RoofCAD

User Guide

True North Estimating Systems, Ltd.
100 Broadview Avenue, Suite 308
Toronto, Ontario, Canada M4M 3H3
Phone (416) 778-0843
Fax (416) 778-5880

Product Sales: sales@roof-ware.com

Product Support: support@roof-ware.com

Company Web site: www.roof-ware.com

Table of Contents

Section 5: Drawing Files

Section 6: Drawing Objects

Section 7: Layers

Section 8: Templates

Section 9: Smart Objects

Section 10: Symbols

Table of Contents

Section 31: Digitizing with RoofCAD—Advanced

Section 32: Creating Your Own Details

Section 33: Working with Manufacturers' Details

Section 34: Reference

Section 35: Template Setup

Section 36: Digitizer Setup

Section 36: Digitizer Setup (cont'd.)

Section 37: Glossary

Section 38: Sales and Support

Section 1

For Those New To RoofCAD

For Those New to RoofCAD

If you are evaluating RoofCAD

If you do not yet own a copy of RoofCAD the quickest way to get the feel for the program is to run through the How to Draw a Flat Roof tutorial. This tutorial will show you how to draw a flat roof from a rough site sketch. If you then want to know more about RoofCAD read the rest of this topic, which is what owners of RoofCAD licenses are instructed to read.

If you need personal assistance with any part of RoofCAD please contact our sales department at (416) 778-0843 and we will be happy to step you through the program.

Welcome to RoofCAD!

Thank you for purchasing RoofCAD (or if you have not yet purchased, thank you for considering RoofCAD for your company). For those new to RoofCAD this topic will teach you everything you need to know to be successful with this product.

- First is a brief discussion about what RoofCAD is and what it can do for you.
- Next is an explanation of the different RoofCAD licenses.
- Last is a minimum list of topics you must read to operate RoofCAD successfully.

What is RoofCAD?

RoofCAD is a CAD (Computer Aided Design) program, designed for the roofing industry. It differs from other CAD programs in that it was designed exclusively for the roofing industry.

All other CAD products are made for the mass market and will never provide enhancements exclusively for you, the roofing professional. With RoofCAD all we do is work on new features for the roofing industry, which you will receive in our regular RoofCAD upgrades. This means you will find other CAD products difficult to learn and cumbersome to use. With RoofCAD we keep the program simple by including only the features a roofer will need (not features that architects, engineers, road builders etc. need).

What RoofCAD Can Do For You

Here is a list of the major uses of RoofCAD:

- **Draw Roofs**: Draw complex roofs on screen in minutes from rough site sketches.
- **Takeoff Measurements:** Automatically generates a list of takeoff quantities for everything you draw.

- **Enhance Your Proposals:** Impress your customers by adding a RoofCAD drawing to your proposals.
- **Library of Your Customers' Roofs:** Develop a library of your customer's roofs on your computer. Call up any roof in seconds.
- **Service Calls:** For service calls, simply call up the roof on screen, circle the problem area, add a note, and print. Your service man now has the drawing he needs to solve the problem efficiently.
- **Visual Maintenance History:** Maintain a history on each of your customer's roofs. Draw inspection results and work done directly onto the drawing, over any time period. Then with a click of the mouse recall any time period for any roof.
- **Details:** Create your own library of details or read in and modify manufacturers details.
- **Digitize Blue Prints:** Add the RoofCAD-Digitizer module and you can measure your blue prints with RoofCAD.

RoofCAD's System Requirements

To operate the program you must be running Windows 98, Windows ME, Windows 2000, or Windows XP (Professional or Home) on an IBM compatible Pentium or better computer, with 16 megabytes of RAM and 10 megabytes of hard disk space.

What RoofCAD Licenses Do You Own?

What you need to learn depends on what RoofCAD licenses you own. There are currently two types of RoofCAD licenses. We call them RoofCAD and RoofCAD-Digitizer. If you purchase both licenses they can be combined on a single security device or separately on two devices. Below is an explanation of the two licenses.

RoofCAD License Features

- Draw a roof from a rough site sketch (i.e. where no blue prints available).
- Draw details.
- Draw or modify symbols and templates.
- Cannot be used with a digitizer.

RoofCAD-Digitizer License Features

- Allows you to measure blue prints with a digitizer.
- Cannot draw a roof from a rough site sketch (i.e. where no blue prints available).
- Cannot draw details.
- Cannot draw or modify symbols and templates.

Note: ***If you have one of these licenses and want to purchase the other, you can do so at any time by calling our sales department at (416) 778-0843.***

What You Need to Learn

No matter which RoofCAD license you own, the following topics are the first topics you must read:

Section 2 About Your Security Device

Section 3 Conventions in this Guide

RoofCAD License Owners

The first thing you need to do is run through the tutorial How to Draw a Flat Roof. However to become a competent RoofCAD user you must read the following topics in the following order (don't follow the topic order):

Must Reading:

Section 25 Basic Flat Roof Tutorial--this will quickly give you the feel of RoofCAD.

Section 38 Sales and Support--learn how to get help.

Section 4 The RoofCAD Interface--learn about the RoofCAD interface and tools.

Section 5 Drawing Files--learn how to work with RoofCAD files.

Section 15 Drawing Settings--learn about drawing settings like scale and paper size.

Section 7 Layers--learn to use layers in your drawing.

Section 8 Templates--learn about templates.

Section 6 Drawing Objects--learn how to select, delete, move, and rotate objects.

Section 35 Template Setup--learn to set RoofCAD up for the way you work.

Section 16 Layout Wizard--learn how to draw roof outlines, arcs etc.

RoofCAD-Digitizer License Owners

Whether you own both RoofCAD licenses or not read the above topics first. If you own just the RoofCAD-Digitizer license most of the contents of the

above topics apply to you anyway. What does not apply is some of the drawing tool instructions found in the Tools Menu section of the Interface topic.

Note: Menu options and button not available to a RoofCAD-Digitizer only license are grayed out in the RoofCAD window.

The following are the topics to read to setup your digitizer and learn how to use it.

Must Reading:

Section 36	Digitizer Setup--how to get your digitizer working.
Section 30	Digitizing with RoofCAD--Basic--learn how to digitize.
Section 14	Digitizer Scale--learn how to set the scale when digitizing with RoofCAD.

Section 2

About Your Security Device

About Your Security Device

Note: ***We highly recommend that you read this entire topic to understand the role of your security device.***

What is the security device?

The security device (or hardware key) is the small plastic device that came with your software delivery. It prevents unauthorized use of our software.

The device contains an encoded chip that tells us which of our software programs you are authorized to run. This ensures that we do not lose sales revenue to "software pirating".

Selling software is our business. It is how we recoup the substantial investments we have made to develop our products. It is also how we make a profit after the investment is paid off. Lost sales due to unauthorized copying of our product is a huge potential problem for us. That's why the security device is so important to our business.

What do I do with the security device?

Depending on the type of device you ordered with your RoofWare or RoofCAD software, you may do one of two things.

If you ordered a Parallel or Printer Port device…

…your security device plugs into the printer port of your computer. If you are using a printer on that printer port you must attach your device in the proper manner. This means you should attach the security device first. Then plug your printer cable into the back of the security device.

If you ordered a USB (Universal Serial Bus) device…

…your security device plugs into one of the USB ports on your computer. The USB device will also work if you have either a passive or powered USB hub attached to your computer.

The security device **must** be on the computer when you run the software. If it is not, the software will run in demonstration mode.

Protecting Parallel (Printer Port) devices

With parallel devices, any peripheral other than a printer (scanners, tape drives, zip drives etc.) can damage a security device. **Do not attach one of these types of devices to the printer port when the security device is attached.** For more information see Can a Device Get Damaged? in this section.

Protecting USB (Universal Serial Bus) devices

With USB devices, any powered peripheral (digital camera, scanner, tape drives, zip drives etc.) can damage a security device. **Do not attach one of these types of devices to the USB port when the security device is attached.** For more information see Can a device get damaged? in this section.

How does it work?

Parallel Device

The device is attached to any printer port on your computer. When the program starts it checks the device to see if you are authorized to run the program you are attempting to run. If so the program starts. If not, the program starts in Demonstration Mode.

Note: ***Adding the security device after the program has started in demonstration mode will not take the program out of demonstration mode. You must close RoofCAD and restart it after attaching the device.***

USB Device

The device is attached to any USB port on your computer or USB hub. When the program starts it checks the device to see if you are authorized to run the program you are attempting to run. If so the program starts. If not, the program starts in Demonstration Mode.

Note: ***Adding the security device after the program has started in demonstration mode will not take the program out of demonstration mode. You must close RoofCAD and restart it after attaching the device.***

What common problems might I encounter with the security devices?

Security devices are an invisible form of software protection that cause no adverse problems 95% of the time. Most customers attach them to their computers and forget about them. However, there are some problems that can occur:

- When using the program with a laptop you have to be sure that you have the device with you (and have not forgotten it back at the office).
- Sometimes when RoofCAD starts it fails to find the security device even though the device is attached to the computer. This is a very rare occurrence and if it persists let us know and we will replace the device. When it happens RoofCAD will come up in Demonstration Mode. You know you are in Demonstration Mode because a dialog box displays the warning that you are in Demonstration Mode at program startup. Do not draw anything unless you are prepared to lose your work.

Note: ***Adding the security device after getting this message will not get you out of Demonstration Mode. You must close RoofCAD and start it again.***

After a restart, RoofCAD will usually find the device. If it does not, reboot your computer and start RoofCAD again. If the problem persists, call us and if the problem cannot be corrected we will replace your device by overnight service.

Why not another form of software security?

The security device is the best means today of preventing unauthorized use of a software program. Security devices are widely used throughout the software industry, mostly by companies catering to smaller markets.

There is no form of software security that is as absolute and works with less inconvenience than the security device.

Note: ***We (like all software companies) are constantly on the lookout for a better solution to software security. We ourselves do not like the security device and will adopt any solution that comes along that offers the same protection against unauthorized use that the security device does.***

Why doesn't Microsoft use them?

The simple answer is the size of the market. Where companies like Microsoft have the potential to sell millions of copies of their software, we are in a market that numbers in the thousands. Microsoft builds "losses due to software pirating" into their pricing strategy because their market is large enough to absorb it. It's almost like you pay for Microsoft piracy losses whenever you purchase a new computer with any Windows operating system pre-installed or any other Microsoft product. You just don't know you're doing it.

Our market—you and people like you--is not large enough to do that. Consequently, we have adopted a much simpler and, we think, more understandable pricing strategy and software protection scheme.

I buy single copies of other programs and load them on different computers. Why not yours?

You may not know this but having more than one person using the same software license at the same time is illegal, except where explicitly stated with site licenses or similar mass licensing concepts. If you read the software licensing agreements that come with software programs you will discover that most allow for use of that copy (license) of the program by only one person on one computer at any time.

What if my device doesn't work?

If your device is not working we will replace it at no charge. Send us the device overnight and we will return a replacement device.

Can a device get damaged?

Yes. Both Parallel and USB devices can be damaged by scanners, zip drives, digital cameras, tape backup units—generally any kind of peripheral that draws or passes power through the device. Any of these add-ons may be a potential device killer. If you have peripherals like these connected to the same printer or shared USB port as your security device, remove your RoofCAD device before using your other peripheral.

As a more permanent solution we recommend that you add another printer port to your computer (usually around $50) or buy a powered USB hub (usually $85 or less) and run the security device on its own port or hub connection.

Once a device is damaged it will not allow the program out of demonstration mode.

What if I lose my device?

We STRONGLY RECOMMEND that you add the full cost of the software to your insurance policy. If your device is lost or stolen you will be charged full price for a new security device.

Section 3

Conventions in This Guide

Conventions in This Guide

Help Conventions

This RoofCAD documentation uses the following conventions:

Words in italics may refer to things on screen like names of windows, fields, boxes, and buttons etc.

Bold instructions indicate an action you are to take like type and press usually refer to using the keyboard. Click, select or choose means you are to click the left mouse button. If the right mouse button is to be used we will explicitly say right click.

Menu|Command refers to the name of a menu and a command that appears within that menu. For example, File|Save means "from the File menu, choose the Save command".

Section 4

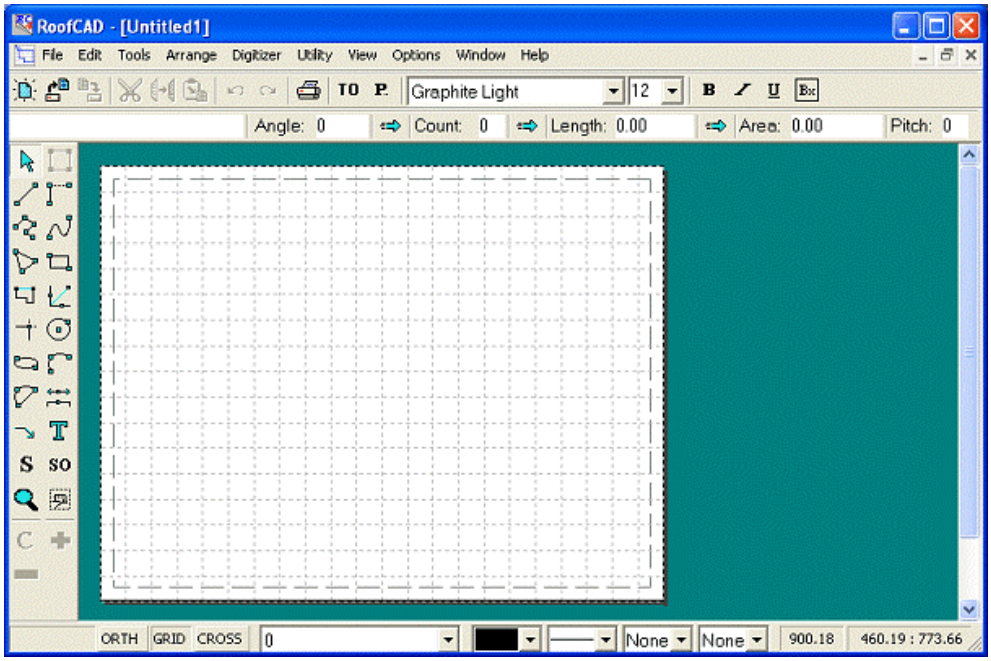
The RoofCAD Interface

The RoofCAD Interface

About the RoofCAD Interface

The RoofCAD window consists of two toolbars, a menu, an object information bar, a status bar and a drawing area.

Note: *If you are new to RoofCAD, be sure to read about the drawing tools under The Tools Menu in this section of RoofCAD Bible.*



The main RoofCAD window. You'll do all your drawing work here.

In this overview of the RoofCAD Interface, you'll find descriptions of every tool and function described in the order they appear on your RoofCAD Main Menu.

The File Menu

The File menu contains options related to working with files like opening new or existing drawings, saving or exporting drawings, and printing drawings. For information on how to work with files see Section 5, Drawing Files.

File|New|Empty

Starts a new, empty drawing page. "Empty" means the drawing page has no legend. Use this option only when drawing identifiers such as a legend, title block, etc., are not necessary. For example, if you want to draw a detail, you probably would not want the standard roof legend on your drawing.

Keyboard Shortcut Ctrl + N

File|New|Use Template

Starts a new drawing page with the default template's settings and look applied to it. This is the option you should normally use when starting a new roof drawing. If you want to start a new drawing with a template other than the default template, choose the File|Open menu command, click the template you want to use, then click OK.

Warning: If you start a new drawing by using "File|Open" to open a template, you MUST use "File|Save As" when saving the template. If you use "File|Save" you will overwrite your template.

File|Open

Opens an existing drawing. For instructions on how to do this see Section 5, Drawing Files.

Keyboard Shortcut Ctrl + O

File|Close

Closes the currently displayed drawing.

Keyboard Shortcut Ctrl + W

File|Save

Saves the changes made to the drawing. If this is the first time you are saving a new drawing, you will be asked to enter a file name for the drawing. If you want to save a copy of the drawing under a different name, you should choose Save As. For instructions on how to do this see Section 5, Drawing Files.

Keyboard Shortcut Ctrl + S

File|Save As

Allows you to enter a new filename for the drawing. Doing this will preserve the original drawing or template under the old name. After you have used Save As on a drawing, using Save will save changes to the new file. For instructions on how to do this see Section 5, Drawing Files.

File|Save As Default Template

Takes the drawing you currently have open and makes it the default template. The next time you choose File|New|Use Template, this template's settings and look will be applied to the new drawing. If you wish to use a

template other than the default, use File|Open to open the template. To learn more about Templates see Section 5, Drawing Files.

Warning: ***If you start a new drawing by using "File|Open" to open a template, you MUST use "File|Save As" when saving the template. If you use "File|Save" you will overwrite your template.***

File|Export As DWG

Produces a copy of the drawing in DWG file format. The submenu lets you choose what version of dwg to export.

File|Export As DXF

Produces a copy of the drawing in DXF file format. The submenu lets you choose what version of dxf to export.

File|Export As Taper-Plus DXF

Produces a copy of the drawing specific for Taper-Plus, the leading tapered insulation estimating software program for the roofing industry. Doing so means you can send your drawing by e-mail attachment or on diskette to the people that do your tapered estimates for you (provided they are using the Taper Plus software). They in return can send you back the completed tapered design, which you can load into RoofCAD. For more information see Section 5, Drawing Files.

File|Load ePlan

This option will be available in our upcoming ePlan module. When made available this module will allow you to load the new "Electronic Blue Prints" like the new Dodge Plans.

File|Set ePlan Scale

See File|Load ePlan above.

File|Clear ePlan

See File|Load ePlan above.

File|Print|Print Drawing

This option prints the drawing. This option will not print the Takeoff Record. To do that choose File|Print|Print Takeoff Record from the RoofCAD menu. For more information see Section 5, Drawing Files.

Keyboard Shortcut **Ctrl + P**

File|Print|Print Takeoff Record

Prints the Takeoff Record. For more information see Section 5, Drawing Files.

Most Recently Used Files List

RoofCAD displays the most recently used files in a list. Up to nine files are shown.

File|Exit

Exits RoofCAD. If a drawing is open and recent changes have not yet been saved, you will be asked if you want to save changes.

The Edit Menu

The Edit menu contains options related to editing objects.

Edit|Undo

Reverses or undoes your previous action, usually adding or deleting something in your drawing. If you accidentally delete something from your drawing, from the Edit menu, click Undo to restore the deleted item.

Keyboard Shortcut **Ctrl + Z**

Edit|Redo

If you decide later you didn't want to undo this action, click Edit|Redo.

Keyboard Shortcut **Ctrl + Y**

Edit|Cut

Cuts one or more selected objects to the RoofCAD clipboard. Usually used in conjunction with Paste. Pressing this button will remove the selected object(s) from your drawing and put them in memory. Clicking the Paste button, then clicking on the page will duplicate the cut objects and place them onto the drawing. This option is not used to cut and paste objects into other Windows programs. To do that, use Copy to Windows Clipboard. For more information on how to cut/copy and paste (duplicate an object) see Section 6, Drawing Objects.

Keyboard Shortcut **Ctrl + X**

Edit|Copy Button

Copies one or more selected objects to the RoofCAD clipboard. Usually used in conjunction with Paste. This option is not used to copy and paste objects into other Windows programs.

To do that, use Copy to Windows Clipboard. For more information on how to cut/copy and paste (duplicate an object) see Section 6, Drawing Objects.

Keyboard Shortcut Ctrl + C

Edit|Paste Button

Click this button to paste previously cut or copied objects. Clicking the Paste button displays a "ghost" image to help you place the objects you want to paste in your drawing. Position the ghost image and click to paste the objects onto your drawing. This option is not used to copy and paste objects into other Windows programs. To do that, use Copy to Windows Clipboard. For more information on how to cut/copy and paste (duplicate an object) see Section 6, Drawing Objects.

Keyboard Shortcut Ctrl + V

Edit|Copy to Windows Clipboard

Use this option to copy a selected object(s) to the Windows Clipboard when you want to paste the object(s) into other Windows programs.

When you choose this item, your mouse cursor will changes to look like this.

The Windows Clipboard mouse cursor.

You can now click two corners to define a rectangle around the area of the drawing you wish to copy to the Windows Clipboard. Images in the Windows Clipboard can be pasted into many other applications such as WordPad, WordPerfect, or Microsoft Word using the "Paste" command from the Edit menu in these applications.

Edit|Clear All

This option will warn you once then delete the entire contents of your drawing, except for the contents of the $FORMAT layer.

Keyboard Shortcut Ctrl + Del

Edit|Delete

Deletes all selected objects in your drawing. You can also press the Del key on the keyboard to delete selected objects.

Edit|Select Layer

Selects all objects on the current layer.

Edit|Select All

Selects the entire contents of the drawing, including the contents of invisible layers.

Edit|Deselect Layer

Deselects everything on the current layer.

Edit|Deselect All

Deselects all objects.

Keyboard Shortcut Esc

Edit|Create Symbol

Transforms selected objects into a symbol. When you choose this item, you will be prompted to enter a name for the symbol, and to indicate whether or not this will be a scaled symbol. A scaled symbol will appear larger or smaller as you change the drawing scale. The default is to create an unscaled symbol that will always appear at the same size on your drawing, regardless of what drawing scale you are using.

This option is not how you create new symbols in the symbol library. It will make a symbol for the current drawing only. To add new symbols to the Symbol Library see Section 10, Symbols.

Warning: Do not make symbol out of Smart Objects (objects drawn from the Smart Object Browser). Doing so will remove them and their quantities from the Takeoff Record.

Edit|Group Selected

Groups selected objects into a single object. Doing this makes them easy to select and move without losing their position relative to each other. This option would be used mostly when drawing details.

To use, select several objects that you want to group then choose this menu option and they will be considered one object.

Warning: Do not group Smart Objects (objects drawn from the Smart Object Browser). Doing so will remove them and their quantities from the Takeoff Record.

Edit|Ungroup

Ungroups a symbol or a group.

The Tools Menu

The Tools menu contains the drawing tools. You MUST know how to use the drawing tools in order to draw in RoofCAD.

Normally you draw a roof using the Smart Objects. Using the Smart Objects is the quickest way to draw and the only way to generate a Takeoff Record. When you draw with a Smart Object you are actually using one of the drawing tools. In fact part of setting up a Smart Object is telling RoofCAD which drawing tool to use with the Smart Object.

You can draw by choosing a drawing tool from the menu (or clicking its button) instead of using Smart Objects. Use this method when you want to draw something without creating or changing the Takeoff Record. For example, you may have drawn a roof with Smart Objects but now want to show an adjoining roof just for reference. Draw it with the drawing tools and the Takeoff Record does not change.

The other times you will draw with the drawing tools are when there are no Smart Objects for what you want to draw. You may, for example, want to draw a detail or even a map to the job site.

Whether drawing with Smart Objects or not you have to know how to use the drawing tools in order to draw in RoofCAD.

Following is a list of every drawing tool in RoofCAD and how to use it. If you are new to RoofCAD there are 6 tools you need to learn now: The Pointer Tool, Line Tool, Polygon Tool, Rectangle Tool, Polyline Tool, and the Layout Wizard. Learn these first and come back to learn the others later.

Note: ***Using the Layout Wizard is explained in Section 16, Layout Wizard.***

Tools|SmartObject Browser

Opens (but does not close) the Smart Object Browser. Smart Objects are what you use to draw a roof. Click on the Smart Object you want to draw, then add it to your drawing. To learn more about Smart Objects see Section 9, Smart Objects.

Tools|Symbol Browser

Opens and closes the Symbol Browser. The symbol browser lets you browse your symbol library. When you find a symbol you want to add to the drawing click on the symbol, then click on the drawing where you want it placed. To learn more about Symbols see Section 10, Symbols.

Tools|Section Browser

Opens the Section Browser Window. This feature lets you break out a sub section of a roof or add two or more roofs together on your takeoff record. For a full explanation of Section see the Sections topic.

Note: ***Sections are an advanced topic. If you are new to RoofCAD you need to learn the other tools first.***

Tools|Pointer

The Pointer tool is used to select objects, move objects and resize objects. You select objects by clicking on them or dragging a rectangle around them.

To move an object that has been selected, press and hold down the mouse button on the object (not on the bounding boxes) and move the mouse to the new location for the object, and release the mouse button.

To resize an object press and hold down the mouse button on one of the bounding boxes, move the mouse and you will see the object resizing. When you have the object at the desired size release the mouse button.

For more information see Section 6, Drawing Objects.

Tools|Corner

Use the Corner Tool to manipulate the corners of polygons and polylines. Select the object to be manipulated, then click the Corner tool button. Black boxes will appear on the corners of the object. Put the mouse pointer on a box, press and hold down the mouse button, then drag the mouse and the corner will move with the mouse.

Tools|Line|Line

Use the Line Tool to draw straight lines. Click once to start the line, move the mouse and you will see the line forming. Once you have the line formed click the mouse again to complete the line.

Tools|Line|H/V Line

Use the Horizontal/Vertical Line Tool to draw lines locked at 90-degree angles. Click once to start the line, move the mouse and you will see the line forming. Once you have the line formed click the mouse again to complete the line.

Tools|Line|Polygon

Use the Polygon Tool to draw closed areas. This tool works the same as the Polyline tool except the final segment is joined to the first (closing the area). Pick a starting point and click. Move the mouse and you will see the first segment forming. Once you have the segment formed, click the mouse again to complete it. Move the mouse to form the next segment and click the mouse to complete it. Notice that the shape is always closed as you draw it. After adding all the segments right click to finish the Polygon.

Tools|Line|Rectangle

Draws rectangles. Position the mouse where the first corner of the rectangle is to be and click. Move the mouse and you will see the rectangle forming. When you have formed the rectangle, click the mouse again.

Tools|Line|Polyline

Draws a multi segment line. This tool works the same as the Polygon tool except that the RoofCAD does not close the shape. Pick a starting point and click. Move the mouse and you will see the first segment forming. Once you have the segment formed, click the mouse again to complete it. Move the mouse to form the next segment and click the mouse to complete it.

After adding all the segments, right click to tell RoofCAD you are finished.

Tools|Line|Freestyle

Use the Freestyle Tool to draw freeform lines by clicking at the starting point, moving the mouse to draw, then clicking at the end.

Tools|Curve|Circle

Draws circles. Click where you want the center of the circle to be. Move the mouse and you will see the circle forming. When you have formed the circle click again to finish.

Tools|Curve|Arc

Draws arcs. Click where you want the first end point of the arc. Move the mouse to where you want the other end point of the arc and click again. Move the mouse; you will see the arc forming. When you have formed the arc click again to finish.

Tools|Curve|Closed Arc

Draws closed arcs. Click where you want the first end point of the arc. Move the mouse to where you want the other end point of the arc and click again.

Move the mouse; you will see the arc forming. When you have formed the arc click again to finish.

Tools|Curve|Ellipse

Draws ellipses. Click and move the mouse, you will see the ellipse forming. When you have formed the ellipse click again to finish.

Tools|Special|Layout Wizard

The Layout Wizard is used primarily to draw roof outlines. It allows you to accurately enter wall lengths and angles from the keyboard. To learn how to use the Layout Wizard see Section 16, Layout Wizard.

Tools|Special|Hip/Valley Tool

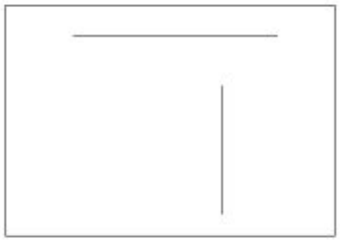
Draws hips and valleys. To use this tool you must first draw a roof outline then define the pitch of each of the eaves. You use the Hip/Valley Tool by clicking on two connecting eaves. Move the mouse and you will see the hip/valley line forming. It is locked at the proper angle, based on the pitch of the two eaves that define it (RoofCAD does the math for you). Move the mouse until you have the hip/valley formed to the desired length and click. The pitched roof tutorials will explain this tool further.

Tools|Special|Trim Tool

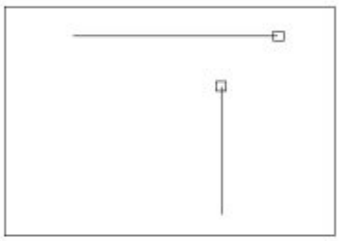
This tool will either extend or trim two non-parallel lines to their point of intersection, or extend or trim one line to where it meets a second line. In either case the angles of the lines will remain the same. This tool is handy when drawing pitched roofs, because it will make two hips meet at the same point. It is also useful when drawing details.

To extend or trim two lines so that they both end at the same intersection:

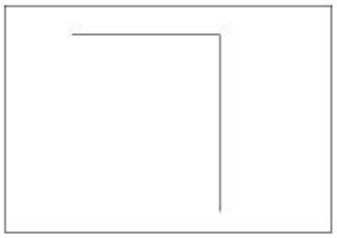
1. Draw two lines like below.



2. Choose the Trim Tool and click on the end points of the two lines as indicated below.

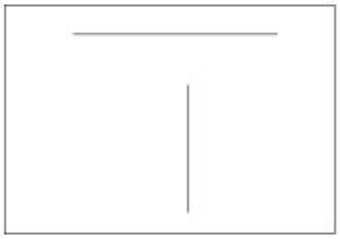


3. The horizontal line will be trimmed and the vertical line extended to make the two end points meet at one intersection as below.

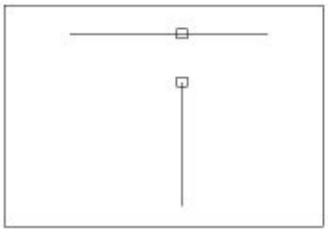


To extend or trim one line so that it ends where it meets another, non-parallel line:

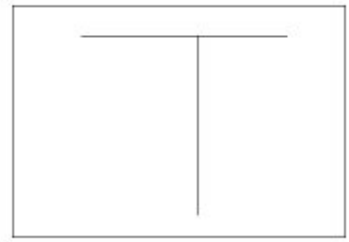
1. Start a new drawing and with one of the line tools draw two lines like below.



2. Choose the Trim Tool and click on the end point of the vertical line and anywhere along the horizontal line (just not on the end points) as indicated below.



3. The vertical line has been extended to meet the horizontal line as below:



Tip:	**For Method 2, it must be possible for the first line to cross the second without extending the second line.**

Tools|Special|Image

Use the image tool to add digital photos and images to your drawing.

RoofCAD is compatible with most common image formats. Once added to the drawing the images can be selected, resized, moved and deleted. The only thing you can't do with an image, at this point, is rotate it.

How to add an Image to your drawing:

First, you need to do a little preparation. Place a copy of your image file in the "Photos" folder under your RoofCAD folder. When you copy the image into this folder be sure to give it a unique name. That way, you won't overwrite another image file in this folder.

Hint:	**We recommend that you place a COPY of the image file in the Photos folder because that dedicates the image to RoofCAD. Then, if anything happens to the original, it won't matter because RoofCAD uses the copy.**

1. In RoofCAD, choose Tools|Special|Image from the menu or click the button on the left hand tool bar.
2. Position the mouse on the drawing.
3. Click the mouse.
4. Move the mouse and a box will begin to form. Make the box the same size that you want your image to be when you place it in your drawing.
5. Click the mouse when the box is formed. The Open window appears.
6. Find the image you want. Highlight it and click OK. The image appears on the drawing.

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 cannot be rotated in RoofCAD. So rotate it first in your image software.
- RoofCAD does not have any image processing tools. So manipulations like contrast, brightness, resolution, etc., must be done in your imaging software.
- Images are not stored in your RoofCAD file. A RoofCAD drawing simply maintains a link or pointer 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.
- Lots of images on a drawing will slow down the program. There are ways of keeping your image files very small without sacrificing quality. We recommend that you learn how to work with images properly in your image software. Small images help performance greatly but if you have an older computer you may find adding images makes RoofCAD slow. Unfortunately this is the reality of working with graphic images. By their nature they demand a lot more resources from a computer. If you want to use images, you may have to upgrade your computer.

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 floppy disk and give it to someone, then you need to put the image files on the floppy as well.

If you want to send a RoofCAD drawing to someone as an e-mail attachment, you need to attach the images as well.

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 same folder to find any other missing image files.

How to find where an image file is located:

- Select the image with the pointer tool on the drawing.
- Look at the far left cell on the status bar and you will see the image file's location.

Tools|Text

Use the Text Tool to place text on your drawing.

1. Click the text tool button.
2. Click on the page where the text is to appear. The text window appears.
3. Type desired text and press the enter key whenever you want a new line in the text.
4. Click the OK button and the text is added to the drawing.

To edit any text on your drawing, select it with the pointer tool then click the Text tool button.

To change the look of the text see the menu item Options|Font.

Tools|Dimension

Adds dimensions to any line on your drawing. Click on the line you wish to dimension, then click on which side of the line you want the dimension to appear. Dimensions are normally added to the Dimensions layer. That way they can be made visible or invisible. To learn more about layers see Section 7, Layers. For an example of how to add dimensions, see the How to Section 25, Basic Flat Roof Tutorial.

Tools|Leader

Draws leaders. First click where you want the arrowhead to appear. Then move the mouse and you will see the segment forming. Click to finish the segment. Repeat for each additional segment. Right click to finish the leader.

Tools|Zoom

Zooming in on your drawing means to enlarge it on the screen. This is done whenever you can no longer work accurately on the drawing because objects on the drawing are too small. A good example of this is when you are trying to select an object, which is close to several other objects, and every time you click to select, you get the wrong object. Zooming in on the area will make it much easier to select the object you want.

To Zoom in:

1. Click the Zoom Tool button.
2. To zoom in on an area of your drawing you will form a rectangle around the area. Position the mouse where you want the first corner of the rectangle to be. Now click the mouse.
3. Move the mouse and you will see a rectangle being formed. Move the mouse until you have formed a rectangle around what you want to zoom in on.
4. Click the mouse and you are now zoomed in to where the rectangle was drawn.

Hint: **When zoomed in, use the scroll bars to move around the drawing.**

To Zoom Out:

You can zoom out 10% at a time.

1. Click the Zoom Tool button.
2. Position the cross hair of the mouse cursor in the center of what you want to zoom out on.
3. Right click. You are now zoomed out by 10%.

Hint: **The RoofCAD menu option View|Fit to Window puts you back to the original view of the entire drawing in one step.**

The Arrange Menu

The Arrange menu contains items for manipulating layer and object properties and positioning.

Arrange|Layer

This option opens and closes the Layer window. The Layer window allows you to switch from one layer to another. You can also add, delete, or rename layers, and make a layer visible or invisible.

This area shows the current layer.

This area of the RoofCAD window displays the Current Layer. Click on the arrow to the right to open and close the Layer window.

To learn about layers see Section 7, Layers.

Arrange|Properties

This option opens and closes the Properties window. The Properties window can be used to change the size and angle of an object as well as what layer the object belongs to. For full instructions see Section 18, Properties.

Arrange|Order

The **Arrange|Order|Bring to Front** and **Send to Back** menu commands will visually place selected objects in the background or foreground. Sometimes you can end up with an object covered by another object (if you draw one over another). If this happens you would select the top object and choose **Arrange|Order| Send to Back** and the top object will now be under the bottom object.

This situation does not happen that often but when it does this is a handy tool.

How to Use the Order Menu Option:

1. Draw a small rectangle.
2. Draw another, larger, rectangle over top of the first one.
3. With the pointer tool select the larger rectangle.
4. From the RoofCAD menu choose Options|Fill Color/Pattern. The Fill pattern window appears.
5. Click on the White color button. The large rectangle is filled with white making the smaller rectangle disappear. The smaller rectangle disappears because it was drawn first and is considered to be under the larger rectangle.
6. To see our small rectangle we need to change its order relative to the large rectangle. If the large rectangle is not selected use the pointer tool to select it again.
7. From the RoofCAD menu choose Arrange|Order| Send to Back. In CAD terms the small rectangle is now the top object of the two, so it is once again visible.

You also could have selected the small rectangle (even though you cant see it you can select it if you click in the right place) and chosen **Bring to Front**. This would have accomplished the same thing.

Arrange|Align

The **Arrange|Align** menu items will align groups of selected objects. Objects may be aligned along their left, right, top, or bottom edges, or along

their centers vertically or horizontally. All objects will be aligned with the first object selected.

This is handy for rooftop objects like drains, stacks, and curbs when you want them all lined up.

How to Use the Alignment Option:

1. Add three drains around a drawing.
2. With the pointer tool select the upper most drain. This is the drain that the alignment will be based on for this sample (you could have chosen any one of the drains). Now select the remaining drains in any order.
3. From the RoofCAD menu choose Arrange|Align|Align Top. All the drains are now aligned with the upper most drain.

There are several different alignment options. All are found under the **Arrange|Align** menu option. **Align|Left, Right, Top,** and **Bottom** a pretty straight forward.

Arrange|Align|Center Vertical will line up objects vertically so that a straight line could be drawn through their centers. The **Arrange|Align|Center Horizontal** does the same except horizontally.

Arrange|Rotate 90

This option will rotate selected objects in 90-degree increments. You can also rotate a selected object with the "[" and "]" keyboard keys. For more instruction on how to rotate an object see Section 6, Drawing Objects.

Arrange|Flip Horizontal

This option will transform selected objects into their horizontal mirror image.

Arrange|Flip Vertical

This option will transform selected objects into their vertical mirror image.

The Digitizer Menu

This menu contains items for setting up your digitizer. If you do not have a RoofCAD-Digitizer license, or RoofCAD was unable to find the digitizer on startup, these items will be grayed out. For instructions on how to digitize see Section 30, Digitizing with RoofCAD—Basic.

Digitizer|Define Workspace

This option will prompt you to define the area on your digitizer you will be working within by digitizing the upper left, then the lower right corner of the work area. By defining the upper left and lower right corner you are

forming an invisible rectangle around the roof (or what ever it is you are digitizing). RoofCAD will then make that rectangle fit the on screen page.

Digitizer|Define Menucard

This option will prompt you to define the placement of your RoofCAD-Digitizer menu card by digitizing the upper left, then the lower right corners indicated on the menu card by a cross hair in a circle. It is important that the menu card be placed so that it is parallel to the edge of the digitizer, and that it not be moved during a session. If the menu card is moved, its position must be redefined before it can be used.

Digitizer|Set Digitizer Scale

This option will open a window where you can enter the scale of the document you are about to digitize from. This can be done by typing in the scale as indicated on the document, e.g. 1/4, or by digitizing a dimensioned wall on the document, and typing in the length of the wall. For more details see Section 14, Digitizer Scale.

Digitizer|Fit Workspace to Page

This option will set up your RoofCAD drawing so that the workspace you defined will be scaled to fit within the drawing page in your RoofCAD window. This function is also performed automatically when you set your digitizer scale so you will not use this option very often.

Digitizer|Digitizer Setup

This option opens a dialog where you can indicate which COM port your digitizer is connected to. If, when you started RoofCAD you saw a Message Box saying "Unable to initialize digitizer, and most of the Digitizer menu items are grayed out, try changing the COM port, then click the Digitizer|Connect menu item. If connection is successful, all the Digitizer menu items will become enabled.

Digitizer|Digitizer|Connect

This option will normally be grayed out if RoofCAD was unable to find the digitizer.

The Utility Menu

This menu contains several utilities.

Utility|Send Area

This option will send the area in the object information bar to RoofWare (our estimating module).

Utility|Send Length

This option will send the length in the object information bar to RoofWare (our estimating module).

Utility|Send Count

This option will send the count in the object information bar to RoofWare (our estimating module).

Utility|Takeoff Record

Press this button to open the Takeoff Record window. If you press this button when the Takeoff Record window is open it will close the Takeoff Record window.

Utility|Symbol Library Manager

This option will open the Symbol Library Manager window. With this window you can add, delete and edit the symbols in your symbol library. To learn about this window see Section 22, Symbol Library Manager.

Utility|Calculator|Add

Calculator Add. To perform a calculator operation, select the first object and click the + or - button. Repeat with other objects. The result of the calculation is displayed in the Object Information Line. Numbers appearing in the Object Information Line are colored red while a calculation is active. Click the C button (the clear button) to clear a calculation.

Utility|Calculator|Subtract

Calculator Subtract. To perform a calculator operation, select the first object and click the + or - button. Repeat with other objects. The result of the calculation is displayed in the Object Information Line. Numbers appearing in the Object Information Line are colored red while a calculation is active. Click the C button (the clear button) to clear a calculation.

Utility|Calculator|Clear

Calculator Clear. Clears a current calculator operation.

The View Menu

This menu allows you to change the zoom level and pan around large drawings.

View|Pan Window

This option will open the Pan Window. This window is a tool to help you navigate around a drawing when you are zoomed in. When the window opens, you will see the entire drawing in miniature, with a red rectangle representing the portion of the drawing currently visible in the main RoofCAD window. When you click and drag this rectangle the main

RoofCAD window will scroll to display the portion of the drawing outlined by the rectangle. When you change the zoom level of the drawing, the red rectangle will resize to reflect the current view.

How to Use the Pan Window:

1. Load an existing drawing. If you still have the dixiesea.rcg drawing that comes with RoofCAD that would be a good one to try.
2. Zoom in on part of the drawing.
3. Choose View |Pan Window from the menu. This opens the Pan window, which displays the entire drawing.

Hint:	**The Pan window can be resized and moved. So make it a convenient size and move it to a location that will obstruct as little as possible of the main drawing. RoofCAD will remember the size and position for next time.**

A red rectangle in the Pan window represents the portion of the drawing visible in the main window (what you have zoomed in on).

4. Put the mouse pointer inside the rectangle. Press and hold down the mouse button. Now move the mouse. The image in the main drawing window moves wherever the rectangle goes.

View|Zoom In

This option will zoom the drawing in by approximately 10% when clicked.

Keyboard Shortcut: + (the Plus sign)

View|Zoom Out

This Option will zoom the drawing out by approximately 10% when clicked.

Keyboard Shortcut: - (the minus sign)

View|Fit to Window

This Option will zoom the drawing so that the drawing page will fit entirely within the window.

View|Actual Size

This Option will display the drawing at the approximate size it will appear when printed.

View|Refresh

This Option redraws the screen for you. Sometimes if you're doing a lot of work on a drawing, the screen may not always refresh properly. You may

find some random marks on the drawing surface and your drawing may look generally messy. The Refresh Option forces your screen to redraw.

Keyboard Shortcut: F5

The Options Menu

This menu contains the options that change drawing settings, program settings, and drawing tool settings.

Options|Margin On/Off

This option toggles the display of the dashed border around the RoofCAD page. A check mark beside the menu item indicates that the option is turned on. This margin represents the printable area of the page. (Most printers do no print completely to the edge of the paper) This dashed line will not show when the drawing is printed.

Options|Grid On/Off

This Option toggles the display of the grid lines on the RoofCAD page. A check mark beside the menu item indicates that the option is turned on. The size of the grid is set in the Drawing Settings window. The grid lines will not be printed when the drawing is printed.

Options|Cross Hairs On/Off

This option toggles between the normal small cursor and a large AutoCAD-style crosshair. To toggle between the normal cursor and the large cursor choose **Options|Crosshairs On/Off** from the menu, click the CROSS button, or press "C" on your keyboard.

Options|Snaps

This option contains items to turn on different snap features. Snaps are a CAD term. Snaps give you the ability to connect drawing objects together with greater accuracy.

Options|Snaps|Snap Off

Turn off all snaps.

Keyboard Shortcut: F3

Options|Snaps|Snap Length

Length Snap only kicks in when you are drawing/digitizing an object made up of lines like an expansion joint or gas line, or, in the case of digitizing, the roof outline itself. Length Snap "snaps" your line lengths to the nearest foot (or whatever other increment you specify in the Drawing Settings window). This snap is, of course, optional. Implement it if you want your line lengths to be rounded to whole numbers. So when digitizing a roof outline, instead of getting a line length that is 33.67', you will get 34.00'.

Length Snap Tutorial:

1. Start a new drawing.
2. Open the Smart Object Browser and choose Miscellaneous|Gas Line.
3. Click the mouse on the drawing.
4. Move the mouse and notice the Length readout cell on the status bar displays the length as you move the mouse.
5. Press the "L" key on the keyboard. This turns Length Snap on. Move the mouse some more and notice the Length readout cell on the status bar displays the length rounded to the nearest foot. You can make this increment whatever you want in the drawing settings window.

Hint: **Length snap can be on at the same time as grid snap. Grid snap is in effect until you start to draw; then length snap takes over.**

Options|Snaps|Snap to Grid

This option will cause all mouse actions to snap to an invisible grid. The size of the snap units is set in the Drawing Settings window.

Options|Snaps|Ortho

Ortho mode helps you to draw straight lines. Ever notice when you need to draw a straight up and down or left and right line, it is hard to hold the mouse steady enough to get the line straight? Or when digitizing, do you always end up with crooked lines? Ortho mode solves this. Ortho mode locks a line at a specific angle. RoofCAD ships with the ortho angle set to 45-degree increments. So all you have to do is specify the line length and ortho mode will keep it straight. You can specify the ortho angle increment in the Drawing Settings window (Options|Drawing Settings).

Ortho mode can be toggled on and off by clicking the ORTH button or by pressing "O" on the keyboard. When ortho mode is on, the ORTH button looks pressed in.

How to Use Ortho Mode:

It only works when drawing a new line or manipulating an existing line. If ortho mode is off, click the ORTH button to turn it on. If ortho mode is on, click ORTH to turn it off.

While digitizing, it's easier to use the "O" key.

Tip: **Ortho Mode does not work while using the Layout Wizard.**

Warning: **Be very careful using Ortho Mode while digitizing angled walls. Here is an example of what could go wrong: You are digitizing a roof outline with Ortho Mode on and your Ortho Mode is set to 45 degree increments. So far you have digitized 90 degree walls but the next wall is an angled wall that is close to BUT NOT EXACTLY a 45 degree angle. If you digitize the wall with Ortho mode on, the wall will be drawn at 45 degrees thus making the takeoff inaccurate.**

Before you digitize the wall you need to press the "O" key on the keyboard to turn Ortho Mode off. Use the ORTHO button as your visual cue as to whether Ortho mode is on or off. When button is pressed in, Ortho mode is on.

Options|Snaps|Snap to End Point

Snaps the cursor, while drawing, to the closest end point of a line or corner. In a circle or ellipse, it will also snap to the 3, 6, 9 and 12 o'clock positions.

To try this snap, do this:

1. Click the Line tool button and draw a single line.
2. Now hold down the Ctrl key on the keyboard, position the mouse pointer near the end of the line you just drew.
3. Click the mouse while still holding down the Ctrl key. The mouse jumps to the closest corner of the existing line.
4. Move the mouse and click again to complete the line.

This snap works with any drawing tool including the Layout Wizard. With the Layout Wizard it is only the starting point that can be snapped.

This snap can also be used with the keyboard. **Ctrl + F2** will reposition the cursor to the closest end point of a line or corner of two lines.

To try this out, add a rectangle to the drawing with the rectangle tool , then:

1. Position the mouse pointer near one of the rectangle's corners and let go of the mouse.
2. On the keyboard, hold down the Ctrl key and tap the F2 key at the same time. The mouse repositions itself exactly on the corner of the rectangle.

Options|Snaps|Snap to Midpoint

Snaps the cursor, while drawing, to the closest midpoint of a line. It will also snap to the center point of a circle or ellipse.

To try this snap do this:

1. If you do not have a line on the page already, click the Line tool button and draw a single line.
2. Now hold down the Shift key on the keyboard, position the mouse pointer near the middle of the line you just drew.
3. Click the mouse while still holding down the Shift key. The mouse jumps to the midpoint of the closest line.
4. Move the mouse and click again to complete the line.

This snap works with any drawing tool including the Layout Wizard. With the Layout Wizard it is only the starting point that can be snapped.

This snap can also be used with the keyboard. **Shift + F2** will reposition the cursor to the closest midpoint of a line.

To try this out, add a rectangle to the drawing (if there is not already one there) with the rectangle tool , then:

1. Position the mouse pointer near the midpoint of one of the rectangle's lines and let go of the mouse.
2. On the keyboard hold down the Shift key and tap the F2 key at the same time. The mouse repositions itself exactly on the midpoint of the line.

Options|Snaps|Snap to Line

Snaps the cursor while drawing to the closest line. It does not snap to the end or midpoint, just to the closest point along the closest line It will also snap to the perimeter of a circle.

To try this snap, do this:

1. If you do not have a line on the page already, click the Line tool button and draw a single line.
2. Now hold down the Ctrl and Shift keys on the keyboard, at the same time. Position the mouse pointer anywhere along the existing line.
3. Click the mouse while still holding down the Ctrl and Shift keys. The mouse jumps to the closest point along the line.
4. Move the mouse and click again to complete the line.

This snap works with any drawing tool including the Layout Wizard. With the Layout Wizard it is only the starting point that can be snapped.

This snap can also be used with the keyboard. **CTRL + Shift + F2** will reposition the cursor to the closest point of the closest line.

To try this out add a rectangle to the drawing (if there is not already one there) with the rectangle tool , then:

1. Position the mouse pointer near one of the lines (anywhere along the line) and let go of the mouse.
2. On the keyboard hold down the Ctrl and Shift key at the same time and tap the F2 key. The mouse repositions itself exactly on the line, at the point on the line closest to the cursor.

Options|Drawing Settings

This option will open the Drawing Settings window. In this window you can change settings for the current drawing, such as drawing scale, paper size, and grid and snap sizes. For more information see Section 15, Drawing Settings.

Options|Program Settings

This option will open the Program Settings window, where you can customize how your RoofCAD program works. Some of the things you can set are the default font RoofCAD will use for text, the default template that will be used when you choose the File|New|Use Template menu item (or click the New button), the location for the Smart Object and Symbol files. For more information see Program Settings.

Options|Font

This option will open the Font dialog box. In this dialog, you can set the font style, size, and attributes RoofCAD will use for text. You can change the font of existing text by selecting the text, then opening the font dialog box and selecting the desired style and size.

Clicking the following buttons will affect currently selected text. If no text is selected, font style changes will affect the next text you add to the drawing.

is for bolding text.

is for italics.

is for underlining.

puts a box around the text.

The Window Menu

This menu lets you arrange several open drawing files in different ways as well as letting you switch between drawings.

The lower area of the Window menu will display a list of all open drawings. The names of the drawing files are added to this portion of the menu when they are opened. You can quickly switch from one drawing to another by

clicking on a drawing name in this area. A checkmark will appear beside the name of the drawing that currently has focus.

Window|Cascade

This option will resize and cascade all open drawing windows so that the title bars of all are visible.

Window|Tile

This option will resize and tile all open drawing windows so that all will be visible in the main RoofCAD window.

Window|Arrange Icons

This option arrange all minimized drawing window icons in a neat row.

Window|Close All

This option will close all open drawing windows.

The Help Menu

This menu contains the help options.

Help|Help Topics

This option will open your RoofCAD help file at the Contents page.

Help|Tips

This option will open the Tips Dialog where you can view some handy tips for working with RoofCAD. There is checkbox in this dialog that can be toggled to make the dialog appear with a new tip every time you start RoofCAD.

Help|About RoofCAD

This option will open a dialog containing information about RoofCAD and True North Estimating Systems, Ltd.

Help|Sentinel Info

This option will open a dialog that displays the version and serial number for your Sentinel security device.

Miscellaneous RoofCAD Interface Items

Object Information Bar

The object information bar.

This area displays the roof label, angle, pitch, count, length and area of selected objects. Not all of these are applicable to every object. For example if you select a drain, only the count box will display a total. If the numbers in these areas are lit red, the numbers refer to the current calculator totals. The Send button sends the quantity to the right of the button to RoofWare (our estimating module).

ToolTip and Smart Object Name Cell

Hold your mouse over a button and a brief description of the button's purpose is displayed here. This box also displays the Smart Object name of a selected object. If an object has multiple Smart Objects applied to it, the name of the first Smart Object that was applied will appear here.

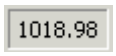
Much of the information in RoofCAD Tool Tips and the Object Information Bar is duplicated here in the Tool Tip and Smart Object Name Cell.

X,Y Readout Cell

Displays the current x, y coordinates of the cursor. Pressing F2 sets the current position as 0, 0. This is useful when placing objects like drains when you know how far they need to be in from a corner of a roof.

If the Snap to Grid setting is on, the x,y readout will change by the snap amount each time you press the up, down, left or right arrow keys on the keyboard.

Warning: This rule is not in effect if the Pointer tool is the current selected tool.



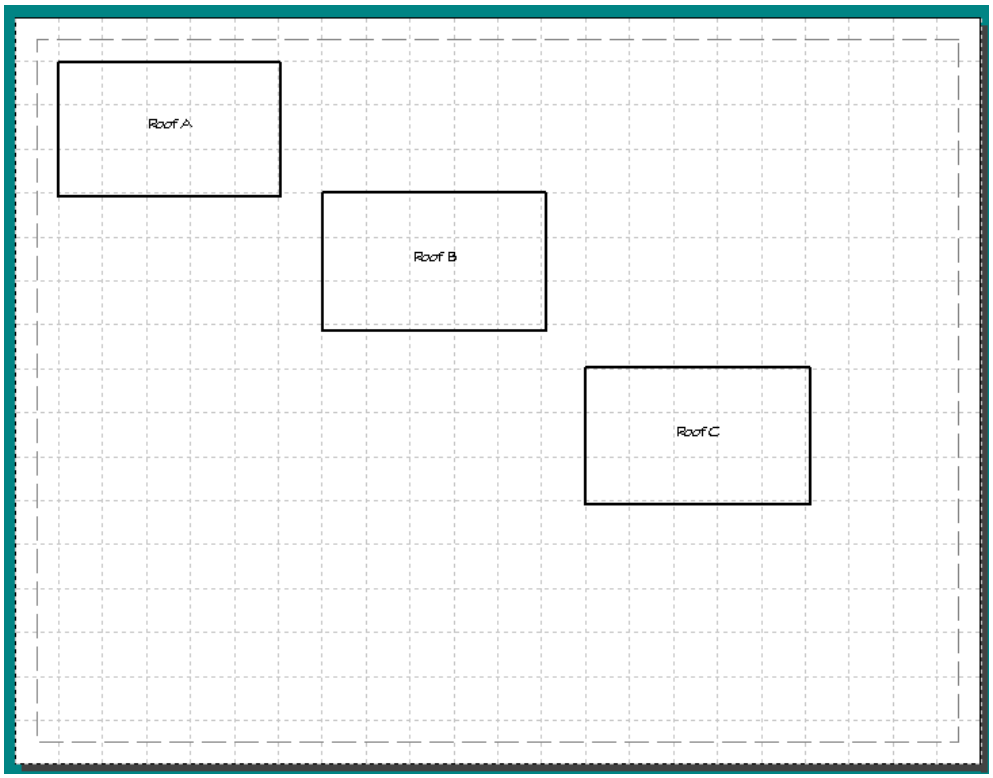
Length Readout Cell

The Length Readout cell is to the left of the X,Y readout cell on the bottom status bar. It works much like the X,Y readout except that it displays the distance from the point of origin on a direct line. The point of origin is defined by where you pressed F2 or in the case of drawing a line, where you last clicked the mouse. This is handy in several circumstances:

- When you need to start a new roof a specified distance along an angled wall of an existing roof.
- Placing a scupper at an exact distance on an angled wall.
- When drawing a multi-segment line or digitizing a roof outline, the Length Readout will display the length of each segment as you draw it.

The Drawing Area

The drawing area is where you draw with RoofCAD. It displays a simulated paper page. This becomes the actual page that will print out. So position the things you draw where you want them printed on the page. You draw on the drawing area with the Drawing Tools.



RoofCAD drawing area.

Section 5

Drawing Files

Drawing Files

In this section, you'll learn how to:

- open a drawing
- save a drawing
- open DWG and DXF files
- export RoofCAD drawings to DWG and DXF formats
- export RoofCAD drawings for Taper-Plus software
- print a drawing

About RoofCAD drawings

A drawing is simply a file stored on your computer. You can name your file anything you like. It's a good idea to make up file names that can remind you later what your drawing was about. RoofCAD automatically adds the extension **.rcg** to the end of every RoofCAD file you save.

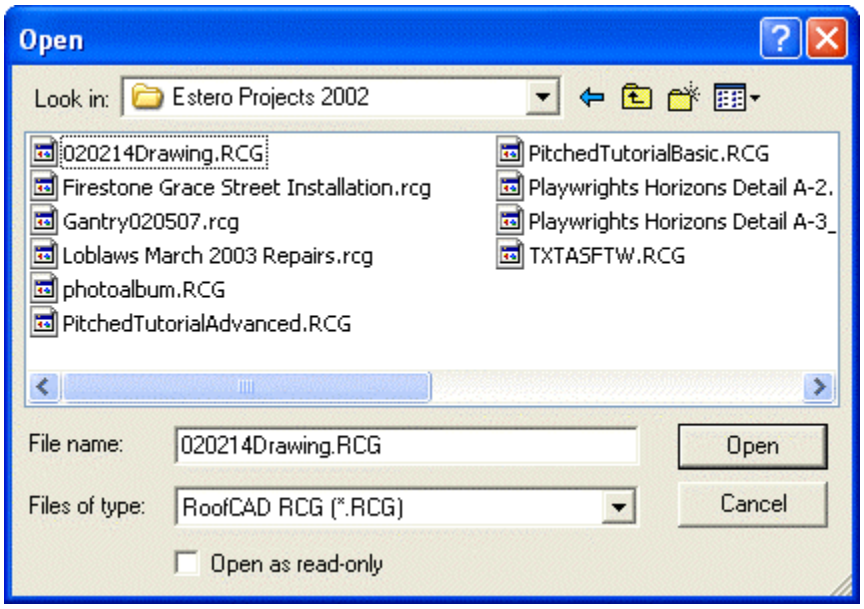
Working with files in RoofCAD is the same as working with files in any other Windows program such as Microsoft Word or Microsoft Excel. You organize your files in folders and subfolders. How you add and maintain folders is up to you.

You can use Windows Explorer or My Computer to add, delete, and rename folders as well as moving files around from folder to folder.

You should know that you can also perform all these operations inside RoofCAD from the File Open dialog box. From the menu, click File|Open. Right click any selection to see a list of available commands or actions that you can do in the File Open dialog.

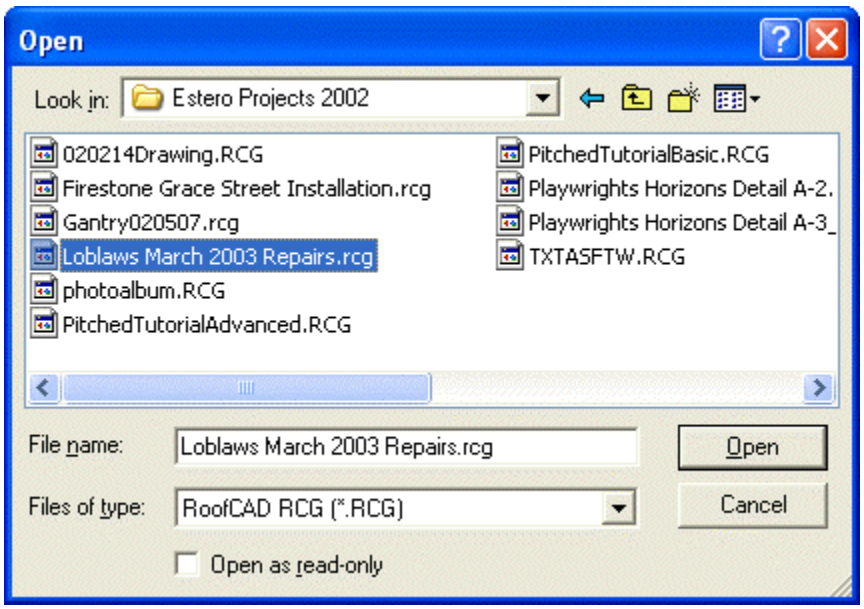
How to Open a Drawing

1. From the RoofCAD main menu, click File|Open. You'll see the Open dialog box.



The Open dialog box looks like this.

2. Click on the name of the drawing you wish to open. You may need to navigate through the folders to find the drawing The Open dialog will now look something like this:



Choosing a drawing from the Open dialog.

Click Open and the drawing will be opened.

How to Save a Drawing

Tip: **If you started your drawing by clicking File|Open to open a template, instead of File|New|Use Template, the first time you save, you must click File|Save As to save your drawing-- not the obvious Save menu option. If you click Save you will overwrite your template.**

Save As

Using this option is a way of copying the current drawing to a different name.

1. From the RoofCAD menu click File|Save As. The Save As window appears.
2. The current name of the drawing will be displayed. Type in a new name for your drawing.
3. Press Enter or click Save. RoofCAD saves the drawing to the new name.

Hint: **After you have saved with the Save As option, clicking Save will save further changes to the new file.**

Save

Use this option to save a new drawing for the first time or resave a drawing to the same name after you've made changes.

1. Click the Save button. RoofCAD resaves your drawing or if it is a new drawing displays the save window.
2. If the Save dialog has appeared, type a name for your file. Press Enter (or click Save).

How to Open DWG and DXF Files

RoofCAD can read AutoCAD DWG files and DXF files. DWG files are AutoCAD's native file format and are generally more accurate than DXF files. The DWG read allows you to load any AutoCAD file into RoofCAD. This is especially useful if you are working with manufacturers' details as most are created as DWG files and it is usually a special request to get them in DXF format.

To Open a DWG or DXF format file:

1. From the RoofCAD menu choose File|Open. The Open window appears.
2. In the Files of type list, click AutoCAD DWG (*.DWG) or AutoCAD DXF (*.DXF).
3. Navigate to the drive and folder where the file is located. The file will now be visible in the file area of the Open dialog box.

4. Click on the file you want to open then click Open. The drawing will now appear on screen.

Note: ***Not all DWG and DXF files are 100% compatible. It is possible that the drawing in the RoofCAD window may not look exactly like the original (so you may have to do some manual fixing of the drawing). DWG files are normally better than DXF files but DWG files can still have problems because AutoCAD refuses to release its DWG file specification to us or anyone else. Therefore our DWG file capabilities are built without a specification. However our DWG tools are among the best in the world and are improved on a regular basis. If you have a problem please send us the file and we will find out what the problem is. In some cases we can make changes to RoofCAD to better handle that type of file in the future. You will receive changes we make in the next upgrade of RoofCAD.***

Exporting RoofCAD files to DWG and DXF file formats

RoofCAD can export a drawing to either AutoCAD DWG or AutoCAD DXF format.

To Export a DWG or DXF format file:

1. Open the RoofCAD drawing you want to export.
2. Click File|Export As DWG or File|Export As DXF. Both of these options have submenus that let you choose what version of file you want to export. Choose the appropriate version. The Save As window appears.
3. Enter a name for the file (or keep the current name). RoofCAD will automatically add ".DWG" or ".DXF" to the end of the file name.
4. Click Save.

Your drawing will be saved in a format that can be read by AutoCAD.

Exporting RoofCAD Drawings for Taper-Plus

RoofCAD has a dedicated export that prepares RoofCAD files so they can be read by the industry--leading tapered insulation estimating program, Taper-Plus. Exporting to Taper-Plus means you can send drawings on diskette or as an e-mail attachment to the people that do your tapered estimates for you (provided, of course, they use Taper-Plus.). They in return can send you back the completed tapered design, which you can load into RoofCAD.

To export to Taper-Plus format:

1. Open the RoofCAD drawing you want to export.
2. Click File|Export Taper-Plus DXF. The Save As window appears.
3. Enter a name for the file (or keep the current name). RoofCAD automatically adds .DXF to the end of the name.

4. Click Save. The export file is now created ready to be sent to Taper-Plus.

To View a Taper-Plus Drawing:

Taper-Plus drawings are in DXF format. To view a Taper-Plus drawing that you have received from the person who did the tapered estimate for you:

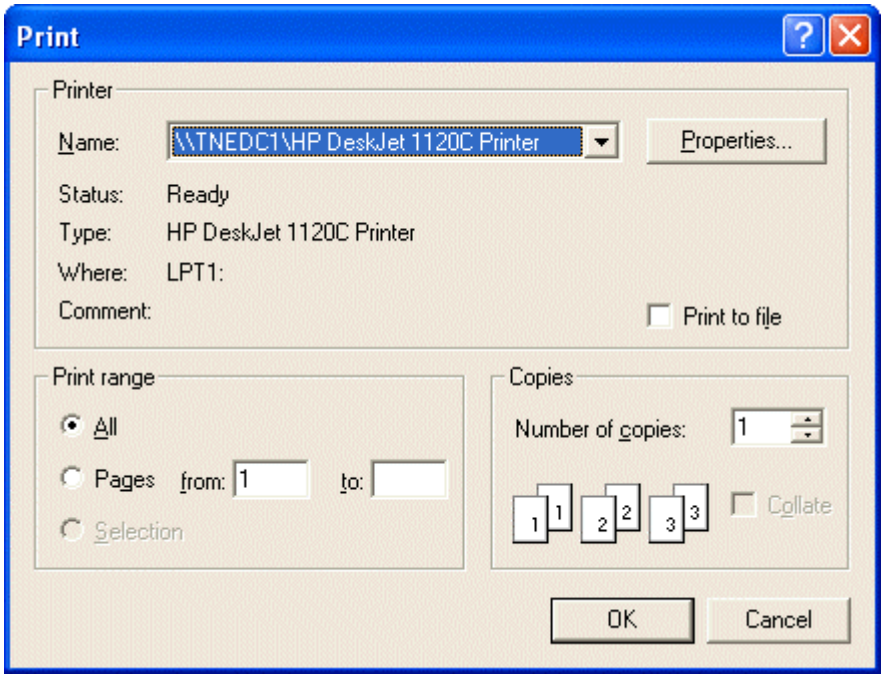
1. From the RoofCAD menu choose File|Open. The Open window appears.
2. In the Files of type list, click AutoCAD DXF (*.DXF).
3. Navigate to the drive and folder where the Taper-Plus file is located. The Taper-Plus file will now be visible in the file area.
4. Click the file you want to open, then click Open.

The Taper-Plus drawing will now appear on screen.

How to Print a Drawing

1. Open the RoofCAD drawing you want to print.
2. From the RoofCAD menu click File|Print|Print Drawing (or click the Print button). The Print window appears.

(Your Print dialog may look different from the one you see here.)



Your Print dialog may look different.

RoofCAD automatically knows the paper size and orientation of your drawing and sends this information to your printer. You may want to make further selections such as "Draft Quality" for faster printing.

3. Click OK. Your drawing will be printed.

How to Print the Takeoff Record

1. Open your RoofCAD drawing.
2. From the RoofCAD menu choose File|Print|Print Takeoff Record. The Takeoff Record for your drawing will open. After the Takeoff Record opens, you will see the Print dialog.
3. Change any settings you need to, like number of copies or print quality, for example.
4. Click Print.

By default, the Takeoff Record prints to an 8.5" x 11" page with Portrait orientation.

Hint: **Clicking the Print button only prints the drawing. It does not work for the Takeoff Record.**

Section 6

Drawing Objects

Drawing Objects

In this section, you'll learn how to:

- Select and Deselect an Object
- Move an Object
- Resize an Object
- Rotate an Object
- Delete an Object
- Duplicate an Object (Copy & Paste)
- Change an Object's Line Type or Color
- Fill an Object with a Color or Hatch Pattern

Everything you draw on the RoofCAD page is considered to be a drawing object; lines, roofs, drains, symbols, text, and walls are all drawing objects. One of the great capabilities of RoofCAD is the ability to modify an object after it has been drawn. To modify an object you first have to tell RoofCAD which object you want to modify. You do this by selecting the object with the Pointer tool. You can select more than one object and modify them all as a group.

How to Select an Object

Select objects with the Pointer Tool.

You select objects by clicking them or dragging a rectangle around them.

You can select any objects that are on the current layer of your drawing. If you are having difficulty selecting an object, it may be that you are on the wrong layer. If you don't know how to switch layers see Section 7, Layers.

How to Select an Object by Clicking the Pointer Tool:

1. Click on the Pointer tool or choose Tools|Pointer from the RoofCAD menu. The mouse cursor now has an arrowhead.
2. Position the tip of the mouse pointer within the **tolerance range** of the object you wish to select.
3. Click the mouse and the object will be selected. When an object is selected it turns magenta and you will see "bounding boxes" around it. Bounding boxes are small squares that show the actual edges of the image. Bounding boxes can be used to resize an object with your mouse, discussed later in this section.

Tolerance Range

When selecting an object there is a tolerance range that you must be within. The tolerance range is about ¼ inch on either side of the edge of the object. Below are some examples of selecting object:

If you have a large roof and you click in the middle the roof, the roof will not get selected. You must move your mouse to within ¼ inch on either side of one of the walls.

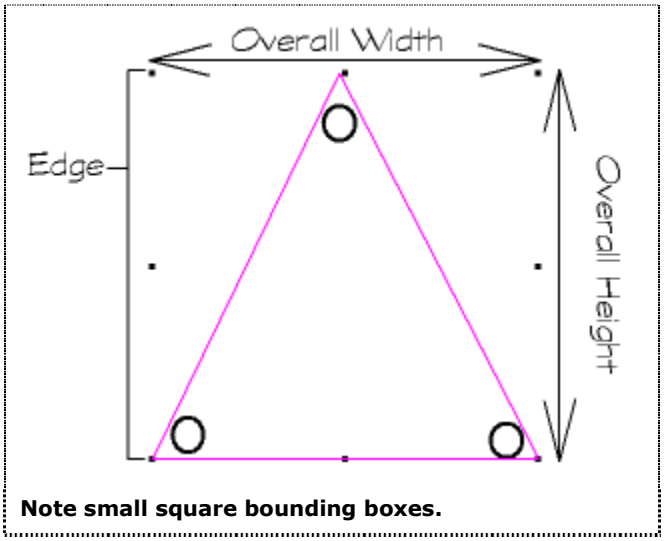
If you click directly on a wall, the wall only will become selected and not the whole roof.

If you have several objects close together the one that the mouse tip is closest to is the one that will get selected.

The ¼ inch tolerance works regardless of zoom level. So if you are zoomed way in on an object you still have to hit the ¼ inch tolerance range to select it.

The tolerance range starts at the edge of the object. The edge of the object is based on the overall dimensions of the object—not the visible lines.

In the illustration below, we are zoomed in very close on our Antenna symbol. Notice where the edge of the object is considered to be. Some of the lines in this object are not close enough to the tolerance range to select the object. So don't click on the visual lines. Click on where you know the edge to be.



Note small square bounding boxes.

Hint:	**You can select more than one object. If you select an object then click on another both will be selected. If you continue to select more objects they will be added to the select group.**

How to Deselect an Object by Clicking the Pointer Tool:

Deselecting an object is done the same way as selecting an object. Click in the tolerance range of a selected object and it will be deselected. You can also deselect by pressing Esc.

How to Deselect All Selected Objects:

To deselect all selected objects, press Esc. This is the easiest way to deselect an object.

How to Select an Object by Dragging a Rectangle:

Selecting with this method is done when you want to select a number of objects at once. You will form a rectangle around the objects you want to select. The tolerance rule applies here. So any object that is within ¼ inch of the rectangle will get selected.

1. Position the mouse where you want the first corner of the rectangle to be.

Press down **and hold** the mouse button.

2. Move the mouse and you will see a rectangle forming. Form the rectangle around the objects you want selected.
3. Release the mouse button. The objects will now be selected.

Hint:	**If there is an object you want to remove from the selected group of objects, click on it with the mouse.**

How to Select all Objects on a Layer:

If you want to select all objects on the current layer, choose Edit|Select Layer from the menu.

How to Select all Objects on a Drawing:

If you want to select all objects on the entire drawing choose Edit|Select All from the menu.

Special Selection Instructions

Objects that are Hard to Select

If the objects you are trying to select are very small and difficult to pick up because there are other objects nearby, it helps to zoom in on the object using the Zoom tool.

Use the Zoom Tool for hard-to-select objects.

Selection Keys

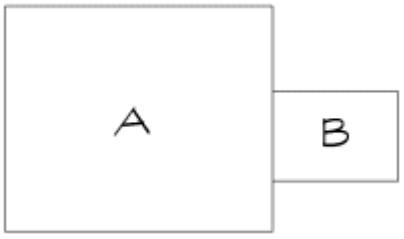
There are some special keyboard keys to help you with difficult selection problems.

Page Up/Page Down keys change which line is selected in a polygon or polyline. If you are having trouble selecting one wall of a roof because it is under the wall of another roof (the classic line on top of a line problem) use the Page Up/Page Down keys to select the line. To see how this works try this:

1. As in the illustration below, add two rectangles to a blank drawing with the rectangle tool.

Use the Rectangle Tool.

Draw B first then A second.



Draw two rectangles like this.

2. With the pointer tool select roof B. Roof B is now highlighted.
3. Now press the Page Up or Page Down keys and you will see each wall of roof B become highlighted in succession. The difficult wall here is the one that is under the adjoining A roof wall. So you would stop when the difficult wall is highlighted.

Home/End keys shift selection from one object in the drawing to another. Using your drawing of the two rectangles, select one then press the Home or End key. Selection will alternate from roof A to B.

How to Move an Object

To move an object in RoofCAD you must first select the object(s). There are two ways to move selected objects in RoofCAD; with the mouse or with the keyboard.

How to Move an Object with the Mouse:

1. Select the object.
2. Position the mouse pointer inside the bounding boxes of the selected object (but not on one of the bounding boxes).

3. Press and hold down the mouse button.
4. Move the mouse and you will see the object moving with it.
5. When you have the mouse where you want it release the mouse button.
6. To deselect the object, press Esc.

How to Move an Object with the Keyboard:

1. Select the object.
2. Press the up, down, right or left arrow key on the keyboard and the object will move.
3. To deselect the object, press Esc.

If the Snap to Grid feature is on, each key press will move the selected object(s) by one snap unit. If the Snap to Grid feature is off, each key press will move the selected object(s) by one pixel, which is the smallest unit of measurement your monitor is capable of displaying.

Hint: **Sometimes when you are zoomed in and moving an object with the keyboard, one key press can move the object too far. This is because the Snap to Grid option is on. Choose Options|Snap|Snap Off from the RoofCAD menu or simply click the GRID button on the status bar. Then when you move the object, it will now move in much smaller increments.**

How to Resize an Object

You can resize an object with your mouse or by entering dimensions directly into the Properties dialog box. Resizing with the mouse is not accurate and should only be done when an object's size (length width and area) doesn't matter to your final drawing. To be accurate when resizing an object use the Properties dialog box. To learn about the Properties window see Section 18, Properties.

To Resize an Object with the Mouse:

1. Select the object (you can also resize a group of selected objects).
2. Position the tip of the mouse pointer on one of the bounding boxes.
3. Press and hold down the mouse.
4. Move the mouse and you will see the object resizing.
5. When you have the object at the desired size release the mouse button.
6. To deselect the object, press Esc.

Warning: **If you have drawn a roof (or any object) to exact dimensions, resizing it will mean that the roof is no longer accurate per the original dimensions you use. If you want to change a roof size accurately, select the roof, click**

on the Layout Wizard button and edit the wall lengths in the Layout Wizard.

How to Rotate an Object

There are three ways to rotate an object; by keyboard, through menu options, and in the Properties dialog. In this section we will discuss the keyboard and menu method. To learn about rotating an object in the Properties dialog, see Section 18, Properties.

How to Rotate an Object with the Keyboard:

1. Select the object you want to rotate.
2. Press the "[" key on the keyboard once. The object rotates 1/4 of a degree counter clockwise.
3. Press the "[" key repeatedly and the object will rotate 1/4 degree every time.
4. Hold down the "[" key and the object rotates quickly (2 degrees at a time).
5. Press the "]" key and the object will rotate in the opposite direction.
6. To deselect the object, press Esc.

The idea is to hold down the "[" or "]" key to rotate the object quickly and when you get close to the desired position you can press the "[" or "]" key one press at a time for fine adjustment.

Tip: **Because this method rotates the object at a set ¼ degree increment you may not get the object exactly where you want it. For more accurate rotation use the Properties dialog.**

How to Rotate an Object with Menu Options:

The menu gives you only one option for rotating an object and that is the Arrange|Rotate 90 option.

1. Select the object you want to rotate.
2. Choose Arrange|Rotate 90 from the RoofCAD menu. The object rotates 90 degrees counter clockwise.

Repeat step 2 to rotate the object another 90 degrees.

To deselect the object, press Esc.

How to Delete an Object

1. Select the object(s) to be deleted.

2. Press the Delete key on your keyboard.

How to Duplicate an Object (Copy and Paste)

1. Select the object(s) you want to duplicate.

The next step is to add the object(s) to the RoofCAD clipboard.

You have two choices.

Cut removes the object from you drawing (looks almost like Delete) but it retains the object on the RoofCAD clipboard so you can Paste it on to your drawing somewhere else.

Copy leaves the object on your drawing while retaining on the RoofCAD clipboard.

2a. To Cut choose Edit|Cut from the menu or click the cut button.

2b. To Copy choose Edit|Copy from the menu or click the copy button.

The selected object(s) have now been copied to the RoofCAD clipboard.

3. To insert the copy of the object onto the drawing, choose Edit|Paste from the menu or click the Paste button. Your cursor will change to look like this.

This is the Paste pointer, also called a cursor.

Tip:	**When your mouse pointer changes to Paste, RoofCAD also shows a "ghost" image of the object you will be pasting in your drawing. Use the "ghost" image to precisely place where you want the pasted object to go.**

4. Click on the drawing where you want the copy of the object to appear. The copied object will be added to the drawing.

Hint:	**You can paste more copies on the drawing by clicking again with the cursor.**

How to Change an Object's Line Type or Color

To change the line type and color of a line, use the palettes designed for this job. The Color and Line Type palettes sit side by side on the status line and look like this:

Changing Line Type

1. Select the line you want to change. If the object is a polygon or polyline you can select the entire object so that every line gets changed or select one or more individual lines of the object.
2. Open the Line Type palette by clicking the drop down arrow at the right of the palette box. Your display changes to look like this:

3. Click on the line type/thickness that you want. RoofCAD will highlight your choice. You will see the line or lines you selected change to the new type or thickness of line immediately.
4. To deselect the object, press Esc.

Changing Line Color

1. Select the line you want to change. If the object is a polygon or polyline you can select the entire object so that every line gets changed or select one or more individual lines of the object.
2. Open the Line Color palette by clicking the drop down arrow at the right of the palette box. Your display changes to look like this:

Click on the line color that you want. RoofCAD will highlight your choice.

Tip:	**You will not see the color change until the objects are deselected.**

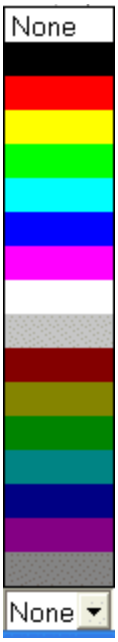
To deselect the object, press Esc.

How to Fill an Object with a Color or Hatch Pattern

To fill an object with a color or hatch pattern, use the palettes designed for this job. The Color and Fill palettes sit side by side on the status line and will look like this before you have filled your drawing object:

To Fill an Object with a Color

1. Select the closed object (circle, closed arc, polygon, ellipse, rectangle) that you want to add the color to.
2. Open the Fill Color palette by clicking the drop down arrow at the right of the palette box. Your display changes to look like this:



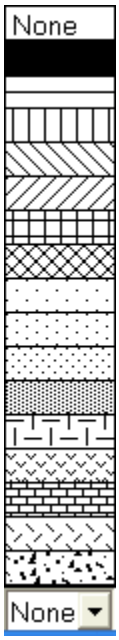
Click on the desired color. All selected objects will be filled with that color.

Hint:	**If you want to remove an existing color, click the [None] button on the Color palette.**

To deselect the object, press Esc.

To Add a Fill or Hatch Pattern to an Object

1. Select the closed object (circle, closed arc, polygon, ellipse, rectangle) that you want to add the fill pattern to.
2. Open the Fill Pattern palette by clicking the drop down arrow at the right of the palette box. Your display changes to look like this:



3. Click on the desired pattern. All selected objects will be filled with that color.

Hint: **If you want to remove an existing pattern, click the [None] button on the Fill Pattern palette.**

4. To deselect the object, press Esc.

Hint: **To add a shaded area to your roof that shows a partial roof replacement area (or something like that), you may have to draw a polygon or rectangle. Fill patterns only work with closed objects. Use the polygon or rectangle tool to outline the area then add the fill pattern. Do not use a Smart Object to draw the area or the total will be added to the Takeoff Record.**

Section 7

Layers

Layers

About Layers

All good CAD programs have a feature called layers. Layers are like transparencies on an overhead projector.

With two or three transparencies overlaid on the projector you see a particular image on the screen. If you remove a transparency, the image changes. In RoofCAD the effect of "removing of a transparency" is done by making a layer Invisible. Three common uses for this are:

- Dimensions: In RoofCAD we recommend drawing dimensions on a Dimensions layer that way you can make them invisible when doing a print out for a customer who might very well hand your drawing over to the next roofer. This method of adding dimensions is demonstrated in Section 25, Basic Flat Roof Tutorial.
- Maintenance History: Draw maintenance information for a given time period on a layer. Then add a new layer for each new time period. Keep each maintenance layer invisible until you want to see it. Over time you end up with a complete maintenance history on the roof. Information to draw on these layers would be things like problem indicators, shaded areas indicating parts of the roof that have be replaced, text showing work order or invoice numbers and dates of each repair.
- Organization: Keep you drawings organized by keeping similar items on the same layer. We recommend that every component of the roof be kept on the 0 layer. Formatting items, like the legend, the title block, and the north indicator should be kept on the $FORMAT layer (the $FORMAT layer is a special layer in RoofCAD) Dimensions should be kept on the Dimensions layer, history items on the Maintenance History layer, and so on.

When you want to change an object you have drawn, you have to change it on the layer, or transparency, where that the object was originally drawn. In RoofCAD, this means you can only select objects from the current layer. To select an object that has been drawn on another layer, first you have to switch to that layer. This feature prevents you selecting and changing drawing objects accidentally. Later in this section, you'll find full instructions on how to switch between layers in your RoofCAD drawing.

Some Things to Note About Layers

In RoofCAD you can have as many layers in a drawing as you like.

You can only select objects that are on the current layer. If you are having difficulty selecting an object, maybe you are on the wrong layer. You can tell which layer you are on by checking the status line at the bottom of the RoofCAD window. For example, if you are on the Dimensions layer the status line would look like this:

Look at the status line to see the current layer.

Remember that what ever 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. If you are not on the 0 layer, 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.

The $FORMAT Layer

The $FORMAT layer is a special layer in RoofCAD. Anything on this layer remains "glued" to the page regardless of scale changes.

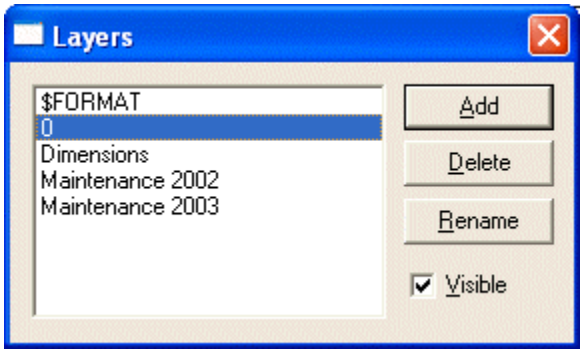
This layer is used to hold Formatting items like the legend, the title block, and the North indicator. Anything added to this page will not move or resize when the scale of the drawing is changed.

Smart Objects on the $FORMAT layer do not get added to the Takeoff Record.

Warning: **The name of this layer is important. If it is renamed, it will not work.**

The Layers Dialog

This is the Layer dialog. It can be accessed from the Arrange|Layer menu item, or by clicking the arrow button next to the layer name display in the status line at the bottom of the RoofCAD window and selecting Manage Layers… at the very top of the list.



The Layers dialog box.

To switch between layers in a drawing, click on the desired layer name. Double-clicking will switch layers and close the dialog.

The Visible check box determines a layer's visibility. Layers that are not visible can only be seen when they are selected as the current layer. Smart Objects on layers that are not visible will only appear on the Take Off Record when that layer is the current layer.

The $FORMAT layer is a special layer for page setup intended to keep legends, title blocks, logos, etc. Items on this layer will not move or resize when the drawing scale is changed. Objects on this layer will not be included on the Takeoff Record.

Select More than One Layer

You can select several specific layers of a drawing. For example, to move the roof plan you may need to select a few layers but not the $FORMAT layer.

To select the contents of two or more layers, first Select All then deselect the layers you don't want.

Sample Exercise:

1. Open one of your drawings.
2. Choose Edit|Select All from the menu. Everything is now selected.
3. Switch to the $FORMAT layer.
4. Choose Edit|Deselect Layer from the menu. Now everything but the format layer is selected.

Section 8

Templates

Templates

In this section, you'll learn how to:

- Start a New Drawing Using the Default Template
- Define the Default Template

About Templates

Templates are simply RoofCAD drawings. We call them templates because you use them as a template when you start a new drawing. It is faster to start a drawing with a template because the template will have all your default drawings settings, all layers that you commonly use, your standard legend, title block, and North indicator—in fact, anything that you use all the time--already added to it.

There are several templates shipped with RoofCAD. Because they are just RoofCAD drawings, you can modify them to your liking. Here are the file names of the templates that ship with RoofCAD:

File Name	Description
t8x11p.rcg	8.5"x11" page with portrait orientation
t8x11l.rcg	8.5"x11" page with landscape orientation
t8x14l.rcg	8.5"x14" page with landscape orientation
t11x17l.rcg	11"x17" page with landscape orientation
t12x18l.rcg	11"x17" page with landscape orientation
t18x24l.rcg	11"x17" page with landscape orientation
t24x36l.rcg	11"x17" page with landscape orientation
t36x48l.rcg	11"x17" page with landscape orientation
tdetail.rcg	8.5"x11" page with portrait orientation made for detail drawing

Listed below are two special digitizer templates. Only customers who have purchased the RoofCAD-Digitizer license will use these templates.

File Name	Description
td8x14l.rcg	8.5"x14" page with landscape orientation
td11x17l.rcg	11"x17" page with landscape orientation

You'll find two backup copies of these files in the RoofCAD\Templates folder. One backup copy has the extension .rcg. The other has the extension .bak. If you modify a template use the File|Save As option to replace the backup copies in the RoofCAD\Templates folder.

Tip: **If you accidentally overwrite a template, use the backup of the template from the RoofCAD\Templates folder.**

You can choose one template as your default template. RoofCAD ships with the t8x14l.rcg file as the default template. Specifying a default template means that when you start a new drawing using the File|New|Use Template menu option or by clicking the New button, a new drawing will be started and the settings and look of the default template will be applied to it.

If you want to use a template other than the default template you have to use the File|Open menu option (which is just like opening any other file).

Warning: **If you use File|Open to open a template you must use File|Save As to save the drawing. If you use File|Save you will overwrite the template. If you do overwrite the template you can retrieve a backup from the RoofCAD\Templates folder.**

Start a New Drawing Using the Default Template

The quickest way to get a drawing started is to start a new drawing using the default template. When you do this, a new drawing will be started and the settings and look of the drawing you defined as the default template will be applied to it.

To Start a new Drawing Using the Default Template:

- Choose File|New|Use Template from the RoofCAD menu option or click the New button.

Click this to start a new drawing with the default template.

A new drawing appears with the settings and look of the drawing you specified as the default template.

Define the Default Template

To set a template as the default:

- Open the file you want to use as the default template.
- Choose File|Save As Default from the menu.

Now when you start a new drawing, choose File|New|Use Template.

Section 9

Smart Objects

Smart Objects

In this section, you'll learn how to:

- Draw a Roof Opening
- How to Add a Scupper

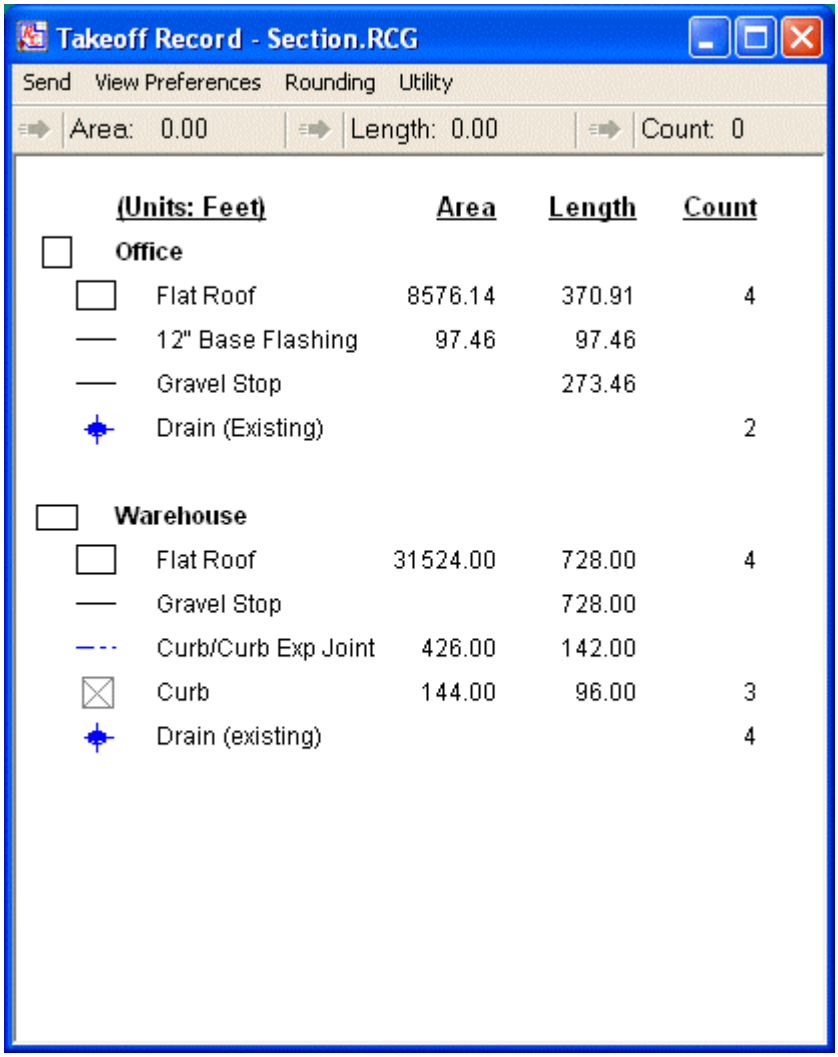
About Smart Objects

Smart Objects are the backbone of RoofCAD. The easiest way to draw a roof with RoofCAD is with Smart Objects. There is a Smart Object for every type of roof object. Roof objects are everything you find on a roof. For example, the roof outline itself is considered a roof object. Walls, curbs, drains, and plumbing stacks are all roof objects.

When you draw with Smart Objects you click on the Smart Object you want to draw, then draw it on the page. Using a Smart Object does several things:

- Chooses the RoofCAD drawing tool used to draw this object
- Sets the line type, thickness and color
- Set a fill pattern if applicable
- Adds the Smart Object and its quantities to the Takeoff Record

The sample Takeoff Record below displays the Smart Objects used in a drawing and their quantities.



A typical RoofCAD Takeoff Record

This topic will explain everything you need to know about Smart Objects.

One key to learning and using Smart Objects is to first learn how the drawing tools work. There are only a few drawing tools you need to learn to get started. Start with these tools and learn the other ones later.

- Pointer Tool
- Layout Wizard
- Line Tool
- Polygon Tool
- Polyline Tool
- Rectangle Tool

To learn the drawing tools read "The Tools Menu" in Section 4, The Interface.

Drawing with Smart Objects

There are just over 70 Smart Objects in the Smart Object Browser. These 70 objects fall into just a few different types. So once you know how to draw with one of a type, the rest are the same.

How to Draw a Roof Opening

When you draw a roof opening, RoofCAD automatically determines which roof the opening applies to. The area of the opening is deducted from that of the roof on the Takeoff Record. If RoofCAD cannot determine which roof the opening should belong to, it will prompt you to identify the roof by clicking on one of the roof's walls.

How to Draw a Roof Opening:

Draw a roof outline.

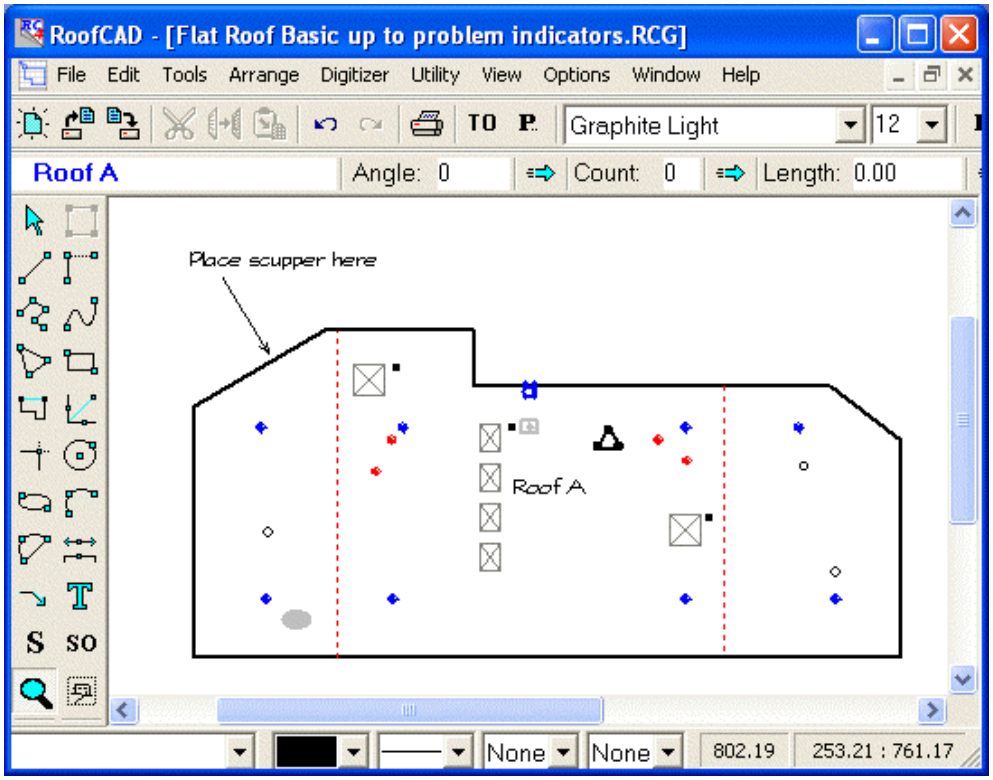
Choose the Roof Opening Smart Object and draw an opening (a Roof Opening is normally drawn with the Layout Wizard). When you are done drawing the opening, RoofCAD deducts the openings area from that of the roof.

How to Add a Scupper

Scuppers are symbols. They look best when they are rotated to match the angle of the wall.

Now, let's add a scupper.

1. Open the Smart Object Browser.
2. Click Drains/Scuppers to expand the list of drains and scuppers.
3. Click Scupper (Thru Wall).
4. Position the Scupper close to where we've done it in the illustration on the next page.



Position your scupper the way we've done here.

Tip: **When you place something this close to the edge of a roof there is a chance it make actually "fall" of the roof when you place it. To ensure it gets placed on the roof just be sure the target roof name is displayed in the upper left Roof Display area of the Object Information Bar in the RoofCAD window before you place it.**

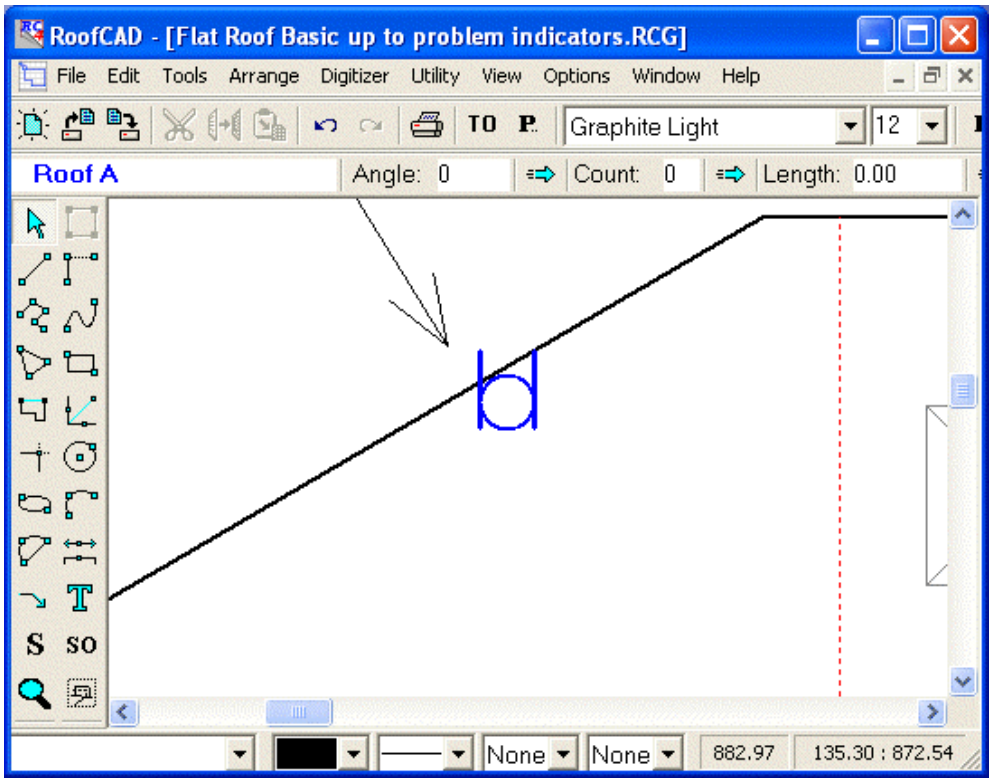
Since we added the scupper to an angled wall, rotating it to match the wall will make it look better. We're going to zoom in on the scupper, just to make it easier to work on it. A lot of times, you'll find it easier to work with objects by zooming in on them.

Use the Zoom Tool.

1. Click on the zoom tool button on the toolbar, on the left side of the screen.

Position the mouse up and to the left of the scupper and click the mouse once. Now move the mouse down and to the right of the scupper. You should see a rectangle form around the scupper. Click again.

Your screen should now look a little bit like the one in our illustration.

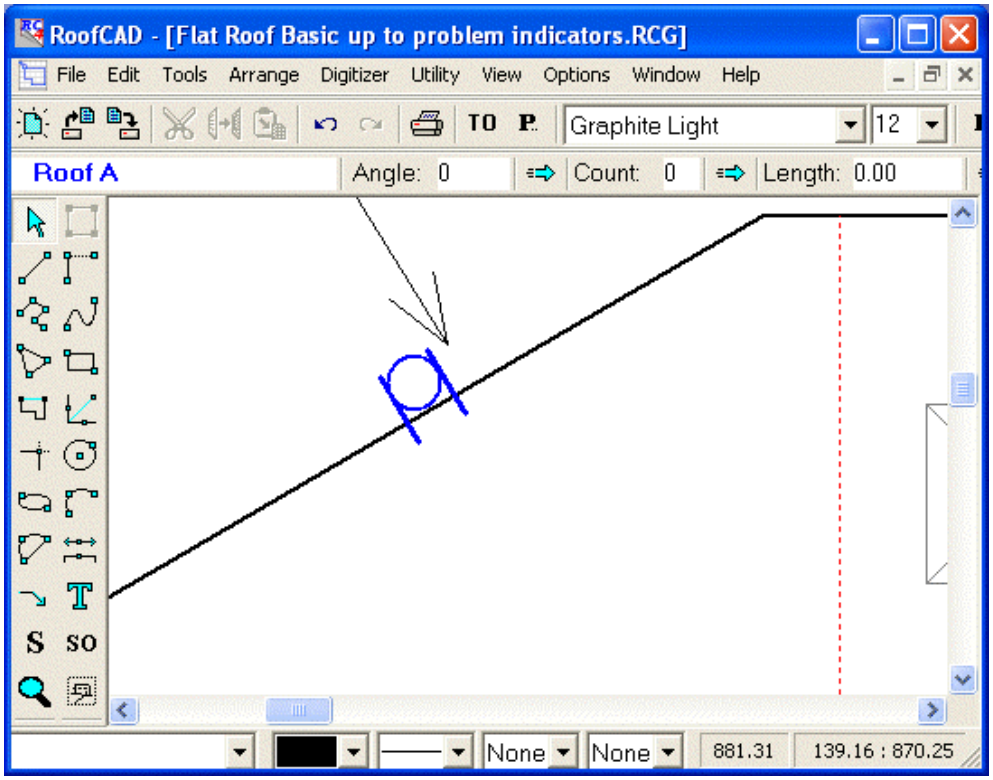


After zooming, your screen looks a little like this.

Now we're going to use the Pointer Tool to select the scupper so we can rotate it.

Click the Pointer Tool on the toolbar on the left side of the screen.

1. Keeping the tip of the pointer away from the wall of the roof (as much as possible), click the tip of the pointer on the scupper. The scupper is now selected. If you got the wall instead, right click and try again.
2. Press the "]" key and the scupper will rotate clockwise 1/4 degree. Holding the "]" key down will rotate the scupper more quickly. Rotate the scupper until it looks like our illustration, next page.



Rotate the scupper until it looks like this.

If your scupper is rotated correctly but is not in the same position as ours, use the arrow keys on the keyboard to move it (you can also use the mouse).

Section 10

Symbols

Symbols

In this section, you'll learn how to:

- Create a New Symbol
- Modify an Existing Symbol
- Use the Symbol Browser
- Use the Symbol Library Manager

About Symbols

Symbols are objects you can add to a drawing that are always the same. Some examples are Plumbing Stacks, Drains, Curbs, etc. Symbols like Curbs may look the same from drawing to drawing but RoofCAD allows you to resize them. RoofCAD comes with a complete set of Roof symbols but you can add new ones and modify the existing symbols if you like. To create or modify symbols you need to be a competent RoofCAD user. This means you should have read and be able to use the features discussed in these sections:

- Section 4, The Interface: The Tools Menu
- Section 6, Drawing Objects

How to Create A New Symbol

1. Open a new empty drawing (choosing File|New|Empty will open a new blank page).
2. From the RoofCAD toolbar, click the Symbol Browser tool button.

This is the Symbol Browser button.

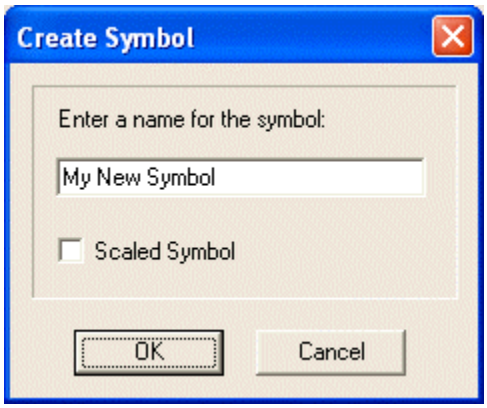
3. Choose an existing symbol of a type and/or size that is close to the one you want to create. Pick a spot on the page and click the mouse. The symbol appears on the page.
4. Zoom in on the symbol.

This is the Zoom Tool.

5. Now draw your new symbol using the existing symbol as a model for size and/or look.
6. Once drawn, select the objects that will make up the new symbol.

Hint:	**Dragging a box around all the objects with the pointer tool is probably the easiest way to do this.**

7. Choose Utility|Symbol Library Manager from the menu. The Symbol Library Manager window appears.
8. Click the Import button. The Create Symbol dialog box appears.



This is the Create Symbol dialog box.

9. Type in a name for the symbol and decide whether the symbol will be scaled or not. A scaled symbol retains its physical size no matter what the scale. This means that the symbol will look smaller at a 1"=40' scale that it does at a 1"=10' scale. A non-scaled symbol always looks the same size no matter what the scale.

Warning: **Your choice of scaled or non-scaled is permanent. If you want to change it you must recreate the symbol, which is not a big deal, see "How to Modify an Existing Symbol" below.**

10. Click OK. The Create Symbol dialog disappears and your new symbol has now been added to the Symbol Library.

How to Modify an Existing Symbol

1. Open a new empty drawing (choosing File|New|Empty will open an new blank page).
2. From the RoofCAD toolbar, click the Symbol Browser button.

This is the Symbol Browser button.

3. Choose the symbol that you want to modify. Pick a spot on the page and click the mouse. The symbol appears on the page.
4. Zoom in on the symbol.

This is the Zoom Tool.

5. Select the symbol by clicking it with the Pointer Tool.

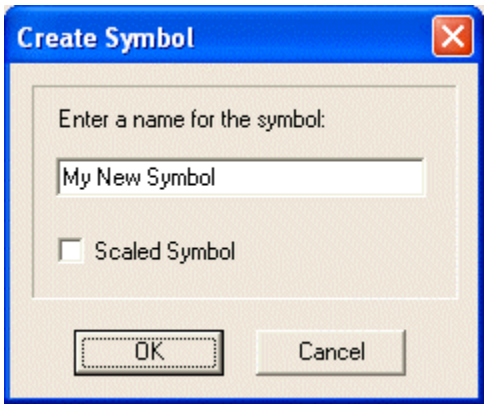
Use the Pointer Tool.

6. From the RoofCAD menu, click Edit|Ungroup. The symbol is now ungrouped.
7. Now make your modifications to the symbol.

8. Once drawn, select the objects that will make up the modified symbol.

Tip:	**Dragging a box around all the objects with the pointer tool is probably the easiest way to do this.**

9. From the RoofCAD menu, click Utility|Symbol Library Manager. The Symbol Library Manager window appears.
10. Click the Import button. The create symbol window appears.



This is the Create Symbol dialog box.

11. Type in the symbol name (it must be spelled exactly the same or you will create a new symbol) and decide whether the symbol will be scaled or not. A scaled symbol retains its physical size no matter what the scale. This means that the symbol will look smaller at a 1"=40' scale that it does at a 1"=10' scale. A non-scaled symbol always looks the same size no matter what the scale.

Warning:	**Your choice of scaled or non-scaled is permanent. If you want to change it you must recreate the symbol, which is done by following these "How to Modify an Existing Symbol" steps again.**

12. Click OK. If you spelled the symbol name exactly the same as the original a message will appear asking if you want to overwrite the original. Click OK again and the Create Symbol dialog disappears.

Your modified symbol has now replaced the original.

Section 11

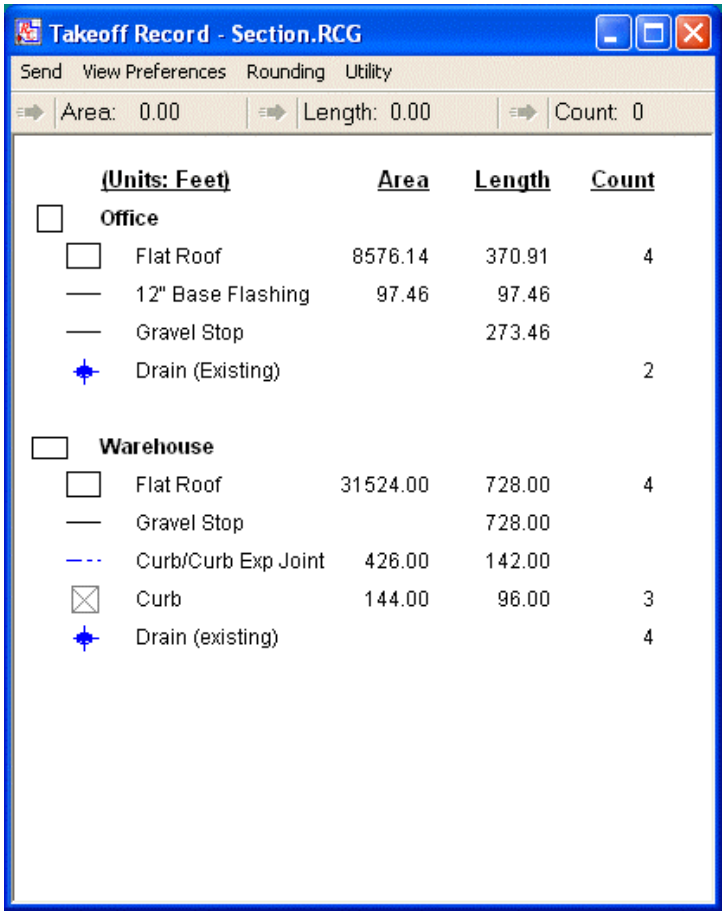
Sections

Sections

The Section Tool does two things:

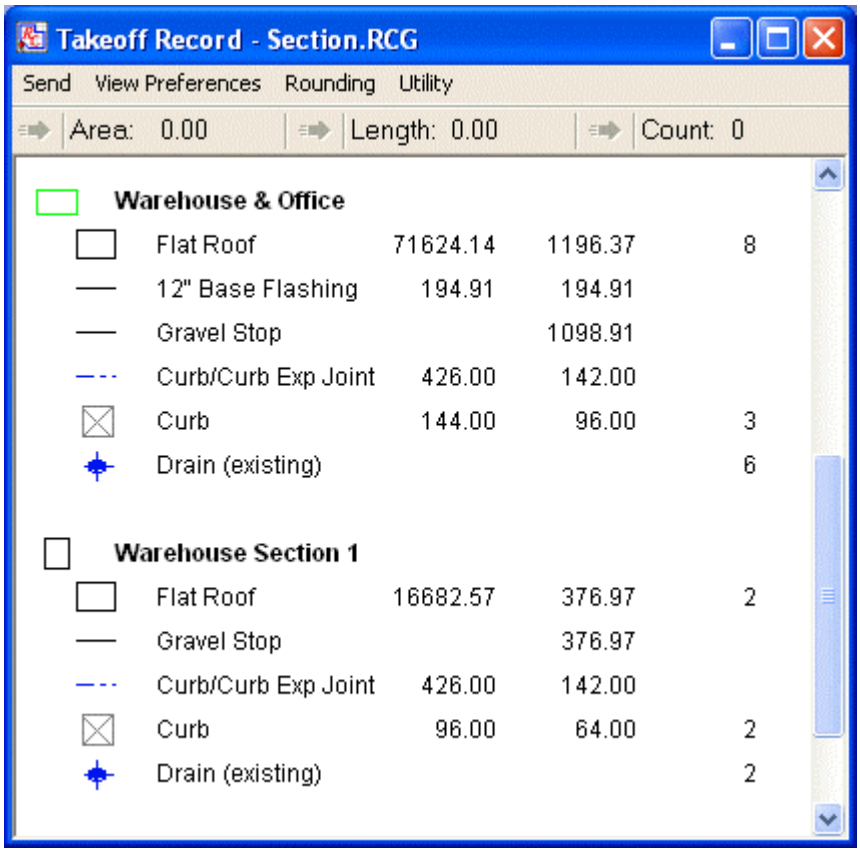
- It allows you to takeoff a subsection of a roof. For example, if you need a takeoff of an area of wet insulation, you would use this tool to draw the perimeter of the area. Once you have drawn the perimeter, the Takeoff Record will show a complete list of smart objects and quantities that are within that perimeter, e.g. roof area, number of drains and vents, linear feet of gravel stop etc.
- It allows you to add two or more roofs together. For example, if you have a drawing with five roofs on it and the owner wants a quote to replace roofs #1 and #3 at the same time, you would use the section tool to combine these two roofs into one total on the takeoff record.

In the tutorial that follows we will start out by loading a sample drawing that has a warehouse and an office roof on it. The Takeoff Record for the drawing looks like this:



The Takeoff Record for Section.rcg.

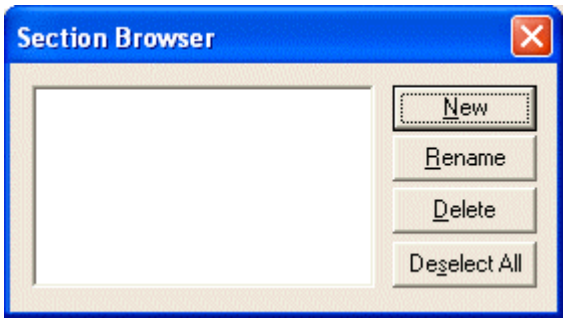
We will first break out a subsection of the warehouse roof and then add the two roofs together. When we finish the Takeoff Record will display the new section and the two roofs combined like this:



The new Takeoff Record will look like this.

This tutorial will show you how to use the Sections tool. Let's start by opening a sample drawing for you to work from.

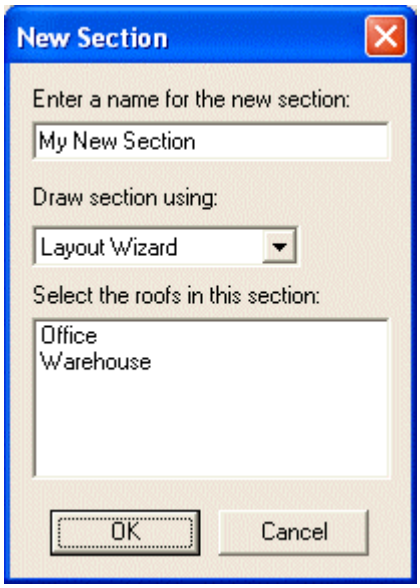
1. From the RoofCAD main menu, click File|Open. The Open dialog appears.
2. Find the folder Tutorial Drawings in the RoofCAD folder and open it. Now look for the file called Section.rcg. Click it to highlight the file name.
3. Click Open. The Section.rcg drawing appears on the screen.
4. From the RoofCAD menu, click Tools|Section Browser. The Section Browser window appears. It looks like our following illustration.



The Section Browser dialog box.

Now we are going to outline a subsection on the left side of the warehouse roof (from the expansion joint to the left wall).

5. Click the New button on the Section Browser. This will open the New Section dialog, which looks like this:

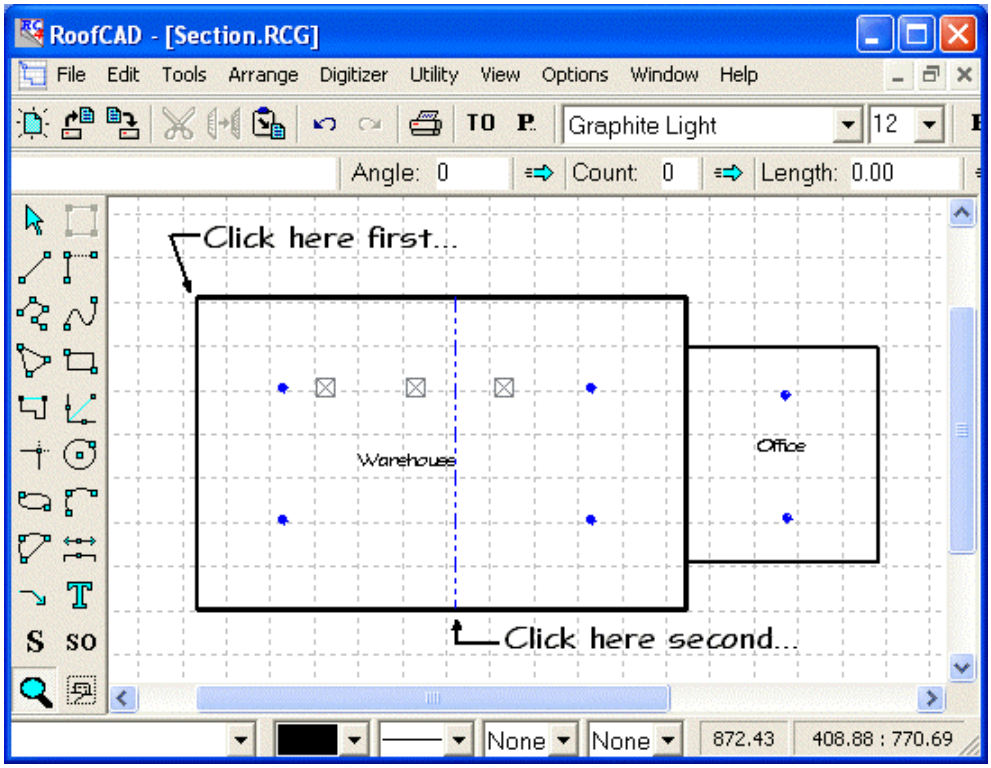


The New Section dialog box.

6. In the box under "Enter a name for the new section:" type **Warehouse Section 1**.
7. Click on the Draw Section Using box. Click Rectangle Tool.

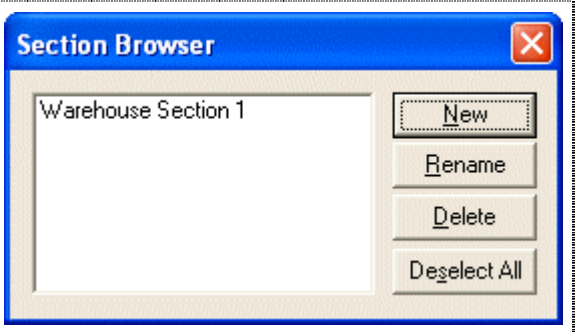
Hint:	**The rectangle and polygon tools are used for overlaying your section outline on existing lines. The Layout Wizard is used when you are going to draw your own outline.**

8. We will now identify the section by super imposing a rectangle over the left side of the roof. Hold down the Ctrl key and click the mouse at the two points shown in the following illustration:



Hold down the Ctrl key and click these two points.

9. Now we must tell RoofCAD which roofs to include in this section. This is straightforward in this example because only one roof is involved. In the "Select the roofs in this section" box, click **Warehouse**. This tells RoofCAD to include only the Smart Objects from the Warehouse roof.
10. Click OK and you are back to the Section Browser window that now looks like this:



The Section Browser has a new entry.

TO

This is the Takeoff Record button.

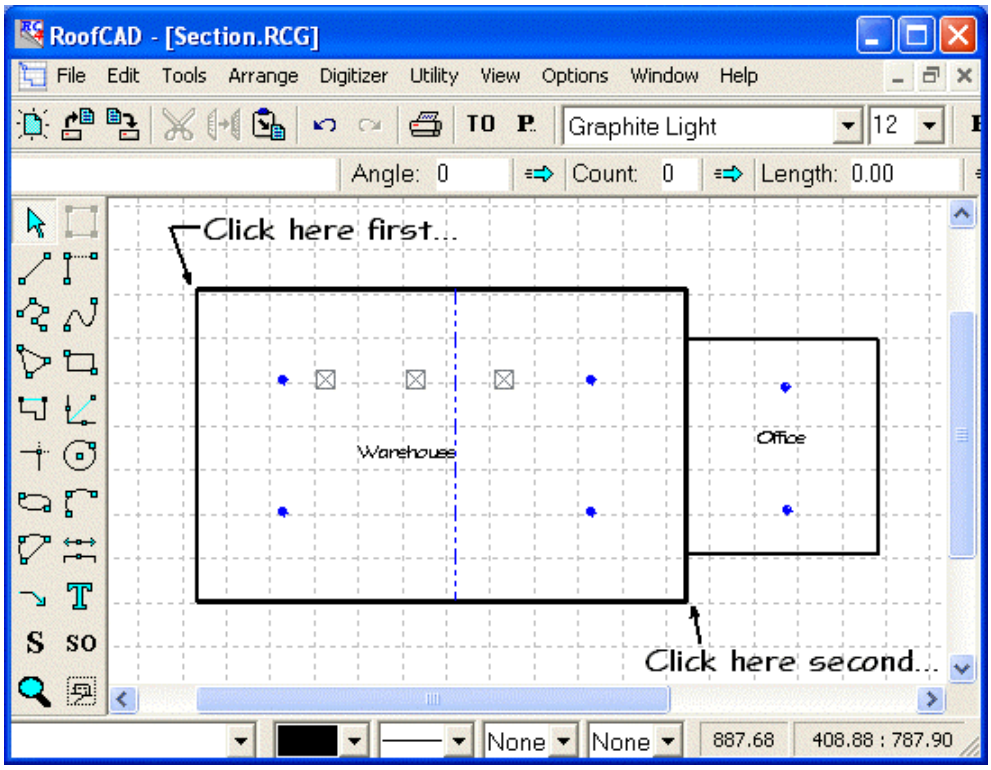
11. Now lets take a quick look at the takeoff record. Click on the Takeoff Record button. The Takeoff Record appears. You may need to scroll down a bit to see the break out for Warehouse Section 1.
12. Click on the Takeoff Record button again. The Takeoff Record disappears.

Now lets see how the Section Tool can be used to get combined totals for two or more roofs.

1. In the Section Browser, click the New button again. The New Section window appears.
2. Type **Warehouse & Office** as the section name.
3. Click Draw Section Using. Click Rectangle Tool.

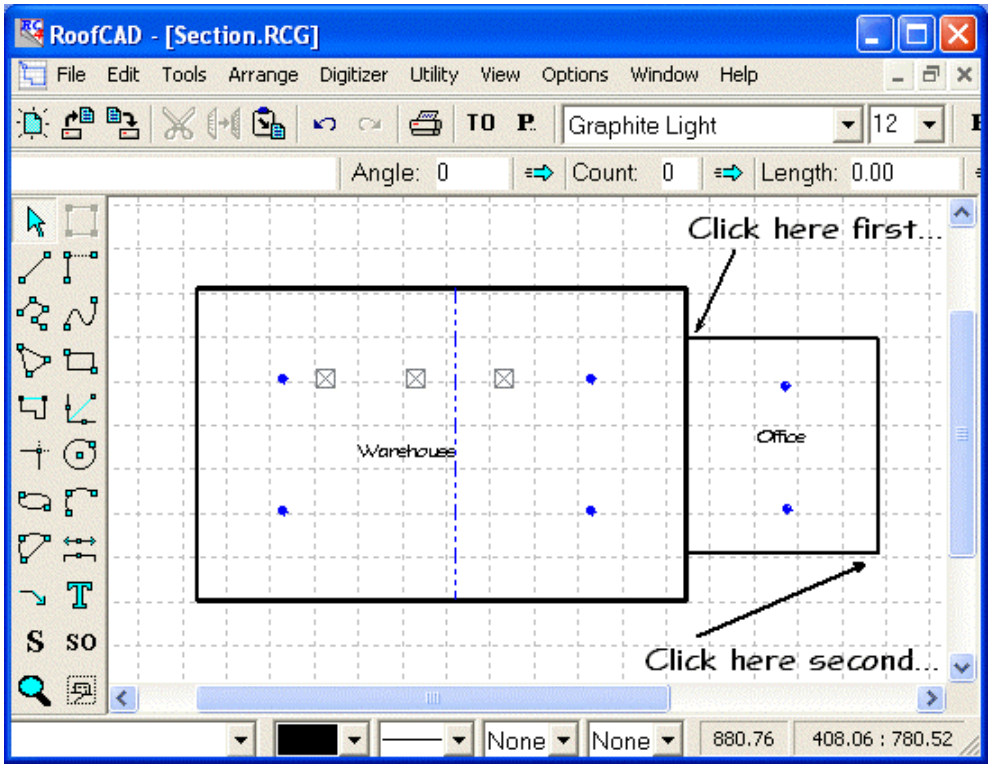
We will now indicate what we want by superimposing rectangles over the Warehouse and Office roofs.

4. Hold down the Ctrl key and click the mouse on the two points indicated in this illustration following:



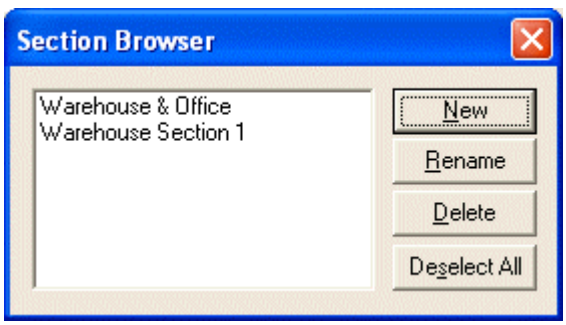
Hold the Ctrl key while you click these two points.

5. Hold down the Ctrl key again and click the mouse on the two points indicated in the following illustration:



Hold the Ctrl key while you click these two points.

6. Now we must tell RoofCAD which roofs to include. In the "Select the roofs in this section:" box, click **Warehouse** and **Office**.
7. Click the Done button and you are back to the Section Browser window that now looks like this:



The Section Browser with your changes.

8. Click the X in the top right corner of the Section Browser. The Browser closes.

Lets take a look at the Takeoff Record.

TO

This is the Takeoff Record button.

Click on the Takeoff Record button . The Takeoff Record appears. Notice the totals for the two roofs under the heading "Warehouse & Office"

Here are a couple of more tips about sections:

- Roofs & Sections are organized alphabetically on the Takeoff record, so name your sections accordingly.
- Sections are treated like any other object. They can be selected, moved, resized, rotated, and deleted like any other object. They can also have a hatch pattern.
- Sections are anchored to the roof that you apply them to. So if you move the roof the section moves with it.

Warning: **In our second example our section was made up of two outlines, one on the warehouse and one on the office. If you move either roof the section from the other roof moves with it. This will change the quantities on the Takeoff Record!**

Section 12

Working with Data Files

Working with Data Files

When we talk about data files in RoofCAD, we are referring to the Smart Object file, the files for your Symbol Libraries, and the RoofCAD drawing you use as your default template.

Data Files can be Shared on a Network

If you have several people on a network they can share the same data files. This means that if any changes are made to these files everyone gets the changes immediately, instead of having to copy the file to each computer.

The first step here is to copy your data files to a shared network drive that everyone is mapped to. The name of each file is shown below along with the folders they are found in on a typical installation (your install may vary):

Filename	Description
c:\roofcad\Roofcad.tpl	(Smart Object file)
c:\roofcad\symbols\Roof.sbl	(Roof Symbol Library)
c:\roofcad\symbols\Details.sbl	(Detail Component Symbol Library)
c:\roofcad\T8x14l.rcg	(Default Template)

We highly recommend that you create a folder called "Roofcad" on your network drive (for example, "g:\Roofcad") and copy the data files into the same folder structure under this folder. RoofCAD has an automatic backup feature that allows you to go mobile with no effort as long as you put the data files in the same folder structure on the network.

As an example, the following listing would be our recommended folder structure if your network drive letter was g:

```
g:\Roofcad\Roofcad.tpl
g:\Roofcad\symbols\Roof.sbl
g:\Roofcad\symbols\Details.sbl
g:\Roofcad\T8x14l.rcg
```

Notice how the structure matches the folder structure of the C: drive exactly.

The next step is to switch from using the current data files to using the files on the network drive.

How to Switch to Using the Network Files:

1. Choose Options|Program Settings from the menu. The Program Settings window appears.

2. Click the "Browse" button beside the Default Smart Objects box. The Open dialog box appears.
3. Use the Open dialog to navigate to the network folder that contains the file roofcad.tpl file.
4. Click roofcad.tpl file. It becomes selected.
5. Click the Open button. The Default Smart Objects box now displays the path to the network copy of the roofcad.tpl file.
6. Click OK and the Program Settings window disappears. You will now be using the network copy of the roofcad.tpl file.

Repeat steps 2 to 6 for the symbol library and default template.

Tip: **If you want to hit the road with your laptop, you will no longer have access to the Data files on the network. To handle this, RoofCAD automatically backs up your data files (Smart Objects, Symbols, and your default template) to your C: drive every time you start RoofCAD. When you start RoofCAD, if it can't find your data files (because you are not attached to the network), the program will automatically switch to using the data files that were backed up on your C: drive. When you get back to the office, RoofCAD automatically switches back to using the network files. Also note that this only works if the folder structure on your network drive exactly matches the structure on your C: drive.**

Auto Backup of Symbol Library and Smart Object Files

These files are backed up automatically by RoofCAD. If one becomes corrupted, RoofCAD will automatically revert to the last backup.

Section 13

Working with Photos

Working with Photos

RoofCAD allows you to add digital photos and images to a drawing. You can show a photo of the customer's building, a flashing in need of repair, or add your company's logo to your templates.

RoofCAD supports most common image formats. Once added to the drawing, the images can be selected, resized, moved and deleted. The only thing you can't do with an image is rotate it.

How to Add an Image to Your Drawing:

1. The first step is to place a copy of your image file in the Photos folder which is found under your RoofCAD folder. When you copy the image into this folder be sure to give it a unique name, i.e. do not overwrite another file in this folder.

Tip: **We recommend that you place a COPY of the image file in the Photos folder because that dedicates the image to RoofCAD. If anything happens to the original it won't matter because RoofCAD uses the copy.**

2. Open RoofCAD. From the RoofCAD main menu, click Tools|Special|Image.

   You can also click the Image Tool on the left hand tool bar.

The Image Tool looks like this.

3. Position the mouse on the drawing and click once.
4. Move the mouse and a box will begin to form. Form the box where you want to place the image.
5. When you've finished forming your box for the image, click once. The Open dialog appears.
6. Navigate to the image you want. Highlight it and click Open. The image appears on the drawing.

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 cannot be rotated in RoofCAD. So rotate it first in your image software.
- 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.
- Lots of images on a drawing will slow down the program. There are ways of keeping your image files very small without sacrificing quality. We recommend that you learn how to work with images properly in your image software. Small images help performance greatly but if you have an older computer you may find adding images makes RoofCAD slow. Unfortunately this is the reality of working with graphic images, by their nature they demand a lot more resources from a computer. If you want to use images, you may have to upgrade your computer.

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 floppy disk and give it to someone, then you need to put the image files on the floppy as well.

If you want to e-mail a RoofCAD drawing to someone, you need to e-mail the images as well.

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.

How to Check Where an Image File is Located:

1. Select the image with the pointer tool on the drawing.
2. Look at the far left cell on the status bar and you will see the image file's location.

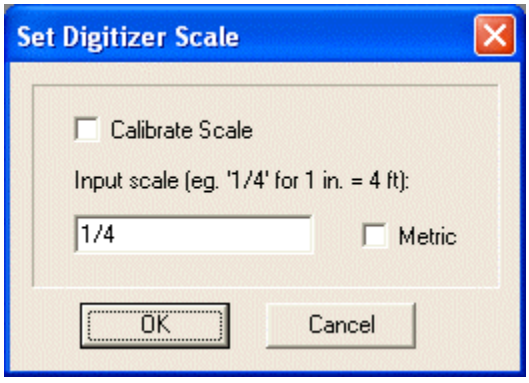
Section 14

Digitizer Scale

Digitizer Scale

Note: ***To digitize plans and blue prints with RoofCAD, you must have the RoofCAD-Digitizer module, which is sold separately.***

This is the Digitizer Scale dialog box. This is where you set the scale of the document you are about to digitize.

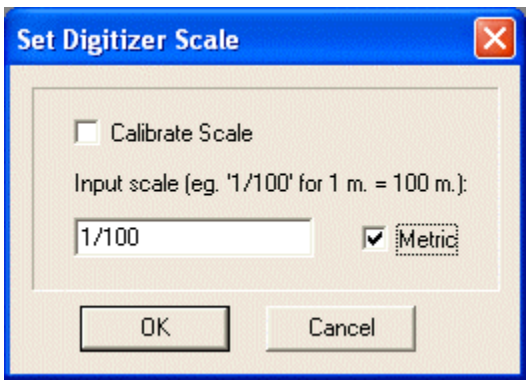


The Digitizer Scale dialog box.

The scale can be entered in either Metric or Imperial form. In the picture above, the scale is entered in Imperial: 1 inch = 4 feet.

Metric Scales

You can use metric scales in your RoofCAD drawings. We designed it so that if you are digitizing a set of metric blue prints you can set a metric scale but you have a choice to make the resulting RoofCAD drawing measurements metric or imperial (feet and inches). This means that your Takeoff Record results can still show feet even though the blue print is in meters (metric). Setting a metric scale works the same as setting an imperial (feet and inches) scale, except you must first set the check mark in the Metric check box if you want to use a metric scale. An example of a Metric scale is shown in our illustration on the following page, where 1 meter = 100 meters.



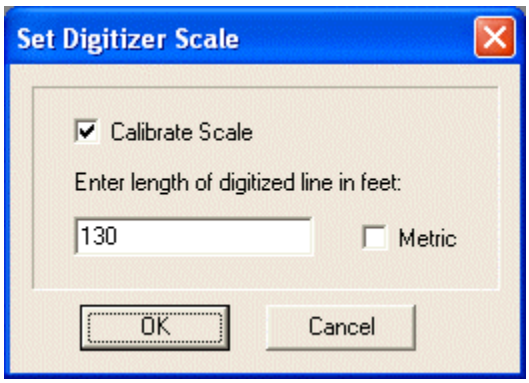
A typical Metric setting.

Calibrate Scale

You can calibrate a scale for a drawing. As long as there is one dimensioned line on the drawing, RoofCAD can determine the scale. You digitize both ends of the line, then enter the length, and RoofCAD figures out what the scale is. Use it when the scale of a drawing is questionable and with reduced plans.

How to Calibrate a Scale:

1. Click to check the Calibrate Scale box. The Set Digitizer Scale dialog will change to provide you with an area to enter the length of a digitized line.



The Set Digitizer Scale box changes.

2. Digitize the start and end point of a "good" line on the blue print. A good line is one that has a reliable dimension on it, so that you know for sure how long that line is. An actual dimension line is usually a "good" line. Use your best judgment.
3. Enter the actual length of the line you just digitized where is says Enter length of digitized line in feet.
4. Click OK.

RoofCAD has now determined the scale of the drawing.

If you want to check what the scale was set to, choose Digitizer|Set Digitizer Scale from the RoofCAD menu. Click cancel when you are done checking the scale.

Hint:	**You can move from one part of the Set Digitizer Scale window to another by digitizing the up and down arrows on the digitizer menu. Digitizing the "Select" option on the menu will check or uncheck a checkbox.**

Section 15

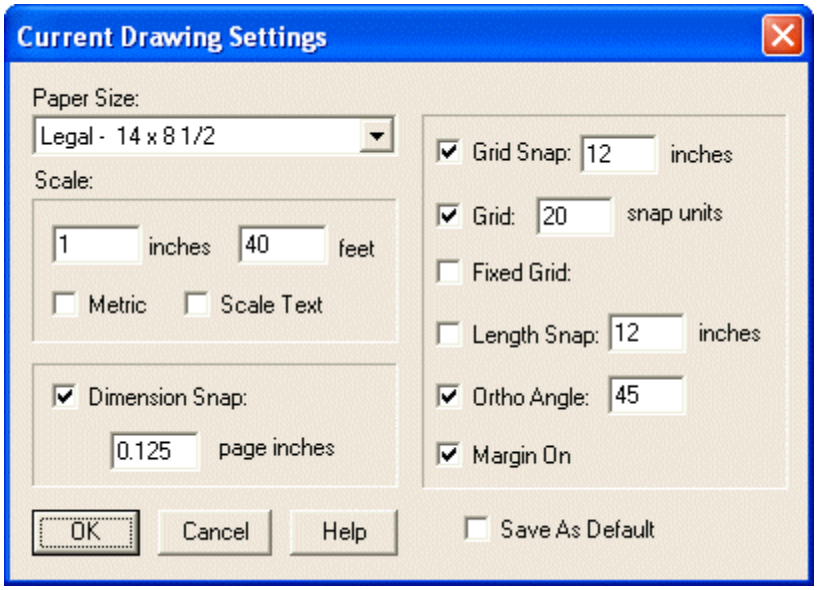
Drawing Settings

Drawing Settings

In this section you'll learn how to:

- Setup the Drawing Page
- Display the Grid
- Snap to the Grid
- Display the Margin
- Set the Scale

This is the Drawing Settings dialog. It can be opened from the Options|Drawing Settings menu item.



The Drawing Settings dialog box.

Use this dialog to change the settings for the current drawing. If you want these settings to apply to all new, blank drawings opened, check the 'Save As Default' check box before clicking the 'OK' button. (This will not affect the settings of a drawing template which is an existing drawing; instead, the currently displayed settings will be used every time you open a blank drawing page using the 'File|New|Empty' menu item.).

Paper Size:

Use this drop-down box to change the size and orientation of the drawing page in the RoofCAD window.

Scale:

Enter the scale of your drawing in this area. When you print the drawing, this will be the scale used. If you prefer to work using metric measurements,

check the 'Metric' check box. All measurements displayed by RoofCAD or entered by you will now be in meters.

If you are changing the scale of a drawing with objects already drawn, they will change size in relation to the drawing page to reflect the scale change. If you want all text on the drawing to change size as well, check the 'Scale Text' check box, otherwise any text on the drawing will stay the same size.

We've provided a table to act as a general guideline for what scale to set for the size of building and the page size you are using. It is helpful to set a scale before you draw the roof or at least get it close to what the final scale will be. If you start to draw a roof outline with a scale that is not close to what the final scale will be, the outline will either be huge (possibly disappearing of the page) or very small. Of these two conditions only the huge outline is the problem because it will run off the page as you are drawing it, which means you have to draw part or most of the roof outline "blind".

Of course it is hard to know the scale you need until you see the roof outline on the page. That is why we supply this guideline. Find the roof size under the page size you are using then set the corresponding scale.

General Scale Guideline

	11 x 8½ Template	14 x 8½ Template	17 x 11 Template
Scale	**O/A Size of drwg.**	**O/A Size of drwg.**	**O/A Size of drwg.**
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'

Dimension Snap:

The 'Dimension Snap On' check box toggles the use of the dimension snap feature. Using this snap ensures that all dimensions placed on the drawing will appear at a uniform distance from the lines they are dimensioning. The area below this check box specifies this distance in physical page inches.

Grid Snap:

The 'Grid Snap' check box toggles the use of the snap-to-grid feature. When this feature is on, all drawing actions will snap to increments defined in the text box. The snap unit spacing is expressed in inches. This option can also be toggled from the 'Options|Snaps|Snap to Grid' menu item or the GRID button on the status line. With Snap to Grid on your mouse cursor will move a set distance each time you press the up, down, left or right arrow

key on the keyboard. The X,Y Readout will show you how far you are moving.

Grid:

The 'Grid' check box toggles the display of dashed grid lines in the background of your drawing. These lines will not be printed when you print your drawing. The 'Snap Units' box sets the spacing of the grid lines. The grid spacing is expressed in terms of snap units. For example, if your grid spacing is 20 snap units and your snap spacing is 12 inches, a grid line will be drawn every 20 ft.

Fixed Grid:

There are two types of snap grid, a fixed and a floating grid. The floating snap grid makes the placing of objects, with the x,y coordinates, more accurate. We recommend that you use the floating grid which means no check mark in this check box. If you use a floating grid, the snap grid gets reset every time you press F2 on the keyboard. So when you press F2 and arrow key to where you want the drain you will be exactly over a grid point. Thus the drain will stay put. If you use the fixed grid to do the same thing, when you drop the drain it may jump slightly to the nearest grid point.

The only time you may still want to use the "Fixed" snap grid is when drawing details. The fixed snap grid is effective for large scale (1"=2') detail work.

Hint: **You probably will never need to change this setting. Only very advanced users would want to use the "fixed" grid. So by default there should be no checkmark in this check box.**

Length Snap:

Length Snap only kicks in when you are drawing/digitizing an object made up of lines like an expansion joint, gas line or in the case of digitizing, the roof outline itself. What Length Snap does is "snaps" (rounds) your line lengths to the nearest foot (or whatever increment you specify). So when digitizing a roof outline instead of getting a line length that is 33.67' you will get 34.00'. This snap of course is optional. Implement it if you want your line lengths to be rounded to whole numbers.

Sample Tutorial:

1. Start a new drawing.
2. Open the Smart Object Browser and choose Gas Line.
3. Click the mouse on the drawing.
4. Move the mouse and notice the new Length read out cell on the status bar displays the length as you move the mouse.

5. Press the "L" key on the keyboard. This turns length snap on. Move the mouse some more and notice the Length read out cell on the status bar displays the length rounded to the nearest foot. You can make this increment whatever you want in the drawing settings window.

Tip: **Length snap can be on at the same time as grid snap. Grid snap is in effect until you start to draw then length snap takes over.**

Ortho Angle:

Ortho mode helps you to draw straight lines. Ever notice when you need to draw a straight up and down or left and right line, it is hard to hold the mouse steady enough to get the line straight? Or when digitizing, you always end up with crooked lines?

Ortho mode solves this. Ortho mode locks a line at a specific angle. RoofCAD ships with the ortho angle set to 45-degree increments. So all you have to do is specify the line length and ortho mode will keep it straight.

Ortho mode is toggled on and off with the "Ortho" button or by pressing "O" on your keyboard. You can turn it on and off as required while you draw. When ortho mode is on, the ORTH button on the status line will be depressed.

This is the Ortho mode button.

How to Use Ortho Mode:

Ortho mode only works when drawing or manipulating an existing line. If ortho mode is off, press "O" on the keyboard to turn it on. If ortho mode is on, press "O" on the keyboard to turn it off. Pressing "O" also works while digitizing.

Tip: **Ortho Mode does not work while using the Layout Wizard.**

Warning: **Be very careful when you use Ortho Mode while digitizing angled walls. Here is an example of what could go wrong: You are digitizing a roof outline with Ortho Mode on and your Ortho Mode is set to 45 degree increments. So far you have digitized 90-degree walls but the next wall is an angled wall that is close to BUT is not a 45-degree angle. If you digitize the wall with ortho mode on it will be drawn at 45 degrees thus making the takeoff inaccurate. Before you digitize the wall you need to press the "O" key on the keyboard to turn Ortho Mode off. Use the Ortho button on the status line as your visual cue as to whether ortho mode is on or off. When the Ortho button is pressed down, ortho mode is on.**

Margin:

The 'Margin On' check box toggles the display of the dashed line approximately ¼" in from the edge of the RoofCAD drawing page. This line represents the printable area of your drawing. (Most printers cannot print all the way to the edge of the paper). This dashed line will not be printed when you print your drawing. This option can also be toggled from the 'Options|Margin On/Off' menu item.

Save As Default:

When the 'Save As Default' check box is checked before clicking 'OK' the currently displayed settings will be used every time you open a blank drawing page using the 'File|New|Empty' menu item.

Section 16

The Layout Wizard

The Layout Wizard

This is the Layout Wizard.

RoofCAD's Layout Wizard

Access the Layout Wizard either by using any Smart Object that uses the Layout Wizard as its drawing tool, or by clicking its toolbar button.

This is the Layout Wizard toolbar button.

The Layout Wizard is a tool for drawing an area from measurements (See Section 25, Basic Flat Roof Tutorial.). It may also be used to edit an existing area by selecting the area, then clicking the button in the toolbar.

With the Layout Wizard, you enter dimensions for each line, then click the Next button to move to the next line. The Previous button can also be used to back up to a previous line if a measurement needs to be adjusted. If the Closed check box is checked, the Wizard will complete the area for you by drawing a line from the endpoint of the last line you entered, back to the starting point. If it is not checked, you will be drawing a connected series of lines. The Remove button will remove the last line entered and the Insert button will insert a new line.

Hint:	**You only need to use insert when you have missed a line and want to go back and insert it.**

The dimensions of a line can be specified in several ways.

If the line is perfectly horizontal or vertical, the easiest method is to enter the length of the line in the Length edit box, then press the arrow key on

your keyboard that corresponds to the direction you want the line to be drawn in.

If the line is at an odd angle, its dimensions can be defined in one of two ways:

1. Enter the horizontal and vertical components of the line's slope in the Horz. and Vert. edit boxes, using the arrow keys on your keyboard to indicate the direction of the slope (up, down, left, right).

or

2. Enter the length of the line in the Length edit box, then enter the line's absolute angle in the Angle edit box, or the angle relative to the previous line in the Rel. Angle edit box. If using the Rel. Angle edit box, you can use the arrow keys to indicate the direction of the angle's sweep: left for clockwise, right for counterclockwise from the previous line.

Arcs

The Layout Wizard can also draw arcs on your roof outlines. In the small tutorial that follows, we'll show you how to do this.

How to Use the Arc Feature in the Layout Wizard

We will show you how the arc feature works by drawing a sample roof.

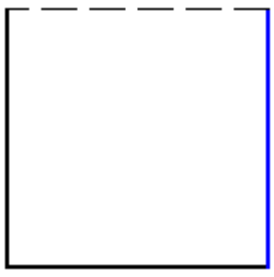
1. Start a new drawing, set the scale to 1 inch to 40 feet and open the Smart Object Browser.
2. Choose the Flat Roof Smart Object and click in on the drawing near the upper left corner, to start a new roof. The Layout Wizard appears.
3. Draw the following walls:

   100, down arrow, Enter

   100, right arrow, Enter

   100, up arrow (do not hit enter on this wall)

This leaves the third wall blue in color. The roof should look like this:



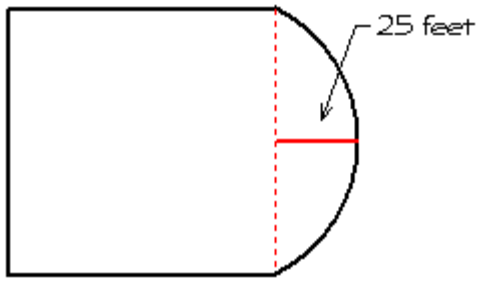
Your roof should look like this.

The blue wall is what we call the baseline of the arc. Drawing the baseline is the first step to drawing the arc. If the base line runs at an odd angle you draw it just like you would any other odd angle wall.

4. Click on the Arc check box on the right side of the Layout Wizard window. A check mark appears. The length, angle and relative angle input boxes have now changed to accept arc input (see illustration following). Also notice the wall now has a slight arc to it.

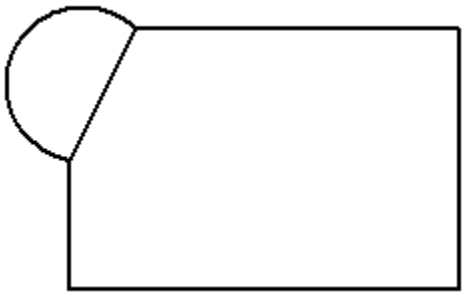
Layout Wizard with Arc function checked

5. What we will do now is define the arc. There are three methods available to define an arc. We will show you the most common one you will use. In the input box marked Distance to Base type 25 and press the tab key (do not press enter yet, pressing tab will show you the result of what you typed in without advancing to the next wall). The wall now has a greater arc to it. The following illustration shows where the 25-foot measurement comes from on the roof:



The 25-foot distance to base

Here is a sample of an arc drawn from an odd angle baseline.



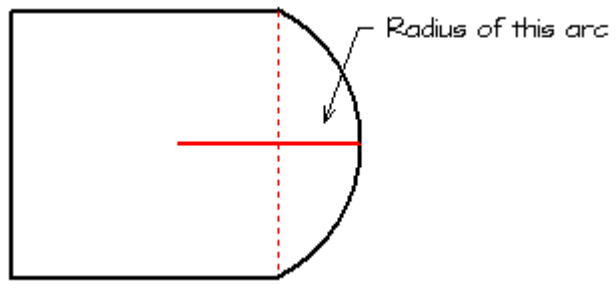
Arc drawn from odd angle baseline.

In either case to draw an arc accurately you must (when you are up on the roof) measure from where the arc starts out from the roof (the Baseline) to the deepest point of the arc.

Tip: **Using the right and left arrow keys on your keyboard while in one of the arc input edit boxes will change the direction of the bulge of the arc.**

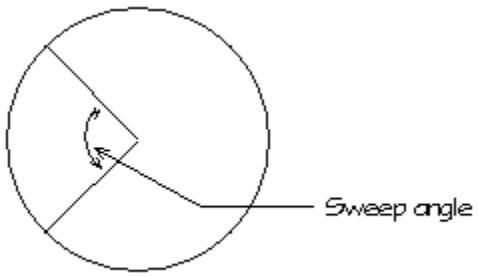
There are two more ways of defining the arc (after the baseline has been drawn):

1. **Radius:** In the Radius edit box, enter the radius of the circle that the arc is a section of. This is can be very difficult to determine in most cases and you will not use this method very much. Be aware the Distance to Base (the above method) and radius are not the same thing. Only in the case of a semicircle would they be the same. The following illustration indicates the measurement you would need for the radius:



Radius of the arc

2. **Sweep Angle:** In the Sweep Angle edit box, enter the sweep angle described by the arc. The sweep angle is the angle that would be formed by two lines drawn from the center of the arc's circle to the endpoints of the arc, as in following illustration:



Sweep angle

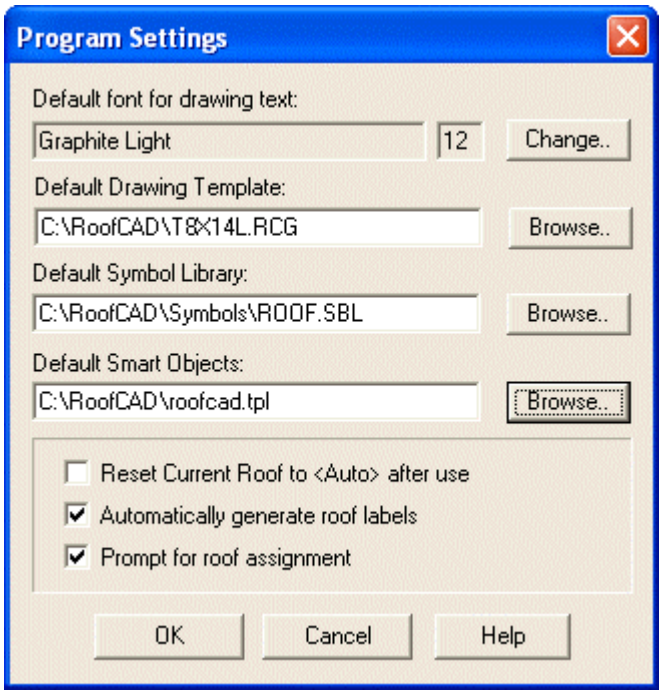
Hint:	**A perfectly rounded corner of a building is usually an arc with a 90-degree sweep angle. And a building with a perfect semicircle on the end of it would be a 180-degree sweep angle.**

Section 17

Program Settings

Program Settings

This is the Program Settings Dialog.



Click Options|Program Settings

In this dialog box, you can specify the following:

Default Font

Tells RoofCAD which font you want to use for drawing text when you first start a drawing.

Default Template

Allows you to specify which template you want to use as the default template. Click the Browse button and a File Open Dialog box will appear. Select the template you want to use as the default, and click the OK button in the File Open Dialog. The name of the file you chose will appear in the Default template box. This is the file that will be used when you choose the File|New|Use Template menu option.

Default Symbol Library

Allows you to specify which library RoofCAD will use. Use this if you want to share your symbol library on the network. Click the Browse button and a File Open Dialog box will appear. Select the library you want to use as the default, and click the OK button in the File Open Dialog. The name of the file you chose will appear.

Default Smart Objects

Allows you to specify the location of your Smart Object file. This is most commonly used to switch to a shared Smart Object file on a network drive. Click the Browse button and a File Open Dialog box will appear. Select the Smart Object file you want to use as the default, and click the OK button in the File Open Dialog. The name of the file you chose will appear.

Reset Current Roof to <Auto> after Use

This tells RoofCAD to reset the Current Roof box on the Smart Object browser back to <Auto> after you have forced a Smart Object onto a specific roof. We recommend that you leave this option off (unchecked).

Automatically generate roof labels

With Auto Roof Labeling on, RoofCAD stamps the roof name on the roof.

Prompt for roof assignment

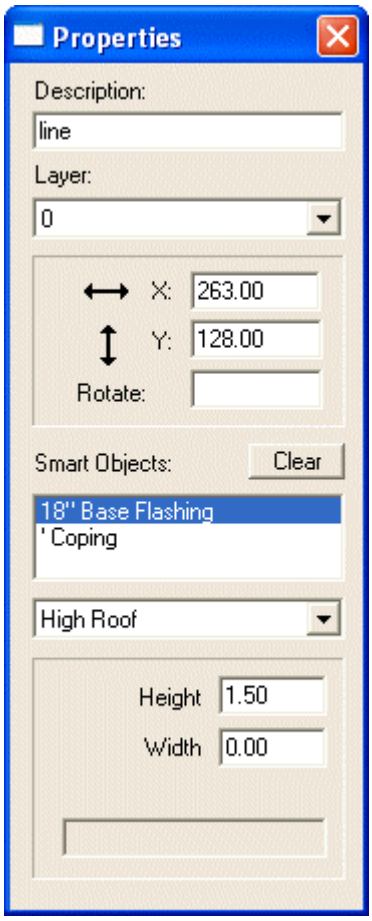
With this option, if you add something to the drawing that does not end up physically on a roof, RoofCAD will prompt you to choose which roof you want the item on. A classic example for this is a scupper. It is easy to miss the roof by a bit when adding a scupper close to the edge. If this option is not on the scupper will end up under <no roof> on the Takeoff Record.

Section 18

Properties

Properties

This is the Properties dialog box.



Properties dialog box.

Access the Properties dialog box by clicking the Properties button on the Object Information Bar or, from the RoofCAD main menu, clicking Arrange|Properties.

This is the Properties button.

This dialog box is very useful for viewing and editing object properties, such as what layer the object is on or what Smart Objects are associated with the object.

Description contains an optional name you can assign to an object. This name does not appear anywhere else, and defaults to a graphic description of the object, i.e. "line".

Layer displays which layer the currently selected object(s) are on. You can instantly move objects from one layer to another by selecting the objects, then selecting the layer you wish them to be moved to from a list shown when you click here.

X,Y displays the overall width and height of selected objects. This area is most useful for quickly setting the dimensions of a rectangular or circular area, or for editing single, unattached lines.

After typing in the desired dimension, press Enter or the Tab key to make the new dimension take effect.

Rotate provides a means to rotate selected objects by a given amount. This property applies to all objects except ellipses (due to Windows graphics limitations, ellipses can only be drawn horizontally or vertically).

Rotate selected items by typing in the amount by which you want to rotate them. For example, if you have a line at an angle of 33 degrees, typing 45 in the Rotate edit box, then pressing Enter, will result in a line with a 78-degree angle.

Smart Object displays any and all Smart Objects associated with the selected object.

If several items, all with different Smart Objects are selected, this area will not be used. To clear a Smart Object from a selected item, click the Smart Object you want to remove, then click the Clear button.

Smart Object properties, such as X and Y dimensions, are displayed at the bottom of the Properties dialog. These properties will vary according to the type of object. These properties can be changed by typing in the desired value and pressing Enter or the Tab key.

Owning Roof displays which roof owns the selected object. In our illustration on the preceding page, the 18" Base Flashing belongs to High Roof. If you click, you can see a list of all the available roofs. Choosing another roof changes which roof this smart object is assigned to. If there are multiple smart objects in the box above this one (18" Base Flashing box in the graphic), each of the Smart Objects can belong to the same or a different roof.

Roof Name displays the name of a selected roof. Changing the name in the box changes the roof name.

Hint:	**This changes the roof name on the Takeoff Record but not the text label on the drawing. You need to change the text label manually.**

Special Functions

Rotate an object when you know how much you want it rotated:

1. Select the object.
2. Choose Arrange|Properties from the menu (or click the button on the Object Information Bar), enter the amount to rotate by (in degrees), then hit the <Enter> key (you can also use negative numbers). The object is now rotated by that amount.

Rotate an object when you do not know how much you want it rotated:

Good examples of when you would want to do this are:

- Rotating a Scupper or Flashing Problem object to sit properly on an odd angle wall.
- Rotating one roof to line up with an odd angle wall of another roof. In a lot of cases, when a roof has to sit at an odd angle on the page, it is easier to draw the roof square on the screen. For example if you had to draw a rectangular roof at an odd angle on the screen (so that it would butt up to an odd angle wall of another roof), every wall of the rectangular roof has to be drawn as an odd angle wall in the Layout Wizard. But now with the rotate capabilities you can draw the rectangular roofs walls as 90-degree walls (which is the easiest roof to draw), then rotate the roof after it is drawn.

1. Select the object to be rotated.
2. Choose Arrange|Properties from the menu (or click the Properties button on the Object Information Bar), enter a small number like 1 or .25 in the rotate box. Press the <Enter> key repeatedly to rotate the object to the desired position. Holding down the <Enter> key will make the object rotate quickly.

Hint: **Rotating an object is most easily done using the "[" or "]" keys on the keyboard. Select the object then press either of these keys.**

Smart Objects

Smart Objects are displayed in a scrolling list. The Clear button next to this list will remove the selected Smart Object from the selected drawing object. By default, the list displays up to three Smart Objects associated with an item, but there may be more. You can see all the Smart Objects associated with an item by scrolling through the list.

To remove any other Smart Object in the list, select it in the list and press the Clear button.

Move Objects to Different Layers

You can move a selected object from one layer to another by changing the layer in the Properties dialog. For more information about layers see Section 7, Layers.

How to move an object to a different layer:

1. Select an object on a drawing.
2. Choose Arrange|Properties from the menu (or click the Properties button on the Object Information Bar).
3. Click on Layer to get a list of layers.
4. Click on the layer you want to move the object to.

The object has now been moved to that layer.

Section 19

Smart Object Browser

Smart Object Browser

This is the Smart Object Browser.

RoofCAD's Smart Object Browser

To open the Smart Object Browser, from the RoofCAD main menu, click Tools|Smart Object Browser or click the Smart Object button on the toolbar.

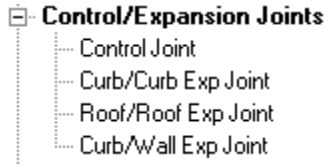
SO

The Smart Object button looks like this.

Smart Objects are organized under headings. To see a list of available Smart Objects under a heading, "expand" the heading by clicking the plus sign (+) to the left of the heading. To collapse a previously expanded heading, click the minus (-) sign beside it at the left.

Collapsed headings look like this:

Expanded headings look like this:



You can organize your list of Smart Objects by selecting any item and dragging and dropping it anywhere in your Smart Object list. You can also organize the headings you see in the Smart Object Browser. You can create new headings, rename headings that are already there, or delete headings you don't want any more.

To create a new heading:

1. Right click any existing heading in the Smart Object browser.
2. From the shortcut menu, select New Heading. The New Heading dialog box opens.
3. Type the name of your new heading.
4. Click OK.

To rename a heading:

1. Right click the existing heading you want to rename.
2. From the shortcut menu, select Rename Heading. The Rename Heading dialog box opens.
3. Type the new name of your heading.
4. Click OK.

To delete a heading:

1. Right click the heading you want to delete.
2. From the shortcut menu, select Delete Heading.

Tip:	**You can't delete a heading that has a list of Smart Objects underneath it. To delete the heading, you must first move the Smart Objects underneath it to a new heading, or delete the Smart Objects from the list.**

About Smart Objects

There are two ways to use Smart Objects:

- You can draw with a Smart Object tool by clicking on the item in the browser, then drawing
- You can select an existing object on the drawing and assign the Smart Object to it by clicking on the item in the browser

In both cases you may be prompted to enter some properties, depending on the type of Smart Object and whether or not it has been set to use default property values. These properties can be changed at any time by selecting the object on the drawing, then opening the Properties Dialog.

If you are using the first method, RoofCAD will automatically set up your drawing tool and colors according to the defaults set in the Smart Object Editor. If you like, you can change to a different tool using the 'Drawing Tool' drop-down box below the Smart Object list. When you draw the object, it will be given the line type, color, and fill specified in the Smart Object Designer.

If you are using the second method, select the objects on the drawing that you wish to set, then click on the desired Smart Object in the browser. You can set more than one object at a time e.g. select all the walls of your roof outline that require 18" Flashing, then click once on an 18" Flashing item in the browser.

Since any object on the drawing can have more than one Smart Object attached, the default is to add to the Smart Objects already associated with an object. If you want to replace all Smart Objects attached to the object, check the 'Replace Existing Smart Objects' checkbox at the bottom of the dialog after selecting the objects on the drawing and before clicking on the Smart Object item in the browser.

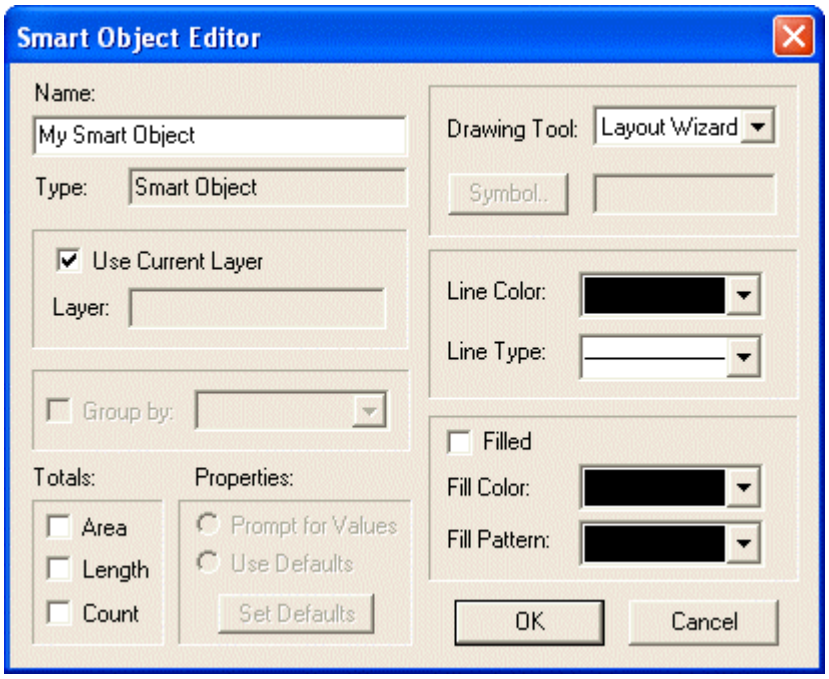
To find out about creating your own Smart Objects, or changing the appearance or properties or an existing Smart Object, see Section 20, The Smart Object Editor.

Section 20

The Smart Object Editor

The Smart Object Editor

This is the Smart Object Editor.



The Smart Object Editor

It is accessed from the Smart Object Browser.

Use the Smart Object Editor to customize the list of Smart Objects RoofCAD uses. When you first get RoofCAD, you receive a default list of Smart Objects, ready to use, so that you can get started right away. At some point you may wish to change the appearance or behavior of a Smart Object, or create your own Smart Objects.

To create a new Smart Object, see Creating New Smart Objects further on in this section.

For information on how to use Smart Objects, see Section 19, Smart Object Browser.

Name

The Name prompt displays the name of the current Smart Object.

Type

The Type area displays the base type of the current Smart Object. This area cannot be edited.

Type can only be set when creating a new Smart Object.

Layer

The Layer area displays what layer objects drawn with this Smart Object will appear on. If the layer does not exist, it will be created. If the 'Use Current Layer' checkbox is checked, this entry will be ignored, and the object drawn on whichever layer is current at the time.

Group By

If the Group By checkbox is checked, objects in the Takeoff Record with this Smart Object will be itemized by the property displayed in the drop-down box. If this Smart Object is of a type that has no properties, this area will be disabled.

Totals

The Totals checkboxes allow you to set the totals you want to see for this Smart Object in the Takeoff Record (e.g. for Gravel Stop, only length is needed, for Drains, only count is needed).

Properties

The Properties area allows you to set default values to be used when using this Smart Object. To use default values, check the 'Use Defaults' checkbox, then click the 'Set Defaults' button to enter the default values to be used. If you want to enter the Smart Object properties every time you use the Smart Object, check the 'Prompt for Values' checkbox. If the Smart Object has no properties, this area will be disabled.

Drawing Tool

The Drawing Tool drop-down box allows you to set the default tool to use when drawing with this Smart Object. If the tool chosen is the symbol tool, click the 'Symbol' button to open a pick-list of symbols to choose from. Note: the default tool can be over-ridden from the Smart Object Browser.

Line Properties

The Line Properties area lets you customize the look of your Smart Object. To set the line type and color used to draw the Smart Object, click on the rectangles to the right of the words 'Line Color' and 'Line Type' and choose the desired setting. If this Smart Object is a symbol, this area will be disabled.

Fill Properties

The Fill Properties area lets you customize the look of your Smart Object. To set the fill color and pattern used to draw the Smart Object, check the 'Filled' checkbox, then click on the rectangles to the right of the words 'Fill Color' and 'Pattern' and choose the desired setting. To remove a fill pattern from a Smart Object uncheck the 'Filled' checkbox. If this Smart Object uses a line tool this area will be disabled.

OK

Click OK to close the dialog when you are finished creating and editing the Smart Objects. Everything you have done will now be saved.

Cancel

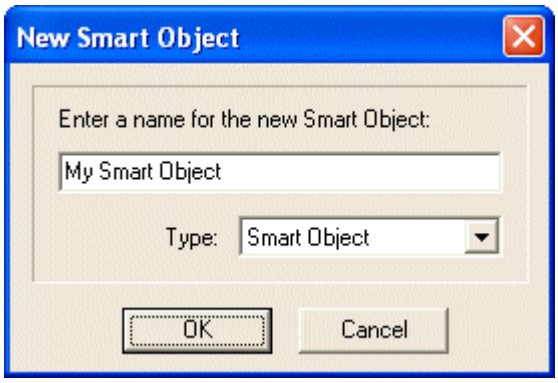
Click the 'Cancel' button if you want to close this dialog without saving any of the changes you have made. Any new Smart Objects you added will be discarded.

Creating a New Smart Object

To create a new Smart Object:

1. Open the Smart Object Browser. Right click any Smart Object in the list.

2. From the shortcut menu, select New.



Select New, and you'll see this dialog first.

You will see a dialog box asking you to enter a name for the new Smart Object. Choose a base Type for the Smart Object by clicking and selecting from the list.

The Type of Smart Object you choose is very important, as each has different properties, and will calculate its totals for the Takeoff Record differently. Here is a summary of all the Smart Object types available in RoofCAD.

After you have entered this information, click OK, and you will see your new Smart Object in the Description area of the Smart Object Editor.

Smart Object:

This is a generic Smart Object type. It has no special properties. This is a catch-all category for items you wish to appear on the Takeoff Record that don't fit into any other categories.

When creating a Smart Object of this type, it is very important to choose the default drawing tool carefully. If this is a Smart Object that will only be assigned to lines, you should choose a line tool, such as line, horz/vert line, or polyline. If this Smart Object will be assigned to closed polygons or circles, you should choose the Layout Wizard, polygon, rectangle, or circle tool. If this Smart Object will be represented by a symbol, you should choose the symbol tool.

Roof Area:

The Roof Area Smart Object type can apply only to closed polygons or circles. It has two properties: height and pitch. The height property refers to the height of the roof from the ground. This property is not currently used by RoofCAD, and can be ignored if you wish. The pitch property will be used when RoofCAD calculates the area of the Roof Area object.

Hip/Valley:

The Hip and Valley Smart Objects types are identical and can be used interchangeably (i.e. you could create one Smart Object called Hip/Valley and base it on either the Hip or Valley type). This Smart Object has one property: pitch. If you use the Hip/Valley tool to draw these objects, RoofCAD will automatically calculate the correct pitch for you, based on the pitch of the connecting eaves. Therefore it is usually not necessary to enter a value for this property yourself. The pitch will be used to calculate the length of the hip or valley.

Roof Ridge:

The Roof Ridge Smart Object type is used to represent roof ridges. It has no properties.

Roof Eave:

The Roof Eave Smart Object type has two properties: pitch, height, and overhang. As with the Roof Area Smart Object, height is not currently used in RoofCAD, and can be ignored. The pitch property is important, as it is used by RoofCAD to calculate the pitch of hips and valleys as you draw them. Pitch is entered as a number /12 (e.g. if the eave has a pitch of 4/12 (rise/run), you would enter 4 as the pitch property). The overhang property is used if you have drawn your Roof Area from footprint measurements. Enter the amount of the overhang in feet, and RoofCAD will extend the eave lines and calculate the perimeter accordingly. The original footprint outline will be represented by a dashed line. If you have taken your measurements from the outside, enter 0 for the overhang.

Wall:

The Wall Smart Object type has two properties: height and width. This base type is used for such items as Parapet Walls, Base Flashing, Gravel Stop, etc. The height and width properties will be used to calculate the amount of

material needed. If only a lineal footage is needed, height and width should be set to 0. If an area of coverage is required (i.e. for materials that extend up the wall) enter the height of coverage in feet. If the material represented by the Smart Object will extend over the top of the wall, enter the width in feet. Otherwise, enter 0.

Rake Edge:

The Rake Edge Smart Object type has two properties: pitch and overhang. The pitch entered will be used when calculating the length of the rake edge. The overhang property is used if you have drawn your Roof Area from footprint measurements. Enter the amount of the overhang in feet, and RoofCAD will extend the rake edges and calculate the perimeter accordingly. The original footprint outline will be represented by a dashed line. If you have taken your measurements from the outside, enter 0 for the overhang.

Roof Curb:

The Roof Curb Smart Object type has three properties: length, width, and height. These properties are used by RoofCAD to calculate the amount of material needed to cover the sides of the Roof Curb. Roof Curb objects are usually drawn using a symbol, which will automatically size itself to correspond to the properties you entered.

Hint: **You can also use the Roof Curb base type to create a Skylight object, or any rooftop item that requires material to extend up the sides. Use a symbol, or for odd shaped skylights, you can use the Layout Wizard or polygon tool. If the item is odd-shaped, the length and width properties will be ignored, and the actual perimeter and the height property will be used to calculate the amount of material needed.**

Drain:

The Drain Smart Object type has no properties. It exists as a separate category for the Taper-Plus export function.

Roof Opening:

The Roof Opening Smart Object type has two properties: pitch and the RoofID of the Roof Area it belongs to. The RoofID is a read-only number automatically generated by RoofCAD. When RoofCAD calculates the area of this roof, it will deduct the area of the Roof Opening before displaying it in the Takeoff Record. Use the Roof Opening Smart Object for enclosed courtyards, large skylights, and penthouses sitting on top of the main roof (i.e. in situations where you will want to deduct the area of the penthouse from the area of the main roof to estimate the amount of material needed for the main roof).

Roof Stack:

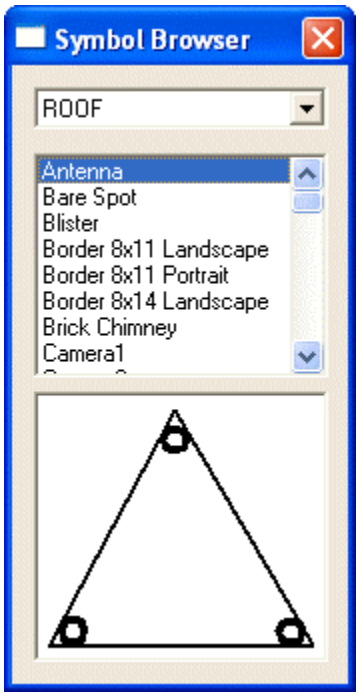
The Roof Stack Smart Object type functions like a round Roof Curb Smart Object type. It has two properties: height and diameter, which are used by RoofCAD to calculate the amount of material required to cover the sides of the item.

Section 21

The Symbol Browser

The Symbol Browser

This is the Symbol Browser.



RoofCAD's Symbol Browser

To access the Symbol Browser, from the RoofCAD main menu, click Tools|Symbol Browser or click the tool bar button for the Symbol Browser.

S

This is the Symbol Browser button.

The Symbol Browser allows you to browse and select symbols to insert into your RoofCAD drawing. The box at the top of the dialog displays the name of the currently loaded symbol library. In this case, it is 'Roof Symbols', the library that comes installed with RoofCAD. To view a symbol, click on the symbol name in the list box, and the symbol will be displayed in the view area below the list box.

To use the symbol, after clicking on the name in the Browser, click on the drawing at the spot where you wish the symbol to be inserted. (The point you click will be center of the symbol you are inserting). To insert more than one copy of the symbol, continue clicking on the drawing until all the symbols are placed.

To edit or add new symbols to the symbol library, or to create new libraries, see Section 22, Symbol Library Manager.

If you have created more symbol libraries using the Symbol Library Manager, you can open a different library by clicking the drop-down list box at the top of the Symbol Browser. In the Item list, click the symbol library you want to use.

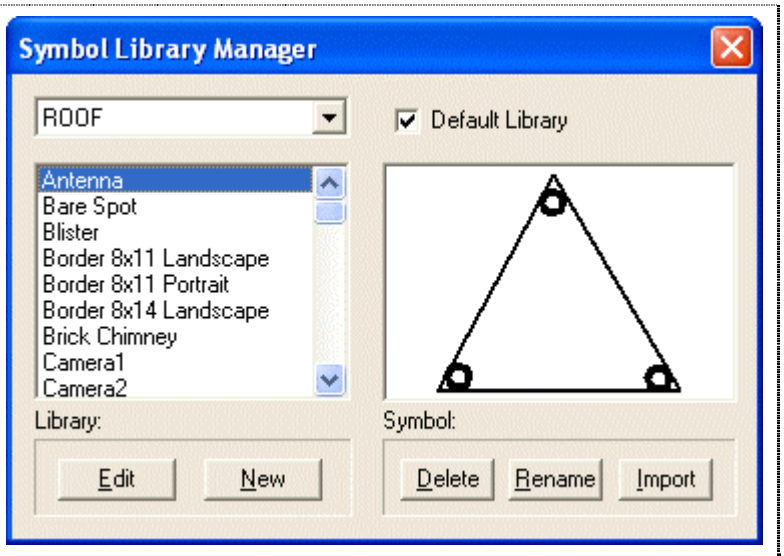
Tip: **Symbols added to your drawing from the Symbol Browser will not be totaled on the Takeoff Record. They are for visual representation only. To include symbol totals on the Takeoff Record, insert them using the Smart Object Browser.**

Section 22

Symbol Library Manager

Symbol Library Manager

This is the Symbol Library Manager.



RoofCAD's Symbol Library Manager

To access the Symbol Library Manager, from the RoofCAD main menu, click Utilities|Symbol Library Manager.

Description:

The description area displays the name of the currently displayed library. This is the internal name of the library, not the name of the actual file.

Each library is stored on your hard disk in separate file with the '.sbl' extension. RoofCAD comes supplied with two libraries; 'Roof' is a file named roof.sbl. 'Detail' is a file named detail.sbl. Both files are found in your RoofCAD\Symbols folder.

To change from one symbol library to another, in the Description prompt, click the library you want to use.

Default Library:

When the 'Default Library' checkbox is checked, the currently displayed symbol library will be the one used when you open the Symbol Browser, or use the Symbol pick-list from the Smart Object Editor.

Symbol List:

This area displays a list of the symbols contained in this symbol library. To view a symbol, click on it's name in this list.

Symbol Viewer:

This area displays the currently selected symbol.

Edit:

Click the 'Edit' button to open the current library as a drawing in RoofCAD. You can then edit the symbols in the library, but this can be unwieldy.

For a much simpler way to create new symbols or edit existing ones, see Section 10, Symbols.

New:

Click the 'New' button to create a new symbol library. The new library will be opened as an empty page in RoofCAD. Name the library by using the text tool to place the name on the page. Create your symbols then save the drawing as a file with the .sbl extension.

Delete:

Clicking the 'Delete' button will delete the currently displayed symbol from the symbol library.

Rename:

Click the 'Rename' button to rename the currently displayed symbol.

Import:

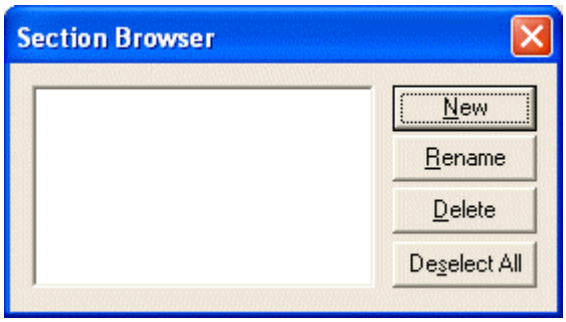
To import a symbol from a RoofCAD drawing into the symbol library, select the symbol in the drawing, then click the 'Import' button. If the library already contains a symbol by the same name, you will be asked if you wish to overwrite the existing symbol. If you choose yes, the existing symbol will be replaced by the imported symbol. If you choose no, you will be asked to enter a new name for the imported symbol. If you choose cancel, the import will be aborted. If the import is successful, the new symbol will appear selected in the symbol list and displayed in the symbol viewer.

Section 23

Section Browser

Section Browser

This is the Section Browser.



Section Browser

To access the Section Browser, from the RoofCAD main menu, click Tools|Section Browser.

With the Section Browser you can create, delete, or rename sections.

Selecting sections by clicking on their names in the browser will highlight the sections on the drawing.

Hint:	**It is easier to select sections, with the pointer tool, right on your drawing or by clicking on the section name in the Takeoff Record.**

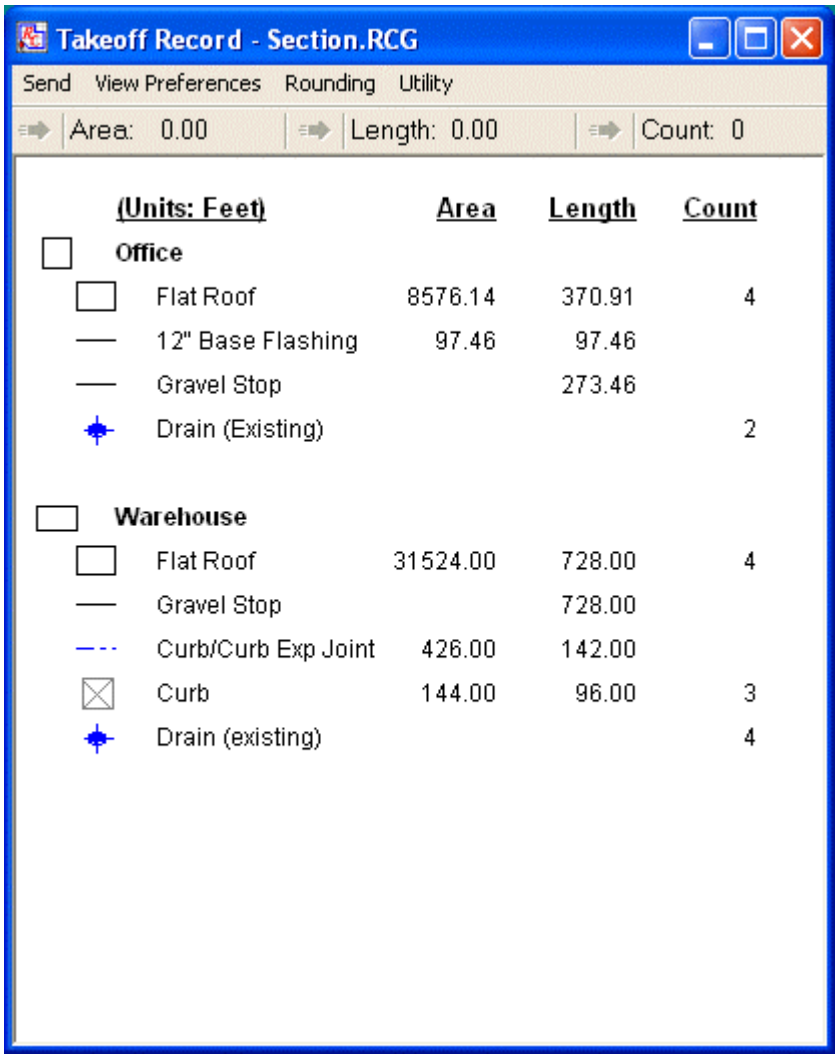
For a step-by-step tutorial on using sections, see Section 11, Sections.

Section 24

The Takeoff Record

Takeoff Record

This is the Takeoff Record.



The Takeoff Record

To access the Takeoff Record, from the RoofCAD main menu, click Utilities|TakeOff Record or click the Takeoff Record button on the Object Information Bar.

TO

This is the Takeoff Record button.

The Takeoff Record is where all the visible Smart Objects on your drawing are totaled. Which totals appear for each Smart Object (Area, Length, Count) is determined by the Smart Object itself, and can be set in the Smart Object Editor.

The Takeoff Record can be organized in one of three ways: Consolidated, Itemized, and Detail. These options are available under the View Preferences menu on the Takeoff Record Window.

- Itemized View: This is the default view. This view displays each roof and its contents.
- Detailed View: This displays every occurrence of each smart object under each roof. For example if a roof had four walls with "18 Base Flashing" the takeoff record would show four entries for "18 Base Flashing" under that roof.
- Consolidated View: This view show grand totals for each smart object. It does not show any roof names.

When you select an entry in the Takeoff Record, all objects included in that entry will be highlighted in your drawing, and the entry totals will be displayed in the boxes at the top of the Takeoff Record window. Clicking the Send... buttons next to the displayed numbers, or using the Send... menu items will send the indicated total to a RoofWare window.

Section 25

Basic Flat Roof Tutorial

How to Draw a Flat Roof--Basic

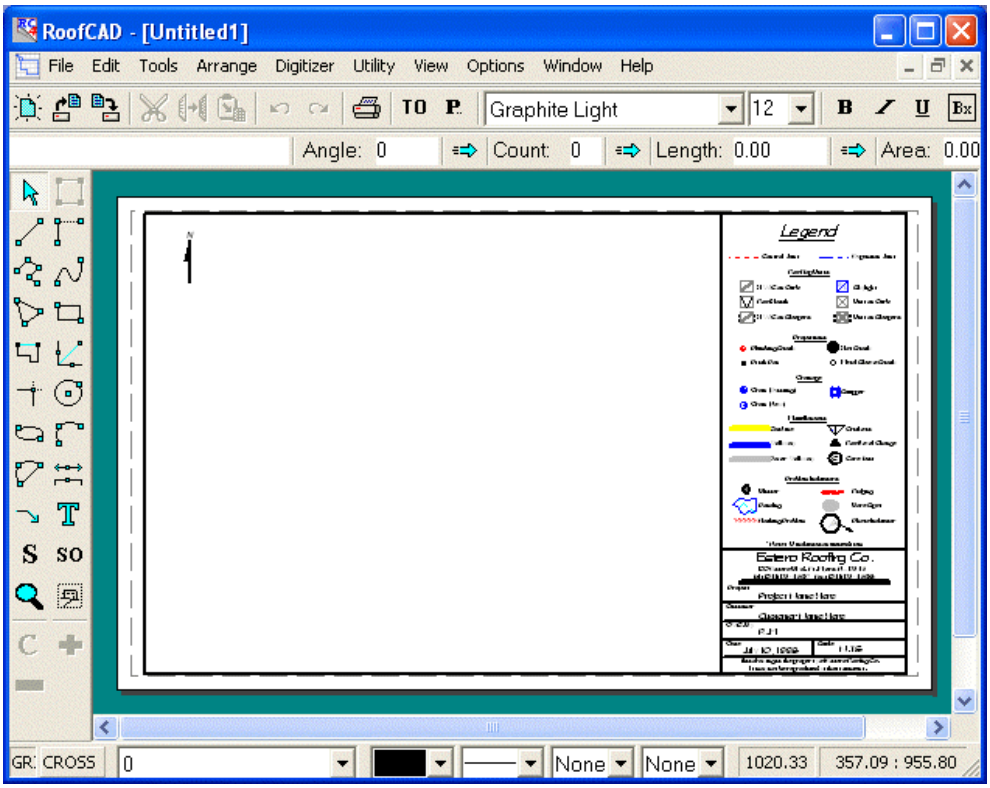
How to Start a New Drawing

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. This tutorial is the fastest way to learn how to draw roofs with RoofCAD.

1. Start RoofCAD by double clicking the icon on your desktop.
2. 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:



A new RoofCAD drawing.

Templates are just normal RoofCAD files that have been set up to help you get 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 (also found in Section 15, Drawing Settings, and in Section 34, Reference). We recommend you copy the chart and keep it by your computer until you get used to using it.

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

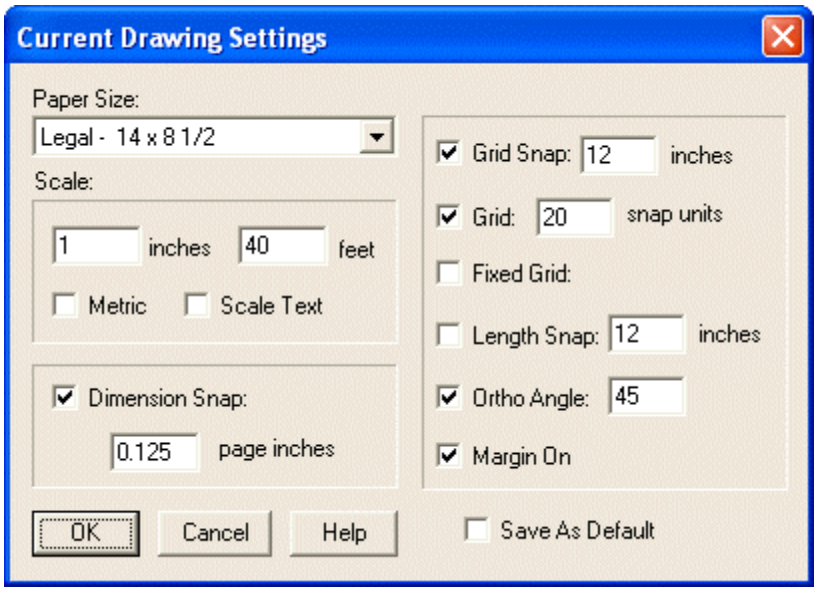
General Scale Guideline

	11 x 8½ Template	14 x 8½ Template	17 x 11 Template
Scale	**O/A Size of drwg.**	**O/A Size of drwg.**	**O/A Size of drwg.**
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 14x8.5 template and our building over all size is 268' by 126', which will fit in the 330'x260' size, so our scale will be 1"=40'.

To set the scale:

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



The Drawing Settings dialog

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

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

How to Draw the Roof Outline from Site Measurements

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.

1. To get started choose Tools|Smart Object Browser from the RoofCAD menu or click the toolbar button.

SO

The Smart Object Browser button.

The Smart Object Browser appears and looks like this:

Smart Object Browser

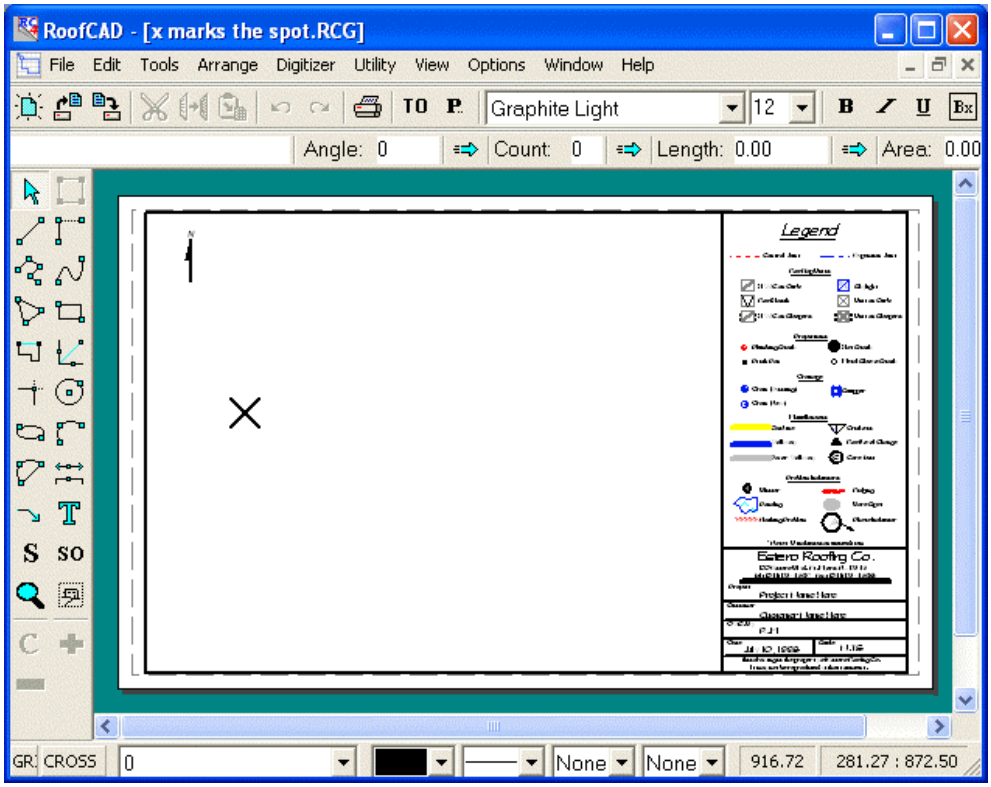
We will keep the Smart Object Browser on screen while we create the roof drawing. So if necessary move it to a location on the screen that is out of the way of your drawing, usually the upper right corner. RoofCAD will remember where you place the browser, so that each time you access it, it will appear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

The Smart Object Browser displays a list of common roof objects. Notice the objects marked (Dig) or (Digitizer). RoofCAD can be used with a digitizer to measure from blueprints. You would only use these objects if you were digitizing.

2. Click on the first object in the list--Flat Roof.
3. 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:



X marks the spot!

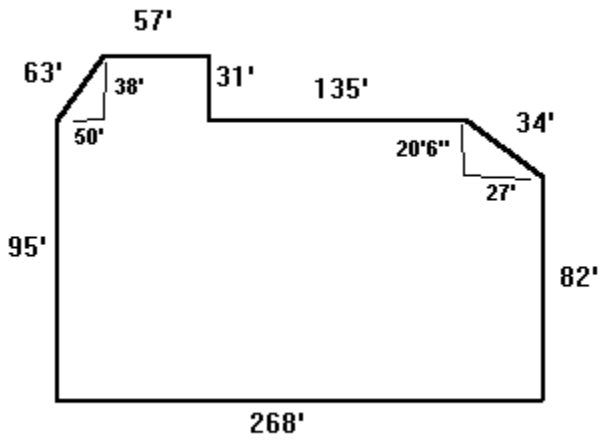
4. Once positioned, click the mouse. The Layout Wizard window appears. It looks like this:

The Layout Wizard

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 roof wizard. Below is a picture of the roof outline we will be drawing:



A rough site sketch

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

5. 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 as per how it is on our rough sketch. RoofCAD uses the arrow keys to draw the basic left, right, up, down lines. We will see in a minute how to handle odd angle lines.
6. 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.**

7. 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.**

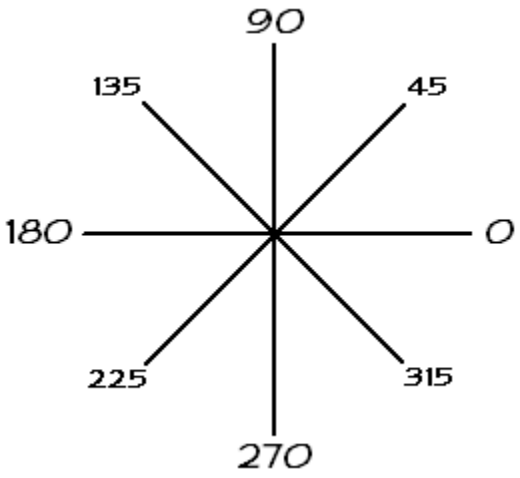
8. Type 82, press the up arrow key, then press Enter. The third wall is now complete.

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 foot 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.

9. Press the Tab key 3 times and the Horizontal field will be highlighted.
10. Now type 27 and press the left arrow key.
11. Press the Tab key once and the vertical field will now be highlighted.
12. Type 20.5 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.
13. 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 below 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 degrees

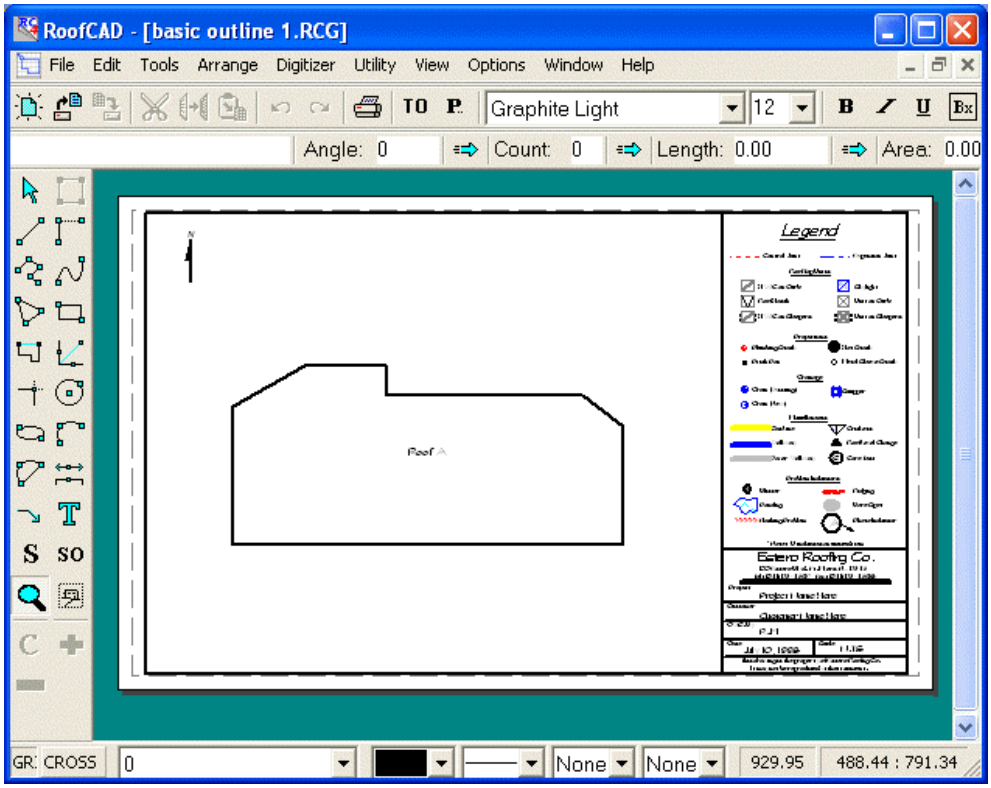
Angles in RoofCAD work the same as any CAD program. When you draw a line the angle of the line is relative to the starting point. Reference the above diagram when deciding the number to input for an angle. If you think of the preceding illustration as 8 separate lines that start from the center point 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.

Now lets finish the outline of our roof.

14. Press the tab key twice. This moves your cursor back to the Length field.
15. Type 135, press the left arrow key and press Enter.
16. Type 31, press the up arrow key and press Enter.
17. 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:



The completed outline.

If you have multiple detached roofs to draw, you handle each one the same way. We also recommend that if you have a building with multiple roof levels you draw each level separately, then join them together. To learn how to move a roof outline or any object on the drawing see Section 6, Drawing Objects.

Define the Walls of the Roof Outline

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. In your* RoofCAD *folder, look for the folder called* Tutorial Drawings. *In that folder, look for* Flat Roof Basic Outline.rcg. *Open that file to continue the tutorial.***

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 does the wall have a 24" base flashing and a coping cap or is it a gravel stop, etc.

1. 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.

The Smart Object Browser button.

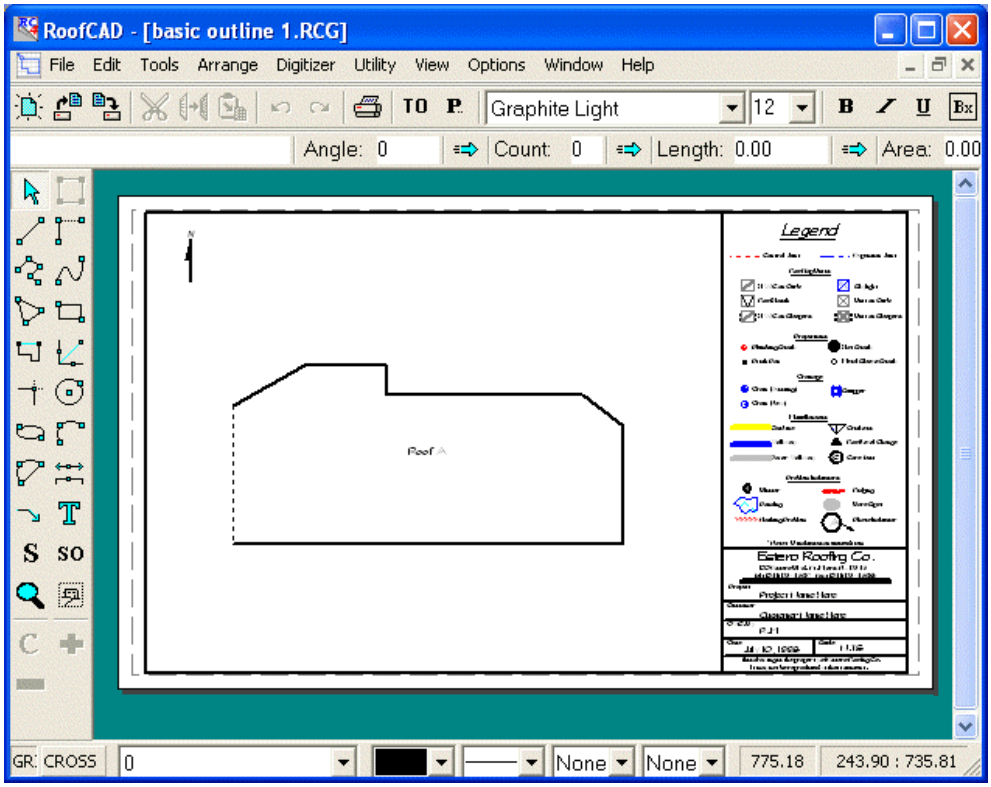
The Smart Object Browser appears and looks like this:

You've seen this before...

We have supplied the common wall definitions (Smart Objects) with RoofCAD. However you can change, delete or add to these with the Smart Object Editor. To learn how to create or edit Smart Objects, see Section 20, Smart Object Editor.

Get ready to use the Pointer tool.

2. 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.



Select the 95-foot wall.

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 and Area 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.**

3. Now in the Smart Object browser expand the heading called Base Flashing and click 24" Base Flashing. RoofCAD now knows this wall has a 24" Base Flashing.
4. Lets also add an 18" Metal Coping. Expand the Terminations heading of the Smart Object Browser and click ' Coping.
5. A window appears that asks you for the Height and Width of the Coping. You need only enter the Height, which is the stretch out or girth of the metal. RoofCAD currently only handles input in feet not inches. So enter 1.5 for an 18" stretch out and Click the OK button. We have

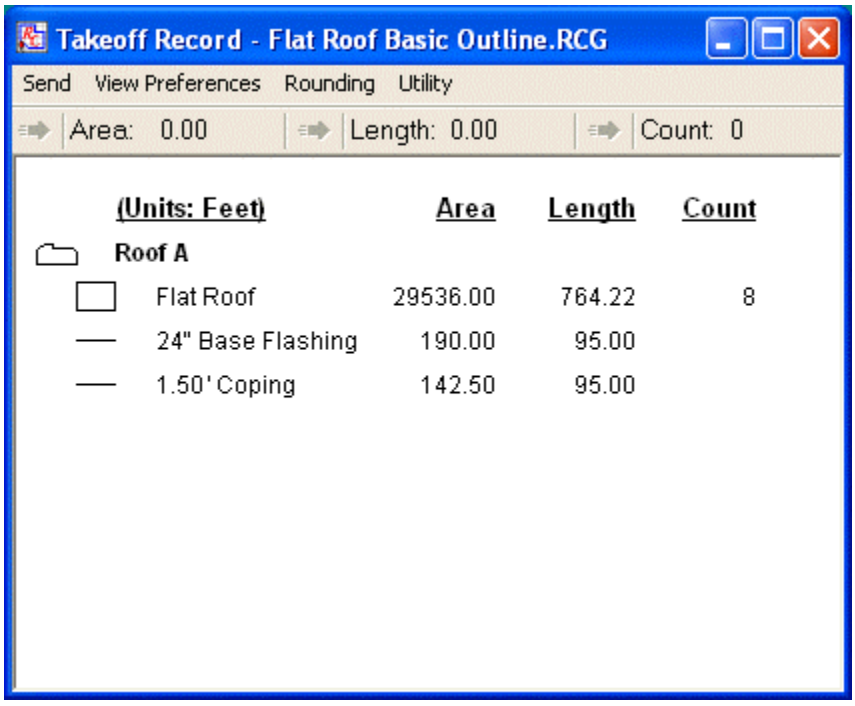
plans to allow input in inches in the near future. We have provided a chart that shows decimal equivalents to inches. See our reference table, Decimal Equivalents to Inches, in Section 34, Reference.

Tip: **If you do input a Width it will just be added to the Height when RoofCAD calculates the square footage of metal required.**

6. Now press Esc to deselect the 95-foot wall. All walls should be black (deselected).
7. Lets 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).

TO **The Takeoff Record button.**

The Takeoff Record window appears and looks like this:



The Takeoff Record.

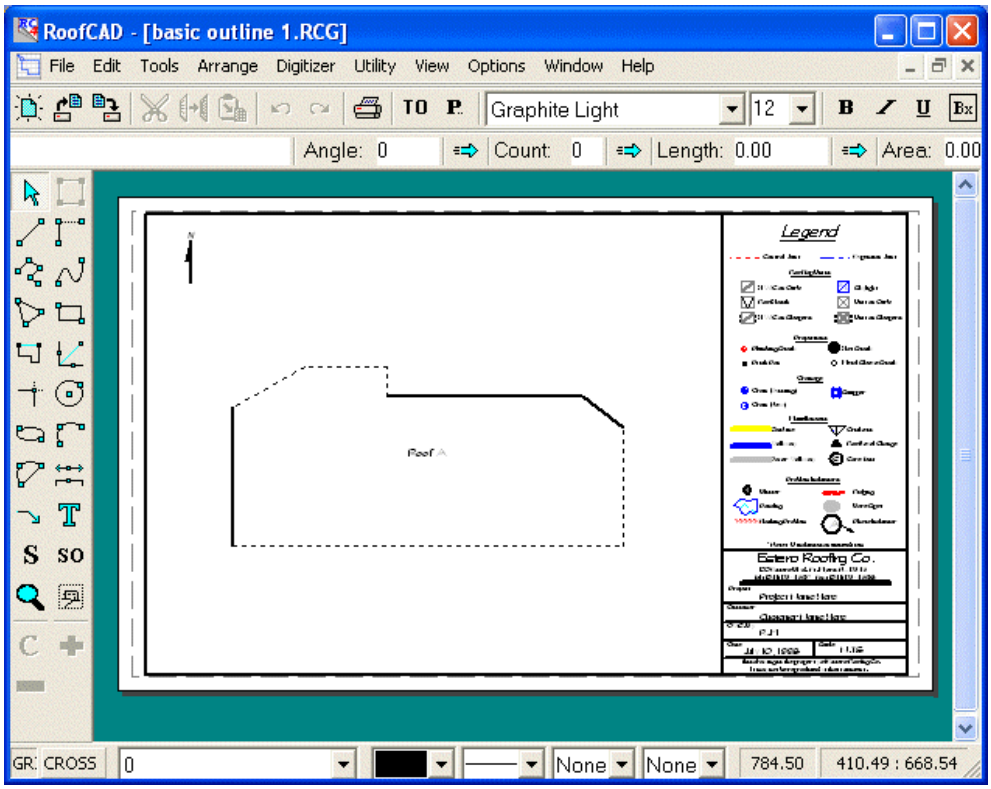
Notice that RoofCAD has named our roof "Roof A" and recorded the Smart Objects we added to the roof. The Takeoff Record will continue to be built by RoofCAD as you draw. If you draw with anything other than the Smart Objects, what you draw will not be added to the Takeoff Record. For example you can 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.

Hint: **To learn how to change a roof name read Roof Name in Section 18, Properties.**

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

Now lets 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.

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



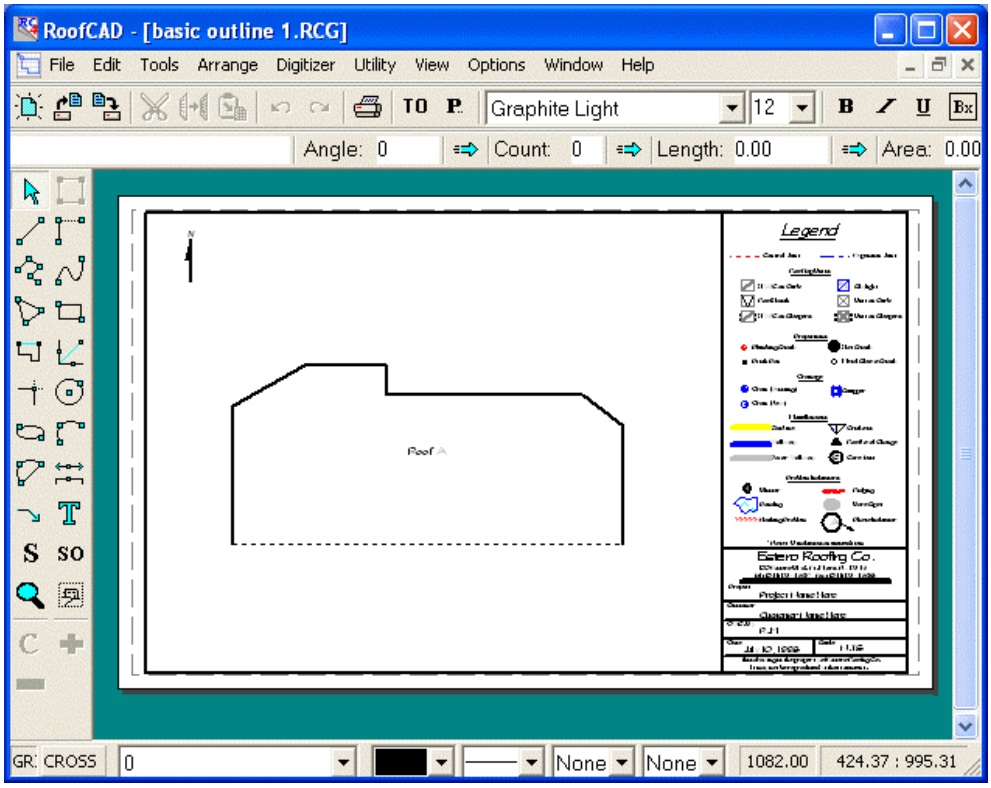
Click these five walls.

10. If it isn't already, expand the heading Base Flashings and click 36" Base Flashing.

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

11. Next expand Terminations and click ' Coping. The Smart Object Properties window appears.

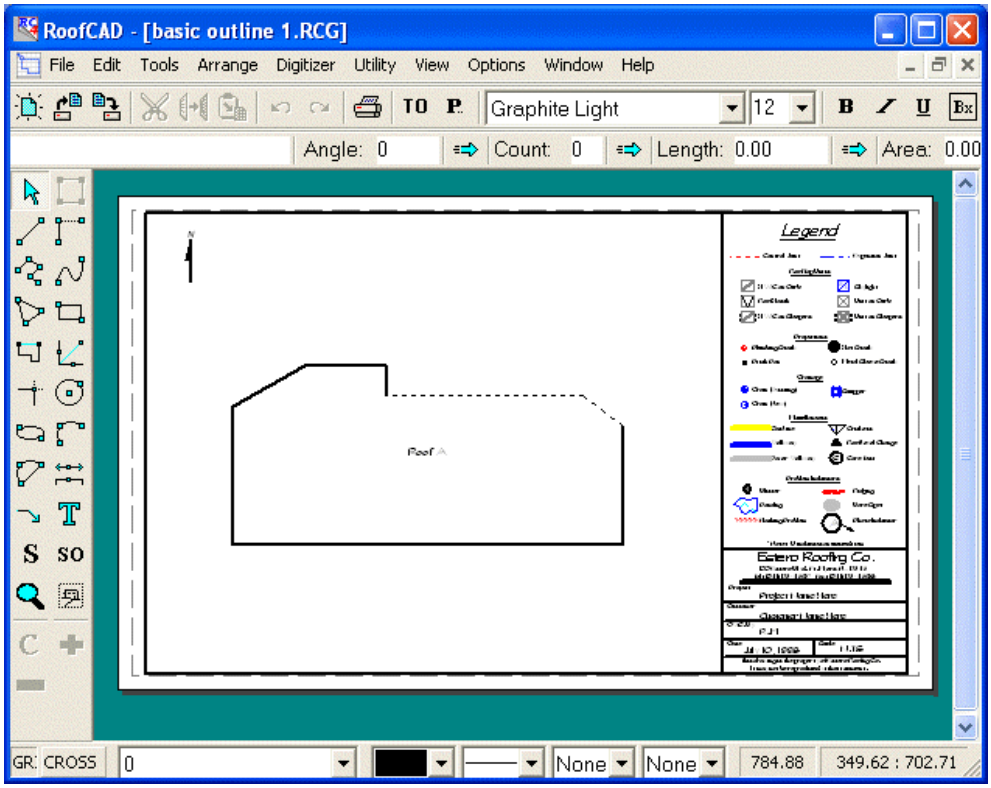
12. Type 2 (for a 24" coping) in the Height box and press Enter. The Smart Object Properties window disappears. These walls have now been defined as having 36" Base Flashing with a 24" metal coping.
13. Right click on the drawing. All the walls are deselected.
14. Now click on the 268-foot wall at the bottom of the roof as indicated in the following illustration by a dotted line.



Select the 268-foot wall.

The wall is now highlighted.

15. For this example we will say that this roof has a 12" fascia extension coming down from the metal cap. In the Smart Object Browser, click on ' Fascia under the Terminations heading. The Smart Object Properties window appears.
16. Type 1 in the Height box and click the OK button. The Smart Object Properties window disappears and the Fascia has been added to the Takeoff Record.
17. Press Esc and all the walls are now deselected.
18. The final two walls are a gravel stop edge detail. Now using the tip of the mouse pointer click on the two remaining walls indicated in the following illustration:



Select these walls for a gravel stop detail.

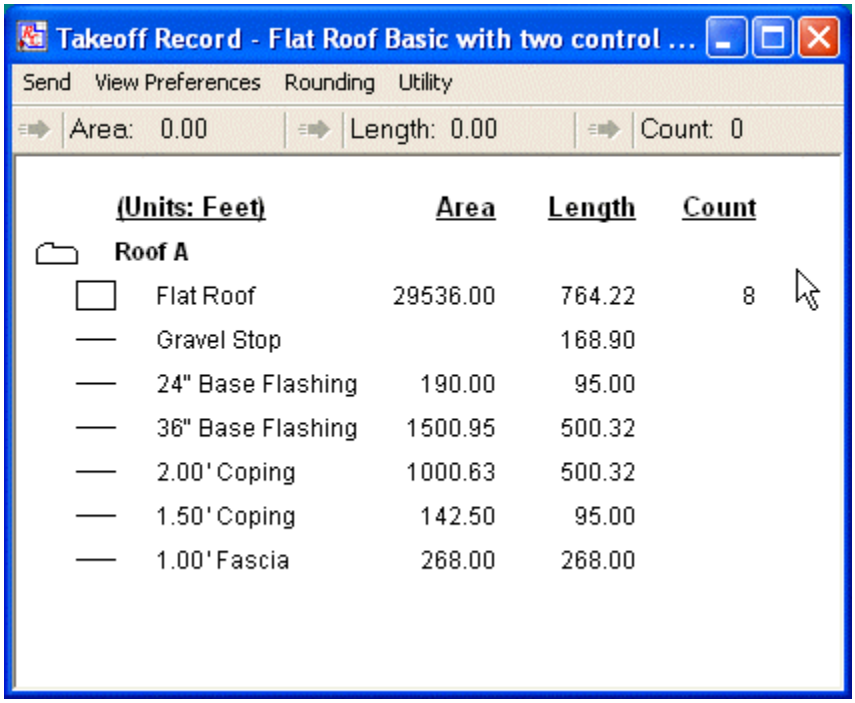
The walls are now highlighted.

19. Expand the Roof Edges heading and click on Gravel Stop. These walls have now been defined as gravel stop.
20. Press Esc to deselect these walls.
21. RoofCAD now knows about all the walls of your roof. Let's take a quick look at the Takeoff Record RoofCAD has created for your drawing.

TO

Click the Takeoff Record button.

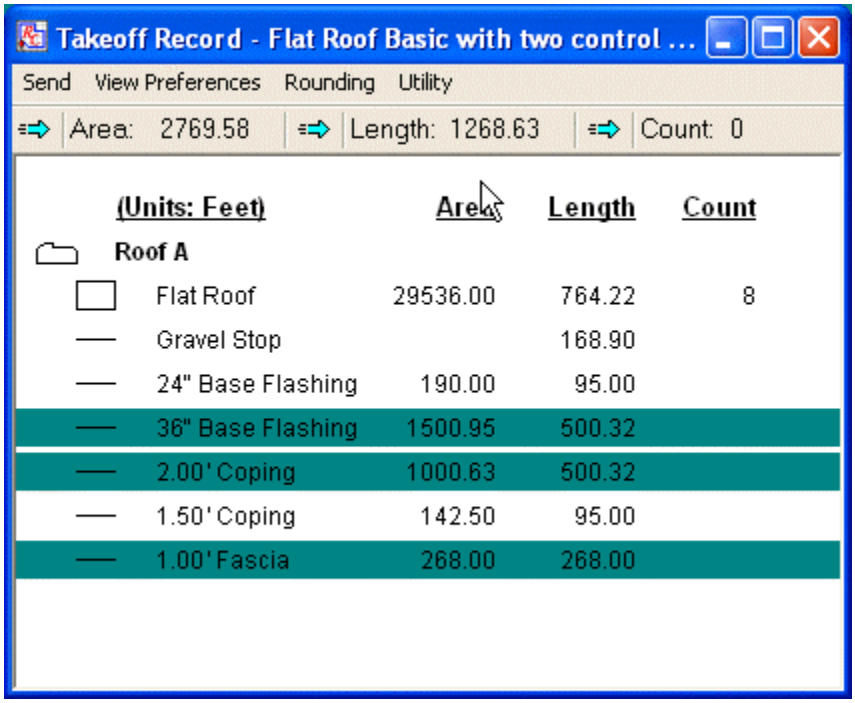
The Takeoff Record window appears. It looks like this:



The Takeoff Record with your changes.

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.

22. In the Takeoff Record click on the 36" Base Flashing line. Notice that on the drawing all the 36" Base Flashing is now selected (you may need to move the Takeoff Record to see the drawing).
23. Click on white space in the drawing (not on the Takeoff Record) and press Esc to deselect the 36" Base Flashing walls.
24. The Takeoff Record's interaction with the drawing goes the other way as well. Click the wall we added the Fascia to (the bottom wall of the roof). Notice in the Takeoff Record everything that was defined for that wall is highlighted as in the following illustration:



The Takeoff Record is dynamic.

25. Click on the Takeoff Record button. The Takeoff Record window closes.
26. Press Esc. This deselects everything.

How to Zoom in on Your Roof

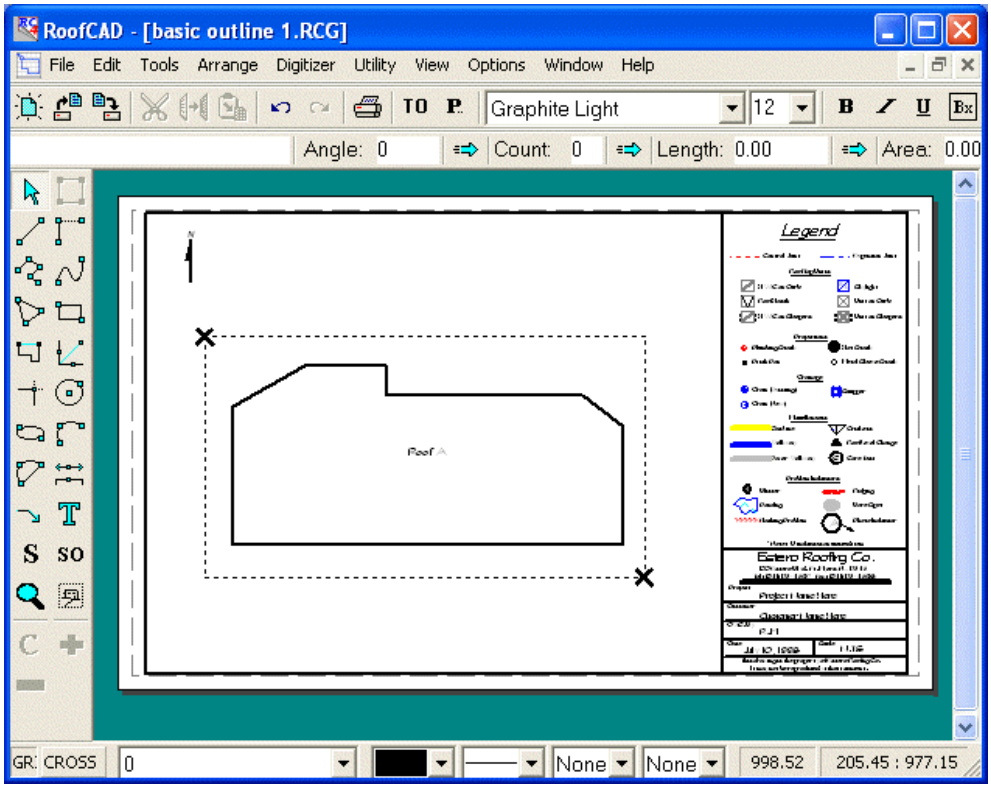
In this tutorial you will learn to zoom in on your roof. Because roofs are so big and your computer monitor is so small, it is often hard to work on your drawing because everything looks so small. By using the Zoom tool you can enlarge any area of the drawing you want. Once zoomed in on an area you can pan around the drawing using the scroll bars. (Better yet, try the Pan window. The Pan window is described in Section 4, The RoofCAD Interface, View Menu). You can also reset the view to where you started so that you can see the whole drawing page.

There are two ways to change your zoom level, with the Zoom tool and with the View menu.

Let's start with the Zoom tool.

The Zoom tool looks like this.

1. Click the Zoom tool and move your mouse cursor out over the drawing. Position the cross hair of the cursor approximately on the upper left X as shown in the following illustration.

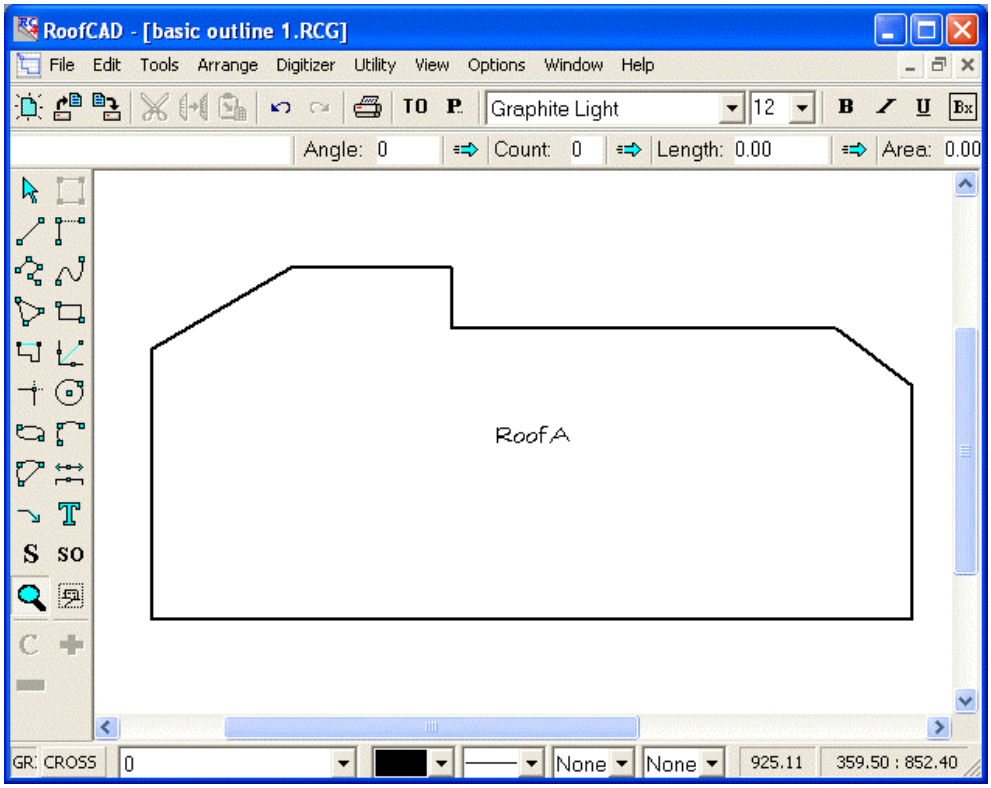


X marks the spot. Click upper left and lower right to zoom in.

2. Now click the mouse.
3. Move the mouse and you will see a rectangle being formed. Move the mouse until the cross hair on the cursor is approximately where the lower right X is, in the above image.
4. Click the mouse and you are now zoomed in to where the rectangle was drawn.
5. Now position the mouse in the center of the roof and right click. This zooms you out by 10%.

Tip:	**You can use the scroll bars to move around the drawing at any time.**

6. Now from the RoofCAD menu choose View|Fit to Window this puts you back to the original view of the entire drawing.
7. We want to be zoomed in to continue working on our drawing so repeat steps 1 to 4. The roof is now enlarged as in the following illustration.



Zoomed in on the roof.

How to Draw Control and Expansion Joints

This tutorial will add two control joints to our roof. Keep in mind that expansion joints and any other type of roof divider would be handled the same way. We will show you two methods of adding the control joints. The first is a free hand type method where the control joint is drawn on the screen with the mouse. The second is a more accurate method where we will place the control joint exactly on the roof using the keyboard.

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. In your*** **RoofCAD** ***folder, look for the folder called*** **Tutorial Drawings.** ***In that folder, look for*** **Flat Roof Basic Outline.rcg.** ***Open that file to continue the tutorial.***

---

1. First lets 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.**

---

2. In the Smart Object Browser, expand Control/Expansion Joints. Click Control Joint and move your mouse out over the drawing.
3. We will now draw the control joint indicated below. Position the cross hair on the mouse cursor approximately at one of the ends of the control joint as indicated in the image below.

4. While holding down the Ctrl and Shift keys at the same time click the mouse. Then release the Ctrl and Shift keys.

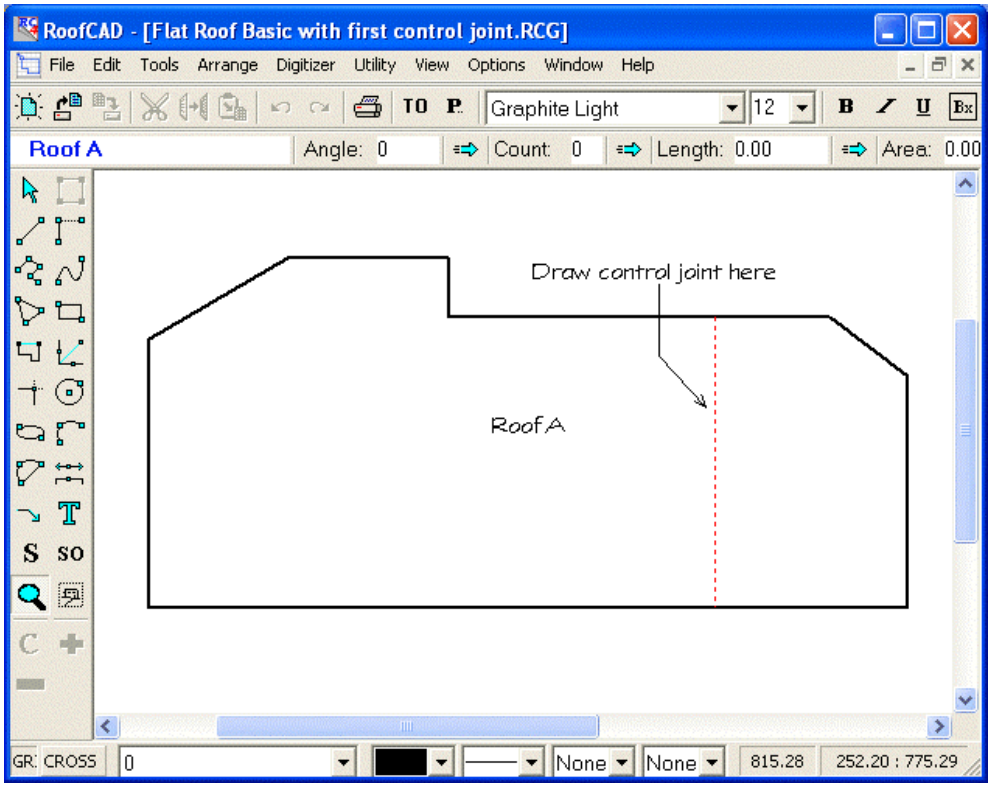
Hint: **Holding the Ctrl and Shift keys down when clicking will make the control joint line start exactly at the wall. This saves you from having to visually line it up. You don't *have* to do this; we just think it makes life easier.**

5. Now move the mouse and you will see the control joint forming.
6. Position the cross hair of the cursor at the other wall, making sure the control 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. Ortho Mode locks your line at 45 and 90 degree angles (this is a setting you can change in the Drawing Settings dialog). 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.

Bear in mind you can also click the ORTH button to get the same effect. The Ortho button looks like this.

7. Again 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.



Draw a control joint.

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

1. Position the cross hair of your cursor near the bottom left corner of the roof.
2. While holding down the CTRL key, press the F2 key once. The cursor is now positioned exactly on the corner of the roof.
3. 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.
4. For this example lets say the control 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").
5. Press the space bar on the keyboard once.
6. Now move the mouse and you will see the control joint forming.
7. Position the cross hair of the cursor at the other wall.
8. 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.
9. Press the "O" key on the keyboard to turn Ortho Mode off.

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

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.

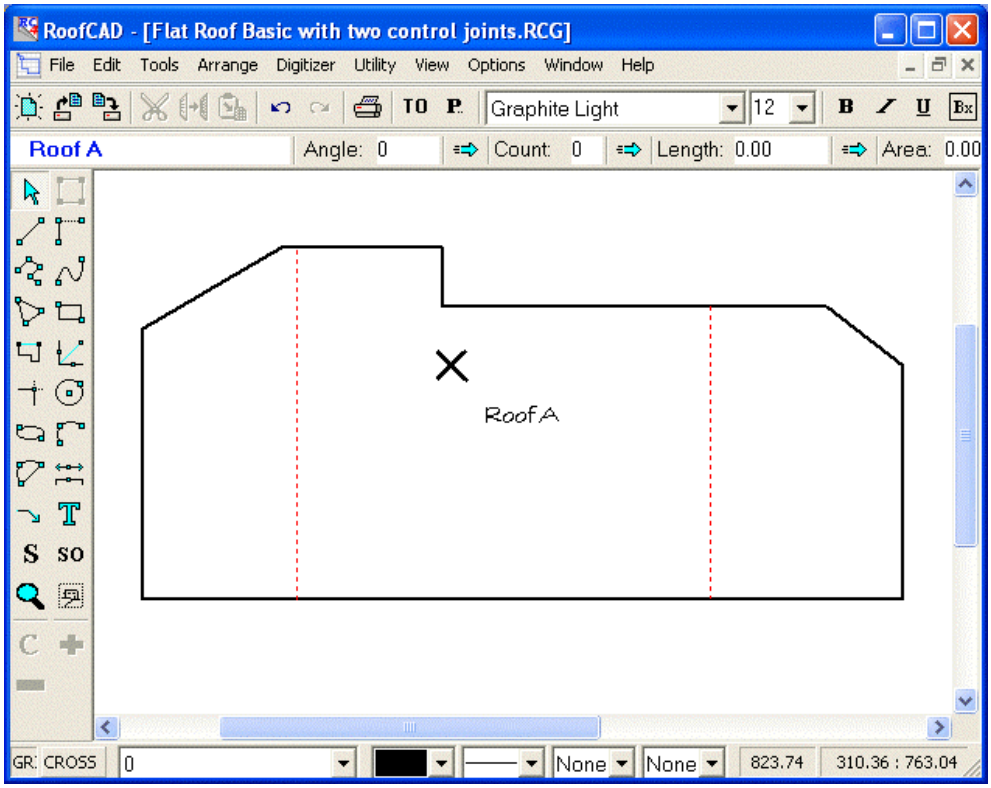
Note: ***If you are picking up at this point in the tutorial, you don't have to draw the basic outline of our Flat Roof again. It has already been done for you. In your* RoofCAD *folder, look for the folder called* Tutorial Drawings. *In that folder, look for* Flat Roof Basic with two control joints.rcg. *Open that file to continue the tutorial.***

1. 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.**

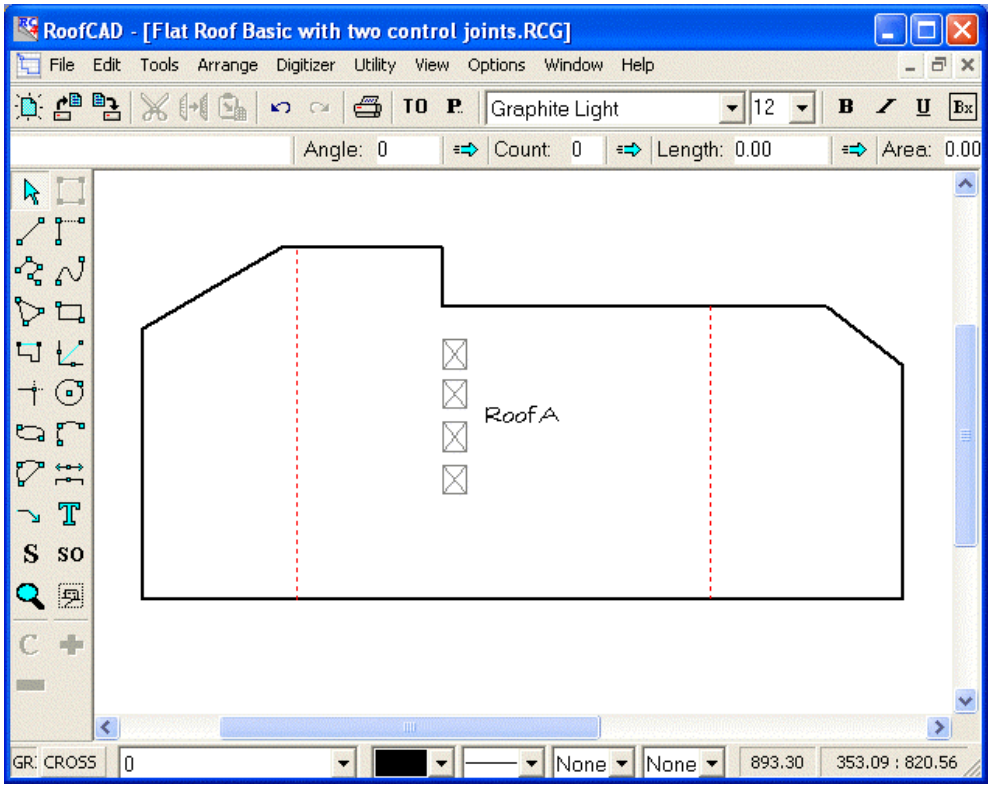
2. We have four 8x10 foot curbs on this roof, so on the keyboard type 8, press the tab key, then type 10. We will leave the height at 1.5 feet. This is the height of flashing required. Press Enter and we are now ready to draw our curbs.

3. Move the mouse cursor to approximately the position shown in the following illustration. Once positioned take your hand off the mouse and press the space bar once. DO NOT TOUCH THE MOUSE. This places your first 8x10 curb.



Place your first curb here.

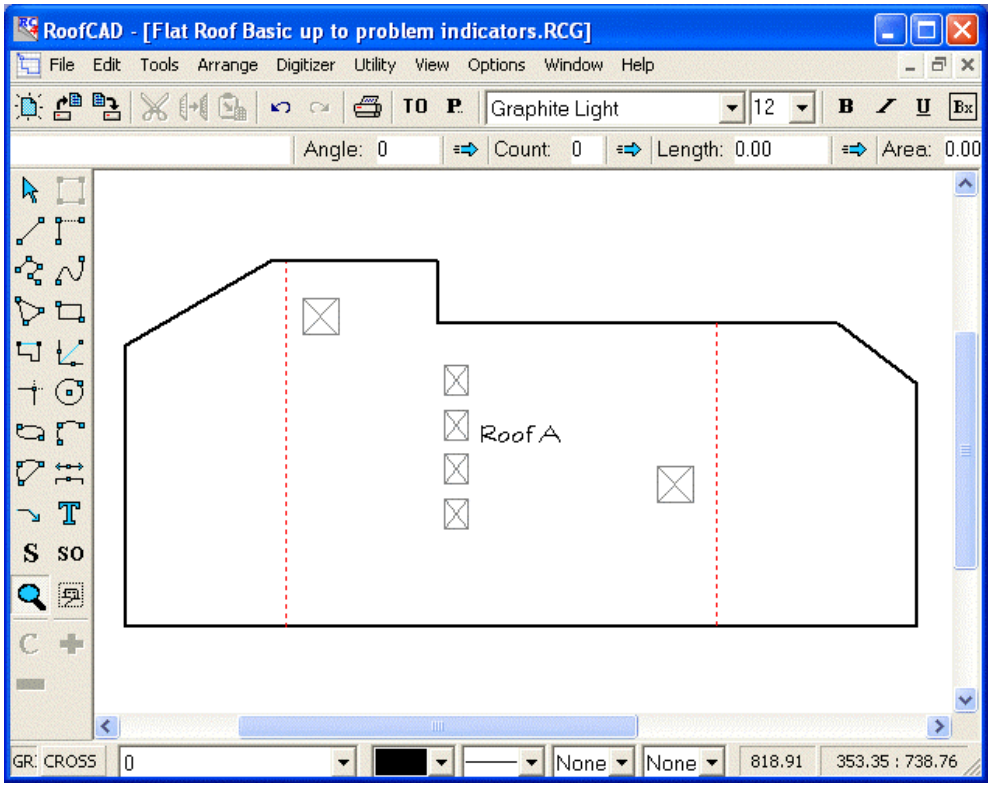
4. Press the down arrow (on your keyboard) 15 times. The cursor is now below the first curb.
5. Press the spacebar again. This will draw another curb.
6. Repeat this twice more so that we have four curbs lined up one under another. Your roof will now look like this:



Your roof with four curbs placed.

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

7. In the Smart Object Browser click on Curb again. A window will appear prompting you for the length and width of the curb.
8. Type 12 press the tab key, type 12 and press Enter.
9. 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.



Place the 12 ft. curbs approximately here.

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

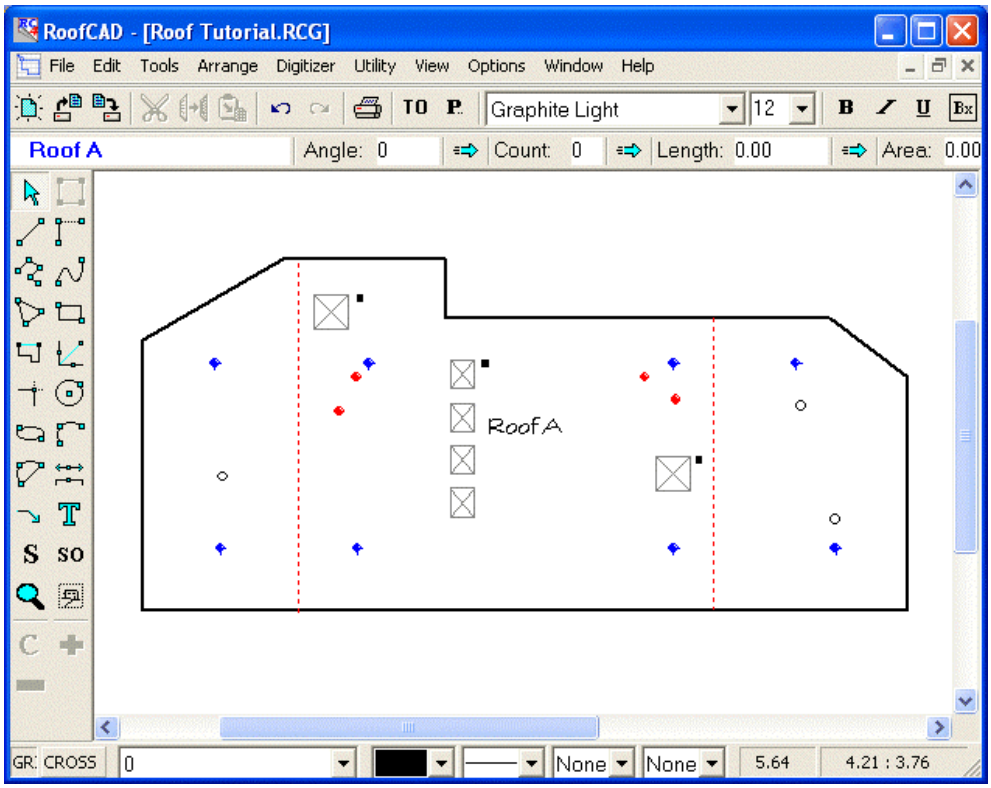
Next we will add some stacks drains and other items to the drawing.

1. In the Smart Object Browser expand the Roof Penetrations section and click Plumbing Stack.
2. 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.
3. Repeat to add a few more plumbing stacks.
4. Choose some of the other items from the Roof Penetrations section and add them to the drawing the same way.
5. In the Smart Object browser scroll down to the Drains/Scuppers section.
6. Click on Drain (existing). You can add a drain a set distance in from a corner just like we did the control joint.
7. Position your mouse cross hair near the lower left corner of the drawing.

8. Hold down the CTRL key and press the F2 key once. The cursor is now exactly on the corner of the roof.
9. Press F2 to zero out the x,y coordinates in the lower right corner of the RoofCAD window.
10. Press the right arrow key until the coordinates read "27.00 : 0.00".
11. 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.
12. Press the spacebar once. RoofCAD has placed a drain at exactly that location.

Hint: **The roof drains may look kind of small and strange but don't worry they will look fine on the printed page. The reason they look strange is because of your monitor's inability to deal with such small detail. This is normal unless you spend a lot of money on a high quality monitor, which really isn't necessary.**

13. 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.



Additional objects added to your roof.

14. Click the Pointer tool button.

The Pointer tool.

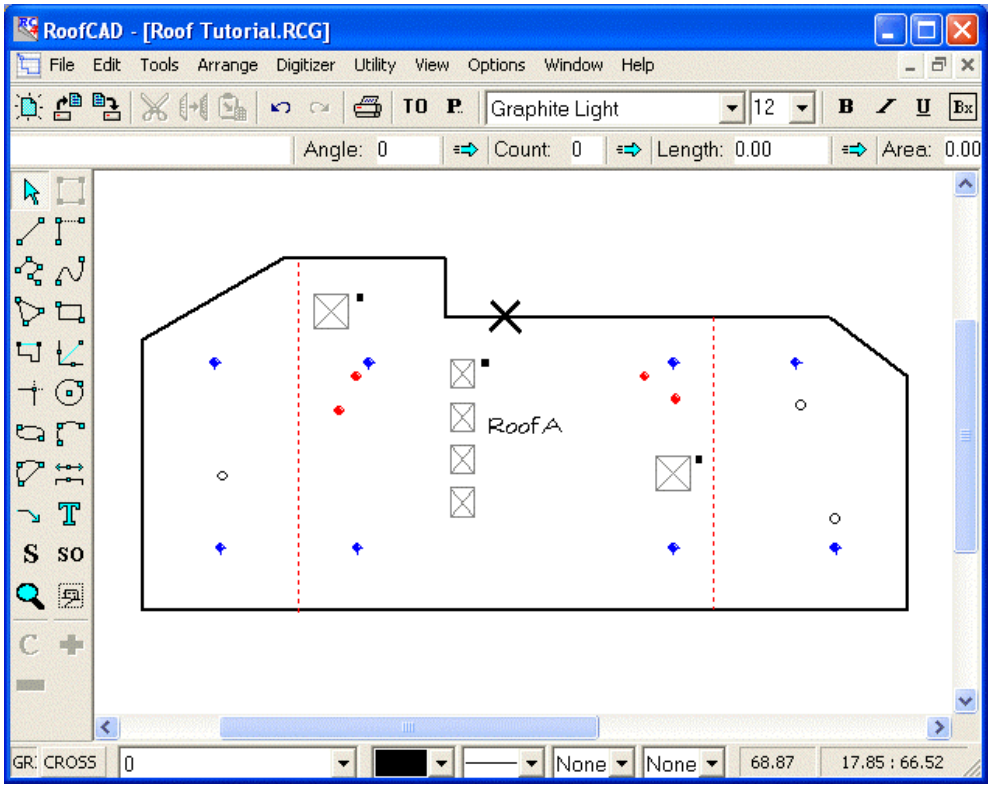
15. Click on the lower left drain (the one we just positioned using the x,y coordinates).
16. Click on the other 3 drains on the bottom row of drains. All four drains are now selected.
17. From the RoofCAD menu choose Arrange|Align|Align Top. All four drains are now on the same line across the drawing.

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

18. 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 out quickly then you should ignore the slower techniques and use the fastest method possible.**

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



X marks the spot—put a scupper here.

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.

18. In the Smart Object Browser, expand Drains/Scuppers. 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.

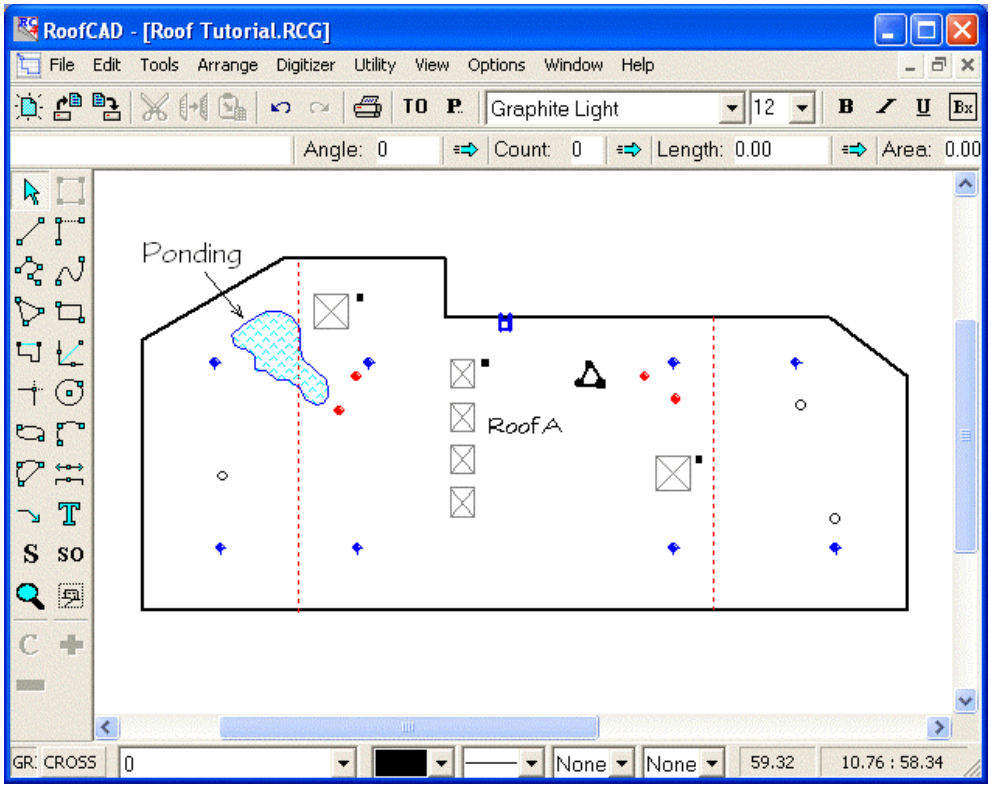
Click the mouse and the scupper is placed on the roof.

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.**

19. Now lets add a couple of items from the Miscellaneous section of the Smart Object Browser. In the Smart Object browser expand the Miscellaneous section.
20. Click on the Smart Object Antenna.
21. Now pick a place on the drawing where you would like the antenna. Position the mouse at that place.
22. Click the mouse and the antenna symbol appears.
23. Now lets add a single walkway paver. Scroll down the list until you see the Paver Smart Object.
24. Click on Paver.
25. 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.
26. Finally lets add some problem indicators. In the Smart Object Browser expand the Problem Indicator heading.
27. Click on Bare Spot then position the mouse pointer at a place on the drawing where you want the bare spot to appear.
28. Click the mouse and the Bare Spot symbol appears.

Hint:	**Except for Ponding, all other problem indicators work the same way as the Bare Spot.**

29. Lets add an area of ponding. In the Smart Object browser click on Ponding.
30. To add the Ponding you click the mouse at several points to make an outline of the ponding area. See our illustration following:



Your roof outline with ponding added.

To draw this ponding area we clicked the mouse once at each of the points that the perimeter (of the ponding) 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.

31. Finally lets add some ridging. Click on ridging in the Smart Object Browser.
32. 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.

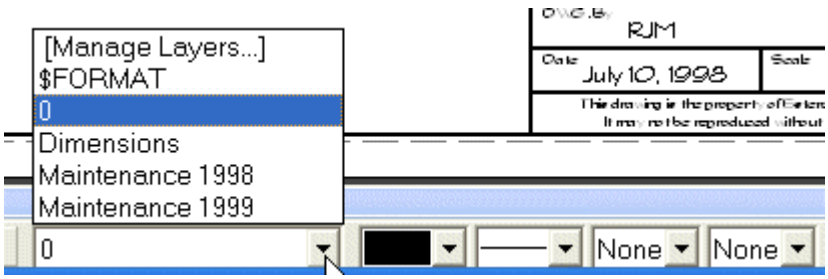
Add Dimension Lines to Your Drawing

Dimension lines are one of the things that take an average looking drawing and make it extremely professional looking. 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.

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. In your* RoofCAD *folder, look for the folder called* Tutorial Drawings. *In that folder, look for* Flat Roof Basic dimensioning.rcg. *Open that file to continue the tutorial.***

1. 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:



Click the layer name or arrow at the right to see this list.

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 draw deficiencies you found after inspecting the roof. The Dimensions layer is where the dimension lines are stored.

2. Click on the word Dimensions. The Layers list closes and you are now working on the Dimensions layer.

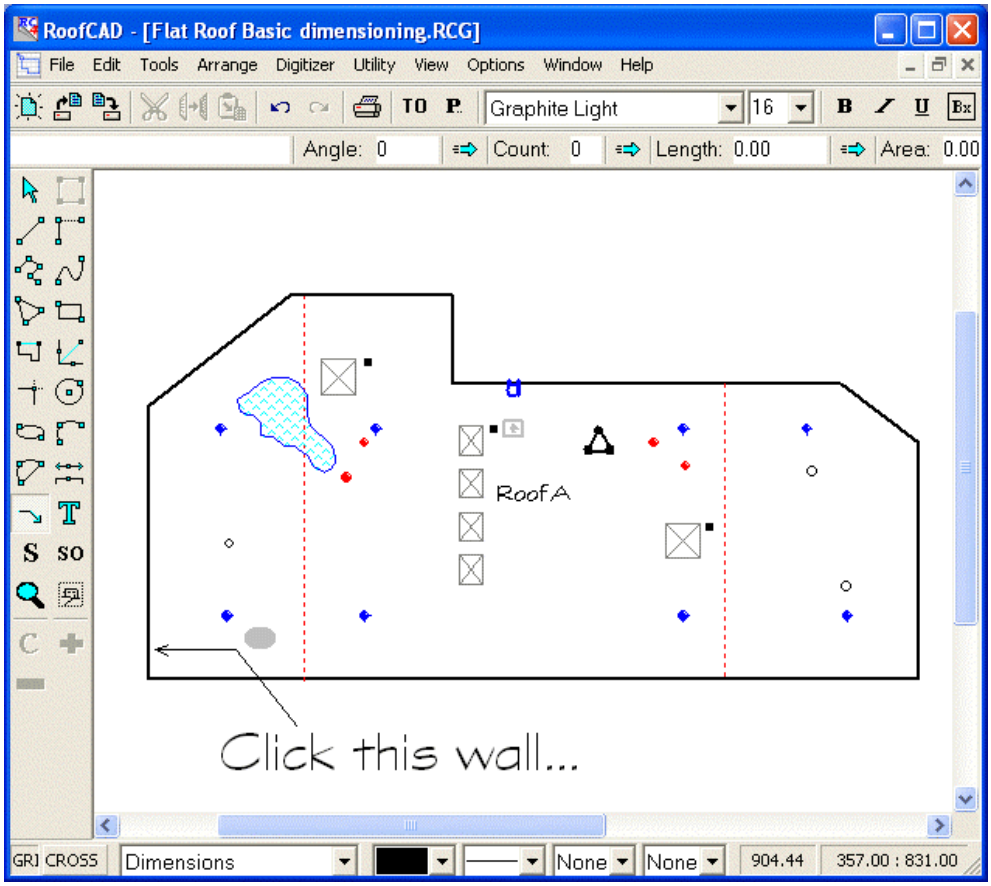
   You can tell which layer you are on by checking the status line at the bottom of the RoofCAD window. It will now look like this:

To find out what layer you're on, check the status line.

3. 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.

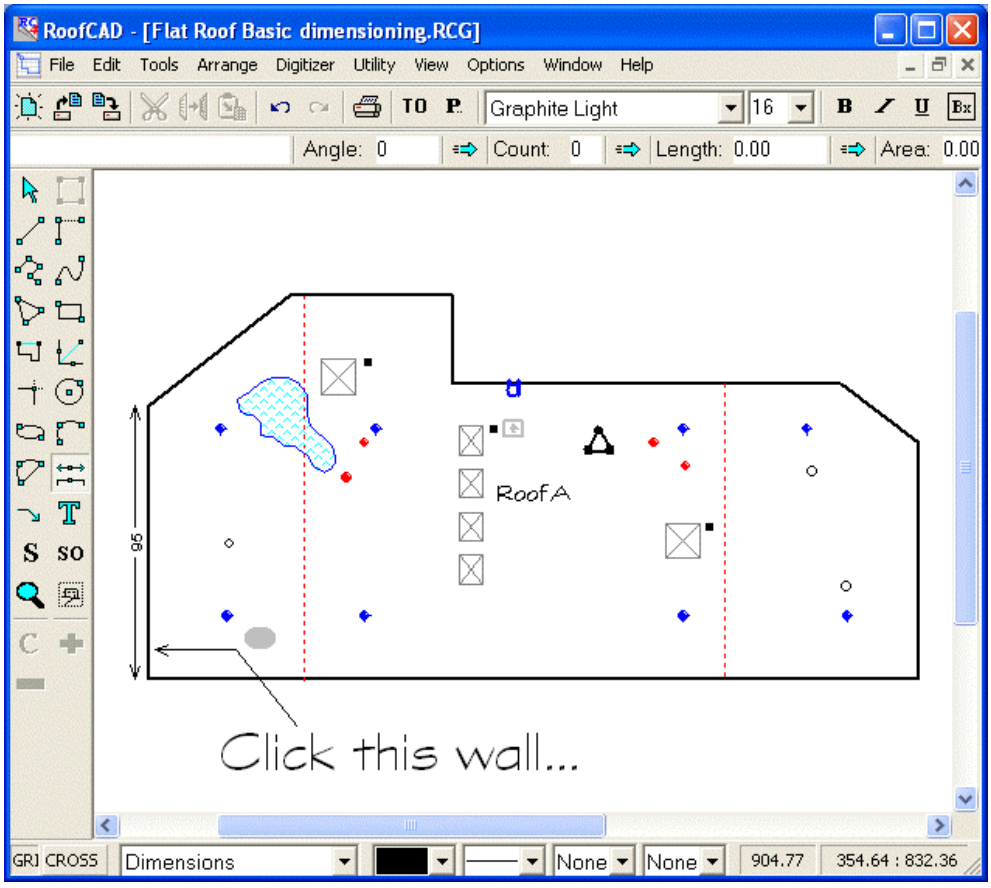
This is the Dimension tool button.

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



Click to add a dimension.

5. Move the mouse pointer to the left of the wall and click again. The wall is now dimensioned like the following illustration:



The dimension added.

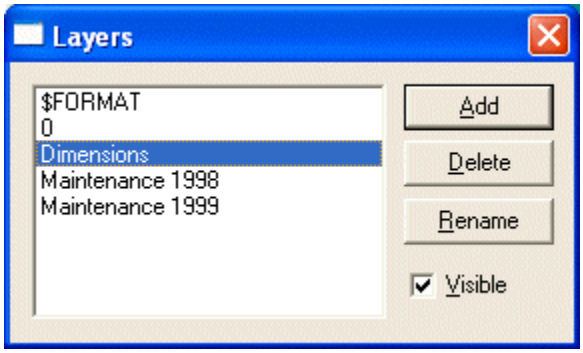
Tip:	**If you had clicked on the right side of the wall the dimension would be on the right side of the wall.**

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.

6. Pick another wall to dimension and click it.
7. Now click on the side of the wall that you want the dimension to appear on. The dimension now appears.
8. Go ahead and dimension the other walls of the roof.

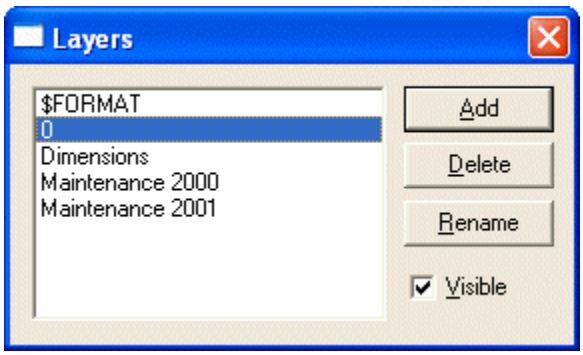
Now we will demonstrate why we add the dimensions to a different layer than the rest of the roof.

1. 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:



Your Dimensions layer should be highlighted.

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



Click on the 0 layer.

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 dimensions to work from. He will have to visit the roof and do his own takeoff.

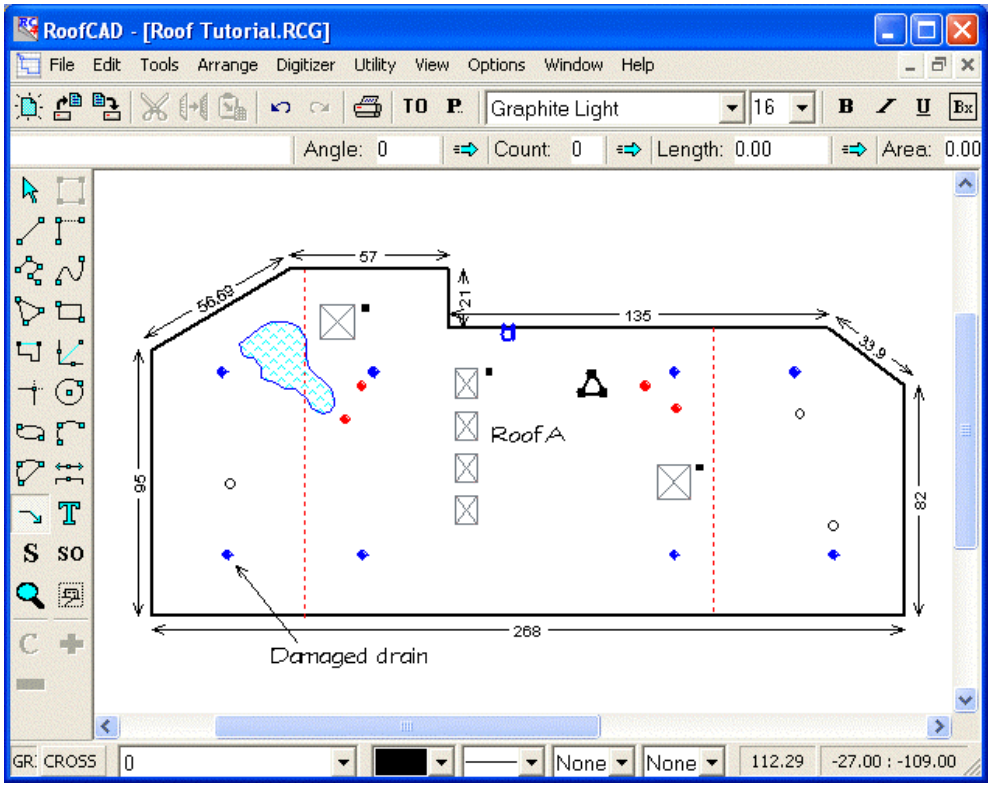
Now lets make the dimensions visible again.

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

Tip: **Remember what ever 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 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 lets point out a damaged drain on the drawing, like the following illustration:



A leader and text helps the professional look of your drawing.

To draw a leader you click the mouse first where you want the arrowhead to appear then click once to draw each segment of the leader. Finally, to finish the leader, right click.

To add a single segment leader like you see in our illustration, follow these steps.

1. 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.

2. 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.
3. Now move the mouse and you will see the first segment of the leader being formed. To complete this segment, click once.
4. To finish the leader, right click. The leader is now complete and you can see the arrowhead has been drawn where you first clicked.

Hint: **To create a leader with more segments, simply repeat these steps. For example, to create a two-segment leader:**

Position the cross hair of the mouse where the tip of the arrowhead should be and click.

Move the mouse and you'll see the first segment of the leader being formed. To complete the segment, click once more.

Move the mouse again, and you'll see the second segment forming. To complete, or "anchor" this segment, click once more.

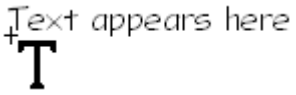
Right click. Your two-segment leader is now complete.

Now lets add some text to make the leader meaningful.

1. 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.

2. 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.

3. Once you have the mouse pointer positioned, click the mouse. The Input Text window appears.
4. Type Damaged Drain.

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

5. 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.

6. 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.

Hint:	**You may have noticed by now that clicking the button for the tool you want to use is the fastest way to get that tool.**

7. Position the tip of the mouse pointer on the Damaged Drain text.
8. Click the mouse. The text is now selected (magenta in color with 8 black boxes around it).
9. 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.
10. Once you have the text where you want it, press Esc. The text is now deselected.

Add Photos

Now we will add a digital photo to the drawing. The method used here can also be used to add other graphics like logos.

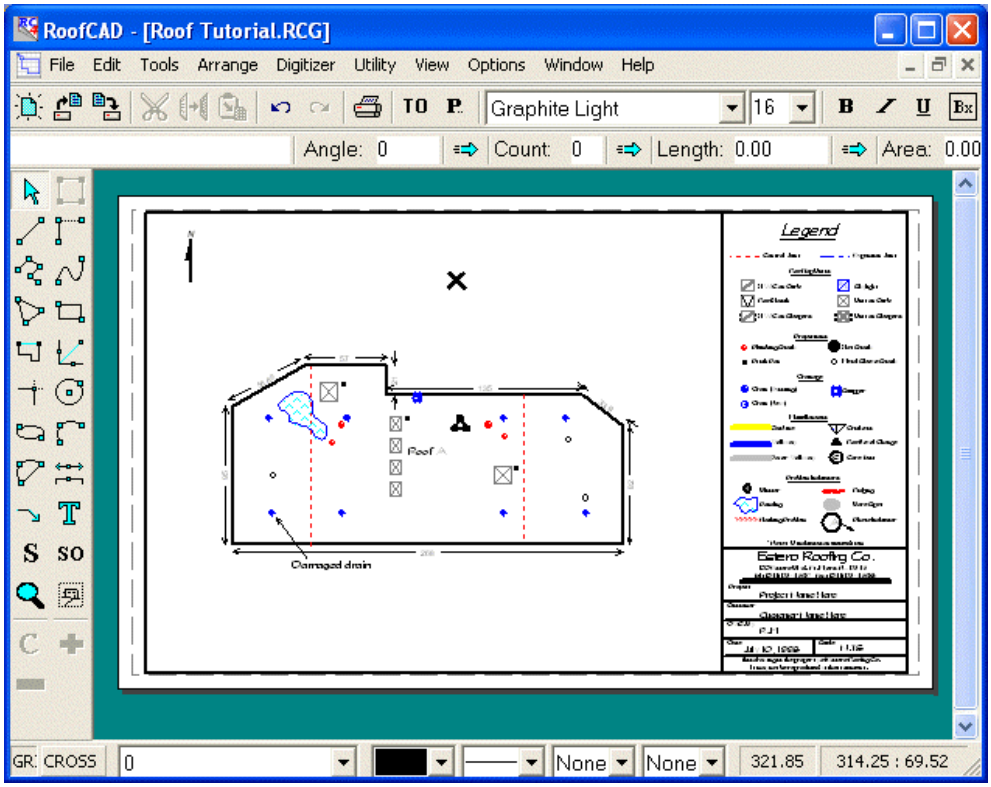
The first step is to place a copy of your image file in the "Photos" folder which is found under your RoofCAD folder. When you copy the image into this folder be sure to give it a unique name, i.e. do not overwrite another file in this folder. For this tutorial we already have a photo file in the folder ready to go.

Tip:	**We recommend that you place a COPY of the image file in the Photos folder because that dedicates the image to RoofCAD. i.e. if anything happens to the original it won't matter because RoofCAD uses the copy.**

1. From the RoofCAD menu choose View|Fit to Window. We are now zoomed out on the drawing.
2. Now choose Tools|Special|Image from the menu or click the button on the left hand tool bar.

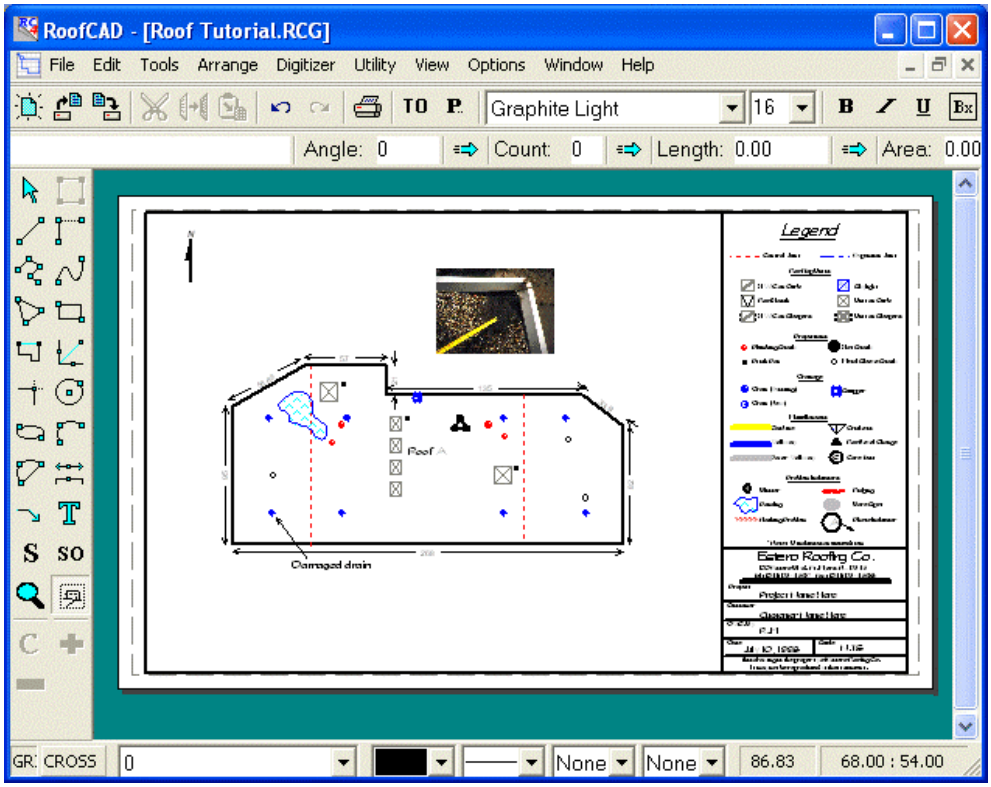
The Image tool.

3. Position the mouse on the drawing approximately where the big x is in the illustration following:



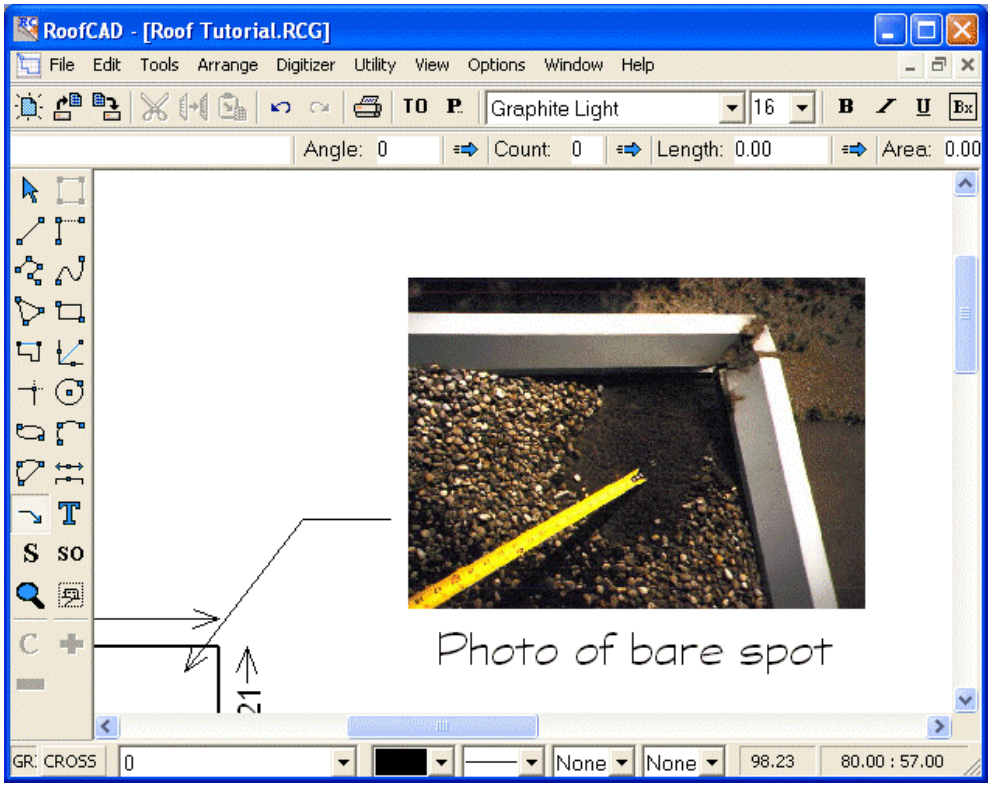
X marks the spot! Start putting your photo in here.

4. Click the mouse.
5. 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.
6. Click the mouse when the box is formed. The Open window appears.
7. Now navigate to the "Photos" folder which is under the RoofCAD folder. Once in the Photos folder you will see the image named "Barespot.jpg". Click on it then click Open. The image appears on the drawing as in the illustration following:



Here's the photo laid in. Treat your graphic logos, etc. the same way.

8. Now like we showed you earlier you can add some text and an arrow that points to the bare spot on the roof. The end result will look like the zoomed in view which follows:



Add a leader and a little text...

Tip:	**By default, RoofCAD will show you previews of most image formats.**

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 cannot be rotated in RoofCAD. So rotate it first in your image software.
- 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.

- Lots of images on a drawing will slow down the program. There are ways of keeping your image files very small without sacrificing quality. We recommend that you learn how to work with images properly in your image software. Small images help performance greatly but if you have an older computer you may find adding images makes RoofCAD slow. Unfortunately this is the reality of working with graphic images, by their nature they demand a lot more resources from a computer. If you want to use images, you may have to upgrade your computer.

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 floppy disk and give it to someone, then you need to put the image files on the floppy as well.

If you want to e-mail a RoofCAD drawing to someone, you need to e-mail the images as well.

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.

How to Check Where an Image File is Located:

1. Select the image with the pointer tool on the drawing.
2. Look at the far left cell on the status bar and you will see the image file's location.

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.

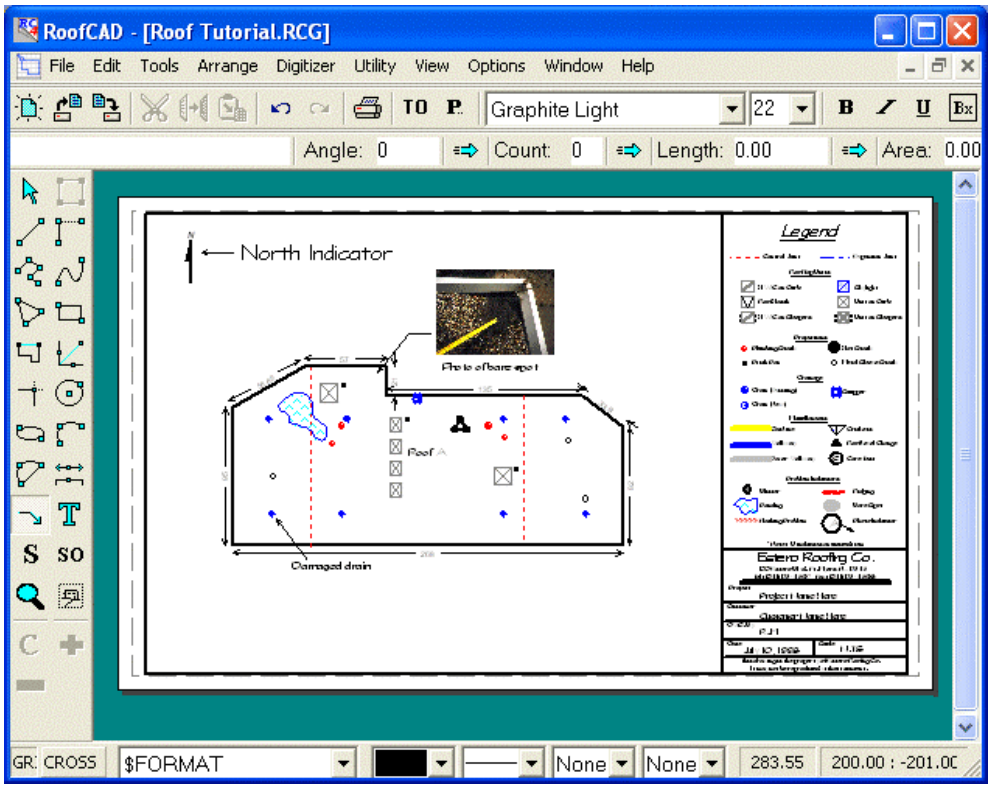
1. On the RoofCAD status line, click the Layer name displayed there. A list of layers appears.

2. 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 below:



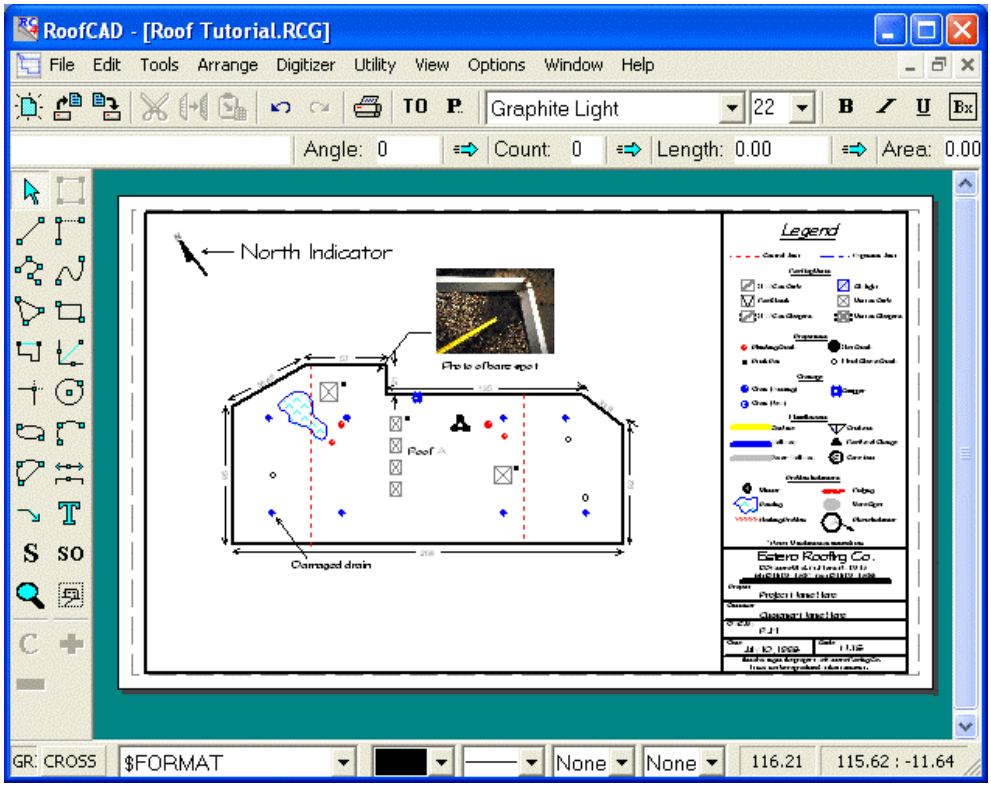
Remember to switch to the $FORMAT layer.

1. Click the Pointer Tool button (or choose Tools|Pointer from the RoofCAD menu).

Remember this?

2. Position the tip of the Pointer Arrow on the North Indicator.
3. Click the mouse. The North Indicator is now selected.

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



The North Indicator rotated...

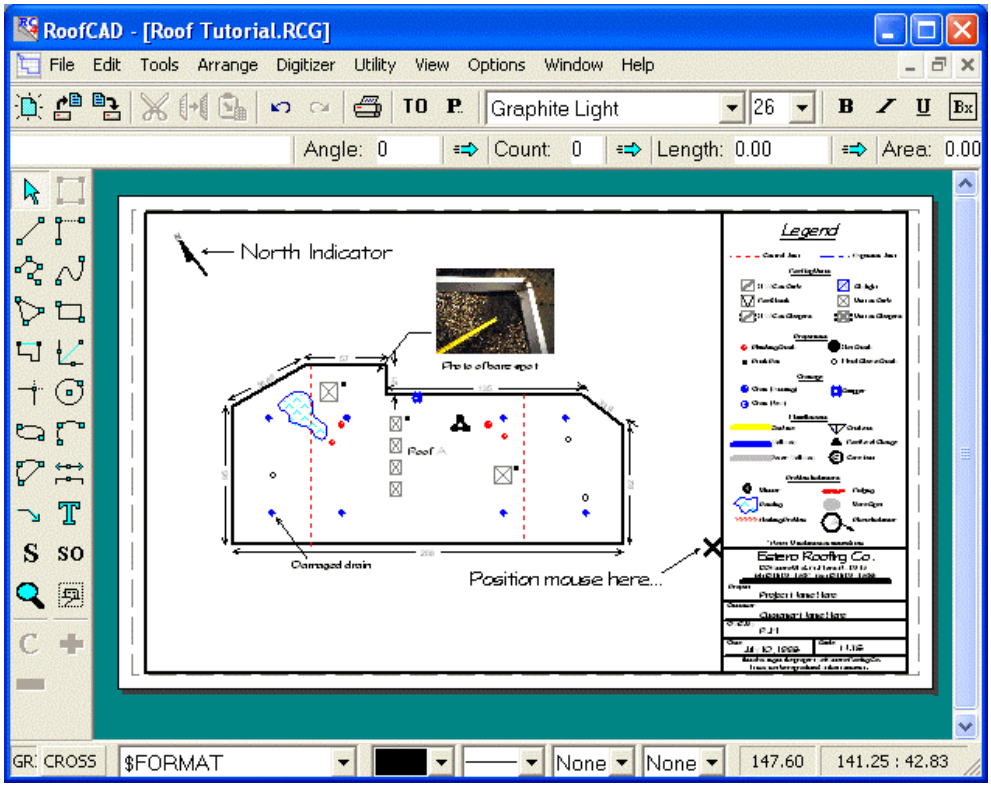
4. On the keyboard press the [key (this is the square bracket key). The North Indicator has rotated 1/4 of a degree counter clockwise.
5. Press and hold down the [key until the North Indicator is positioned approximately as in the above image. Notice that the North Indicator rotates more rapidly when 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).
6. When you are done rotating the North Indicator, press Esc. The North Indicator is now deselected.

Fill in the Title Block

1. Click the Zoom tool button (or choose Tools|Zoom from the RoofCAD menu).

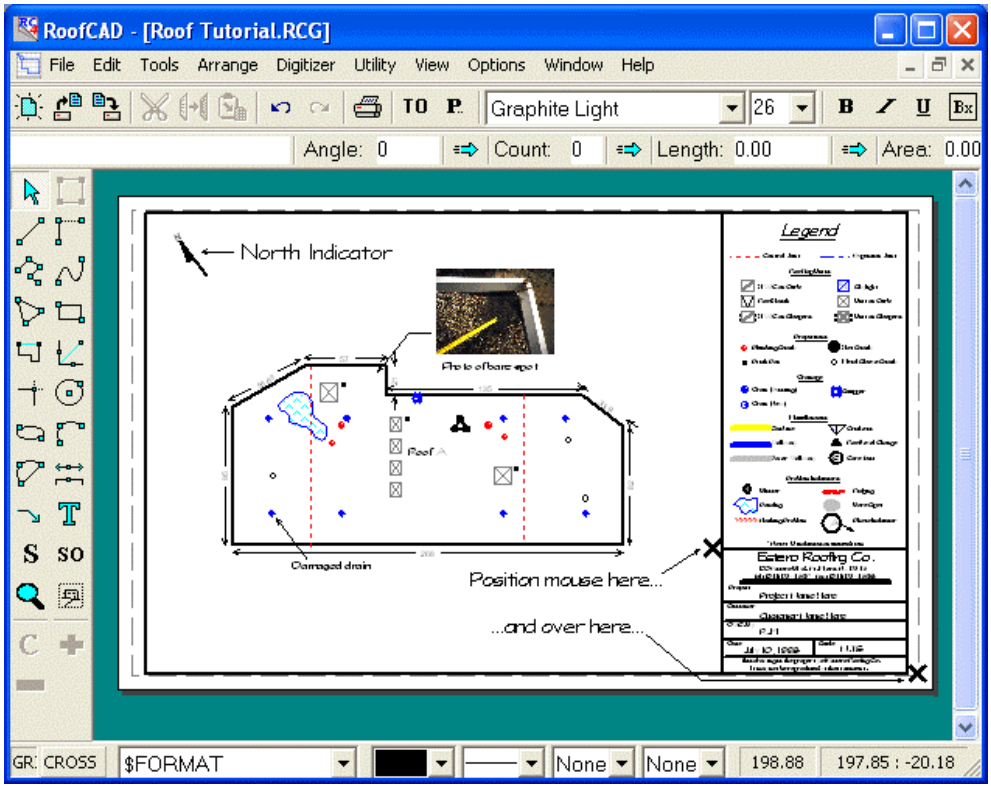
The Zoom tool.

2. Position the mouse up and to the left of the Title Block as indicated in the following illustration:



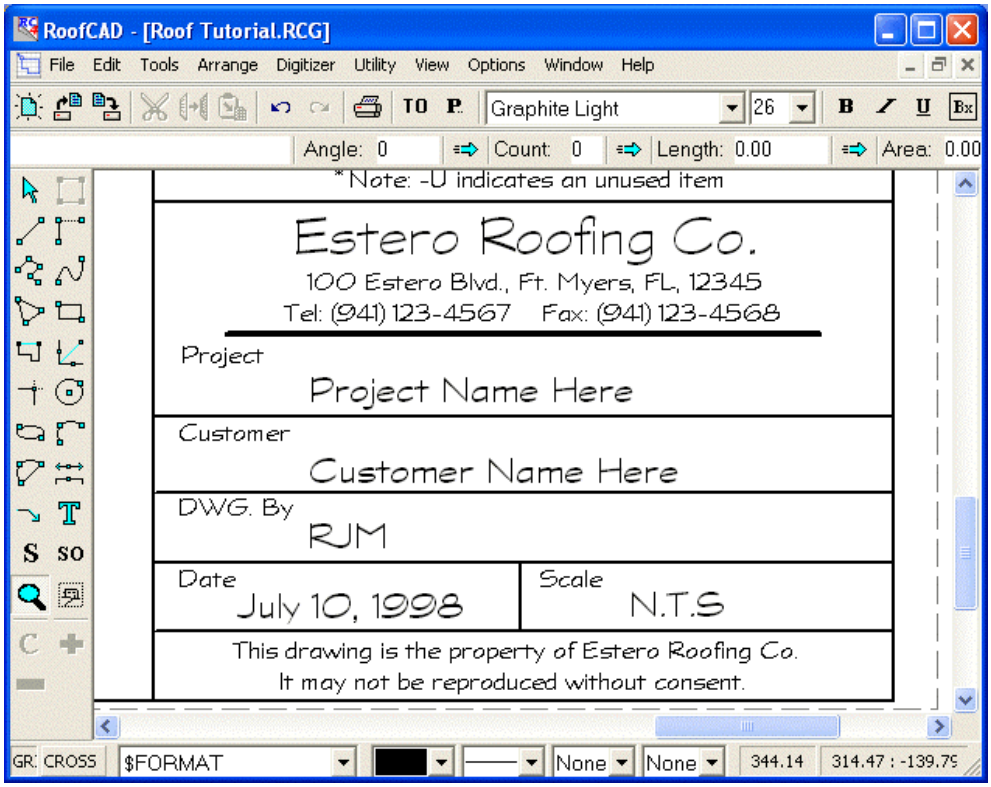
Start here to zoom...

4. Click the mouse.
5. Move the mouse and you will see the zoom rectangle forming. Form the rectangle completely around the Title Block. Your mouse will be approximately where the 2nd X is in the illustration following:



...and finish here.

6. Click the mouse. You will now be zoomed in on the Title Block as in the following illustration:



Zoomed in on the Title Block.

7. Click the Pointer Tool button (or choose Tools|Pointer from the RoofCAD menu).
8. Position the tip of the Pointer Arrow on the Project Name Here text.
9. Click the mouse. The text is now highlighted.
10. Now click on the Text Tool button (or choose Tools|Text from the RoofCAD menu). The Change Text window appears.
11. 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.
12. Click the OK button and Snook Wholesale is now in the title block.
13. 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 with out 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 will leave you to fill in the rest of the Title Block, if you want to practice.

Now lets zoom out and return to the 0 (zero) layer. (remember what we said earlier about returning to the 0 layer before saving?).

1. From the RoofCAD menu choose View|Fit to Window. You are now zoomed out on the drawing.
2. On the RoofCAD status line, click the Layer name to open the list of layers.
3. Click the 0 layer to make it the current layer and close the list.

Review the Takeoff Record

Our drawing is now complete. Lets review the Takeoff Record to see the final results.

1. Click the Takeoff Record button . The Takeoff Record appears. Notice that everything we have drawn is on the Takeoff Record.
2. When you are finished reviewing the Takeoff Record, click the Takeoff Record button again. The Takeoff Record disappears.

Save and Print the Drawing (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. For those who do own a copy of RoofCAD let's first save the drawing.

1. From the RoofCAD menu choose File|Save. The File Save As window appears.
2. The word untitled is highlighted in the File name box. Type in the name Snook Wholesale Maintenance Project.
3. Click the OK button. The file is now saved.

To print the drawing:

1. From the RoofCAD menu choose File|Print|Print Drawing or press the print button . The print window appears.
2. Click OK and RoofCAD will print your drawing.

To print the Takeoff Record:

1. From the RoofCAD menu choose File|Print|Print Takeoff Record. The Print dialog appears.
2. Click OK and RoofCAD will print the Takeoff Record.

Tip:	**The Print button only prints the drawing. It does not work for the Takeoff Record.**

The Takeoff Record defaults to an 8 ½ x 11 page with Portrait orientation.

This concludes this tutorial. We hope this has given you a good introduction to the product. If you have purchased a copy of RoofCAD, we recommend that you practice what you have learned. Then read Section 26, Advanced Flat Roof Tutorial.

If you have any questions please contact us at (416) 778-0843.

Section 26

Advanced Flat Roof Tutorial

Flat Roof Tutorial--Advanced

This topic will cover functionality you will need as you become more advanced in your use of RoofCAD. This topic assumes you have read "Flat Roof Tutorial - Basic" and are proficient with the basics of RoofCAD. In this topic we present the advanced features of RoofCAD in tutorial format so you can try each of them out and refer to them again later if necessary. We highly recommend that you go through each tutorial at least once.

How to Draw Multiple Roofs

The main concerns with drawing multiple roofs are:

- Getting each roof broken out properly on the Takeoff Record.
- Joining roof outlines properly.

In RoofCAD we recommend you draw each level of a roof as a separate roof outline. So if you have a building with three different roof levels we recommend you draw three separate roof outlines then join them together.

Every time you draw a roof outline in RoofCAD a separate roof is added to the Takeoff Record. Unless you have RoofCAD set to prompt you for roof names, the program will name the roofs automatically.

Follow this example to test this out:

1. Start a new drawing and open the Smart Object Browser.
2. Draw a roof that is 40' by 40'. This is what a building with a single roof on it would look like.
3. Now we will draw a building with 2 roof levels. Draw a roof outline that is 50' by 50'. This will be the high roof.
4. Now draw another roof that is 20' by 20' but keep it separate from the 50' by 50' roof.

Check the takeoff record and you will see that all three roofs are broken out. Now, since visually these roofs need to be joined we will move the 20 by 20 roof so that it is joined to the 50 by 50.

5. Click on the pointer tool on the left hand tool bar.
6. Select the 20 by 20 roof. Now you can move it into place with the mouse or keyboard.
7. To move it with the mouse, position your mouse inside the roof outline, then press and hold down the mouse button.
8. Move the mouse and the roof outline will move with it. Release the mouse button when you have the roof positioned correctly (join it up to any of the walls on the 50 by 50 roof).

9. Now we will demonstrate the keyboard method. With the roof still selected, press any of the arrow keys on your keyboard and watch the outline move.

Hint: **Sometimes when moving a roof with the keyboard you will not be able to get it lined up exactly as you want. It will seem to jump too far or too little. The solution is to turn Snap to Grid off. You can do this by pressing the "G" key on the keyboard or, on the main menu, clicking Options|Snaps|Snap to Grid. Once Snap to Grid is off the roof will move in the smallest increment possible. Press "G" to turn Snap to Grid back on.**

This is the Grid Snap button.

Hint: **Sometimes roofs and other things look lined up on screen but are not that way when you print. The way to solve this is to zoom in close on what you are lining up. Once you zoom in your screens resolution will match or exceed that of the printer so it will be obvious whether things are lined up or not.**

How to select "tough to select" Objects

There will be times when you have trouble selecting things on a drawing. RoofCAD has several nifty ways of handling these objects. There are a few reasons why an object could be hard to select:

- The object is to close to another object. This is solved by zooming in closer, then selecting the object.
- The object is not on the current layer. This is solved by changing to the layer that the object is on and then selecting it.
- The object is under another object. Most commonly this occurs where two roofs join. Officially in a CAD program one wall (line) is under the other. You will notice that when you click on the line that joins the two roofs only one line will get selected. How do you select the other line? There are three methods to use here:

1. Move the two roofs apart temporarily, then move them back together.
2. Select the roof whose wall you cannot get selected and press the Page Up or Page Down key repeatedly until the target wall is selected.
3. In the Smart Object browser click on "Current Roof" and select the roof you want from the list. Now click on the line with the pointer tool and the target line will become selected. Choosing the roof in "Current Roof" means that RoofCAD can only select objects from that roof.

Warning: **It is very important that you set Current Roof back to "<Auto>" when you are done selecting. If you do not do this, Smart Objects added to the drawing will be assigned to the roof selected in the Current Roof box. This means that on the Takeoff Record, things will be listed under this roof that don't belong to this roof. If this happens it is correctable, see "How to Change Ownership of an Object from One Roof to Another" in this topic.**

How to Handle a Roof on another Roof

We call this the roof on roof situation. Of course this comes up all the time in roofing. Usually it is a penthouse but you can also have very large roofs stacked on top of each other. It is important that you know how to deal with this situation properly.

In the roof on roof situation you have to "cut out" the area of the upper roof from the lower roof. If you don't RoofCAD will assume you are roofing this area and include the square footage on the takeoff record. This effectively doubles the area of the upper roof.

Here is an example to show you how to handle the roof on roof:

1. Draw a roof then draw another roof on top of it.
2. Select the upper roof.
3. Click on Roof Opening in the Smart Object Browser.

The area of the upper roof has now been deducted from the lower roof. Check the Takeoff Record to verify this.

The next problem on the heels of solving this one is how do you assign wall flashing Smart Objects to the lower roof and the edge flashing to the upper roof. The problem lies in the fact that we only have one line to use for both the upper and lower flashings

Normally when you select a wall and click on a wall flashing Smart Object like "18" Base Flashing", it gets assigned to the roof that is selected. So when you select the upper roof and choose "Gravel Stop", the gravel stop gets applied to the upper roof. So how do we handle the base flashing at the bottom of the wall?

The solution is in the Smart Object browser. On it there is a Current Roof box. Normally this box is set to "<Auto>", which means RoofCAD will decide which roof to assign the Smart Object to. To add the base flashings you set "Current Roof" to the lower roof. This forces the flashing you choose to be assigned to the lower roof. Continuing from the above example we will now illustrate how this works:

1. Select the upper roof.

2. In the Smart Object Browser click on "Gravel Stop". This assigns gravel stop to the upper roof.
3. Change Current Roof (on the Smart Object Browser) to "Roof A" (the lower roof).
4. In the Smart Object Browser click on "18" Base Flashing". This correctly assigns the 18" base flashing to the lower roof.
5. Set current roof back to "<Auto>". This step is extremely important. If you don't do this, every object you add to the drawing will be assigned to the lower roof whether it should be on that roof or not.

Tip: **The Current Roof box will be empty until you add the first roof to the drawing.**

Hint: **The entry "<No Roof>" in the Current Roof list represents any space on the drawing where there is no roof.**

How to Change a Roof Name

RoofCAD automatically names each roof outline for you i.e. Roof A, Roof B etc. To change a roof name:

1. Select the roof.
2. Choose Arrange|Properties from the menu (or press the Properties button).

This is the Properties button.

The Properties window appears.

3. The roof name is in the bottom box on this window. Type the new name in this box.
4. Close the window. The Takeoff Record will now show the new name for this roof.

Hint: **Notice that the roof name label on the drawing did not change. RoofCAD maintains no link to this label, so you must edit it manually. Do this by selecting the text with the pointer tool and clicking the text button.**

How to have RoofCAD Prompt You for Roof Names

Instead of RoofCAD automatically naming the roofs for you, you can have RoofCAD prompt you for a name. To do this:

1. Open the Smart Object Browser.

2. Right click Flat Roof. From the shortcut menu, select Edit. The Smart Object Editor opens showing you the current settings for Flat Roof.
3. In the Properties section of the editor, click "Prompt for values".
4. Click OK.

Now when you click Flat Roof in the Smart Object Browser, RoofCAD will prompt you for a roof name. If you don't click "Flat Roof" you will not be prompted. So if you have several roofs to draw click "Flat Roof" before drawing each roof and you will be prompted. If you don't click Flat Roof before drawing a roof, RoofCAD will Auto Name the roof. If you forget to do this you can change the roof name after it is drawn, see "How to Change a Roof Name" above.

Hint: **RoofCAD will attempt to follow your naming pattern when auto naming a roof. If you name the first roof "Roof 1.0" then draw the second roof without clicking Flat Roof, RoofCAD will know to name the second roof "Roof 1.1". Another example is if you name the first roof "Roof 1A", RoofCAD will name the next roof "Roof 1B" and so on. So you don't necessarily have to click Flat Roof every time.**

How to Disable Automatic Roof Labeling

With Auto Roof Labeling on RoofCAD stamps the roof name on the roof. To turn Auto Labeling off:

1. Choose Options|Program Settings from the menu. The Program Settings window will appear.
2. Remove the checkmark from the option "Automatically generate roof labels".
3. Click OK to close the Program Settings window.

How to Change Ownership of an Object from One Roof to Another

You can change what roof an item belongs to by selecting the item and calling up the Properties dialog (choose Arrange|Properties from the menu or press the Properties button).

This is the Properties button.

In the Properties dialog you will find a box that displays the name of the roof that the item belongs to. Click on this box to select a different roof. You will notice in the Takeoff Record that the object now falls under the selected roof.

How to View Grand Totals on the Takeoff Record

Along with the breakout of each roof on the Takeoff Record you can also view the grand total of all the roofs together:

1. Open the Takeoff Record.
2. From the Takeoff Record menu choose "View Preferences|Consolidate" and RoofCAD will display the grand totals.

Tip: **The takeoff record remembers what view you last choose and will default to that view until you change to another view.**

Copy and Paste Issue

If you copy (or cut) and paste a roof, the pasted roof will have the same name as the original. You must manually change the pasted roof's name. See "How to Change a Roof Name" in this section.

How to Draw a Gas Line

Gas line, conduit and other objects that cross several roofs can create a unique problem that is simple to solve.

For example if you have a multi-segment Gas Line, RoofCAD will assign each segment to a roof. If a single segment lies on two roofs, RoofCAD will calculate which roof owns more of the segment and the segment gets assigned to that roof. So if you have a gas line that runs continuously across more than one roof, we recommend that you draw a separate segment for each roof. If you do this correctly they will look like one continuous gas line but each segment will be assigned to the correct roof on the Takeoff Record.

Here is an exercise that shows how to do this:

1. Draw 2 roofs that are joined along one wall.
2. Choose the Gas Line smart object from the Smart Object Browser.
3. Position the cursor on Roof A and click to start the Gas Line.
4. Now position the cursor at a point along the wall where the two roofs join and click the mouse to complete the first segment.
5. Now move the cursor across Roof B to form the segment that will be on Roof B and click the mouse again. Now right click the mouse to finish.

Check your Takeoff Record and you will see that RoofCAD has allocated the correct amount of Gas Line to each roof.

Add and Remove Lines on an Existing Roof

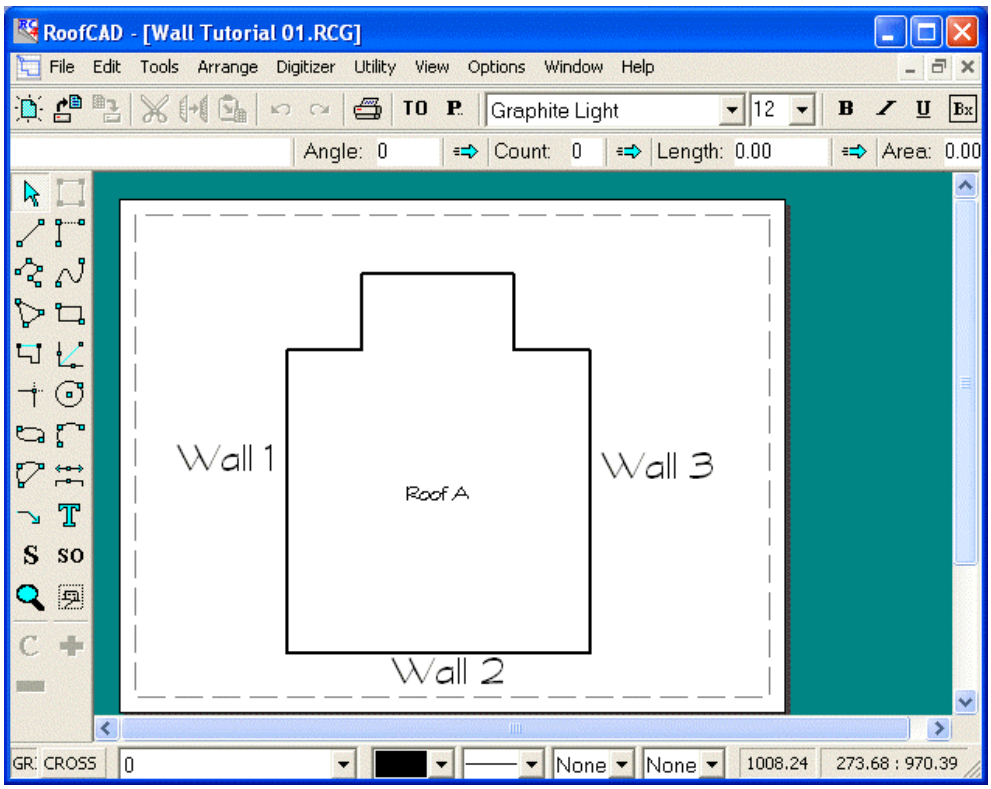
So you forgot a wall, or added too many walls to your roof outline? You have to redraw it right? No!!!

You can add and remove walls from a roof, after the fact. This also applies to any multi-line object.

This ability to add and remove lines is available with the mouse/keyboard as well as with the Layout Wizard. Here are two exercises to illustrate how both methods work.

How to Add and Remove Lines with the Keyboard:

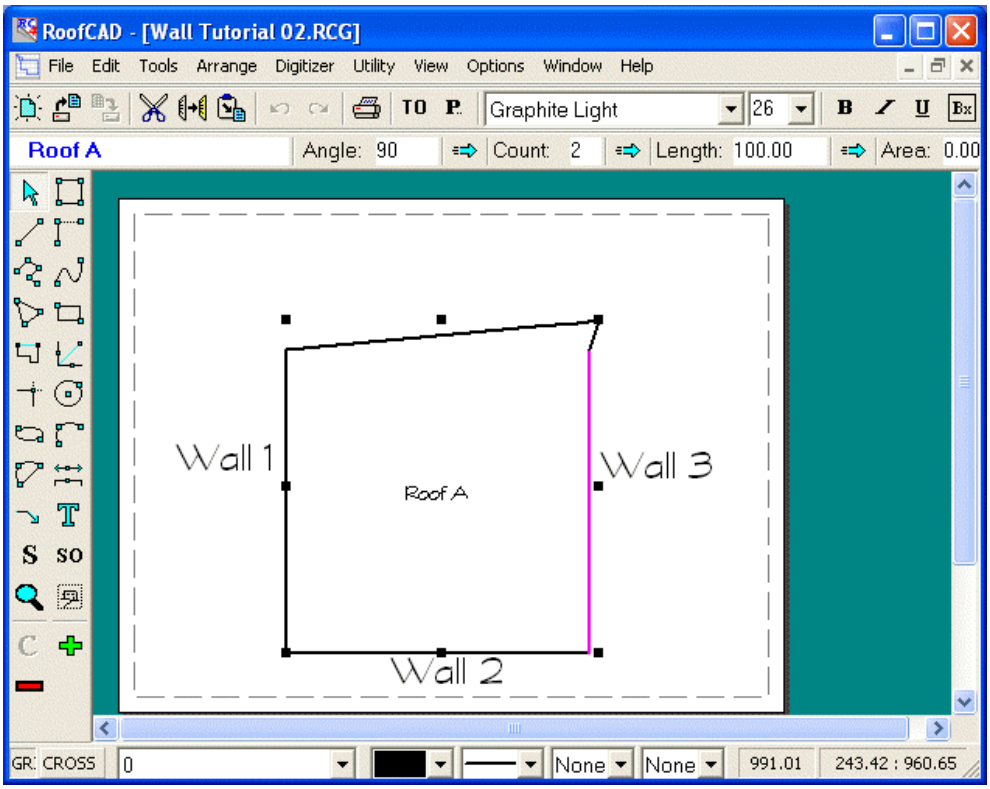
1. First draw a square roof (counter clockwise) with 100' walls. Now lets say that instead of square it really should look like this:



How it *should* look.

Right now our square roof has 4 walls. So to change it to the above shape we need to add 4 more walls. We will first do this with the keyboard then the Layout Wizard. Of course using the keyboard is not accurate like the Layout Wizard is. We show this keyboard example just so you know to use it.

2. Select wall 3 with the pointer tool.
3. Press the Insert key on the keyboard. An additional line has been added to the rectangle.
4. Since we need 4 new walls, press the Insert key 3 more times. Your drawing will now look like this:



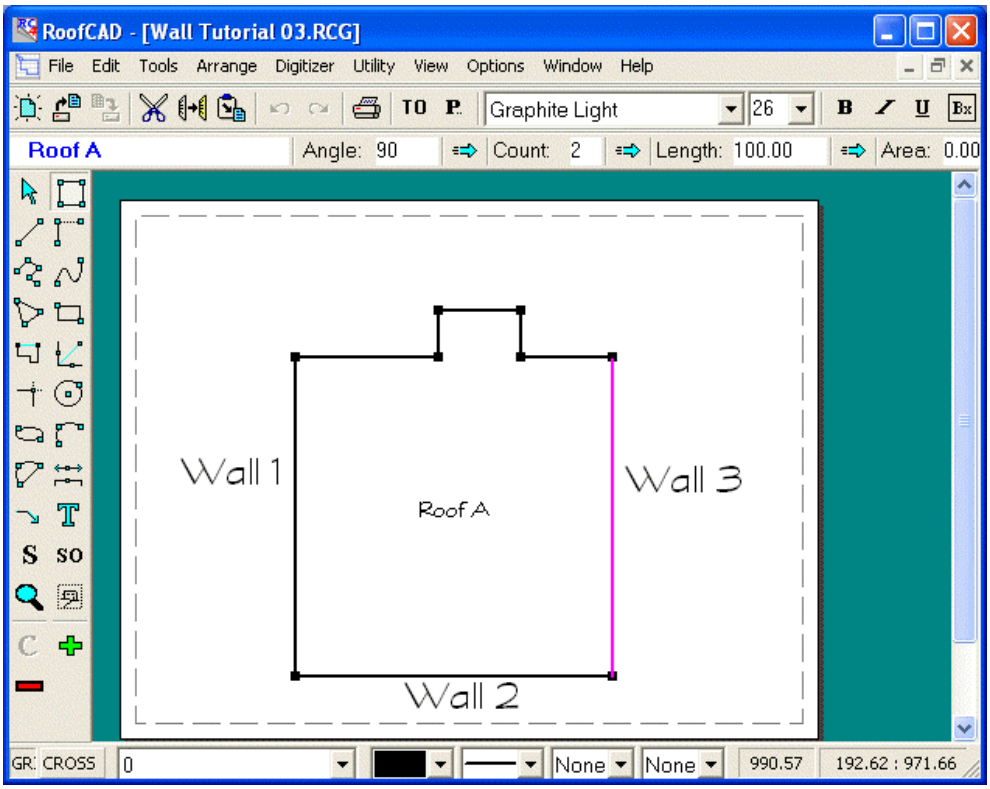
How it looks when inserts have been added...

5. Click the Corner Tool button.

This is the Corner tool.

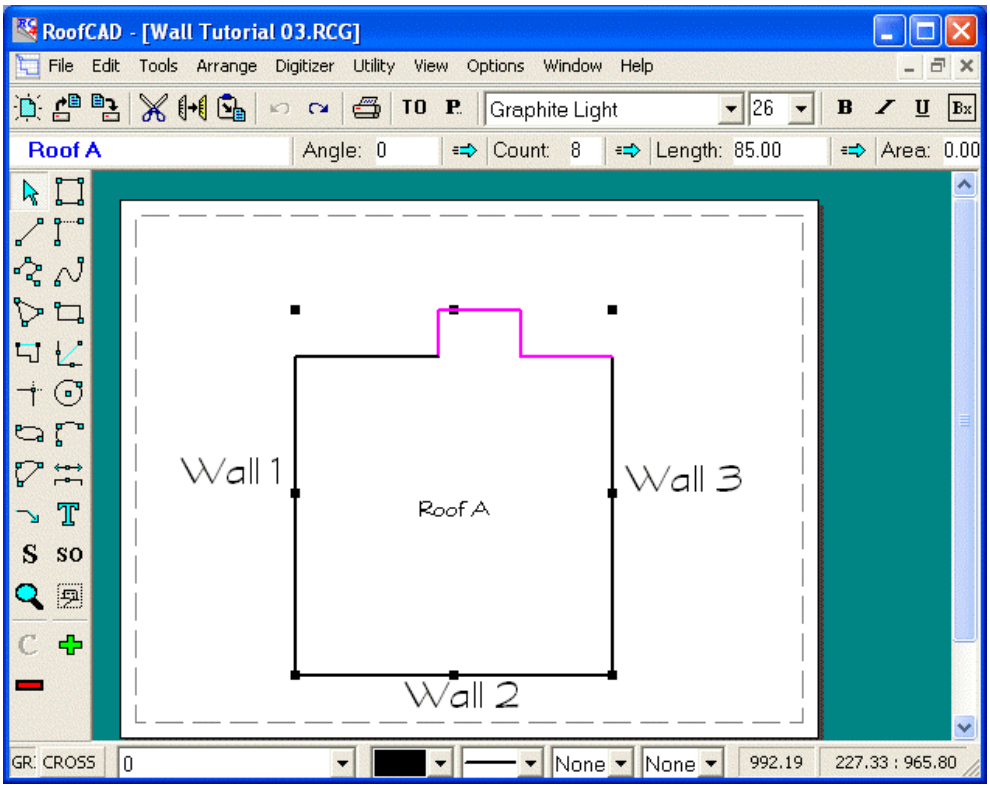
RoofCAD has now placed a handle on each of the corners of the roof.

6. Now drag each corner to make the desired shape like below:



Drag 'em into position like this.

7. Press Esc to deselect.
8. Now lets delete the extra walls to return the roof to a square shape.
9. Highlight the 4 new walls like below:



10. Press the Delete key on your keyboard and the lines are deleted.

Keep this drawing on screen for the next tutorial.

How to Add and Remove Lines with the Layout Wizard:

Now let's accomplish the same thing more accurately with the Layout Wizard.

1. Select the roof with the Pointer Tool.
2. Choose Tools|Special|Layout Wizard from the menu (or click the Layout Wizard button). The Layout Wizard appears.

The Layout Wizard button.

3. Click the Next button until wall 3 is highlighted in blue.
4. Click the "Insert" button. A new line is inserted and is highlighted in blue.
5. Type 25 and press the Left arrow key.
6. Click the Insert Button again and another line is inserted.
7. Type 25 and press the Up arrow key.
8. Click the Insert Button again and another line is inserted.
9. Type 50 and press the Left arrow key.

10. Click the Insert Button again and another line is inserted.
11. Finally type 25 and press the Down arrow key.
12. Click the Finish button and the changes are complete

Hint:	**Notice the "Remove" button. It removes the line that is highlighted in blue.**

Tip:	**You cannot add a line to an object that is currently a single line segment.**

Select a Roof and its Contents with One Click

As you know the Takeoff Record will now show a roof-by-roof breakout. If you click on the roof name in the takeoff record, the roof and its contents (drains, curbs etc.) become selected.

Sample Exercise:

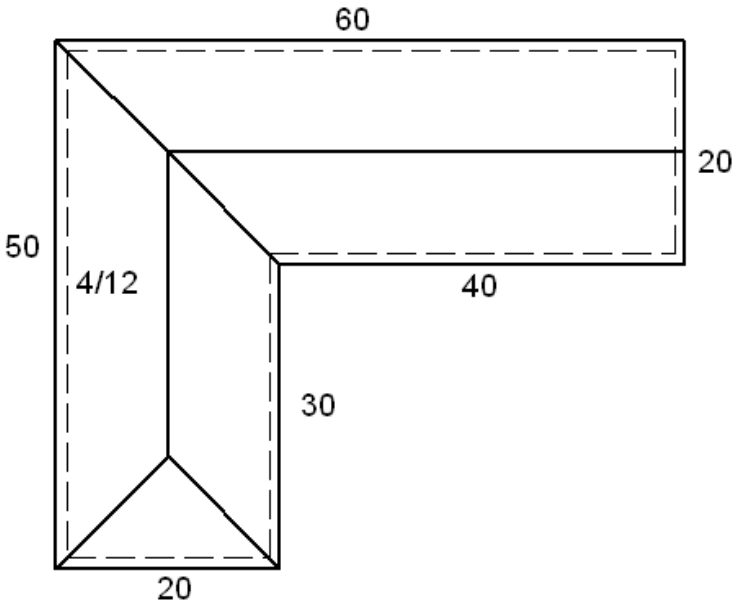
1. Open one of your existing drawings.
2. Open the Takeoff Record.
3. Click on the label "Roof A". Notice that Roof A and everything that belongs to it is now selected. This is really handy when you want to move or delete a roof and its objects.

Section 27

Basic Pitched Roof Tutorial

How to Draw a Pitched Roof—Basic

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.



This is our site sketch.

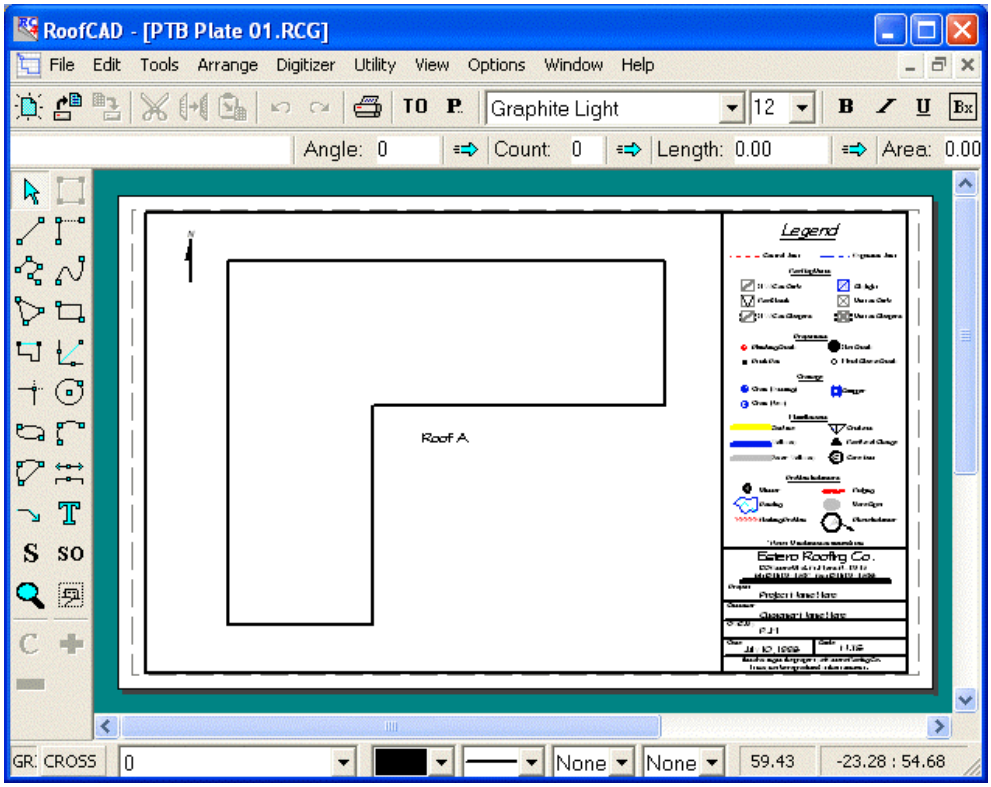
We will use an 8x14 template at a 1"=8' scale (see Section 8, Templates and Section 15, Drawing Settings).

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 Roof Perimeter.

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 Outline from Site Measurements in Section 25, Basic Flat Roof Tutorial). Your drawing should look similar to the one below.

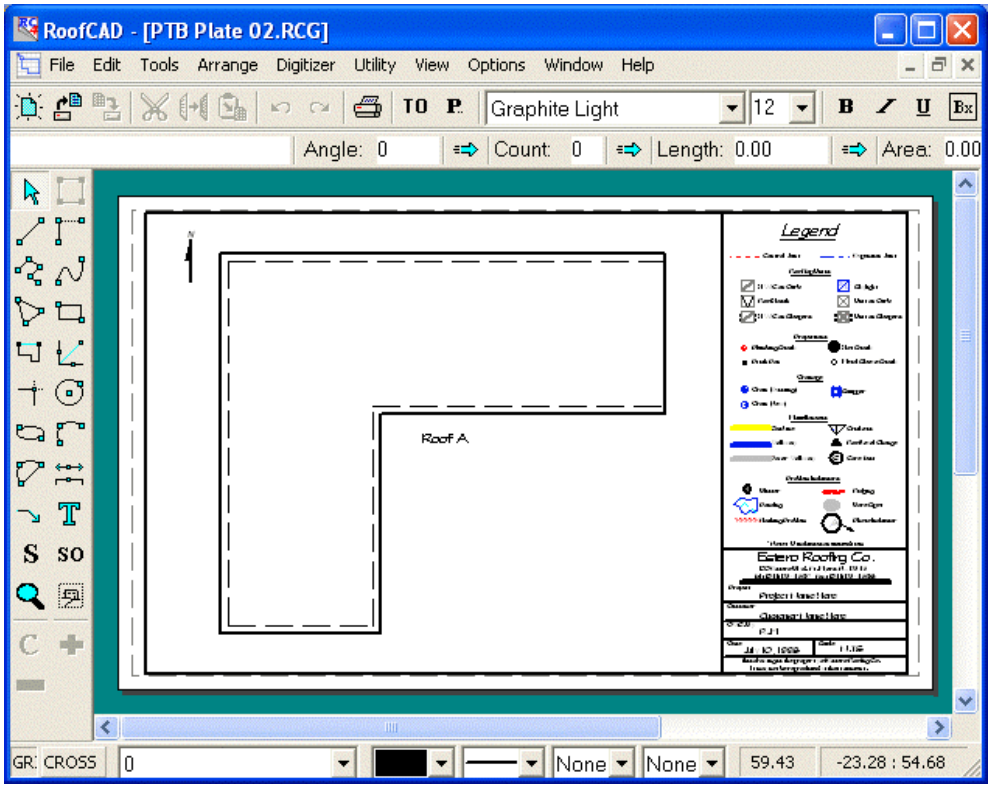


The completed roof outline.

The next step is to set up the eave properties. Select all the eaves of the building (all but the rightmost side), and click the Eave Smart Object in the Browser. 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.

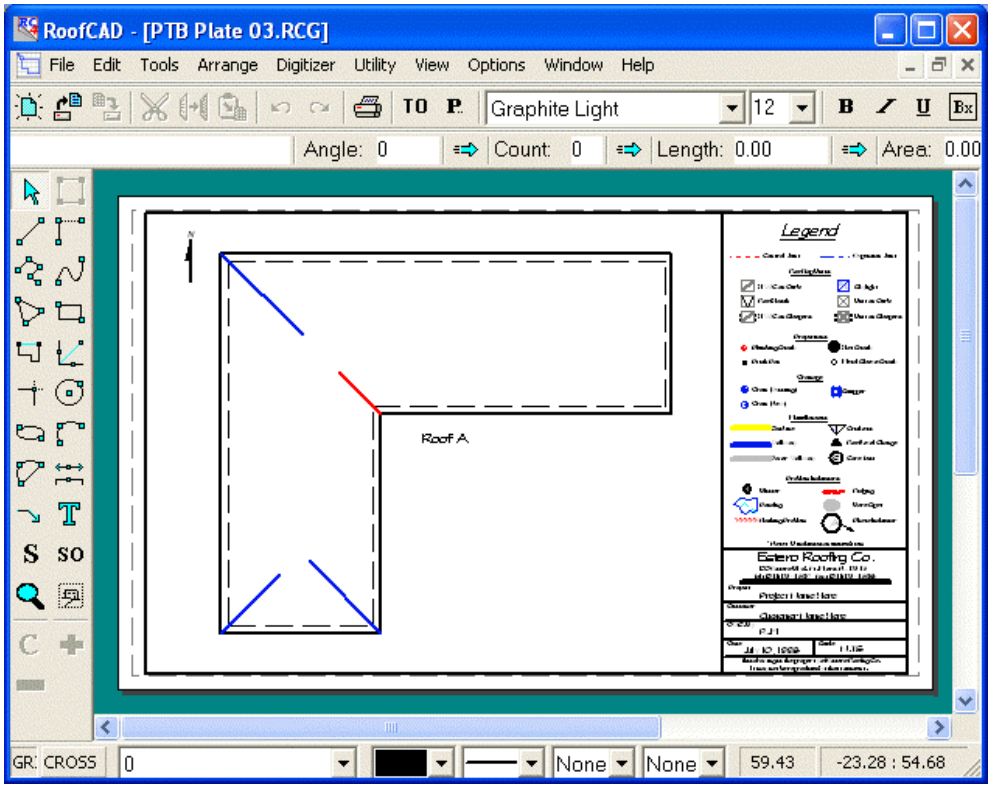


How it looks after eave information is entered.

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, valley 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/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:



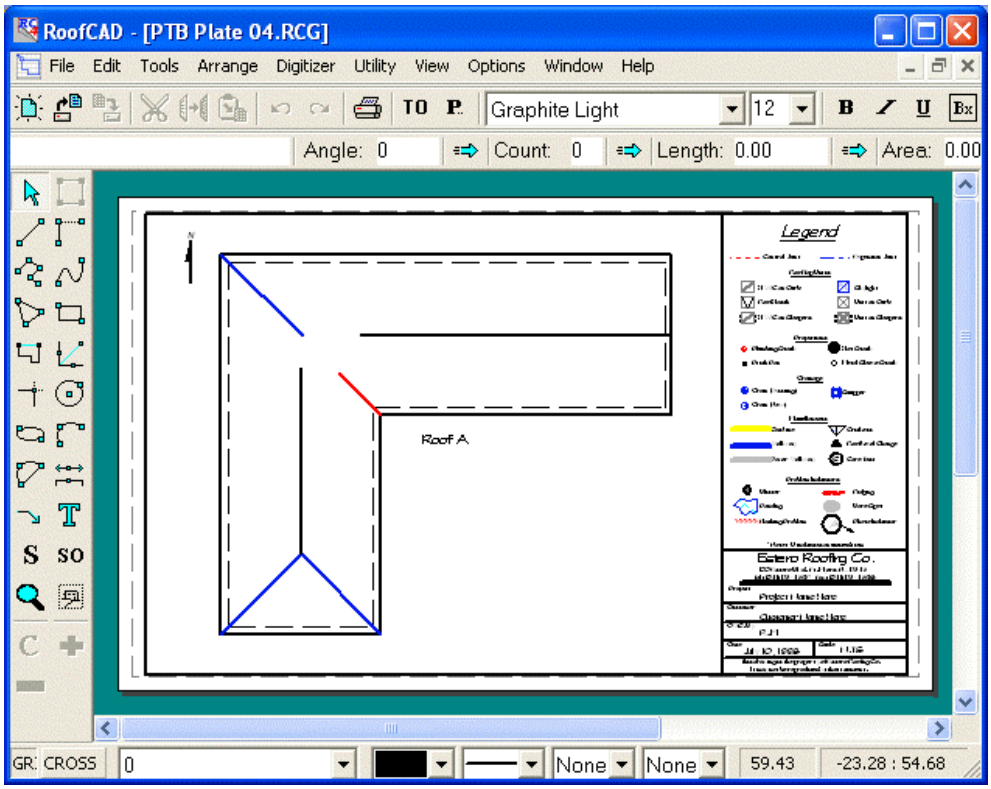
Now starting to take shape with some hips and valleys.

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.

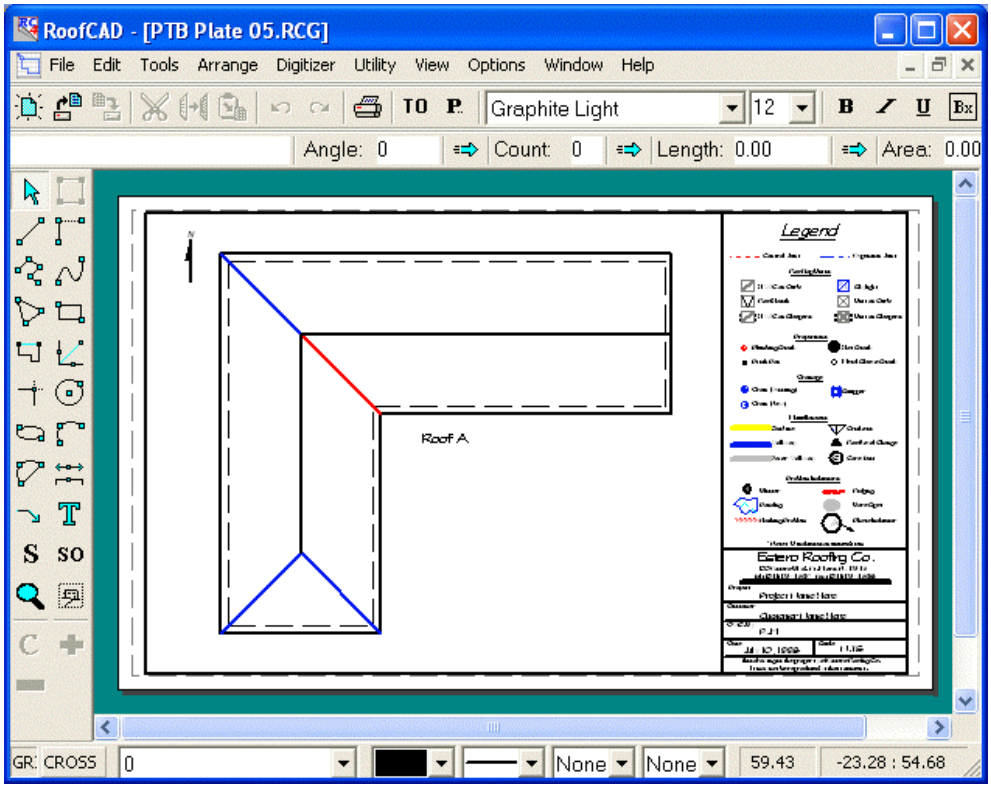
With this tool click on the endpoints of the two hips. RoofCAD will adjust the lengths of the hips to the point where they intersect. (We will not trim the hip and valley at the bend of the ell until we have placed the ridges). Now choose the Ridge Smart Object from the Browser. To make drawing the ridges 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 the arrow next to the drop-down box and choose Horz./Vert. Line tool 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:



Getting ready to finish the ridges...

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:

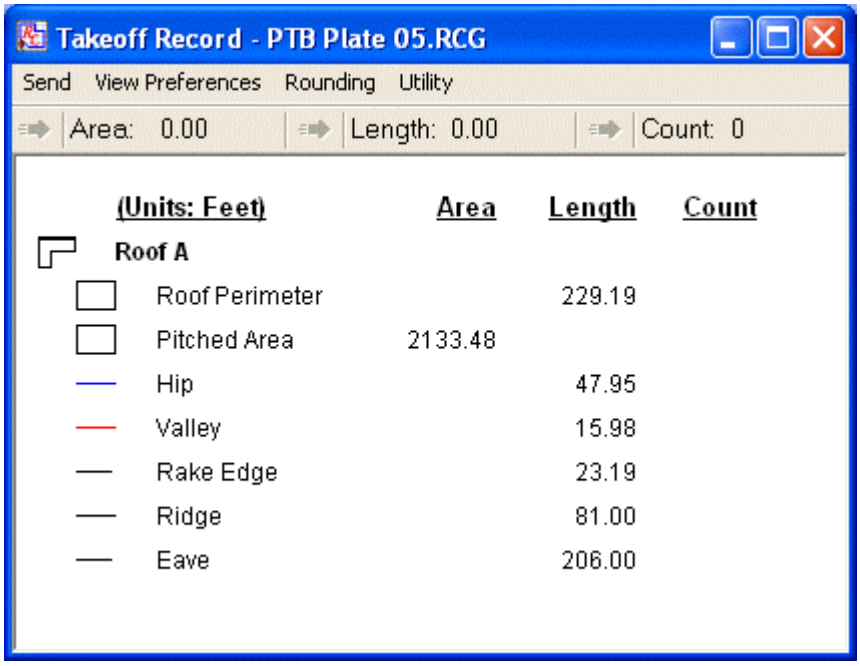


The final result—ready for roof planes.

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). Since we have the same pitch all the way around the roof use the pointer tool to select the roof. Next click on "Pitched Area" in the Smart Object Browser. 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:



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.

Section 28

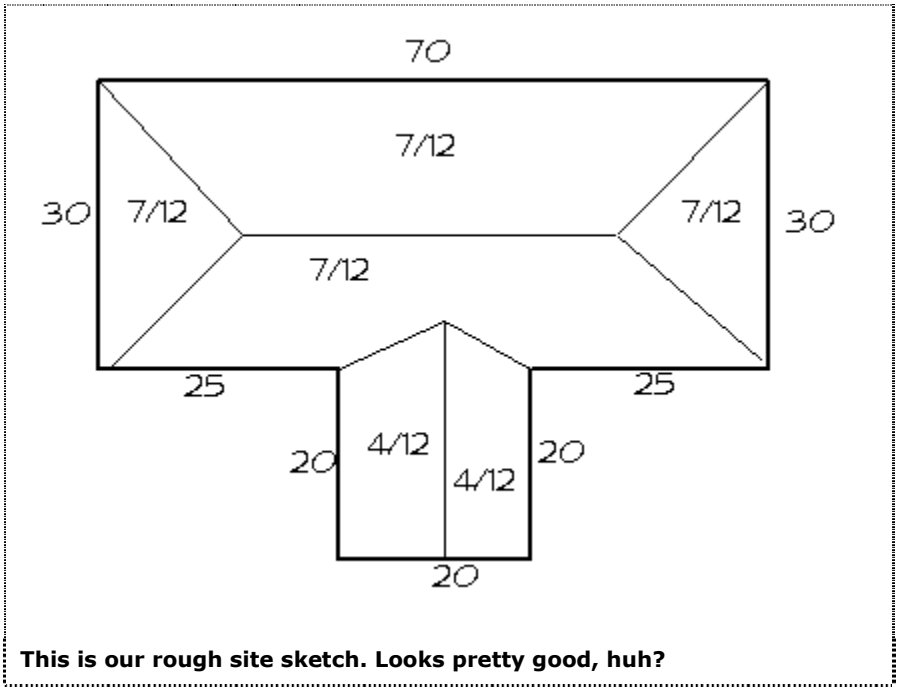
Advanced Pitched Roof Tutorial

How to Draw a Pitched Roof—Advanced

In this tutorial we will take you through the steps of drawing a roof that has more than one pitch.

If you have not already, you should read "How to Draw a Roof Outline from Site Measurements" in Section 25, Basic Flat Roof Tutorial and Section 27, Basic Pitched Roof Tutorial.

We will be drawing the roof sketched below:

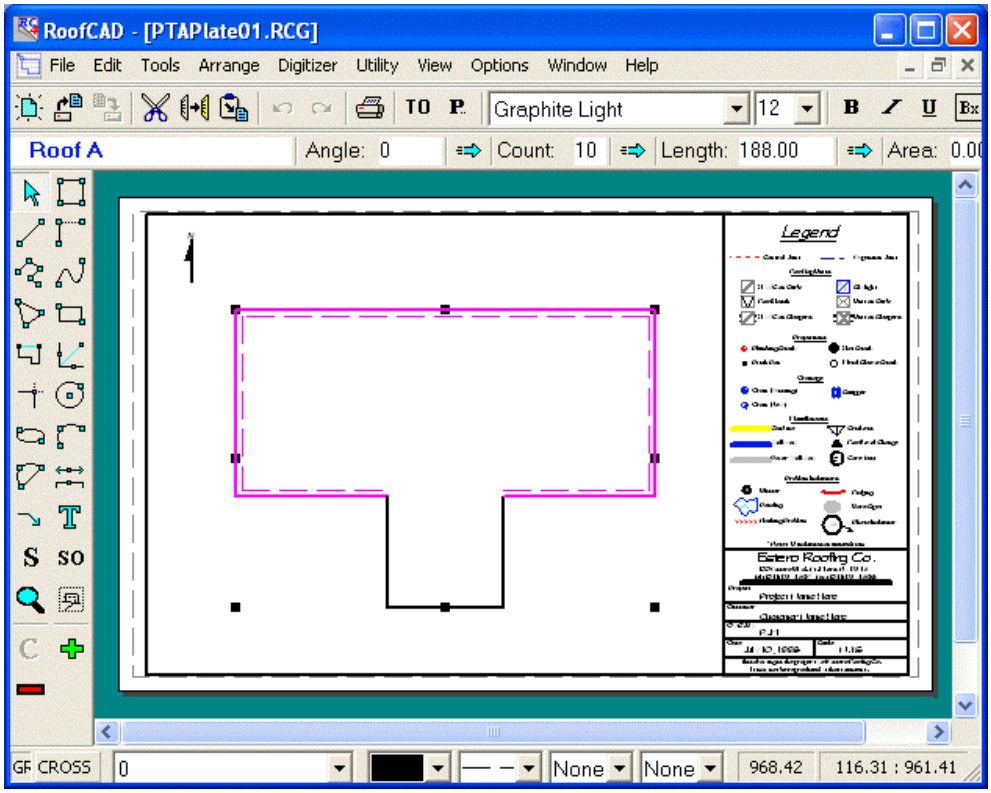


This is our rough site sketch. Looks pretty good, huh?

We will use an 8x14 template, and a scale of 1/10. We also know that the overhang on this roof is 1 ft. Drawing a roof with more than one pitch is similar to drawing a basic pitched roof, with one important difference: in order to get an accurate Pitched Roof area on the Takeoff Record, we must outline each roof plane individually. Obviously, we can't do that until after we have drawn in the hips, valleys, and ridges. The first step is to draw the roof outline.

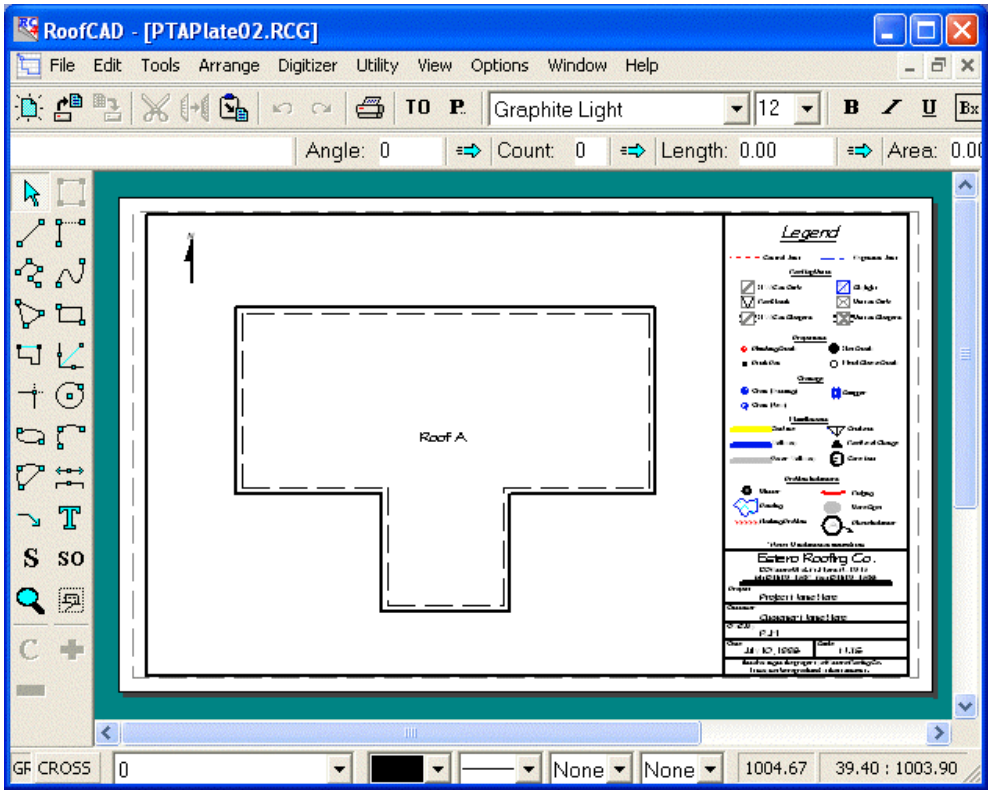
Expand Pitched Roof in the Smart Object Browser and click Roof Perimeter. Draw the outline like we did in the basic pitched roof tutorial.

After you have finished drawing the footprint, select all the eaves that have the 7/12 pitch, then click on the Eave Smart Object in the Browser, entering a Pitch of 7 and an Overhang of 1, as shown in our following illustration:



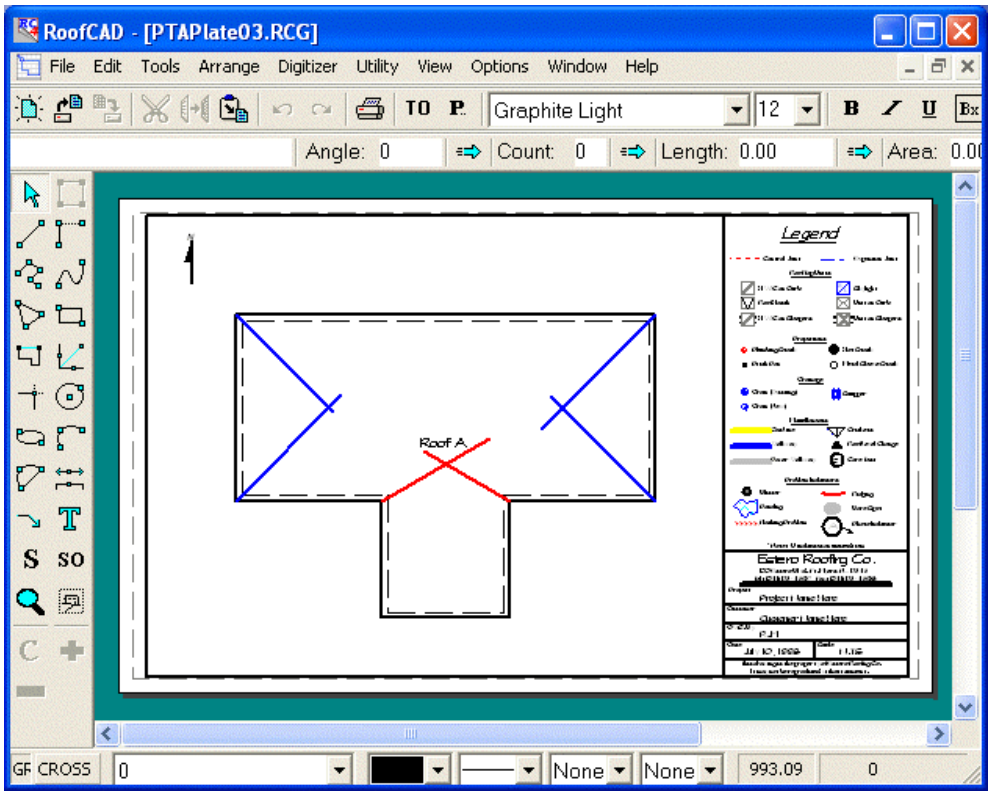
Select all eaves with a 7/12 pitch.

Press Esc to deselect everything. Select the eaves with a 4/12 pitch, and click on the Eave Smart Object in the Browser, entering a Pitch of 4 and an Overhang of 1. Press Esc to deselect everything. Select the 4/12 rake edge, then click on the Rake Edge Smart Object in the Browser, entering a Pitch of 4 and an Overhang of 1. Press Esc to deselect everything. Your drawing should now look something like this:



All eaves have been entered now.

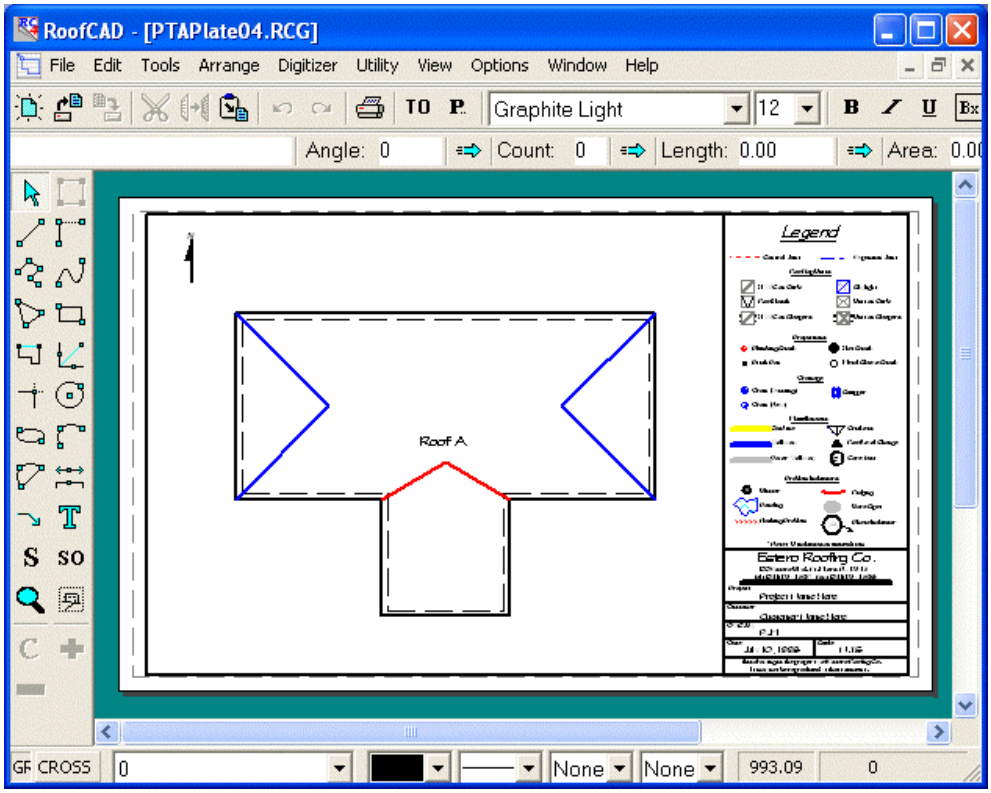
Next, we will draw in the hips and valleys. Select the Hip Smart Object from the Browser. With the mouse, click on two adjoining eaves, then click when the hip RoofCAD draws is extended in the correct direction. Repeat this process for all of the hips. Next, select the Valley Smart Object from the Browser and repeat the above process for each of the valleys. Your drawing should now look something like this:



Hips and valleys added...

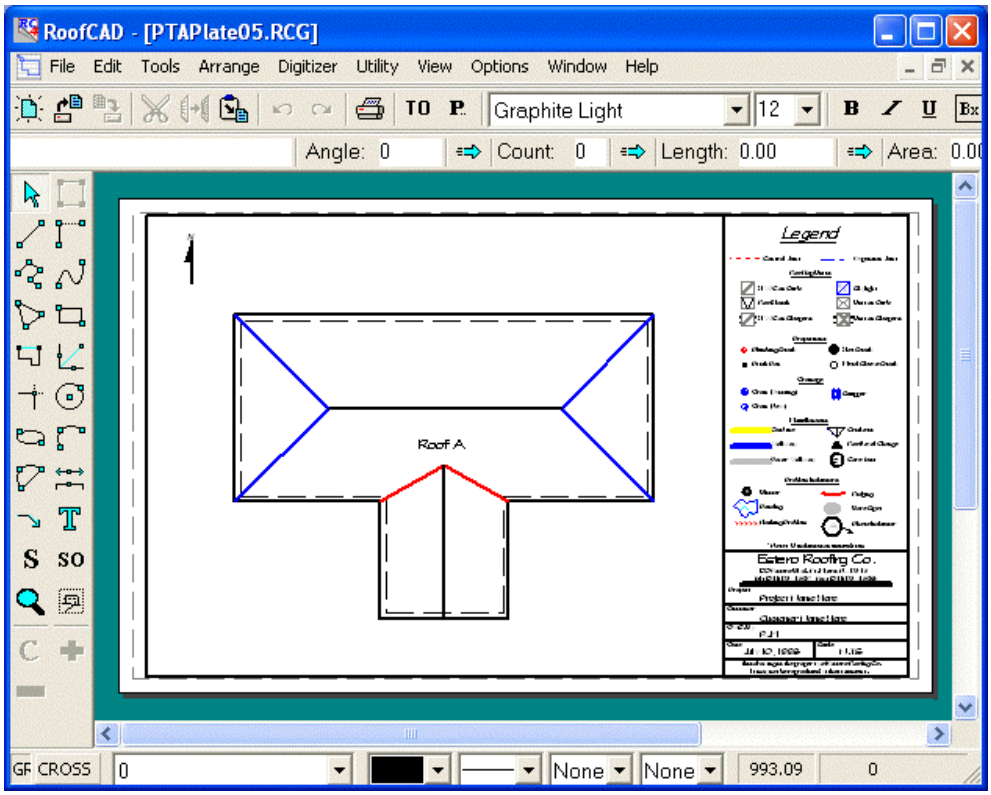
Get ready to use the Trim tool...

Use the Trim tool as we did in the Basic Pitched Roof tutorial to trim the hips and valleys to the correct lengths, as you see in the illustration following:



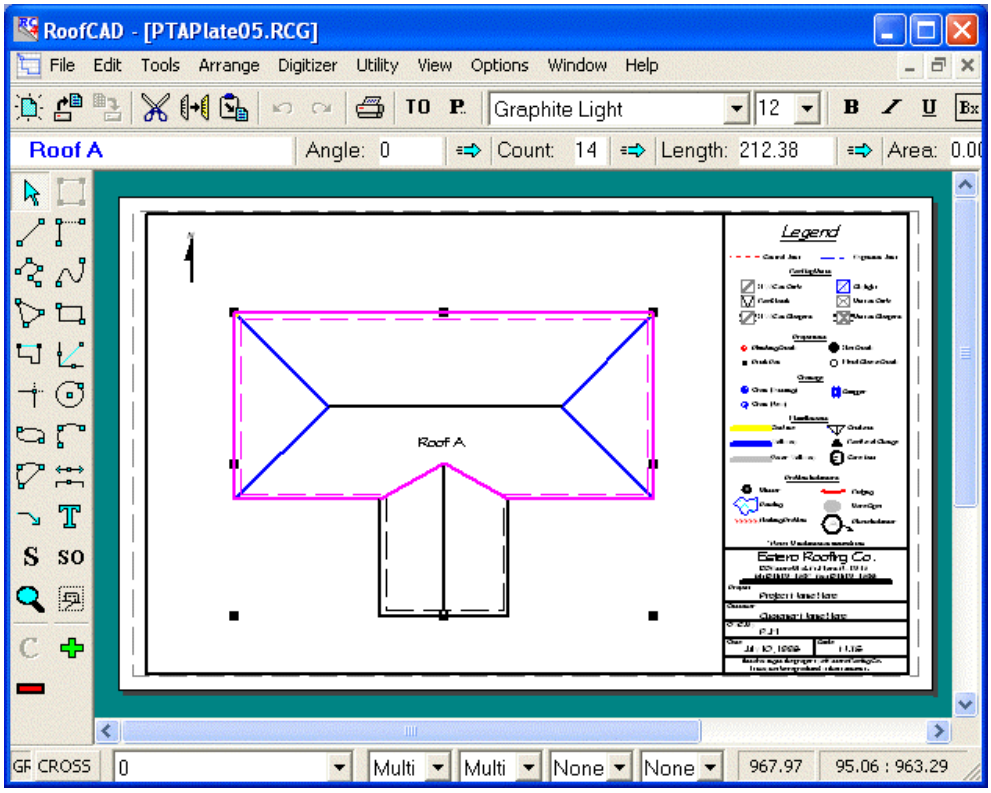
Hips and valleys nicely trimmed.

Now we are ready to draw our ridges. Select the Ridge Smart Object from the Browser. We will again be making use of the Snap Hotkeys to place our ridges accurately. Holding down the Ctrl key on your keyboard, click near the point where the hips on the left side of the roof meet, then still holding down the Ctrl key, click near the point where the hips on the right side of the roof meet. To draw the vertical ridge, hold down the Ctrl key and click near the point where the valleys meet, then holding down the Shift key, click on the rake edge at the south end of the roof. Using the Shift key snaps the end of that ridge to the exact midpoint of the rake edge. Your drawing should now look something like this:



Snap keys make this a little easier.

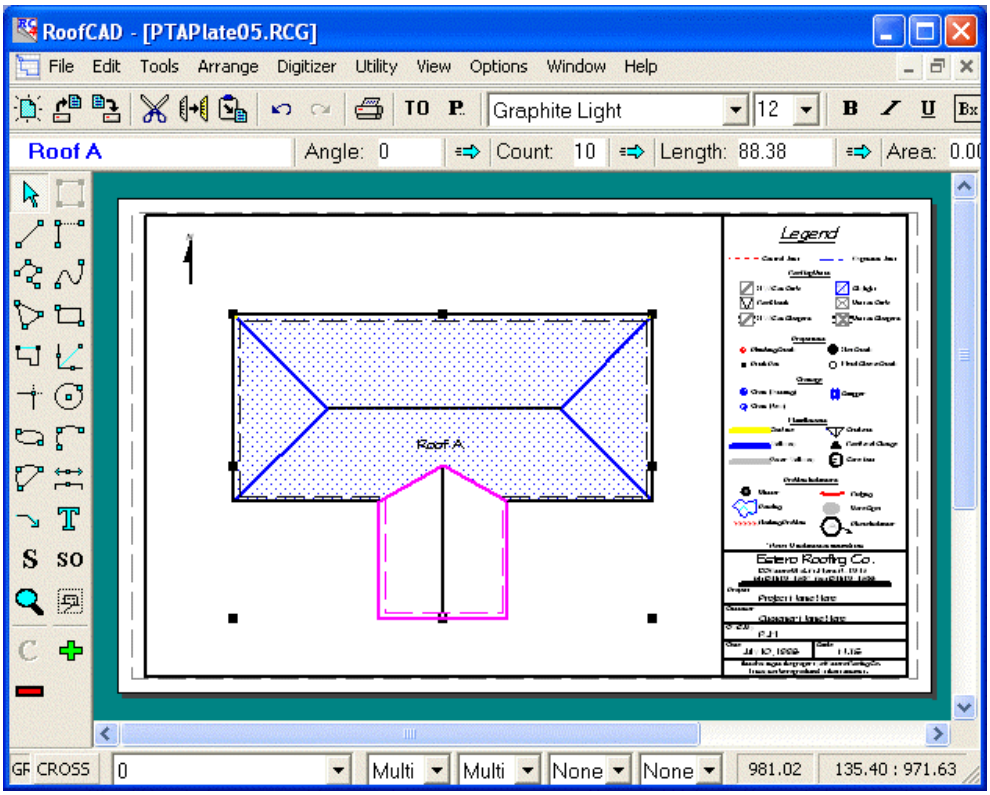
Now we are ready for the final step of outlining our roof planes. From the Smart Object Browser, select the "Pitched Area" Smart Object, entering a Pitch of 7, and manually change the Drawing Tool displayed in the drop-down box at the bottom of the Browser to the Polygon tool (we don't want to use the Layout Wizard in this situation). Holding down the Ctrl key, outline the 7/12 pitched area of the roof by clicking on each corner around the perimeter of this area, (highlighted in the following illustration).



Define the 7/12 pitched area...

When you have outlined the area, right click to indicate to RoofCAD that you have finished this area.

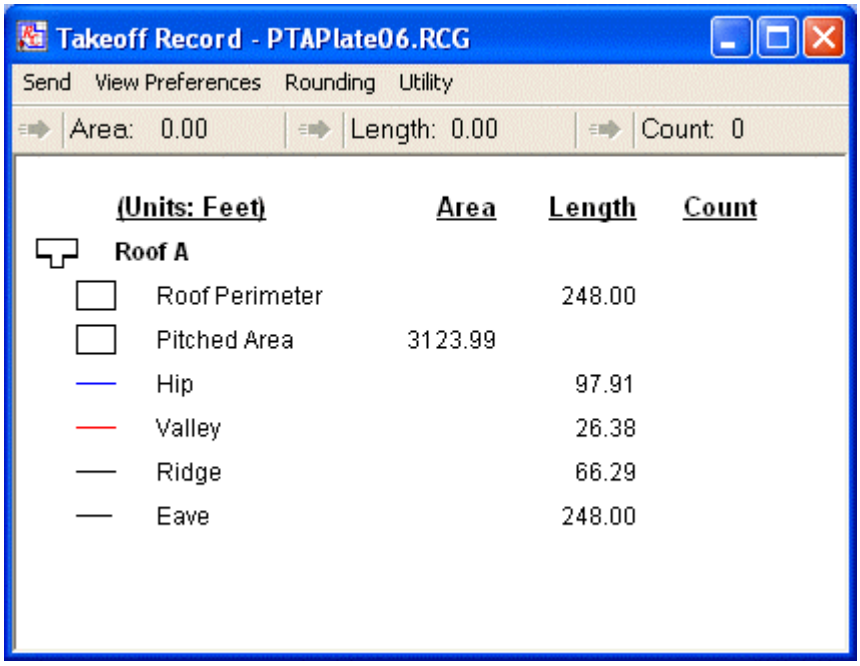
Click on the Pitched Roof Smart Object in the Browser again, this time entering a Pitch of 4, and again changing to the Polygon Tool. Holding down the Ctrl key, outline the 4/12 pitched area of the roof, as highlighted in the following illustration.



Then define the 4/12 pitched area and we're done.

Right click to finish the area.

We have now finished drawing this roof. Your Takeoff Record should now look like this:



The Takeoff Record for our finished roof.

To learn how to draw more complicated roofs, with hips and valleys that run from ridge to ridge, see Section 29, Expert Pitched Roof Tutorial.

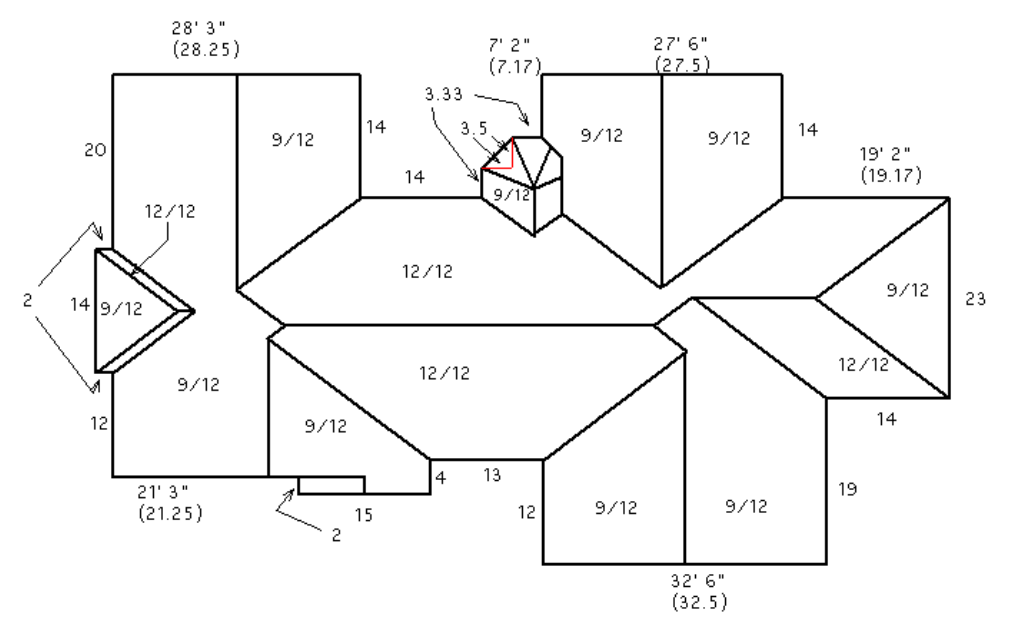
Section 29

Expert Pitched Roof Tutorial

How to Draw a Pitched Roof--Expert

This tutorial will take you through the steps of drawing a complex roof, with multiple pitches and hips and valleys that run from ridge to ridge. If you have not already, you should read "How to Draw a Roof Outline from Site Measurements' in Section 25, Basic Flat Roof Tutorial, Section 27, Basic Pitched Roof Tutorial, and Section 28, Advanced Pitched Roof Tutorial before beginning this tutorial.

The roof we will be drawing is shown in the following illustration:

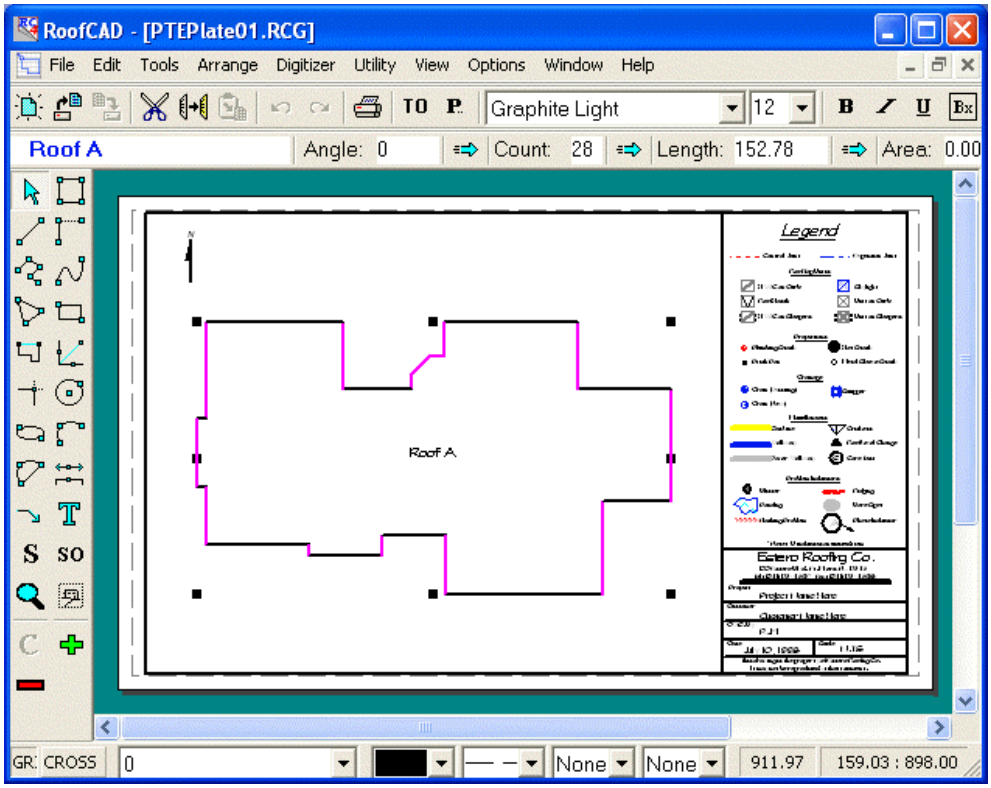


A complex site sketch.

We will use an 8x14 template, and set the scale to 1/12. The measurements above are outside measurements, so there will be no overhang to enter.

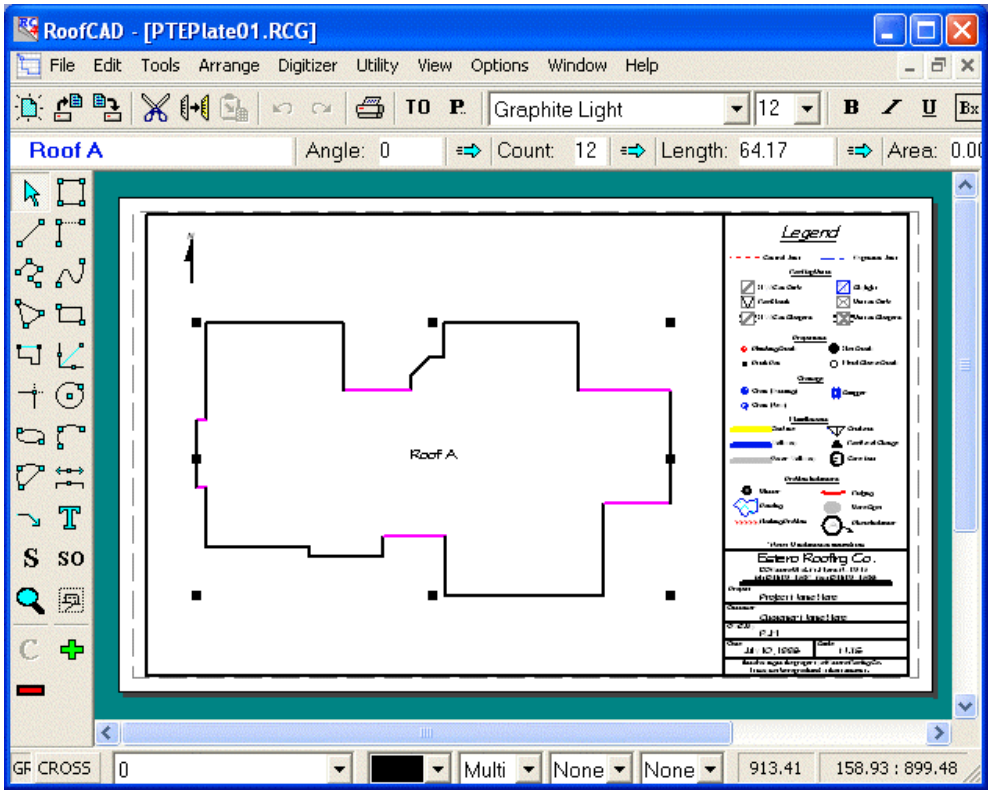
Draw the outline now using the Roof Perimeter Smart Object.

After you have finished drawing the outline, select all the eaves that have the 9/12 pitch, then click on the Eave Smart Object in the Browser, entering a Pitch of 9 and an Overhang of 0, as the next illustration shows:



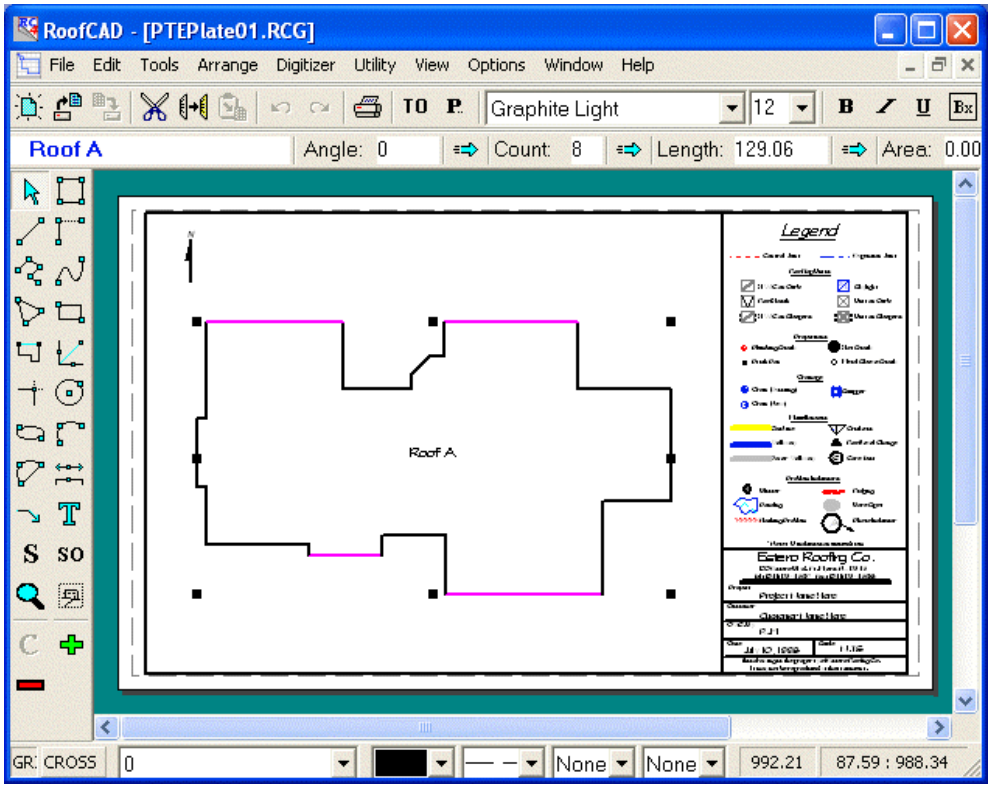
Select all eaves with a 9/12 pitch...

Press Esc to deselect all. Next, select all the 12/12 eaves, and click the Eave Smart Object in the Browser, entering 12 for the Pitch and 0 for the Overhang, as the next illustration shows:



...now the 12/12 eaves...

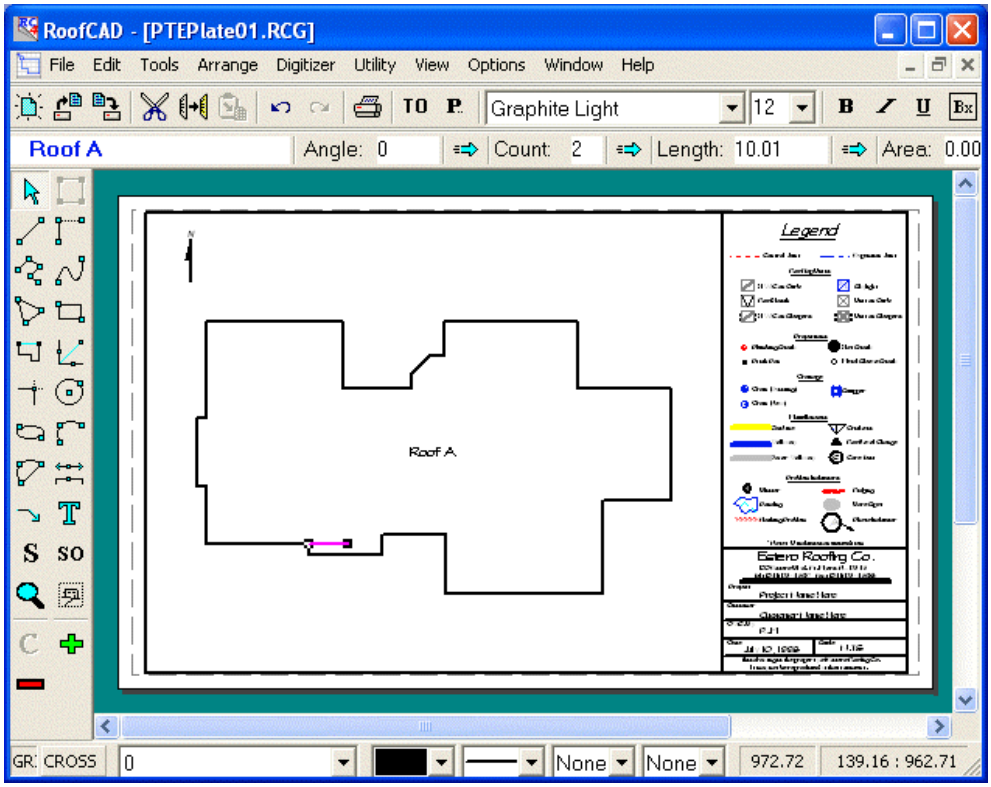
Press Esc to deselect all. Next, select the rake edges with a 9/12 pitch and click on the Rake Edge Smart Object in The Browser, entering a pitch of 9 and an Overhang of 0, as the next illustration shows:



...9/12 rake edges...

Press Esc to deselect all.

Next, we will draw in the small rake edge in the lower left area of the roof (highlighted in the next illustration).

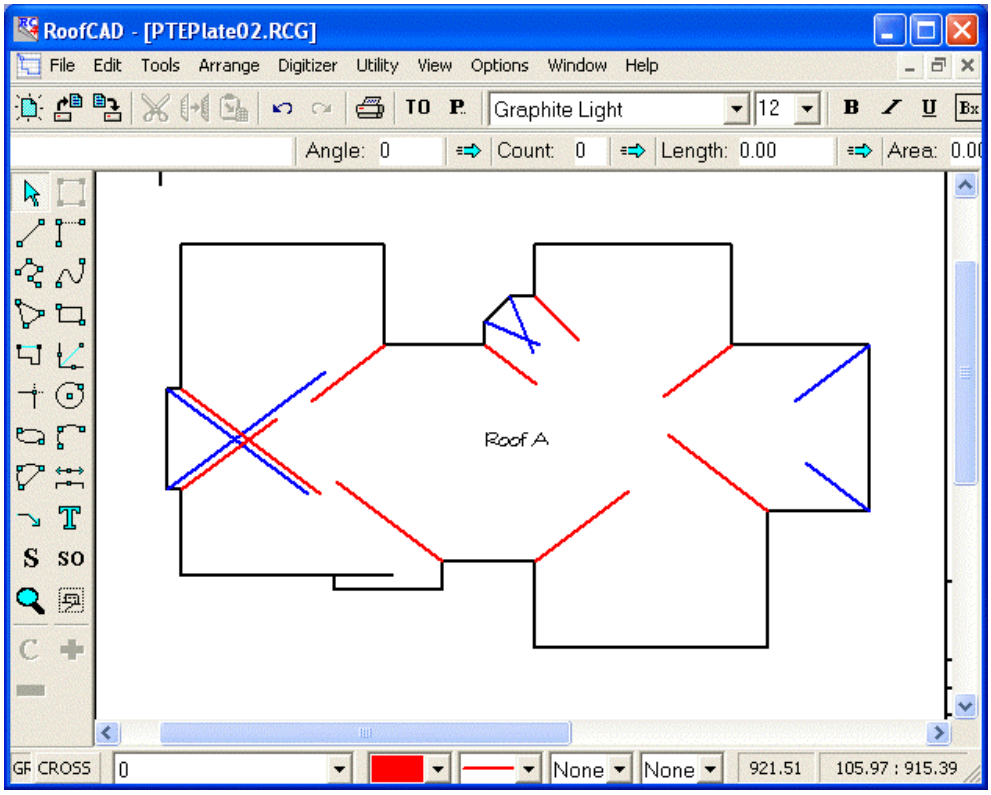


Now, we'll put in this small rake edge.

Choose the Rake Edge Smart Object from the Browser, and change the Drawing Tool in the drop-down box to the Line tool and press the "O" key to turn ortho mode on. Holding down the Ctrl key (snap to end point mode), click on the corner where the rake edge starts. Release the Ctrl key and click about halfway over. We will later use the Trim tool to trim the rake to the ridge after we have drawn in the ridge. Now press the "O" key to turn ortho mode off.

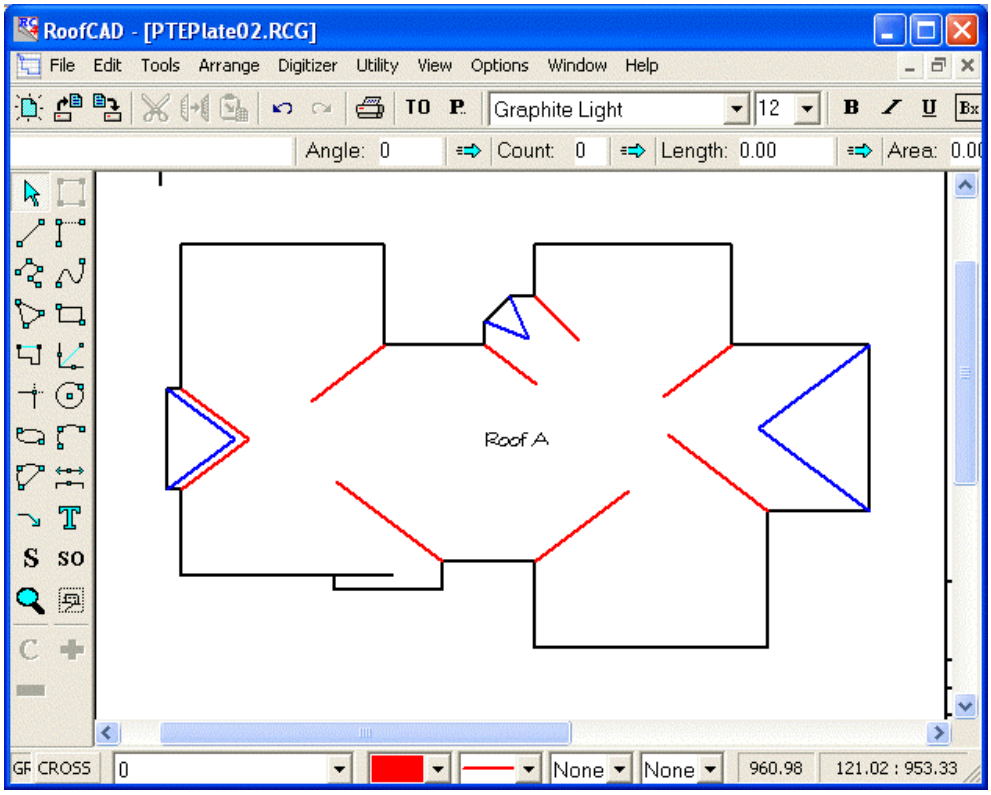
Next we are going to draw in all the simple hips and valleys: i.e. the ones running off the perimeter eaves. Select the Hip Smart Object from the Browser. With the mouse, click on two adjoining eaves, then click when the hip RoofCAD draws is extended in the correct direction.

Repeat this process for all of the hips. Next, select the Valley Smart Object from the Browser and repeat the above process for each of the valleys. Your drawing should now look something like this:



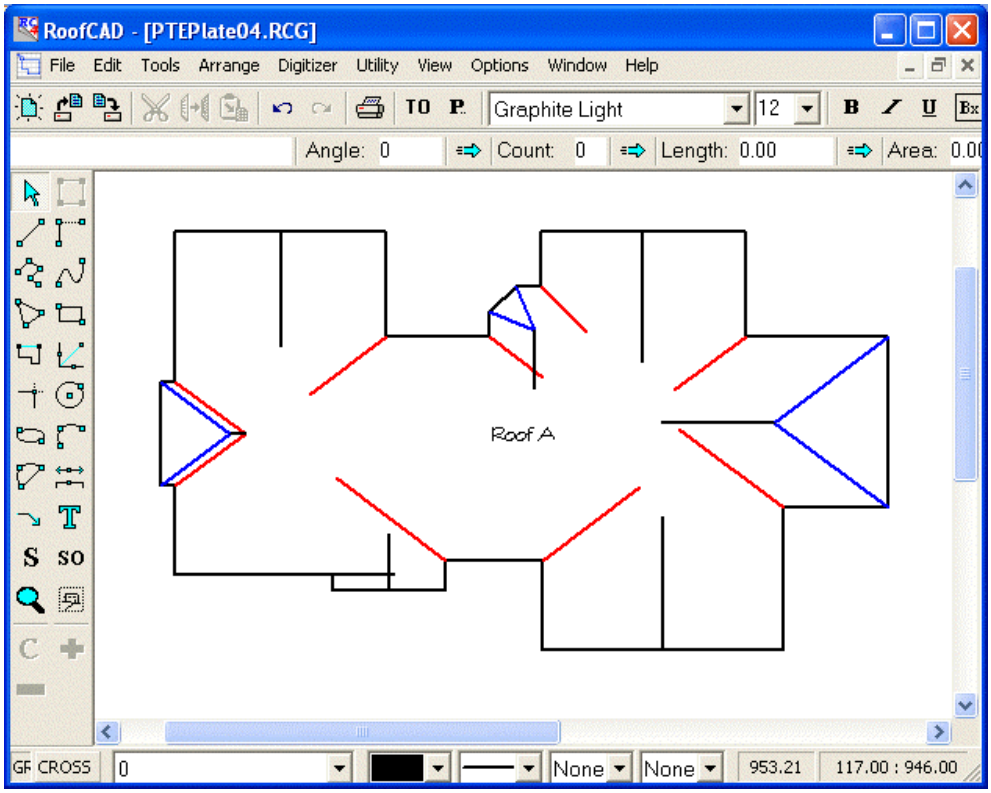
Draw all the simple hips and valleys.

Now use the Trim tool to trim the connecting hips and valleys to each other, as you see in the next illustration:



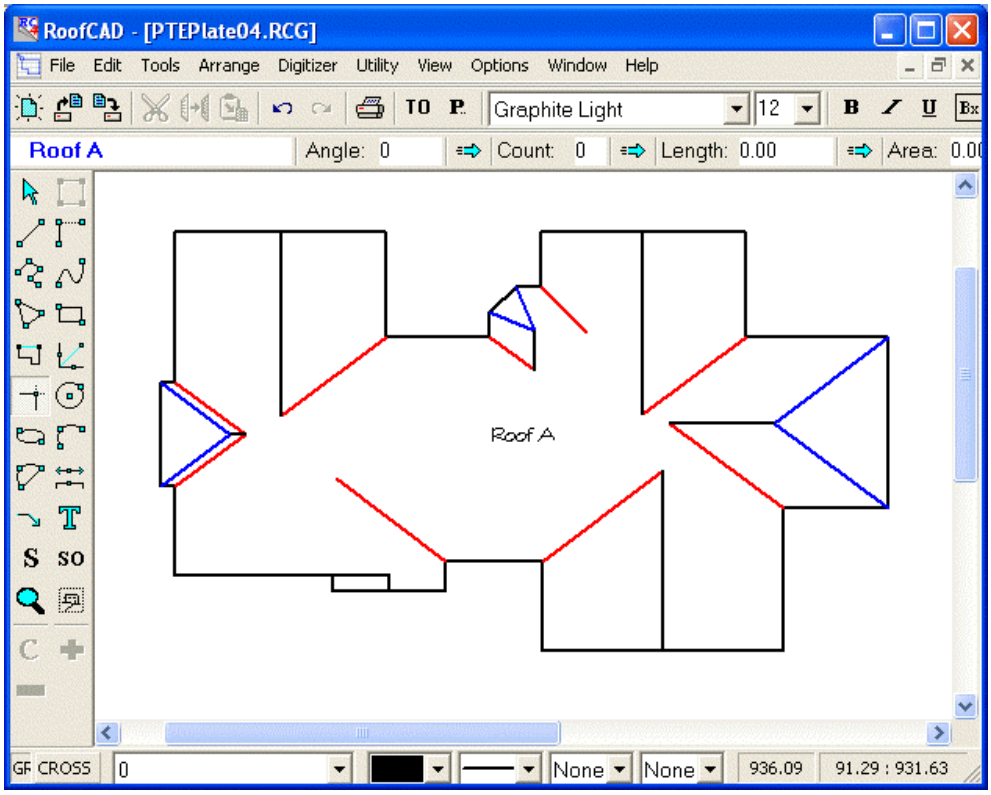
Some hips and valleys trimmed.

The next step is to draw in the simple ridges: i.e. the ones that extend from hips we have already drawn, or that exactly bisect the rake edges, as highlighted in the drawing below. Choose the Ridge Smart Object from the Browser, making sure the Drawing Tool displayed is the Line tool. Press the "O" key to turn ortho mode on. To draw each of the four ridges extending from the rakes, hold down the Shift key (snap to midpoint mode) and click near the rake edge. Release the Shift key, and click when the ridge is approximately the correct length. (We will be trimming them later). To draw the ridges extending from the joined hips, hold down the Ctrl key, and click near the joined hips. Release the Ctrl key, and click when the ridge is approximately the right length. For the small ridge that runs between the joined hips and joined valleys on the left side of the building, hold down the Ctrl key and click near the joined hips, then still holding down the Ctrl key, click near the joined valleys. (You may need to zoom in on your drawing to click in the right places). Press the "O" key to turn ortho mode off. You drawing should now look something like this:



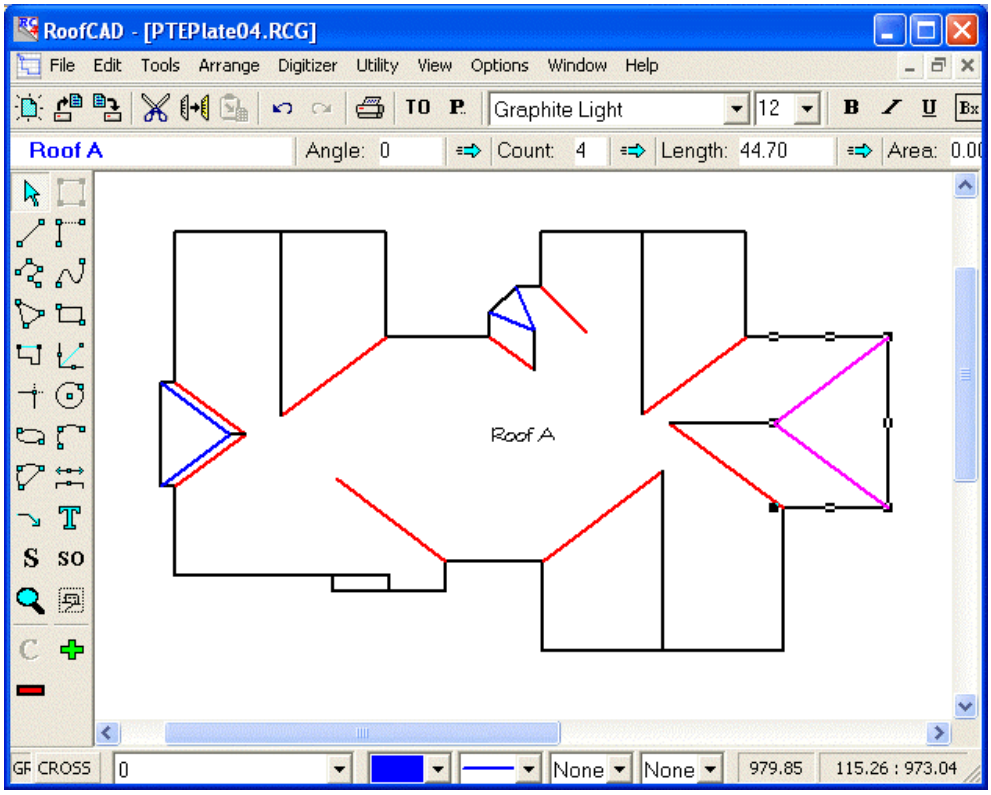
Simple ridges have been added...

The next step is to trim the ridges to the valleys with which they intersect, as in the drawing you see following:



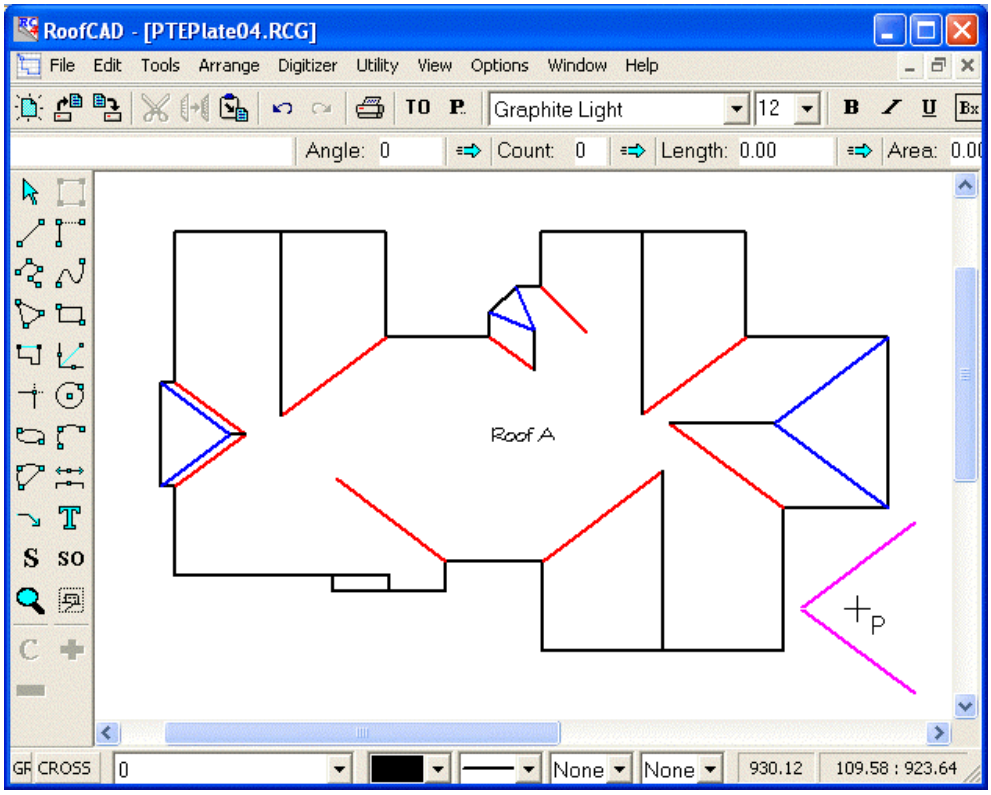
...and use the Trim tool to join 'em up.

Now we must draw in the hips and valleys that are not connected to any eaves, so we won't be able to use the Hip/Valley tool. Instead, we will copy and paste hips we have already drawn, move them into place, and trim them. We can do this because a hip drawn between a 9/12 and a 12/12 roof will always have the same angle and pitch. We will start by selecting the two hips on the right end of the building, highlighted in our illustration following:



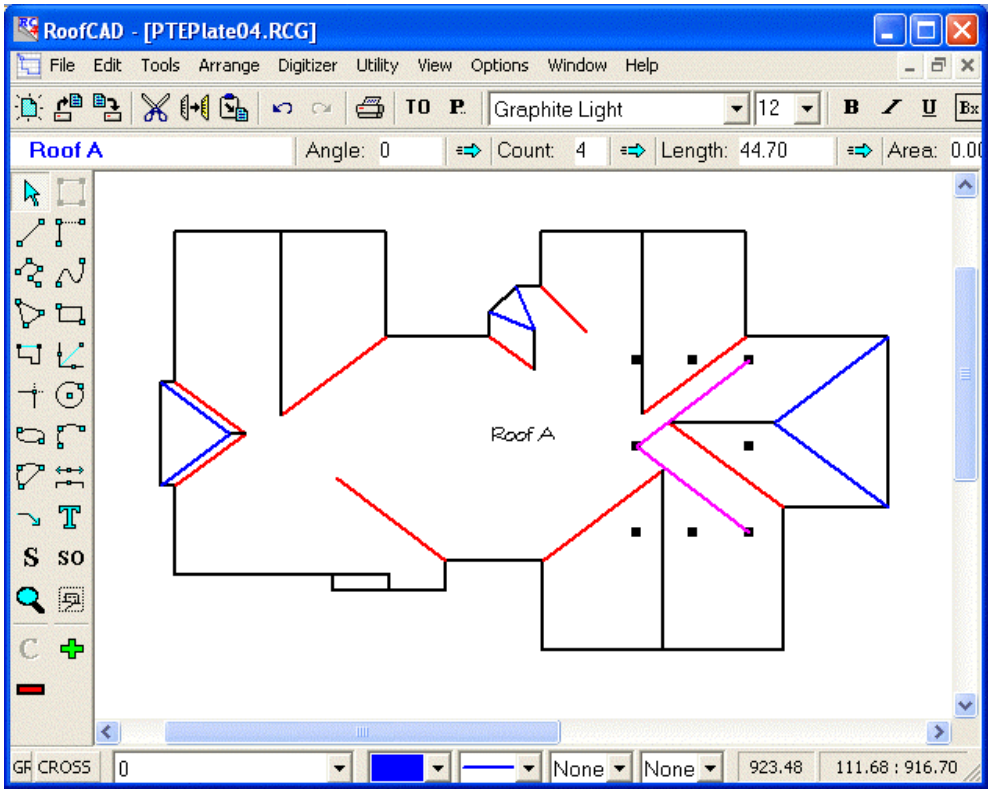
Two hips selected...

Click the Edit|Copy menu item, and a copy of these hips is now stored in the RoofCAD clipboard. Click the Edit|Paste menu item. Your mouse pointer changes to the Paste pointer, and you'll see a "ghost" image of the hips you just copied. You should see something like the ghost image and the +P pointer shown in the lower right corner of the following illustration.



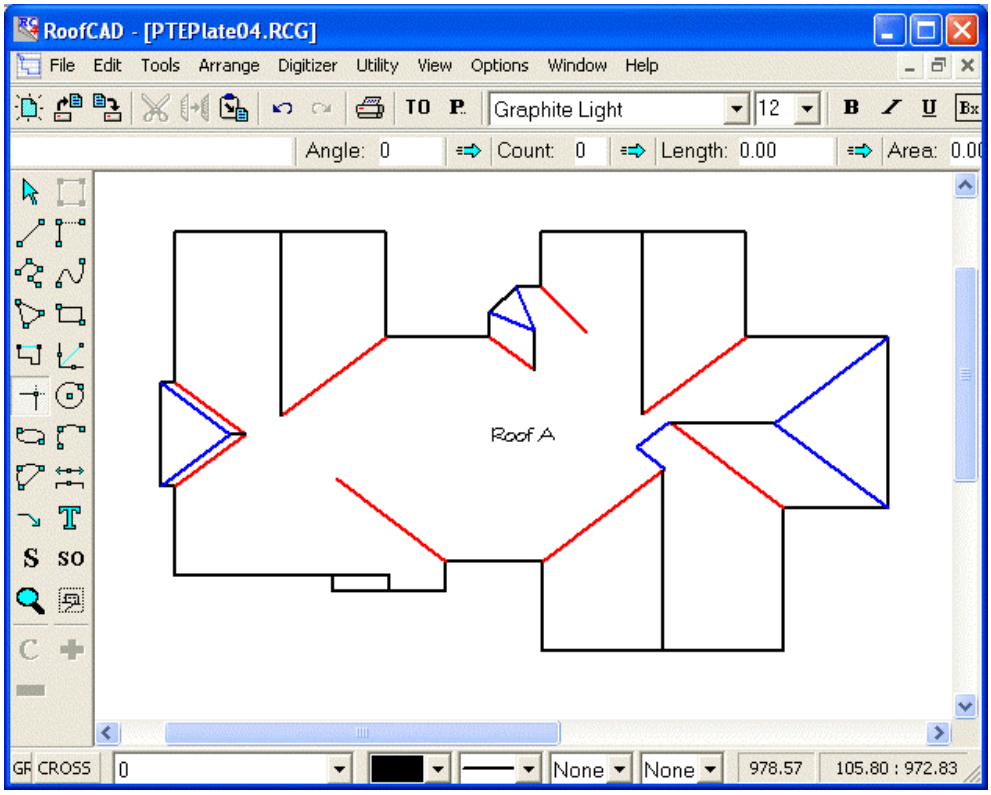
The "ghost" image helps you place where the hip will be pasted.

You can use this ghost image to line up your hips on the roof. If you miss, don't worry. With the Pointer tool select both hips, then move the hips into the position illustrated below, so that they are just touching the points where the ridges and valleys meet. You will want to zoom in so that you can see clearly and place the hips precisely.



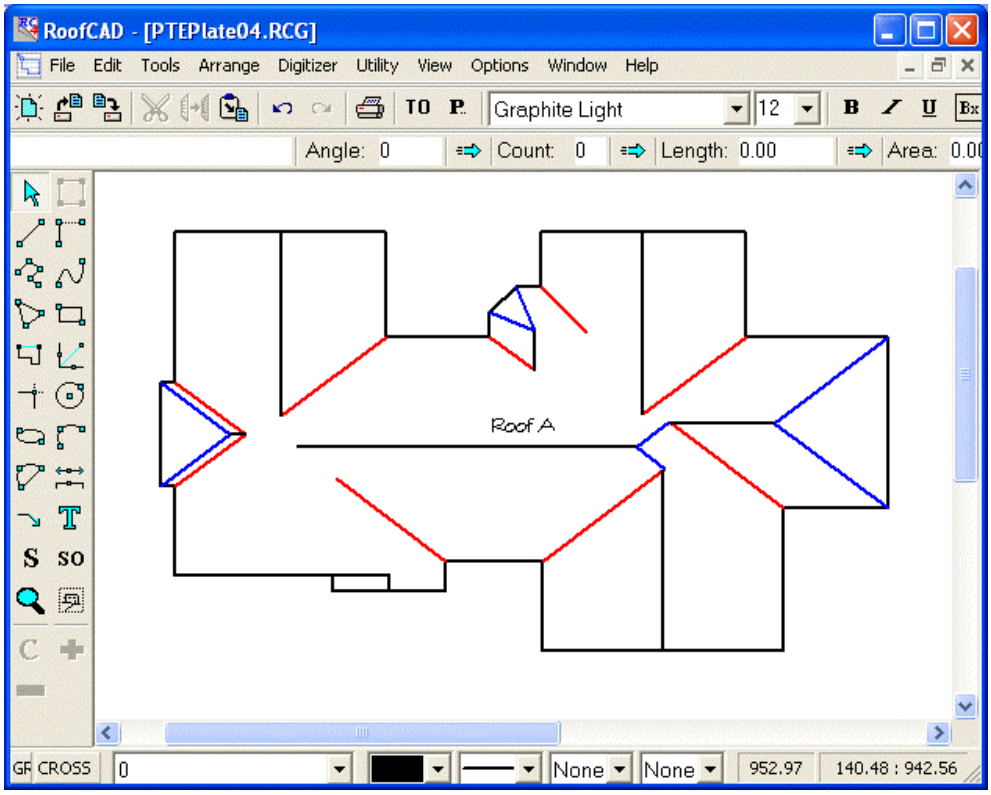
Placing the hips precisely...

Once the hips are in position, use the Trim tool to trim the ends to the intersection points. Your drawing should look like the next picture:



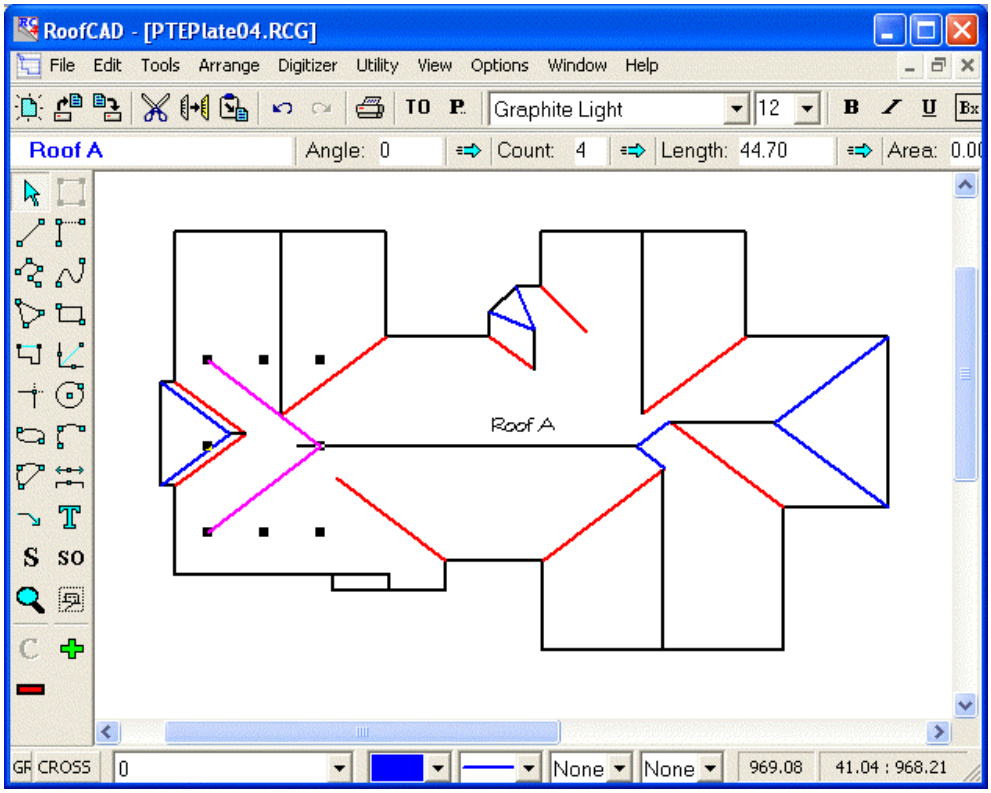
...and how it looks after the Trim tool does its work.

Now we can draw the ridge that extends from the hips we have just drawn. Choose the Ridge Smart Object from the Browser, making sure the Drawing Tool indicated is the Line tool. Press the "O" key to turn Ortho mode on. Holding down the Ctrl key click near the point where the hips meet. Release the Ctrl key. Move the mouse to the left and click when the ridge is approximately the right length, shown below. Press the "O" key to turn ortho mode off.



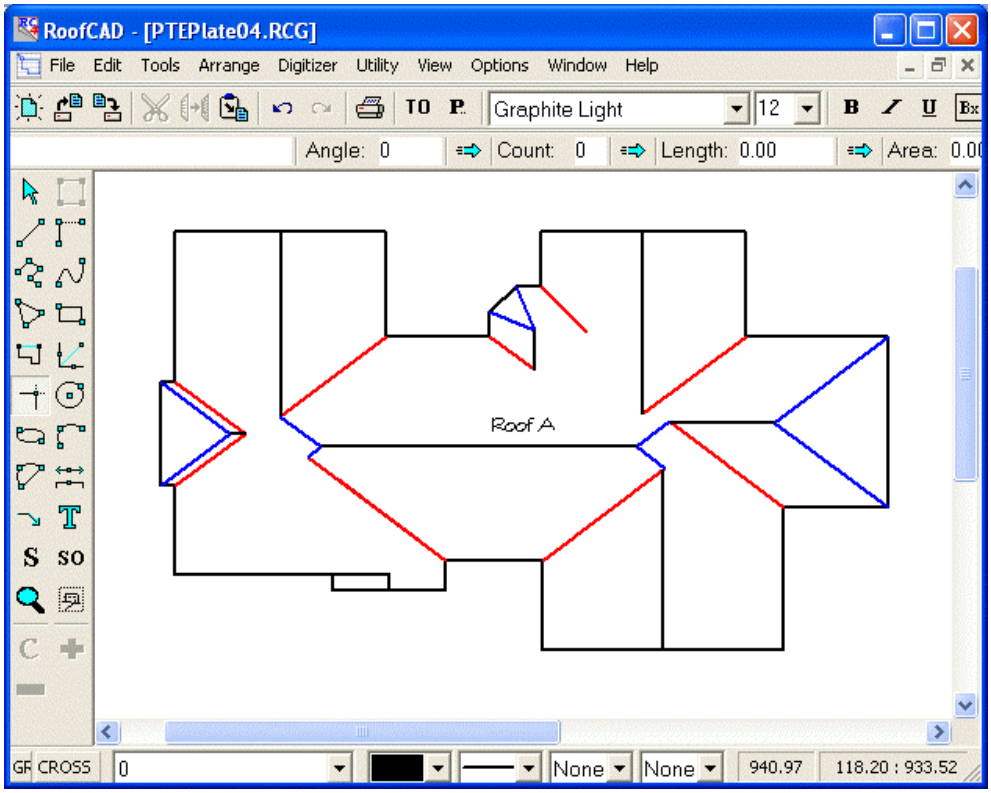
Draw in the ridge.

Now we are ready to insert the hips on the left end of this ridge. A copy of the hips we copied in the previous step will still be on the RoofCAD clipboard. Choose Edit|Paste, and click in the left hand area of the roof. A copy of the hips will be inserted. Select both hips and choose the Arrange|Flip Vertical menu item. This will produce a mirror image of the selected items. Move the selected hips into place so that the ridge we just drew intersects the point where the hips join, and the upper hip is just touching the point where the upper ridge and valley intersect, as the next illustration shows:



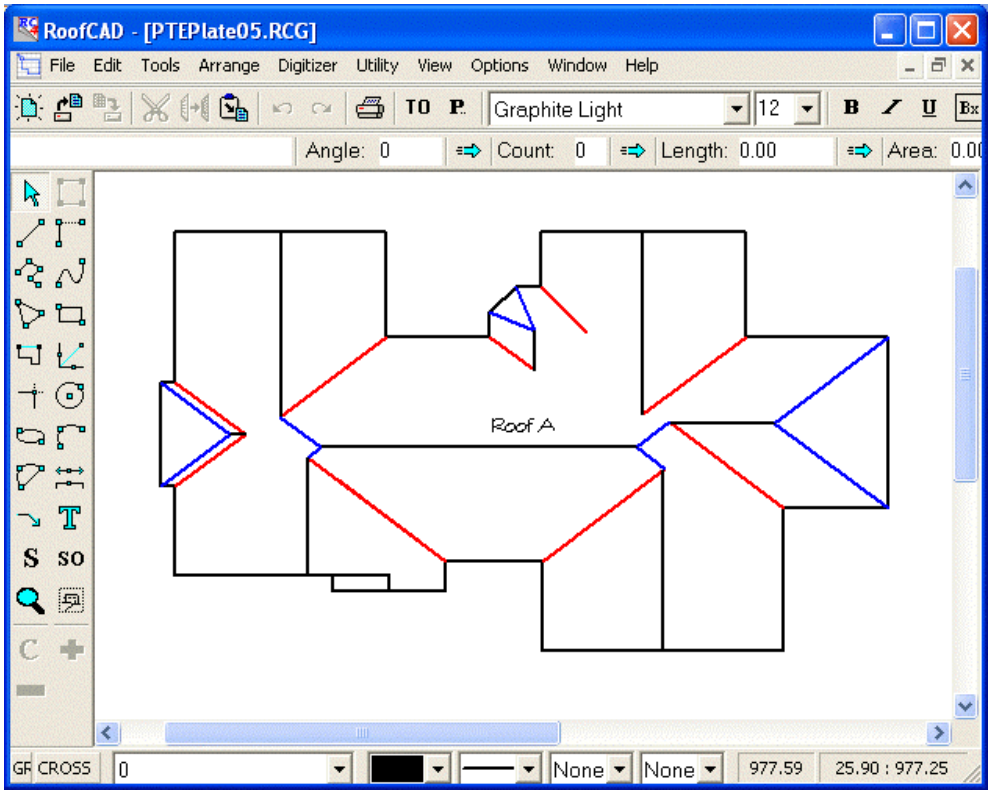
The hips after the Arrange|Flip Vertical command.

Use the Trim tool to trim the ridge to the intersection point of the hips, and to trim the ends of the hips to the valleys. Your drawing should look like the one that follows:



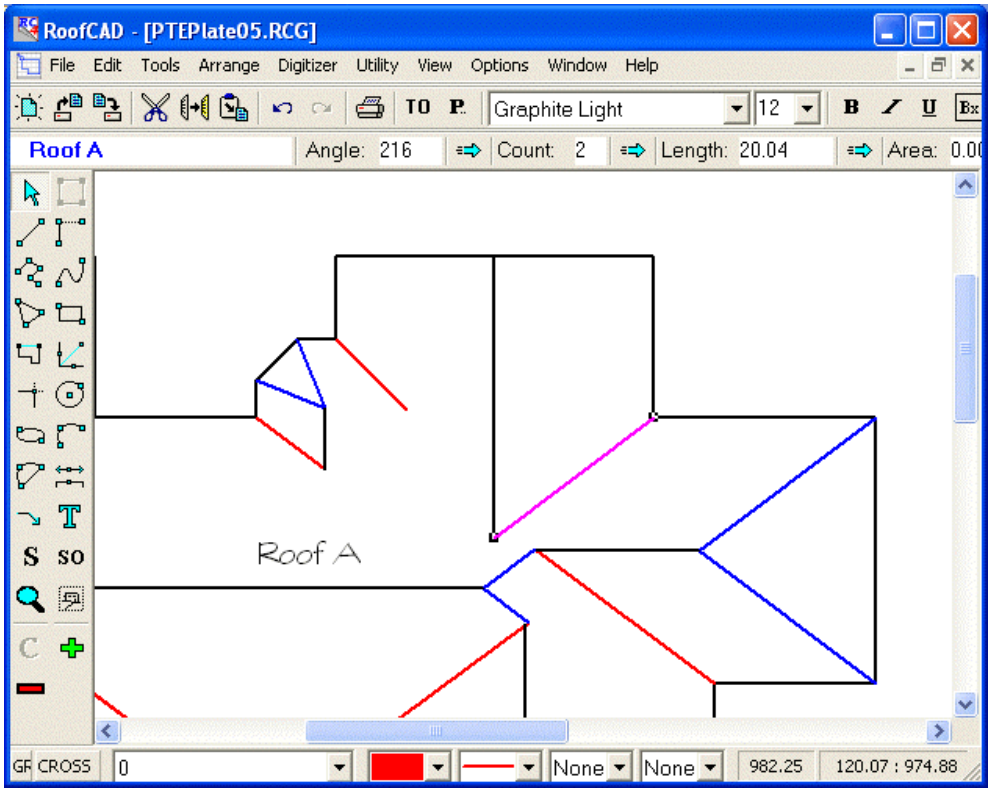
After trimming, the hips look like this.

Now we can draw in the ridge that drops down from lower hip that we just added. Choose the Ridge Smart Object from the Browser, again making sure that the Drawing Tool displayed is the Horiz./Vert. Line tool. Holding down the Ctrl key, click near the point where the lower hip joins the valley. Holding down BOTH the Ctrl and the Shift keys (snap to Line mode) click on the rake edge where the ridge ends. The result is pictured next:



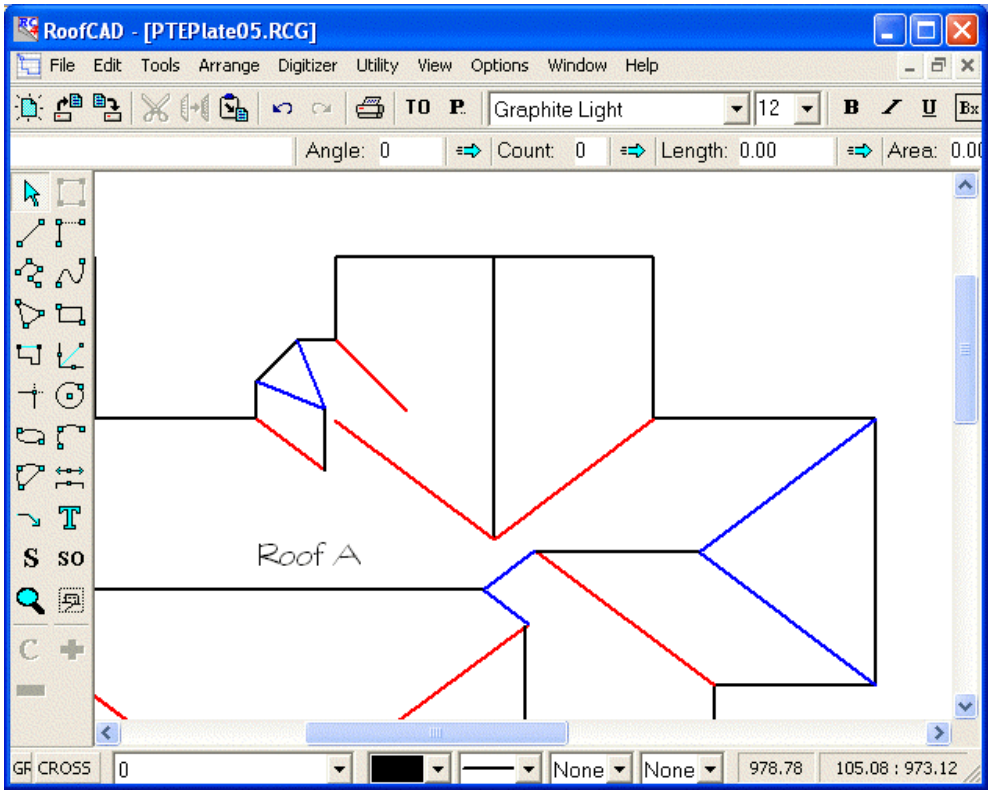
Now add the ridge.

Now zoom in on the upper right area of the roof. Select the valley highlighted in the next illustration:



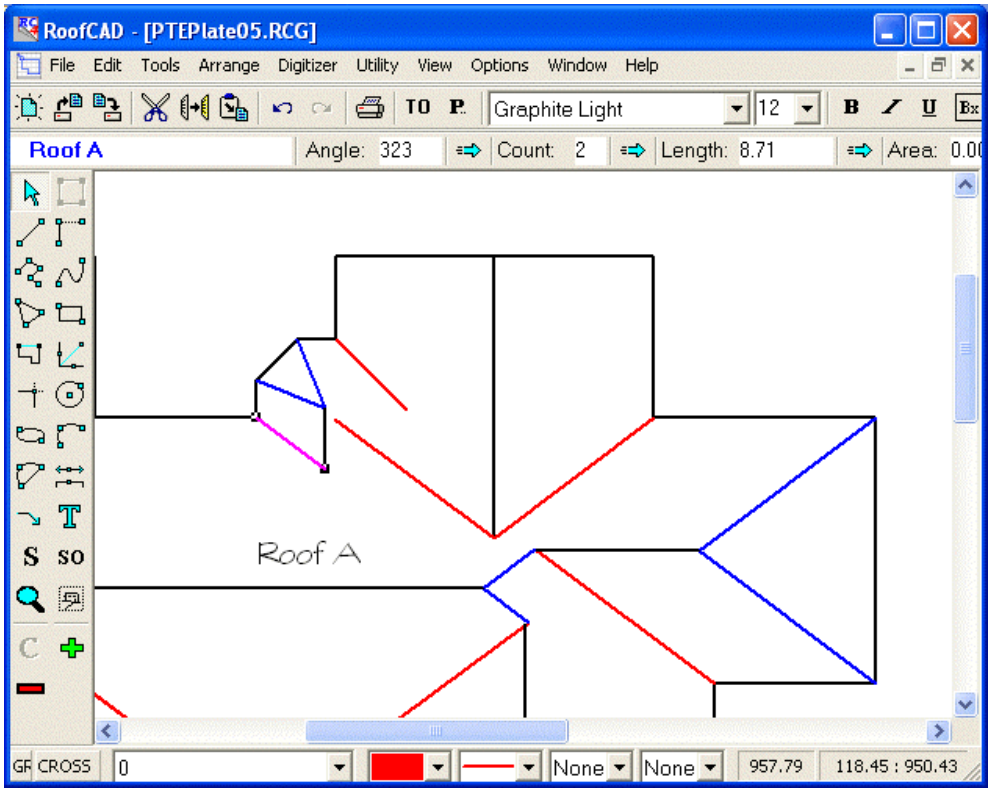
Zoom in and highlight this valley.

Click the Edit|Copy menu item, then Edit|Paste menu item, then click with the mouse on the other side of the ridge. Select the inserted copy of the valley, then click the Arrange|Flip Vertical menu item. Move the new valley into place so that the end just touches the point where the original valley and the ridge intersect, as the next illustration shows:



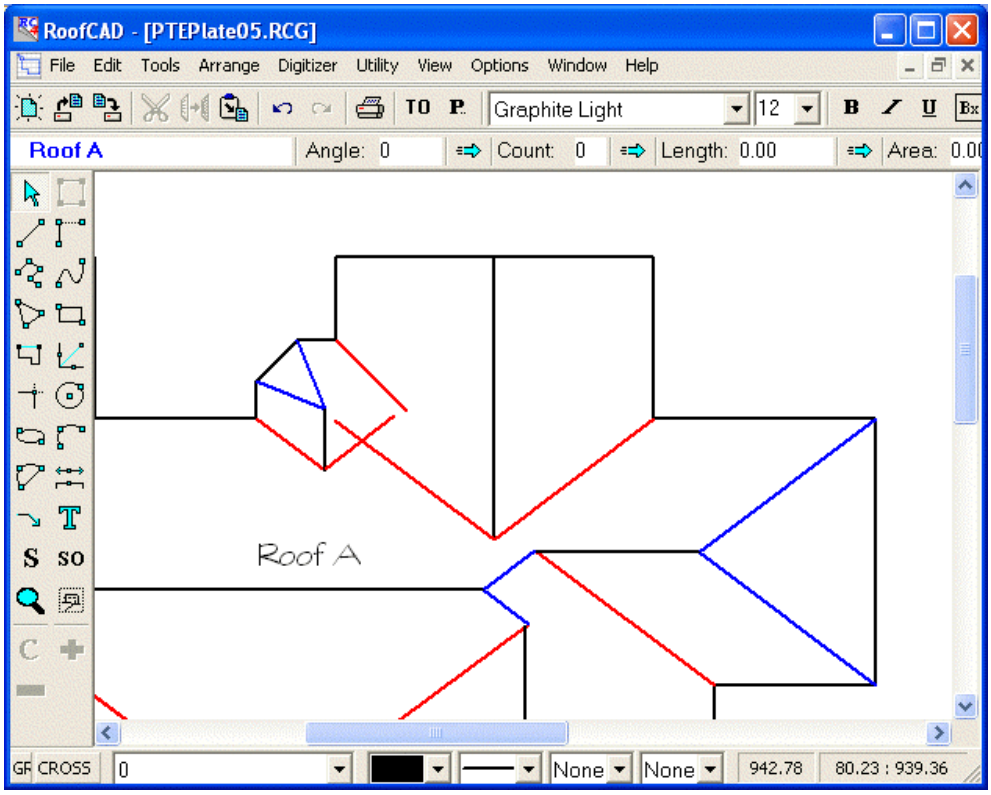
After Copy, Paste, and Arrange|Flip Vertical.

Now select the small valley you see highlighted next:



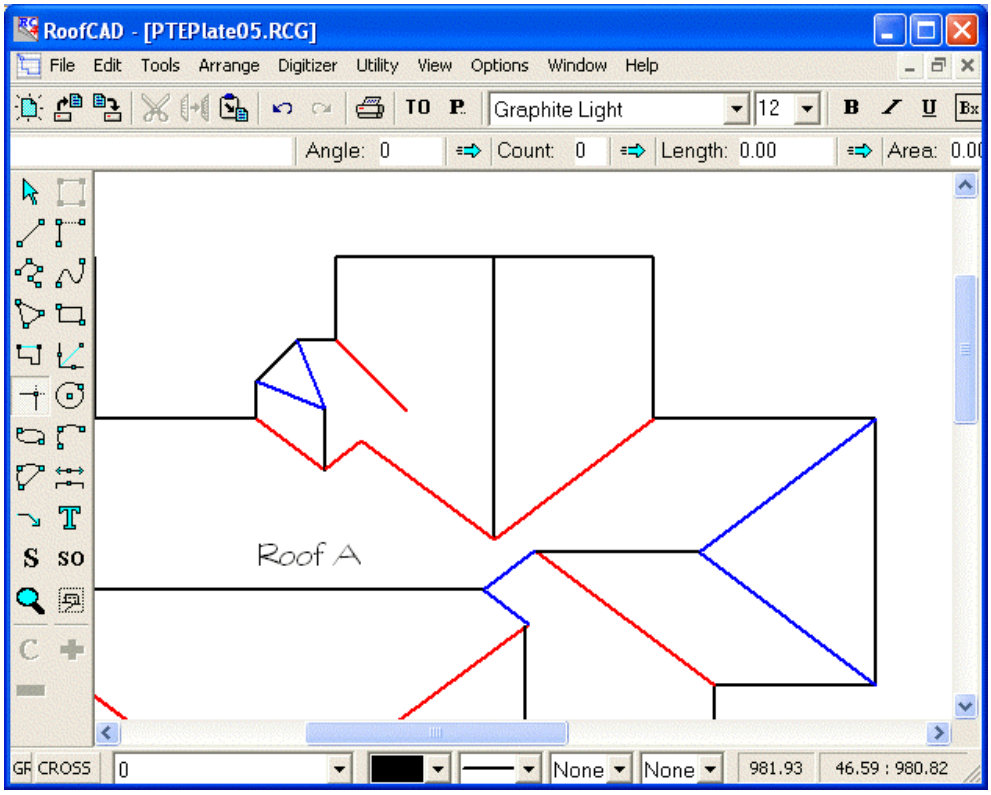
Highlight this valley.

Click Edit|Copy and Edit|Paste, then click on the page to insert the copy. Select the copy and click Arrange|Flip Vertical. Move the copied valley into place so that the end just touches the point where the original valley and ridge intersect, as the next illustration shows:



Once more, Copy, Paste, then Arrange|Flip Vertical.

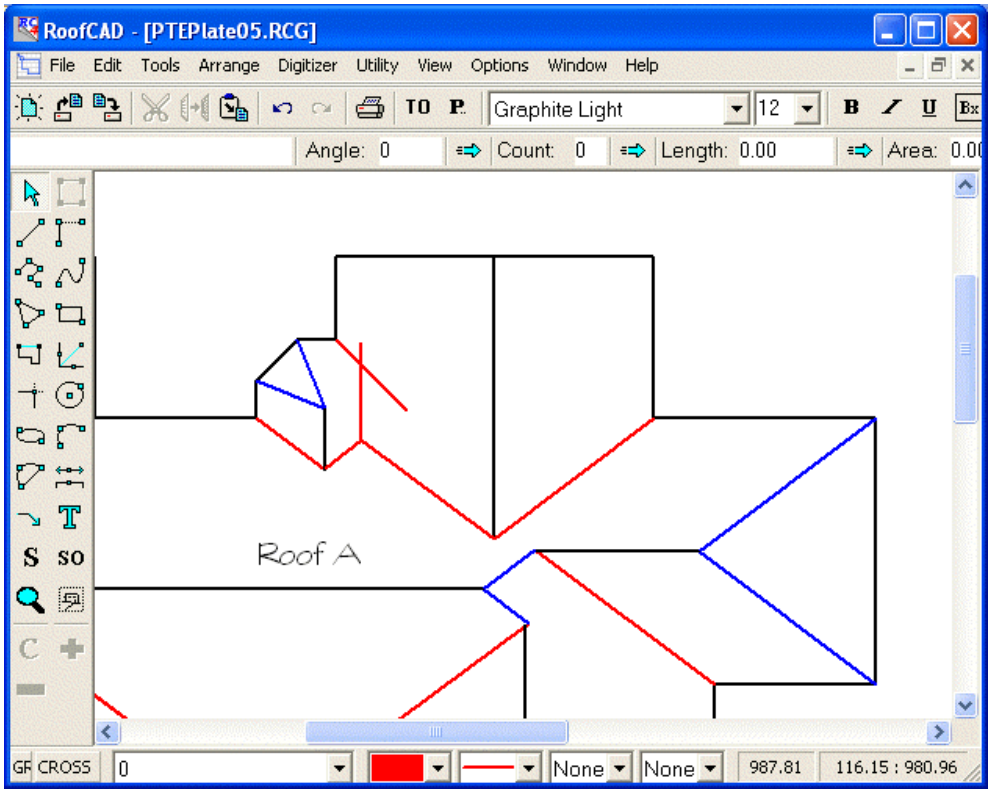
Now use the Trim tool to trim the two new valleys to their intersection point, as the next illustration shows:



After the Trim tool.

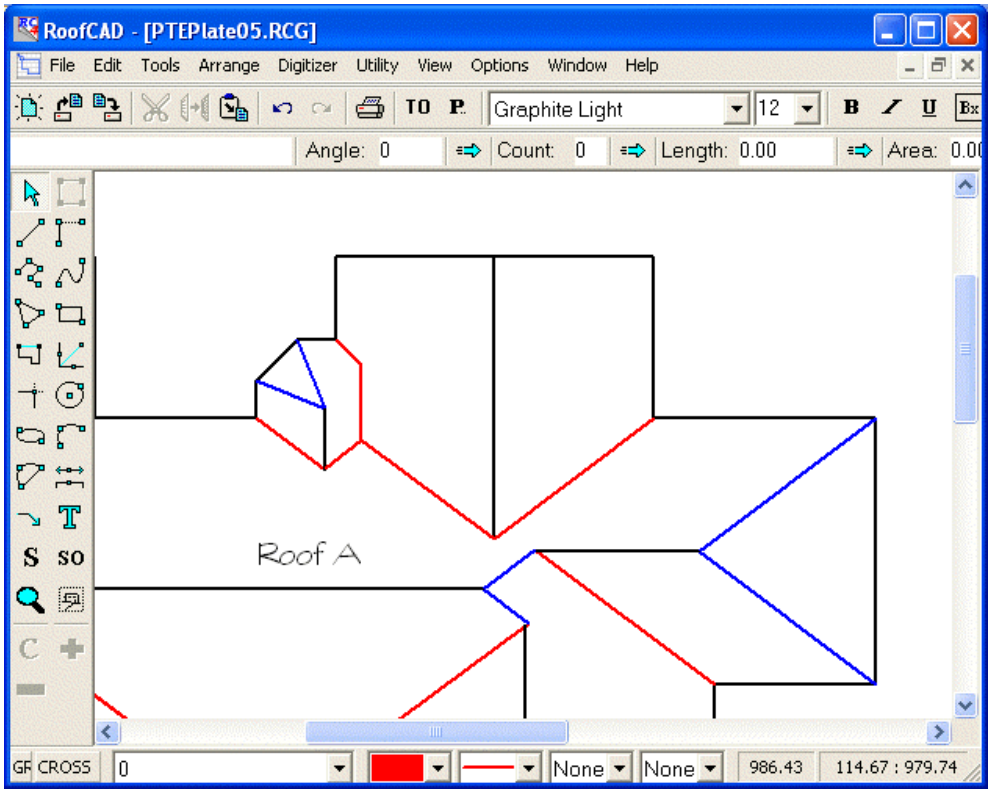
Now we will draw the valley that extends from the join of the two valleys we just trimmed. This valley is different from all the others in that it has no pitch. For this reason, we can draw it with a simple line tool. (Only the Hip/Valley tool can calculate a hip/valley pitch automatically). Choose the Valley Smart Object from the Browser. Change the Drawing Tool to Line. Press the "O" key to turn ortho mode on. Holding down the Ctrl key, click on the point where the two valleys join. Release the Ctrl key. Draw the line as the next illustration shows.

Press the "O" key to turn ortho mode off.



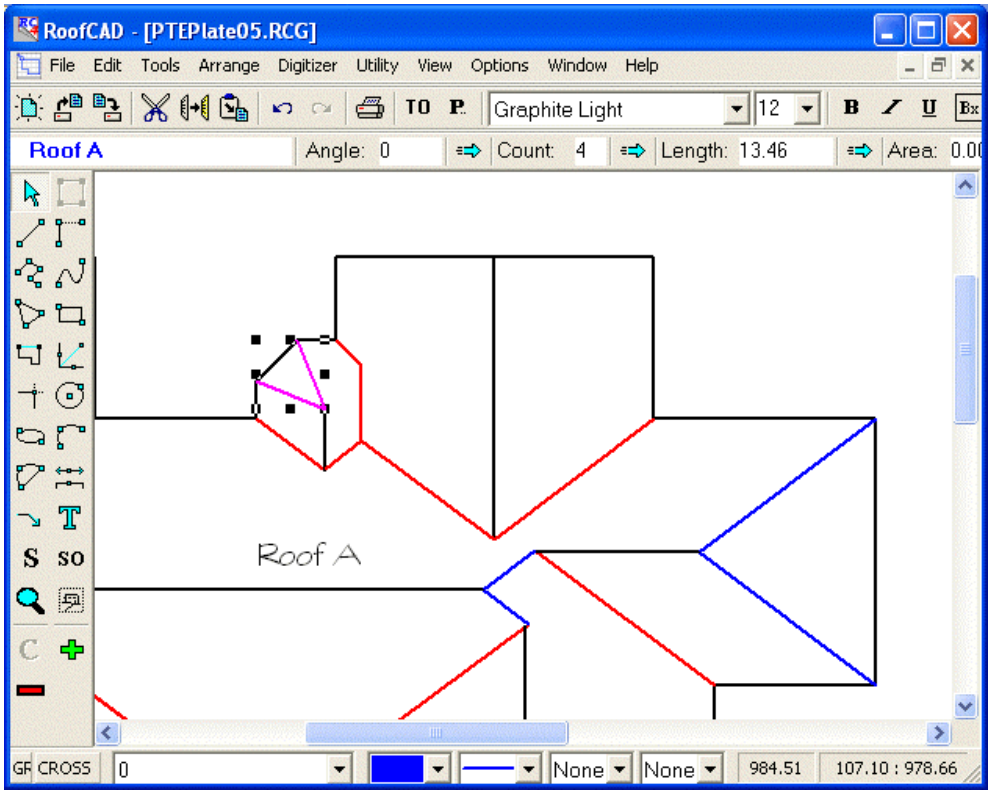
Draw this new valley.

Use the Trim tool to trim this valley to the one is intersects, as you see following:



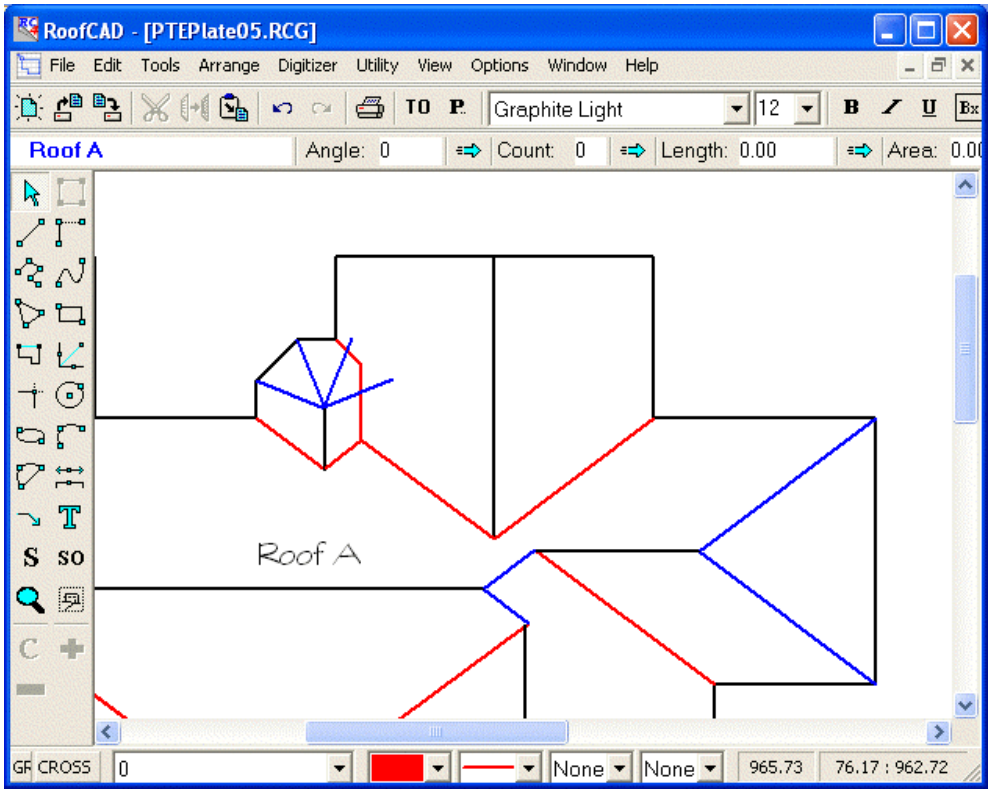
After trimming.

Drawing in the last two hips on the small octagonal roof section below requires a bit of geometrical deduction. We can calculate the angle between the two hips that are already drawn by dividing 360 degrees by the number of sides the roof would have if it went completely around: i.e. 8. This gives us an angle of 45 degrees. (We could also determine this by selecting each of the hips individually, viewing their angles in the Properties Dialog, and calculating the difference). Therefore, we must place two more hips at exactly 45-degree intervals. An easy way to do that in this case is to select the two hips highlighted below, click Edit|Copy and Edit|Paste, then click to insert the copies on the page.



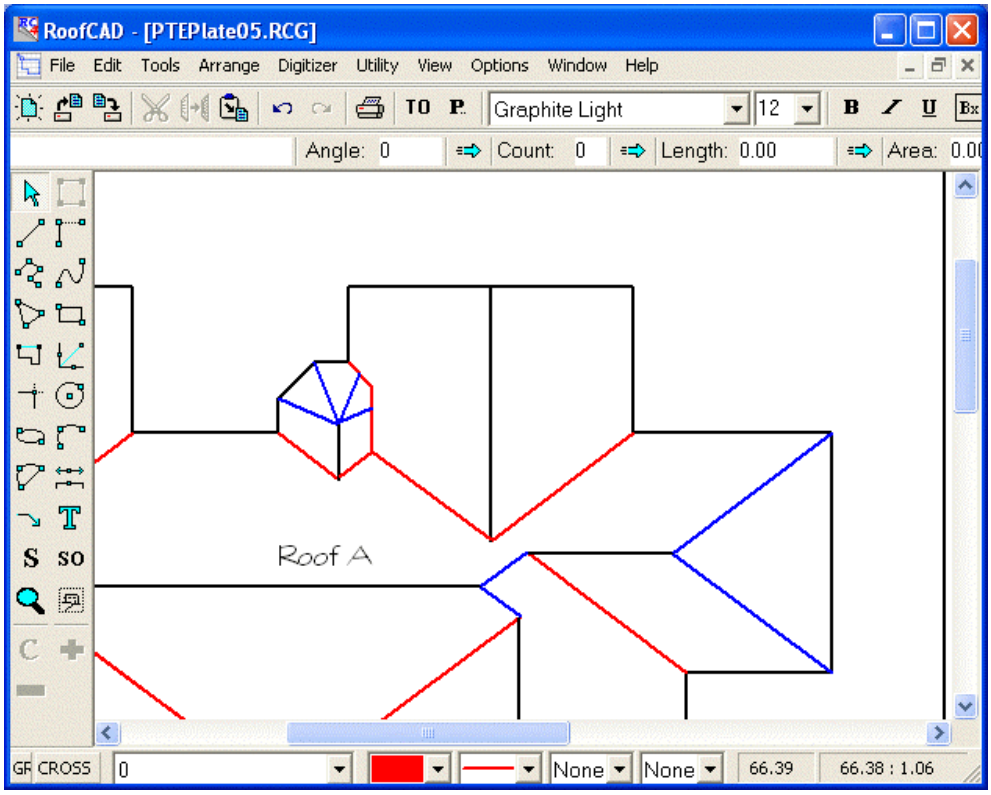
Select, copy, and paste. Then use Arrange|Rotate to help align them properly.

Select the copies and click the Arrange|Rotate 90 menu item 3 times. (This menu option rotates selected objects 90 degrees in a counter-clockwise direction. We want to go 90 degrees clockwise, so we must rotate 3 times to get there). Move the copied hips into position as shown in the next illustration:



Now you're drawing looks like this.

Use the Trim tool to trim the hips to the valleys they intersect. Since we don't want the valleys themselves trimmed, after you click the end of the hip to be trimmed click in the middle of the valley, not on the end. This will cause only the hip to be adjusted to the point where it intersects the valley. You drawing should now look like the next one here:



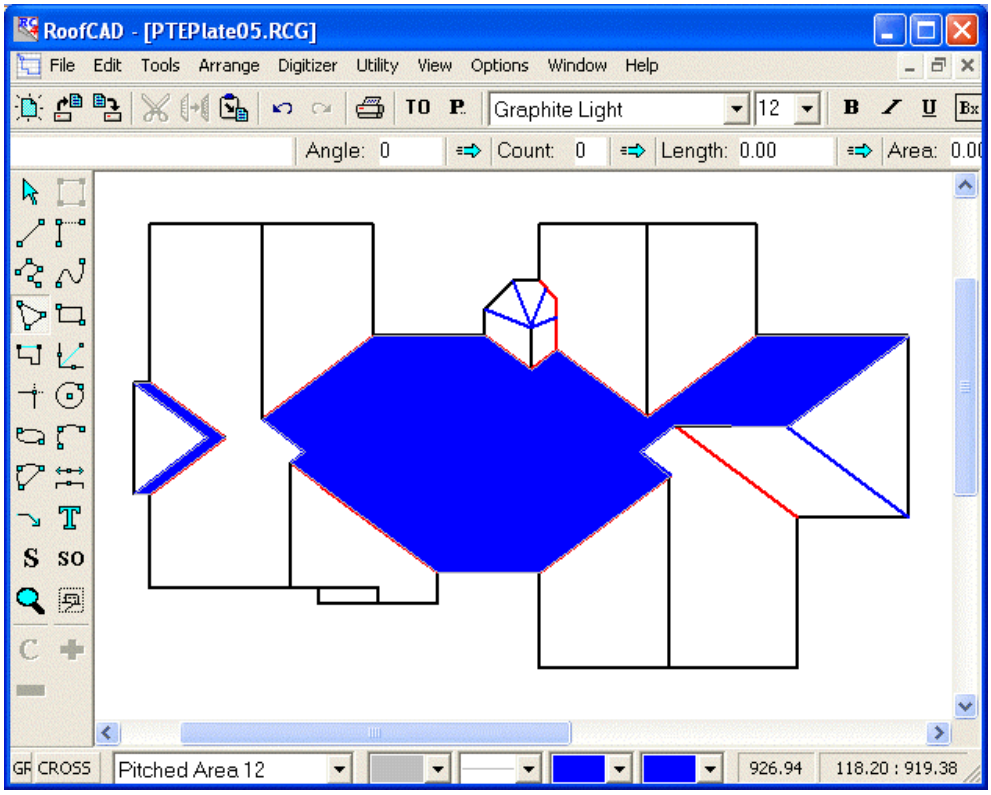
Nicely trimmed, and you're nearly done.

Now that all the hips, valleys, and ridges have been drawn in, we are ready to outline the pitched roof areas.

Tip:	**The following steps are necessary to produce a roof area on the Takeoff Record. If you are drawing the roof for visual presentation only, the drawing is now complete.**

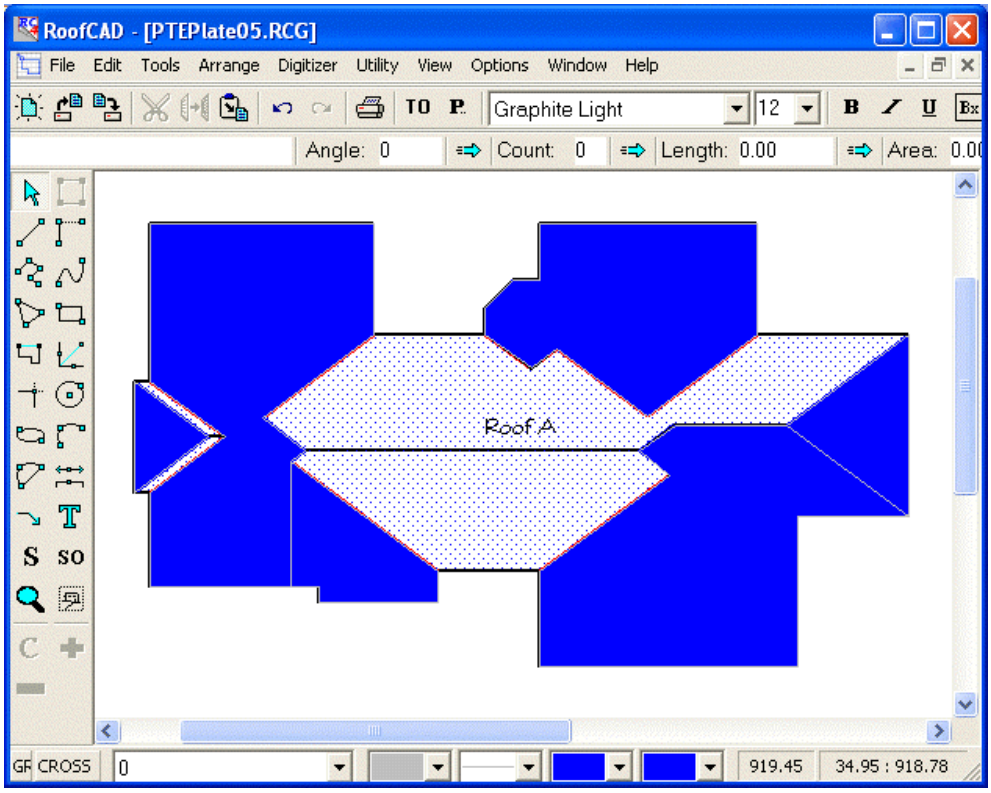
Choose the "Pitched Area" Smart Object from the Browser. Enter a pitch of 12, and change the Drawing Tool in the Browser to the Polygon Tool. Holding down the Ctrl key constantly, click on each of the corners of the blue shaded areas pictured below. When you have finished one area, right click to indicate to RoofCAD that you are finished before starting to outline the second area.

Tip:	**To do this part, you may want to zoom out or use the Fit to Window menu option.**



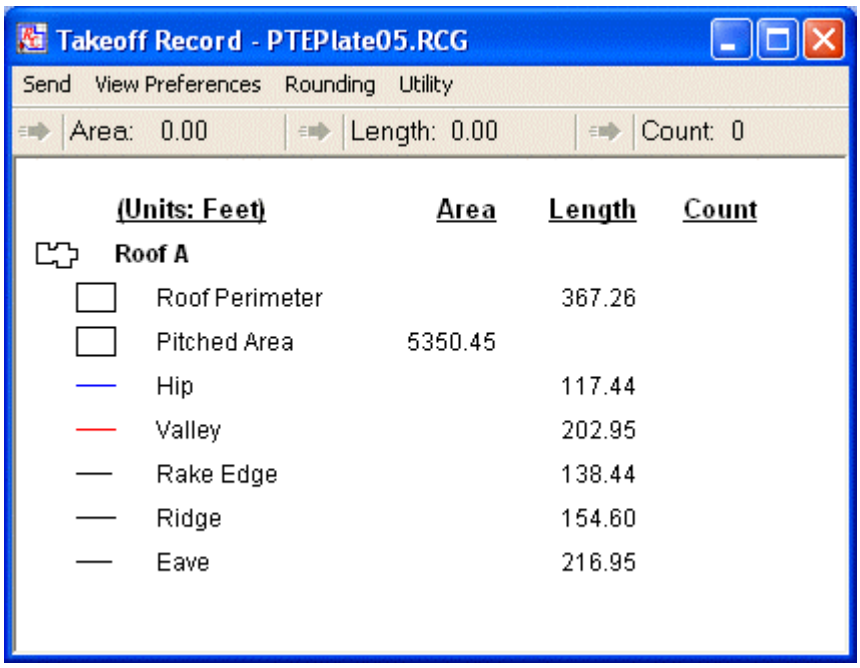
Outlining roof planes to finish off the Takeoff Record.

When you have outlined the two areas shown above, click again on the Pitched Roof Smart Object in the Browser, this time entering a Pitch of 9. Remember also to change the Drawing Tool to the Polygon Tool. (Clicking on the item in the Browser caused RoofCAD to change back to the default tool for this item). Holding down the Ctrl key throughout, click on each corner of the blue shaded areas below, right clicking between each area.



Now outline the areas pitched at 9/12.

Our drawing and Takeoff are now complete. Open your Takeoff Record. It should look like this:



(Units: Feet)	Area	Length	Count
Roof A			
Roof Perimeter		367.26	
Pitched Area	5350.45		
Hip		117.44	
Valley		202.95	
Rake Edge		138.44	
Ridge		154.60	
Eave		216.95	

The final result in the Takeoff Record.

This concludes the Expert Pitched Roof tutorial.

Section 30

Digitizing with RoofCAD—Basic

Basic Digitizing Skills with RoofCAD

This topic will teach you how to digitize with RoofCAD in the most basic way. This tutorial will produce a Takeoff Record of "Grand Total" quantities. This means that if you have a multi-roof building you will not get a breakout of quantities for each roof. All you will get is an accumulated total of all the roof quantities added together. It also means that if you have some metal roofing and some shingle roofing you will get just one total for pitched roofing with no breakout for each roof type. We suggest you start your learning with this tutorial then move on to the Advanced tutorial, which will show you how to get a breakout of quantities for each roof.

If you're going to digitize, you must have purchased the RoofCAD-Digitizer module which is an add-on to the basic RoofCAD module.

In this tutorial you will digitize a sample drawing that has both flat and pitched roofing. This tutorial assumes your digitizer is set up and working correctly. If you have not set up your digitizer yet, see Section 37, Digitizer Setup.

After starting RoofCAD:

Open the Digitizer Template

1. Choose File|Open from the menu. The open drawing window appears.
2. In the RoofCAD folder, click the file td8x14l.rcg. The file will now be highlighted.
3. Click Open. The digitizer template file appears.

This digitizer template is a special template. You will notice that there is no legend or title block displayed. The legend and title block actually are there but are temporarily hidden.

Setup for Digitizing

For this tutorial we have provided a sample drawing. The drawing is on the last page of this topic in the manual and is titled "Digitizer Tutorial Drawing". The drawing was also installed on your computer when you installed RoofCAD. If you can't find the drawing in your copy of this manual, just open it in RoofCAD and print it. The file is DIGTUTOR.RCG. You'll find it in RoofCAD\Tutorial Drawings.

1. Tape the "Digitizer Tutorial Drawing" on the digitizer. Make sure it is as square as possible with the digitizer i.e. the bottom of the page should be parallel with the bottom of the digitizer.
2. The first step to take when starting a new digitizer session is to define the work space. This simply tells RoofCAD where the roof is on the digitizer. Knowing this allows RoofCAD to center the roof nicely on the "on screen" page. Digitize "Define Workspace" on the digitizer menu. RoofCAD asks you to digitize the upper left corner of the workspace.

3. Digitize the "upper left bullet" on the drawing. On a real set of drawings there is no correct place to click, just as long as you are up and to the left of the uppermost left corner of the roof. RoofCAD now asks you to digitize the lower right corner of the workspace.
4. Digitize the "lower right bullet". Again where you click is really up to you just as long as the point is down and to the right of the lowermost right corner of the roof. RoofCAD can now orient your roof to fit nicely on your on-screen drawing area.

Hint: **What you are doing when you define the workspace is drawing an invisible rectangle by defining the upper left and lower right corners. If any portion of your roof is not within this rectangle you will not be able to digitize it, so it doesn't hurt to be a little generous with the size of this rectangle.**

Tip: **On a real set of drawings it is a good idea to mark the location of the two points. This allows you to re-orient the workspace if you need to come back and digitize more later.**

5. Digitize Set Scale on the digitizer menu.
6. You can enter your scale from the keyboard or the digitizer. A 1/8"=1' scale would be entered as 1/8. A 3/32"=1' scale is entered as 3/32. Our scale on the tutorial drawing is 1"=20' so on the digitizer menu Digitize 1 then / then 20.
7. Digitize the Enter option on the menu. The scale window closes and the scale is now set. If you need to check what the scale is just digitize the Set Scale option again.

Hint: **RoofCAD thinks of Imperial (English) scales in terms of 1" on the drawing being equal to so many inches 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 like the one on our sample drawing are easy because they pretty much always are expressed as** 1"= something**. For instructions on how to handle Metric scales and how to calibrate a scale, see Section 14, Digitizer Scale.**

How to Digitize a Flat Roof

This first section will show you how to handle a flat roof.

1. Digitize the Smart Object button on the digitizer menu. The Smart Object Browser opens.
2. Digitize the down arrow on the left side of the digitizer menu until the highlight bar is over the Flat Roof (Dig) option. (Dig) stands for digitizer. When digitizing always use the (Dig) smart objects, if you have a choice.
3. Digitize the Enter button on the menu. You are now ready to digitize the roof.

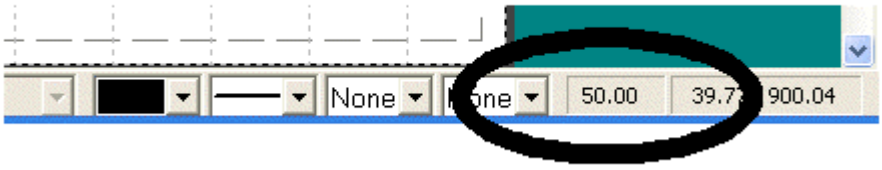
Now we will digitize Roof A and at the same time show you a few tricks.

1. Digitize corner A1 of Roof A. Your computer beeps once.

Hint: **If you cannot hear the beep turn up your computer speakers. If this does not work digitize the speaker symbol on the permanent menu on the digitizer (this is the glued on or painted on menu that has the number 0-9 on it). This will make the digitizer beep.**

---

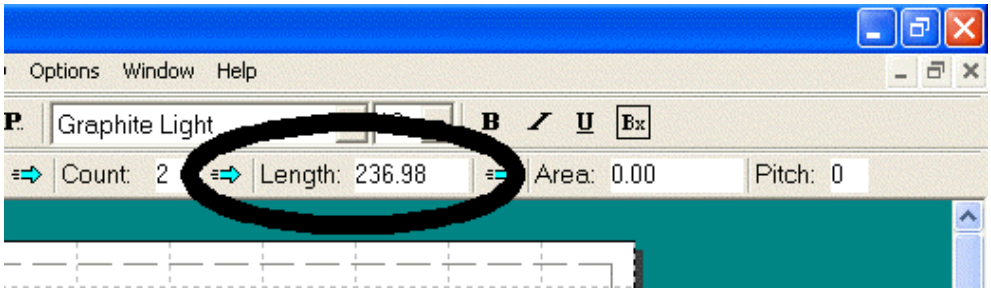
2. Digitize corner A2. Notice that the length of the line you digitized is displayed in the lower status bar, similar to where the number 50 is on the right hand side in the illustration you see here:



The line length is displayed in the status line shown here.

If yours does not say 50.00 exactly, don't worry about it. We will show you how to be more accurate at the end of this tutorial.

3. Digitize corner A3. Notice that the length cell in the top status bar displays the accumulated length of the roof outline. Note that this includes the line that joins corner A3 back to A1 (RoofCAD always closes the outline). So far we have an accumulated length of 236.98 feet like below:



Accumulated length is shown in the Object Info bar.

4. Now lets say you made a mistake. RoofCAD allows you to UNDO one or more lines. Digitize the Backspace option on the digitizer menu (or the keyboard). The A2-A3 line disappears.
5. Digitize the backspace option again. Notice that it does not remove the A1-A2 line. This is because it is the only remaining line. Digitize the Cancel Takeoff option and the line will disappear.

Hint:	**The Escape key on the keyboard will also cancel the takeoff.**

6. Now digitize every corner of Roof A once. The entire outline is now visible on screen.
7. Digitize the Finish Takeoff button on the menu. This completes the digitizing of the roof A outline.
8. Now digitize the corners of roof B and Digitize Finish Takeoff when done. You now have both flat roofs on screen.
9. Finally digitize the corners of the penthouse on roof B. After all, it, too, is a roof. When you have done this, digitize Finish Takeoff . Now all our roofs have been digitized and we are ready to go to the next step.

Hint:	**You may have lines on your roofs (on screen) that did not come out straight. There is a way to handle that called Ortho mode. To learn about Ortho mode see the Ortho Mode Tutorial at the end of this topic.**

How to Digitize a Roof Opening

There are two reasons to add a roof opening to a drawing.

- There is an open area, such as a courtyard, on the roof.
- There is another roof on top of the roof. We call this a "roof on roof" situation. Usually it is a penthouse but you can also have very large roofs stacked on top of each other.

In the roof on roof situation you have to "cut out" the area of the upper roof from the lower roof. If you don't, RoofCAD will assume you are roofing this

area and include the square footage on the takeoff record. This effectively doubles the area of the upper roof.

On our "Digitizer Tutorial Drawing" we have a courtyard on Roof A and a Penthouse on Roof B. First we will do the courtyard:

1. Digitize the Smart Objects button on the digitizer menu. The Smart Object Browser is now the active window.
2. Digitize the down arrow on the left side of the digitizer menu until the highlight bar is on Roof Opening (Dig).
3. Digitize the enter button on the menu. You are now ready to digitize the courtyard.
4. Digitize all corners of the courtyard once. The outline of the courtyard appears on screen.
5. Digitize the Finish Takeoff button on the menu. RoofCAD has now deducted the area of the opening from Roof A.

Now we will make the opening on Roof B.

1. Digitize all corners of the Penthouse once.
2. Digitize the Finish Takeoff button on the menu. RoofCAD has now deducted the area of the "cut out" from Roof B.

Notice that RoofCAD has placed the opening over top of the penthouse. The advanced digitizer tutorial will show you a cleaner way of dealing with this.

How to Digitize a Pitched Roof

Now we will digitize the pitched roofs. Remember this tutorial will not break out the metal roof and the shingle roof separately. Both roofs will collectively be referred to as pitched area on the Takeoff Record. The advanced digitizer tutorial will show you how to break out these roofs.

1. The key to drawing pitched roofs with RoofCAD is to draw the roof outline first. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until the "Pitched Roof" heading is highlighted. If the "Pitched Roof" heading is collapsed (i.e. you can't see any items underneath it), digitize the Enter option to expand the list. You should see "Roof Perimeter (Dig)" in the list of Pitched Roof items.
3. Digitize the down arrow until "Roof Perimeter (Dig)" is highlighted. Digitize the Enter option.
4. Digitize the four corners of the shingle roof.
5. Digitize the Finish Takeoff option on the menu. The shingle perimeter is complete.
6. Now digitize the four corners of the metal roof.
7. Digitize the Finish Takeoff option on the menu. The metal roof perimeter is complete.

Now that the perimeters are drawn we will digitize all of the different roof planes.

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow or up arrow until "Pitched Area (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties dialog appears.

   This window is prompting you for the pitch of the roof in the form of rise over run. The run of 12 is implied, so all you have to enter is the rise. Digitize 6 on the menu (as in 6/12).

   Digitize Enter and the window closes.

4. Now digitize the four corners of the shingle roof.
5. Digitize the Finish Takeoff option on the menu. The shingle roof plane is complete.
6. Now Digitize the three points that make up one of the 6/12 roof planes on the metal roof.

Digitize the Finish Takeoff option on the menu card.

Tip: **Pressing either barrel button on your stylus has the same effect as digitizing the Finish Takeoff option on the menu card. If you use this method, make sure your stylus is within 1 inch of your digitizer board or rollup.**

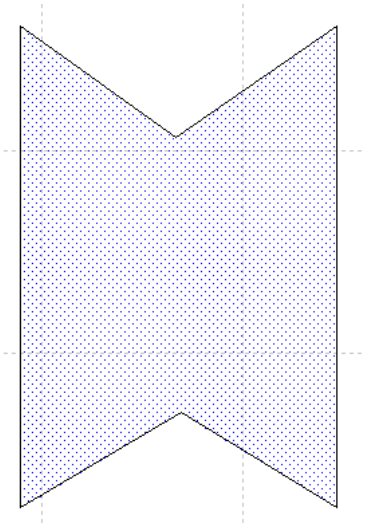
---

8. Next Digitize the three points that make up the other 6/12 roof plane on the metal roof.
9. Digitize the Finish Takeoff option on the menu.
10. Now digitize the dormer, which is also a 6/12 roof plane.
11. Digitize the Finish Takeoff option on the menu.
12. Now we need to change to a 4/12 pitch. Digitize the Smart Object option on the menu.
13. Digitize the Enter option. The Smart Object Properties window appears.

    Again we are prompted for a pitch. Digitize 4 on the menu (as in 4/12).

    Digitize Enter and the window closes.

14. Now we will digitize the 4/12 roof planes on the metal roof. Since they are joined you can do them both at once. This means you will end up digitizing a shape like the one below:



Digitize the 6 points that make up the 4/12 shape.

15. Digitize the Finish Takeoff option on the menu. The 4/12 metal roof planes are done.

The pitched roof areas are now taken off.

Handle Opening Under the Dormer

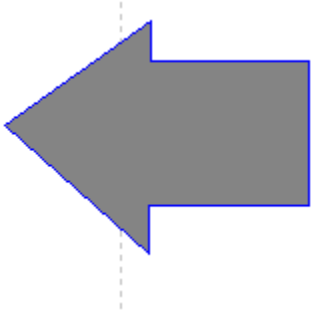
To take off a dormer properly we need to "cut out" the area underneath the dormer that will not be roofed.

1. Digitize the Smart Object option on the menu.
2. Digitize the up or down arrows until "Pitched Opening (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the pitch of the area to be "cut out". Since the opening is "cut out" of the 4/12 roof plane, digitize 4 on the menu.

   Digitize enter and the window closes.

4. Now digitize the "cut out" area which is shaded in gray on the drawing:



Note that the cut out shape is not the same as the dormer roof. This is because we don't cut out under the overhang of the dormer.

5. Digitize the Finish Takeoff option on the menu. The opening area has been deducted from the 4/12 roof plane.

Finish the Pitched Roof

Now we will finish the pitched roof off by adding hips, ridge, rake edge etc.

Hips

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Hip (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the pitch of the hip. Digitize 4 on the menu.

   Digitize enter and the window closes.

4. Now we will digitize the hips. Digitize the start and end point of each hip.

Rake Edge

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Rake Edge" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the rake edge pitch. Digitize 6 on the menu.

   Digitize enter and the window closes.

4. Now digitize the start and end point of each rake.

Ridge

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Ridge" is highlighted.
3. Digitize the Enter option.
4. Now digitize the start and end point of each ridge.

These three items are enough to give you the feel for how everything else (valleys, eaves etc.) are digitized. So we will not digitize everything in this tutorial.

Define Perimeter Walls

Now lets go back and define the perimeter walls of our flat roofs.

1. Digitize the Smart Objects option. This sets focus to the Smart Object Browser window.
2. Now digitize the down arrow on the menu (or page down) until you get to the Base Flashings heading. If this heading isn't expanded already, digitize the Enter option to expand it. Digitize the down arrow to highlight 24" Base Flashing. Digitize the Enter option on the menu.
3. Now we will digitize some walls on Roof A. Digitize corner A1 then corner A2 and finally A3.
4. Digitize the Finish Takeoff option on the menu card.
5. On Roof B digitize corner B1 then corner B2 and finally B3.
6. Digitize the Finish Takeoff option on the menu card.

The 24" Base Flashing has been added to your takeoff. Notice that you have to digitize finish before you can start on roof B. This tells RoofCAD to stop drawing a continuous line and allows you to start again from a new point.

Now lets add some gravel stop.

1. Digitize the Smart Objects option. This sets focus to the Smart Object Browser window.
2. Now Digitize the up arrow on the menu until you get to the Roof Edges heading. If this heading is collapsed, digitize the Enter option to expand it. Digitize the up or down arrows until you have highlighted Gravel Stop. Digitize the Enter option on the menu.
3. Digitize corner A1 then corner A7 and finally A6.
4. Digitize the Finish Takeoff option on the menu card.

We have now taken off the 24" base flashing and the gravel stop. We will stop defining walls at this point since they all work the same way.

Now lets check our Takeoff Record.

TO

Click the Takeoff Record button.

The Takeoff Record appears. Notice how it is broken out as Roof A and Roof B. This is not the view we want to see. The breakout may not be accurate because we have not taken the time to specify what belongs on each roof. This is what we will do in the advanced tutorial. It is EXTREMELY IMPORTANT that you do not rely on what you see in this view of the

takeoff record when digitizing as we have described in this tutorial. Instead we need to change to the Consolidated View:

1. Choose View Preferences|Consolidate from the Takeoff Record menu (not the RoofCAD menu). Now the Takeoff Record displays the consolidated totals of each Smart Object. This is the view you must use for this tutorial.
2. Close the Takeoff Record window.

How to Digitize Control/Expansion Joints

1. With the digitizer pen digitize on the Smart Objects option on the digitizer menu. This sets focus to the Smart Object Browser window.
2. Digitize the down arrow on the menu until you get to the "Control/Expansion Joints" heading. Expand it if necessary by digitizing Enter on the menu. Position the highlight bar on "Curb/Curb Exp Joint" and digitize the enter option on the menu.
3. We have two expansion joints on this drawing. Digitize one end point of the expansion joint on Roof A.
4. Digitize the other end of the expansion joint.
5. Now digitize the two end points of the expansion joint of Roof B.

Hint: **Digitizing expansion/control joints works different than digitizing walls because expansion joints are usually single segments rather than multiple segments. If you had an expansion joint that was made up of two continuous segments you would digitize the starting point of the first segment then the end point of the first segment. Next you would digitize the end point of the first segment again because it is also the first point of the second segment. Lastly you would digitize the second point of the second segment. Because RoofCAD is always expecting two points to be digitized you do not have to Finish Takeoff between separate expansion joints. Finish is done automatically after every second point.**

How to Digitize Curbs

1. With the digitizer pen digitize the Smart Objects option on the digitizer menu. This sets focus to the Smart Object Browser window.
2. Digitize the down arrow on the menu until you get to the Curbs & Sleepers heading. Expand it if you need to. Position the highlight bar on the Curb smart object and digitize the Enter option on the menu.
3. RoofCAD asks you for the length and width of the curb. We will do the curb on Roof B first. Its size is 6x6, although normally the size will not be marked and you will have to hand Scale the size off the drawing. Digitize 6 on the menu card. The 6 is now visible in the Length box.
4. Digitize the down arrow on the digitizer menu. Your cursor will now be in the width field.

5 Digitize the 6 again. The 6 appears in the width box. Notice the Height box. This is for the height of membrane required (in feet). You can change this as well if you wish.
6. Digitize the enter option on the menu. The input window disappears.
7. Digitize the pen once in the middle of the curb on Roof B. The curb appears on the drawing.

If you had more 6x6 curbs you would now digitize once in the center of each one. To digitize a curb of another size you would repeat the above process but use different length and width numbers.

The above method works well when you have a lot of curbs of the same size. If, however, you have many different sized curbs there is another method. We will demonstrate this now with the curb on Roof A.

1. With the mouse, click on the "Drawing Tool" box on the Smart Object Browser. A list drops down.
2. Click on "Rectangle Tool". RoofCAD is now ready to digitize curbs with the Rectangle Tool.
3. Digitize the upper left corner of the curb on Roof A.
4. Digitize the lower right corner of the curb. The curb appears on the screen.

Notice that we did not have to enter the curb size. The trade off is that RoofCAD does not place the nice curb symbol on the drawing.

The same two techniques apply for the other curb type objects; hatches, chimneys and skylights.

How to Digitize Count Items

Count items are things such as vents, drains, scuppers etc.

1. With the digitizer pen digitize the Smart Objects option on the digitizer menu.
2. Digitize the down arrow on the menu until you get to the Roof Penetrations heading and expand it to see a list of items underneath. Position the highlight bar on the Plumbing Stack and digitize the enter option on the menu.
3. Now digitize each of the plumbing stacks on the drawing (indicated with a small red circle).
4. We are done digitizing so close the Smart Object Browser now.

Drains, scuppers and all of the other count type items work the same way.

Check your Takeoff Record

We have now added all the standard items you need to digitize. Lets see how our takeoff record looks now.

TO

Click the Takeoff Record button.

1. Click the Takeoff Record button. The Takeoff Record appears. Notice how everything you digitized has been totaled nicely ready for estimating.
2. Close the Takeoff Record window.

Complete Your Drawing

There a few final steps that are optional to completing your drawing.

1. With the mouse, choose Options|Drawing Settings from the RoofCAD menu. The Current Drawing Settings window appears.
2. Change the Paper Size from "Letter - 11x8-1/2" to "Legal - 14x8-1/2" and click OK. The page size on screen is now bigger. The bigger page size will accommodate the legend.
3. Choose Options|Arrange|Layers from the RoofCAD menu. The Layers window appears
4. Click "$Format". The $Format layer is where the legend, north indicator and title block are. The title block is where you enter the project information.
5. Click the Visible check box. A checkmark appears.
6. Click on the 0 (zero) layer and close the layers window by clicking the small box in the upper left corner of the layers window.

How to Save Your Drawing

This tutorial started out by loading a template. It is very important that you do not save over a template or you will lose your template (it will no longer be empty when you load it). Although we provide a backup of each template with RoofCAD it is better to avoid this problem.

To avoid saving over a template you need to use the Save As option rather than the Save option. Once you have used Save As, the drawing will be renamed and it is safe to use the Save option without losing your template.

1. From the RoofCAD menu choose File|Save As. The Save As window appears.
2. The current name of the drawing will be displayed (the template name). Type the name you will use for the drawing.
3. Click OK. RoofCAD saves the drawing to the new name.

How to Print the Drawing & Takeoff Record

1. Choose File|Print|Print Drawing from the Roof CAD window. The Print window appears.
2. Click OK or Print in the dialog box for your printer. The drawing will now be printed.

3. Once the drawing has printed choose File|Print|Print Takeoff Record from the Roof CAD window. The Print window appears.
4. Click OK or Print in the dialog box for your printer.

Special Instructions

Drawing Arcs

There is an arc tool available in RoofCAD but not if you only have a RoofCAD-Digitizer license. To use the Arc tool you must have a RoofCAD license. If you have a RoofCAD-Digitizer license only, you can still draw arcs by drawing several short segments. If you have a RoofCAD license below are the instructions for using the Arc tool.

A full explanation of how to draw arcs with the Layout Wizard can be found in Section 16, The Layout Wizard. When you encounter arcs while digitizing there are steps you must follow. But first read up on how to handle arcs with the layout wizard and then come back to this section.

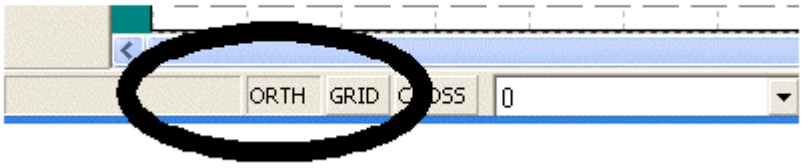
How to Handle Arcs When Digitizing:

Handling arcs when digitizing is a two-part process. You don't actually draw the arc until after you have finished digitizing the roof outline. You add the arc by editing the digitized roof outline with the Layout Wizard.

1. Digitize the roof outline. When you come to an arc digitize the two points that make up the baseline as if there was a straight wall there and not an arc.
2. After you have finished the outline use the pointer tool to select the roof outline.
3. Choose Tools|Special|Layout Wizard or click on the Layout Wizard Button.. The Layout Wizard Appears. Now form the arc as per the instructions in the topic Layout Wizard.

How to Use Ortho Mode

Ortho mode forces the lines you digitize to run at 90 or 45 degree angles (or what ever angle you set in the Drawing Settings window, 90 and 45 are the default). In other words they will be straight. If the line you are about to digitize is not a 90 or 45 degree line you need to turn Ortho mode off. If the line is a 90 or 45, you should turn Ortho mode on. Ortho mode is turned off and on with the "O" key on your keyboard. So you can turn it on and off as you digitize each line of your roof. When Ortho mode is on, the ORTH button on the status line looks “pressed in” or in its down position. When Ortho mode is off the ORTH button will be unpressed, or in its up position.



In the Pressed or down position, Ortho mode is ON.

Using the "Digitizer Tutorial Drawing" follow these steps to learn how to use Ortho mode.

1. Put the "Digitizer Tutorial Drawing" on the digitizer.
2. Start a new drawing. Define the workspace and set the scale.
3. Press the "O" key on your keyboard. The ORTH button on the status line at the bottom of your screen will look down, or "pressed in".

   If it is not, press the "O" key again. When the button is in the down position, Ortho mode is on. Now all your lines will be forced to 90 or 45 degree angles (unless you have changed the ortho angle to something other than 45 degrees).
4. Now digitize the first 5 corners of Roof A. The lines will be nice and straight and the 45 degree wall will run at exactly 45 degrees.
5. The next wall is 23 degree wall, so we do not want Ortho mode on. Press the "O" key on the keyboard. The button will change to the up position meaning ortho mode is now off.
6. Digitize corner 6.
7. Press the "O" key on the keyboard. Ortho mode is now on.
8. Digitize corner 7.

Warning: **Obviously you have to be very careful that Ortho mode is not on when digitizing a wall that is not a 90 or 45 degree wall. In fact you may want to only use Ortho mode on horizontal and vertical lines (90 degree) just to be safe.**

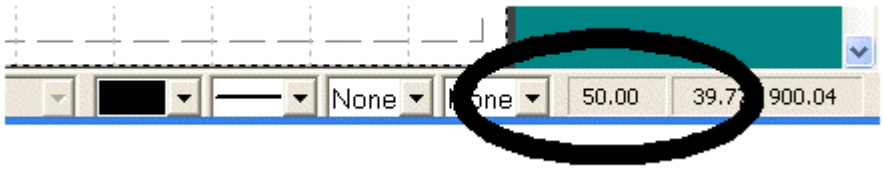
This concludes the Ortho mode tutorial.

How to use Length Snap

Length snap will make all your digitized line come out to whole numbers. It does this by snapping (rounding) the line to the nearest whole number. Using the "Digitizer Tutorial Drawing" follow these steps to learn how to use the length snap feature.

1. Put the "Digitizer Tutorial Drawing" on the digitizer.
2. Start a new drawing. Define the workspace and set the scale.

3. With the mouse choose Options | Drawing Settings. The Current Drawing Settings window opens.
4. Put a check mark on the "Length Snap" option (if there is not one there already) and be sure it is set to 12".
5. Click OK and the Drawing Settings window disappears.
6. Select "Flat Roof (Digitizer)" from the Smart Object menu.
7. Digitize the first 2 corners of Roof A. Now look at the new "Length Readout" box on the bottom status bar (beside the X,Y readout):



Length Snap rounds out your measurements.

If you digitized it like we did, your readout will be "50.00". If its not, don't worry. The point here is that whatever you digitized was rounded to a whole number i.e. only zeros after the decimal. If you like to see "clean" numbers like this, then you will want to have length rounding on by default on your digitizer template. To do so, open your digitizer template, check the "Length Snap" box in the Drawing Settings window as we did above and save the template.

Tip:	**It may be mathematical impossible for RoofCAD to round the last line of a roof outline. This is because RoofCAD has to close the shape and to do so the line length may not come to a whole number.**

This completes the length snap tutorial.

Section 31

Digitizing with RoofCAD—Advanced

Advanced Digitizing Skills with RoofCAD

This is the advanced digitizer tutorial. It differs from the basic tutorial in that this tutorial will break each roof out on the Takeoff Record. To make sure everything gets allocated to the correct roof requires some extra effort. RoofCAD does most of the work but there are things that need your supervision or they could end up allocated to the wrong roof. The main things you have to be careful with are things like perimeter wall flashings and scuppers because they are placed so close to the edge of the roof. By nature, digitizing is a bit "sloppy" as anyone who has digitized will tell you. So the danger is that when placing objects like these you may miss the roof (if even just slightly). The result can be a base flashing applied to the wrong roof or applied to no roof at all. RoofCAD has the tools to make sure everything gets allocated correctly and even to fix things that got allocated to the wrong roof. This tutorial will show you these tools and several other tips and tricks.

This topic assumes you have completed Section 30, Digitizing with RoofCAD--Basic. If you are new to digitizing with RoofCAD, do that tutorial first.

After starting RoofCAD:

Open the Digitizer Template

1. Choose File|Open from the menu. The open drawing window appears.
2. Click the file td8x14l.rcg. The file will now be highlighted.
3. Click OK. The digitizer template file appears.

This digitizer template is a special template. You will notice that there is no legend or title block displayed. The legend and title block actually are there but are temporarily hidden.

Setup for Digitizing

For this tutorial we have provided a sample drawing. The drawing is on the last page of this topic in the manual and is titled "Digitizer Tutorial Drawing". The drawing was also installed on your computer when you installed RoofCAD. If you can't find the drawing in your copy of this manual, just open it in RoofCAD and print it. The file is DIGTUTOR.RCG. You'll find it in RoofCAD\Tutorial Drawings.

1. Tape the "Digitizer Tutorial Drawing" on the digitizer. Make sure it is as square as possible with the digitizer i.e. the bottom of the page should be parallel with the bottom of the digitizer.
2. The first step to take when starting a new digitizer session is to define the work space. This simply tells RoofCAD where the roof is on the digitizer. Knowing this allows RoofCAD to center the roof nicely on the "on screen" page. Digitize "Define Workspace" on the digitizer menu. RoofCAD asks you to digitize the upper left corner of the workspace.

3. Digitize the "upper left bullet" on the drawing. On a real set of drawings there is no correct place to click, just as long as you are up and to the left of the uppermost left corner of the roof. RoofCAD now asks you to digitize the lower right corner of the workspace.
4. Digitize the "lower right bullet". Again where you click is really up to you just as long as the point is down and to the right of the lowermost right corner of the roof. RoofCAD can now orient your roof to fit nicely on your on-screen drawing area.

Hint: **What you are doing when you define the workspace is drawing an invisible rectangle by defining the upper left and lower right corners. If any portion of your roof is not within this rectangle you will not be able to digitize it, so it doesn't hurt to be a little generous with the size of this rectangle.**

Tip: **On a real set of drawings it is a good idea to mark the location of the two points. This allows you to re-orient the workspace if you need to come back and digitize more later.**

5. Digitize Set Scale on the digitizer menu.
6. You can enter your scale from the keyboard or the digitizer. A 1/8"=1' scale would be entered as 1/8. A 3/32"=1' scale is entered as 3/32. Our scale on the tutorial drawing is 1"=20' so on the digitizer menu Digitize 1 then / then 20.
7. Digitize the Enter option on the menu. The scale window closes and the scale is now set. If you need to check what the scale is just digitize the Set Scale option again.

Hint: **RoofCAD thinks of Imperial (English) scales in terms of 1" on the drawing being equal to so many inches 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 like the one on our sample drawing are easy because they pretty much always are expressed as** 1"= something**. For instructions on how to handle Metric scales and how to calibrate a scale, see Section 14, Digitizer Scale.**

How to Digitize a Flat Roof

This first section will show you how to handle a flat roof.

You should do this part of the tutorial even if you only do pitched roofs because it contains some tricks that apply to pitched roofing as well.

1. Digitize the Smart Objects button on the digitizer menu. The Smart Object Browser window appears.
2. Digitize the down arrow on the left side of the digitizer menu until the highlight bar is over the Flat Roof (Dig) option. (Dig) stands for digitizer. When digitizing always use the (Dig) smart objects, if you have a choice.
3. Digitize the enter button on the menu. You are now ready to digitize the roof.
4. Digitize all the corners of roof A once. Do not digitize the first point twice, RoofCAD will close the outline for you. The roof outline will appear on screen as you digitize.
5. Digitize the Finish Takeoff button on the menu. This completes the digitizing of the roof A outline.
6. Now digitize the corners of roof B and Digitize Finish Takeoff when done. You now have both flat roofs on screen.
7. Finally digitize the corners of the penthouse on roof B. After all it too is a roof. When you have done this, digitize Finish Takeoff. Now all our roofs have been digitized and we are ready to go to the next step.

How to Digitize a Roof Opening

Just like drawing a roof manually with RoofCAD there are two reasons to add a roof opening to a drawing.

- There is an open area, like a courtyard on the roof.
- There is another roof on top of the roof. We call this a roof on roof situation. Usually it is a penthouse but you can also have very large roofs stacked on top of each other.

In the roof on roof situation you have to "cut out" the area of the upper roof from the lower roof. If you don't, RoofCAD will assume you are roofing this area and include the square footage on the takeoff record. This effectively doubles the area of the upper roof.

On our "Digitizer Tutorial Drawing" we have a courtyard on Roof A and a Penthouse on Roof B. First we will do the courtyard:

1. Digitize the Smart Objects button on the digitizer menu. The Smart Object Browser is now the active window.
2. Digitize the down arrow on the left side of the digitizer menu until the highlight bar is on Roof Opening (Dig).
3. Digitize the enter button on the menu. You are now ready to digitize the courtyard.

4. Digitize all corners of the courtyard once. The outline of the courtyard appears on screen.
5. Digitize the Finish Takeoff button on the menu. RoofCAD has now deducted the area of the opening from Roof A.

Now we will make the opening on Roof B. This will deduct the area that is under the penthouse, from Roof B's area. We will now show you a more refined technique for handling this type of opening than you learned in the basic digitizer tutorial. Unlike the courtyard, for this opening, there is already an outline in place, that being the penthouse. Since an outline is there already we can use the outline and not have to draw the opening. This method means switching to the mouse for a second:

Use the Pointer tool.

1. With the mouse click the Pointer tool. Now select the penthouse outline by clicking the tip of the arrow just off one of the penthouse walls. Do not click directly on a wall or you will select only that wall. If you did this correctly all the walls of the penthouse will now be magenta in color. If you only got one wall selected, right click to deselect and try again.
2. Now, in the Smart Object Browser click Roof Opening (Dig). RoofCAD now knows that the outline is not only the penthouse roof but it is also an opening. The area of the opening has now been deducted from Roof B.
3. Press Esc. The Penthouse is now deselected.

As you can see there are two ways to add an opening. In the case of the courtyard you had no choice but to digitize it because there wasn't an existing outline to work with. In the case of the penthouse you could handle it the way we did or you could digitize it. It's your choice. The way we showed you makes a cleaner drawing and will be slightly more accurate.

Define Perimeter Walls

Now that our roofs and openings are done we will now define the perimeter walls. If you want a roof-by-roof breakout on the Takeoff Record, perimeter walls are one of the things you have to manually force onto each roof. RoofCAD allocates most objects automatically to the proper roof but when you digitize a perimeter wall flashing there is a chance you will miss the roof i.e. inadvertently digitize outside of the roof outline. (Something as simple as the drawing shifting on the digitizer can cause this). To be sure about roof assignments, you must override RoofCAD's automatic allocation. There are two ways to do this:

- Tell RoofCAD what roof you want the flashing on then digitize it.
- Select the walls with the mouse, then choose the flashings you want on that wall in the Smart Object Browser. If you are used to drawing with

regular RoofCAD, you already know this technique. We prefer this method because it makes a cleaner drawing and it eliminates a lot of potential error.

We will show you both methods to illustrate the benefits and pitfalls. First we will show you method "a" where you will re-digitize the walls.

Method A

1. Digitize the Smart Objects option. This sets focus to the Smart Object Browser window.
2. Digitize the Backspace option on the menu until the Current Roof box (at the bottom of the Smart Object Browser) has Roof A in it. If you miss Roof A, keep digitizing the Backspace option until it comes up again. The Smart Object Browser will look like this:

The Smart Object Browser.

This step takes RoofCAD out of automatic allocation mode and tells it that what you are about to digitize belongs to Roof A.

3. Now digitize the down arrow on the menu (or page down) until you get to the Base Flashings heading. Digitize Enter to expand the Base Flashings list if you need to. Position the highlight bar on 24" Base Flashing. Digitize the enter option on the menu.
4. Now we will digitize some walls on Roof A. Digitize corner A1 then corner A2 and finally A3.
5. Digitize the Finish Takeoff option on the menu card.
6. Digitize the Smart Objects option. This sets focus back to the Smart Object Browser window.

Warning: **The danger with this method is that you will forget to change current roof to the next roof. If you forget to do so, everything you digitize will get allocated to Roof A. So Digitize the Backspace option on the menu until the Current Roof box (at the bottom of the Smart Object Browser) has Roof B in it.**

7. Digitize the enter option on the menu. We are now ready to digitize the 24" Base Flashing on Roof B.
8. On Roof B Digitize corner B1 then corner B2 and finally B3.
9. Digitize the Finish Takeoff option on the menu card.
10. Now for the most important step. You must set RoofCAD back to automatic allocation mode. If you don't everything you digitize from now on will get allocated to Roof B. To set RoofCAD back to automatic allocation mode, digitize Smart Objects on the menu.
11. Now digitize the Backspace option until Current Roof is set to <Auto>.

The 24" Base Flashing has been assigned to Roof A and Roof B because you set Current Roof to Roof A then Roof B.

Method B

Now we will demonstrate method "B". If you are used to drawing with regular RoofCAD, you already know this technique. We prefer this method because it makes a cleaner drawing and it eliminates a lot of potential error.

With this method you override RoofCAD's automatic allocation mode by selecting the lines of the roof with the mouse then click the Smart Object you want on those walls.

You'll be using the Pointer tool.

1. With the mouse click the Pointer tool.
2. Now we will select the walls that are to be designated as gravel stop. Click the tip of the mouse pointer on the 123' wall that joins corners A1 and A7 on Roof A. The wall will become selected (it turns magenta in color).

3. Using your mouse, expand Roof Edges. To expand a heading, click the plus sign (+) beside the heading. Click Gravel Stop once. Wall A1-A7 is now a Gravel Stop.

   That is how you designate one wall. However, if you have multiple walls that need to be assigned as gravel stop, RoofCAD will allow you to make all the assignments at once. All you have to do is select all the walls first.

4. First we must deselect wall A1-A7. Press Esc. The wall is now deselected (black in color).
5. Click the tip of the mouse pointer on Roof A's wall A6-A7. The wall becomes selected.
6. Now click on wall A5-A6, then click on wall A4-A5. If you did this correctly all three walls will be selected. If you made a mistake, press Esc and try again.

We will now select one more wall.

The wall we want is the Roof B wall B1-B4, which is the wall that joins Roof A and Roof B. This wall presents a problem that you must know how to overcome. The problem is that this wall and Roof A's wall A2-A3 are one on top of the other. So if you were to click your mouse on the wall there is a 50-50 chance you will get the Roof A wall instead. This is a problem anytime you have a line on a line. RoofCAD gives you an easy way around this:

In the Smart Object Browser click "Current Roof". You see a list of choices.

Click Roof B in the list. "Roof B" is now displayed in the Current Roof box. Doing this puts RoofCAD into a mode where only Roof B walls can be selected.

Now click the tip of the mouse pointer on wall B1-B4. The wall becomes selected.

On the Smart Object Browser click on the "Current Roof" box.

Click on <Auto>. "<Auto>" is now displayed in the Current Roof box.

Auto is RoofCAD's normal mode. In this mode RoofCAD automatically determines which roof a Smart Object will be added to.

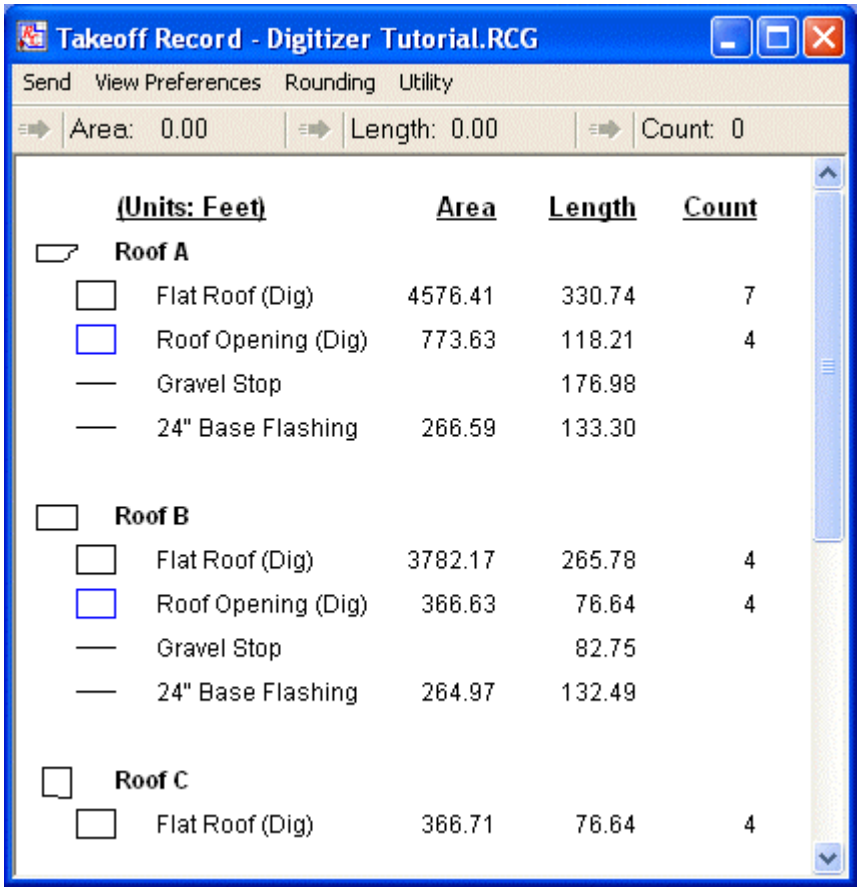
Warning: **You must switch Current Roof back to <Auto> before clicking Gravel Stop or all of the gravel stop will be assigned to Roof B even though some of it belongs on Roof A.**

7. Now we have four walls selected, 3 from Roof A and 1 from Roof B, all of which need to be assigned gravel stop. Click Gravel Stop in the Smart Object Browser. The walls have now been designated as gravel stop.
8. Press Esc. The walls are now deselected.

TO

You're going to use the Takeoff Record button.

Click on the Takeoff Record button. The Takeoff Record appears and looks like this:



The Takeoff Record looks like this.

Notice how everything has been allocated to the correct roof. You can verify this by clicking on things in the Takeoff Record. For example click the Gravel Stop under Roof B and you will see the lines that have gravel stop become highlighted on the drawing (you may have to move the Takeoff Record window to see this). Click on some other things in the Takeoff Record to make sure they are in the right place on the drawing. When you are done, close the Takeoff Record window and right click on the page to deselect everything.

So as you can see, both methods of designating walls can get the job done. We prefer method B because it does not add any new lines to the drawing. This makes for a cleaner drawing that can be easier to modify later, if need be.

How to Digitize Control/Expansion Joints

1. With the digitizer pen digitize on the Smart Objects option on the digitizer menu. This sets focus to the Smart Object Browser window.

2. Digitize the down arrow on the menu until you get to the "Control/Expansion Joints" heading. Expand it if necessary by digitizing Enter on the menu. Position the highlight bar on "Curb/Curb Exp Joint" and digitize the enter option on the menu.
3. We have two expansion joints on this drawing. Digitize one end point of the expansion joint on Roof A.
4. Digitize the other end of the expansion joint.
5. Now digitize the two end points of the expansion joint of Roof B.

Hint: **Digitizing expansion/control joints works different than digitizing walls because expansion joints are usually single segments rather than multiple segments. If you had an expansion joint that was made up of two continuous segments you would digitize the starting point of the first segment then the end point of the first segment. Next you would digitize the end point of the first segment again because it is also the first point of the second segment. Lastly you would digitize the second point of the second segment. Because RoofCAD is always expecting two points to be digitized you do not have to Finish Takeoff between separate expansion joints. Finish is done automatically after every second point.**

How to Digitize Curbs

1. With the digitizer pen digitize the Smart Objects option on the digitizer menu. This sets focus to the Smart Object Browser window.
2. Digitize the down arrow on the menu until you get to the Curbs & Sleepers heading. Expand it if you need to. Position the highlight bar on the Curb smart object and digitize the Enter option on the menu.
3. RoofCAD asks you for the length and width of the curb. We will do the curb on Roof B first. Its size is 6x6, although normally the size will not be marked and you will have to hand Scale the size off the drawing. Digitize 6 on the menu card. The 6 is now visible in the Length box.
4. Digitize the down arrow on the digitizer menu. Your cursor will now be in the width field.
5 Digitize the 6 again. The 6 appears in the width box. Notice the Height box. This is for the height of membrane required (in feet). You can change this as well if you wish.
6. Digitize the enter option on the menu. The input window disappears.
7. Digitize the pen once in the middle of the curb on Roof B. The curb appears on the drawing.

If you had more 6x6 curbs you would now digitize once in the center of each one. To digitize a curb of another size you would repeat the above process but use different length and width numbers.

The above method works well when you have a lot of curbs of the same size. If, however, you have many different sized curbs there is another method. We will demonstrate this now with the curb on Roof A.

1. With the mouse, click on the "Drawing Tool" box on the Smart Object Browser. A list drops down.
2. Click on "Rectangle Tool". RoofCAD is now ready to digitize curbs with the Rectangle Tool.
3. Digitize the upper left corner of the curb on Roof A.
4. Digitize the lower right corner of the curb. The curb appears on the screen.

Notice that we did not have to enter the curb size. The trade off is that RoofCAD does not place the nice curb symbol on the drawing.

The same two techniques apply for the other curb type objects; hatches, chimneys and skylights.

How to Digitize Count Items

Count items are things such as vents, drains, scuppers etc.

1. With the digitizer pen digitize the Smart Objects option on the digitizer menu.
2. Digitize the down arrow on the menu until you get to the Roof Penetrations heading and expand it if necessary. Position the highlight bar on the Plumbing Stack and digitize the enter option on the menu.
3. Now digitize each of the plumbing stacks on the drawing (indicated with a small red circle).

Drains, pitch pans and all of the other count type items work the same way. The only exception is a count item that is near the edge of the roof and thus in danger of being allocated to the wrong roof. A simple way to deal with this type of item is to digitize them a "safe" distance in from the edge of the roof, instead of digitizing where they actually are. You can move them out with the mouse later if you like.

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.**

Tip: **Once an object has been allocated to a roof, the allocation cannot be changed just by moving the object. For instructions on how to change the allocation see “Special Topics” in this section.**

How to Digitize a Gas Line

Gas line, conduit and other objects that can cross several roofs, create a unique problem that is simple to solve. On our sample drawing we have a gas line that crosses Roof A and Roof B. The following steps will illustrate the problem and how to handle it.

1. Digitize on the Smart Objects option on the digitizer menu.
2. Digitize the down arrow on the menu until you get to the "Miscellaneous" section and expand it if you need to. Position the highlight bar on "Gas Line" and digitize the enter option on the menu.
3. Digitize the end point of the gas line at the top of Roof A, where it meets the A1-A7 wall.
4. Digitize the next two points.
5. Now we reach the crucial point. Digitize the point where the gas line meets the A2-A3 wall (the junction with Roof B). Your inclination may have been to go right to the end of the gas line on Roof B. RoofCAD allocates things like gas line, segment by segment. So as you add segments RoofCAD allocates them to a roof. If we had digitized the point at the end of the gas line on Roof B (at the junction of wall B2-B3) we would have had one long segment crossing Roof A and B. In this case RoofCAD calculates which roof has more of the segment on it and allocates the segment to that roof. This of course would be inaccurate. By digitizing where we did, we will end up with two segments, one on each roof.
6. Digitize the final point at the end of the gas line on Roof B (at the junction of wall B2-B3).
7. Digitize the Finish Takeoff option on the menu.

How to Digitize a Pitched Roof

Now we will digitize the pitched roofs.

1. The key to digitizing pitched roofs with RoofCAD is to digitize the roof outline first. Digitize the Smart Object option on the menu.
2. Digitize the up arrow until you get the Pitched Roof heading and expand it if necessary. Then digitize the up or down arrows until "Roof Perimeter (Dig)" is highlighted.
3. Digitize the Enter option.
4. Digitize the four corners of the shingle roof.
5. Digitize the Finish Takeoff option on the menu. The shingle perimeter is complete.
6. Now digitize the four corners of the metal roof.
7. Digitize the Finish Takeoff option on the menu. The metal roof perimeter is complete.

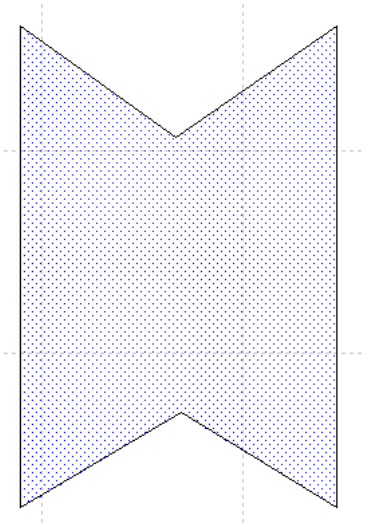
Now that the perimeters are drawn we will digitize all of the different roof planes.

1. Digitize the Smart Object option on the menu.
2. Digitize the up or down arrows until "Pitched Area (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the pitch of the roof in the form of rise over run. The run of 12 is implied, so all you have to enter is the rise. Digitize 6 on the menu (as in 6/12).

   Digitize Enter and the window closes.

4. Now digitize the four corners of the shingle roof.
5. Digitize the Finish Takeoff option on the menu. The shingle roof plane is complete.
6. Now digitize the three points that make up one of the 6/12 roof planes on the metal roof.
7. Digitize the Finish Takeoff option on the menu.
8. Next digitize the three points that make up the other 6/12 roof plane on the metal roof.
9. Digitize the Finish Takeoff option on the menu.
10. Now digitize the dormer, which is also a 6/12 roof plane.
11. Digitize the Finish Takeoff option on the menu.
12. Now we need to change to a 4/12 pitch. Digitize the Smart Object option on the menu.
13. Digitize the Enter option. The Smart Object Properties window appears. Again we are prompted for a pitch. Digitize 4 on the menu (as in 4/12). Digitize enter and the window closes.
14. Now we will digitize the 4/12 roof planes on the metal roof. Since they are joined you can do them both at once. This means you will end up digitizing a shape like the one following:



Digitize the 6 points that make up the 4/12 shape.

15. Digitize the Finish Takeoff option on the menu. The 4/12 metal roof planes are done.

The pitched roof areas are now taken off.

Handle Opening Under the Dormer

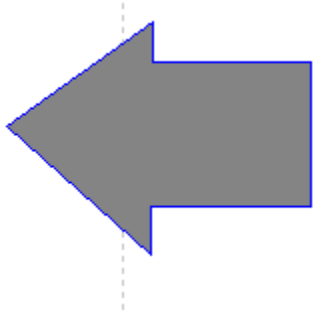
To take off a dormer properly we need to "cut out" the area underneath the dormer that will not be roofed.

1. Digitize the Smart Object option on the menu.
2. Digitize the up or down arrows until "Pitched Opening (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the pitch of the area to be "cut out". Since the opening is "cut out" of the 4/12 roof plane, digitize 4 on the menu.

   Digitize enter and the window closes.

4. Now digitize the "cut out" area that is shaded in gray on the drawing:



   Note that the cut out shape is not the same as the dormer roof. This is because we don't cut out under the overhang of the dormer.

5. Digitize the Finish Takeoff option on the menu. The opening area has been deducted from the 4/12 roof plane.

Finish the Pitched Roof

Now we will finish the pitched roof off by adding hips, ridge, rake edge etc.

Hips

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Hip (Dig)" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the pitch of the hip. Digitize 4 on the menu.

   Digitize enter and the window closes.

4. Now we will digitize the hips. Digitize the start and end point of each hip.

Rake Edge

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Rake Edge" is highlighted.
3. Digitize the Enter option. The Smart Object Properties window appears.

   This window is prompting you for the rake edge pitch. Digitize 6 on the menu.

   Digitize enter and the window closes.

4. Now digitize the start and end point of each rake.

Ridge

1. Digitize the Smart Object option on the menu.
2. Digitize the down arrow until "Ridge" is highlighted.
3. Digitize the Enter option.
4. Now digitize the start and end point of each ridge.

These three items are enough to give you the feel for how everything else (valleys, eaves etc.) is digitized. So we will not digitize everything in this tutorial.

Check your Takeoff Record

We have now added all the standard items you need to digitize. Lets see how our takeoff record looks now.

TO

You'll be using the Takeoff Record button.

1. Click the Takeoff Record button. The Takeoff Record appears. Notice how everything you digitized has been total nicely ready for estimating.
2. Close the Takeoff Record window.

Complete Your Drawing

There are a few final, optional steps to completing your drawing.

1. With the mouse, choose Options|Drawing Settings from the RoofCAD menu. The

Current Drawing Settings window appears.

2. Change the Paper Size from "Letter - 11x8-1/2" to "Legal - 14x8-1/2" and click OK. The page size on screen is now bigger. The bigger page size will accommodate the legend.
3. Choose Options|Arrange|Layers from the RoofCAD menu. The Layers window appears

4. Click "$Format". The $Format layer is where the legend, north indicator and title block are. The title block is where you enter the project information.
5. Click the Visible check box. A checkmark appears.
6. Click on the 0 (zero) layer and close the layers window by clicking the small box in the upper left corner of the layers window.

How to Save Your Drawing

This tutorial started out by loading a template. It is very important that you do not save over a template or you will lose your template (it will no longer be empty when you load it). Although we provide a backup of each template with RoofCAD it is better to avoid this problem.

To avoid saving over a template you need to use the Save As option rather than the Save option. Once you have used Save As, the drawing will be renamed and it is safe to use the Save option without losing your template.

1. From the RoofCAD menu choose File|Save As. The Save As window appears.
2. The current name of the drawing will be displayed (the template name). Type the name you will use for the drawing.
3. Click OK. RoofCAD saves the drawing to the new name.

How to Print the Drawing & Takeoff Record

1. Choose File|Print|Print Drawing from the Roof CAD window. The Print window appears.
2. Click OK or Print in the dialog box for your printer. The drawing will now be printed.
3. Once the drawing has printed choose File|Print|Print Takeoff Record from the Roof CAD window. The Print window appears.
4. Click OK or Print in the dialog box for your printer.

Special Topics

How to Change Ownership of an Object from One Roof to Another:

You can change what roof an item belongs to by selecting the item and opening the Properties dialog (choose Arrange|Properties from the menu). In the properties window you will find a box that displays the name of the roof that the item belongs to. Click on this box to select a different roof. You will notice in the takeoff record that the object now falls under the selected roof.

Section 32

Creating Your Own Details

Drawing Your Own Details

This tutorial will show you how to draw details with RoofCAD. Anyone who has done some detail drawings knows that they can be tedious and difficult to draw. In RoofCAD 2000 we introduced the first step in our detail drawing strategy. This step is to add a symbol library of stock components like 2x4's, metal flashings, insulations etc. These components are drawn to scale so all you have to do is drop them on the page and print.

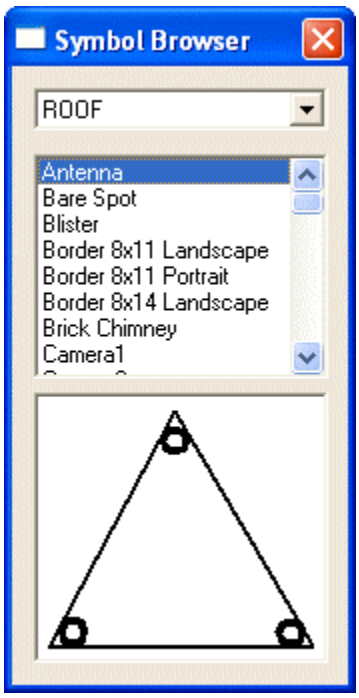
Very shortly we will be introducing a complete set of generic details. This library of details will be made from the above mentioned detail component library and will have section details for every roof system (BUR, EPDM, Thermo Plastic, Modified). The details are fully modifiable so you can adapt them to your own needs. The introduction of this library means you have the choice of building your own details from the component library or purchasing the pre-made set.

RoofCAD installs 2 files on your computer:

- Detail.sbl- This is the library of detail components.
- Tdetail.RCG- This is a template file you can use for drawing details.

How to Open the Detail Component Library:

1. Choose Tools|Symbol Browser from the menu. The Symbol Browser appears.



The Symbol Browser.

2. Click the arrow next to where you see the word "ROOF". A list appears.
3. Click "Detail". You've just changed to the Detail Component Library.

If you want to switch back to the roof symbol library, click the arrow and select ROOF.

Hint: **You can make the detail.sbl library your default library in the Program Settings window. To open the program settings window choose Options|Program Settings from the menu.**

How to Draw a Detail:

Once the Detail Component library is open, you are ready to draw details. Drawing a detail is a bit of an art form, in that you will be able to use our pre-made components but you will still have to draw some of your own objects using the RoofCAD drawings tools.

The way to learn how to draw details is to draw one. You will need to become familiar with the components in the library. Some things like membranes are not in there. You will need to draw these by hand with the line or polyline tool.

To get you started we have added a detail template to your RoofCAD folder. So the fist thing to do is open the template:

1. Choose File|Open from the menu. The Open window appears.
2. Click on the file named Tdetail.RCG in the RoofCAD folder and click the OK button. The detail template provided with RoofCAD appears.

Now draw a detail by clicking on components in the Symbol Browser and adding them to the page. When you can't find something in the Symbol Browser you will need to draw it with the drawing tools. To learn about the drawing tools see Section 4, The Interface, specifically the section on the tools menu.

Drawing details also requires you to be an advanced RoofCAD user. You need to know how to move, resize, rotate objects etc. Everything you need to learn can be found in this manual with Section 4, The Interface, being your starting point.

Detail drawing takes practice but with some experimentation you will find that it is quite easy to do.

Section 33

Working with Manufacturers' Details

Working with Manufacturers' Details

We include a number of manufacturers' details on the RoofCAD CD. They are also available from manufacturers' CDs and Web sites. This topic will give you some basic guidelines on how to work with them. Viewing the details is easy. Modifying them, however, requires some advanced skills.

Tip: **The manufacturers' details are on the installation CD. Since they take up 300 Megabytes of space (about ½ the CD), we don't automatically install them on your hard drive. You can however, copy them to your hard drive from the CD if you like. You can find the details on the CD in the "D:\roofcad\details" (where D: is your CD drive).**

How to load a manufacturer's detail in RoofCAD

Manufacturers' details will be in either DWG or DXF format. Mostly they will be DWG. RoofCAD handles both formats. Follow these steps to open a Manville detail:

1. Choose File|Open from the menu. The Open window appears.
2. Change the file type to "AutoCAD DWG" in the "List files of type" box.
3. Navigate your way to the "d:\roofcad\details\manville\bur" folder (where D: is your CD drive).
4. Click on the file named "FE01BFL.DWG", then click OK. The detail will load up on the screen.

So far, so good.

You are now able to print and/or modify the file. There are a couple of things you have to understand in order to modify a manufacturer's detail both of which come about from the fact that a professional CAD operator created the drawing. Because they operate a CAD program for a living they introduced a level of complexity in the detail that a non-CAD professional would not. The main things are:

- They draw their objects over many layers and very often the layer names are not descriptive. The problem comes to light when you try to select an object. You click on it but it does not become selected. If this happens it is because the object is on another layer.
- The other problem is that their objects tend to be made from many lines, circles etc. For example you may try to select a 2x4 only to discover that instead of being one object it is actually 6 individual lines and every line has to be selected individually. Not exactly user friendly stuff! But they didn't make the detail for you; they made it for another CAD operator to use.

The above two points are life in the manufacturers' detail world. If you don't want to deal with these problems you can use our detail component library to build your own details. See Section 32, Creating Your Own Details, or you can purchase from us a pre-made set of standard details for BUR, Modified, EPDM and Thermal Plastic roofing. Our detail set does not suffer from any of the problems found in manufacturers' details. For details call our sales department at (416) 778-0843.

If you want to forge ahead with the manufacturers' details we can solve the first problem but not the second. How we over come the multi-layer problem is to move everything to one layer.

To get everything on one layer:

1. From the menu choose Edit|Select All. Everything will now be selected.

You're going to use the Properties button.

2. Click the Properties button (or choose Arrange|Properties from the menu). The Properties dialog appears.
3. Click on the Layers box and choose the 0 (zero) layer from the list that appears. All objects are now on the 0 layer.
4. Close the Properties window and press Esc to deselect everything.

Now you will notice that you can select anything you want without changing layers. From this point you use your RoofCAD skills to modify the detail to suit your needs. After making your modifications you we recommend you use Save As to save the file in RoofCAD's RCG format. You do have the choice of saving it in DWG or DXF format as well but we only recommend this if you are sending the file to someone who uses a different CAD program.

To Save the File in RoofCAD Format:

1. Choose File|Save As from the menu. The Save As window appears.
2. Change the file name, if you wish, navigate to the folder on your hard drive where you want to store the file (you cannot save to the CD) then click OK. The file is now a RoofCAD file.

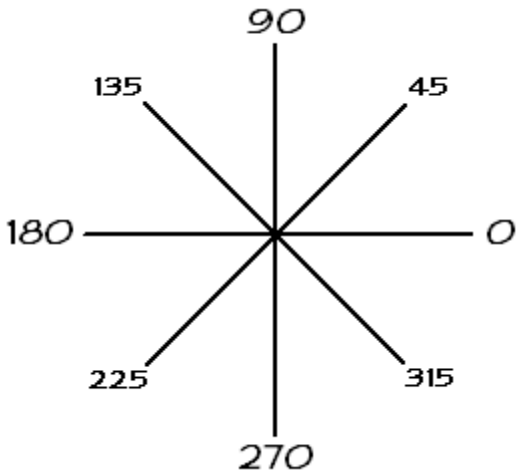
This concludes this topic. Working with details requires some advanced skills and practice but it will not take long to become proficient.

Section 34
Reference

Reference

CAD Angles

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 diagram below when deciding the number to input for an angle. If you think of the diagram 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.



Decimal Equivalents to Inches

1"=.08	1-1/4"=.10	1-1/2"=.13	1-3/4=.15
2"=.17	2-1/4"=.19	2-1/2"=.21	2-3/4=.23
3"=.25	3-1/4"=.27	3-1/2"=.29	3-3/4=.31
4"=.33	4-1/4"=.35	4-1/2"=.38	4-3/4=.40
5"=.42	5-1/4"=.44	5-1/2"=.46	5-3/4=.48
6"=.50	6-1/4"=.52	6-1/2"=.54	6-3/4=.56
7"=.58	7-1/4"=.60	7-1/2"=.63	7-3/4=.65
8"=.67	8-1/4"=.69	8-1/2"=.71	8-3/4=.73
9"=.75	9-1/4"=.77	9-1/2"=.79	9-3/4=.81
10"=.83	10-1/4"=.85	10-1/2"=.88	10-3/4=.90
11"=.92	11-1/4"=.94	11-1/2"=.96	11-3/4=.98

This chart is accurate to 2 decimal places only.

Scale Guideline

Here is a general guideline for what scale to set for the size of building and the page size you are using. It is helpful to set a scale before you draw the roof or at least get it close to what the final scale will be. If you start to draw a roof outline with a scale that is not close to what the final scale will be, the outline will either be huge (possibly disappearing of the page) or very small. Of these two conditions only the huge outline is the problem because it will run off the page as you are drawing it, which means you have to draw part or most of the roof outline "blind".

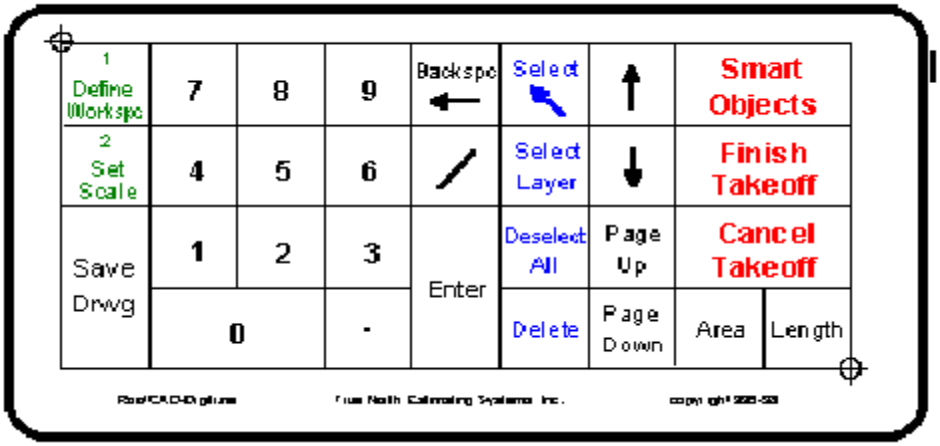
Of course, it is hard to know the scale you need until you see the roof outline on the page. That is why we have published this guideline. Find the roof size under the page size you are using, then set the corresponding scale. To learn how to set a scale, see Section 15, Drawing Settings.

General Scale Guideline

	11 x 8½ Template	14 x 8½ Template	17 x 11 Template
Scale	**O/A Size of drwg.**	**O/A Size of drwg.**	**O/A Size of drwg.**
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'

Digitizer Menu

If your menu card is lost call us for a replacement. In the meantime you can use this image as a temporary card.



Keyboard Shortcuts

Working with a mouse is OK, but why don't you try some of these shortcut keys?

Press	To
CTRL+N	Open a new "empty" drawing
CTRL+O	To open a drawing
CTRL+P	To print a drawing
CTRL+S	To save a drawing
CTRL+W	To close a drawing
CTRL+TAB	To go to the next open drawing
CTRL+X	Cut a selected drawing object
CTRL+C	Copy a selected drawing object
CTRL+V	Paste a selected drawing object
CTRL+Z	Undo the last action
CTRL+Y	Redo the last action
CTRL+DEL	Delete the entire drawing
+	Zoom in
-	Zoom out
F5	Refresh or redraw the screen
Esc	Deselect

Section 35

Template Setup

Template Setup

In this topic we will show you how to do some basic RoofCAD setup for your company. If you have followed the instructions in Section 1, For Those New to RoofCAD, you should be familiar with:

- Section 4, The Interface
- Section 5, Drawing Files
- Section 15, Drawing Settings
- Section 7, Layers
- Section 8, Templates
- Section 6, Drawing Objects

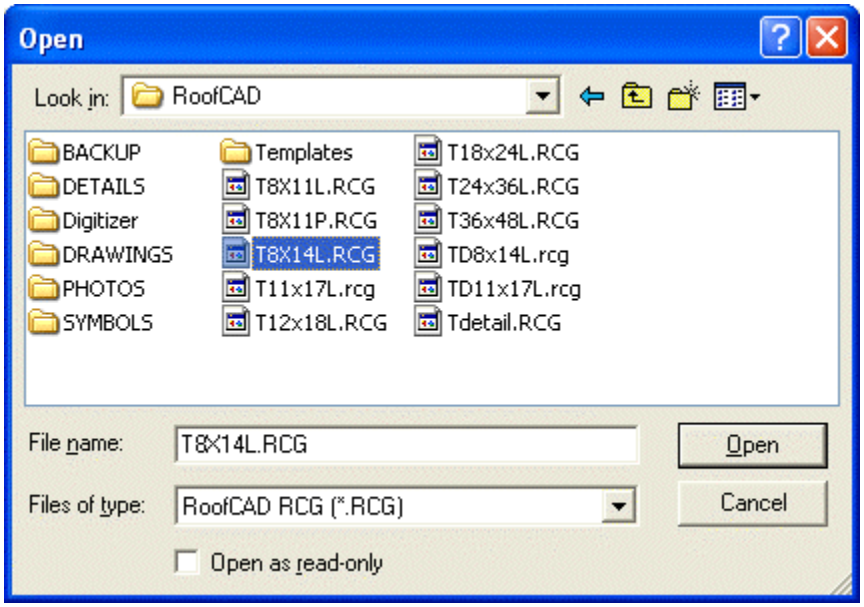
If you are not familiar with these sections or are not following the steps in Section 1, For Those New to RoofCAD, we highly recommend that you do so. Being familiar with these sections topics will help you through this one.

Add Your Company Name to the Title Block

These steps will show you how to add your company name to one template (we will use the t8x14l.rcg template as our example). Repeat these steps for each of the templates you intend to use. If you are new to computers we recommend that you change just the t8x14l.rcg template for now and when you are more comfortable change the other templates.

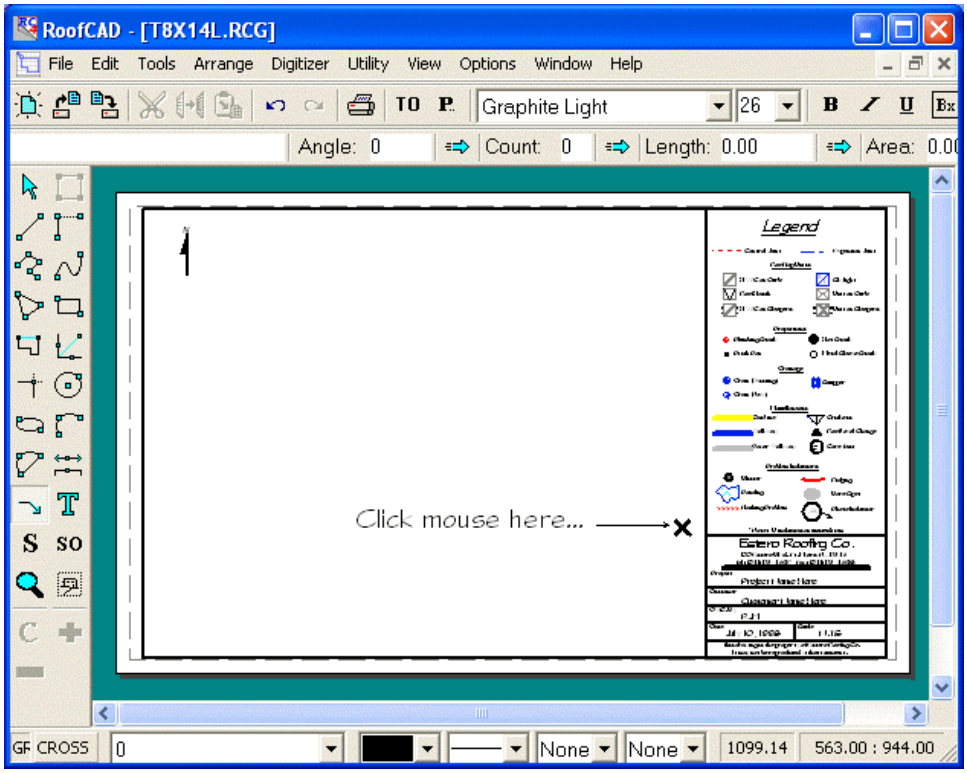
How to Add Your Company Name to a Template:

1. Choose File|Open from the RoofCAD menu. The Open window appears.
2. In the list of files in the big box under file name, click on the file t8x14l.rcg as we illustrate here:



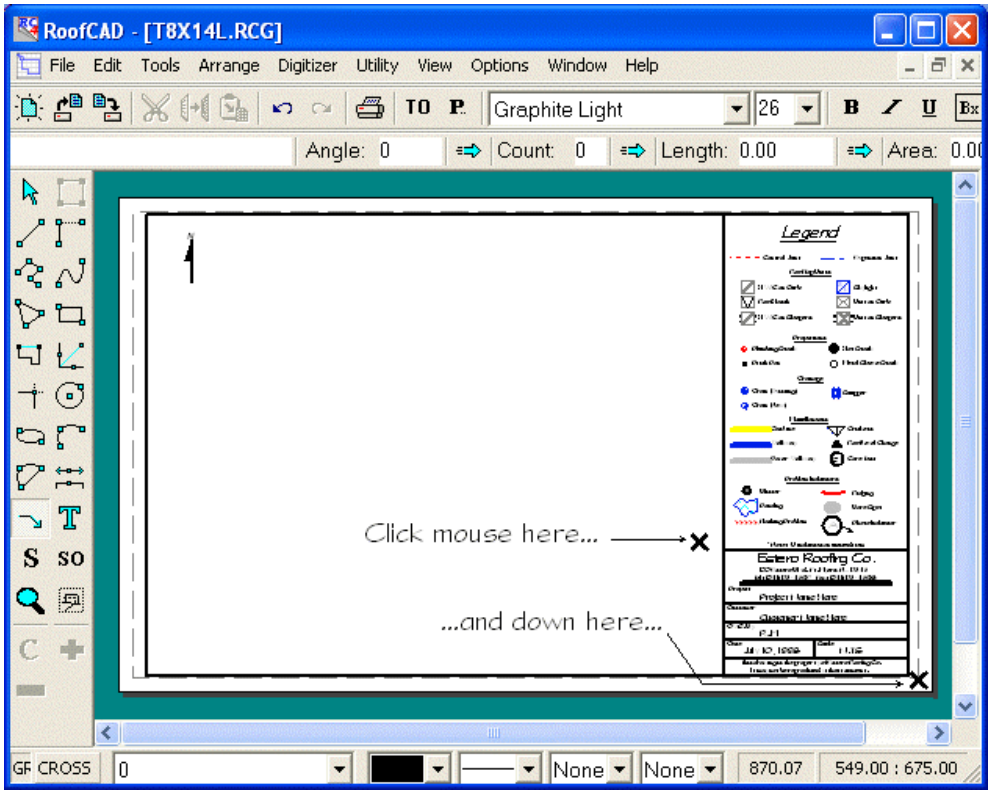
Click T8X14L.RCG.

3. Click Open. The t8x14l.rcg template appears on screen.
4. Choose Tools|Zoom from the RoofCAD menu. Your mouse pointer is now a magnifying glass.
5. Click the mouse where you see the X in our illustration:



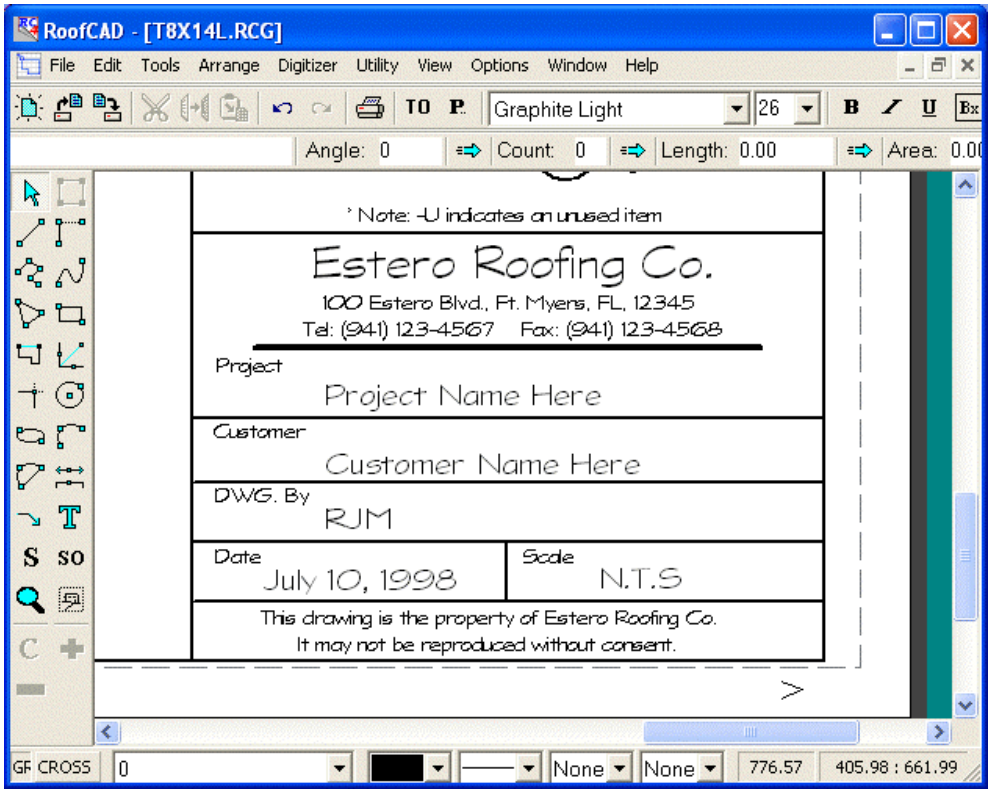
X marks the spot!

6. Move the mouse and you will see a rectangle forming. Now position the mouse on the X in the next image. This will form a rectangle around the title block.



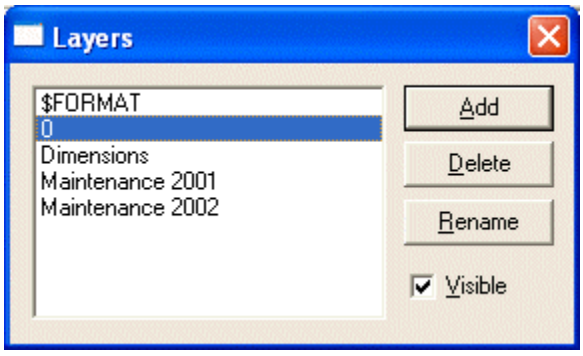
X marks the spot! (Again...)

7. Click the mouse. You are now zoomed in on the title block as we show here:



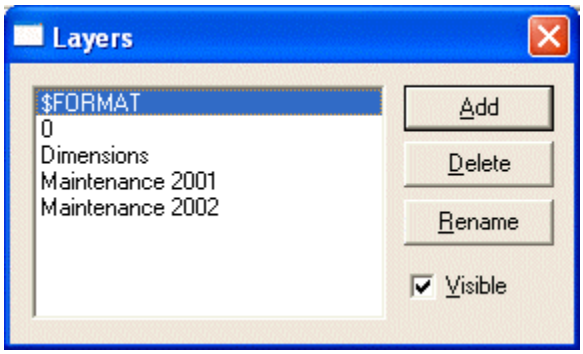
Zoomed in on the title block.

8. Choose Arrange|Layer from the RoofCAD menu. The Layers dialog appears and looks like this:



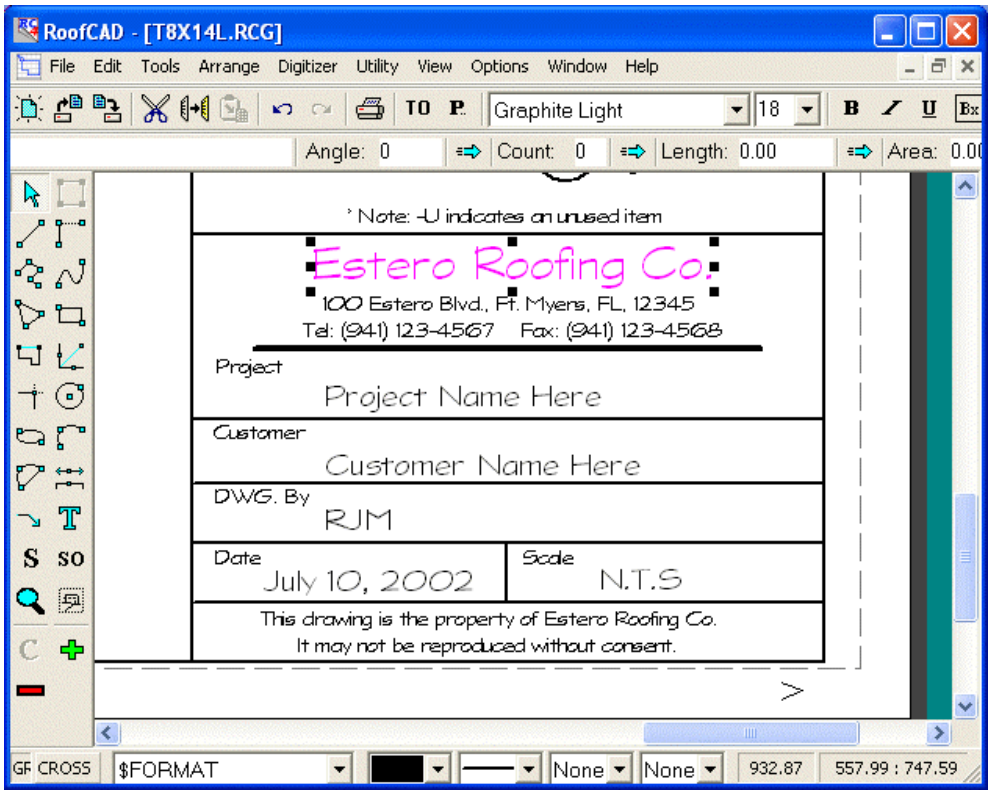
The Layers dialog.

9. Click on the word $FORMAT and it will be highlighted like this:



Click $FORMAT to highlight it.

10. Close the Layer dialog.
11. Choose Tools | Pointer from the RoofCAD menu.
12. Position the tip of the mouse pointer on the text Estero Roofing Co. and click the mouse. The text is now selected as we show here:



Click to select the company name.

13. Choose Tools | Text from the RoofCAD menu. The Input Text dialog appears.
14. Type in your company name and click OK. Your company name now appears in the title block.

If your company name is too long you have two choices; shorten the name, or change the font size.

To Shorten the Name

1. To shorten the name choose Tools|Text from the RoofCAD menu. The Input Text window appears.
2. Shorten the name and click the OK button.

Repeat until the name is the right size.

If your company name is not in the right place move it with the mouse or the arrow keys on the keyboard (If you use the arrow keys to move the text and you need it to move in finer increments, click the GRID button on the status line to turn Grid Snap off.

To Change the Font Size

1. Click the Font Size box on the RoofCAD Formatting Toolbar. From the drop down list, select a smaller font size. You'll see the text size change immediately.

OR:

2. In the Font Size box, type in a smaller number for the font size. To see the effect of the change, you'll need to click anywhere on the drawing surface before the text will resize.

Repeat until the name is the right size.

If your company name is not in the right place move it with the mouse or the arrow keys on the keyboard (If you use the arrow keys to move the text and you need it to move in finer increments, click the GRID button on the status line to turn Grid Snap off.

Press Esc to deselect the text.

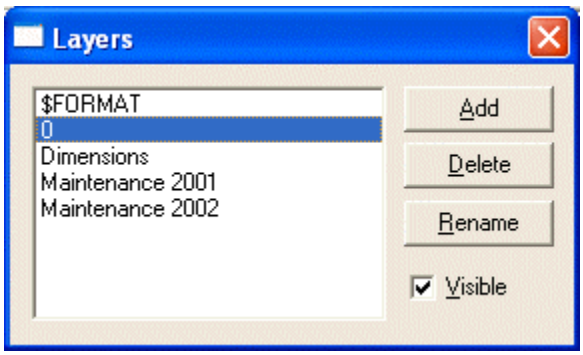
Repeat step 11 to 14 with the address, phone numbers, and the disclaimer at the bottom.

Change Back to the 0 Layer

Changing back to the O layer after you've made changes to the legend ensures that you won't start a drawing on the $FORMAT layer by mistake. Anything that you draw on the $FORMAT layer will not change if you change the drawing scale. Objects on the $FORMAT layer do not appear on the Takeoff Record.

1. Click the Layer list on the status line. From the list that appears, click Manage Layers… The Layers dialog appears.

2. Click on the 0 in the list. Your layer window will look like this:



Change back to the 0 layer.

3. Close the Layers dialog.
4. Choose File|Save from the RoofCAD menu. The changes have now been saved for this template.

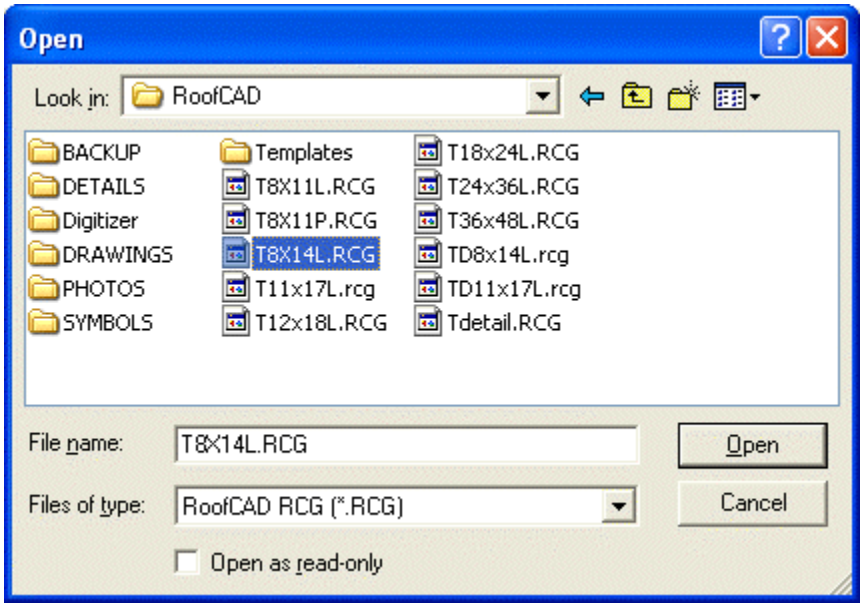
Now repeat these steps for all the other templates you intend to use.

Align the Legend to Your Printer

Every printer prints slightly different. This topic will align the legend to your printer. You will need to follow these steps with every template that you use (this topic uses the t8x14l.rcg template as an example).

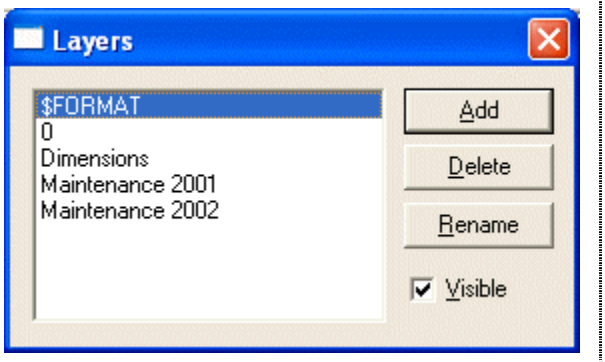
The margin around the page represents the end of the printable region for your printer (most printers cannot print right to the edge of the page). The displayed margin is not 100% accurate because individual printers can vary, so you must align the legend manually then save it in position. The following steps, very simply, will have you print a template, adjust the legend position then print again until the legend prints out centered on the page.

1. Choose File|Open from the RoofCAD menu. The Open dialog appears.
2. In the list of files in the big box under file name, click on the file t8x14l.rcg as in our illustration following:



Click T8x14L.RCG.

3. Click Open. The t8x14l.rcg template appears on screen.
4. Click the Layer list on the status line. From the list that appears, click Manage Layers… The Layers dialog appears. Click $FORMAT to highlight it like this:



Click $FORMAT to change layers.

6. Close the Layers dialog.
7. Choose File|Print|Print Drawing from the RoofCAD menu. The print window appears. RoofCAD automatically knows what size sheet of paper you want to print.
8. Click OK and RoofCAD will print the drawing.

   If your the legend is not centered or runs off the page do the following then try printing again.
9. Choose Edit|Select Layer from the RoofCAD menu. The entire contents of the $FORMAT layer is selected.

10. Move the contents of the layer by pressing the left, right, up or down arrow keys on the keyboard.

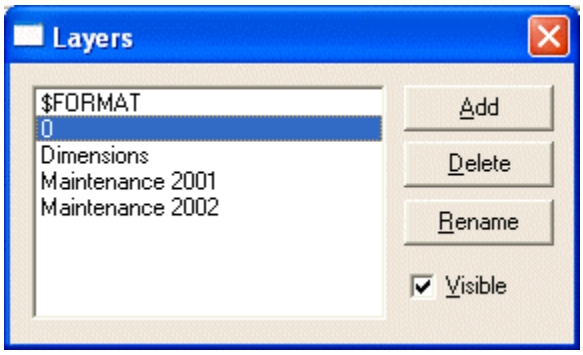
Hint:	**If you want to move the legend in finer increments. Click the GRID button on the status line to turn Grid Snap off.**

11. Once you have positioned the legend to correct the misalignment, try printing it again by choosing File|Print|Print Drawing from the RoofCAD menu. The Print window appears.
12. Click OK.

Repeat steps 7 to 12 until you have the legend positioned and printing correctly.

Now, let's switch back to the 0 layer so you don't start drawing a roof on the $FORMAT layer by mistake. Remember, objects on the $FORMAT layer will not resize if you change your drawing scale.

1. Click the Layer list on the status line. From the list that appears, click Manage Layers… The Layers dialog appears.
2. Click on the 0 in the list. Your layer window will look like this:



Change back to the 0 layer.

3. Choose Arrange|Layer from the RoofCAD menu. The Layers window disappears.
4. Choose File|Save from the RoofCAD menu. The changes have now been saved for this template.

Now repeat these steps for all the other templates you intend to use.

Section 36

Digitizer Setup

Digitizer Setup

This section pertains to those who have purchased the digitizer module of RoofCAD. This module allows you to generate takeoffs from blue prints, if you do not have this module and want to know more call us at the number on the Order Form.

To setup your digitizer there are a couple of steps to complete:

- Connect your digitizer to your computer.
- Configure the digitizer.
- Setup RoofCAD.

Once you have completed all these steps your digitizer should be ready to use. To learn about how to digitize with RoofCAD, read Section 30, Digitizing with RoofCAD—Basic.

This setup can be a bit technical so if you have any trouble. call our technical support.

Requirements

- You must have a digitizer.
- You must have purchased the RoofCAD digitizer module.
- You must have RoofCAD installed.
- You must have your RoofCAD security device attached to the parallel port or USB port of your computer.
- You must have a free serial port. If you have a modem you will probably not have a free serial port. Most computers come with two serial ports. Your mouse will probably use one port so that leaves only one spare. If you have a modem or other serial device it will use the remaining port. If you do not have a free serial port it is possible to have another added, but this requires technical expertise, so you should consult your computer supplier. If you have any questions about this call our technical support.

If you have taken care of all of the above, you are ready to setup your digitizer.

Connect Your Digitizer to Your Computer

1. Unpack your digitizer and lay it next to your computer (it will need to be close to your computer in order for the cable to reach). If you have purchased a digitizer stand set it up now and set your digitizer on it.
2. Attach the stylus (pen) cable to the digitizer controller.
3. Attach the serial cable to the digitizer and your computer. Please note that on your computer you will be attaching to a serial port (or com port). Most computers come with two serial ports. They are male

connections on the back of your computer that can be two different sizes (9 pin or 25 pin). Normally your mouse will be using serial port number one. Just find an available serial port and plug the digitizer cable into it.

Tip: **Although the serial ports can be 9 or 25 pin they work the same. So to connect to the open serial port you may need to us a 9 to 25-pin adapter.**

4. Attach the power adapter to the digitizer then plug it into the wall.

Configure the Digitizer

Digitizers need to be configured. Older digitizers use switches to achieve this, while the newer ones use a menu system. Following are the setting for GTCO, Kurta, Calcomp, and Sonic GP-9 digitizers. If you have a different digitizer refer to Detailed Digitizer Setup in this section or call our technical support.

GTCO Settings:

Warning: **If you have a digitizer that can be turned upside down be sure that you have set the orientation, which must be done if you turn it upside down.**

Menu Based GTCO Digitizer Settings

The new GTCO digitizers use menus or superset settings instead of switches, for configuration. The superset menu is a short menu painted on or glued to the digitizer. On a hard board this menu is at the top and on the roll up it is at the bottom left. RoofCAD uses GTCO superset 12. To use a superset, digitize the S on the menu, then digitize the 1, then the 2. At this point your digitizer should beep four times to indicate that the superset has been accepted. You are ready to continue with the RoofCAD Setup.

Switch Based GTCO Digitizer Settings

The following are the settings that need to be set if you have an older switch based digitizer. The switches are found, not on the digitizer, but on a separate box called the controller. Set them as follows:

(1= on, 0 = off)

SW1 - 00110001

SW2 - 11111000

SW3 - 00000000

SW stands for switch bank. The switch banks should be clearly marked on the controller as should the correct switch position for on and off.

GP-9 Settings:

If you are using a Sonic GP-9 digitizer, you configure the digitizer with one of four GP9 configuration files installed with RoofCAD.

To Configure Your GP9 Digitizer:

1. To load one of these files, you must run the setup software that came with your digitizer called: gp9.exe. It is normally located in a folder called Sac on your computers hard drive. Locate the gp9.exe file with Windows Explorer and double click it.

Note: We also ship the gp9.exe file on our CD (although it may be out of date compared with what you received from the manufacturer). You can find the file on the CD in the Roofcad\digitizer\gp9 folder or on your hard drive in the same folder.

2. After establishing communication with the digitizer port, select "Load a File" from the menu.
3. Choose one of the following options:

- If your digitizer is at the top of your work area, load file: RoofCAD\Digitizer\GP9\Top1.gp9
- If your digitizer is on the right side of your work area, load file: RoofCAD\Digitizer\GP9\Right1.gp9
- If your digitizer is on the left side of your work area, load file: RoofCAD\Digitizer\GP9\Left1.gp9
- If your digitizer is on the bottom side of your work area, load file: RoofCAD\Digitizer\GP9\Bottom1.gp9

Tip: **Each of the above file names has a number in it. This number represents the COM port number that you will be using the digitizer on. So if you are using COM 2 and want the digitizer at the top of your work area you would choose the file Top2.gp9.**

- 4. After you have loaded the appropriate configuration file, choose "Make Settings in GP-9 Permanent" from the menu. Exit the program.

You are now ready to proceed with the RoofCAD Setup

Kurta Settings:

To setup your Kurta digitizer take the following steps:

1. Place the movable Kurta menu card on digitizer.
2. Digitize "SETUP MENU" on fixed menu painted on board.
3. Digitize lower left, then lower right bullets on movable menu.
4. Digitize the following settings on the movable menu:

   Serial Speed: 9600

Serial Misc: 1 stop bit, 8 data bits, No parity

Format: F9

Resolution: .001 inch

Mode: Point

Miscellany: CR on, LF on, Tone off

5. Digitize "Store 1" under Memory.
6. Digitize "RESET" on the fixed, painted on menu.

The Kurta board will automatically use the configuration stored in the "Memory: Store 1" on startup or when the "RESET" item on the fixed menu is digitized.

You are now ready to proceed with the RoofCAD Setup.

Calcomp Drawing Board III Settings:

To configure your Calcomp Drawing Board III for use with RoofCAD, the menu strip at the top of the board is used.

1. Digitize the 'Config/Exit' item.
2. Digitize Bank item 'A'
3. As you move the pen/cursor over the number items, the digitizer's power light will blink if the number item is OFF, or glow steady if the item is ON. Digitizing the number will toggle it on or off.

   The following numbers should be ON:

   2, 6, 7, 8, 9, 10, 13, 16, 17, 18

   All others should be OFF.

4. Digitize the 'Config/Exit' item.
5. Digitize the 'Config/Exit' item again.
6. Digitize Bank item 'B'

   Make sure the following numbers are ON:

   3, 4, 7, 8, 18

   All others should be OFF.

8. Digitize the 'Config/Exit' item.
9. Digitize the 'Config/Exit' item again.
10. Digitize the Bank item 'C'

    Make sure the following numbers are ON:

3, 4
All others should be OFF.

12. Digitize the 'Config/Exit'item.

After you have performed this set up work, you should make these settings your default settings. If you do not do this, you will have to reconfigure the digitizer every time it is turned off and on.

1. Digitize the 'Config/Exit' item
2. Digitizer the Save 'Default' item
3. Digitize the 'Config/Exit' item

Detailed Digitizer Setup

If your digitizer is not one of the models listed here, you may still be able to set up your digitizer for use with RoofCAD. The communication and format settings required by RoofCAD are outlined here. Refer to the documentation that came with your digitizer board to determine if it can be configured to these specifications.

Communication Options
Baud: 9600
Data Bits: 8
Stop Bits:1
Parity:None

Output Format Options
ASCII
Button: Include
Space: Include
Line Feed (LF):Include
Carriage Return (CR):Include
Decimal: Exclude
+/- sign: Exclude

Mode Options
Mode: Point
Resolution:1000 lpi

Rate
Not Used

The output from your digitizer can be verified with a Window's utility called HyperTerminal, usually found under Start|Programs|Accessories.

The output produced by your digitizer should conform to this format:

FXXXXX YYYYYCRLF

…where F is a button code (usually 1 or 0), XXXXX is the x coordinate of the digitized point followed by a space, and YYYYY is the y coordinate of the digitized point. The CR and LF are a carriage return and line feed, respectively, and will cause each set of numbers to appear on a separate line in HyperTerminal (you will not see the actual letters 'CR' or 'LF' on the screen). There should be no + or - signs, decimal points or other symbols or letters in the output.

Once the digitizer is producing the required output, proceed with the RoofCAD Setup.

Setup RoofCAD

Start RoofCAD by double clicking on the RoofCAD icon.

If you get a OpenComm Error with a message that says "Unable to initialize digitizer. Check com port settings in Digitizer Setup", it means that RoofCAD is not set to the same serial port that your digitizer is plugged into. To correct this:

1. Click on the Digitizer menu option and choose the Digitizer Setup option out of the menu that appears. This will bring up the Digitizer Setting window.
2. If the current setting is COM 2, change it to COM 1 or if the current setting is COM 1, change it to COM 2 and click the OK button.
3. Click on the Digitizer menu option and choose the Connect item. If connection is successful, you will get a "Digitizer Connected" message. Click OK and continue.

If you got the OpenComm Error again, it means that serial ports 1 and 2 are not available. Repeat the three steps using COM 3 or COM 4. If you are still unable to connect, you should contact you computer supplier to have an additional serial port configured.

Define Menu Card

The next step is to place and define the RoofCAD-Digitizer menu card that you received with RoofCAD.

1. Tape the menu card along the bottom right of the board (bottom left may be more convenient if you are left handed), within the active area and parallel to the bottom edge of the digitizer.

   The active area on the hard boards is within the square "hash" marks that are about 4" in from the edge of the board in all 4 corners. You can check if the menu is in the active area by holding the digitizer pen at the bottom edge of the menu. If the light on the pen is on you are in the active area.

   The active area on the roll up digitizers is anywhere within the grid.

If you are using a sonic digitizer, attach the menu card to your work surface, within the active range of the digitizer (within 36"x48" of the face of the digitizer), parallel to the digitizer.

2. In RoofCAD choose Digitizer|Define Menu Card from the menu. A small window will appear asking you to digitize the upper left corner of the menu card.
3. Digitize the small cross hair in a circle at the top left of the menu card. The small window now asks you to digitize the lower right corner of the menu card.
4. Digitize the small cross hair in a circle at the bottom right of the menu card. The small window disappears and your menu is now defined.

Warning: **If the menu card is moved, you will have to redefine its position before it can be used again. If you are using a sonic digitizer, and the digitizer is moved in relation to the menu card, you will have to redefine the menu card again.**

You are now ready to begin digitizing. See Section 30, Digitizing with RoofCAD—Basic for a step-by-step tutorial.

Section 37

Glossary

Glossary

This is a glossary of concepts and terms that you will find in RoofCAD.

Drawing Templates

Templates are simply RoofCAD drawings. We call them templates because you use them as a template when you start a new drawing. It is faster to start a drawing with a template because the template will have all your default drawings settings, it will have layers hat you commonly use already added to it and it will have a legend, title block, north indicator and anything else you want, already on it. For more information about templates see Section 8, Templates.

$FORMAT Layer

The $FORMAT layer is a special layer in RoofCAD. Anything on this layer remains "glued" to the page regardless of scale changes.

This layer is used to hold Formatting items like the legend, the title block and the north indicator. Anything added to this page will not move or resize when the scale of the drawing is changed. For more information about layers see Section 7, Layers.

Layers

Layers are to a CAD program what transparencies are to an overhead projector. You can have as many layers in a drawing as you like. There are several uses for layers. For example if there are things you do not want accidentally selected and moved, like our legend template, you can put them on there own layer. Unless you are on that layer you cannot select the items on the layer, therefore they cannot be moved accidentally. Layers can also be visible or invisible. So you could store your roof drawing on a visible layer and have a maintenance history on invisible layers. Each year could be stored on a different layer so then you could view each year one at a time. For more information about layers see Section 7, Layers.

Sections

This feature allows you to divide your Takeoff Record into different sections. For example if you are proposing to re-roof an area of wet insulation you would use the section tool to outline the area to be replaced and the Takeoff Record will then display the quantities of all the smart objects in that section, e.g. roof area, number of drains and vents, lineal feet of gravel stop etc. You can create as many sections as you like. For example, you can take one large roof and divide it into a number of smaller sections or you could make a section that consists of several roofs. There is no limit to how you can divide up a project. For more information about Sections see Section 11, Sections.

Security Device

The security device (or hardware key) is the small plastic device that came with your software. It prevents unauthorized use of our software. The device contains an encoded chip that tells us which of our software programs you are authorized to run. This ensures that we do not lose sales revenue to "software pirating". It must be attached to the printer port of your computer, or to your USB port, for RoofCAD to run in full mode (not demo mode). We highly recommend that you read about the security device in Section 2, Security Device.

Smart Objects

Smart Objects are the backbone of RoofCAD. The easiest way to draw a roof with RoofCAD is with Smart Objects. There is a Smart Object for every type of roof object. Roof objects are all things you find on a roof. For example, the roof outline itself is considered a roof object, as are all walls, curbs, drains and plumbing stacks. When you draw with Smart Objects you click on the Smart Object you want to draw, then draw it on the page. Using a Smart Object does several things: Chooses the RoofCAD drawing tool used to draw this object. Sets the line type, thickness and color. Set a fill pattern if applicable. Adds the Smart Object and it's quantities to the Takeoff Record. For more information about Smart Objects see Section 9, Smart Objects.

Symbols

Symbols are objects you can add to a drawing that are always the same like Plumbing Stacks, Drains, Curbs etc. Symbols like Curbs may look the same from drawing to drawing but RoofCAD allows you to resize them. RoofCAD comes with a complete set of Roof symbols but you can add new ones and modify the existing ones if you like. To create or modify symbols you be a competent RoofCAD user. For more information about Symbols see Section 10, Symbols.

Section 38

Sales and Support

Sales

For RoofCAD sales information and pricing, contact:

True North Estimating Systems, Ltd.
100 Broadview Avenue, Suite 308
Toronto, Ontario, Canada M4M 3H3
Phone: (416) 778-0843
Fax: (416) 778-5880
E-mail: sales@roof-ware.com

Support

We highly recommend that you read the entire RoofCAD Bible and Help file. To get to the help file from anywhere in the program choose Help|Contents. Pressing F1 will also call up the help window, however it will go directly to the help topic for the window you are viewing.

If cannot find an answer to your questions in the manual or help file, please call us at:

True North Estimating Systems, Ltd.
100 Broadview Avenue, Suite 308
Toronto, Ontario, Canada M4M 3H3
Phone: (416) 778-0843
Fax: (416) 778-5880
E-mail: support@roof-ware.com