

Tips and Tricks #42

PROCESS FOR DIGITISING A ROOF FROM AERIAL IMAGES

Introduction

There are many options in this program that you may never use. Try to ignore most of them until specifically requested to use them. This will make using this process a lot easier for you, and whole lot less confusing. There may be a few alternate methods for acquiring an aerial image depending on the source image. If you're digitising a scanned plan, please refer to that tutorial specifically (Tips 24 and 41 at the AppliCad web site). You may also notice very slight differences between different products. Concentrate on the overall process and if you get stuck, send a question to our support team.

Capturing the Client's Roof Image

1. Start the aerial image database (eg Google™). Insert client's address and zoom in to best view. Ensure that North is still North (if not, double click the [N] symbol to re-orient the image view to true north).
2. Measure overall width and length of house roof. Note for later use. You should also note the latitude and longitude of the property.
3. Start Windows Snipping Tool™ and capture area of screen that includes the client's roof.
4. Open Microsoft Paint™; paste the clipped view from clipboard. Annotate with length and width from measurements and the latitude and longitude. **Save-As** a BMP into the C:\AppliCad_ User folder using a name that uniquely identifies the job as the plan view.



5. Go back to Google™ and select an appropriate Street View™ image of the client's roof. Start Windows Snipping Tool™ and capture area of screen that includes the client's roof.

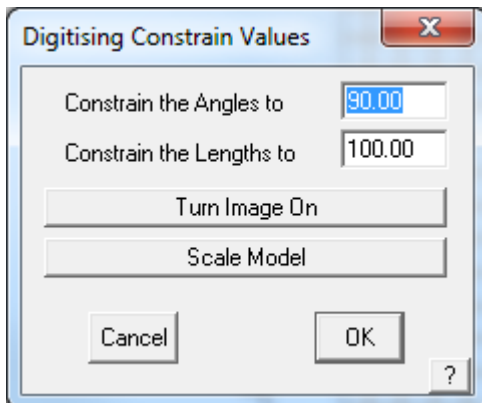


6. Open Microsoft Paint™; paste the clipped view from clipboard. Annotate with length and width from measurements. Save-As a BMP into the AppliCad User folder using a name that uniquely identifies the job as

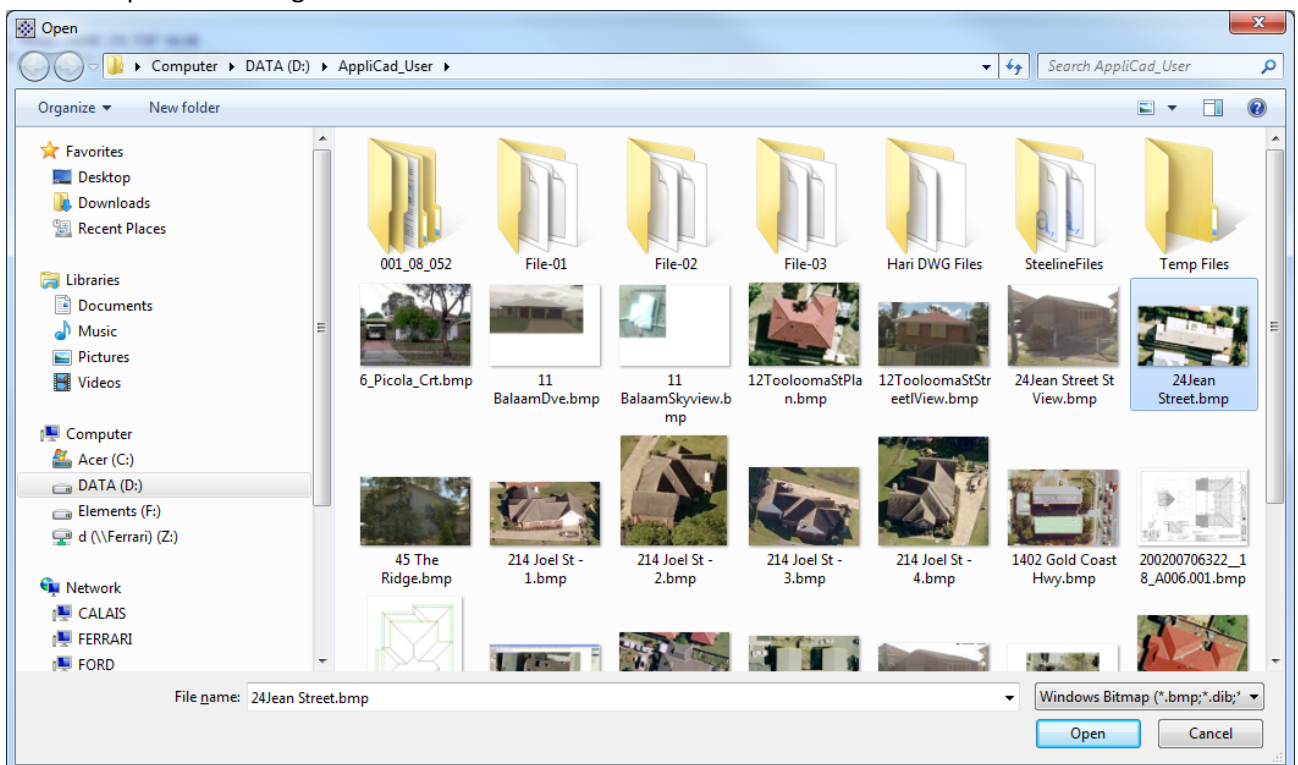
the street view.

Digitise the Client's Roof from Image Underlay

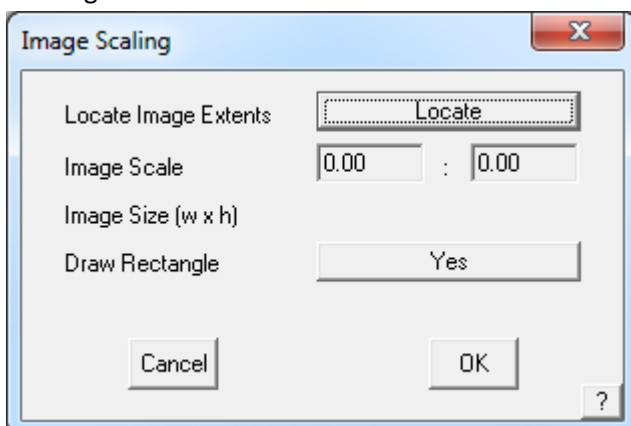
7. Start up AppliCad and select **ConstructRoof > Digitise Roof** option. Set the Constraining options as shown below and select **Turn Image On**



8. Select the plan view image of the client's roof.

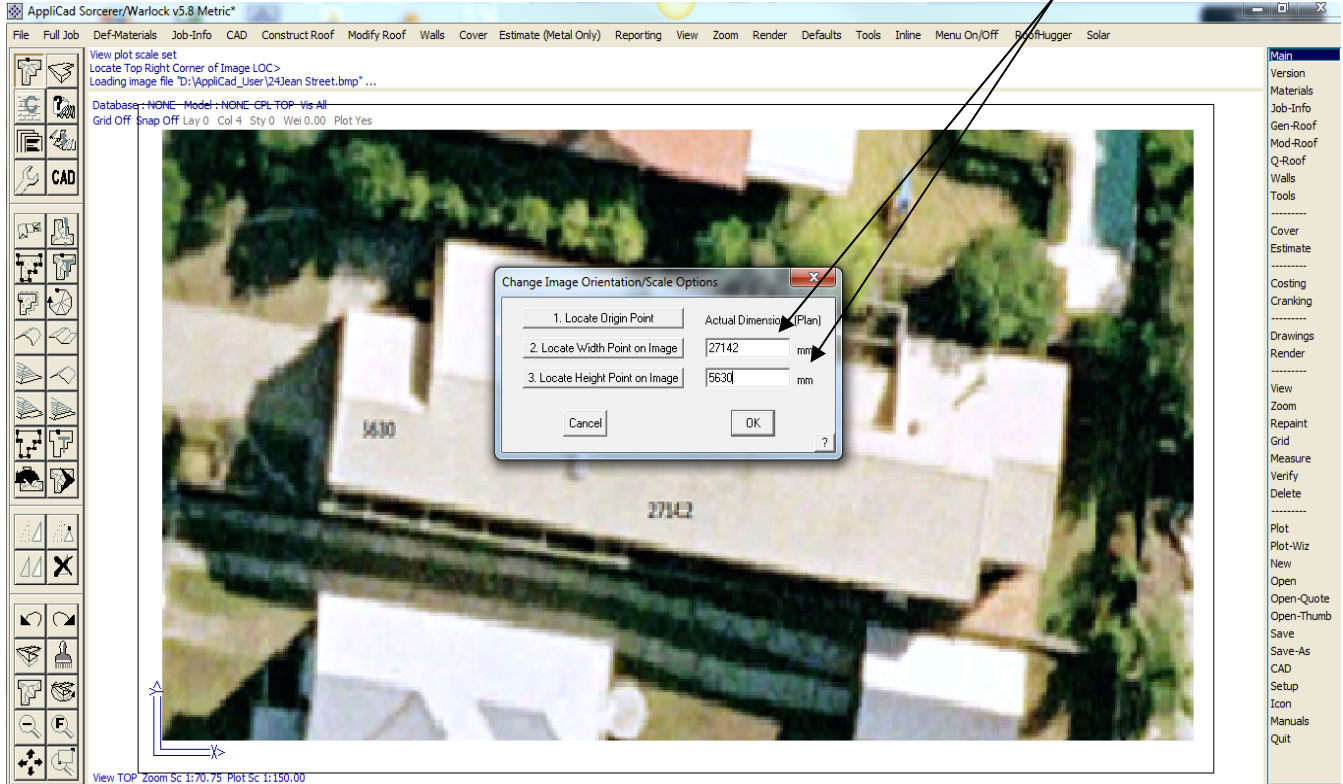


9. The Image scaling box is then displayed and we will stick with the simple 'Locate' option, select Draw Rectangle - Yes and then select OK.

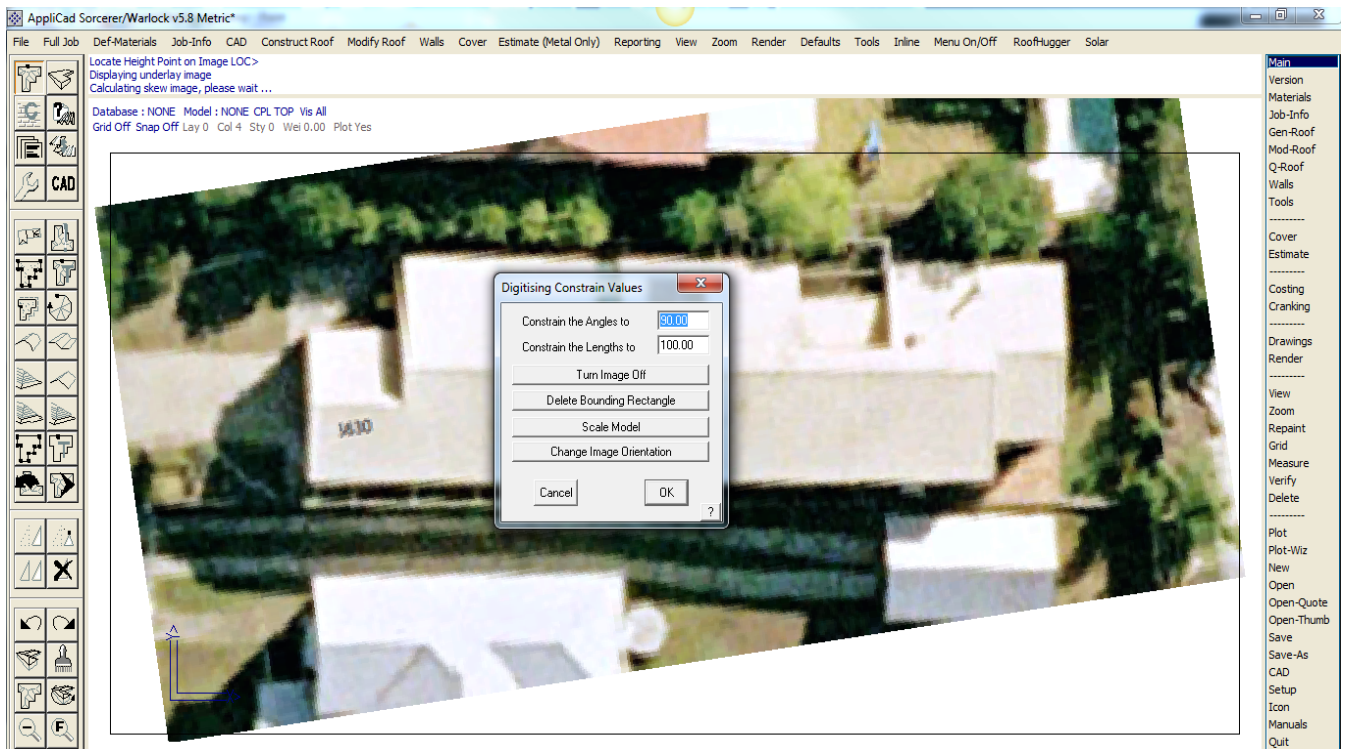


10. The CPL origin is displayed at the lower left of screen and the cursor is attached to a dynamic box. Left click at about the right proportions for the selected image. The image is displayed with a rectangle around it. The rectangle aids with scaling and zooming around the model and includes the image.
11. The change Image Orientation/Scale Options box is displayed. Enter the width and height dimensions we recorded earlier. The select button 1. Locate Origin Point, then select the corner of the roof. The lower left is typically the best point to select. Then select button 2. Locate Width Point on Image, then select the extreme right hand edge where the original dimension was taken from; lastly select button 3. Locate Height Point of Image and select the point where the height was taken from. Use the long cross hair cursor to assist in selecting these corners as accurately as you can.

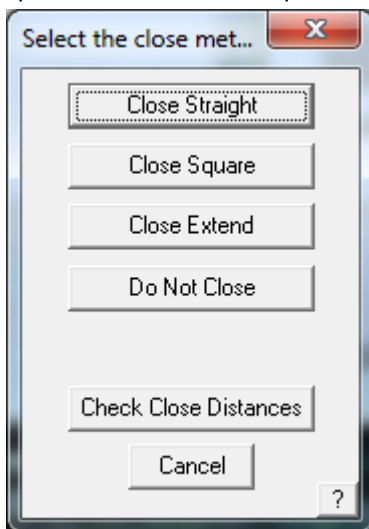
Roof Gross Width and Height fields



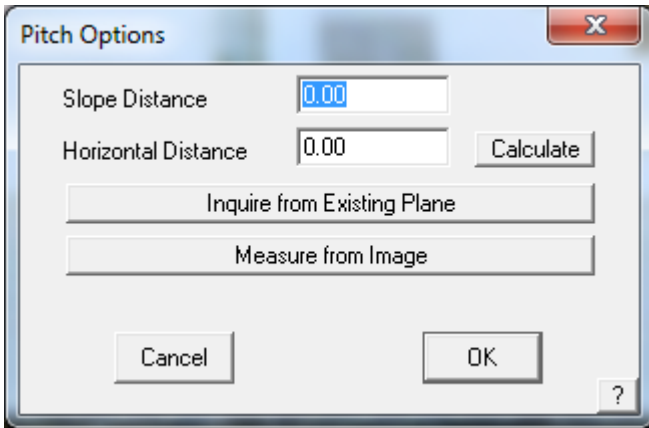
12. Then select OK. The software then goes off and automatically scales the image and adjusts for any skew in the image. It will now be presented with the roof square to the screen as an Architect might draw it.



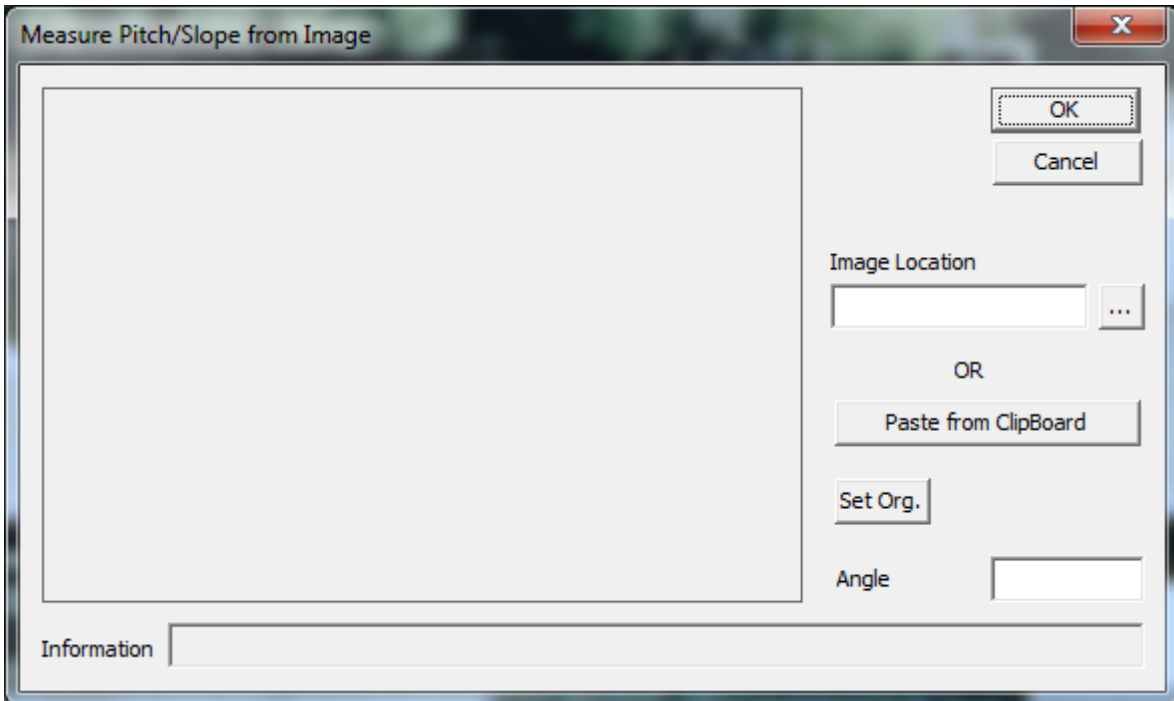
13. Select OK and the cursor is now connected to the Origin point and has a dynamic line attached to it ready for you to digitise the roof perimeter. Carefully select each corner of the roof until you get to the second last point then select the right mouse button (Cancel). You will then be presented with the Close outline options. Select Close Square.



14. You are then prompted for re-scaling the outline. This will not normally be required, so select OK.
15. The Roof Defaults dialog is displayed and this is where the roof starts to take shape. If you are concerned about the appearance of the roof hatching, select Metal for category of Roof Type. Next select the Storey number. This is only important if you have multilevel structures and if the software is being used for material and labour calculations. Next we must determine the roof pitch. Select the button [...] next to the Pitch field and select Measure from Image.



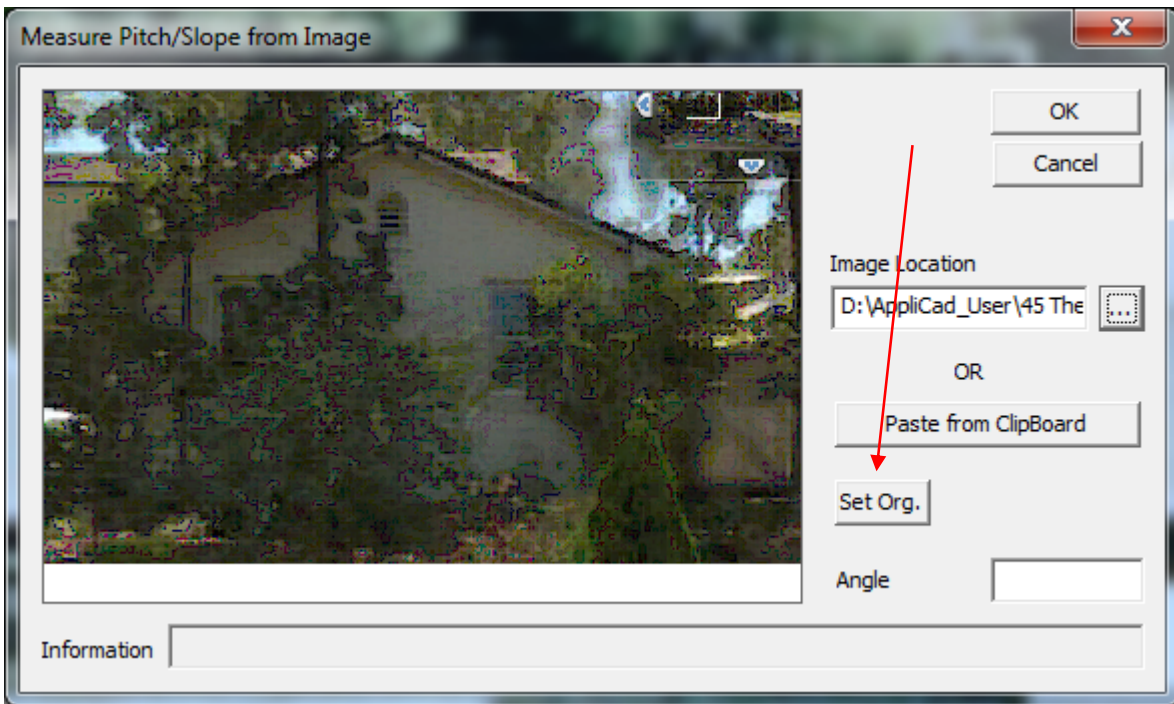
16. The following dialog box is displayed. Select the button [...] next to the Image Location field.



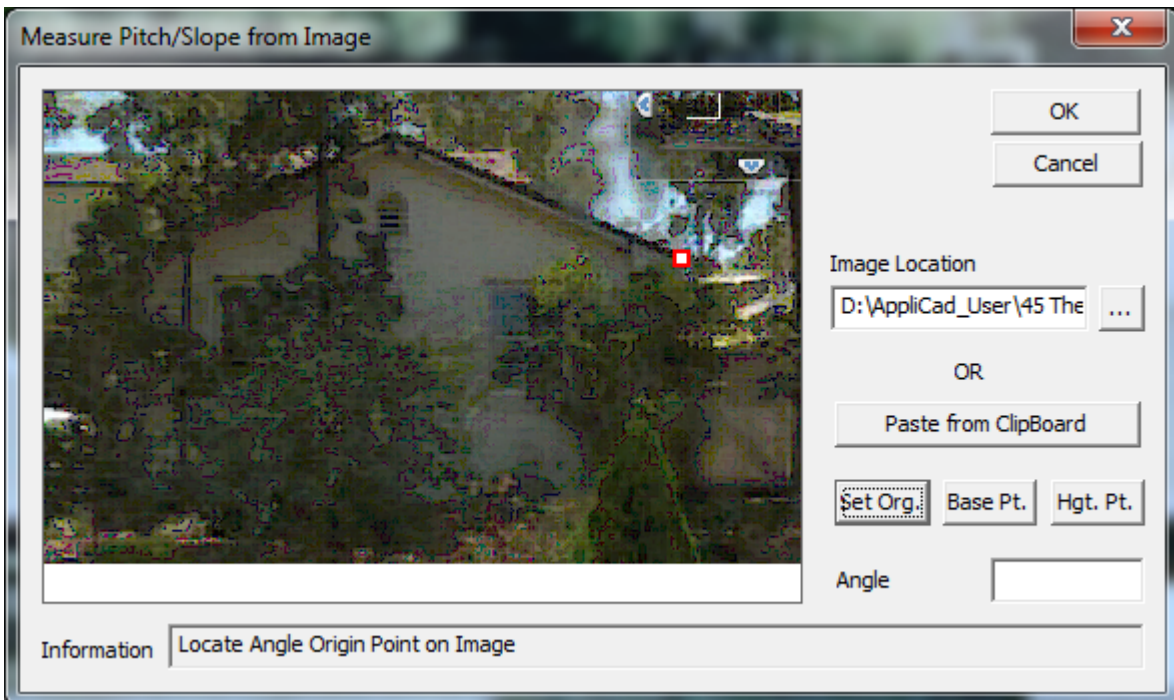
17. The folder path is displayed and you should be already looking in the correct location, ie the C:\AppliCad_Solar_User folder where you saved the images above. Select the required image of the elevation of the roof.



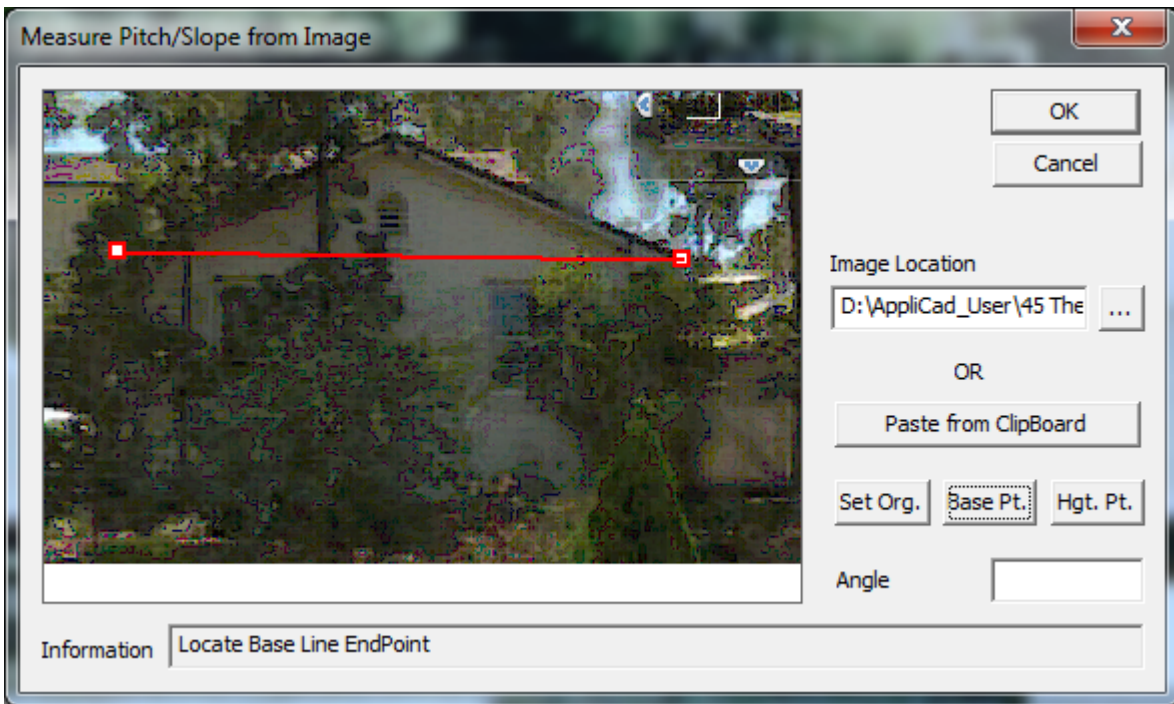
18. The image is then displayed in the work space of the dialog, as shown below.



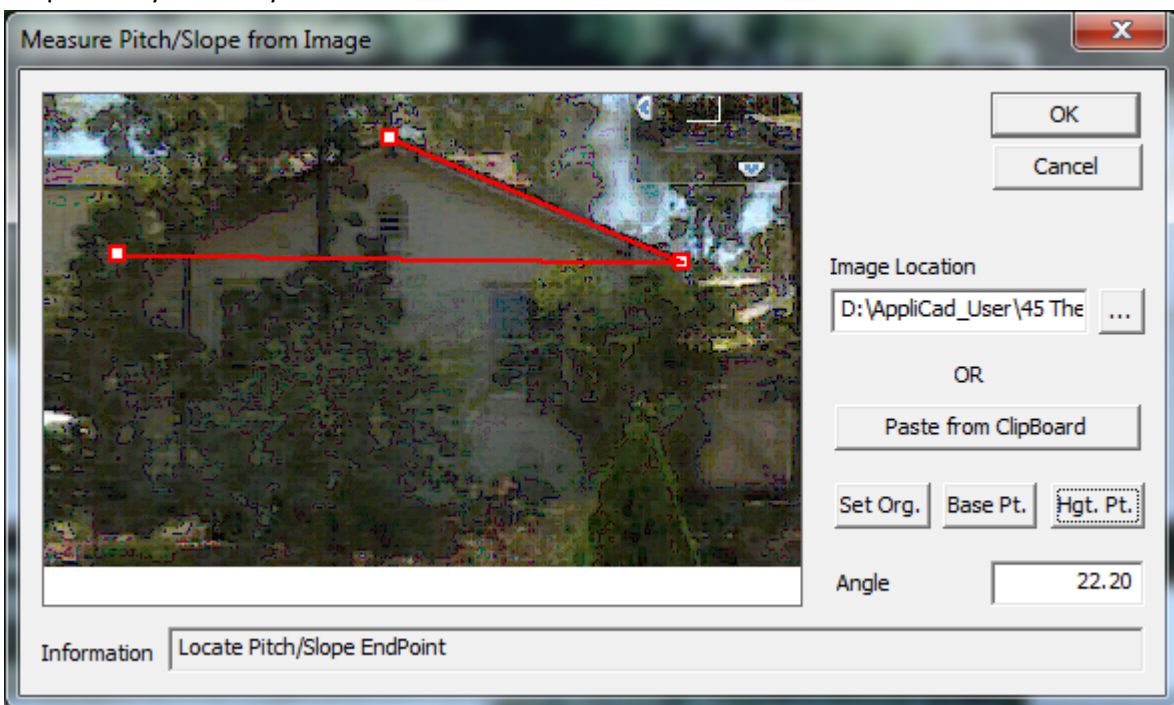
19. The first step in determining the pitch is to set an origin point (start of the angle of pitch). Select the button, **Set Org** and left click on the corner of the roof as accurately as you can. A big dot is drawn.



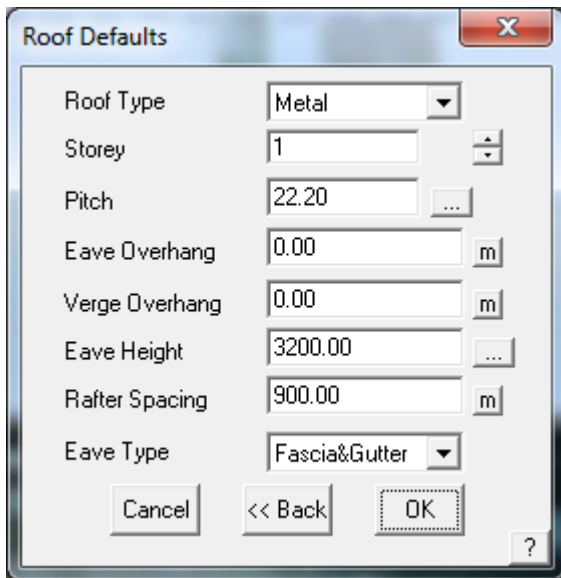
20. Next step is to set the base point for the reference line to measure the pitch from. Select the button **Base Pt** and left click a point on the opposite side of the roof. A line is drawn.



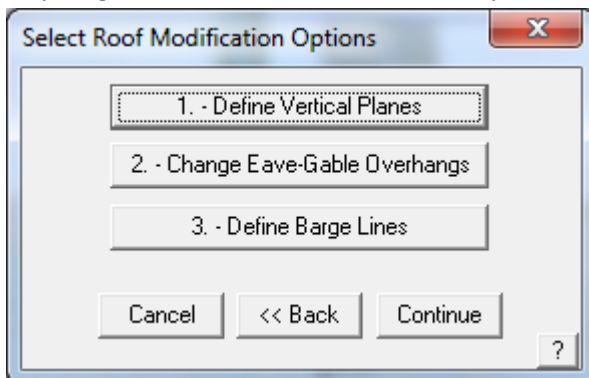
21. Next select the apex of the roof to determine the roof pitch. Select the **Hgt Pt** button and left click the apex of the ridge as carefully as you can. An angle of pitch is displayed in the **Angle** field. You may reselect any of the points if you think you need to refine the measurement.



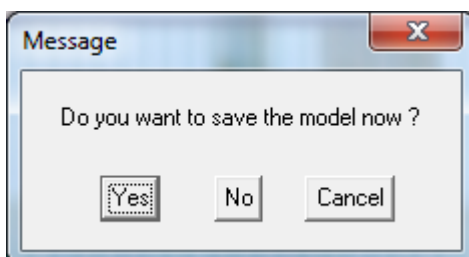
22. Select OK and the Roof Defaults dialog box is returned with the determined pitch in the pitch field.



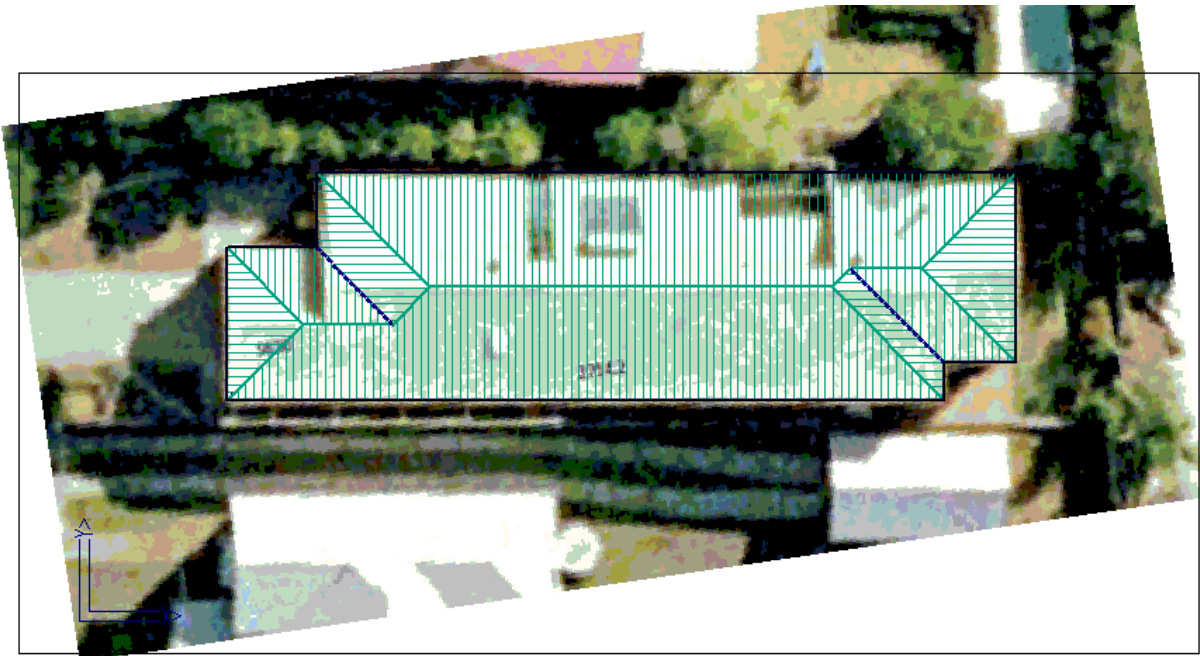
23. Since we're digitising the perimeter of the roof, we do not need to account for overhangs at the eave or gable end (verge), so set these to 0. The Eave Height is important so that the relationship between the roof and surrounding structures or obstructions are correct relative to the roof. This is difficult to measure and may be guessed with reasonable accuracy for our purposes.



24. Select OK and the next dialog box is displayed requesting preset roof modifications. Ignore these for now and select OK. The roof is modelled and the roof planes inserted.
25. You are then prompted to save the job and that would be wise. Select Yes and select a database and model to write to.



26. The model with the re-skewed image and the 3D roof model created over the top is then displayed on screen and waiting the next steps – modifying the roof to the correct geometry and adding the trees and solar panels.



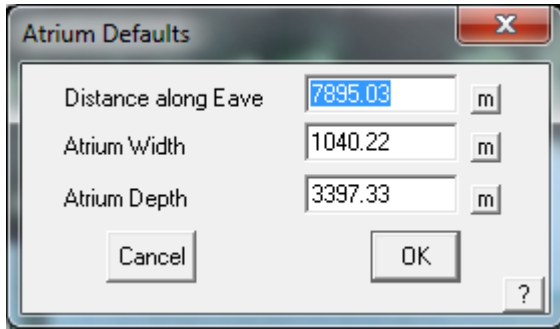
Modify Roof Model to Add Architectural Features

27. AppliCad has many automatic functions for adding architectural features to the roof, usually in a single mouse click. These features are important as they may take up real estate on the roof where panels may otherwise fit, or they may cast a shadow across our PV array. We locate these features as accurately as we can. All the Mod-Roof functions have a measure tool to determine the size of these features from our graphic image. Now that the image is scaled to the size of our roof, this can be achieved with surprising accuracy.
28. The next thing we need to do on our example then, is turn our hip ends into gable ends. Select the **Modify Roof** function **Hip To Gable**. Then following the prompts, select the ridge lines in turn working from the outside to inside. Each hip becomes a gable as shown below:



29. The next thing to do is add the atrium that extends along the northern face of the roof. Select **Mod-Roof > Atrium**. You will be prompted for the eave line to construct the atrium on and the following dialog box is displayed. Since we do not have the correct measurements, we can extract those from our image by clicking

on the [m] button next to each field. Select the feature to be measured with the left mouse button and the measured length will be inserted in the appropriate field of the box.



30. Then select OK and the atrium is constructed automatically as shown below:



Now use the usual process for checking the model for accuracy, applying materials and generating the client proposal.

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