ePlan Takeoff Tutorial—Residential

A RoofLogic Digitizer license upgrades RoofCAD so that you have the ability to digitize paper plans, electronic plans and satellite images.

This tutorial is an introduction to how to digitize an ePlan (electronic plan). From the electronic plan you will create a drawing and produce takeoff quantities. For complete instructions on how to work with RoofCAD you need to read the other sections in the user Guide, especially Section 25, Basic Flat Roof Tutorial and Section 30, Digitizing with RoofCAD.

Hint:	**In this tutorial we will show you how to takeoff from plan view. To learn how to takeoff from elevations see Section 31; Advanced Pitched Roof Topics.**

This tutorial will work for both people who own and do not own a Digitizer license. Just keep in mind however, it was written from the perspective of someone who does not own a Digitizer license. The trial version of Digitizer has certain restrictions which we will point out along the way.

For best results we recommend using a large monitor. Large format monitors have come way down in price in recent years. Some of our customers are using monitors as large as 34".

So let's see how this thing works.

Acquire the ePlan File

ePlans can be acquired from many sources including plan rooms, architects, general contractors and services like iSquare Foot or Dodge McGraw Hill.

Each ePlan is a file. Usually the file is a .TIF file. RoofCAD, however, is capable of handling most popular graphic file formats.

If your ePlans are in PDF format you will need to use a third party document converter to extract the ePlan out of the PDF and get it in TIF format.

Hint:	**We have had good results with a product called Universal Document Converter. It installs a printer driver on your system. To extract an ePlan out of a PDF, first open the PDF and go to the page that has the ePlan. Next print that page to the Universal Document Converter printer. To get this product go to: http://www.print-driver.com/ .**

Load the ePlan

Trial Version Restriction: You can only load the sample ePlans that came with RoofCAD.

1. From the menu choose File|New|Empty. An empty page appears.
2. Choose the Digitizer/Satellite Trial|Load Eplan/Satellite Image menu option.
3. Navigate to the RoofCAD|Eplans folder and open the "Sample ePlan-Residential.jpg" file. The image is now displayed on the drawing page. We will first work with the plan view of the roof in the lower left corner.
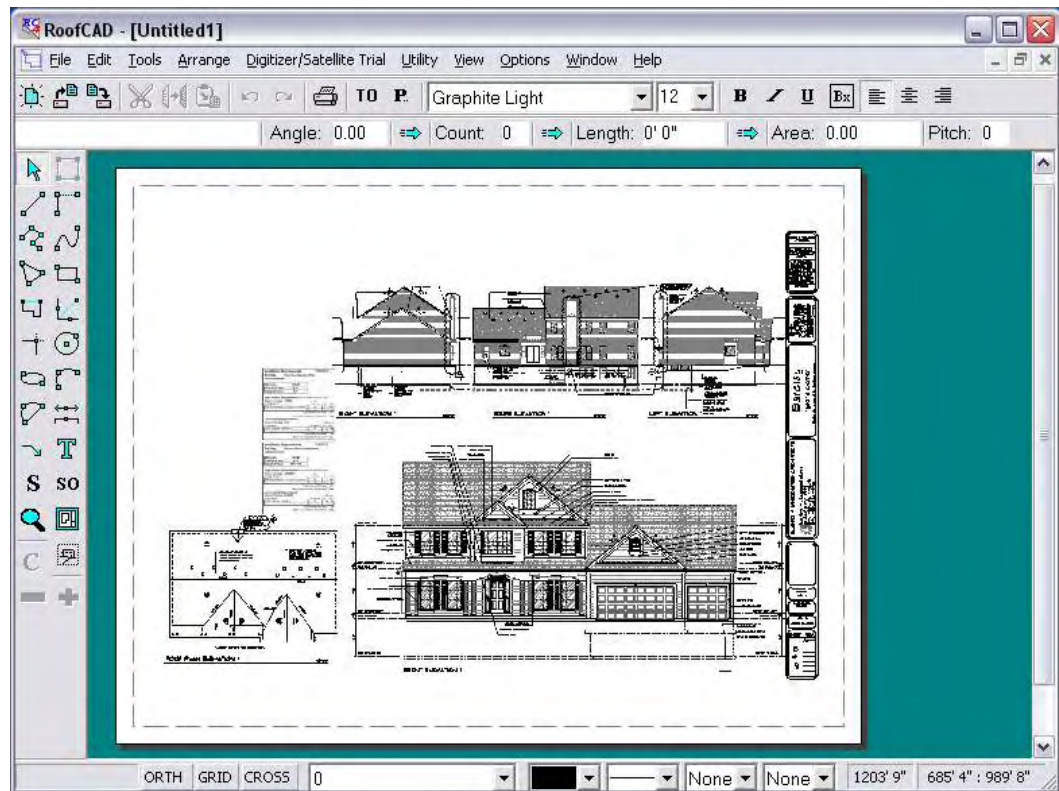
Simple Navigation Skills

In order to work effectively with the drawing you need to learn 3 simple skills.

Zoom In/Out

By far the easiest way to zoom in and out on the image is to use the wheel on your mouse. Roll the wheel towards you to zoom in. Roll away to zoom out. Give it a try!

One important thing to know is that the system orients itself based on your mouse pointer location. If you want to zoom in on an object, keep your mouse pointer on it as you roll the wheel. This takes a little practice but you will quickly get used to it.

If you get into trouble press F on your keyboard to reset the zoom level to full page view.

Mouse Wheel   Zooms you in and out.

Pan

While zoomed in you will want to pan around the image. This works somewhat like a PDF document. To pan, simply hold down the P key on your keyboard and you will notice the cursor turns into a hand symbol.

With the P button held down, press and hold down your mouse button. You can now move your mouse to pan the page. When you're done release the P key and the mouse button.

P   Hold down to pan.

Fit to Window

As mentioned above pressing the F key on your keyboard will reset the zoom level to full page view.

F   Resets zoom level to full page view.

Refresh

As you pan, zoom and draw the screen may get a little messy with false lines. Just hit F5 at anytime to clean them up.

F5   Refreshes the screen.

Large Cross Hair

The normal RoofCAD drawing cursors display a small cross hair. Turning on the large cross hair expands the lines of the cross hair to stretch edge to edge on the screen. This is really useful when drawing roof outlines because the longer cross hair line is easier to line up over a wall.

For most other drawing operations you will probably want the large cross hair off because it tends to get in the way and can sometimes leave false lines on the screen. If you get false lines, use F5 to clear them up.

To turn the large cross hair on and off press the C key on your keyboard. Try it now!

C   Turns large Crosshair on and off.

Ortho Mode

Ortho mode is extremely useful because it keeps the lines you draw straight, so you don't have to.

Ortho Mode locks your lines to predefined angles, thus making it easier to keep lines straight. RoofCAD ships with the Ortho angle set to 15-degree increments. Our experience has shown that most buildings have angles

divisible by 15 degrees, so you should be able to keep Ortho on much of the time.

If the system won't let you draw a line at the angle you want, simply turn Ortho off, draw the line then turn it on again.

When Ortho Mode is on, the ORTH button on the status line is depressed. You can click this button to turn Ortho on or off. Pressing the "O" key on the keyboard also toggles Ortho Mode on and off.

O   **Turns Ortho mode on and off.**

Those are the core tools you need to know to start drawing with satellite images.

Align the Image

This step will help you square the building to the drawing page. Most ePlans will be square already but for those that are not do this.

1. If Ortho mode is on, turn it off. To do this, press the O key on your keyboard.

2. From the menu choose Digitizer|Satellite Trial|Align Eplan. A message appears.
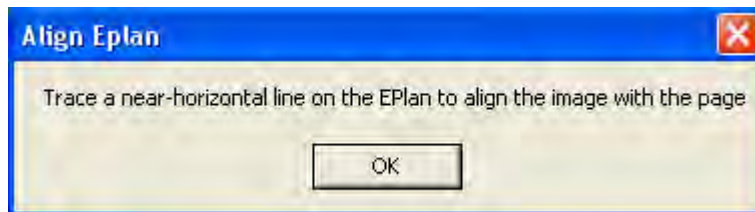
3. Click OK.
4. Now find a line that should run parallel to the bottom of the page. Click your mouse at the start and the end point of a line, similar to what we have done in the next image.

Hint: **If you are having trouble positioning the mouse exactly on the line, use the arrow keys on your keyboard. They are much more accurate. Be sure Grid Snap is off for best results. Press G on your keyboard. Grid Snap is off when the** GRID **button at the bottom of the screen is not pushed in.**
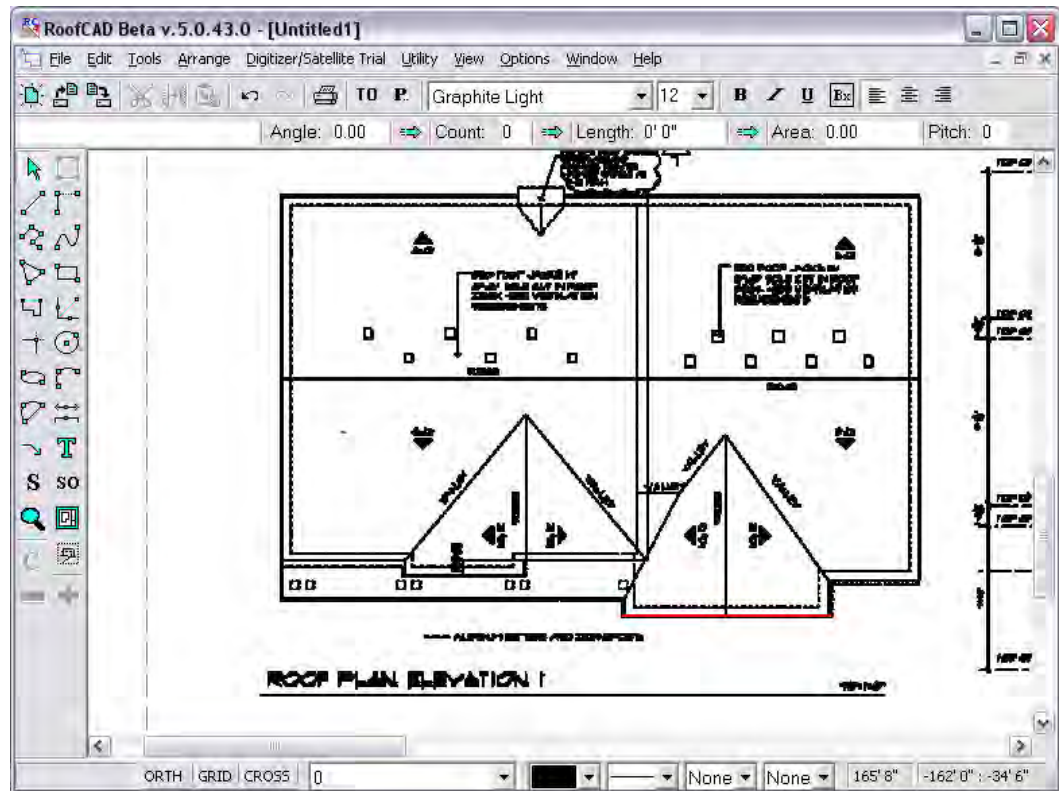
Your image is now square with the page.

Hint: As shown in our image it can help to zoom in.

You can do a quick check to see how square your drawing is with the page, by turning on the large crosshair.

The large cross hair is turned on by pressing the C key on your keyboard or clicking the CROSS button at the bottom of the page.

Now hover your mouse over the horizontal and vertical perimeter walls of the roof. The red crosshair line should run right along the wall. If it is skewed, run the Align ePlan option again. Having the image square to the page makes it much, much easier to draw.

C   Turns the large crosshair on and off.

Set Scale

Trial Version Restriction: You cannot enter a scale. You can only use the preset scale provided by RoofCAD.

There are two ways to set scale. Enter the scale indicated on the drawing or calibrate the scale.

A 1/8"=1' scale would be entered as 1/8. A 3/32"=1' scale is entered as 3/32.

Hint: **RoofCAD thinks of Imperial (English) scales in terms of 1" on the drawing being equal to so many feet on the ground. A** 1/8" scale **means that** 1 inch **is** equal **to** 8 feet **on the ground. A 1/16" scale means 1 inch equals 16 feet on the ground. A scale like 3/32" is a bit of an exception in that instead of "1 inch equals", this scale is expressed as "3 inches equals". This doesn't matter to RoofCAD, just input this scale as 3/32. Engineering scales are easy because they are pretty much always expressed as** 1"= something**. For instructions on how to handle Metric scales , see Section 14, <u>Digitizer Scale</u>.**

Once you have set a scale you should always verify it by measuring a known dimension on the drawing. If RoofCAD calculates a length different than the dimension you will need to use Calibrate scale, to come up with the real scale.

The trial version only lets you calibrate, so we will do that now. To calibrate a scale RoofCAD needs to know the length of something on the image. A dimension line is usually the easiest. Find the longest one you can. There are no dimensions on our plan so we will use a wall instead.

1. From the menu choose Digitizer/Satellite Trial|Set Eplan Scale. The Set Eplan Scale window appears.
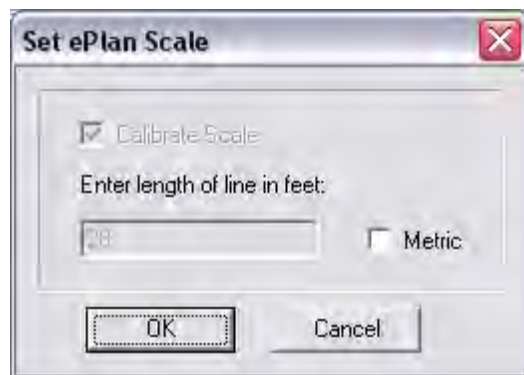
This is where you type in the length of one of the perimeter walls. In the trial version you cannot type in the length.

Now you will tell RoofCAD which wall is 28' long.
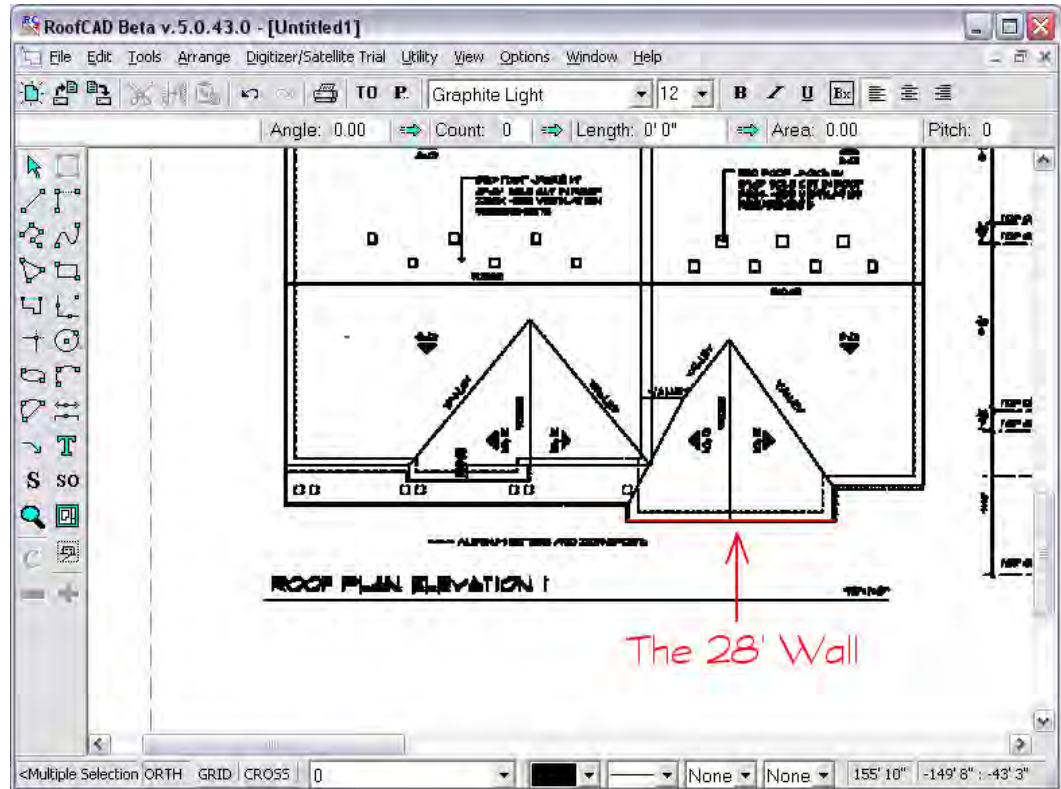
Don't click the drawing or you will start the drawing process. You first need to set focus to the main program window. The easiest way is to click anywhere in the title bar of the RoofCAD window. It looks like this.

2. Now zoom in a bit on the wall. If you have trouble, use the pan tool. If you get all messed up, hit F on the keyboard and try again.
3. Click the mouse at one end of the wall.
4. Now click the other end of the wall.

You will end up with a red line that looks like this.
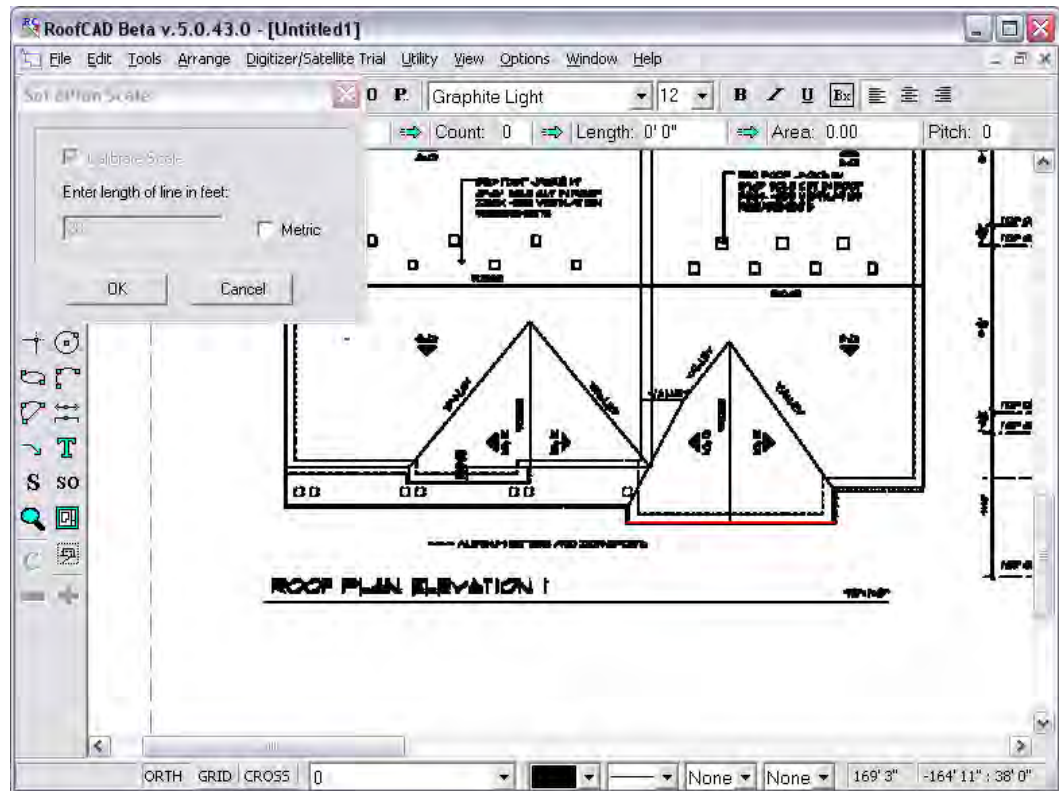
5. Now click the OK button on the Set Eplan Scale window. The scale has now been established.

Draw the Roof Outline

Now we will draw the roof outline.

1. Click the SO button on the left hand tool bar. The Smart Object Browser will appear.

SO

The Smart Object Browser button.

Usually it is best to position the Smart Object Brower in the upper right of the window. This will keep it out of the way. You can also resize the Smart Object browser. Making it taller is helpful.

2. Expand the ***Pitched Roof*** node and click the Pitched Roof (Dig) smart object. It prompts you for a roof name; click OK to accept the default.

We are now ready to draw the roof outline. However, let's make life easier by turning on the large Crosshair and making sure Grid Snap is off.

3. Press the C key on your keyboard. This turns on the large cross hair, which makes it easier to line things up.

C   Turns large Crosshair on and off.

4. Press G on your keyboard until Grid Snap is off.

Grid snap forces your cursor to "snap" to 1 foot increments. When Grid Snap is off, the GRID button at the bottom of the screen is NOT pushed in.

**G**   **Turns grid snap on and off.**

It will also help if Ortho Mode is on. Ortho mode keeps your lines straight so you don't have to.

When Ortho Mode is on, the ORTH button on the status line is depressed. Pressing the "O" key on the keyboard toggles Ortho Mode on and off.

5. Make sure the ORTH button is pressed in now.

O   **Turns Ortho mode on and off.**

6. Press F on your keyboard to reset the zoom level.
7. Now zoom in as show below.
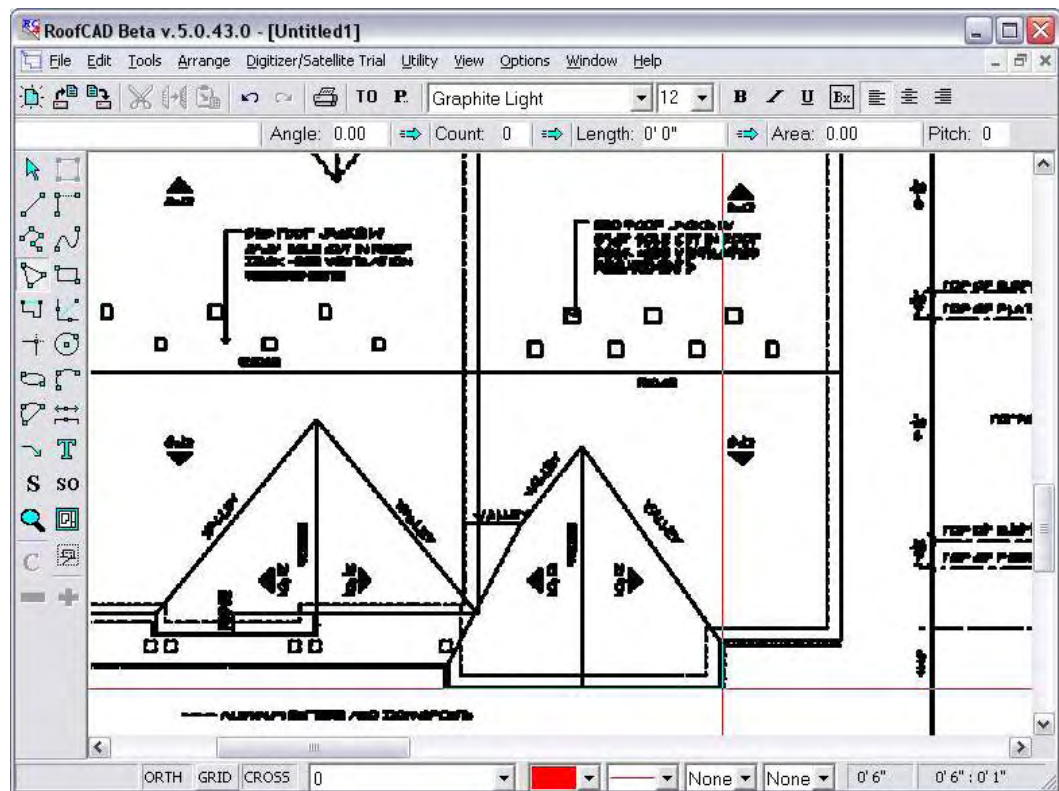
8. Click your mouse on the corner shown in the above image.
9. Now click the next 2 corners. Your screen will look like the next image.

Hint: **With Ortho on all you have to do is line up the crosshair with the next wall.**
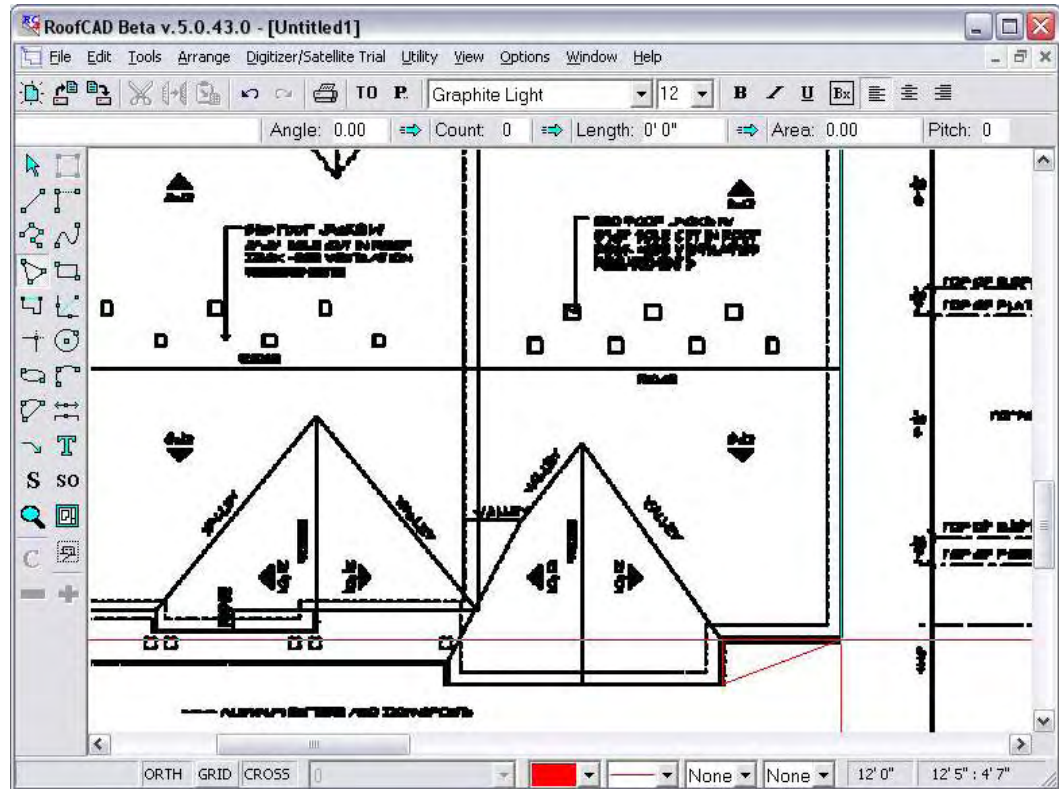
10. Now pan up and click the other end of the vertical wall. Hold down the P key on your keyboard and drag the satellite image. Release the P key when you are done panning.

11. Next finish clicking the rest of the corners, working counter clockwise.

Hint: **If at any time you want to start over, press Esc on your keyboard.**

The screen will get "messy". When it does press F5 on your keyboard to clear it up.

If you ever need to undo a mistake, press the Backspace key and the last point you clicked will be undone.

If you have trouble positioning the mouse, use the keyboard. You can draw by moving the mouse with the arrow keys. Pressing the space bar is the same as clicking the mouse.

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12. Once you have made it all the way around the roof, right click to finish. Your screen should now look like this.
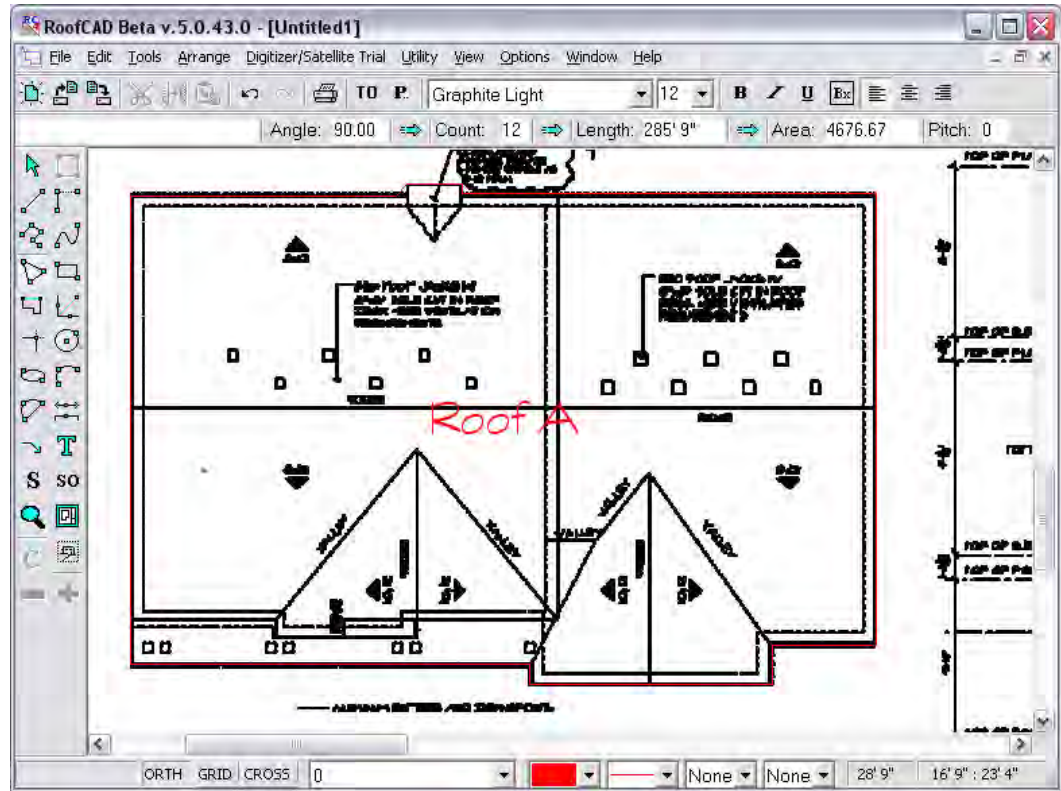
Press C on the keyboard to turn the large Crosshair off. We won't need it anymore.
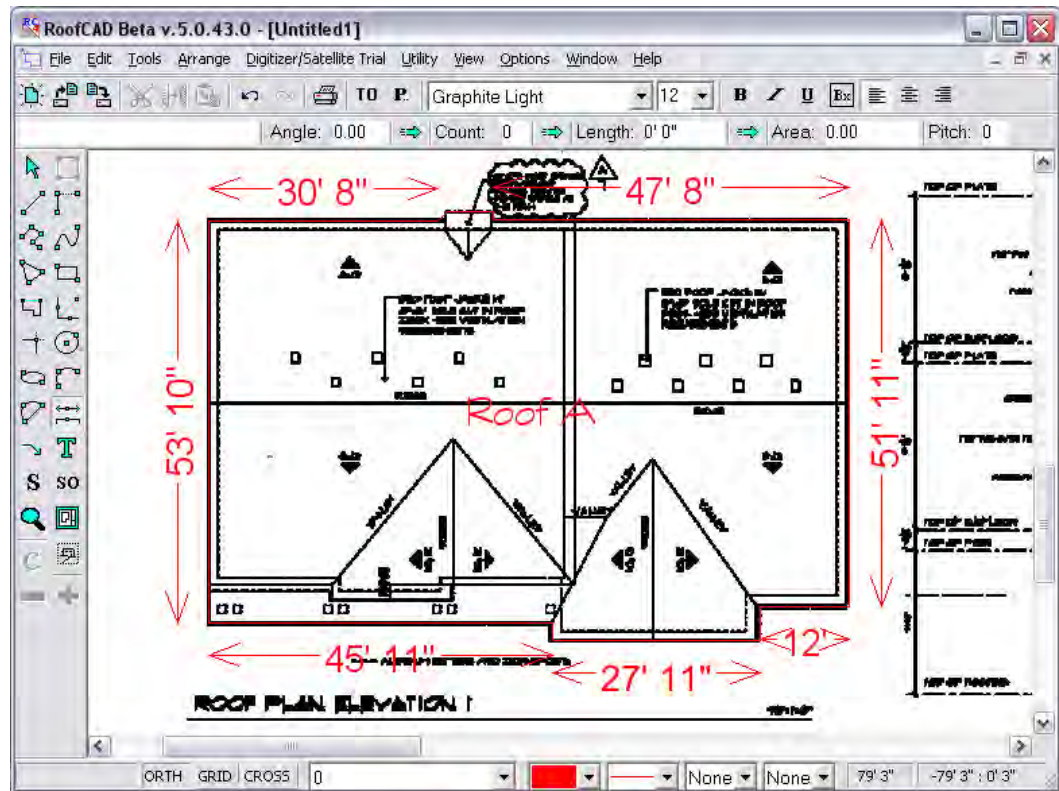
Add Dimensions

You can add dimensions at any time to your roof outlines.

1. Choose the dimensions tool from the left hand toolbar.

The Dimension Tool.

2. To add a dimension to a wall, click the wall. This highlights the wall.
3. Now click on the inside or outside of the wall and the system will place the dimension line where you clicked.

Feel free to add as many dimension lines as you like.

Move the Roof Labels

Our Roof A label is sitting right on a ridge, which is not a good spot. So let's move it.

1. On the left hand toolbar click the pointer tool.

The pointer tool.

2. Now click the tip of the cursor on the Roof A label. The text becomes selected.
3. Now drag the Roof A label off of the ridge. Find a spot on where it will not be in the way and drop it there.
4. Press Esc on the keyboard to deselect the roof label.

That's how you move things in RoofCAD.

Define Perimeter Walls, Hips, Valleys, Ridges...

Here is where we define all the lines on the image.

Eave, Rake & Step Flashing

Get ready to use the Pointer tool.

1   The next step is to select an Eave. Click on the Pointer tool button on the left side tool bar.

2. Then, with the mouse, position the tip of the pointer directly on an eave (not the rake edges). Click and the line will turn magenta in color. Do the same with all eave lines. Your drawing should look like the next image.
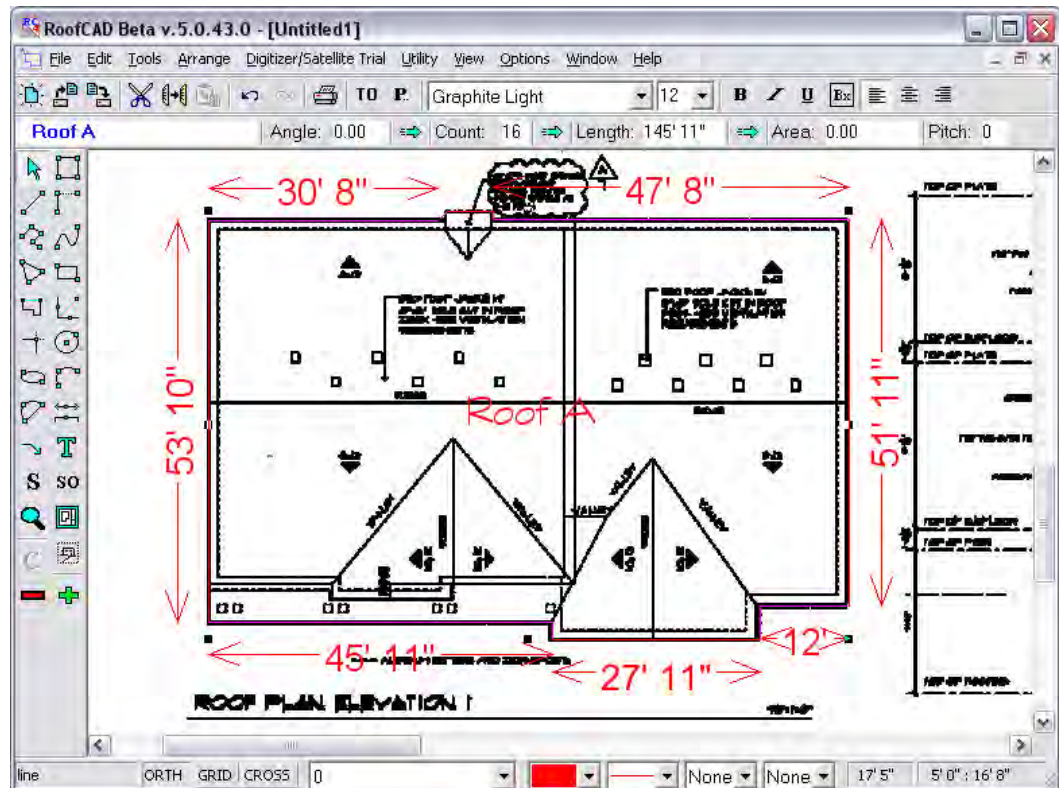
Hint: **The tip of the cursor arrow must be right on the line to select it. If you make a mistake and want to start over, press Esc on the keyboard.**

Some of the eave lines are pretty small, so you may need to zoom in to select them.

1. In the Smart Object Browser expand the Pitched Perimeter section and click Eave. The properties window appears.

Pitch and Overhang do not apply when digitizing. They are used when drawing from site measured dimensions. However to avoid confusion it is not a bad idea to set the pitch.

Height is optional; it has no effect on the quantity calculations.

2. Set pitch to 8 and click OK.

3. Press Esc on the Keyboard to deselect.

Hint: **Notice that the eaves are now black. Perimeter lines stay red until they are assigned a Smart Object. That way you don't miss any.**

All the remaining perimeter lines are Rake edges, except for the small dormer at the back of the house. It is actually a step flashing at a chimney. You have to look at the elevations to figure that out.

Also, the rake on the dormer at the front is a 10/12 pitch where the rest are 8/12. So here's how we handle that.

4. Select all the rake edges except for the front dormer now.
5. Click Rake Edge in the Smart Object Browser.
6. Set pitch to 8 and overhang to 0 and click OK.
7. Press Esc to deselect the lines.

Notice that the dimension lines on the rake edges have been updated to take into account the 8/12 pitch.

8. Now select the rake line on the dormer at the front of the house.
9. Click Rake Edge in the Smart Object Browser.
10. Set pitch to 10 and overhang to 0 and click OK.
11. Press Esc on the keyboard to deselect the rakes.
12. Now select the small step flashing at the back of the house, like in the next image.
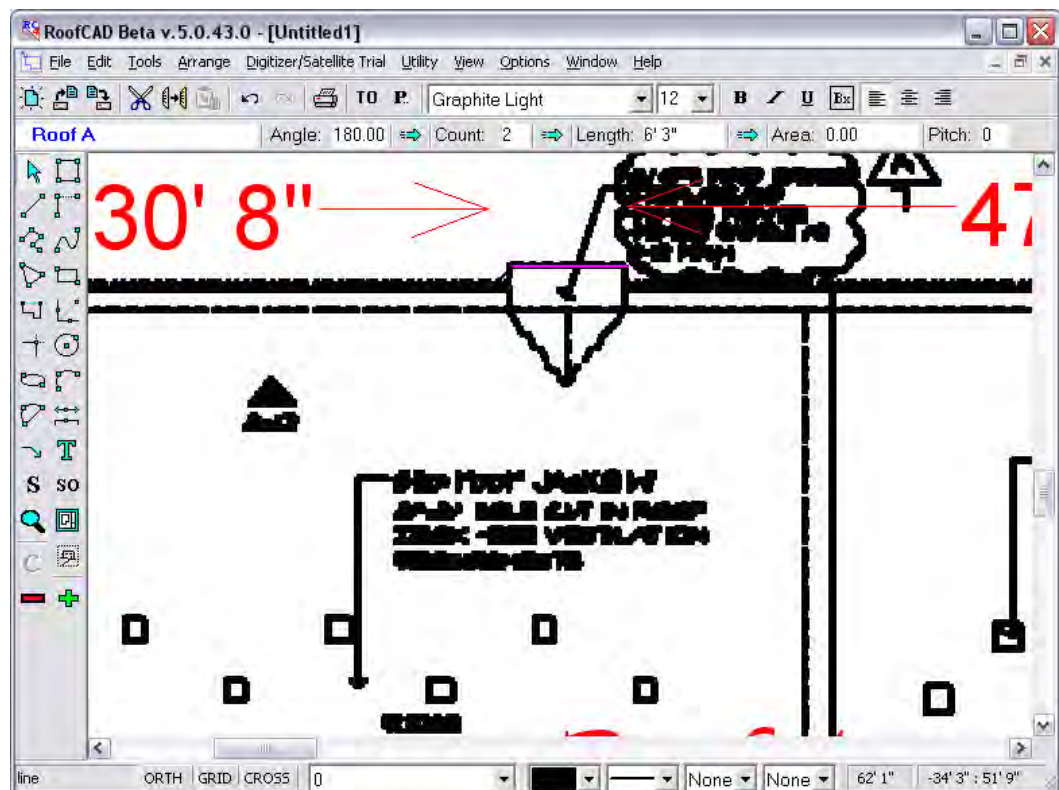
13. In the Smart Object Browser click End/Step Flashing. The properties window appears.

14. Set pitch to 8 and click OK.

15. Press Esc on the keyboard to deselect the line.

Now, because of the design of this roof there are some eaves and rakes that are not part of the outline. They get drawn in like this.

1. In the Smart Object Browser click Eave again. The properties window appears.

2. Click OK.

3. Using the next image as a reference, click all the points along eave 1.

4. Right click to finish.

5. Click the start and end point of eave 2.

6. Right click to finish.
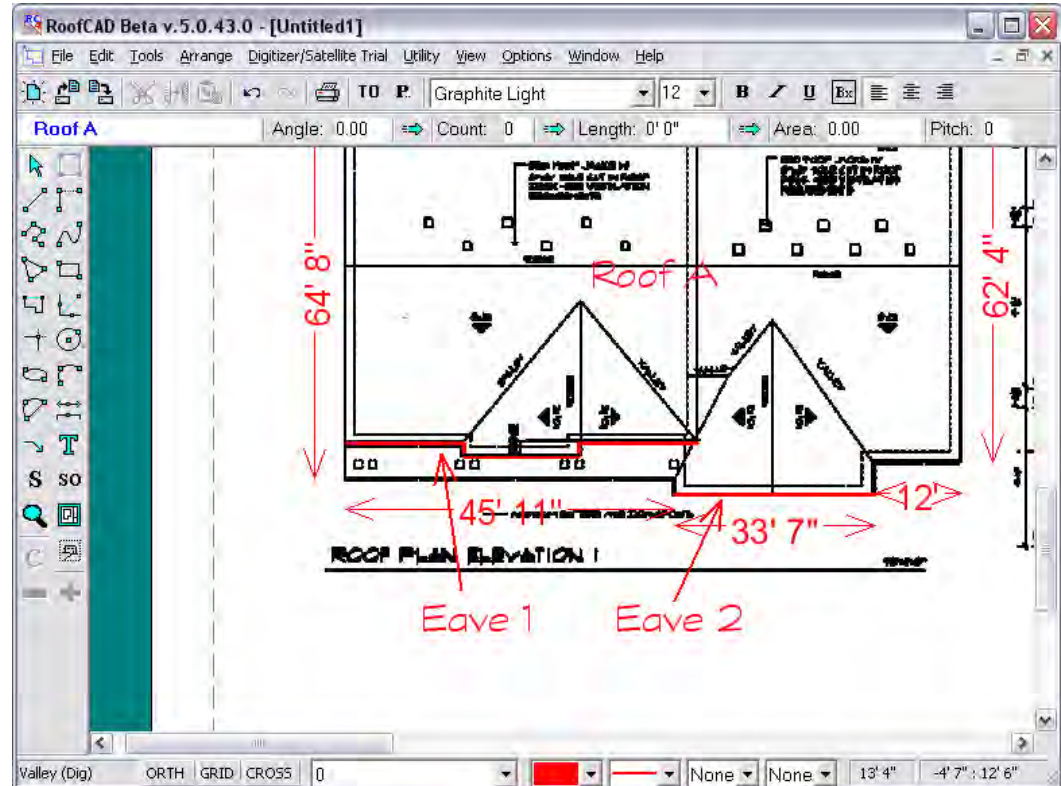
7. Now, in the Smart Object Browser click Rake Edge. The properties window appears.

8. Click OK.

9. The next image shows the two lines we need to draw. Click the start and end points of the first line.

10. Right click to finish.

11. Click the start and end points of the second line.

12. Right click to finish.
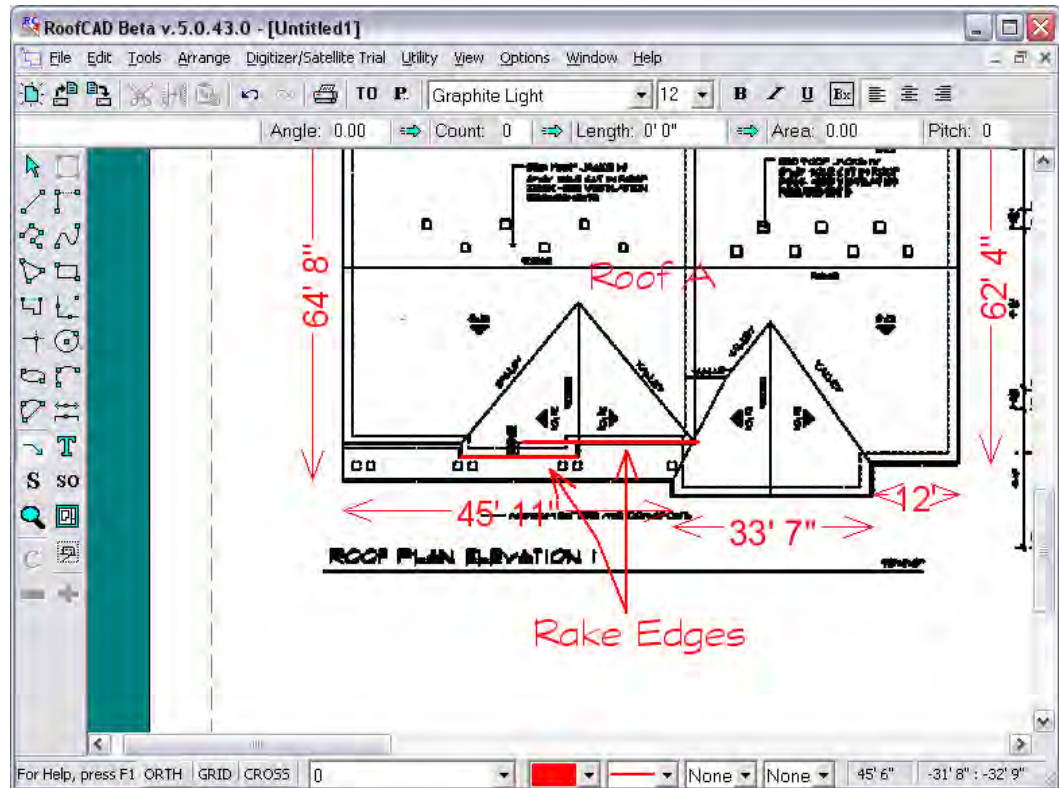
This is how you draw lines that are not part of the roof outline.

Valleys, Ridges

There are no hips on our drawing but they work the same way as valleys.

1. In the Smart Object Browser click Valley (Dig). The properties window appears.
2. Enter 10 for the pitch and click OK.
3. Press O to turn Ortho mode off.

Hint:	If the dormer and the main roof were both the same pitch, the valley would have run at a 45 degree angle and you could have left Ortho on.

4. As in the following image, click the mouse once at the start and end of the valley.
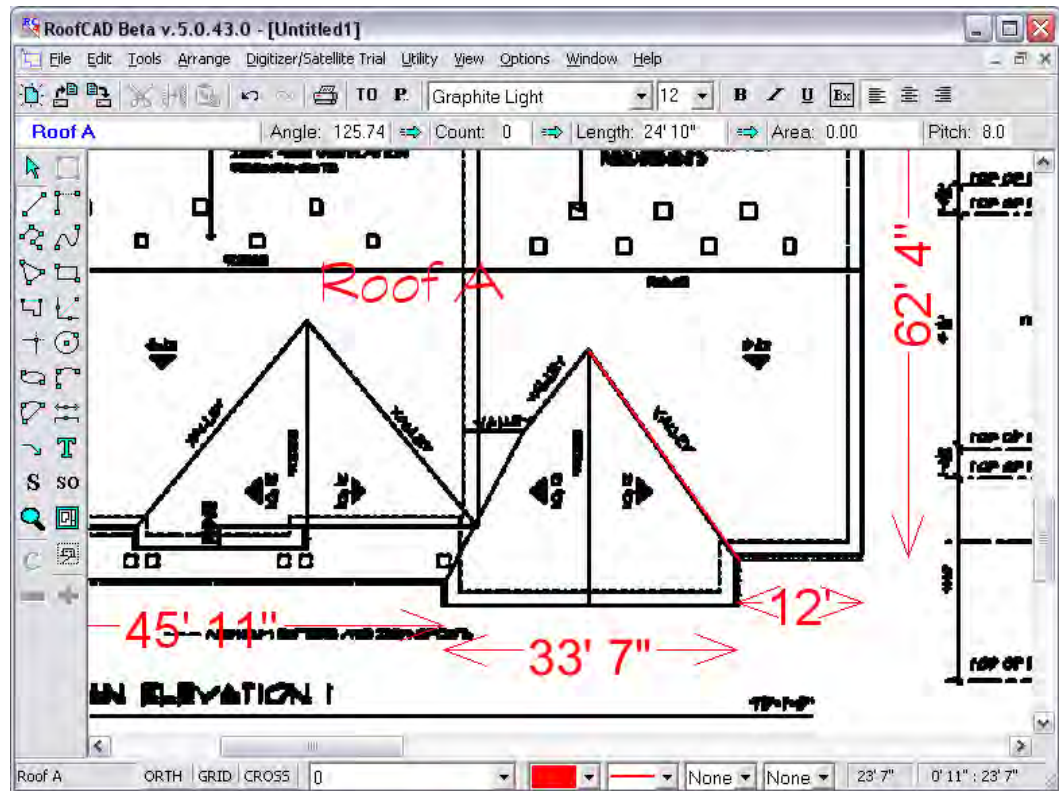
Here is another feature that will help. It is called Snap to End Point. We will demonstrate it by drawing the valley on the other side.

1. Hold down the CTRL key and click the mouse where the two eaves meet. CTRL makes the end of the valley snap exactly on the corner.

Hint: **If you make a mistake press Esc. This terminates the current drawing operation and lets you start again.**

2. Release CTRL because we don't have anything to snap to at the other end of the valley. Now click where the valley meets the small slope change line (incorrectly labeled as a valley on the drawing). Your drawing should look like the following image.
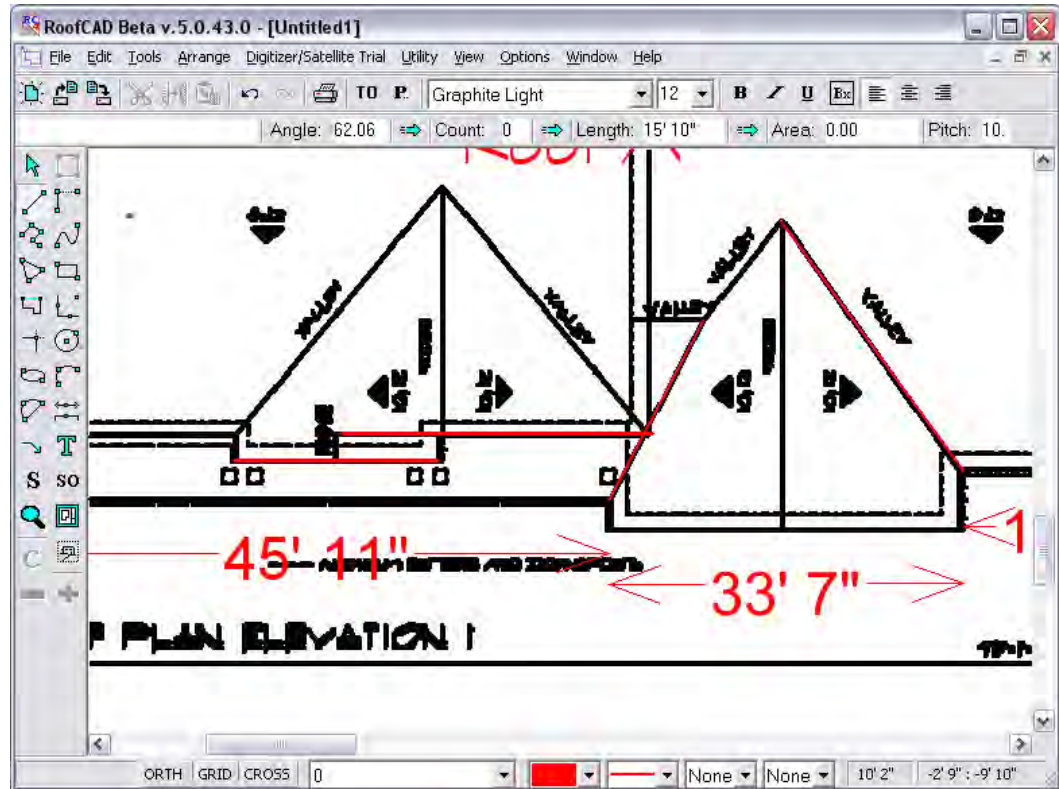
3. Hold down CTRL again and draw the second leg of that valley.

4. Now draw the remaining valleys.

While we are at it, let's draw that slope change line.

1. In the Smart Object Browser choose Slope Change. The properties window appears.

2. Enter 8 for the pitch and click OK.

Hint: **The pitch for a slop change is always the same as the pitch for the upper roof plane.**

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3. Draw the slope change line.

Ridges are drawn the same way. Of course, ridges don't have a pitch factor to enter. We will let you draw the ridges on your own. Your drawing should end up looking like the following image.

There are also head walls that need to be identified as per the next image. We'll let you handle that as well.
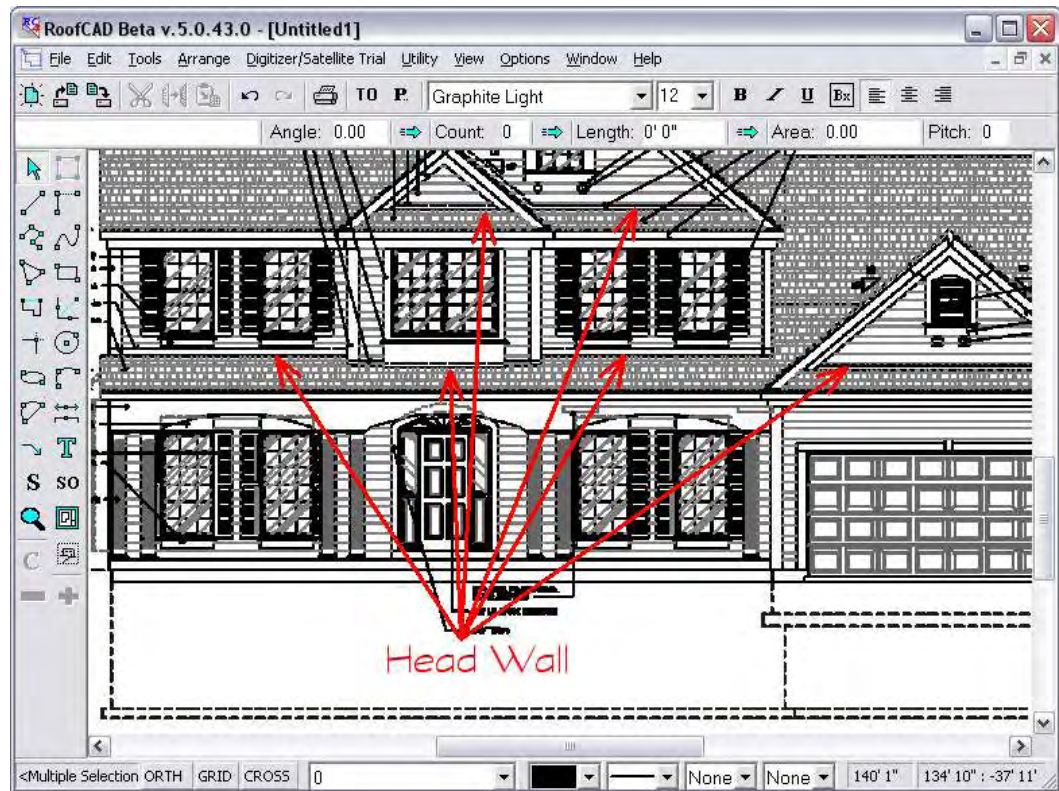
Finally we will draw the step flashing where the lower roof connects to the wall for the upper roof.

1. In the Smart Object Browser click End/Step Flashing. The properties window appears.
2. Enter 8 for pitch and click OK.
3. Now draw the step flashing.

Hint: **Remember to turn Ortho mode off if it is not letting you draw the line at the angle you want. Press the O key to turn it off and on.**

Keep using CTRL to connect all your lines. It will make a neater and more accurate drawing.
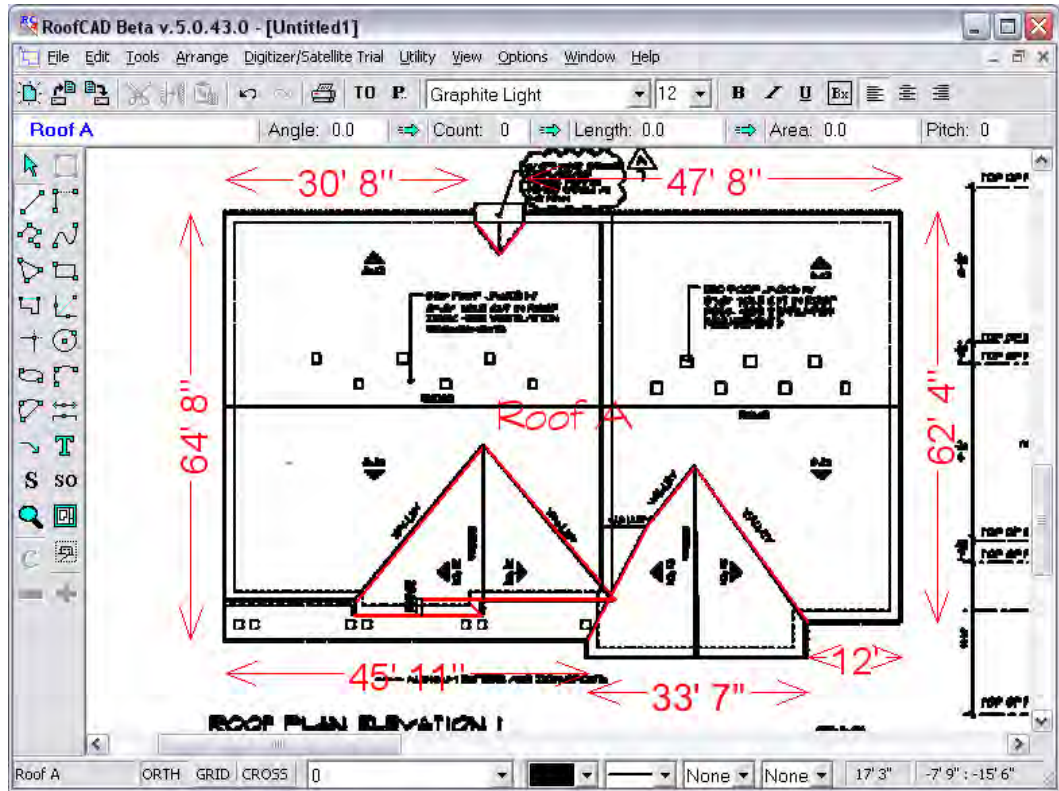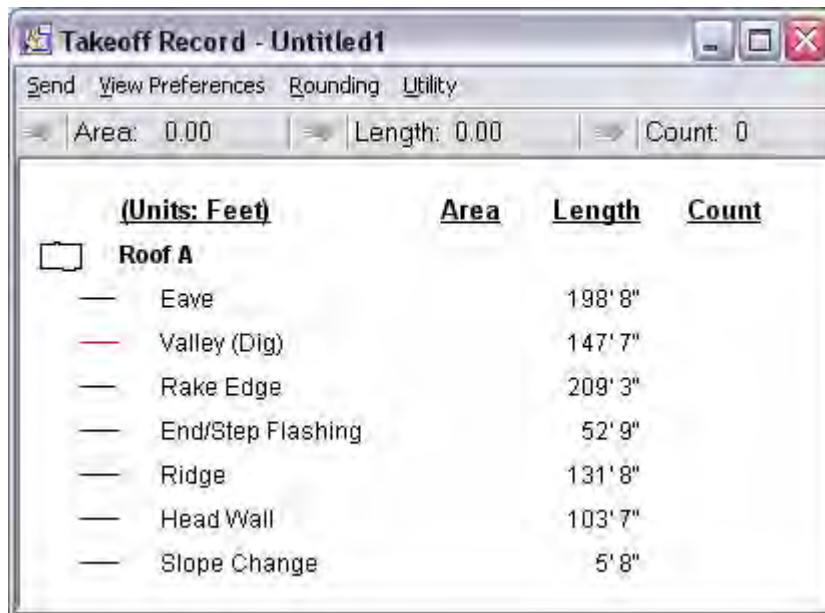

So let's see the quantities generated so far.

Click the Takeoff Record button on the top toolbar. The Takeoff Record appears like in the next image.

TO

**Opens and closes the Takeoff Record.**

Draw the Roof Planes

Roof planes are what generate the square footage of the roof. There are two ways to draw roof planes.

1. When there are roof planes of different pitches or the roof is broken up in any way, you need to draw each roof plane individually. For example if there was a flat roof or an opening in the middle of the pitched roof, you must use this method.
2. If the pitch of every roof plan is the same and the roof is unbroken in any way, you can select the roof outline and click Roof plane.

Our roof has three different pitches and is broken up into an upper and lower section so we have to use Method 1. We will first draw the odd lower roof plane.
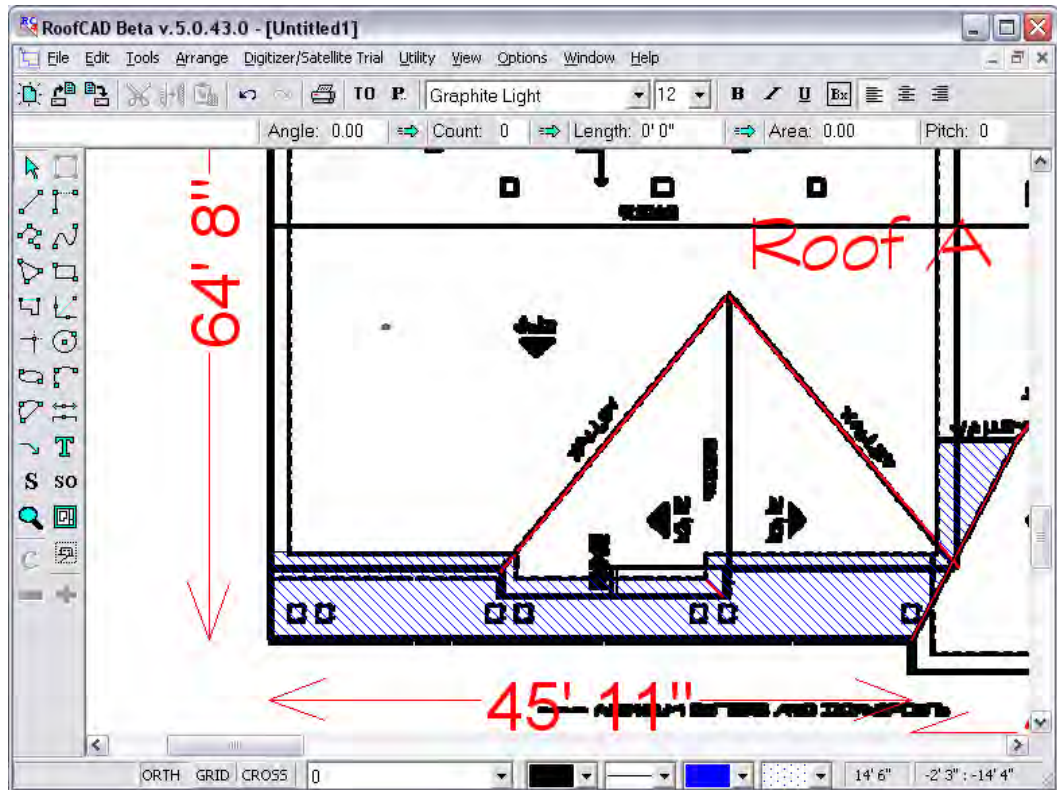
1. In the Smart Object Browser click Roof Plane (Dig). The properties window appears.
2. Enter 6 for the pitch and click OK.
3. Click all the corners of the lower section as shown in the above image.
4. When you are done, right click the mouse to finish.
5. In the Smart Object Browser click Roof Plane (Dig) again. The properties window appears.
6. Enter 10 for the pitch and click OK.

7. Hold down the CTRL key and click all the corners of the two 10/12 dormer type roofs like in the next image.

8. When you are done, right click the mouse to finish.
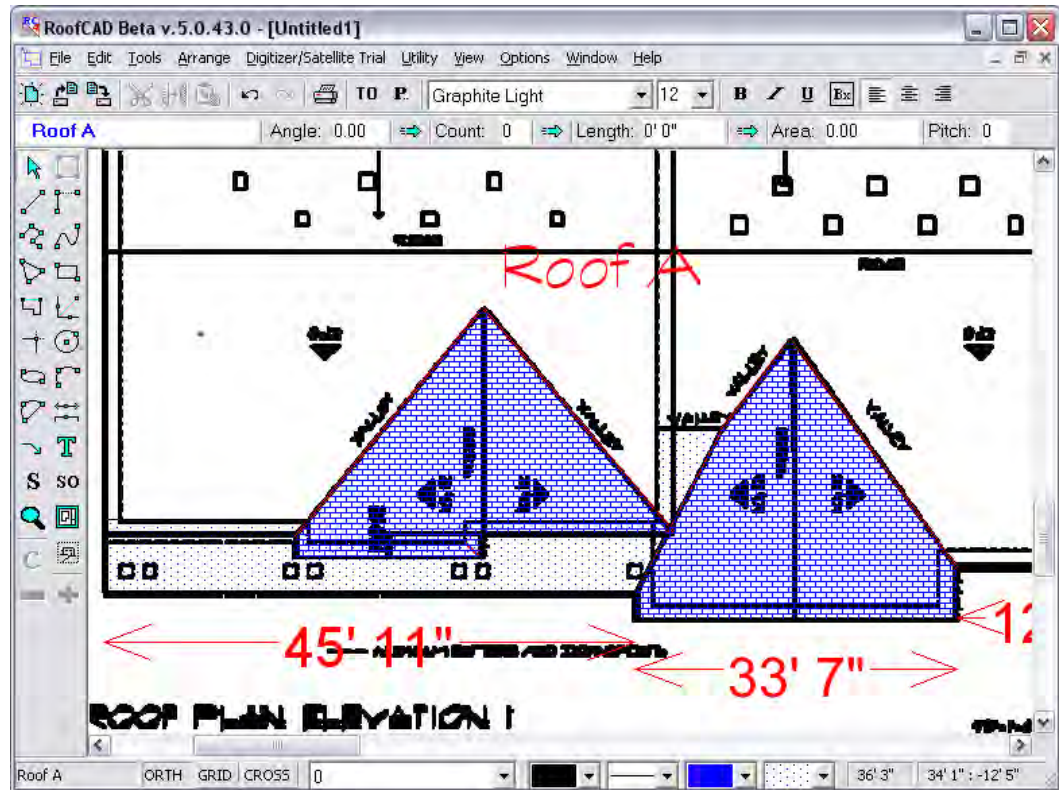
That's it. Not too tough, eh? We'll let you draw the remaining two roof planes. Let's have a look at the result.

1. Open the Takeoff Record.

TO

Opens and closes the Takeoff Record.

See how we have a total area for the roof planes, even though they have three different pitches? On the menu at the top of the Takeoff Record (NOT THE ROOFCAD WINDOW) choose View Preferences|Detail.

Now you get a line item for each Roof Plane.

2. Click any of the roof planes in the list and RoofCAD highlights it for you on the page.

3. On the menu at the top of the Takeoff Record (NOT THE ROOFCAD WINDOW) choose View Preferences|Itemize. This sets the Takeoff Record back to the default view.

Add Roof Top Objects

As you can see in the Smart Object Browser there are many other things you can draw. We will leave you to experiment with most of them. However, to give you the flavor let's add an HVAC unit, some plumbing stacks and roof vents.

On our sample drawing there are no plumbing stacks so we'll pretend.

1. In the Smart Object Browser, expand the Pitched Curbs section.
2. Click on Pitched Curb (HVAC). The system prompts you for the dimensions. Enter 4 for the length and 4 for the width. Leave Height at 1'6", this is the flashing height.
3. Now choose a place on the roof and click. The HVAC unit appears.

Hint: **The area under the unit can be deducted from the roof plane it sits on but this is not done automatically. To do this you need to draw the opening with the Pitched Opening (Dig) Smart Object.**

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1. Expand the Pitched Penetrations section and click Pitched Plumbing Stack. The Properties window appears. Click OK to accept the defaults.
2. Click on the drawing to add a plumbing stack.
3. Click on Roof Vent.
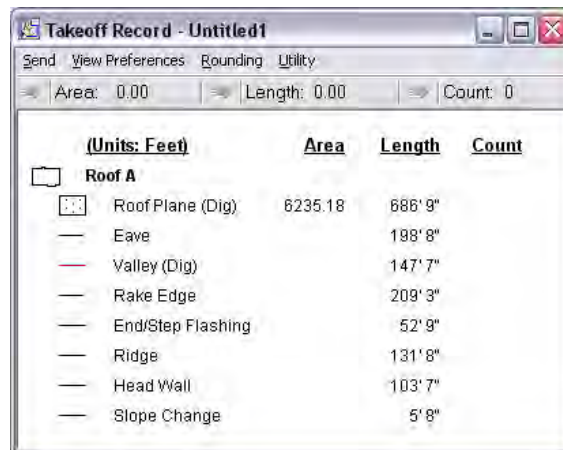4. Click on the drawing where all the roof vents are.

It's that simple.

Click the Takeoff Record button to see the quantities that have been generated.

TO

Opens and closes the Takeoff Record.

The next image shows how our Takeoff Record turned out.

Our Drawing is Complete

There are many other pitched roof objects you can draw. We suggest you go through all the other tutorials in the manual to see how everything is done. Before we print let's do a few more things.

Rescale

If you discover you have digitized the ePlan at the wrong scale you can use our rescale feature to fix it. The rescale feature corrects every line on the drawing and recalculates all quantities.

You can't do this in the trial version but here is how it would work. To use the feature choose Digitize/Satellite Trial|Recale from the menu. Then you enter the correct scale and click OK.

Change the Color of your Dimensions

If your dimensions are red and you want to change them to black (or any color), do this.

1. With the pointer tool select all the dimensions.
2. Click the color pallet button at the bottom of the window as show in the next image.
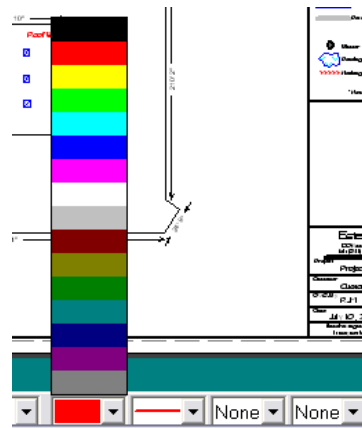
3. Choose a color.
4. Press Esc on your keyboard. The dimensions are now the new color.

Apply a Template

Now we're almost done. You can make your drawing complete by applying a template.

1. First hide the ePlan image by choosing Digitizer/Satellite Trial|Hide ePlan from the menu.

Hint:	If you delete or move the ePlan on your computer you will not be able to show it again. You will have to use the Load ePlan option instead.

2. Now, from the menu choose File|Apply Template. Navigate to the RoofCAD\Templates folder. The system displays the available templates.
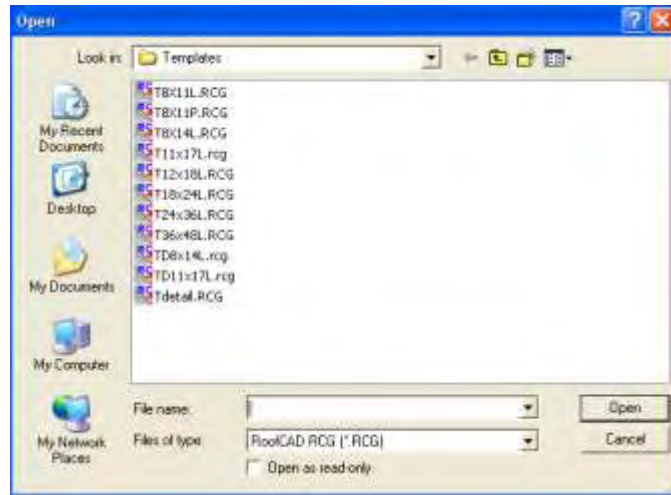
3. Select the T11x17L.rcg template and click Open.

Applying a template means choosing a paper size, in this case 11x17, and adding a legend to your drawing.

The legend and title block can be customized for your company. For example you will want to get your company name or logo on every template.

To improve the look of your drawing you will probably need to change the drawing scale and center the roofs on the page.

Center Drawing on Page

- From the menu choose Edit|Select Layer.
- Drag the roofs to the center of the page so that it looks right.

Hint:	You can also select by choosing the pointer tool, then drawing a rectangle around everything you want selected. If you make a mistake hit Esc and try again.

Change Scale

- From the menu Choose Options|Drawing Settings
- In the Scale area change the feet side of the scale.

Hint:	A higher number decreases the size of your roofs on the page and a lower number does the opposite.

Print the Drawing & Takeoff Record

Before you print, you need to decide whether to leave the satellite image on the drawing or not. To hide it, choose the menu option Digitizer/Satellite Trial|Hide Eplan.

Now all you have to do is click the print button or choose File|Print|Print Drawing.

To print the takeoff record, choose File|Print|Print Takeoff Record.

Hint:	We HIGHLY recommend you read Section 31; <u>Advanced Pitched Roof Topics</u>. 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.

This completes our tour, for more information or a live presentation over the Internet please call us at (416) 778-0843.