CHAPTER 5

AccuDraw and SmartLine

PROJECT EXERCISE

This project exercise provides step-by-step instructions for creating the design shown in Figure P5–1. The intent is to guide you in applying AccuDraw and SmartLine.

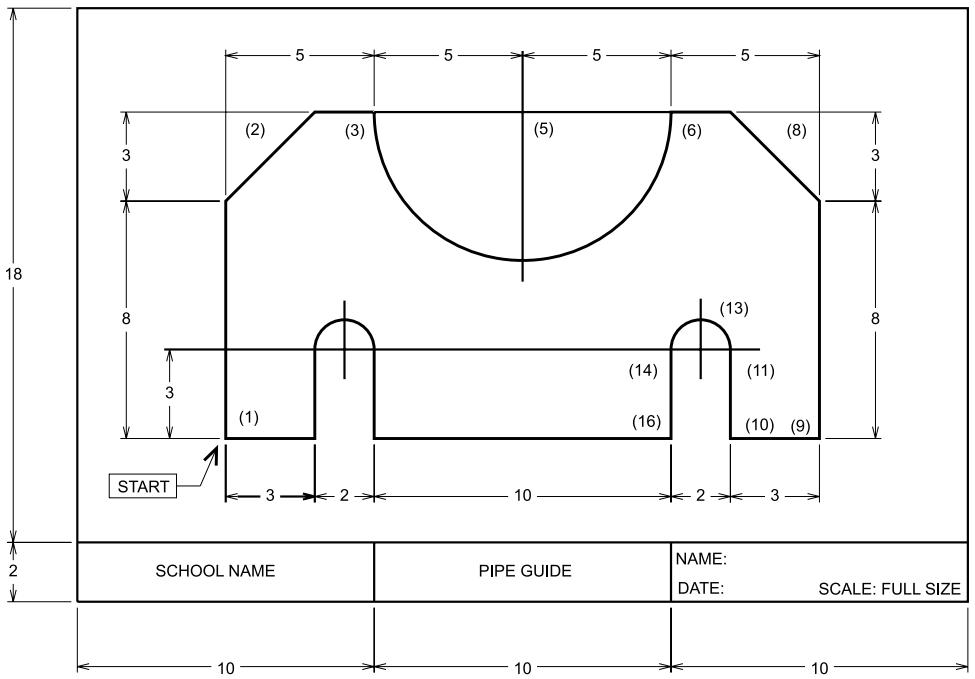


Figure P5–1 Completed project design

Notes: The dimensions are not part of this project. They are included in Figure P5–1 only to show the size of the design.

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.

PREPARE THE DESIGN FILE

In this procedure you start MicroStation, create a design file, and enter the initial settings.

STEP 1: Invoke MicroStation program.

STEP 2: Create and open a new design file named CH5.dgn using the seed2d.dgn seed file.

STEP 3: In the **Design File** dialog box:

- Set the **Master Units** and **Sub Units** to "Inches."
- Set the **Coordinates Format** to **Master Units**.
- Set the **Grid Master** to **0.1** inch, set the **Grid Reference** to **10**, and turn the **Grid Lock** check box OFF
- Close the Design File dialog box.

STEP 4: Turn on AccuSnap.

STEP 5: Set **Keypoint** as the default tentative snap mode.

STEP 6: Invoke the AccuDraw tool from the Primary Tool box (see Figure P5–2).

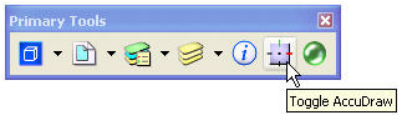


Figure P5–2 Invoking the AccuDraw tool

STEP 7: Open the AccuDraw Settings box from the **Settings** menu.

STEP 8: Click the **Operation** tab and make the settings shown in Figure P5–3.

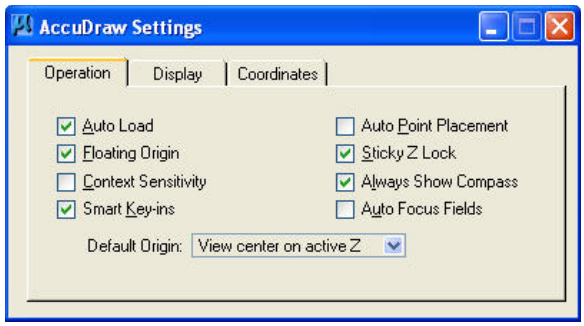


Figure P5–3 AccuDraw Operation settings

STEP 9: Click the **Display** tab and make the settings shown in Figure P5–4.

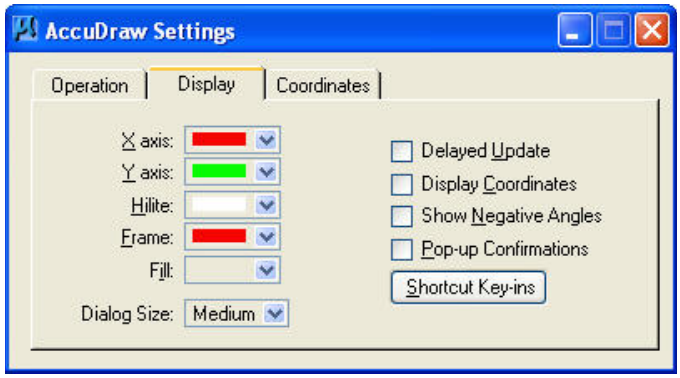


Figure P5–4 AccuDraw Display settings

STEP 10: Click the **Coordinates** tab and make the settings shown in Figure P5–5.

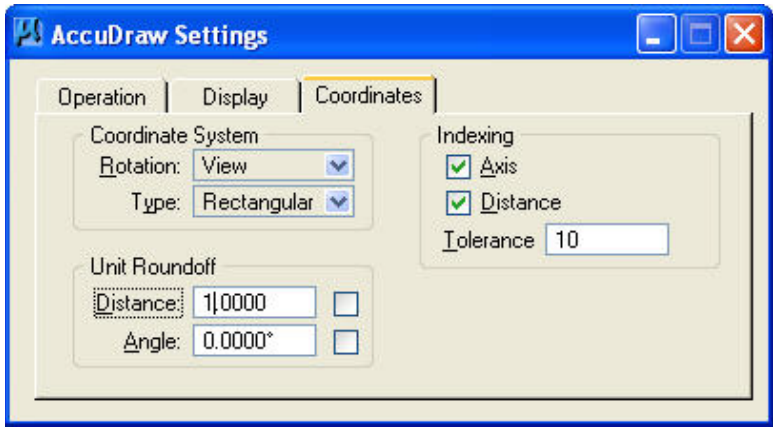


Figure P5–5 AccuDraw Coordinates settings

STEP 11: Select **File > Save Settings**.

DRAW THE BORDER AND TITLE BLOCK

Draw the border and title block as shown in Figure P5–1, employing AccuDraw to aid in element placement.

STEP 1: Invoke the Place Block tool from the Task Navigator tool box (active task set to Polygons) and select the **Orthogonal Method**.

MicroStation prompts:

Place Block > Enter first point

Place a data point to define the lower left corner of the border.

Place Block > Enter opposite corner

Key-in **30** in the AccuDraw coordinates box **X** text field and **20** in the **Y** text field. Click the Data button to place the upper right corner of the block.

STEP 2: Fit the view window.

STEP 3: Invoke the Place Line tool.

MicroStation prompts:

Place Line > Enter first point

Move the pointer over the lower left corner of the block until AccuSnap snaps to the corner and click the Tentative Button. Key-in the letter O to center the AccuDraw compass over the tentative point. Move the pointer up until the AccuDraw coordinates box **Y** field displays 2.0000 and click the Data button to start placing a line.

Place Line > Enter end point

Move the pointer to the right until the AccuDraw coordinates box **X** field displays 30.0000 and click the Data button to complete the line. Click the Reset button.

Place Line > Enter first point

Move the pointer over the lower left corner of the block until AccuSnap snaps to the corner and click the Tentative Button. Key in the letter **O** to center the AccuDraw compass over the tentative point. Move the pointer to the right until the AccuDraw coordinates box **X** field displays 10.0000 and click the Data button to start placing a line.

Place Line > Enter end point

Move the pointer up until the AccuDraw coordinates box **Y** field displays 2.0000 and click the Data button to complete the line. Click the Reset button.

Place Line > Enter first point

Move the pointer over the lower left corner of the block until AccuSnap snaps to the corner and click the Tentative Button. Key in the letter **O** to center the AccuDraw compass over the tentative point. Move the pointer to the right until the AccuDraw coordinates box **X** field displays 20.0000 and click the Data button to start placing a line.

Place Line > Enter end point

Move the pointer up until the AccuDraw coordinates box **Y** field displays 2.0000 and click the Data button to complete the line. Click the Reset button.)

STEP 4: Place the text in each section of the title block using the Engineering font (3), 0.6 inches for the large text size, and 0.3 inches for the small text size:

- Place a company name in the left title block.

- Place your name to the right of "NAME."
- Place today's date to the right of "DATE."

DRAW THE DESIGN

Draw the pipe guide shown in Figure P5–1 using AccuDraw and SmartLine.

STEP 1: Invoke Place SmartLine from the Task Navigator tool box (active task set to Linear), as shown in Figure P5–6. In the Tool Settings window, set the **Vertex Type** to **Chamfered**, and key-in **3** in the **Chamfer Offset** text field.

Figure P5–6 Invoke Place SmartLine and set the Chamfer Offset to 3

Note: Numbers in parentheses have been added to the following MicroStation prompts and to Figure P5–1, to help you keep up with where you are in the procedure for drawing the pipe guide. Those numbers do not appear in the MicroStation prompts on the screen and will not be drawn.

MicroStation prompts:

(1) Place SmartLine > Enter first vertex

Move the pointer over the lower left corner of the border block until AccuSnap snaps to the corner and click the Tentative Button. Key in the letter **O** to center the AccuDraw compass over the tentative point. In the AccuDraw coordinates box key-in **5.5** in the **Y** text field and **5** in the **X** text field. Click the Data button to start the SmartLine.

(2) Place SmartLine > Enter the next vertex or reset to complete

Move the pointer up until the AccuDraw coordinates box displays 11.0000 in the **Y** text field and click the Data button to complete placing the first SmartLine segment.

(3) Place SmartLine > Enter the next vertex or reset to complete

Move the pointer to the right until the AccuDraw coordinates box **X** text field displays 5.0000 and click the Data button.

The completed portion of the pipe guide should match Figure 5–7.

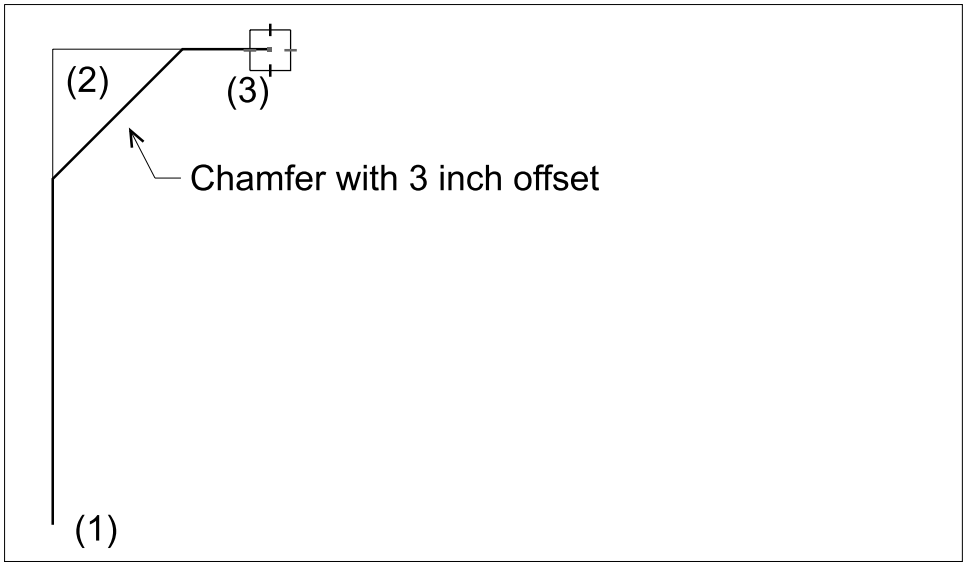


Figure P5–7 The completed left side of the pipe guide

(4) Place SmartLine > Enter the next vertex or reset to complete

Change the SmartLine Segment Type to Arcs.

(5) Place SmartLine > Enter arc center

Move the pointer to the right until the AccuDraw coordinates box X text field displays 5.0000 and click the Data button to define the location of the arc center.

(6) Place SmartLine > Define the sweep angle

Move the pointer to the right until the AccuDraw coordinate box X text field displays 5.0000, and click the Data button to complete placing the arc.

(7) Place SmartLine > Enter arc center

Change the SmartLine Segment Type to Lines.

(8) Place SmartLine > Enter the next vertex or reset to complete

Move the pointer to the right until the AccuDraw coordinates box X text field displays 5.0000, and click the Data button.

The completed portion of the pipe guide should match Figure 5–8.

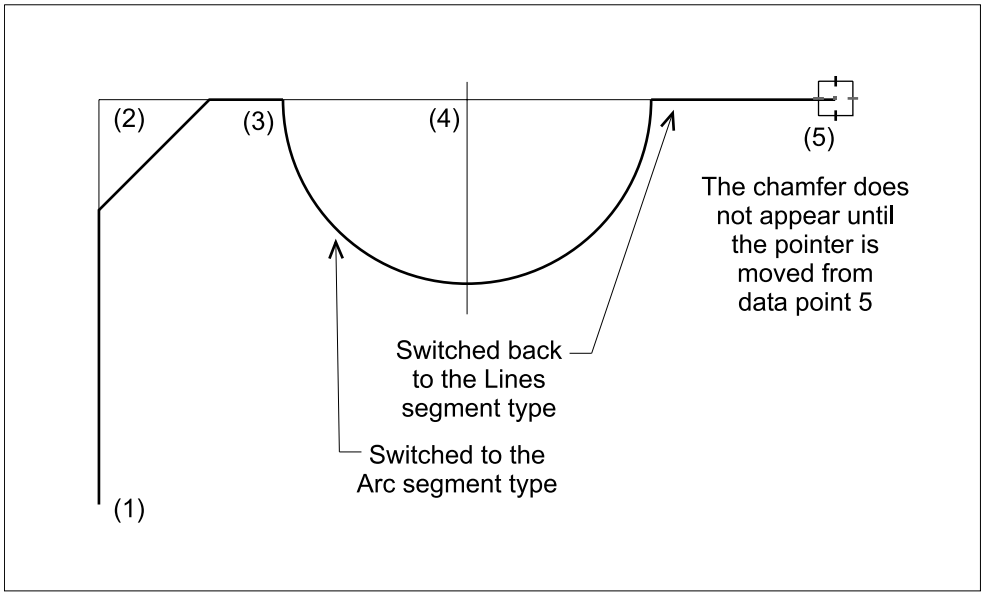


Figure P5–8 The completed left and top sides of the pipe guide

(9) Place SmartLine > Enter the next vertex or reset to complete

Move the pointer down until the AccuDraw coordinates box **Y** text field displays -11.0000, and click the Data button.

(10) Place SmartLine > Enter the next vertex or reset to complete

Change the SmartLine Vertex Type to Sharp. Move the pointer to the left until the AccuDraw coordinates box **X** text field displays −3.0000 and click the Data button.

(11) Place SmartLine > Enter the next vertex or reset to complete

Move the pointer up until the AccuDraw coordinates box **Y** text field displays 3.0000 and click the Data button.

(12) Place SmartLine > Enter the next vertex or reset to complete

Change the SmartLine Segment Type to Arcs.

(13) Place SmartLine > Enter arc center

Move the pointer to left until the Accu-Draw coordinates box **X** text field displays −1.0000, and click the Data button to define the center of the arc.

(14) Place SmartLine > Define sweep angle

Move the pointer to left until the AccuDraw coordinates box **X** text field displays −1.0000 and click the Data button to complete the arc.

The completed portion of the pipe guide should match Figure 5–9.

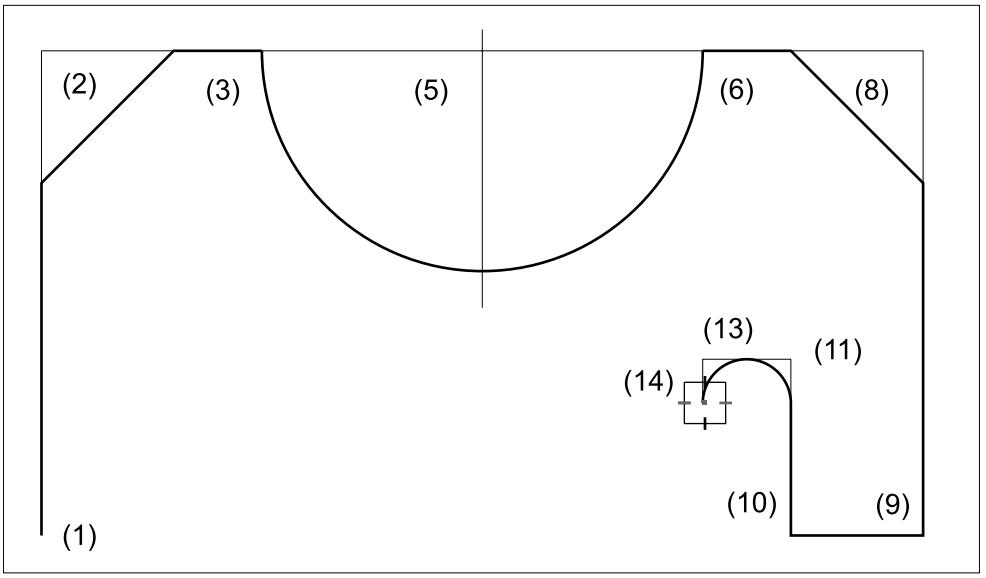


Figure P5–9 The completed right slot on the bottom of the pipe guide

(15) Place SmartLine > Enter arc center

Change the SmartLine Segment Type to Lines.

(16) Place SmartLine > Enter the next vertex or reset to complete

Complete the remainder of the pipe guide.

The completed portion of the pipe guide should match Figure 5–1 (without the dimensions).

STEP 2: Select **File > Save Settings**.

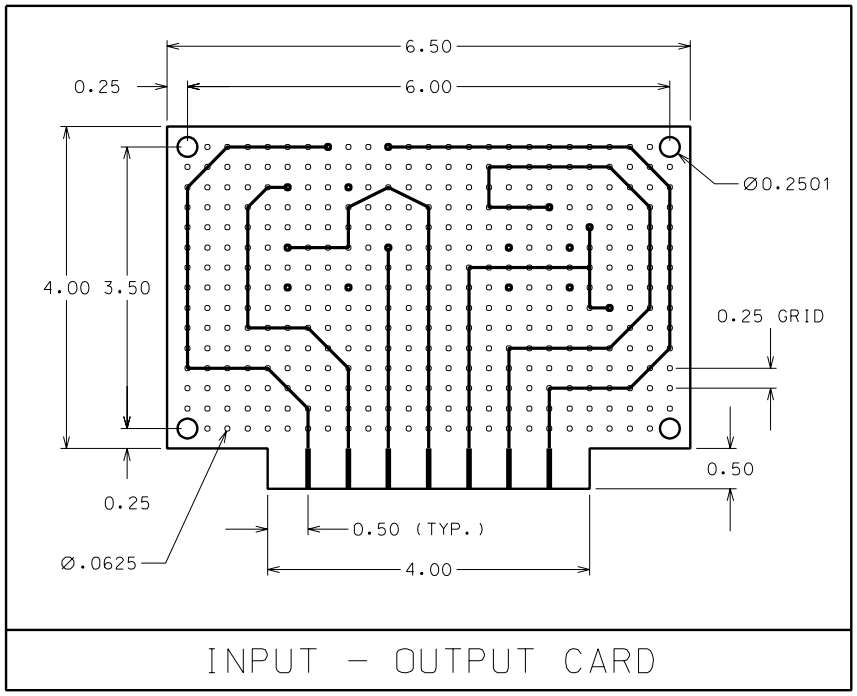
DRAWING EXERCISES 5–1 THROUGH 5–5

Use the following table to set up the design files for Exercises 5–1 through 5–3.

SETTING	VALUE
Seed File	seed2d.dgn
Working Units	Master Units=Inches, Sub Units = Inches
Grid	Grid Master = .25, Grid Reference = 4, Grid Lock ON

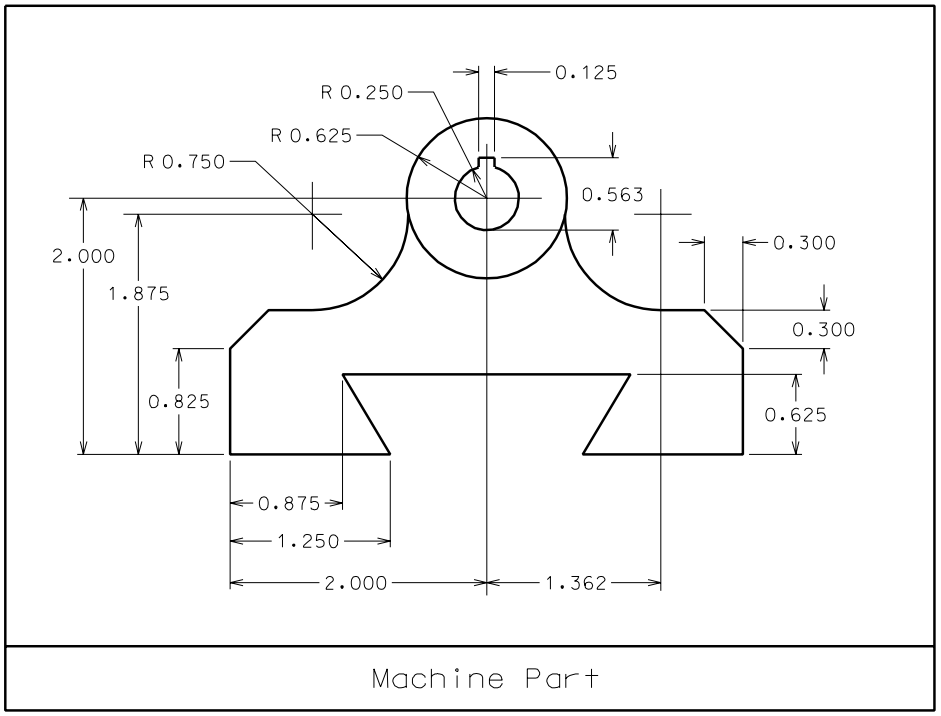
Exercise 5–1

INPUT-OUTPUT CARD



Exercise 5–2

MACHINE PART

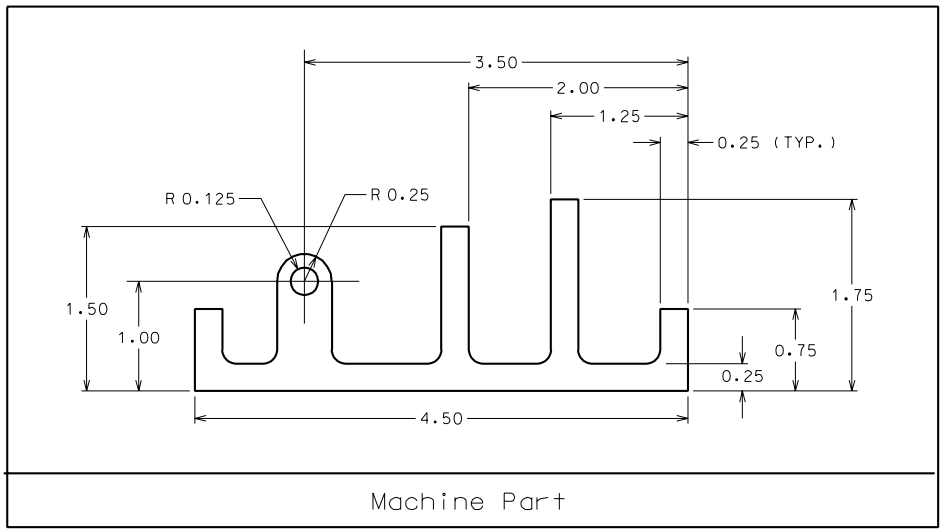


Exercise 5–3

MACHINE PART

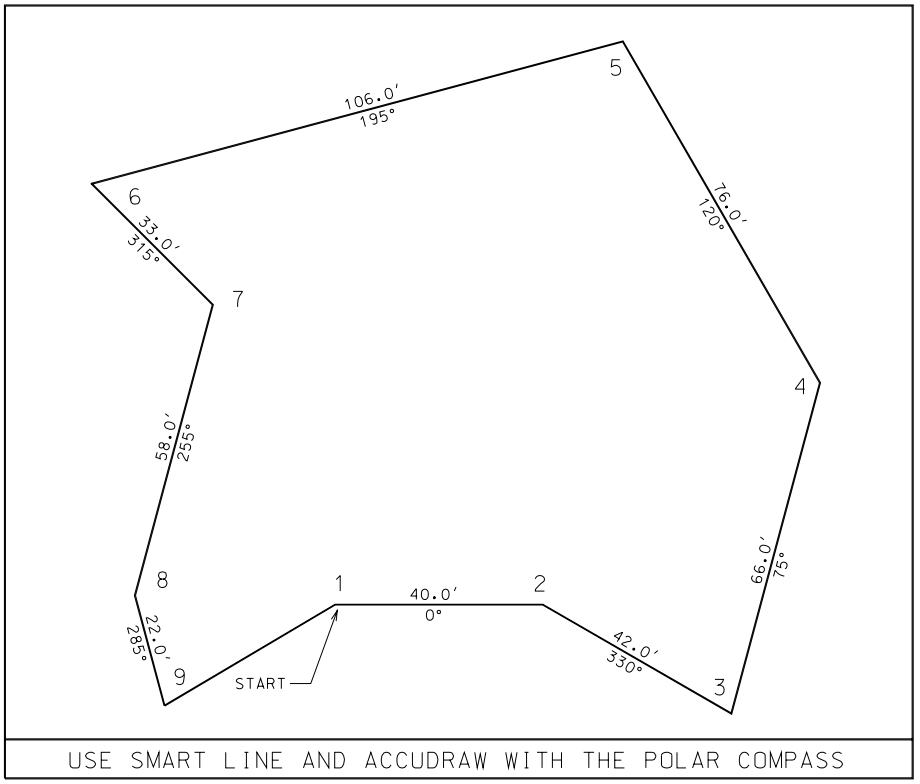
Use the following table to set up the design files for Exercises 5–4 through 5–5.

SETTING	VALUE
Seed File	seed2d.dgn
Working Units	Master Units=Feet, Sub Units = Inches
Grid	Grid Master = .25, Grid Reference = 4, Grid Lock ON



Exercise 5–4

PLOT PLAN



Exercise 5–5

MASTER BATH FLOOR PLAN