

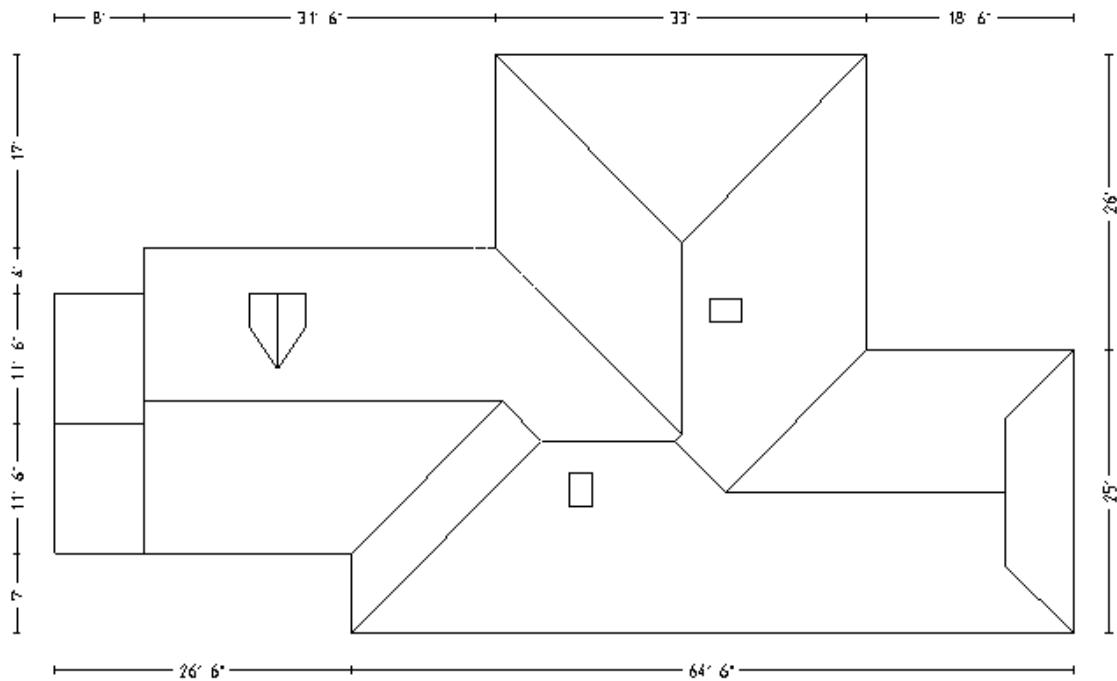
Q-Roof Tutorial

The Q-Roof process lets you quickly and easily generate a roof plan either by digitising the roof plan on a digitiser, or constructing roof geometry using dimensions on the roof plan. In this way you can digitise good quality blueprints for new construction work and use field measurements for re-roofing.

Lets first consider a new construction job.

New Construction

Lets consider the following roof plan we need to estimate. You can see that the roof has a split gable on the



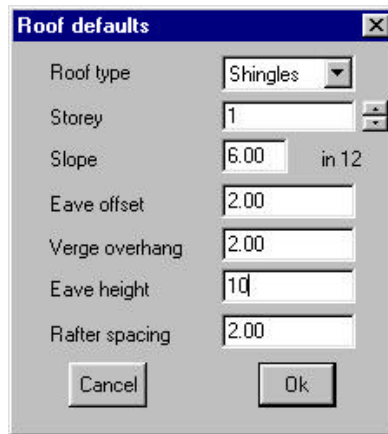
left hand end, a dormer at the left, a dutch gable (boston-hip) on the right and 2 skylights

We have all external dimensions, the scale of the plan is 1:100, and the slope is 6 in 12. So, lets go ahead and digitize this job.

Step 1 : You must have already set up your digitizer so that Windows recognizes it as a mouse. Note that you can use your normal 3 button mouse and the digitiser puck together. If you haven't set up your digitiser then you better do it now! An, if you haven't started Sorcerer, then start it now and maximise its window.

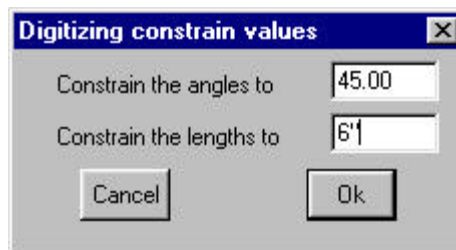
Step 2: Now place the roof plan on the digitizer and make sure you can track the roof plan with the puck over the graphics area of the screen.

Step 3 : Select **Q-Roof | Roof-defaults** and set the roof defaults to the following.

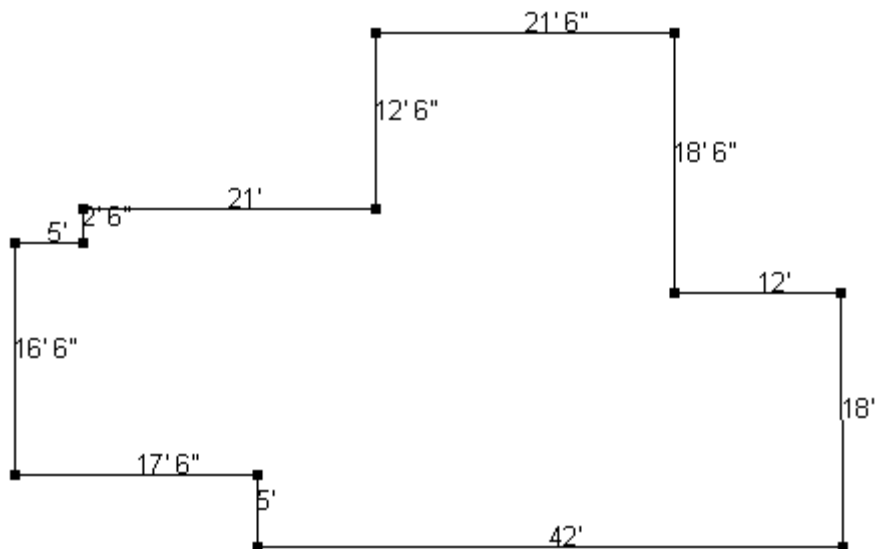


Step 4 : Using the Q-roof menu, set the zoom scale to that of the plan so your measurements are close to the real measurements.. So use **Q-Roof | Zoom-Scale** and enter 100.

Step 5 : Now we can start digitizing by using **Q-Roof | Draw-Lines**. After you set the constrain parameters to 45 degrees and 6", digitize the eave outline of the roof.



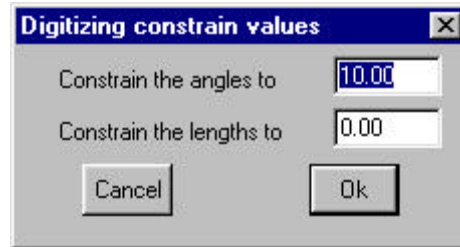
On-screen you will see the following outline, annotated with lengths. Do not worry that the lengths are not



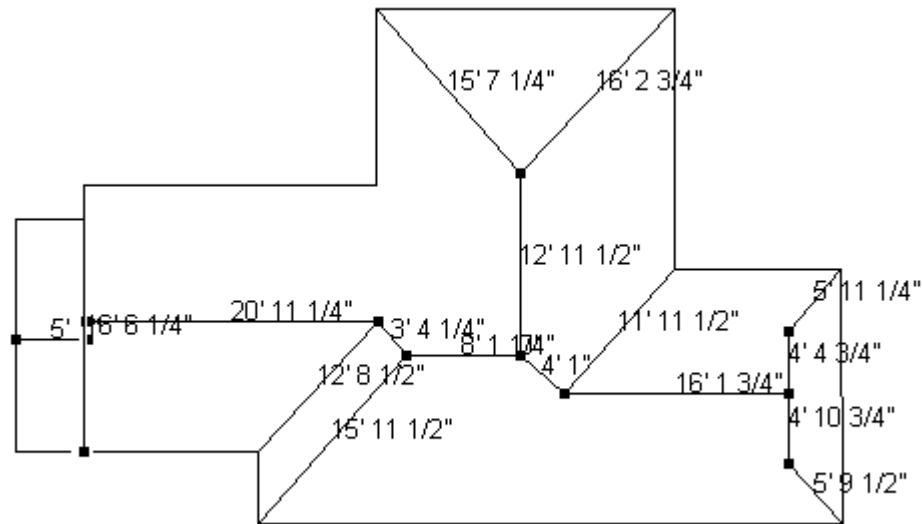
exactly what is detailed on your original roof plan : we will address that easily later.

Again using **Q-Roof | Draw-Lines** digitize all the ridges, hips and valleys : leave the dormer and skylights until later.

First of all, make the constrain values as 10 and 0.

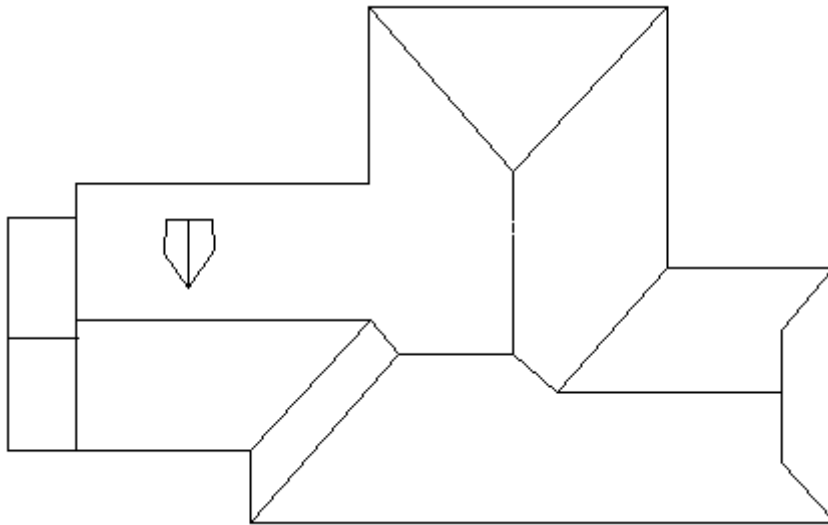


After you digitize the roof lines, you get something like the following.

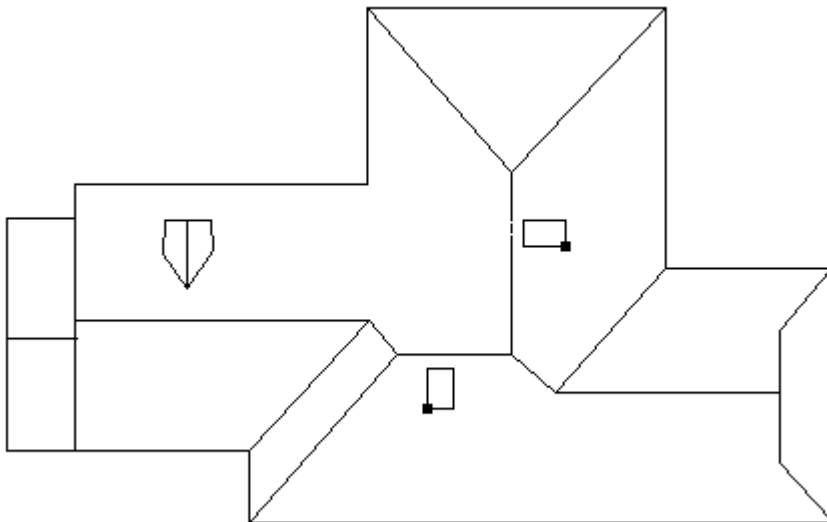


Remember that when you digitize, auto-snap is enabled which means that an existing point (end point of a line) will be used if it falls within the snap tolerance, or a line is used. If neither a point or line fall in the snap area, the actual position is modified based on the angle and distance constraints you imposed earlier.

No digitize the dormer in the same way.



Step 6 : Now insert the skylights using Cover | Fixtures and selecting Skylight from the list of available fixtures. Then, locate the bottom left hand corner of the skylight, then a direction. The resultant roof will then look like the following.



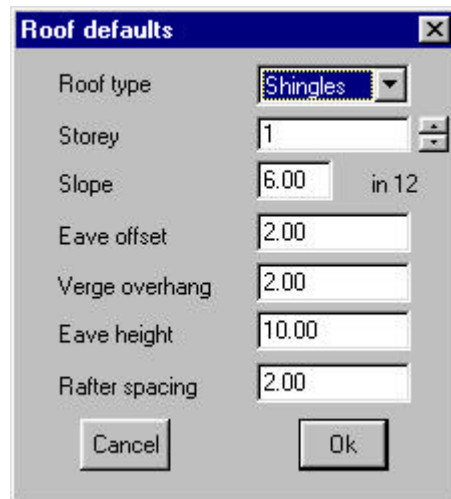
Step 7 : After we have finished doing all the digitising we need to do, we can re-scale the model so it represents the actual dimensions. So, select **Q-Roof | Scale-Model** and then select a line in the model to use as a baseline. Then you are prompted to enter the actual length of this line. You will get that from the blueprint. After you enter that length, the model is re-scaled to suit. You can select **Q-Roof | Measure-Len** at anytime to measure the length of lines in the model.

Step 8. We will now generate the roof planes on the roof using **Q-Roof | Gen-Planes**. This command inserts roof planes on all closed shapes. The first thing you need to check though, is that each line which intersects another line is actually divided at that intersection. The most common position for this to not occur, is the end of a ridge at a gable. You must ensure that the rake line is actually divided at the end point of the ridge, other wise the ridge will be ignored when the planes are created.

It's quite likely that the most left hand gable line on the split gable, is continuous through the end of the ridge. To determine this and to divide the gable line at the ridge intersection, select **Q-Roof | Divide-Line**. Then, select the gable line. The line will then highlight, letting you know its extents. If you need to divide the line, then snap to the point at the end of the ridge. Now, you will have what we need. You may need to check other gable lines in the model, so do that now.

Step 9 : We are now ready to generate the roof planes, so select **Q-Roof | Gen-Planes**. After you select Yes to the prompt, the closed loops are identified and the roof planes are inserted. If there are any unconnected lines in the model, they are displayed so you can determine some appropriate action (ie divide them as in step 7).

After the roof planes are inserted, you then confirm the roof defaults in the following dialog box.



Parameter	Value
Roof type	Shingles
Storey	1
Slope	6.00 in 12
Eave offset	2.00
Verge overhang	2.00
Eave height	10.00
Rafter spacing	2.00

Select **Utilities | Show-Planes** so you can easily see the roof planes. This command simply draws a hatching on the planes to make them recognisable and easy to select.

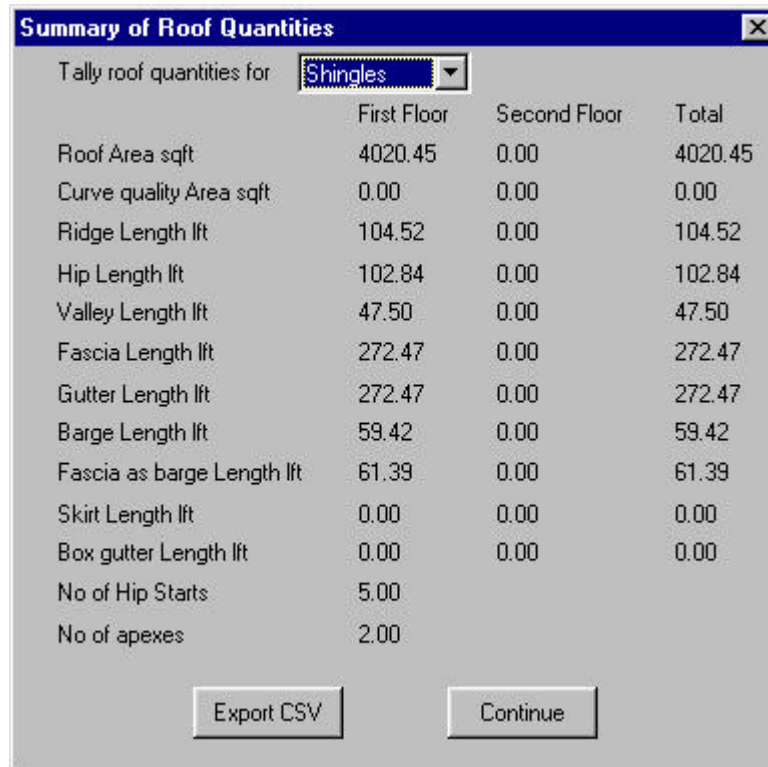
The **Gen-Planes** command also inserts a plane around the perimeter of the roof. You can delete this using **Q-Roof | Delete**. You will also notice a plane around the base of the dormer. Use **Q-Roof | Delete** to delete that one too.

Step 10 : You may want to create a hole in the roof plane under the dormer. To do that, select **Q-Roof | Hole**, select the roof plane, then select the lines around the hole. The hole will be created when you select the last line in the hole. You may want to zoom up to the dormer: you can use **Zoom | Window** from the main menu to do that.

If you want to punch holes for the skylights, then you must draw in the hole boundary using **Q-Roof | Draw-Lines** followed by selecting **Q-Roof | Hole**

Step 11 : You now need to set the line types of the lines in the model. Select **Q-Roof | Set-LineType**, then select one or more lines, then the type of line you want those lines to be (ie Ridge, Fascia and Gutter etc). The color coding system helps you identify what you have done. So do that now.

Step 12 : You can get the geometric quantities using **Utilities | Tally-Quantities** similar to those below.



The screenshot shows a dialog box titled "Summary of Roof Quantities" with a close button (X) in the top right corner. Below the title bar, there is a label "Tally roof quantities for" followed by a dropdown menu currently set to "Shingles". The main area contains a table with four columns: "First Floor", "Second Floor", and "Total". The rows list various roof metrics and their corresponding values for each floor and the total. At the bottom of the dialog, there are two buttons: "Export CSV" and "Continue".

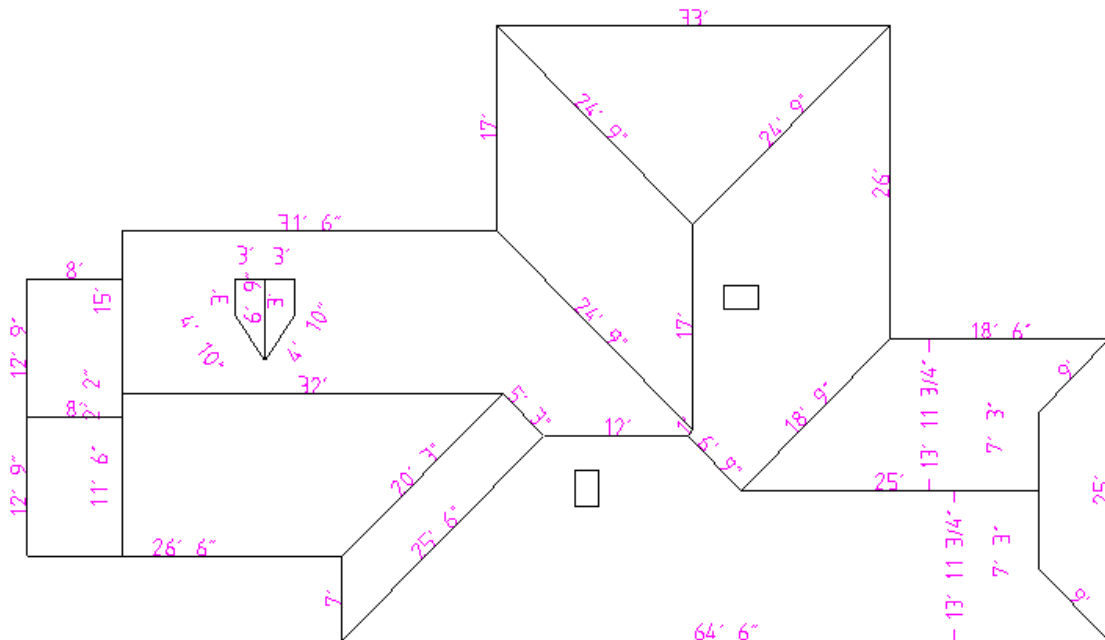
	First Floor	Second Floor	Total
Roof Area sqft	4020.45	0.00	4020.45
Curve quality Area sqft	0.00	0.00	0.00
Ridge Length lft	104.52	0.00	104.52
Hip Length lft	102.84	0.00	102.84
Valley Length lft	47.50	0.00	47.50
Fascia Length lft	272.47	0.00	272.47
Gutter Length lft	272.47	0.00	272.47
Barge Length lft	59.42	0.00	59.42
Fascia as barge Length lft	61.39	0.00	61.39
Skirt Length lft	0.00	0.00	0.00
Box gutter Length lft	0.00	0.00	0.00
No of Hip Starts	5.00		
No of apexes	2.00		

Step 13 : This completes the roof digitising phase.

Re-Roofing

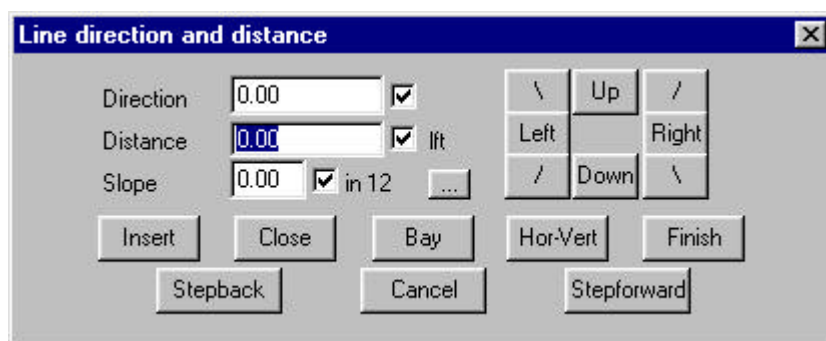
A re-roofing job differs from a new construction job simply because you have not got a scaled blueprint to work from. Typically, you have gone out to the site, measured up the roof with horizontal and slope measurements, and you will derive the slope from up and over measurements. At best your mud map simply records your measurements. The task now is to transfer those measurements from your cigarette pack to the computer and get a result in which you have confidence.

So lets use the same plan as above, but consider it a re-roofing job. The following diagram shows the measurements you may have taken.



All the rake measurements are along the rake. The fascia is horizontal. There are up and over measurements on the right hand hip which will be used to calculate the slope.

Step 1 : The first thing to do is track the outline shape around the fascias and rakes. Select **Q-Roof | Track-Lines** which first asks you to locate a spot on screen – anywhere will do. After you select a position, the Track lines dialog box is displayed as shown below.



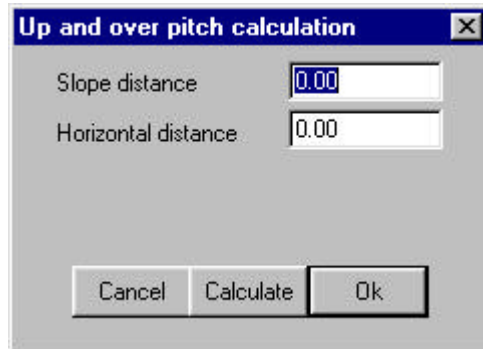
There are several ways to enter the direction –we will settle on using **l** for left, **r** for right, **d** for down and **u** for up as it is the easiest method.

So, starting at the bottom right hand corner and going clockwise, you would enter the following.

So in the distance field,

```
enter      1 64' 6
then      u 7
then      1 26' 6
```

We have assumed the slope of these lines to be zero, whereas the next line is a rake measurement. We then need to calculate the slope to use. If you know the slope, you can enter it directly into the slope field. Otherwise, to calculate it using the up and over measurements, click the '...' button to the right of the slope field. This will display the Up and Over pitch calculation dialog box

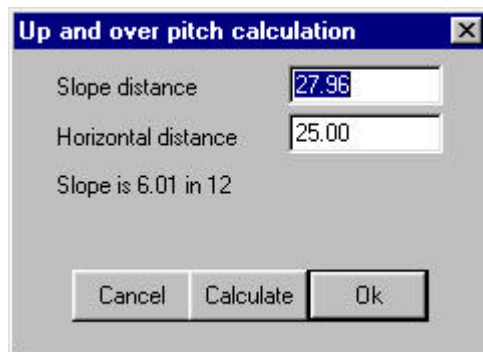


In the Slope field enter 27' 11.5"

In the horizontal field enter 25'

Then press the Calculate button.

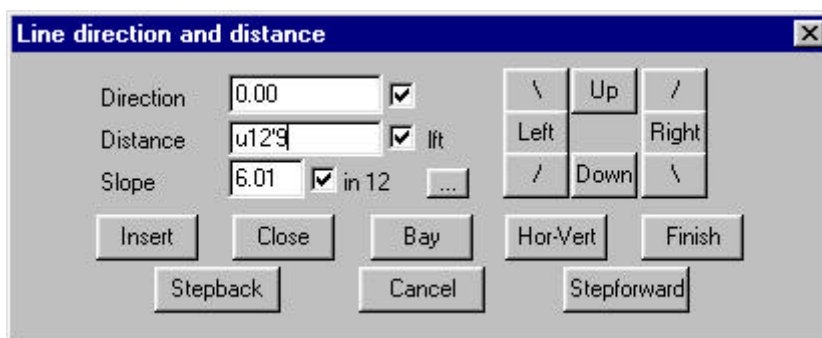
You will see the result as



When you click Ok, the slope value is carried over to the track outline dialog box. (The result is probably supposed to be 6 in 12, but these is some round off error in the measurements)

So, carry on with the input as

```
u 12'9
```



u 12'9

Now enter 0 in the slope field, so the next measurements are horizontal.

r 8'

u 4'

r 31' 6"

u 17'

r 33'

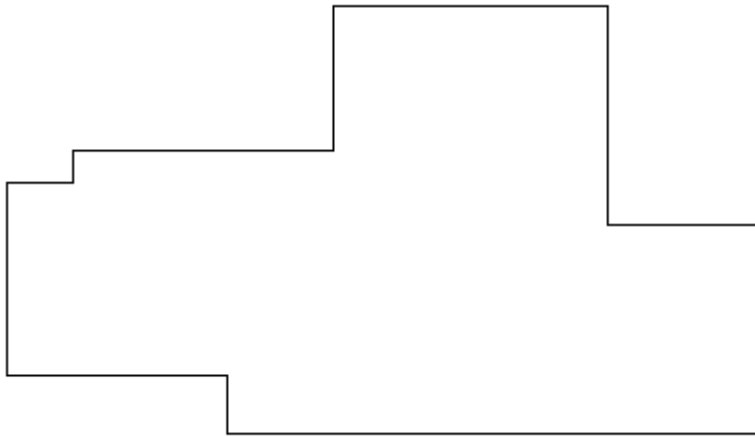
d 26'

At this point we can close the outline using the square method. Click Close, and the Close dialog box is displayed. Then select Close Square.

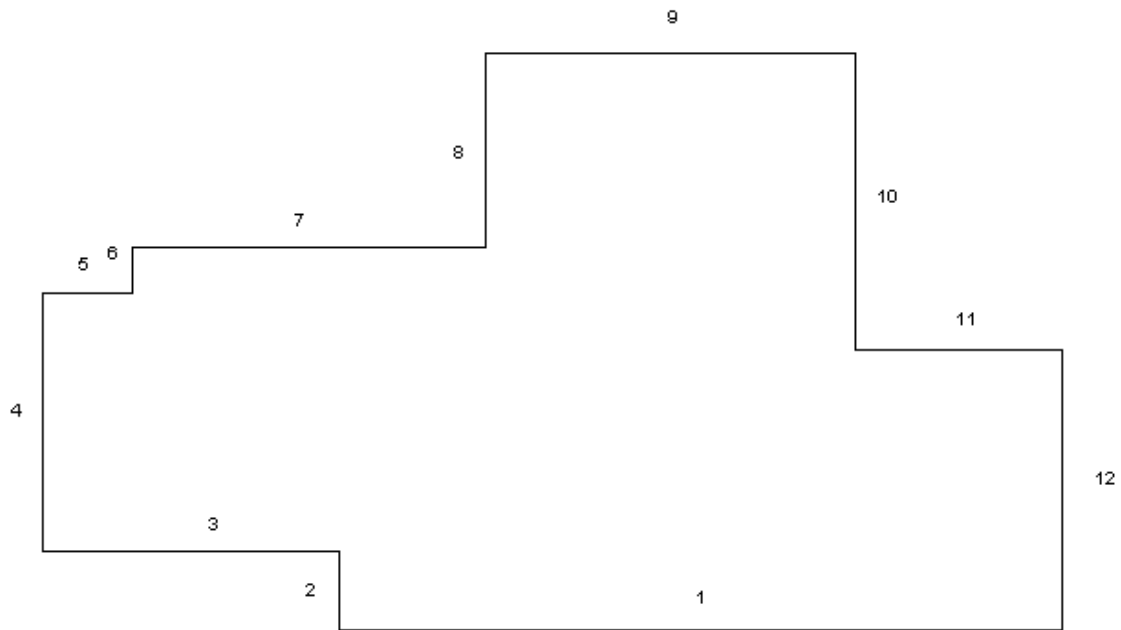
You are then return to the Track Outline dialog box, where you select Finish. The outline is then drawn. You can check the final two measurements against what the system calculates. As long as they are the same (or close) then it confirms the field measurements and your outline input.

The close results are 18'6" and 24' 9 3/4 " which are close enough.

The resultant outline should look like



In order to identify each line later in the tutorial, I have numbered the lines as follows.



Step 2 : We will now insert the ridge lines using **Q-Roof | Bisect-Line**. We will use this command later to draw the hips and valleys too.

To insert a ridge, select line 5 then line 3 which inserts ridge 1

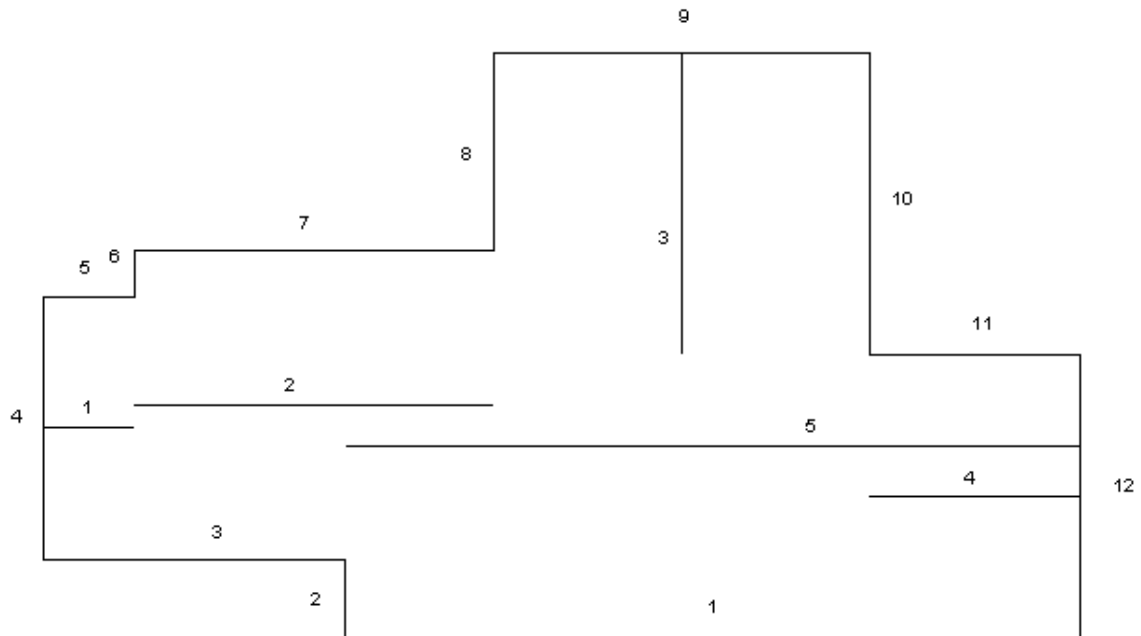
Line 7 then line 3 which inserts ridge 2

Line 10 then line 8 which inserts ridge 3

Line 11 then line 1 which inserts ridge 4

Line 1 then line 7 which inserts ridge 5

You will see that the ridge extends as far as the first line you select.



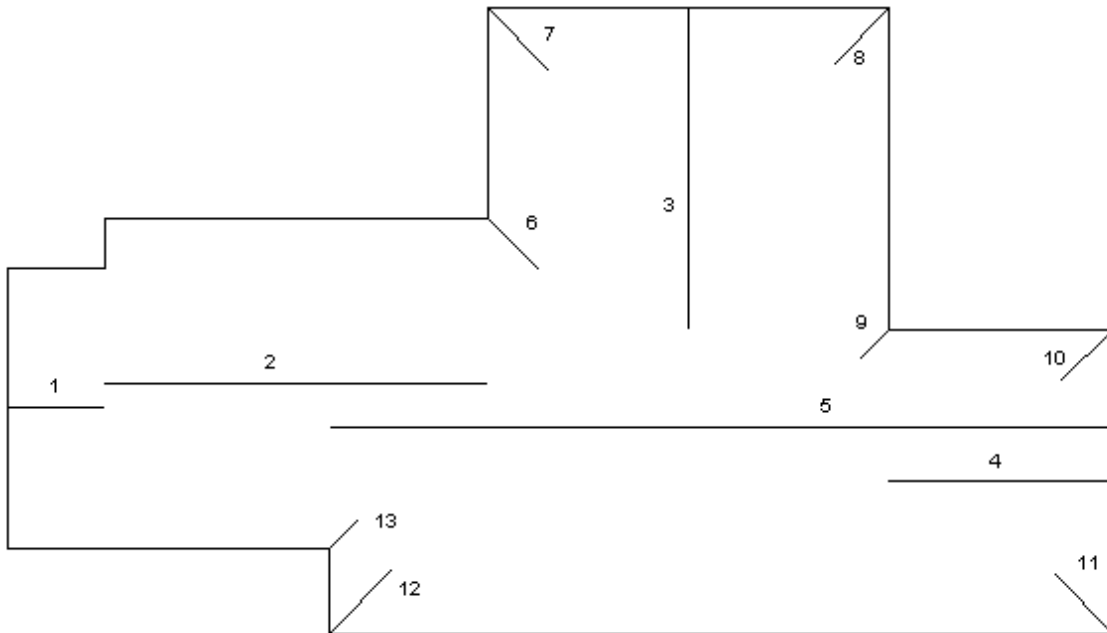
I have again numbered them to simply identify them in the tutorial.

Step 3 : Now insert the hips and valleys using **Q-Roof | Bisect-Line**. In this case, you select 2 connecting eave lines, then locate an approximate end point of the hip or valley.

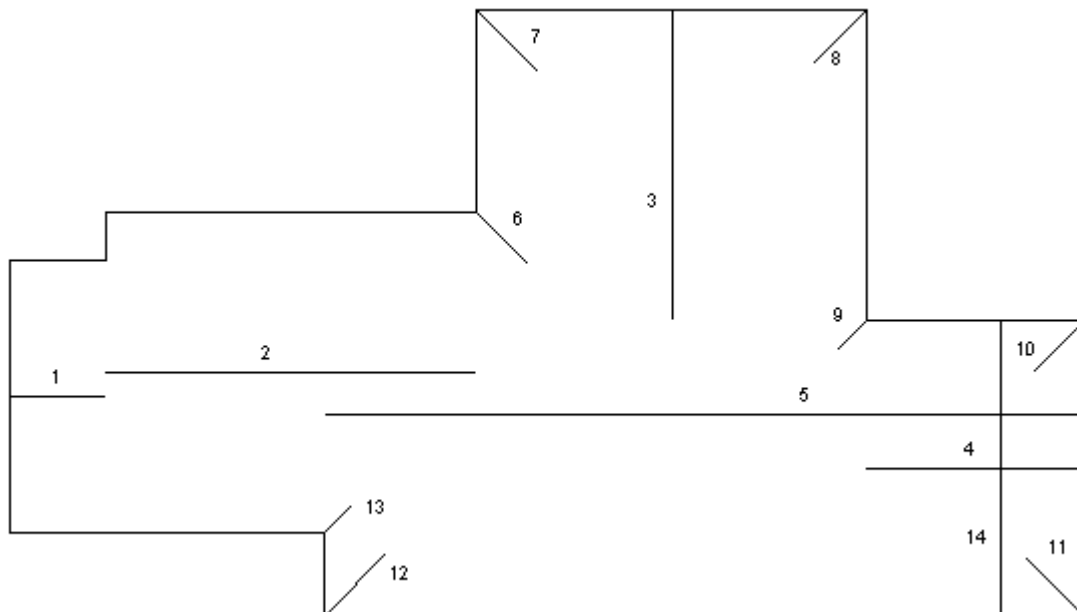
So proceed to insert lines at corners defined by eaves

- 7 and 8
- 8 and 9
- 9 and 10
- 10 and 11
- 11 and 12
- 12 and 1
- 1 and 2
- 2 and 3

Your roof plan should look something like this



Step 4 : To insert the line of the dutch hip, select **Q-Roof | Parallel-Line**. In the dialog box, you enter a distance and a slope. After selecting Ok, you select the line to copy (line 12) and then the side to place the

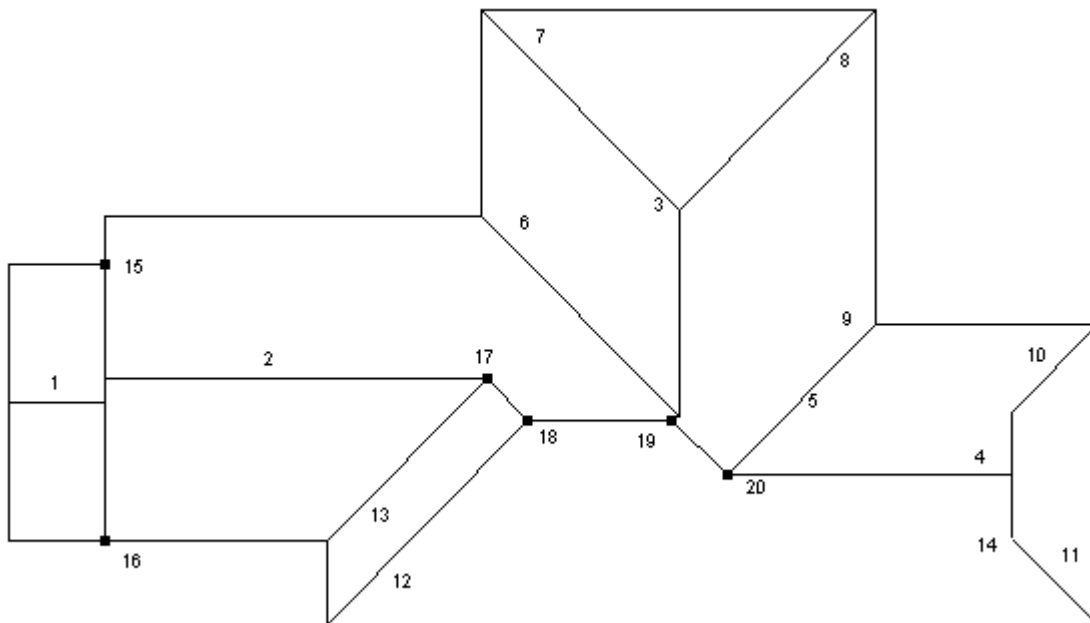


copy on. I have used a slope distance of 8' and a slope of 6 in 12. This creates line 14.

Step 5 : Then the hips, ridges and valleys need to be trimmed together using **Q-Roof | Trim-Line**. Note that when you trim a line, you must select the end of the line you want to have moved. Also, you must do each lines separately (ie to trim lines 12 and 2 to each other you must first select 13 then line 2, then 2, then 13).

So, trim the following pairs of lines together:

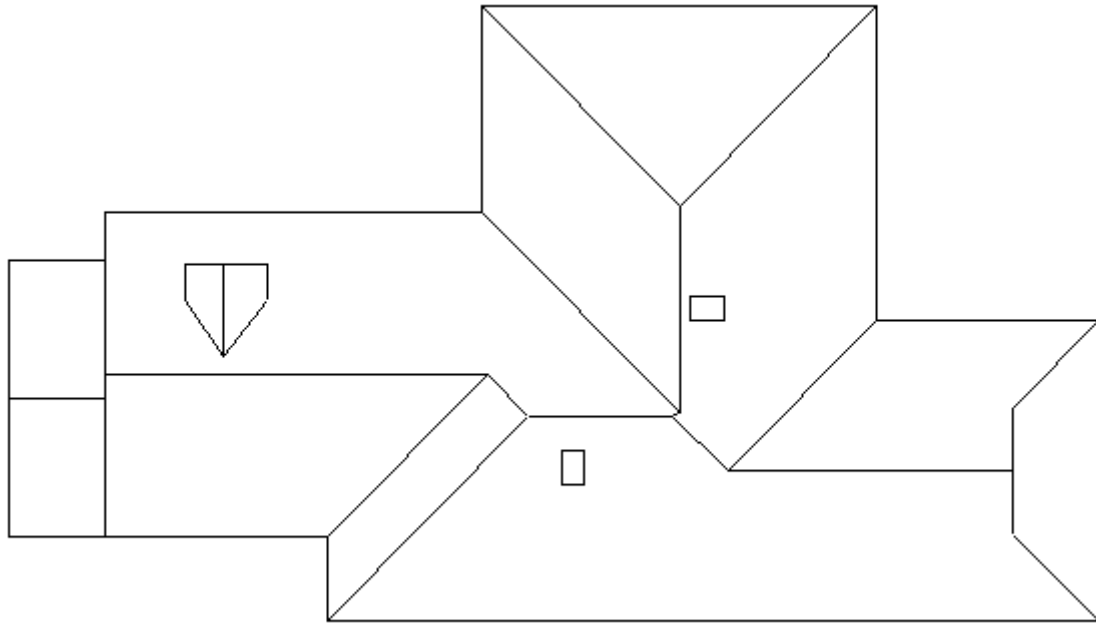
- 13 -> 2
- 6->3
- 7->8
- 3->8
- 12->5
- 9->4
- 10->14
- 11->14
- 4->14



Further lines need to be drawn using Q-Roof | Draw-Lines between the highlighted points above.; namely

- 15 -> 16
- 17->18
- 19->20

Step 6 : You can now use **Q-Roof | Draw-Lines** or **Track-Lines** to draw the dormer in. Then **Cover | Fixtures** to insert the skylights. The final roof will look something like that below.



Step 7 : From now on, refer to Step 8 above to see how to generate the roof planes and get a take-off.