CHAPTER 9

Measurement and Dimensioning

PROJECT EXERCISE

This project exercise provides step-by-step instructions for placing dimensions for the completed Chapter 4 project design, as shown in Figure P9–1. The intent of this project is to guide you in applying the Dimension settings and dimension placement tools.

Note: If you have not drawn this design, refer to the practice for Chapter 4.

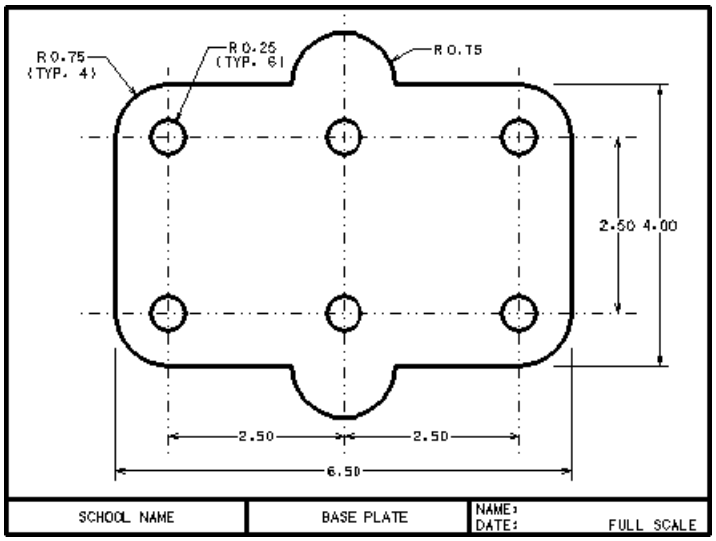


Figure P9–1 Chapter 4 project design

SET UP DIMENSIONING FOR THE CHAPTER 4 PROJECT

This procedure loads the Chapter 4 project design file in MicroStation, and enters the Dimension settings.

Note: As you complete each step in the project procedures, place a check mark by the step to help you keep up with where you are in the project.

STEP 1: Invoke MicroStation using the normal technique for the operating system on your workstation, and open the Chapter 4 project design file named CH4.DGN.

STEP 2: If necessary, invoke the Fit View tool to fit the view.

STEP 3: Open the Dimension Settings box by selecting **Dimensions** from the **Element** drop-down menu. MicroStation displays the dimension settings similar to Figure P9–2a.

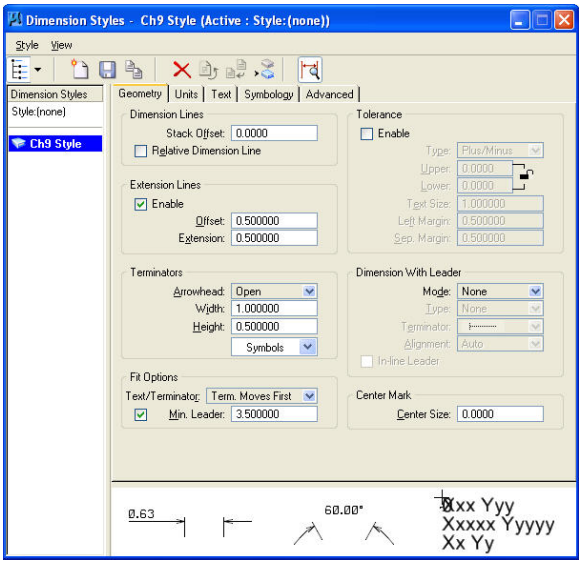


Figure P9–2a Dimension Settings box Geometry tab

STEP 4: Set the dimension settings as shown in Figures P9–2a through P9–2d.

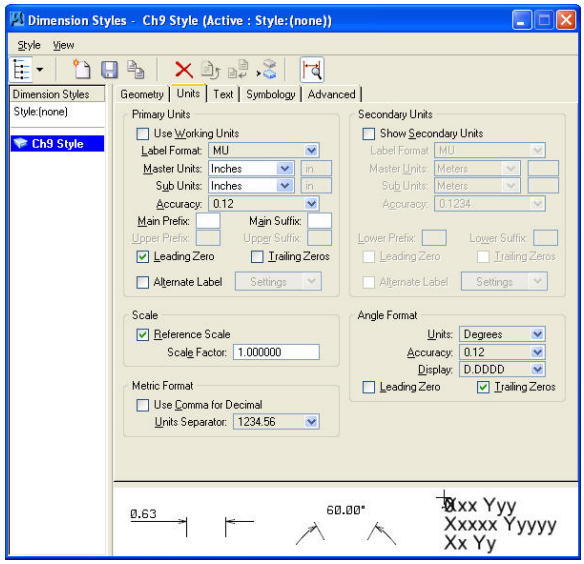


Figure P9–2b Dimension Settings box Units tab

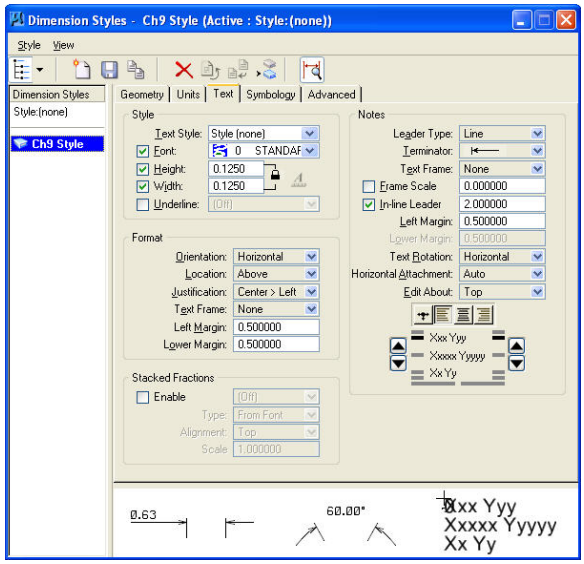


Figure P9–2c Dimension Settings box Text tab

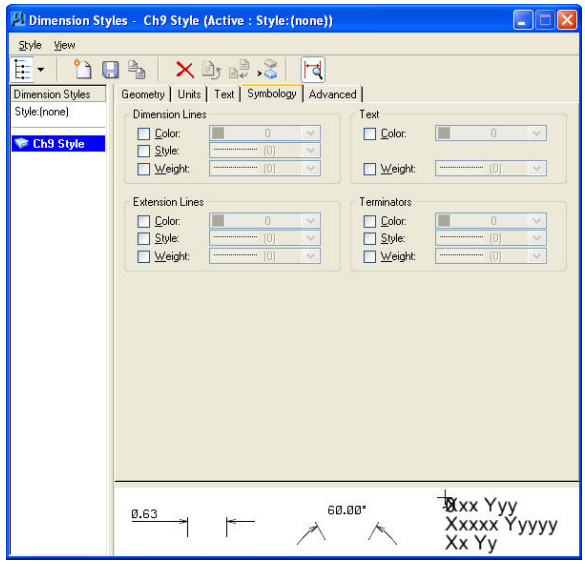


Figure P9–2d Dimension Settings box Symbology tab

STEP 5: To save the dimension settings, select **Save** from the **Style** menu.

PLACE THE RADIAL DIMENSIONS

This procedure places the radial dimensions and adds text below the dimension on the circle, as shown in Figure P9–3.

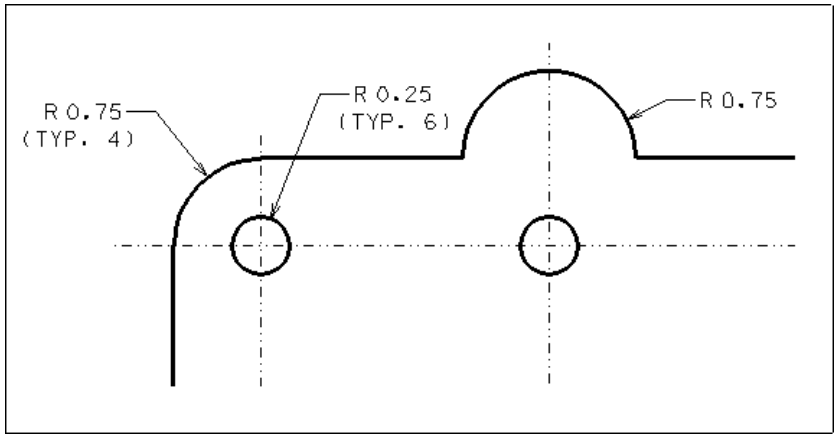


Figure P9–3 Completed radial dimensions

STEP 1: Invoke the Dimension Radius tool from the Task Navigator tool box (active task set to Dimensions). In the tool settings window, expand the window by clicking

the **Show Basic Options** arrow and select the **Dimension Radius** tool. Set the other options on the tool settings box to match to Figure P9–4.

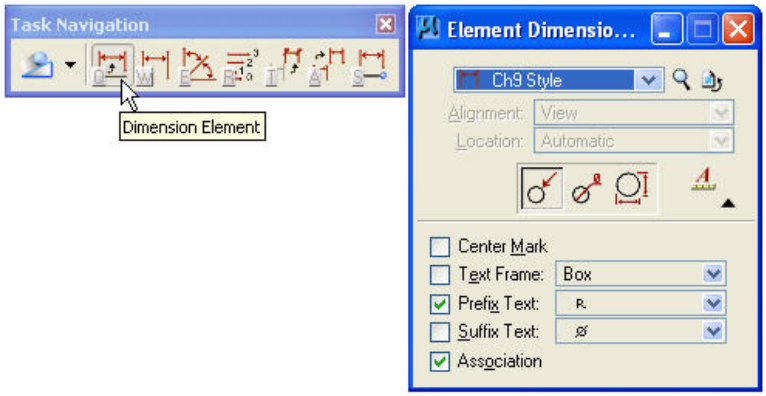


Figure P9–4 Invoking the Dimension Element tool

MicroStation prompts:

Dimension Radius > Select element to dimension

Select the top, left fillet.

Dimension Radius > Select location of dimension, Accept/Reset

Drag the image of the dimension text to the location where you want to place it and place a data point to complete the dimension.

STEP 2: Place a radial dimension on the top left circle.

STEP 3: Place a radial dimension on the top arc.

STEP 4: Invoke the Place Text By Origin tool from the Task Navigator tool box (active task set to Text). In the tool settings box, set the text **Height** and **Width** to 0.125.

MicroStation prompts:

Enter Text > Enter text

In the Text Editor window, type (TYP. 4).

Enter Text > Enter more characters or position text

In the Text Editor window, type TYP. 4. (Place the text centered under the fillet's dimension text, as shown in Figure P9–3.

STEP 5: Repeat the procedure of step 4 to place (TYP. 6) below the circle's dimension text.

STEP 6: Select **Save Settings** from the **File** drop-down menu.

PLACE OUTER LINEAR DIMENSIONS

This procedure places the linear overall length and width dimensions, as shown in Figure P9–5.

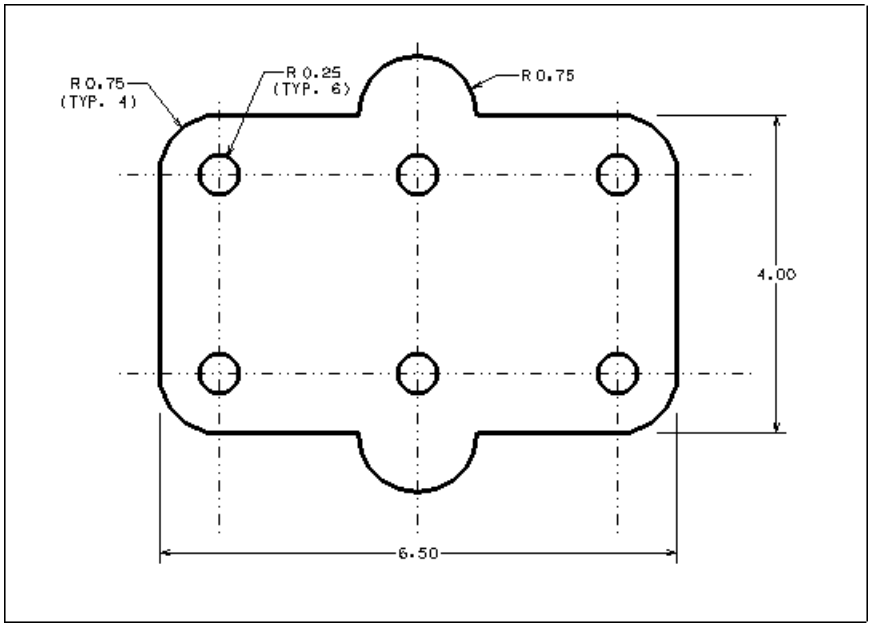


Figure P9–5 Completed length and width dimensions

STEP 1: To place the vertical dimension, invoke the Dimension Linear tool from the Task Navigator tool box (active task set to Dimensions). In the tool settings window, expand the window by clicking the **Show Basic Options** arrow and select the **Linear Size** tool. Set the other options on the tool settings box to match Figure P9–6.

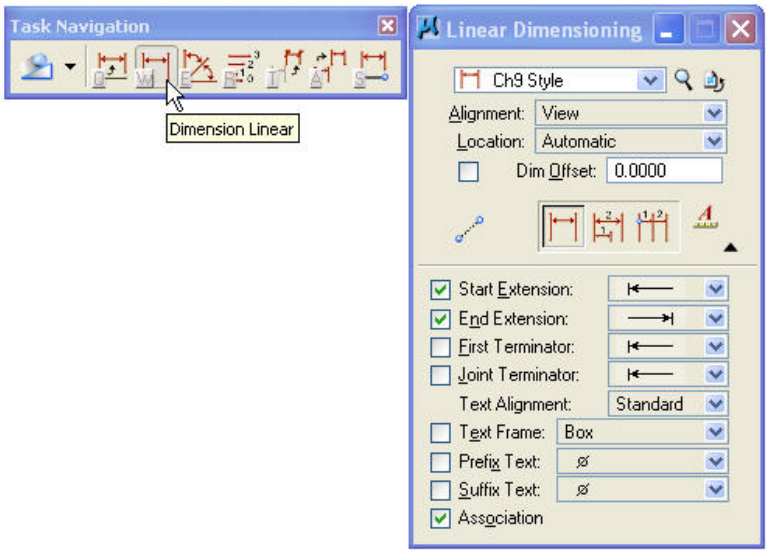


Figure P9–6 Invoking the Dimension Linear tool

MicroStation prompts:

> Dimension Size with Arrow > Select start of dimension

Keypoint snap at the joining point between the horizontal line and the top fillet, and place a data point to define the starting point of the dimension.

> Dimension Size with Arrow > Select dimension endpoint

Keypoint snap at the joining point between the horizontal line and the bottom fillet, and place a data point to complete the height dimension.

> Dimension Size with Arrow > Define length of extension line

Drag the placement pointer about 1.5 Master Units straight to the right and place a data point to define the length of the extension line.

STEP 2: Click the Reset button twice to start a new linear dimension, and dimension the 6.5 horizontal length of the base plate.

PLACE CENTERLINE DIMENSIONS

This procedure turns OFF placement of extension lines and dimensions the centerlines, as shown in Figure P9–7.

STEP 1: Click the Reset button twice to start a new linear dimension, and in the tool settings box, turn OFF the **Start Extension** and **End Extension** check boxes.

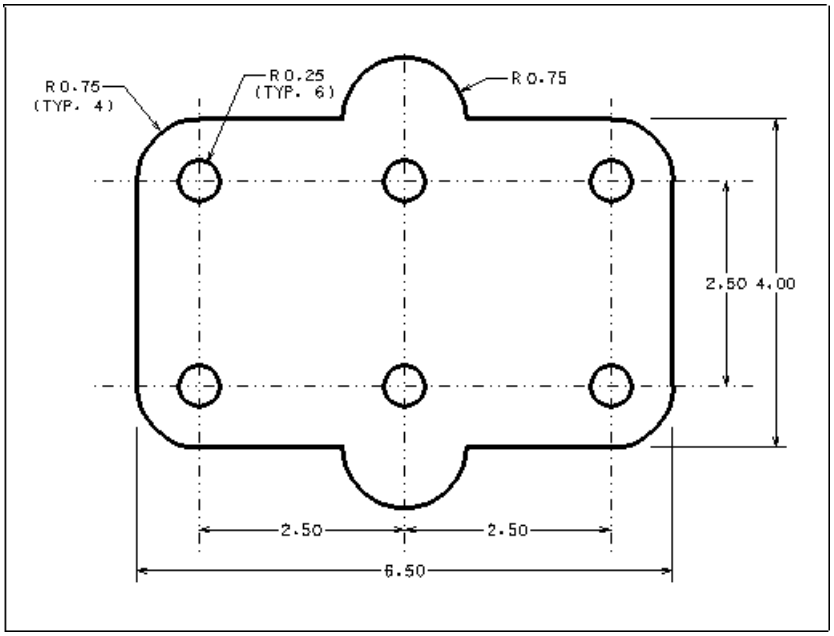


Figure P9–7 Completed overall length and width dimensions

STEP 2: Place the vertical dimension.

MicroStation prompts:

Dimension Size with Arrow > Select start of dimension

Keypoint snap to the right end of the top centerline and place a data point.

Define Size with Arrow > Select dimension endpoint

Keypoint snap to the right end of the lower horizontal centerline.

Dimension Size with Arrow > Define length of extension line

Drag the placement pointer about .25 Master Units to the right and place a data point.

STEP 3: Click the Reset button twice to start a new linear dimension, and place the horizontal centerline dimensions.

STEP 4: Compress the design and save the design settings.

DRAWING EXERCISES 9–1 THROUGH 9–5

Exercise 9–1

Use Mechanical dimensioning to place dimensions on the flange gasket created in Exercise 4–8.

Exercise 9–2

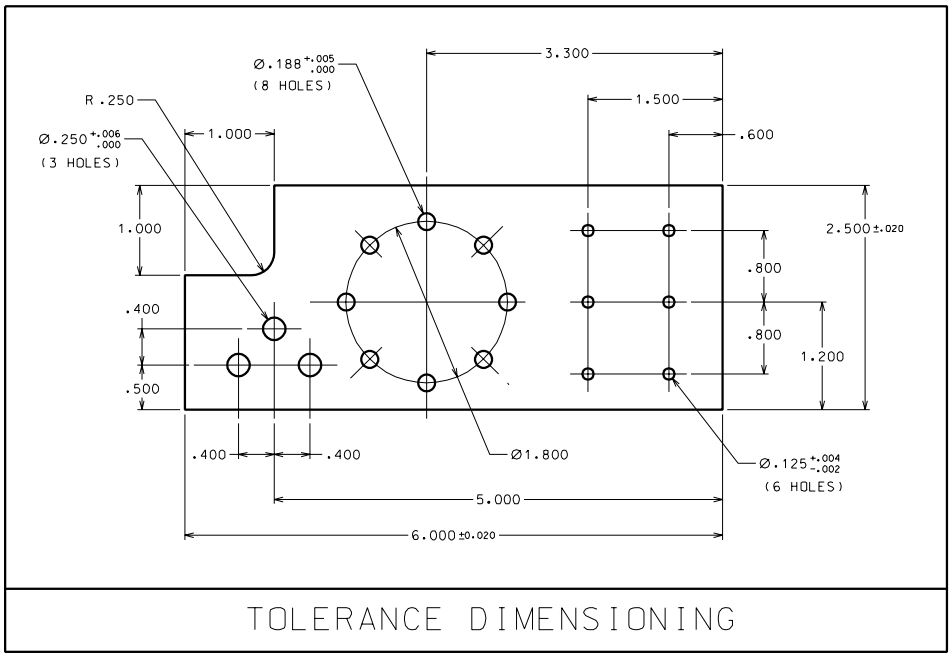
Use Mechanical dimensioning to place dimensions on the machine part created in Exercise 5–2.

Exercise 9–3

TOLERANCE DIMENSIONING

Use the following table to set up the design file for Exercise 9–3 and draw and dimension the object shown in the figure.

SETTING	VALUE
Seed File	seed2d.dgn
Working Units	Master Units and Sub Units to Inches
Grid	Grid Master = 0.1, Grid Reference = 10



TOLERANCE DIMENSIONING

Exercise 9–4

Use AEC dimensioning to place dimensions on the master bathroom floor plan created in Exercise 5–5.

Exercise 9–5

Use AEC dimensioning to place dimensions on the custom doors created in Exercise 6–5.