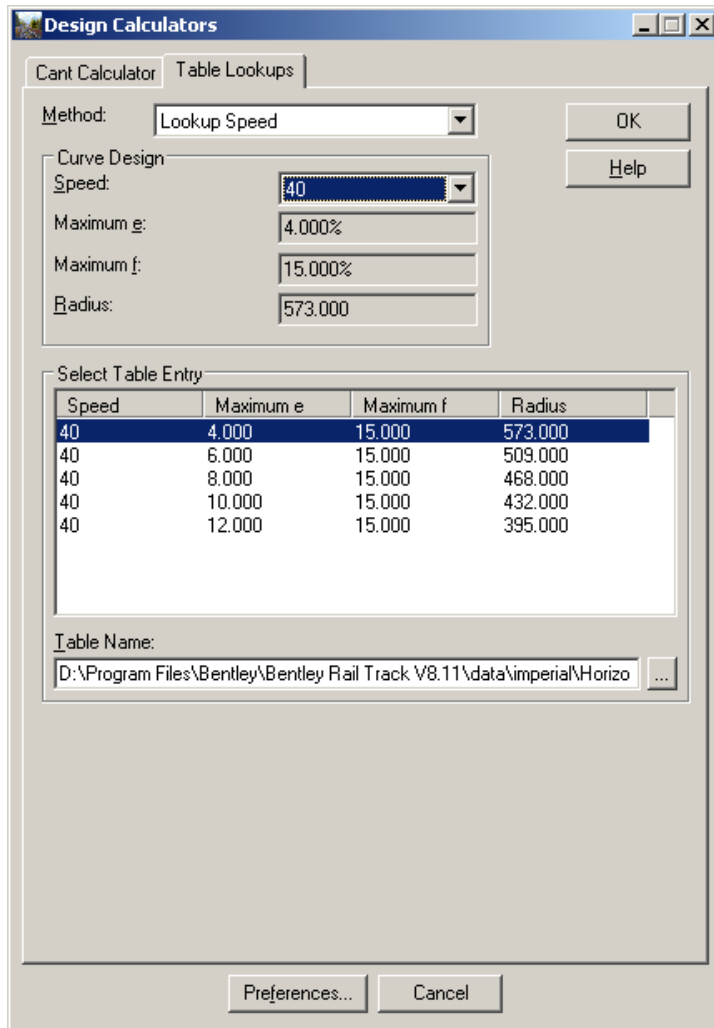
English -  $R = V^2 / [15(e+f)]$ , where R is the radius (ft), V is the vehicle speed (mph), e is the rate of roadway superelevation (ft/ft), and f is the side friction factor

Metric -  $R = V^2 / [127(e/100+f)]$ , where R is the radius (m), V is the vehicle speed (kmh), e is the rate of roadway superelevation (m/m), and f is the side friction factor

*Compute Speed* – computes the speed using the equations for the compute radius method for imperial and metric units.

*Lookup Radius* – reads the values for radius, maximum f and speed values varying the rate of superelevation. These values are read from an ASCII file specified under Table Name and contains information from “A Policy on Geometric Design of Highways and Streets 1994” for imperial and metric units.

*Lookup Speed* – reads in the values for radius, maximum f and maximum e varying the vehicle speed. These values are read from an ASCII file specified under Table Name and contains information from “A Policy on Geometric Design of Highways and Streets 1994” for imperial and metric units.



You can save the settings as a preference.

Hit OK. The software will take the required radius into the Define Horizontal Curve dialog box.

**Define Horizontal Curve Set**

Horizontal PI  
 Define By: Known PI Coordinates

Direction Back: S 88°35'25.85818" E

Length Back: 698.761

Point Name:

Northing: 5671247.9294

Easting: 4501252.5612

Direction Ahead: S 49°46'45.34895" E

Length Ahead: 944.071

Apply  
 Close  
 Undo  
 Rate Calc...  
 Design Calc...  
 Curve Calc...  
 Report...  
 Help

Horizontal Curve  
 Curve Set Type:  SCS  SCSCS

Leading Transition: Clothoid 0.000

Radius 1: 9°59'57.34839" 573.000

Compound Transition: Clothoid 0.000

Radius 2: 0°00'00.00000" 0.000

Trailing Transition: Clothoid 0.000

Define By:  Radius

Tangent to Spiral Point Name:

Spiral to Tangent Northing: 5671253.8683

Point on Curve Easting: 4501011.1891

Angle up to PCC (PC to PCC) 0°00'00.00000"

Angle after PCC (PCC to PT)

First < Previous Next > Last Select

Apply will save the curve value to the alignment. Close the dialog box.

**LESSON NAME: SIMPLIFIED GEOMETRY TOOLS**

**LESSON OBJECTIVE:**

This lesson will show how to setup the new simplified geometry tools.

**EXERCISE: SETTING UP THE NEW SIMPLIFIED GEOMETRY TOOLS**

**HORIZONTAL DESIGN**

This exercise will guide you through the steps to get started with the Simplified Geometry Tools

1. Create a new horizontal alignment
2. Setup your horizontal geometry settings



**Leading Transition**

defines the leading transition spiral's length or constant. This field honors Tools > Options > Geometry and Define Transitions by Length or Constant.

**Radius**

defines the circular arc's radius.

**Trailing Transition**

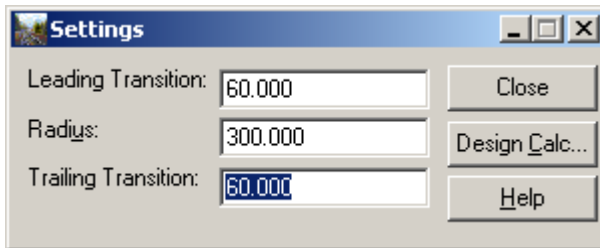
defines the trailing transition spiral's length or constant. This field honors Tools > Options > Geometry and Define Transitions by Length or Constant.

**Design Calculator**

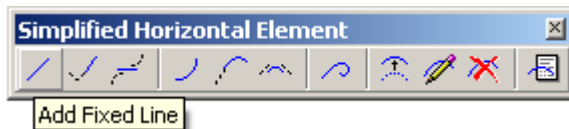
invokes the design calculator to define the transition lengths and radius from design criteria.

**Note:** This dialog should remain active while using the Simplified Horizontal Elements commands. As you change settings on this dialog, commands that use these settings instantly reflect these settings.

3. Do the following settings:

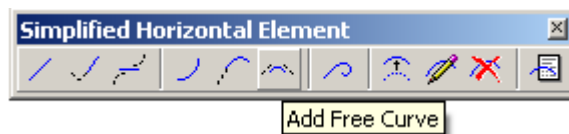


4. Start the design process with Add Fixed Line:



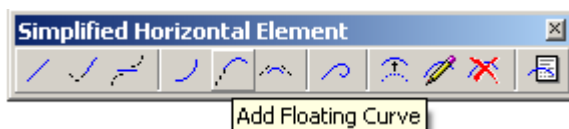
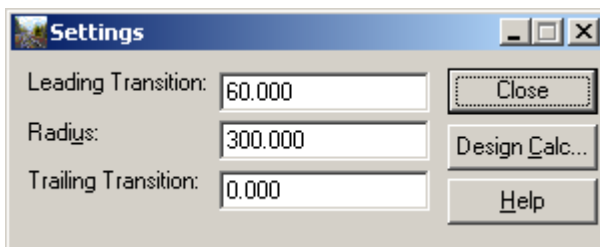
The command works a little bit different then the Horizontal Element Method.

5. Fill the gaps with the Add Free Curve command.

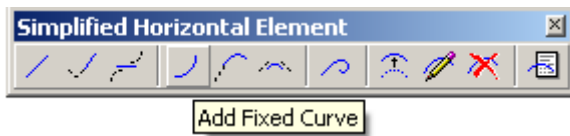
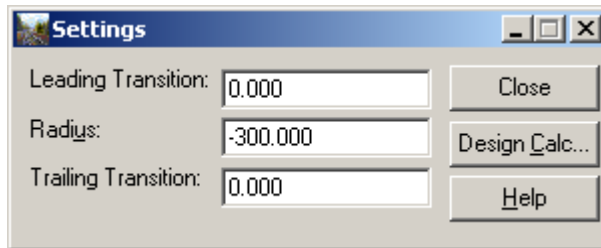


The software takes the values from the settings.

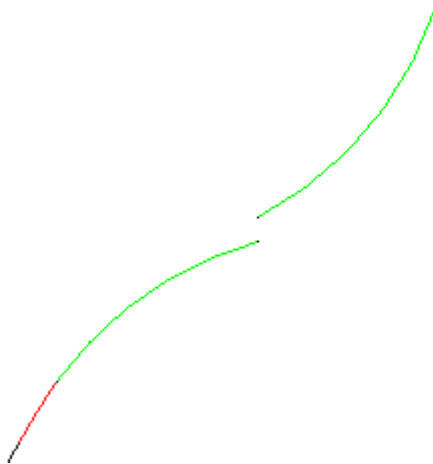
6. Add a Floating Curve and use these settings:



7. Add a Fixed Curve with the following settings

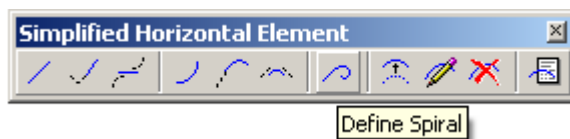


If you have a solution like shown



you can fill a reverse spiral between reverse arcs.

8. Use Define Spiral



The reverse spirals have the same parameter.

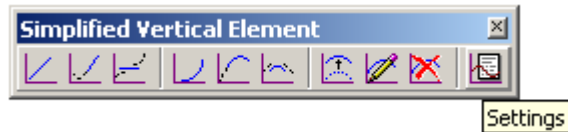
### 9. Check the Integrity.

Type	Station...	Northing...	Easting @ ...	Direction @ Start	Northing ...	Easting @ ...	Direction @ End	Length	Radius	Constant	Integrity ...	Integrity ...	Element I...
Linear	0.000	3063.3654	3299.3248	N 26°49'01.6895...	3237.5272	3387.3657	N 26°49'01.6895...	195.150			OK	OK	OK
Clothoid	195.150	3237.5272	3387.3657	N 26°49'01.6895...	3290.1191	3416.1909	N 32°32'48.1661...	60.000	300.000	134.164	OK	OK	OK
Circular	255.150	3290.1191	3416.1909	N 32°32'48.1661...	3409.5326	3563.5024	N 69°23'43.8907...	192.940			OK	OK	OK
Clothoid	448.090	3409.5326	3563.5024	N 69°23'43.8907...	3426.8513	3620.9207	N 75°07'30.3714...	60.000	300.000	134.164	OK	OK	OK
Linear	508.090	3426.8513	3620.9207	N 75°07'30.3714...	3504.1720	3912.0265	N 75°07'30.3714...	301.199			OK	OK	OK
Clothoid	809.289	3504.1720	3912.0265	N 75°07'30.3714...	3521.4908	3969.4448	N 69°23'43.8907...	60.000	300.000	134.164	OK	OK	OK
Circular	869.289	3521.4908	3969.4448	N 69°23'43.8907...	3627.5913	4107.7489	N 35°37'01.0439...	176.864	-300.000		OK	OK	OK
Clothoid	1046.154	3627.5913	4107.7489	N 35°37'01.0439...	3678.5639	4139.3496	N 29°53'14.5632...	60.000	300.000	134.164	OK	OK	OK
Linear	1106.154	3678.5639	4139.3496	N 29°53'14.5632...	3738.8423	4173.9936	N 29°53'14.5632...	69.525			OK	OK	OK
Clothoid	1175.678	3738.8423	4173.9936	N 29°53'14.5632...	3789.8148	4205.5943	N 35°37'01.0439...	60.000	300.000	134.164	OK	OK	OK
Circular	1235.678	3789.8148	4205.5943	N 35°37'01.0439...	3834.0037	4244.3298	N 46°51'28.4258...	58.857			OK	OK	OK
Clothoid	1294.536	3834.0037	4244.3298	N 46°51'28.4258...	3902.3977	4339.6531	N 58°04'49.3429...	117.522	300.000	187.767	OK	OK	OK
Clothoid	1412.057	3902.3977	4339.6531	N 58°04'49.3429...	3970.7917	4434.9764	N 46°51'28.4258...	117.522		187.767	OK	OK	OK
Circular	1529.579	3970.7917	4434.9764	N 46°51'28.4258...	4094.6189	4514.3708	N 18°29'32.5720...	148.609	-300.000		OK	OK	OK

If you move an element all radii will be hold as they are designed.

### VERTICAL DESIGN

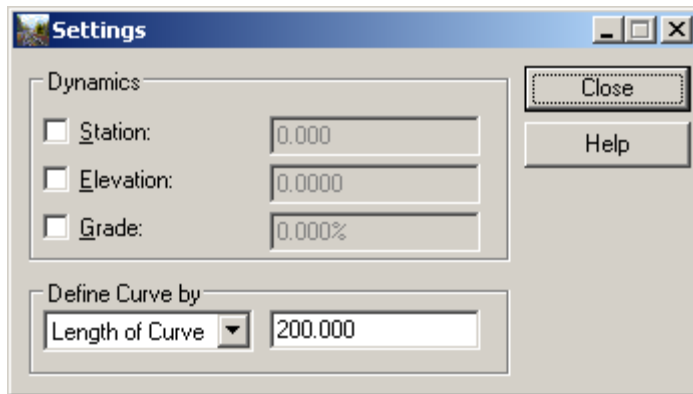
1. Create a vertical alignment
2. Create a profile
3. Setup your vertical geometry settings



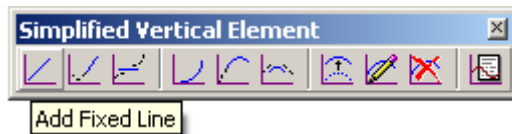
Define Curve by

Length of Curve, Rate of Change and K or Radius, depending upon whether the vertical alignment is defined with parabolas or vertical circles. The text input field defines the parabola's length, rate of change or K or a circular's radius in the Add Fixed Curve, Add Floating Curve and Add Free Curve.

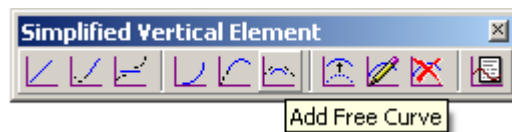
**Note:** This dialog should remain active while using the Simplified Horizontal Elements commands. As you change settings on this dialog, commands that use these settings instantly reflect these settings



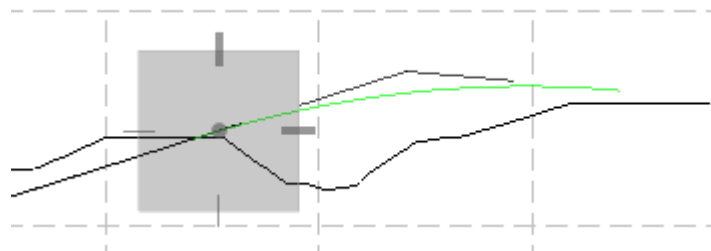
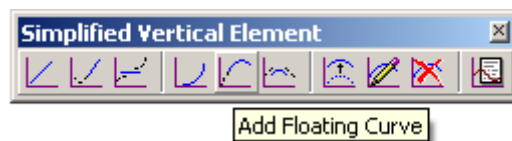
4. Create a Fixed Vertical Line



5. Add a Free Vertical Curve

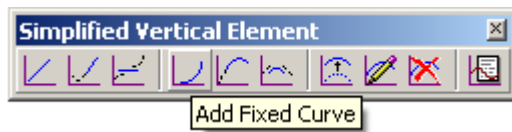


6. Add a Floating Curve

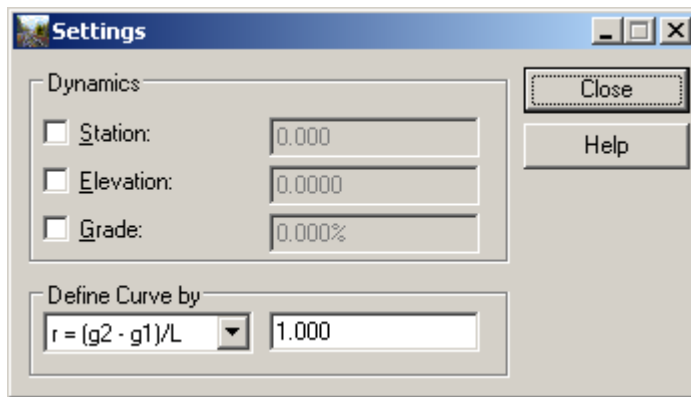




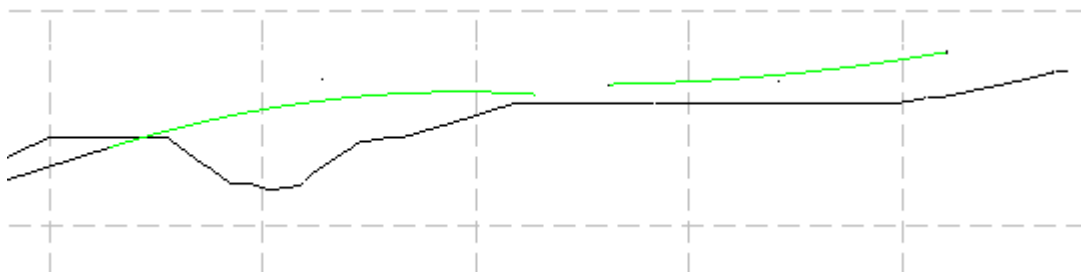
7. Add Fixed Curve



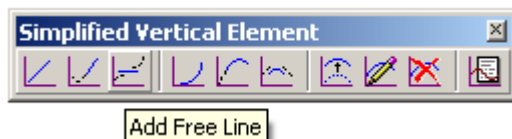
8. Use the following settings



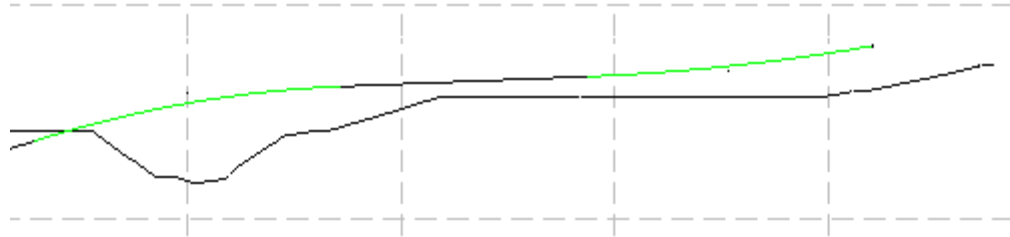
You may have this solution:



9. Use Add Free Line



And fill the gap between the reverse vertical arcs.



**LESSON NAME: HORIZONTAL ELEMENT**

**LESSON OBJECTIVE:**

*This exercise will guide you through the steps to get started with Fixed Elements*

**EXERCISE: ADD FIXED ELEMENTS**

*This exercise will guide you through the steps to get started with Fixed Elements*

1. Create a new horizontal alignment
2. Create New cogo points (3 new cogo points)

Geometry > Cogo Points > New ..

You may have this result:



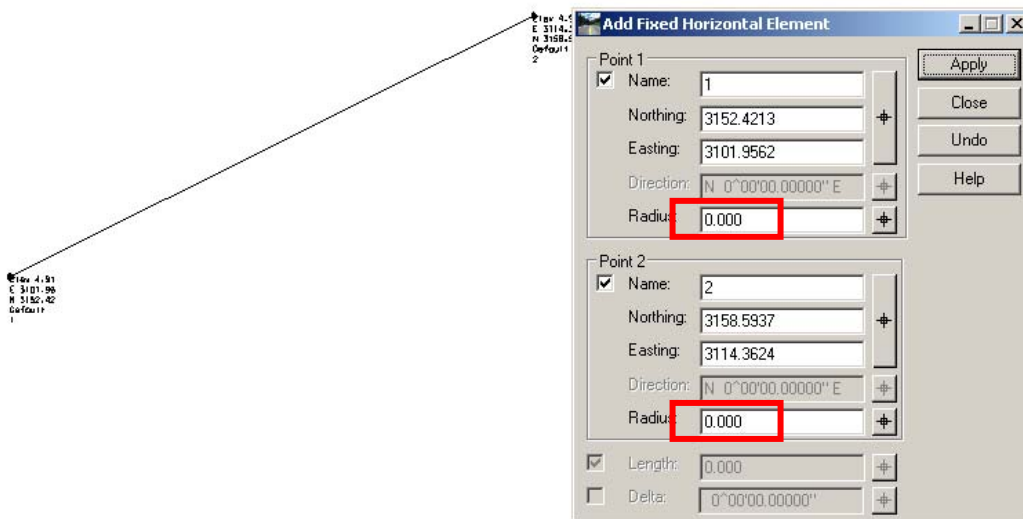
### 3. Add Fixed Horizontal Elements



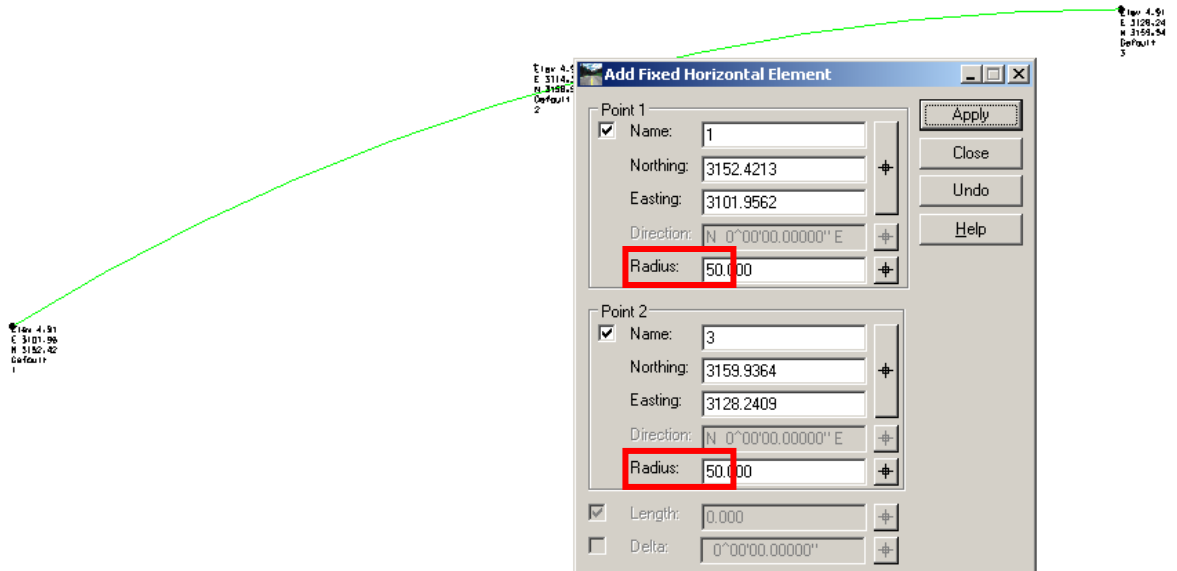
Use this command to add a fixed element using point, length or delta as controls then adds the solution to the alignment. This command is limited to clothoid spirals. creates the element and displays it into the alignment.

The element type is determined by the following rules:

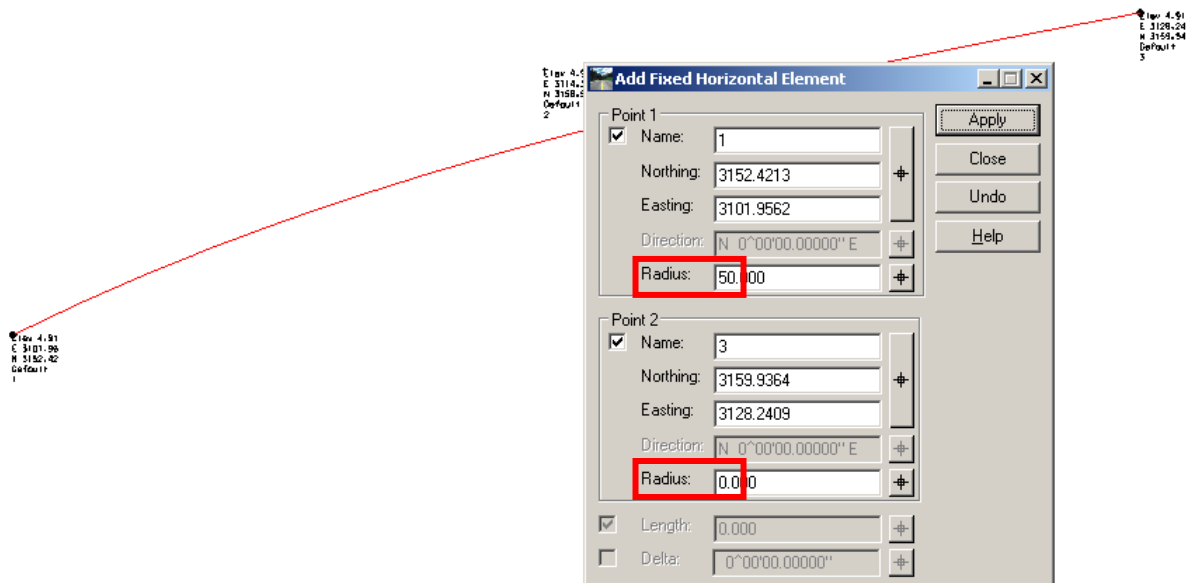
Linear: Point 1's Radius and Point 2's Radius is zero



Circular: Point 1's Radius and Point 2's Radius is equal and non-zero



Spiral: Point 1's Radius and Point 2's Radius is non-equal and like sign



When the software successfully creates the element, this element is added to the undo buffer (single element undo).

Also the Point 1 data is updated with the computed data from computed element. This facilitates creating an alignment from a single interface and with the minimum number of data points.

**LESSON NAME: SEGMENT ALIGNMENT**

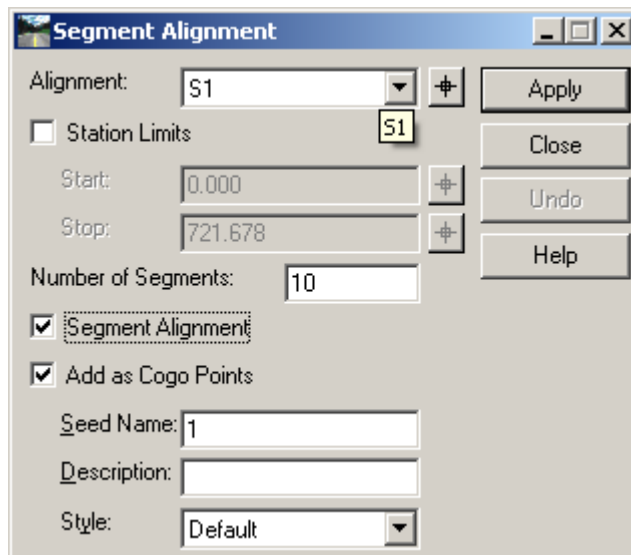
**LESSON OBJECTIVE:**

This lesson will show how to use the Segment Alignment Utility

**EXERCISE: SEGMENT ALIGNMENT**

*This lesson will guide you how to use the Segment Alignment Utility*

1. Load Segment.alg
2. Use the Segmentation Utility Geometry > Utilities > Segment Alignment



Apply.

Constructs a line by division or proportion along a line, constructs an arc by division or proportion along an arc or curve.

### 3. Check the horiz. Integrity an review the results

Type	Station ...	Northing ...	Easting @ ...	Direction @ Start	Northing ...	Easting @ ...	Direction @ End	Length	Radius	Constant	Integrity ...	Integrity ...	Element I...
Linear	0.000	3086.7951	3216.0634	N 33°03'29.5660...	3147.2801	3255.4302	N 33°03'29.5660...	72.168			OK	OK	OK
Linear	72.168	3147.2801	3255.4302	N 33°03'29.5660...	3196.6513	3287.5637	N 33°03'29.5660...	58.907			OK	OK	OK
Clothoid	131.075	3196.6513	3287.5637	N 33°03'29.5660...	3207.7545	3294.8134	N 33°18'36.3052...	13.260		141.421	OK	OK	OK
Clothoid	144.336	3207.7545	3294.8134	N 33°18'36.3052...	3229.8798	3309.8267	N 35°21'00.1583...	26.740		141.421	OK	OK	OK
Circular	171.075	3229.8798	3309.8267	N 35°21'00.1583...	3265.6884	3337.7561	N 40°33'20.6613...	45.428	500.000		OK	OK	OK
Circular	216.503	3265.6884	3337.7561	N 40°33'20.6613...	3316.9490	3388.4662	N 48°49'32.0160...	72.168	500.000		OK	OK	OK
Circular	288.671	3316.9490	3388.4662	N 48°49'32.0160...	3360.3827	3446.0220	N 57°05'43.3708...	72.168	500.000		OK	OK	OK
Circular	360.839	3360.3827	3446.0220	N 57°05'43.3708...	3395.0862	3509.2266	N 65°21'54.7255...	72.168	500.000		OK	OK	OK
Circular	433.007	3395.0862	3509.2266	N 65°21'54.7255...	3420.3378	3576.7655	N 73°38'06.0803...	72.168	500.000		OK	OK	OK
Circular	505.175	3420.3378	3576.7655	N 73°38'06.0803...	3424.1953	3590.6374	N 75°17'05.9880...	14.399	500.000		OK	OK	OK
Clothoid	519.573	3424.1953	3590.6374	N 75°17'05.9880...	3433.3199	3629.5799	N 77°34'36.5803...	40.000		141.421	OK	OK	OK
Linear	559.573	3433.3199	3629.5799	N 77°34'36.5803...	3437.1426	3646.9329	N 77°34'36.5803...	17.769			OK	OK	OK
Linear	577.342	3437.1426	3646.9329	N 77°34'36.5803...	3452.6680	3717.4109	N 77°34'36.5803...	72.168			OK	OK	OK
Linear	649.510	3452.6680	3717.4109	N 77°34'36.5803...	3468.1935	3787.8889	N 77°34'36.5803...	72.168			OK	OK	OK

### LESSON NAME: CHAIN POINTS

#### LESSON OBJECTIVE:

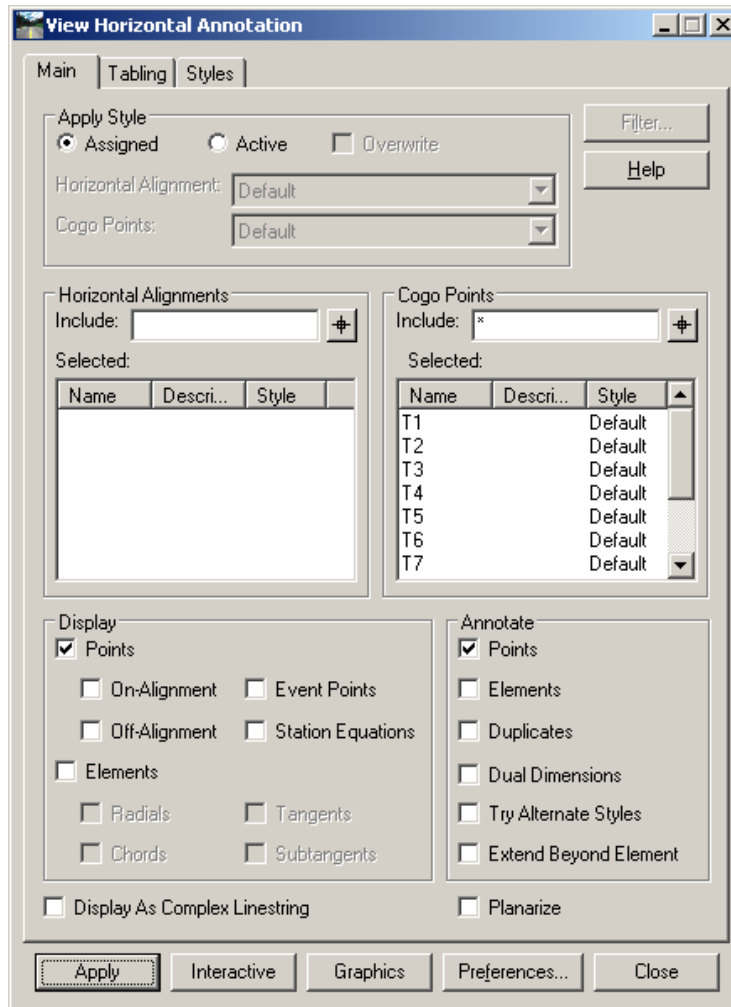
This lesson will show how to use the Chain Points Utility

#### EXERCISE: CHAIN POINTS BY COGO POINTS

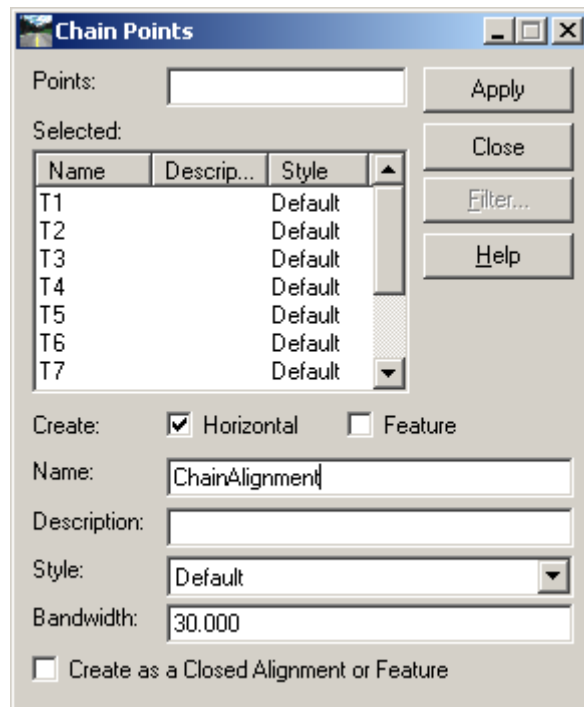
This lesson will guide you how to use the Chain Points Utility

1. Load Chain Points.alg

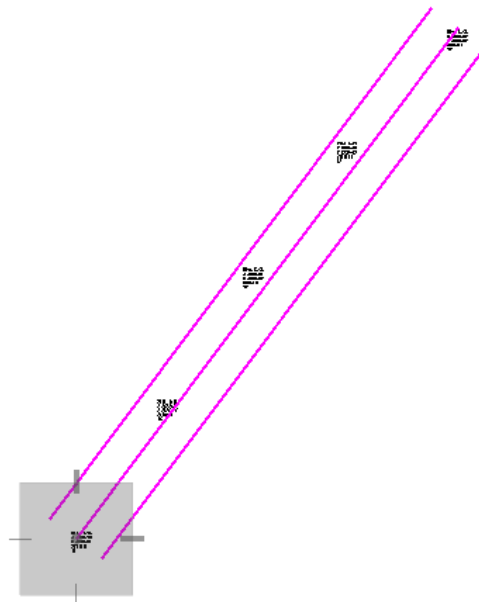
## 2. View the cogo points



- Use the Utility Geometry > Utilities > Chain Points by alignment



Apply & Identify the 1<sup>st</sup> points then the 2<sup>nd</sup> point

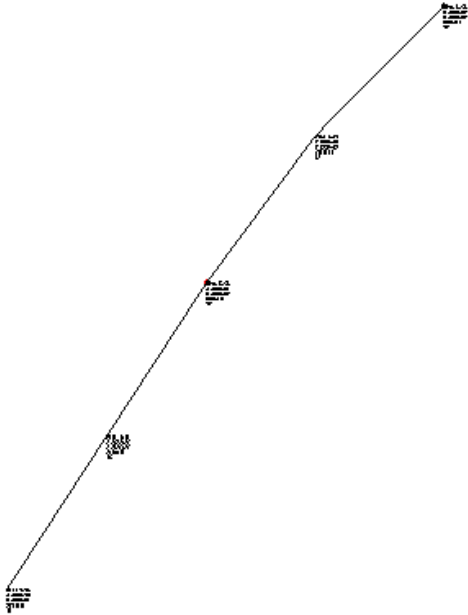


The magenta line views the bandwidth of 30 ft or m

**Hint:** Turn the Cogo Snap Lock ON



The result should look like this:

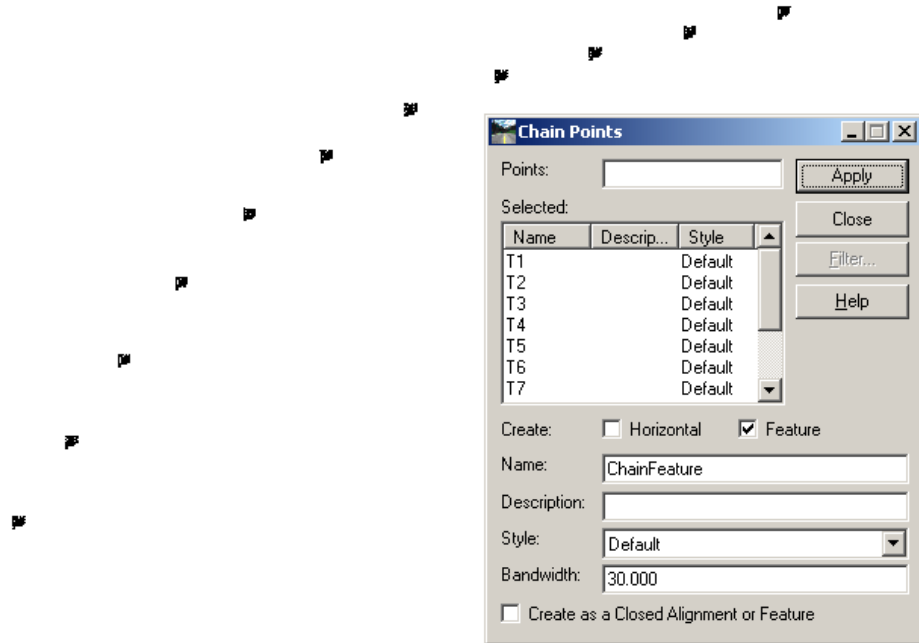


The screenshot shows the 'Chain Points' dialog box. It has a title bar with the text 'Chain Points'. Below the title bar, there is a 'Points:' field with an empty text box and an 'Apply' button. Below that is a 'Selected:' section containing a table with three columns: 'Name', 'Descrip...', and 'Style'. The table lists points T1 through T7, all with 'Default' in the 'Style' column. To the right of the table are buttons for 'Close', 'Filter...', and 'Help'. Below the table, there are two radio buttons: 'Horizontal' (checked) and 'Feature'. Below that are fields for 'Name' (containing 'ChainAlignmenu'), 'Description', 'Style' (a dropdown menu set to 'Default'), and 'Bandwidth' (containing '30.000'). At the bottom, there is a checkbox labeled 'Create as a Closed Alignment or Feature' which is unchecked.

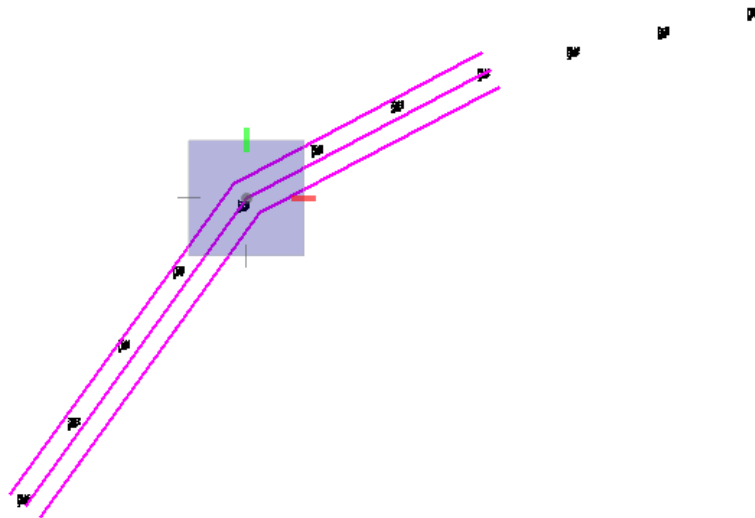
Name	Descrip...	Style
T1		Default
T2		Default
T3		Default
T4		Default
T5		Default
T6		Default
T7		Default

### EXERCISE: CHAIN POINTS FOR FEATURES

4. Create a surface
5. Turn the Feature check box ON.

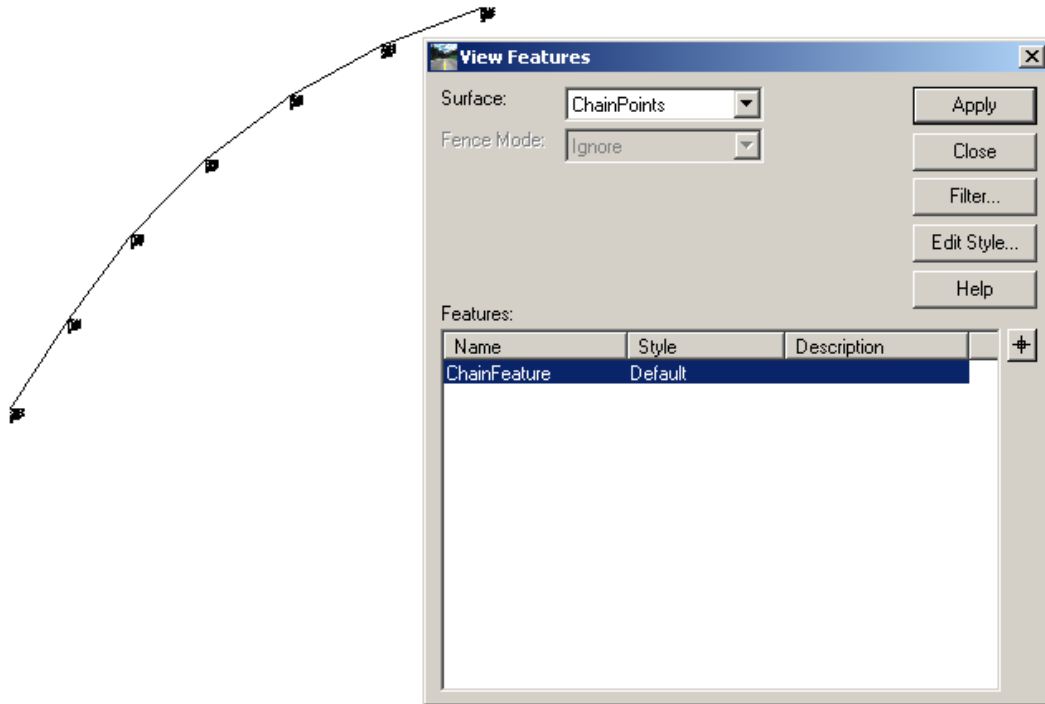


6. Apply



Identify the points you want to create a feature on.

7. Surface > View Surface > Features



**LESSON NAME: CURVE FITTING**

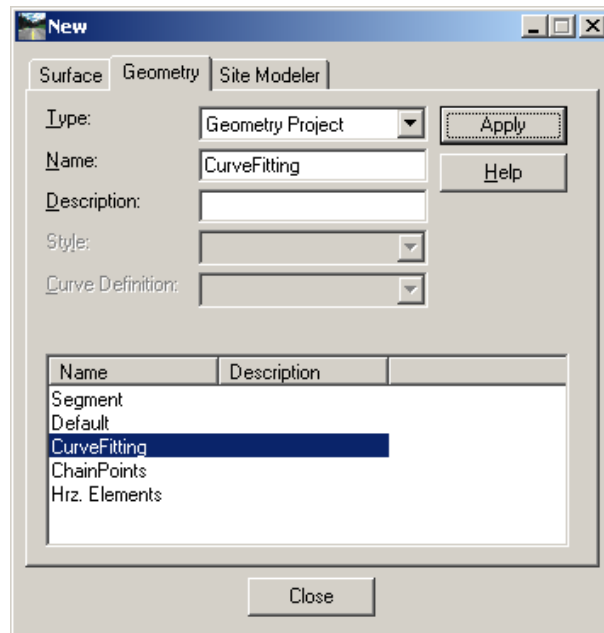
**LESSON OBJECTIVE:**

This lesson will show how to use the curve fitting utility to find the best fit alignment between 2 lines

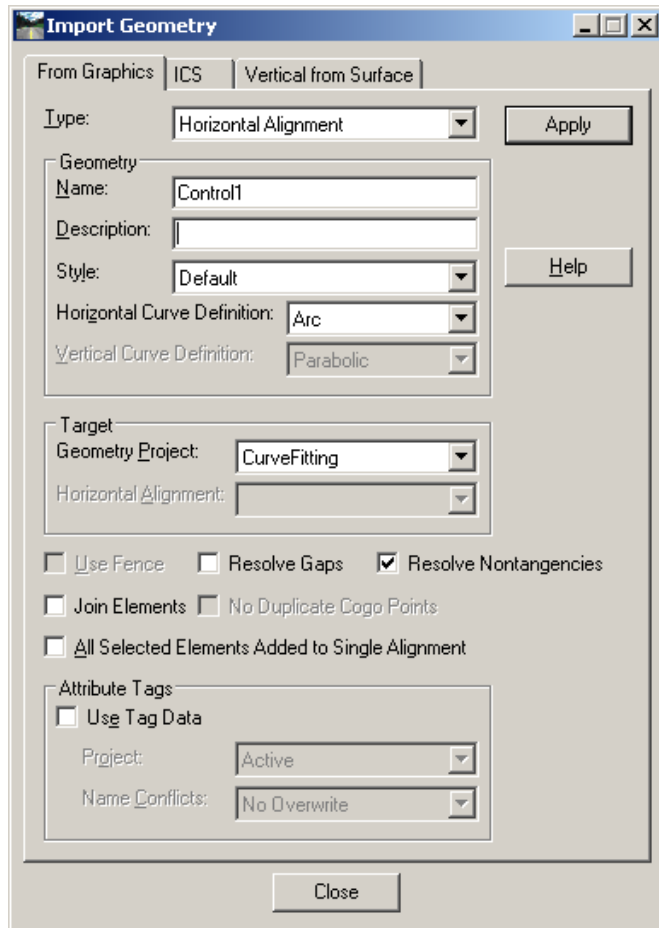
**EXERCISE:**

This lesson will show how to use the curve fitting utility to find the best fit alignment between 2 lines

1. Load Curve Fitting.dgn  
The graphic should display 2 line strings as surveyed features
2. Create a New Geometry Project



3. Import Geometry from Graphic lines  
File > Import > Geometry > From Graphics ...



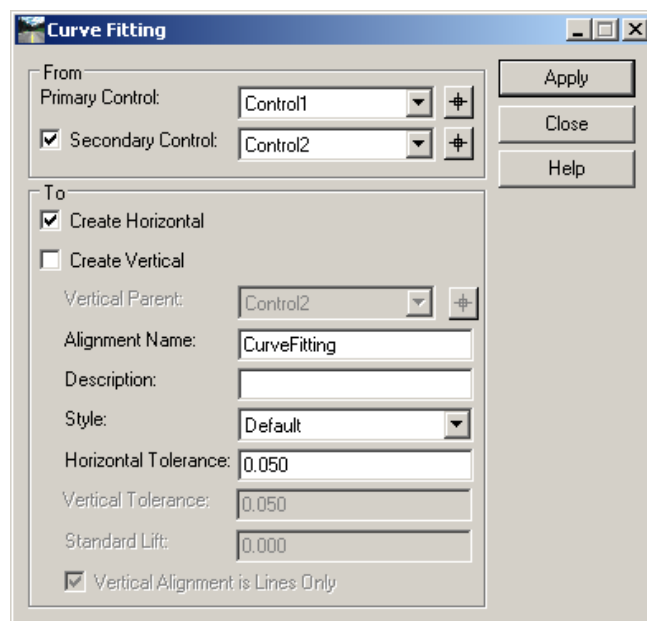
#### 4. Create a Best Fit Alignment between control line

Uses a 3D line-string, in the form of a horizontal alignment, and creates a new horizontal alignment and vertical alignment that is defined with lines and arcs. The resultant geometry passes within a user-defined tolerance of the point data.

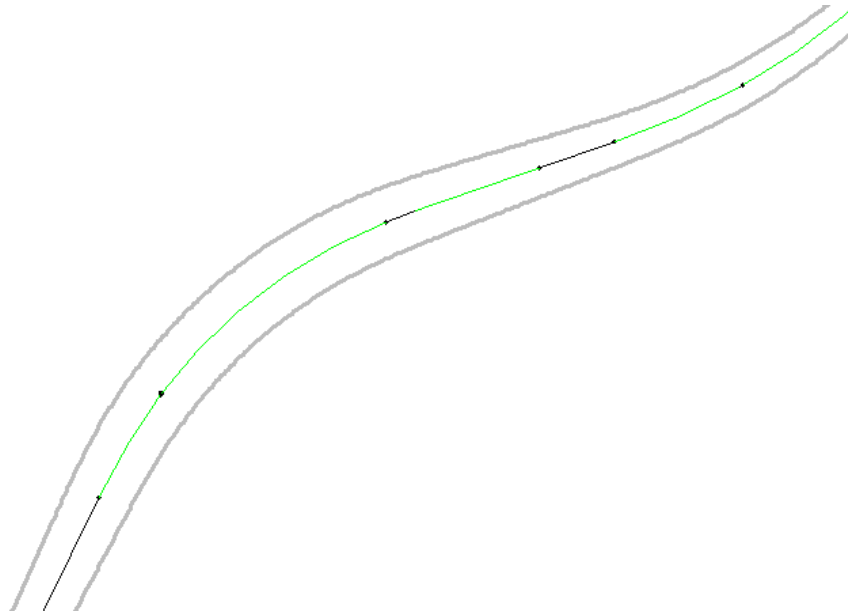
Curve Fitting does not create transition spirals. Transition spirals are created by Quick regression Analysis. Visit the rail seminar.

The Curve Fitting command's source data is an alignment defined as a line-string with xyz values. Quick regression's source is a regression buffer.

Use this command to curve fit a horizontal and vertical alignment.



The software has been created a new horizontal alignment.



### 5. Check Integrity

Type	Station ...	Northing ...	Easting @ ...	Direction @ Start	Northing ...	Easting @ ...	Direction @ End	Length	Radius	Constant	Integrity ...	Integrity ...	Elemen
Linear	0.000	3110.2655	3123.7249	N 26°06'45.1301"	3303.9870	3218.6807	N 26°06'45.13018" E	215.742			OK	OK	OK
Circular	215.742	3303.9870	3218.6807	N 26°06'45.1301"	3342.5838	3241.7743	N 35°40'27.01041" E	45.030	269.833		OK	OK	OK
Linear	260.772	3342.5838	3241.7743	N 35°40'27.0104"	3343.1136	3242.1547	N 35°40'27.01041" E	0.652			OK	Non-coinci...	OK
Circular	261.425	3343.1022	3242.1706	N 36°56'46.6779"	3407.3978	3326.6697	N 68°31'06.51922" E	107.534	195.149		Non-coinci...	Non-coinci...	Condition
Linear	368.959	3407.4689	3326.6418	N 68°55'24.4354"	3411.5979	3337.3555	N 68°55'24.43541" E	11.482			Non-coinci...	Non-coinci...	OK
Circular	380.441	3411.6154	3337.3501	N 70°38'34.6944"	3427.7875	3384.2538	N 71°18'33.50189" E	49.614	4266.102		Non-coinci...	Non-coinci...	OK
Linear	430.054	3427.7889	3384.2533	N 70°55'57.3393"	3437.5378	3412.4583	N 70°55'57.33937" E	29.842			Non-coinci...	OK	OK
Circular	459.897	3437.5378	3412.4583	N 70°55'57.3393"	3458.0216	3459.2222	N 61°45'29.25962" E	51.108	-319.176		OK	OK	OK
Linear	511.005	3458.0216	3459.2222	N 61°45'29.2596"	3458.8799	3460.8201	N 61°45'29.25962" E	1.814			OK	Non-coinci...	OK
Circular	512.818	3458.8959	3460.8115	N 60°41'14.0195"	3537.9811	3547.0123	N 34°14'34.62220" E	118.028	-255.726		Non-coinci...	Non-coinci...	OK
Linear	630.846	3537.9397	3547.0732	N 33°57'45.5343"	3548.8695	3554.4352	N 33°57'45.53433" E	13.178			Non-coinci...	Non-coinci...	OK
Circular	644.024	3548.8620	3554.4479	N 32°36'56.5068"	3602.9655	3588.8609	N 32°18'06.47976" E	64.121	-11703.991		Non-coinci...	Non-coinci...	OK
Linear	708.145	3602.9579	3588.8727	N 32°24'54.7809"	3764.9502	3691.7365	N 32°24'54.78094" E	191.892			Non-coinci...	OK	OK

As you can see there some issues with the colinearity.

You can try to get a better geometrical result if you set the tolerance higher.

**Curve Fitting**

From

Primary Control: Control1

Secondary Control: Control2

Apply

Close

Help

To

Create Horizontal

Create Vertical

Vertical Parent: CurveFitting

Alignment Name: CurveFittinh

Description:

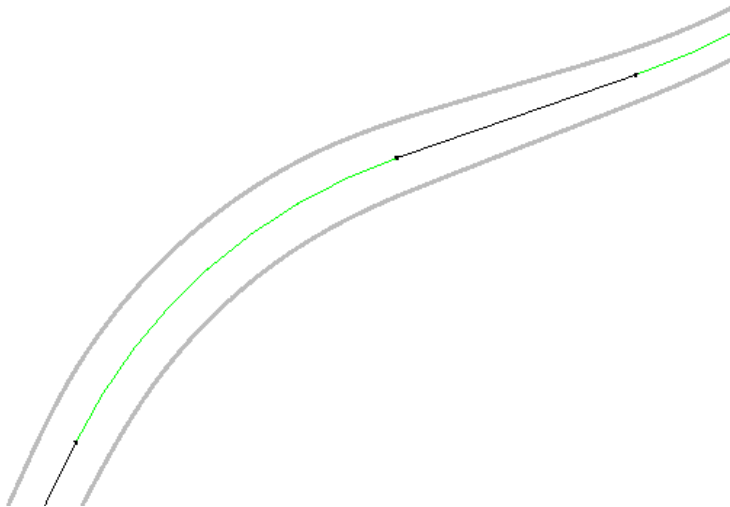
Style: Default

Horizontal Tolerance: 0.500

Vertical Tolerance: 0.050

Standard Lift: 0.000

Vertical Alignment is Lines Only



**Check Horizontal Integrity**

Type	Station ...	Northing ...	Easting @ ...	Direction @ Start	Northing ...	Easting @ ...	Direction @ End	Length	Radius	Constant	Integrity ...	Integrity ...	Elemen
Linear	0.000	3110.3637	3123.5260	N 26°16'13.1807...	3299.4852	3216.8738	N 26°16'13.18078" E	210.905			OK	OK	OK
Circular	210.905	3299.4852	3216.8738	N 26°16'13.1807...	3409.1068	3336.9992	N 68°57'53.99602" E	166.450	223.374		OK	OK	OK
Linear	377.354	3409.1068	3336.9992	N 68°57'53.9960...	3437.7728	3411.5406	N 68°57'53.99602" E	79.863			OK	OK	OK
Circular	457.218	3437.7728	3411.5406	N 68°57'53.9960...	3561.3207	3562.4335	N 32°24'54.78094" E	198.366	-310.961		OK	OK	OK
Linear	655.584	3561.3207	3562.4335	N 32°24'54.7809...	3764.9502	3691.7365	N 32°24'54.78094" E	241.214			OK	OK	OK

Select    First    < Previous    Next >    Last