CHAPTER 8

Element Modification

PROJECT EXERCISE

This project exercise provides step-by-step instructions for creating the Utility–Storage Floor Plan shown in Figure P8–1. The intent is to guide you in applying the Multi-line setting, placement, and joints tools.

Note: The dimensions are not part of this project. They are included in Figure P8–1 as an aid to drawing the design.

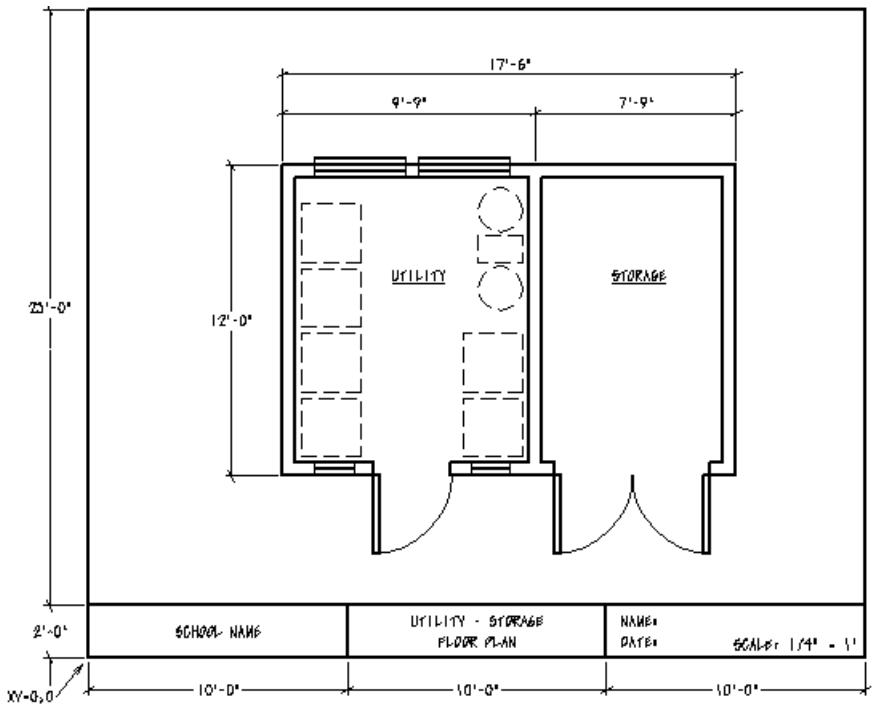


Figure P8–1 Completed project design

PREPARE THE DESIGN FILE

This procedure starts MicroStation, creates a design file, and enters the initial 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, and create a new design file named CH8.DGN using the seed2d.dgn seed file.

STEP 2: In the Design File dialog box set the following:

- Make sure the Working Unit is set to Feet for Master Unit and Inches for the Sub Unit.
- Grid Master to 0.5, Grid Reference to 2, and Grid Lock ON.

STEP 3: Invoke the Text settings box from the drop-down menu **Element**, and adjust the settings as follows:

- **Font** = 41 - Architectural
- **Text Height** = 0.4
- **Text Width** = 0.3
- **Line Spacing** = 0.4
- Single-line and Multi-line justifications = Center Center

STEP 4: Turn on AccuDraw, and make the following settings in the AccuDraw settings box:

- **Unit Roundoff Distance** = 0:1
- **Coordinate System Rotation** = Top
- **Coordinate System Type** = Rectangular
- **Operation Floating Origin** = ON
- **Operation Context Sensitivity** = ON
- **Operation Smart Key-ins** = ON
- **Operation Auto Point Placement** = OFF
- Open Coordinate Readout settings box, set Coordinates Format to Sub Units

STEP 5: Create the following levels and assign properties as indicated using the Level Manager settings box:

- Objects – Color to red (3), **Line Style** to 0 (continuous), and **Line Weight** to 2.
- Border–**Color** to green (2), **Line Style** to 0 (continuous), and the **Line Weight** to 1

- Temp Lines–**Color** to green (2), **Line Style** to 1 (short dashes), and **Line Weight** to 1.
- Hidden–**Color** to white (0), **Line Style** to 2 (hidden), and **Line Weight** to 1.
- Mline – **Color** to blue, **Line Style** to 0 (Continuous) and **Line Weight** to 1.

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

DRAW THE BORDER AND TITLE BLOCK

This procedure draws the border and title block, then places the required text in the title block.

STEP 1: Using Figure P8–1 as a guide, draw the 30′ × 25′ border and title block on level Border. Place the lower-left corner of the border at XY=0,0.

STEP 2: Fit the view window.

STEP 3: Place the title block text:

- Replace "SCHOOL NAME" with your school or company name, or make up a name.
- Place your name to the right of "NAME:"
- Place today's date to the right of "DATE:"

STEP 4: Select **Save Settings** from the **File** drop-down menu.

CREATE A MULTI-LINE PROFILE

This procedure sets up the multi-line element to be used to draw the walls of the utility–storage floor plan.

STEP 1: Open the Multi-lines settings box by selecting **Multi-line Styles** from the **Element** drop-down menu.

STEP 2: In the Multi-line Styles dialog box create a new style (**Style > New**) and name it Ch8 Style.

STEP 3: If the style contains more than two line components, delete all but two of them. To delete each extra line:

- Select the line to delete.
- Select **Profile > Delete**.

STEP 4: Select the **Offset** on of the remaining lines., set the **Offset** to 0.0000 (the working line), and set the Attributes as shown in Figure P8–2.

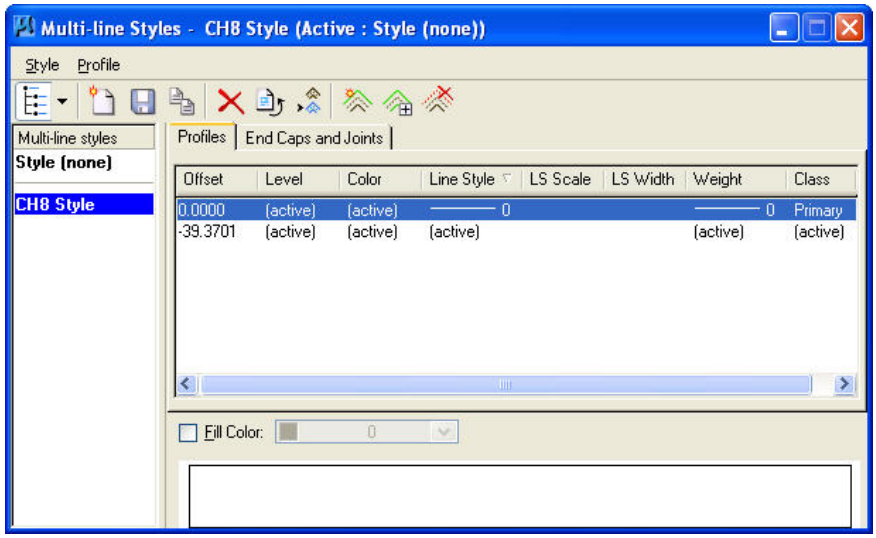


Figure P8–2 Settings for the working line in the wall's Multi-line profile

STEP 5: Select the second line in the Component list box and set the Attributes as shown in Figure P8–3.

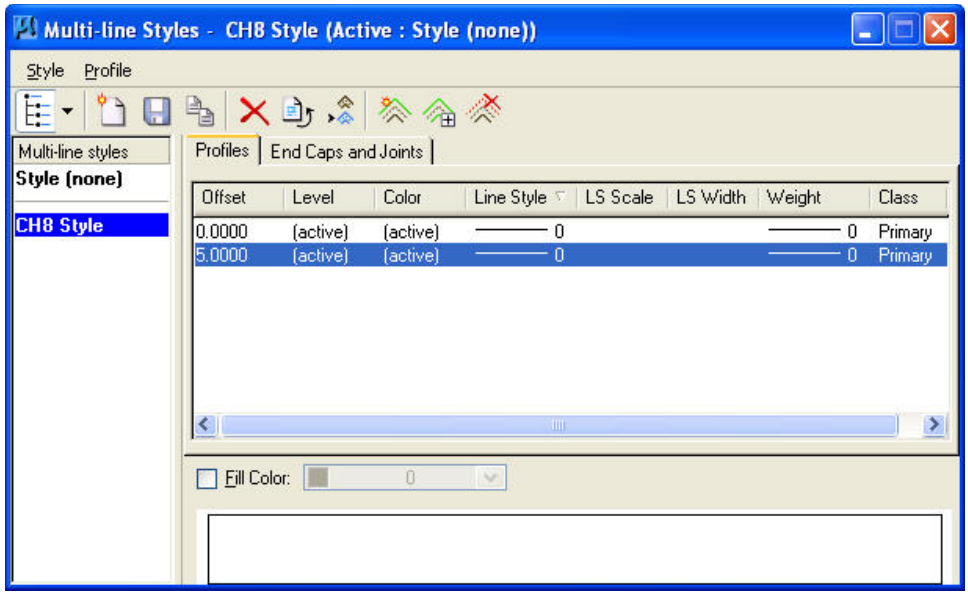


Figure P8–3 Setting the Attributes for the second line in the wall's Multi-line profile

STEP 6: Set the **Start Cap**, **End Cap**, and **Joints** as shown in Figure P8–4.

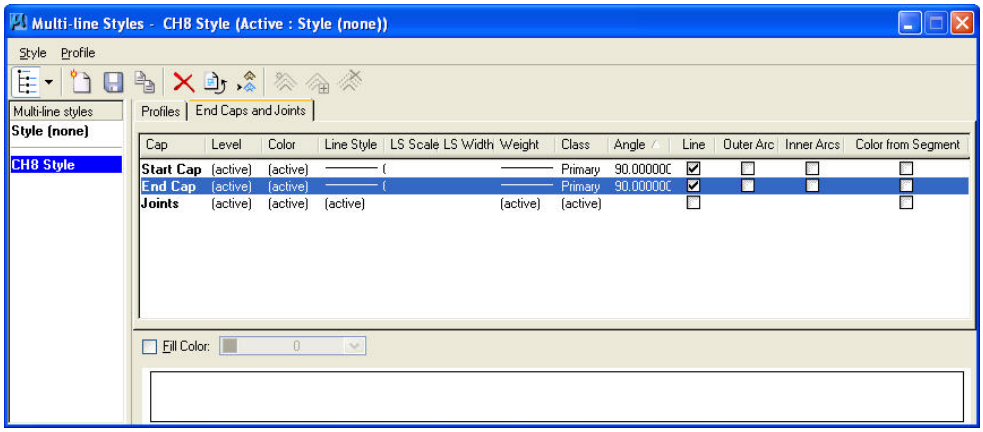


Figure P8–4 Start Cap settings for the wall's Multi-line profile

STEP 7: Select **Save All** from the **Style** drop-down menu.

DRAW THE WALLS

This procedure uses the Multi-line tool and AccuDraw to draw the utility–storage floor plan walls, as shown in Figure P8–5.

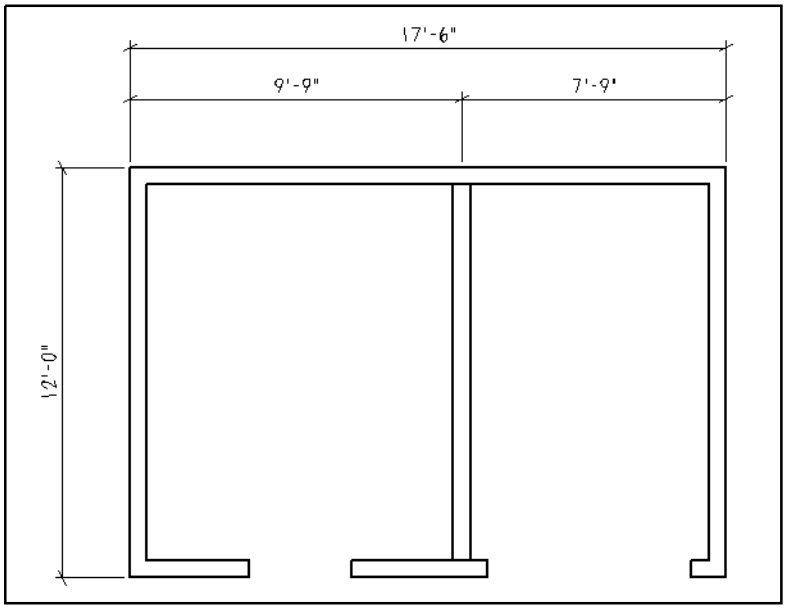


Figure P8–5 The walls before holes are cut for the windows

STEP 1: Set the Active Level to Objects.

STEP 2: Invoke the Place Multi-line tool from the Task Navigator tool box (active task set to Linear), and, in the Tool Settings window, select **Ch8** Style from the Style menu, select **Workline** from the **Place by** menu, and turn OFF the **Length** and **Angle** check boxes, as shown in Figure P8–6.

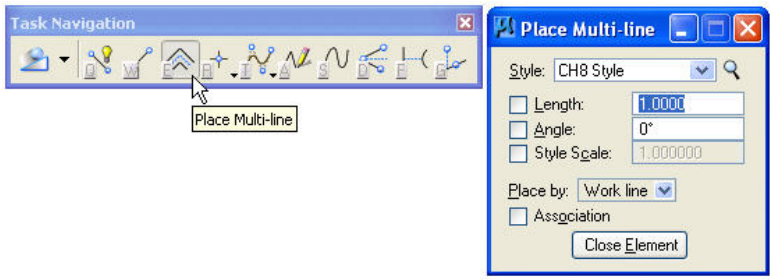


Figure P8–6 Invoking the Place Multi-line tool

MicroStation prompts:

Place Multi-line > Enter first point

Keypoint snap to the lower-left corner of the border, press the O key to position the AccuDraw compass at the Keypoint, then place a data point at this offset from the compass: X = 24 and Y = 7.

Place Multi-line > Enter vertex or Reset to complete

Place the next data point at this offset from the compass: X = 1 and Y = 0.

Place Multi-line > Enter vertex or Reset to complete

Place the next data point at this offset from the compass: X = 0 and Y = 12.

Place Multi-line > Enter vertex or Reset to complete

Place the next data point at this offset from the compass: X = 0 and Y = 17.5.

Place Multi-line > Enter vertex or Reset to complete

Place the next data point at this offset from the compass: X = 0 and Y = 12.

Place Multi-line > Enter vertex or Reset to complete

Place the next data point at this offset from the compass: X = 0 and Y = 3.5.

Place Multi-line > Enter vertex or Reset to complete

Click the Reset button.

The completed Multi-line element is shown in Figure P8–7.

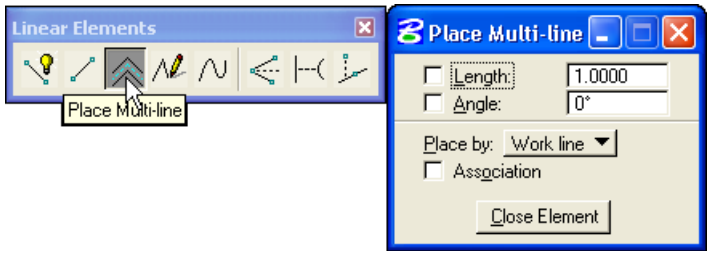


Figure P8–7 First Multi-line element

STEP 3: With the Multi-line tool still active, start the next short piece of multi-line outer wall by Keypoint snapping to the lower right corner of the bottom left horizontal wall, as shown by the note in Figure P8–8.

STEP 4: Press the **O** key to position the AccuDraw compass on the Keypoint.

STEP 5: Start the new Multi-line at this offset from the compass: *X* = 3 and *Y* = 0.

STEP 6: Place the next data point at this offset from the compass: *X* = 4 and *Y* = 0.

STEP 7: Click the Reset button to complete the Multi-line.

STEP 8: Use the Window Area tool to move in close to the walls you just completed, then click the Reset button to return to placing Multi-line elements.

The completed Multi-line element is shown in Figure P8–8.

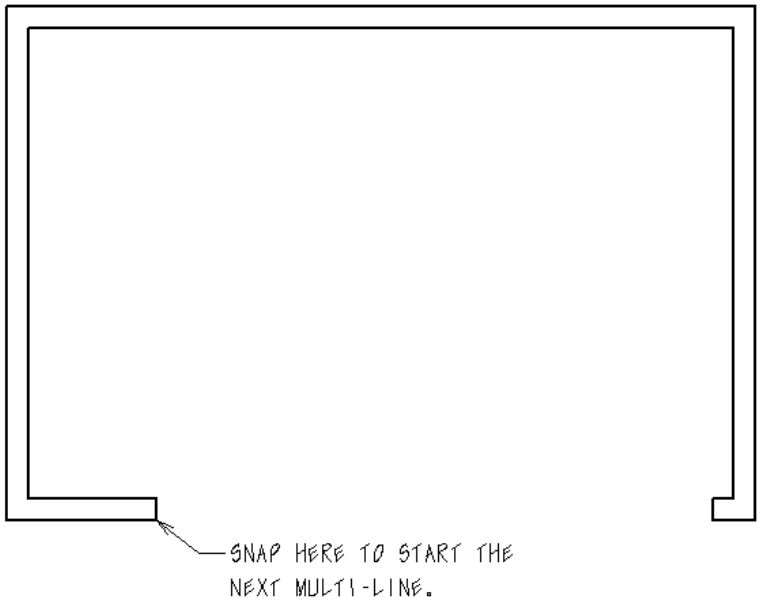


Figure P8–8 Completed outer wall Multi-line elements

STEP 9: Draw the interior wall by Keypoint snapping to the inside of the top-left corner of the outer wall, as shown by the note in Figure P8–9.

STEP 10: Press the **O** key to position the AccuDraw compass on the Keypoint.

STEP 11: Start the new Multi-line at this offset from the compass: *X* = 9 and *Y* = 0.

STEP 12: Place the next data point at this offset from the compass: *X* = 0 and *Y* = –11.

STEP 13: Click the Reset button to complete the Multi-line.

The completed Multi-line element is shown in Figure P8–5.

CUT HOLES FOR PLACING WINDOWS IN THE OUTER WALL

This procedure uses the Multi-line Joints tools to clean up the inner and outer wall intersections and to cut four holes in the utility room wall for windows, as shown in Figure P8–9.

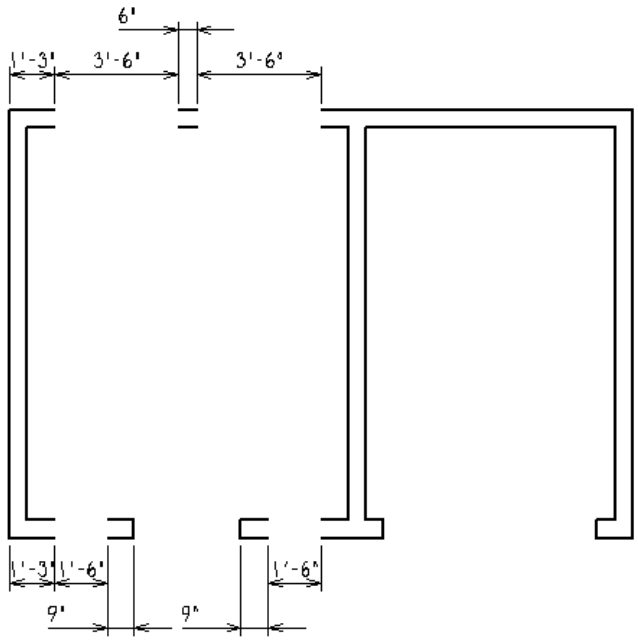


Figure P8–9 The walls after cutting holes for windows and wall unions

STEP 1: Open the **Multi-line Joints** tool box from the **Tools** drop-down menu.

STEP 2: To create the joint at the top of the interior wall, invoke the Construct Open Tee Joint tool from the Multi-line Joints tool box.

MicroStation prompts:

Construct Open Tee Joint > Identify element

Select the interior Multi-line element near its top, select the exterior Multi-line element, and then click the Data button in space to complete the joint.)

STEP 3: Repeat step 2 for the joint at the bottom of the interior wall.

STEP 4: To create the window openings next to the utility room door, invoke the Cut All Component Lines tool from the Multi-line Joints tool box.

MicroStation prompts:

Cut All Component Lines > Identify element

Keypoint snap to the lower-left outside corner of the outer wall, then press the O key to position the AccuDraw compass on the Keypoint, and start the cut at this offset from the compass: X = 1.25 and Y = 0.

Cut All Component Lines

Complete the cut at this offset from the compass: X = 1.5 and Y = 0.

Cut All Component Lines > Identify element

Keypoint snap to the lower-left corner of the wall on the right side of the utility room door, then press the O key. Start the cut at this offset from the compass: X = .75 and Y = 0.

Cut All Component Lines

Complete the cut at this offset from the compass: X = 1.5 and Y = 0.

STEP 5: Use the Cut All Component Lines tool to cut two 3.5′-wide window holes in the top wall of the utility room. Use the dimensions in Figure P8–9 as a guide.

DRAW THE WINDOWS WITH THE PLACE MULTI-LINE TOOL

This procedure changes the Multi-line settings, then uses the Place Multi-line tool to place windows in the opening created in the utility room exterior walls, as shown in Figure P8–10.

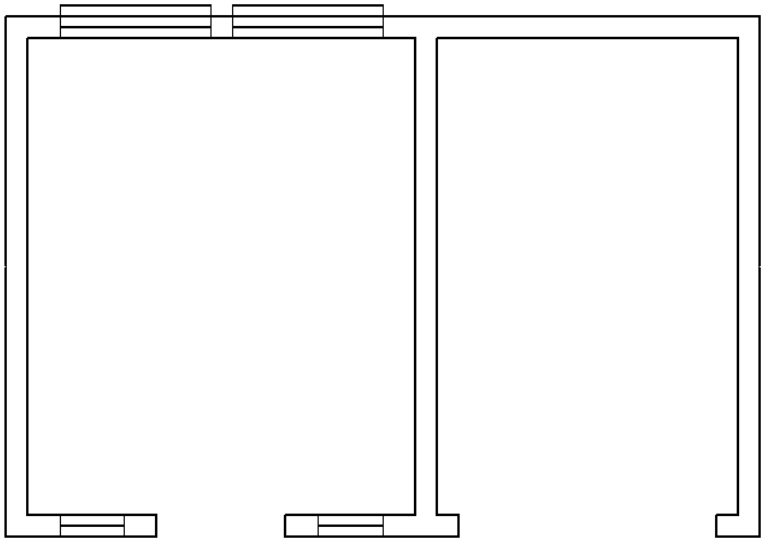


Figure P8–10 Utility room walls with windows inserted

STEP 1: Select **Multi-lines** from the **Element** drop-down menu.

STEP 2: In the Multi-lines settings box, **Insert a Line** component with an **Offset** of 0.25, and set the new line to the same attribute values as the other two line components.

STEP 3: Invoke the Place Multi-line tool from the Linear Element tool box, and place Multi-line elements in the spaces on each side of the utility room door.

STEP 4: In the Multi-lines settings box, **Insert** a fourth **Line** component with an **Offset** of 0.75 and set the new line to the same attribute values as the other three line components.

STEP 5: Place Multi-line elements in the spaces cut into the top utility room wall.

COMPLETE THE FLOOR PLAN

This procedure places the equipment in the utility room and the room names in each room, as shown in Figure P8–11.

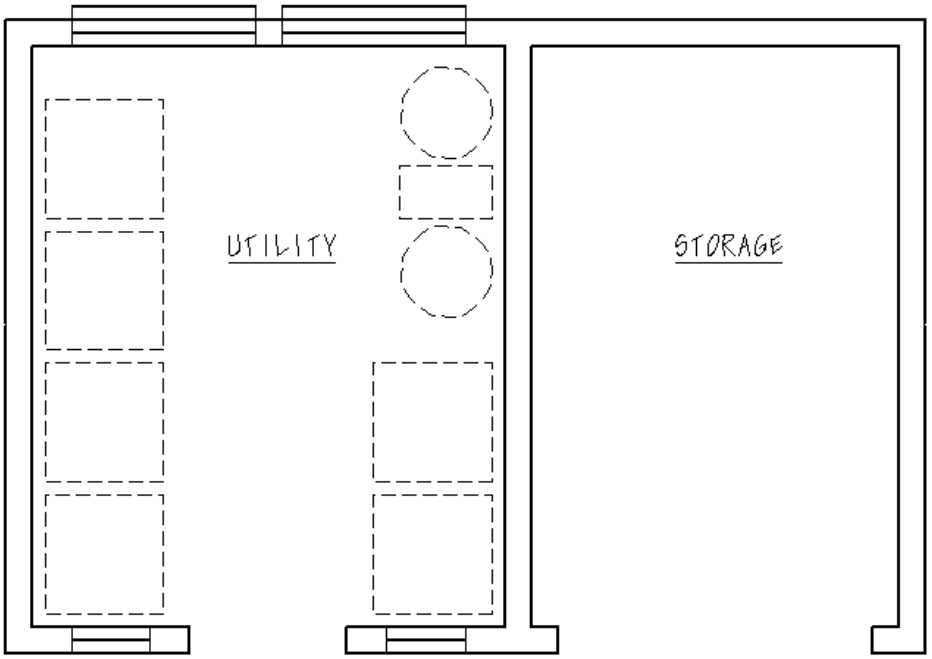


Figure P8–11 Completed floor plan

STEP 1: Place the equipment symbols in the utility room with the following dimensions:

- 6 each, 2.25′ × 2.25′ blocks
- 1 each, 1.0′ × 1.75′ block
- 2 each, 0.875-radius circles

STEP 2: Place the room names with the same text font and size as the title block text.

STEP 3: Invoke the Fit View tool to fit the view in the window view.

STEP 4: Compare your design to Figure P8–1 and, if necessary, correct mistakes.

STEP 5: Compress the design and save the design settings.

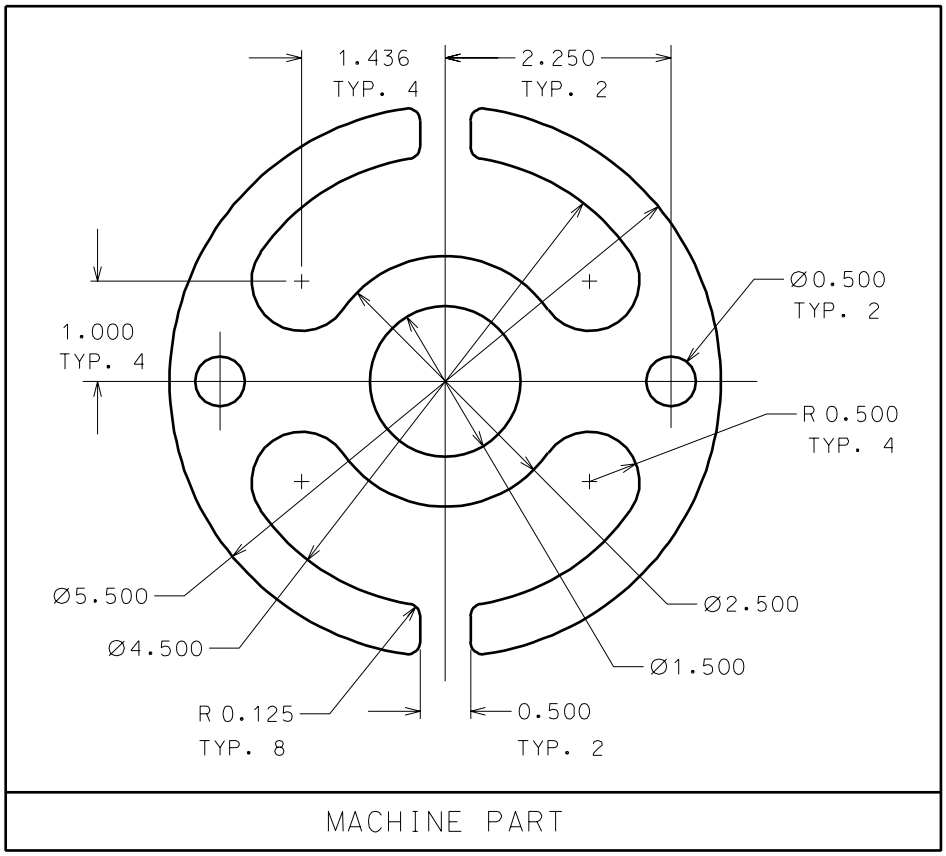
DRAWING EXERCISES 8–1 THROUGH 8–5

Use the following table to set up the design files for Exercises 8–1 through 8–3.

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

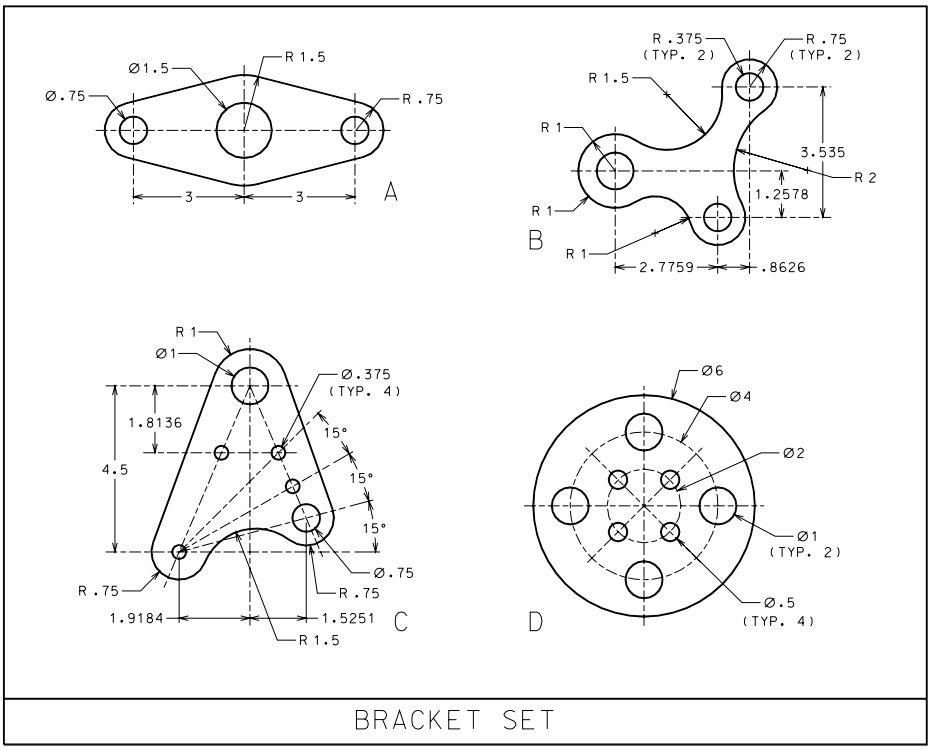
Exercise 8–1

MACHINE PART

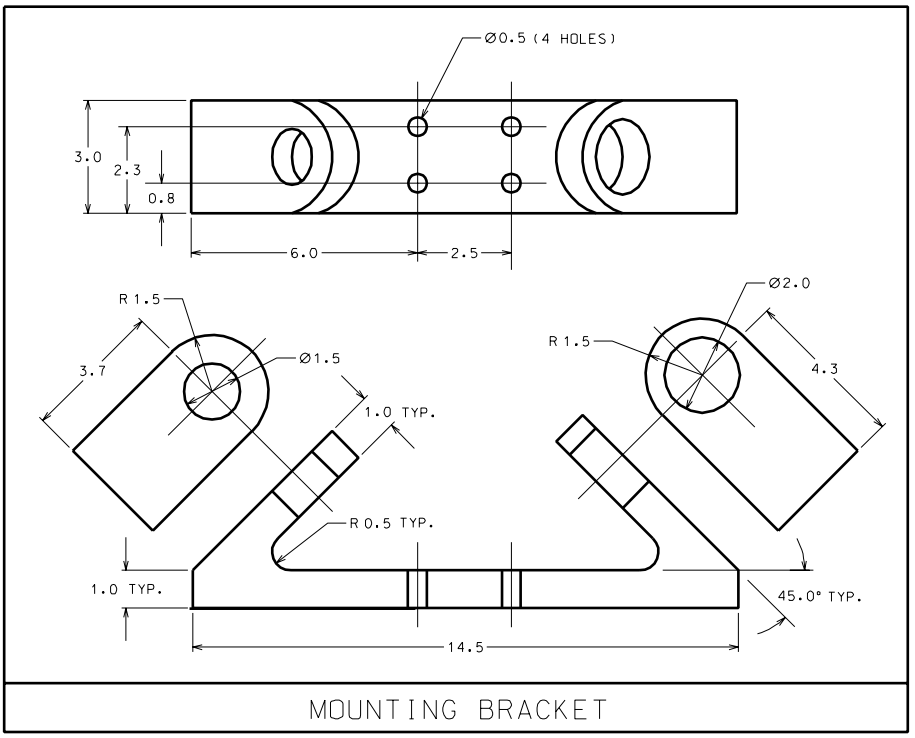


Exercise 8–2

BRACKET SET



Exercise 8–3
MOUNTING BRACKET

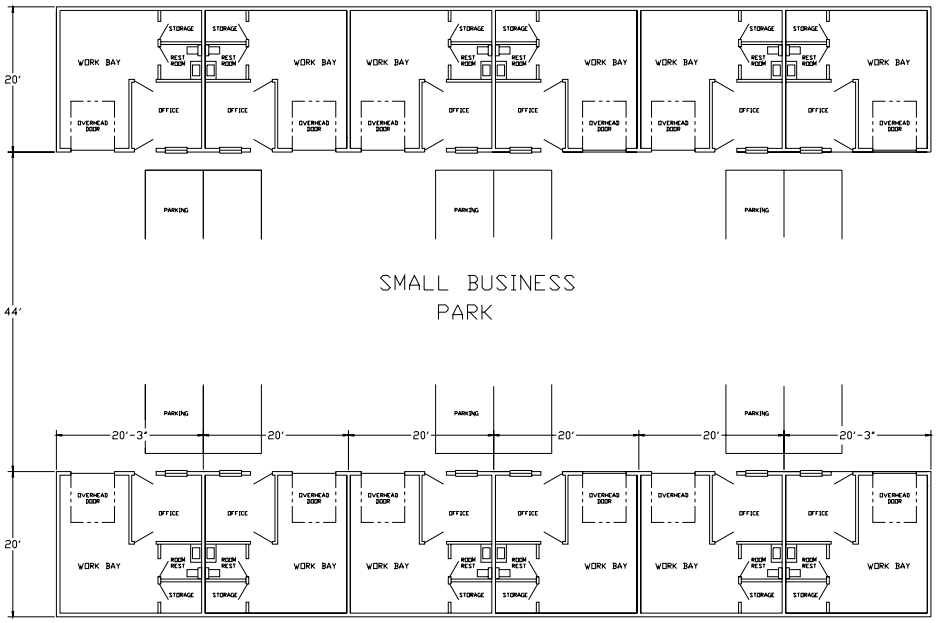


Use the following table to set up the design files for Exercises 8–4 and 8–5.

SETTING	VALUE
Seed File	2dEnglishArch.dgn
Working Units	Master Units: Feet and Sub Units: Inches
Grid	Master = 0.5, Grid Reference = 24

Exercise 8–4

SMALL BUSINESS PARK PLAN



Exercise 8–5

SELF-STORAGE WAREHOUSE PLAN