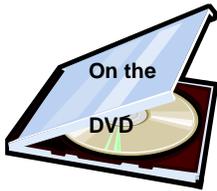


CHAPTER 19

Drawing a Suspended Ceiling with Grid and Tile

Step By Step Tutorial

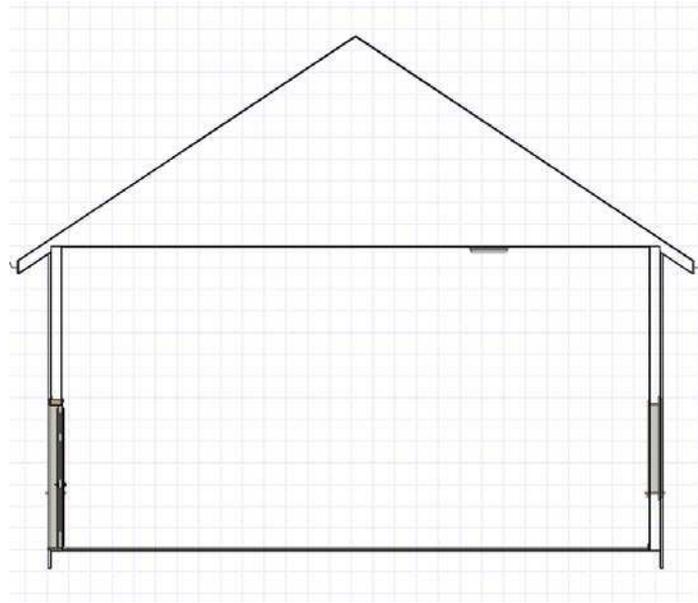
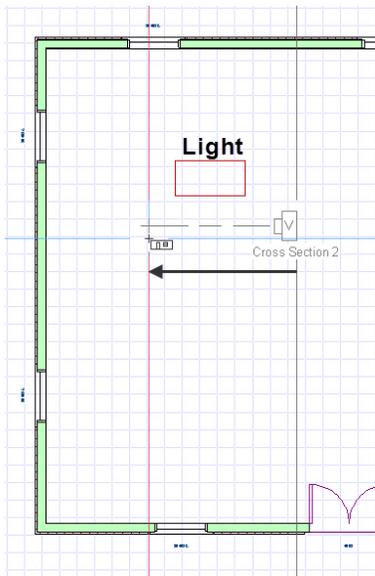
In this chapter, you will draw a suspended ceiling with a grid and tile. You will see how to lay out the lights within such a ceiling. You will learn how to make even borders for the tiles on each side of the ceiling, and you will develop a reflected ceiling plan.



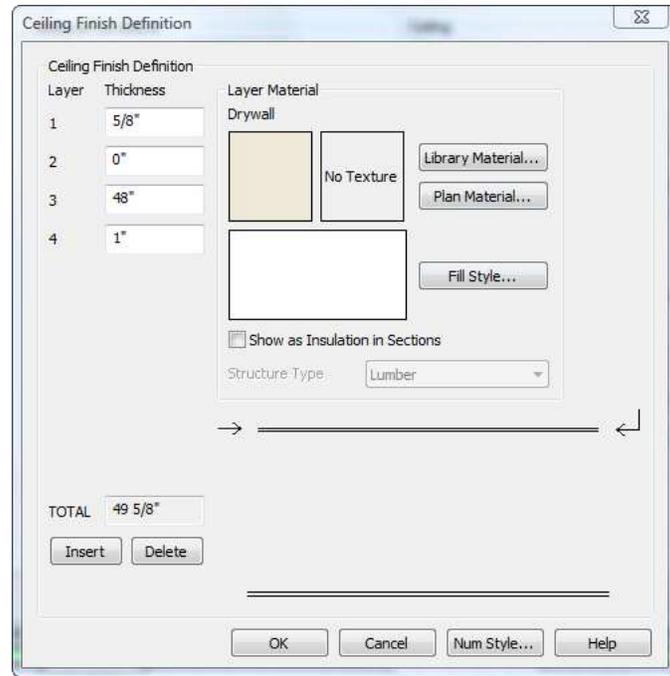
The drawing, D17.plan, is used in the following exercise on drawing a suspended ceiling with grid and tile, and can be found in the **X6 Expert Drawing Before** folder on the DVD.

STEPS: Drawing a Suspended Ceiling with Grid and Tile

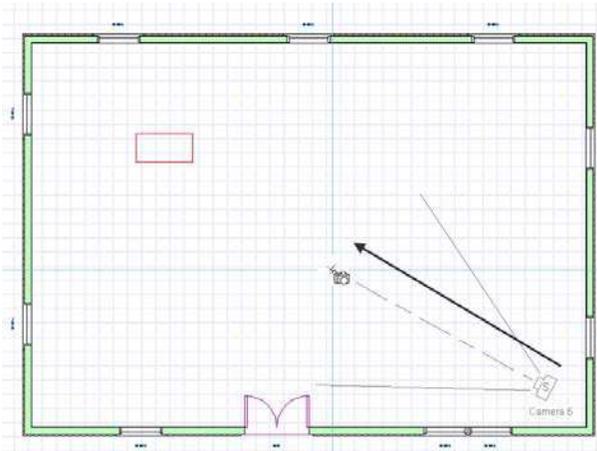
1. Open the **D17.plan** from the DVD. This drawing shows a one room floor plan with a high ceiling. A light fixture in the ceiling has been added.
2. Take a  **Backclipped Cross Section** view through the light near the left end of the room. Start to the right of the light and drag through the light. You see the light sitting up against the ceiling (if necessary, turn off the layer, **Electrical, Labels**). The structural ceiling is 14 feet off of the floor.



3. Close the cross section view.
4. Open the room's specification dialog (hint: press the space bar and then double-click inside the room). Go to the **Structure** panel and observe the height of **Ceiling (B)**. It should show **168"**. We want our suspended ceiling at 120" or 48" lower than the height of **Ceiling (B)**.
5. On the **Structure** panel, click the **Edit** button for **Ceiling Finish (J)**. The  Ceiling Finish Definition dialog displays. There are two layers, **Layer 1** and **Layer 2**, currently in place. **Layer 1**, the drywall, is **5/8"** thick. **Layer 2**, the paint, is **0"** thick.
6. Click in the **Thickness** box for **Layer 2**. Press the **Insert** button twice. You get **Layer 3** and **Layer 4**. Change the thickness back to **0"** for **Layer 2** and the material back to **Color-Bone** (you will find the material in the  Plan Materials dialog). It does not really matter if you change the material, because on new construction you probably would not paint the ceiling if you build a suspended ceiling under.
7. Input **48"** (from our calculation in step 4) in the **Thickness** box for **Layer 3**. The material for this layer has already been entered as **Insulation Air Gap**, which is what we want. **Layer 4** is going to be the thickness of the tile. Input **1"** in the **Thickness** box for this layer. Click the **Library Material** button to display the  Select Library Object dialog. Under **Materials**, find **Ceiling Tiles**, and select **Square Ceiling Tiles**. Click **OK** to close the  Select Library Object dialog. Click **OK** to close the  Ceiling Finish Definition dialog. Notice in the graphic where the suspended ceiling is displayed. Also note that Chief Architect has calculated the new height for **Finished Ceiling (F)**.



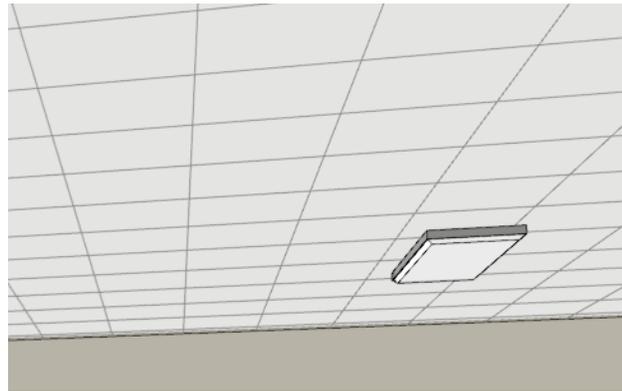
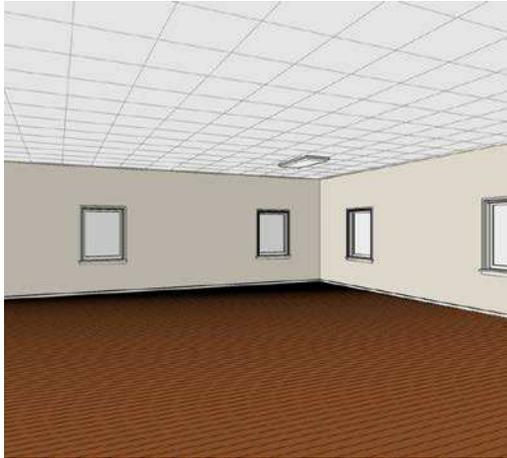
- Press **OK** to close the  Room Specification dialog.
- Take a  **Full Camera** perspective view of the room. Drag from right to left towards the light fixture. If you find that the edges of the ceiling along the front and rear exterior walls are sloped you will need to raise the roof planes slightly. Skip step 10 if your suspended ceiling is already flat.



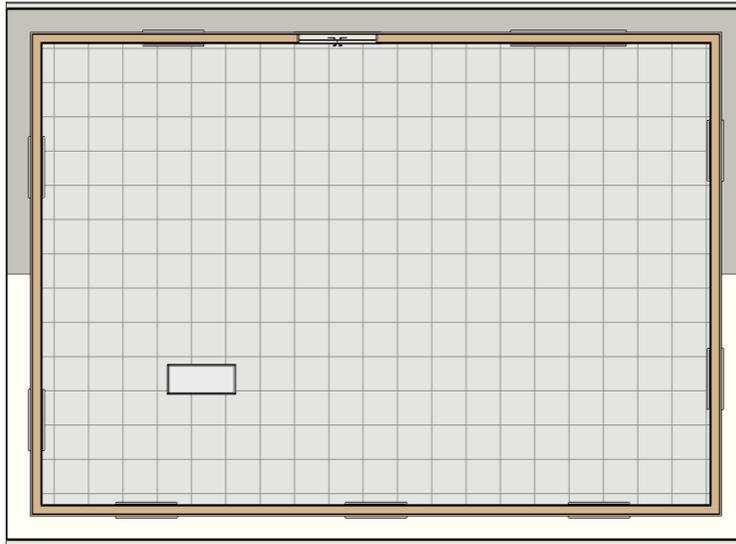
- Switch to the plan view. Select both the roof planes and click the  **Transform/Replicate Object** edit tool button. The  Transform/Replicate Object dialog displays. Check **Move**. Change the **Z Delta** value to **3"**. Click **OK**. Switch back to the 3D view. The problem should have been corrected

and we now have a flat suspended ceiling. If you still see the ceiling sloping at the edges, move the roof up another inch or two until you have a flat ceiling.

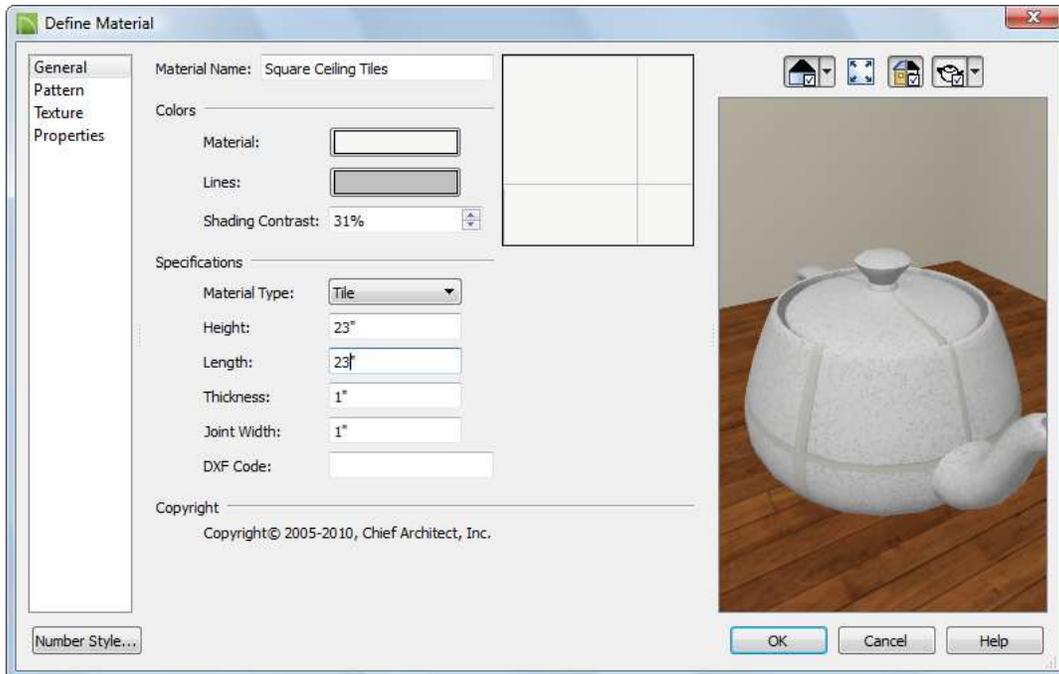
11. Click the  **Vector View** tool button found in the  **Standard** drop-down menu. If you rotate the view a little and zoom in, you will see that the light fixture does not quite fit the grid. If you noticed, the position of the light in relation to the grid pattern was the same in the perspective camera view. Also, notice that the borders are not even. This was true in the perspective camera view as well. You will need to shift the grid pattern and the textures to make the borders even.



12. Close the 3D view. We are going to use an unusual 3D view to shift the pattern over.
13. Click the  **Orthographic Full Overview** button from the  **Backclipped Cross Section** drop-down menu.
14. Select **3D ► View Direction ► Bottom View**.
15. Use the  **Delete Surface** tool to delete the floor surfaces until you see the ceiling grid. Should be 3 clicks.



16. Click the  **Adjust Material Definition** tool button. Click on the ceiling. The  **Define Material** dialog displays. You can use this dialog to make the necessary adjustments.
17. Notice that on the **General** panel you can change some of the properties of the material. Go to the **Pattern** panel. Here you can change both the horizontal (X) and vertical (y) offsets. Go to the **Texture** panel. Here you can change the offset value for both the X and Y positions for the texture.
18. On the **Texture** panel, notice the **X Scale** and **Y Scale** for the texture in the **Scale** section. It is 24" x 24". Go to the **General** panel and notice that you also have 24" x 24" showing for the **Height** and the **Length** of the tile. The **Thickness** is shown as $\frac{1}{4}$ ". Change the **Thickness** to **1"**. Change the **Joint Width** to **1"**. To match the overall size of the texture, we will need to adjust the overall size of the pattern. Change the **Height** and the **Length** to **23"**.



19. Go to the **Texture** panel. We will need to determine how much we will need to adjust the origin (the **X Position** and the **Y Position**) for the texture in the pattern. Click **OK** to close the dialog.

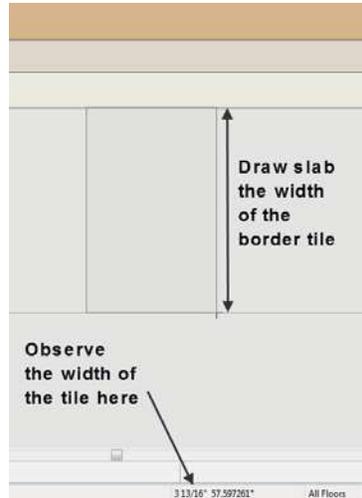
20. Use the  **Delete Surface** tool to delete the floor surfaces until you see the ceiling grid again.

We need to determine the width of the partial tiles that border the walls. There are no CAD or dimensional tools available in the 3D view. But there is a tool that you can use. It is the  **Slab** tool.

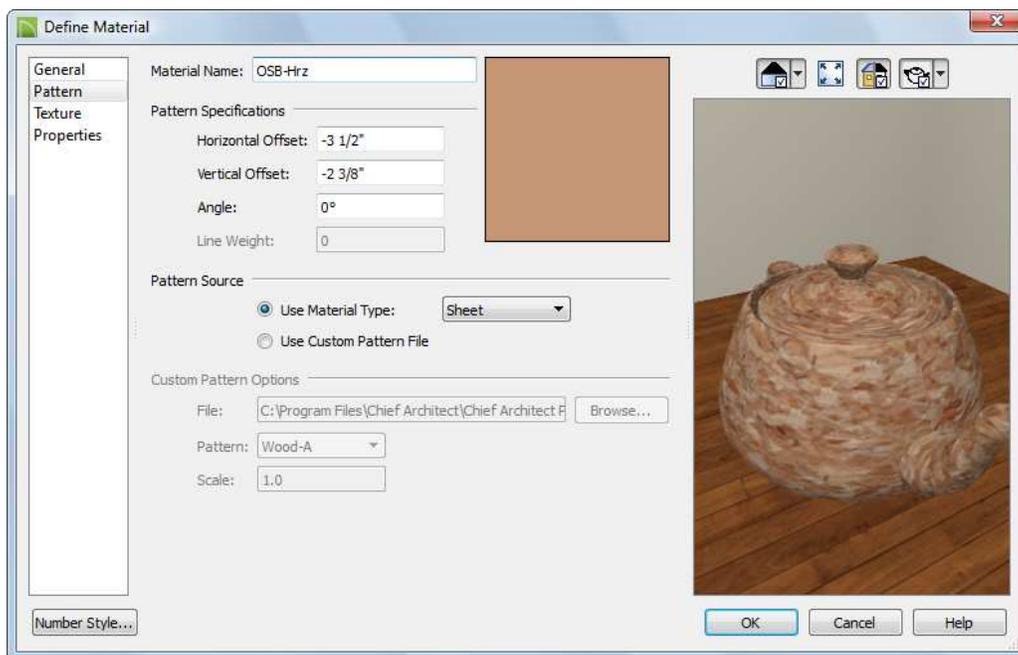
21. Click the  **Slab** tool.

22. Toggle off  **Grid Snaps**.

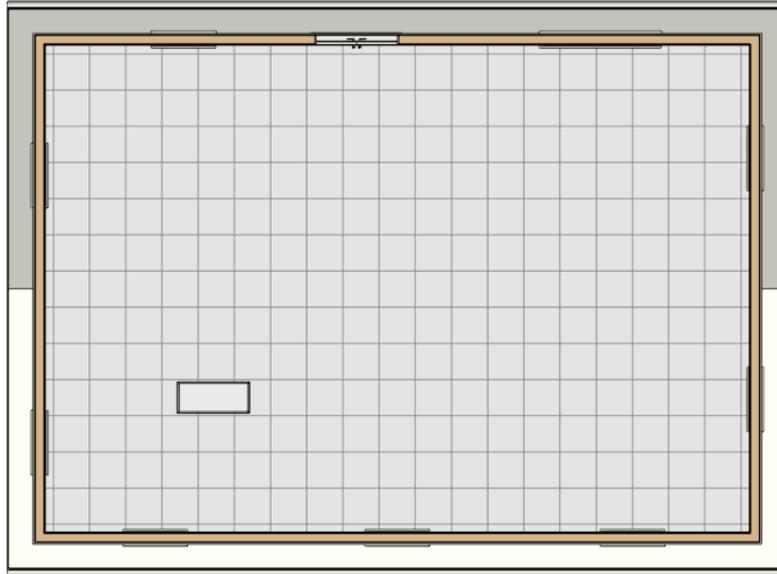
23. Zoom-in close to the rear wall and draw a slab the width of one of the tiles next to the wall. Do not release the mouse button or the slab will be created. You don't want to actually create the slab. Observe the width of the slab on the Status Bar. In the illustration the width is shown as $3 \frac{13}{16}$ " or about $3 \frac{3}{4}$ ". Without releasing the mouse button, press the Esc key.



24. Follow the same procedure to determine the width of the tiles that border the front wall. The width should be close to $8 \frac{3}{4}$ ". Do the same for the right and left walls. The width of the tiles bordering the right wall should be close to $2 \frac{3}{4}$ ". The width of the tiles on the left wall should be about 9".
25. Now you can do the math to calculate what you need to adjust the pattern for the tiles so that the borders are even. Click the  **Adjust Material Definition** tool button. Click on the ceiling. The  Define Material dialog displays.
26. Go to the **Pattern** panel. Change the vertical offset to the difference between the width of the tiles along the rear and front wall divided by 2. Place a minus sign to shift the pattern downward. Change the horizontal offset to difference between the width of the tiles along the right and left walls divided by 2. Place a minus sign to shift the pattern to the left. Click **OK**.

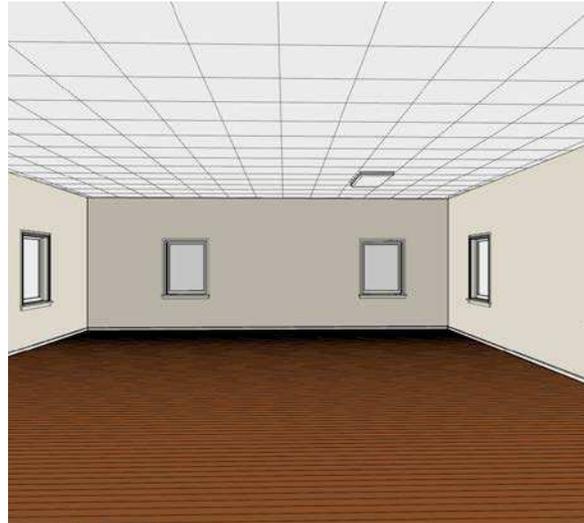
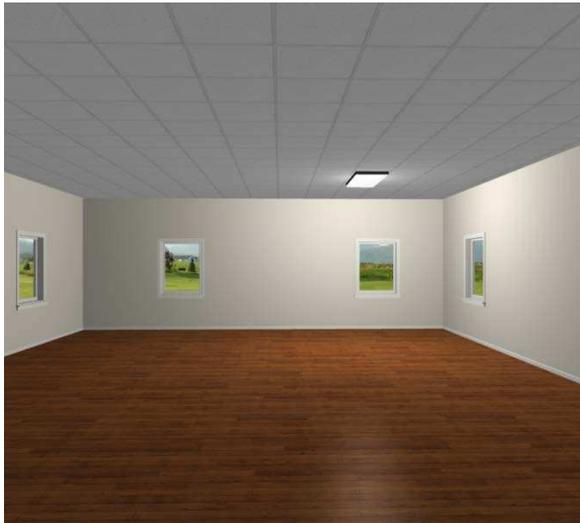


27. Use the  **Delete Surface** tool to delete the floor surfaces until you see the ceiling grid again. Your border tiles should now look even. If not, you would need to follow the same steps again starting at step 22. In the next step we will shift the texture origin the same amount as we just did for the pattern.



28. Click the  **Adjust Material Definition** tool button. Click on the ceiling. The  **Define Material** dialog displays. Go to the **Texture** panel. Change the y position to the same value as the **Vertical Offset** on the **Pattern** panel (you can copy and paste). Change the x position to the same value as the **Horizontal Offset** on the **Pattern** panel. The texture should now shift the same as the pattern because of the adjustment we made earlier in step 17.
29. Go to the **General** panel. Note that you can change the color of the pattern lines by clicking on the color bar for **Lines** in the **Colors** section. Change the color to black, then use the slider in the **Color Chooser** dialog to lighten it a little. Go to the **Pattern** panel. In the **Pattern Specifications** section, change the **Weight** to **20**. Click **OK** to close the  **Define Material** dialog.
30. Use the  **Delete Surface** tool to delete the floor surfaces until you see the ceiling grid again.
31. Click the  **Show Line Weights** tool button (should be on the right side of your drawing area). You will need to zoom into the drawing to see the difference in the line weights.
32. Zoom into the light fixture. It actually should look pretty good as it was placed in the original drawing to come out like this. If you want you can move the light fixture to make any adjustment needed.
33. Close the 3D view. If necessary, press F6 to fill the window.

34. Take a  **Full Camera** perspective view of the room. You should find that the render lines for the textures have shifted so that the borders are even and the light looks well placed. Click the  **Vector View** tool button. Again, the borders should look pretty decently even, and the light should fit into the grid nicely.



You could adjust the size of the tiles or choose different size tiles to get closer to full size tiles along the borders. This is something that you would need to work with in your design efforts. By applying the principles learned here, this should be easy to do.

You began with a plan that already had a light fixture placed. You then developed a suspended ceiling using specific materials and you shifted the pattern of those materials, which better fit the light and gave you even borders. Now you are going to draw a reflected ceiling design with CAD lines, basing it on the position of the light. You will be drawing several CAD lines, which you will put on their own layer.

35. Close the 3D view.

36. Click the  **Display Options** tool button to display the  Layer Display Options dialog. Your layer set should display as the **Default Set**.
37. Click the **New** button to display the  New Layer Name dialog. Type **Reflected Ceiling Plan** (or you could just type **RCP**) for the new layer, which will appear in all of the layer sets. Click **OK**. We want to make this the current CAD drawing layer so that CAD objects you draw from now on will be on the **Reflected Ceiling Plan** layer. You will want to remember, however, that you will need to come back and change the CAD drawing layer back to the **CAD, Default** layer.
38. Note that $\frac{1}{4}$ " **Scale Annotations** is displayed in the **Active Annotation Set Control** drop-down list window. Click the  **Annotation Sets** tool button to display the  Annotation Sets dialog. For the **Current CAD Layer**, change the layer to the **Reflected Ceiling Plan** layer. Click **OK**. Select $\frac{1}{4}$ " **Scale**

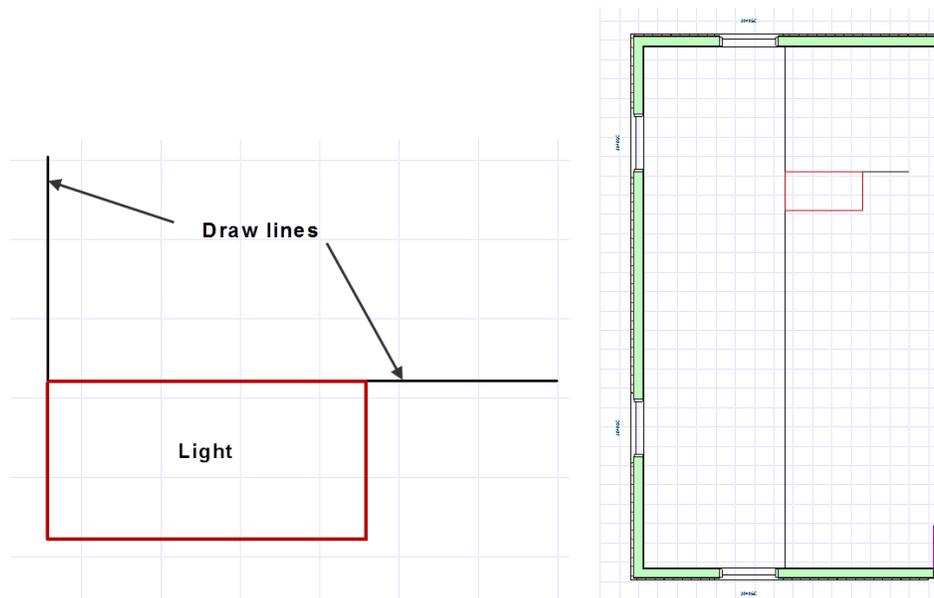
Annotations from the **Active Annotation Set Control** drop-down list. All CAD objects that you draw using $\frac{1}{4}$ " **Scale Annotations** from now on will go on the **Reflected Ceiling Plan** layer. Make sure that $\frac{1}{4}$ " **Scale Annotations** is still displayed in the **Active Annotation Set Control** drop-down list window.

39. Zoom in close to the light. Your grid snaps should still be off. If not, toggle them off by clicking the



Grid Snaps button. This will prevent the lines you will draw from snapping to the grid.

40. Press W to start the line command. Draw a line along the left side of the light and another line along the top of the light, as shown in the illustration. Extend the vertical line out and snap it to the walls on either side.



41. Select the vertical line and click the  **Multiple Copy** edit tool button. Click the  **Multiple Copy Interval** edit button to display the  Multiple Copy dialog. In the **General Objects Primary Offset** box, change the offset (offset is to center of objects) to **48"**. Click **OK**.

42. Drag copies of the vertical line across the drawing to the right wall. Remember that all of these lines will be on the **Reflected Ceiling Plan** layer.

43. Select the vertical line and click the  **Multiple Copy** edit tool button again and drag copies of the vertical line to the left wall. Press Esc when you finish.

44. Select the horizontal line that you drew and extend it to both walls.

With the horizontal line still selected, click the  **Multiple Copy** edit tool button. Click the  **Multiple Copy Interval** edit button to display the  Multiple Copy dialog. In the **General Objects Primary Offset** box, change the offset (offset is to center of objects) to **24"**. Click **OK**. As with the vertical line, drag copies of the horizontal line to both walls.