

# Chapter 29

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## Template Drawings

### Learning Objectives

**After completing this chapter you will be able to:**

- Create template drawings.
- Load template drawings using dialog boxes and the command line.
- Do an initial drawing setup.
- Customize drawings with layers and dimensioning specifications.
- Customize drawings with layouts, viewports and paper space.

## CREATING TEMPLATE DRAWINGS

One way to customize AutoCAD is to create template drawings that contain initial drawing setup information and if desired, visible objects and text. When the user starts a new drawing, the settings associated with the template drawing are automatically loaded. If you start a new drawing from scratch, AutoCAD loads default setup values. For example, the default limits are (0.0,0.0), (12.0,9.0) and the default layer is 0 with white color and continuous linetype. Generally, these default parameters need to be reset before generating a drawing on the computer using AutoCAD. A considerable amount of time is required to set up the layers, colors, linetypes, lineweights, limits, snaps, units, text height, dimensioning variables, and other parameters. Sometimes, border lines and a title block may also be needed.

In production drawings, most of the drawing setup values remain the same. For example, the company title block, border, layers, linetypes, dimension variables, text height, LTSCALE, and other drawing setup values do not change. You will save considerable time if you save these values and reload them when starting a new drawing. You can do this by creating template drawings that contain the initial drawing setup information configured according to the company specifications. They can also contain a border, title block, tolerance table, block definitions, floating viewports in the paper space, and perhaps some notes and instructions that are common to all drawings.

## THE STANDARD TEMPLATE DRAWINGS

AutoCAD software package comes with standard template drawings like Acad.dwt, Acadiso.dwt, Ansi a (portrait) -color dependent plot styles.dwt, Din a1 -named plot styles.dwt, and so on. The ansi, din, and iso template drawings are based on the drawing standards developed by ANSI (American National Standards Institute), DIN (German), and ISO (International Organization for Standardization). When you start a new drawing and you are using the **Startup** dialog box, the **Create New Drawing** dialog box is displayed on the screen. To load the template drawing, select the **Use a Template** button and the list of standard template drawings is displayed. From this list you can select any template drawing according to your requirements. If you want to start a drawing with default settings, select the **Start from Scratch** button in the **Create New Drawing** dialog box. The following are some of the system variables, with the default values that are assigned to a new drawing.

<u>System Variable Name</u>	<u>Default Value</u>
CHAMFERA	0.5000
CHAMFERB	0.5000
COLOR	Bylayer
DIMALT	Off
DIMALTD	2
DIMALTF	25.4
DIMPOST	None
DIMASO	On
DIMASZ	0.18
FILLETRAD	0.5000
GRID	0.5000

GRIDMODE	0
ISOPLANE	Left
LIMMIN	0.0000,0.0000
LIMMAX	12.0000,9.0000
LTSCALE	1.0
MIRRTEXT	1 (Text mirrored like other objects)
TILEMODE	1 (On)

Example 1

Create a template drawing using **Advanced Setup** wizard of the **Create Drawings** tab with the following specifications and save it with the name *proto1.dwt*.

Units	Engineering with precision 0'-0.00"
Angle	Decimal degrees with precision 0.
Angle Direction	Counterclockwise
Area	144'x96'

Step 1

Select the option to show the **Startup** dialog box in the **System** tab of the **Options** dialog box. Choose **New** from the **File** menu to display the **Create New Drawing** dialog box. Choose the **Use a Wizard** button and select the **Advanced Setup** option as shown in Figure 29-1. Choose **OK**. The **Units** page of the **Advanced Setup** dialog box is displayed.

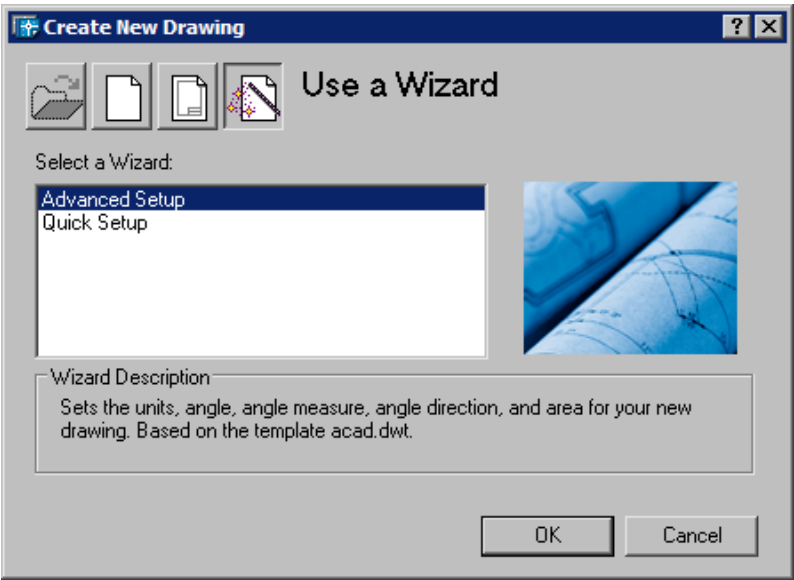
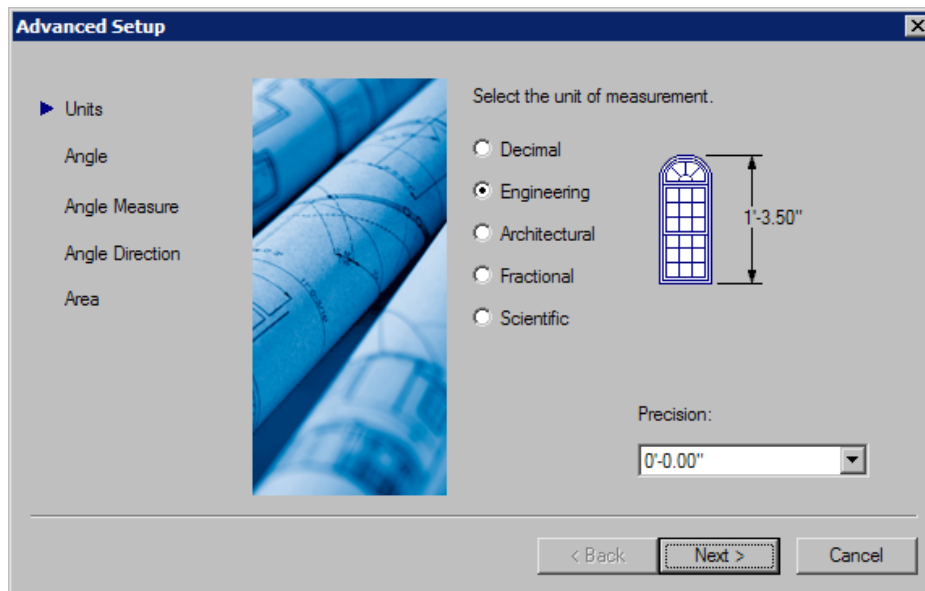


Figure 29-1 *Advanced Setup* wizard option of the *Create New Drawing* dialog box

**Step 2**

Select the **Engineering** radio button. Select **0'-0.00"** precision from the **Precision** drop-down list as shown in Figure 29-2 and then choose the **Next** button. The **Angle** page of the **Advanced Setup** dialog box is displayed.



*Figure 29-2 Units page of the Advanced Setup dialog box*

**Step 3**

In the **Angle** page, select the **Decimal Degrees** radio button and select **0** from the **Precision** drop-down list as shown in Figure 29-3. Choose the **Next** button. The **Angle Measure** page of the **Advanced Setup** dialog box is displayed.

**Step 4**

In the **Angle Measure** page, select the **East** radio button. Choose the **Next** button to display the **Angle Direction** page.

**Step 5**

Select the **Counter-Clockwise** radio button and then choose the **Next** button. The **Area** page is displayed. Specify the area as 144' and 96' by entering the value of width and length as **144'** and **96'** in the **Width** and **Length** edit boxes and then choose the **Finish** button. Use the **All** option of the **ZOOM** command to display the new limits on the screen. Save the template drawing as *proto1.dwt*.

**Note**

*If you want to customize only units and area, you can use the **Quick Setup** in the **Create New Drawing** dialog box.*

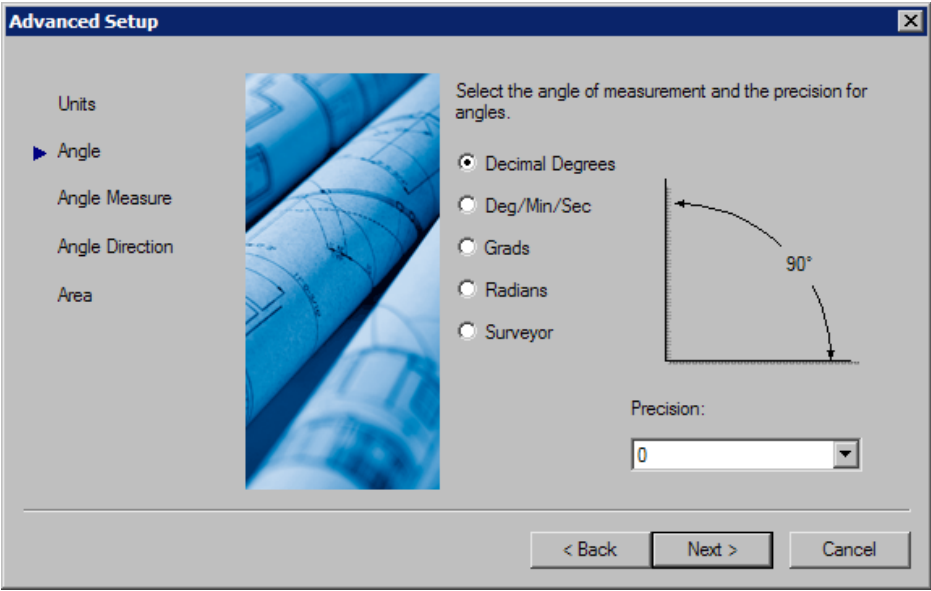


Figure 29-3 Angle page of the *Advanced Setup* dialog box

## Example 2

Create a template drawing with the following specifications. The template should be saved with the name *proto2.dwt*.

Limits	18.0,12.0
Snap	0.25
Grid	0.50
Text height	0.125
Units	3 digits to the right of decimal point
	Decimal degrees
	2 digits to the right of decimal point
	0 angle along positive X axis (east)
	Angle positive if measured counterclockwise

### Step 1

#### Starting a new drawing

Start AutoCAD and choose **Start from Scratch** in the **Create New Drawing** dialog box. From the **Default Settings** area, select the **Imperial (feet and inches)** radio button as shown in Figure 29-4. Choose **OK** to open a new file.

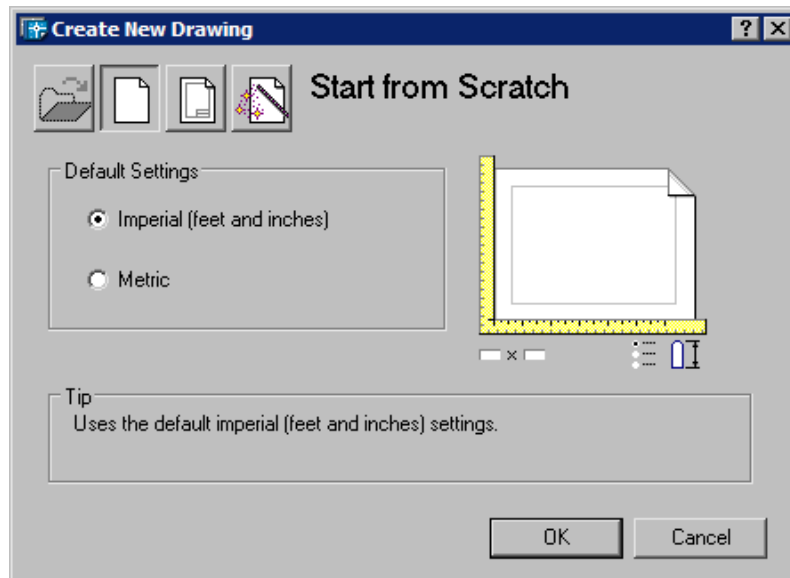


Figure 29-4 Start from Scratch option of the Create New File dialog box

## Step 2

### Setting limits, snap, grid, and text size

The **LIMITS** command can be invoked by choosing **Drawing Limits** from the **Format** menu or by entering **LIMITS** at the Command prompt.

Command: **LIMITS**

Specify lower left corner or [ON/OFF] <0.00,0.00>: **0,0**

Specify upper right corner <12.0,9.0>: **18.0,12.0**

After setting the limits, the next step is to increase the drawing display area. Use the **ZOOM** command with the **All** option to display the new limits on the screen.

Now, right-click on the **Snap** or **Grid** button in the status bar to display the shortcut menu. Choose the **Settings** in the shortcut menu to display the **Drafting Settings** dialog box. You can also choose the **Object Snap Settings** button from the **Object Snap** toolbar to display the **Drafting Settings** dialog box. Choose the **SNAP** and **GRID** tab. Enter **0.25** and **0.25** in the **Snap X spacing** and **Snap Y spacing** edit boxes respectively. Enter **0.5** and **0.5** in the **Grid X spacing** and **Grid Y spacing** edit boxes respectively. Then choose **OK**.



### Note

You can also use **SNAP** and **GRID** commands to set these values.

Size of the text can be changed by entering **TEXTSIZE** at the Command prompt.

Command: **TEXTSIZE**

Enter new value for TEXTSIZE <0.2000>: **0.125**

**Step 3****Setting units**

Choose **Format > Units** from the menu bar or enter **UNITS** at the Command prompt to invoke the **Drawing Units** dialog box shown in Figure 29-5. In the **Length** area, select **0.000** from the **Precision** drop-down list. In the **Angle** area, select **Decimal Degrees** from the **Type** drop-down list and **0.00** from the **Precision** drop-down list. Also make sure the **Clockwise** radio button from the **Angle** area is not selected.

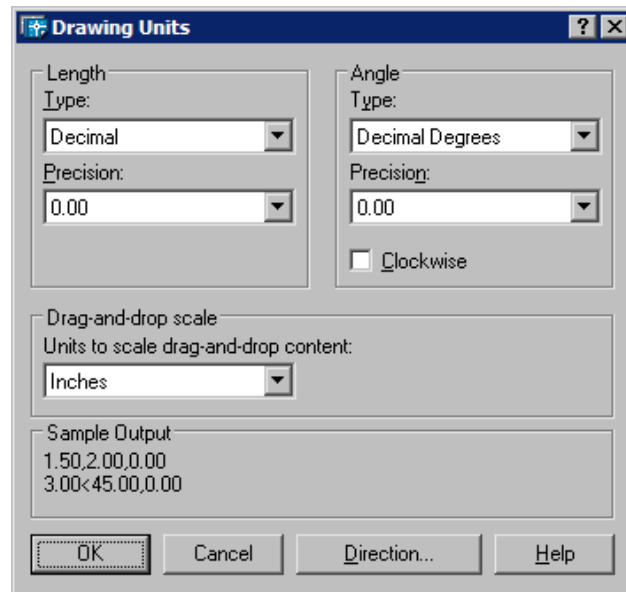


Figure 29-5 Drawing Units dialog box

Choose the **Direction** button to display the **Direction Control** dialog box (Figure 29-6) and select the **East** radio button. Exit both the dialog boxes

**Step 4**

Now, save the drawing as *proto2.dwt* using the **SAVE** command. You must select **AutoCAD Drawing Template (\*.dwt)** from the **Files of type** drop-down list in the dialog box. This drawing is now saved as *proto2.dwt* on the default drive. You can also save this drawing on a diskette in drives A or B using the **Save Drawing As** dialog box.

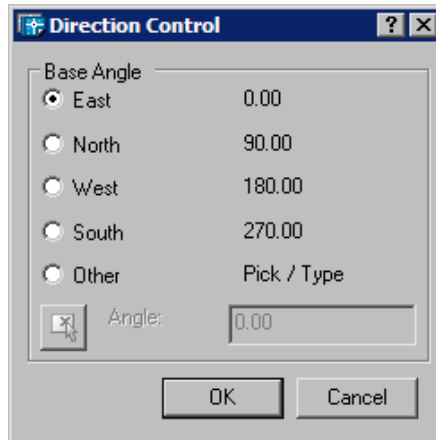


Figure 29-6 *Direction Control* dialog

## LOADING A TEMPLATE DRAWING

You can use the template drawing to start a new drawing. To use the preset values of the template drawing, start AutoCAD or select the **QNew** button from the **Standard** toolbar. The dialog box that appears will depend on whether you have selected the option to show **Startup** dialog box or not from the **Options** dialog box. If you have selected this option, the **Create New Drawing** dialog box appears. Choose the **Use a Template** option. All the templates that are saved in the default **Template** directory will be shown in the **Select a Template** list box, see Figure 29-7. If you have saved the template in any other file, choose the **Browse** button. The **Select a template file** dialog box is displayed. You can use this dialog box to browse the directory in which the template file is saved.

If you have selected the option of not showing the **Startup** dialog box, the **Select template** dialog box appears when you choose the **QNew** button. This dialog box also displays the default **Template** folder and all the template files saved in it, see Figure 29-8. You can use this dialog box to select the template file you want to open.

Using any of the previously mentioned dialog boxes, select *proto1.dwt* template drawing. AutoCAD will start a new drawing that will have the same setup as that of template drawing *proto1.dwt*.

You can have several template drawings, each with a different setup. For example, **PROTOB** for a 18" by 12" drawing, **PROTOC** for a 24" by 18" drawing. Each template drawing can be created according to user-defined specifications. You can then load any of these template drawings as discussed previously.



### Note

You can also use the command line to load a template drawing. Set the value of the **FILEDIA** system variable to **0** and then enter **QNEW** at the command line. You will be prompted to enter the name of the template file at the command line.



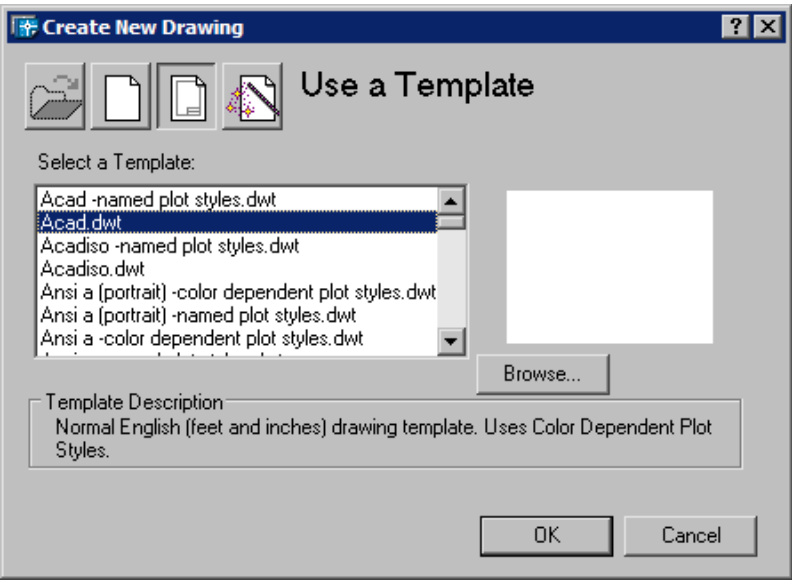


Figure 29-7 Templates available in the default **Templates** directory

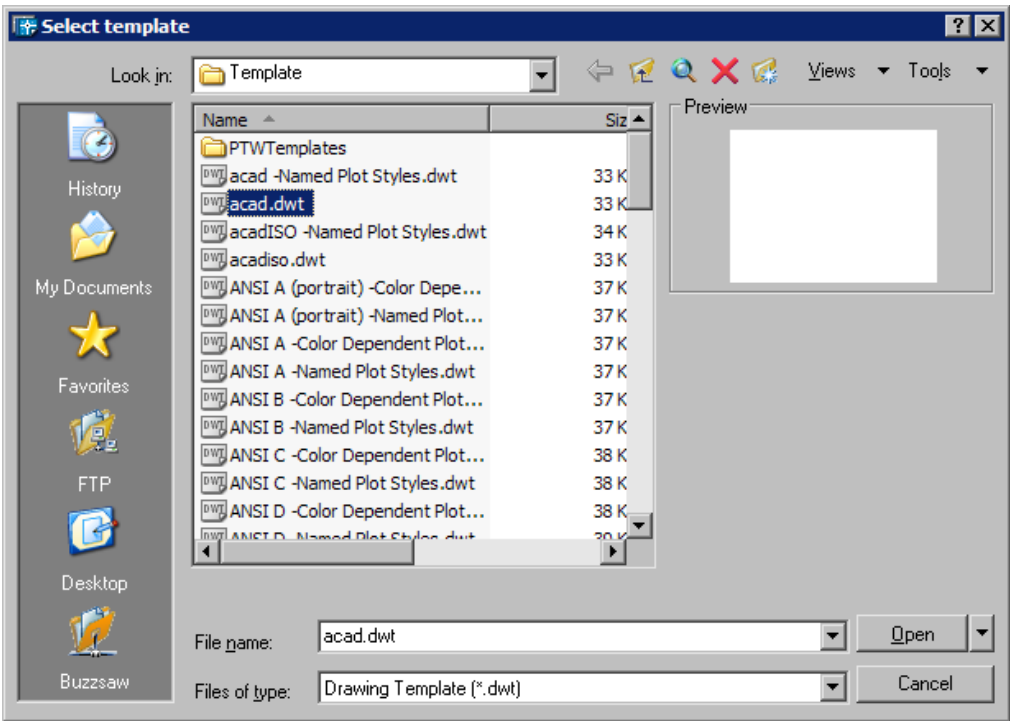


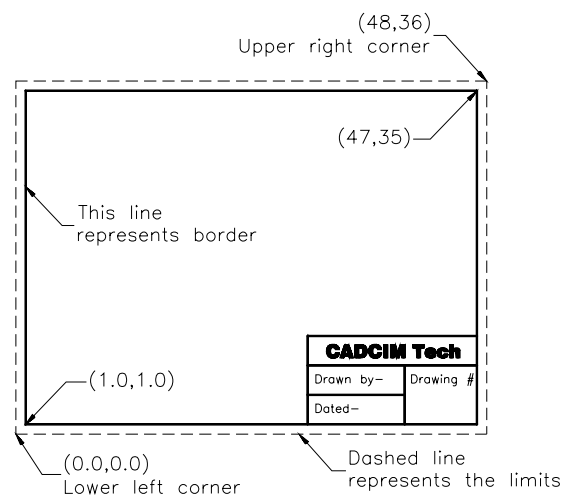
Figure 29-8 *Select template* dialog box that appears if the option to show the **Startup** dialog box is not selected

## CUSTOMIZING DRAWINGS WITH LAYERS AND DIMENSIONING SPECIFICATIONS

Most production drawings need multiple layers for different groups of objects. In addition to layers, it is a good practice to assign different colors to different layers to control the line width at the time of plotting. You can generate a template drawing that contains the desired number of layers with linetypes and colors according to your company specifications. You can then use this template drawing to make a new drawing. The next example illustrates the procedure used for customizing a drawing with layers, linetypes, and colors.

### Example 3

Create a template drawing *proto3.dwt* that has a border and the company's title block, as shown in Figure 29-9.



**Figure 29-9** Template drawing for Example 3

This template drawing will have the following initial drawing setup.

Limits	48.0,36.0
Text height	0.25
Border line lineweight	0.012"
Ltscale	4.0

#### DIMENSIONS

Overall dimension scale factor 4.0  
 Dimension text above the extension line  
 Dimension text aligned with dimension line

# **LAYERS**

<u>Layer Names</u>	<u>Line Type</u>	<u>Color</u>
0	Continuous	White
OBJ	Continuous	Red
CEN	Center	Yellow
HID	Hidden	Blue
DIM	Continuous	Green
BOR	Continuous	Magenta

## **Step 1**

### **Setting limits, text size, polyline width, polyline and linetype scaling**

Start a new drawing with default parameters by selecting the **Start from Scratch** option in the **Create New Drawings** dialog box. In the new drawing file, use the AutoCAD commands to set up the values as given for this example. Also, draw a border and a title block as shown in Figure 29-9. In this figure, the hidden lines indicate the drawing limits. The border lines are 1.0 units inside the drawing limits. For the border lines, increase the lineweight to a value of 0.012".

Use the following procedure to produce the prototype drawing for Example 3.

1. Invoke the **LIMITS** command by choosing **Drawing Limits** from the **Format** menu or by entering **LIMITS** at the Command prompt. The following is the prompt sequence

Command: **LIMITS**

Specify lower left corner or [ON/OFF] <0.00,0.00>: **0,0**

Specify upper right corner <12.0,9.0>: **48.0,36.0**

2. Increase the drawing display area by invoking the **All** option of the **ZOOM** command
3. Enter **TEXTSIZE** at the Command prompt to change the text size.

Command: **TEXTSIZE**

Enter new value for TEXTSIZE <0.2000>: **0.25**

4. Next, you will draw the border using the **RECTANG** command. The prompt sequence to draw the rectangle is:

Command: **RECTANG**

Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]: **1.0,1.0**

Specify other corner point or [Dimensions]: **47.0,35.0**

5. Now, select the rectangle and select **0.012"** from the **Lineweight Control** drop-down list in the **Properties** toolbar. Make sure the **Show/Hide Lineweight** button is chosen in the status bar.

6. Enter **LTSCALE** at the Command prompt to change the linetype scale.

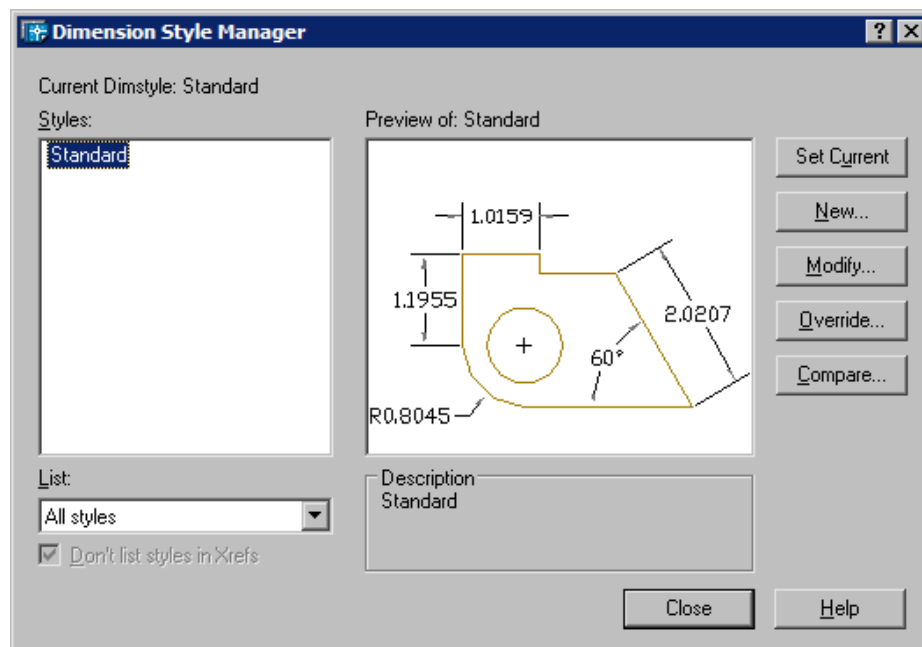
Command: **LTSCALE**

Enter new linetype scale factor<Current>: **4.0**

## Step 2

### Setting dimensioning parameters

You can use the **Dimension Style Manager** dialog box to set the dimension variables. Choose the **Dimension Style** button from the **Dimension** toolbar or choose **Style** from the **Dimension** menu to invoke the **Dimension Style Manager** dialog box as shown in Figure 29-10.



*Figure 29-10 Dimension Style Manager dialog box*

You can also invoke this dialog box by entering **DIMSTYLE** at the Command prompt. Choose the **New** button from the **Dimension Style Manager** dialog box. The **Create New Dimension Style** dialog box is displayed. Specify new style name as **MYDIM1** in the **New Style Name** edit box as shown in the Figure 29-11 and then choose the **Continue** button. The **New Dimension Style:MYDIM1** dialog box is displayed.

### Overall dimension scale factor

To specify dimension scale factor, choose the **Fit** tab of the **New Dimension Style:MYDIM1** dialog box. Set the value in the **Use overall scale of** as **4** in the **Scale for Dimension Features** area (Figure 29-12).

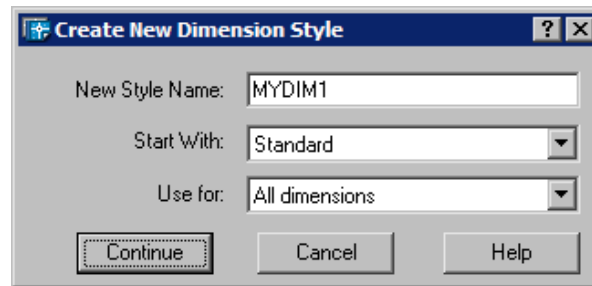


Figure 29-11 Create New Dimension Style dialog box

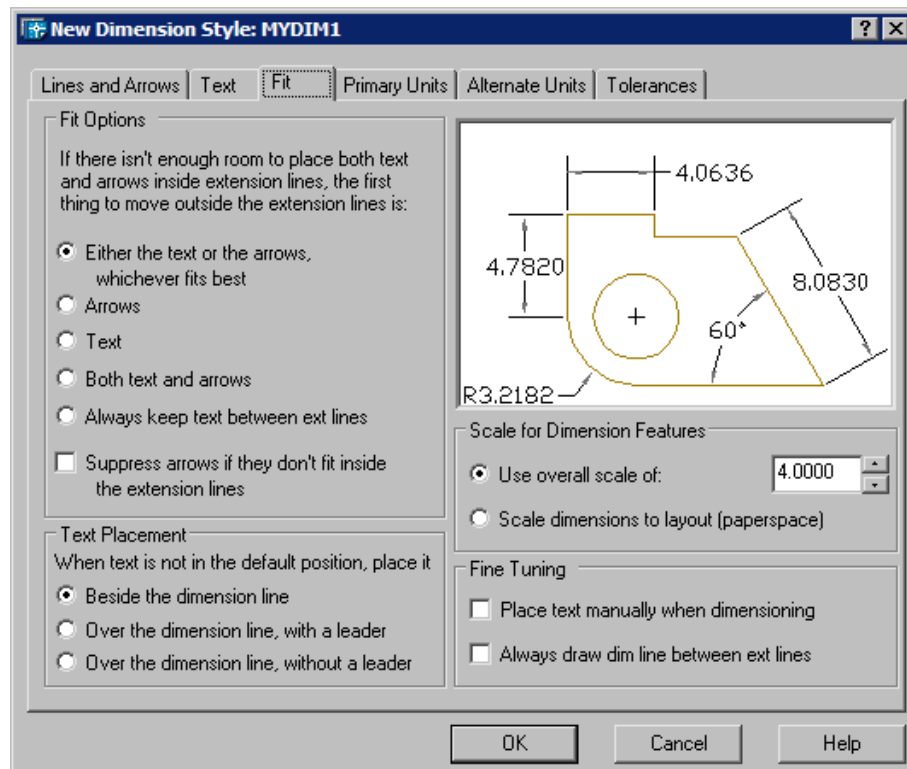


Figure 29-12 Fit tab of the New Dimension Style:MYDIM1 dialog box

#### Dimension text over the dimension line

Choose the **Text** tab of the **New Dimension Style:MYDIM1** dialog box. Select the **Over the dimension line, with a leader** radio button from the **Text Placement** area.

#### Dimension text aligned with the dimension line

In the **Text Alignment** area of the **Text** tab, select the **Aligned with the dimension line** radio button and then choose **OK** to exit the **New Dimension Style:MYDIM1** dialog box.

### Setting the new dimension style current

A new dimension style with the name **MYDIM1** is shown in the **Styles** area of the **Dimension Style Manager** dialog box. Select this dimension style and then choose the **Set Current** button to make it the current dimension style. Choose the **Close** button to exit this dialog box.

### Step 3

#### Setting layers

Choose the **Layer Properties Manager** button from the **Layers** toolbar or choose **Layer** from the **Format** menu to invoke **Layer Properties Manager** dialog box as shown in Figure 29-13.

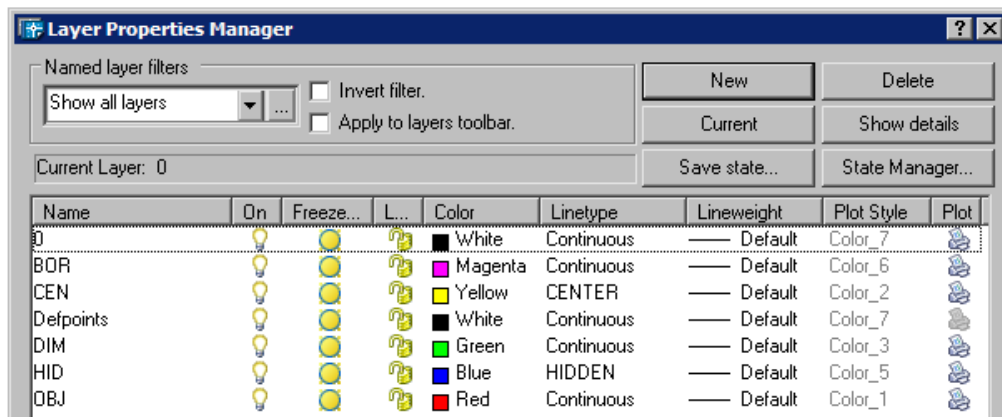


Figure 29-13 Partial display of the **Layer Properties Manager** dialog box

You can also invoke the **Layer Properties Manager** dialog box by entering **LAYER** at the Command prompt. Choose the **New** button in the **Layer Properties Manager** dialog box and rename **Layer1** as **OBJ**. Choose the color swatch of the **OBJ** layer to display the **Select Color** dialog box. Select the **Red** color and choose **OK**; the red color is assigned to the **OBJ** layer. Again choose the **New** button in the **Layer Properties Manager** dialog box and rename the **Layer1** as **CEN**. Choose the linetype swatch to display the **Select Linetype** dialog box.

If the different linetypes are not already loaded, choose the **Load** button to display the **Load or Reload Linetypes** dialog box. Select the **CENTER** linetype from the **Available Linetypes** area and choose **OK**. The **Select Linetype** dialog box will reappear. Select the **CENTER** linetype from the **Loaded linetypes** area and choose **OK**. Choose the color swatch to display the **Select Color** dialog box. Select the **Yellow** color and choose **OK**; the color yellow and linetype center is assigned to the layer **CEN**. Similarly different linetypes and different colors can be set for different layers mentioned in the example.

You can also use the **-LAYER** command to set the layers and linetypes from the Command prompt.

**Step 4**

**Adding title block**

Next, add the title block and the text as shown in Figure 29-8. After completing the drawing, save it as *proto3.dwt*. You have created a template drawing (PROTO3) that contains all the information given in Example 3.

**CUSTOMIZING A DRAWING WITH LAYOUT**

The Layout (paper space) provides a convenient way to plot multiple views of a three-dimensional (3D) drawing or multiple views of a regular two-dimensional (2D) drawing. It takes quite some time to set up the viewports in model space with different vpoints and scale factors. You can create prototype drawings that contain predefined viewport settings, with vpoint and other desired information. If you create a new drawing or insert a drawing, the views are automatically generated. The following example illustrates the procedure for generating a prototype drawing with paper space and model space viewports.

**Example 4**

Create a template drawing as shown in Figure 29-14 with four views in Layout3 (Paper space) that display front, top, side, and 3D views of the object. The plot size is 10.5 by 8 inches. The plot scale is 0.5 or 1/2" = 1". The paper space viewports should have the following vpoint setting.

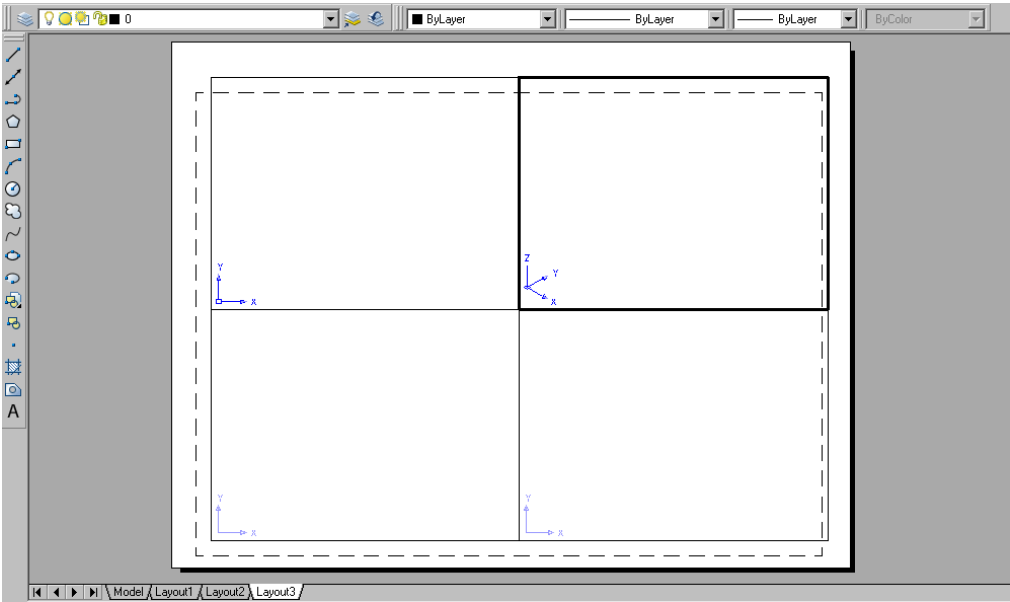


Figure 29-14 Paper space with four viewports

<u>Viewports</u>	<u>Vpoint</u>	<u>View</u>
Top right	1,-1,1	3D view

Top left	0,0,1	Top view
Lower right	1,0,0	Right side view
Lower left	0,-1,0	Front view

Start AutoCAD and create a new drawing. Use the following commands and options to set up various parameters.

### Step 1

The first step is to create a new layout using the **LAYOUT** command. You can also right-click on **Model** or any **Layout** tab to display the shortcut menu. From the shortcut menu, choose **New layout**.

Command: **LAYOUT**

Enter layout option [Copy/Delete/New/Template/Rename/SAveas/Set/?] <set>: **N**

Enter new Layout name <Layout3>: **Layout3**

### Step 2

Next, select the new layout (Layout 3) tab, the **Page Setup - Layout3** dialog box is displayed. The **Plot Device** tab is chosen by default. Select the printer or plotter that you want to use. In this example HP LaserJet4000 is used.

### Step 3

Choose the **Layout Settings** tab and select the paper size that is supported by the selected plotting device. In this example the paper size is 8.5x11. Choose the **OK** button to accept the settings and exit the dialog box. The new layout (Layout3) is displayed on the screen with default viewport. Use the **ERASE** command to erase this viewport.

### Step 4

Next, you need to set up a layer with the name VIEW for viewports and assign it green color. Invoke the **Layer Properties Manager** dialog box. Choose the **New** button and name the **Layer1** as **VIEW**. Choose the color swatch of the **VIEW** layer to display the **Select Color** dialog box. Select the color **Green** and choose the **OK** button. This color will be assigned to **View** layer. Also, make the **VIEW** layer current and then choose the **OK** button to exit.

### Step 5

To create four viewports, use the **MVIEW** command. In order to invoke the **MVIEW** command choose **Viewports > 4Viewport** from the **View** menu or directly enter **MVIEW** command at the Command prompt. Then switch to model space to zoom the display to half the size.

Command: **MVIEW**

Specify corner of viewport or

[ON/OFF/Fit/Hideplot/Lock/Object/Polygonal/Restore/2/3/4] <Fit>: **4**

Specify first corner or [Fit] <Fit>: **0.25,0.25**

Specify opposite corner: **10.25,7.75**



Choose the **Paper** button in the status bar to activate the model space or enter **MSPACE** at the Command prompt.

Command: **MSPACE** (or **MS**)

Make the first viewport active by selecting a point in the viewport and then use the **ZOOM** command to specify the paper space scale factor to 0.5. The **ZOOM** command can be invoked by choosing **Zoom > Scale** from the **View** menu or by entering **ZOOM** at the Command prompt.

Command: **ZOOM**

Specify corner of window, enter a scale factor (nX or nXP), or

[All/Center/Dynamic/Extents/Previous/Scale/Window] <real time>: **0.5XP**

Now, make the next viewport active and specify the scale factor. Do the same for the remaining viewports.

#### Step 6

The next step is to change the viewpoints of different paper space viewports using the **VPOINT** command. To invoke this command, choose **3D Views > VPOINT** from the **View** menu or enter **VPOINT** at the Command prompt. The vpoint values for different viewports are shown in Example 5. To set the view point for the lower-left viewport the Command prompt sequence is as follows.

Command: **VPOINT**

Current view direction: VIEWDIR=0.0000,0.0000,1.0000

Specify a view point or [Rotate] <display compass and tripod>: **0,-1,0**

Similarly use the **VPOINT** command to set the vpoint of other viewports.

#### Step 7

Use the **Model** button in the status bar to change to paper space and then set a new layer **PBORDER** with yellow color. Make the **PBORDER** layer current, draw a border, and if needed a title block using the **PLINE** command. You can also change to paper space by entering **PSPACE** at the Command prompt.

The **PLINE** command can be invoked by choosing the **Polyline** button from the **Draw** toolbar or by choosing **Polyline** from the **Draw** menu. The **PLINE** command can also be invoked by entering **PLINE** at the Command prompt.

Command: **PLINE**

Specify start point: **0,0**

Current line-width is 0.0000

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **0,8.0**

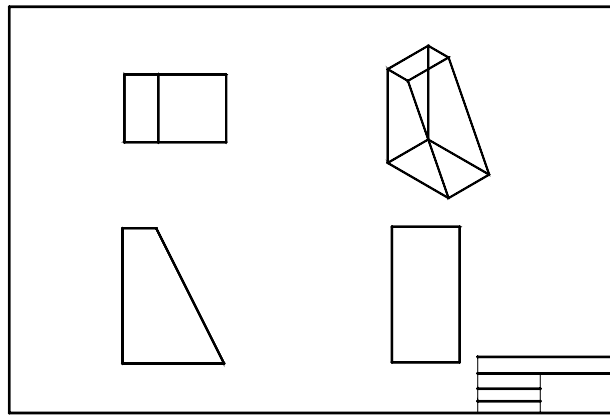
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **10.5,8.0**

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **10.5,0**

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **C**

### Step 8

The last step is to select the **Model** tab (or change the **TILEMODE** to 1) and save the prototype drawing. To test the layout that you just created, make the 3D drawing as shown in Figure 29-18 or make any 3D object. Switch to **Layout 3** tab, you will find four different views of the object (Figure 29-15). If the object views do not appear in the viewports, use the **PAN** commands to position the views in the viewports. You can freeze the **VIEW** layer so that the viewports do not appear on the drawing. You can plot this drawing from the **Layout3** with a plot scale factor of 1:1 and the size of the plot will be exactly as specified.



*Figure 29-15 Four views of a 3D object in paper space*

## CUSTOMIZING DRAWINGS WITH VIEWPORTS

In certain applications you may need multiple model space viewport configurations to display different views of an object. This involves setting up the desired viewports and then changing the viewpoint for different viewports. You can create a prototype drawing that contains a required number of viewports and the viewpoint information. If you insert a 3D object in one of the viewports of the prototype drawing, you will automatically get different views of the object without setting viewports or viewpoints. The following example illustrates the procedure for creating a prototype drawing with a standard number (four) of viewports and viewpoints.

### Example 5

Create a prototype drawing with four viewports, as shown in Figure 29-16.

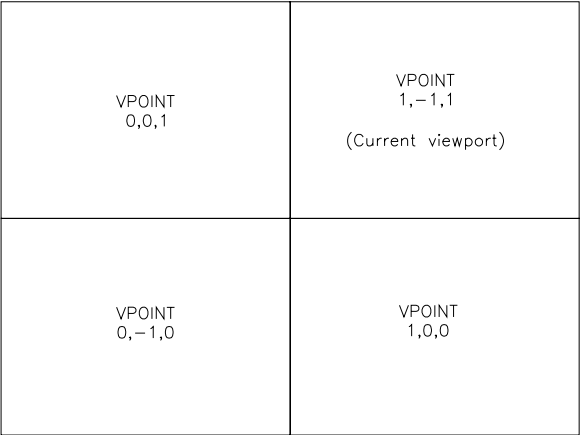


Figure 29-16 Viewports with different viewpoints

The viewports should have the following viewpoints.

<u>Viewports</u>	<u>Vpoint</u>	<u>View</u>
Top right	1,-1,1	3D view
Top left	0,0,1	Top view
Lower right	1,0,0	Right side view
Lower left	0,-1,0	Front view

Step 1

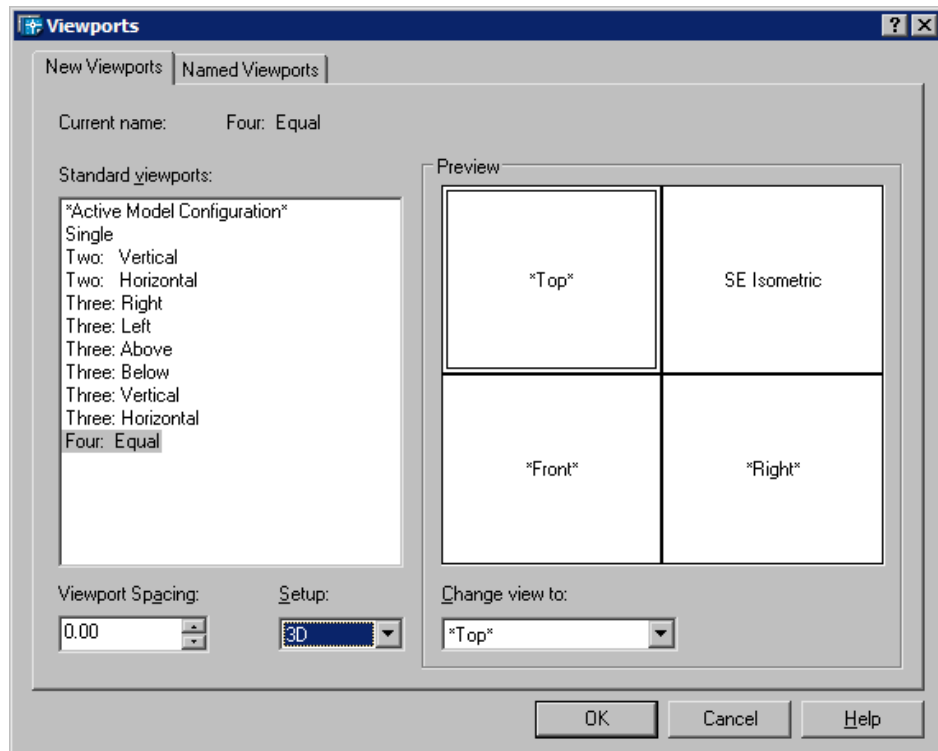
Start AutoCAD and create a new drawing from scratch.

Step 2

Setting viewports

Viewports and corresponding viewpoints can be set with the **VPORTS** command. You can also choose the **Display Viewports Dialog** button from the **Viewports** toolbar or choose **Viewports > New Viewports** from the **View** menu to display the **Viewports** dialog box as shown in Figure 29-17. Select **Four:Equal** from the **Standard Viewports** area. In the **Preview** area four equal viewports are displayed. Select **3D** from the **Setup** drop-down list. The four viewports with the different viewpoints will be displayed in the **Preview** area as Top, Front, Right and SE Isometric respectively. **Top** represents the viewpoints as (0,0,1), **Front** represents the viewpoints as (0,-1,0), **Right** represents the viewpoints as (1,0,0) and **SE Isometric** represents the viewpoints as (1,-1,1) respectively. Choose the **OK** button. Save the drawing as *proto5.dwt*.

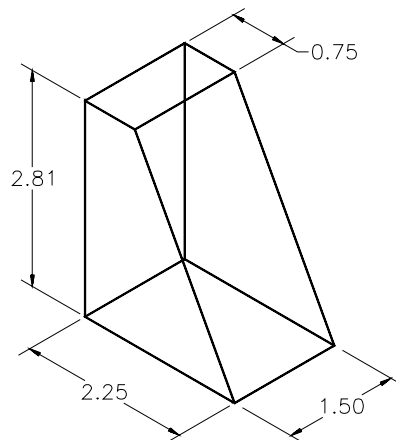
Viewports and viewpoints can also be set by entering **-VPORTS** and **VPOINT** at the Command prompt respectively.



*Figure 29-17 Viewports dialog box*

### Step 3

Start a new drawing and draw the 3D tapered block as shown in Figure 29-18.



*Figure 29-18 3D tapered block*

#### Step 4

Again start a new drawing, TEST, using the prototype drawing *proto5.dwt*. Make the top right viewport current and insert or create a drawing shown in Figure 29-18. Four different views will be automatically displayed on the screen as shown in Figure 29-19.

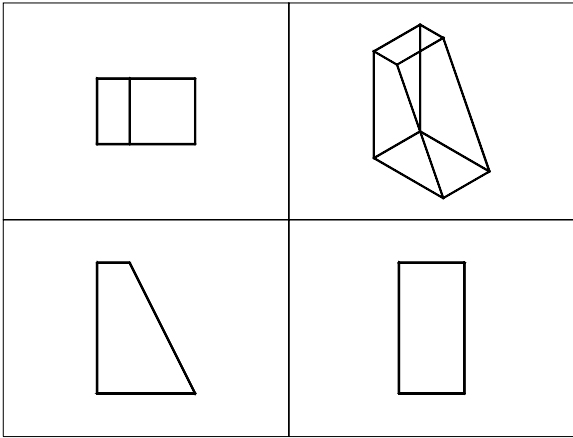


Figure 29-19 Different views of 3D tapered block

## CUSTOMIZING DRAWINGS ACCORDING TO PLOT SIZE AND DRAWING SCALE

For controlling the plot area, it is recommended to use layouts. You can make the drawing of any size, use the layout to specify the sheet size, and then draw the border and title block. However you can also plot a drawing in the model space and set up the system variables so that the plotted drawing is to your specifications. You can generate a template drawing according to plot size and scale. For example, if the scale is  $1/16" = 1'$  and the drawing is to be plotted on a 36" by 24" area, you can calculate drawing parameters like limits, **DIMSCALE**, and **LTSCALE** and save them in a template drawing. This will save considerable time in the initial drawing setup and provide uniformity in the drawings. The next example explains the procedure involved in customizing a drawing according to a certain plot size and scale.



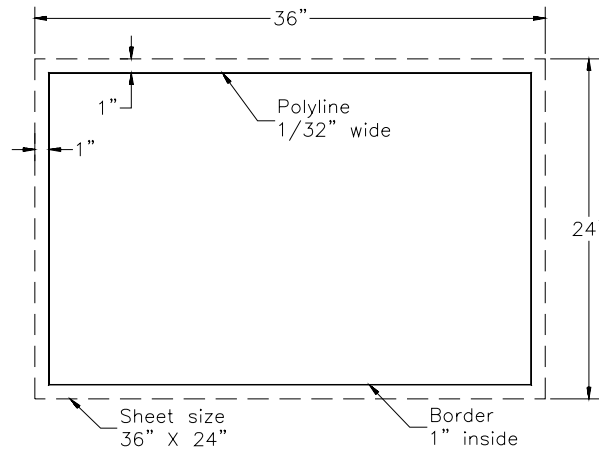
#### Note

You can also use the paper space to specify the paper size and scale.

### Example 6

Create a template drawing (**PROTO6**) with the following specifications.

Plotted sheet size	36" by 24" (Figure 29-20)
Scale	$1/8" = 1.0'$
Snap	3'



**Figure 29-20** Border of template drawing

Grid	6'
Text height	1/4" on plotted drawing
Linetype scale	Calculate
Dimscale factor	Calculate
Units	Architectural
	Precision, 16-denominator of smallest fraction
	Angle in degrees/minutes/seconds
	Precision, 0d00'
	Direction control, base angle, east
	Angle positive if measured counterclockwise
Border	Border should be 1" inside the edges of the plotted drawing sheet, using PLINE 1/32" wide when plotted (Figure 29-20)

### Step 1

#### Calculating limits, text height, linetype scale, dimension scale and polyline width

In this example, you need to calculate some values before you set the parameters. For example, the limits of the drawing depend on the plotted size of the drawing and the scale of the drawing. Similarly, **LTSCALE** and **DIMSCALE** depend on the plot scale of the drawing. The following calculations explain the procedure for finding the values of limits, ltsscale, dimscale, and text height.

#### Limits

Given:

Sheet size 36" x 24"

Scale 1/8" = 1'

or 1" = 8'

Calculate:

X Limit

Y Limit

Since sheet size is 36" x 24" and scale is 1/8" = 1'

Therefore, X Limit =  $36 \times 8' = 288'$

Y Limit =  $24 \times 8' = 192'$

### Text height

Given:

Text height when plotted = 1/4"

Scale 1/8" = 1'

Calculate:

Text height

Since scale is 1/8" = 1'

or 1/8" = 12"

or 1" = 96"

Therefore, scale factor = 96

Text height =  $1/4" \times 96$   
 $= 24" = 2'$

### Linetype scale and dimension scale

Known:

Since scale is 1/8" = 1'

or 1/8" = 12"

or 1" = 96"

Calculate:

LTSCALE and DIMSCALE

Since scale factor = 96

Therefore, LTSCALE = Scale factor = 96

Similarly, DIMSCALE = 96

(All dimension variables, like DIMTXT and DIMASZ, will be multiplied by 96.)

### Polyline Width

Given:

Scale is 1/8" = 1'

Calculate:

PLINE width

Since scale is 1/8" = 1'

or 1" = 8'

or 1" = 96"

Therefore,

PLINE width =  $1/32 \times 96$   
 $= 3"$

After calculating the parameters, use the following AutoCAD commands to set up the drawing and save the drawing as *proto6.dwt*.

## Step 2

### Setting units

Start a new drawing and choose **Units** from the **Format** menu or enter **UNITS** at the Command prompt to display the **Drawing Units** dialog box. Choose **Architectural** from the **Type** drop-down list in the **Length** area. Choose **0'-01/16"** from the **Precision** drop-down list. Make sure the **Clockwise** radio button in the **Angle** area is not checked. Select **Deg/Min/Sec** from the **Type** drop-down list and select **0d00** from the **Precision** drop-down list in the **Angle** area. Now choose the **Direction** button to display the **Directional Control** dialog box. Choose the **East** radio button if it is not selected in the **Base Angle** area and then choose **OK**.

## Step 3

### Setting limits, snap and grid, textsize, linetype scale, dimension scale, dimension style and pline

To set the **LIMITS**, select **Drawing Limits** from the **Format** menu or enter **LIMITS** at the Command prompt.

Command: **LIMITS**

Specify lower left corner or [ON/OFF] <0'-0",0'-0">: **0,0**

Specify upper right corner <1'-0",0'-9">: **288',192'**

Right-click on the **Snap** or **Grid** button in the status bar to invoke the shortcut menu. In the shortcut menu choose the **Settings** to display the **Drafting Settings** dialog box. You can also choose the **Object Snap Settings** button from the **Object Snap** toolbar to display the **Drafting Settings** dialog box. In the dialog box choose the **Snap and Grid** tab. Enter **3'** and **3'** in the **Snap X spacing** and **Snap Y spacing** edit boxes respectively. Enter **6'** and **6'** in the **Grid X spacing** and **Grid Y spacing** edit boxes respectively. Then choose **OK**.

You can also set these values by entering **SNAP** and **GRID** at the Command prompt.

The size of the text can be changed by entering **TEXTSIZE** at the Command prompt.

Command: **TEXTSIZE**

Enter new value for TEXTSIZE <current>: **2'**

To set the **LTSCALE**, choose the **Linetype** from the **Format** menu or enter **LINETYPE** at the Command prompt to invoke the **Linetype Manager** dialog box. Choose the **Show details** button. Specify the **Global scale factor** as **96** in the **Global scale factor** edit box.

You can also change the scale of the linetype by entering **LTSCALE** at the Command prompt.



To set the **DIMSTYLE**, choose the **Dimension Style** button from the **Dimension** toolbar or choose **Style** from the **Dimension** menu to invoke the **Dimension Style Manager** dialog box. Choose the **New** button from the **Dimension Style Manager** dialog box to invoke the **Create New Dimension Style** dialog box. Specify the new style name as **MYDIM2** in the **New Style Name** edit box and then choose the **Continue** button. The **New Dimension Style: MYDIM2** dialog box will be displayed. Choose the **Fit** tab and set the value in the **Use overall scale of** spinner to **96** in the **Scale for Dimension Features** area. Now choose the **OK** button to again display the **Dimension Style Manager** dialog box. Choose **Close** to exit the dialog box.

You can invoke **PLINE** command by choosing the **Polyline** button from the **Draw** toolbar or enter **PLINE** at the Command prompt.

Command: **PLINE**  
Specify start point: **8',8'**  
Current line-width is **0.0000**  
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **W**  
Specify starting width <0.00>: **3**  
Specify ending width <0'-3">: **ENTER**  
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **280',8'**  
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **280',184'**  
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **8',184'**  
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: **C**

Now save the drawing as *proto6.dwt*.

### Self- Evaluation Test

Answer the following questions and then compare your answers to the correct answers given at the end of this chapter.

1. The template drawings are stored in \_\_\_\_\_.
2. To use a template file, select the \_\_\_\_\_ option in the **Create Drawing** tab of \_\_\_\_\_ dialog box.
3. To start a drawing with default setup, select the \_\_\_\_\_ option in the **Create Drawing** tab of \_\_\_\_\_ dialog box.

4. If plot size is 36" x 24", and the scale is  $1/2" = 1'$ , then X Limit = \_\_\_\_\_ and Y Limit = \_\_\_\_\_.
5. You can use AutoCAD's \_\_\_\_\_ command to set up a viewport in paper space.

### Review Questions

Answer the following questions.

1. The default value of **DIMSCALE** is \_\_\_\_\_.
2. The default value for **DIMTXT** is \_\_\_\_\_.
3. The default value for **SNAP** is \_\_\_\_\_.
4. Architectural units can be selected by using the \_\_\_\_\_ command or the \_\_\_\_\_ command.
5. Name three standard template drawings that come with AutoCAD software \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
6. If the plot size is 24" x 18", and the scale is  $1" = 20'$ , the X Limit = \_\_\_\_\_ and Y Limit = \_\_\_\_\_.
7. If the plot size is 200 x 150 and limits are (0.00,0.00) and (600.00,450.00), the **LTSCALE** factor = \_\_\_\_\_.
8. \_\_\_\_\_ provides a convenient way to plot multiple views of a 3D drawing or multiple views of a regular 2D drawing.
9. You can use the \_\_\_\_\_ command to change to paper space.
10. You can use AutoCAD's \_\_\_\_\_ command to change to model space.
11. The values that can be assigned to **TILEMODE** are \_\_\_\_\_ and \_\_\_\_\_.
12. In the model space, if you want to reduce the display size by half, the scale factor you enter in the **ZOOM**-Scale command is \_\_\_\_\_.

**Exercises**

**Exercise 1**

General

Create a template drawing (*protoe1.dwt*) with the following specifications.

Units	Architectural with precision 0'-0 1/16
Angle	Decimal Degrees with precision 0.
Base angle	East.
Angle direction	Counterclockwise.
Limits	48' x 36'

**Exercise 2**

General

Create a template drawing (*protoe2.dwt*) with the following specifications.

Limits	36.0,24.0
Snap	0.5
Grid	1.0
Text height	0.25
Units	Decimal
	Precision 0.00
	Decimal degrees
	Precision 0
	Base angle, East
	Angle positive if measured counterclockwise

**Exercise 3**

General

Create a template drawing (*protoe3.dwt*) with the following specifications.

Limits	48.0,36.0
Text height	0.25
PLINE width	0.03
LTSCALE	4.0
DIMSCALE	4.0
Plot size	10.5 x 8

**LAYERS**

<u>Layer Names</u>	<u>Line Type</u>	<u>Color</u>
0	Continuous	White
OBJECT	Continuous	Green
CENTER	Center	Magenta
HIDDEN	Hidden	Blue
DIM	Continuous	Red
BORDER	Continuous	Cyan

**Exercise 4**

*General*

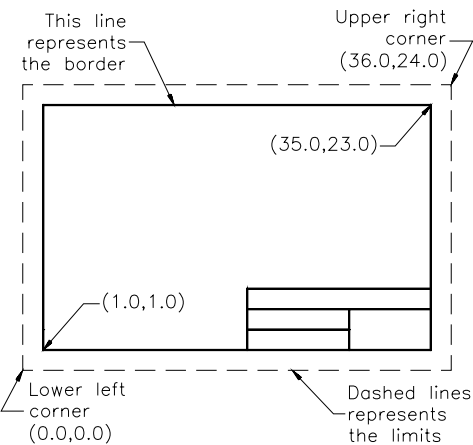
Create a prototype drawing with the following specifications (the name of the drawing is *protoe4.dwt*).

Limits	36.0,24.0
Border	35.0,23.0
Grid	1.0
Snap	0.5
Text height	0.15
Units	Decimal (up to 2 places)
LTSCALE	1
Current layer	Object

**LAYERS**

<u>Layer Name</u>	<u>Linetype</u>	<u>Color</u>
0	Continuous	White
Object	Continuous	Red
Hidden	Hidden	Yellow
Center	Center	Green
Dim	Continuous	Blue
Border	Continuous	Magenta
Notes	Continuous	White

This prototype drawing should have a border line and title block as shown in Figure 29-21.



**Figure 29-21** *Prototype drawing*

Exercise 5

General

Create a template drawing shown in Figure 29-22 with the following specifications and save it with the name *protoe5.dwt*.

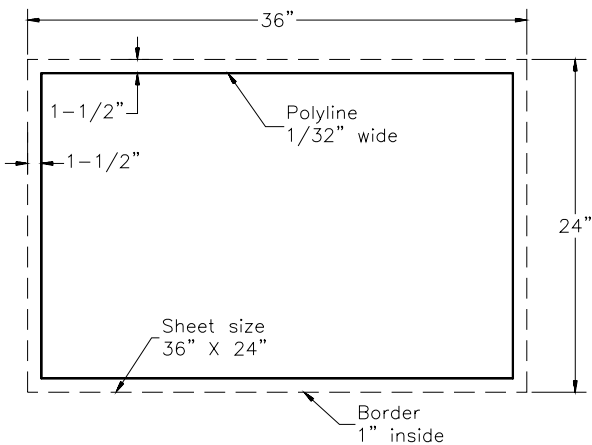


Figure 29-22 Drawing for Exercise 5

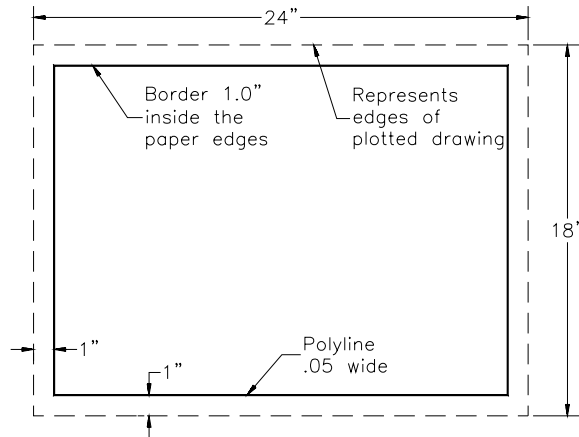
Plotted sheet size	36" x 24" (Figure 29-22)
Scale	1/2" = 1.0'
Text height	1/4" on plotted drawing
LTSCALE	24
DIMSCALE	24
Units	Architectural
	32-denominator of smallest fraction to display
	Angle in degrees/minutes/seconds
	Precision 0d00"00"
	Angle positive if measured counterclockwise
Border	Border is 1-1/2" inside the edges of the plotted drawing sheet, using PLINE 1/32" wide when plotted.

Exercise 6

General

Create a prototype drawing with the following specifications (the name of the drawing is *protoe6.dwt*).

Plotted sheet size	24" x 18" (Figure 29-23)
Scale	1/2"=1.0'
Border	The border is 1" inside the edges of the plotted drawing sheet, using PLINE 0.05" wide when plotted (Figure 29-23)



*Figure 29-23 Prototype drawing*

Dimension text over the dimension line  
Dimensions aligned with the dimension line  
Calculate overall dimension scale factor  
Enable the display of alternate units  
Dimensions to be associative.

#### **Answers to Self-Evaluation Test**

1 - .dwt, 2 - Use A Template, 3 - Start From Scratch, 4 - 72"x48", 5 - MVIEW.