



CAD Camp 2009

Revit Architecture

Extending the Family – Advanced Families & Components

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S5-2

Course Summary:

Learn how to create advanced families and components in Revit Architecture. This course is suited for individuals with experience in creating families and working in Revit Architecture projects. Attendees will walk away with the ability to create advanced parametric 3D components & shared parameters for use in their Revit projects.

Instructor:

Ms. Lamb is a Certified Revit Architecture 2009 Professional and a Technical Specialist for U.S. CAD with nearly 10 years experience in the Architectural industry. Prior to joining the Autodesk reseller channel, she was an AutoCAD Instructor at the Delaware Technical and Community College and has served as a CAD technician in a variety of architectural firms. Ms. Lamb has experience using AutoCAD on a variety of residential and commercial projects and more recently has utilized Revit Architecture to complete construction documents on both domestic and international resorts and residences. She regularly conducts seminars in the use of Autodesk technology in Architectural design and provides implementation services, customization, training, and support on Revit Architecture.

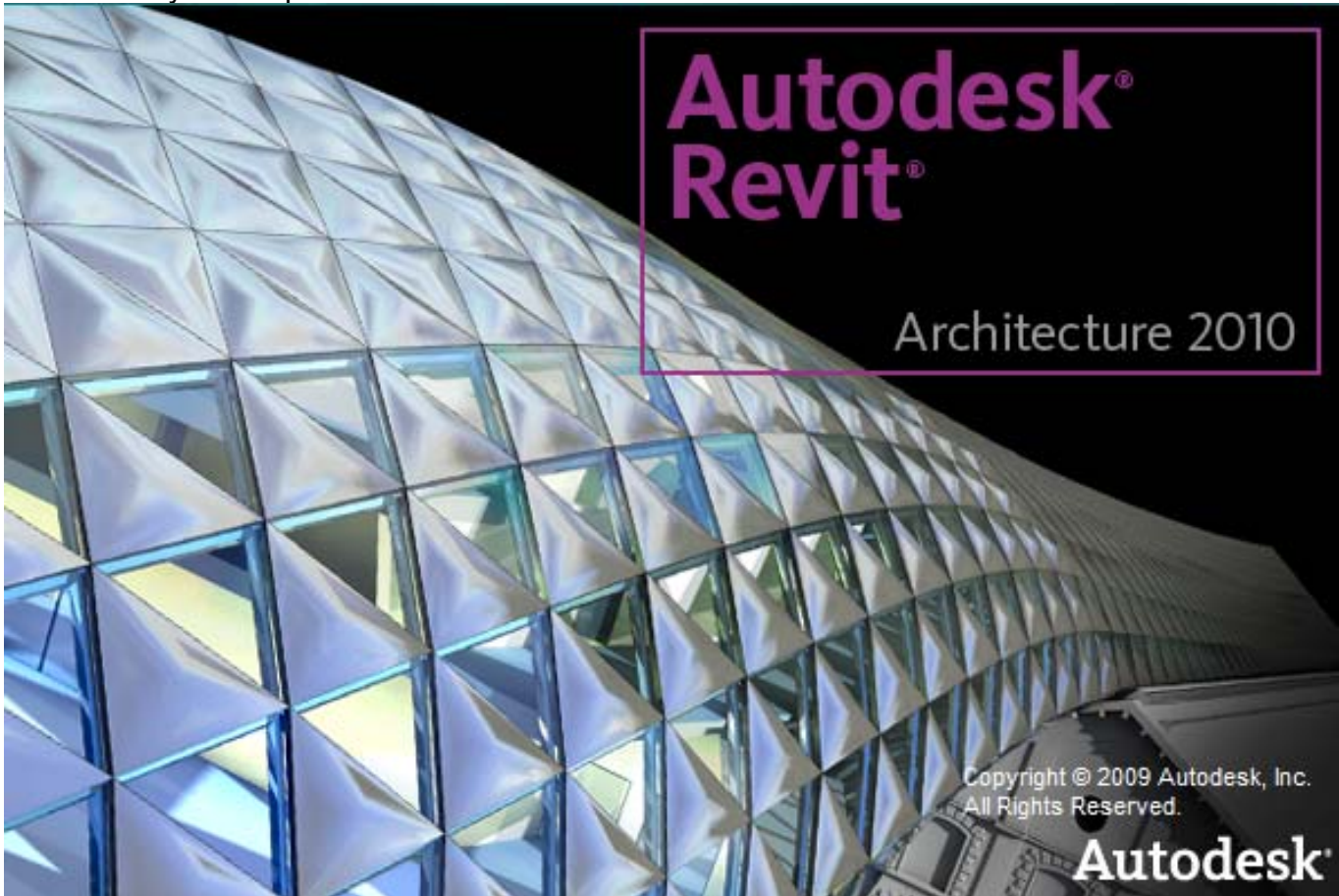


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Extending the Family – Advanced Families & Components

This handout covers advanced techniques to modify families & components. Hopefully you are coming to the class with some experience in creating basic families & components. Use this presentation & handout as guide to exploring more advanced techniques to build on the skills you have already developed.



Advanced

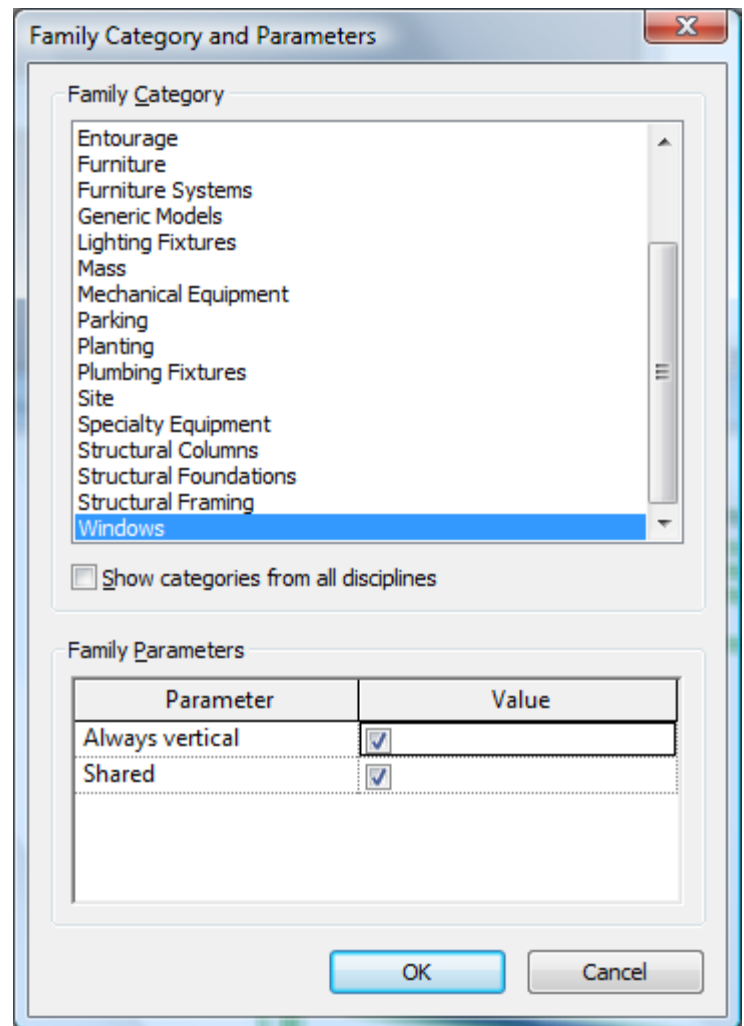
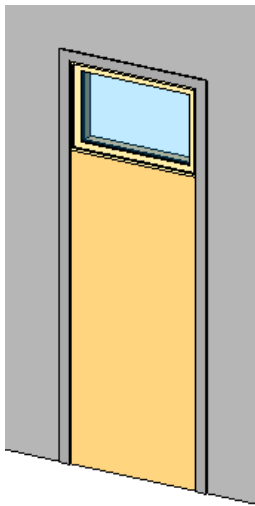
Nested Families

Nested Families are a great feature. They allow you to create components separately and load them together to create more complex families. Many times architects want to have a door and window beside each other with the trim encasing both of them together, but they want each item to schedule separately. Nesting families and checking the “shared” box will achieve this result.

How To:

1. Start a new generic model wall based family
2. Open the Window & Door families
3. Delete trim from both window & door
4. Settings > Family Category & Parameters, Check “shared” for both window & door
5. Load both window & door into the generic family
6. Place each in wall & adjust height
7. Align & lock to centerline ref. plane
8. Create sweeps for trim
9. Save as...
10. Load into project
11. Test out with schedules

** Tip – use tag all not tagged for windows & doors



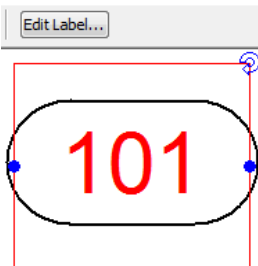
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Tags & Shared Parameters

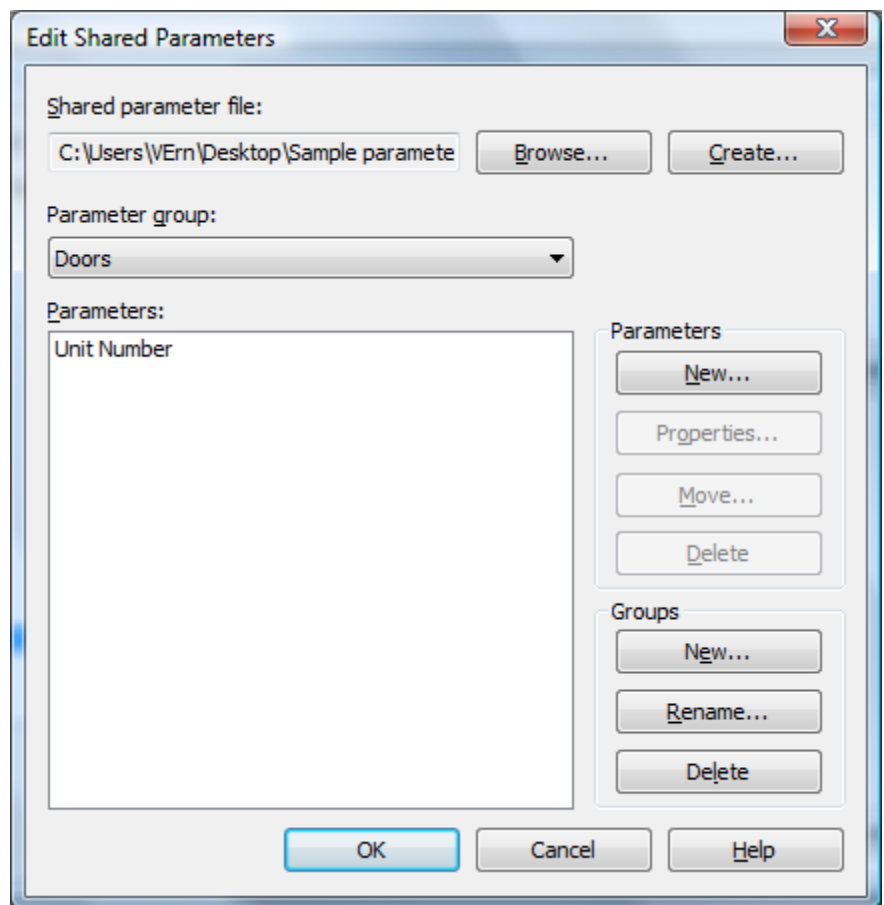
Tags are a fairly simple concept but when you add shared parameters the concept can get confusing & complex. The confusion usually starts in at the choice between creating a project parameter & a shared parameter.

Project parameters are what users work with in schedules most of the time, door width & height, room finishes, comments, descriptions, etc... Shared Parameters are only needed when you need to see the information in a tag. For example, if you needed to tag doors according to unit type then you would create a shared parameter.

Shared parameters should be created in the tag family. Once you choose to create a shared parameter you will have to create a shared parameter file. Only one shared parameter file can be loaded into a project. Many offices have elected to create one shared parameter file to be used office wide and loaded into the office template. Here they define shared parameters to be used by their standard tags.



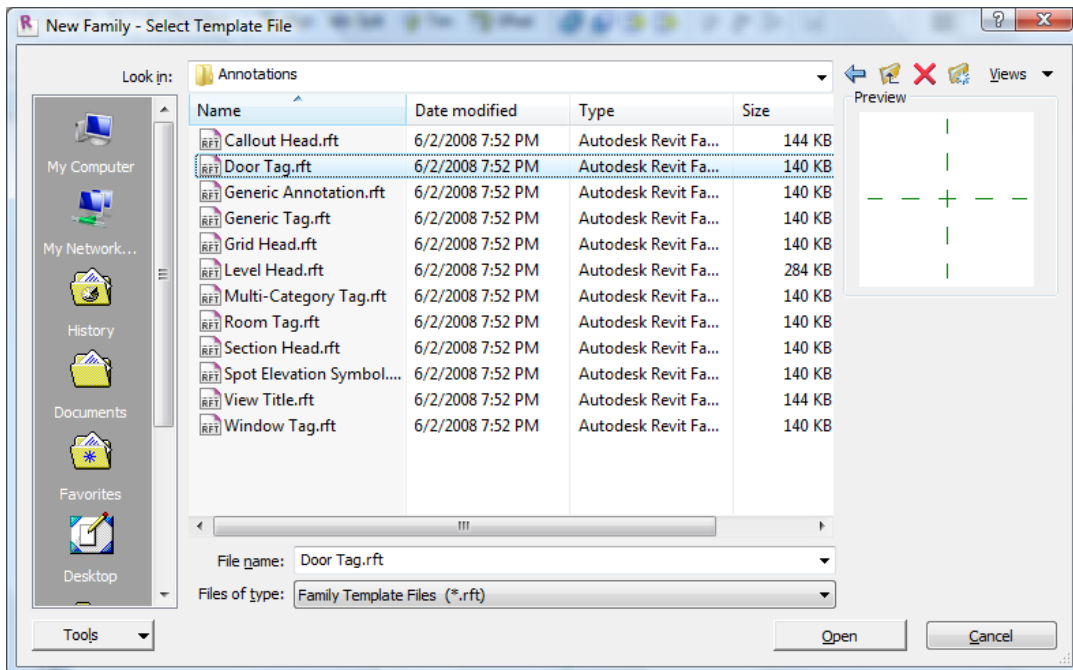
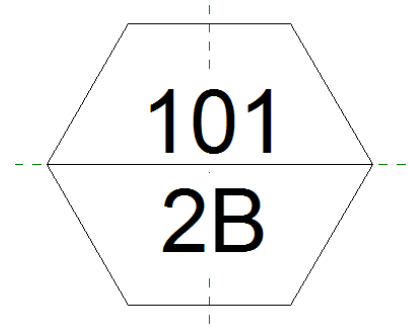
After the tag & shared parameter has been created both the tag & the parameter have to be each loaded into the project. Make sure your project references the shared parameter file. Then load the specific parameters into the project.



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How To:

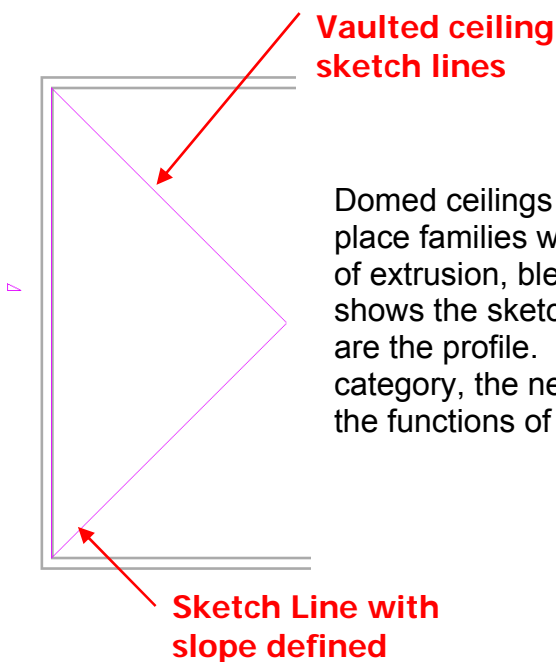
1. Start a new door tag family
2. Sketch out a shape for the tag
3. Create a label
4. Choose mark
5. Click on the “add parameter” button
6. Click the “select” button & say yes
7. Create a shared parameter file & browse to a central location to save it
8. Create a new parameter called “doors”
9. Create a new parameter called Unit Type
10. Click Ok, Ok, Ok, then add it to the label
11. Change sample value to 2B
12. Check break on the first line
13. Save & load into your project
14. In the project, load the shared parameters file
15. Settings> Project Parameters > Add > Shared Parameters > Select
16. Choose Unit Type
17. Specify a group (Identity Data) and Category (Doors)
18. Place a door tag to test it out



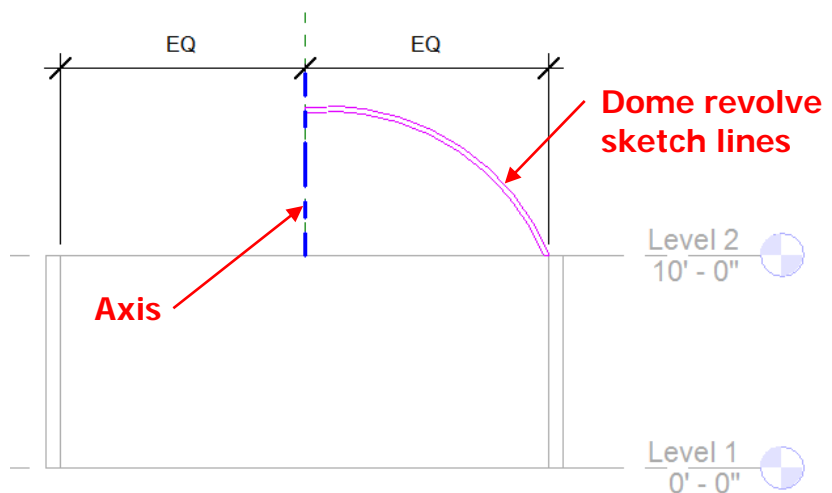
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Ceilings

Vaulted ceilings can be achieved in Revit, but they're not quite as simple as roofs. Looking at the sketch lines of a ceiling you can see that defining slopes (on the options bar) is an available choice along with the slope arrow tool. Slope arrows allow you to control the difference in height from the tail to the head of the arrow. Defining sketch lines as having slope allows you to specify slopes such as 4/12. Unfortunately Revit ceilings won't let you define multiple sides as having slope. So, we're left with a work-around. Create each side of the vaulted ceiling independently and define the slopes in each.



Domed ceilings can also be achieved through more advanced techniques. In-place families will allow a user to create any shape using the Solid & Void forms of extrusion, blend, revolve, sweep, and swept blend. The screen shot below shows the sketch for a revolve. The blue line being the axis and the pink lines are the profile. If the in-place family is defined as being part of the ceiling category, the new dome will also be able to host light fixtures as well as have all the functions of a standard ceiling.

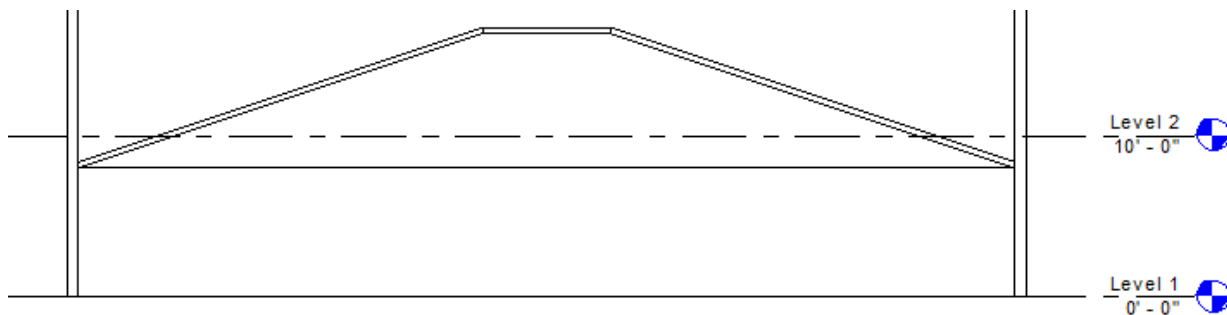


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How To: Vaulted

1. In a ceiling plan view start the ceiling command
2. Pick one wall & draw lines @ 45 degrees from corners to center of room
3. Trim line together
4. Select wall line & define sketch
5. Change slope by clicking on line, then the slope value
6. Repeat for all 4 sides

**Tip – if you move the walls then the sketch will need modifying too



How To: Dome

1. Create an In-place family from the modeling tab
2. Choose the ceiling category and name the family
3. Create & name a reference plane down the center of the room
4. Create a section parallel & facing that ref plane
5. Got to the section view
6. Start a solid revolve format he solid form button
7. Choose the named ref plane created in step 3
8. Sketch the revolve profile
9. Choose “Axis” from the design bar and sketch the axis line
10. Finish the sketch

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Ceiling Soffits / Lighting Coves

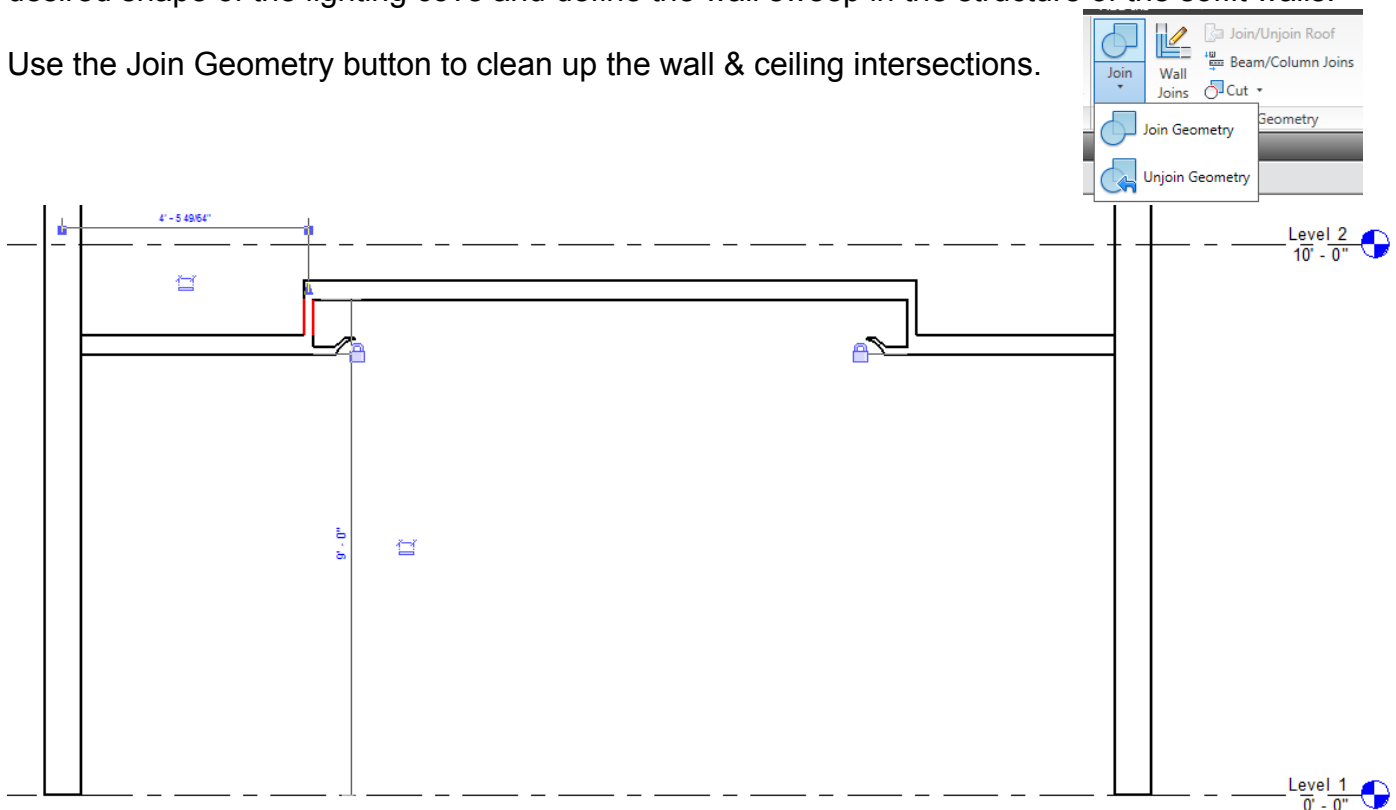
Ceiling soffits and lighting coves can be achieved through a combination of ceilings, walls, and sweeps.

For a ceiling soffit I recommend creating the lowest ceiling first and sketching a hole in the ceiling where the higher ceiling will exist. Sketch the walls by picking the ceiling hole boundaries & locking the interior finish face of the walls to these boundaries, this will allow the user more flexibility in changing the size of the hole. Another helpful tip is to create a new type of wall that is defined as a "soffit" wall. This makes selection easier for future changes.

To create the higher ceiling, you want to use the "pick walls" tool to keep the higher ceiling boundaries attached to the walls. Make sure that the ceiling extends to the furthest finish layer so your building section will clean up nicely.

Lighting coves use the same concept but just takes it a step further. Since we are using walls to create the soffit, a wall sweep can be used to create the lighting cove. Create a new profile in the desired shape of the lighting cove and define the wall sweep in the structure of the soffit walls.

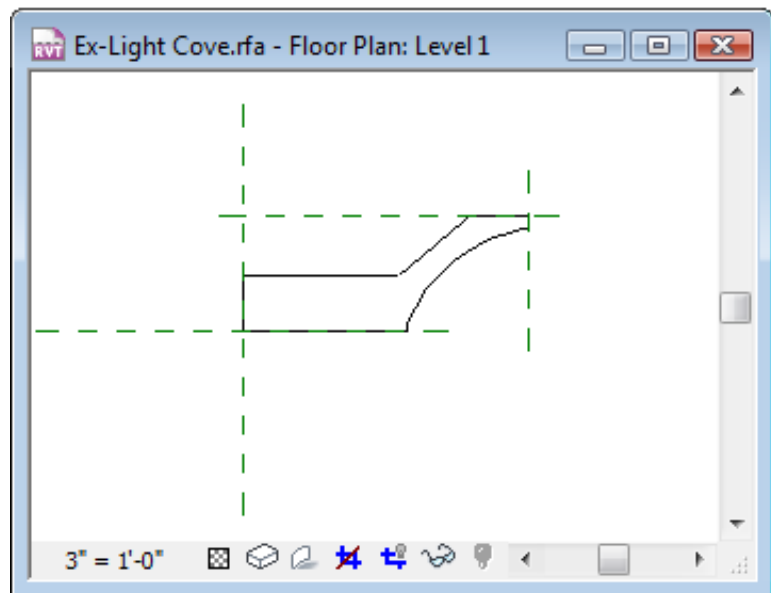
Use the Join Geometry button to clean up the wall & ceiling intersections.



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How To: Soffit

1. Pick wall for lower ceiling and sketch hole in the middle
2. Draw soffit walls by picking & locking
3. Draw upper ceiling by picking soffit walls
4. Make sure the sketch line are on the far side of the walls & set ceiling height
5. Adjust heights of soffit walls from bottom face of lower ceiling, to top of upper ceiling
6. Attach tope so walls to upper ceiling
7. Join geometry with the walls and bottom/upper ceilings



How To: Lighting Cove

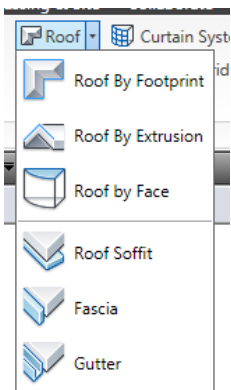
1. Create cove profile
2. Load into project
3. Select soffit walls and look at type properties
4. Edit the structure
5. Click on the preview button, & choose section
6. Click on sweeps
7. Add profile, pick it from the drop down list
8. Distance = 0, Side = Interior
9. Ok, Ok, Ok, Ok, Check it out in section

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Roofs

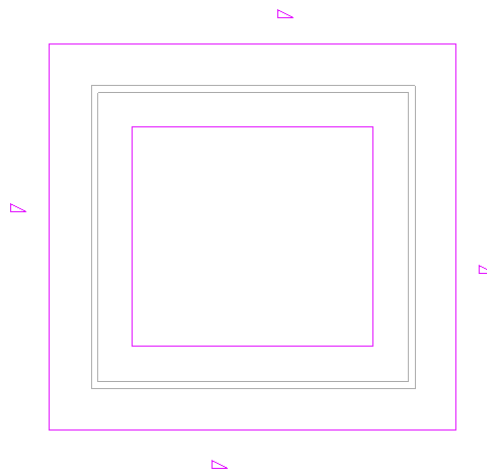
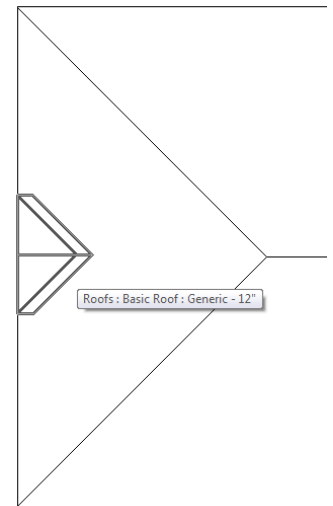
I consider dormers and double pitch roofs advanced roofs.

Dormers can be created as a separate footprint roof, then using the “Join Roofs” command to extend & trim the dormer to the main roof. An opening is still needed in the main roof and can be achieved with the “Dormer Opening” tool on the modeling tab, under openings.



Double pitch roofs require the creation of two footprint roofs. The first one is created using the “Pick Walls” tool based on the core of walls and with a defined overhang. Then use the offset command to create a copy of the sketch lines defining the cutoff of the lower roof. Create the second footprint roof by picking & locking the sketch line to the edge of the lower roof.

In a section view, move the upper roof to meet the lower roof and join geometry to clean up the intersection.



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How To: Dormers

1. Create regular footprint roof around building
2. Create a dormer using footprint roof and defining slope on 2 sides
3. Use join roofs tool
4. Pick back edge of dormer, pick face of main roof (easier in 3D view)
5. Switch back to plan view
6. Use opening tool to create dormer opening
7. Pick main roof, pick dormer
8. Finish sketch

How To: Double Pitch

1. Create regular footprint roof with overhang & low slope
2. Use offset command to create hole in middle (make sure there is no slope defined)
3. Create new footprint roof using pick & lock to create the sketch line
4. Adjust slope to higher value and finish sketch
5. Create section view & move upper roof to meet the lower one
6. Use join geometry to clean up the intersection

