



This newsletter is designed to work as an on-line user group, based on the successful New Zealand VectorWorks User Group format. Each month we cover a main topic in a workshop for most of the newsletter then have a page of general questions and answers. In this news letter you will find a link to the workshop topic, a link to the questions and answers and links to extended podcasts (tips and trick movies).

Workshop Topic

Introduction to Rendering and Textures

Rendering in VectorWorks is where you start to enjoy your 3D Models, where you make them come to life. This workshop is an introduction to rendering (which is pretty easy), but rendering is nothing without textures which can make your models into something special.

Q & A

Questions from users and the answers from Jonathan.

“What is the best way to create 3D fillet welds for 3D steel details, e.g.steel brackets etc?”

Extended Podcast 036

This podcast shows you how to set your dimensions and units so that you can measure areas for a worksheet in one unit type but put dimensions on the page in a different unit.

Extended Podcast 037

This podcast shows you how to quickly edit viewports. At the last user group meeting I showed some quick ways to edit viewports, and it seemed that not many people knew these tricks...

Introduction To Rendering and Textures

Rendering

I think that Rendering is one of the fun parts of VectorWorks, You can see you building coming to life. But it can take a long time to get nice results.



While RenderWorks can be fun it can also be very time consuming. On more than one occasion I have been have stopped to look at the time and wondered where the day has gone.

Some of the renderings can take several minutes to render. The original of this image took ages to get looking right. Each rendering took over 5 mins.

If you are going to start rendering check your computer for memory and speed.

You should be getting the fastest computer you can afford with a minimum of 1GB. If I'm buying a computer these days, I'm getting at least 2GB RAM installed.

2.1 Preparation

Create the model

Obviously you have to create a model to render. When you create your model think about texturing the model as you draw. This means think about the objects you draw and how they will be textured.

If you use a lot of classes, for things like internal walls, external walls etc, then you can you the class set up dialog box to assign textures as you draw. Using classes for things like the windows and doors is a great way to get the textures on them, and it's really fast. Using this method you can set up your file for the textures, even without any textures in the file yet.

Also consider using a lot of symbols. I did a project with a lot of small detailed corbels under the eaves. These were not symbols and the textures that I assigned had to be assigned to each object individually. If the corbels had been symbols I could have assigned the texture to one object and they would all have been updated together.

When you are setting up a model for rendering, the first thing to do is to plan where your render. Where will you be standing, what will you be looking at. This will help you to decide on what you need to draw and what you can leave out. If you don't know what areas you will be rendering then you will have to draw the whole building and assign textures to the all the objects in the drawing. If you have used a lot of classes, like for internal walls and furniture, work out if some of these classes can be turned off to speed up the rendering process.

2.2 Preferences

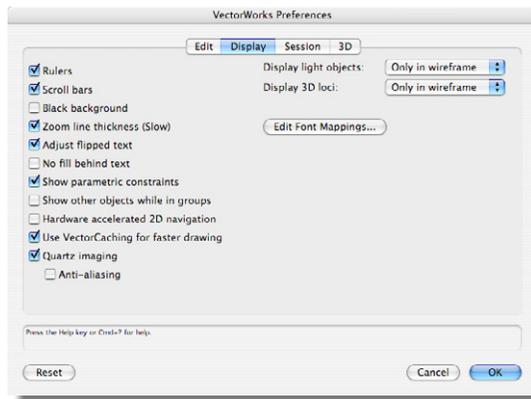
VectorWorks Preferences

VectorWorks Preferences affect every VectorWorks file.

[cadmovie019](#)

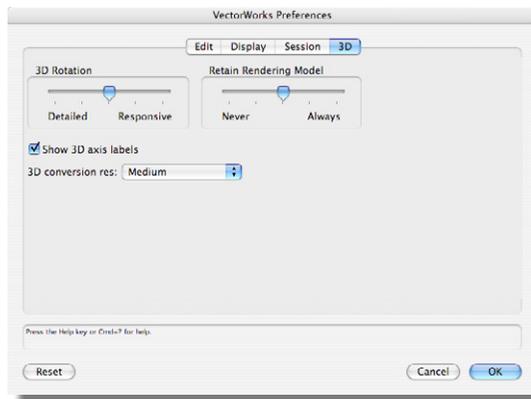
- From the Menu Bar choose **Tools > Options > VectorWorks Preferences...**

Under the **Display** tab there is the control over the display of light objects and 3D Loci.



I usually choose the “Only in Wireframe” option so that in wireframe I can see the lights and move them around, but when I render the view the lights are not displayed, just the output from the light source is visible.

Under the **3D** tab are controls for the resolution of the conversion resolution (how finely 2D shapes are converted to 3D faces), and how VectorWorks retains the 3D geometry in its memory. If you choose “Always” then VectorWorks should keep the model rendered in OpenGL when you walk through the building.

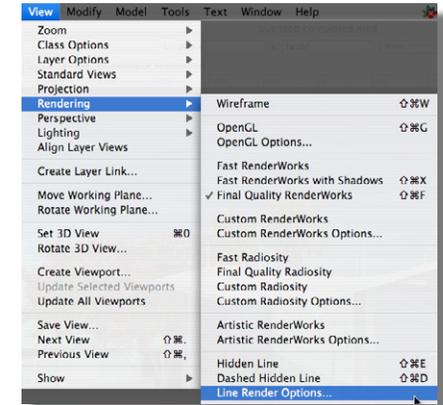


- Click on the **OK** Button.

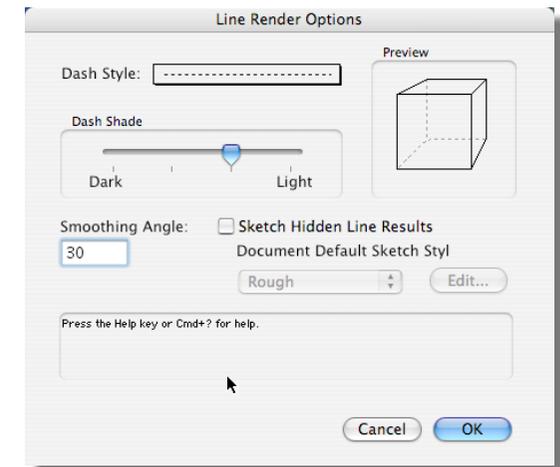
Line Render Options

[cadmovie020](#)

- From the Menu Bar choose **View > Rendering > Line Render Options...**



- Change the smoothing angle to **30°**. The smoothing angle controls the facets that you see on a hidden line rendering. Setting an angle of 30° will show very few of the facets.
- You can also choose the settings for sketch rendering (we’ll cover this later).
- Click on the **OK** Button.

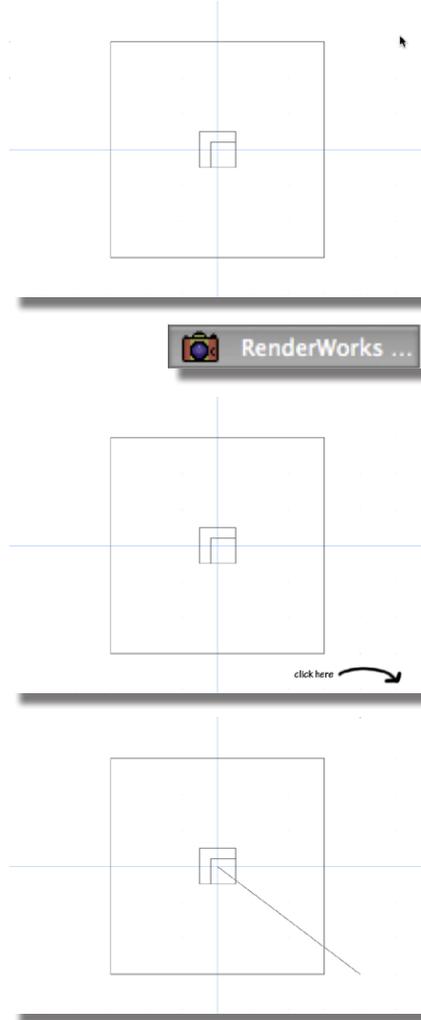


RenderWorks Camera

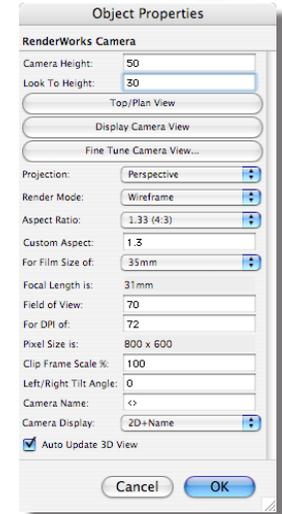
The RenderWorks Camera tool allows you to make a view similar to the Set 3D View, but it's an object that you can move around and edit, so it's more useful than the Set 3D command.

[cadmovie021](#)

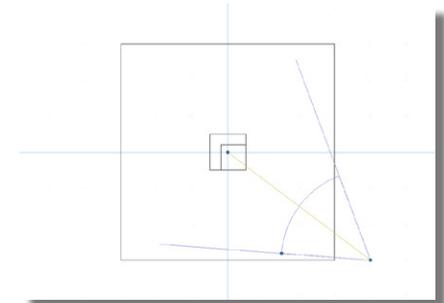
- Open a file.
- From the Visualisation toolset choose the **Renderworks Camera** tool.
- Click once for the camera position.
- Move the cursor into the object. This is the centre of your view, i.e. what you are looking at, click once.



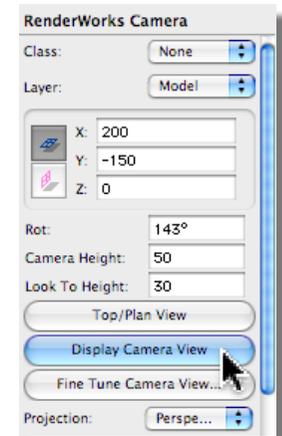
- The first time you use this tool you will see this dialog box where you can set some of the options for the RenderWorks Camera tool.



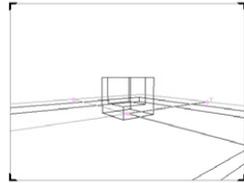
- The RenderWorks Camera stays on the drawing. This allows you to move the camera if you don't like the position of the camera.



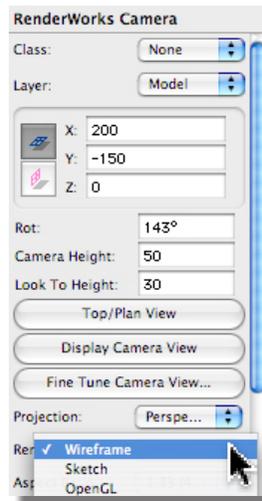
- On the Object Info Palette, click on the Display Camera View button.



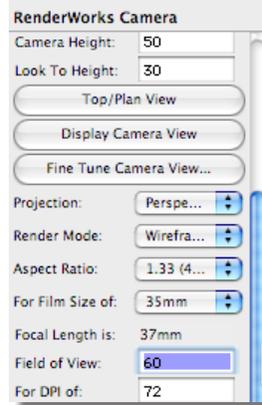
- VectorWorks shows you the view.



- Use the Object Info Palette to change the display settings for the RenderWorks Camera.



- You can also change the setting of the camera lens if you want to edit the perspective of the view.



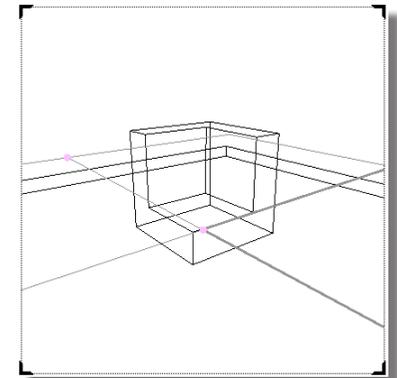
- VectorWorks updates the view when you hit the Enter or Return key.

2.4 Rendering Types

Rendering is a way of looking at your 3D model with light and shade. There are several ways of doing this and each different way has some advantages and some disadvantages.

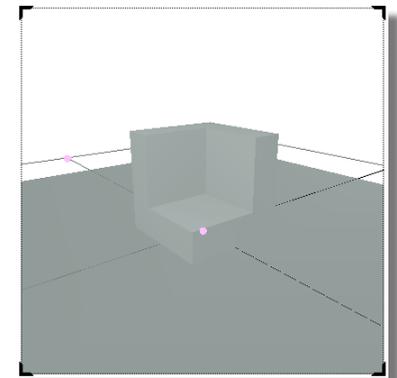
[cadmovie022](#)

- Open a file.



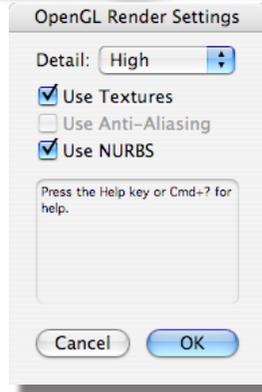
Open GL

- From the Menu bar Choose **Views > Rendering > OpenGL**.
- Now you can see a view with light and shade and it makes it easier to read the object.
- OpenGL rendering is fast but not very detailed.



OpenGL Options

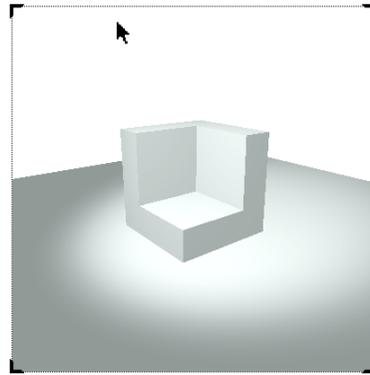
- From the Menu bar Choose **Views > Rendering > OpenGL Options.**
- If you set a high level of detail VectorWorks will take longer to render the view. Each of these option will make the view more detailed and therefore it will take longer to render.



- Try changing the details from low to high and see if the results are different.

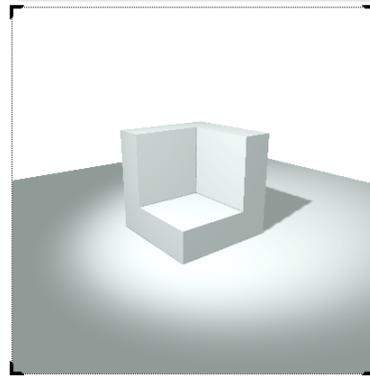
Fast RenderWorks

- From the Menu bar Choose **Views > Rendering > Fast RenderWorks.**
- This is fast but without shadows it's not much to look at.



Fast RenderWorks with shadows

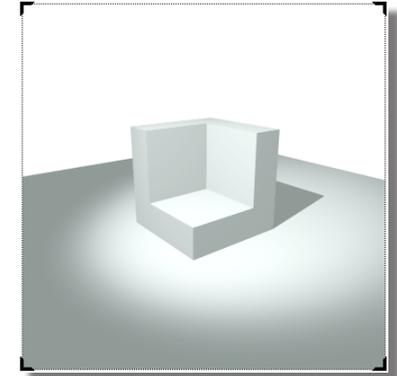
- From the Menu bar Choose **Views > Rendering > Fast RenderWorks With Shadows.**



This is a *good* rendering mode if you want it quickly. It's a bit crude, but it is FAST!

Final quality RenderWorks

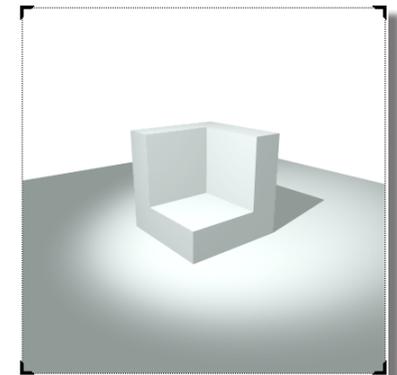
- From the Menu bar Choose **Views > Rendering > Final Quality RenderWorks.**
- This one of the best rendering options available, but it is also fairly slow. Some views can take several minutes



Custom RenderWorks

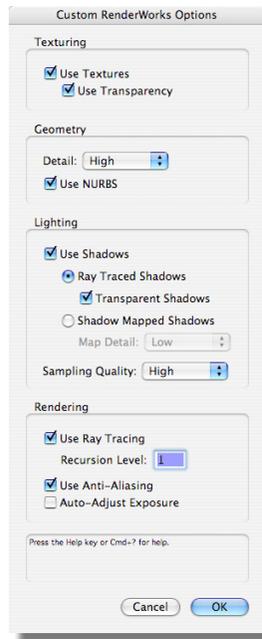
- From the Menu bar Choose **Views > Rendering > Custom RenderWorks.**

This method allows you to control the quality the *best* rendering available, allowing you to balance quality with the time you have available.



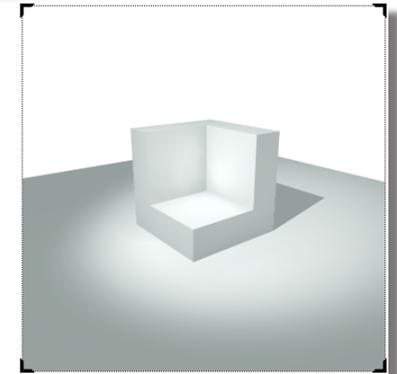
RenderWorks Options

- From the Menu bar Choose **Views > Rendering > Custom RenderWorks Options...**
- The RenderWorks options control the rendered results if you use Custom RenderWorks or if you use the render bitmap tool. Each of these choices can dramatically improve the rendered image, but they will also add to the time that it takes to render an image.
- Ray Traced shadows are crisp but slower, shadow mapped shadows are not as crisp but they are faster.
- Ray Tracing on reflective objects like marble, mirrors and glass looks better, the recursion level is how many bounces of light VectorWorks considers.
- Generally you would use textures. If you don't use textures VectorWorks will use the colour of the object as assigned by the attributes palette. Glass will not be transparent if you do not turn on the Use Transparency.
- Anti-Aliasing reduces the look of jagged pixels on the screen and make the printed image look better.

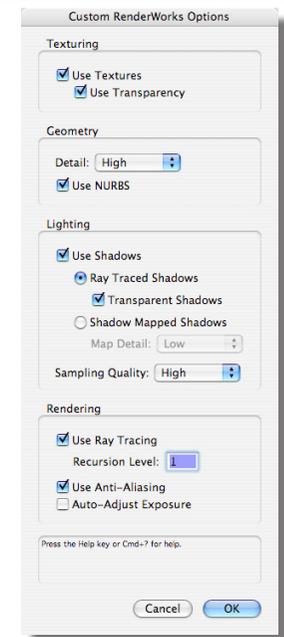


Final Quality Radiosity

- From the Menu bar Choose **Views > Rendering > Final Quality Radiosity**.
- This one of the best rendering options available, but it is also the slowest. Some views can take several minutes



Be careful if you choose the Custom Radiosity option. I've played with the options to increase the quality of the rendering, but if you increase the energy and accuracy, you might find that the rendering time increases dramatically.



Textures

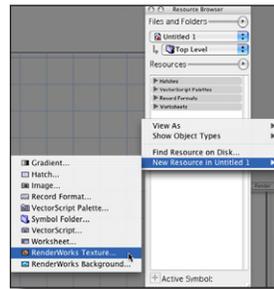
Textures are the things that make your drawing stand out and have a bit of zing. They can be created inside VectorWorks and can be created from digital images, or from shaders (built in mathematical descriptions of textures).

You should consider having an office library to store resources like symbols, layer and class standards and textures. It will be a lot easier for you to find textures that you like using in your library rather than hunting through all your old files.

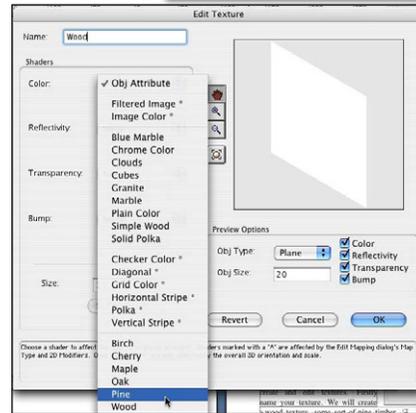
[cadmovie023](#)

Creating Textures

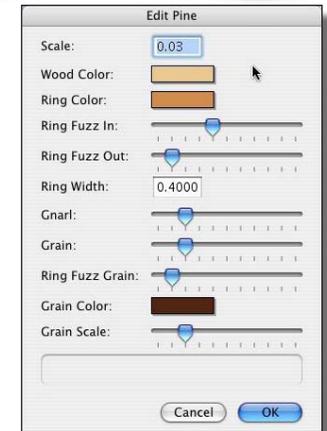
- Open a file.
- Open the resources palette and right click on an empty area of the Resource Browser.
- Choose **New Resource in... > Texture**.



- This dialog box allows you to create and edit textures.
- Name your texture. We will create a wood texture, some sort of pine timber.
- Name the timber **Wood**.
- Click on the pop-up menu for colour.
- This will open a menu for you to choose the type of colour. It could be a scanned image, or one of the built-in shaders.
- Choose **Pine**.

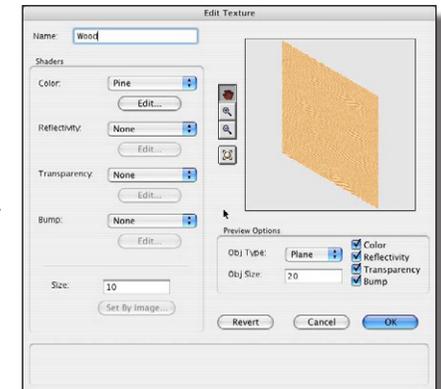


- After you have chosen pine, you can click on the edit button directly below Pine, this opens the Edit pine dialog. Here you can make your texture look like real pine by changing the colour, grain, gnarl, etc.



- Click on the **OK** button.

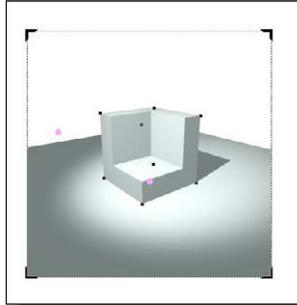
- Change the Size to **40mm (1.75")**.
- Change the **Obj Size** to **50mm (2")**, This means that the preview object is 50mm in size. This should give you a good idea of the grain on our object.
- Click on the **OK** button.



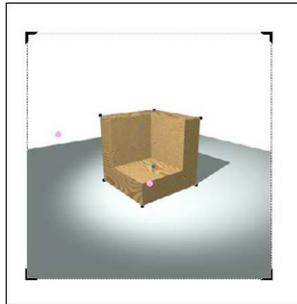
This is a great way to get an idea of what the texture will look like on your object.

Assigning Textures Directly

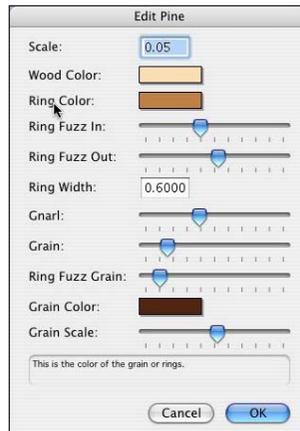
- Select the object that you want to assign the texture to.
- On the Resource Brower double click on your **Wood** texture.



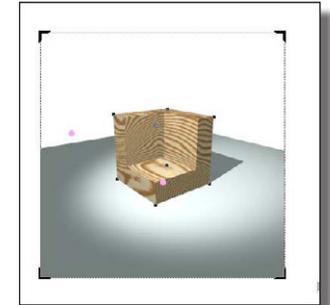
- To edit the texture, right mouse click on the Wood texture on the Resource Brower.



- Choose **Edit** from the pop-up menu.
- Edit the pine texture to match the picture.



- It is important to edit the textures so that they look correct.



Tip:

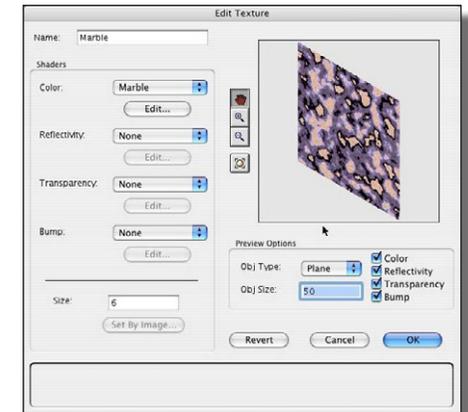
you can also Drag and drop textures from the Resource Brower onto a 3d object to assign the textures.

Assigning Textures Using Classes

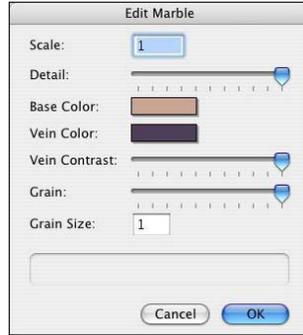
If you set up your file early on to use textures for specific classes that you want to texture then you have an advantage when it is time to assign the textures. By going to the classes dialog you can then texture all the objects of a specific class.

[cadmovie024](#)

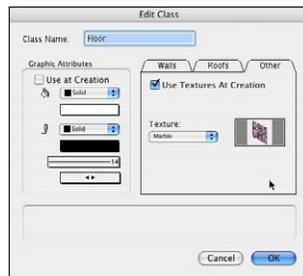
- Create a new texture.
- Name it **Marble**.
- Use a Marble texture from the Color pop-up menu.



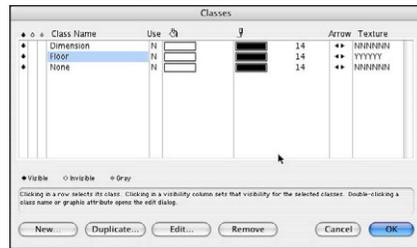
- Edit the marble so that it has better colours and grain.
- Click on the **OK** button.
- Click on the **OK** button.



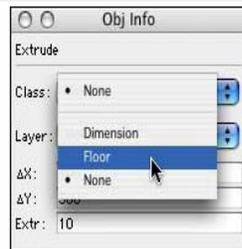
- Open the classes Setup dialog, from the Menu Bar choose: **Tools > Organization...**
- Double click on the **Floor** class.
- Set **Marble** and the texture for the class.
- Click on the **OK** button.



- If you get a dialog box asking if you want to assign the texture to all objects say yes always.
- If you use objects in VectorWorks there is often the choice to use classes for parts of the objects. This makes it very easy and quick to add textures to objects. It also makes it easy to control the textures in a project.



- Select the floor object.
- Assign the floor object to the Floor class.

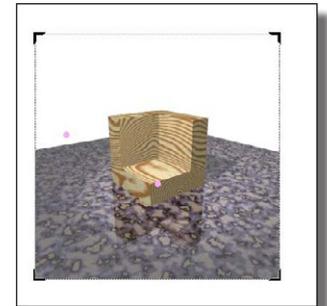


Mapping Textures

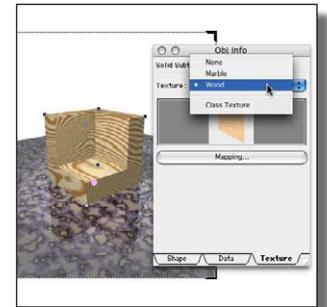
Mapping textures is the way that VectorWorks (and the other CAD programs) drape the textures of the objects. One of the tricks to getting a good render is to get the texture mapping right. The wood texture has to appear the right size for the rendering to look right. When we created the texture we set the preview on the object to be 50mm, this was to give us an idea of what the texture would look like on a reasonable sized object.

[cadmovie025](#)

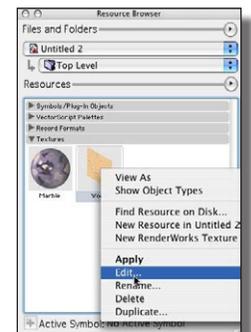
- Open a file.
- This file has an object with textures already in it. .
- Open the **Object Info Palette**. If it is not open go to the Menu Bar and choose: **Window > Palettes > Object Info**.



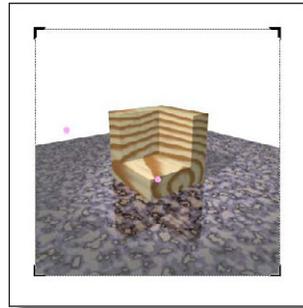
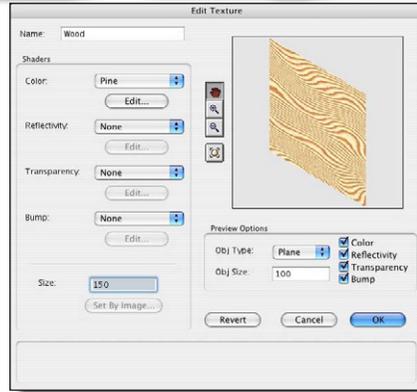
- Click on the Tab for **Textures**.
- This is used to apply textures to VectorWorks objects and also allows you to adjust the mapping.
- In this case the easiest way to edit the mapping of the texture is to edit the texture.



- Using the Resource Brower. Find the wood texture and right mouse click on it.
- Choose **Edit**.



- On the Edit Texture dialog, change the size to **150mm (6")**. That is over 3x bigger than it was.
- This will cause the texture to look too big.
- Click on the **OK** button.
- You can now see the size of the texture that we created is not suitable for our timber block, , although it may be great for a far away view.

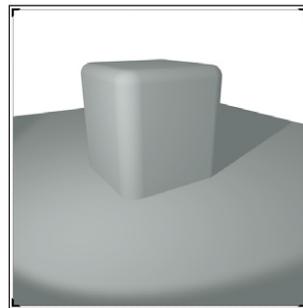


Often you need to exaggerate textures to get them to read correctly in a rendered image.

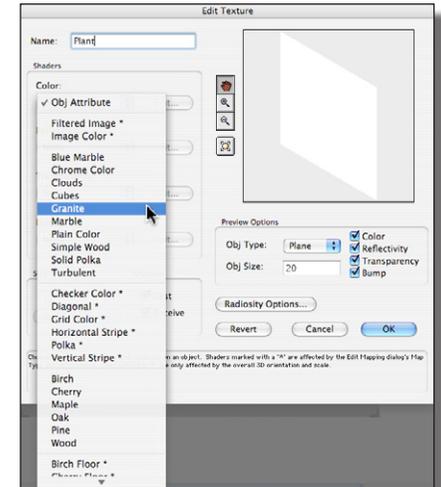
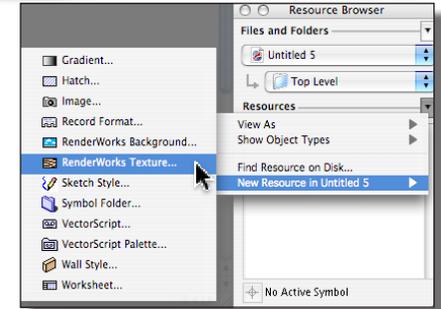
Another example of this would be to make a plant texture for small plants. I was with some clients the other day and they wanted to make some simple textures for plants.

[cadmovie026](#)

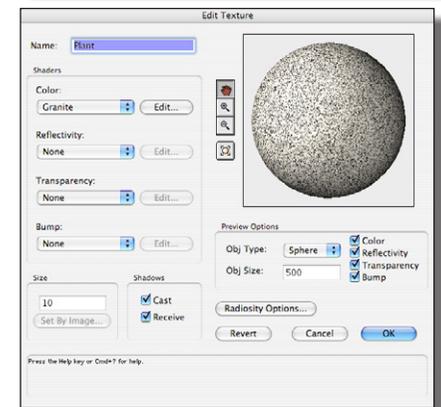
- Open a file. We'll make a plant texture and some grass.



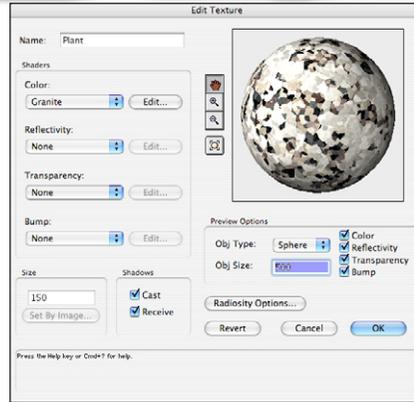
- Click on the Resources Menu on the Resource Browser.
- Choose : **New Resource > Renderworks Texture...**
- Choose the Granite texture.



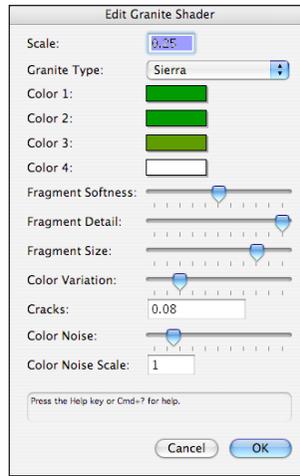
- Name the texture.
- Set the review options to a sphere so that you can see what the texture would look like on a round object.
- Set the size of the preview to 500mm, as this is the size of the plant.



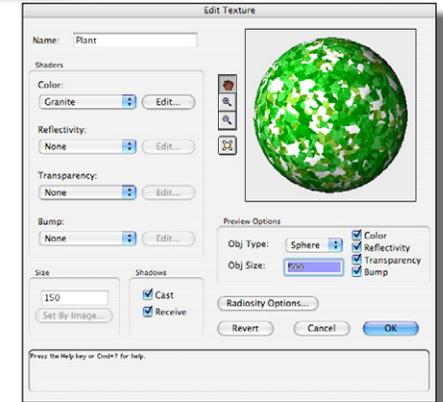
- This will let you see the texture on the plant accurately.
- Change the size of the texture until the granite looks like the size of leaves.



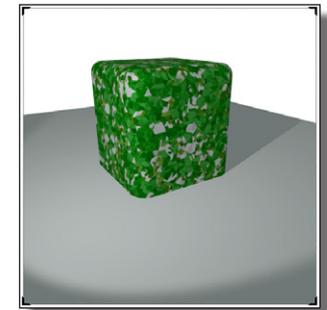
- Click on the **Edit** button on the Granite so that you can change the colour of the granite.



- If you set some parts of different greens, and one part to the flower colour (in this case the white flower for a camellia), you get a random spread of flowers.



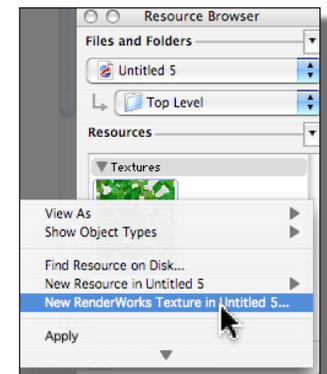
- Apply the texture to the plant.



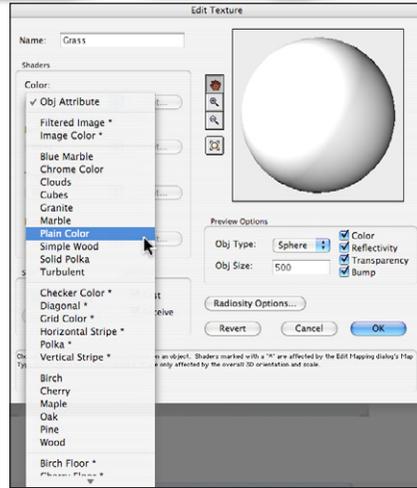
[cadmovie027](#)

- To make the grass we can use a similar process, but for grass I might make a plain colour with a bump map to make the ground look a bit like grass.

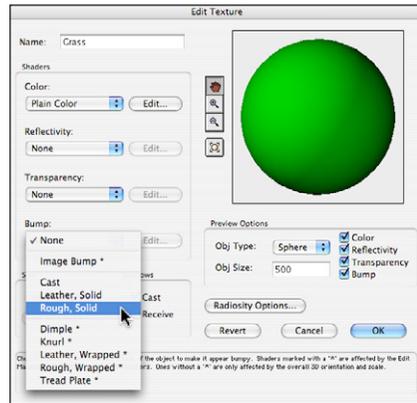
- Use the Resource Browser to create a new texture.



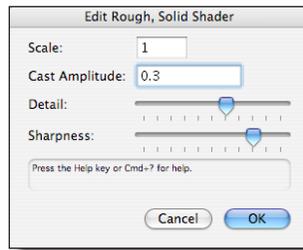
- Choose a **Plain Color**.
- Click on the **Edit...** button to get a nice green colour.
- Set the preview options so that you have a sphere **500mm (2')**.



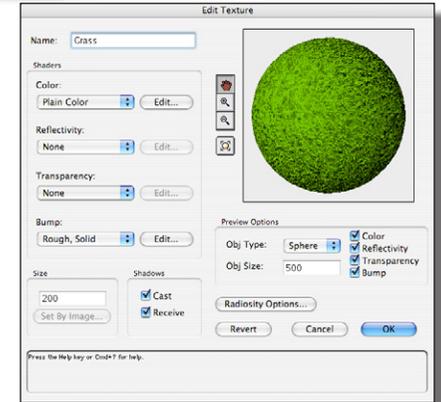
- Set a bump for the grass. I've used **Rough, Solid**.
- Set the texture size so that the texture looks suitable.



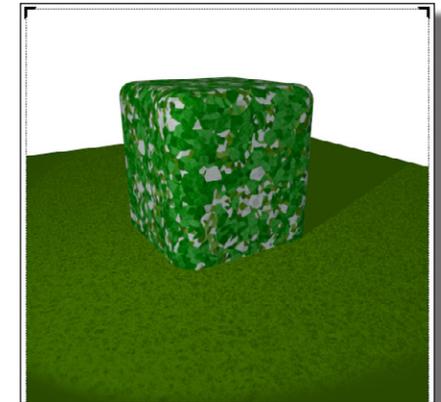
- Click on the **Edit...** Button to change the settings to suit.



- Now you can see the preview. Get the preview looking good and then when you apply the texture, it looks better.



- Apply the grass texture to the base. Now we have a plant on a grass lawn....

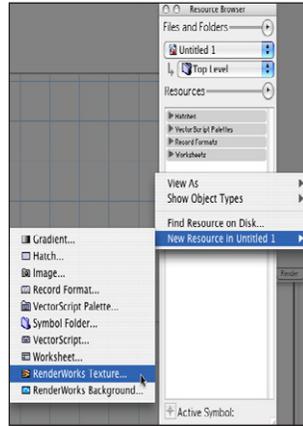


Texture From Image

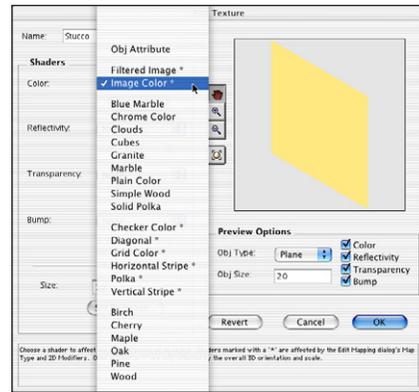
Creating a texture from an image allows you to make any texture that you want. You can scan an object, a logo, you can use a digital photo or you can make up an image in Photoshop.

[cadmovie028](#)

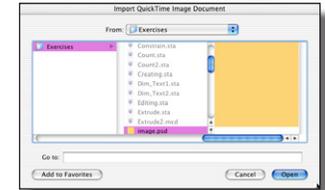
- Open the file **Render_5.sta** from the exercises folder.
- Right click on the Resources Browser.
- Choose **New Resource in... > RenderWorks Texture...**



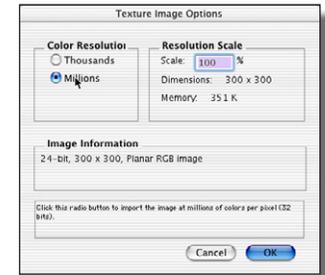
- To create an texture from an image you need to create the image. I have already made one for you and placed it in the exercises folder.
- On the texture Dialog Box choose **Image Color** from the pop-up where it says Color. When you choose this from the pop-up, VectorWorks wants to know which file to import.



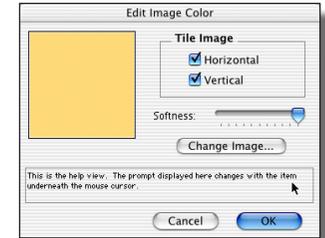
- Find the **image.psd** file in the exercises folder.
- Click on the **OK** button.



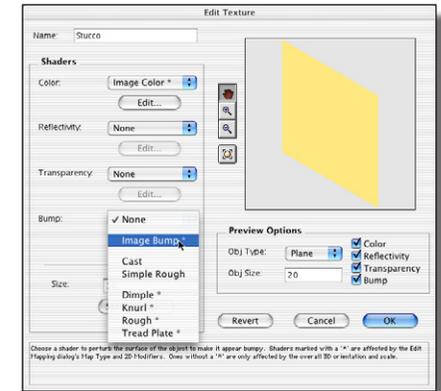
- Set the colours to **Millions** of colours and size **100%...**
- Click on the **OK** button.



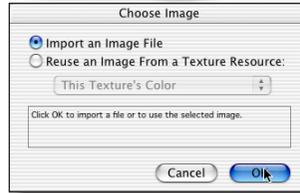
- Tile image horizontally and vertically, otherwise your texture will be a small square in the middle.
- Click on the **OK** button.



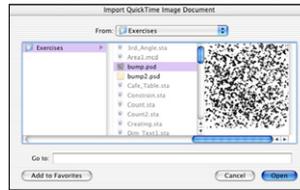
- Click on the **Bump** pop-up menu.



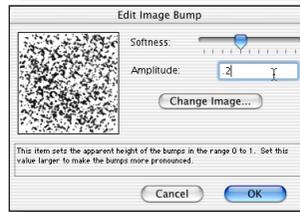
- I have made an image file that will be a bump on the texture.



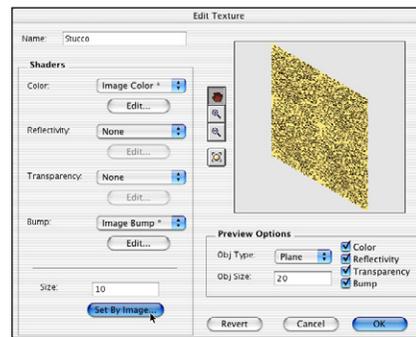
- Choose the **bump.psd** file from the exercise folder.
- Click on the **OK** button.



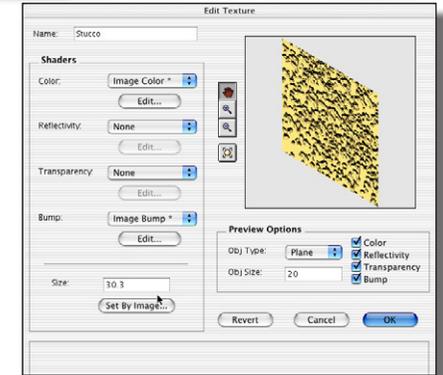
- Set the colours to **thousands** and the size to **100%**.
- Click on the **OK** button.
- The softness controls how the bumps appear, with soft edges, or with sharp edges. To get real control over the transition from the base texture to the bump, make sure that you have soft edges on your image.



- This is the image with the bump. You can also control the size of the texture.
- Click on the Set by Image button to set the size of the texture.
- Change the image size to **30mm (1.25")**.



- Click on the **OK** button.
- Apply this texture to your object and render the view in Final Quality RenderWorks.

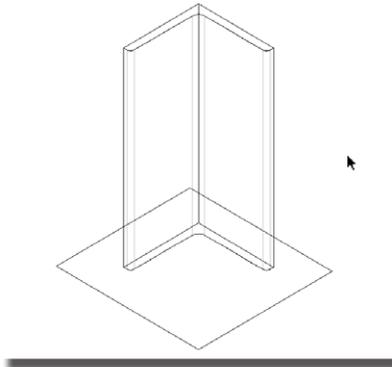


Questions and Answers

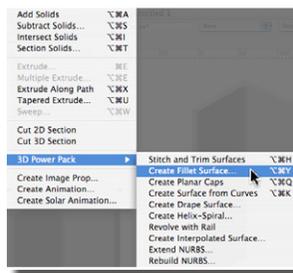
Q. "What is the best way to create 3D fillet welds for 3D steel details, e.g. steel brackets etc?"

There are two ways to place a 3D fillet. The first method is used for placing 3D fillets on two NURBS surfaces, the second method is used to fillet a solid object.

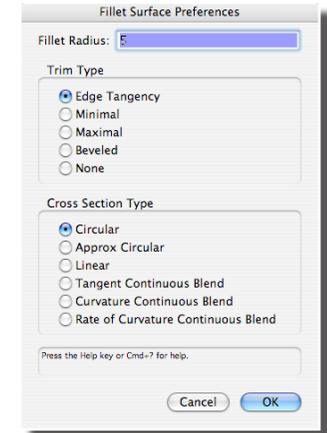
Let's look at the first method. If you have a solid object like this one, you will have to convert it to NURBS curves, using the command from the menu bar: **Modify > Convert > Convert to NURBS.**



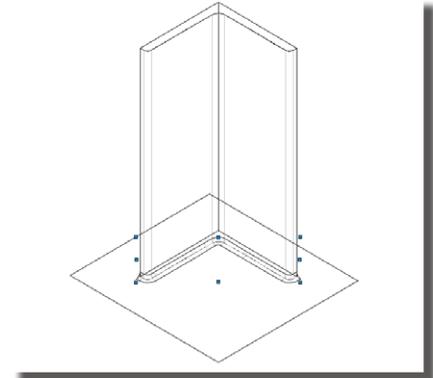
- Select the two NURBS surfaces.
- Choose **Model > 3D Power Pack > Create Fillet Surface...** from the Menu Bar.



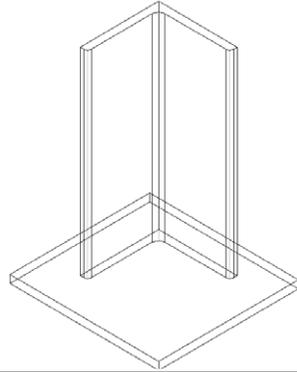
- Choose the options that you want. You will have to try different options here. I tried some worked really well on a larger object but didn't work on a smaller object.
- Click on the **OK** button.



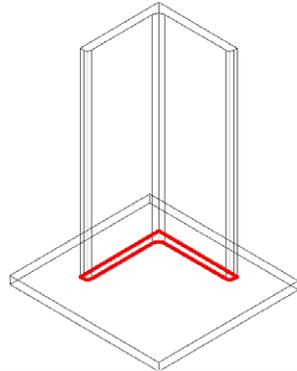
- The fillet surface is independent from the NURBS curves that you started with. This means that you can change the colour or texture of the fillet.



Let's look at the second method. This method needs two solid objects that are added together to make a Solid object. Extrude two or more objects and then use the command: **Model > Add Solids** to make them into one solid addition, or **Model > Subtract Solids...** To make a solid subtraction.



- Choose the Fillet Edge Tool from the 3D Modelling toolset.
- Click on the edges that you want to fillet. If you hold down the shift key you can select more than one edge.



- Click on the green tick on the Mode Bar. VectorWorks places the fillet, but it is now part of the object, so you can't change the colour of the fillet separate from the main object.

