

Creating Families

As you're probably becoming acutely aware, having the right content makes or breaks an Autodesk® Revit® Architecture project. I'm sure you're also very aware that, other than the content Autodesk has provided and the content you downloaded from this book's web page, you don't have anywhere near the amount of content you need to start a project! That being said, it's time to buckle down and dig into how Revit works and see how having adjustable, parametric families will turn you into a Revit fan for life.

This chapter covers the following topics:

- ▶ **Creating a basic family**
- ▶ **Using a complex family to create an arched door**
- ▶ **Creating an in-place family**

Creating a Basic Family

The first item you'll tackle is how to create a basic family. You'll start with the creation of a wall sweep and then move on to creating an arched doorway. As you become fluent with these two basic family types, you'll start to be able to create families quite fast.

You have to start somewhere. To be honest, no good family is "basic," but some are easier to create than others. The concept is the same, however.

Essentially, a family has three fundamental components.

Reference Planes Yes, reference planes drive the family. Look at these as the family's skeleton.

Constraints *Constraints* are dimensions with a parameter associated with them to give the skeleton its flexibility.

3D Massing 3D massing is locked to the skeleton. Let's call this the skin. Corny, I know, but it gets the point across.



NOTE Metric users should not type in *mm* or other metric abbreviations when entering amounts suggested in the exercises. Revit will not accept such abbreviations. Simply enter the number provided within the parentheses.

First, you need to figure out where to start. Any family that you want to insert into a Revit model must begin with a template. Choosing the correct template, as you'll soon discover, will make your life much simpler.

The objective of this procedure is to start a new family by choosing a template in Revit. Follow these steps:

1. Open Revit Architecture.
2. In the Recent Files screen, click the New link in the Families column, or click the Application button and select New > Family.
3. Select Profile-Hosted.rft (Metric Profile-Hosted.rft), and then click Open.

As mentioned earlier, you'll notice the reference planes. A good family starts and ends with these. Next, you'll notice some text. Revit adds *advice* in each of its family templates. After you read the advice, you can delete it. You'll do that in a moment, but first let's add reference planes to the family.

Adding Reference Planes to a Family

The one bad thing about creating a family is that you can get away with doing so without using reference planes. This is unfortunate, because a family made with no (or not enough) reference planes will be faulty at best. I've learned that lesson the hard way. Although it may seem redundant to add reference planes, I strongly advise you to use them and use them often.

In the following procedure, you'll offset some reference planes to create the wall sweep. Follow these steps:

1. On the Datum panel of the Create tab, click the Reference Plane button, as shown in Figure BC2.1.

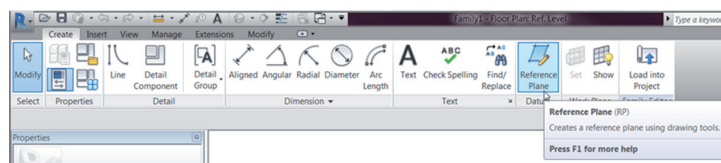


FIGURE BC2.1: The Reference Plane button on the Create tab

2. In the Draw panel, click the Pick Lines button.
3. On the Options bar, set Offset to 1'-0" (300 mm).
4. Hover your cursor over the center, vertical reference plane. When the blue reference line appears to the right of the vertical plane (as shown in Figure BC2.2), pick the center reference plane. You now have two vertical reference planes spaced 1'-0" (300 mm) apart.

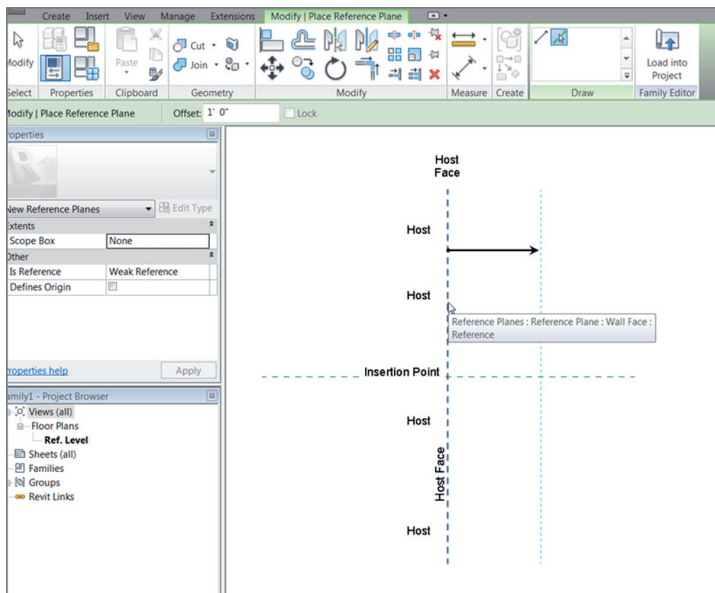


FIGURE BC2.2: Adding a second vertical reference plane

5. With the Reference Plane command still running, pick the horizontal reference plane, and offset it down using the same offset increment of 1'-0" (300 mm). Your family should resemble Figure BC2.3.

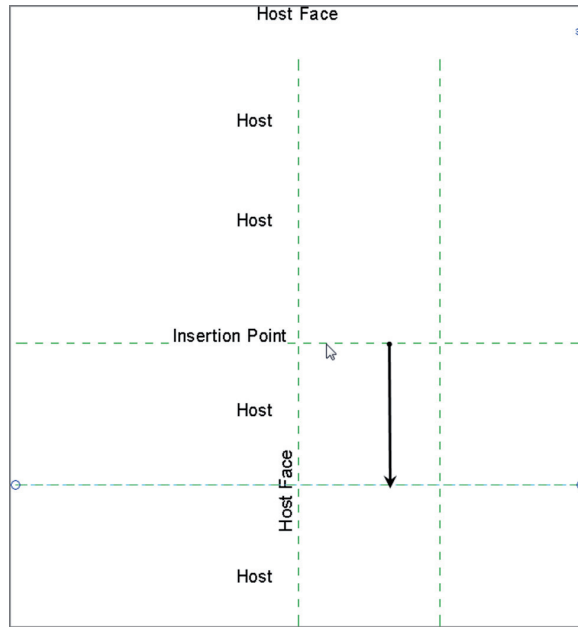


FIGURE BC 2 . 3 : Adding a second horizontal reference plane downward

These two reference planes represent the body of the sweep. Next, let's add two more secondary reference planes for more control over the family.

1. Set Offset to 2" (50 mm).
2. Offset the top horizontal reference plane down.
3. Offset the left vertical reference plane to the right (see Figure BC2.4).

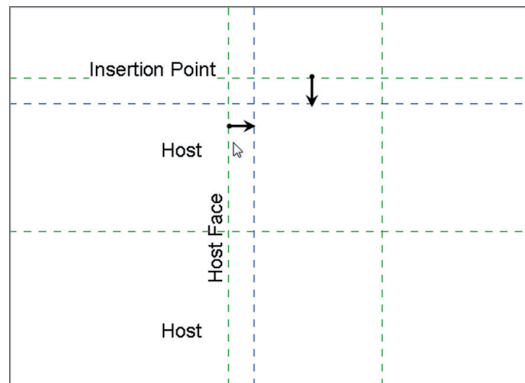


FIGURE BC 2 . 4 : Offsetting two more reference planes

With the reference planes in place, you can move on to adding dimensions to them. After you add the dimensions, you'll add parameters to those dimensions to make your family flexible when you add it to the model.

Adding Dimensions and Parameters to a Family

You're now looking at one of the most outstanding features of Revit. Because you can create a parametric component easily and then allow the end user to change the dimensions, you can put your company into overdrive in terms of pushing BIM through and having success with Revit.

The next procedure involves adding dimensions to the reference planes you've already put in place. The procedure after that will add parameters to the dimensions you've added. Follow these steps:

1. On the Measure panel of the Modify | Place Reference Plane tab, click the Aligned Dimension button.
2. Add a horizontal dimension from the left reference plane to the right reference plane. The dimension should be 1'-0" (300 mm).
3. Add a second dimension from the top reference plane to the bottom reference plane. The dimension should be 1'-0" (300 mm).
4. Add a dimension from the left reference plane to the 2" (50 mm) reference plane to the right.
5. Add a dimension from the top reference plane to the reference plane 2" (50 mm) down (see Figure BC2.5).

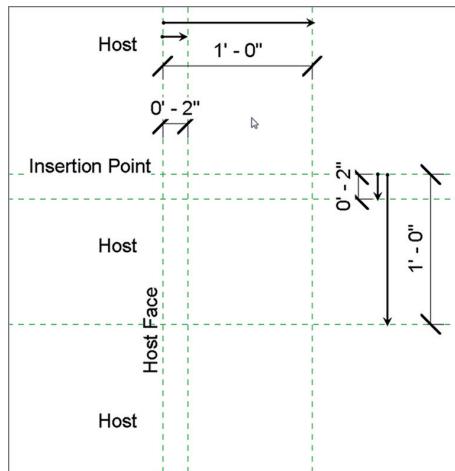


FIGURE BC2.5: Adding the dimensions to the reference planes

The next step is to make this family come alive! Because you're in the Family Editor, when you select a dimension, you can choose to add a label to the dimension. This label is tied to a parameter that can be modified.

To add a label to a dimension, follow these steps:

1. Press Esc twice. Then, select the top, horizontal 1'-0" (300 mm) dimension.
2. On the Options bar, click the Label pull-down menu, and choose Add Parameter (see Figure BC2.6).

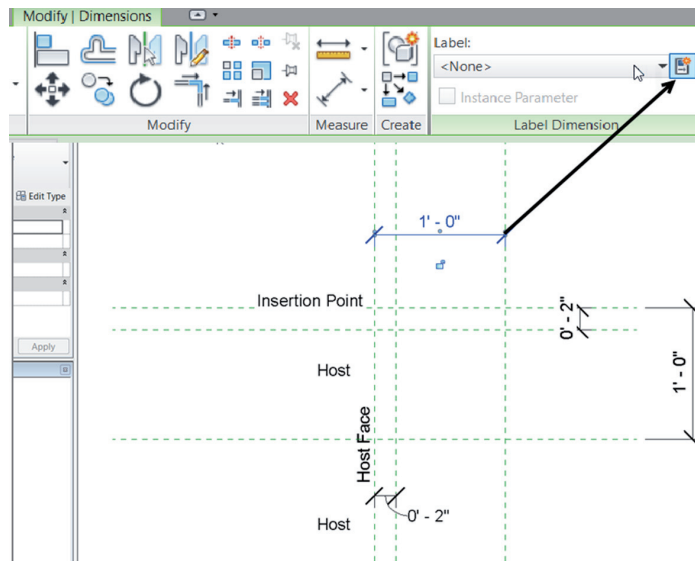


FIGURE BC2.6: Choosing Add Parameter on the Options bar

3. In the Parameter Properties dialog box, under Parameter Data (as shown in Figure BC2.7), type Width for Name.

FIGURE BC 2.7: Configuring the parameter



NOTE When you add a name to the parameter, you're actually adding part of a formula. There is a chance that this name will be part of a mathematical expression. When you name parameters, be deliberate, and give the names some thought. Also keep in mind that the mathematical expressions built into the parameters are case sensitive. If you capitalize the first letter of each word, be consistent.

4. Click OK. The parameter is added to the dimension.
5. Select the 1'-0" (300 mm) vertical dimension.
6. On the Options bar, click the Label pull-down menu.
7. Select Add Parameter.
8. For Name, type Height.
9. Click OK.
10. Select the two 2" (50 mm) dimensions.

CHOOSING INSTANCE OR TYPE

Whether to use Instance or Type may be the most important decision you make when creating family parameters. As you've noticed, when you're modifying a family in the model (such as a wall, door, or window), you can either make a change to the single instance of the component you've selected or click Type and change the component globally in the model.

When the parameter was created, either Instance or Type was selected. So, when you're creating a parameter, you need to ask yourself, "Do I want the user to modify only one instance of this family by changing this parameter, or do I want the user to change every instance of this family by changing this parameter?"

To complicate matters, if you plan to use this parameter in a mathematical expression, every parameter in that expression must be of the same type. For example, you can't add an instance parameter to a type parameter. Revit won't allow it.

11. On the Options bar, click the Label pull-down menu.
12. Select Add Parameter.
13. For Name, type Reveal.
14. Click OK.
15. Click anywhere to clear the selection.

The reference planes are in place, and the dimensions are set with the parameters. It's time to go behind the scenes and see how these families operate by examining the family types and adding formulas to the parameters.

The Type Properties Dialog Box

Within the Family Editor lies a powerful dialog box that lets you organize the parameters associated with the family you're creating. The Type Properties dialog box also allows you to perform calculations and to add increments in an attempt to test the flexibility of the family before it's passed into the model.

The objective of the following procedure is to open the Family Types dialog box and configure some parameters. Follow these steps:

1. On the Properties panel, click the Family Types button, as shown in Figure BC2.8.

Remember, if you hold the Ctrl key, you can select multiple items. The objective of selecting both the 2" (50 mm) dimensions is that you're going to create one parameter and put both items on it.

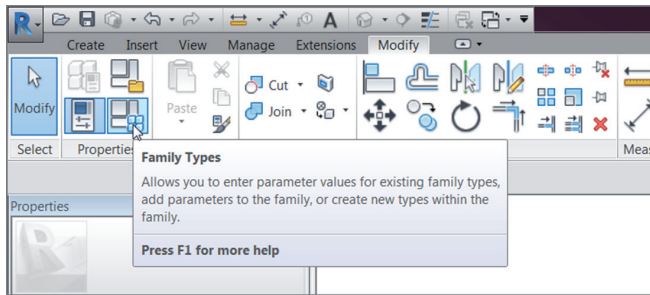


FIGURE BC2.8: The Family Types button on the Properties panel

2. In the Family Types dialog box, click into the Formula cell in the Height row.
3. Type Width, and press the Tab key (see Figure BC2.9).

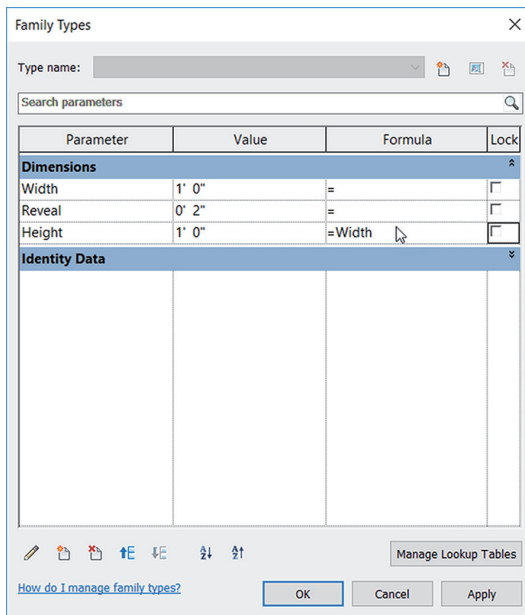


FIGURE BC2.9: The Height parameter is now constrained to the Width parameter.

4. Click into the Width Value (the area in the Width row that has the 1'-0" [300 mm] increment).

5. Change Width from 1'-0" (300 mm) to 6" (150 mm). The Height value changes, too.
6. Click OK. The 1'-0" (300 mm) dimensions are reduced to 6" (150 mm).
7. Click the Family Types button.
8. Change Width back to 1'-0" (300 mm).
9. Click Apply. The dimensions update in the drawing area.
10. Click the New button in the Family Types area, as shown in Figure BC2.10.
11. Call the new type 12" × 12" (300 mm × 300 mm), and click OK (see Figure BC2.10).

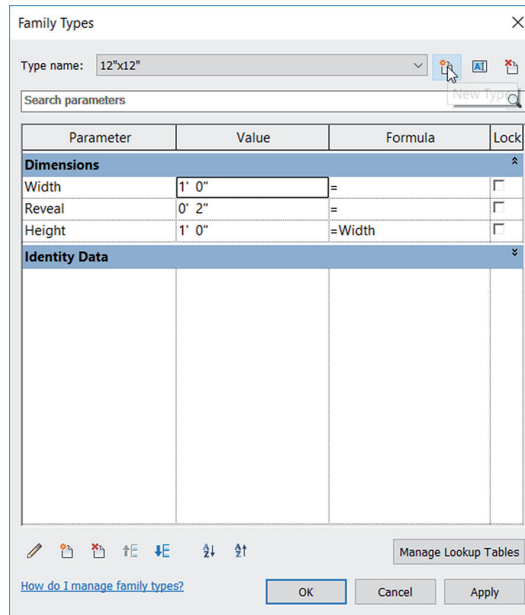


FIGURE BC2.10: Creating a new family type

12. Click the New button again.
13. Call the new type 6" × 6" (150 mm × 150 mm), and click OK.
14. Change Width to 6" (150 mm).
15. Change Reveal to 1" (25 mm).

16. Click Apply. The reference planes and dimensions update.
17. Change Type back to 12" × 12" (300 mm × 300 mm).
18. Click OK.
19. Click Save, and save the family somewhere you'll be able to retrieve it later. Name the file **Cove sweep.rfa**.

Now that the reference planes and parameters are in place, you can flex the family to make sure it will work properly when you load it into the project.

IT'S TIME TO FLEX YOUR FAMILY

With the family complete, you need to go back to the Type Properties dialog box and change the parameters to see where the family will break. This testing is called *flexing* in the Revit world and should be done as often as possible.

The next step is to add the physical lines that form the perimeter of the sweep. Given that this was created using the hosted profile template, the actual family will merely be a 2D profile. The family won't become a 3D object until you pass it into the model and use it as a wall sweep.

In this procedure, you'll draw the perimeter of the cove sweep:

1. On the Detail panel of the Create tab, click the Line button.
2. Draw a line from the intersection labeled 1 in Figure BC2.11 to the intersection labeled 2.
3. Draw a line from point 2 to point 3.
4. Press Esc.
5. Draw a line from point 1 to point 4.
6. Draw a line from point 4 to point 5.
7. On the Draw panel, click the Start-End-Radius Arc button, and draw an arc from point 5 to point 3. When the two points are snapped into place, move your cursor to the left until the radius snaps into place (point 6). Your family should look like Figure BC2.11.

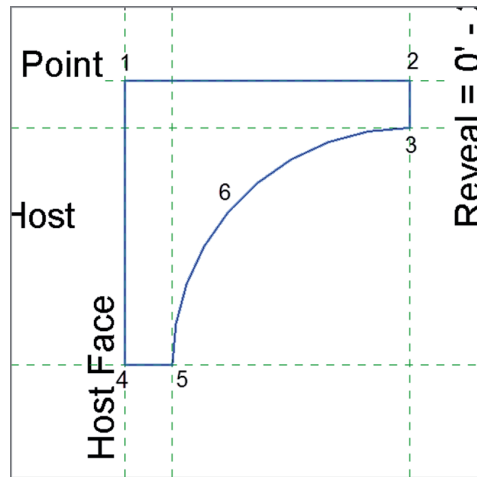


FIGURE BC 2.11: Drawing the boundary of the profile

Now you can load the family into the model and use it as a wall sweep. This is when you get to enjoy the fruits of your labor. To get started, open the building model you've been using to follow along. If you missed the previous chapter, go to the book's web page at www.sybex.com/go/revit2017ner. From there, you can browse to Chapter BC2 and find the `NER-BC2.rvt` file. Follow along with these steps:

1. Open the Cove Sweep file (if you've closed it).
2. On the Family Editor panel, click the Load Into Project button.
3. In the `NER-BC2` project, select one of the exterior walls in the east wing.
4. In the Properties dialog box, click Edit Type.
5. Click the Edit button in the Structure row.
6. Make sure the preview is on and that it's showing a section.
7. Click the Sweeps button.
8. In the Wall Sweeps dialog box, click the Add button.
9. For the Profile, select Cove Sweep: 12" × 12" (300 mm × 300 mm) from the list (notice that 6" × 6" [150 mm × 150 mm] is available too).
10. For Material, apply Concrete - Precast Concrete.
11. Set Distance to -1'-4" (-400 mm).
12. In the From column, make sure the value is Top.

13. In the Side column, make sure the choice is Exterior.
14. Click OK twice.
15. Click OK yet again.
16. Zoom in on the walls. There should be a sweep, as shown in Figure BC2.12.

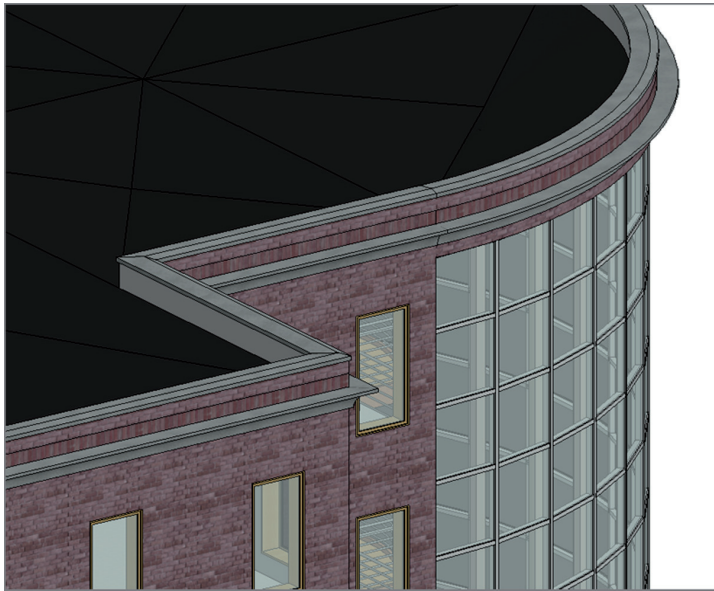


FIGURE BC2.12: The new precast concrete wall sweep

You're getting a taste for what you can do with this powerful tool. And as you can see, you're only scratching the surface of the fun you can have. Now you're ready to try a real family!

The next section of this chapter will be spent on creating an opening with a radial header. Think about the lessons learned with the cove sweep, and dig in.

Using a Complex Family to Create an Arched Door

The "easy" family is out of the way, and next you'll begin blending the procedures of creating a parametric frame with actual 3D extrusions and sweeps. These 3D extrusions and sweeps will behave exactly like the cove family you just

made. When you learn how to create one type of family, the knowledge transfers to the next.

This section of the chapter starts with a blank door template and proceeds with modifying a wall cut. Then you'll add casing, a jamb, and a door. Follow these steps:

1. Click the Application button, and select New > Family.
2. Find the template called Door.rft (Metric Door.rft), and click Open.
3. Quite a bit of work has been done for you. This is great, but you don't need all the items in the template. Select the door jambs, as shown in Figure BC2.13, and delete them from either side of the door.

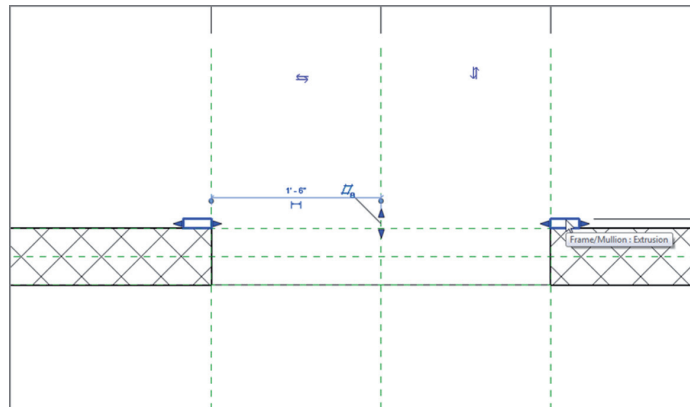


FIGURE BC2.13: Deleting the jambs from either side of the door

4. In the Project Browser, find the Exterior elevation under the Elevations (Elevation 1) category, and open it.
5. In this view, you see a wall and an opening. Select the bottom of the opening, as shown in Figure BC2.14.

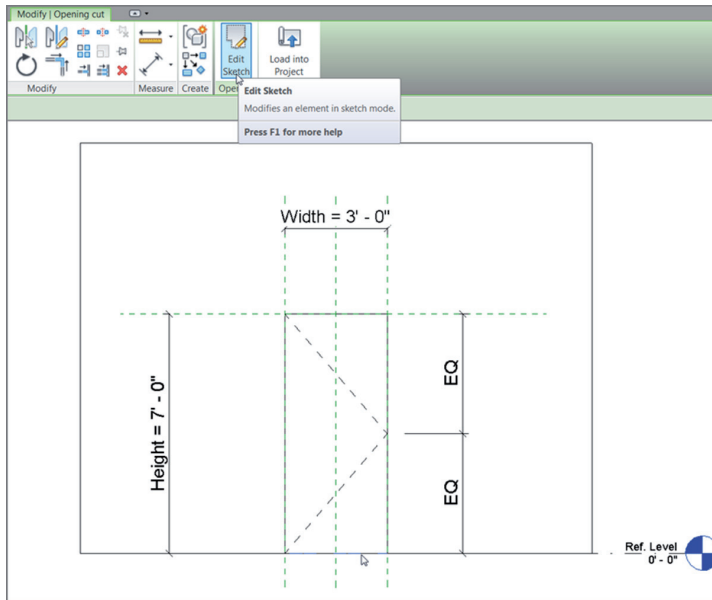


FIGURE BC2.14: Editing the door opening



NOTE The wall that you see is provided by Revit in order for you to design your opening to be flexible with any size wall in the model after you load this family. After the door family is in the project, this wall is removed. It's provided merely for layout.

6. On the Options bar, click Transparent In: Elevation.
7. Click the Edit Sketch button on the Opening panel (see Figure BC2.14).
8. By clicking Edit Sketch, you enter Sketch Mode. On the Draw panel, click the Start-End-Radius Arc button.
9. Draw an arc, as shown in Figure BC2.15.

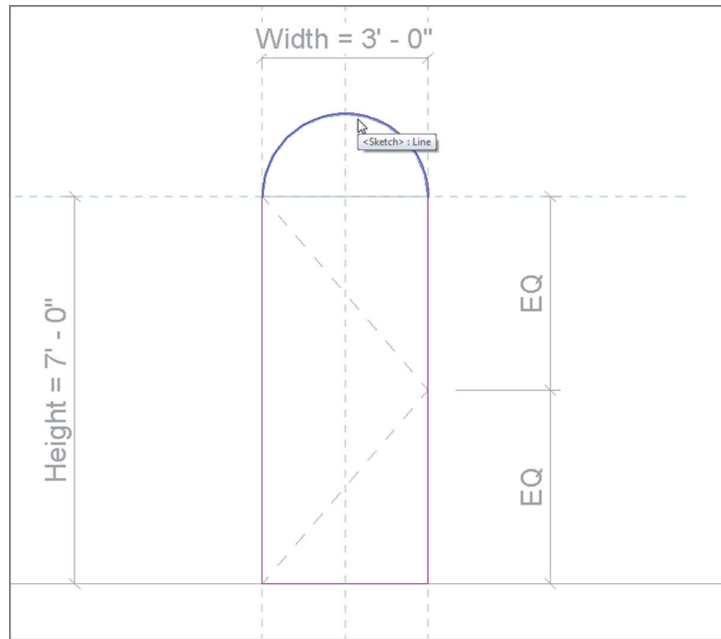


FIGURE BC 2.15: Rounding off the door top

10. Delete the leftover top line. Your door opening should be a continuous perimeter.
11. Click Finish Edit Mode.

With the opening in place, you can begin testing. Yes, you need to test the width to see whether the actual radial top will behave as expected. Taking the time to do this now is an extremely small concession to the pain of deleting half the family later trying to find out what broke.

1. Click the Family Types button on the Properties panel.
2. Change the value for Width to 4'-0" (1200 mm).
3. Click OK.
4. Verify that the arc behaved as expected. If it didn't, you need to re-edit the opening and make sure you're snapped to the correct points.

I told you that would be quick. That is all the time it takes to make sure your family is good to go up to this point.

Now let's add some components to the family. The first item you'll tackle is the door jamb. You'll do this by creating a solid form and then a solid extrusion.

Creating a 3D Extrusion in a Family

Other than the curtain wall you applied to a face of a mass in the previous chapter, you've been working in this huge 3D program without doing a single 3D operation. Well, that has come to an end. At some point, you'll need to deal with 3D and massing. When it comes to learning families, you can't avoid it.

But 3D in a family is slightly different than any 3D item you may have created in the past. The wonderful thing about creating 3D items in a family is that these items are fully adjustable after they're created.

The objective of the next procedure is to create a door jamb using solid extrusion. You'll then lock the faces of the extrusion to the walls so that the family will adapt to any wall thickness when passed into the model. Follow these steps:

1. Make sure you're in the exterior elevation.
2. On the Forms panel of the Create tab, click the Extrusion button.
3. In the Work Plane panel, click the Set button, as shown in Figure BC2.16.

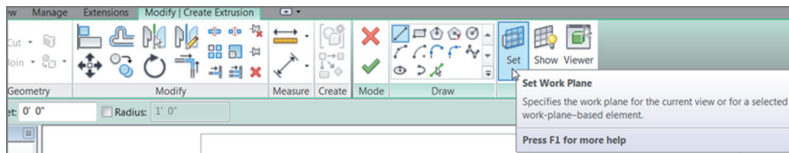


FIGURE BC2.16: Clicking the Set Work Plane button

4. In the Work Plane dialog box, click Pick A Plane, and then click OK.
5. Pick the face of the wall, as shown in Figure BC2.17.

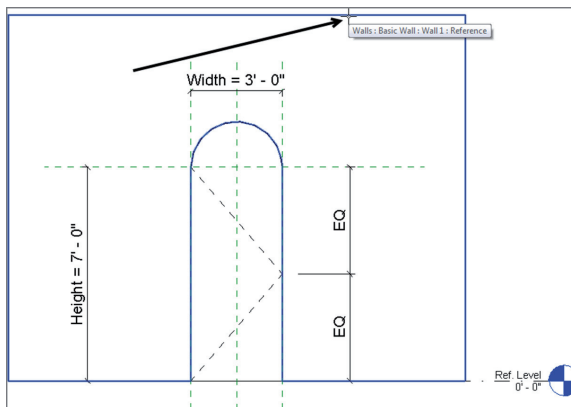


FIGURE BC2.17: Setting the Reference Plane to the face of the wall

6. Now that the work plane has been set, click the Pick Lines icon on the Draw panel.



WARNING Steps 3–5 have you set the work plane to the face of the wall. *This is of the utmost importance.* If you skip these steps, your door won't respond to the change in the wall's thickness when you load it into the model.

7. On the Options bar, select the Lock toggle.
8. Pick the inside face of the opening (see Figure BC2.18).

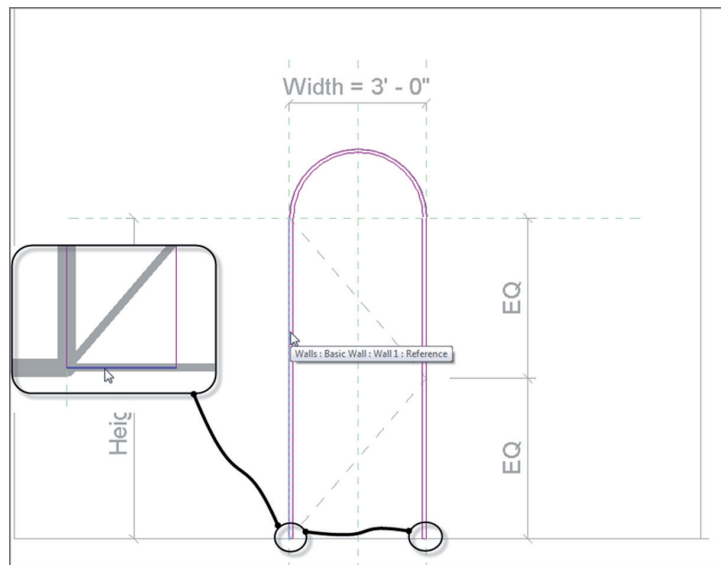
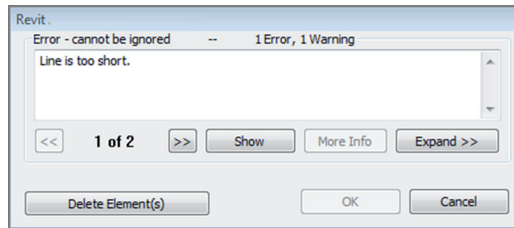


FIGURE BC2.18: Drawing the bottom line

9. Change Offset on the Options bar to 1" (25 mm).
10. Pick the same lines, offsetting the inside face of the jamb into the opening 1" (25 mm).
11. Zoom into the bottom of the jambs.

LINE IS TOO SHORT

You may get an error at some point as you pick these lines, as shown here. This is more of a nuisance than anything else. All you need to do is click OK, delete the line(s) that were set into the wrong spot, and redo the same command. You'll have more success the second time through.



12. Set Offset on the Options bar to 0.
13. Draw a line connecting the bottom of each jamb (see Figure BC2.18).
14. Set Extrusion End to -3" (-75 mm).
15. Click the small button to the right of the Material row (see Figure BC2.19).
16. Click Add Parameter at the lower left of the dialog box.
17. Name the parameter **Jamb Material**.
Group parameter under **Materials and Finishes**, and keep it as **Type** parameter.
18. Keep it grouped under **Materials And Finishes**.
19. Keep it a **Type** parameter.
20. Click OK.
21. The Material field is no longer active. Click OK again, and then click **Finish Edit Mode**.

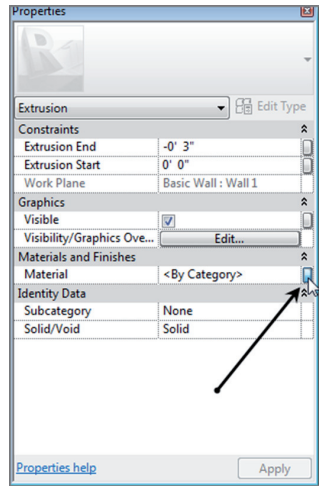


FIGURE BC 2.19: Associating the Material Parameter

What did you just do? By not selecting the actual material in the properties of the extrusion, you created a parameter so that users can specify whatever material they deem necessary. This is a valuable step in family creation: it's called *flexibility*.

Speaking of flexibility, this jamb is held at a steady 3" (75 mm). This is an incorrect value and will remain static unless you do something about it. You'll do so right now.

The goal of the next procedure is to align the inside face of the jamb with the inside face of the wall and to lock that alignment in place. Follow these steps:

1. Go to a 3D view, and make sure you're spun around so that you can see the inside face of the wall where the jamb doesn't align.
2. Click the Align button on the Modify tab, as shown in Figure BC2.20.
3. On the Options bar, select Wall Faces for Preference.
4. Pick the inside face of the wall.
5. Pick the inside face of the jamb.
6. Click the closed padlock icon that appears (see Figure BC2.20).
7. Press Esc.
8. Click the Save icon.

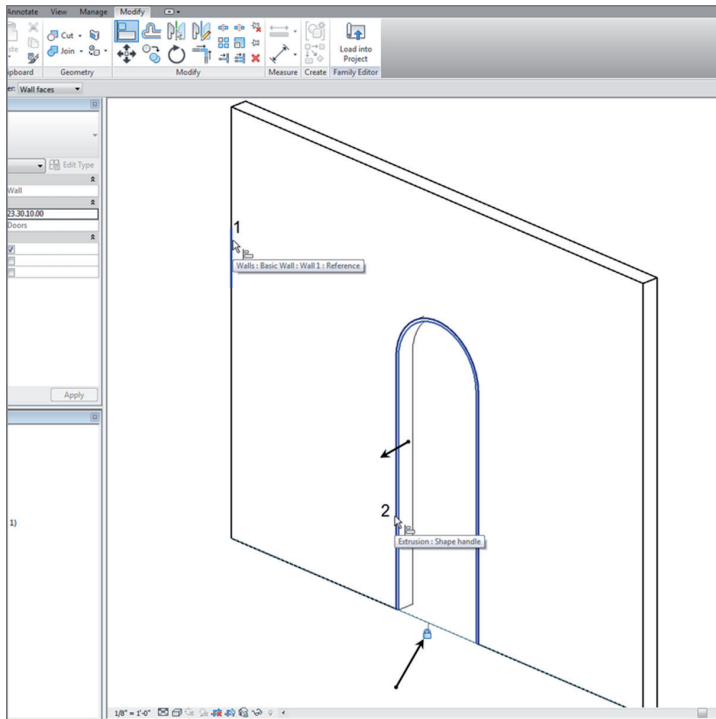


FIGURE BC 2 . 2 0: Aligning and locking the inside face of the jamb to the wall

9. Save the door in a directory where you'll be able to find it.
10. Call it **Arched Door.rfa**.
11. Make sure your project is open.
12. In the Arched Door.rfa file, click Load Into Project.

If you have more than one project or family open, Revit will make you choose a model to load the family into. Be sure to pick your project file.

13. In the model, open the Level 1 view.
14. On the Architecture tab, click the Door button.
15. Insert the new door in the wall, as shown in Figure BC2.21. (Don't worry too much about placement.)

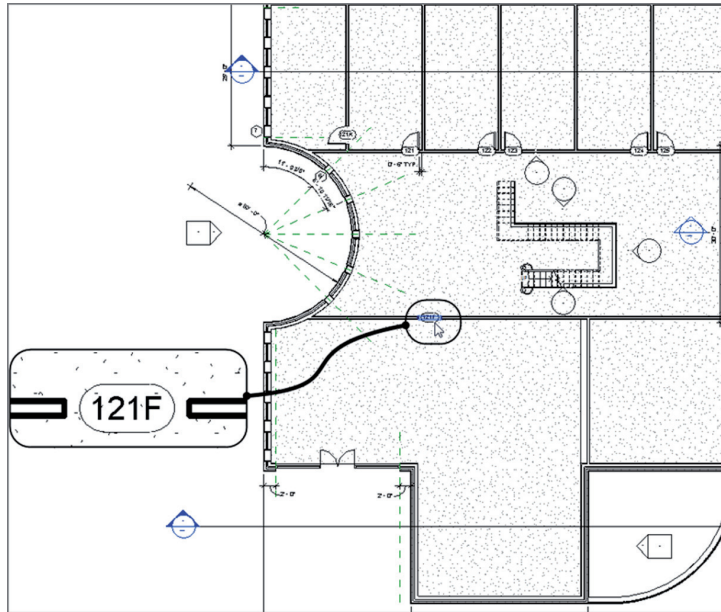


FIGURE BC 2.21: Adding the family to the project

16. Select the door.
17. In the Properties dialog box, click Edit Type, and observe the parameters. Look familiar? You created them!
18. Click OK.
19. Go back to the door family.

Wow! This thing actually works. Good deal. The next trick is to add some casing to the outside of the frame. To do so, you'll have to use a solid sweep.

Creating a 3D Sweep in a Family

Going along the same lines (literally) as the extrusion, you can create a situation where you sketch a path and extrude a profile along that path. The trick is to make sure this sweep can flex along with the door.

The objective of the next procedure is to create the door casing by using a 3D sweep. Follow these steps:

1. Go to a 3D view (if you aren't there already), and position the view so that it looks like Figure BC2.22.

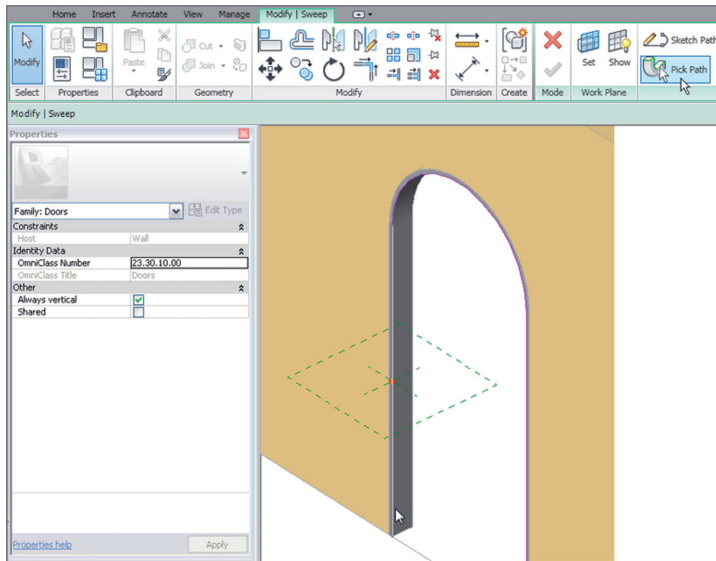


FIGURE BC2.22: Picking the path for the sweep

2. On the Create tab, click the Sweep button.
3. On the Sweep panel, click the Pick Path button.
4. Pick the inside corner of the jamb, starting with the left side (see Figure BC2.22).
5. Click Finish Edit Mode on the Mode panel.
6. On the Sweep panel, click the Load Profile button.
7. Go to the Profiles > Finish Carpentry folder, and select Casing Profile-2.rfa.
8. Click Open.
9. In the menu on the Sweep panel, click the Profile drop-down, and select Casing Profile 2: 5 1/2" × 13/16" (the red dot is replaced with the actual profile).
10. On the Options bar, type -0'-5 3/4" (-144 mm) for the Y offset. The profile is pushed back onto the wall with a 1/4" (6 mm) reveal.
11. Click Finish Edit Mode. Select the new sweep.
12. In the Properties dialog box, click the small button to the right of the Material category.

13. Click Add Parameter.
14. Call the parameter **Casing Material**.
15. Group it under Materials And Finishes.
16. Click OK twice.
17. Repeat steps 2 through 11 on the other side of the door. (Don't try to mirror the sweep—it won't work.)
18. Save the family.
19. Load it into the project. Select Overwrite Existing Version.
20. In your model, select the door.
21. In the Properties dialog box, click Edit Type.
22. Change the Width value to 3'-0" (900 mm).
23. Click OK.

Your door is still working properly and looks better, as shown in Figure BC2.23.

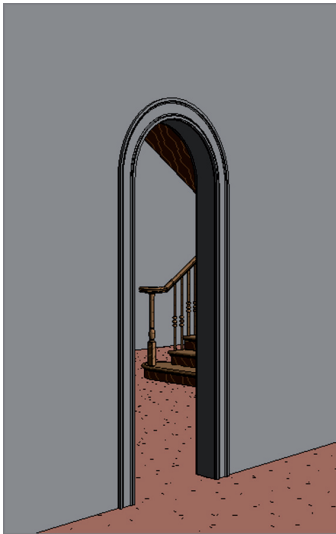


FIGURE BC2.23: The finished sweep. If you'd like, go ahead and create a new camera view of this door.

Let's move forward and begin working on adding a door to the family. The biggest challenge here will be the plan swing representation, but with a few new

items to learn, this won't be a problem.

In the next procedure, you'll add a door, a stop, and some plan symbolic line-work. Follow these steps:

1. Open the door family.
2. Go to the exterior elevation.
3. On the Create tab, click the Extrusion button.
4. On the Draw panel, click the Pick Lines icon.
5. Set Offset to 1/8" (3 mm).
6. Offset the two sides and the radial top of the jamb extrusion to the inside.
7. Set Offset to 1/2" (12 mm).
8. Offset the bottom up (see Figure BC2.24).

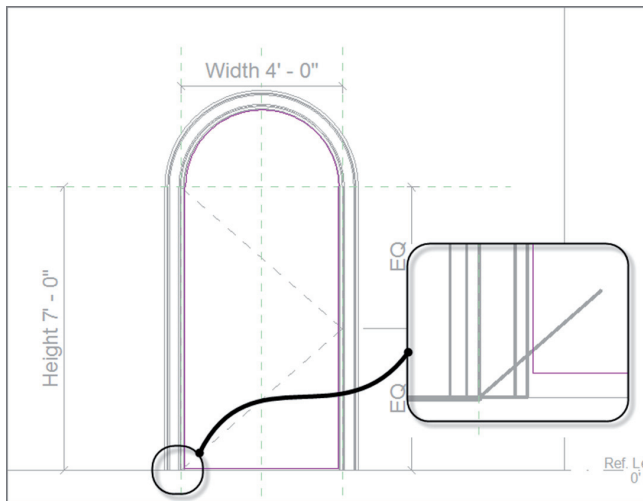


FIGURE BC2.24: Adding the door

9. Trim the bottom corners so that the door is one panel.
10. In the Properties dialog box, make sure Extrusion is current in the Type menu.
11. For the Extrusion end, type -1 3/8" (-35 mm).
12. For the material, click the button to the right of the Material field, and add a new parameter called Door Material.

13. Keep it categorized under Materials And Finishes.
14. Click OK twice.
15. Click Finish Edit Mode.
16. In the Project Browser, go to the Ref. Level floor plan view.

Your door should look like the one in Figure BC2.25.

17. Load the door into your project. (Click Yes to overwrite the door that is there.) Verify that the door looks correct.

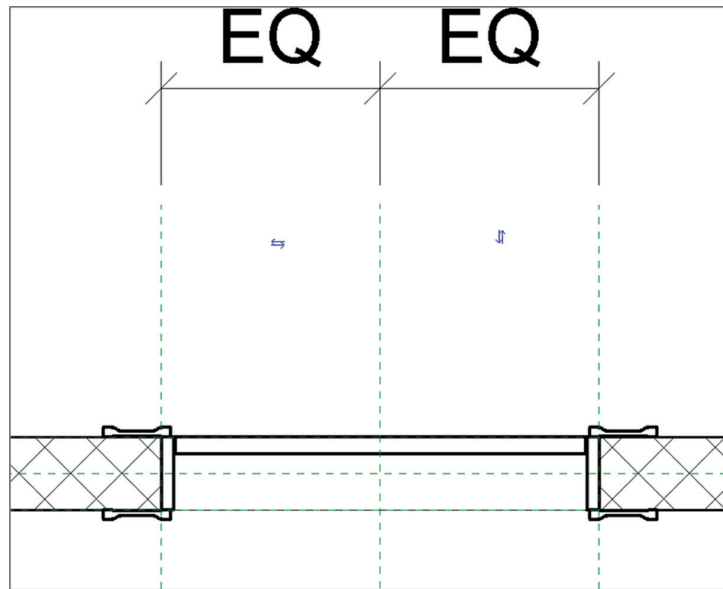


FIGURE BC2.25: The finished door in plan

Now that you've created the door, you can fix up the plan view. You need to add a door swing. In addition, you don't want to see the door panel in any plan view, so you can create a view state to turn it off in the plan view. Follow these steps:

1. Go back to the door family in the Ref Plan view. On the Annotate tab, click the Symbolic Line button, as shown in Figure BC2.26.

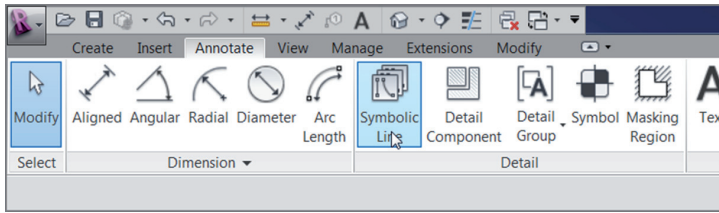


FIGURE BC 2.26: The Symbolic Line button

2. Draw a line straight up from the right corner of the jamb (on the exterior side of the wall) 4'-0" (1200 mm), as shown in Figure BC2.27.

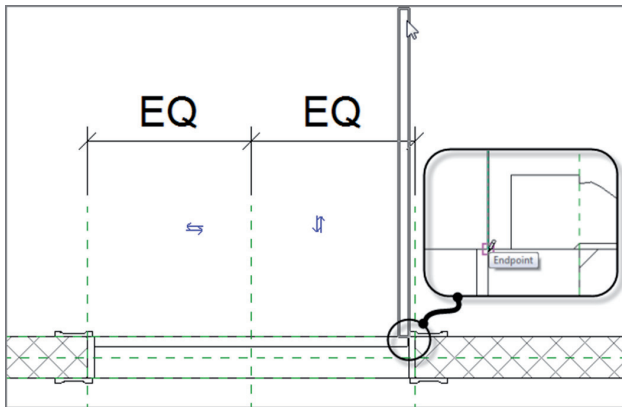


FIGURE BC 2.27: Drawing the symbolic door swing

3. Draw another line to the left 1 3/8" (35 mm).
4. Draw another line straight down 4'-0" (1200 mm).
5. Draw another line to the right 1 3/8" (35 mm) (see Figure BC2.28).
6. Click the Symbolic Line button again (if isn't currently running).
7. Draw an arc from the left side of the jamb to the top of the symbolic swing, as shown in Figure BC2.28. Click Modify.

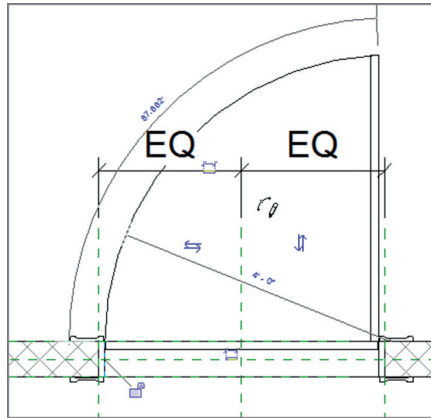


FIGURE BC 2.28: Drawing the plan swing arc

With the plan swing in place, you can turn off the actual door panel. This process is quick and painless.

1. Select the door panel.
2. On the Modify | Extrusion tab, click the Visibility Settings button on the Mode panel.
3. Deselect Plan/RCP.
4. Deselect When Cut In Plan/RCP (If Category Permits).
5. Click OK.
6. Save the family.
7. Load it into the project. Overwrite the existing version. If it didn't explode, your door is complete!

As you can see, it isn't that difficult to create a family. This topic could be a book within a book. Start experimenting with your own families. If you run into a snag, send me an email at ewing@cscos.com, and we can work on it.

The next type of family you'll study is one that can't be avoided. Eventually, you'll need the surrounding geometry of the model to create the family. This is called an *in-place family*.

Creating an In-Place Family

An in-place family gives you the best of both worlds. When you start the In-Place Family command, your model turns into the Family Editor. You can

make a family exactly the same way you just did, except that it's native to the model. Many times, you'll need this flexibility when you have a family that you'll never use again in any other building. This also gives you the flexibility to create custom content that can't be created using the conventional Revit commands.

To create an in-place family, follow these steps:

1. Open the model on which you've been working.
2. Open the section view called West Wing South Wall Section. You're in the atrium.
3. On the Architecture tab, click Component > Model In-Place, as shown in Figure BC2.29.

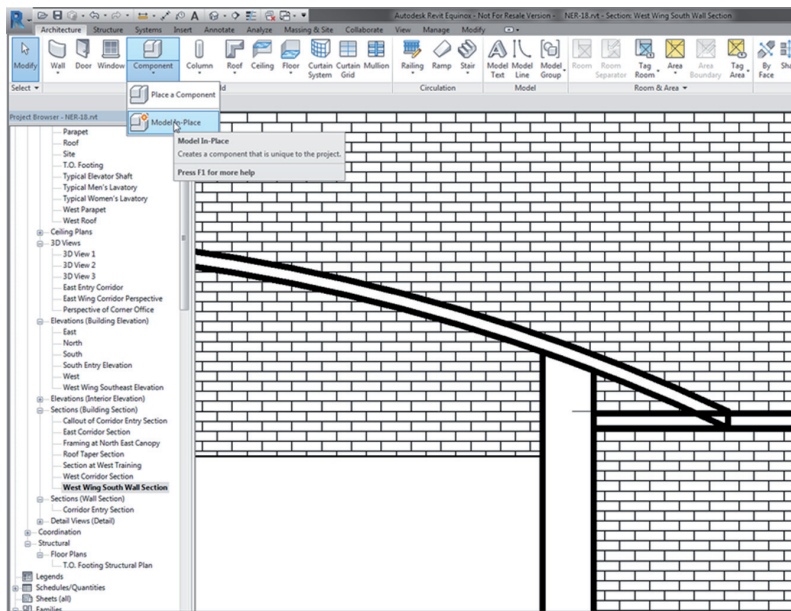


FIGURE BC2.29: Starting an in-place family

4. Set Family Category to Doors, and then click OK.
5. Call the new door **West Opening**.
6. Click OK.
7. On the Model panel of the Create tab, click the Opening button.
8. Pick the brick wall facing you.
9. Sketch an opening, as shown in Figure BC2.30.

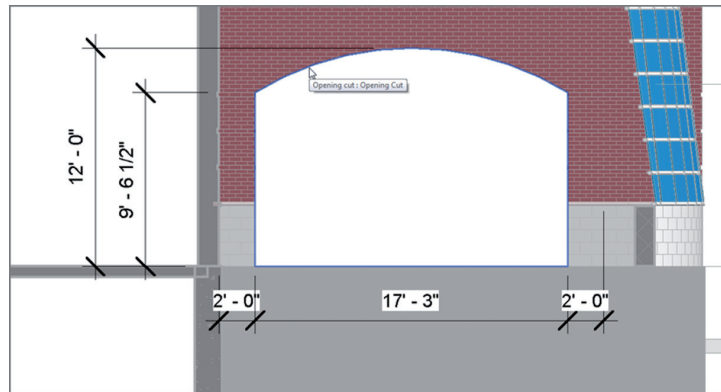


FIGURE BC 2.30: The arched opening

10. Click Finish Edit Mode.
11. Go to a 3D view.
12. On the Forms panel of the Create tab, click the Sweep button.
13. On the Sweep panel, click the Pick Path button.
14. Pick the exterior corners of the opening forming the arc and the two straight lines to either side of the opening (see Figure BC2.31).

When you're picking the lines for the path, you'll find that you can't pick the entire line on either of the two sides of the opening. All you need to do is pick any line on the three corners and then trim the lines to meet at the corners.

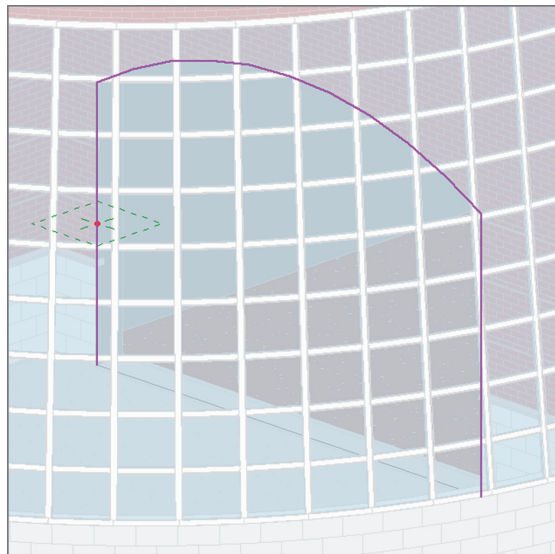


FIGURE BC 2.31: Picking the exterior edge for the sweep's path

15. Click Finish Edit Mode on the Mode tab.
16. In the Project Browser, go to the Level 1 floor plan. Zoom into the new opening.
17. Click the Select Profile button on the Sweep panel.
18. On the Sweep panel, click the Edit Profile button (see Figure BC2.32).

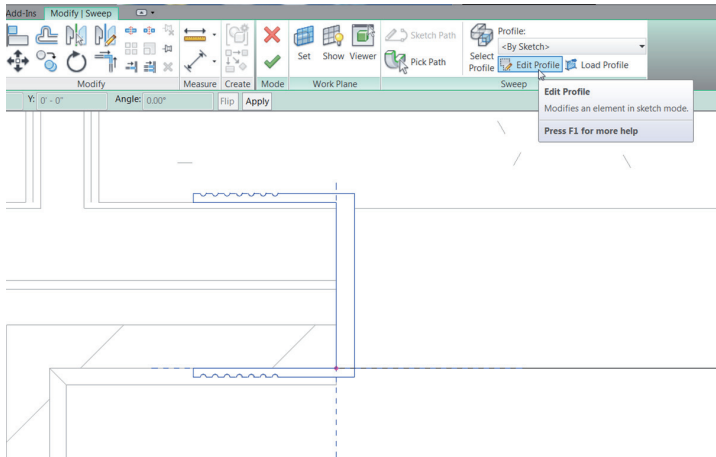


FIGURE BC2.32: Sketching the profile

19. Sketch a profile similar to that shown in Figure BC2.32. Make it any size, shape, and complexity you want.
20. Click Finish Edit Mode.
21. In the Properties dialog box, make sure Sweep is current, and then click the little gray button to the left of the Materials row.
22. Add a parameter called **Casing Material**. Click OK.
23. At the bottom of the Properties palette, in the Other category, click Trajectory Segmentation.
24. Set Maximum Segment Angle to 1.
25. Click Finish Edit Mode.
26. Click Finish Model.
27. Go to a 3D view. Your opening should look like Figure BC2.33.

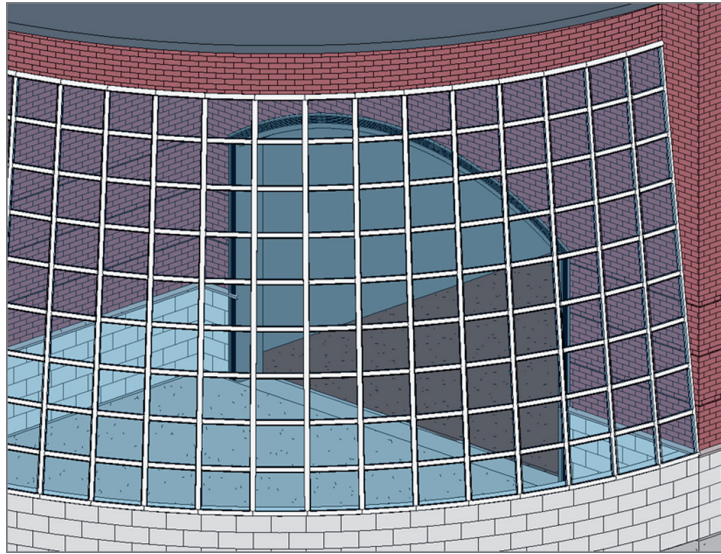


FIGURE BC 2.33: The finished family

The moral of the story is this: when you have a custom situation in the model that can't be created using the conventional Revit tools, create an in-place family. You should make it as flexible as possible and give the user some choices, such as materials, so that anyone can manipulate the family as if Autodesk provided it.

Are You Experienced?

Now you can...

- ✓ create a cove sweep family
- ✓ identify the family template you need to use to start a family
- ✓ create a door family
- ✓ add symbolic lines to a family
- ✓ create an in-place family
- ✓ create sweeps and extrusions
- ✓ create parameters