

# REVIT ARCHITECTURE 2016

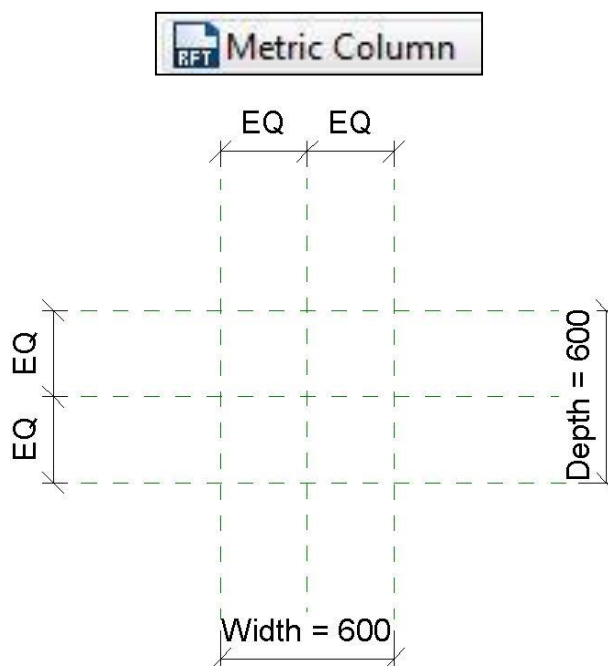
## Revit Architecture 2016: CREATE A CHAMFERED COLUMN COMPONENT

About creating a chamfered column family typical to the Victorian cottage style. Add the column to your custom library for use over and over again.

In this exercise you will work in the Family Editor environment. This environment is similar to the Project environment but there are some differences. On the Ribbon the tools have been swapped out to Family editor tools. The home tab has a Forms panel with extrusions, blends, sweeps and revolves as opposed to walls doors and windows etc. There are no levels or grids to apply constraints, instead we work with reference planes to determine where the geometry gets built from.

### Step 1: Choose the Right Family Template

From the application menu (the big "R"), select "New" and "Family". In the template dialogue, select "Metric Column.rft". Save the family to your library and name it "Chamfered Column".



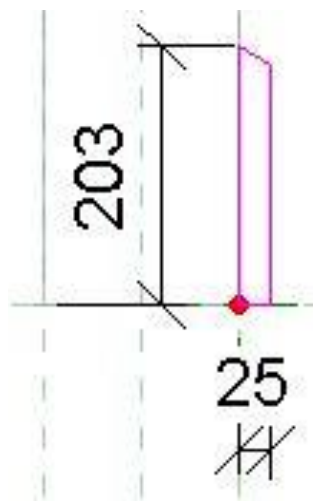
### Step 2: Column Shaft

- Open the Lower Ref Level view. In the Home tab, select Extrusion. Use the rectangle drawing tool to create a rectangle of any size within the bounding ref planes.
- Use the align tool to align and lock the sides of the rectangle to the four reference planes that define the width and depth parameters.

- Rather than assign a material to the column, it is better associate material parameters to it so that the materials can be defined in the project. For design flexibility, create a material parameter for the shaft and another for the base and capital. In the Properties box, opposite Material, click the little square at the far right. This will bring up the Associate Family Parameter box. Click “Add Parameter” and name it “Column Shaft Material.” Add another parameter and name it “Column Base and Capital Material”. OK out of the dialogue. Finish the extrusion.
- Open the Front Elevation and use the Align tool to align and lock the top of the extrusion to the Upper Ref Level. Flex the model by moving the level up and down. Open the 3D view and flex the column by changing the width, depth dimensions. Change the width and depth to 200mm for now.

### Step 3: Column Base

- Open the Ref Level view. In the Home tab, pick “Sweep” and then “Sketch Path”. Use the pick tool to pick and LOCK the edges of the shaft extrusion. Click the green check in the Mode panel to end the path sketch.
- In the Sweep Panel, pick Edit Profile and select Right Elevation as the view to draw the sweep profile. From the red dot at the base of the column, draw an 203mm vertical line up. Align and LOCK the line to the side of the shaft. Use the line tool to draw a sloping line down and then a vertical line down to the Ref Level. Close the loop with a horizontal line back to the face of the shaft. Select the outer vertical line and change the temporary dimension to 25mm”.

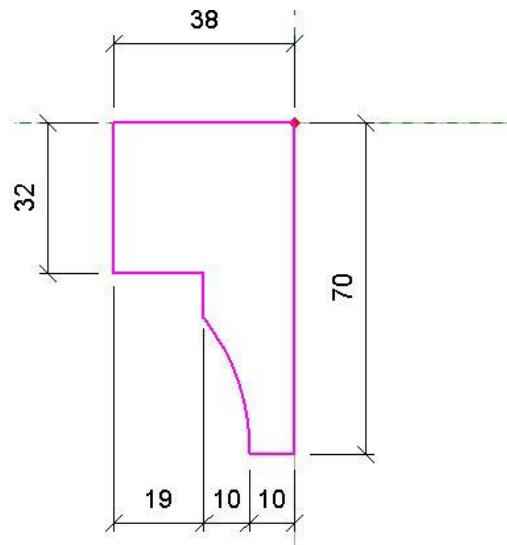


**Column Base Profile**

- Finish the profile and then the sweep. Open the 3D view and flex the width and depth to ensure that the base is locked to the column shaft. Select the base and in the property box, change the material to the Column Base and Capital material by picking the little box to the right of the material field.

## Step 4: Column Capital

- Open the Ref Level view. Once again, select Sweep from the Home tab and Sketch Sweep. Use the pick tool to pick and lock the path to the shaft sides (not the base sides). Finish the path sketch.
- Now draw the sweep profile in an elevation view. Use the dimensions and shape below or create your own profile. Be sure to lock the top of the profile to the Upper Ref Level and the side to the side of the column shaft. In the Properties box, make the material the Column Base and Shaft Material.

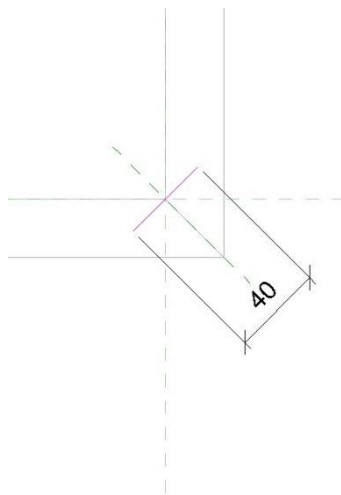


**Column Capital Profile**

- Finish the profile and sweep. Open the 3D view and flex the column. You will finish the column by creating chamfers from voids. Before doing so you may want to save this family as a box column for use when an un-chamfered column is needed.

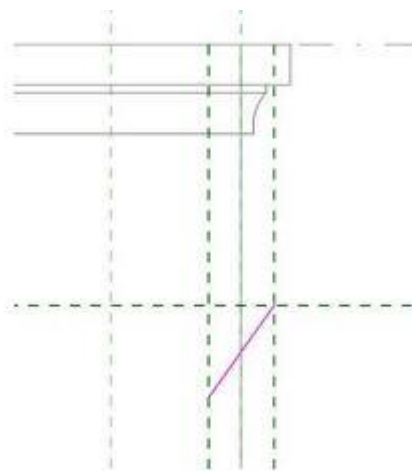
## Step 5: Chamfered Corners

- You will create a void sweep at one corner and then mirror it to the other three corners. Open the Ref Level view.
- Home Tab > Void Forms > Void Sweep. In the Sweep panel, pick “Sketch Path”. Zoom in the lower right corner of the column, snap to the shaft corner (the inner one) and draw a 20mm line at a 45 degree angle upwards to the right. Hit escape twice then select this line and extend it diagonally down to the left so that the line is 40mm long. The profile plane perpendicular to this line should snap to the column corner. In the Mode panel, click the green check to exit path mode.



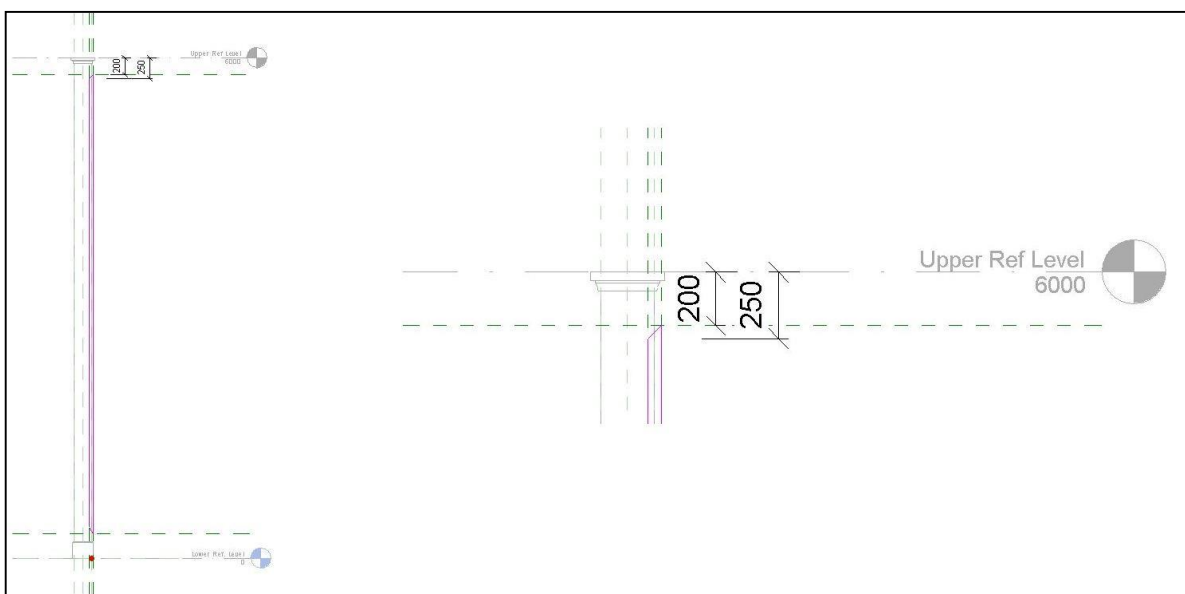
### Chamfer Path

- In the Sweep Panel, select “Edit Profile” Choose the front elevation as the editing view. You will add four ref planes to help in sketching the profile. Pick ref lines 25mm to the right and left of the column right edge. Now pick one 300mm above the Lower Ref Level and one 200mm below the Upper Ref Level.
- Zoom into the upper right corner and draw a diagonal line from the intersection of the upper ref plane and the right ref plane down to the left at a 135 degree angle to the left ref plane.



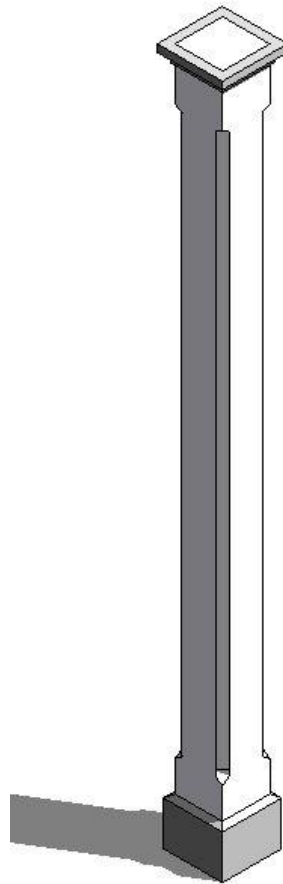
### Upper Edge of the Chamfer Profile

- Repeat this process at the bottom of the column with a line diagonally up from the right most ref plane to the left ref plane. Now connect the ends of the two diagonal lines with vertical lines to complete the loop. Note that the loop starts within the shaft and extends outside the shaft. This completes the profile but before finishing it, the top of the profile must be locked to the Upper Ref Level so the the chamfer will grow with the column.
- Zoom in to the top of the column. From the Annotate tab, pick aligned dimension and dimension from the Upper Ref Level line to the upper right corner of the chamfer. It should read 200mm. Now lock this dimension. Dimension and lock the dimension from the Upper Ref Level to the lower left corner.



### Chamfer Void Profile

- Finish the profile and then finish the sweep. Open the 3D view. There should be a chamfer cut out of one corner. Open the front elevation and move the Ref Upper Level up and down to make sure that the chamfer extends with the column. If not, reopen the sweep and make sure that the dimension to the upper profile edge are locked. If there is no cut chamfer, your sweep is probably an object rather than a void. In this case, delete the sweep and start over using a void sweep.
- As a last step, turn off visibility of the sweep in plan views and mirror it to the other three corners of the shaft. Finally open each of the mirrored sweeps and dimension and lock the top of the sweep profile to the Upper Ref Line. Flex the column and if all works, save the file and load it into the project.



### **The Completed Chamfered Column**

Hopefully this exercise will give you some practice in working in the Family Editor environment and increase your understanding of working with extrusions and void forms.

