

LAB 3 - 3D View Control

Chapter Objectives:

After completing this exercise you will know how to:

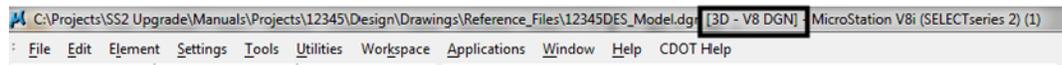
- Check the elevation of an element
- Rotate a view using the *rv*= keyin
- Rotate a view using the 3-point method
- Rotate a view by element
- Rotate to a standard view (Top, Front, etc.)
- Check and set the **Active Depth**
- Check and set the **Display Depth**

Lab 3.1 - Starting MicroStation

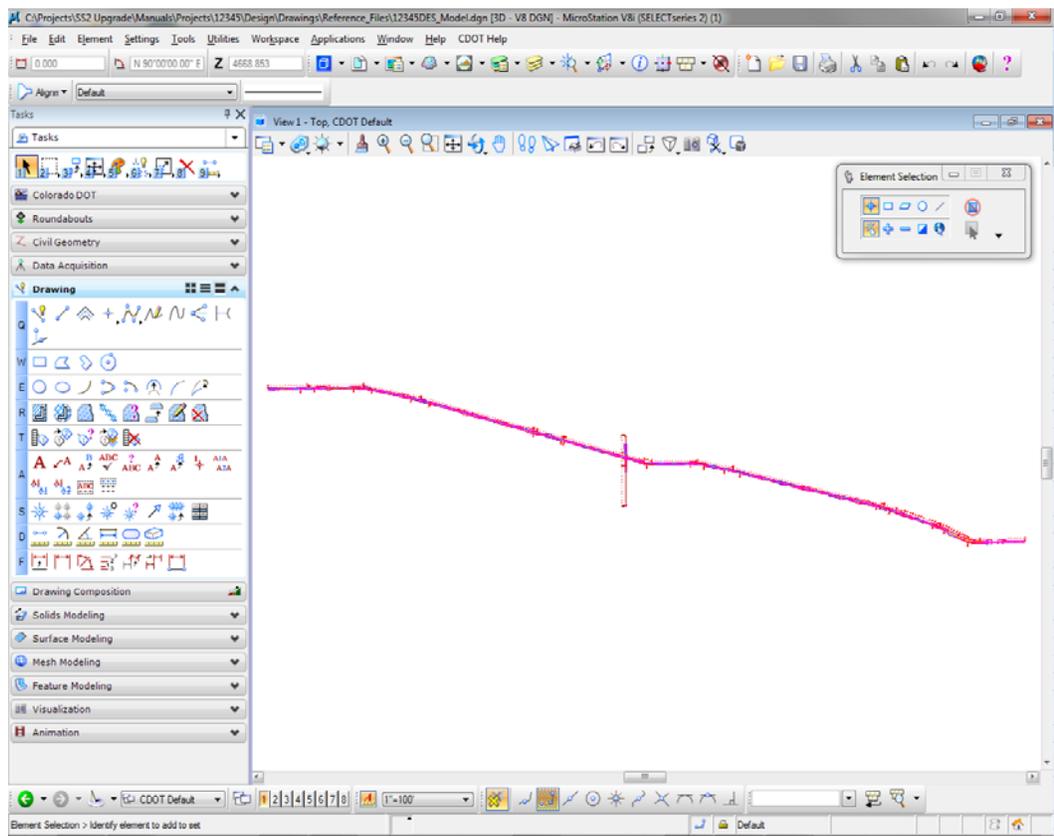
1. Start MicroStation and open the design file **12345DES_Model.dgn** from the **C:\Projects\12345\ Design\Drawings\Reference_Files** folder.

You will use this CDOT project, which has proposed graphics placed at the correct elevations, to practice with the concept of 3D view controls.

2. Look in the top title bar of the MicroStation window and note that this is a 3D file.



3. Fit View 1



The design file shows only the proposed alignments because only the ALG levels were turned on when settings were last saved.

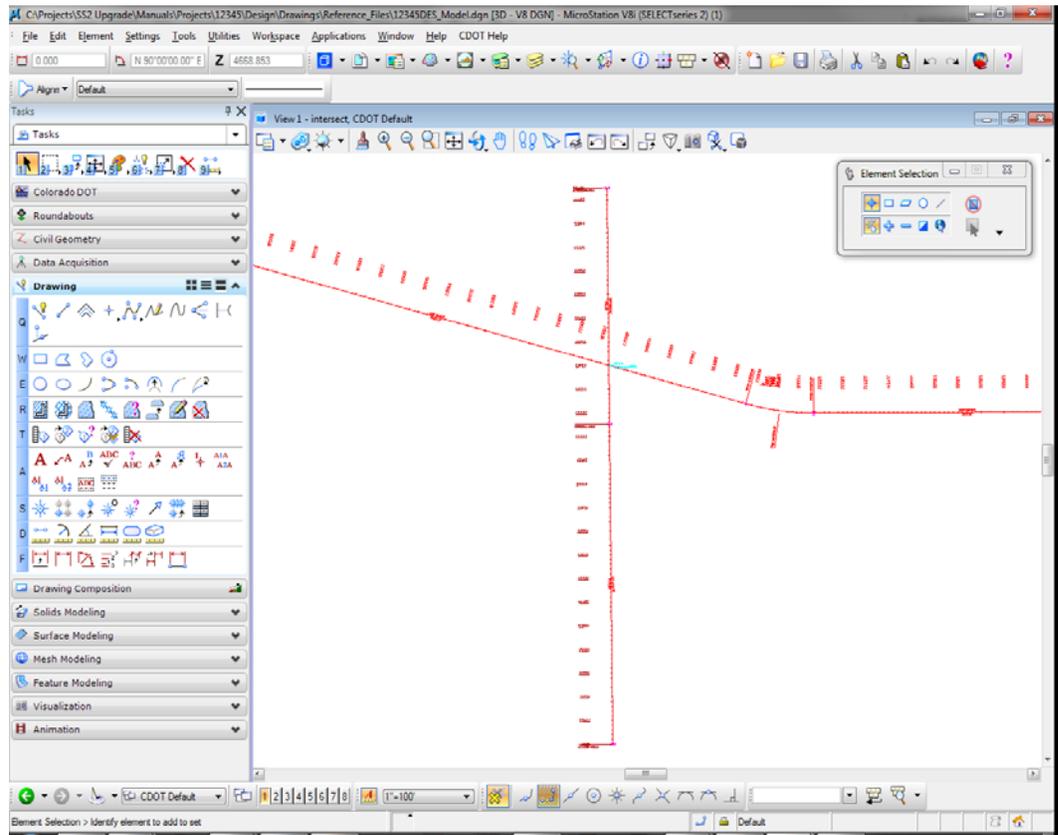
Lab 3.2 - Checking Element Elevations

You can quickly check the coordinates of any point (including the Z coordinate in a 3D file) by placing a tentative point.

1. Key in **vi=intersect** to recall the alignment saved view.

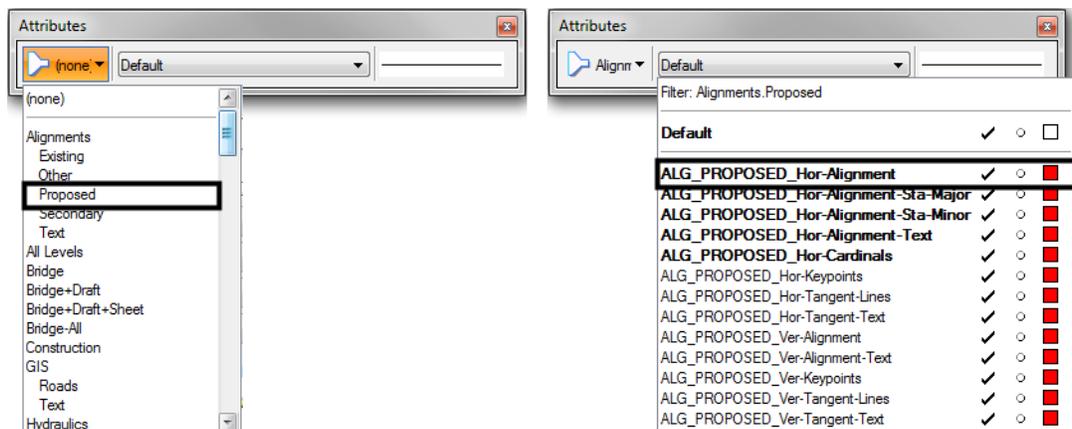
Note: Always press <Enter> or <Tab> after keyins.

2. <D> anywhere in View 1 to recall the saved view.



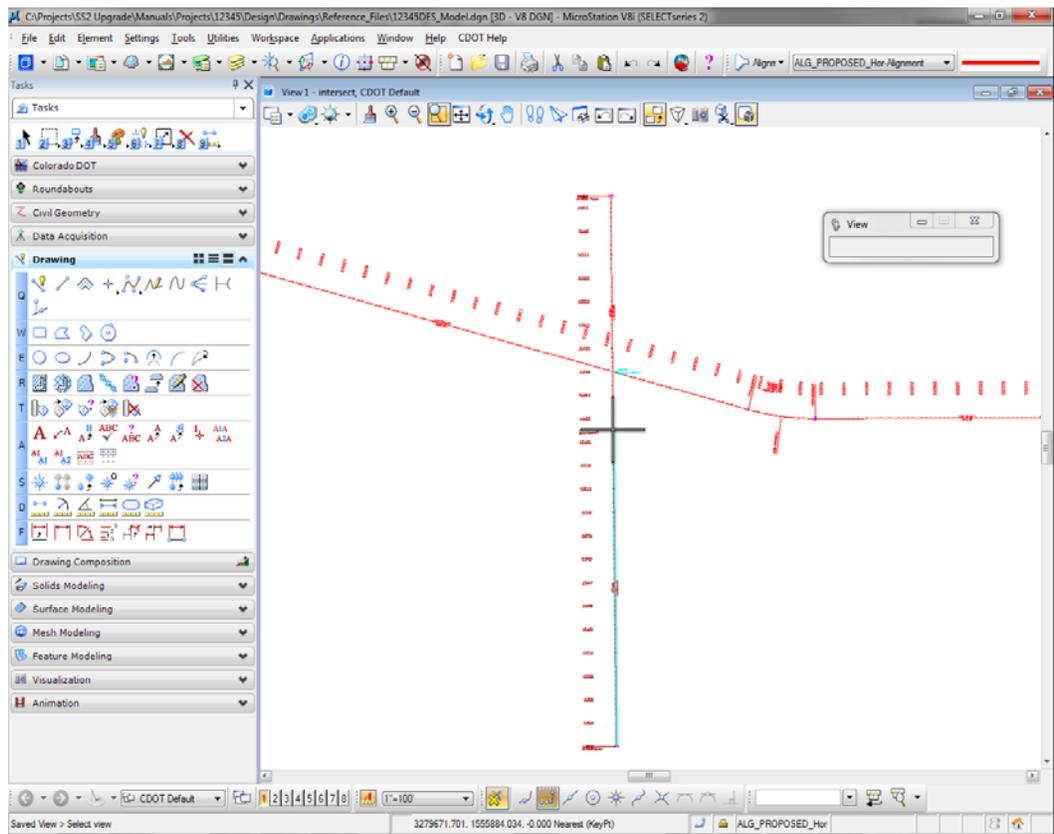
The design file has some graphics, like the horizontal alignment, placed at elevation 0. Other graphics, like contours generated by InRoads, are placed at an elevation range of approximately 6600 ft.

3. On the Attributes toolbar, set the filter to **Alignments-Proposed** and then set the active level to **ALG_PPROPOSED_Hor-Alignment**.



- Place a Tentative point <T> on the North-South crossroad alignment just south of the intersection.

Note: The Tentative button in the CDOT workspace is set to the **Left and Right Cord** on the mouse. If you want to change it, select **Workspace > Button Assignments**.



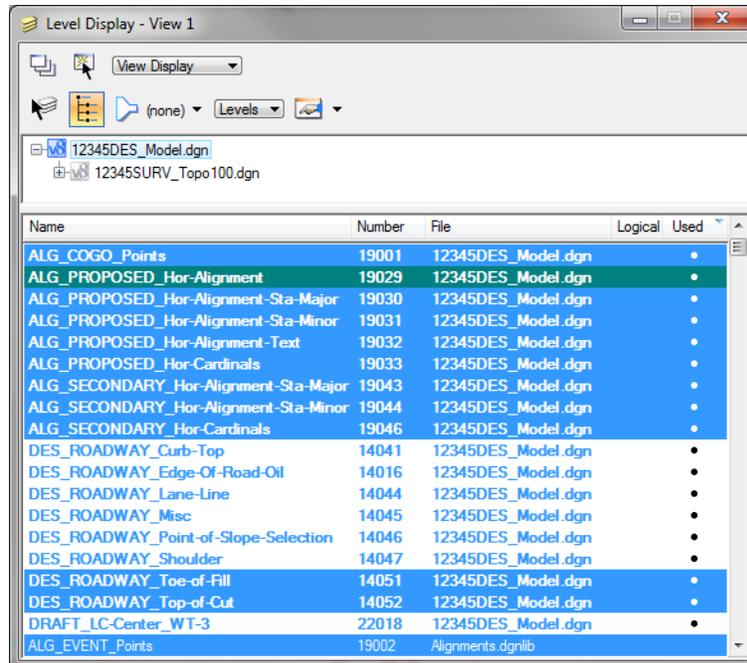
The tentative point jumps to the closest key-point on the element. You will see a large cross-hair at the key-point. You'll learn more about keypoint and other snap modes in other chapters.

A tentative point is a temporary location that displays the coordinates for the point in the **Message Field** (bottom of screen).

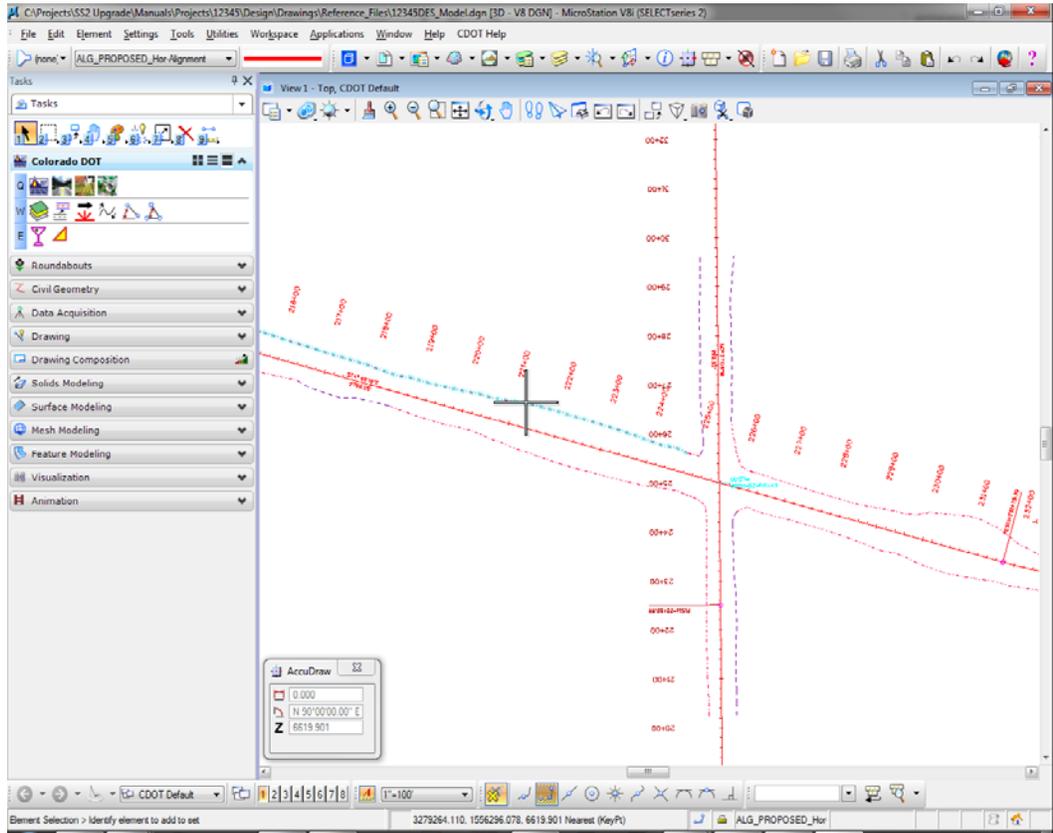
3279671.701, 1555884.034, -0.000 Nearest (KeyPt)

Note that the centerline alignment graphic in the top view (plan view) has a Z value of 0. Therefore it has an elevation of 0.

- Open **Level Display** and set the level **Filter** to **None** to show all levels. Sort by **Name** and then **Used** levels. Turn on the levels **DES_ROADWAY_Toe-of-Fill** and **DES_ROADWAY_Top-of-Cut**.



6. <T> on one of the cut or fill lines and note its elevation (Z coordinate).

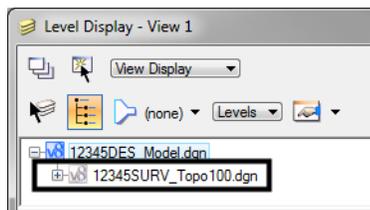


3279264.110, 1556296.078, 6619.901 Nearest (KeyPt)

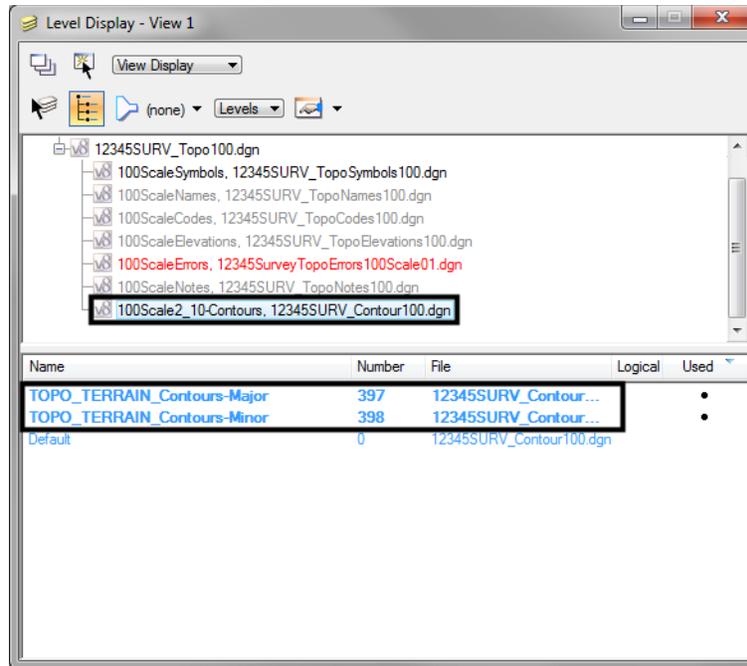
7. <T> on a few other top or toe lines and note the elevations.

The graphics should be placed at a depth of approximately 6620 ft. or within a close range.

8. In **Level Display**, click on the + symbol next to the file **12345SurveyTopo100Scale.dgn** to expand the list of reference files.



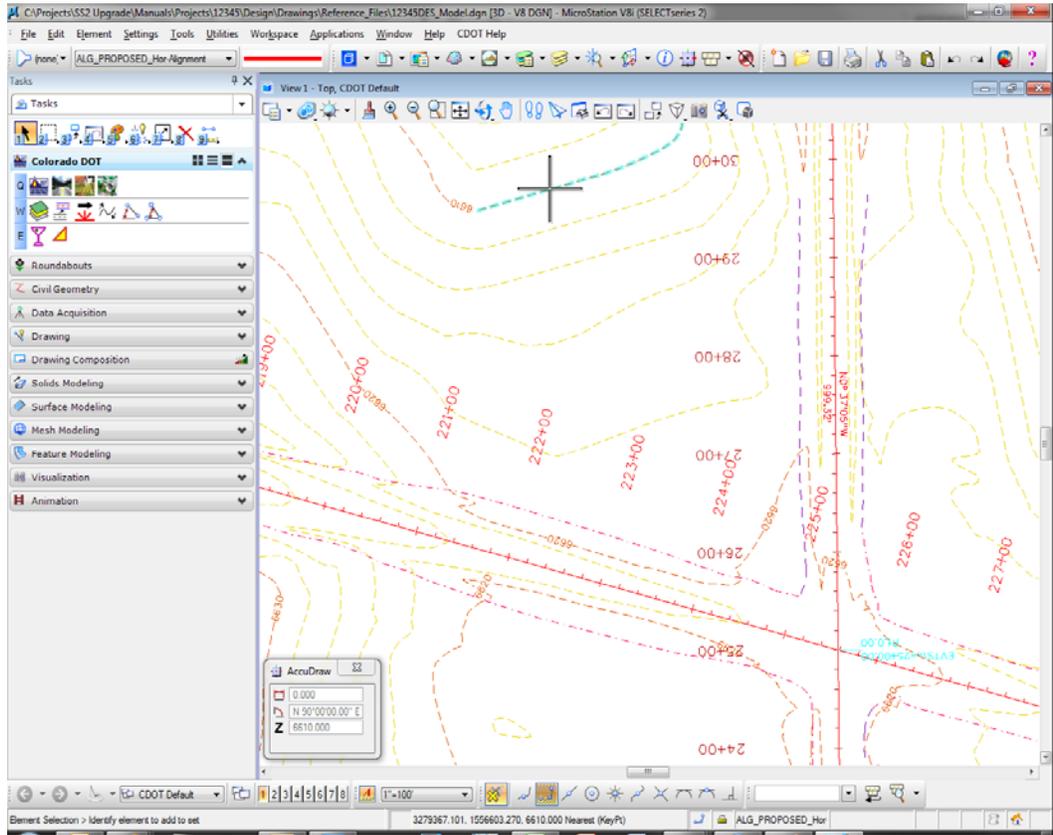
9. Highlight the reference_100Scale2_10-Contours, 12345SURV_Contour100.dgn and turn on levels TOPO_TERRAIN_Contours-Major and TOPO_TERRAIN_Contours-Minor.



Note: The contour file is a reference to the design model file. You'll learn more about references in the *Create the Project and Design Model* lab.

10. Window in on some of the contours to the right of the intersection so that you can easily read the labels.

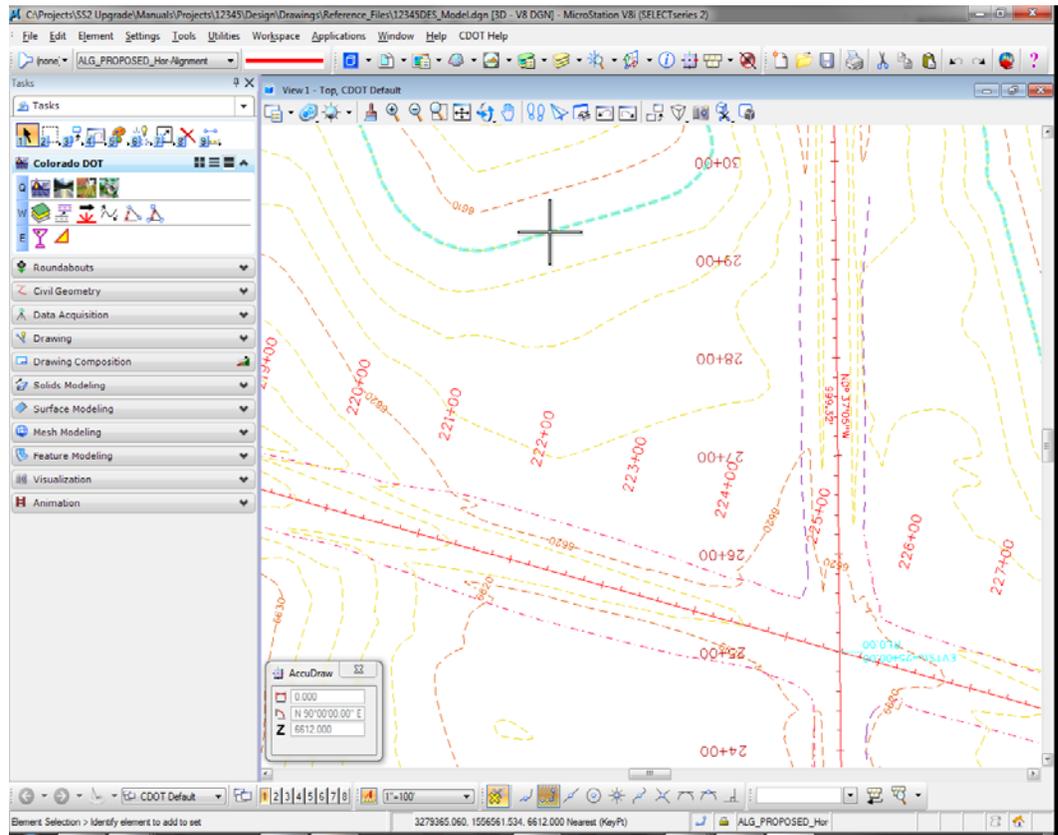
11. <T> on some of the major contour graphics and note the elevations.



3279367.101, 1556603.270, 6610.000 Nearest (KeyPt)

The major contours are placed at 10 ft. intervals.

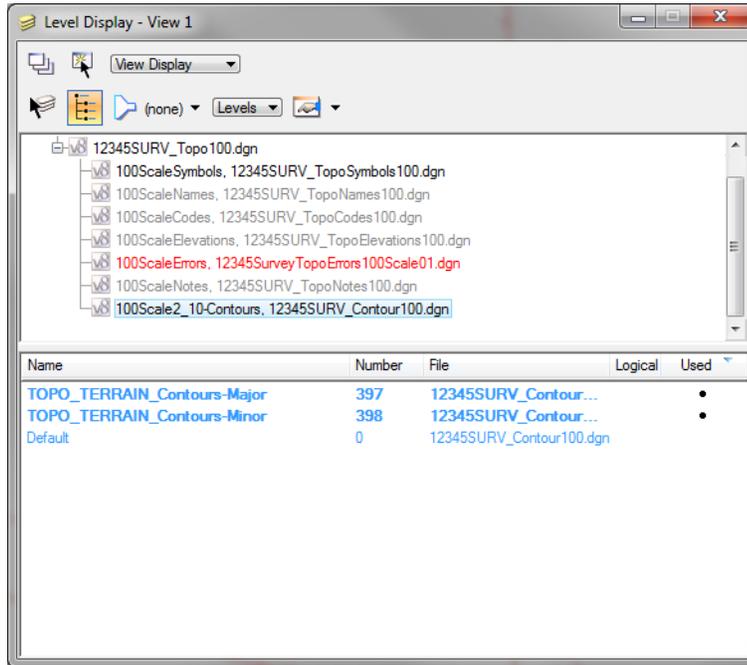
12. <T> on some of the minor contour graphics and note the elevations.



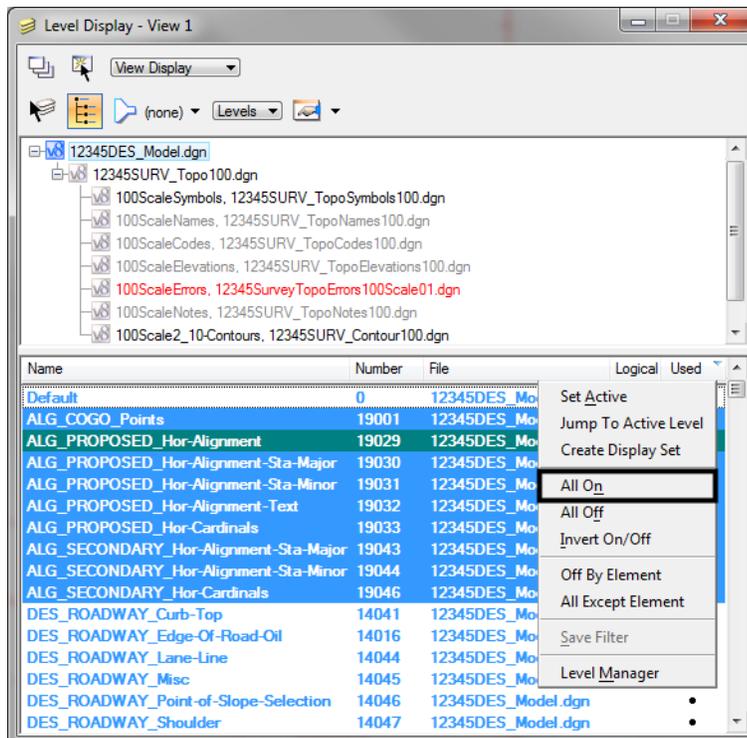
3279365.060, 1556561.534, 6612.000 Nearest (KeyPt)

The minor contours are placed at 2 ft. intervals.

13. In Level Display, turn off the existing major and minor contour levels as shown.

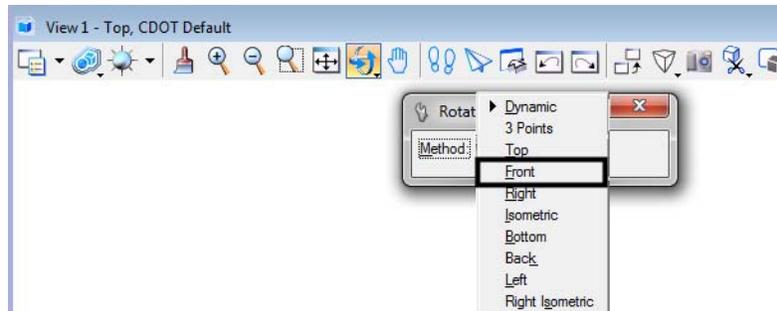


14. In Level Display, highlight the 12345DES_Model.dgn file to work with the master file levels again and turn all levels on.

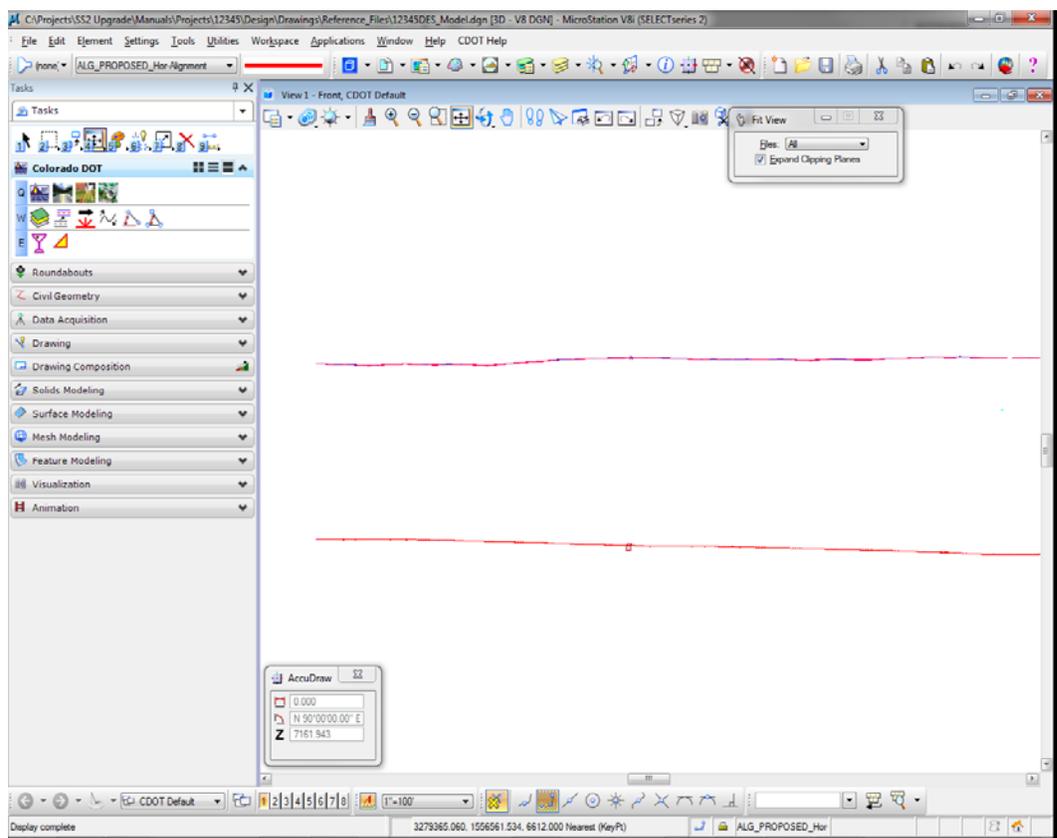


Lab 3.3 - Rotating a 3D Standard View

1. From the View Control toolbar, select Rotate View.



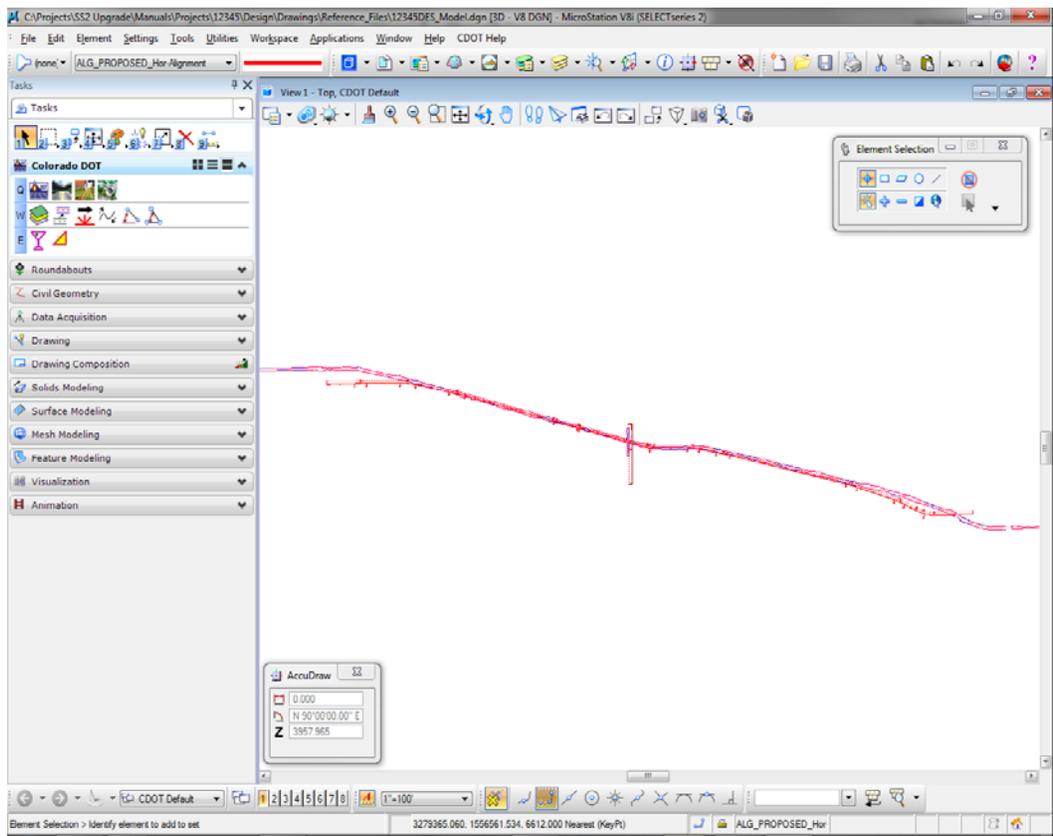
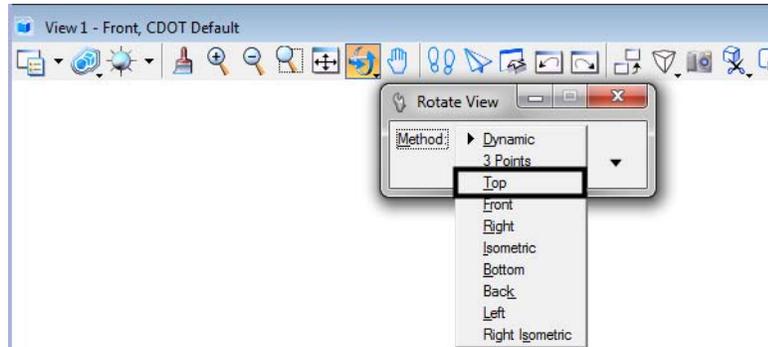
2. In the Tool Settings box, set Method to Front.
3. Fit View 1.



The view is rotated from Top (plan view) to Front (elevation view). Note that some graphics, (like the red horizontal alignments you checked earlier), are displayed at elevation 0 below the proposed graphics (edges of oil, cut/fill lines, etc.), which are displayed at the correct elevation (6620 ft. range).

Note: Rotating to the Front view is a handy way to visually check your file for erroneous information or bad elevations which “spike” down to 0.

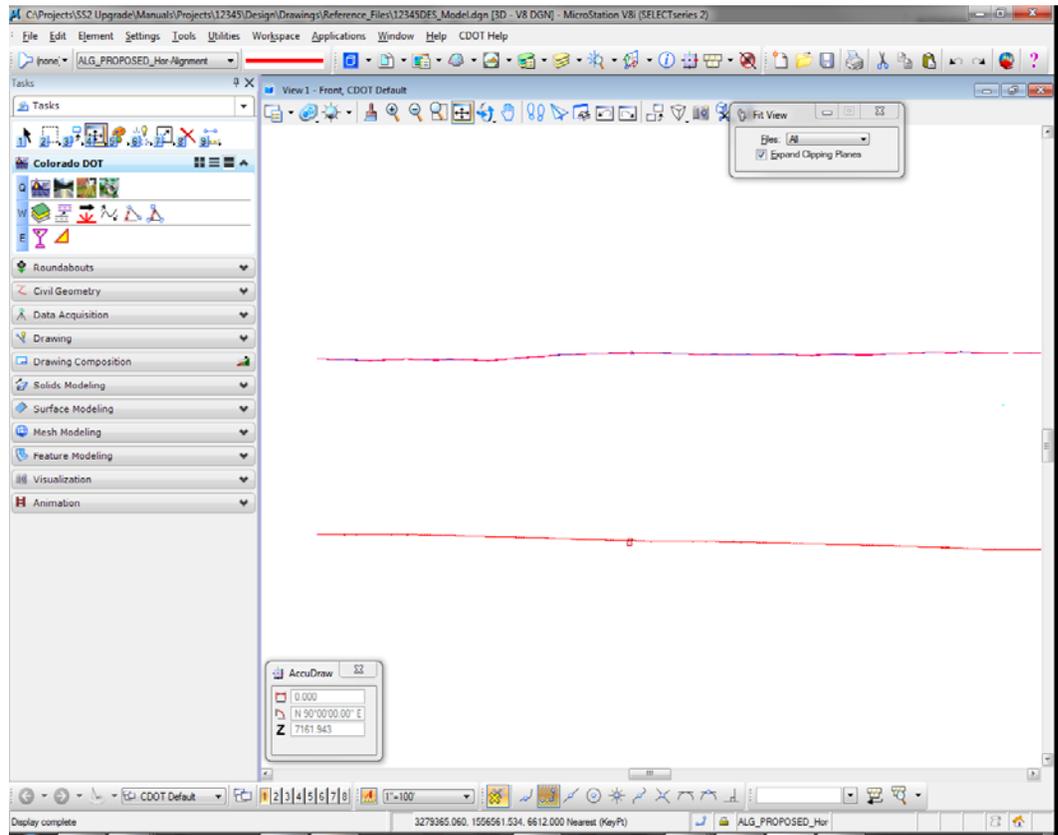
4. Select the **Rotate View** command again and set the **Method** to **Top**.



This returns the view to a plan view and its original un-rotated settings.

5. Key in **vi=front**.

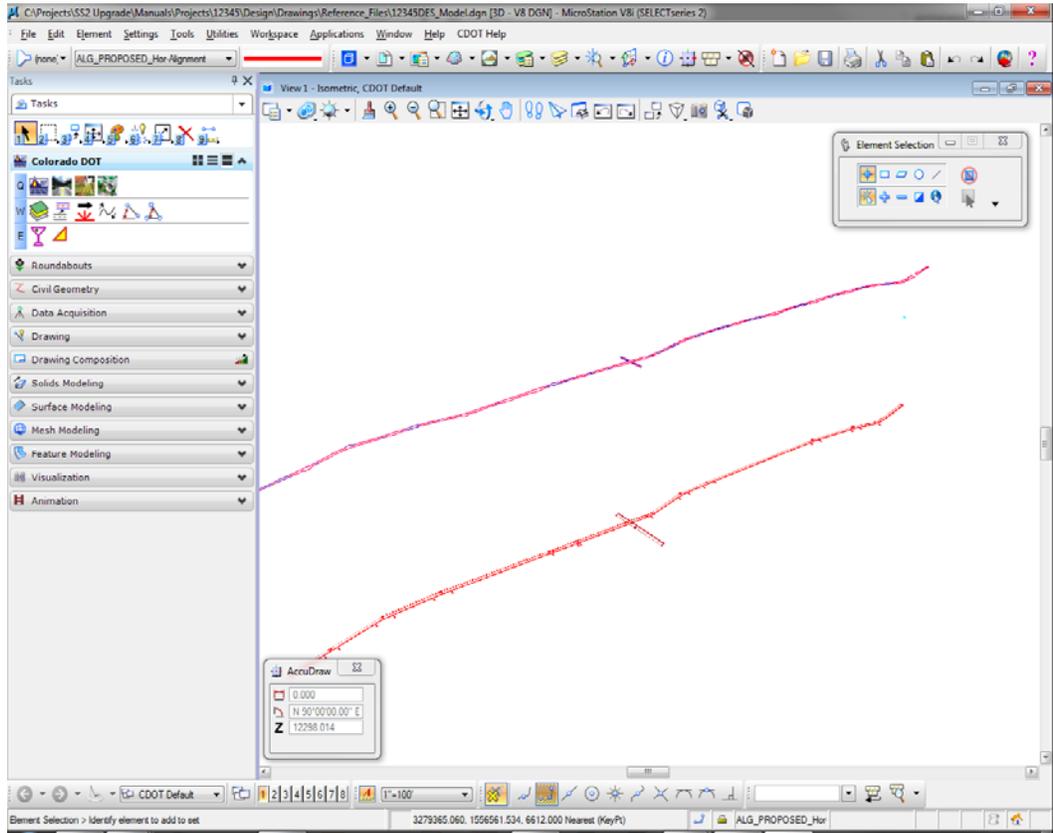
6. <D> to select the view.



The view is rotated back to an elevation view. You can use the **vi=** keyin to rotate to standard views (top, front, isometric, etc.) as well as to recall saved views.

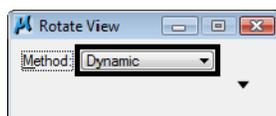
7. Key in **vi=iso**.
8. <D> to select the view.

9. Fit the view.



10. This gives another 3D perspective of the design file graphics.

11. Select the **Rotate View** command again and set the **Method** to **Dynamic**.

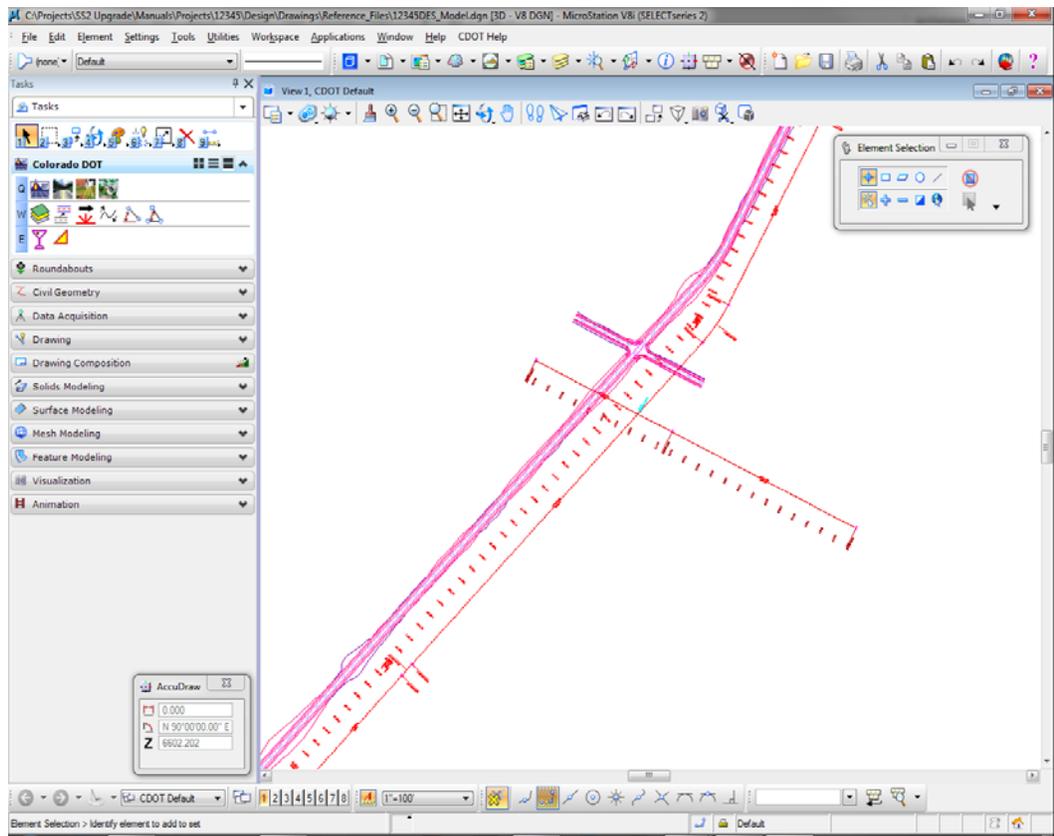


12. <D> near the intersection in the view to identify it for rotation, then move your cursor in a counter-clockwise motion.

Note: You can also <D> **and hold** on the “+” displayed when the command is selected, then drag it to the location you would like to rotate about. The rotation point can be Accusnapped to a graphic element. This will make it easier to control the rotation and keep the desired elements within the view.

As you move your cursor the view dynamically rotates.

- Zoom in on the intersection and continue experimenting with the **Dynamic** rotation option until you're comfortable with the tool.



Note: If you <T> on a location (like the intersection center) after selecting the **Dynamic** method, you will rotate about the tentative point.

Lab 3.4 - Check the Active Display Settings

Check the Current Active Depth

- Rotate the view back to **Top**.
- Fit the view.
- In the MicroStation **Key-in** box, key in **az=\$** to check the active depth.

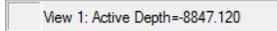
Note: The dollar symbol (\$) is used to request current settings. You can also use a question mark (?).

MicroStation prompts: **Select View**.

- <D> anywhere in View 1 (top view).

Note: Active and Display depths are view dependent (i.e. you set these in each view). Therefore, you have to tell MicroStation which view you want to check the **Active Depth** in by data pointing in the view.

5. Check the **Message** field.



View 1: Active Depth=-8847.120

MicroStation returns the current active depth setting. Yours may be different than shown. This means if any graphics are placed in the design file's top view without giving them an elevation, they will go in at this elevation or depth.

Since the depth axis of the top view (plan view in a 3D file) is the Z axis, this means graphics will be placed at this elevation.

6. Key in **az=0**.
7. <D> to select the view.
8. Key in **az=\$**.
9. <D> to select the view.

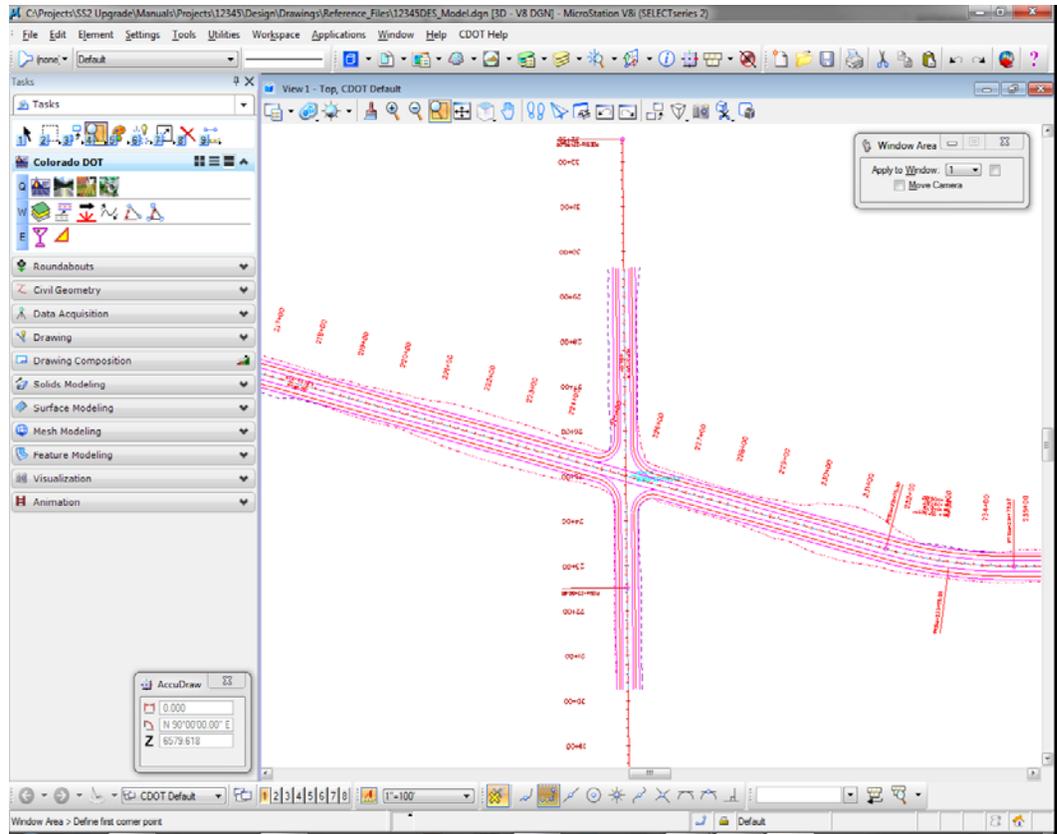


View 1: Active Depth=0.000

You have now set the active depth to 0. Any new graphics placed in the file will be placed at an elevation of 0, unless you snap to an element at another elevation.

Check Current Display Depth Settings

1. Window in around the intersection.



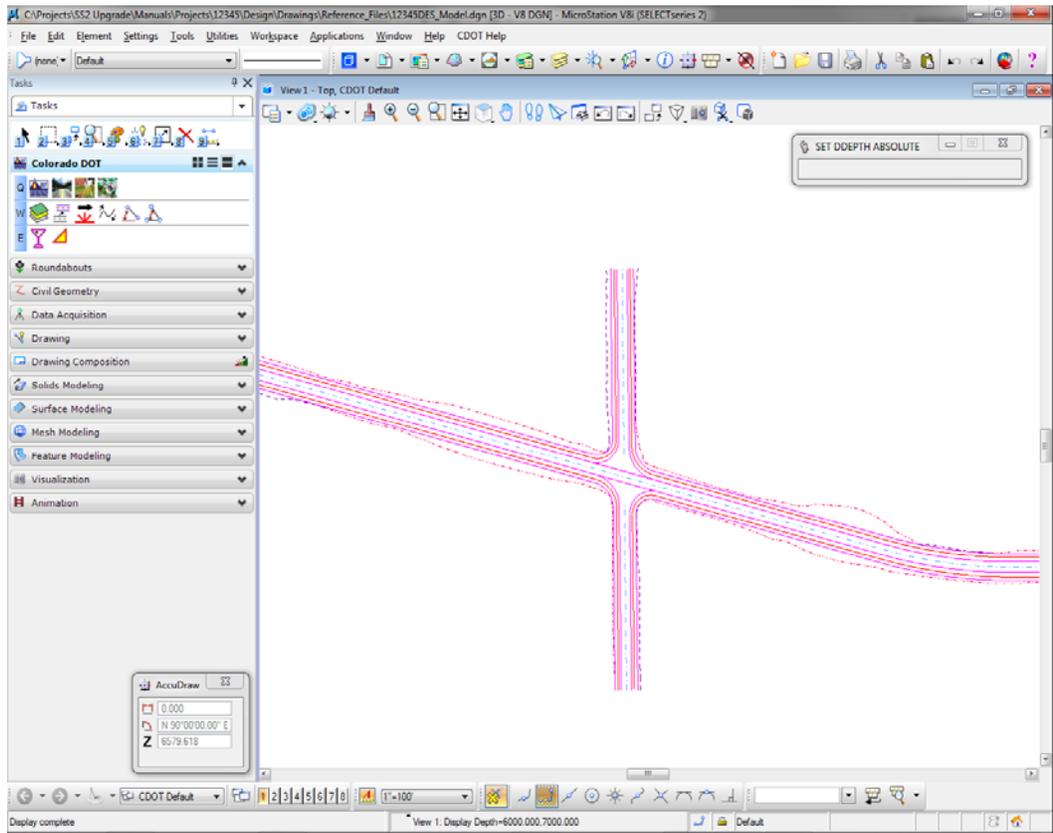
2. Key in **dp=\$**, then press <Enter>.
3. <D> in View 1.
4. Check the **Message** for the current display depth settings.

View 1: Display Depth=-10490.498,17125.695

The current display depth in the top view is set very large. Yours may vary from that shown. Therefore, you are able to see all the graphics in the top view since they fall in the depth (elevation) range.

5. Key in **dp=6000,7000**.

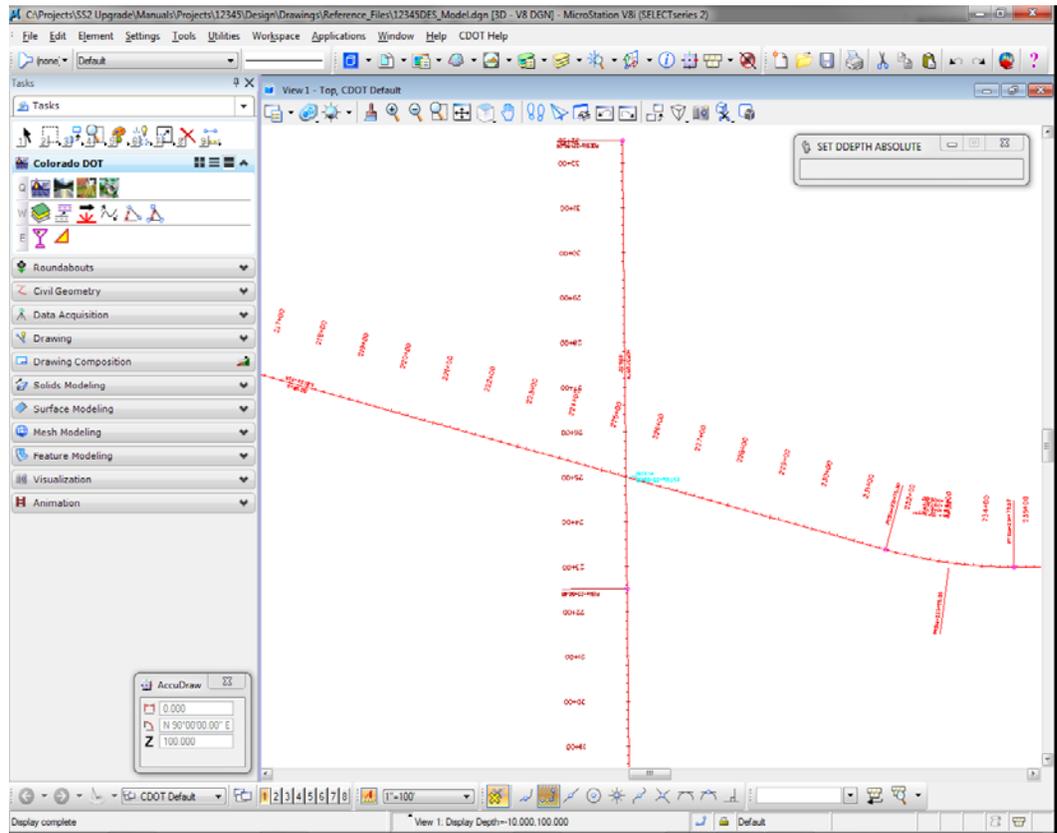
6. <D> anywhere in View 1 and look at your graphics.



The graphics placed at this elevation range (shoulder, edge-of-oil, cut/fill lines, etc.) now appear in the view. All of the graphics placed at elevation 0, like the red proposed horizontal alignment, stationing and alignment text, are not displayed.

7. Key in **dp= -10,100**.

8. <D> anywhere in View 1 and look at your graphics.



Only the elements placed in this elevation range (e.g. the proposed horizontal alignment and text placed at 0) appear in the view. All other graphics are outside of this elevation range and are not displayed.

9. Fit View 1.
All of the graphics appear in the view.
10. Key in **dp=\$**.
11. <D> anywhere in View 1 and check the **Message** field.

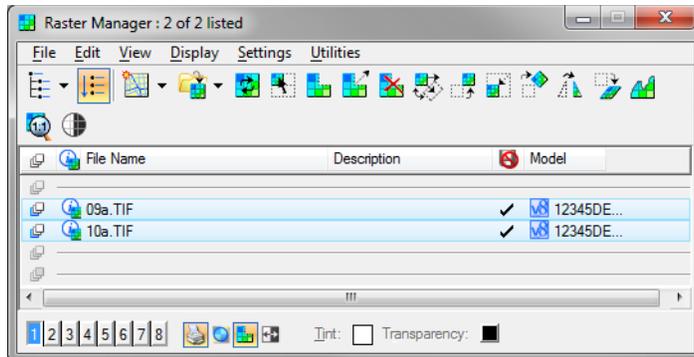
View 1: Display Depth=-10490.498,17125.695

The display depth range is automatically expanded after using the Fit command to show all of the elements in the view.

Lab 3.5 - Turn On Raster Images

1. Select File > Raster Manager.

2. Select both raster images using the **Shift** or **CTRL** buttons and toggle on View 1 from the lower left of the dialog box.



3. Close the **Raster Manager** box.
4. Fit View 1.
The raster images are now on for a future lab.
5. Select **File > Save Settings**.
6. This saves all settings changes, including open views, levels turned on/off, active and display depth settings, etc. The next time you enter this design file, it will appear just as you left it.
7. **Exit MicroStation**.