7. Proposed Roadway Profiles

In this exercise, we will use the Vertical Alignment Profile Generator tool to set up the proposed vertical alignment profile for our roadway.

I.) Generate the Proposed Profile

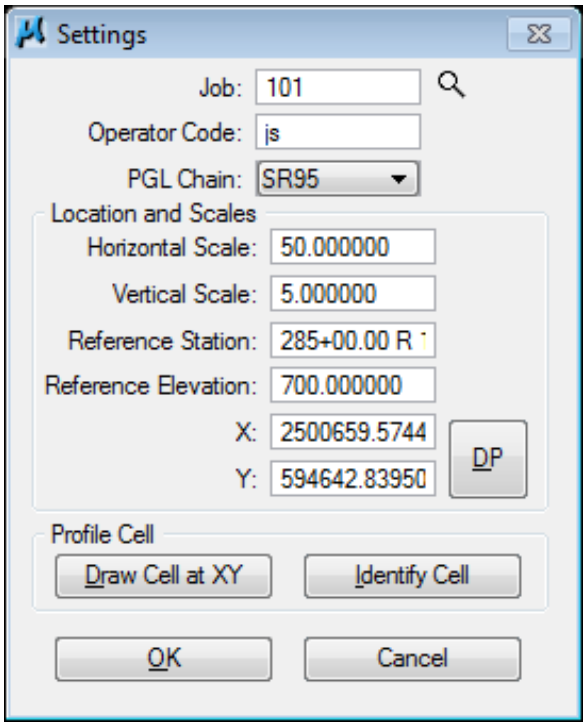
1) Open the MicroStation file:

C:\Projects\Roane\SR95PoplarCr\ROSR95Alignments.dgn

Access Project Manager

2) Select the Vertical Alignment button from the Project Manager workflow dialog.

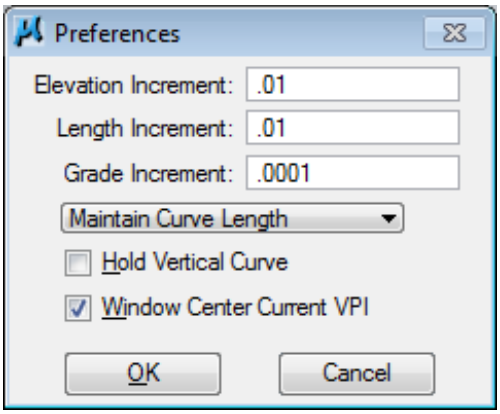
3) All of the information in the Settings dialog should be automatically populated based upon the information we set up in our working alignment definition.



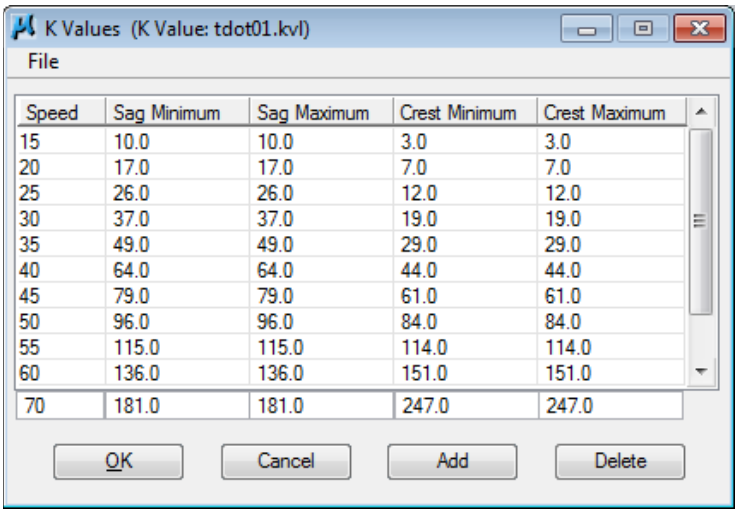
Click the OK button to commence developing of the proposed profile.

4) The Profile Generator dialog is opened for us but before we start storing our profile lets look at some additional controls. In the dialog, go to the drop down option File → Preferences

These special controls may be used to control how stations, lengths or grades are set. We use the defaults for the most part but click on Window Center Current VPI so we will always see the area we are defining at the time and set the vertical curve control option to Maintain Curve Length. Click on the OK button once settings are made.

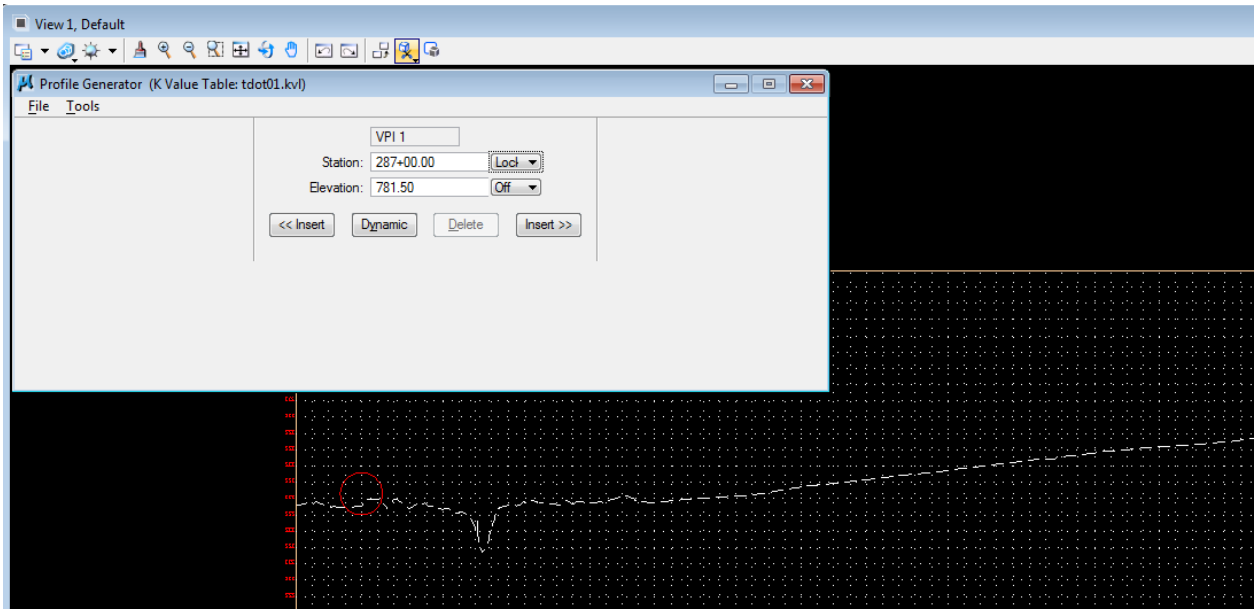


5) In the Profile Generator dialog go to the drop down option File → K Value Table. By default the standard K value file tdot01.kvl is loaded. This file contains K values based on T.D.O.T.'s RD01 standard roadway drawings. Click on the Cancel button retain the current settings.



If you need to reset this table, in the K Values dialog select the drop down option File → Open, navigate to the folder C:\Users\Public\Geopak Standards and load the desired file. Click on the OK button once settings are made.

6) Now that we have made our initial settings, we can start setting up our proposed profile. Set the first VPI Station to 287+00 and Elevation to 781.50 as shown in the diagram below. Be sure to press the Enter key after each entry is made.



In graphics, we can see our VPI position point.

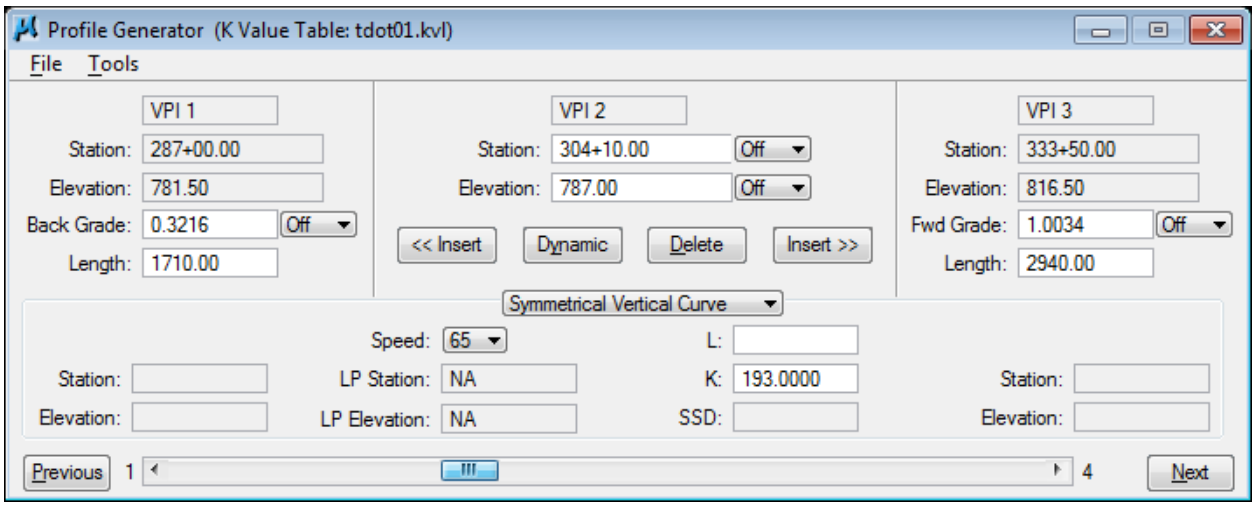
7) Press the Insert button on the right and complete the VPI Station and Elevation of the subsequent VPIs as detailed in the table below.

VPI	Station	Elevation
2	304+10	787.00
3	333+50	816.50
4	347+50	793.32

NOTE:

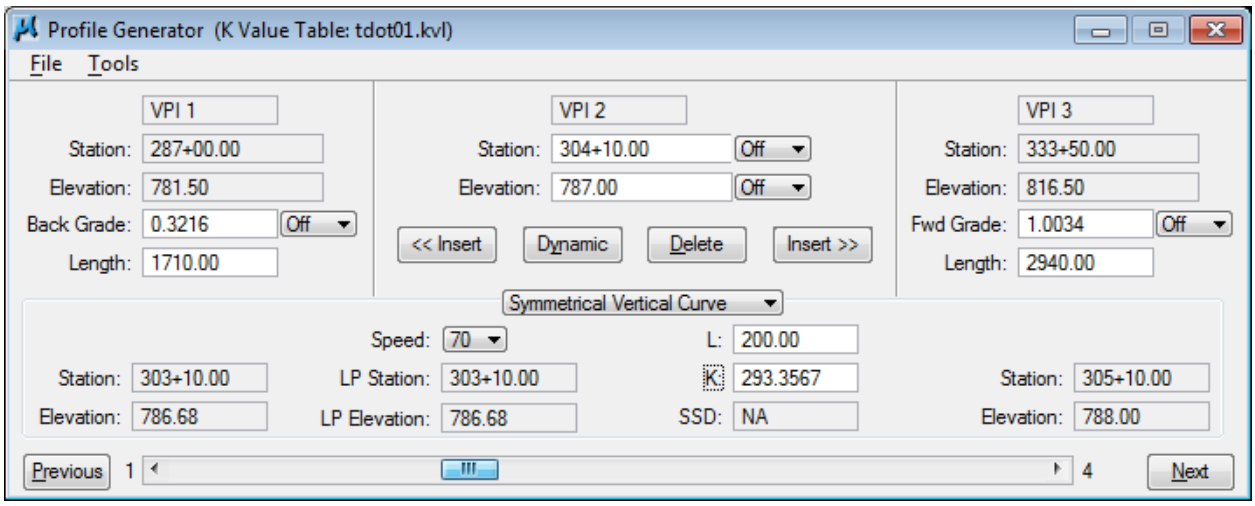
The Dynamic button allows you to set VPIs by eye when values are not yet known and can be used in conjunction with the Lock or Inc (increment) buttons to the right of the station & elevation values. Lock will lock that particular value down while the other is dynamic. Inc will force dynamics to use value controls set in preferences.

8) Press the Previous button at lower left of dialog to return to VPI #2 as shown in the diagram below.



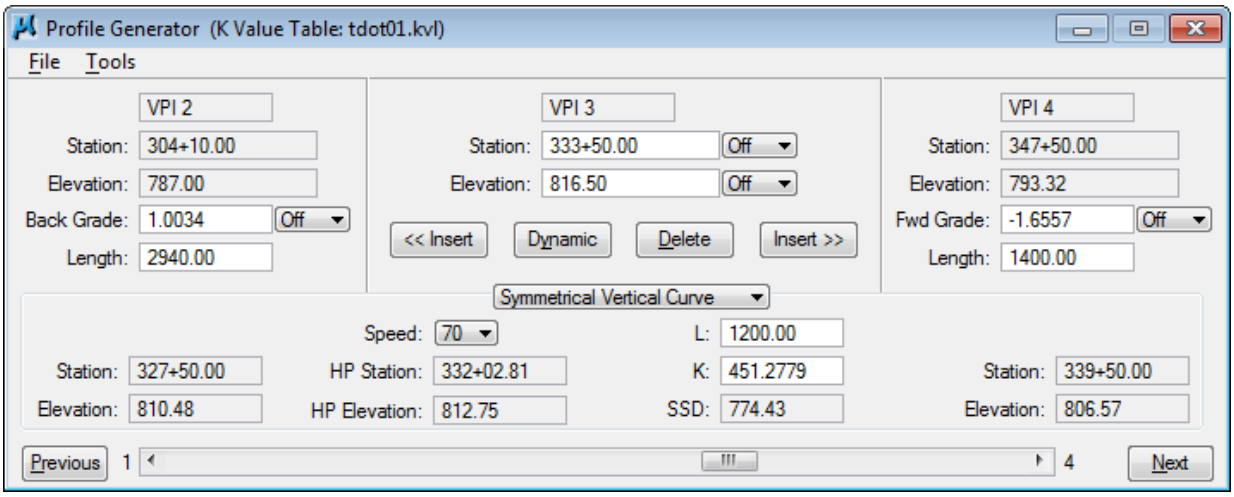
9) Make sure the curve type at the bottom is set to Symmetrical and set the Design Speed to 60. The K value is automatically read from our table and a curve length of 92.72 is computed.

We need an even length of curve preferably in 50 or 100 foot increments and this VPI has a small algebraic difference so go ahead and change the curve length to 200.

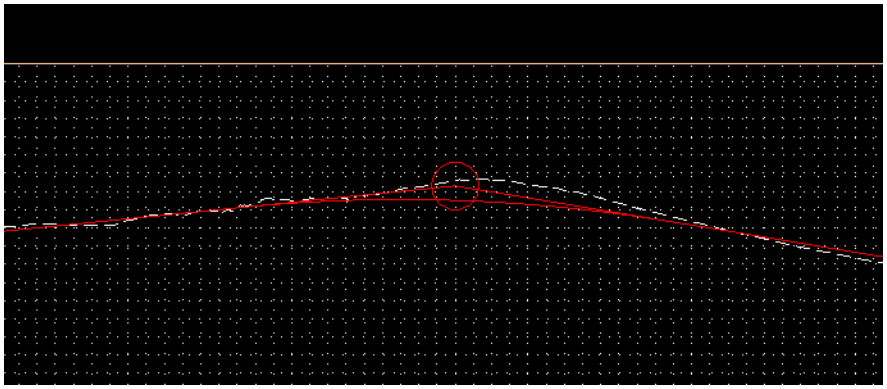


The new curve length is used to calculate a new K value which is used with our K value table to indicate that we are now meeting 70 mph vertical design speed criteria.

10) Press the Next button at lower right of dialog to preview the information for VPI #3. We only need a 50 mph vertical curve here but go ahead and set a curve length of 1200 which yields a Design Speed of 70 mph.

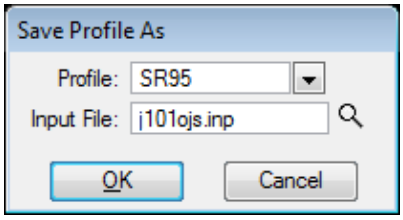


In graphics, we can see our curve as specified.



NOTE:
Graphics shown while using Profile Generator are temporary visualizations and disappear when the program is exited. Graphics for the plans are displayed using D&C Manager which we will do in the next section.

11) Save the proposed profile by selecting File → Save Profile from the Profile Generator dialog. Enter SR95 for the profile name and click OK to save. Click OK again to dismiss the Confirmation message box.



12) Exit the Profile Generator dialog. When prompted to save your profile, you can answer NO since we did that in Step 11. When prompted to save your Vertical Alignment settings, press YES.

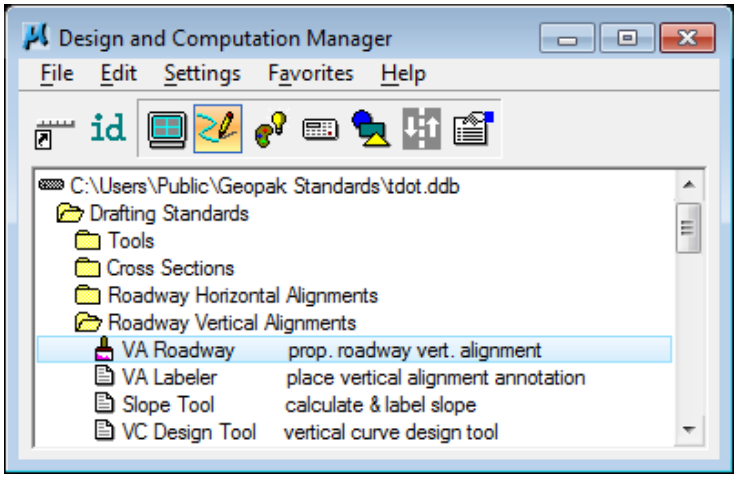
II.) Drawing the Proposed Profile

Next, we are drawing the proposed profile SR95 utilizing D&C Manager.

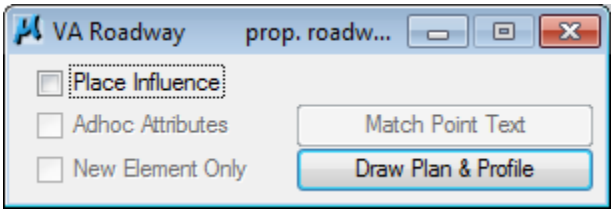
1) Access the D&C Manager.

Select the item:

Drafting Standards → Roadway Vertical Alignments → VA Roadway.

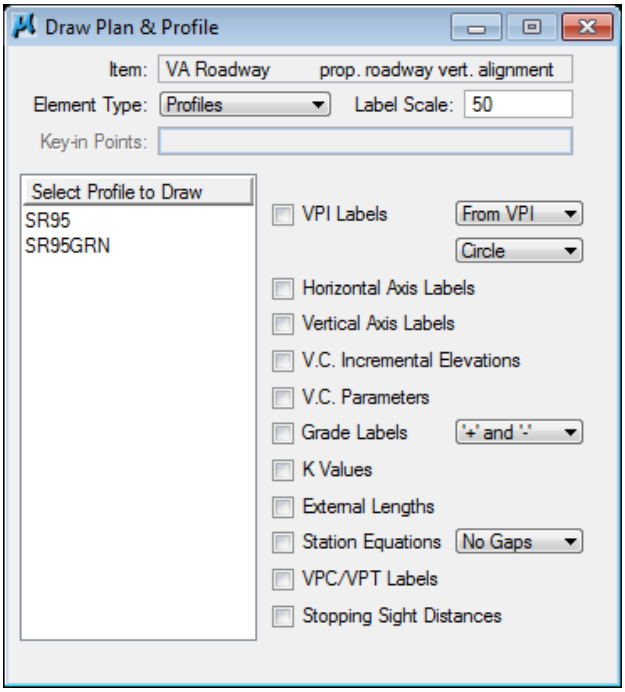


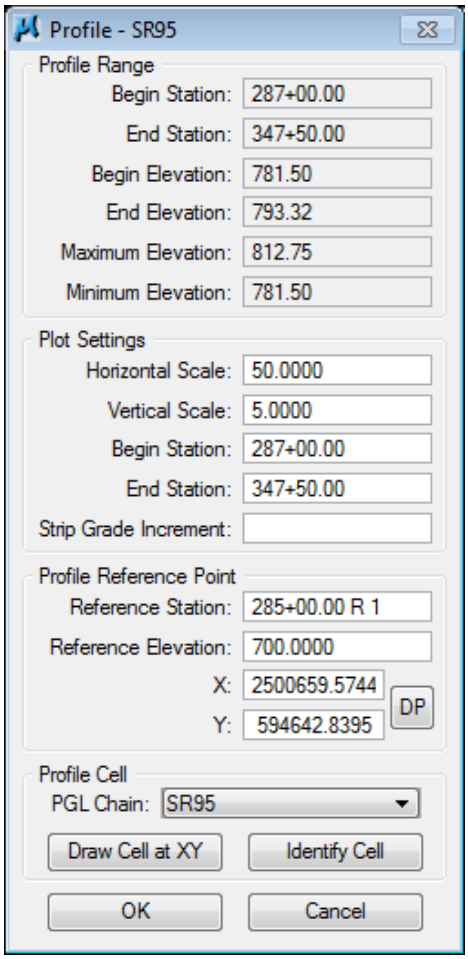
2) Press the Draw Plan & Profile button on the secondary dialog.



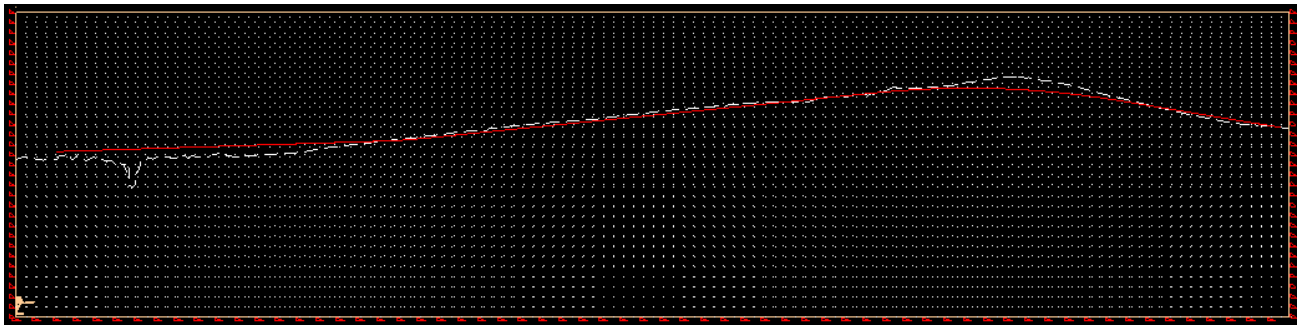
Plot the proposed profile 'SR95' using the parameters as shown in the following dialogs. Options required for proposed roadway profile line work are set by default. Do not turn on any annotation options. All annotation is placed with a separate program which we will use next. Single click on the profile name in the Draw Plan & Profile dialog.

Since we have our profile control information set up in the working alignment, all of that data in the Profile dialog is filled in automatically. Review the data then click OK to draw the profile.



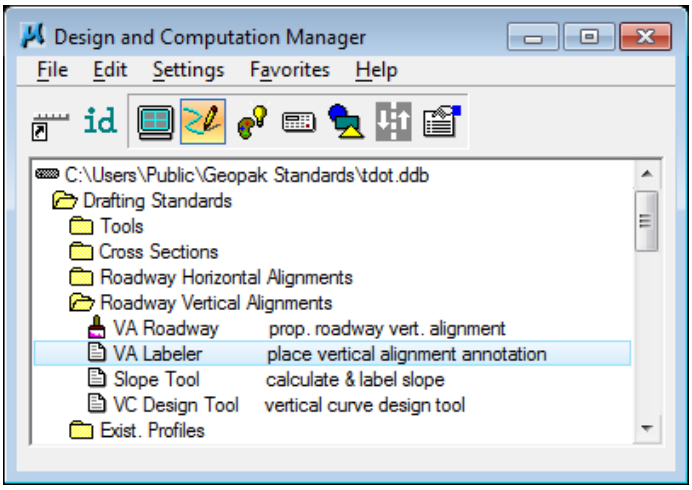


3) Exit the Draw Plan and Profile dialog then review the proposed vertical alignment line work in MicroStation.

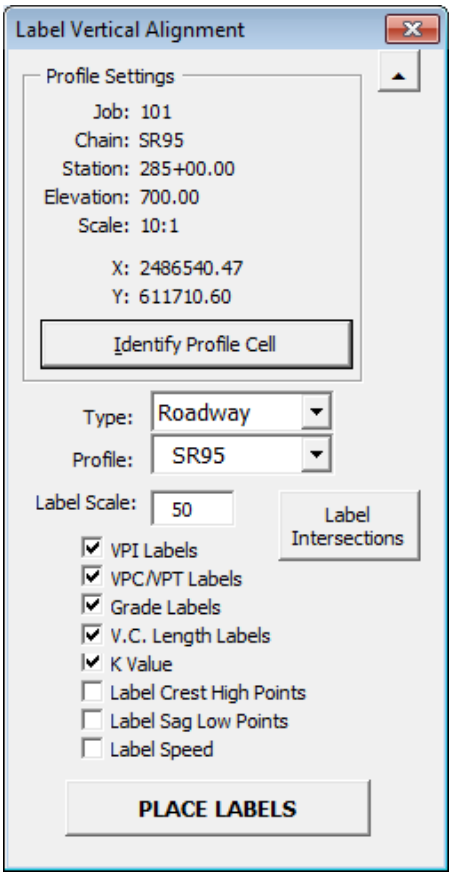


4) We run a separate special program to place all of the vertical alignment annotation. Double-click the item**:**

Drafting Standards → Roadway Vertical Alignments → VA Labeler



5) The Label Vertical Alignment Dialog is opened.



6) Click on the Identify Profile Cell command button and click on the Geopak profile cell for our profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to enlarge the dialog after identifying the cell.

After reading the profile cell and populating the Profile Settings at the top of the dialog, the GPK file is read for all profiles/vertical alignments applicable for display on this profile and fills the profile list box.

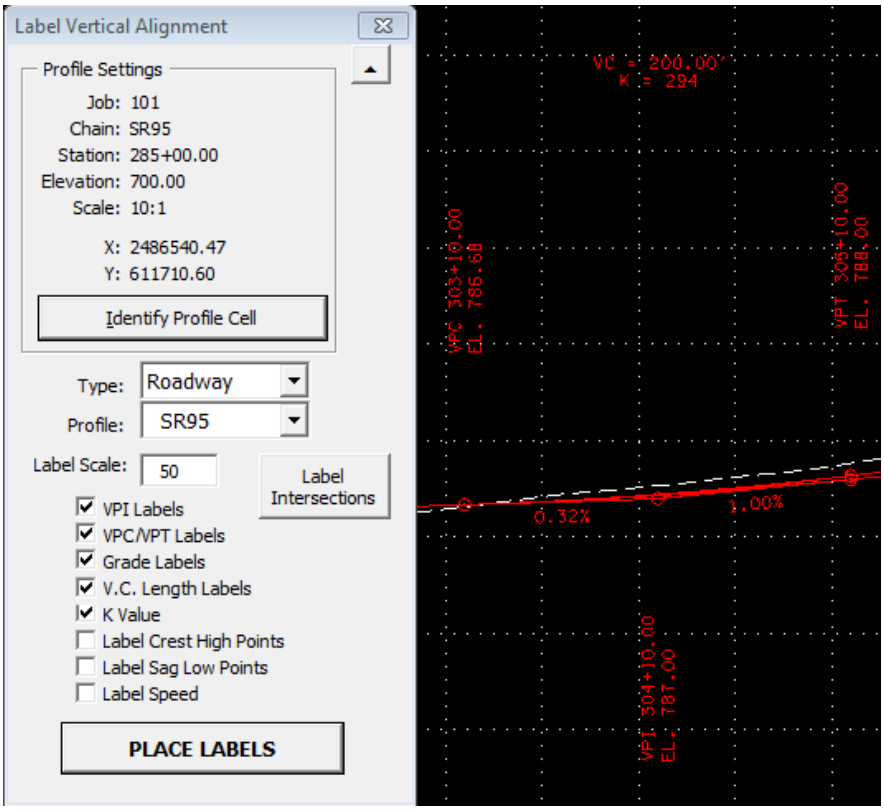
7) Next, set the Type of profile to be labeled. The default is Roadway which is what we need. Options to label special ditches or private drives are also available. The type controls text sizes, orientation and symbology.

8) Set the Profile option to SR95.

9) Set the Scale to 50 if not set already. The current active scale is read when the program is started to fill in this field automatically.

10) Finally, the label options can be adjusted as needed. The type of profile to be labeled determines which default options are turned on. For this class, we will use the defaults for Roadway.

11) Now that all control values are set, click on the Place Labels command button and the vertical alignment is annotated. Review the annotation graphics and click the red **X** to close the dialog. You can close D&C Manager as well.

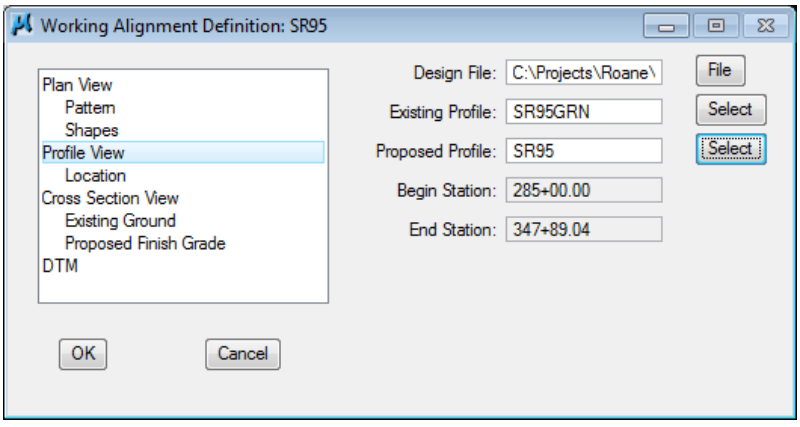


III.) Working Alignment - Define Proposed Profile

We are completing the Profile View of the Working Alignment Definition in Project Manager.

1) Press the Define button from the workflow dialog of Project Manager.

2) Highlight the Profile View option and populate the Proposed Profile field as depicted below using the Select button.



3) Press the OK button to save the updates and close the dialog.