

## **Exercise 9-6** **Creating a Window Family**

Estimated Time: 10 minutes  
File: ex8-5, generic model wall based.rft

This exercise reinforces the following skills:

- ❑ Standard Component Families
- ❑ Templates

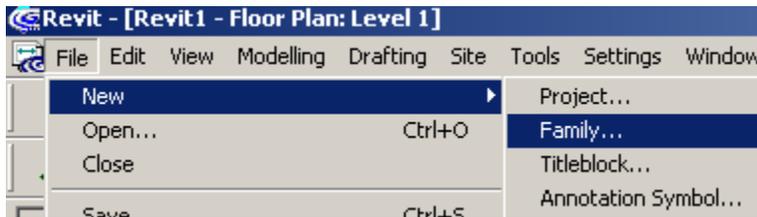


We want to create an arched window.

Width	Height	Rise
2'-0"	0'-9"	3'
2'-0"	1'-3"	3"
2'-0"	2'-3"	3'
2'-0"	3'-3"	3"
2'-0"	3'-8"	3"

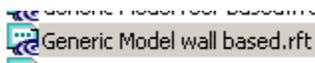
The user will be able to select from several sizes for the window style.

A family defines a set of parametric values that control the element's size and shape.



Go to  
File→New→Family.

**Step 1:**  
**Select the appropriate family template to use.**

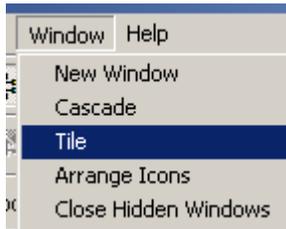


Locate the 'Generic Model wall based.rft' file in the Templates folder.

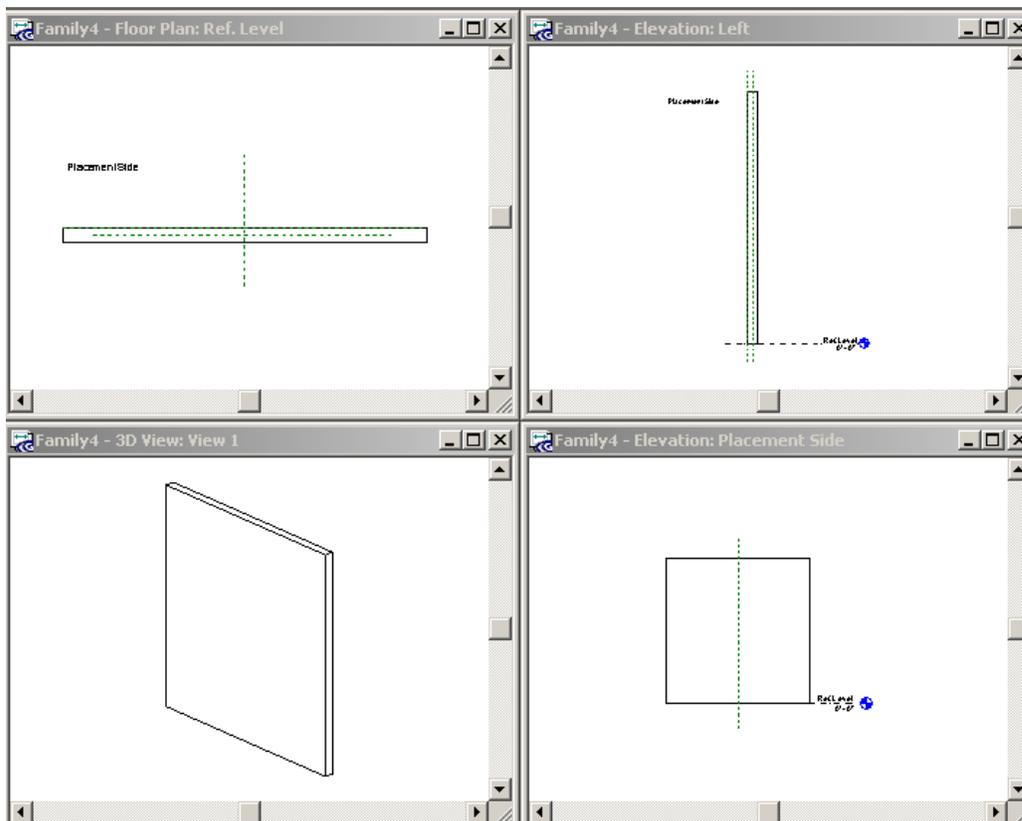
There is a window template as well, but it is not suitable for the geometry we want to create.

**Step 2:**  
***Define sub-categories for the family***

Sub-categories determine how the object will appear in different views



Go to Window→Tile so you can see all the windows related to the window family template.

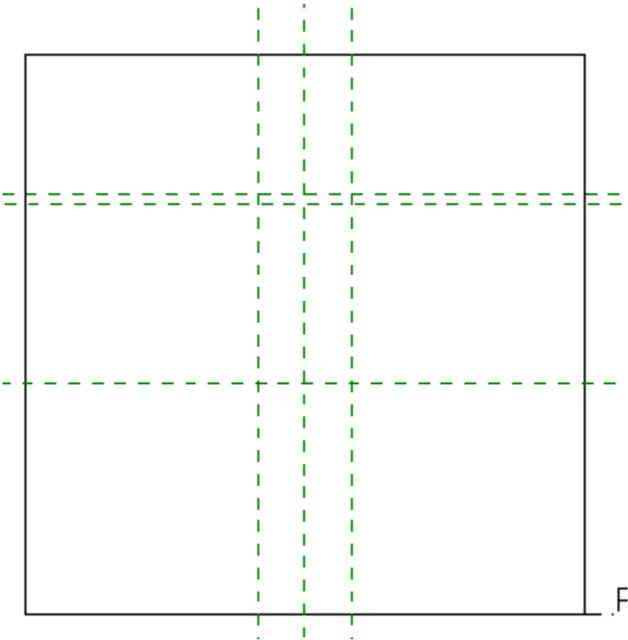


Activate the Exterior Elevation window.

***Step 3:***  
***Lay out reference planes.***

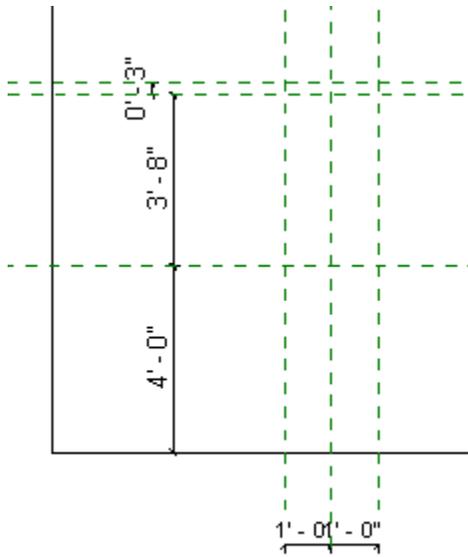


Select the Ref Plane tool.

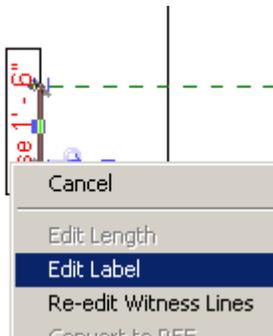


Add reference planes to define the outline of your window.

***Step 4:***  
***Dimension planes to control the parametric geometry.***



**Step 5:**  
*Label dimensions to become type or instance parameters.*

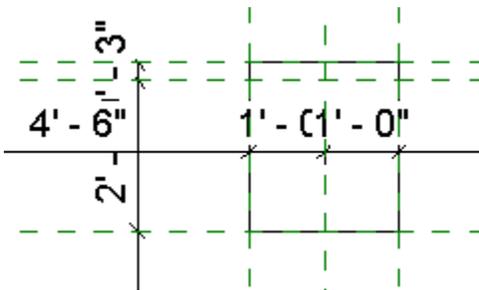


To label the reference plane, highlight the dimension, right click and select 'Edit Label'. Do not add a dimension. The dimension is already assigned.



Type Name
Arch- 2' x 9"
Arch- 2' x 1'-3"
Arch- 2' x 2'-3"
Arch- 2' x 3'-3"
Arch- 2' x 3'-8"
Arch- 2' x 9"

Create five types using the table provided.



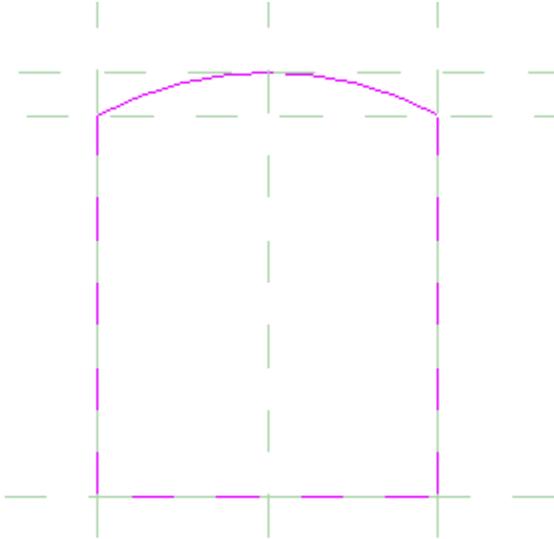
**Step 7:**

*Activate different types and verify that the reference planes shift correctly with the dimensions assigned.*

**Step 8:**  
**Create the wall opening to accommodate the window.**



Select the Opening tool.



Draw a 3-point arc using the intersect points provided by the reference planes.  
Draw three lines to complete the opening.

Select 'Finish Sketch'.

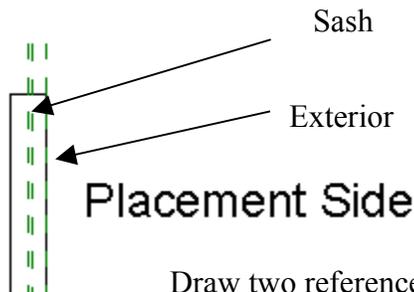


Activate the 3D View – View1 to see your opening.

**Step 9:**  
**Create your 3D geometry to define your model.**



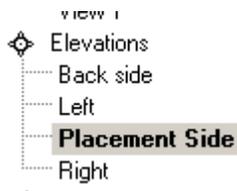
Use the Ref Plane tool.



Draw two reference planes.  
Select each plane and name them using Properties.



Select the middle reference plane line.  
Use Properties to redefine it as the center plane (front/back).



Activate the Placement Side.

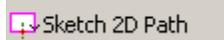
First, we create the window frame.



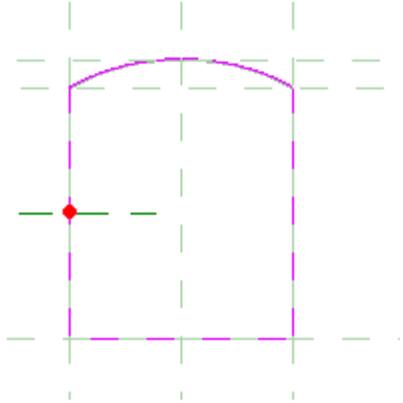
Select the Solid tool.



Select the Sweep option.  
Press 'OK'.



Select the Sketch 2D Path tool.

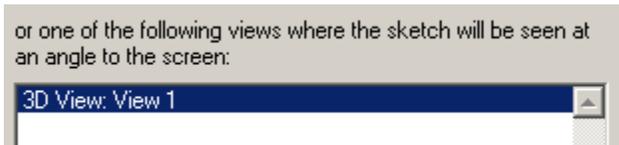


Sketch around the opening.

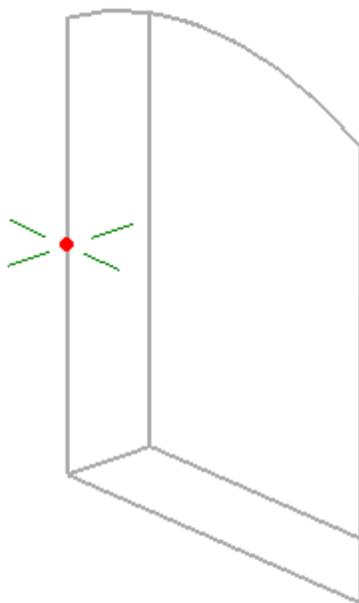
Select 'Finish Sketch'.



Select 'Sketch Profile'.



Select the 3D View: View 1.

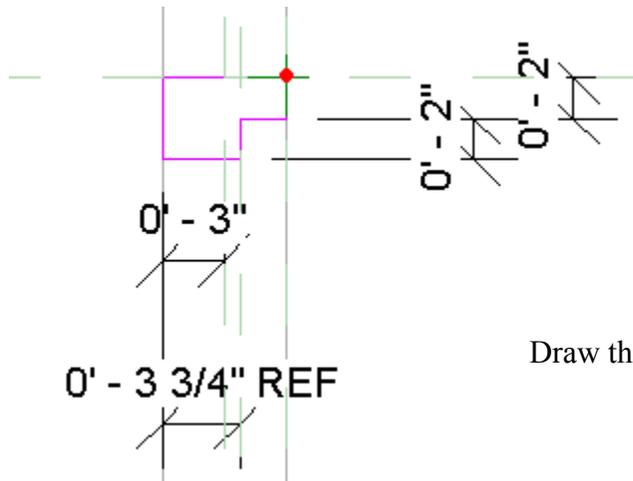


The red dot indicates the intersection point between the path and the profile.

We want to locate our profile at the red dot.



Activate the Right elevation.

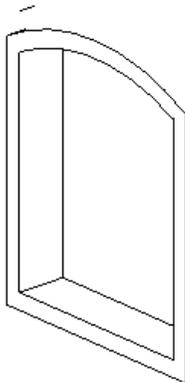


Draw the profile shown.

Select 'Finish Profile'.



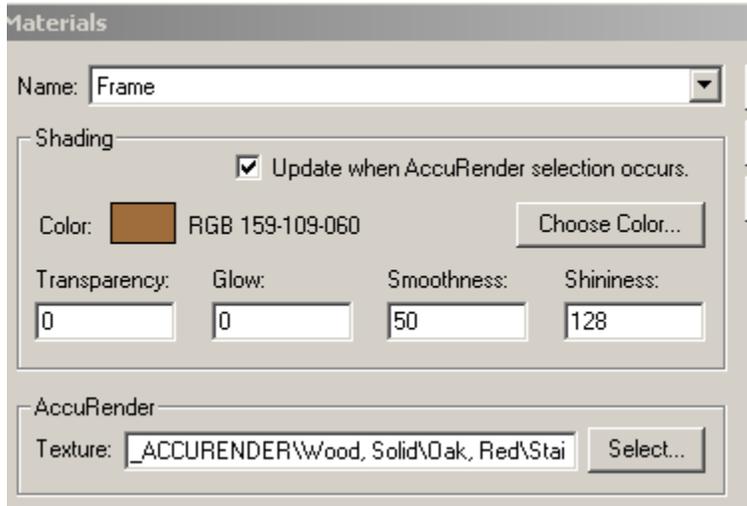
Select 'Finish Sweep'.



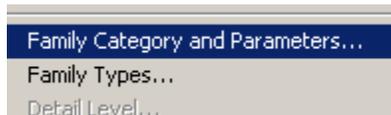
Switch to 3D:View 1.



**TIP:** If you do not set your family file to use the applicable Family Categories, you will have difficulty properly defining your family. Use Settings to adding the correct family categories to your file.



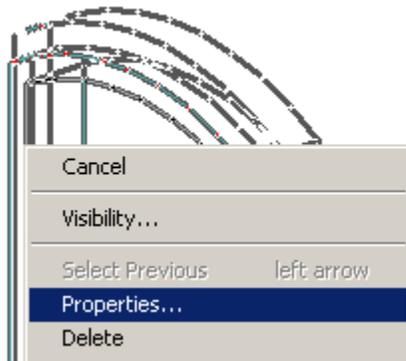
Go to Settings→Materials. Create a new material called 'Frame'. Set the Texture to Solid/Oak/Red/Stained, No Gloss. Set the Colors to brown for shading.



Go to Settings→Family Category and Parameters...



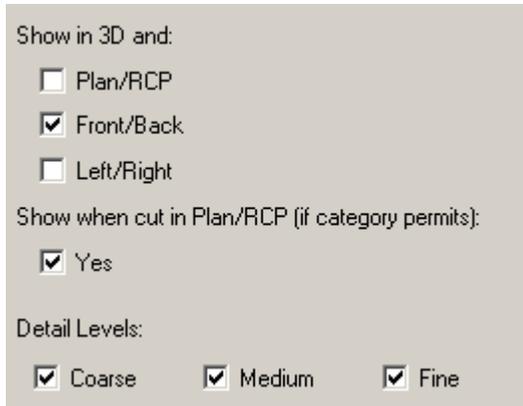
Define your family to use Window family categories.



Select the Sweep. Right click and select 'Properties'.

Parameter	Value
Visibility	Edit...
Subcategory	Frame/Mullion
Material	Frame
Solid/Void	Solid

Set the Subcategory to Frame/Mullion. Set the Material to Frame. Select 'Edit' under Visibility.

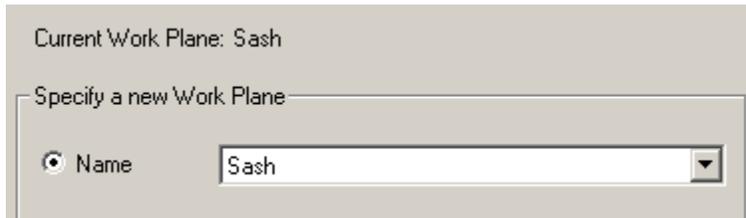


Disable visibility for Plan/RCP and Left/Right views.

Press 'OK'.

Next we add the sash using an extrusion.

Go to Tools→Work Plane.



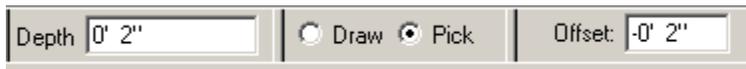
Set the Work Plane to Sash.



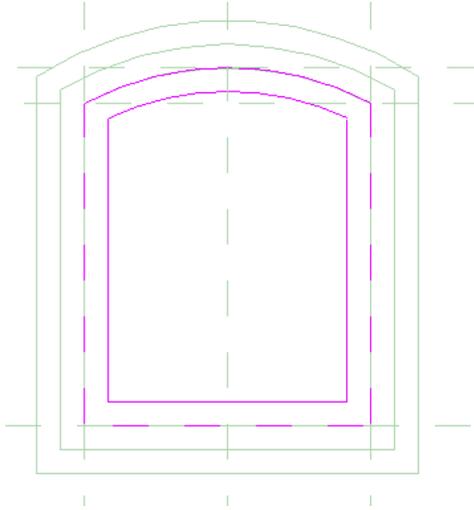
Select the Solid tool.

Enable the Extrusion option and press 'OK'.

Activate Lines mode.  
In the Options bar, select the Depth to 2".  
Enable 'Pick'.  
Set the Offset to -0'2".

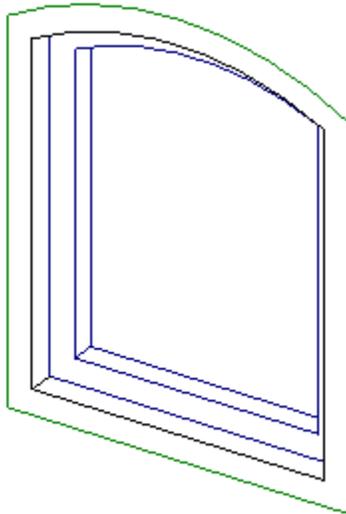


Use TAB to select the middle of the Sweep frame.



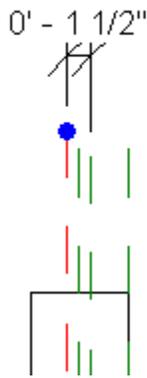
Pick the lines and arc you just placed to create another offset.

Select 'Finish Sketch'.



Switch to 3D View: View 1 to see the sash.

Pick the sash and change the properties as before.



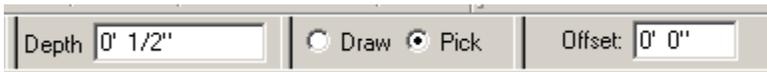
Create another reference plan for the glass.  
Set the plane 1.5" to the left.  
Name the plane 'Glazing'.

Set the current work plane to Glazing using Tools→Work Plane.



Select the Solid tool.

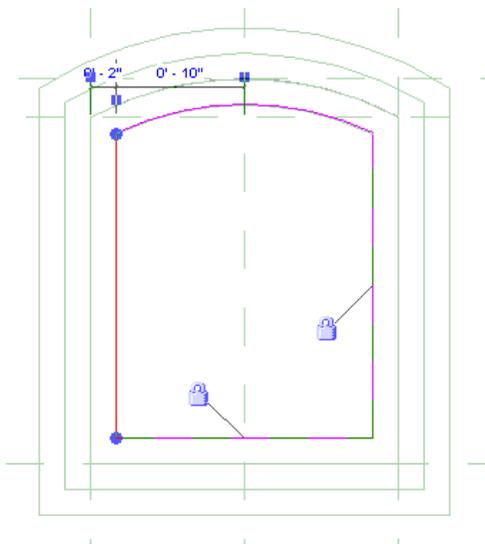
Enable the Extrusion option and press 'OK'.



Set the Depth to 1/2\".

Enable Pick.

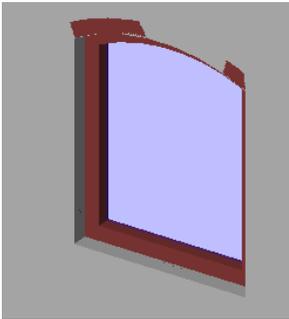
Set the Offset to 0\".



Pick the inside edges of the sash and lock the edges so they will adapt when the geometry changes.

Parameter	Value
Extrusion End	0' 0 1/2"
Extrusion start	0' 0"
Visibility	Edit...
Subcategory	Glass
Material	Glass
Solid/Void	Solid

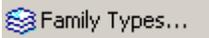
Set the Properties for the window to Glass for the Subcategory and material.  
Edit Visibility as before.



If you shade the view, you should see the frame and glass properly.

**Step 10:**

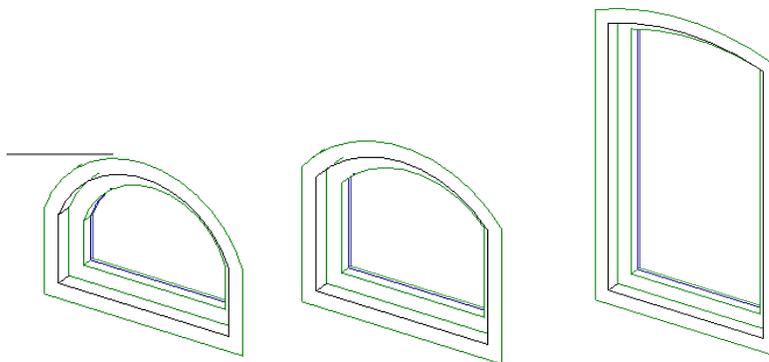
*Activate the different family types to see if the geometry reacts correctly.*



Select the Family Types tool and see what happens when you activate the different types.

If there is a problem, select the element with the problem and Edit Sketch.

Most likely, you forgot to lock an element in place.



**Step 11:**

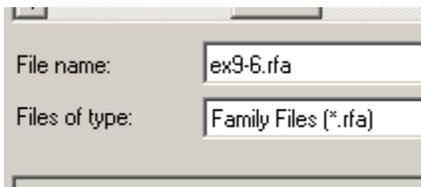
**Save family and load into a project to see how it performs within the project environment.**

Save the file as ex9-6.

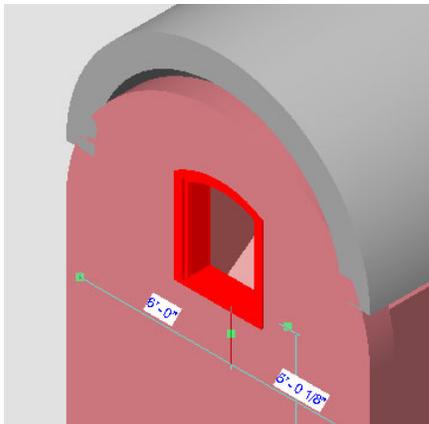
Open file ex8-5.rvt.



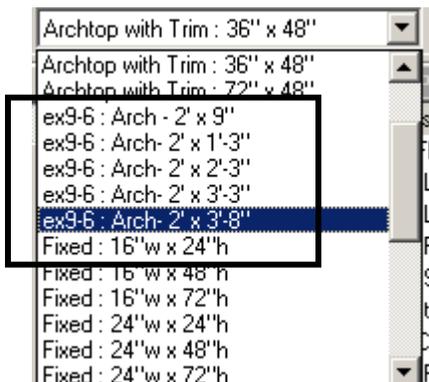
Go to File→Load from Library→Load Family.



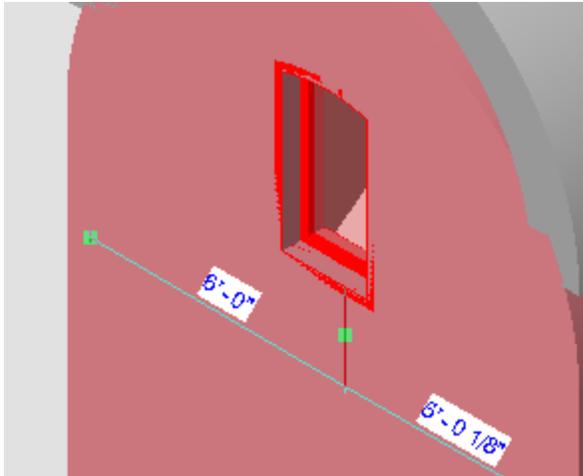
Locate the ex9-6.rfa file (the arched window we just created).  
Notice that the window is previewed for you.



Pick the arched window you placed in the gable and look in the Type drop-down.



We see all the types we defined in our family.  
Select the Arch-2'x3'-8".



The window updates.

Try out other versions of your family to see how they look.