Tip Sheet

ArchiCAD 12
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Internal Sun Penetration – Sun Study

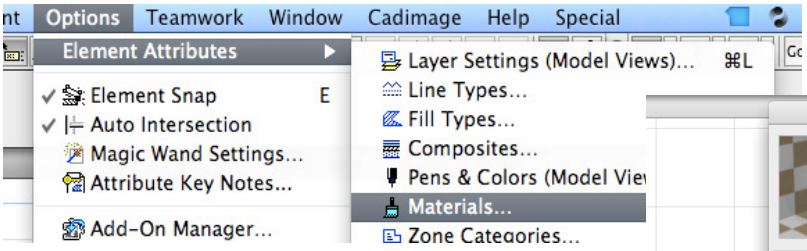
ArchiCAD has the ability to create animated Sun Studies where your static 3D perspective or axonometric view is generated at successive intervals from sunrise to sunset. The final result shows you exactly where the Sun and Shadows will fall on any given day, which is very useful for highlighting the stark difference between summer and winter sunlight angles.

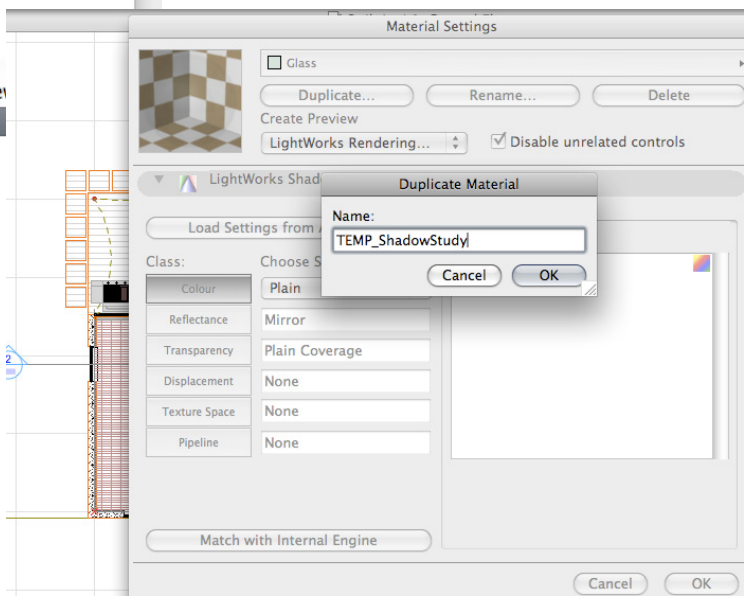
This tip takes the presentation concept one step further by showing you how to view the interior of the building in either a static or animated Sun Study with the focus being the amount of light penetration the Sun is able to offer.

Getting Started

The first step in this process is the creation of a new material that will temporarily be used with the wall or roof elements that you want to see through. In this example I will be making the roof transparent so we can see the differences between mid January and mid June sunlight penetration into the building.

Go to **Options > Element Attributes > Materials**. Within the **Material Settings** dialog box, select **Glass** (as this is close to what we will use eventually) press the **Duplicate** button. Because the new material will only be used as a temporary material,





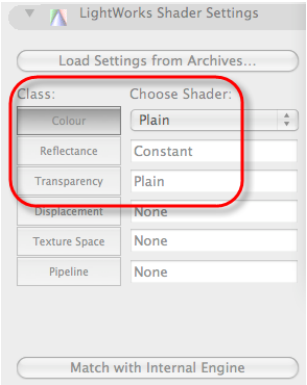
it might pay to name it something that will not interfere with your standard workflow. Using a "z" at the beginning for example, will see it listed at the end of most material pullout menus and therefore be much easier to find.

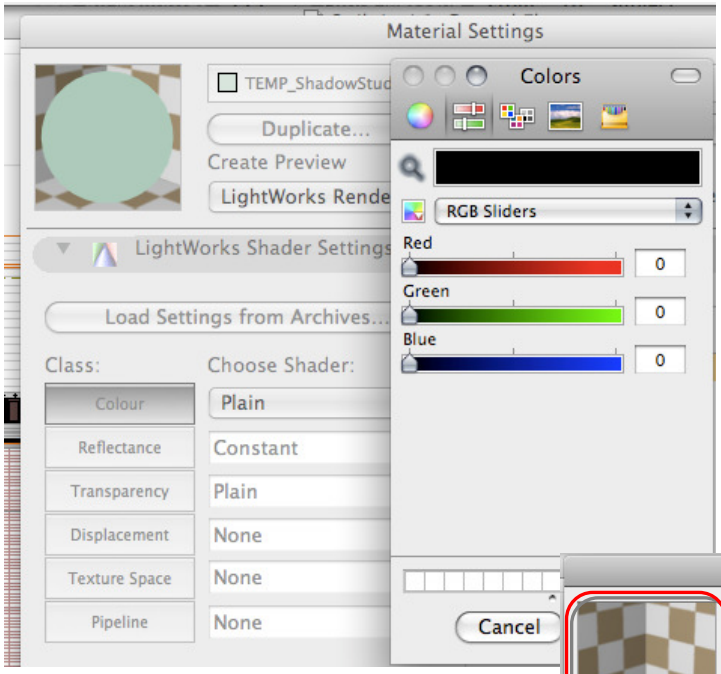
The next step is to set the material up in the Lightworks Shading dialog and not the Internal Engine. Under **Create Preview** select **Lightworks Rendering...**

There are three **Class** types that need changing within this page; **Colour**, **Reflectance** and **Transparency**.

From the pulldown menus for each, set these to:

Colour = Plain
Reflectance = Constant
Transparency = Plain

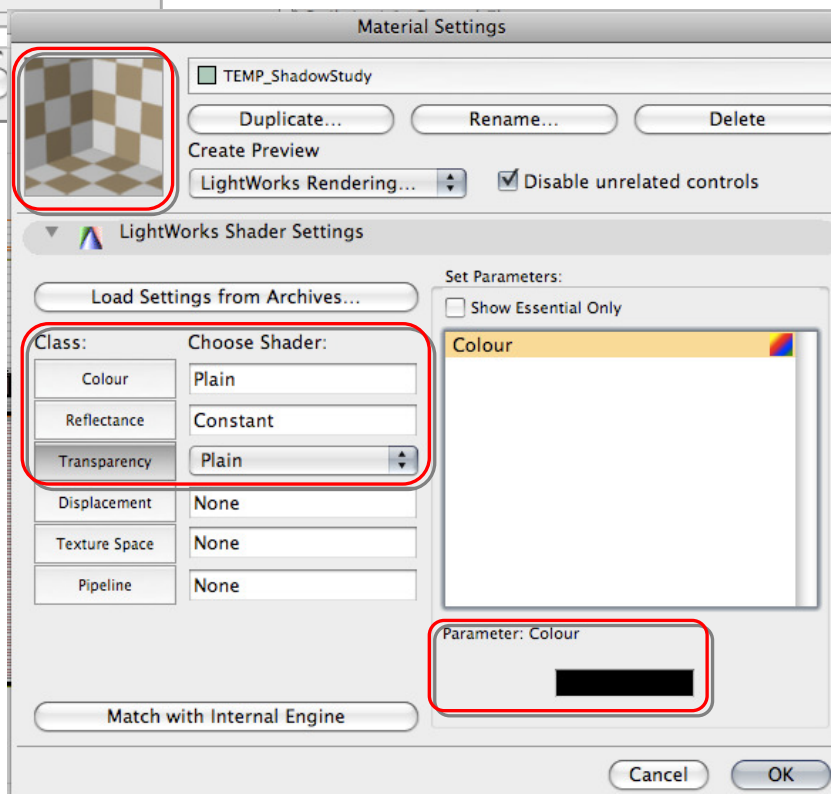




Clicking on the **Colour** button again, then on the **Colour** Parameter will display the **Parameter Colour** swatch, double click on this swatch and change the RGB values all to 0 (sliders all the way to the left) to create a solid black shade, do this for both **Transparency** as well.

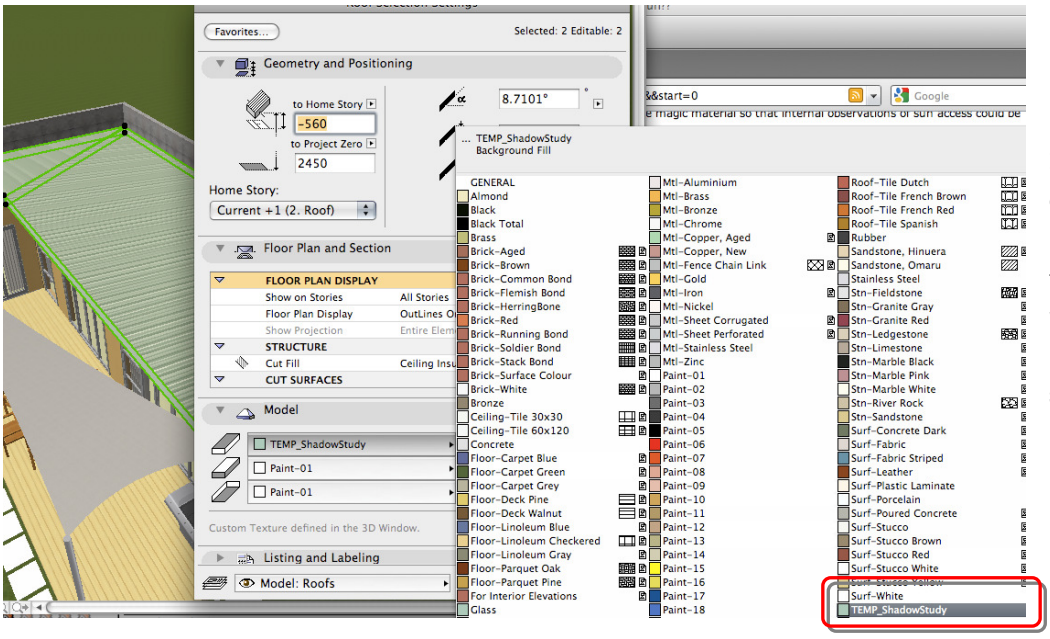
You can ignore the three other fields, provided they are all set to **None** (otherwise set them as such).

Now your preview window in the top left should look like the one below.

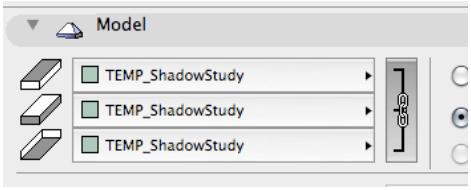


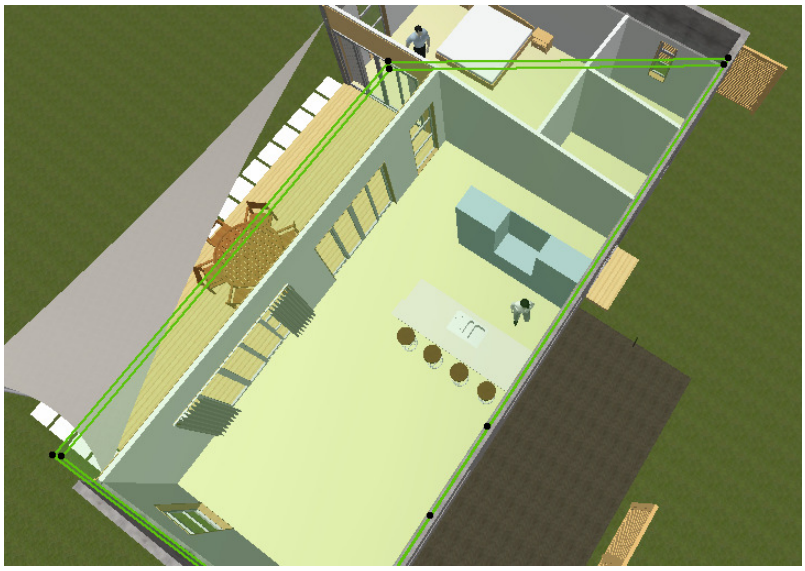
Now that we have a new transparent material that still casts a shadow, we need to apply this to the building elements we wish to see through, in this case it is going to be the roof planes.

It is important to note that for the easiest results it pays to turn off any Cadimage Roof Accessories (or Wall Accessories if a wall is affected) so that there is a simple roofline that will cast eaves shadows as needed.



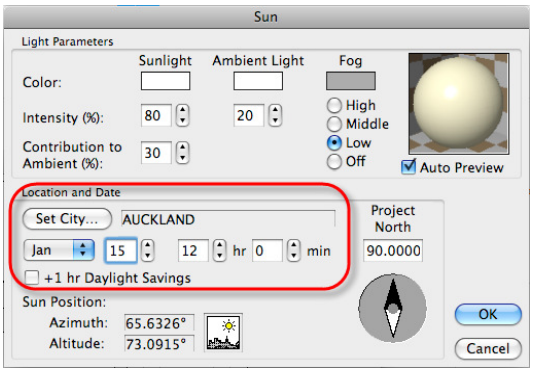
In the 3D Window you can now change the materials for the items you want to be transparent. In this example we have two roof planes that need to be adjusted. Be sure to set all surfaces to the new material (Top, Bottom & Edges).





Here you can see the roof we just changed is not visible unless it is selected.

Now you can go to **Document > Creative Imaging > Photorender Projection** to see what the results are.



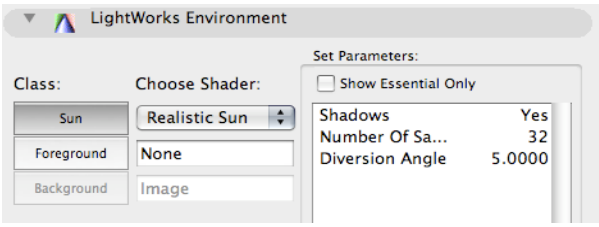
Simply changing the date and time in the Sun Settings will produce the different results.

This material works as you see it in the Render window, and an animated Sun Study can also be performed from the desired viewpoint to accurately see the amount of light available to the building's interior.

Render taken mid-January

Render taken mid-June

Notes

You may find that there are strange shadow lines on the floor that look like the walls – this is due to the high reflectivity of your floors. Just adjust the reflectance value in the Lightworks material settings.

Using *Realistic Sun* (from the Photorender settings dialog) as opposed to *Sun* will give you softer shadows as above. It will take a longer time to render however, so use at your discretion.