Making an Architectural Drawing Template

In this chapter, you will cover the following to World Class standards:

- **Starting from Scratch for the Last time**
- **Creating New Layers in an AutoCAD Drawing**
- **Setting Your Object Snaps**
- **Modifying Text Styles**
- **Creating an Architectural Dimension Style**
- **Modifying the Drawing Units**
- **Setting the Drawing Limits**
- **Modifying the Linetype Scale**
- **Saving a Drawing Template**

In the first two units, the Rectangular and the Circular problem, you created layers, set Object Snaps, modified the Standard Dimension Style and made other system variable changes to make the drawing clear to read. In this chapter, you will again repeat all of these alterations, but now those settings will be saved as an architectural template, so in the future you won't have to change the settings every time you start a new drawing. An architectural template is not the only type of drawing model required by designers, engineers and architects. Metric, civil and electrical templates are also useful when creating all sorts of various types of prints. To create a template, you need to start the drawing from scratch.

Starting from Scratch for the Last Time

Pick the New Drawing tool on the Quick Access toolbar and the Select template window will appear. Click the down arrow to the right of the Open button, and Select Open with No Template, either Imperial (English) or Metric. Choose the Imperial (feet and inches) option since this will use the conventional measurement used in the United States (See Figure 8.1). The metric choice will not just align your system variable for the metric system, but the decimal numbers such as 1.500 will be displayed as 1,500 since the comma is used as a decimal point in the metric system. If you are building a mechanical or metric template outside the United States, then you would pick the metric radial button.
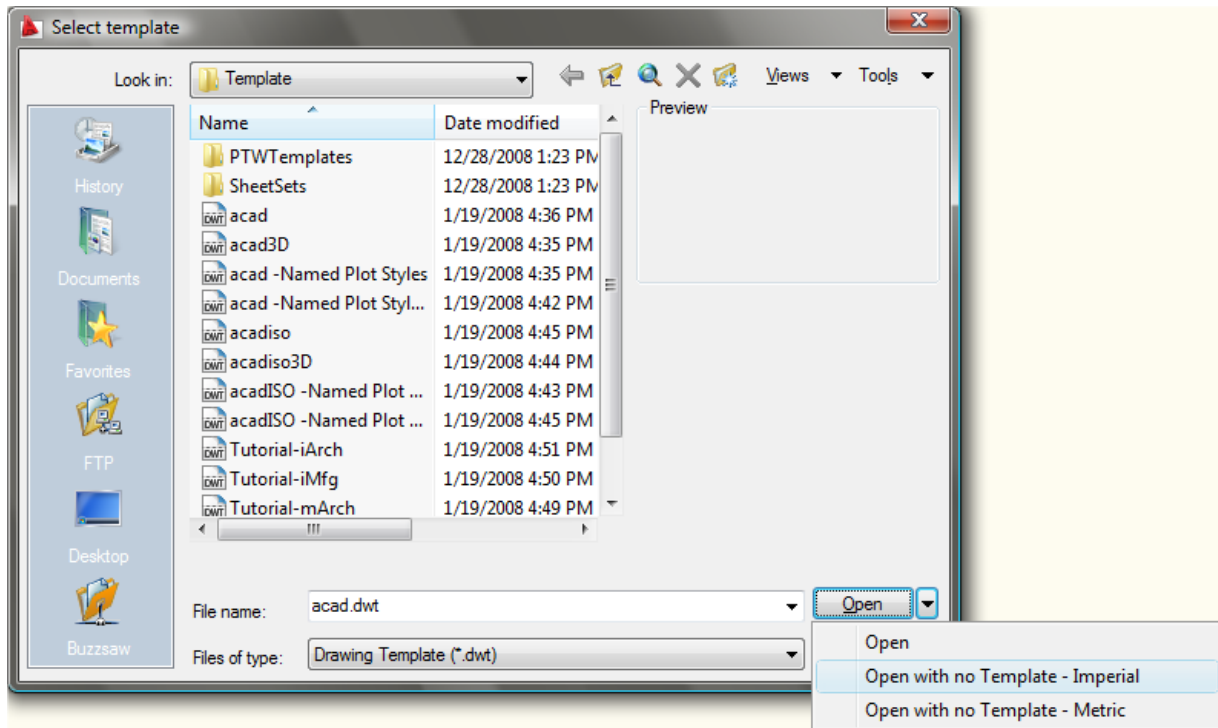

Figure 8.1 – Opening a new file with no template

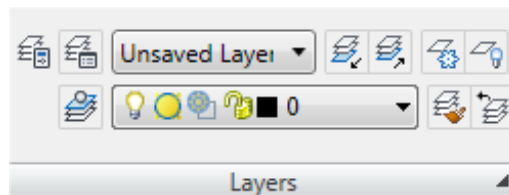# Creating New Layers in an AutoCAD Drawing

_____

Figure 8.2 - The Layers Panel

When expanding the orthographic drawing and adding more than one view, like a top and front view, new linetypes such as hidden, section and hatch will be needed to explain these views to the machinist or construction worker. You will also need new layers for the drawing border and possible hatching for cross section views. To create new layers using the Layers Properties Manager, select the Layer Properties command button to the left of the Layers Control list box on the Layers panel (see Figure 8.2). Add the following layers shown in Table 8.1 using the New button in the Layer Properties Manager.

Layer Name	Color	Linetype
Border	8 (dk. gray)	Continuous
Center	Green	Center
Dimension	Red	Continuous
Door	15 (brown)	Continuous
Electrical	152 (blue)	Continuous
Floor	134 (green)	Continuous
Foundation	254 (lt. gray)	Continuous
Hatch	254 (lt. gray)	Continuous
Hidden	Blue	Hidden
HVAC	90 (green)	Continuous
Plumbing	20 (red)	Continuous
Roof	37 Olive	Continuous
Section	Magenta	Phantom
Text	Cyan	Continuous
Wall	22 (orange)	Continuous
Window	204	Continuous

Table 8.1 - Architectural Template Layers

To create this template, you need make seven new layers. To create the layers, select the New button. Immediately, the layer name is ready for editing, so type, "Border", and ENTER twice to add each new layer. Continue to add the new layers until you type the Text layer name. Next, you need to choose different colors to help distinguish between the layers. To change colors, place your mouse arrow over the color box in the Border layer row and single left click with your mouse. The Select Color window will appear in front of the Layers Properties Manager. Select the gray (color 8) on the Standard Colors Row from the Standards Colors row

and select the OK button. You will now see that Border layer is 8 (gray). Repeat the process until you select the Blue color for the Text layer.

To finish creating and modifying layers, you need to change the linetype to a Center linetype on the Center layer, Hidden linetype on the Hidden layer, and the Phantom linetype on the Section layer. Place your arrow over "Continuous" in the Center layer row and single left click with your mouse. The Select Linetype window will appear in front of the Layers Properties Manager (Figure 8.3). Note that only the Continuous Linetype is loaded; so select the Load button and the Load and Reload Linetypes window will appear. Scroll down, highlight the CENTER linetype and select the OK button. Repeat the process for the Hidden and Phantom linetypes so that four different linetypes are shown in the Select Linetypes window.
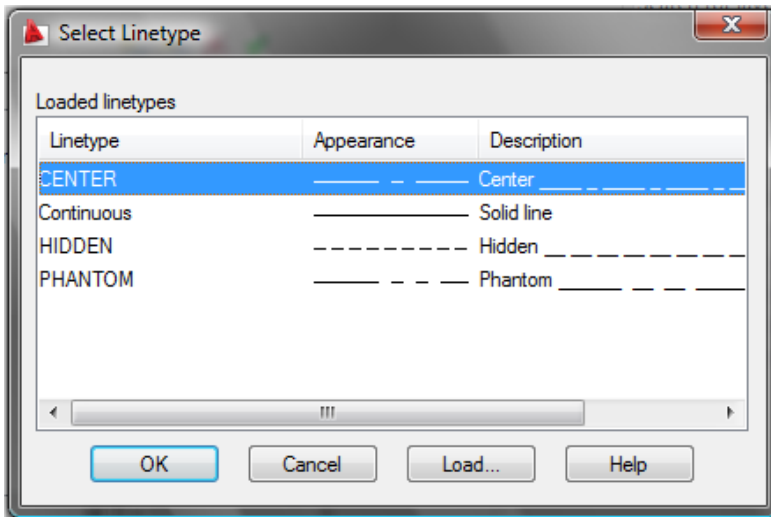
Highlight the CENTER linetype in the Select Linetype window and select OK. You will now see that the Center layer has a CENTER linetype (Figure 8.4). Place your mouse arrow over the text "Continuous" in the Hidden layer to re-enter the Select Linetype window. Highlight the Hidden linetype in the Select Linetype window and select OK. Repeat the same steps for the Section layer to load the Phantom linetype.
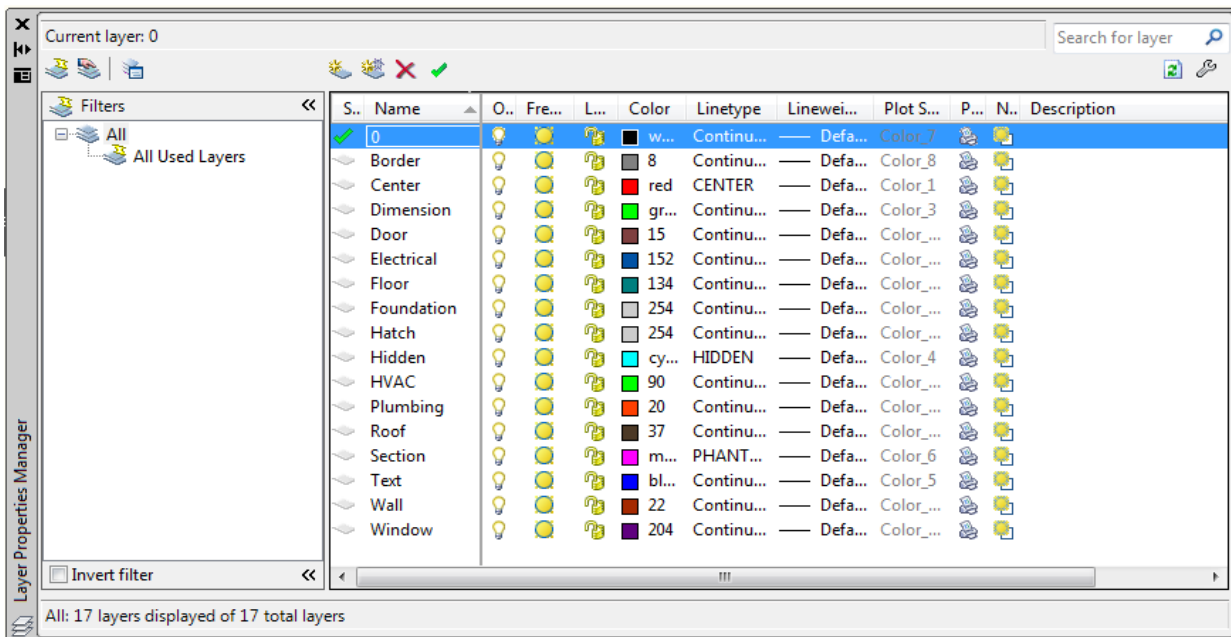
Figure 8.3 - The Select Linetype Window

Figure 8.4 - The Layer Properties Manager window

Setting your Object Snaps

_____

Setting Object Snaps will allow you to select points precisely. Bring up the Object Snaps Settings by right-clicking on the Object Snaps icon on the tray at the bottom of the screen and selecting Settings. In the Architectural template, you need to select the Object Snap Mode Center for grabbing the center point of a circle, recognized by an orange circle when in the zone (Figure 8.5). You also need to choose Endpoint, Midpoint, Quadrant, Intersection and Perpendicular.
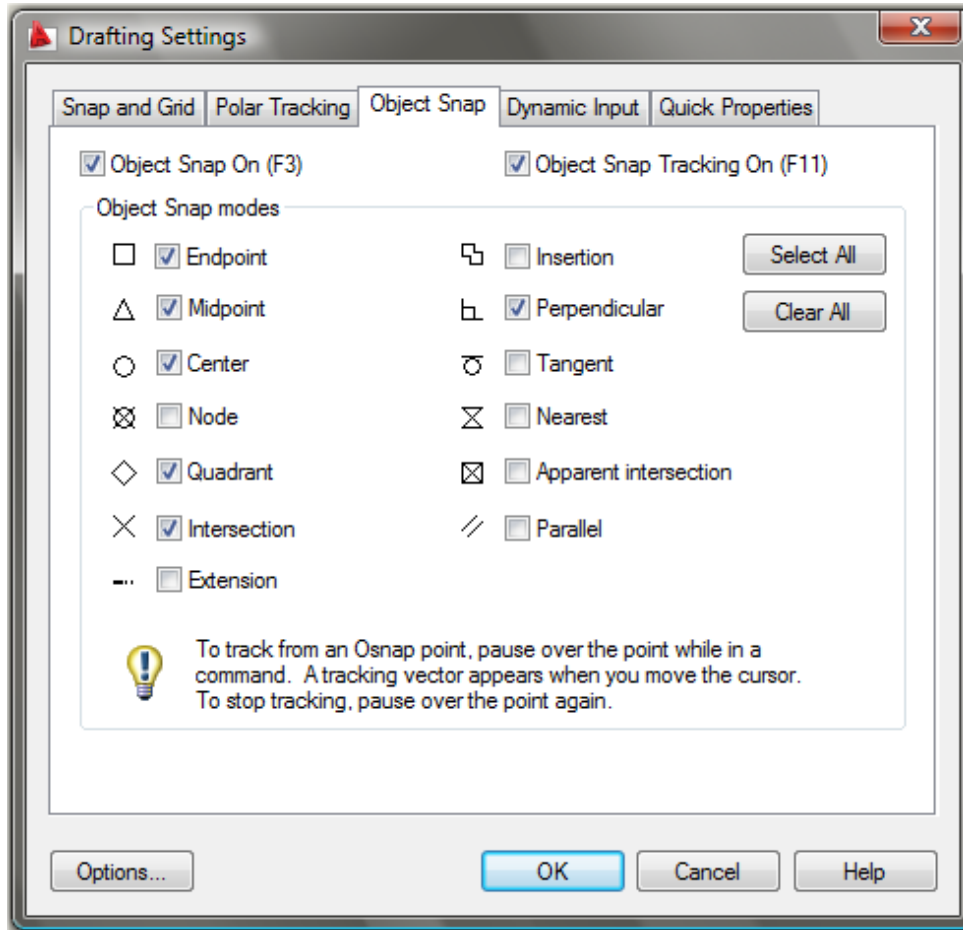

Figure 8.5 – Object Snap Settings

Modifying the Text Style

_____

Many companies or organizations will want you to change the font that will be used in their drawings. You probably should not change the AutoCAD system defaults, but make a new Text Style for the Architectural template. Select the Text Style tool on the Text panel under the Annotate Tab to open the Text Style window. For the principle of ease, name the Text Style "Architectural".
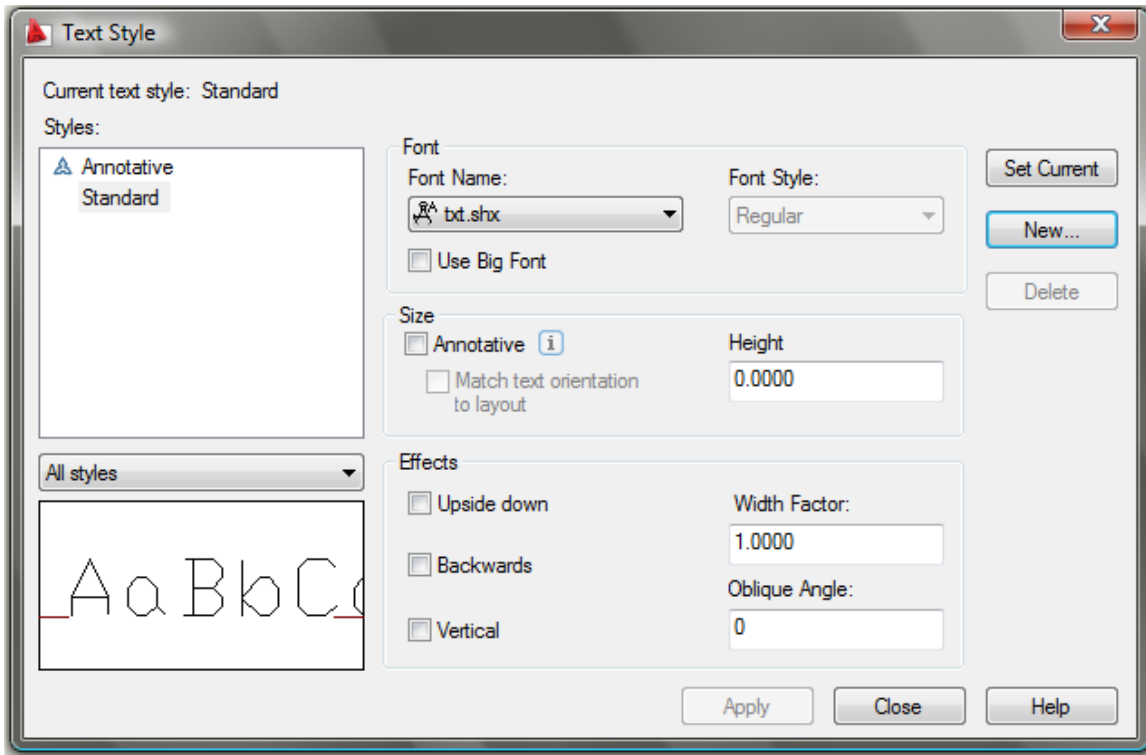
Figure 8.6 – Text Style window

As you can see in Figure 8.6, the system is set to Standard Style and the Font is "txt". In the Preview window, you can see that the Txt font is edgy and may not meet the visual requirements of your corporation. The Height is 0.0000, which means that whatever setting the System Variable Textsize is registered will be the size of the text when using Mtext. Notice there are check boxes for Upside down, Backwards and Vertical text if you so desire.
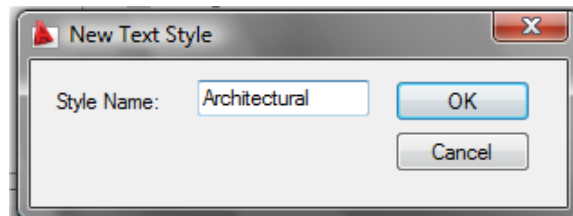

Figure 8.7 – Naming a New Text Style

To make a new text style, select the New button and the New Text Style window will appear. Type the word "Architectural" for the Style Name and press the OK button as shown in Figure 8.7. The Text Style window will show the style name as mechanical. Pick Arial for the Font name as shown in Figure 8.8. Select Apply and OK to exit the dialogue box.

To change the default text size, type textsize at the command line. You will notice the default is 0.2000. Type 0.125 and Enter as shown in Figure 8.9.
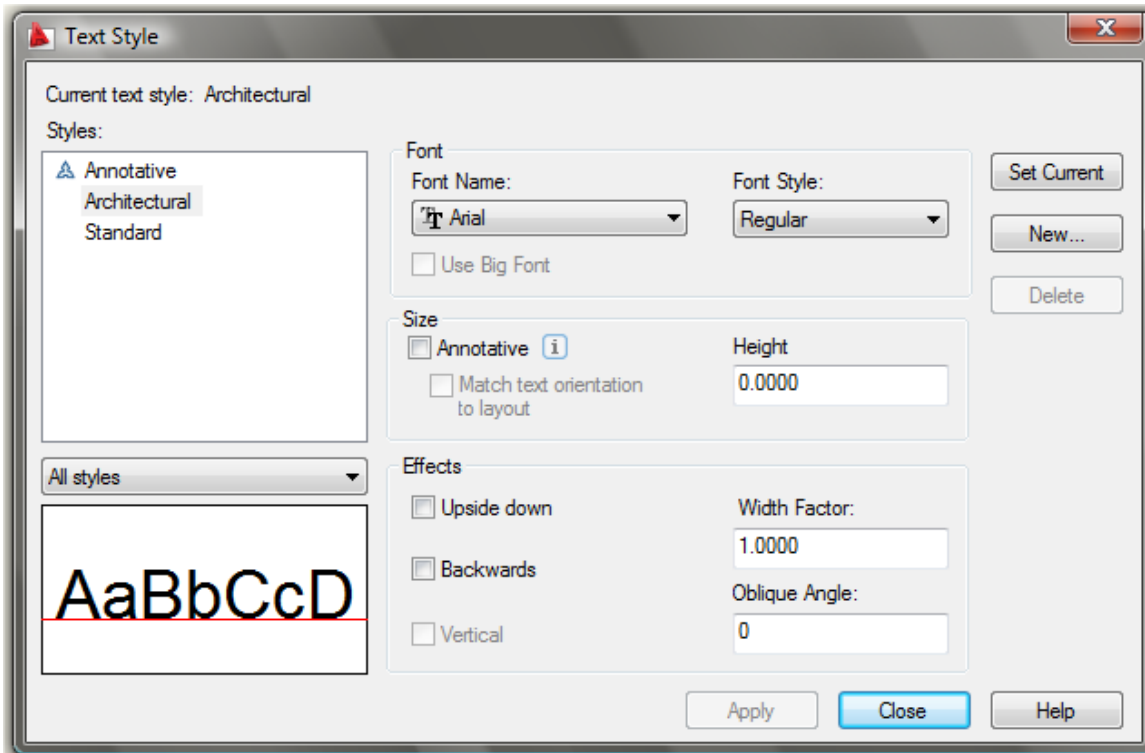
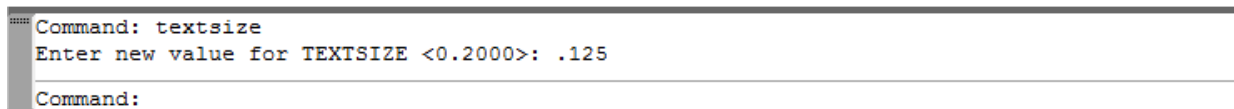**Figure 8.8 – Selecting a Font with the Text Style window**

```
Command: textsize
Enter new value for TEXTSIZE <0.2000>: .125

Command:
```

Figure 8.9 – Setting the Text Size Variable at the Command Line

# Creating a Architectural Dimension Style

_____

In your previous problems and practice exercises, you opened the Dimension Style window and modified the dimension variables on every drawing. As with Layers, Object Snaps and Text Styles, you want to make a custom variation using the Standard Dimension Style as the starting point. Open the Dimension Style Manager window by selecting the Dimension Style tool on the Dimensions panel under the Annotate tab (see Figure 8.10). There is a list of Styles on the left, a Preview of the style highlighted, the Set Current, New, Modify, Override and Compare buttons, Description field and Close and Help buttons. In the past, you have modified the Standard Style using the Modify button, but today you will select the New button to make the Architectural Dimension Style.

Figure 8.10 – Dimension Style Manager
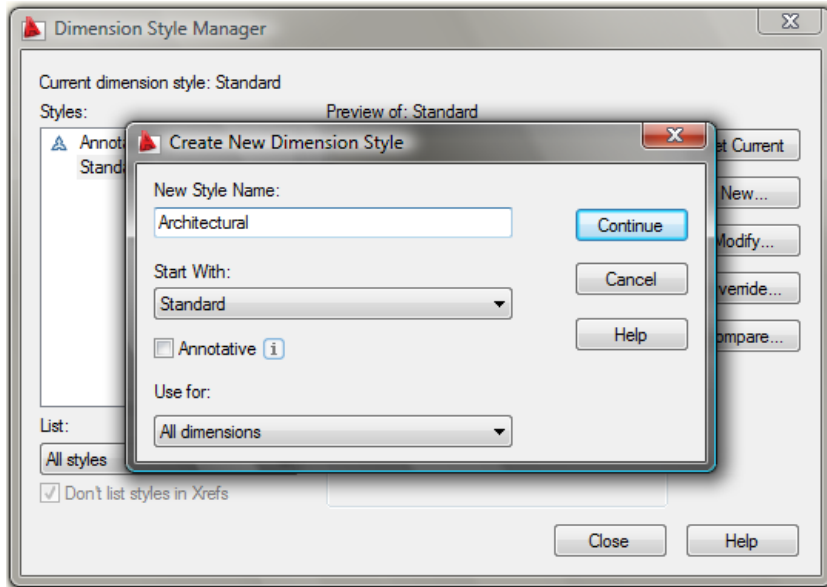
Type in the New Style Name, "Architectural," retain the Standard style to Start With, and Use for all dimensions. Then select the Continue button to enter the dialogue box that will allow you to set all the variables for the new Architectural Dimension Style (Figure 8.10).

**Figure 8.11 – Modify Dimension Style, Lines tab**
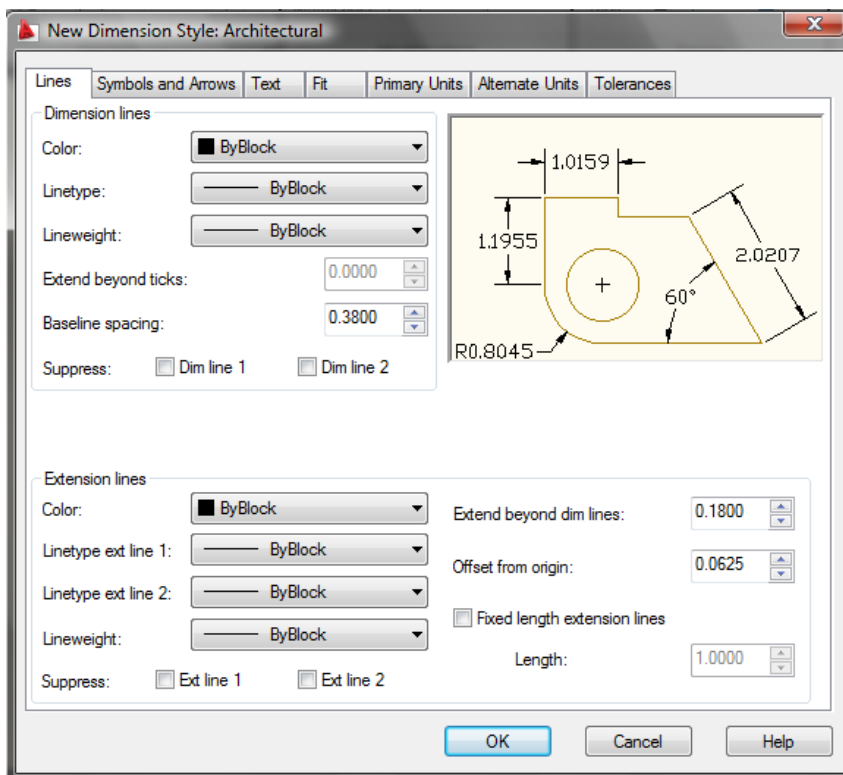
The New Dimension Style window will appear. The Lines tab shown in Figure 8.11 allows you to alter every part of the Dimension Lines and Extension Lines. You will not change any attributes on the Lines tab.

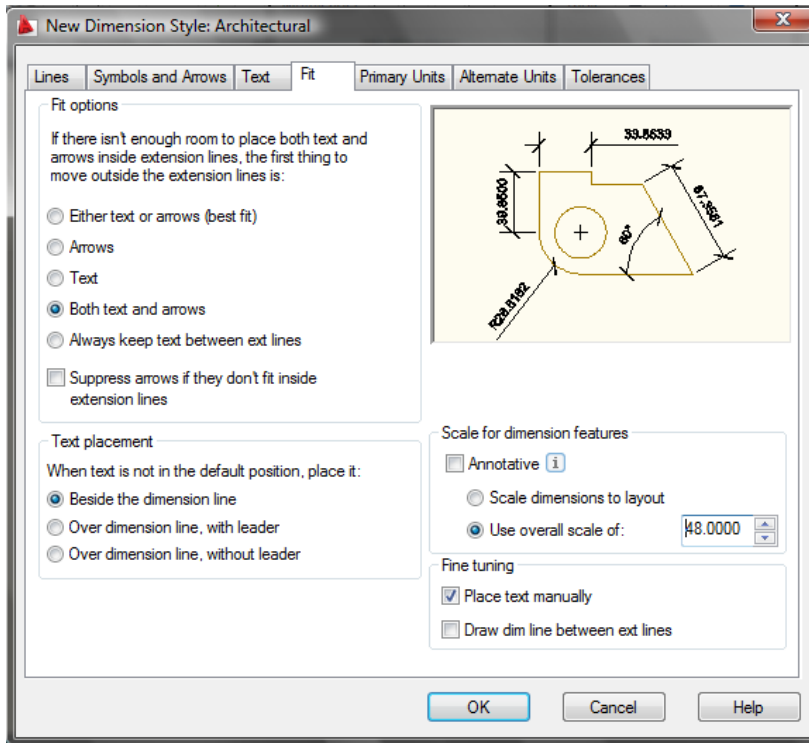**Figure 8.12 – Modify Dimension Style, Symbols and Arrows tab**
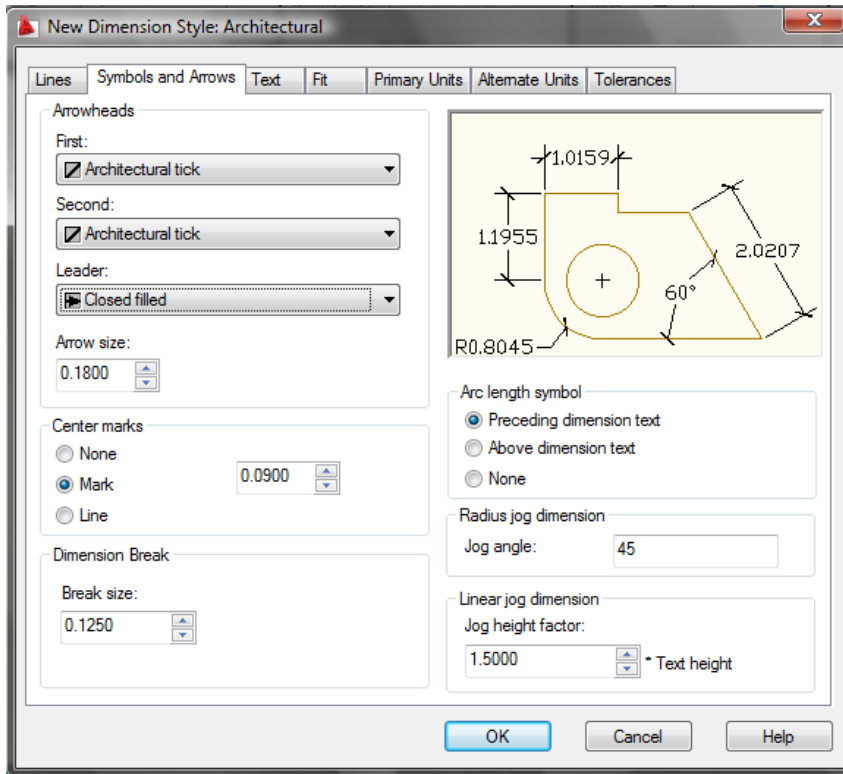
The Symbols and Arrows tab allows you to change the settings for Arrowheads and Center Marks. Change the Arrowheads to Architectural tick. Leave the Leader as a Closed filled arrow, as shown in Figure 8.12.

Figure 8.13 – Modify Dimension Style, Text tab
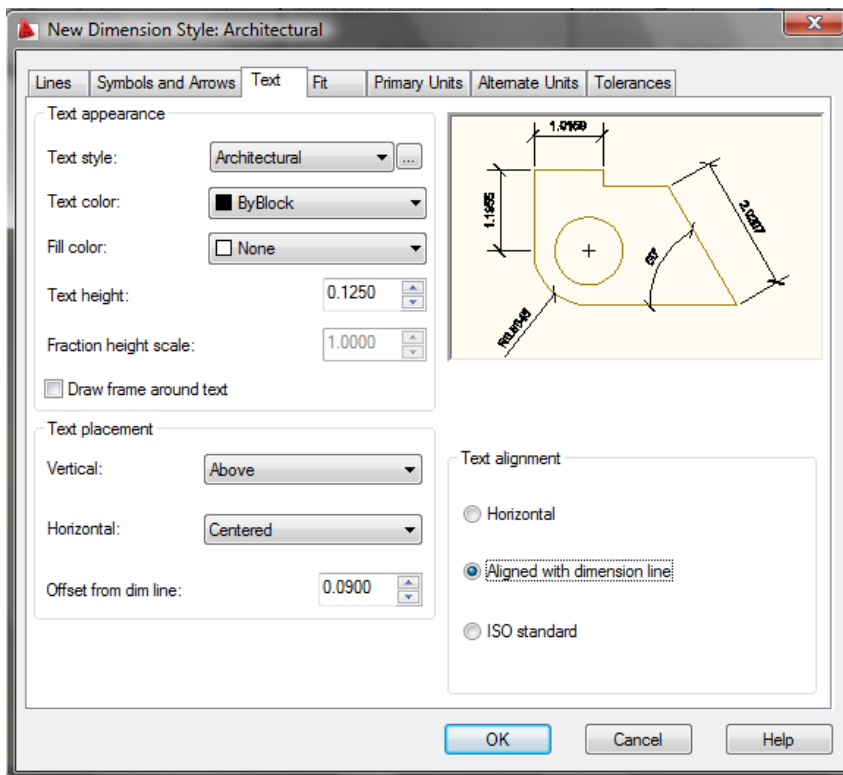
Proceeding to the Text tab, you can choose to edit the Text Appearance, Text Placement and Text Alignment. Set the Text style to Architectural and the Text height to 0.125. In many architectural firms the Text placement is above on the Vertical and Centered in horizontal alignment. Select the radial button for Aligned with dimension line. The architectural dimension style is shown in the image in the right corner of Figure 8.13.

The Fit tab allows you to adjust the dimension variables to compensate for room issues. You will make a couple of changes on this tab. First select the radial button for "Both Text and Arrows". By Choosing this radial button, the Diameters will be flanked by regular dimension lines instead of using a leader. Now, check the box for placing the text manually when dimensioning. This will allow you to move the text in every direction on the final step of inserting a dimension (Figure 8.14).

Figure 8.14 – Modify Dimension Style, Fit tab

Set the overall scale to 48, that will match the ¼" = 1' (1:48) ratio in residential housing drawings.
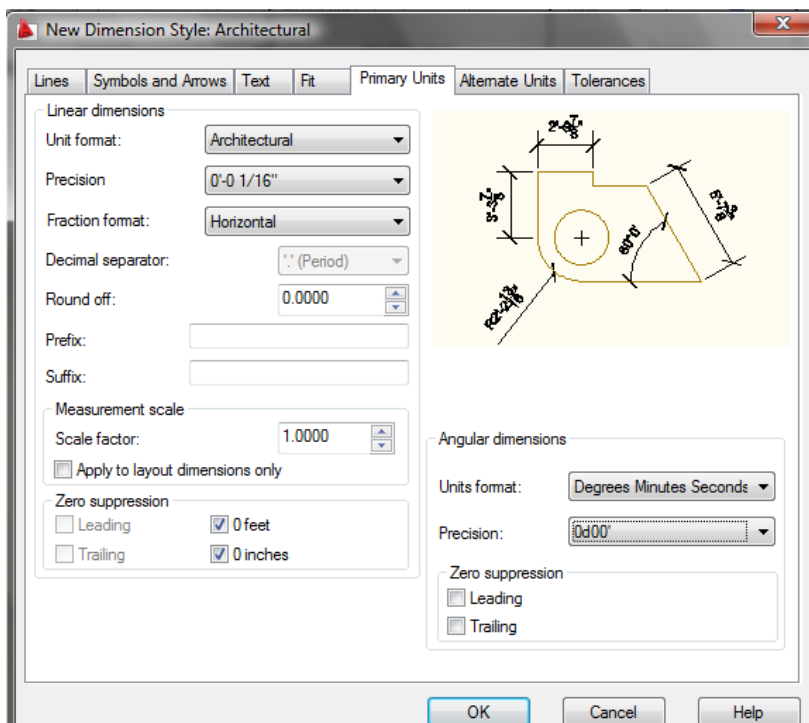
In the Primary Units tab, the Unit format will change to Architectural and the Precision to 1/16 as shown in Figure 8.15. The other Linear Dimension settings are used periodically, such as Round Off, but the 1.0000 Scale Factor in the Measurement Scale should always stay at one. Confusing this setting with other scale factors like line or text scale will change the value of all the dimensions in the AutoCAD drawing.

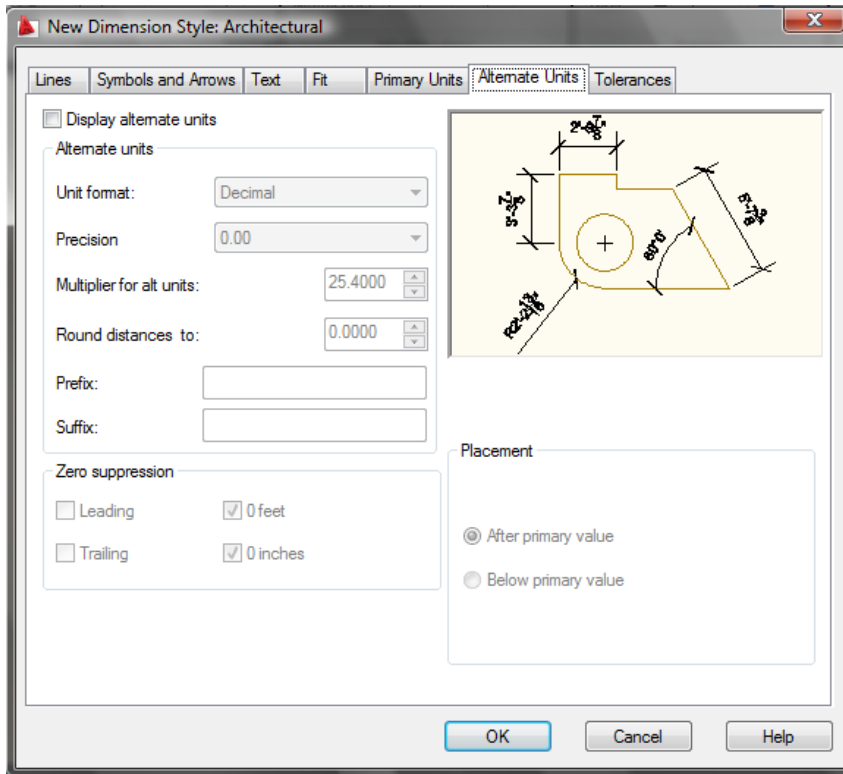**Figure 8.15 – Modify Dimension Style, Primary Units tab**

Change the Angular Dimensions to Degrees Minutes Seconds and set precision to 0d00' to allow the reader of the print to see the angles in at least a 1 minute of a degree.

The Alternate Units tab would be used when you want to list the English value of the Architectural unit below or alongside the dimension text. For example, if you checked "Display alternate units", a dimension showing 25.4 millimeters will have the (1.00) alternate dimension in parenthesis below the 25.4 text.
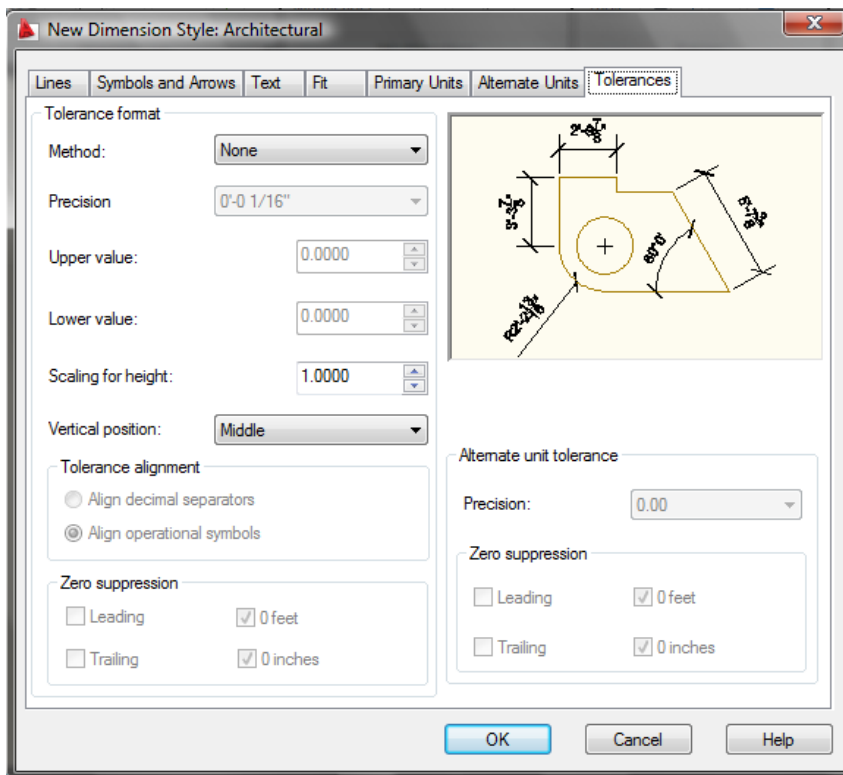
Figure 8.16 – Modify Dimension Style, Alternate Units tab

The Tolerance tab is an option mostly used by a Mechanical Designer or Engineer when they need to discuss the range of allowable error in the part when manufacturing or accepting the components at the production site. Right now this is being addressed in the notes that will be typed in every drawing you do. As the parts become more complex, this feature will be utilized to correctly show the detail dimensions (Figure 8.17).

**Figure 8.17 – Modify Dimension Style, Tolerances tab**
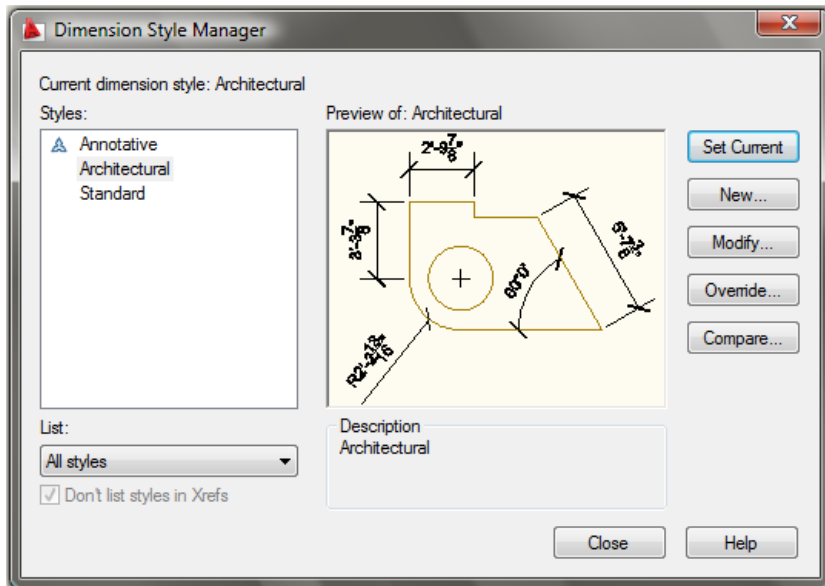
To save the changes that you made in the Architectural Dimension Style window, select the OK button. When you have more than one style listed in the Styles window in the left side of the dialogue box, highlight the style you desire and press the Set Current button. Now press the Close button on the first window (Figure 8.18) to finish the procedure.

Figure 8.18 – The finished Architectural dimension style

You will want to make changes to the dimension variables based upon what your customer or industrial workers expect to see in their drawing. Remember, in most cases you are the detailer of the design, but others will comment on your choices when they have to read your product.

Modifying the Drawing Units

_____
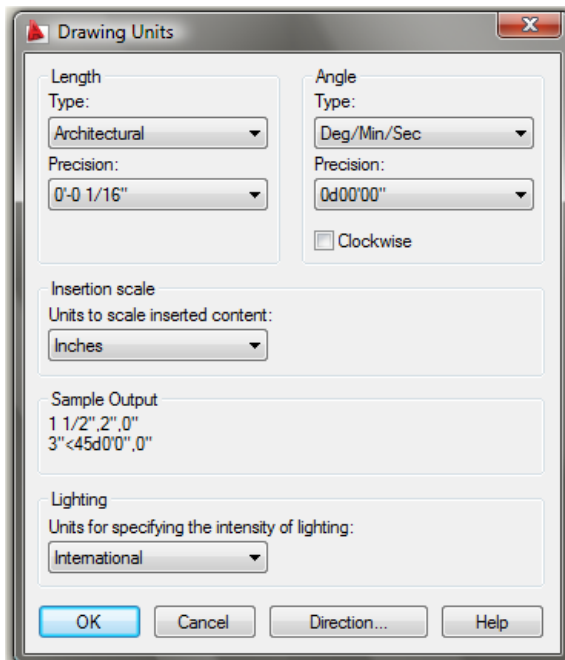
When you observe the units on the status bar, the system default is a four decimal place number, and the angular precision shows figures rounded to a whole numbers. From the Menu Browser, select Format, then Units to modify these adjustable units in the AutoCAD drawing. Change Decimal to Architectural and Decimal Degrees to Deg/Min/Sec. Also, set the Angle precision to 0d00'00" to allow the reader of the print to see the angles in at least a 1 second of a degree.

Figure 8.19 – Setting Drawing Units

Setting the Drawing Limits

_____

Under Format in the Menu Browser under Format, you will see the option to select the Drawing Limits. When selected, at the Command line, the remark *"Specify lower left corner or [ON/OFF], 0.0000, 0.0000>:"* will appear. Hit Enter to retain the 0,0 lower left limit, but when the second statement *"Specify upper right corner <12.0000,9.0000>:"* appears, type 100',60' to make a larger field on the graphical display when the drawing begins (Figure 8.20).

```
Command: '_limits
Reset Model space limits:
Specify lower left corner or [ON/OFF] <0'-0",0'-0">:
Specify upper right corner <1'-0",0'-9">: 100',60'

Command:
```

Figure 8.20 – Setting the Drawing Limits at the Command Line

Modifying the Linetype Scale

_____

The Linetype scale is the last system variable that you will change in the Architectural template. At the Command Line, type "ltscale" and hit Enter. At the prompt *"Enter new linetype scale factor <1.0000>:"* type 24. You will be able to see your hidden, section and centerlines better when the drawing field is larger (Figure 8.21).

```
Reset Model space limits:
Specify lower left corner or [ON/OFF] <0'-0",0'-0">:
Specify upper right corner <1'-0",0'-9">: 100',60'
Command: ltscale
Enter new linetype scale factor <1.0000>: 24
```

Figure 8.21 – Modifying the Linetype Scale at the Command Line

Saving a Drawing Template

_____

To save your new template, select Save Drawing As and the Save Drawing As window will appear as shown in Figure 8.21. You can save the template anywhere such as a floppy drive, server drive or in the AutoCAD template folder.
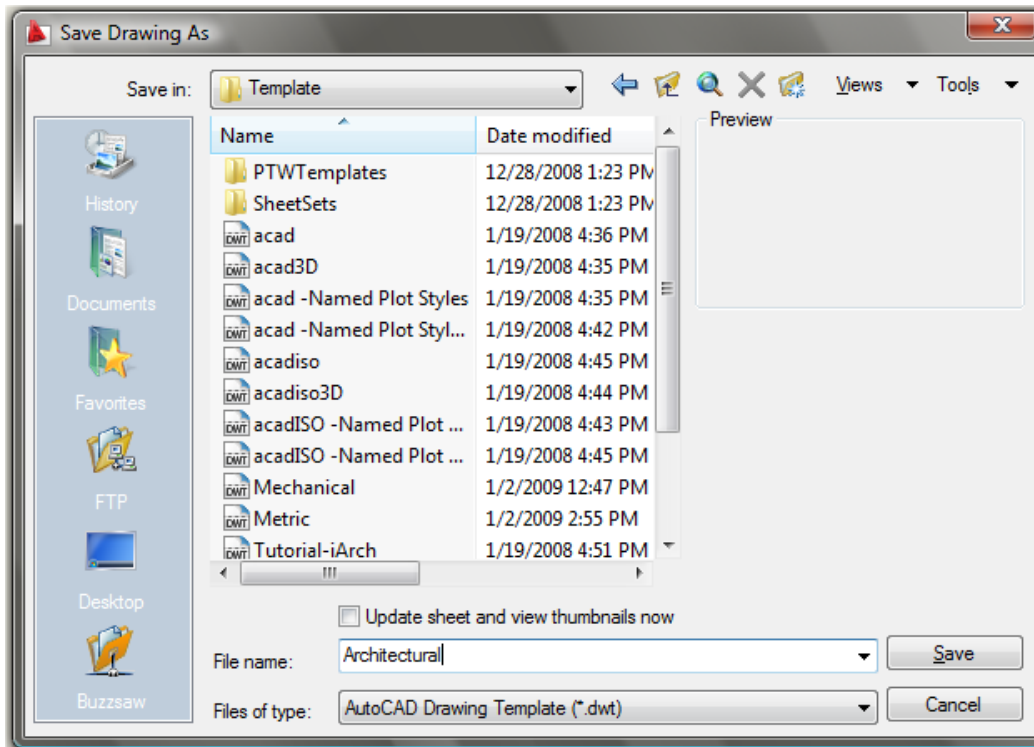
Figure 8.22 – Saving the Architectural Template

If you are using the same computer every day, save the file in the AutoCAD template folder, type the file name "Architectural" and choose the File Type to be AutoCAD Drawing Template File (*.dwt) as shown in Figure 8.22. After clicking the Save button, a Template Description window will appear for you to type the Description, "Architectural Template," and maintain the English measurement system. Always pick the English measurement if you are working on drawings where you desire non-European looking dimensions.
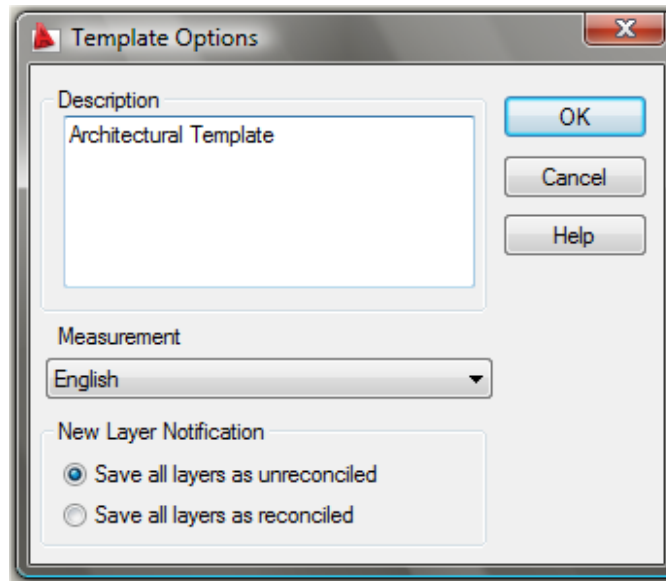

Figure 8.22 – Creating a Template Description

To make any changes to the template if an omission is discovered, open the template (dwt) in AutoCAD, make the changes, and save your work. If you do not update your basic guiding tools, then you will forever be altering the drawings manually. You may continue with additional templates for Civil and Electrical Engineering for future projects.

* World Class CAD Challenge 02-17c * - This task is not timed but we do challenge you to test your Architectural template on some sample drawings to discover whether you would be required to modify any system variables or create a layer that is forgotten. Continue to test your templates, each time you can write down your omission and open the template, make the change to maintain your World Class status.