LAB 7 - Place Guardrail Lines

In this exercise, you'll place guardrail lines in the design model file and then work with the custom line styles.

Chapter Objectives:

After completing this exercise you will know how to:

- Use the CDOT Menu to place custom lines styles
- Change the direction of a directional line style
- Change the elevation of an element after placement
- Change the level on which an element was placed
- Update graphics to *ByLevel Symbology*

Lab 7.1 - Open the Design Model File

1. From the MicroStation Manager, open the **12345DES_Model.dgn** file from the **\Design\Drawings\Reference_Files** folder

Note that the aerial photo raster images are attached.

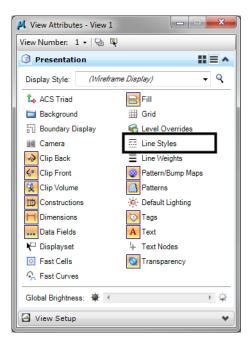
2. Select the **Raster Manager Icon** from the Primary toolbar, or you may select **File** > **Raster Manager**.



3. Select both raster images, **09a.tif** and **10a.tif**, and turn off their display in View 1.

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4. Select the View Attributes icon from the view toolbar and toggle Off Line Styles



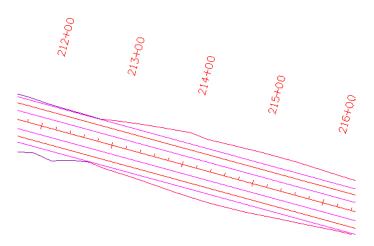
Lab 7.2 - Draw the Guardrail

Next, you'll follow the steps below to place guardrail along the fill area approaching the intersection.

Create the guardrail trace lines

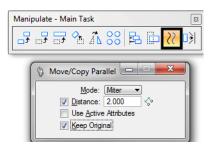
Create temporary lines using the Move/Copy Parallel command.

1. Window in to the area to the left of the intersection around station range 212+00-216+00 as shown.



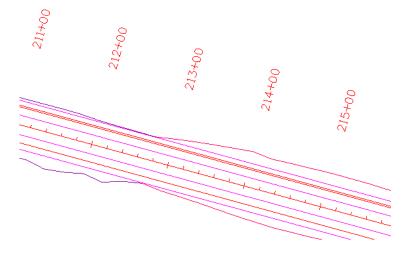
- C:\Projects\SS2 Upgrade\Manuals\Projects\12345\Design\ <u>File Edit Element Settings Tools Utilities Works</u> 🔁 • 🗈 • 📻 • 🚳 • 🖂 • 🥪 • 🖄 Tasks Ψ× 🙆 Tasks -C 1 24 3 - 🔁 💦 🚔 Сору 💒 Colorado D 1 1 ···· 5 2 Move 🜻 Roundabou ···: * 3 Scale 🏹 Civil Geom °.ħ. 4 Rotate 🕅 Data Acqui 5 Mirror V Drawing ۸N 6 Array Ŷ Q مر 昆 7 Align Elements By Edge w 🗆 🔿 8 Stretch 22 00 9 Move Parallel Е 刯 0 Move To Contact R 🎢 🎒 т ኬ 💸 Open 'Manipulate' as Toolbox
- 2. From the *Main* task toolbar, open Manipulate as a toolbar.

- 3. Select the Move Parallel tool from the *Manipulate* toolbar.
- 4. In the *Tool Settings* box:
 - Toggle on **Distance** and key in *2*.
 - Toggle on Keep Original.

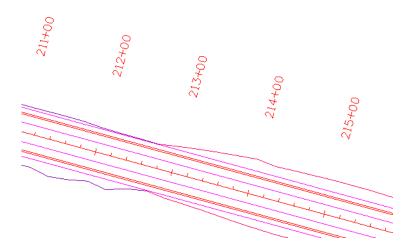


- 5. **<D>** on the red Edge of Oil line on the upper (North) side of the road.
- 6. Move your cursor up to establish the direction for the parallel copy.

7. **<D>** to copy the Edge of Oil line.



8. Repeat the above steps to create a guardrail trace line for the lower (South) side of the road. Be sure to parallel copy the Edge of Oil line.

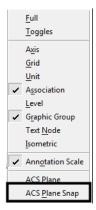


Trim the trace line for the extent of the guardrail

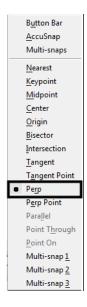
- 1. On the *CDOT Menu*, select **Drafting > Linework**.
- 2. Set the Line Weight category to 1.

Note: This should automatically select the Place SmartLine tool.

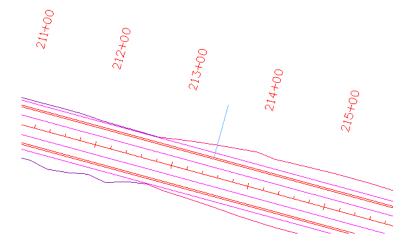
3. On the Status bar, turn Off ACS Depth Snap.



- **Note:** Make sure that **ACS Depth Snap** lock does **not** have a check mark beside of it to ensure that it is off.
- 4. On the Status bar, set the active snap mode to Perp.

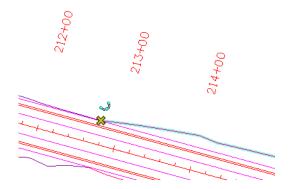


5. **<D>** on the guardrail trace line you just copied.



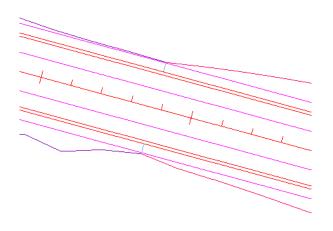
As you move your cursor, note how you can only place perpendicular to the trace line.

6. AccuSnap on the endpoint of the Toe of Fill line as shown to draw the perpendicular line.



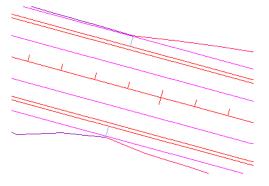
This will serve as the cutting element for the trace line. The guardrail starts at the beginning of the toe of fill line.

- 7. $\langle \mathbf{R} \rangle$ when done.
- 8. Repeat the above steps to create a trim line for the other side of the road and be sure to **AccuSnap** to the end of the toe of fill line.

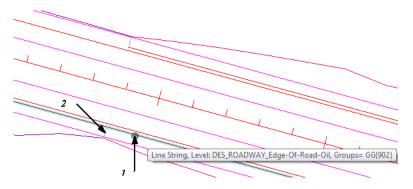


- K C:\Projects\SS2 Upgrade\Manuals\Projects\12345\Design\Drawings\Reference <u>File Edit Element Settings Tools Utilities Workspace Applications</u> 🔁 • 🗈 • 📻 • 🚳 • 🗛 • 🥪 • 🍃 • 📩 • 🎲 - 👬 Tasks Ψ× Top, CDC 💁 Tasks • 1 2 3 4 5 3 -7 1 Modify Element 💒 Colorado DOT Ľ 2 Partial Delete Roundabouts Break Element By Point ∠ Civil Geometry 3 🕅 Data Acquisition 4 Extend Line Trim To Intersection 5 V Drawing Trim To Element **V** NZ. 6 \otimes + Q Trim Multiple ما 8 IntelliTrim w 🗆 📿 📎 🏹 9 Insert Vertex 00ノンか 10 Е] 0 Delete Vertex 🚳 구 2 🎱 🙆 R Construct Circular Fillet Q T b 🤣 🗞 🐝 W Construct Chamfer $A \sim^A A \neq^B \sqrt{ABC}$ ABC A Open 'Modify' as Toolbox AI AI AD 1.11
- 9. Select the Trim To Element command.

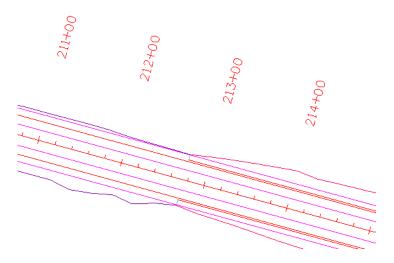
- 10. **<D>** on the trace line on the side of the element to keep, to the right of the perpendicular line.
- 11. **<D>** on the perpendicular line to trim the trace element to this point.



<D> to accept.



- 12. **Update** your view, if necessary.
- 13. Repeat to trim the lower side as shown.



14. Delete the blue perpendicular trim lines.

Check the ACS Plane Snap lock

1. **<T>** on the left end of the upper trace line.

3278437.039, 1556493.963 6629.277 learest (KeyPt)

Note that the trace lines were copied at the same elevation as the edge of oil lines. When you place the guardrail lines, you want to place them at an elevation of 0.

Note: If you want the guardrail lines to pick up the correct elevations of the roadway surface, you can drape them with InRoads.

- 2. Key in *az=0*
- 3. **<D>** anywhere in the view to set the active depth.

View 1: Active Depth=0.000

Note: The CDOT default active depth is set to 0.

4. Select the Locks button from the *Status* bar.

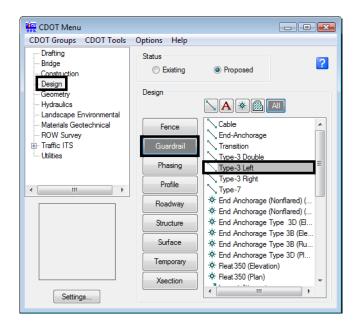
5. Turn ACS Plane Snap lock On.

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~	ACS <u>P</u> lane Snap

With **ACS Plane Snap** lock turned on, you will place elements at the active depth instead of picking up the elevation of elements you snap on.

Place the guardrail lines

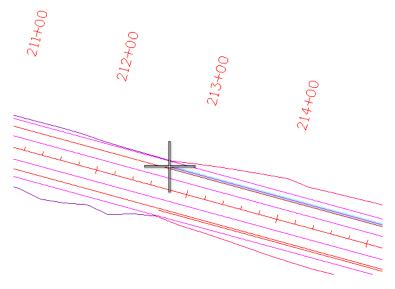
- 1. On the CDOT Menu, select **Design** from the *Explorer Window*.
- 2. Set the Category to Guardrail and select the item Type 3 left.



Note: This *automatically* sets the active level to *DES_GUARDRAIL_Type-3_Left* with all *ByLevel* settings (color, style and weight), and *automatically* selects the *Place* SmartLine command. Note that the ByLevel style is a directional custom line style called GUARDRAIL_Left_Proposed.

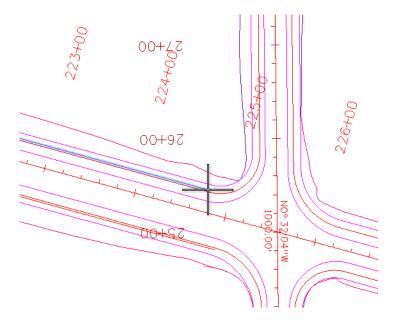
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	Color	: (ByLevel) 5
	Style	: (ByLevel) GUARDRAIL_Left_proposed
	Weight	: (ByLevel) 2

3. <T> on the left endpoint of the upper trace line as shown.



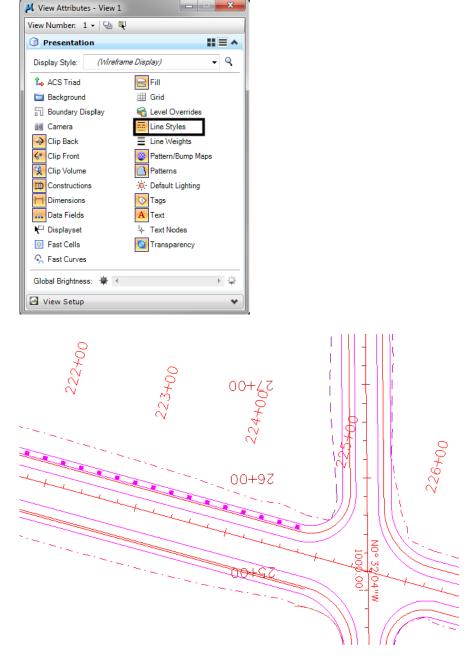
Check the message field. Note that with *ACS Plane Snap* lock on, you're placing the line at a Z value of 0 instead of the elevation of the line's endpoint.

- 4. $\langle D \rangle$ to accept.
- 5. Pan or Zoom to locate the other endpoint of the trace line near the intersection.
 - **Note:** Remember when using View Controls in the middle of a drawing command, reset <**R**> once to get back to the command.



6. Snap (<T>, then <D>) on the right endpoint as shown.

7. $\langle \mathbf{R} \rangle$ when done.



8. Select Settings > View Attributes and toggle on Line Styles.

9. On the CDOT Menu select Guardrail Type-3 Right.

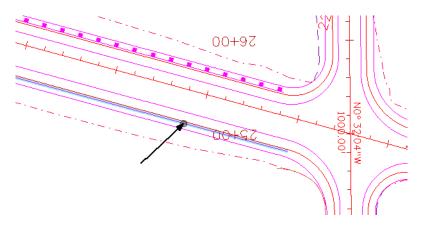
10. For the South side of the road we will use a different method. Select the **Change Element Attributes** from the Main task toolbar.



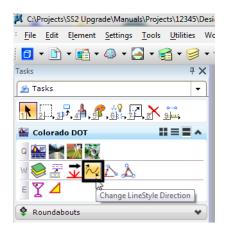
11. From the Tool Settings window toggle on Use Active Attributes, as well as Level, Color, Style, and Weight, this will use the correct guardrail line as selected from the CDOT menu.

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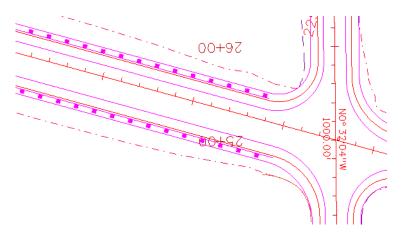
12. Select the South guardrail line.



Note: We have changed the attributes of the trace line to be the new guardrail line. Some custom line styles, like these, depend on the direction they are drawn. If the new guardrail line is placed in the wrong direction (the posts should be on the outside), select the **Change Direction** tool from the *Misc. Tools* task toolbar in the Colorado DOT task tab.



- *Note:* The *Misc. Tools* toolbar was created for CDOT using handy tools from within MicroStation.
- 13. Select the South guardrail line.



Note: Since we simply changed the attributes of the line we offset, it remains at its original elevation. We must now change the elevation of the new element to 0.

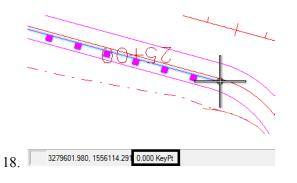
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14. From the CDOT Menu, select **CDOT Tools > ModElev**.

15. From the Tool Settings window, type an elevation of **O** and select Single.



- 16. Select **<D>** the new guardrail line.
- 17. The elevation has been changed to 0. To check, snap <T> to the endpoint of the line and notice the elevation in the status bar.

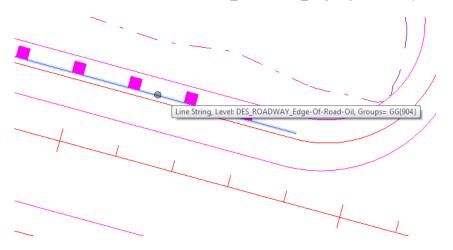


19. Turn AccuSnap back On.



Delete the North trace line

- 1. Select **Delete** from the **Main** task toolbar.
- 2. Hover over on the trace line with your mouse.
 - **Note:** Watch for the trace line (not the guardrail line) to highlight. If you see the guardrail posts highlighted, <**R**> until the trace line highlights (watch for pop-up information to show the line on level **DES_ROADWAY_Edge-of-Road-Oil**).



When using the **Delete** command, use the reset button to select coincident elements.

3. With the correct line highlighted, **<D>** to accept.

Lab 7.3 - Use Element Information to Change Levels

1. Select Element > Information or select this command from the *Primary* toolbar.



- 2. **<D>** on the upper *Type 3* guardrail lines you've just placed.
- 3. Read the basic element information in the *Message* field.

Line, Level: DES_GUARDRAIL_Type-3_Left

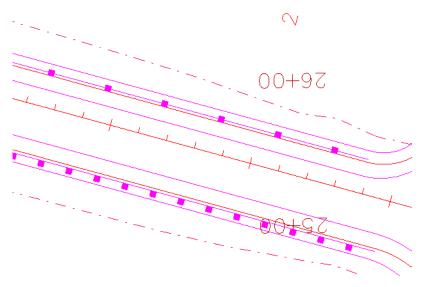
This is the same as the pop-up information provided when you "hover" over an element with your cursor.

4. In the *General* section of the *Element Information* box review the element attributes and properties.

General		2
Description	Line	
Level	DES_GUARDRAIL_Type-3_Left	
Color	DES_GUARDRAIL_Type-3_Left	
Line Style	DES GUARDRAIL Type-3 Right DES GUARDRAIL Type-7	
Weight	DES GUARDRAIL Type-7 DES Misc	
Class	DES PHASING	-
Template	DES_PHASING-Hatch	
Transparency	DES_REMOVALS	
Geometry	DES_ROADWAY_Approach DES_ROADWAY_Control-Line	
⊞ Start	DES_ROADWAY_Curb-Back	
End .	DES_ROADWAY_Curb-Flowline	
Length	DES_ROADWAY_Curb-Top DES_ROADWAY_Ditch-Bottom	
Direction	DES ROADWAY Ditch-Flowline	
Elevation Angle	DES_ROADWAY_Ditch-Top	-
DeltaX	1154.497	
DeltaY	-314.638	
DeltaZ	-5.559	
Total Length	1196.616	
Extended		ž
Raw Data		3

5. Set the Level to DES_GUARDRAIL_Type_7.

The element is moved to the *DES_GUARDRAIL_Type_7* level and the graphics update.



- **Note:** *Element Information* is one way to change element attributes or properties if the element was originally placed incorrectly.
- 6. Select the Element Information command again and change the Level back to DES_GUARDRAIL_Type-3_Left.

7. Select the **Geometry** section to review the element geometry.

Start End	3278437.042,1556493.962,-0.000 3279597,595,1556177.673,-0.000
Length	1202.881
Direction	S74*45'18.96"E
📕 Element Info	
⊡- N <selection></selection>	
General	<u>۵</u>
Description	Line
Level	DES_GUARDRAIL_Type-3_Left
Color	ByLevel (5)
Line Style	ByLevel (GUARDRAIL_Left_proposed)
Weight	ByLevel (2)
Class	Primary
Template	None
Transparency	0
Geometry	S
⊡ Start	3278437.042,1556493.962,-0.000
1 End	3279597.595,1556177.673,-0.000
Length	1202.881
Direction	S74°45'18.96"E
Elevation Angle	N90°0'0"E
DeltaX	1160.554
DeltaY	-316.289
DeltaZ	0.000
Total Length	1202.881
Extended	
Raw Data	

Note: The element was placed at the CDOT default active depth of 0 in the 3D file.

8. Close the Element Information dialog box when done.

Lab 7.4 - Turn Rasters Back On

1. Fit the view.

2. Select the **Raster Manager** icon from the *Primary Toolbar* and turn both raster files back on in View 1.

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- 3. Fit your view if you don't see the raster images.
- 4. Select File > Save Settings.