Superelevation Profile Diagram

TDOT Department of Transportation **Roadway Design Division**

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The purpose of this document is to provide the designer information to draw the superelevation diagram. This diagram is important to show so that it is easily seen where superelevation changes take place.

In addition to the superelevation diagram on the profile sheet, critical superelevation stations are shown in the cross-sections. These are:

Begin/ End super section

P.C.

P.T.

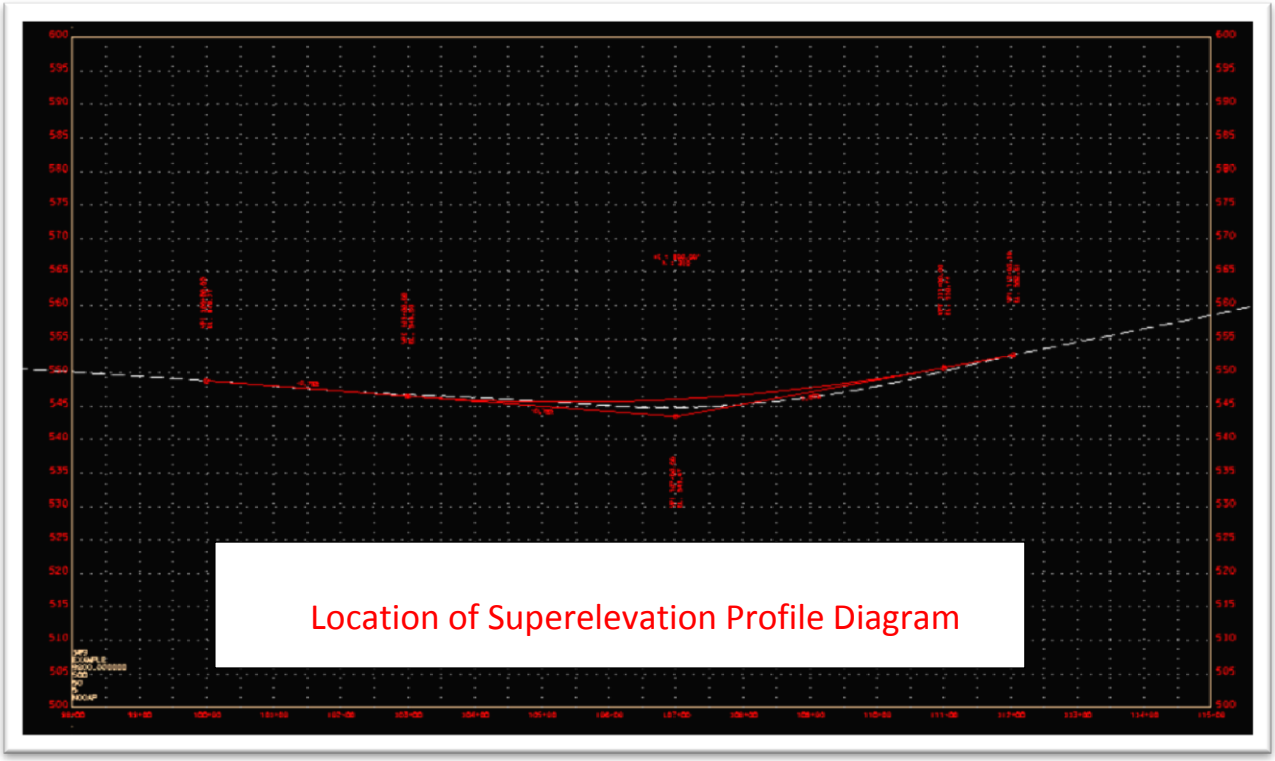
Begin full super section

Reverse Crown

0% cross slope

Superelevation Diagram Placement

The best place to draw the superelevation diagram is in the alignment file. If you have displayed the proposed vertical alignment and a profile grid (See GEOPAK v8i Road Course Guide), the diagram should go in the lower portion of this area.



Determining Critical Superelevation Stations

From the Superelevation Calculations tutorial (.inp file created when "Generate Superelevation Transitions" operation is performed in GEOPAK), the stations where superelevations change are as follows:

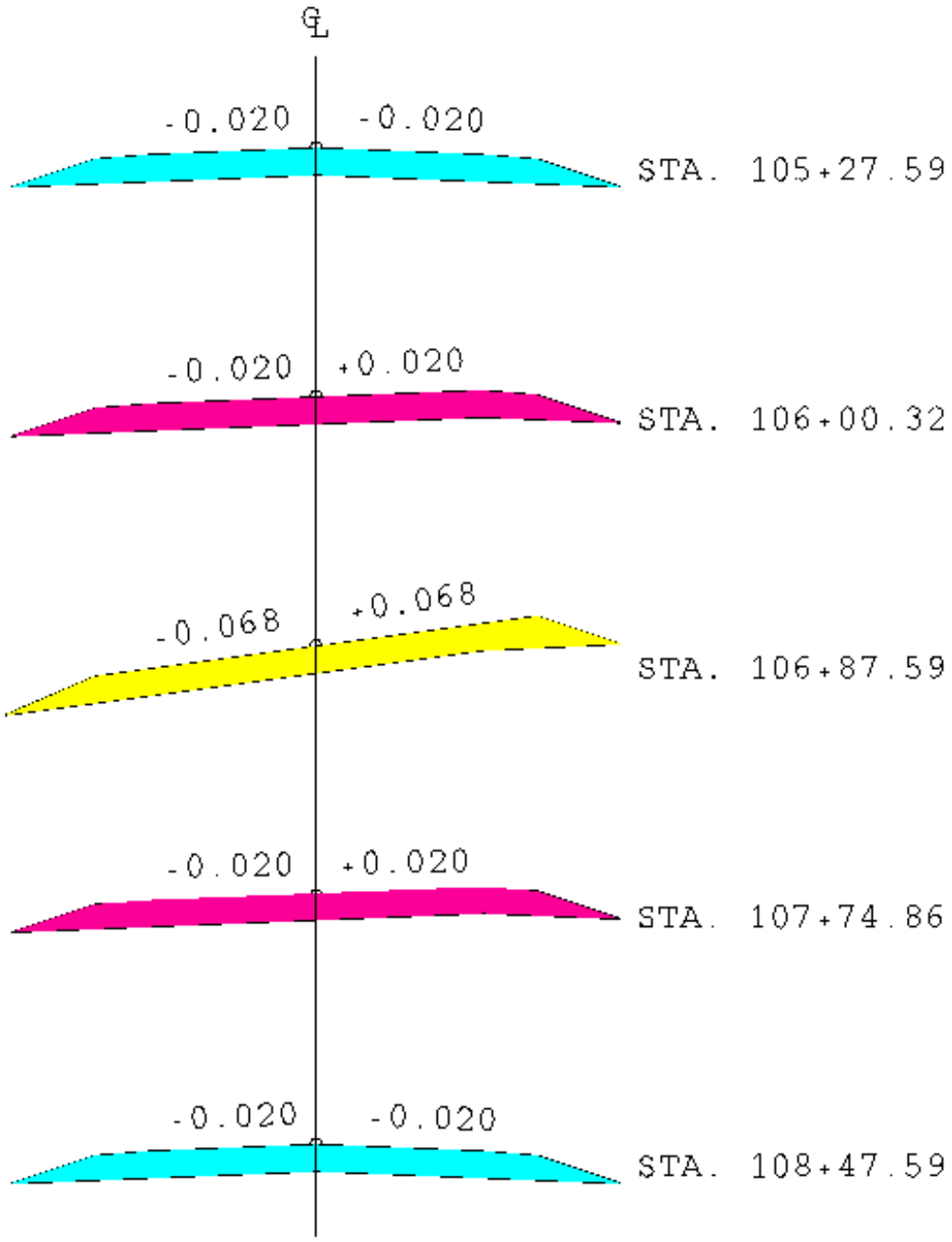
LEFT:

```
ROADNAME   -8.0000
 filler line station / slope
100+00.000000   -2.0000
106+00.315956   -2.0000
106+87.588683   -6.8000  /* Curve D1 */
107+74.861410   -2.0000
112+03.385413   -2.0000
```

RIGHT:

```
ROADNAME   8.0000
 filler line station / slope
100+00.000000   -2.0000
105+27.588683   -2.0000
 106+00.315956    2.0000
106+87.588683    6.8000  /* Curve D1 */
 107+74.861410   -2.0000
108+47.588683   -2.0000
112+03.390000   -2.0000
```

Superelevation Profile Diagram



Drawing the Profile Diagram

Using the 510 elevation line on the grid*, draw a line representing the finished grade which has a slope of 0% or 0 ft/ft.

Use the following symbology settings:

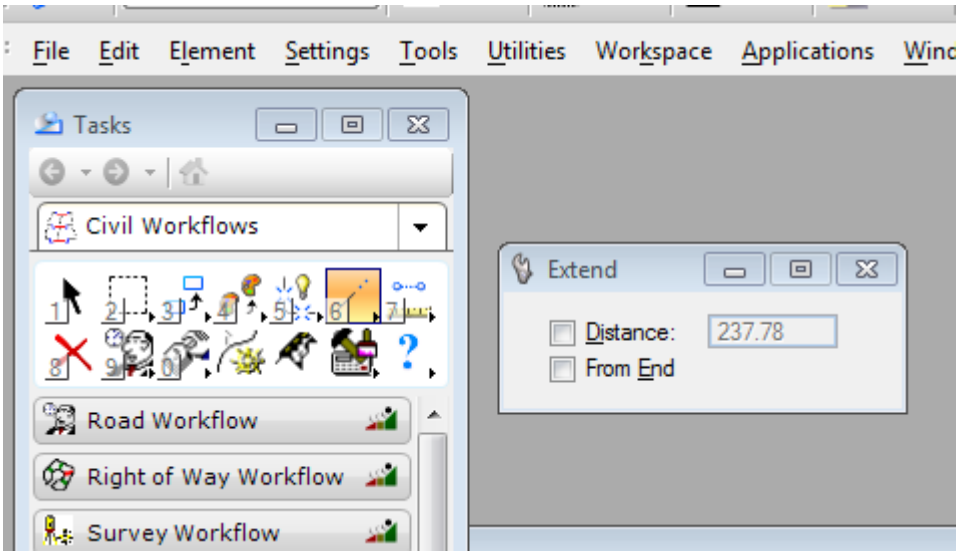
LV: DESIGN-CENTERLINE-Proposed Text

CO: 6

LC: 0

WT:10

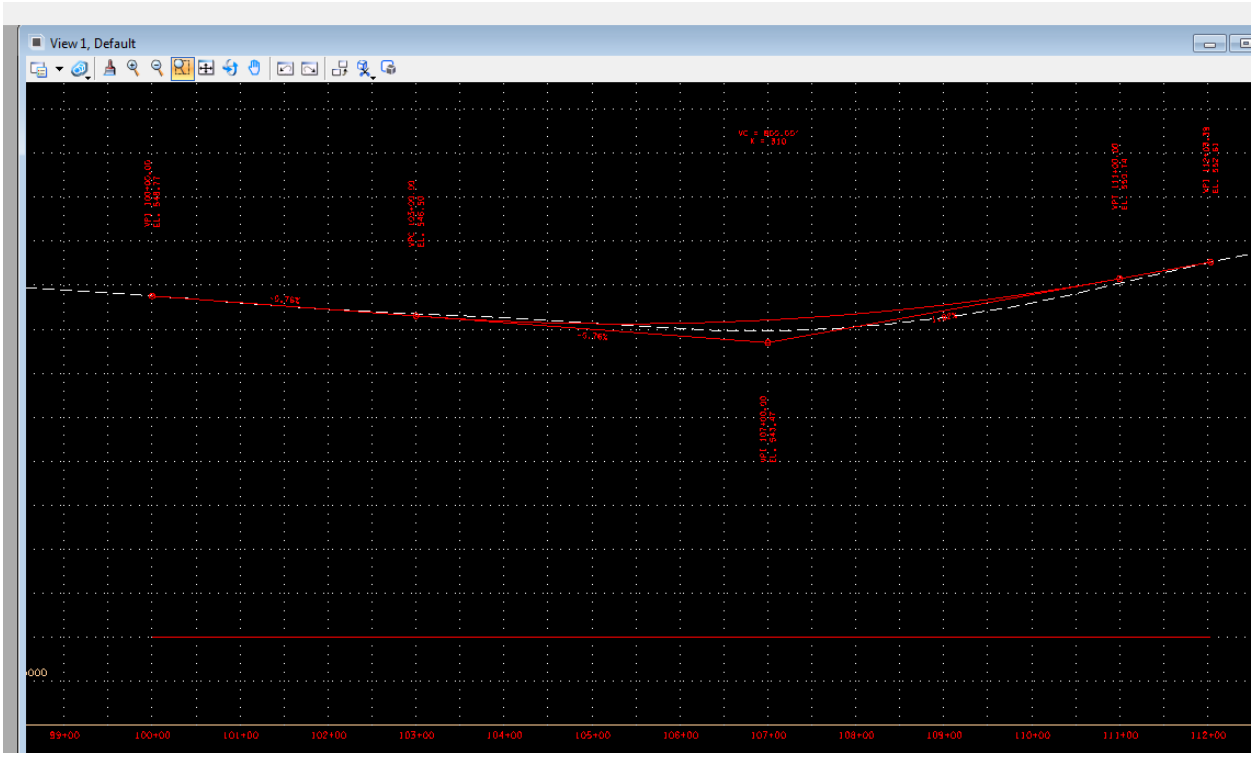
Make sure the line limits are the same as the proposed vertical grade. For this example, sta. 100+00 and sta. 112+03.39.



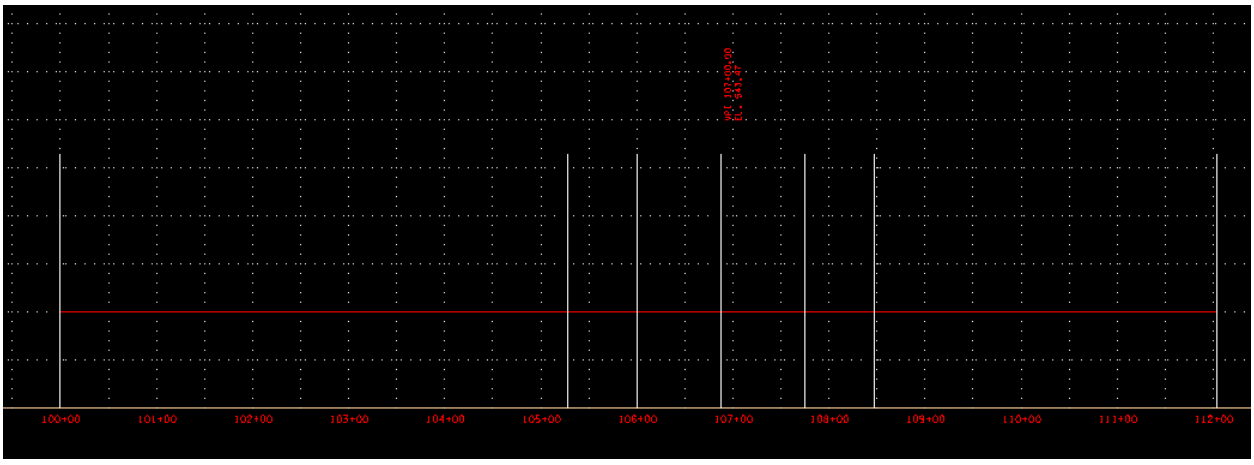
*Depending on the elevations on your project, any elevation line that is a significant distance below the profile

Superelevation Profile Diagram

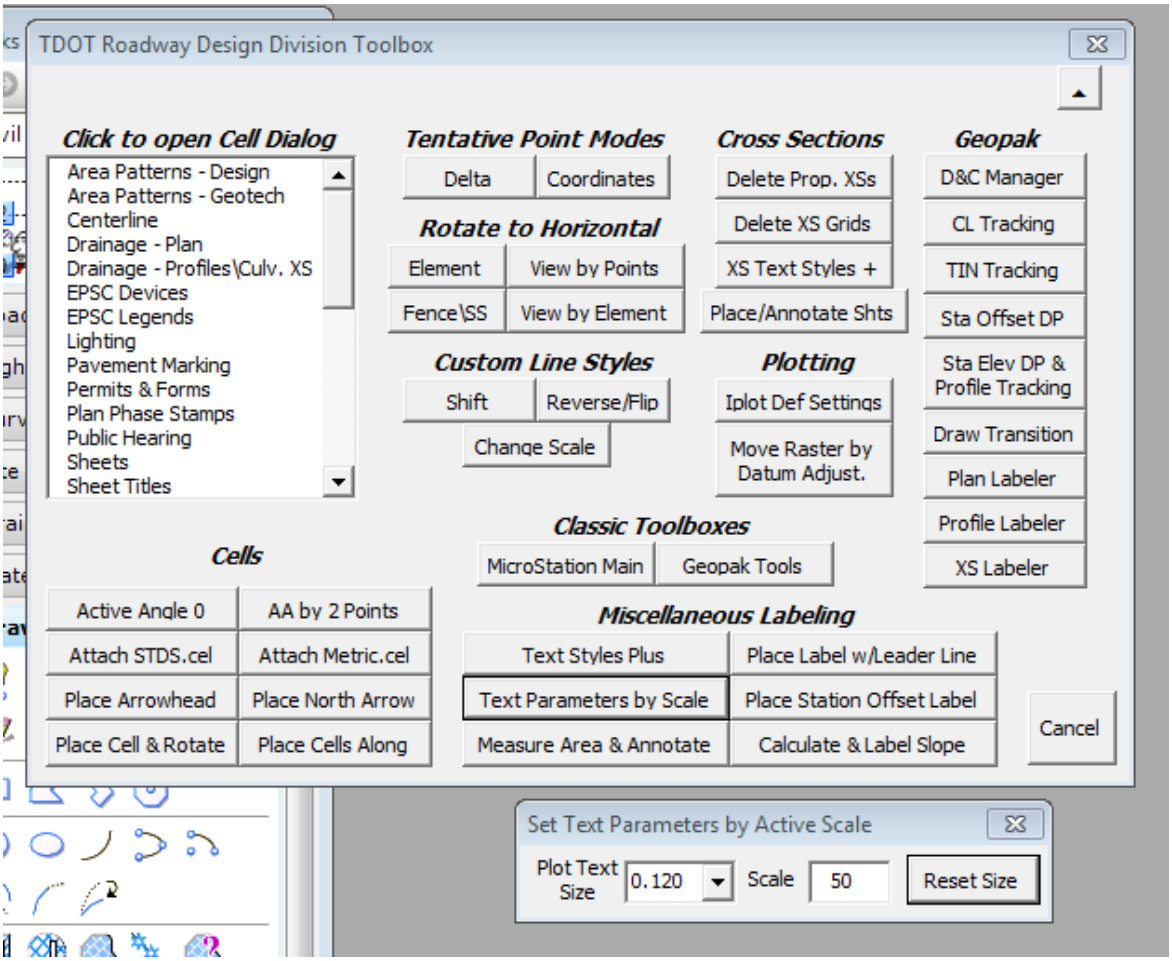
Use “Extend Line” and snap to each end of the profile.



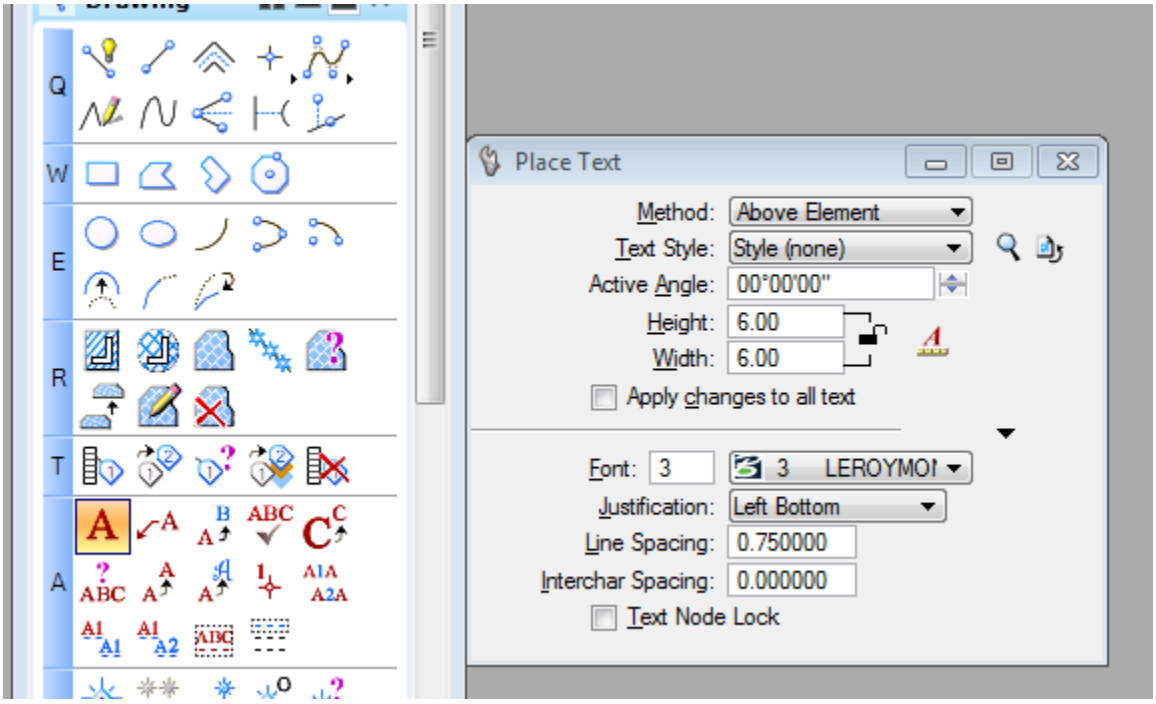
Change line symbology settings WT to 4 and CO to 0, draw vertical lines to represent the superelevation change stations listed on page 2 for both the right and left.

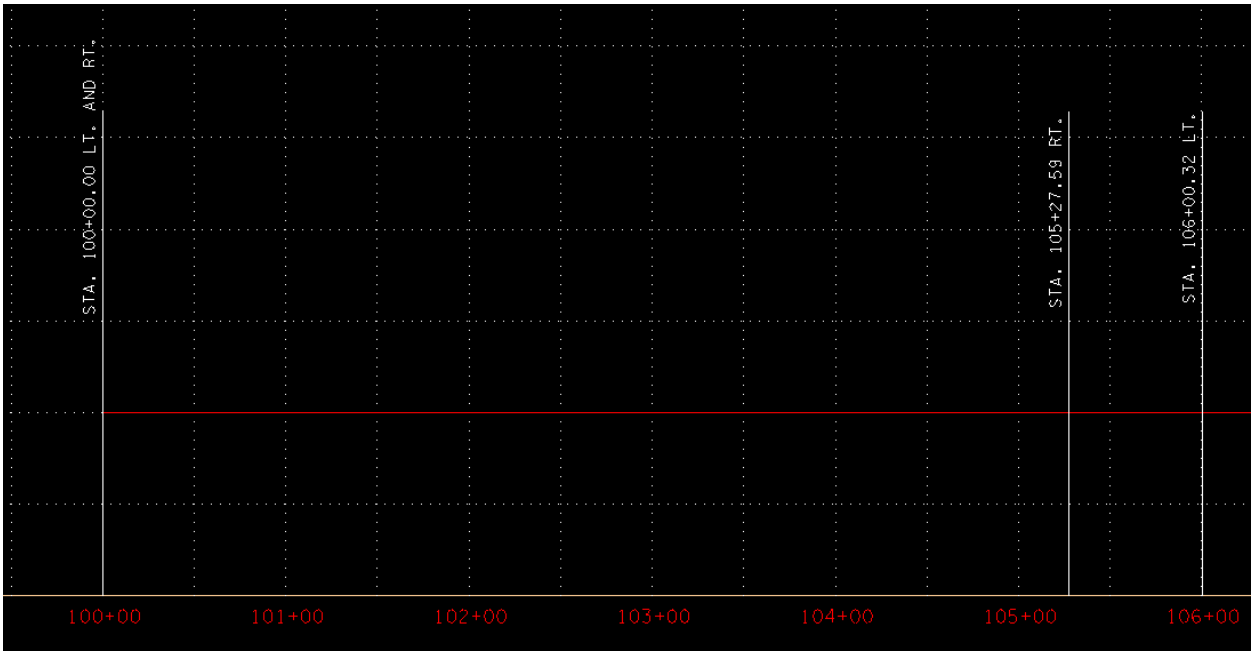


Make text settings as follows and label each vertical line as shown below:

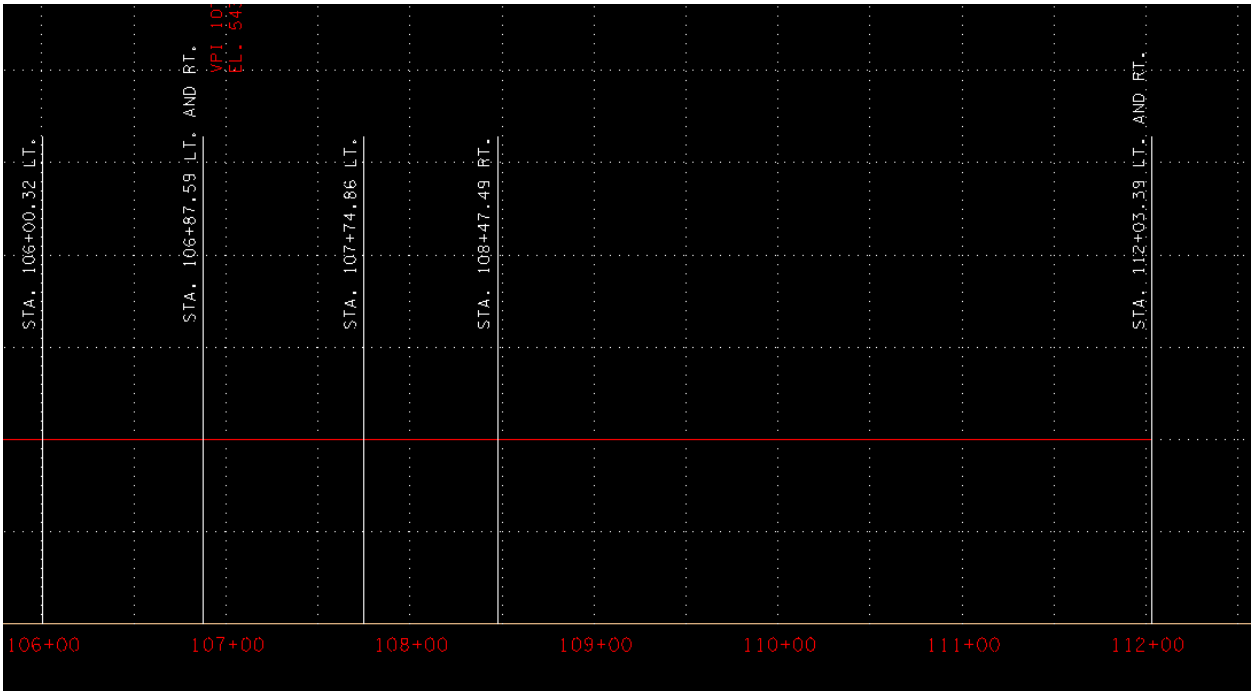


Superelevation Profile Diagram





Superelevation Profile Diagram



Draw the Left Profile Diagram

To distinguish between the left and right diagrams, they should be drawn in different colors. For the left diagram,use the following settings:

LV: DESIGN-CENTERLINE-Proposed Text

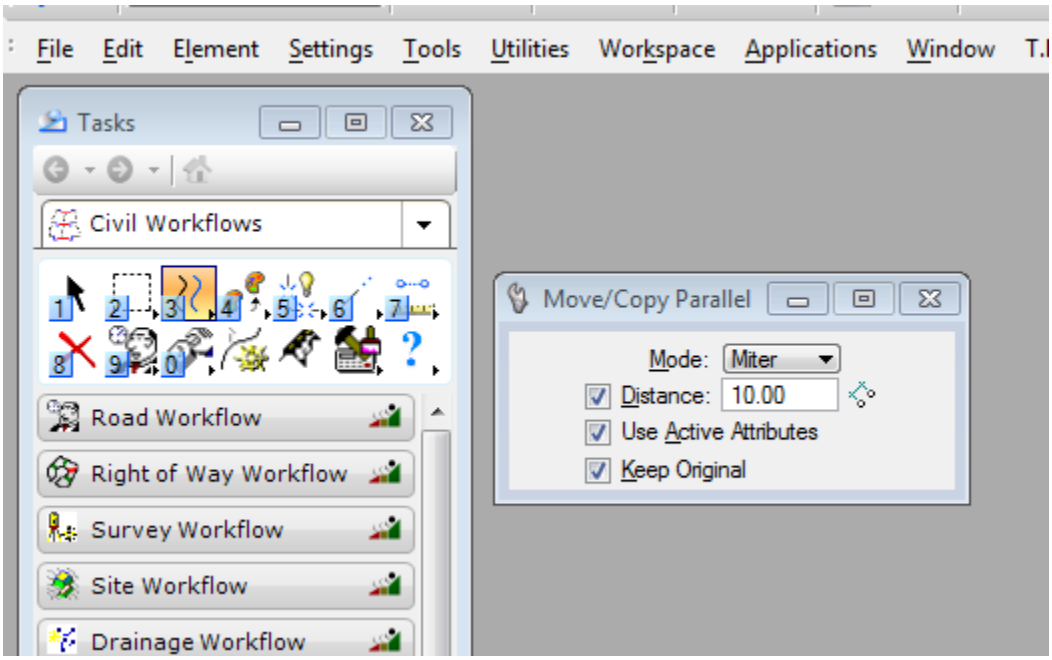
CO: 7

WT: 10

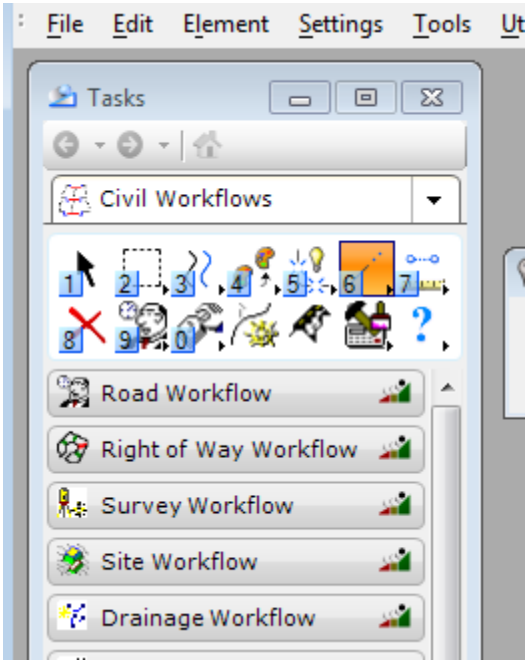
From sta. 100+00 to 106+00.32, the cross slope is a constant -2.00%, or -.020 ft/ft. To draw the diagram proportionally, set one vertical grid, 50 ft, equal to a maximum superelevation of 0.10 ft/ft. Therefore,

$$0.020 \text{ ft/ft} \times \frac{(50 \text{ ft})}{0.100 \text{ ft/ft}} = 10 \text{ ft}$$

The line representing -.020 ft/ft superelevation for the left side can be drawn by copying parallel the red line drawn earlier using the settings:

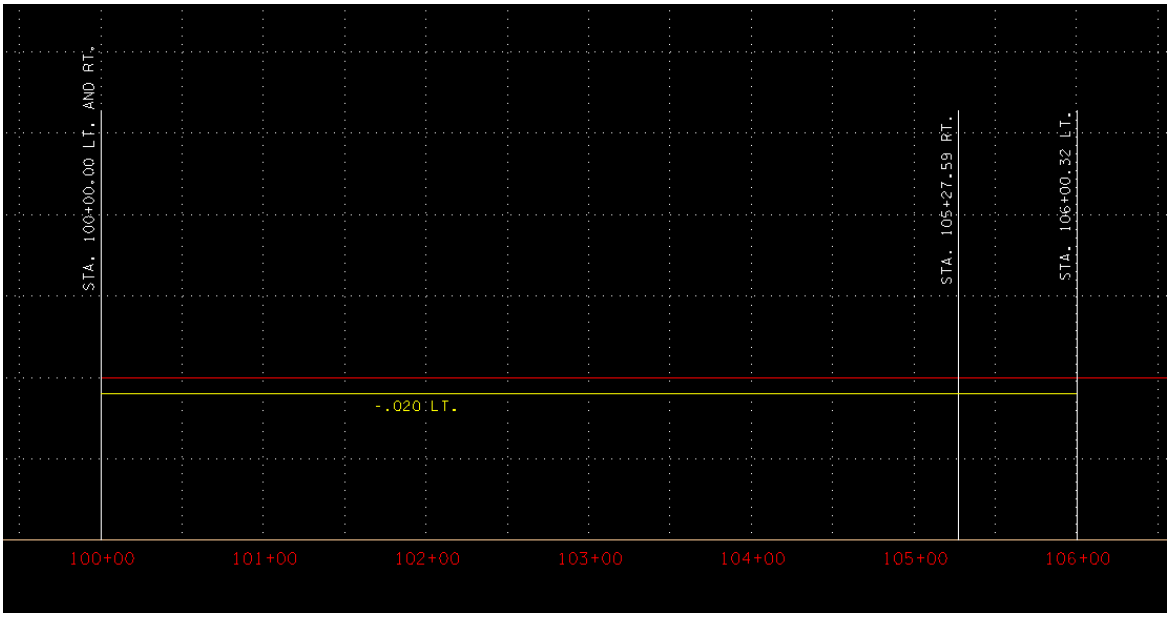


Make sure line ends at the sta. 106+00.32 line by using the “Lengthen or Shorten element to element” command:

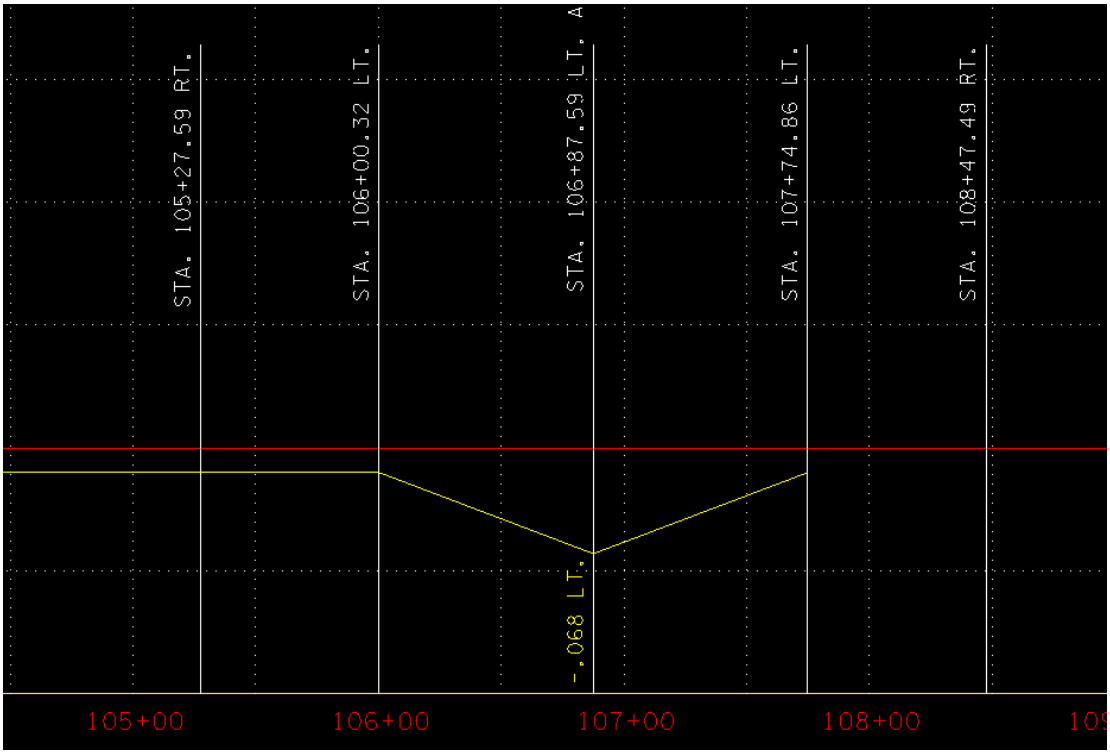


Superelevation Profile Diagram

Label line as shown below using “Place text Under Element” option:

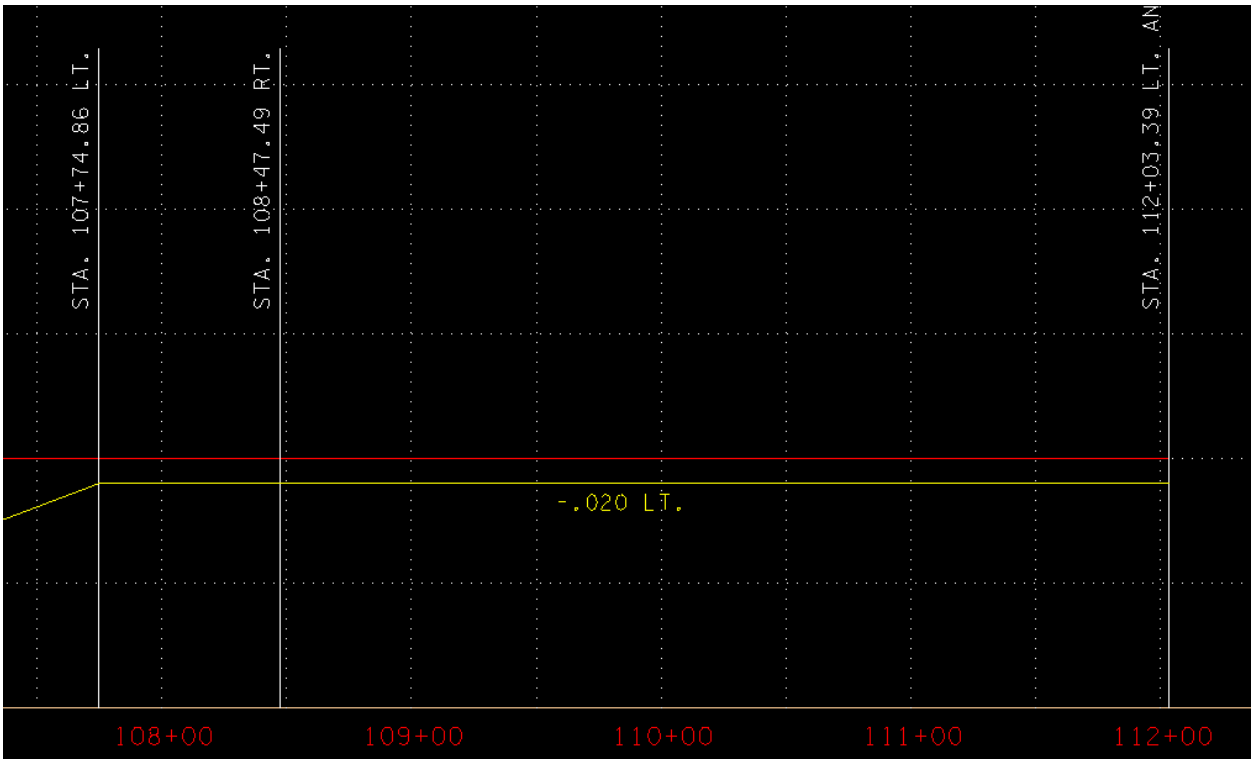


The next segment transitions from -.020 ft/ft at sta. 106+00.32 to -.068 ft/ft at sta.106+87.59, then back to -.020 ft/ft at sta. 107+74.86. Using the same conversion on page 6, -0.068 ft/ft converts to 34 ft. below the red line. Label superelevation at sta. 106+87.59 as shown below using text settings as shown on page 6.

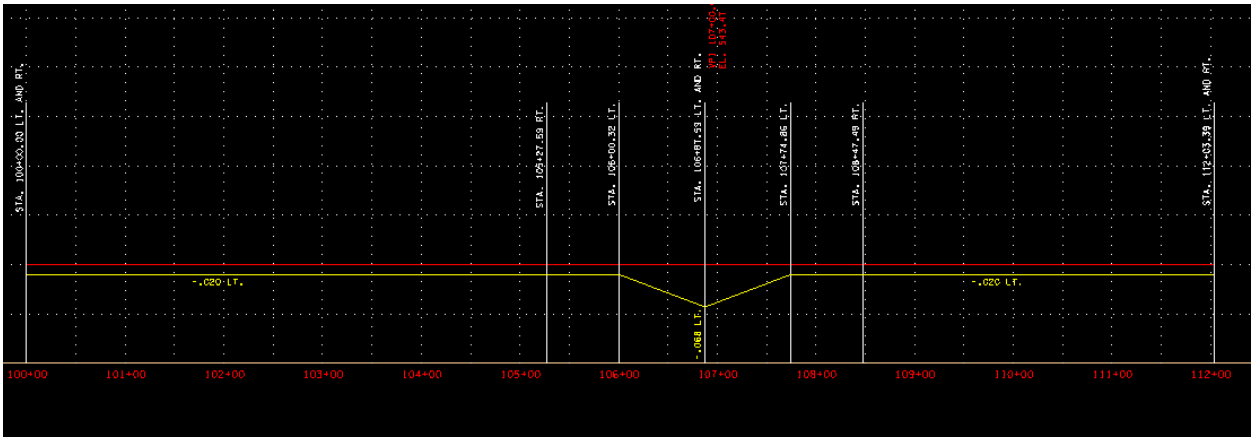


Superelevation Profile Diagram

The last segment, from sta. 107+74.86 to sta. 112+03.39, has a constant slope of -0.020 ft/ft. Draw this segment and label similar to the first segment.



The diagram for the left side should look as shown:



Draw the Right Profile Diagram

Use the following symbology settings:

LV: DESIGN-CENTERLINE-Proposed Curve Text

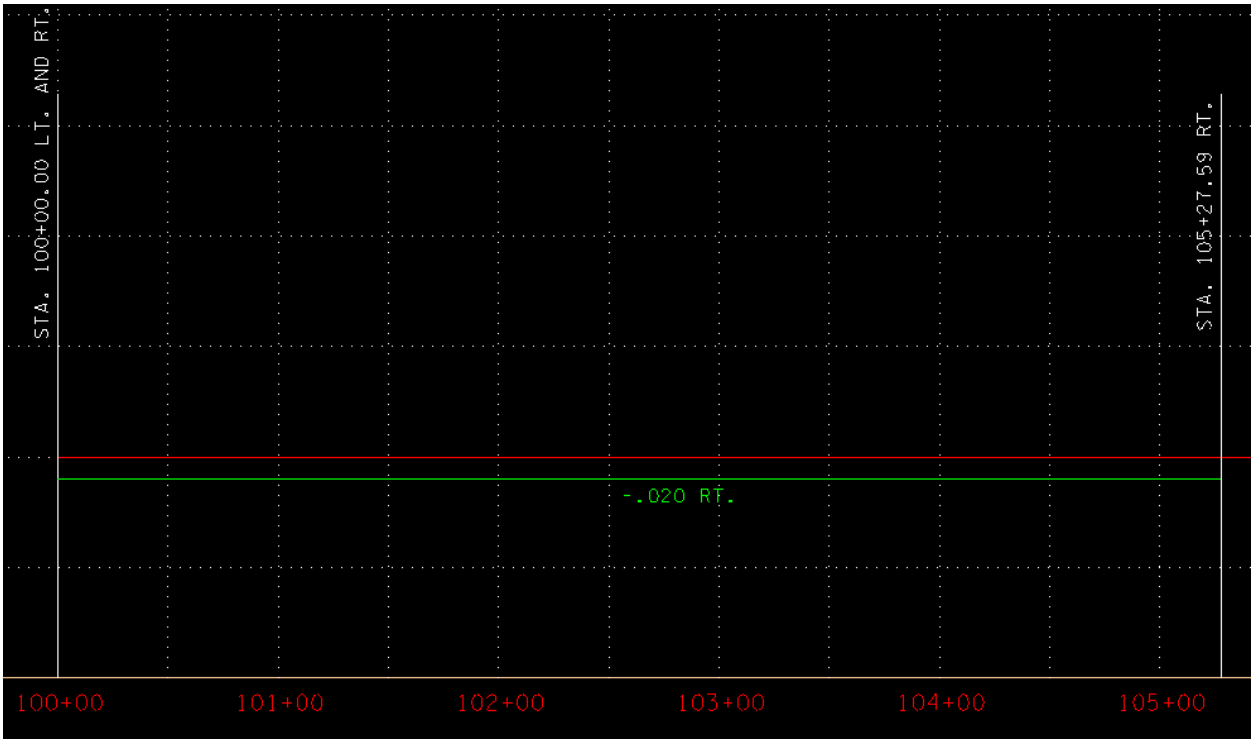
CO: 8

WT: 10

Before drawing the right side diagram , turn off the level “DESIGN – PROFILE – Proposed Text”,which was used for the left side diagram.

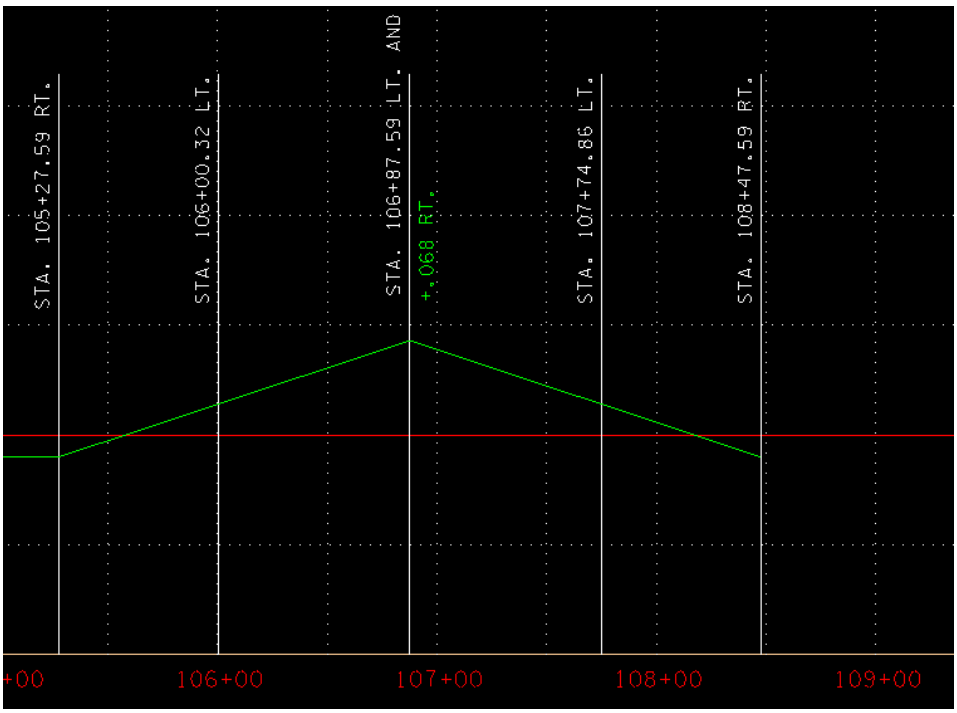
From sta. 100+00 to 105+27.59, the cross slope is a constant -0.020 ft/ft.

Similar to the left side diagram, copy parallel the line representing finished grade 10 ft below itself. Modify the new line to end at sta. 105+27.59.



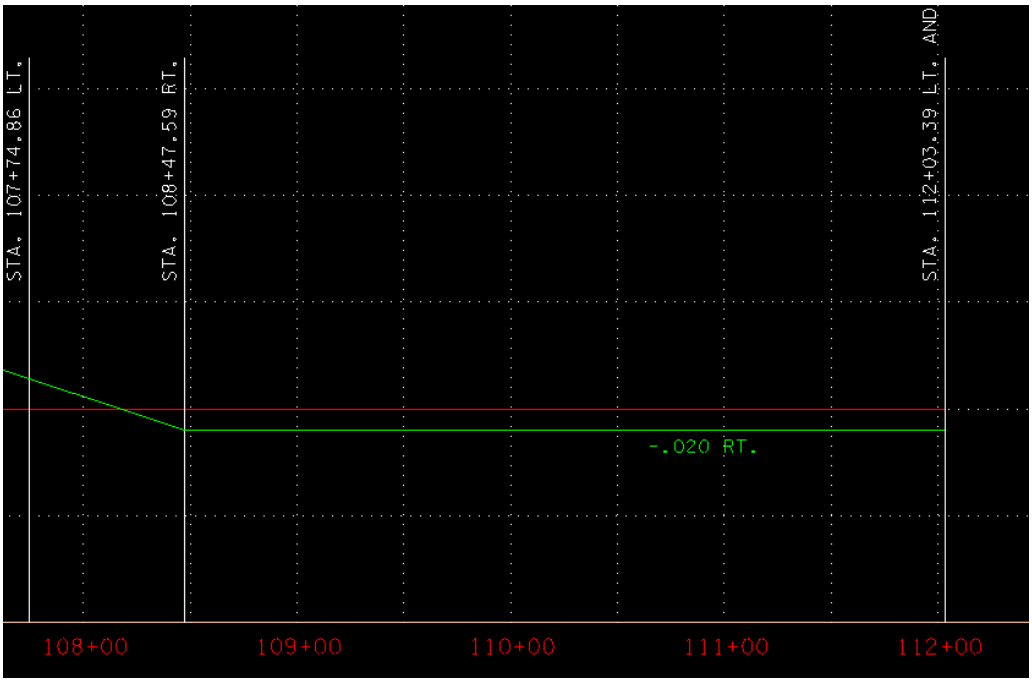
Superelevation Profile Diagram

The next segment transitions from -.020 ft/ft at sta. 105+27.59 to +.068 ft/ft at sta.106+87.59, then back to -.020 ft/ft at sta. 108+47.59. Using the same conversion on page 6, +0.068 ft/ft converts to 34 ft. above the red line. Label superelevation at sta. 106+87.59 as shown below using text settings as shown on page 5.

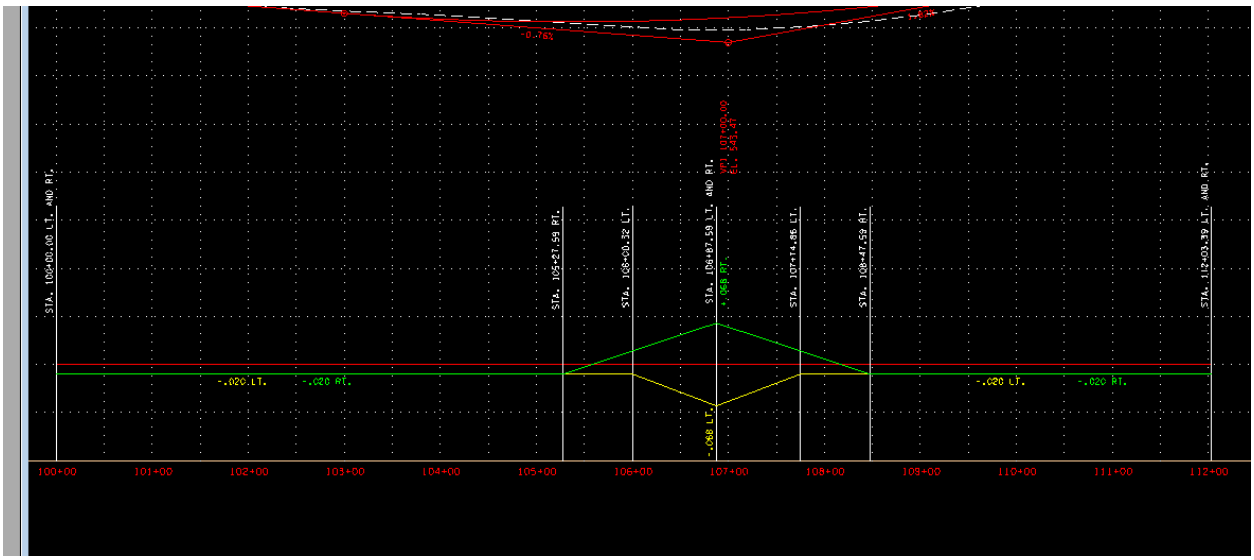


Superelevation Profile Diagram

The last segment, from sta. 108+47.59 to sta. 112+03.39, has a constant slope of -0.020 ft/ft. Draw this segment and label similar to the first segment



Turn the level " DESIGN-PROFILE-Proposed Text" back on and the finished product should look like this:



Superelevation Profile Diagram