1   Hidden Line Tutorial

This is a short tutorial that shows some tricks working with FormZ hidden line renderings. The goal is to achieve the look of typical "technical illustrations", using various line weights and, if necessary, partially colored surfaces. The image on the left gives an example: Thick silhouettes, thin inner edges and the back part of the roof has a grey fill color.

On the following pages you'll learn how to do this step by step... without hours of editing every single segment that is rendered. The software I used to do the screenshots is FormZ 3.9.2 and Adobe Illustrator 7.0 (both Mac), but everything can be done in other software versions too.

If you have difficulties to understand what I say, forgive me. English is not my 1st language (I'm german). Your feedback is welcome, so if you have any corrections or enhancements, just send a short e-Mail to:

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Now, let's get started...

1.1   Setting up the file in FormZ
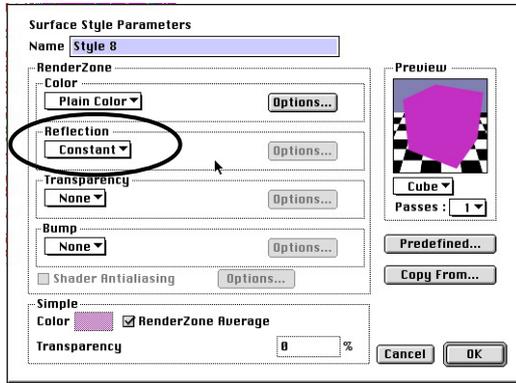
After the modelling is done, there are some settings in FormZ to be done prior to rendering. These are:

◗ Define all your surface styles with reflections set to **Constant**. You should define several different surface styles (even for things that look the same in reality). Later in this tutorial you'll see why.
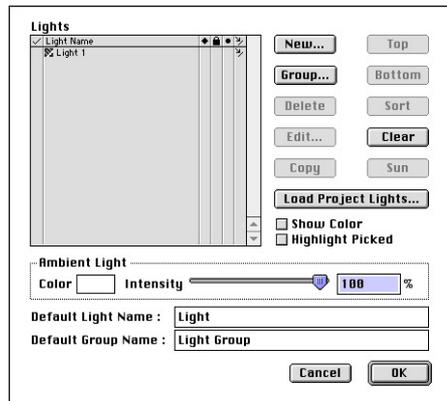
◗ Disable all lights and set the Ambient Light to **100%**.
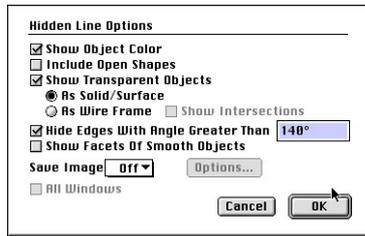
Now you'll set up the rendering options. First, open the Hidden Line Options dialog.

◗   Enable **Show Object Color**

This option results in lines that are rendered using the color (instead of just black). The setting for "Hide Edges with Angle…" depends on your geometry. You may have to try several settings there for the best result.
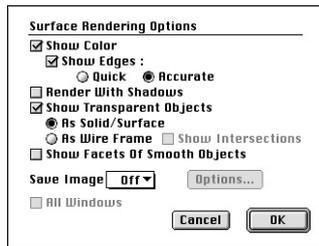
Now open the Surface Rendering Options.

◗   Enable **Show Color**
◗   Enable **Show Edges** (set to **Accurate**)

These settings produce colored surfaces with additionally drawn edges (using the parameters you have set in the Hidden Line Options).

1.2 Applying surface styles
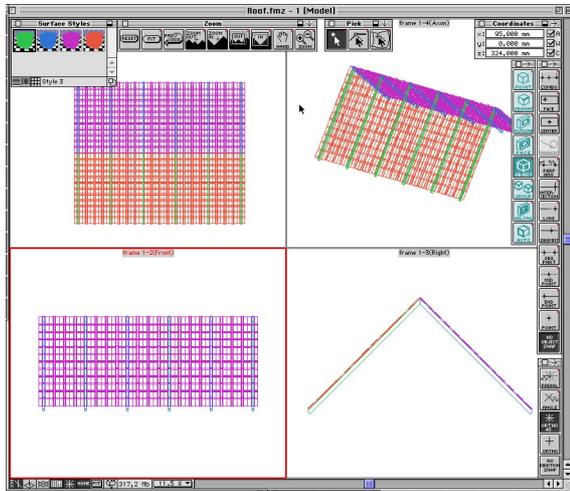
At this point you have to think about what you want or need to do with the rendering. What are the parts you want to handle separately? Let's take the roof example:

The roof consists of four parts (I have joined the single objects for easier handling):

– Front tiles (orange)
– Front wood blocks (green)
– Back wood blocks (blue)
– Back tiles (pink)

While still in FormZ, it is easy to handle each object separately. Later (in Illustrator) the color is everything you have to separate one object from another.

1.3   Rendering
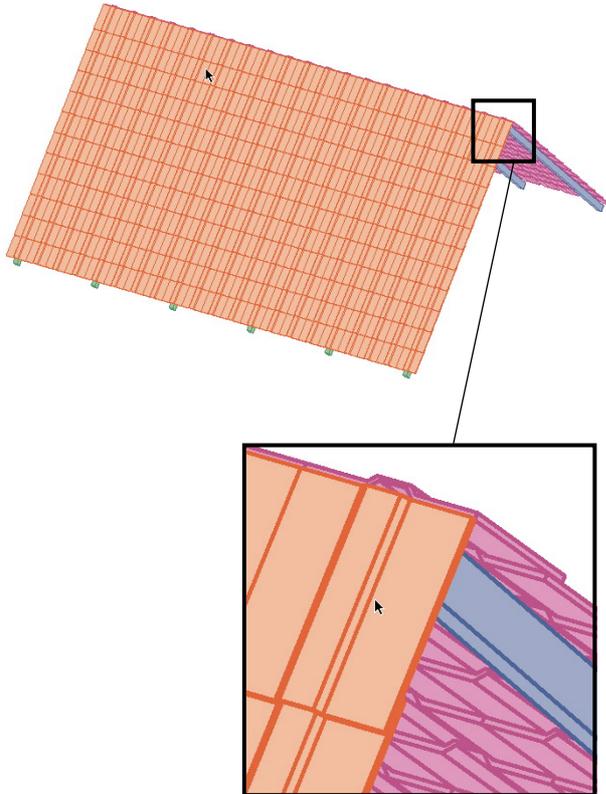
If you have assigned the surface styles, it is time to render. Create a **Surface Rendering** (NOT a Hidden Line Rendering) and save the image as **Illustrator** file.

Your rendering should look similar to the image on the left.

For the next steps, close FormZ and open the rendering in Illustrator.

1.4   Editing the Image in Illustrator
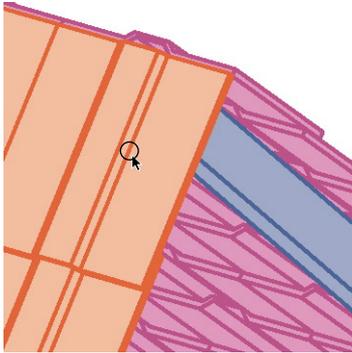
If you open the file in Illustrator, it looks exactly like the surface rendering in FormZ... at first. But you will notice, that the file is quite large, since a surface rendering will render ALL faces, not only the visible ones. If you delete for example some faces of the front tiles, the back tiles will become visible. Now we will reduce the number of single elements for the easiest possible handling.

◗ Klick on one of the (dark orange) edges of the front tiles. Do NOT klick on the filled faces (light orange).
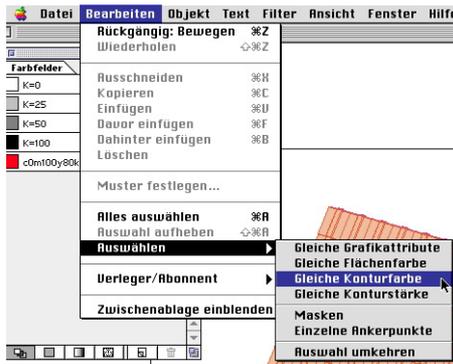
◗ Use the "Edit -> Select -> Same Stroke Color" command to select all of the front tile edges at once.

◗ **Group** them for easier handling.
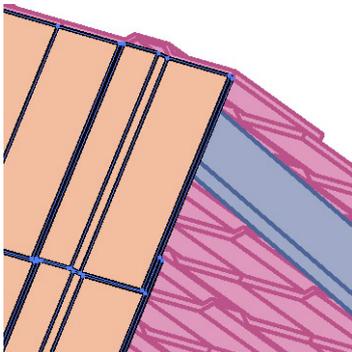
◗ Assign a black stroke color and the desired line weight.

◗ Hide the group of segments
(Object -> Hide Selection).
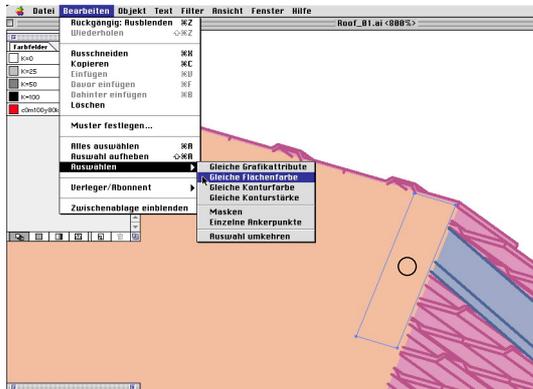
◗ Now click on one of the front tile faces (light orange).

◗ Use the "Edit -> Select -> Same Fill Color" command to select all of the front tile faces at once.

◗ **Union** all these objects using Pathfinder.
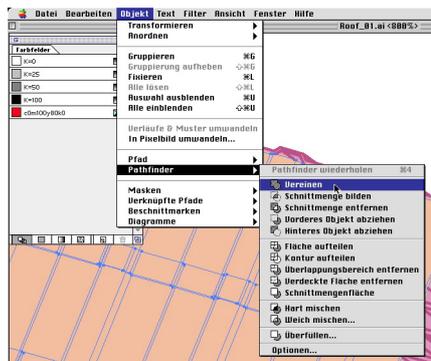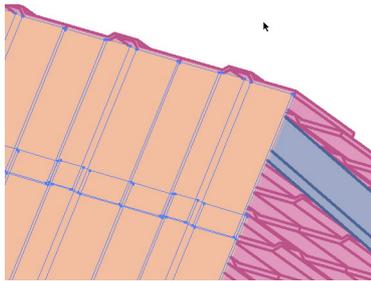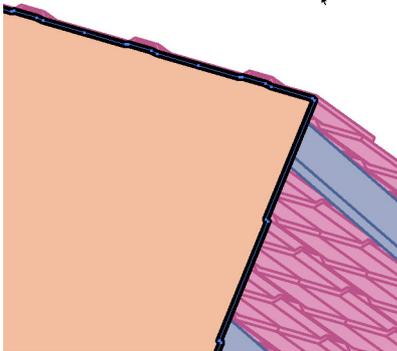
◗ Assign a black stroke color and the desired line weight (thicker than the edges).

◗ Unhide the (previously hidden) group of segments.
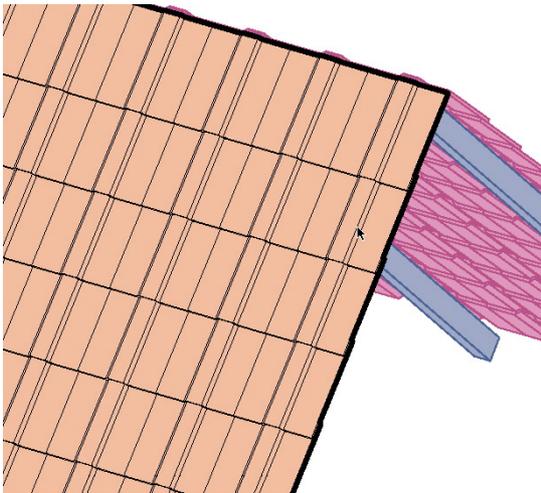
It may be necessary to bring the group of edges to the front again. Finally the image should look like shown on the left.
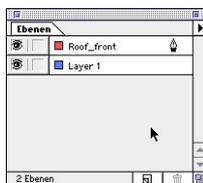
To finish this first step, create a new layer and move both the front tiles face and the group of edges to this layer. This allows you to switch the finished parts invisible, which helps when working on the rest of the image.
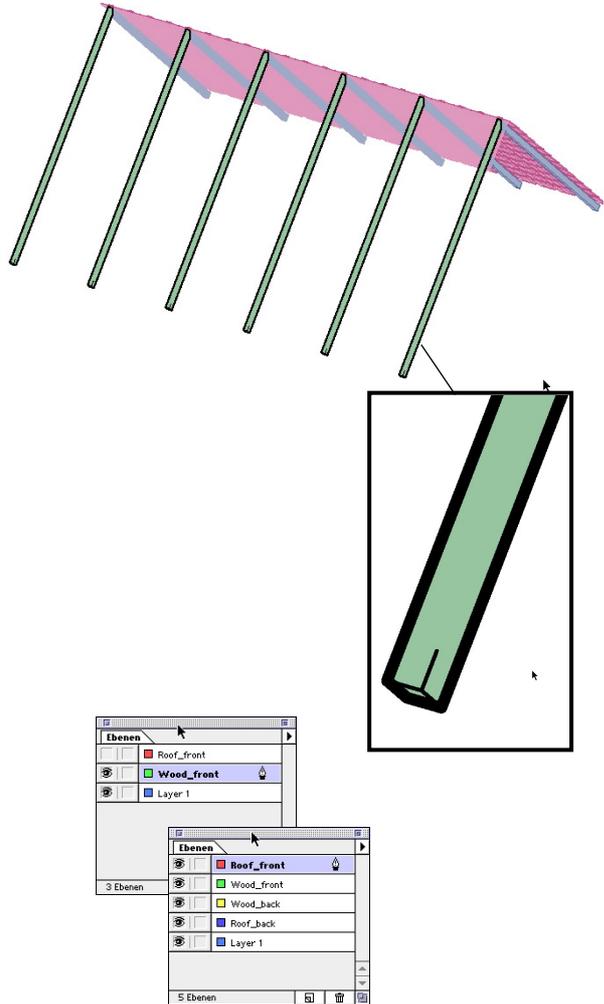
With the "Roof_front" layer made invisible, the image looks like this. Now repeat the steps as done before for the wood blocks (front/green), wood blocks (back/blue) and the back tiles. Always use the same procedure:

➜ Select edge
➜ Select all edges with the same stroke color
➜ Group them
➜ Assign stroke color and line weight
➜ Hide group of edges

➜ Select single face
➜ Select all faces with the same fill color
➜ Union them
➜ Assign stroke color and (thicker) line weight

➜ Unhide edges
➜ Create new layer
➜ Move both, edges and face to new layer
➜ ...
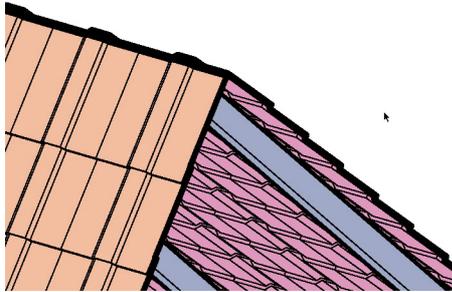
With the finished layers in the correct order, the image looks like this:
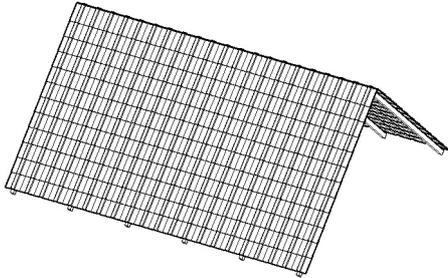
Now you are free to assign the final fill colors, all objects and groups are easily selectable. You can change all fill colors to white or whatever you need. You can also place the complete image in front of a background image, without the background being visible where it should be covered by the object (this would not be possible with a pure hidden line rendering). Or you can switch all the fill colors to "none", which gives an simple hidden line image including different line weights.

Have fun :-)

Bernd Meissner