

Section 1

How to Start a New Drawing

This tutorial will step you through creating a flat roof drawing from a rough site sketch. It does not cover every RoofCAD feature but covers enough to give you a feel for how RoofCAD works.

Start RoofCAD by double clicking the icon on your desktop.

- From the RoofCAD menu choose File|New|Use Template (or click on the New button).



Click the New button.

A new drawing is started with a legend and a title block already on it. RoofCAD will now look like this:



Templates are just normal RoofCAD files that have been set up to help you start drawing faster. You can modify the templates shipped with RoofCAD or create new ones.

How to Set the Drawing Scale

Scale can be set and changed at any time but it is easier if you get the scale close before you start drawing. To help you set the scale we provide the following chart. We recommend you copy the chart and keep it by your computer until you get used to using it.

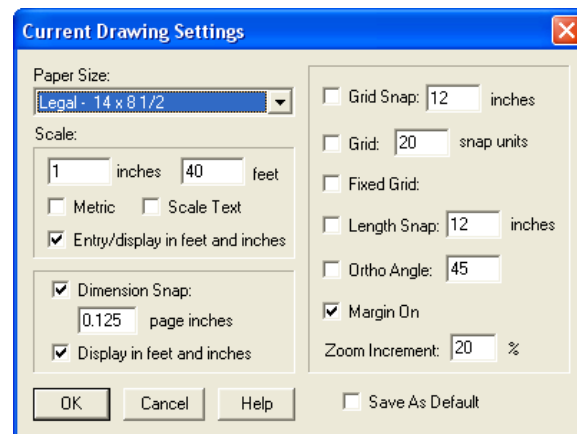
To use this chart, find your page size across the top then look under the page size for the overall size that your building would fit in.

General Scale Guideline

	11 x 8½ Template	14 x 8½ Template	17 x 11 Template
Scale	O/A Size of drawing.	O/A Size of drawing.	O/A Size of drawing.
1" = 10'	60' x 60'	80' x 60'	110' x 80'
1" = 20'	110' x 110'	165' x 125'	245' x 175'
1" = 30'	160' x 180'	250' x 180'	370' x 260'
1" = 40'	240' x 250'	330' x 260'	495' x 355'
1" = 50'	280' x 310'	420' x 330'	620' x 435'
1" = 60'	330' x 380'	500' x 400'	730' x 530'

We are using the 14 x 8 ½ template and our building's overall size is 268' by 126', which will fit in the 330'x260' size, so our scale will be 1"=40'. To set the scale:

- Choose Options | Drawing Settings from the RoofCAD menu. The Drawing Settings dialog appears and looks like this:



Notice that the scale already is 1"=40'. So, for our example, we do not need to change the scale.

- Click the Cancel button. The Drawing Settings window closes.

How to Draw a Roof Section Outline

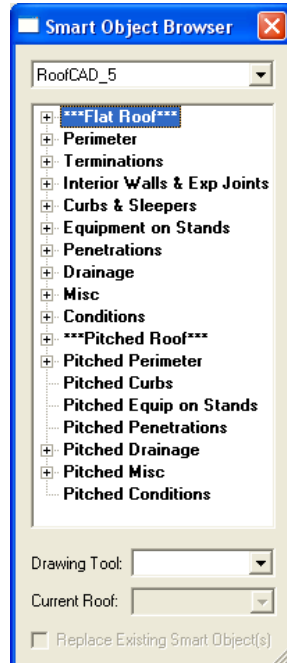
Now we will take you, step by step, through drawing a roof outline from a rough sketch. The sample sketch we will use is from an actual roof survey done by one of our customers.

- To get started, choose Tools | Smart Object Browser from the RoofCAD menu or click the toolbar button on the left hand toolbar.

SO

The Smart Object Browser button.

The Smart Object Browser appears and looks like this:



We will keep the Smart Object Browser on screen while we create the roof drawing. So if necessary move it to a location on the screen that is out of the way of your drawing, usually the upper right corner. RoofCAD will remember where you place the browser, so that each time you access it, it will appear in the same place.

Tip: If the Smart Object Browser is too small, resize it. Hover your mouse pointer over the bottom of the browser until your pointer changes to a double-headed arrow. Press and hold your left mouse button and drag the bottom of the browser window down until you have the desired size.

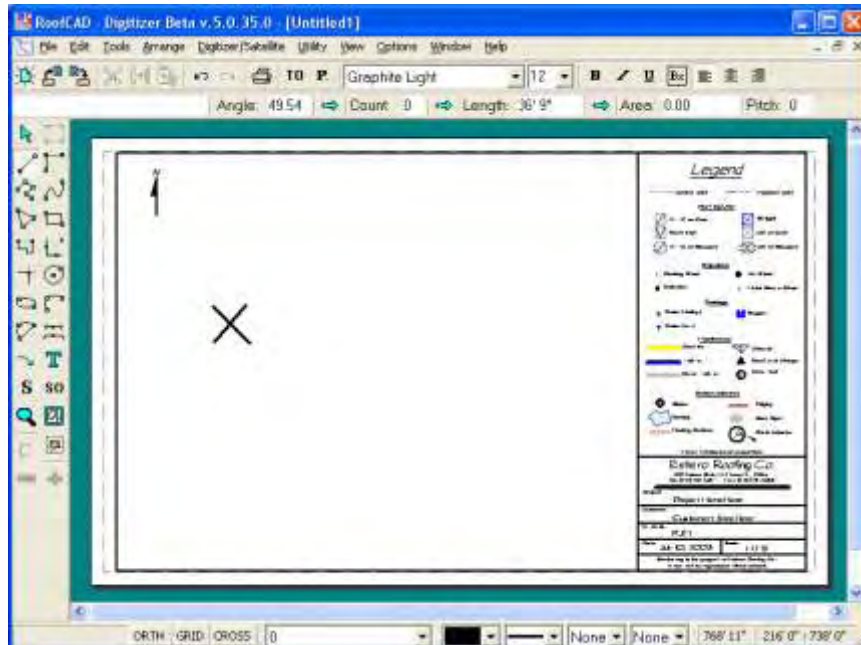
Hint: Do not hang any part of the Smart Object Browser window off the screen or RoofCAD will not retain its position.

- Click on the top heading *****Flat Roof*****.

The Smart Object Browser displays a list of common roof objects. Notice the objects marked (Dig). RoofCAD can be used to draw/takeoff from a satellite image, electronic plans or paper plans (digitizing board required). You would only use these objects if you were digitizing from any of these types of plans.

Hint: Why not try out our satellite image and electronic plan tutorials. See **Tutorials & Movies** under the **Help** menu.

- Click the Flat Roof item and the Roof Properties dialog appears.
- Here is where you name the roof. Click OK to accept Roof A.
- Now move your mouse cursor onto the page and position the cross hair of the cursor approximately where the X is in the following illustration:

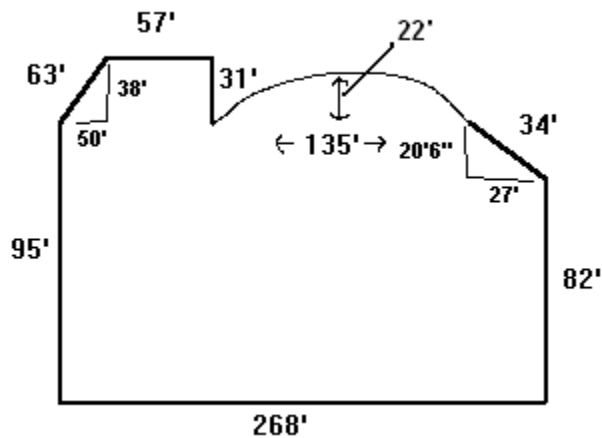


- Once positioned, click the mouse. The Layout Wizard window appears. It looks like this:



Move the Layout Wizard window to a convenient location. The top right corner of your screen will do. This will place it over the Smart Object Browser but that's OK. We won't need the Smart Object Browser while we are drawing the roof outline.

The Layout Wizard allows you to type in the wall lengths and angles that make up the outline of the roof. Even walls with unknown angles are easy with the Layout Wizard. Below is a picture of the roof outline we will be drawing:



Now let's start drawing our roof. The contents of the Length prompt in the Layout Wizard should be highlighted. If not make sure it is.

- Type 95 (the length of the first wall we will draw) and press the down arrow key (on your keyboard). Notice that RoofCAD has drawn the first wall much as it appears on our rough sketch. RoofCAD uses the arrow keys to draw the basic left, right, up, and down lines. (We will show you in a minute how to handle odd angle lines.)
- Press Enter. Pressing Enter is the equivalent of clicking on the Next button. RoofCAD starts a new wall. The new wall is the same length as the previous wall and is 90 degrees to the previous wall. If you are drawing a square roof this works out well but since we are not, we have to correct it by typing in the length of the next wall.

Tip: Notice the dashed line connecting the end of the second wall back to the starting point of the first wall. RoofCAD always closes the roof outline for you. This dashed line represents what will be the final wall if we were to finish the outline now.

- The length field is highlighted once again. Type 268 (the length of the next wall), press the right arrow key, then press Enter.

Hint: You did not actually have to press the right arrow key because the wall was already running to the right. However in the beginning it may be easier for you to get in the habit of pressing the arrow key every time.

Type 82, press the up arrow key, then press Enter. The third wall is now complete.

Odd Angle Walls

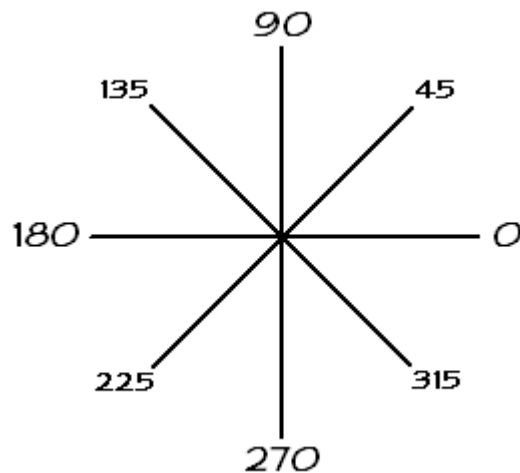
The next wall of our roof is at an odd angle. We know it is not 45 degrees because of the measurement we made on the roof. Having squared off the angle with a measuring tape on the roof, we know that the wall's end point is 27 feet to the left and 20 feet 6 inches up from the starting point (i.e. not a 45 degree angle). To handle this type of wall we make use of the Horizontal and Vertical fields.

- Press the Tab key 3 times and the Horizontal field will be highlighted.
- Now type 27 and press the left arrow key.
- Press the Tab key once and the vertical field will now be highlighted.
- Type 20.6 and press the up arrow key. Notice that the Horizontal and Vertical fields now reflect what you typed including the Up and Left (displayed to the right of these fields). Also notice that the wall on screen looks like the one in our drawing.

Hint: Notice that you typed 20.6 but the system understood that the .6 meant 6" not .6 of a foot. This is because the drawing has been set to accept feet and inch input.

- Press Enter and move on to the next wall.

Tip: You won't always have the horizontal and vertical dimensions to go by. If this is the case you can guess at the angle of the wall. To do so you type in the length of the wall in the Length box then you tab down to the Angle box and enter an angle based on the following diagram. After entering the angle press Tab and you will see the wall change per your input. If the wall does not look right, press Shift + Tab to get back to the Angle box and try a new angle. Keep trying new angles until you are satisfied. When you are done with the wall press Enter to move on to the next wall.



Angles in RoofCAD work the same as any CAD program. When you draw a line the angle of the line is relative to the starting point. Reference the above diagram when deciding the number to input for an angle. If you think of the preceding illustration as 8 separate lines that start from the center point you can see the angle you would have to enter for each line to run the direction that it does. The angles we display in the diagram are the angles you would use for 90 & 45 degree lines.

The next wall is a radius or arc as we call it in RoofCAD.

The rough sketch shows the two dimensions you need to draw an arc.

- Press the tab key twice. This moves your cursor back to the Length field.
- Type 135, and press the left arrow key and **DO NOT PRESS ENTER**. This is what we call the base of the arc.
- Now check the Arc checkbox on the Layout Wizard window. Notice how the line bows a little and the length field is now labeled Distance to Base. This is where you enter the depth of the arc.
- Type 22 and press tab. See? Now you have an arc.

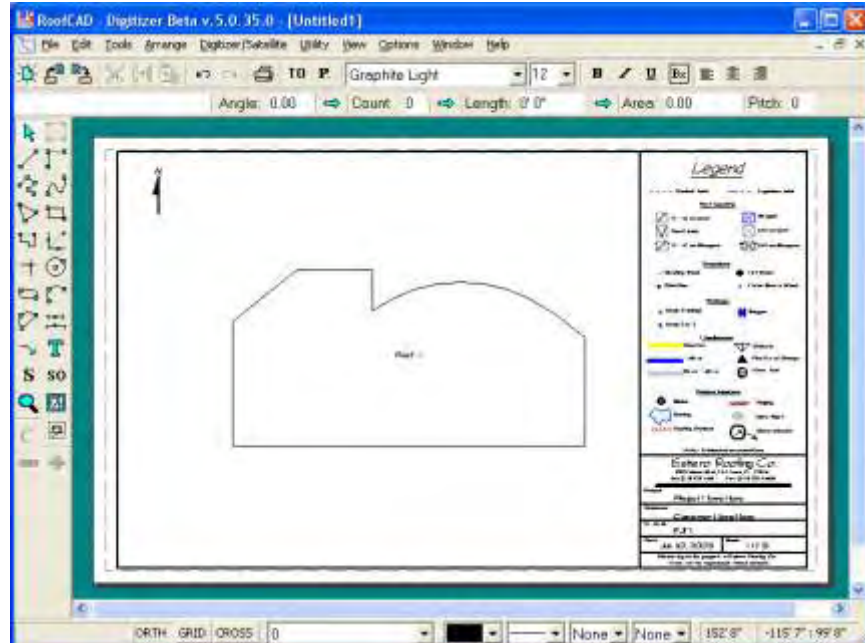
Now let's finish the outline of our roof.

- Press enter to move to the next wall.
- Type 31, press the up arrow key and press Enter.
- Type 57, press the left arrow key but **DO NOT PRESS ENTER**. Since this is the second to last wall, all you have to do is click the Finish button. RoofCAD draws the final wall for you.

Hint: If you pressed Enter by mistake, RoofCAD draws a new wall. Remember that the dashed line is also a wall (or will be when you click the Finish

button) so we have one more wall than we need. To correct this, click the Remove button and the new wall is removed. Then click Finish.

Your screen should now look like this:



If you have multiple roof sections to draw, you handle each one the same way. We recommend that all roof sections be drawn separately, so that you can get a roof area for each as well as the total for the entire drawing. Drawing multiple roof outlines is discussed fully in Section 26, Flat Roof Tutorial--Advanced, in your RoofCAD manual.

Section 2

Note: If you are picking up at this point in the tutorial, you don't have to draw the basic outline of our Flat Roof again. It has already been done for you. Simply load the file:

RoofCAD\Tutorial Drawings\Roof Basic Outline.rcg

Define the Perimeter Walls of the Roof Section

We will now define each of the walls of the outline. This involves assigning one or more Smart Objects to each wall. By this we mean, is the wall a 24" parapet with a coping cap or is it a gravel stop, etc.

- If you do not still have the Smart Object Browser on screen choose Tools | Smart Object Browser from the RoofCAD menu or click the Smart Object button on the toolbar.

SO

The Smart Object Browser button.

The Smart Object Browser appears and looks like this:

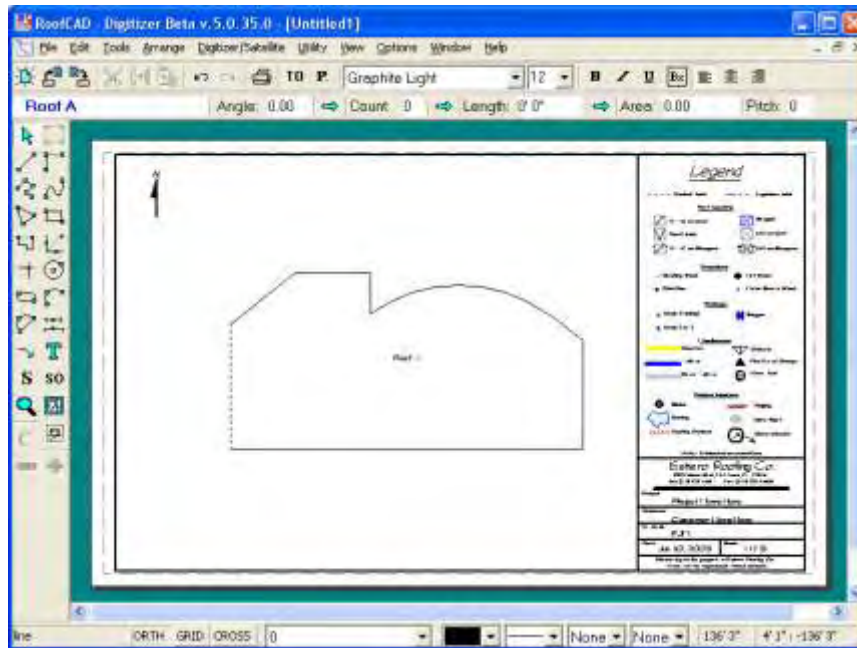


We have supplied the common perimeter wall definitions (Smart Objects) with RoofCAD. However you can change, delete or add to these with the Smart Object Editor. (If you're curious, see Section 20, [The Smart Object Editor](#), in your RoofCAD manual.)



Get ready to use the Pointer tool.

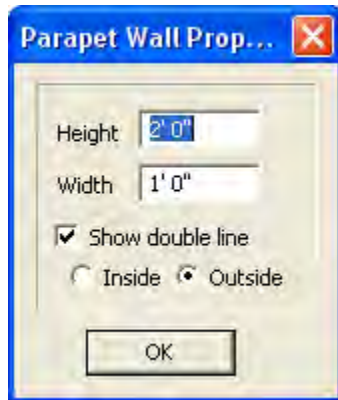
- The first step is to select a wall. Choose the Pointer tool (click on the Pointer tool button on the left side tool bar). Then, with the mouse, position the tip of the pointer, directly on the 95-foot wall (indicated in the following illustration as a dotted line) and click. The wall will turn magenta in color.



Hint: If all the walls become selected (magenta in color) instead of just the 95 foot wall, then you didn't have the tip of the cursor right on the wall. To correct this, press Esc to deselect and try again, this time putting the tip of the arrow right on the wall.

TIP: Notice the Object Info bar (the bar right above the drawing that has Angle, Count, Length, Area and Pitch boxes) shows the length of the wall. You can display the length of any wall by clicking on it in this manner. If you select multiple walls RoofCAD will display the total length of the walls. Remember the wall is selected if it is magenta in color.

- Now in the Smart Object browser, expand the heading called Perimeter and click Parapet 24". The Properties dialog appears.



Notice that you can change the height and width of the wall as well as tell the system whether to draw the parapet as a double line. The inside and outside option tells the system where the second line is to be placed, either inside or outside of the existing line.

- Click OK to accept the values. RoofCAD now knows this wall is a 24" Parapet that is 1' wide. It has also applied a double line to that wall.
- Lets also add an 18" Metal Coping. Expand the Terminations heading of the Smart Object Browser and click 'Coping.
- A window appears that asks you for the Height (stretch out) of the Coping. Enter 1.6 for an 18" stretch out and Click the OK button.
- Now press Esc to deselect the 95-foot wall. All walls should be black (deselected).

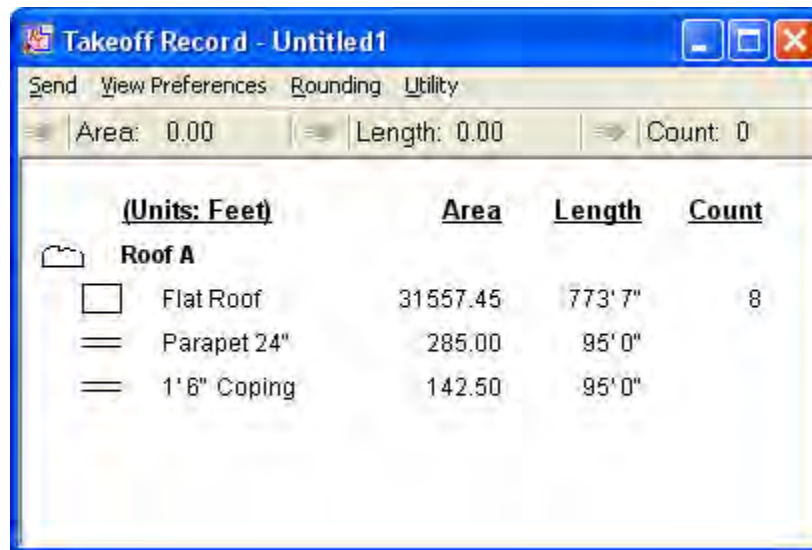
Hint: Right clicking the mouse on the drawing will also deselect everything.

- Let's take a quick look at the Takeoff Record to see what we have accomplished so far. Click the Takeoff Record button (or from the RoofCAD main menu, click Utility | Takeoff Record).

T0

The Takeoff Record button.

The Takeoff Record window appears and looks like this:



Notice that RoofCAD has recorded the Smart Objects we added to the roof. The Takeoff Record will continue to be built by RoofCAD as you draw.

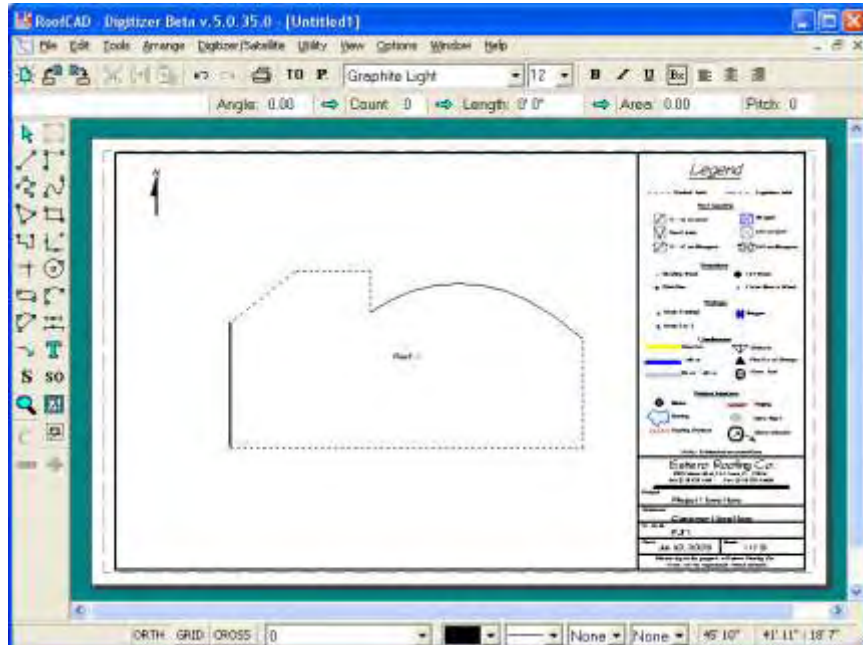
If you draw with anything other than the Smart Objects, what you draw will not be added to the Takeoff Record. For example you can draw with the Drawing Tools found under the Tools menu or add symbols from the Symbol browser. In either case what you draw will not be added to the Takeoff Record. Only Smart Objects get recorded on the Takeoff Record.

Hint: You can rename a roof to anything you like. See Section 26, [Advanced Flat Roof Tutorial](#) in the user guide.

- Click the Takeoff Record button. The Takeoff Record window closes.

Now let's define some other walls. If you have several walls that are to be defined with the same Smart Objects you can define them all at one time.

- Select these five walls (indicated by dotted lines in the following illustration) by clicking the tip of the mouse pointer on each one:

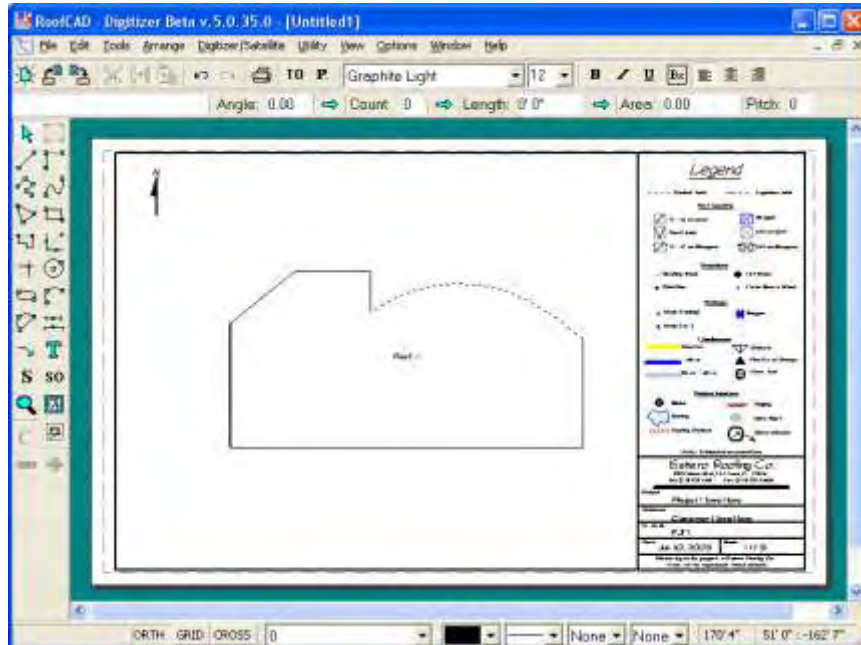


- If it isn't already, expand the heading Perimeter and click Gravel Stop.

Hint: As you select different items in the Smart Object list, it will probably be easier to work if you expand and collapse sections as you need them. This will help you navigate through the Smart Object list faster, too.

These walls have now been designated as Gravel Stop.

- Press Esc and the walls are deselected
- The final two walls are 18" Parapet. Now using the tip of the mouse pointer click on the two remaining walls indicated in the following illustration.



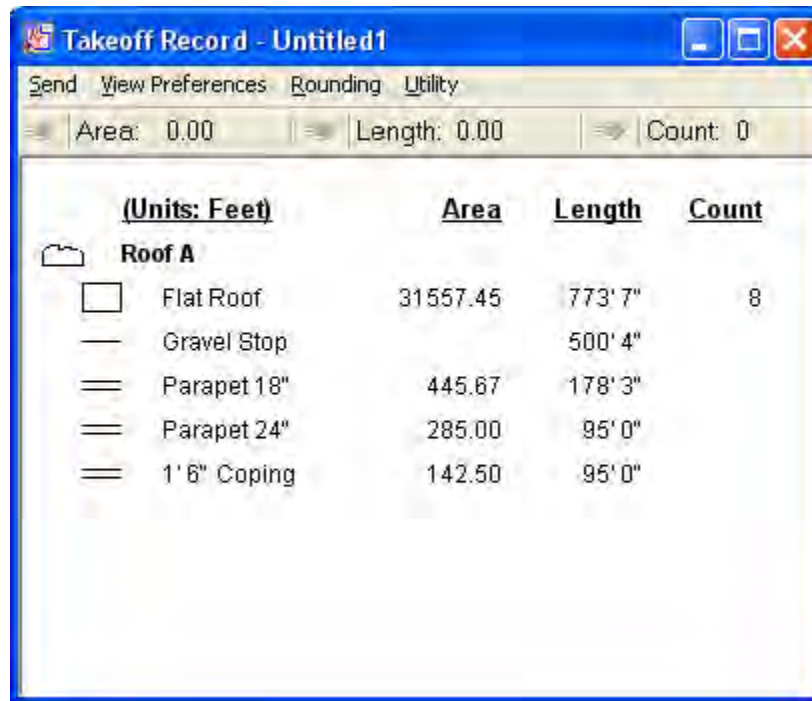
- In the Smart Object Browser click Parapet 18" and the Properties dialog appears.
- Click OK and those two walls are now 18" parapets. We wanted to show you this so that you could see a parapet double line applied to an arc.
- Right click on the drawing. All the walls are deselected.

RoofCAD now knows about all the perimeter walls of your roof. Let's take a quick look at the Takeoff Record RoofCAD has created for your drawing.

T0

Click the Takeoff Record button.

The Takeoff Record window appears. It looks like this:

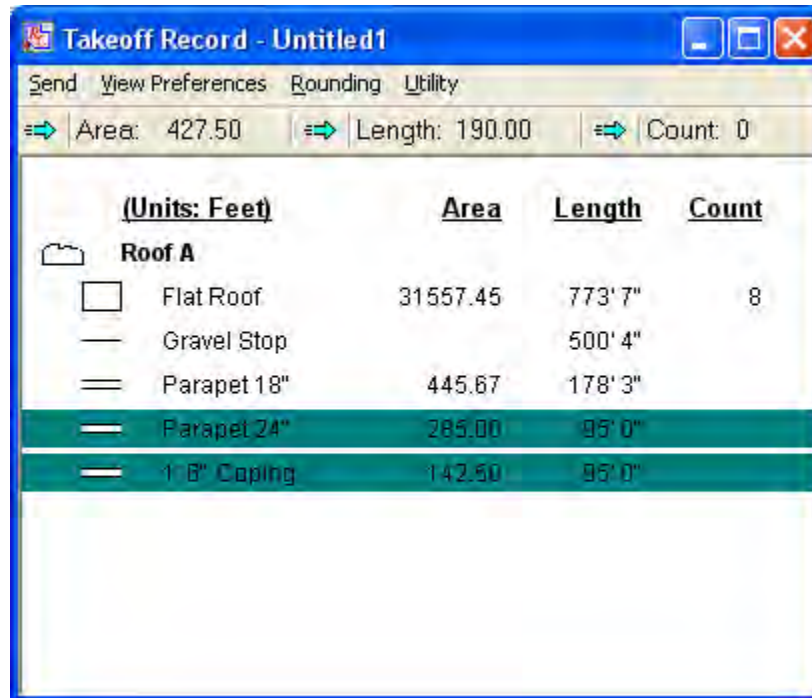


The screenshot shows a window titled "Takeoff Record - Untitled1" with a menu bar containing "Send", "View Preferences", "Rounding", and "Utility". Below the menu bar are three status fields: "Area: 0.00", "Length: 0.00", and "Count: 0". The main content area displays a table with the following data:

<u>(Units: Feet)</u>		<u>Area</u>	<u>Length</u>	<u>Count</u>
Roof A				
<input type="checkbox"/>	Flat Roof	31557.45	773' 7"	8
—	Gravel Stop		500' 4"	
==	Parapet 18"	445.67	178' 3"	
==	Parapet 24"	285.00	95' 0"	
==	1' 6" Coping	142.50	95' 0"	

The Takeoff Record is dynamic. This means that as you add, delete or modify the objects on your drawing, the Takeoff Record will always be up to date. The Takeoff Record also interacts with your drawing.

- In the Takeoff Record click on the Parapet 18". Notice that on the drawing, all instances of Parapet 18" are now selected (you may need to move the Takeoff Record to see the drawing).
- Right click on the drawing (not on the Takeoff Record) to deselect the Parapet 18" walls.
- The Takeoff Record's interaction with the drawing goes the other way as well. Click the far left 95' wall. Notice in the Takeoff Record everything that was defined for that wall is highlighted, as in the following illustration:



	(Units: Feet)	Area	Length	Count
Roof A				
□	Flat Roof	31557.45	773' 7"	8
—	Gravel Stop		500' 4"	
==	Parapet 18"	445.67	178' 3"	
==	Parapet 24"	285.00	95' 0"	
—	1' 6" Coping	142.50	95' 0"	

- Close the Takeoff Record window.
- Press Esc. This deselects everything.

How to Zoom in on Your Roof

In this tutorial you will learn to zoom in on your roof. Because roofs are so big and your computer monitor is so small, it is often hard to work on your drawing because everything looks so small. By using the Zoom tool you can enlarge any area of the drawing you want. Once zoomed in on an area you can pan around the drawing. You can also reset the view to where you started so that you can see the whole drawing again.

RoofCAD has a Zoom tool but by far the easiest way to zoom is with the wheel on your mouse. It takes a little practice to get used to but here's how it works.

Position your mouse cursor on something you would like to zoom in on. To zoom in, roll the mouse wheel toward you. To zoom out, roll it away from you.

The position of your mouse cursor is the key here. With every click of the wheel, RoofCAD will try to center your drawing on your cursor. It may sound like you need to keep the cursor in the middle of the object you are zooming in on, and that is mostly true. However, you will find sometimes that you need to position the cursor to the left or right of the actual center point or your desired object may run off the page.

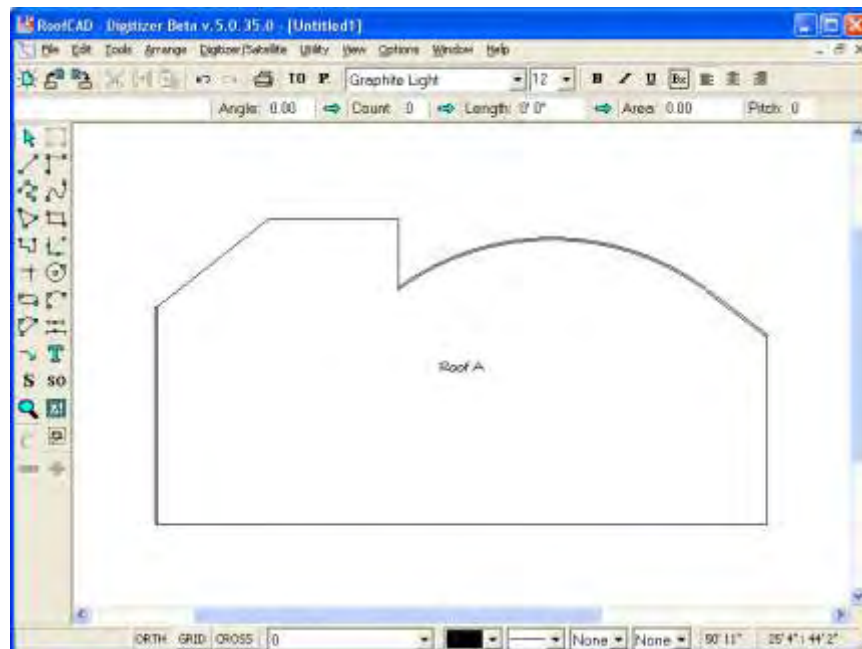
Try it. You'll see what we mean.

If you get messed up press F on your keyboard and the system will reset the drawing to fit in the window.

Once you are zoomed in on your page you can pan around it.

- To Pan hold down the P key on your keyboard. Your cursor changes to the Pan hand.
- Now press and hold down your left mouse button and drag the drawing around the screen.
- Release the P key to stop panning.

Now that you know how to zoom and pan, get yourself zoomed in like in the following image.



How to Draw Interior Walls & Expansion Joints

There are two types of walls and expansion joints; Interior and Perimeter. When an expansion joint or wall exists at the perimeter of a roof section you apply it to the perimeter line from the Perimeter section of the Smart Object browser like we did earlier.

If you have a wall or expansion joint that runs through the interior of your roof section, you draw it by choosing one of the smart objects from the Interior Walls & Exp Joints section of the Smart Object Browser.

This tutorial will add two interior expansion joints to our roof. We will show you two methods of adding the expansion joints. The first is a free hand type method where the expansion joint is drawn on the screen with the mouse. The second is a more accurate method where we will place the

expansion joint precisely on the roof using the keyboard. Keep in mind that any smart object from the Interior Walls & Exp Joints section would be handled the same way.

- First let's be sure that nothing is currently selected. The easiest way to do this is to press the Esc key.


Hint: When nothing on the drawing is magenta color (purple), then you can be sure that nothing is selected. If you have any doubt, from the RoofCAD main menu, click Edit | Deselect All.

- In the Smart Object Browser, expand the Interior Walls & Exp Joints section. Click Interior Expansion Joint and move your mouse out over the drawing.
- We will now draw the expansion joint indicated on the following illustration. Position the cross hair of the mouse cursor on one of the ends of the expansion joint as indicated in the next image.
- Click the mouse. The first end of the expansion joint has been positioned.
- Now move the mouse and you will see the expansion joint forming.
- Position the cross hair of the cursor at the other wall, making sure the expansion joint is straight.

Notice that it can be hard to get the line straight. To make it easier, press the "O" key on your keyboard. This turns on Ortho Mode.

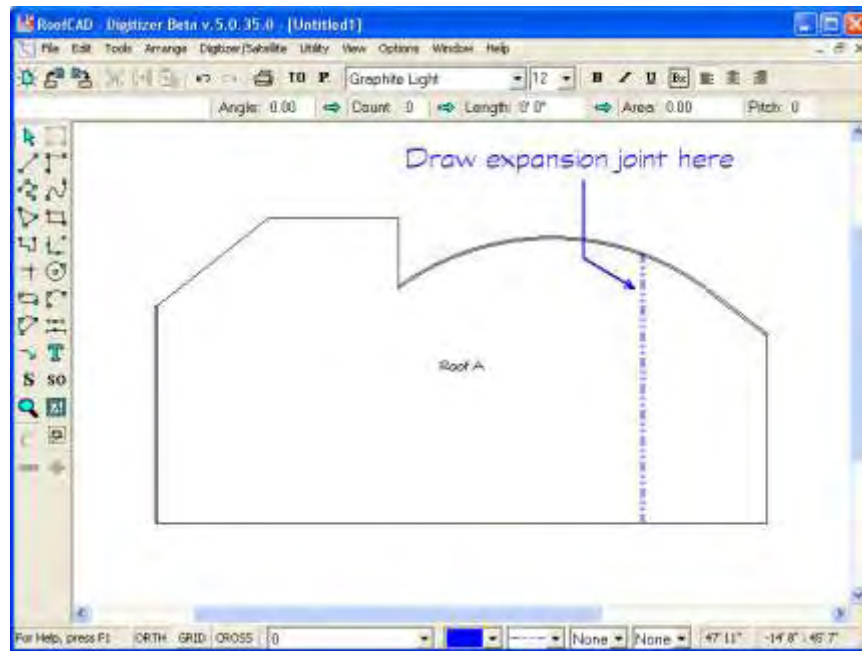
Hint: Ortho Mode locks your line to predefined angles, thus making it easier to keep lines straight. RoofCAD ships with the Ortho angle set to 15-degree increments. Our experience has shown that most buildings and detail drawings use angles divisible by 15, so you should be able to keep Ortho on much of the time. When drawing a line the angle of the line is displayed in the information bar above the drawing.

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. Ortho angle can be changed in the Drawing Settings window.


Bear in mind you can also click the  button to get the same effect.

- Now we will show you how to position the end point more accurately than how you did the start. Hold down the Ctrl and Shift keys at the same time and click the mouse. The expansion joint is now attached to the other wall.

Hint: Holding the Ctrl and Shift keys down when clicking will make the expansion joint line join exactly at the wall. This saves you from having to visually line it up. You don't *have* to do this; we just think it makes life easier.



This is how you draw an expansion joint free hand. If you want to be more accurate in the placement of expansion joints or any other object you can use the keyboard.

- For best results we will turn the grid on. Beside the Orth button at the bottom of the window there is a Grid button . Press the G key on your keyboard so that the button is pressed in.
- Position the cross hair of your cursor near the bottom left corner of the roof.
- While holding down the CTRL key, press the F2 key once. The cursor is now positioned exactly on the corner of the roof.
- Now note the X,Y readout at the bottom right of the RoofCAD window. Press the F2 key and the X,Y will reset to 0,0.
- For this example let's say the expansion joint was measured to be 54 feet in from the corner. Press the right arrow key repeatedly until you have moved the cursor in 54 feet from the corner (the X,Y readout will read now say "54.00 : 0.00").

Hint: Having the Grid on ensures your cursor moves 1 foot for each key press. With the Grid off you will be into fractions of feet. Grid on just makes life easier.

- Press the space bar on the keyboard once.
- Now move the mouse and you will see the control joint forming.
- Position the cross hair of the cursor at upper wall.
- Hold down the Ctrl and Shift keys at the same time and click the mouse. The control joint is now attached to the other wall.
- Press the "O" key on the keyboard to turn Ortho Mode off.

Tip: Ortho Mode is turned on and off as required.

Section 3

Note: If you are picking up at this point in the tutorial, you don't have to draw the basic outline of our Flat Roof again. It has already been done for you. Simply load the file:

RoofCAD\Tutorial Drawings\Flat Roof Basic with two control joints.rcg

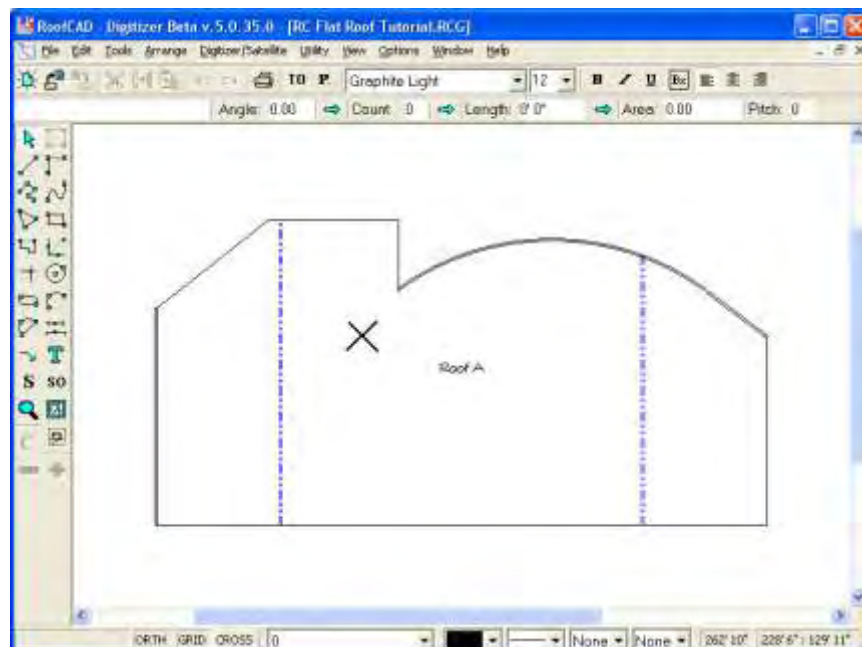
How to Add Roof Curbs

Now we will show you how to add curbs to your roof drawing. Again we will show you two methods.

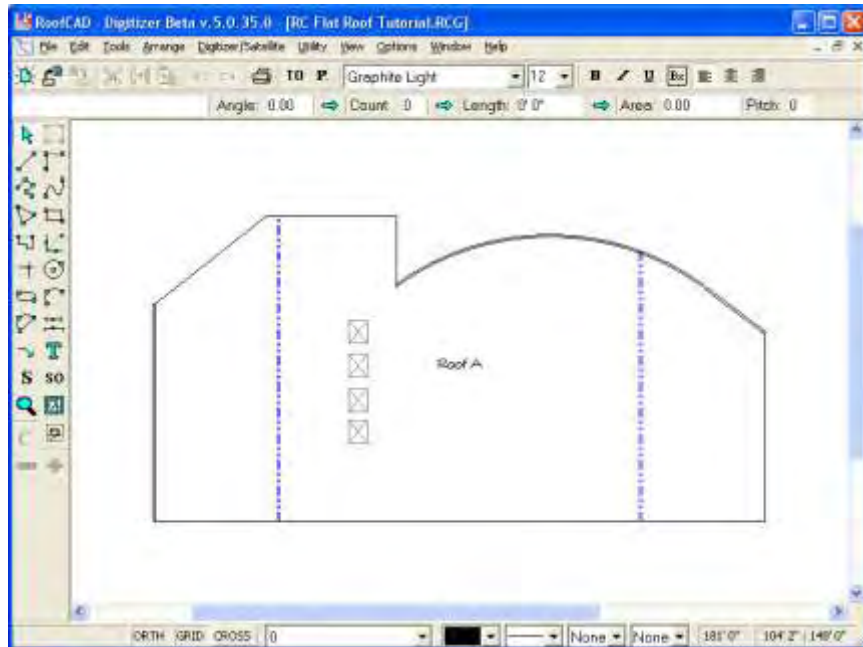
- In the Smart Object Browser expand the Curbs & Sleepers heading and click Curb. A window will appear prompting you for the length and width of the curb.

Hint: In RoofCAD the length of a curb is the distance left to right on the screen. Width is considered to be the distance up and down on the screen. Notice that there are arrows in the dialog box to illustrate this.

- We have four 8x10 foot curbs on this roof, so on the keyboard type 8, press the tab key, then type 10. We will leave the height at 1'6". This is the height of flashing required. Press Enter and we are now ready to draw our curbs.
- Move the mouse cursor to approximately the position shown in the following illustration. Once positioned take your hand off of the mouse and press the space bar once. **DO NOT TOUCH THE MOUSE.** This places your first 8x10 curb.

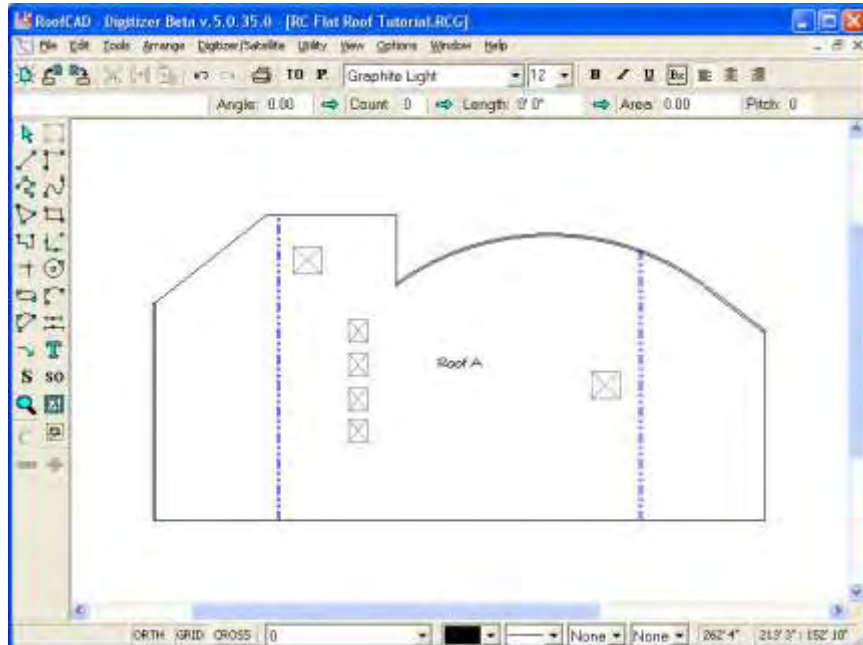


- Press the down arrow (on your keyboard) 15 times. The cursor is now below the first curb.
- Press the spacebar again. This will draw another curb.
- Repeat this twice more so that we have four curbs lined up one under another. Your roof will now look like this:



We also have two 12x12 foot curbs on this roof so let's add them now.

- In the Smart Object Browser click on Curb again. A window will appear prompting you for the length and width of the curb.
- Type 12. Press the tab key> Type 12. Press Enter.
- We will use the freehand method to place these curbs on the roof. So, using the mouse only (not the keyboard), position the mouse cursor approximately on one of the positions in the following illustration and click the mouse. Repeat on the other position for the second curb.



You will notice that in the Curbs and Sleepers section of the Smart Object Browser there are many different types of curbs to choose from. You can of course add new curb types to the list, delete curbs from the list, rename and modify the look of any of the curbs. This is true of all Smart Objects.

How to Add Stacks, Drains & Other Items

Next we will add some stacks, drains and other items to the drawing.

Penetrations



- In the Smart Object Browser expand the Penetrations section and click Plumbing Stack. Stick with the default diameter and height by pressing enter.
- Instead of telling you where to place each of these next few items we will let you add them where you want. So position the mouse where you want your first plumbing stack and click the mouse.
- Repeat to add a few more plumbing stacks.
- Choose some of the other items from the Roof Penetrations section and add them to the drawing the same way.

Drains

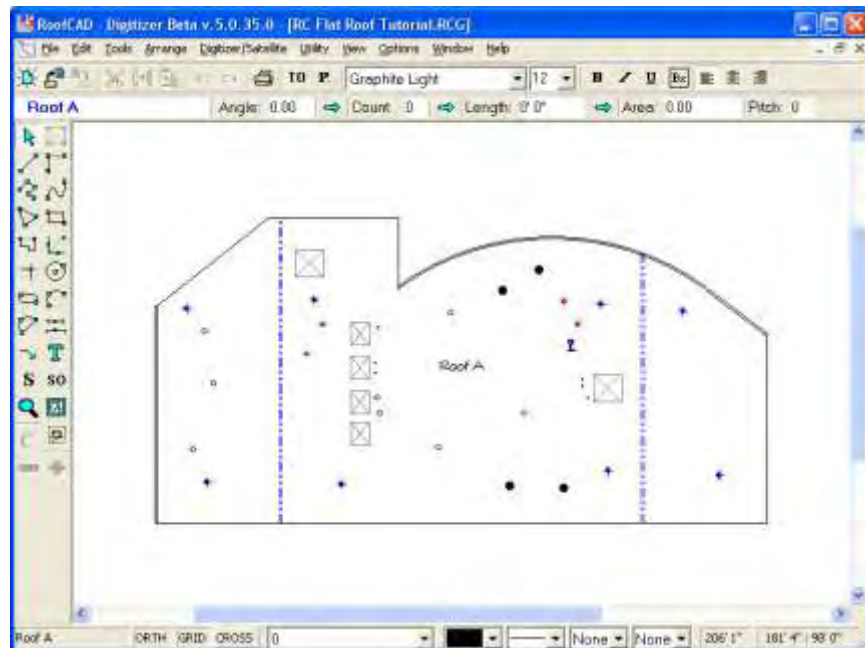
- In the Smart Object browser scroll down to, and expand the Drainage section.
- Click on Drain (existing). Press enter to accept the diameter. You can freehand draw the drains by clicking on the page or you can add a drain


a set distance in from a corner (or any object) just like we did the control joint.

- Position your mouse cross hair near the lower left corner of the drawing.
- Hold down the CTRL key and press the F2 key once. The cursor is now exactly on the corner of the roof.
- Press F2 to zero out the x,y coordinates in the lower right corner of the RoofCAD window.

Hint: Making sure the Grid is turned on will  this easier. Press the G key on your keyboard until the grid button  is pressed in.

- Press the right arrow key until the coordinates read "27.00 : 0.00".
- Press the up arrow key until the coordinates read "27.00 : 22.00". We are now 27 feet across and 22 feet up from the corner of the roof.
- Press the spacebar once. RoofCAD has placed a drain at exactly that location.
- Add the remaining drains as you see in the following illustration. Add them with the mouse and don't worry if they don't line up across the page. Next we will show you how to line them up after drawing them.



- Click the Pointer tool button.
-  The Pointer tool.
- Click on the lower left drain (the one we just positioned using the x,y coordinates).
- Click on the other 3 drains on the bottom row of drains. All four drains are now selected.

- From the RoofCAD menu choose Arrange | Align | Align Top. All four drains are now on the same line across the drawing.

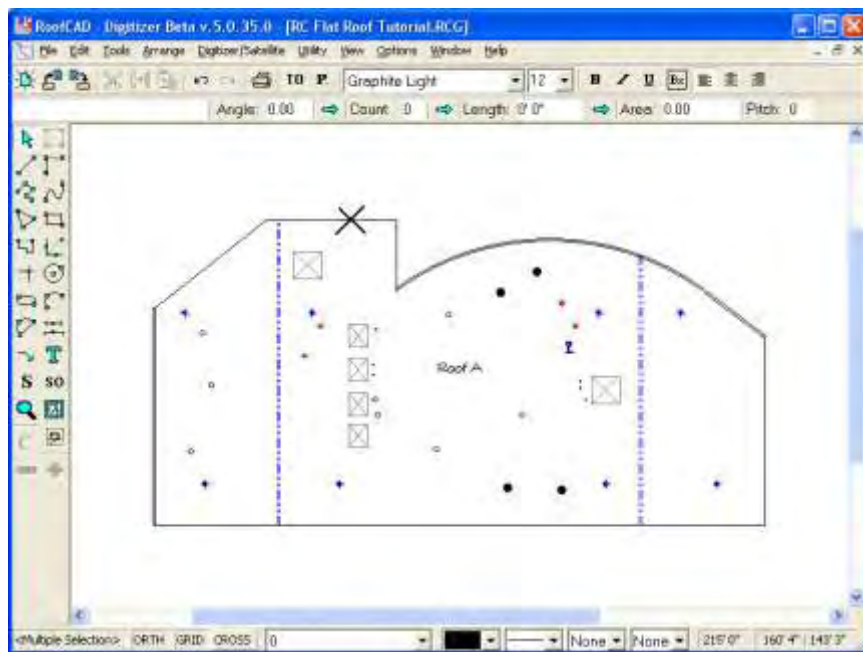
Hint: The first object you choose is the one that the others will be aligned to.

- Press Esc to deselect the drains. You can align the upper row of drains for practice if you wish.

Tip: Of course aligning the drains takes more time, not much but it does take more time. Doing so, like any of the other techniques we have shown you to make a drawing more accurate and look better, is entirely up to you. If you need to get a drawing or takeoff out quickly then you should ignore the slower techniques and use the fastest method possible.

Scupper

Let's add a gravel stop scupper at the location indicated by the X in the illustration that follows:



Anytime you add an object close to the edge of the roof you need to be careful not to miss putting the object on the roof. This is because of the way RoofCAD determines what roof an object belongs to. When you add something to the drawing, RoofCAD determines which roof the object belongs to by calculating if the object is within the perimeter of the roof. This means the object must be directly on a perimeter line or within the perimeter (i.e. on the roof). So as you can imagine. When you place a

scupper and you want to get it on the edge of the roof, you run a risk of putting it mathematically off the roof.

RoofCAD gives you a couple of ways of ensuring your scupper ends up on the roof.

- In the Smart Object Browser, expand Drainage. Click Scupper (Gravel Stop).

Position your mouse at the location of the X, **BUT DO NOT CLICK THE MOUSE YET**. Now look at the far left cell of the Info Bar (at the upper left of the RoofCAD window). If your mouse cross hair is on the roof, you will see "Roof A" in this cell. Move your mouse on and off the roof and notice how this cell changes.

Now position the mouse so that you are on the roof but close to the edge i.e. "Roof A" is displayed.

Click the mouse and the scupper is placed on the roof.

Tip: If you miss the roof, RoofCAD will pop up a window that asks you to identify which roof you want the scupper on. Also, if there is an adjoining roof where you are placing the scupper, you need to be especially careful. If you miss the target roof, RoofCAD will assign the scupper to the adjoining roof.

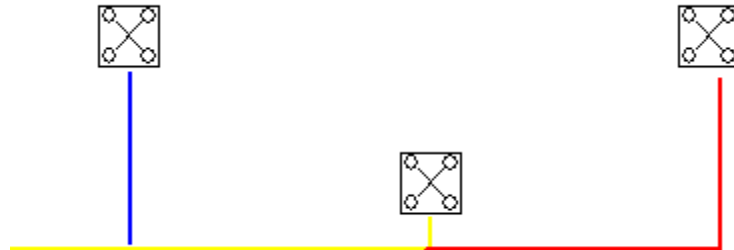
- Now let's add something from the Misc section of the Smart Object Browser. In the Smart Object browser expand the Misc section.
- First we will add a gas line, so click Gas Line.

Gas Line

- Gas Line uses the polyline tool. This tool allows you to draw a line with multiple segments. Click near the edge of the roof.
- Move the mouse and you will see the first segment forming. Position the cursor where you want the first segment to end; usually this is where the gas line takes a turn. Click the mouse. Your first segment is now locked in.
- Move the mouse and you will see the second segment forming. Choose a location to end the second segment and click the mouse.
- Try adding a few more segments. When you are done, right click to finish.

Don't back track over a line you have already drawn or you will double the quantity. Instead finish the line you are drawing and start a new one.

In the below image we ended up having to draw 3 lines. We color coded it you illustrate the point.

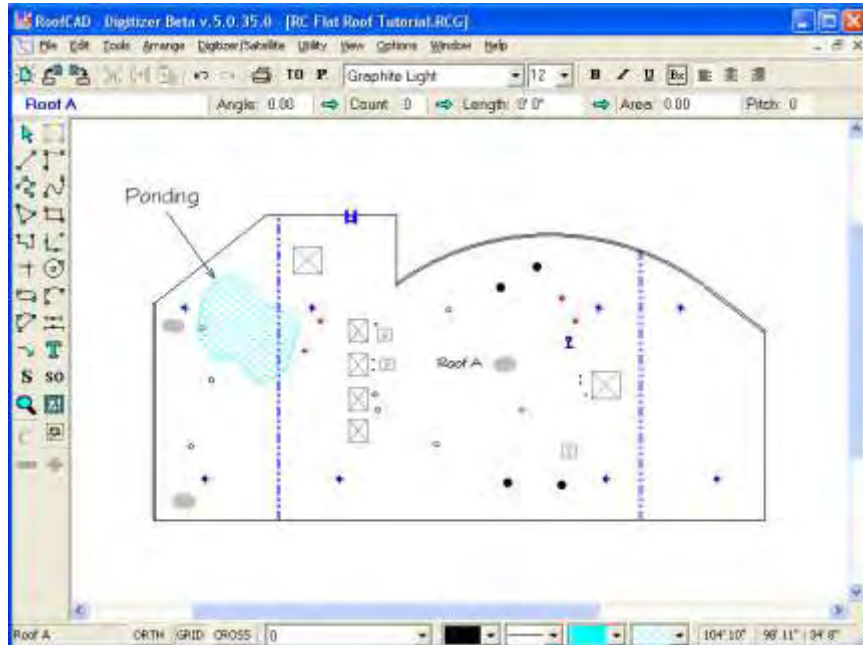


Walkway Paver

- Now let's add a single **walkway paver**. Scroll down the list until you see the Paver Smart Object.
- Click on Paver and the properties window appears.
- Accept the default dimensions by pressing enter.
- Move the mouse pointer to a place on your drawing where you would like to add a paver and click the mouse. The paver symbol appears.

Conditions

- Finally let's add some conditions. Condition is our term for the problems on the roof. In the Smart Object Browser expand the Conditions section.
- Click on Bare Spot and the Properties dialog appears. You can specify the size of each bare spot. Press enter to accept the defaults.
- Position the mouse pointer at a place on the drawing where you want the bare spot to appear.
- Click the mouse and the Bare Spot symbol appears.
- Let's add an area of ponding. In the Smart Object browser click on Ponding.
- To add the Ponding you click the mouse at several points to make an outline of the ponding area. See our illustration following:



To draw this ponding area we clicked the mouse once at each of the points where the perimeter changed direction. To tell RoofCAD when you are finished drawing the ponding area, right click the mouse. You may have to try this a couple of times to get the hang of it. Go ahead and try drawing the Ponding area now.

Hint: If you make a mistake delete and try again. With the pointer tool select the object you want to delete and press the delete key on your keyboard.

- Finally let's add some ridging. Click on ridging in the Smart Object Browser and the properties window appears asking you for the length and width of the problem. Let's say we have a 10' ridge and we figure we will need to repair a 1' width along the ridge. Enter 10 for length, 1 for width and click OK.
- Click the mouse on the drawing where you want the Ridging (we'll let you decide where to put it). The Ridging symbol appears at the locations you chose. Each time you add the ridging symbol you are adding a 10' long 1' wide ridge. To switch to a different size click ridge again, enter the new size, then draw it on the page.

Section 4

Note: If you are picking up at this point in the tutorial, you don't have to draw the basic outline of our Flat Roof again. It has already been done for you. Simply load the file:

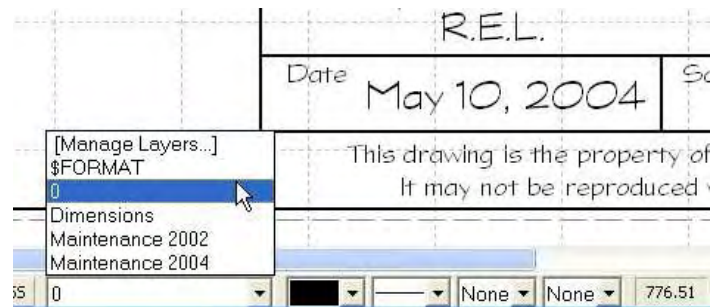
RoofCAD\Tutorial Drawings\Flat Roof Basic dimensioning.rcg

Add Dimension Lines to Your Drawing

Dimension lines are one of the things that take an average looking drawing and make it look smooth and professional. The good news is that adding dimensions to your drawing in RoofCAD is really simple to do.

Before we add the dimension lines we will switch to a different layer of the drawing. Layers are like transparencies on an overhead projector. When you have two or three transparencies on the projector you get one image on the screen and if you remove a transparency the image changes. The usefulness of this with dimensions will be demonstrated here.

- On the status line at the bottom of the RoofCAD window, click the Layer name displayed there. Your screen should look a little like this:



This is a list of the layers in this drawing. The 0 layer is where we drew the roof plan. The \$FORMAT layer is where the legend and title block are stored. The two Maintenance layers are there as an example of where you could record annual maintenance information. The Dimensions layer is where the dimension lines are stored.

- Click on the word Dimensions. The Layers list closes and you are now working on the Dimensions layer.
- You can tell which layer you are on by checking the status line at the bottom of the RoofCAD window. It will now look like this:

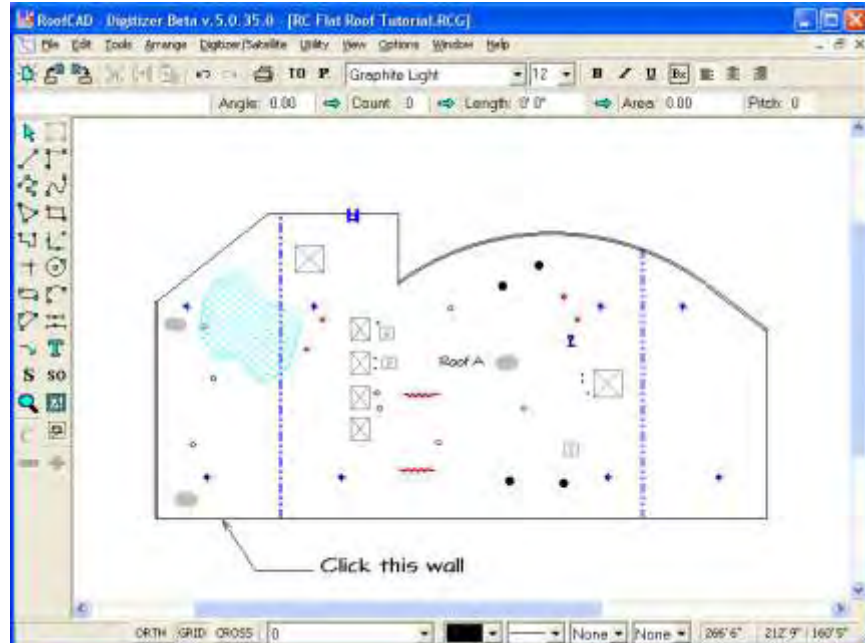


- From the RoofCAD menu choose Tools | Dimension (or click the Dimension Tool button from the Toolbar on the left side of the RoofCAD window). The mouse now has the dimension cursor.

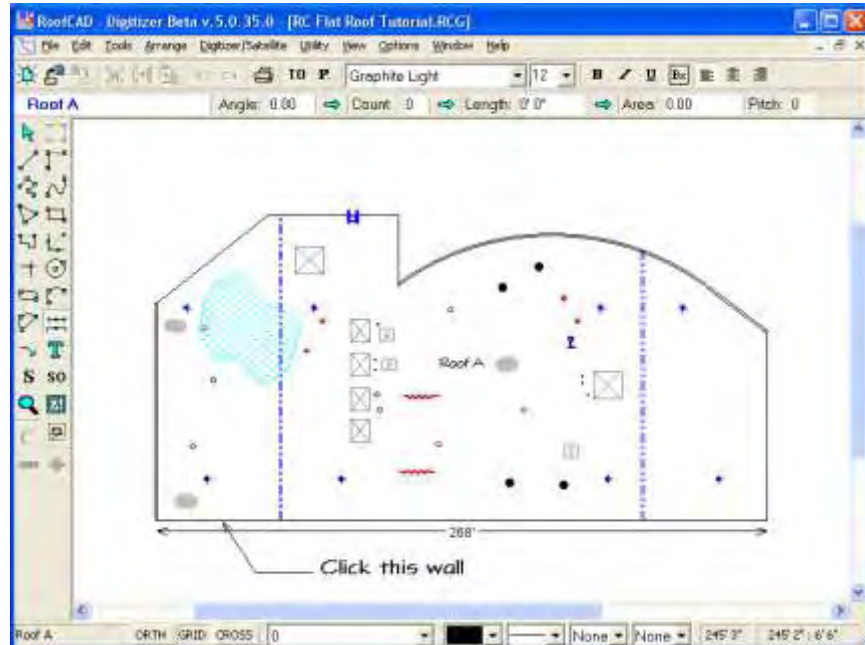


This is the Dimension tool button.

- Position the cross hair of the cursor anywhere on the wall indicated in the following illustration image and click the mouse:



- Move the mouse pointer below the wall and click again. The wall is now dimensioned like the following illustration:



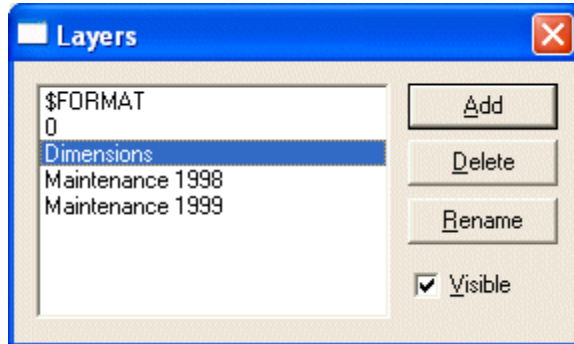
Tip: If you had clicked above the wall the dimension would be on the top side of the wall.

So adding a dimension has two steps. Click on the wall to be dimensioned, then click on which side of the wall you want the dimension to appear.

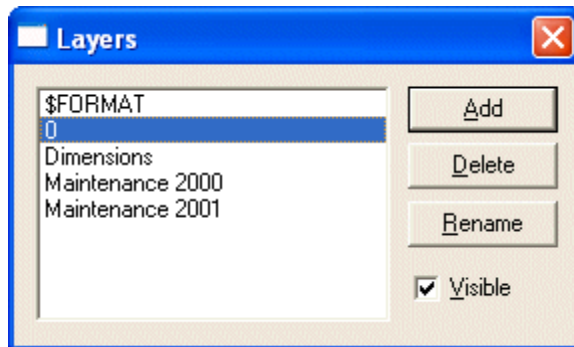
- Now let's dimension a parapet wall. When it comes to parapets you can dimension either one of the two lines that make up the parapet.
- In this case let's use the parapet on the left side of our drawing. Click the outer line.
- Now click to the left of the outer line. The dimension now appears.
- Go ahead and dimension the other walls of the roof. Give the arc a try.

Now we will demonstrate why we add the dimensions to a different layer than the rest of the roof.

- Once again, click the Layer name displayed on the status line. This time, in the Layers List, click Manage Layers... The Layers dialog appears. It should look something like this:



- Notice the Visible check box in the lower right of the window. Click on the check box and the checkmark disappears.
- Now click on the 0 layer in the list, as shown in the following illustration:



Notice that the dimensions have disappeared. They are actually still there; they are just hidden for now. The benefit here is that you can print out the drawing and give it to a customer without the dimensions displayed (you also need to remove the scale if you have marked it on the drawing or change it to N.T.S.). Then if the customer gives your drawing to another roofer you are not giving away any of your hard work. There is no scale or dimension to work from. He will have to visit the roof and do his own takeoff.

Now let's make the dimensions visible again.

- In the Layers dialog click on the Dimensions layer. Now click on the Visible check box. The check mark appears.
- Click on the 0 layer.
- Close the Layers dialog.

Tip: Remember whatever you draw is added to the current layer. So be sure you are on the right layer before you draw. We recommend that you draw your roof plan on the 0 layer as we have done in this tutorial. You should always return to the 0 layer before saving, that way when you open a drawing you will start out on the 0 layer.

Add Photos

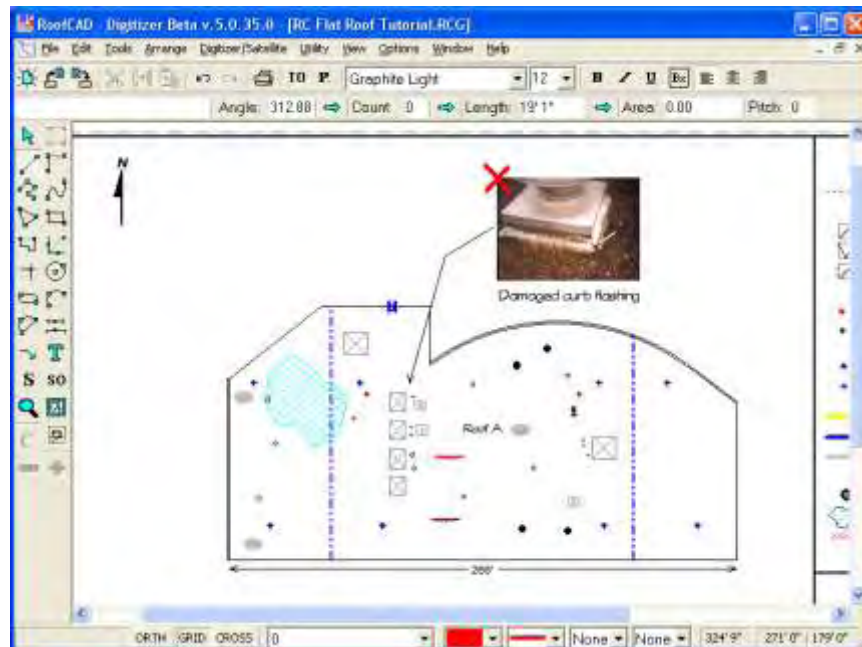
Now we will add a digital photo to the drawing. For this example we will be pointing out a damaged curb flashing, like in the following illustration. The method used here can also be used to add other graphics like logos.

- Press the F key on your keyboard. We can now see the entire drawing.
- Now choose Tools|Special|Image from the menu or click the button on the left hand tool bar.



The Image tool.

- Position the mouse on the drawing approximately where the big red X is in the illustration following:



- Click the mouse.
- Move the mouse down and to the right, and a box will begin to form. Form the box to the size you want your photo or image to occupy on your drawing.
- Click the mouse when the box is formed. The Open window appears.

- Now navigate to the "Photos" folder which is under the RoofCAD folder.

Hint: You can turn on the thumbnail view by clicking the View Menu button.

- In the Photos folder click the image named "curbflsh.jpg". Click Open and the image appears on the drawing.

Next we will show you how to add some text and an arrow that connects the photo to a curb on the roof. But first some important information about photos.

Important Notes about Images:

- When the image first appears, it will be the same size as the box you drew to place it. However, you can then resize it by selecting it and dragging one of the eight bounding box handles.
- The image can be rotated if required.
- RoofCAD does not have any image processing tools. So manipulations like contrast, brightness, resolution must be done in your imaging software.
- Images are not stored in your RoofCAD file. A RoofCAD drawing simply maintains a link to the image file location. If the image file is moved or its location is no longer available then RoofCAD will not be able to display the image. It is extremely important that you manage your image files correctly. By this we mean that you should have a designated folder or folders on your system for image files. We add a folder under RoofCAD called "Photos" for this purpose but you are free to use any folder you want. Be sure not to overwrite an image by using a file name on a new image that is already in use by another file. We will be introducing image management tools in future versions of RoofCAD but for now the management is up to you.

How to Move Images with Your Drawing:

If you move a RoofCAD drawing to a new location such that the image file locations are no longer available, RoofCAD will not be able to display the images. If you want the images to be visible you need to send the image files with the drawing. For example:

If you want to put your RoofCAD drawing on a CD or flash drive and give it to someone, then you need to put the image files on the CD/Flash Drive as well.

If you want to e-mail a RoofCAD drawing to someone, you need to e-mail the images as well. We recommend you zip everything up into a single file.

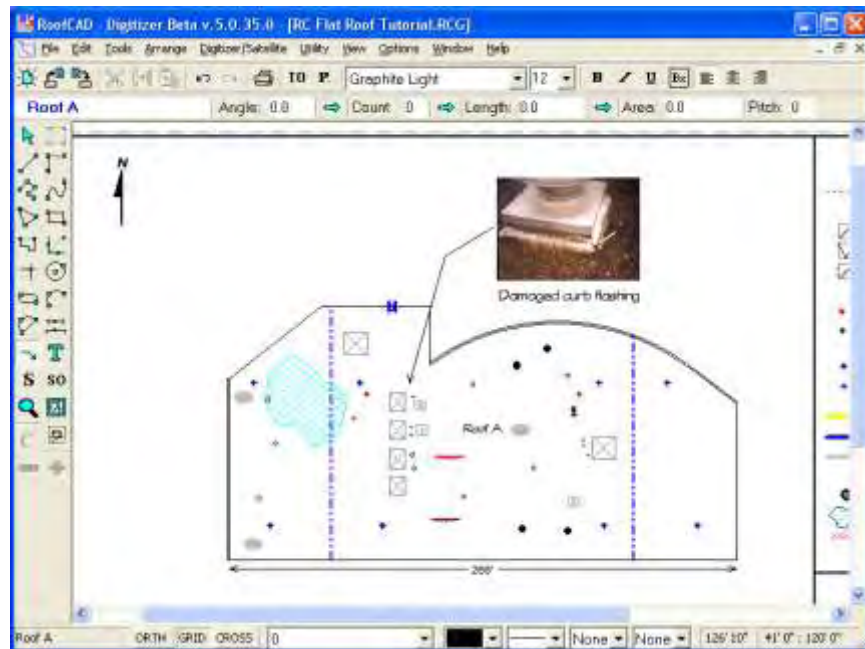
Keep in mind that you can always send a PDF of the file, if the person on the other end does not need to edit the drawing.

These are the steps that RoofCAD will take when it can't find an image file.

- It will look for the images in the same folder as the RoofCAD drawing. So if the drawing and the images are on a floppy disk, you will be fine.
- If the files are not found in the same folder as the RoofCAD drawing you will be asked to show RoofCAD where the image is. Once you specify where one image is, RoofCAD will look in that folder if any other image files are missing.

Add Arrows and Text

Adding arrows (called leaders in RoofCAD and most other CAD programs) and text allows you to point out things on your drawing. For this example let's make our photo more descriptive by adding text and connecting the photo to a curb on the drawing, like in the following image.



- From the RoofCAD menu choose Tools|Leader (or click the Leader tool button from the Toolbar on the left side of the RoofCAD window).



The Leader tool button.

- Position the cross hair of the mouse cursor approximately where the tip of the arrow head is on the leader in the above image. Click the mouse. RoofCAD now knows where to place the arrow head. The arrow head will not appear until we finish the leader.

- Now move the mouse and you will see the first segment of the leader being formed. To complete this segment, click once.
- Now move the mouse and the second segment is being formed. Position your mouse at the edge of the photo and click.
- To finish the leader, right click. The leader is now complete and you can see the arrowhead has been drawn where you first clicked.

Now let's add some text to make the photo and leader meaningful.

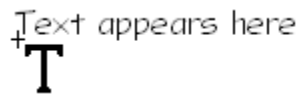
- From the RoofCAD menu choose Tools|Text (or click the Text Tool button from the Toolbar on the left side of the RoofCAD window).



The Text tool.

Hint: You may have noticed by now that clicking the button for the tool you want to use is faster than using the menu.

- Now we will position the mouse cross hair where we want the text to appear. The below diagram illustrates how to position your mouse pointer when adding text:



When you add text, the text will appear up and to the right of the center of the mouse pointer's cross hair.

- Position the mouse pointer under the bottom left end of the photo. Be sure to leave enough room for the height of the text. Click the mouse. The Input Text window appears.
- Type Damaged curb flashing.

Hint: Notice that the Text dialog has room for multiple lines. Just press Enter when you want to start a new line.

- Click the OK button. The Input Text window disappears and the text is now on the drawing.

Until you get used to placing text, you very often have to move it into position after you have added it to the drawing. To move the text we use the same method we would use to move most other objects, on the drawing. So what you are about to learn can be used to move almost anything.

- Press Esc until your mouse cursor turns into a pointer. Or you can click the Pointer tool button on the Toolbar on the left side of the RoofCAD window.



The Pointer tool.

- Position the tip of the mouse pointer on the Damaged curb flashing text.
- Click the mouse. The text is now selected (magenta in color with 8 black boxes around it).
- You can move the text with the mouse but for fine adjustment it is easier to use the keyboard. Press the up, down, left and right arrow keys on the keyboard to move the text.
- Once you have the text where you want it, press Esc. The text is now deselected.

The Finishing Touches

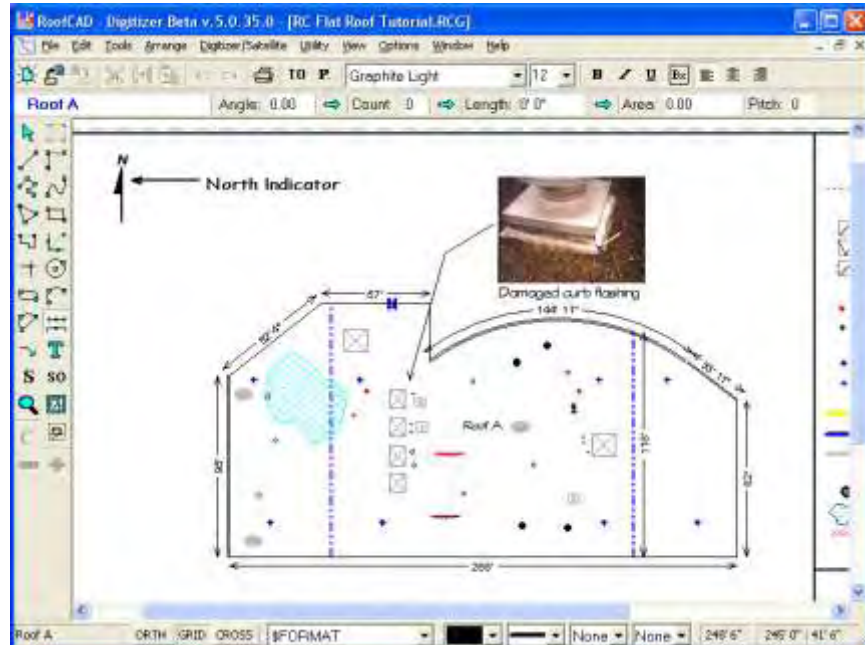
Now we will add the finishing touches to our drawing. We will rotate the North Indicator to the correct angle and add the customer and project name to the title block. Both of these changes are done on the \$FORMAT layer. The \$FORMAT layer is where the legend and title block are stored. So first we need to switch to the \$FORMAT layer.

- On the RoofCAD status line, click the Layer name displayed there. A list of layers appears.
- Click the \$FORMAT layer to make it the current layer.

Rotate the North Indicator

Now we will show you how to rotate the North Indicator. What you learn here can be used to rotate any object on the drawing.

The North Indicator is located in the upper left corner of the drawing as indicated in the following illustration:



- Press Esc until your mouse cursor turns into a pointer. Or you can click the Pointer tool button on the Toolbar on the left side of the RoofCAD window.



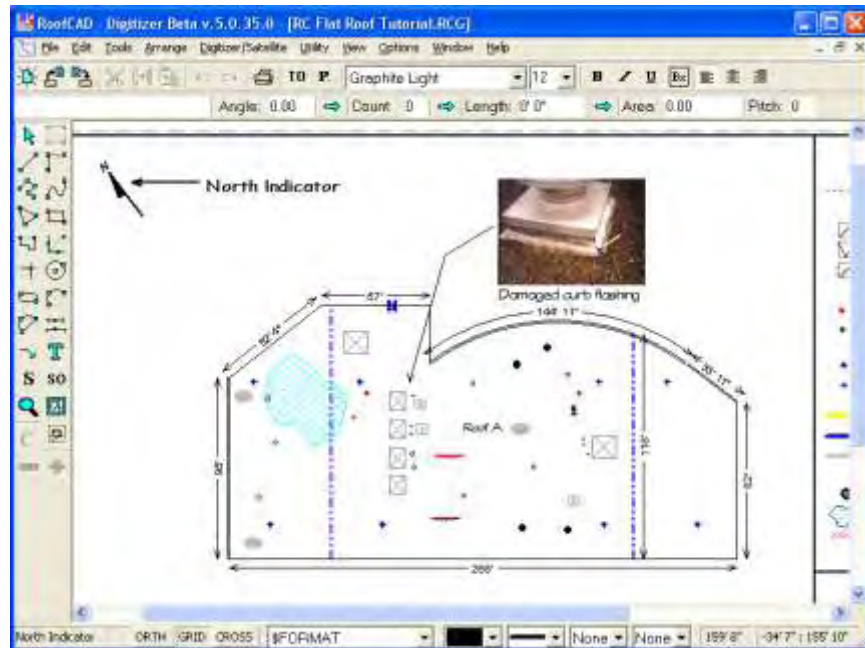
The Pointer tool.

Position the tip of the Pointer Arrow on the North Indicator.

- Click the mouse. The North Indicator is now selected.

25-40 Basic Flat Roof Tutorial

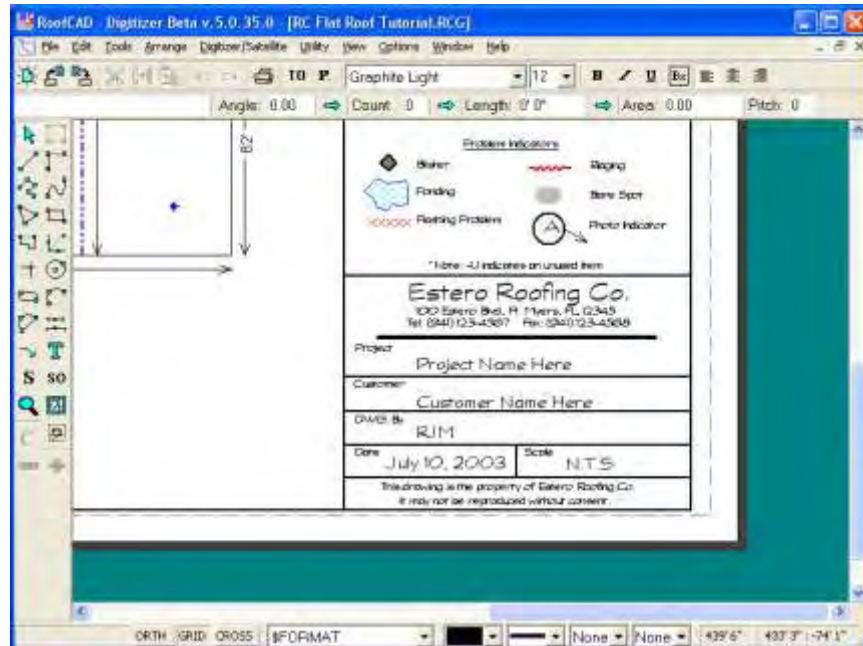
We will now rotate the North Indicator to the position displayed in the following illustration:



- On the keyboard press the [key (this is the square brace key next to P on your keyboard). The North Indicator has rotated 1/4 of a degree counter clockwise.
- Press and hold down the [key until the North Indicator is positioned approximately as in the above image. Notice that the North Indicator rotates more rapidly when you hold down the [key. It is rotating in 2 degree increments while the [key is held down. If you have gone too far the] key will rotate the North Indicator the other way (clockwise).
- When you are done rotating the North Indicator, press Esc. The North Indicator is now deselected.

Fill in the Title Block

Now we need you to zoom in on the title block area. This is the following illustration.



So using the zoom and pan tools you learned earlier, get yourself zoomed in.

Hint: Remember mouse wheel for zoom and P key held down to pan around the page.

- Press Esc until your mouse cursor turns into a pointer. Or you can click the Pointer tool button.
- Position the tip of the Pointer Arrow on the Project Name Here text.
- Click the mouse. The text is now highlighted.
- Now click on the Text Tool button (or choose Tools | Text from the RoofCAD menu). The Change Text window appears.
- The Project Name Here text is in the window and it is highlighted. Leave it highlighted and type Snook Wholesale. Snook Wholesale has now replaced the text Project Name Here.
- Click the OK button and Snook Wholesale is now in the title block.
- Press Esc to deselect. The text Snook Wholesale is now deselected.

This is how we fill in the title block. The reason we don't start the Title Block off without text and just add new text, is that the Project Name Here text is already positioned for you. So by editing it, you don't have to worry about positioning the text like you would if the text was not there.

The rest of the Title Block is filled in the same way as the project name. Select the existing text, click on the text button and change the text to what it should be. We'll leave you to fill in the rest of the Title Block if you want to practice.

Now let's zoom out and return to the 0 (zero) layer. (Remember what we said earlier about returning to the 0 layer before saving?)

- Press F on the keyboard to zoom out.
- On the RoofCAD status line, click the Layer name to open the list of layers.
- Click the 0 layer to make it the current layer.

Review the Takeoff Record

Our drawing is done. Review the Takeoff Record to see the final results.

- Click the Takeoff Record button.

TO

The Takeoff Record button.

The Takeoff Record appears. Notice that everything we have drawn is on the Takeoff Record.

When you are finished reviewing the Takeoff Record, click the Takeoff Record button again. The Takeoff Record disappears.

Save and Print (RoofCAD License Owners Only)

If you have not yet purchased a copy of RoofCAD you will not be able to print or save a drawing. Refer to the sample printouts in the information package to see what a drawing and a Takeoff Record look like on paper.

This concludes this tutorial. We hope this has given you a good introduction to the product.

Please feel free to review our other tutorials. They cover things like pitched roofing, electronic plan and **satellite image** takeoffs and more.

Our entire manual and FAQ (Frequently Asked Questions) document are also available from the help menu,

Hint: We **HIGHLY** recommend you read **Section 26; Advanced Flat Roof Topics**. Amongst other things it will explain how to identify roof sections. This tutorial had only one section, but you will also need to understand how to handle facilities with multiple roof sections.
