chapter fourteen

Managing Paper Space Layouts

CHAPTER OBJECTIVES

- Understand how and why paper space layouts are used
- Associate a printer/plotter with a layout
- Set the page size of a layout
- Create and import page setups
- Create layout viewports
- Set the viewport display scale
- Lock the viewport display
- Control layer visibility per viewport
- Modify viewports
- Create and manage layouts
- Explore the paper space linetype scaling feature

Introduction

In Chapter 1, we explained how AutoCAD has two distinct drawing environments: model space and paper space.

Remember that model space is the theoretically infinite 3D drawing environment where you locate most of the line work and annotation features that make up a drawing. To draw in model space, you select the **Model** tab at the bottom left of the drawing window as shown in Figure 14-1 to make it current.

NOTE

When model space is the active drawing environment, the UCS icon in the lower left-hand corner of the drawing window defaults to the icon shown in Figure 14-2.

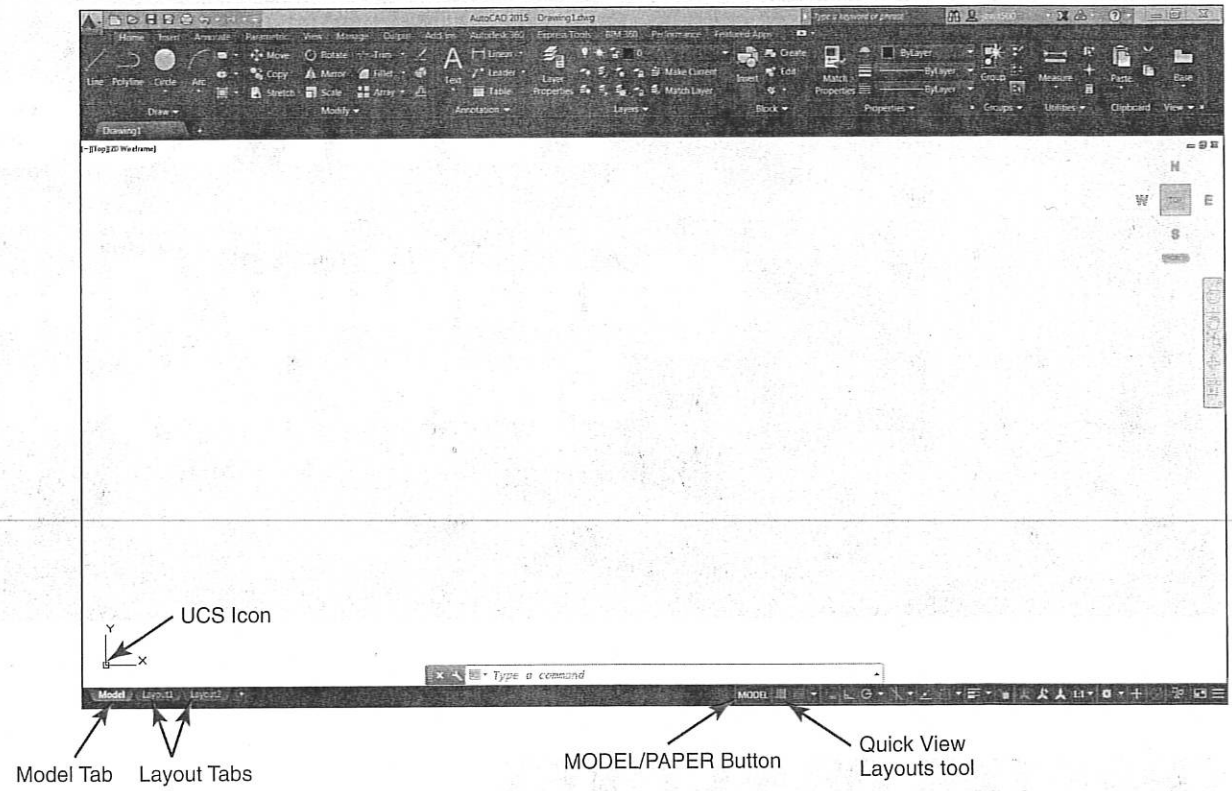


Figure 14-1
Switching between model space and paper space layouts

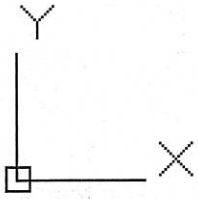


Figure 14-2
The model space UCS icon

To reiterate, paper space is the 2D environment where you lay out the drawing information created in model space for plotting/printing on the desired size of paper and at a specified scale factor. In effect, a layout represents what the drawing will look like when it is printed.

TIP

It is common to locate the title border information in a layout. Locating the border and title text in paper space allows them to be drawn at a scale of 1:1 because the plot scale in paper space is typically 1:1. Many of the default AutoCAD template files have the title border located in paper space.

It is possible to have multiple layouts in a drawing, each one a different paper size and scale. A new AutoCAD drawing that is based on the default template file **(acad.dwt)** contains two generic layouts named **Layout1** and **Layout2**.

The quickest and easiest way to switch between layouts is to select the desired layout tab on the bottom left of the drawing window shown in Figure 14-1.

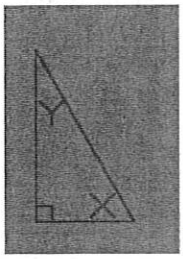


Figure 14-3
The paper space UCS icon

NOTE

When paper space is the active drawing environment, the UCS icon in the lower left-hand corner of the drawing window defaults to the icon shown in Figure 14-3.

Layout Paper Size

The paper size used by an AutoCAD layout is controlled via its *page setup*, similar to setting the paper size of a document in a word processing program.

The difference is that, using AutoCAD, the available paper sizes are determined by the limits of the layout's associated plotting/printing hardware device. For instance, if you are printing on a printer whose maximum paper size capability is 8½″ × 11″ (A-size/letter), then an 8½″ × 11″ paper size is the maximum size you can specify for the layout. Applying this logic, a large-format plotter that is capable of printing up to a 36″ × 24″ drawing (D-size) has many more paper size settings available than the average 8½″ × 11″ office printer. Associating a printer/plotter with a layout and selecting the desired paper size are both controlled using the Page Setup Manager explained later in this chapter.

Layout Viewport Scale

layout viewport: The user-defined window created in a paper space layout that allows you to view drawing information that resides in model space.

The scale of a drawing is controlled via one or more ***layout viewports*** created in a layout.

In Chapter 1 we used the analogy that an AutoCAD paper space layout can be thought of as a 2D sheet of paper that hovers over your 3D model space drawing information. Views of the model space information are created by cutting one or more holes referred to as layout viewports in the paper so that you can see the drawing model below. You scale the model space information displayed in the viewport by zooming in and out at a specific scale factor. It is even possible to create multiple viewports and specify a different scale factor for each individual viewport, as shown in Figure 14-4, allowing you to easily create multiscaled drawings.

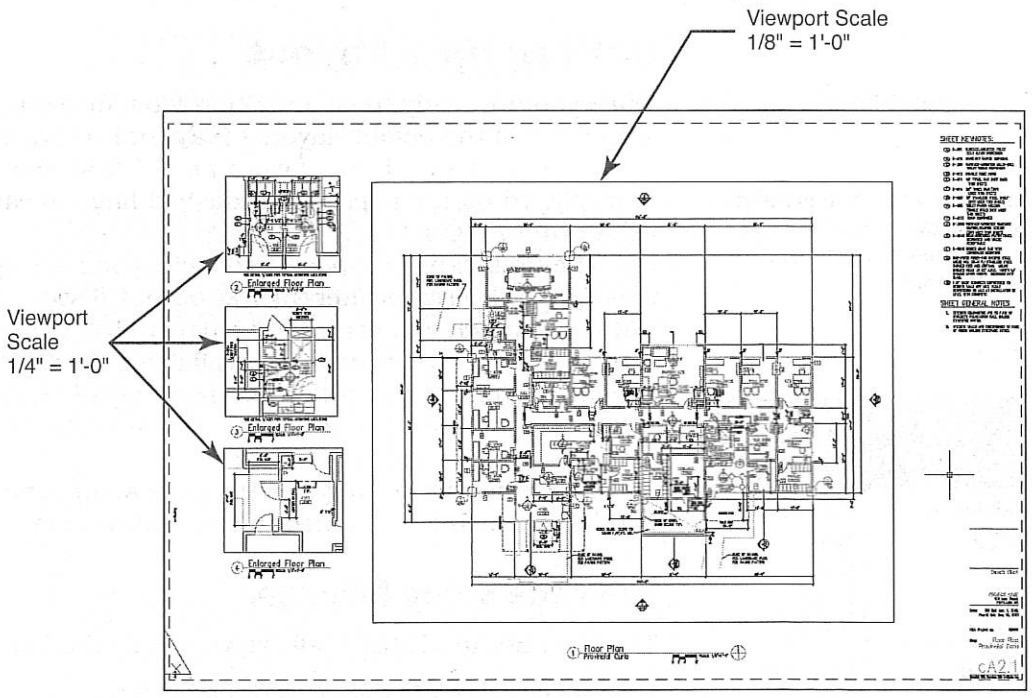


Figure 14-4
Paper space layout with multiple scaled viewports

TIP

AutoCAD provides a list of all of the standard viewport scales on the status bar so that you can quickly set a viewport scale without having to calculate the zoom scale factor each time. Both methods are described later in this chapter.

Being able to create plots with differently scaled viewports is one of the primary benefits of using paper space layouts. This is something you simply can't do in model space unless you scale the actual drawing information—which should be avoided at all costs. Remember that in AutoCAD, the key is to draw everything exactly as it exists in the real world.

Controlling Layers per Layout Viewport

Another very useful capability of layout viewports is that you can freeze and thaw layers per viewport using the viewport layer freeze option introduced in Chapter 6. This allows you to create multiple viewports on one or more layouts that each display different model space drawing information.

You can also control the layer color, linetype, lineweight, transparency, and plot style properties per viewport using viewport layer overrides. Viewport layer overrides allow you to change the layer color, linetype, lineweight, transparency, and plot style properties in each viewport while retaining the original layer properties in model space and in the other layout viewports. Viewport layer overrides are discussed in detail later in this chapter.

FOR MORE DETAILS

See Chapter 6 for more information about using layers to organize drawing information.

Setting Up a Layout

Once you are ready to lay out a drawing for plotting from paper space, select one of the default layouts **(Layout1** or **Layout2)**.

When you switch to a layout for the first time, a single layout viewport is displayed on the page with a dashed line indicating the ***printable area*** as shown in Figure 14-5.

printable area: The actual physical area that can be printed for the currently specified plotting device and paper size.

The first thing you need to do when you are setting up a layout is to specify the desired printer/plotter output device. Once you specify an output device, *then* you can select a paper size. Remember that the two are intimately related because the available paper sizes are determined by the capabilities of the currently associated printer/plotter. The printer/plotter, paper size, and most of the other plot settings are controlled via the page setup associated with the layout.

To modify the settings for the page setup, you use the Page Setup Manager, which is explained in the next section.

PAGE SETUP MANAGER	
Ribbon & Panel:	Output | Plot 
Menu:	File | Page Setup Manager...
Command Line:	PAGESETUP
Command Alias:	None

The Page Setup Manager

The Page Setup Manager allows you to do the following:

- Display details of the current page setup
- Set another page setup current
- Modify an existing page setup
- Create a new page setup
- Import a page setup from another drawing

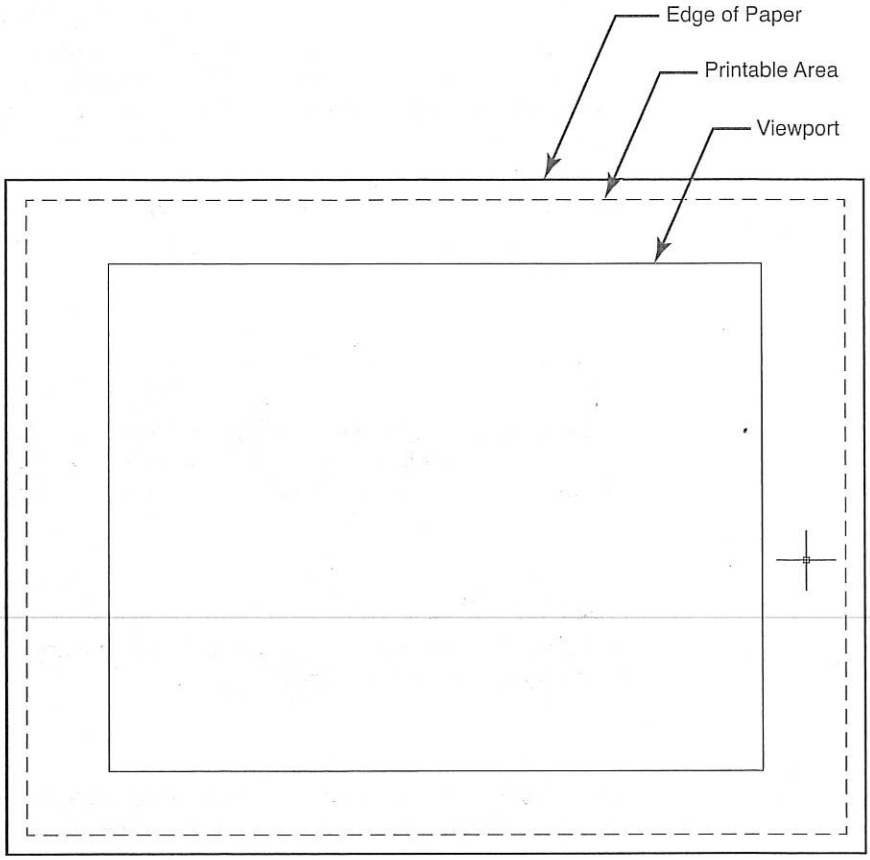


Figure 14-5
Switching to a layout the first time

The **Page Setup Manager** dialog box is shown in Figure 14-6.

Current page displays the page setup that is applied to the current layout. By default it is set to **<None>**.

The **Page setups** box lists the page setups that can be modified or applied to the current layout.

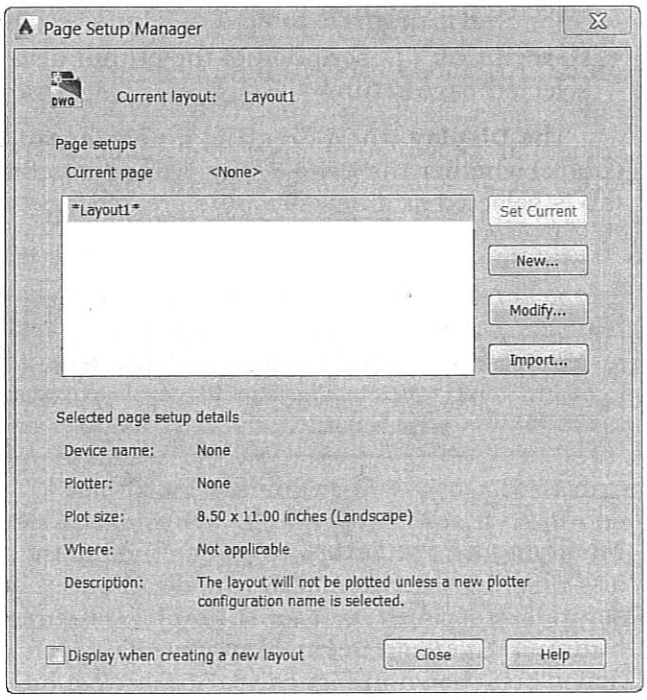


Figure 14-6
The **Page Setup Manager** dialog box

By default, a page setup is automatically applied to each layout with the same name as the layout with an asterisk (*) added to the beginning and end of the layout name. For instance, the default page setups for the **Layout1** and **Layout2** layouts are ***Layout1*** and ***Layout2***, respectively.

Any new or imported page setups are automatically added to the **Page setups** list. You can make a page setup current by double-clicking on it in the list or by highlighting the page setup and selecting the **Set Current** button.

> **TIP**
>
> If you right-click in the **Page setups** list box, a shortcut menu is displayed that allows you to set current, rename, or delete a page setup.

> **NOTE**
>
> It is not possible to set current, rename, or delete any of the default page setups that begin and end with an asterisk.

The **Selected page setup details** area at the bottom of the dialog box displays the following information about the currently selected page setup:

- **Device name** Name of the plot device specified in the currently selected page setup
- **Plotter** Type of plot device specified in the currently selected page setup
- **Plot size** Plot size and orientation specified in the currently selected page setup
- **Where** Physical location of the output device specified in the currently selected page setup
- **Description** Description of the output device specified in the currently selected page setup

The **Display when creating a new layout** check box allows you to control whether the **Page Setup Manager** is displayed when a new layout tab is selected or a new layout is created.

> **TIP**
>
> You can also control whether the **Page Setup Manager** is displayed for new layouts via the **Show Page Setup Manager for new layouts** option on the **Display** tab of the **Options** dialog box.

Modifying a Page Setup. You can modify the settings of a page setup at any time. In order to modify any default page setup, the layout the page setup is associated with must first be set current. Selecting the **Modify...** button in the **Page Setup Manager** dialog box displays the **Page Setup** dialog box shown in Figure 14-7.

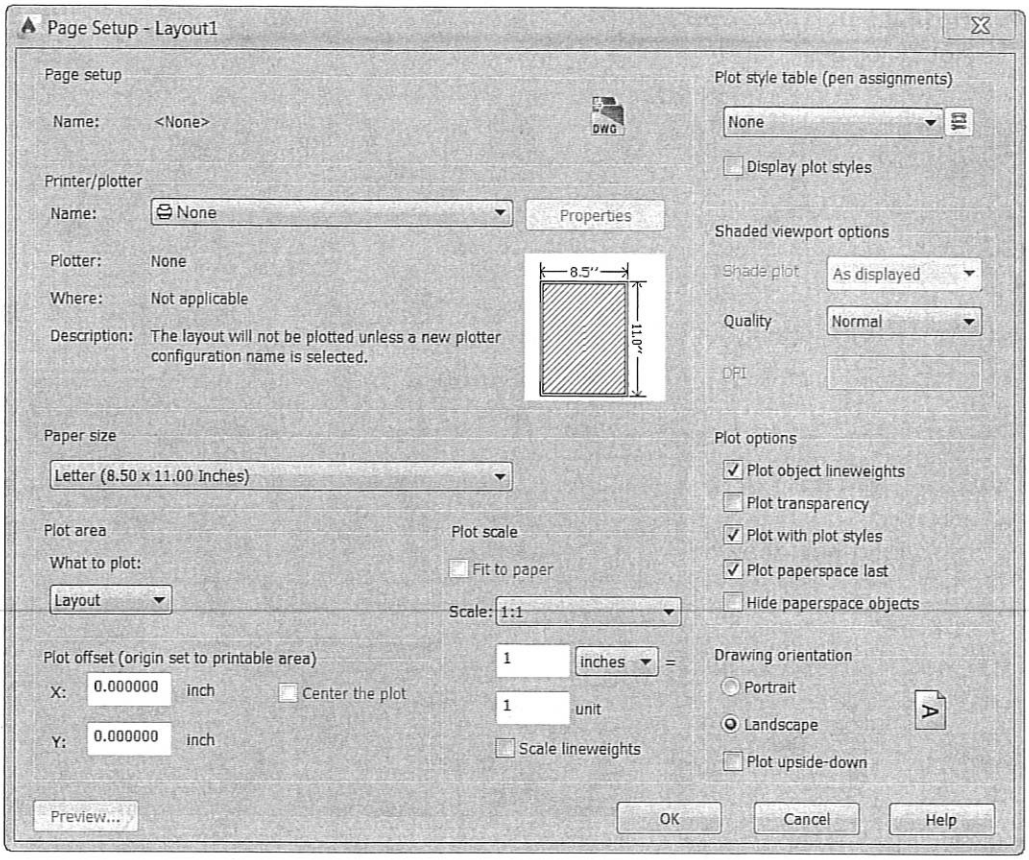


Figure 14-7
The **Page Setup** dialog box

The **Page Setup** dialog box is almost exactly the same as the **Plot** dialog box shown in Figure 14-8. In fact, the two dialog boxes control the same settings. The only differences between the two are:

- Changes made in the **Page Setup** dialog box are saved with the layout. Changes made in the **Plot** dialog box are *not* saved, unless you select the **Apply to Layout** button.
- You can plot from the **Plot** dialog box. You *cannot* plot from the **Page Setup** dialog box.
- The **Plot** dialog box can be toggled to display more plot options using the **More Options** arrow button at the bottom right of the dialog box as shown in Figure 14-8, or it can be set to display a limited number of options.

In this chapter, the main concern is controlling the paper size of the layout so that you can properly set up a drawing for plotting (discussed in Chapter 15). For this reason, most of the other plot-related page setup settings are mentioned only briefly. The following sections explain primarily how to associate an output device so that you can select the desired layout paper size.

Selecting a Printer/Plotter Device. The **Printer/plotter** area of the **Page Setup** dialog box allows you to specify a printer/plotter by selecting it from the **Name:** list box shown in Figure 14-9.

The **Name:** list box provides a list of the available printers/plotters you can associate with a layout. The list includes both ***.PC3 files*** and system printers that are prefixed with different icons—a plotter icon for a .PC3 file and a printer icon for a system printer.

.PC3 file: Plotter configuration file used to store and manage printer/plotter settings.

Figure 14-8
The **Plot** dialog box

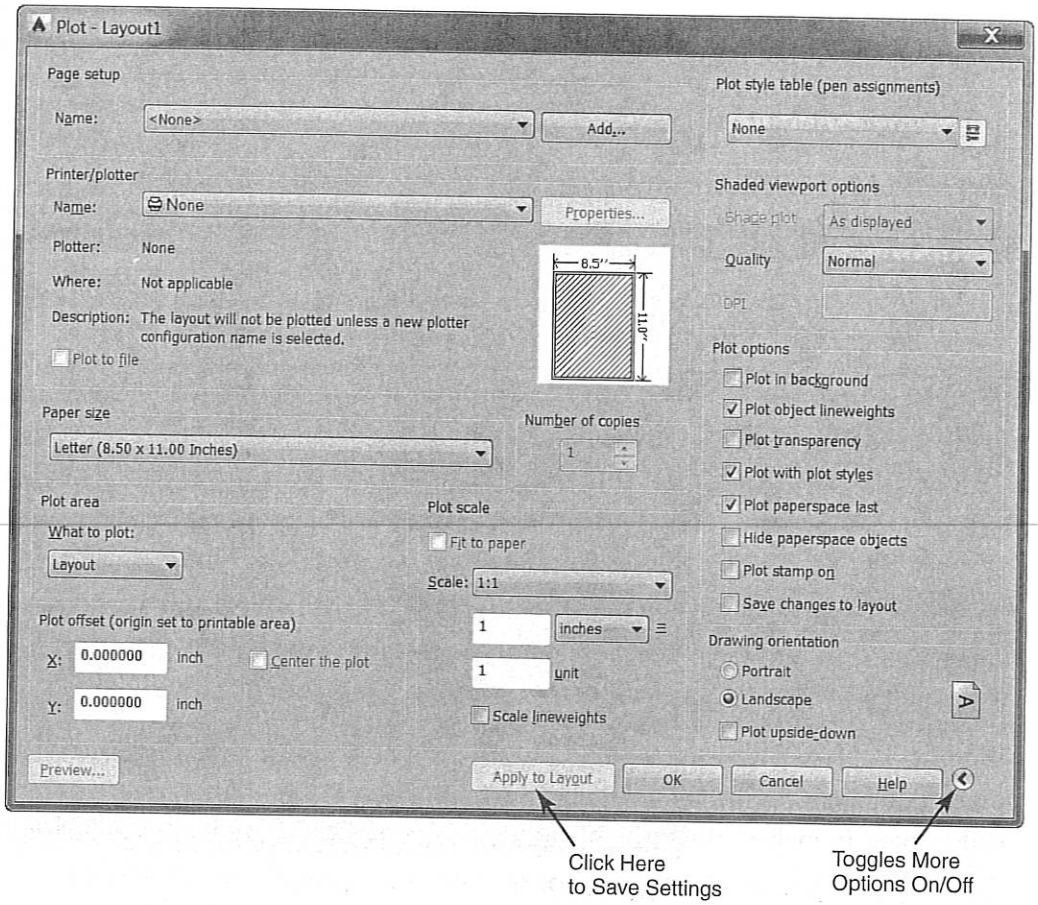
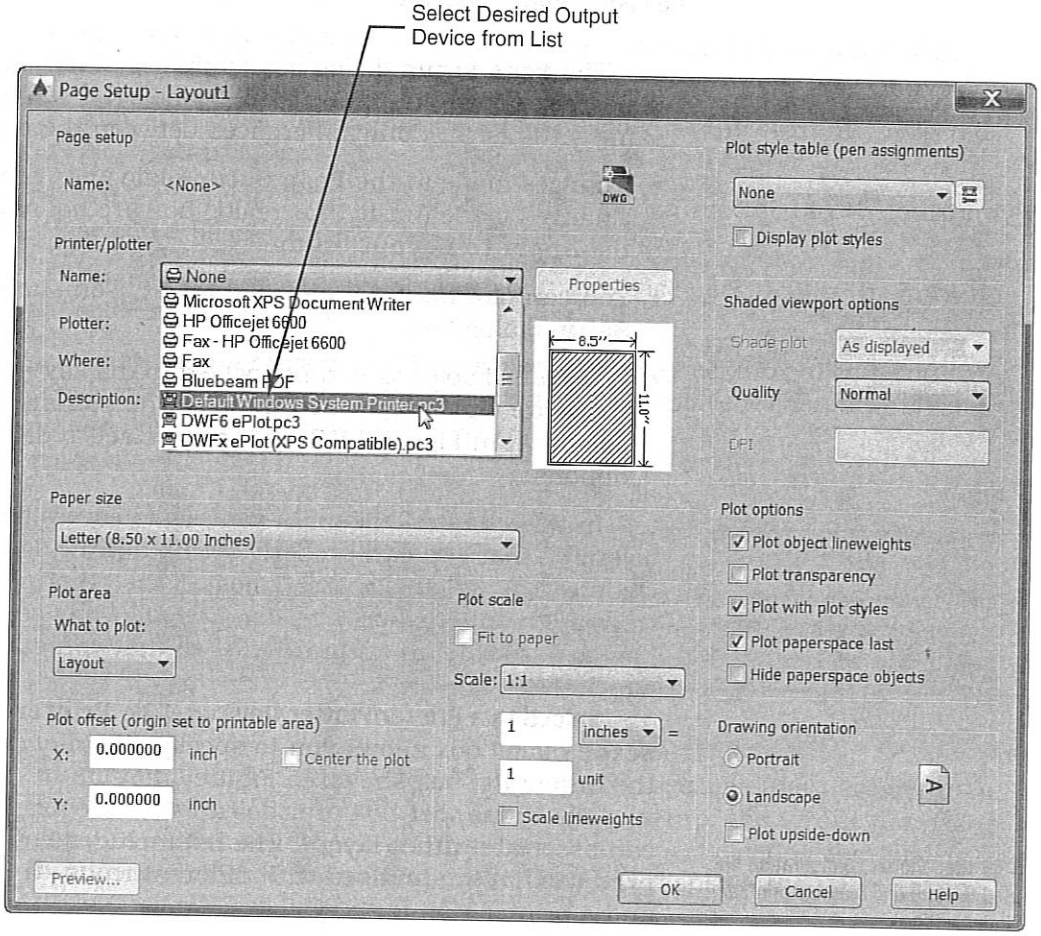


Figure 14-9
Selecting a printer/plotter from the **Name:** list box



The **Properties** button displays the **Plotter Configuration Editor** so you can view or modify the current plotter configuration.

FOR MORE DETAILS

See page 628 in Chapter 15 for more on using the **Plotter Configuration Editor** to manage .PC3 files.

Other information provided about the currently selected printer/plotter includes the following:

- **Plotter** Displays the current name
- **Where** Displays the physical location or port
- **Description** Displays a description if available

The **Preview** window displays the plot area relative to the paper size and the printable area.

NOTE

If the printer/plotter you wish to use is not listed, you can add it using the **Plotter Manager's Add-a-Plotter** wizard.

FOR MORE DETAILS

See page 628 in Chapter 15 for more on using the **Add-a-Plotter** wizard.

Selecting a Paper Size. The **Paper size** list box displays the standard paper sizes that are available for the associated printer/plotter. Every time a different printer/plotter is selected, the **Paper size** list is updated with the paper sizes supported by that device. If no plotter is selected so that the **Name:** list box is set to **None,** a list of all the standard paper sizes is provided.

NOTE

If the selected printer/plotter doesn't support the current paper size, the warning shown in Figure 14-10 is displayed. If you select **OK,** the paper size is changed to the default paper size for the new printer/plotter. If you select **Cancel,** the printer/plotter is changed to **None,** and the paper size is not changed.

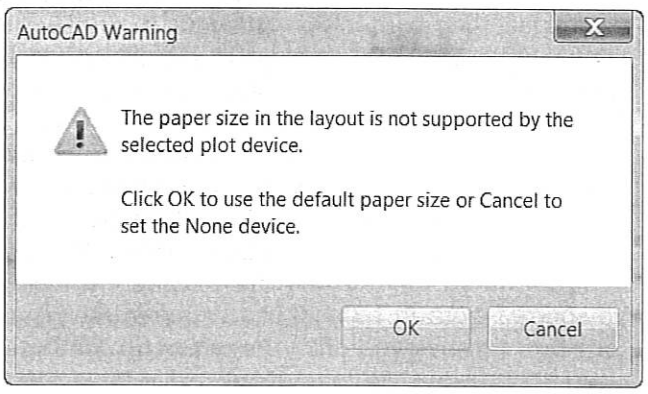


Figure 14-10
Unsupported paper size warning

If you are plotting a raster image, such as a BMP or TIFF file, the size of the plot is specified in pixels, not in inches or millimeters.

> **TIP**
>
> If you are unsure what printer/plotter to specify, you can set the plotter to **None** so that it is still possible to select the desired paper size.

Other Page Setup Settings. The following is a brief overview of a few of the other page setup settings.

The **Plot area** settings determine the area of the drawing to plot. The **What to plot:** list box provides five different options:

- **Display** The current screen display
- **Extents** The extents of the drawing
- **Layout** The current layout
- **View** A named view (must have at least one named view to be enabled)
- **Window** User-specified window area

The **Plot area** is typically set to **Layout** for a paper space layout. The other **Plot area** settings are more commonly used when plotting in model space.

The **Plot offset** area allows you to offset the plot area relative to the lower-left corner of the printable area or the edge of the paper.

> **NOTE**
>
> You can change what the offset is relative to via the **Specify plot offset relative to** options on the **Plot and Publish** tab of the **Options** dialog box.

> **FOR MORE DETAILS**
>
> See Chapter 15 for more detailed information about controlling the other plot settings and plotting your drawing.

The **Plot scale** area controls the ratio of the plotted units to the drawing units. Most of the standard drafting scales are listed in the **Scale:** list box. The default scale is 1:1 when plotting a layout.

Creating a New Page Setup. If you think that you might use the same page setup settings in another layout in the current drawing or even in a layout in another drawing, you can create a named page setup. Named page setups are saved in the drawing file so that they can be applied to other layouts or imported into other drawing files. Importing page setups is explained in the next section.

Using named page setups also allows you to plot the same layout more than one way. You can apply different named page setups to the same layout so that there are different output results each time. For example, you might create different named page setups to plot to printers/plotters that are in different locations.

To create a new named page setup, select the **New...** button in the **Page Setup Manager** dialog box. The **New Page Setup** dialog box shown in Figure 14-11 is displayed.

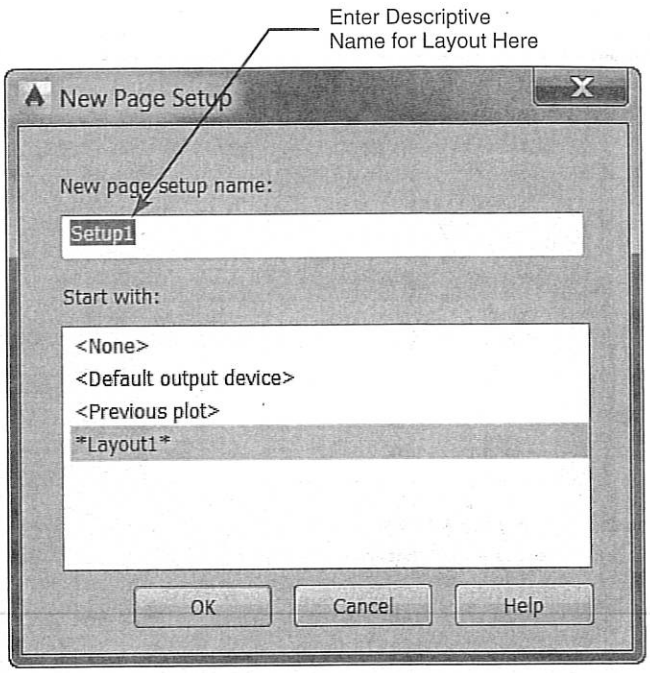


Figure 14-11
The **New Page Setup** dialog box

Enter the name for the new page setup in the **New page setup name:** text box. The default name is **Setup** followed by an integer representing a sequential number (i.e., **Setup1, Setup2**). You should enter a descriptive name indicating the page setup's purpose.

The **Start with:** list allows you to select a page setup to use as a starting point for the new page setup:

- **<None>** No page setup is used as a starting point.
- **<Default output device>** The default output device specified on the **Plot and Publish** tab of the **Options** dialog box is set as the printer in the new page setup.
- **<Previous plot>** The new page setup uses the settings specified in the last plot.

When you select the **OK** button at the bottom of the **New Page Setup** dialog box, the **Page Setup** dialog box shown earlier in Figure 14-7 is displayed using the settings saved with the selected starting point page setup. You can then modify any settings if necessary. When you exit the **Page Setup** dialog box, the new named page setup is displayed in the list of page setups in the **Page Setup Manager** as shown in Figure 14-12.

Importing a Page Setup from Another Drawing. A named page setup can be imported from another drawing file (DWG), drawing template file (DWT), or designexchange format file (DXF). To import a named page setup, select the **Import...** button in the **Page Setup Manager** shown in Figure 14-6. The **Select Page Setup from File** dialog box is displayed so that you can select the source file from which you want to import. After you locate the file and select the **Open** button, the **Import Page Setups** dialog box shown in Figure 14-13 is displayed so you can select one or more page setups.

The **Page setups** list box lists the page setups that can be imported from the selected drawing and whether they are located in model space or paper space. The **Name** column lists the name of the page setup, and the **Location** column lists the page setup location (model or layout).

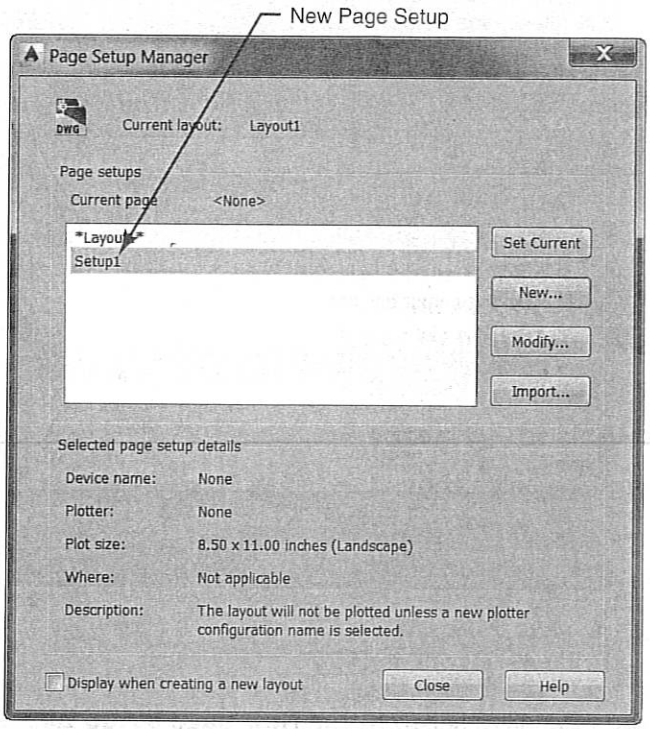


Figure 14-12
The **Page Setup Manager** with new page setup

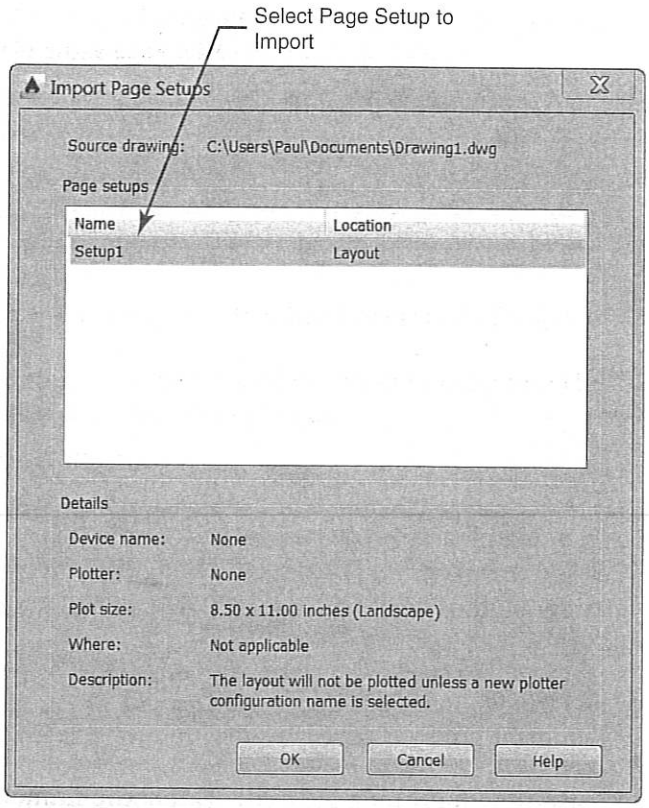


Figure 14-13
The **Import Page Setups** dialog box

NOTE

If a page setup with the name selected already exists in the drawing, a warning is displayed asking you whether you want to redefine it. Selecting **OK** overwrites the page setup with the new page setup settings.

The **Details** area at the bottom of the dialog box displays information about the selected page setup.

- **Device name** The name of the plot device specified in the currently selected page setup
- **Plotter** The type of plot device specified in the currently selected page setup
- **Plot size** The plot size and orientation specified in the currently selected page setup
- **Where** Physical location of the output device specified in the currently selected page setup
- **Description** Description of the output device specified in the currently selected page setup

Select **OK** to import the selected page setup.

Setting a Page Setup Current. The **Set Current** button on the **Page Setup Manager** dialog box sets the selected page setup current for the active layout so that all the page setup settings are updated to match the selected page setup.

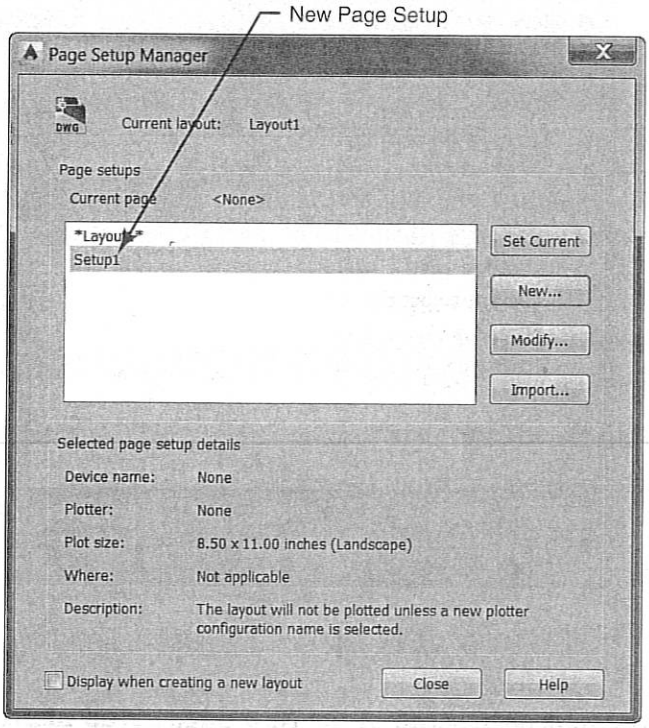


Figure 14-12
The **Page Setup Manager** with new page setup

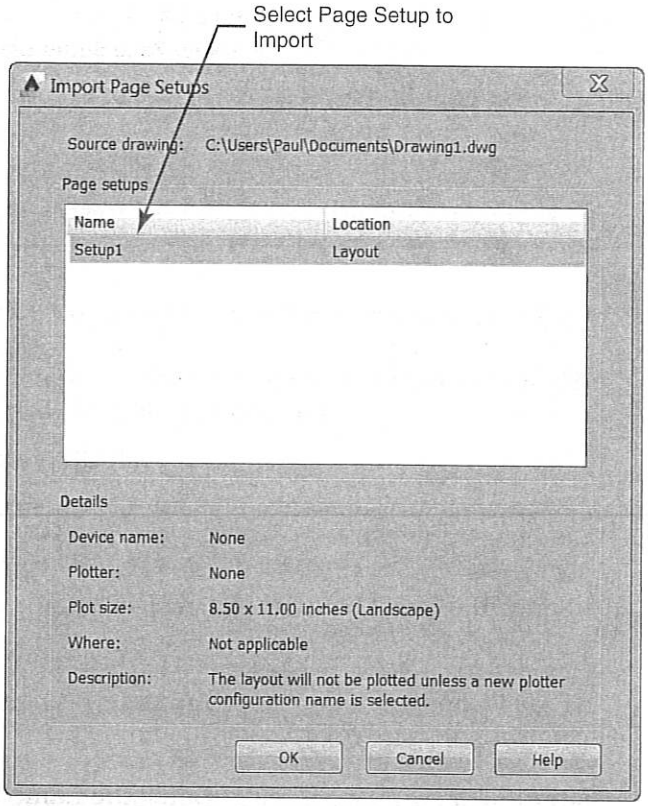


Figure 14-13
The **Import Page Setups** dialog box

NOTE
If a page setup with the name selected already exists in the drawing, a warning is displayed asking you whether you want to redefine it. Selecting **OK** overwrites the page setup with the new page setup settings.

The **Details** area at the bottom of the dialog box displays information about the selected page setup.

- **Device name** The name of the plot device specified in the currently selected page setup
- **Plotter** The type of plot device specified in the currently selected page setup
- **Plot size** The plot size and orientation specified in the currently selected page setup
- **Where** Physical location of the output device specified in the currently selected page setup
- **Description** Description of the output device specified in the currently selected page setup

Select **OK** to import the selected page setup.

Setting a Page Setup Current. The **Set Current** button on the **Page Setup Manager** dialog box sets the selected page setup current for the active layout so that all the page setup settings are updated to match the selected page setup.

To access student data files, go to www.pearsondesigncentral.com.

EXERCISE 14-1 **Using the Page Setup Manager**

1. Open the building floor plan drawing named ***EX14-1*** in the student data files to display the building floor plan shown in Figure 14-14.

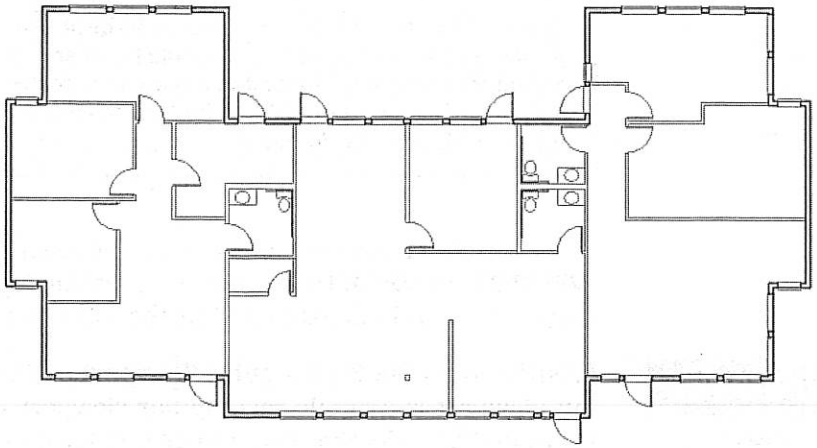


Figure 14-14
Building floor plan

2. Select the **Layout1** tab so that paper space is active and **Layout1** is the current layout.
3. Use the Page Setup Manager to set the associated plotter to **None** and the paper size to **ARCH D (36.00 × 24.00 Inches).**
4. Select the **Layout2** tab, and switch to the **Layout2** layout.
5. Use the Page Setup Manager to set the associated plotter to **None** and the paper size to **ANSI B (17.00 × 11.00 Inches).**
6. Save the drawing as ***CH14_EXERCISE.***

Creating Layout Viewports

Layout viewports are the windows that you create in paper space that allow you to view the drawing information in model space at a specified scale (refer to Figure 14-4). Just like the windows in a building, layout viewports can be many different shapes and sizes. A layout viewport can be rectangular, polygonal, or even circular! You can create a single viewport that fits the paper size of the layout, or you can create multiple viewports. Each viewport is controlled independently so that different model space information can be displayed in each viewport, even at different scales if necessary.

NOTE

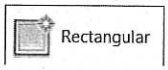
Do not attempt to create one layout viewport completely within the borders of another layout viewport because unpredictable results can occur. It is possible, though, to overlap viewports.

A layout viewport is treated just like other basic AutoCAD drawing objects such as lines, circles, and arcs. Similar to drawing other AutoCAD objects, a new viewport assumes the current object properties such as layer, color, and linetype when it is created.

After a viewport is created, you can modify it using any of the standard modify commands (**ERASE, MOVE, COPY, SCALE,** etc.). You can even use grips to resize a viewport quickly using the **STRETCH** option.

> **TIP**
> Typically, you do not want viewports to be displayed on the final plotted drawing. Because of this, layout viewports should be created on a unique layer so that you can control their visibility. The best approach is to create layout viewports on a layer whose **Plot** property is set to **No plot** so that you can see the viewports in the AutoCAD drawing window, but they do not plot.

You can create one or more layout viewports using the **MVIEW, -VPORTS,** or **VPORTS** command. Creating layout viewports using each of these commands is explained in the following sections.

SINGLE VIEWPORT	
Ribbon & Panel:	Layout | Layout Viewports  Rectangular
Menu:	Views | Viewports | 1 Viewport
Command Line:	MVIEW VPORTS -VPORTS
Command Alias:	MV

Creating a Single Rectangular Viewport. The most common type of layout viewport is a single rectangular viewport. A single rectangular viewport is created by selecting two corner points. It is the default viewport option when you use either the **MVIEW** or **-VPORTS** command.

> **TIP**
> Do not forget to create a unique viewport layer set to **No plot** and make it current before you create a viewport using the **MVIEW** or **-VPORTS** command. Some typical layer names used include **Viewport** or **Vport.**

When you start either command, AutoCAD prompts you to *Specify corner of viewport or* ↓ as shown in Figure 14-15.

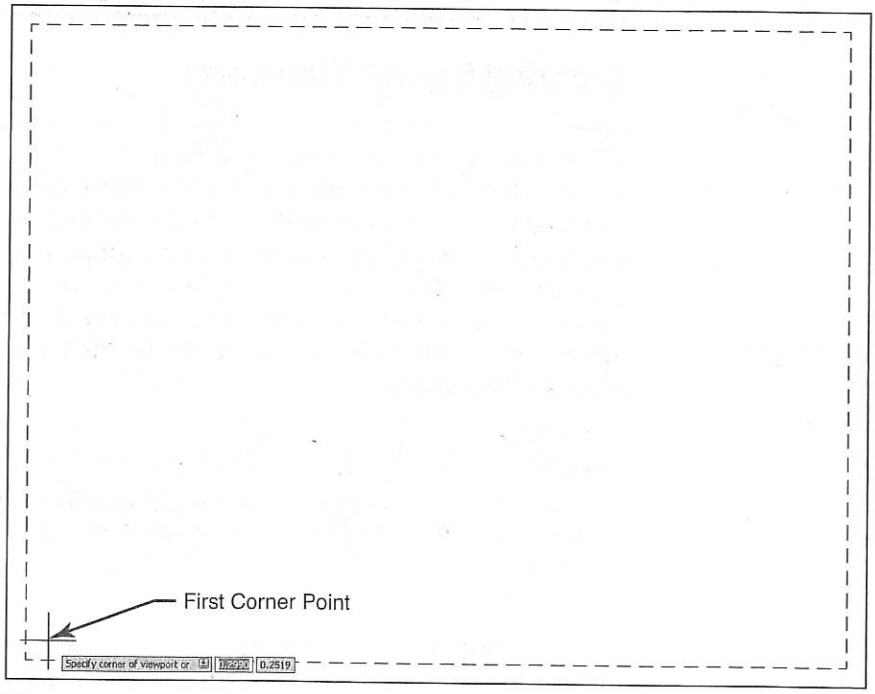


Figure 14-15
Locating the first corner point of a layout viewport

Select the first corner of the viewport or enter a coordinate value at the keyboard. AutoCAD then prompts you to *Specify opposite corner:* as shown in Figure 14-16 so you can specify the second point.

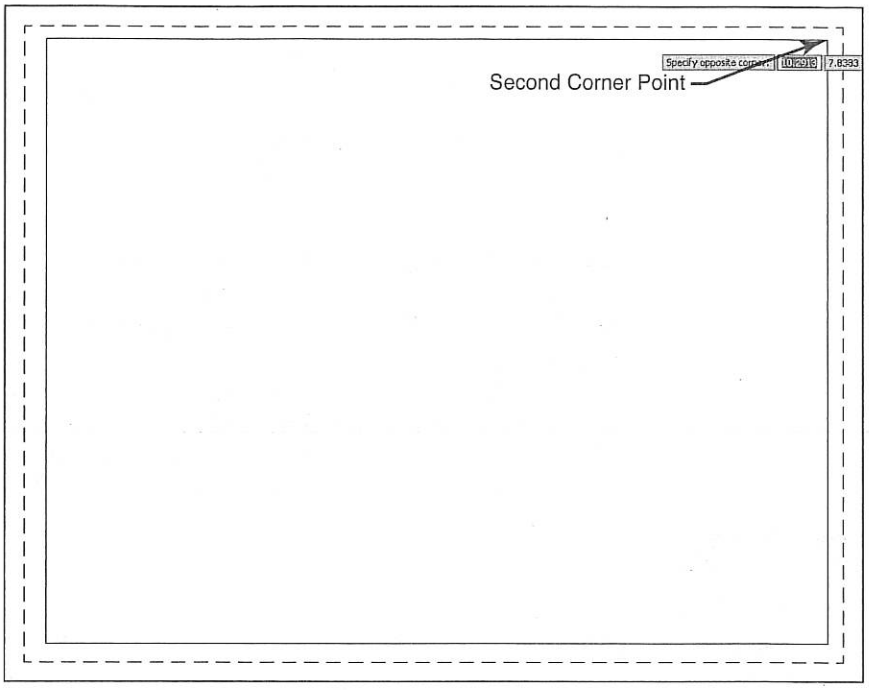


Figure 14-16
Locating the opposite corner point of a layout viewport

The viewport is immediately zoomed to the extents of the model space drawing information as shown in Figure 14-17.

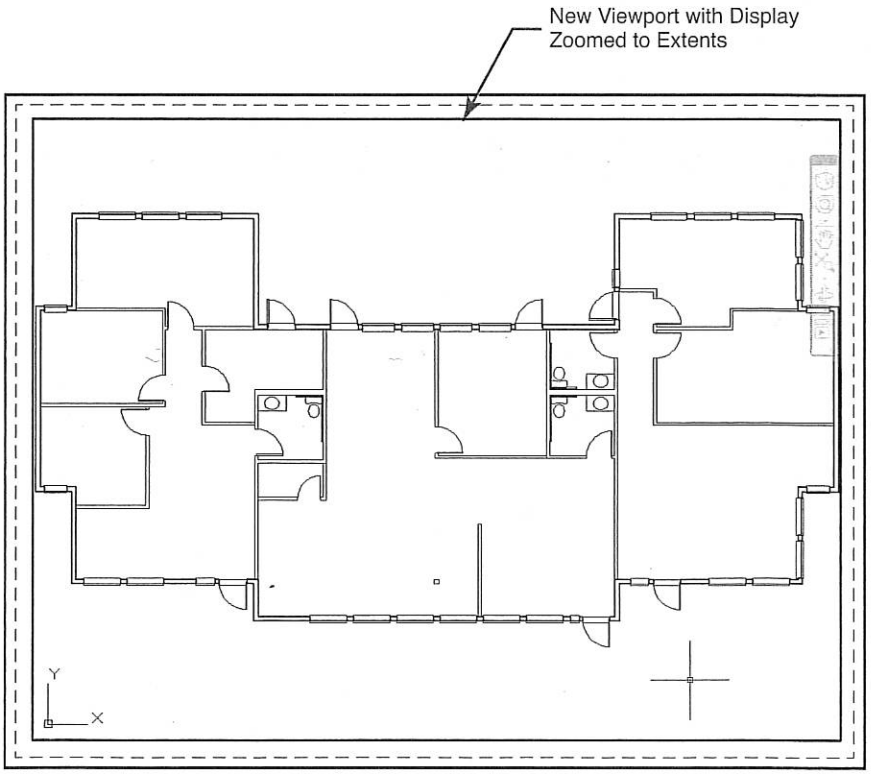


Figure 14-17
New layout viewport defaults to zoom extents

At this point, the viewport is not set at any standard scale. You must manually set the viewport scale factor using the techniques explained later in this chapter.

> **TIP**
> You can create a rectangular viewport that is the exact size of the layout's printable area using the **Fit** option. **Fit** is the default option so that you can simply press the **<Enter>** key when you run either the **MVIEW** or **-VPORTS** command before specifying the first viewport corner point.

Creating a Polygonal Viewport. You can create an irregularly shaped viewport with three or more sides using the **Polygonal** option of the **MVIEW** or **-VPORTS** command. A polygonal viewport is created by selecting multiple points.

To create a polygonal viewport, start the **MVIEW** or **-VPORTS** command and select the **Polygonal** option. AutoCAD prompts you to *Specify start point:*. After selecting the first point, AutoCAD prompts you to *Specify next point or* ↓ so you can start selecting points and define the viewport polygon as shown in Figure 14-18.

POLYGONAL VIEWPORT	
Ribbon & Panel:	Layout | Layout Viewports 
Menu:	Views | Viewports | Polygonal Viewport
Command Line:	MVIEW VPORTS
Command Alias:	MV

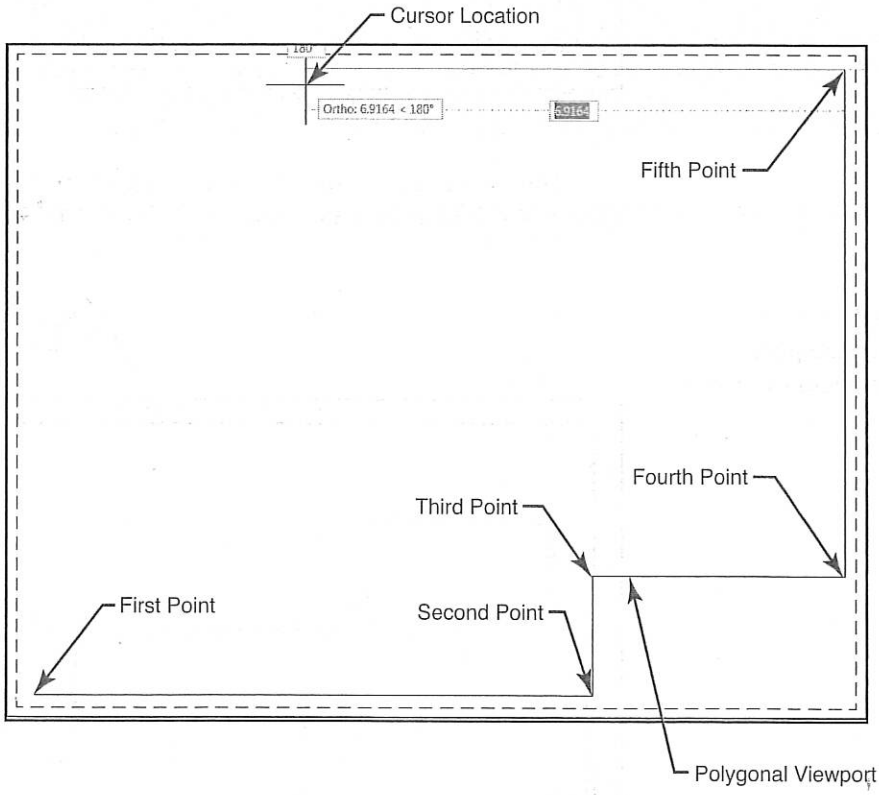


Figure 14-18
Creating a polygonal viewport

To finish the polygon viewport, you close it by selecting the **Close** option. The **Close** option draws a viewport segment from the last current point to the start point and exits the command. Similar to a rectangular viewport, a polygonal viewport is immediately zoomed to the extents of the model space drawing information as shown in Figure 14-19.

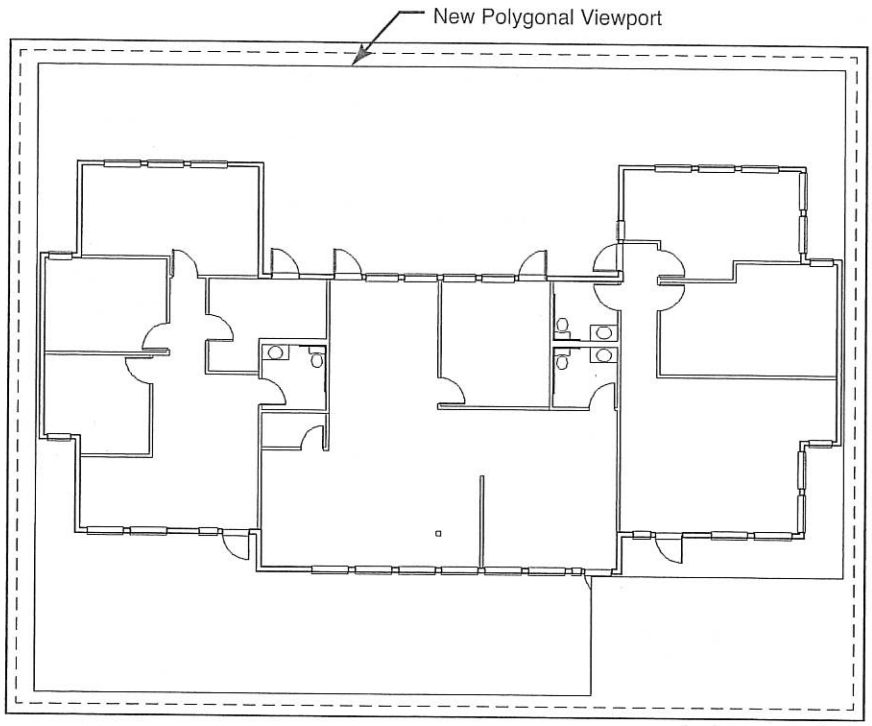


Figure 14-19
Using the **Close** option to complete a polygonal viewport

TIP

You can also press **<Enter>** to close a polygonal viewport after three or more viewport points have been defined.

The **Arc** option allows you to create arc segments when you are defining a polygonal viewport. You can pick a second point to define the arc, or you can select from a number of arc suboptions. The arc creation suboptions are the same as those used with the **PLINE** command.

FOR MORE DETAILS

See page 350 in Chapter 9 for more detailed information about using the **PLINE** command **Arc** options.

OBJECT	
Ribbon & Panel:	Layout | Layout Viewports 
Menu:	Views | Viewports | Object
Command Line:	MVIEW, VPORTS
Command Alias:	MV

The **Length** option creates a viewport segment a specified length at the same angle as the previous segment. If the previous viewport segment is an arc, the new segment is drawn tangent to that arc segment.

The **Undo** option will undo the most recent viewport segment.

Converting an Object into a Viewport. You can convert any of the following objects into a layout viewport:

- Polyline
- Circle
- Ellipse
- Region
- Spline

NOTE

In order to convert a polyline into a viewport, the polyline must be closed, and it must have more than three vertices.

To convert an object into a layout viewport, start the **MVIEW** or **-VPORTS** command, and select the **Object** option. AutoCAD prompts you to *Select object to clip viewport:* so you can pick the object to convert. A circle is shown converted to a viewport in Figure 14-20.

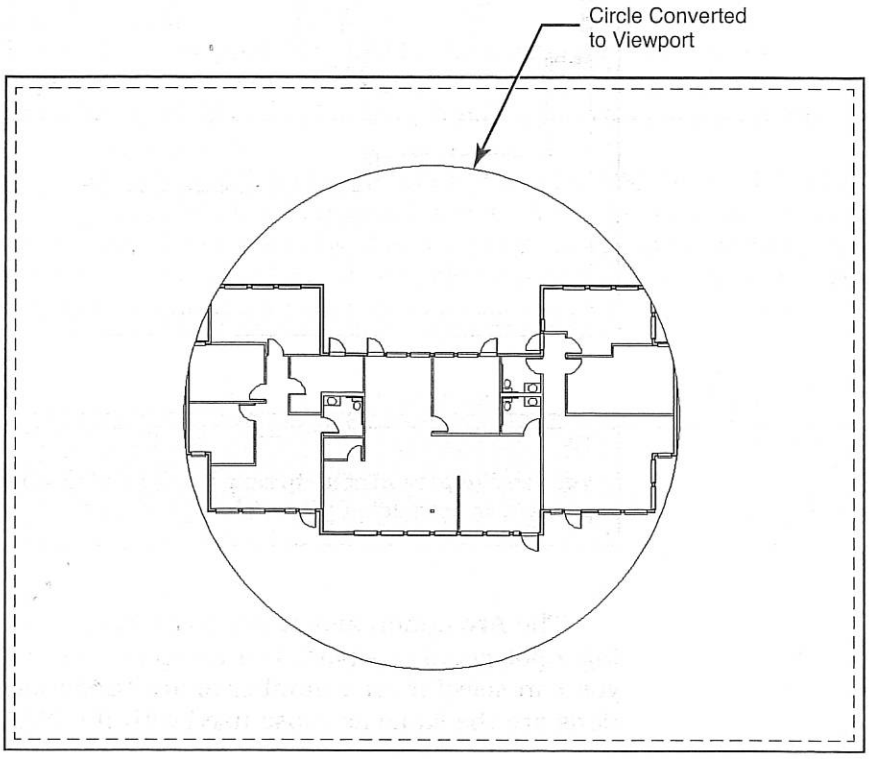


Figure 14-20
Converting a circle to a viewport

NEW VIEWPORT	
Ribbon & Panel:	Layout | Layout Viewports Named
Menu:	Views | Viewports | New Viewports...
Command Line:	VPORTS
Command Alias:	None

Using the Viewports Dialog Box. You can automatically create one or more rectangular viewports using the **Viewports** dialog box. The **VPORTS** command displays the **Viewports** dialog box shown in Figure 14-21.

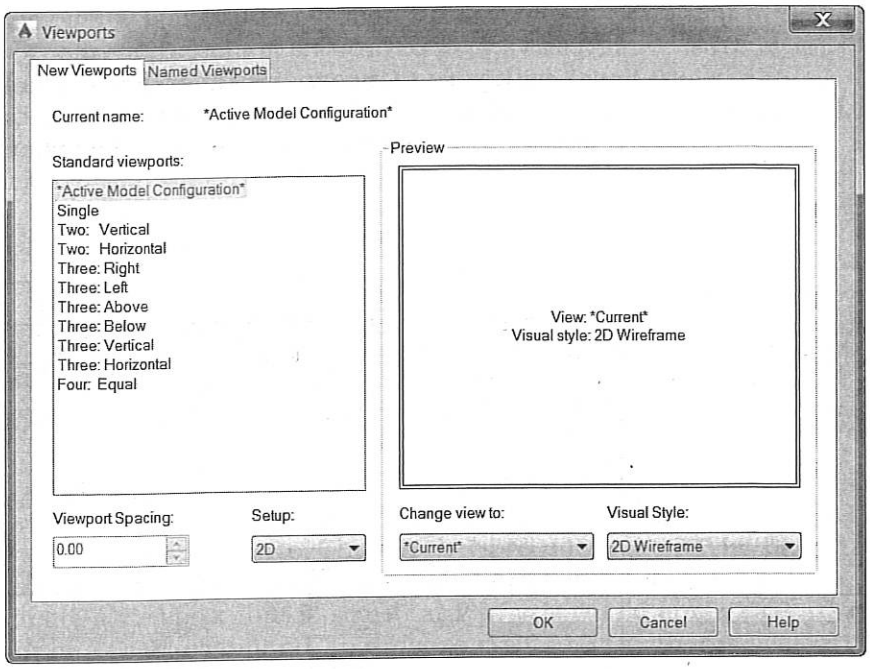
The **Standard viewports:** box on the left displays a list of standard viewport configurations that you can select. The **Preview** window displays a preview of the selected viewport configuration.

The **Viewport Spacing:** box allows you to specify the spacing you want to apply between the viewports for the selected configuration. The **Preview** window is updated to show the results of the spacing indicated.

The **Setup:** list box allows you to switch between a 2D and a 3D viewport setup. When you select 3D, standard orthogonal 3D views are applied to the selected viewport configuration. The **Change view to:** list box replaces the view in the selected viewport with the view you select from the list. The **Visual Style:** list box allows you to change the visual style used for the viewport. It should typically be set to **2D Wireframe,** unless you are working in 3D.

Select **OK** after you have specified the desired configuration and spacing to exit the **Viewports** dialog box. After the dialog box is closed, AutoCAD asks you to specify the rectangular area within which to fit the viewport configuration by prompting you to pick two corner points.

Figure 14-21
The **Viewports** dialog box



TIP

You can use the **Fit** option to make the viewport configuration fill the layout's printable area by pressing the **<Enter>** key when AutoCAD prompts for the first corner point.

EXERCISE 14-2 **Creating Layout Viewports**

1. Continue from Exercise 14-1.
2. Select the **Layout1** tab so that paper space is active and **Layout1** is the current layout.
3. Create a new layer named **Viewport,** set its **Plot** property to **No plot,** and make it the current layer.
4. Create a rectangular viewport using the **MVIEW** or **-VPORTS** command that is the same size as the printable area. *Hint:* The **Fit** option creates a viewport the same size as the printable area.
5. Select the **Layout2** tab and switch to the **Layout2** layout.
6. Create a rectangular viewport using the **MVIEW** or **-VPORTS** command that is the same size as the printable area.
7. Save the drawing.

NOTE

Double-clicking with your mouse directly on the viewport border maximizes the viewport so it fills the entire drawing window. You can double-click on the maximized border to return to the regular layout view. Maximizing viewports is covered later in this chapter.

Making a Viewport Current

There are three ways to make a layout viewport current:

- Select the **PAPER** button on the status bar.
- Enter the **MSPACE** or **MS** command.
- Double-click with your mouse inside a viewport.

The first two methods work best when you are working with a single layout viewport. If you have more than one viewport, you must double-click with your mouse inside the viewport you want to make current. When a viewport is current, its borderline becomes bold, and your mouse pointer changes to the cursor crosshairs mode as shown in Figure 14-22.

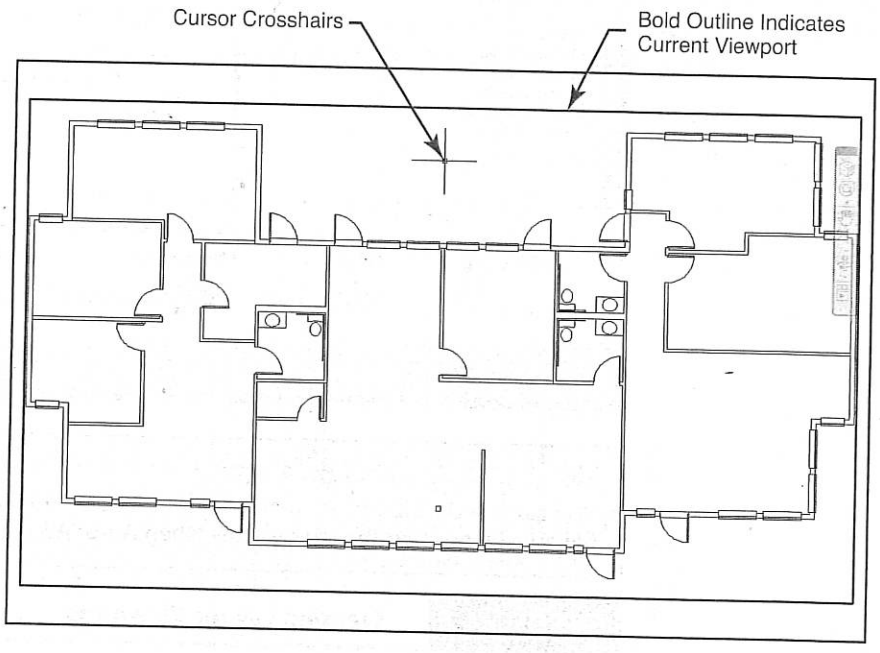


Figure 14-22
Making a layout viewport current

When a viewport is current, you can work on the model space drawing just like you are in model space—although it can be somewhat cumbersome working "through" the viewport. The ability to maximize viewports, which is discussed later in the chapter, makes this process much more user-friendly.

Switching Back to Paper Space. There are three ways to switch back to paper space so that no viewports are current:

- Select the **MODEL** button on the status bar.
- Enter the **PSPACE** or **PS** command.
- Double-click with your mouse outside all viewports.

All information that is created when paper space is active and no viewports are current is added to paper space exclusively **(TILEMODE = 0)**. In this mode, it is possible to add information (such as titles and drawing scales) directly above a viewport. This approach allows you to add information to your drawing that is displayed on the plotted drawing but does not need to be part of the model space design.

Setting the Viewport Scale

As explained earlier in the chapter, the scale of the drawing information displayed in a layout viewport is controlled by zooming in on and out of the active viewport. If you zoom in, the drawing gets larger, and the scale is increased. If you zoom out, the drawing gets smaller, and the scale is decreased. To set a viewport to a standard drafting scale, you must zoom

in on or out of the viewport at a zoom scale factor equal to the scale you want the drawing information to plot. For instance, if you want the drawing information in a viewport to plot at a scale of 2:1, you must zoom in by a scale factor of 2 in the viewport so that everything appears twice as large as actual size. To plot at a scale of 1:2, you zoom out by a scale factor of 1/2 so that everything is half of its actual size.

Zooming in on and out of a layout viewport to a specific scale factor is done using the **XP** option of the **ZOOM** command.

FOR MORE DETAILS

See Chapter 3 for more details about using the **ZOOM** command.

The **X** in the **XP** option represents a multiplication sign, and the **P** stands for paper space. The number preceding the **XP** is the value the view is scaled relative to the paper space scale, which is 1:1. For example, to create a viewport that is scaled at 2:1, you would enter **2XP** in response to the **ZOOM** command. In order to create a view that is scaled 1:2, you would enter **1/2XP** or **.5XP**.

Using the **ZOOM** command with the **XP** option to set the viewport scale is fine when you are working with simple scales such as 2:1 or 1:2. Converting standard drafting scales such as 1/4″ = 1′-0″ or 1–12″ = 1′-0″ to their equivalent scale factors takes a little more time and effort. Luckily, AutoCAD provides some easier ways to set a viewport's scale, which are explained in the following sections.

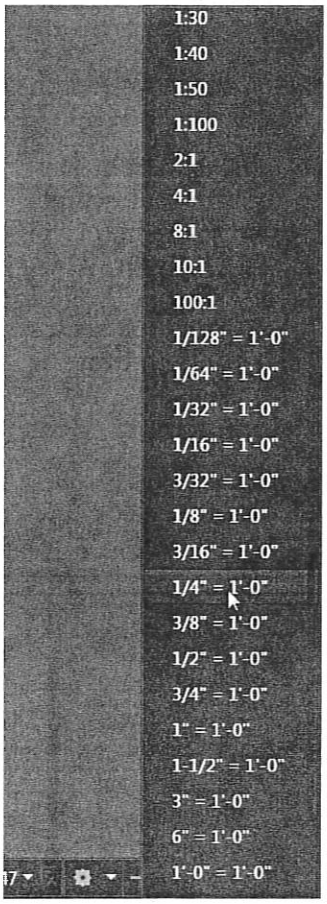


Figure 14-23
Setting the viewport scale

Setting the Viewport Scale on the Status Bar. The easiest way to set the viewport scale is via the **Viewport Scale** button on the right side of the AutoCAD status bar. Clicking anywhere on the **Viewport Scale** button displays a list of standard drafting scales that you can use to set the zoom scale factor of the current viewport as shown in Figure 14-23.

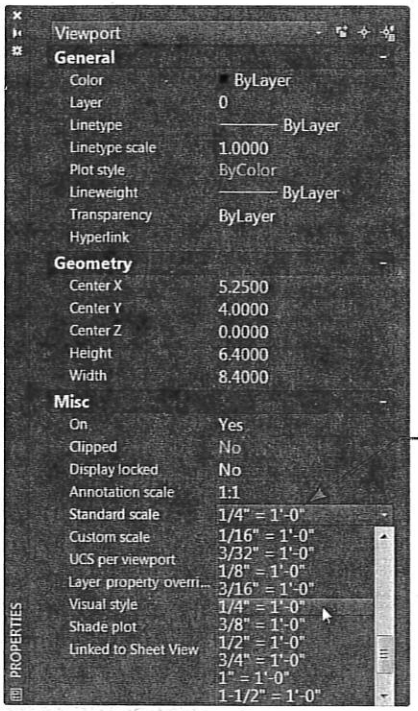
The viewport scale is displayed on the status bar only when a viewport is current. You can make a viewport current by double-clicking in the viewport with your mouse. Select the desired scale factor from the list, and the viewport is zoomed in or out by the preestablished scale factor.

TIP

After the viewport scale is set, zooming in and out using any **Zoom** tools should be avoided. Any incremental zoom is enough to change the zoom scale factor so that it is no longer correct. Panning the display is not a problem because the zoom factor remains the same. The easiest way to prevent inadvertent zooms is to lock the viewport by selecting the **Lock/Unlock Viewport** button to the left of the **Viewport Scale** button on the status bar when the viewport is current and toggling it so the **Lock** icon is closed.

Using the Properties Palette to Set the Viewport Scale. You can also control the viewport scale factor via the **Properties** palette. Setting the viewport scale using the **Properties** palette requires that you be in paper space in order to select the viewport object. Selecting a viewport displays the properties shown in Figure 14-24 so that you can select a **Standard scale** from the list.

Figure 14-24
Setting the viewport scale via the **Properties** palette



TIP
You can also set a custom scale using the **Properties** palette if the scale you need is not in the **Standard scale** list. To specify a custom scale, enter the desired scale factor in the **Custom scale** property text field.

Adding and Editing Scales in the Standard Scale List. The **SCALELISTEDIT** command allows you to add new scales or edit existing scales that appear in the **Scale List** box. You can either type in the command, or you can select **Custom...** from the bottom of the scale list. The **Edit Drawing Scales** dialog box shown in Figure 14-25 is displayed.

The **Scale List** on the left displays the list of currently defined scales. Selecting a scale from the list displays the ratio of paper units to drawing units at the bottom of the **Scale List**.

Figure 14-25
The **Edit Drawing Scales** dialog box

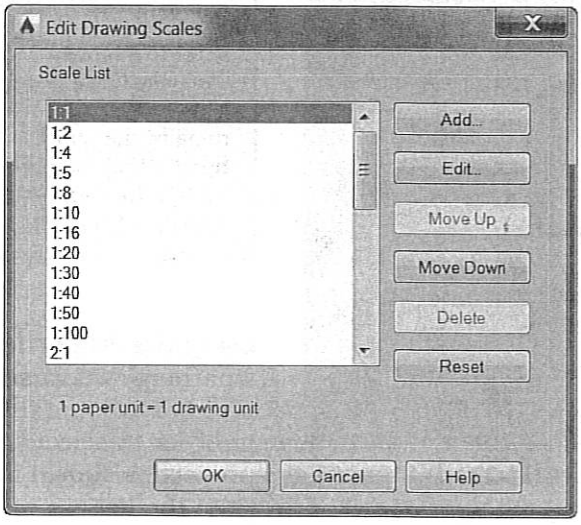
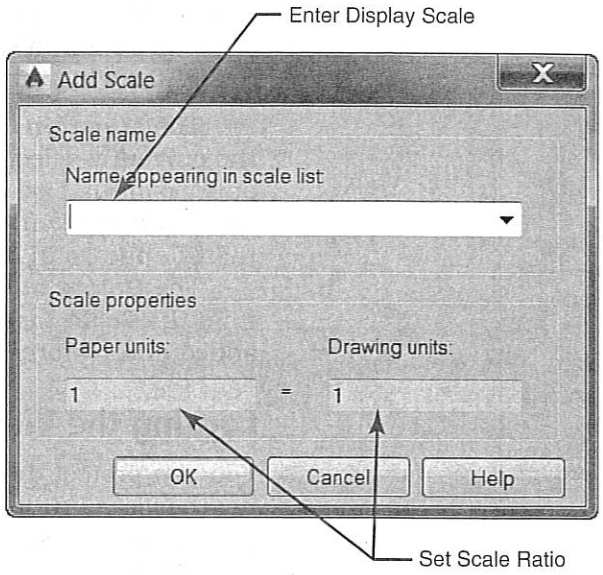


Figure 14-26
The **Add Scale** dialog box



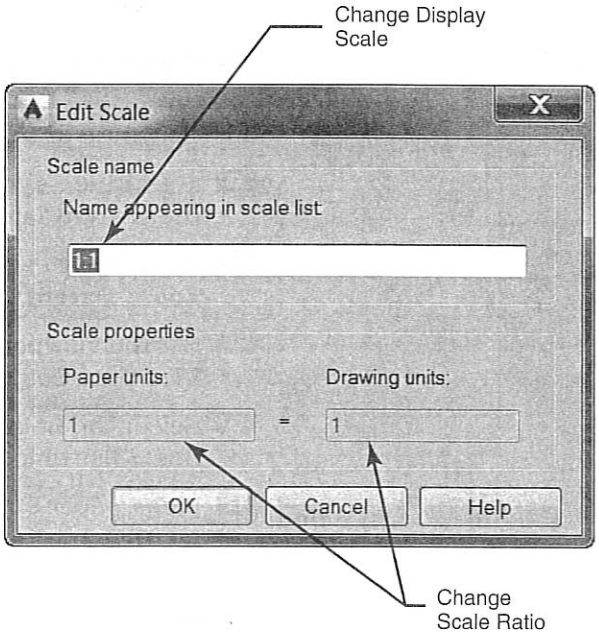
The **Add...** button allows you to add a custom scale to the list via the **Add Scale** dialog box shown in Figure 14-26. In this dialog box:

- The **Scale name** area is where you enter the descriptive or numeric name as you want it to appear in the list in the **Name appearing in scale list** text box.
- The **Scale properties** area is where you set the ratio of paper units to drawing units by entering the numeric values in the **Paper units:** and **Drawing units:** text boxes.

The **Edit...** button in the **Edit Drawing Scales** dialog box allows you to edit an existing scale via the **Edit Scale** dialog box shown in Figure 14-27. In this dialog box:

- The **Scale name** area is where you update the descriptive or numeric name as you want it to appear in the list in the **Name appearing in scale list** text box.

Figure 14-27
The **Edit Scale** dialog box



- The **Scale properties** area is where you change the ratio of paper units to drawing units by entering new numeric values in the **Paper units:** and **Drawing units:** text boxes.

The **Move Up** button in the **Edit Drawing Scales** dialog box moves the currently selected scale in the **Scale List** up one position so that it appears in that position in all scale list boxes. The **Move Down** button moves the currently selected scale in the **Scale List** down one position so that it appears in that position in all scale list boxes.

The **Delete** button permanently removes the currently selected scale from the **Scale List.** The **Reset** button deletes any custom scales that were added and restores the default list of standard AutoCAD scales.

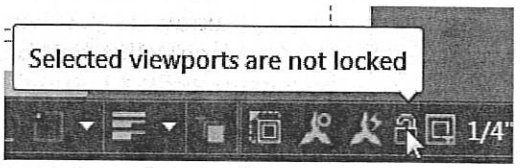
Locking the Viewport Display

You can protect the viewport scale from being accidentally changed by locking the viewport display so it is impossible to zoom or pan inside the viewport when it is current. When a viewport is locked, any attempt to zoom or pan affects the entire paper space layout similarly to if you were working in paper space. The current viewport remains active; it is just temporarily disabled during the zoom or pan process. The easiest way to lock a viewport is to select the **Lock/Unlock Viewport** button on the status bar as shown in Figure 14-28. In addition, you can also use the following methods:

- Select **Lock** or **Unlock** from the drop-down menu on the **Layout Viewports** panel on the **Layout** tab of the ribbon.
- Select viewport and right-click to display the shortcut menu and set the **Display locked** menu item to **Yes**.
- Set the **Display locked** property to **Yes** via the **Properties** palette.
- Use the **MVIEW** command's **Lock** option and select the viewport.

To unlock a viewport, select the **Lock/Unlock Viewport** button or use any of the options listed above and set the **Locked** property to **Off** or **No**.

Figure 14-28
The **Lock/Unlock Viewport** button on the status bar



EXERCISE 14-3 Setting the Viewport Scale

1. Continue from Exercise 14-2.
2. Select the **Layout1** tab so that paper space is active and **Layout1** is the current layout.
3. Make the viewport created in Exercise 14-2 the active viewport, and **Zoom Extents** so that the entire floor plan fills the viewport.
4. Set the viewport scale to **1/4″ = 1′-0″** by selecting it from the **Viewport Scale** list on the right side of the status bar.
5. Select the **Lock/Unlock Viewport** button to the left of the **Viewport Scale** list to lock the viewport.
6. Make paper space the active drawing environment by selecting the **MODEL** button on the status bar and toggling it to **PAPER**.
7. **Layout1** should now look similar to Figure 14-29. It now is 1/4″ = 1′-0″ scale drawing on a D-size sheet (36″ × 24″).

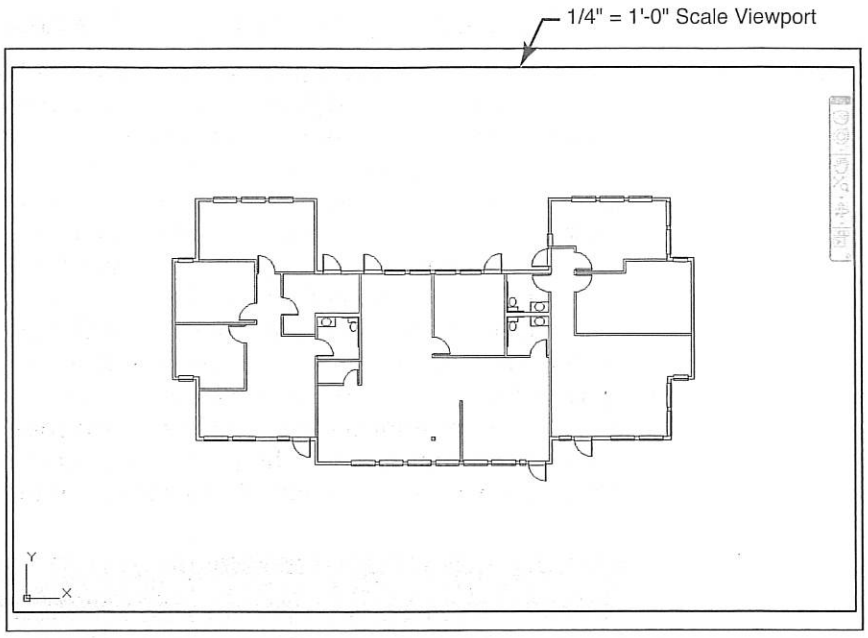


Figure 14-29
Layout1 with **1/4″ = 1′-0″** scale viewport on D-size paper (36″ × 24″)

8. Select the **Layout2** tab, and switch to the **Layout2** layout.
9. Make the viewport created in Exercise 14-2 the active viewport, and **Zoom Extents** so that the entire floor plan fills the viewport.
10. Set the viewport scale to **1/8″ = 1′-0″** by selecting it from the **Viewport Scale** list on the right side of the status bar.
11. Select the **Lock/Unlock Viewport** button to the left of the **Viewport Scale** list to lock the viewport.
12. **Layout2** should now look similar to Figure 14-30. It is now a 1/8″ = 1′-0″ scale drawing on a B-size sheet (17″ × 11″).

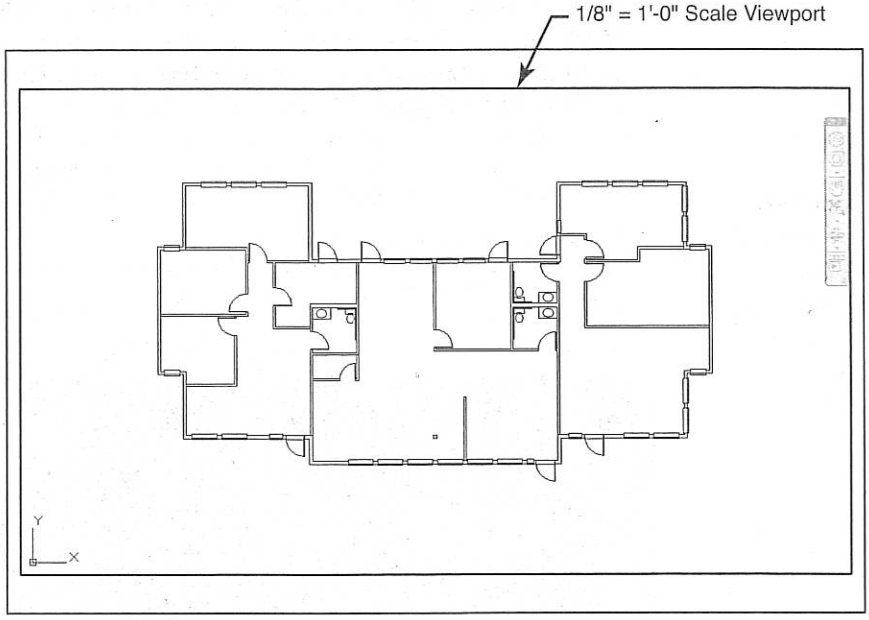


Figure 14-30
Layout2 with **1/8″ = 1′-0″** scale viewport on B-size paper (17″ × 11″)

13. Make paper space the active drawing environment by selecting the **MODEL** button on the status bar and toggling it to **PAPER**.
14. Save the drawing.

Controlling Layers per Layout Viewport

As mentioned earlier, it is possible to control layers per layout viewport so that you can display different model space drawing information in each individual viewport while not affecting the information in model space. You can freeze and thaw layers in individual viewports, as well as control the color, linetype, lineweight, and transparency level used. These individual viewport specific layer settings are referred to as *viewport layer overrides*.

The most popular viewport layer override is the ability to freeze a layer in an individual viewport. This allows you to leave all of the layers on (thawed) in model space but then freeze different layers in each viewport to create multiple views of the same model space information and create different drawings. For example, one layout could be used to display the electrical plan information, and another layout might display only the HVAC plan information. The possibilities are endless, especially when combined with the concept of external reference drawings.

FOR MORE DETAILS

See Chapter 17 for more information about using external reference drawings (xrefs).

There are two different ways to freeze layers per viewport: in the current viewport or in any new viewports. Freezing layers in the **New VP Freeze** column means that any information on the selected layers will not be displayed when you create any new layout viewports in the future.

Freezing layers in the current viewport is most common. Obviously, to freeze layers in the current viewport, you must first make the viewport current. After the viewport is current, start the **LAYER** command to display the **Layer Properties Manager**.

The viewport layer override columns are displayed at the right before the **Description** column as shown in Figure 14-31.

To freeze a layer in the current viewport, click on the sun icon in the **VP Freeze** column, and change it to a snowflake icon, just as with the regular **Freeze** option. The selected layer is frozen in the current viewport as shown in Figure 14-32.

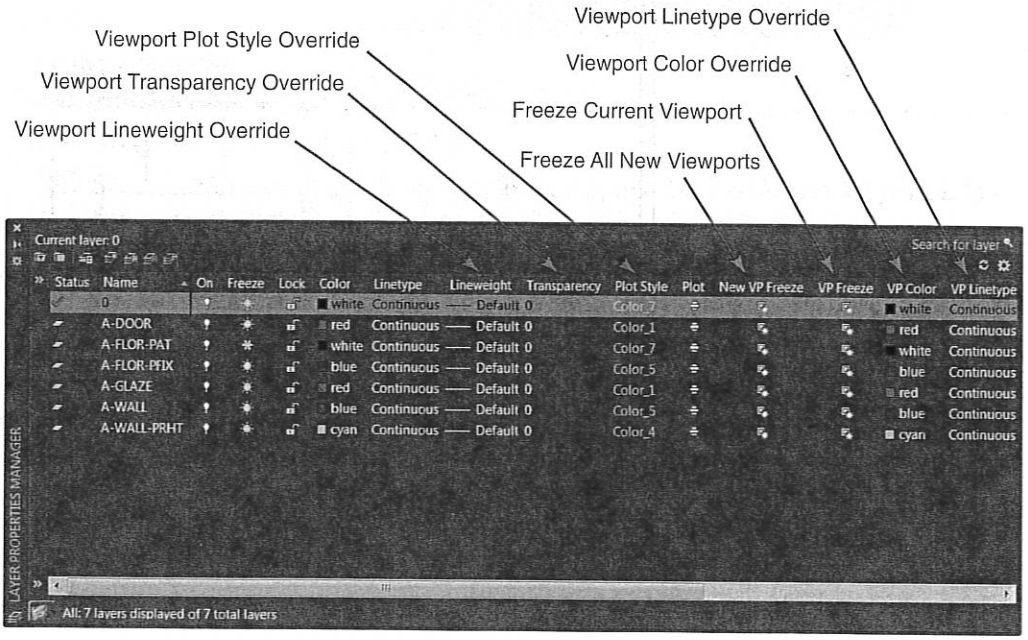


Figure 14-31
The **Layer Properties Manager** in paper space

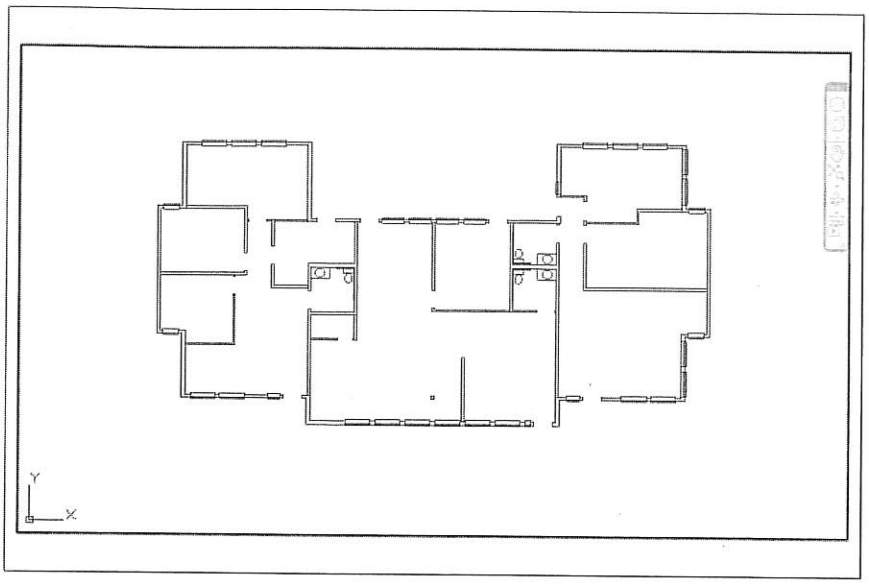


Figure 14-32
Viewport with **A-DOOR** layer frozen

NOTE

When any viewport layer override is applied, a different background color is used in the **Layer Properties Manager**.

The same technique can be used to override the other layer settings (color, linetype, lineweight, transparency, and plot style). Simply make the viewport current and select the desired overrides.

You can remove viewport layer overrides using the right-click menu in the **Layer** list in the **Layer Properties Manager**. The **VPLAYEROVERRIDESMODE** system variable allows you to temporarily turn off all viewport layer overrides.

TIP

When a viewport contains layer overrides, a **Viewport Overrides** property filter is automatically created so that you can select the **Viewport Overrides** filter and view only the layers that contain overrides.

FOR MORE DETAILS

See Chapter 6 for more detailed information about layers and controlling the different layer properties using the **Layer Properties Manager**.

Modifying Layout Viewports

Because they are treated just like most other AutoCAD objects, layout viewports can be modified using most of the same modify commands you are already familiar with. You can move or copy viewports using the **MOVE** and **COPY** commands, just as you can scale and stretch viewports via the **SCALE** and **STRETCH** commands. Probably the most important is the ability to delete viewports using the **ERASE** command.

Resizing Viewports Using Grips. One of the most common ways to resize a viewport is to simply rely on grips. Using a viewport's grips and the

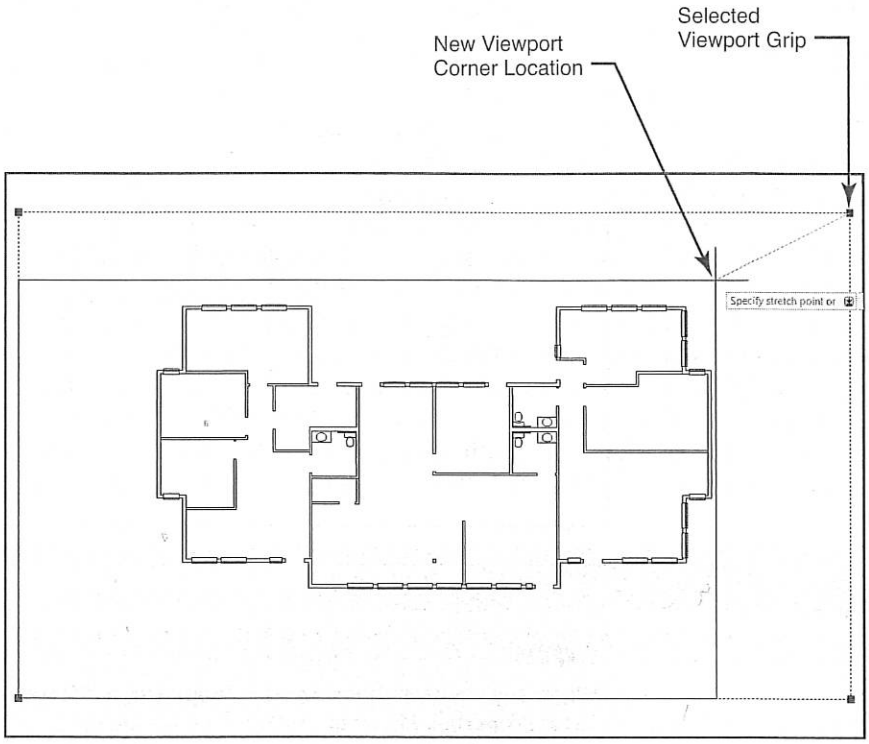


Figure 14-33
Using grips to resize a viewport

Stretch option allows you to modify a viewport quickly and make it the size needed as shown in Figure 14-33.

VIEWPORT CLIP	
Ribbon & Panel:	Layout | Layout Viewports Clip
Pull-down Menu:	None
Command Line:	VPCLIP
Command Alias:	None

FOR MORE DETAILS

See page 295 in Chapter 7 for detailed information about using grips.

Clipping Viewports. You can change the shape of a viewport using the **VPCLIP** command.

Using the **VPCLIP** command, you can either select a different object to convert into a viewport, or you can redefine the viewport using a new polygon viewport.

NOTE

It is possible to convert circles, closed polylines, ellipses, closed splines, and regions into a layout viewport.

When you start the **VPCLIP** command and a viewport is not already selected, AutoCAD prompts you to *Select viewport to clip:* so you can select a viewport. Once a viewport is selected, AutoCAD prompts you to *Select clipping object or* ↓. You can either select an object to convert into a viewport, or you can define a new polygon window by selecting the **Polygon** option. The options for creating a polygon viewport are the same as explained earlier in the chapter. The new viewport that is created to replace the existing viewport is referred to as a *clipping boundary*, as shown in Figure 14-34.

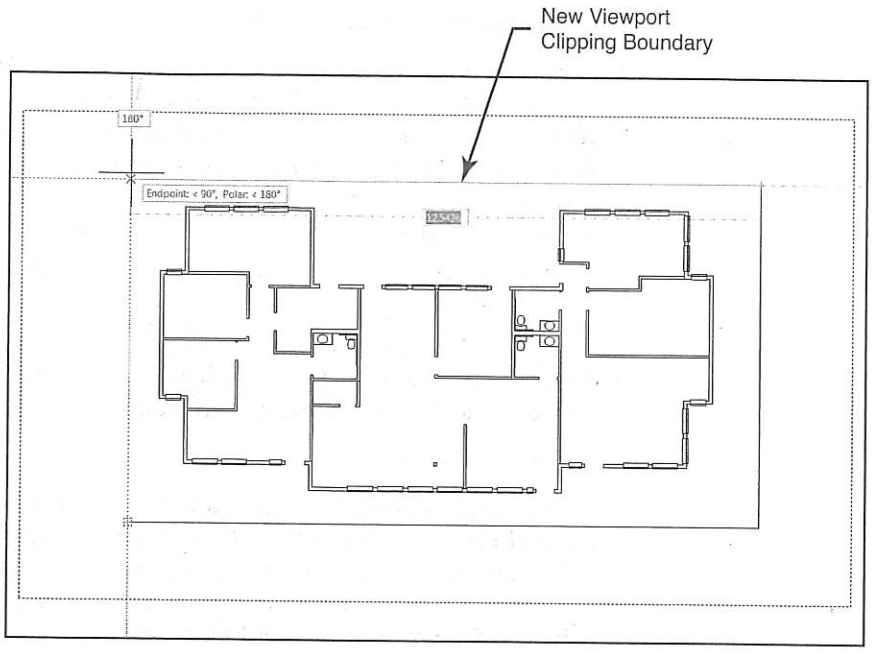


Figure 14-34
Clipping a viewport using the **VPCLIP** command

The **Delete** option deletes the clipping boundary of a selected viewport. The **Delete** option is available only if the selected viewport has already been clipped once using the **VPCLIP** command.

> **TIP**
> You can determine whether a viewport has been clipped using the **VPCLIP** command by checking the viewport's **Clipped** property via the **Properties** palette. If it is set to **Yes,** the viewport has been clipped.

Turning Viewport Display Off and On

You can turn the viewport display on and off temporarily so that the model space objects displayed in the viewport are no longer visible. This can be used to either speed up drawing regeneration time or control what drawing information is plotted. There are three ways to turn a viewport off:

- Select the viewport, right-click to display the shortcut menu, and set the **Display Viewport Objects** menu item to **No**.
- Set the viewport's **On** property to **No** via the **Properties** palette.
- Use the **MVIEW** command's **Off** option and select the viewport.

> **NOTE**
> The viewport boundary is still displayed if a viewport is turned off. Only the model space information is turned off.

A viewport that has been turned off is considered inactive. You can only have up to 64 viewports active at one time.

To make a viewport active again, use any of the options listed above to toggle the viewport's **Display** property to **On** or **Yes.**

> **TIP**
> The maximum number of active viewports is controlled using the **MAXACTVP** system variable. The maximum value is 64.

Maximizing a Viewport

You can maximize a layout viewport so that it fills the entire drawing window area, which makes it easier to work on your model space design without switching entirely from paper space to model space. This feature was introduced to get around the complications of working "through" a layout viewport to get to the model space drawing information while you were still in paper space. There are four ways to maximize a layout viewport:

- Select the **Maximize Viewport** button on the status bar.
- Double-click on the viewport outline.
- Select the viewport, right-click to display the shortcut menu, and select the **Maximize Viewport** menu item.
- Type **VPMAX<Enter>**.

Any method enlarges the viewport to fit the drawing window display area and changes the border to a thick red hashed line (see Figure 14-35).

To pan and zoom when a viewport is maximized and not change the original viewport display when you switch back to the viewport, use the **Minimize Viewport** options below. When a viewport is maximized, it is almost as though you were working in model space on the **Model** tab.

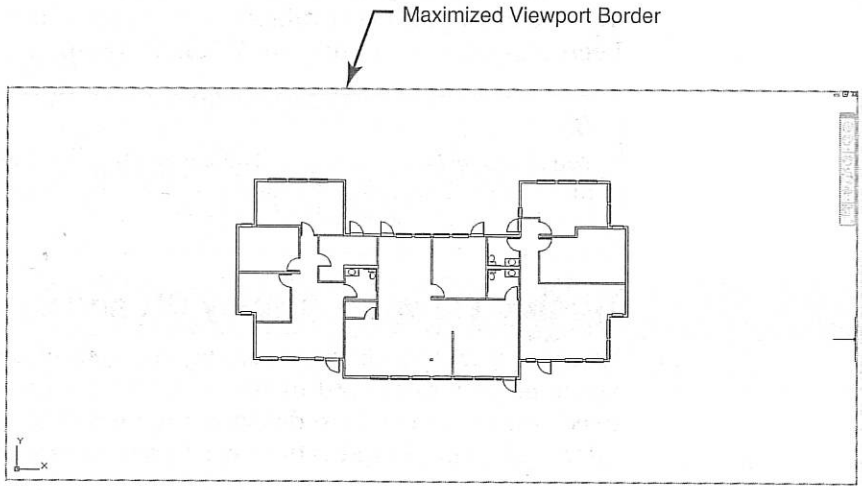


Figure 14-35
Drawing display with a layout viewport maximized

There are four ways to restore the maximized layout viewport back to its original size and display:

- Select the **Minimize Viewport** button on the status bar.
- Double-click on the maximized viewport.
- Select the viewport, right-click to display the shortcut menu, and select the **Minimize Viewport** menu item.
- Type **VPMIN<Enter>**.

EXERCISE 14-4 Working with Multiple Annotation Scales

1. Continue from Exercise 14-3.
2. Create a text style named **Notes** with the following settings:
   a. Font = **Simplex.shx** AutoCAD font
   b. **Annotative** should be checked
   c. Paper text height = **0.125"**

3. Create the following layer:

Name	Color	Linetype	Lineweight	Description
A-Anno-Note	3	Continuous	0.30 mm	Drawing note text

4. Select the **Model** tab so that model space is active.
5. Set the **Notes** text style current on the **Annotation** panel.
6. Set the **A-Anno-Note** layer current in the **Layer** list box.
7. Set the annotation scale to **1/8″ = 1′-0″** by selecting it from the **Annotation Scale** list on the status bar.
8. Create the text shown in Figure 14-36 using the **Center** justification option.

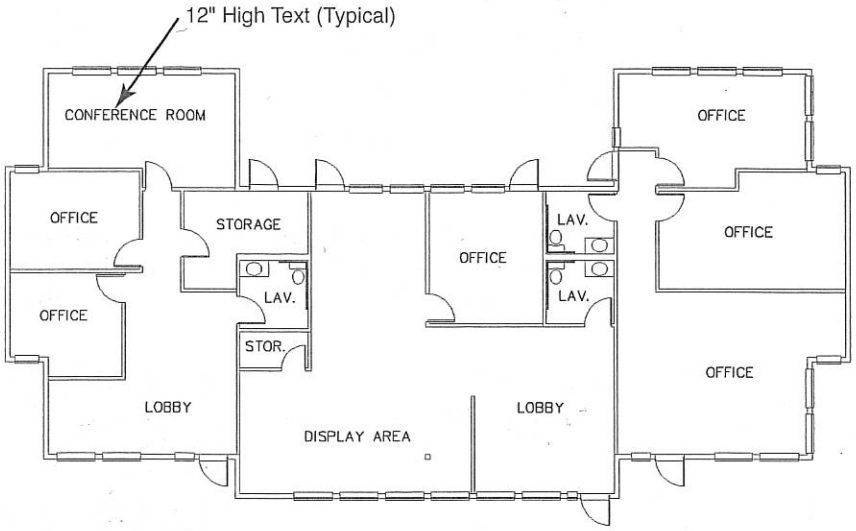


Figure 14-36
1/8″ = 1′-0″ scale view with 12″ high text

9. Select the **Add scales to annotative objects when the annotation scale changes** icon on the left of the **Annotation Scale** button on the status bar so it is on.
10. Set the annotation scale to **1/4″ = 1′-0″** by selecting it from the list on the status bar. All text in the drawing should scale down by 1/2.
11. Center the 1/4″ = 1′-0″ text in each room by using the upper left grip to move each piece of text individually of its 1/8″ = 1′-0″ scale representation as shown in Figure 14-37.

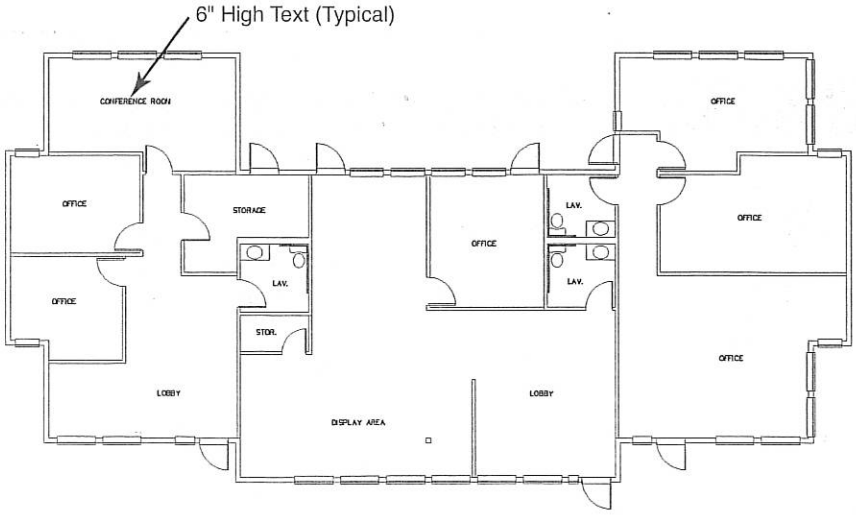


Figure 14-37
1/4″ = 1′-0″ scale view with 6″ high text

12. Select the **Layout1** tab so that paper space is active and **Layout1** is the current layout. Only the 1/4″ = 1′-0″ text is visible.
13. Select the **Layout2** tab, and switch to the **Layout2** layout. Only the 1/8″ = 1′-0″ text is visible.
14. Make paper space the active drawing environment by double-clicking outside the viewport.
15. Save the drawing.

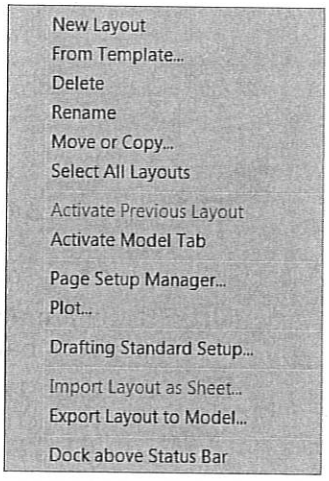
Managing Layouts

The following sections describe how to manage layouts so that you can do the following:

- Create a new layout
- Rename a layout
- Move or copy a layout
- Delete a layout

One of the easiest ways to accomplish any of these tasks is to rely on the layout's right-click shortcut menu. Right-clicking with your mouse on any layout tab displays the shortcut menu shown in Figure 14-38.

Figure 14-38
The **Layout** right-click shortcut menu



TIP
The **Select All Layouts** menu item on the **Layout** right-click menu provides a quick way to perform a task on all the layouts at one time.

NEW LAYOUT	
Ribbon & Panel:	None 
Menu:	Insert | Layout | New Layout
Command Line:	LAYOUT
Command Alias:	LO

The **LAYOUT** command also provides most of the same functionality, but as you might expect, it's not quite as user-friendly. Emphasis is placed on using the right-click menu where appropriate in the following sections.

Creating a New Layout

There are four ways to create a new layout:

- Add a new generic layout tab with the default settings so that the settings must be updated via the Page Setup Manager.

- Import a layout from an existing drawing file (DWG), drawing template file (DWT), or design exchange format file (DXF).
- Use the **Create Layout** wizard that steps you through the layout setup.
- Copy an existing layout tab in the current drawing file and rename it.

The first three methods are described in the following sections. Copying a layout is covered a little later.

Adding a Generic Layout with Default Settings. You can quickly add a generic layout with default page setup settings. You must then use the Page Setup Manager described earlier in this chapter to set up the layout as required.

You can add a generic layout by selecting the **Layout** tab on the right with the plus "+" icon, by right-clicking and selecting **New Layout** from the shortcut menu, or by using the **New** option of the **LAYOUT** command.

AutoCAD prompts you to *Enter new Layout name <Layout3>:* if you add a new layout via the **Insert** menu or the **LAYOUT** command. The default layout name is "Layout" followed by an integer representing the layout number in the sequence.

When you select **New Layout** from the right-click shortcut menu, a layout is added with the default name, and you must rename it. Renaming layouts is covered later in this chapter.

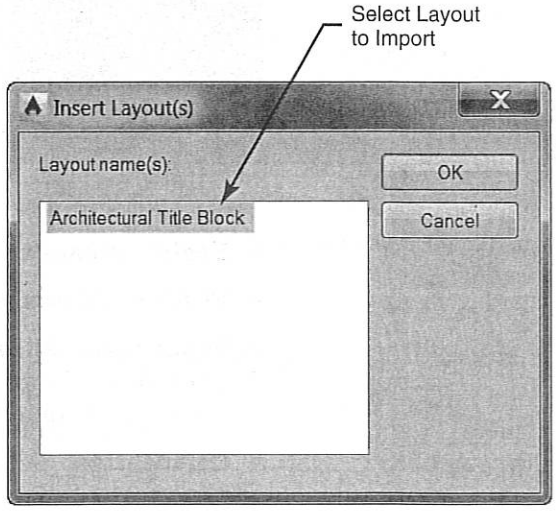
LAYOUT FROM TEMPLATE	
Ribbon & Panel:	None 
Menu:	Insert | Layout | Layout from Template
Command Line:	LAYOUT
Command Alias:	LO

Importing a Layout from a Drawing Template. To save time and effort, you can import a layout that is already set up with the correct paper size and plot settings from an existing drawing file (DWG), drawing template file (DWT), or designexchange format file (DXF).

You can import a layout by selecting **Layout from Template...** from the **Layout** cascade menu on the **Insert** menu, by right-clicking and selecting **From template...** from the shortcut menu, or by using the **Template** option of the **LAYOUT** command.

AutoCAD displays the **Select Template From File** standard file dialog box so you can select the file from which you want to import the layout. Selecting the **Open** button gets a list of the layouts in the selected file and displays them in the **Insert Layout(s)** dialog box shown in Figure 14-39.

Figure 14-39
The **Insert Layout(s)** dialog box



NOTE

If a layout with the same name already exists in the current drawing during the import process, the layout is still added, but it is renamed by prefixing the layout name with a default layout name and a dash (-).

CREATE LAYOUT WIZARD	
Ribbon & Panel:	None
Menu:	Insert | Layout | Create Layout Wizard
Command Line:	LAYOUTWIZARD
Command Alias:	None

Select one or more layouts you want to import in the **Layout name(s):** list box and select **OK.** The selected layout(s) are imported with all their settings and drawing information and added to the right end of the layout tabs at the bottom of the drawing window.

Creating a New Layout Using the Layout Wizard. The **Create Layout** wizard automates the process of creating, *and setting up,* a new layout by prompting you for information about the different layout settings in a series of preprogrammed steps.

You can start the **Create Layout** wizard by selecting **Create Layout Wizard** from the **Layout** cascade menu on the **Insert** menu or by using the **LAYOUTWIZARD** command. The **Create Layout** dialog box is displayed with the **Begin** step displayed as shown in Figure 14-40.

The steps that the wizard will take you through are listed on the left in sequence from top to bottom with the arrow to the left indicating the current step. Select the **Next** button to continue to the next step or the **Back** button to return to a previous step if you want to verify or change anything. The setup steps and options are as follows:

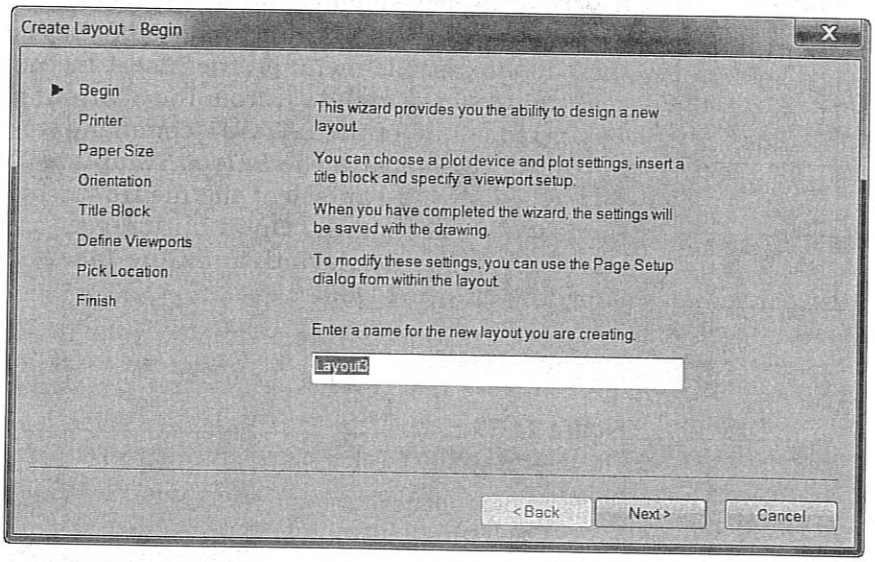


Figure 14-40
The **Create Layout—Begin** step

- **Begin** Allows you to enter the desired name for the new layout
- **Printer** Allows you to select a system printer/plotter output device
- **Paper Size** Allows you to specify a paper size based on the printer selected in the previous step and switch drawing units between millimeters and inches
- **Orientation** Allows you to switch between the portrait and landscape paper orientation modes

- **Title Block** Allows you to insert a predefined title block in the layout as a block or an xref. The title block drawings listed are located in the default AutoCAD **Template** folder

FOR MORE DETAILS

See Chapter 16 for more information about blocks. See Chapter 17 for more information about external references (xrefs).

- **Define Viewports** Allows you to select a layout viewport configuration and set the viewport scale from a list of predefined standard scales
- **Pick Location** Allows you to define the area to fill with the viewport configuration selected in the previous step by picking two corner points. If no location is selected, AutoCAD uses the layout's printable area
- **Finish** Exits the **Create Layout** wizard and creates the new layout with the selected settings

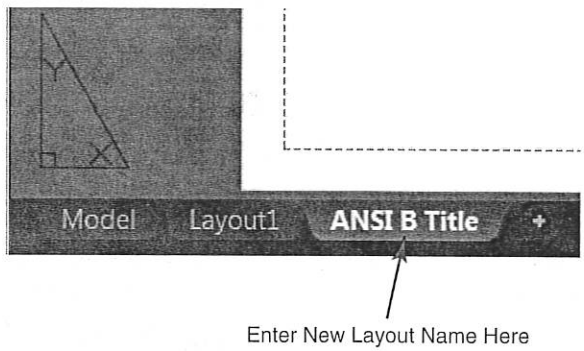
NOTE

You can always change the information entered in the **Create Layout** wizard later by selecting the layout and using the Page Setup Manager explained earlier in the chapter.

Renaming a Layout

The easiest way to rename a layout is to right-click on the layout tab and select **Rename** from the shortcut menu. You can then update the layout name directly on the layout tab as shown in Figure 14-41.

Figure 14-41
Renaming a layout



You can also rename a layout using the **Rename** option of the **LAYOUT** command. Using the **LAYOUT** command requires that you enter the layout to change in response to *Enter layout to rename <Layout1>:* where the current layout is the default name. AutoCAD then prompts you to *Enter new layout name:* so you can enter the new name.

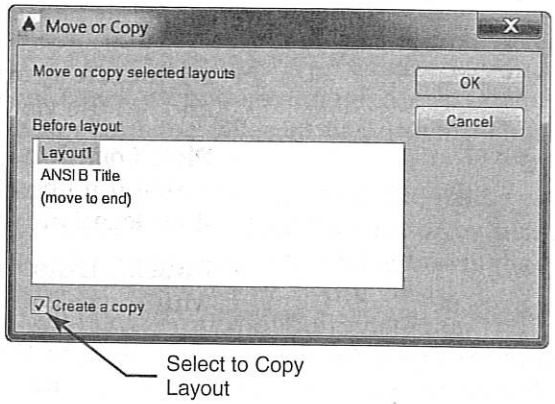
TIP

You can double-click on a layout tab to automatically rename a layout.

Moving or Copying a Layout

The easiest way to move or copy a layout is to right-click on the layout tab and select **Move or Copy...** from the shortcut menu to display the **Move or Copy** dialog box shown in Figure 14-42.

Figure 14-42
The **Move or Copy** dialog box



Select the layout from the list in the **Before layout:** list box that you want to locate the current layout *before*. When you select **OK,** the layout will be moved or copied so it appears as the layout tab directly preceding, or to the left of, the selected tab.

If you want to make a copy of a layout and move it at the same time, select the **Create a copy** check box on the bottom of the dialog box. AutoCAD creates a copy of the layout with the same name as the current layout with a numerical suffix representing the sequence appended in parentheses. For instance, **Layout1** becomes **Layout1(2).**

TIP

It is possible to select a layout tab and drag it into another position with your mouse.

Deleting a Layout

The easiest way to delete a layout is to right-click on the layout tab and select **Delete** from the shortcut menu. AutoCAD displays a warning before deleting the layout so you can cancel the operation or select **OK** to continue.

NOTE

You cannot delete the **Model** tab.

You can also delete a layout using the **Delete** option of the **LAYOUT** command. Using the **LAYOUT** command requires that you enter the layout to delete in response to *Enter name of layout to delete <Layout1>:* where the current layout is the default name.

EXERCISE 14-5 Managing Layouts

1. Continue from Exercise 14-4.
2. Right-click on a layout tab, and select the **From template...** menu item on the **Layout** right-click menu in order to insert a new **Architectural D-Size** layout from an existing AutoCAD drawing template file.

To access student data files, go to www.pearsondesigncentral.com.

3. Select the **Architectural D-Size.dwt** template file in the student data files in the **Select Template From File** dialog box and the **Open** button to display the **Insert Layout(s)** dialog box.
4. Select the **Architectural Title Block** layout, and select the **OK** button to insert the layout.
5. Select the **Architectural Title Block** tab, and switch to the **Architectural Title Block** layout.
6. Set the viewport scale to **1/4″ = 1′-0″** using the techniques learned in Exercise 14-3, and center the floor plan in the viewport so it looks similar to Figure 14-43.

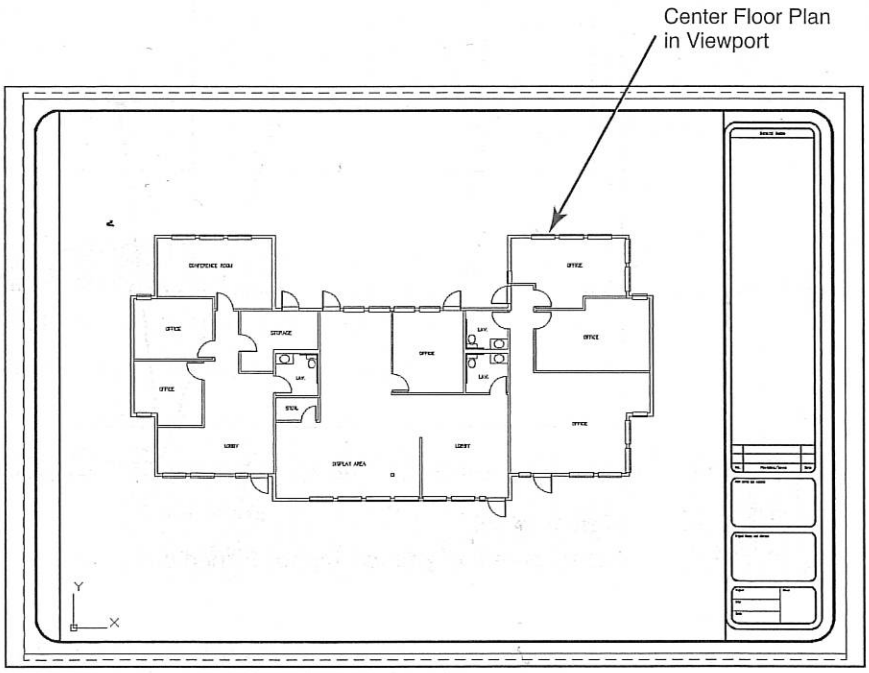


Figure 14-43
The **Architectural Title Block** layout with **1/4″ = 1′-0″** viewport

7. Rename the **Architectural Title Block** layout to **ANSI D Title Block** by right-clicking with your mouse on the **Architectural Title Block** tab and selecting **Rename** from the shortcut menu.
8. Rename the **Layout2** layout to **ANSI B Title Block** by right-clicking with your mouse on the **Layout2** tab and selecting **Rename** from the shortcut menu.
9. Delete the **Layout1** layout by right-clicking with your mouse on the **Layout1** tab and selecting **Delete** from the shortcut menu.
10. Save the drawing.

Paper Space Linetype Scale

The **PSLTSCALE** system variable allows you to scale linetype definitions based on the viewport scale so that linetype definitions will display the same in multiple viewports that have different scale factors. Without paper space linetype scaling, the same linetype definition will appear at different scales in each viewport as shown in Figure 14-44.

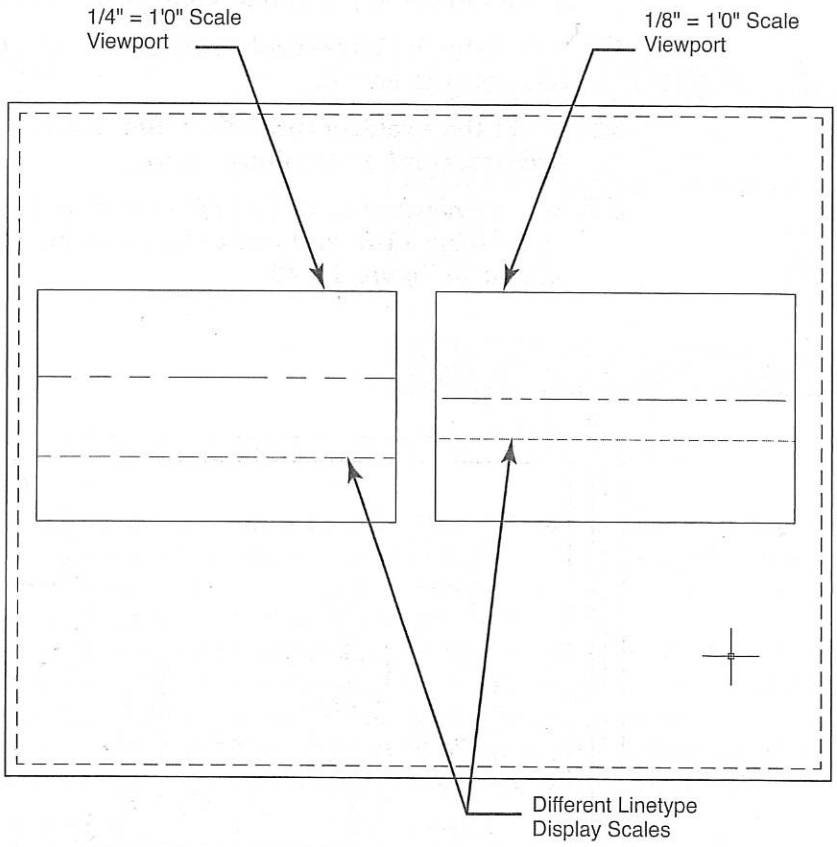


Figure 14-44
Paper space linetype scaling not turned on

Setting **PSLTSCALE** to **1** (on) tells AutoCAD to scale the linetype definitions of all the objects displayed in a viewport by the inverse of the viewport scale factor as shown in Figure 14-45.

Be aware that the global linetype scale controlled using the **LTSCALE** system variable is still in effect when paper space linetype scale is turned on and can have some unintended effects. Typically, the **LTSCALE** system variable is set to **1** when paper space linetype scale is being used **(PSLTSCALE = 1)**.

FOR MORE DETAILS

See page 234 in Chapter 6 for more information about linetype definitions and the **LTSCALE** system variable.

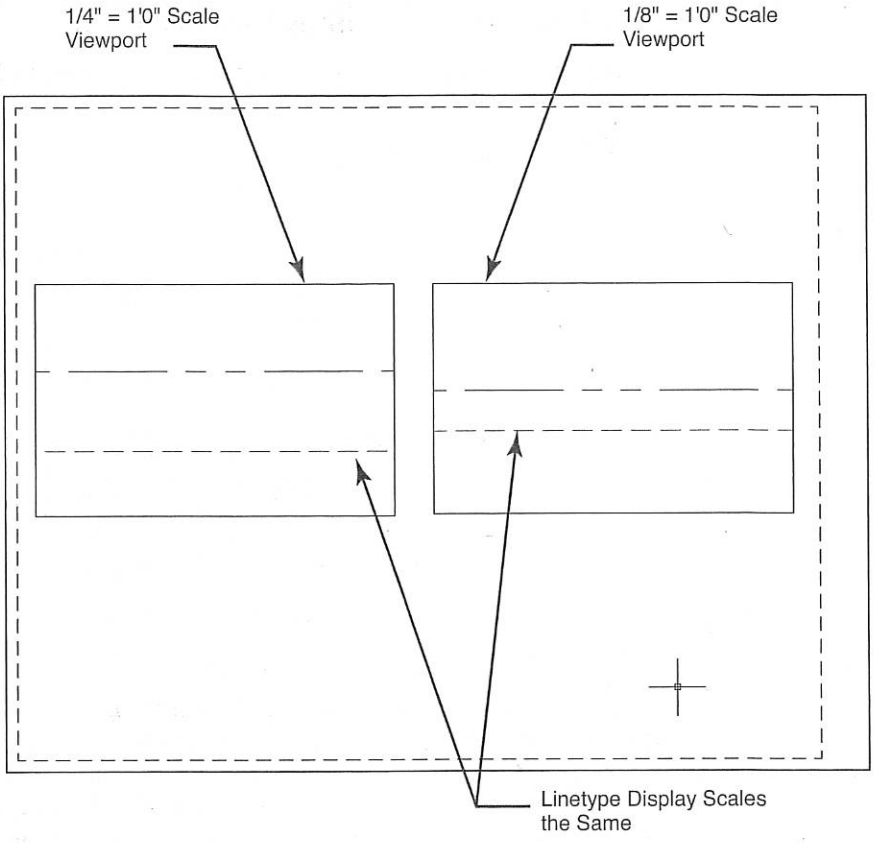


Figure 14-45
Paper space linetype scaling turned on

EXERCISE 14-6 Paper Space Linetype Scaling

1. Continue from Exercise 14-5.
2. Create the following layers:

Name	Color	Linetype	Lineweight	Description
A-Roof-Otln	1	Hidden	Default	Roof outline
A-Site-Prop	5	Phantom	Default	Property line

3. Set the **PSLTSCALE** system variable to **1** so paper space linetype scaling is turned on.
4. Set the **LTSCALE** system variable to **1** to so that global linetype scaling is turned off.
5. Switch to the **ANSI D Title Block** layout.
6. Maximize the viewport using the **Maximize Viewport** button on the status bar so you can work in model space through the viewport.
7. Set the **A-Roof-Otln** layer current in the **Layer** list box.
8. Create the roof outline as shown in Figure 14-46. **Do not** draw dimensions.
9. Set the **A-Site-Prop** layer current in the **Layer** list box.
10. Create the property line as shown in Figure 14-46. **Do not** draw dimensions.

11 Switch to the **ANSI B Title Block** layout.

12 The roof outline and property line should also appear scaled correctly in the 1/8″ = 1′-0″ viewport.

13 Save the drawing.

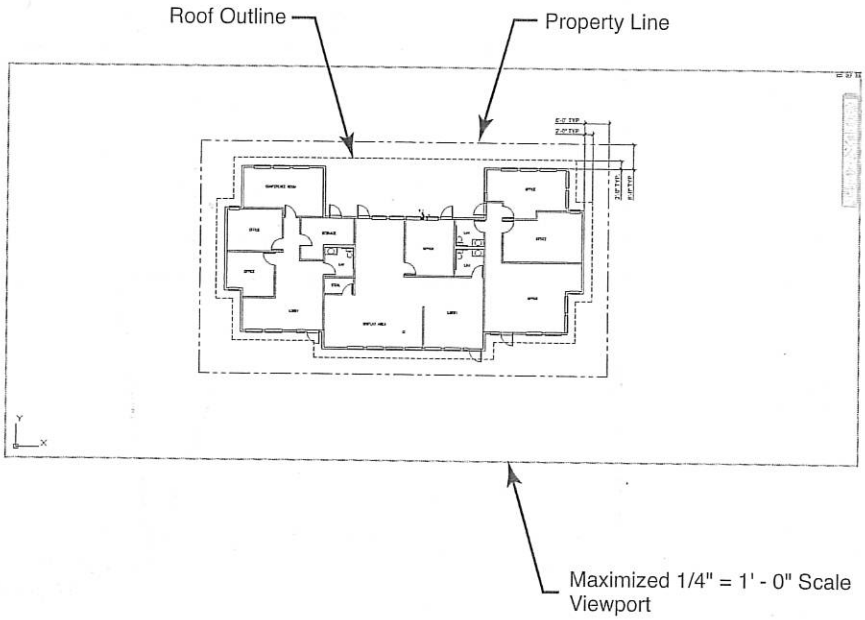


Figure 14-46
Using paper space linetype scaling

A Project 14-5: *Residential Architectural Plan, continued from Chapter 13* [ADVANCED]

1. Open drawing ***P13-5*** from Chapter 13.
2. Select **From template...** from the **Layout** right-click menu to import a layout.
3. Import the **Architectural D-Size** layout and border from the **Architectural D-Size.dwt** template file created in Project 14-3.
4. Select the **Architectural D-Size** layout to make it current.
5. Set the viewport scale to **1/4" = 1'-0"** and center the view as shown in Figure 14-51.
6. Lock the viewport display so the view scale doesn't change.
7. Delete the **Layout1** and **Layout2** layouts.
8. Save the drawing as ***P14-5.***

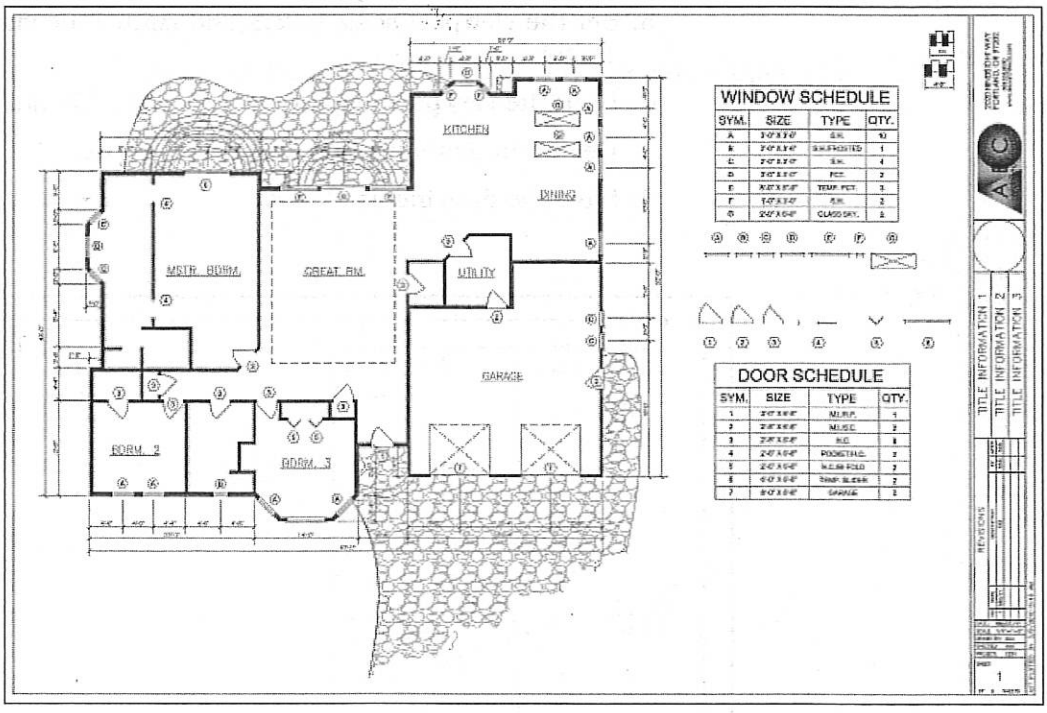


Figure 14-51