Creating Door Swing Angles in Rev

Have you ever wanted to show open doors and windows in 3D? I've had to do that recently and will explain how.

In order to have the option for an open panel for any element—door, window, casework, etc.—we need to nest an additional panel within the original geometry, which will contain a swing angle parameter that would allow that panel to swing to any angle in any view.

Below is a door family example. A reference line has been added and a parameter, called "swing angle." Note the reference plane "Wall Reference Plane" to which the wall has been attached.

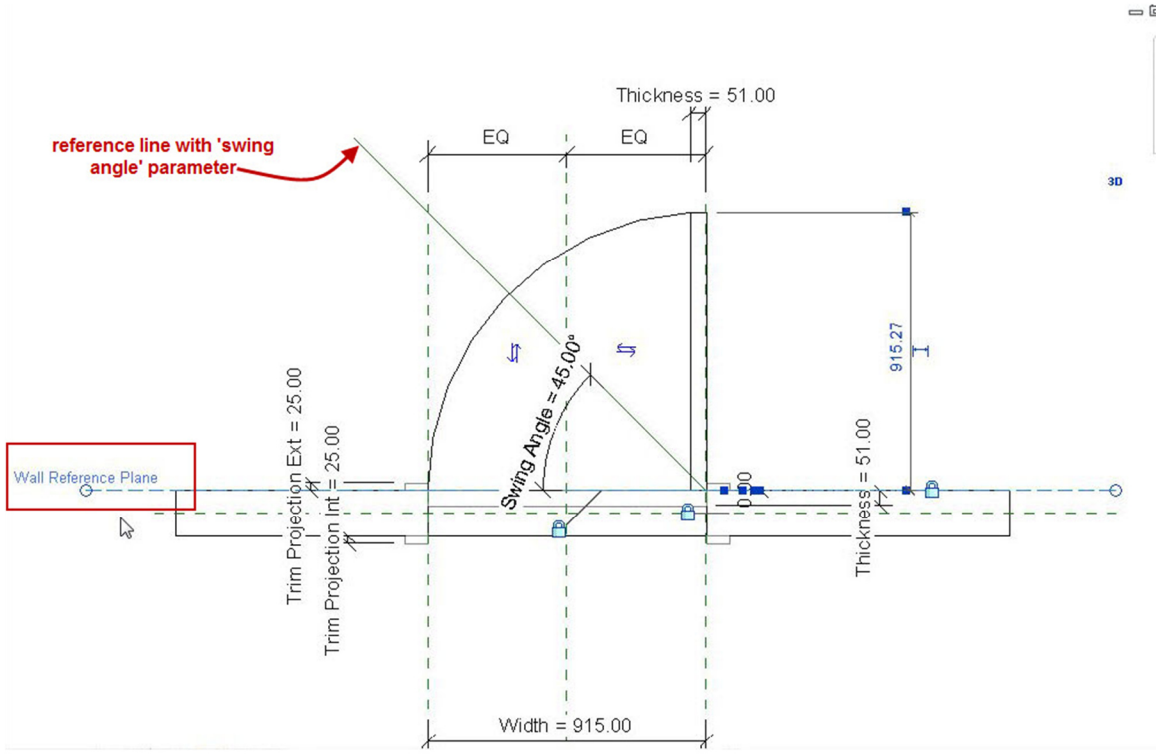

Figure 1: Door Family with added reference line and a 'swing angle' parameter.

Next, we need to align the end point of the new reference line to the Wall Reference Plane, as well as to the right-most vertical reference plane. We pick the Align tool and first select the right-most vertical reference plane and then the end point of the reference line, and lock it.

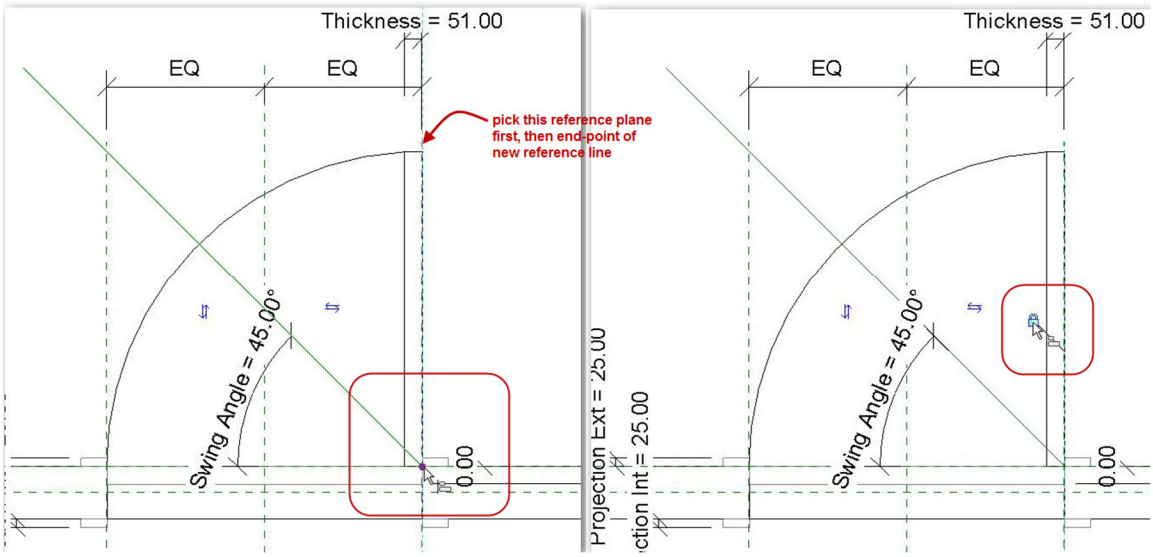

Figure 2: Step 1 – Align vertical reference plane with new reference line. Step 2 – lock them.

We repeat the same procedure for aligning the Wall Reference plane with the end point of the new reference line. Now that we have set our parameter and have locked it to both reference planes, flex the model to make sure it all works out. (Modify Menu - Properties tab - Family Types to change to a different angle, as well as change the door type.)

Next, we need to create our nested panel. To do this, we need to create a new family, a face-based family, starting from the Generic Model face-based.rft template. In it, create a solid extrusion, 3’ width x 7’ height x 2” depth, as shown below.

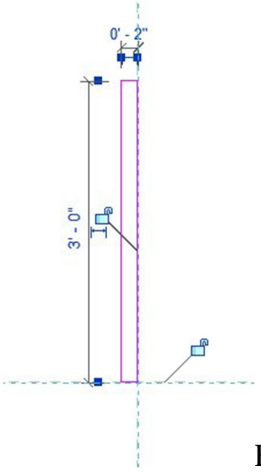

Figure 3: Create a solid extrusion.

We would need this extrusion (our future door panel) to flex in accordance with the hosting door, so we need to add a few parameters, namely width, height, and thickness.

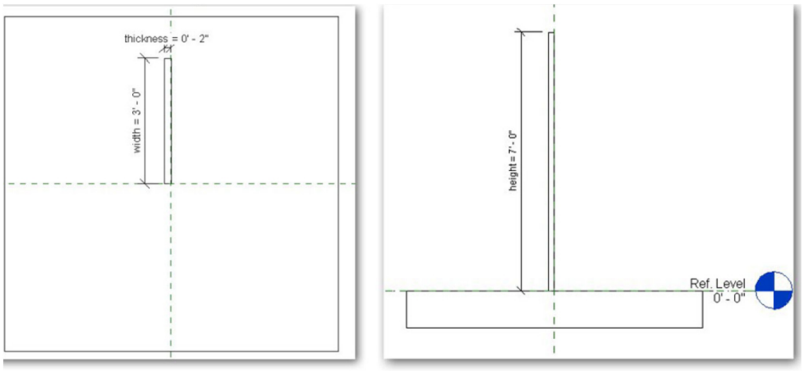

Figure 4: Create parameters for the extrusion.

Let's give our new model a type, calling it a Door Panel, as shown below.

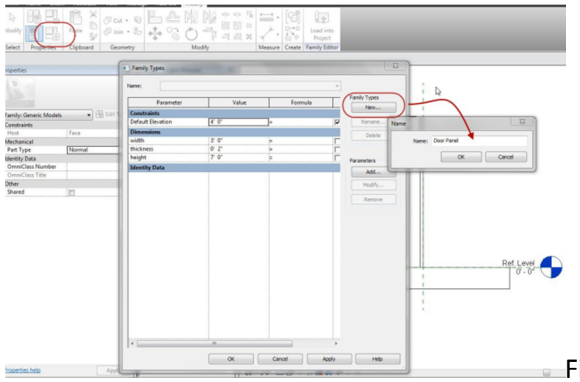

Figure 5: Creating a Door Panel type.

Now, we are ready to nest this new family into our door family. Load the new Door Panel into a 3D view of our original door family, following the steps outlined below. (Make sure you are able to see your reference line in 3D by checking the Annotations tab in the Visibility/Graphics Overrides.) First, upon insertion, select to insert by Place on Work Plane option, in the Placement tab. Space-tab to align the panel, as shown below in the first picture. Second, select as the insertion point, the end point of our new reference line, as shown in the second picture.

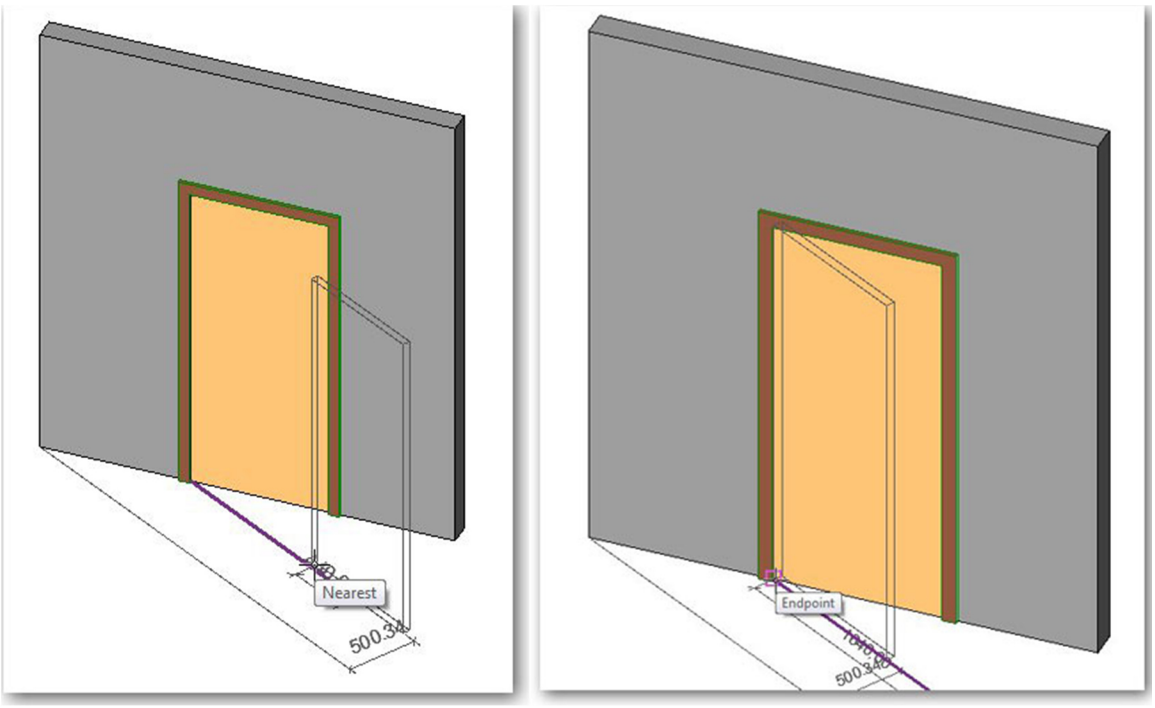

Figure 6: First, select to place by work plane; then select end point for the insertion.

Next, we need to associate the door panel dimensions with the relevant family parameters. With the door panel selected (back in plan), select Edit Type and associate each of our three dimensions with the relevant parameter, as shown below.

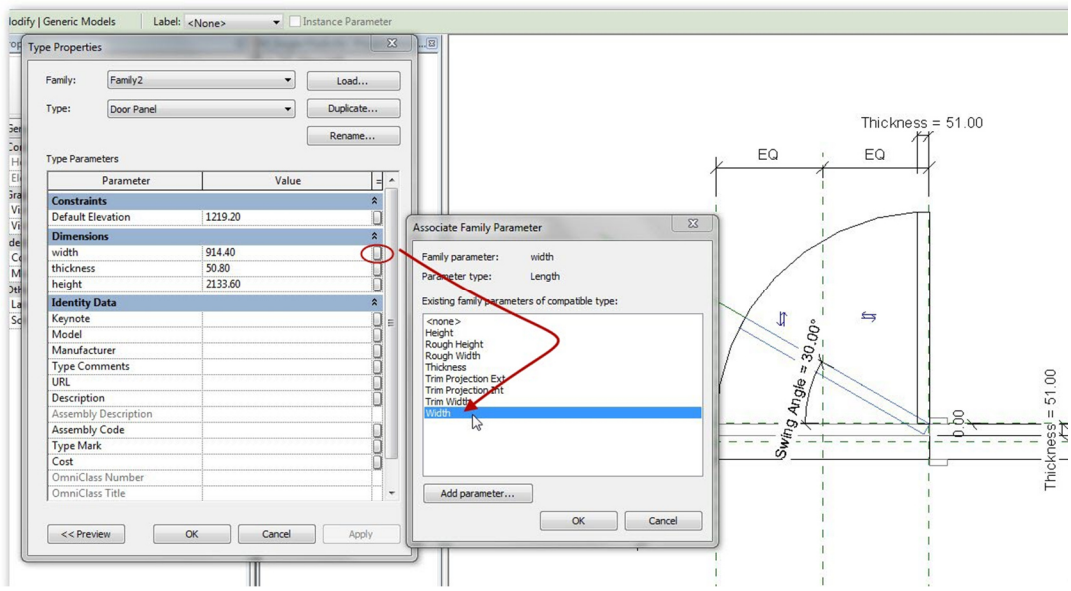

Figure 7: Associate the panel dimensions with the door parameters.

Once all three dimensions have been associated, flex the door to make sure everything works as intended.

Our work is done, except we probably would want to set up a few graphics overrides, such as not showing the new panel in plan (only in 3D), as well as having the option of showing a 45 degree and a 90 degree swing in plan. These are two separate graphics overrides, independent of each other.

First, to prevent the new nested panel from showing in plan, we simply select it and under its Visibility/Graphics overrides in the Properties palette, uncheck the Plan box. On the other hand, for the original door panel not to show in 3D, we need to add a visibility parameter to it. Let's select that panel in a 3D view, and under Properties, add parameter, as shown below.

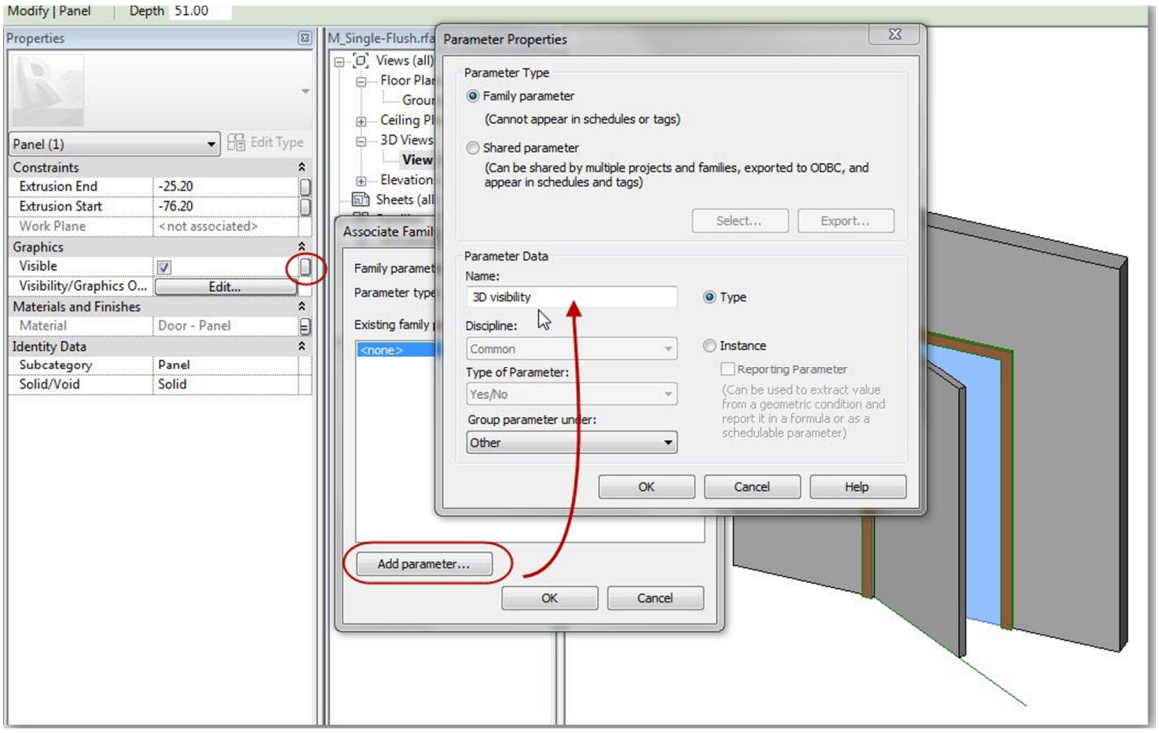

Figure 8: Adding a visibility parameter to the original door panel.

The second option we want to create, namely, to see either a 90degree swing in plan or a 45degree swing in plan (by default all doors in Revit are open at 90 degrees), we would need to engage in a more extensive procedure, which would require creating the 45 and 90 degree plan geometry with symbolic lines and assigning a visibility parameter, just like we did above.

The geometry for a 90 degree swing is by default created for us, so let's just assign a new parameter to it, just as we did above, calling it a 'Plan 90 degree swing.'

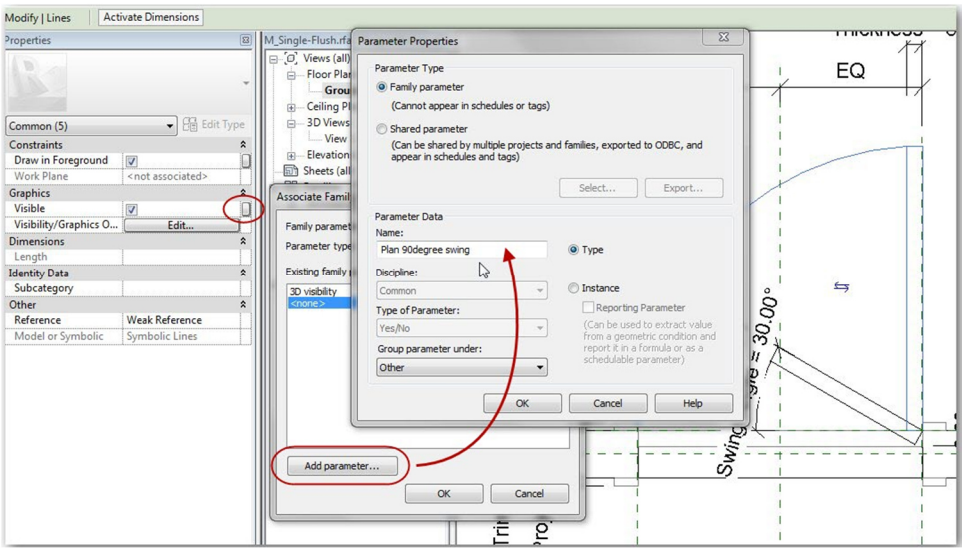

Figure 9: Creating a visibility parameter for plan geometry.

Next, create the same geometry with symbolic lines for a 45 degree swing. Make sure the symbolic lines are of Subcategory Plan Swing (projection). See below.

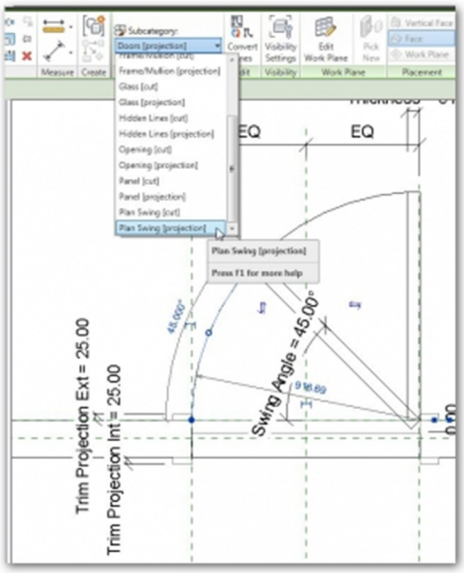

Figure 10: All symbol lines in plan to be of subcategory Plan Swing (projection).

Once done, assign a new parameter to it, calling it a 'Plan 45degree swing' and you're done!

Load the newly created door family in a project and test all of the parameters, both in plan and 3D view.