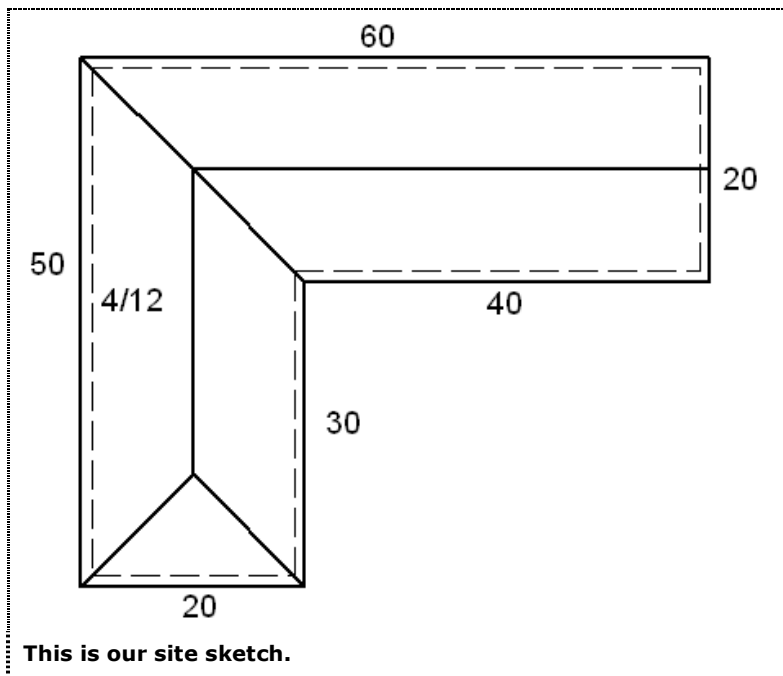


How to Draw a Pitched Roof—Basic

Hint: This tutorial explains how to draw from site measured dimensions, but by far the easiest way to draw an existing roof is from a satellite image. Doing so requires our Digitizer upgrade to RoofCAD. To see how it works try one of our Satellite Tutorials under the Help|Tutorials & Movies menu option.

In this tutorial, we will take you through the steps of drawing a basic pitched roof, i.e. a roof using only one pitch. The sketch below is the roof we are going to draw. We have measured the walls of the house, giving us a footprint, and we know that the pitch of the roof is 4/12, and that the eave overhang is 1 ft.



We will use an 8x14 template at a 1"=8' scale (see Section 8, Templates and Section 15, [Drawing Settings](#)).

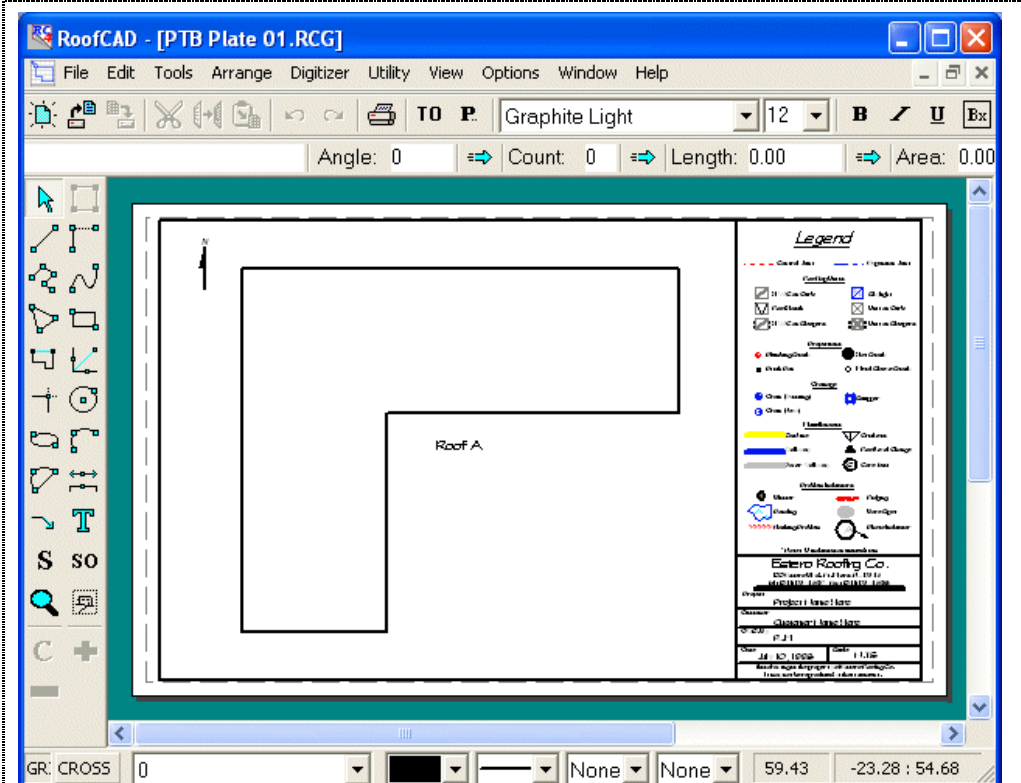
There are two parts to drawing a pitched roof with RoofCAD:

1. Draw the Roof Outline
2. Draw everything that goes on the roof.

We begin by opening the Smart Object Browser, expanding *****Pitched Roof*****, and selecting Pitched Roof.

Next, draw the footprint of the building (the outline) from the measurements on our sketch. (If you are not familiar with drawing an

outline using the Layout Wizard, see How to Draw a Roof Section Outline in Section 25, Basic Flat Roof Tutorial). Your drawing should look similar to the one below.



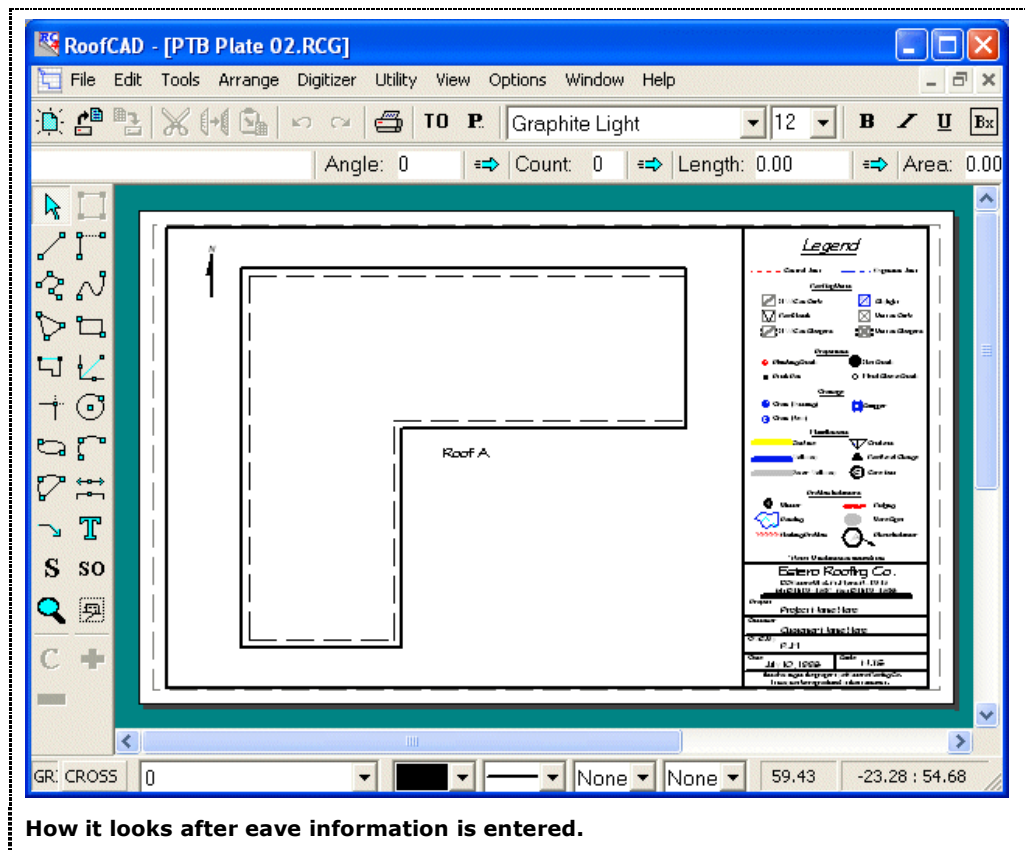
The completed roof outline.

The next step is to set up the eave properties. Select all the eaves of the building (all but the rightmost side), expand the Pitched Perimeter section of the Smart Object Browser and click the Eave Smart Object. You are prompted for some information. Enter the Pitch as 4, and enter the Overhang as 1 (height is not used by RoofCAD at this time).



Enter Pitch and Overhang.

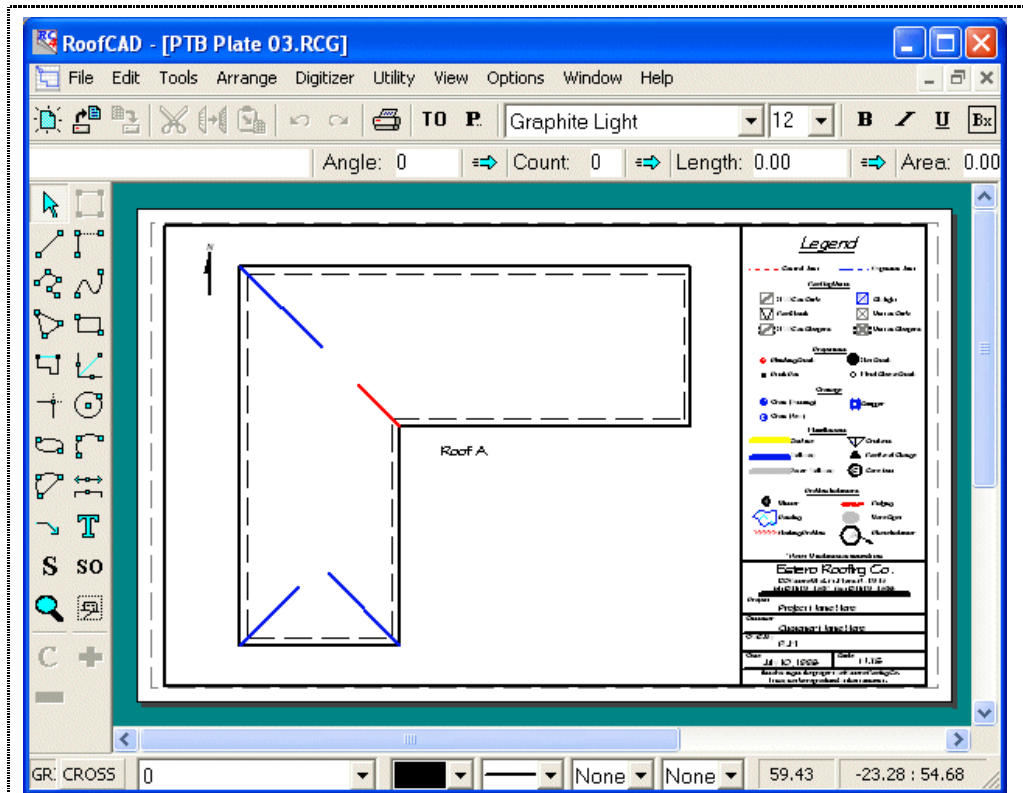
RoofCAD automatically adjusts the outline, showing the original footprint measurement as a dashed line.



Tip: if we were drawing from outside measurements instead of footprint measurements, we would enter the Overhang as 0.

Press Esc to deselect the eaves. Now select the rake edge on the outline, and click the Rake Edge Smart Object in the Browser. Again, enter the Pitch as 4 and the Overhang as 1. Right click on the drawing to deselect the rake edge.

Now we are ready to draw the hips, valleys and ridges of the roof. Click the Hip Smart Object in the browser. With the Hip/Valley tool click on two adjoining eaves. After you have clicked the second eave, you will see a line drawn for you from the corner to your mouse cursor. RoofCAD has calculated the correct angle and pitch at which to draw this hip or valley, based on the pitches of the adjoining eaves. As you move the mouse around, the line follows it, snapping to the correct angle. When the line is pointing in the correct direction, click the mouse just past or just before where you think the hip or valley should end. We will later use the Trim Tool to extend or trim our hips to the correct length. Repeat this process for all the hips on our sketch. To draw the valley, choose the Valley Smart Object from the Browser, and use the same process as for the hips. Your drawing should now look something like this:



Now starting to take shape with some hips and valleys.

Before drawing the ridges, we will connect the hips on the southern wing of the building, so that we know where to start our ridge. To do this, select the Trim tool from the toolbar on the left side of the RoofCAD window.



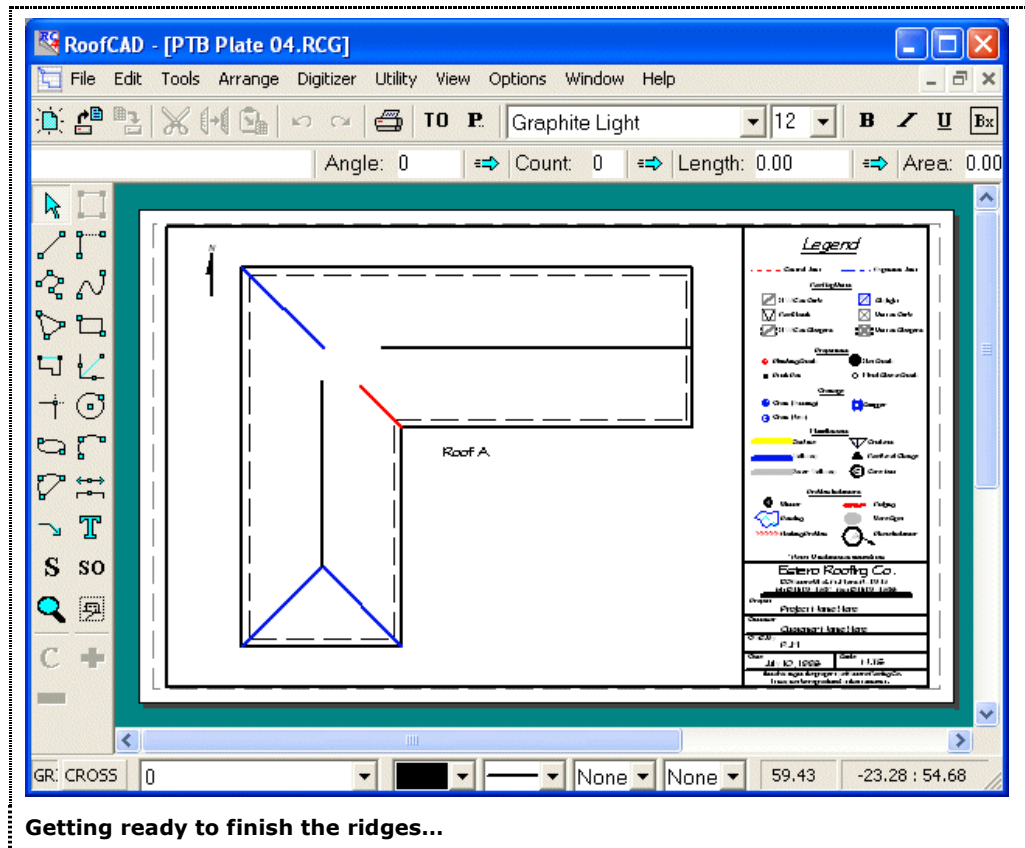
The Trim tool.

Click the endpoints of the two hips. RoofCAD will adjust the lengths of the hips to the point where they intersect. (We will not trim the hip and valley at the bend of the ell until we have placed the ridges). Now choose the Ridge Smart Object from the Browser. To make drawing the ridges easier, make sure the tool showing in the drop down box at the bottom of the Browser is the Horz./Vert. line tool. If it is not, click to select Horz./Vert. Line from the list.

We are going to make use of the Snap hotkeys to draw the ridges so that they join perfectly to the hips and the rake edge.

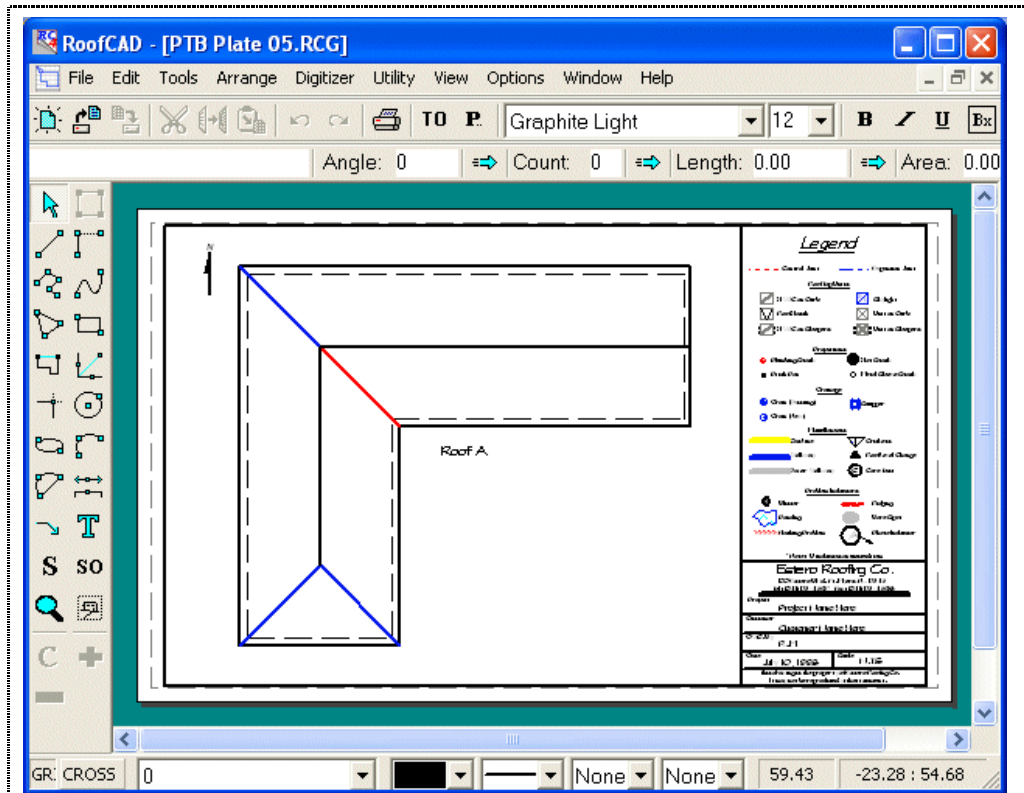
Holding down the Ctrl key on your keyboard (Snap to End Point), click near the point where the hips join on the lower part of the building. The beginning of the ridge snaps to the join. Release the Ctrl key, and move the mouse until the ridge extends near to where it will join the upper hip and valley. Click to finish drawing the ridge.

To draw the other ridge, hold down the Shift key (Snap to Mid Point) and click near the Rake Edge of the building. (Since both sides of the roof are the same pitch, we know that the ridge will fall exactly in the center of the roof). Release the Shift key, and move the mouse until the ridge extends near to where it will join the hip, valley and other ridge. Click to finish drawing the ridge. Your drawing should now look something like this:



Finally, we will use the Trim tool again to make the hip, valley and ridges the correct length.

With the Trim tool, click the end points of one of the ridges and the hip, then click the endpoints of the other ridge and the valley. Your drawing will now look like this:



The final result—ready for roof planes.

Hint: Sometimes after doing a lot of trimming, there may be 'smudges' on the page. To refresh or redraw the screen, press F5.

The only things left to draw are the roof planes (they too are a rooftop object).

We have the same pitch all the way around the roof so use the pointer tool to select the roof perimeter. In the *****Pitched Roof***** section of the Smart Object Browser click Roof Plane. You are prompted for the pitch. Enter 4 (as in 4/12) and click ok. A 4/12 roof plane has been applied across the entire roof.

If we now look at our Takeoff Record it will look like this:

Takeoff Record - Pitched Roof Basic.RCG

Send View Preferences Rounding Utility

⇒ Area: 0.00 ⇒ Length: 0.00 ⇒ Count: 0

(Units: Feet)	Area	Length	Count
Roof A			
Roof Plane	2133.48		
Eave		206' 0"	
Rake Edge		23' 2"	
Hip		47' 11"	
Valley		16' 0"	
Ridge		81' 0"	

The Takeoff Record for our basic pitched roof.

The area of the roof is calculated taking into account the overall pitch of the roof, and the lengths of the hips, valley, and rake edge are calculated based on their individual pitches.

To learn how to draw roofs that use more than one pitch see Section 28, [Advanced Pitched Roof Tutorial](#).

Hint: We **HIGHLY** recommend you read Section 31; **Advanced Pitched Roof Topics**. It will explain how to identify pitched roof sections. This tutorial had only one section, but you will also need to understand how to handle facilities with multiple pitched roof sections.
