LAB 21 - Annotate the Bridge General Layout Sheet

In this lab, you'll annotate the bridge general layout sheet with text, notes and dimensions.
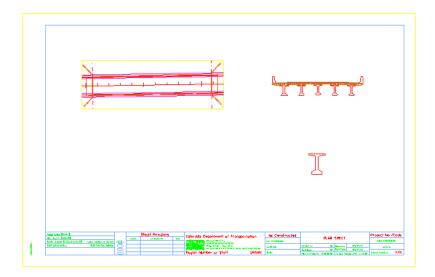
Chapter Objectives:

After completing this exercise you will know how to:

- Set and change the **Text Annotation Scale** to match the drawing scale.
- Place dimensions using the following methods:
  - ♦ Element
  - ♦ Linear
  - ♦ Angle between lines
  - ♦ Bearing and Distance
- Edit dimension text.
- Place notes with curved leaders.

Lab 21.1 - Open Project Plan Sheet

1. Start MicroStation

2. Start MicroStation and open **12345BRDG_Plan01.dgn** from the **C:\Projects\12345\Bridge\Drawings** folder.

Lab 21.2 - Place Text

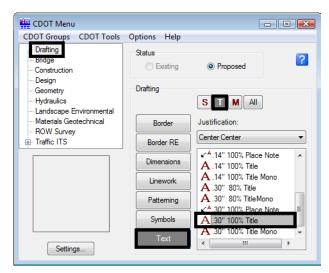Label the different part of the general layout sheet (plan, typical section, etc.)

Set text attributes

1. On the *CDOT Menu Explorer*, select **Drafting > Text** and set the following options:
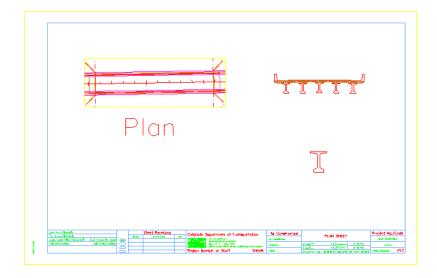
   ♦ **Filter: Title (T)**
   ♦ **Justification: Center Center**
   ♦ **Item: .30" 100% Title**

> *Note:* This sets the active level to **DRAFT_Text-2** and automatically selects the **Place Text** command.

2. In the **Word Processor** box, key in **Plan**

3. Drag your cursor into the view.

4. **<D>** to place the text as shown.

Note: The text is extremely large implying the text annotation scale is obviously wrong.
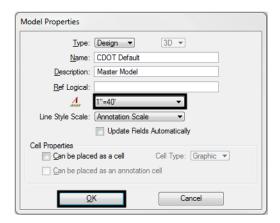
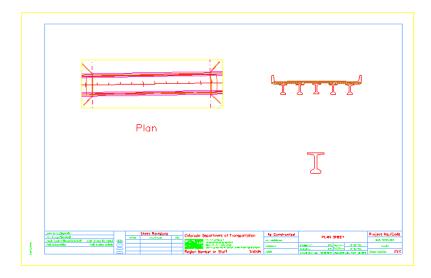5. **<R>** out of the **Place Text** command.

Change the Text Annotation Scale

1. Select **Models** from the **Primary** toolbar.

2. In the **Model** box, select **Edit Model Properties.**

3. The **Text Annotation Scale** is set to **1:100** (the default setting from the seed file).

    Note: This is a 40-scale drawing (the border was placed at a 40 scale around the graphics). Scaling the text 100 times results is text that is the wrong size.

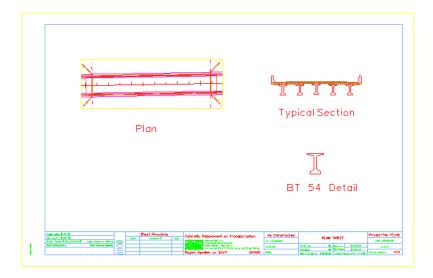4. Change the **Text Annotation Scale** to **1:40** and select **OK**.

5. The text "Plan" is automatically resized for a 40-scale drawing and will now measure correctly when plotted.

6. Close the ***Models*** box.

7. Select **File > Save Settings** to save the new settings.

8. Using the same text attribute settings, place the following text in the locations shown:

    ♦ **Typical Section**
    ♦ **BT 54 Detail**

9. Use the **Move** command to move the text to the desired location, if necessary.
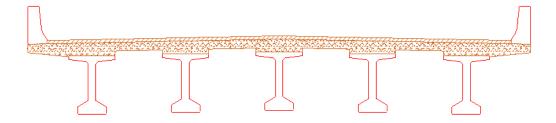

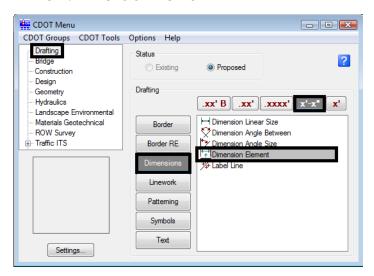
Lab 21.3 - Dimension the Bridge Typical Section

Use the CDOT Menu to dimension the bridge typical section.

Dimension the travel lanes and shoulder by element

1. **Window** around the typical section.

2. On the **CDOT Menu Explorer**, select **Drafting** and set the following options:

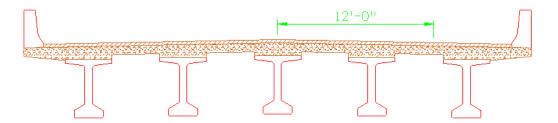   ♦ **Category: Dimensions**
    ♦ **Filter: x'-x"**

♦ **Item: Dimension Element**

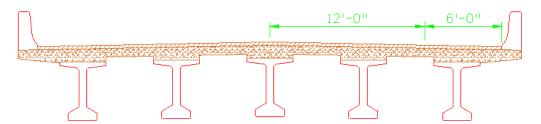*Note:* The **Dimension Element** command is automatically selected.

3. When prompted to select the element to dimension, **<D>** on the top pavement to the right of the centerline.

   Note: This should select the 12 ft **SmartLine** segment which represents the travel lane, if not, **<R>** until you select the correct element.

4. Move your cursor up to establish the length of the extension line and **<D>** to place the dimension.
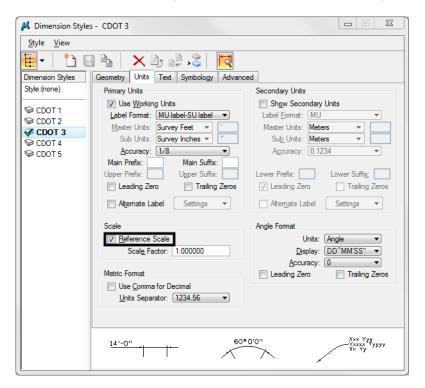

5. Repeat for the 6 ft. right-shoulder segment. **<D>** on the segment near the extension line and then **AccuSnap** on the 12 ft. dimension's terminator to place the dimension.
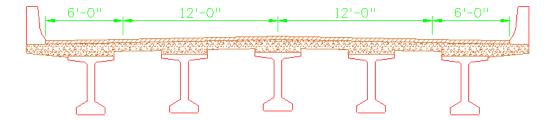
Note: The elements dimension actual size even though the bridge typical section was scaled up 4 times (40: 10 or 1:10 at a 40-scale). This is because **Reference Scale** is turned on in the **Units** tab of the dimension style. The units for dimensioning are, therefore, read from the model file instead of the sheet file. **Reference Scale** is on by default in all CDOT dimension styles.
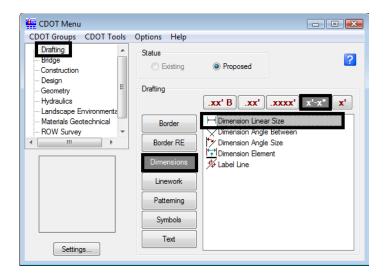

6. Repeat for the left side of the road. Be sure to **AccuSnap** on the adjacent dimension's terminator to line up the dimensions.
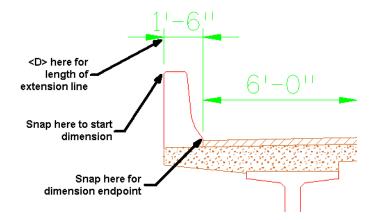
Dimension the bridge rail curb using linear dimensions

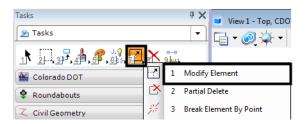1. On the CDOT Menu Explorer, change the **Item** to **Dimension Linear Size**

2. Following your prompts, **AccuSnap** on the end of the back of the rail for the start of the dimension.

3. Move your cursor up to the approximate location shown and **<D>** to define the length of the extension line.

4. **AccuSnap** on the face of the curb as shown to define the end of the dimension.
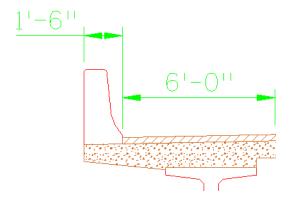

> **Note:** The dimension text is too large for the dimension when placed inside the extension lines. You can **Modify** the text to solve this problem.

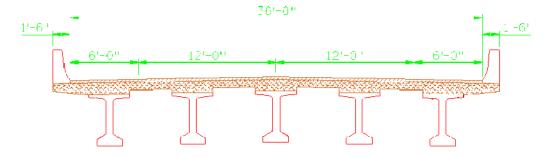5. Select the **Modify** tool from the **Main** task toolbar.

6. **<D>** on the 1'-6" curb dimension text.

7. Lock your cursor on **AccuDraw X** axis and move the text to the left as shown.

8. **<R>** when done.

9. Repeat the above steps and dimension the curb on the right side.

Place additional linear dimensions

1. Using the **Linear Dimension** command, place additional dimensions for the width of the section as shown.

Measure the typical section

1. Select the **Measure Distance** command and set the method to **Between Points.**

2. **AccuSnap** on the left outside curb line.

3. **AccuSnap** on the right outside curb line.

4. Review your results.

The typical section measures 144 ft, which is 4 times the actual size since the detail was scaled up on the drawing. While dimension commands can read reference units (via the **Reference Scale** option in the dimension style), measuring command can not. You should only use **Measuring** command in sheet files where the graphics have been referenced 1:1 (like plan view graphics). If graphics have been scaled in the sheet, you must return to the model file for true measurements.
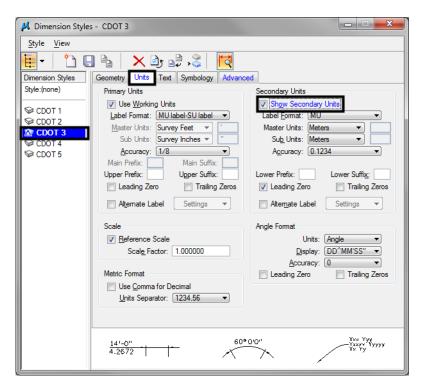
Edit dimensions

Edit the dimension style

You can change the dimension style to show secondary units below the dimension line. While this is intended for dual dimensioning in metric, you can edit this text to add descriptions to your dimensions.

1. Select **Element > Dimension Styles**.

The **Dimension Styles** box opens. This is where all the CDOT standard dimension attributes are set. Typically, you will not need to change these settings for most dimensions.

2. Select the **CDOT 3** style and then select the **Unit** category and toggle on **Show Secondary Units**

Note: Do not select the **save** icon.

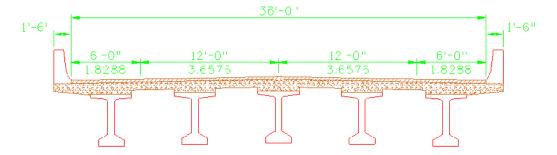3. Close the **Dimension Styles** box.

Change dimensions

1. From the *Dimension* toolbar under the *Drawing* task tab, select **Change Dimension**.

2. **<D>** on the 12 ft travel lane dimension and then **<D>** to accept.

    The dimension is updated to show the secondary units.
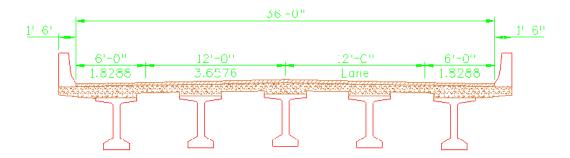
3. Repeat for the other dimensions as shown.

Change dimension text

1. Select the **Edit Text** command from the **Text** toolbar.

2. **<D>** on the 12 ft lane metric text.

    Note: In the **Text Editor**, the dimension text appears as an asterisk (*) to denote that it is associative text.

3. Change the text to **Lane**.

4. **<D>** to accept.

The text is updated on the dimension.

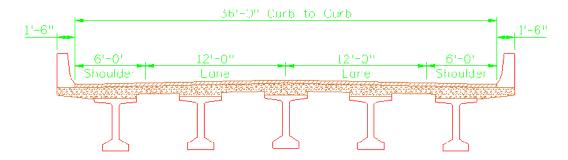5. Repeat for the other travel lane and the shoulders as shown.

Edit dimension text

1. Using the **Edit Text** command, **<D>** on the 36 ft text.

2. In the **Text Editor**, click to the right of the asterisk to get a blinking cursor.

3. **Space** once and key in **Curb to Curb**.

4. **<D>** to accept.
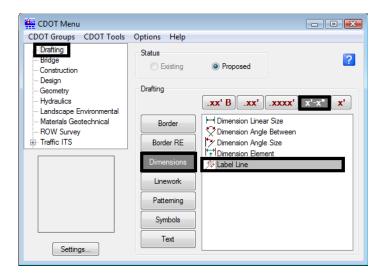
Since you did not delete the asterisk, the text is still associated with the element. You just added text to the associated dimensions.

Dimension the Plan

Dimension the bearing of the centerline

1. On the CDOT menu, select **Label Line**.
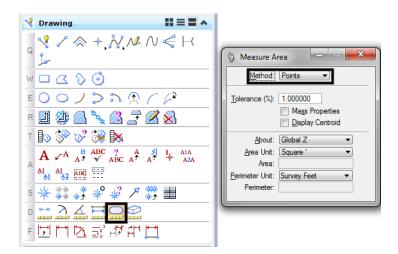

2. **<D>** on the SH 86 centerline.

> *Note:* Both Bearing and Distance are placed. If you do not want one of the dimensions, you can drop the dimension, turn off the **Graphic Group** lock and then delete the dimension.
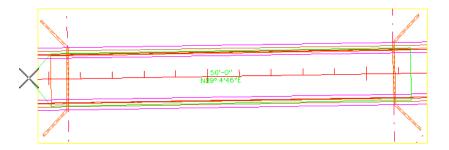
Measure the bridge area

1. Turn **ASC Plane Snap** lock on.

2. Turn **AccuSnap** off.

3. Select the **Measure Area** command from the *Measure* toolbar under the *Drawing* task tab.
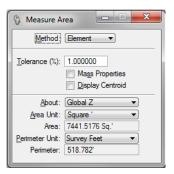
4. Set the **Method** to **Points**.

5. Snap to the four corners of the bridge as shown (see arrows) to dynamically draw a shape to measure.
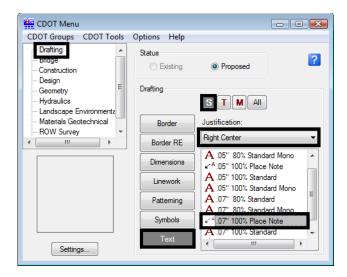

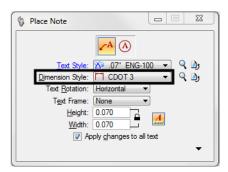6. Reset **<R>** to close the shape to compute the area (do not loop back and snap on the first point).

> ***Note:*** The Points method is the only method that gives you a planar area with Depth lock turned on.

Place a note with a curved leader
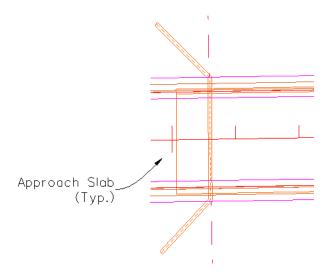
1. From the CDOT Menu, set the text options as shown.

2. Select the **Place Note** command.

3. In the **Tool Settings** box, set the **Dimension Style** to **CDOT 3**.

   Note: The **Place Note** command uses a dimension style for the leader and terminator as well as a text style. The CDOT 3 style will place a curved leader without an in-line leader.
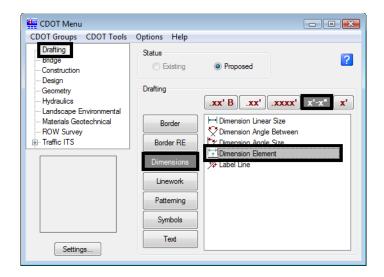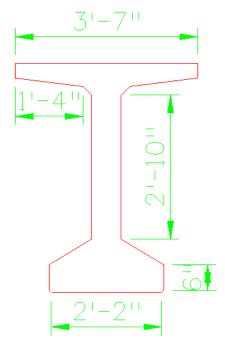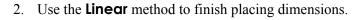
4. Place the note as shown.

Note: Since this style does not use an in-line leader, you can place the text with a data point instead of a reset point on the side of the leader.
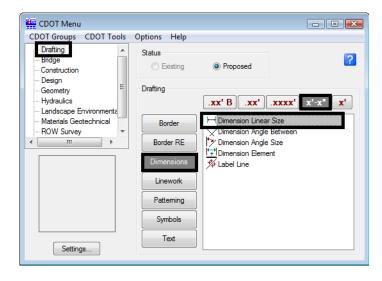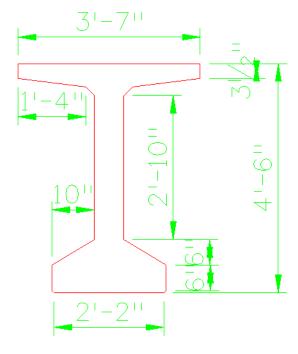
Dimension the Girder Detail

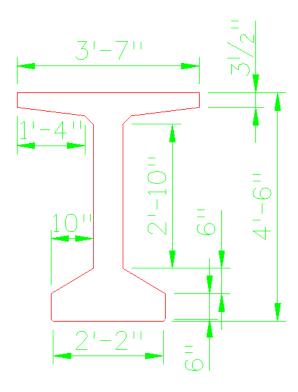1. Use the **Element** method to dimension the girder as shown.

2. Use the **Linear** method to finish placing dimensions.

3. Use the **Modify** command to move the dimension text as shown.

4. **Fit** the view.

5. **Save Settings**.

6. **Exit** MicroStation.