

Short Sharp Training

0808

Welcome to this issue of the *cadsupportonline* user group. This manual is designed to work like a user group meeting. There is a main workshop topic, then a page of general questions and answers, 2 extended movies showing tips or techniques and an area for beginners.

Workshop Topic

Solar Study

When you are designing a building or landscape feature, you may be concerned about the affect of your structure on the surrounding buildings and landscape. Some of my clients have been asked to provide evidence that the building design does not adversely affect the neighboring properties.

Q & A

When Should I use Groups and When Should I Use Symbols?

Extended Podcast 064

Making Symbols for Architects and Interior Designers. Often Architects and interior designers want to have special symbols for furniture or fittings they want in the project. They want the 2D plan to be simple and graphically clear, but they want the 3D model to be complex and detailed.

Extended Podcast 065

Using Photoshop to merge scanned images. Last month I used a scanned site plan that was too big for my scanner. How did I manage to get the scanned image?

Beginners Corner

2D Reshape Tool.

Solar Studies

Introduction

What is a solar study? In basic terms, it is where we use to VectorWorks to show where the sun is coming from and where shadows fall. In architectural terms, we would use the solar study to check the shadows from our building and how they affect neighbors.

I worked on one project several years ago, where the client was worried about shadows from surrounding buildings affecting their tennis tournament. We had to model the surrounding site and apartment buildings to make sure that during June, there were no shadows on the Number 1 Court at Wimbledon.

Solar studies are common with large buildings, and I hear from several clients now that solar studies are expected from by some councils for domestic projects.

There are a few basic steps you need to complete.

- Model the building in 3D.
- Place Lights.
- Render the scene.

That sounds fairly easy, but I wanted to lead you through all the steps anyway and show you how to do this efficiently.

To use this technique you must have VectorWorks Architect, Landmark or Designer. You need these to create the site models. You must have RenderWorks, without it you can not cast shadows on the ground.

Stage 1 - Draw the Site Model

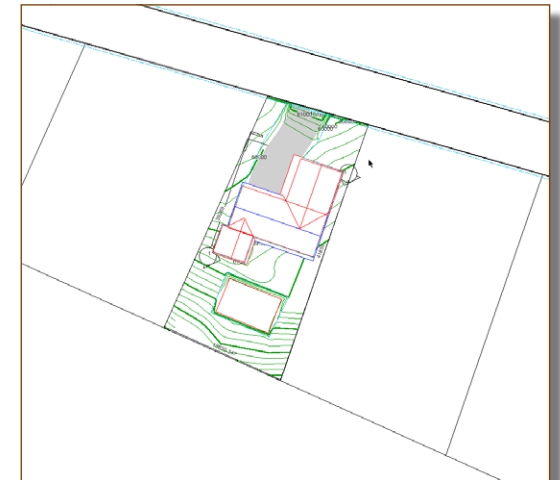
We have covered site modeling in other manuals.

[cadmovie195](http://www.archoncad.com)

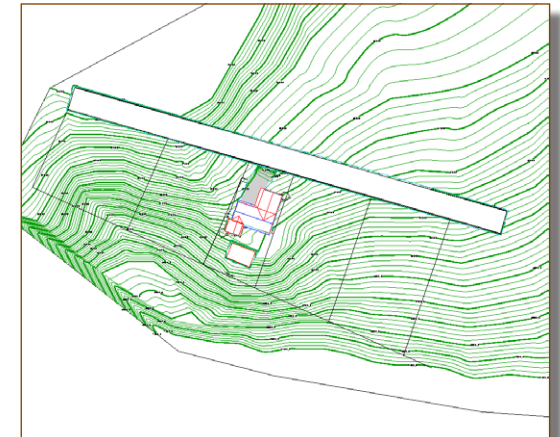
The important difference with solar studies is you need a larger area of site model. Normally when you get a site survey, you only get the site you are working on.

For a solar study you need the surrounding area as well because you want to place adjoining houses and see their shadows on the ground.

You can often get the additional information from the local authority (city council, district council and so on).



The information does not have to be as detailed as the information you get for your site.

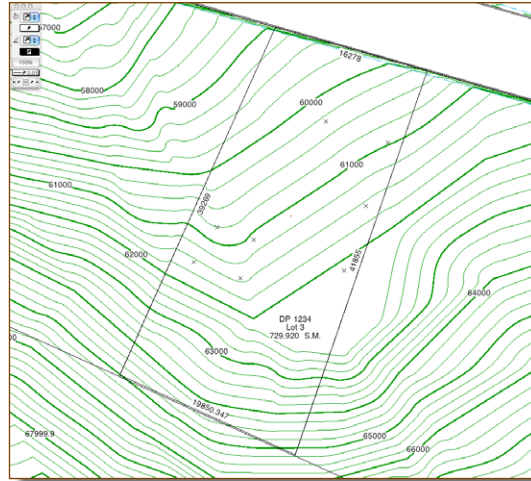


Stage 2 - Draw the Bulk and Location

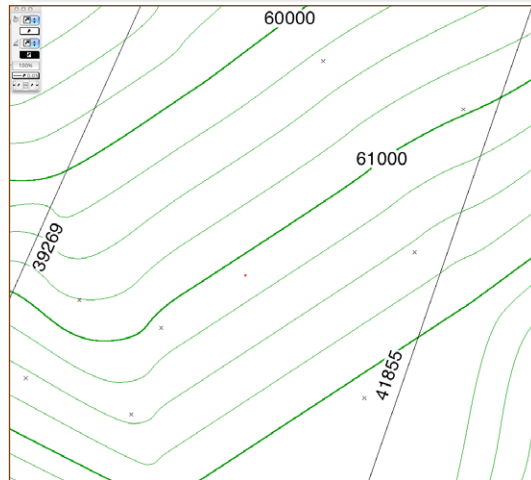
You can draw the building using the standard VectorWorks techniques for drawing walls, adding doors and windows and creating roofs, but if you are at an early stage of the project you could use spaces for the project to get a very fast result.

[cadmovie196](#)

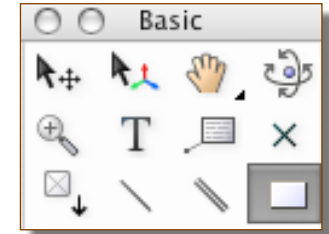
- You need a file with a site model.



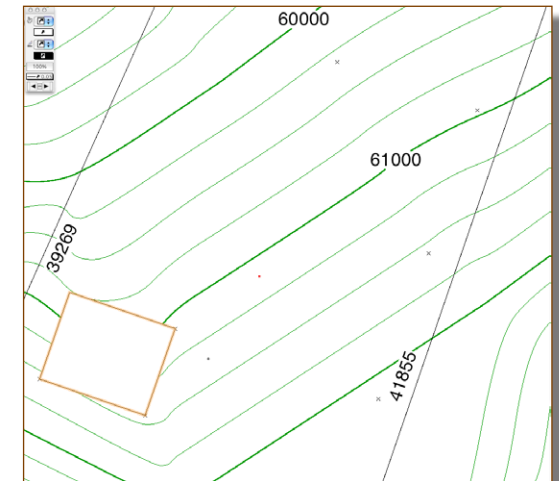
- Zoom into the drawing. This drawing has locus points to help draw the massing models.



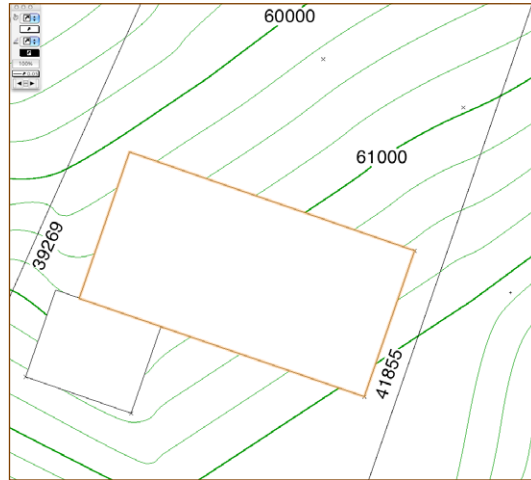
- Go to the **Basic Tool** palette.
- Select the **Rectangle** Tool.



- Go to Tool Bar.
- Click on the **Rotated Rectangle** option.
- Draw the first rectangle



- Draw the second rectangle.



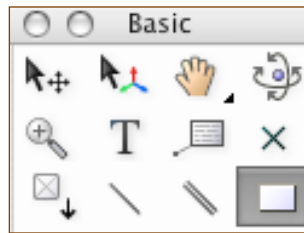
- Draw the third rectangle.

We need to convert these objects from 2D shapes to something in 3D that will allow us to use them.

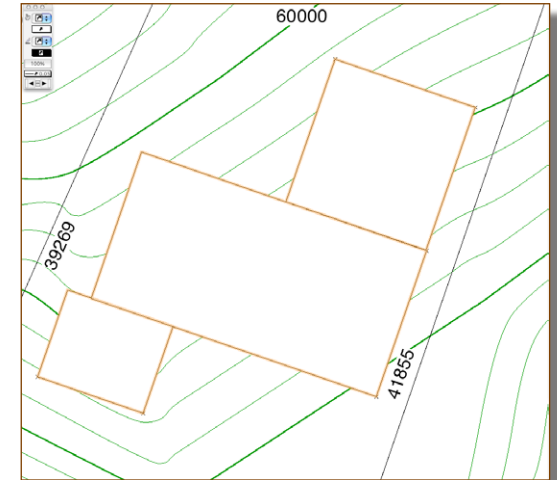
If you have VectorWorks Architect or Designer, you can use spaces, otherwise you can use extrusions. Spaces have an advantage when we want to send them to the site model.

cadmovie197

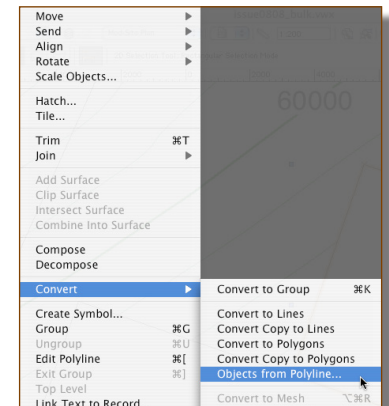
- If you have Architect or Designer, follow these instructions. Otherwise you will have to extrude the rectangles.
- Go to the **Basic Tool** palette.
- Choose the **2D Selection** tool.



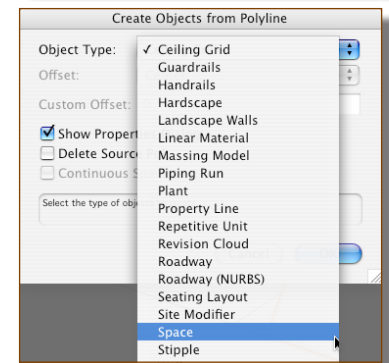
- Select all the 3 rectangles you drew.



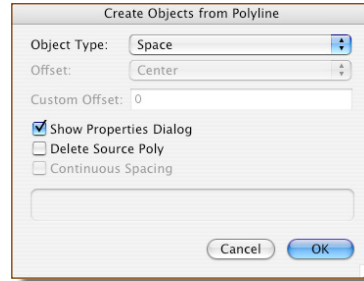
- Go to the **Menu Bar**.
- Choose **Modify > Convert > Objects From Polyline...**



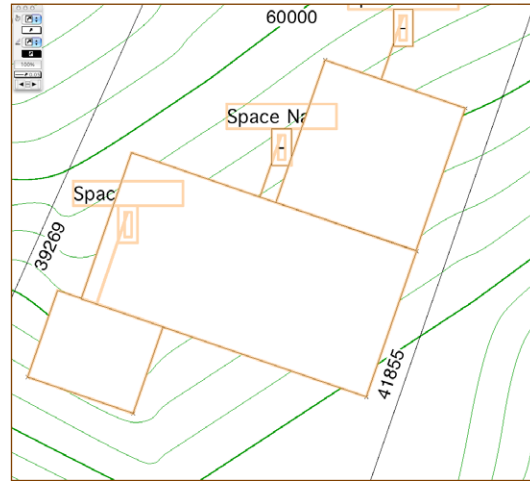
- Click on the pop-up menu.
- Choose **Space**.



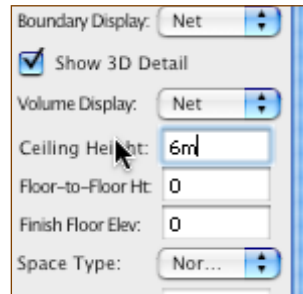
- Click on the **OK** button.



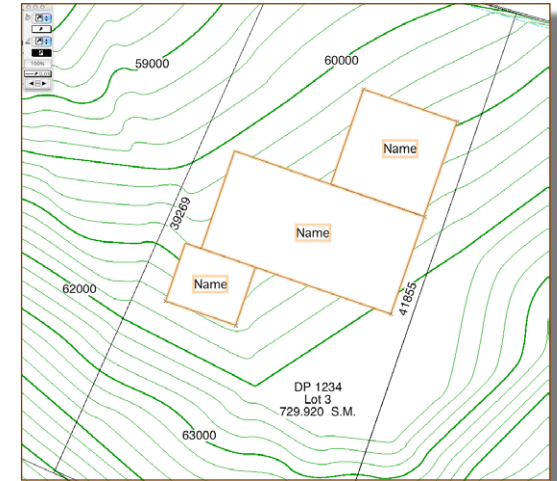
- All the spaces are named and placed on the site. The spaces are named. You can move the placement of the names by using the **2D Selection** tool.



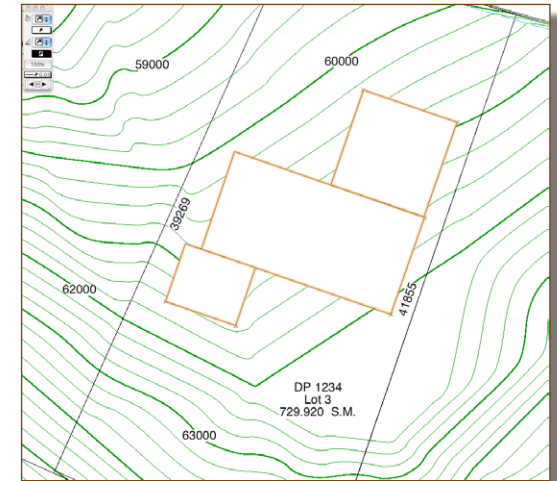
- One of the good reasons to use spaces is that you can use the Object Info Palette to change the height of the spaces. Each space can have a different height.



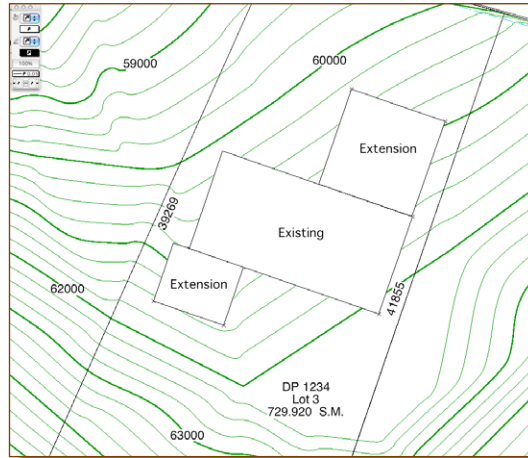
- The spaces are named. You can move the placement of the names by using the **2D Selection** tool.



- You can use the **Object Info Palette** to remove the names.

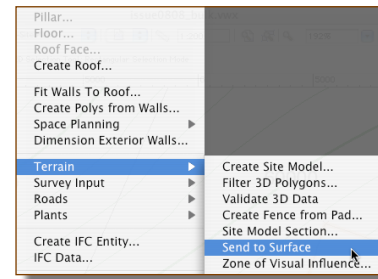


- You can use the **Object Info Palette** to change the names of the spaces.



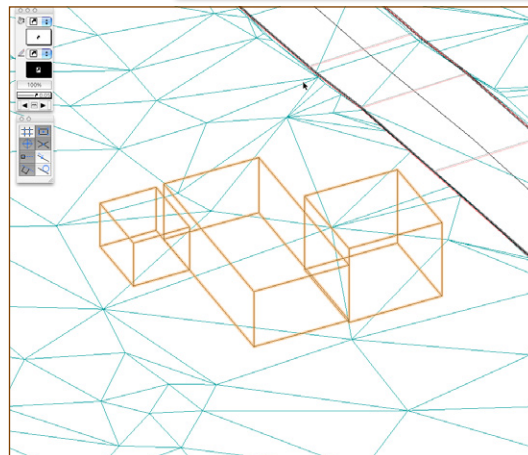
[cadmovie198](#)

- Select the spaces.
- Go to the **Menu Bar**.
- Choose **AEC > Terrain > Send to Surface**. If you are using Landmark this is on the Landmark menu.



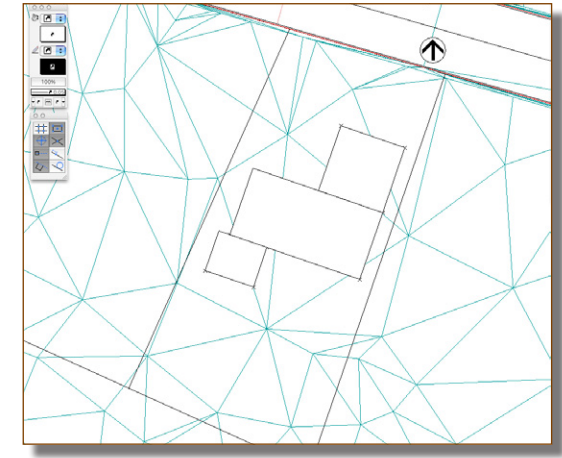
- VectorWorks moves the spaces so that the bottom center of the space is sitting on the ground.

If you have VectorWorks landmark you may not have access to the spaces. You can use extrudes instead of spaces. Just remember that when you use send to surface, the centre of the extrude is sent to the surface.



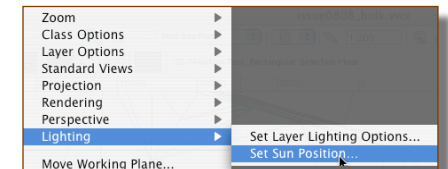
You will have to manually move the space up in 3D by 1/2 the extrusion height.

- Zoom in so you can see the site

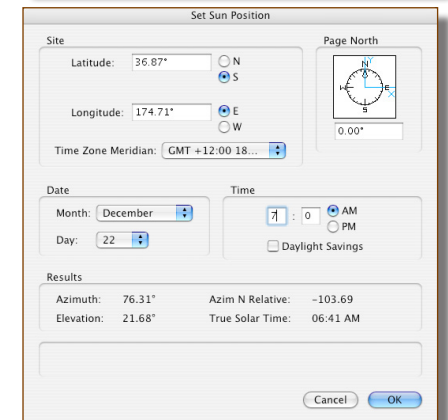


[cadmovie199](#)

- Go to the **Menu Bar**.
- Choose **View > Lighting > Set Sun Position...**

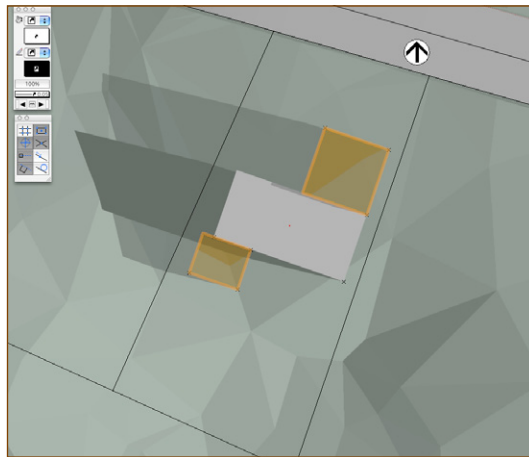
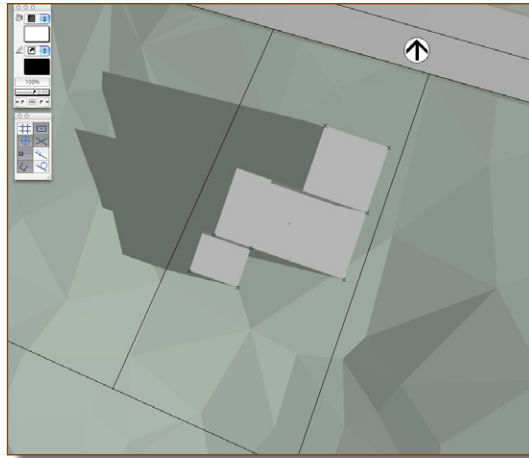


- You need to know your latitude and longitude. I have looked up my site on Google Earth. Google Earth will give you exact latitude and longitude information.
- Set the time zone.
- Set the day of the year.
- Set the month.
- Set the time.
- Click on the **OK** button.



- Change to a **Top** view. This is not Top/Plan, this is the 3D view from above.
- Choose a rendering mode. This is Final Quality Renderworks.

You can see the shadows on the ground. This shows you how to complete the first part. You can not see the adjoining buildings and we have not set up a drawing to print this view.



From this picture it is not easy to see the shadow of the existing building and the effect of the proposed extension. If you add a texture to the extension parts of the project you could show the difference between the existing and proposed.

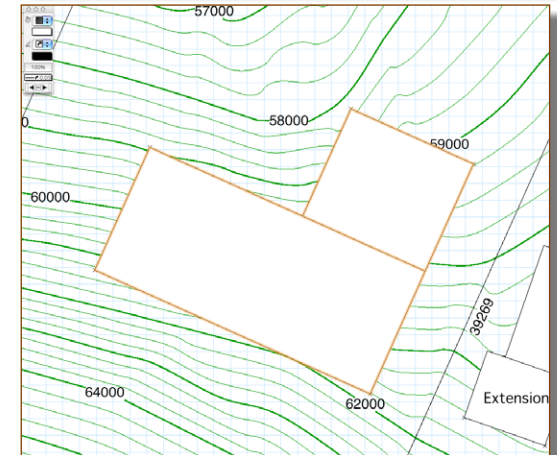
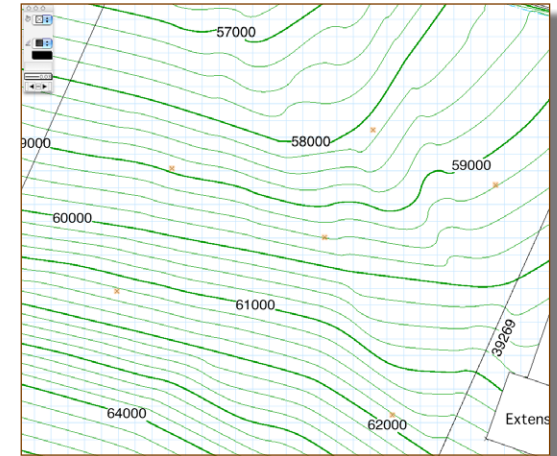
Stage 3 - Model Adjoining Buildings

To see the effect of our building in the neighboring properties, we need to model them. If you have VectorWorks Architect, Landmark or Designer, you will have a tool to help out. The tool is called the Massing Model.

[cadmovie200](http://cadmovie200.com)

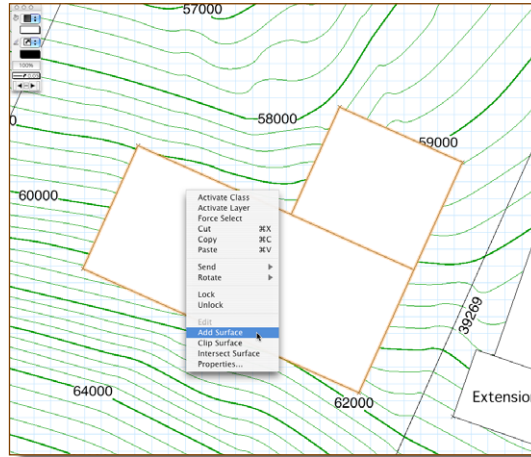
- Zoom into the site to the right of our building. There are 6 locus points for to help with the set out of the building.

You can use Google earth to find the setting out for the neighboring buildings.

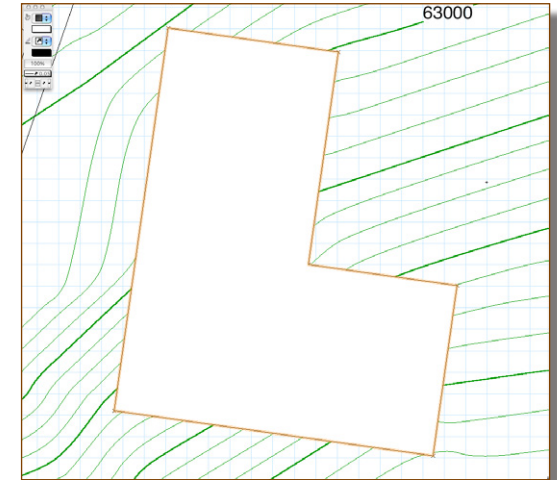


- Go to the **Basic** Tool palette.
- Select the **Rectangle** tool.
- Draw two rectangles for the house next door.

- Select both rectangles.
- If you are using VectorWorks 2008 you can right mouse click on one of the rectangles.
- Select **Add Surface** from the pop-up menu.
- If you are using VectorWorks 12 or earlier, you can find this command on the Modify menu.

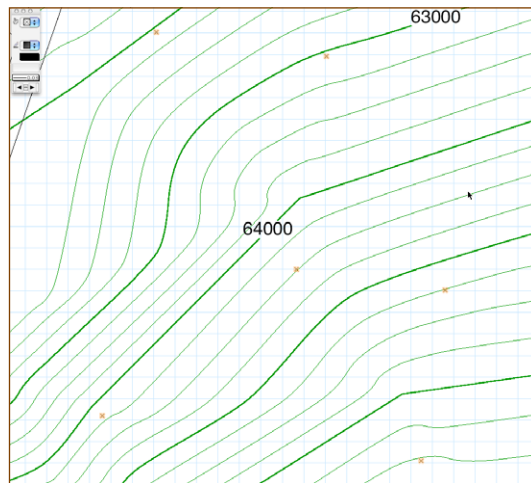


- Draw the rectangles and add them together as we did for the other neighbor.

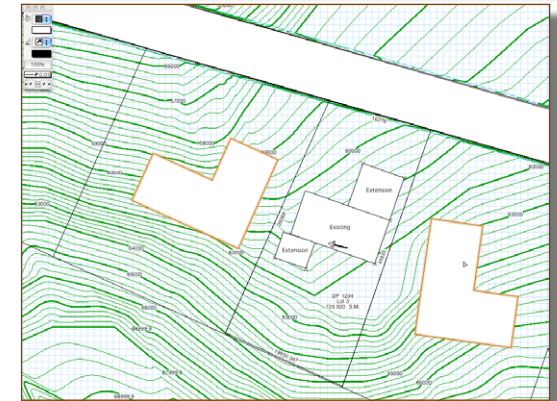


[cadmovie201](#)

- Zoom into the site to the right of our building. There are 6 locus points for to help with the set out of the building.

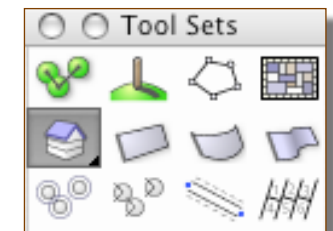


- Go to the **Basic** Tool palette.
- Choose the **2D Selection** tool.
- Select the two polygons for the neighboring houses.

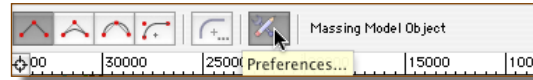


[cadmovie202](#)

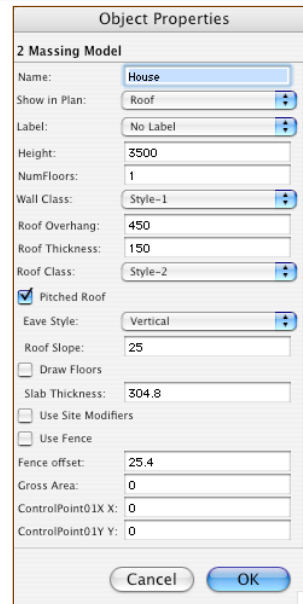
- Go to the **Site Planning** Toolset.
- Select the **Massing Model** tool.



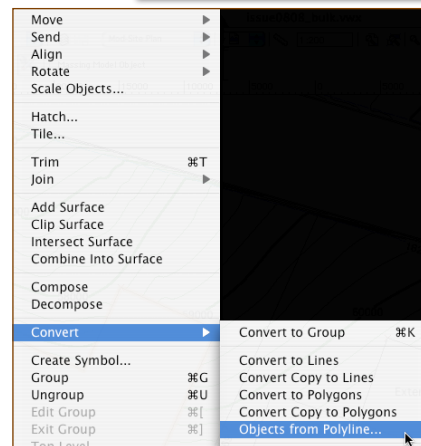
- Go to **Tool Bar**.
- Click on the **Preferences...** button.



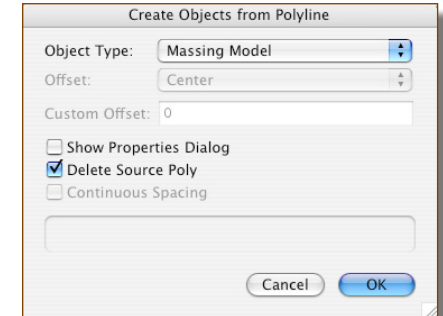
- Set the preferences for the massing models. If you set the preferences here, these setting will apply to every massing model you make from now on.



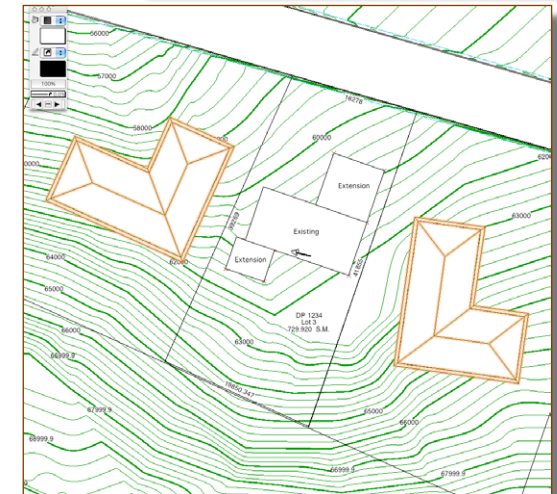
- Go to the **Menu Bar**.
- Choose **Modify > Convert > Objects From Polyline...**



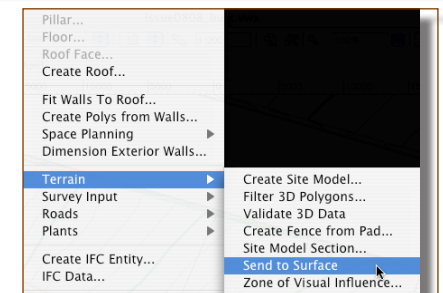
- Click on the pop-up menu.
- Choose **Massing Model**.



- VectorWorks makes your polygons into massing models. They have 3D walls and a roof.



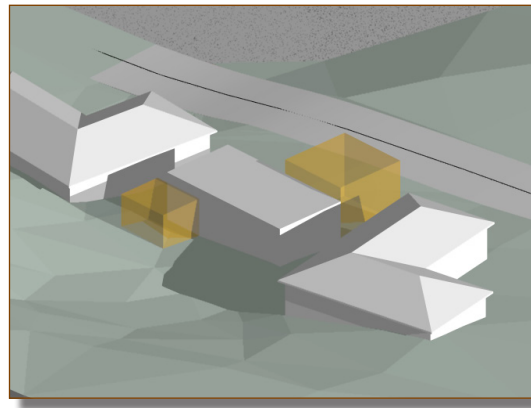
- Go to the **Menu Bar**.
- Choose **AEC > Terrain > Send to Surface**. If you are using Landmark this is on the Landmark menu.



- Your massing models are on the site model. You might have to adjust the height of your massing model, VectorWorks puts the centre of the massing model on the site model.



- If you change to a 3D view and render the scene you will see the affect of your building on the neighbors.



Stage 4 - Solar Study With a VectorWorks Model

So far we have been using VectorWorks to study our bulk and location models, and these are really good for concept design. Now we can to look at the situation where the project is well underway and we have to produce drawings to show the existing solar situation and the proposed shadows.

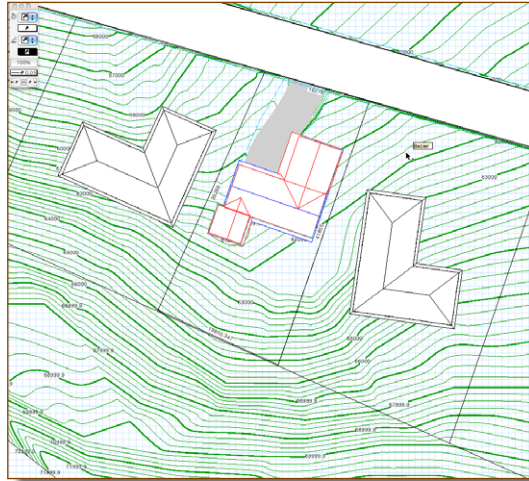
We will be using a pre-made VectorWorks model. I have created this building with the roofs, walls, doors and windows. This building has been drawn the same way I recommend drawing buildings in the Architect Tutorial Manual or the Landmark Tutorial Manual available from your local distributor or online at www.archoncad.com.

I have a class strategy that allows me to show the existing building or I can show the existing and proposed building. I have created the building with roofs on 2 classes so I can show the existing roof separate from the proposed roof by changing the visibility of the classes. I have a similar strategy with the wall styles. I can show the existing building only, or I can show the existing and proposed together.

This is useful because it will allow use to easily make a viewport that shows just the existing building. We can then copy this viewport and edit the classes to show the existing and proposed building. We want to be able the show the existing situation and the proposed situation, classes will be the easiest way to do this.

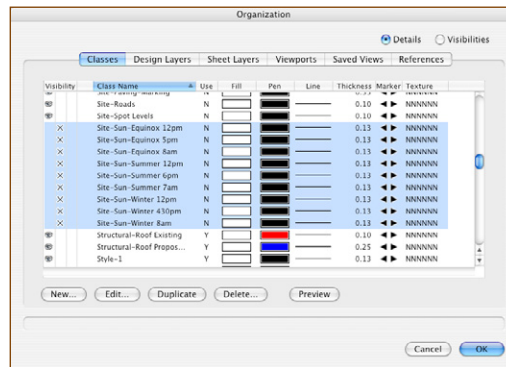
[cadmovie203](#)

- You need a file that has been set up with a site model and the VectorWorks building model and contains the massing models either side of our proposed building.



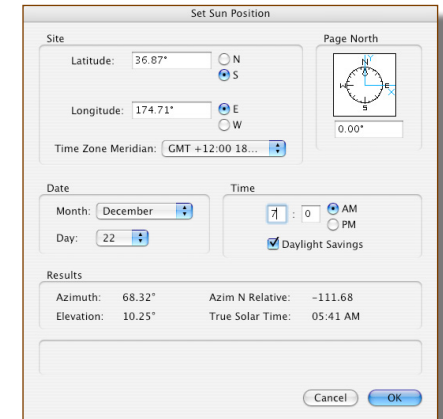
We are going to place a sun for a specific day of the year (summer solstice) and time. When we make our drawings we will want to keep this sun, but be able to hide it when we create a new sun for mid-day summer solstice. We will need to add several suns, 3 for each day of the year we want to measure. We can use classes to control these suns.

- Make 9 new classes for these suns
Site-Sun-Summer 7am
Site-Sun-Summer 12pm
Site-Sun-Summer 6pm
Site-Sun-Winter 8am
Site-Sun-Winter 12pm
Site-Sun-Winter 4:30pm
Site-Sun-Equinox 8am
Site-Sun-Equinox 12pm
Site-Sun-Equinox 5:00pm

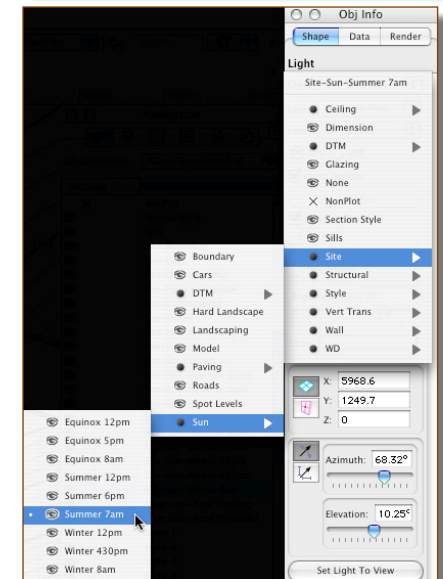


[cadmovie204](#)

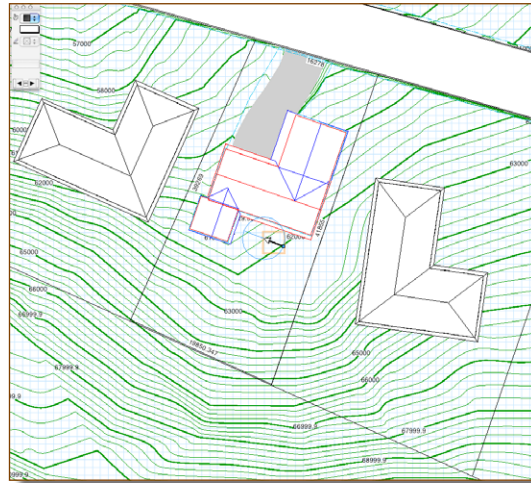
- Go to the **Menu Bar**.
- Choose **View > Lighting > Set Sun Position...**
- Put in the latitude and longitude. Set the time zone.
- Set the day and month. For the Southern Hemisphere use **22nd December**. For the Northern Hemisphere use **22nd June**.
- Set the time to **7am**.
- Click on the **OK** button.



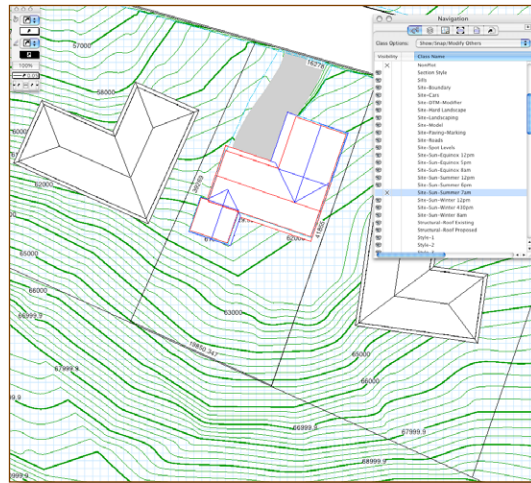
- Go to the **Object Info Palette**.
- Assign the light to the class **Site-Sun-Summer 7am**



- The sun should be in the middle of the drawing.

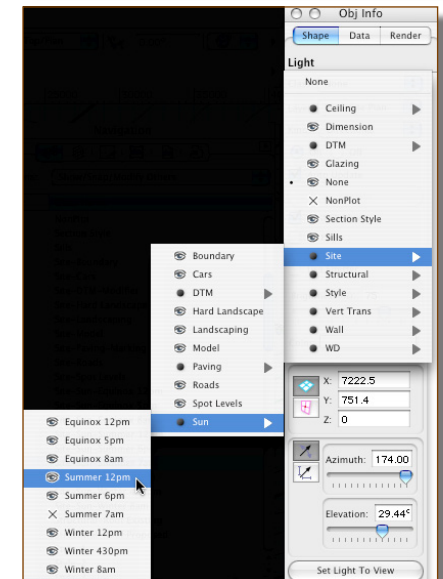
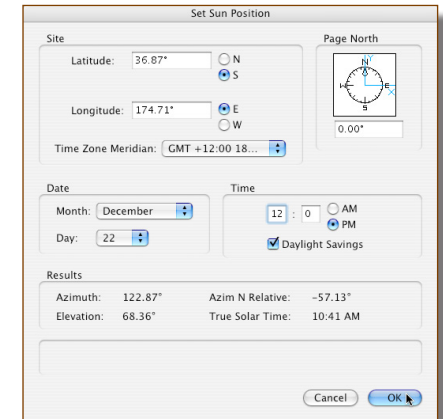


- Use the **Navigation** Palette or the **Organization** dialog to turn the sun class off.

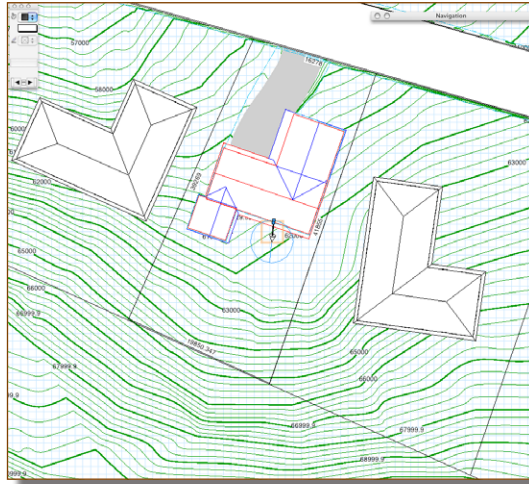


[cadmovie205](http://cadmovie205.com)

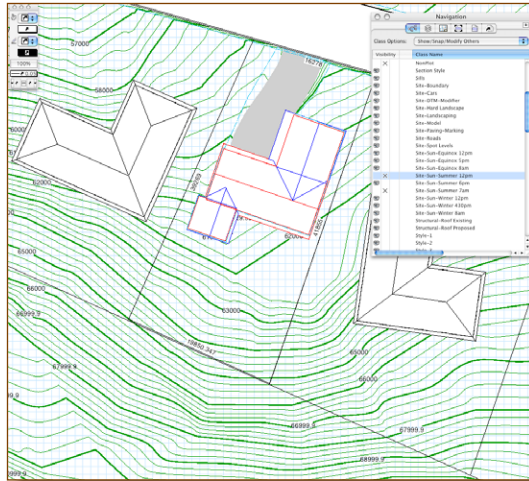
- Go to the **Menu Bar**.
- Choose **View > Lighting > Set Sun Position...**
- Put in the latitude and longitude. Set the time zone.
- Set the day and month. For the Southern Hemisphere use **22nd December**. For the Northern Hemisphere use **22nd June**.
- Set the time to **12pm**.
- Click on the **OK** button.
- Go to the **Object Info** Palette.
- Assign the light to the class **Site-Sun-Summer 12pm**.



- The sun should be in the middle of the drawing.



- Use the Navigation Palette or the Organization dialog to turn the sun class off.

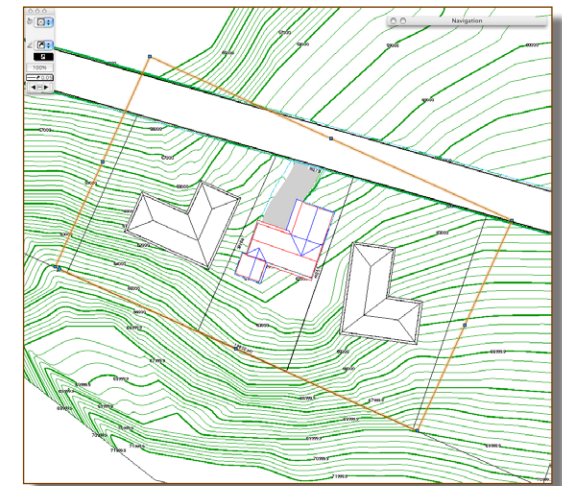


- Go to the **Menu Bar**.
- Choose **View > Lighting > Set Sun Position...**
- Put in the latitude and longitude. Set the time zone.
- Set the day and month. For the Southern Hemisphere use **22nd December**. For the Northern Hemisphere use **22nd June**.
- Set the time to **6pm**.
- Click on the **OK** button.
- Go to the **Object Info Palette**.
- Assign the light to the class **Site-Sun-Summer 6pm**.
- Use the **Navigation Palette** or the Organization dialog to turn the sun class off.

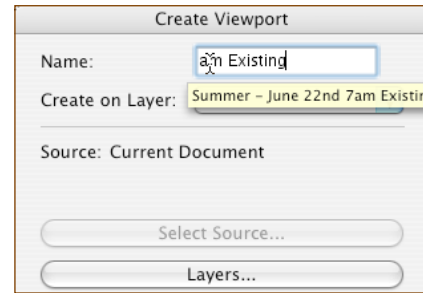
You have 3 lights for Summer Solstice (the longest day of the year), and each light has its own class. This allows you to turn the lights on or off in viewports.

[cadmovie206](http://cadmovie206.com)

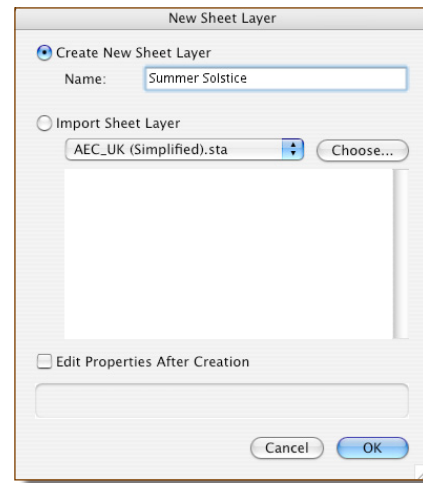
- Draw a rotated rectangle around the sites you want to be in your viewport.
- Go to the **Menu Bar**.
- Choose **View > Create Viewport...**



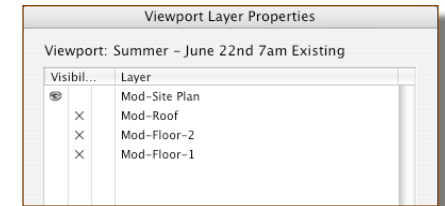
- Name the viewport. Give it the name you want the viewport label to be.



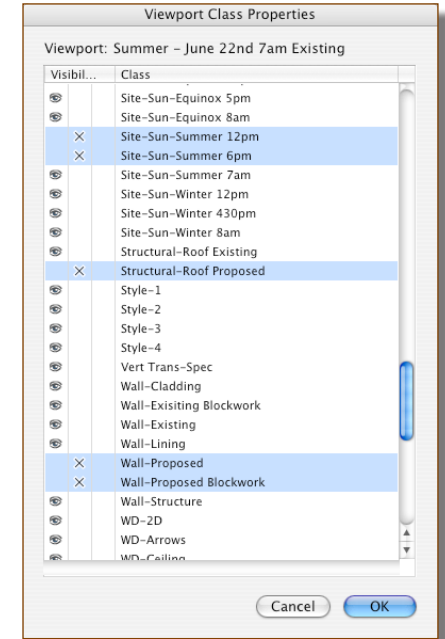
- Name the sheet layer.



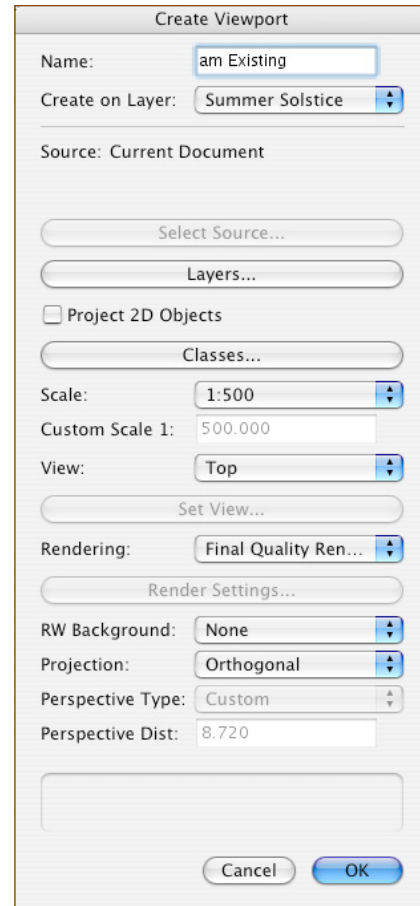
- Click on the **Layers...** button to check the layers for the viewport.
- Click on the **OK** button.



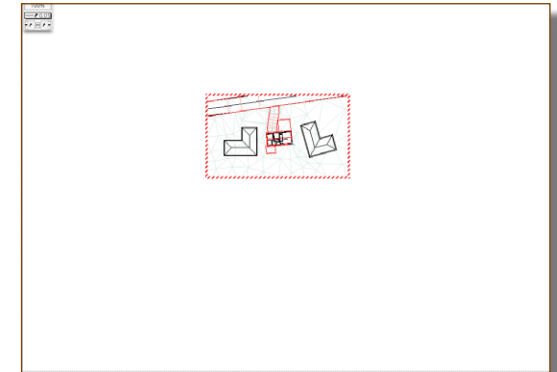
- Click on the **Classes...** button.
- Turn off all the classes we do not want. Make sure the classes for the proposed building are turned off. There might be several of them.
- Click on the **OK** button.



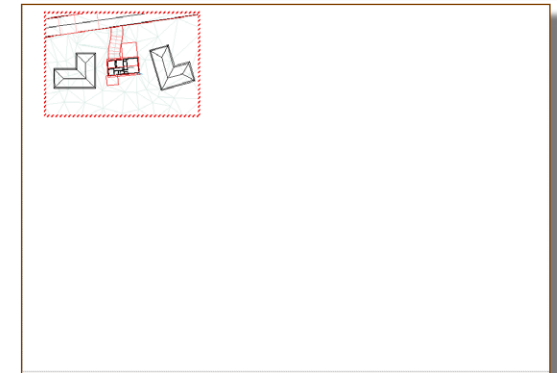
- Set the **Scale**.
- Set the View to **Top**.
- Set the **Rendering** options.
- Click on the **OK** button.



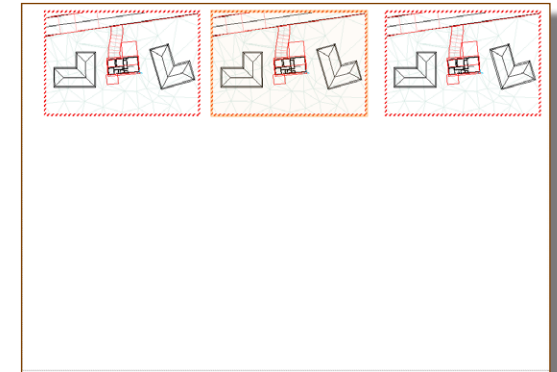
- The viewport in is the center of the page.



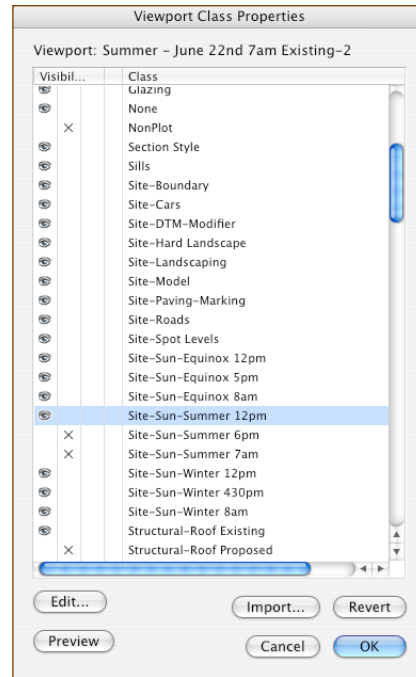
- Use the 2D Selection tool to move the viewport to the top left corner.



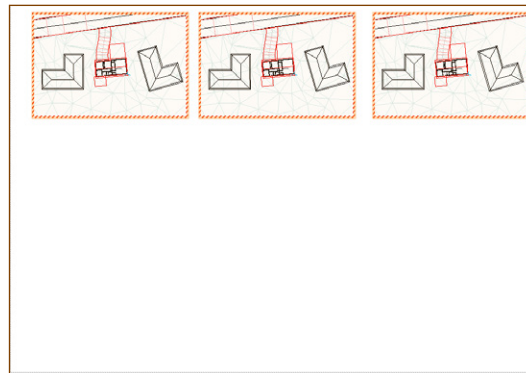
- You can drag a copy of the viewport across the page to set up 3 viewports.



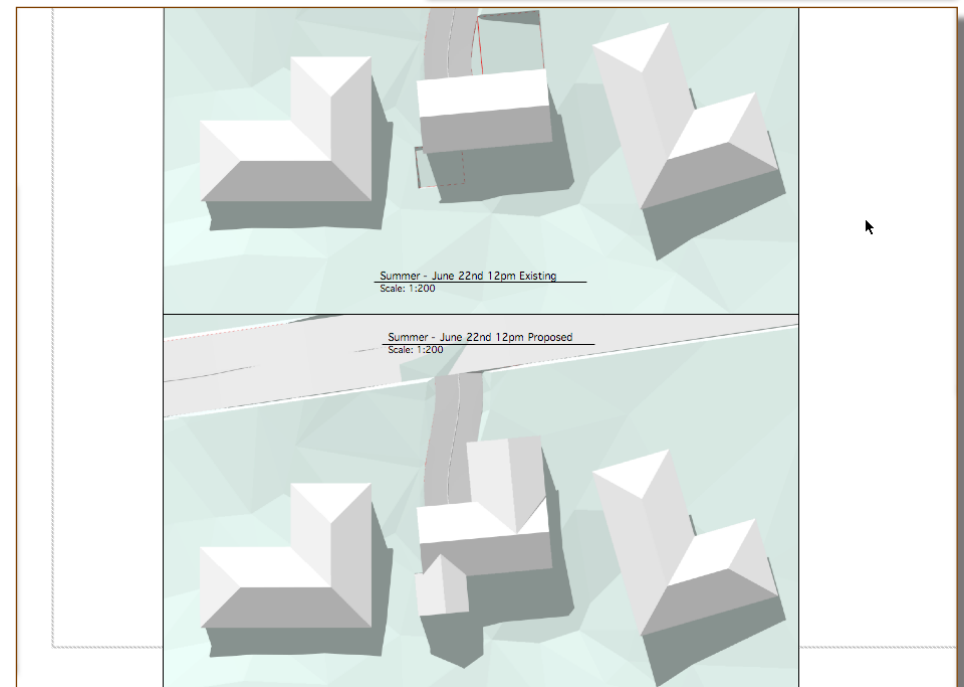
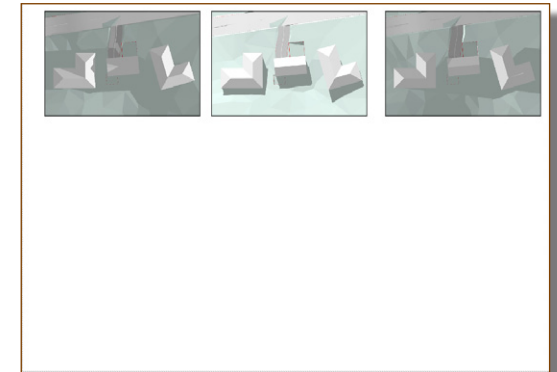
- Select each viewport in turn.
- Check the classes for each viewport. Turn off the lights you do not need, and make sure you turn on the lights you do need.



- Select all the viewports.
- Go to the Object Info Palette .
- Click on the update button.



- You should see rendered views.



I have made the rendered viewports bigger by changing the scale. I have added labels to explain them.

Questions and Answers

Q. When Should I Use Groups, When Should I Use Symbols?

Symbols and groups have been the same in VectorWorks for several versions, so if you are using VectorWorks 12 or earlier, most of the techniques I show you here will work.

Some people use the groups and symbols as if they were the same thing. These are not the same thing. They work very differently.

Groups

Groups should be used for collecting together things you want to keep together. for example, if I'm drawing my sections or elevations in 2D I will often group the complete section of elevation. This allows you to move the elevation or section as a single object.

Use groups for things you want to keep together, but do not use groups for things you want to repeat. If the objects have to be repeatable, then you should use symbols.

Making Groups

- Select the objects you want to make into a group. The objects can be in several classes as you want.
- Go to the **Menu Bar**.
- Choose **Modify > Group**.

The objects are grouped together and can be selected and moved as a single object. The group (the container, not the stuff inside) takes on the active class. If your active class is not set to None, then be careful, as your group might turn off when you don't want it to.

You can make groups inside groups if you want.

Editing Groups

- To edit a group, you can double click on it.
- Or you can select it.
- Go to the **Menu Bar**.
- Choose **Modify > Edit Group**.
- Or you can select it and use the keyboard shortcut **ctrl+[** on a windows machine or **command (apple)+[**.
- Exit a group by click on the Exit Group button at the top right corner of your screen (it is easier to see on VectorWorks 2008).
- Or you can go to the **Menu Bar**
- Choose **Modify > Exit Group**.
- Or you can select it and use the keyboard shortcut **ctrl+]** on a windows machine or **command (apple)+]**.

When you edit groups, there is a VectorWorks preference that controls what you see.

- Go to the **Menu Bar**.
- Choose **Tools > Options > VectorWorks Preferences...> Display**.

The option is called **Show Other Objects while in Groups**. If activated, you will see everything outside the group as well as the group information. If deactivated, you will not see anything outside the group.

Symbols

Use symbols where you want the objects to be repeatable. For example, if you are drawing floor joists in the section of the building, make them a symbol. Symbols are an efficient way of storing objects in VectorWorks. When you use a group and repeat it, VectorWorks stores the information for each group separately. When you repeat a symbol, VectorWorks stores the information for the symbol just once, but remembers the locations of each symbol (called the symbol instance). So, using a lot of symbols is more memory efficient.

As a test I made a file with 100 tables and chairs. Without using symbols the file is 5mb. Then I made one table and chairs into a symbol and placed 100 symbols. This file is 360kb. So, always look for ways to use symbols when you need to repeat objects.

Use symbols where you want to share information between files. Last month we looked at using the Resource Browser. You can not share groups with the Resource Browser, but you can share symbols. You might not need to repeat a detail you have drawn, but you might want to use it on more than one project. In this situation, make the detail into a symbol. It can be accessed from the Resource Browser with other files.

Use symbols when you want to have a different graphic display for 2D and 3D work. For example, if you are working on an interior design project and you want a detailed 3D model for rendering purposes, but for 2D display you want a simple 2D graphic. This is a good time to use a symbol, even if you don't want to repeat this object or use it on another project.

In issue 0802 we covered how to make a window symbol. If you have not looked at this manual, or if you joined since then, download the back issue from this web site:
<http://www.archoncad.co.nz/cadsupport/current.php>

Editing a Symbol

- To edit a symbol you have placed on the screen, double click on it.
- Or you can select it.
- Go to the **Menu Bar**.
- Choose **Modify > Edit Symbol**.
- Or you can select it and use the keyboard shortcut **ctrl+[** on a windows machine or **command (apple)+[**.
- Or you can find the symbol in the Resource Browser and right mouse click on it.
- Choose the option to **Edit...**

When you edit symbols you have the ability to edit the 2D portion or the 3D portion of the symbol. Choose the option you want and click on the OK button.

- Exit a group by click on the **Exit Symbol** button at the top right corner of your screen (it is easier to see on VectorWorks 2008).
- Or you can go to the **Menu Bar**
- Choose **Modify > Exit Symbol**.
- Or you can select it and use the keyboard shortcut **ctrl+]** on a windows machine or **command (apple)+]**.

Beginners Corner - 2D Reshape Tool

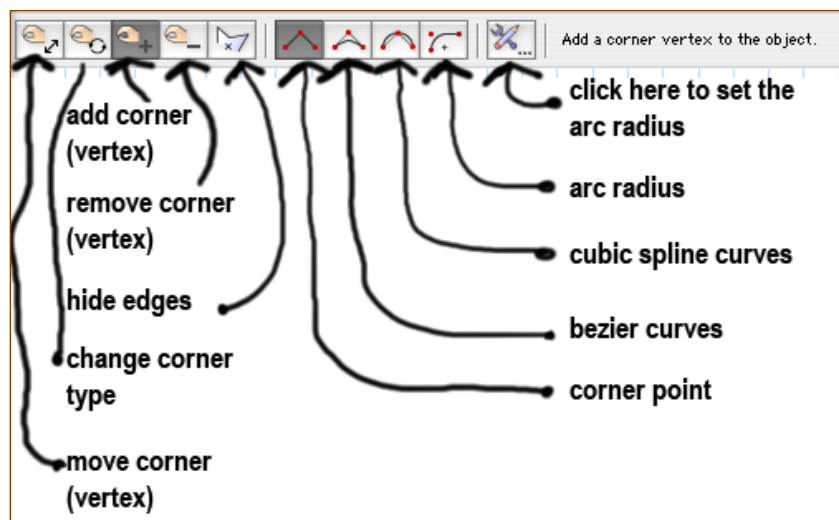
The 2D Reshape tool is much overlooked, but you can use it so many situations. You use the 2D reshape tool to edit:

- polylines
- polygons
- hardscapes
- ceiling grid
- plants
- any path-based 2D shape.

The most often way used to access the 2D Reshape tool is to double click on a polygon, polyline or path object.

This will select the 2D Reshape tool for you.

There are several options on the Tool Bar.



If you want to move a corner or edge, use the first mode.

The second mode is used to change the vertex type. So, you would use this where the corner (vertex) was pointy and you wanted it to be rounded.

- The way to do this is to choose the second mode.
- Choose the new corner type.
- Click on the corner you want to change.

The third mode is used to add a new vertex to your shape.

- The way to do this is to choose the third mode.
- Choose the new corner type.
- Click on the mid point where you want to add the vertex.
- Move the place you want the new vertex.
- Click once.

The 4th mode is used to remove a vertex from your shape.

- The way to do this is to choose the 4th mode.
- Click on the vertex point (the blue handle) you want to remove.

The 5th mode is used to hide edges.

- The way to do this is to choose the 5th mode.
- Click on the mid point for the edge you want to hide.
- Click on the edge again to show it.