HOW TO CREATE FULLY PARAMETRIC FAMILY IN AUTODESK REVIT ARCHITECTURE 2011
In this tutorial you will learn how to create a parametric family for a window opening that can be further enhanced to be an entire window system.
1. Open Revit Architecture 2011

2. In the Revit Architecture opening screen, select new under the families category for starting a new project.

3. To start up the new Revit family, select the Window.rft below for the template. This will be our “base” to create the family.
Your screen should look like the one below with a sample wall host and an opening with preliminary parametric dimensions.
CREATING THE MODEL GEOMETRY

Before beginning any work on the Revit model, make the wall type a bit more “representative” of the wall type that the window family is intended to be hosted by in the model. The existing opening will also be edited.

1. Pick the existing wall structure. It is important in this step not to select any of the green reference plane lines.
2. Click the **edit type** button in the Element Properties dialog box.

![Edit Type Button](image1)

3. In the Type Properties dialog box, click **edit** next to the word “structure”

![Edit Structure Button](image2)

4. Now you are in the Edit Assembly dialog box. Change the thickness of the material in the default wall system to 1’-2” as show below. *Be sure to click OK until all dialog boxes have been exited.*

![Edit Assembly Dialog Box](image3)
5. Select the window opening and delete it. *You may need to press tab several times to be able to select the line needed.*

![Diagram of window opening](image)

**INTERIOR Width = 3' - 0"

6. Navigate to the **Ref Level Floor Plan** view. On the Home ribbon, click the **Void** Forms tool. *In this step, it is critical to select the Void Extrusion.* *(See image below)*
7. Select the rectangle tool in the Modify | Create Void Extrusion tab as shown in the image below. **Make sure to click all four (4) locks to constrain the rectangle to both sides of the reference planes.**
8. In the **Properties** dialog box, click the button directly to the left of the **Extrusion End** constraints dimension box. What this will do is allow you to link the dimension value to a parameter.

9. Select the “height” parameter type as shown above and click **OK**.

10. Click **Apply** after you’ve verified that the **Extrusion End** constraint as been changed to 4’-0”. **This is critical for the rest of the project creation.**
11. Click **finish** to complete defining the void opening for the window.

![Image of Finish Extrusion and Cancel Extrusion buttons]

12. Select the **Modify** ribbon and click the **Cut** tool under the geometry section as shown below.

![Image of Modify ribbon with Cut tool highlighted]

13. In the **Project Browser** dialog box double click **View 1 in 3D View section**
13. Click the **Family Types** icon under the **Modify** tool bar. *Here we will be changing the width and height of the family types parameters.*

14. **SAVE!** Save the file you are currently working in to the following name: **Window Fixed w Sill and Lintel**. *NOTE: This file will automatically save as an .rfa*
MODELING THE LINTEL & WINDOW SILL

1. Navigate to the **Ref. Level** floor plan view in the **Project Browser** dialog box in the model saved as: *Window Fixed w Sill and Lintel.rfa*

2. From the **Home Ribbon**, click the **Reference Plane** tool under the Datum section

   Draw the **Reference Plane** from *left to right* between the wall center line and the exterior face of the wall. What this will do is be the work plane for the extrusions that we will create later for the sill and the lintel for the window.

3. Click the **Modify** tool to end the Reference Plane command tool.

4. Select the Reference Plane you just created. In the Properties dialog box, enter: “Brick of Sill & Lintel for Window” in the space next to **Name**. *Be sure to click apply.*
5. Navigate to the Annotate ribbon and click the **Aligned** dimension tool and place this particular dimension as shown in the image below. *BE SURE you select the reference plane you created in steps 1 – 4 and not the default one in the center of the wall system.*

![Image of exterior and interior with EQ marks and dimension](image)

*This is the reference plane with the parametric dimension for the Lintel and Sill depth.*

6. Select the parametric dimension you just placed in the wall system. Now, from the Options bar, click **Add Parameter** from the drop down list next to the word “Label”

*See next page for image*
7) Now that you are in the Parameter Properties dialog box, leave the “Family parameter” button selected.

8) Enter “Veneer Thickness” under the Parameter Data Name.

9) Group the parameter under “Dimensions” and click the **Instance** button. 

*Make sure steps 7-9 match the image above. Click OK when complete.*
10. In the Family Types dialog box, enter the value of: 0’ – 3 5/8” for the Sill and Lintel depth. Click **Apply** once. The dimension you just added is for the reference plane.

11. Navigate to the **Exterior** Elevation view of the component.

12. Draw the Reference Planes as shown in the image below.
13. With the reference planes you just created, create the aligned dimensions as shown in the image below.

13. Using the same procedure as steps 12 & 13, assign new parameters to the lintel height and sill height to the top and the bottom dimensions.
14. Edit the family by using the **Family Types** tool again. This time we will assign a value of 4” to the sill dimension and 8” to the lintel dimension.

15. From the Modify | Create Void Extrusion ribbon, click the **Set Work Plane** tool (see image below). In the Work Plane dialog box, select “Reference Plane: Back of Sill & Lintel” from the drop down list next to “Name” as shown in the image below.
16. With the Modify | Create Void Extrusion ribbon currently open, click the **Rectangle** tool to create the rectangles as shown in the image below. Make sure to lock all the individual lines to its appropriate Reference Planes so they will move freely any time the widow width, height, sill height or lintel height changes when modified.

17. In the Properties dialog box, click the small button the far right of the value for Extrusion End.
18. In the Associate Family Parameter dialog box, select the “Veneer Thickness” parameter and select **OK**. At this time the Extrusion End should be tied to that parameter and show a dimension of 0”-3 5/8”.

19. Click **Finish** from the ribbon that is currently open.

20. Navigate to the **View 1 3D View** and rotate the component so that you are able to see the exterior side of the wall system and so you see the void that is represented by an orange line type.

21. Navigate to the **View 1 3D View** and rotate the component so that you are able to see the exterior side of the wall system and so you see the void that is represented by an orange line type.
22. From the Modify ribbon, select the **Cut** tool, then select the wall followed by the void. *(Be sure to do these steps in this order)* The void for the lintel and sill should now appear in the wall shown in the image below.

![Wall with void](image)

23. **SAVE!** Save the file you are currently working in.

You have successfully completed a fully parametric window opening family in Revit Architecture 2011. *Please note that this component can be turned into a full window system.*