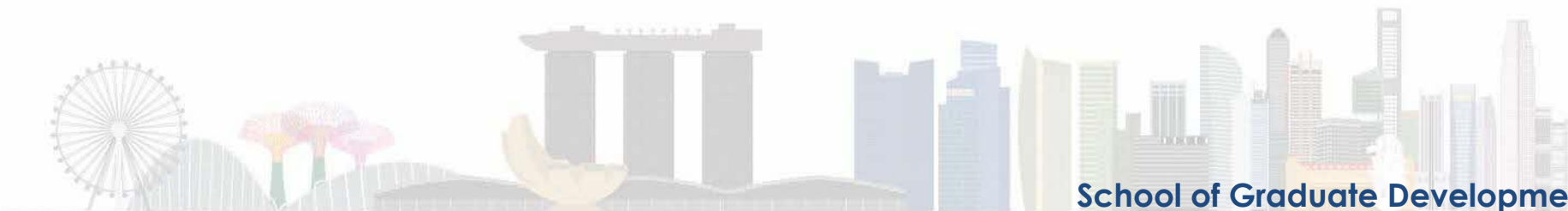


CERTIFICATE COURSE IN BIM MODELLING

Architecture Track



School of Graduate Development and Management

Certificate Course in BIM Modelling (Architecture Track)

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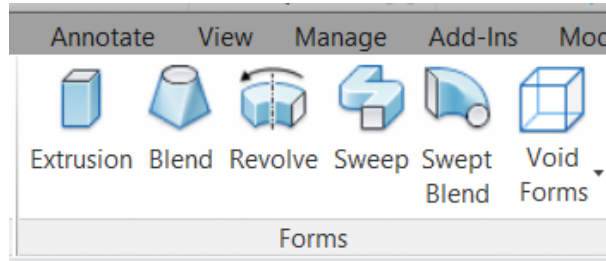
Topic Overview

	Day 1	Day 2	Day 3	Day 4
AM	BIM Fundamentals & Revit Interface	BIM e-Submission Guidelines & Template Overview	(Assignment – 3D part finish)	(Assignment – 2D Documentation, Family)
	Starting a BIM project: Project template, Insert files, Project base point, Grids & Levels, Create views	Basic 3D modeling : staircase, railing, roof, ceiling		
PM	Site & Mass Modelling	(Assignment – 3D part)	Family editor interface & simple family creation	
	Basic 3D modeling : Wall, floor, ramp, doors & windows		Basic 2D elements: rooms, area, annotation, dimension, tags, schedule, sheets, titleblock, exporting files.	

DAY 3

Family editor interface & simple family creation: Object Library-3D & Typical Details-2D

Important



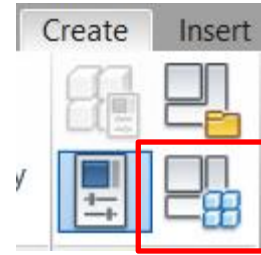
Extrusion, Creates a 3D solid by extruding a 2d shape profile

Blend, Creates a solid 3D shape that changes along its length, blending 2 profiles from a starting shape an ending shape

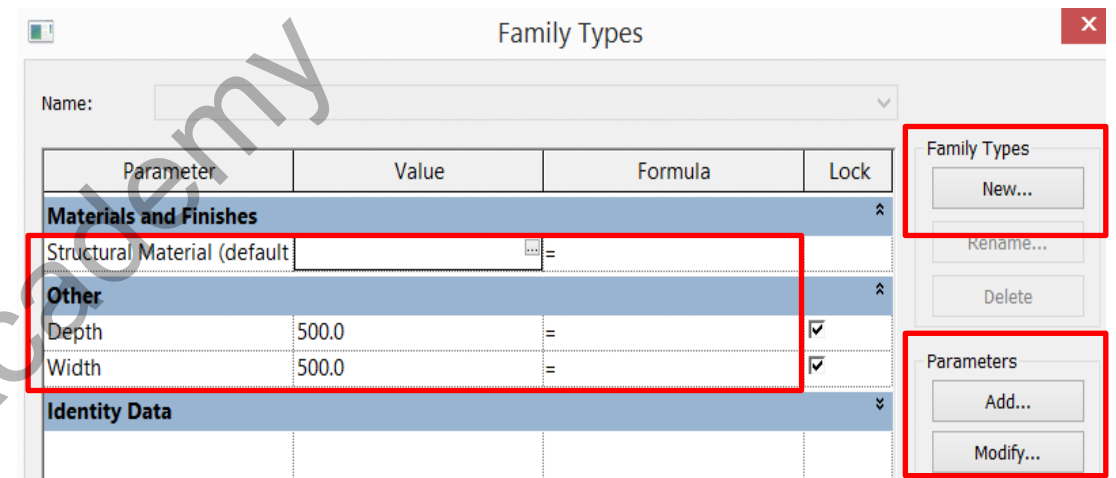
Revolve, create a 3d shape by sweeping a 2d profile around an axis

Sweep, Create a 3D shape by sweeping a 2D profile along the path

Swept Blend, Creates a blend that sweeps along the defined path



Family Types, allows to enter a parameter value for existing family types, add parameter to a family or creates new type within the family



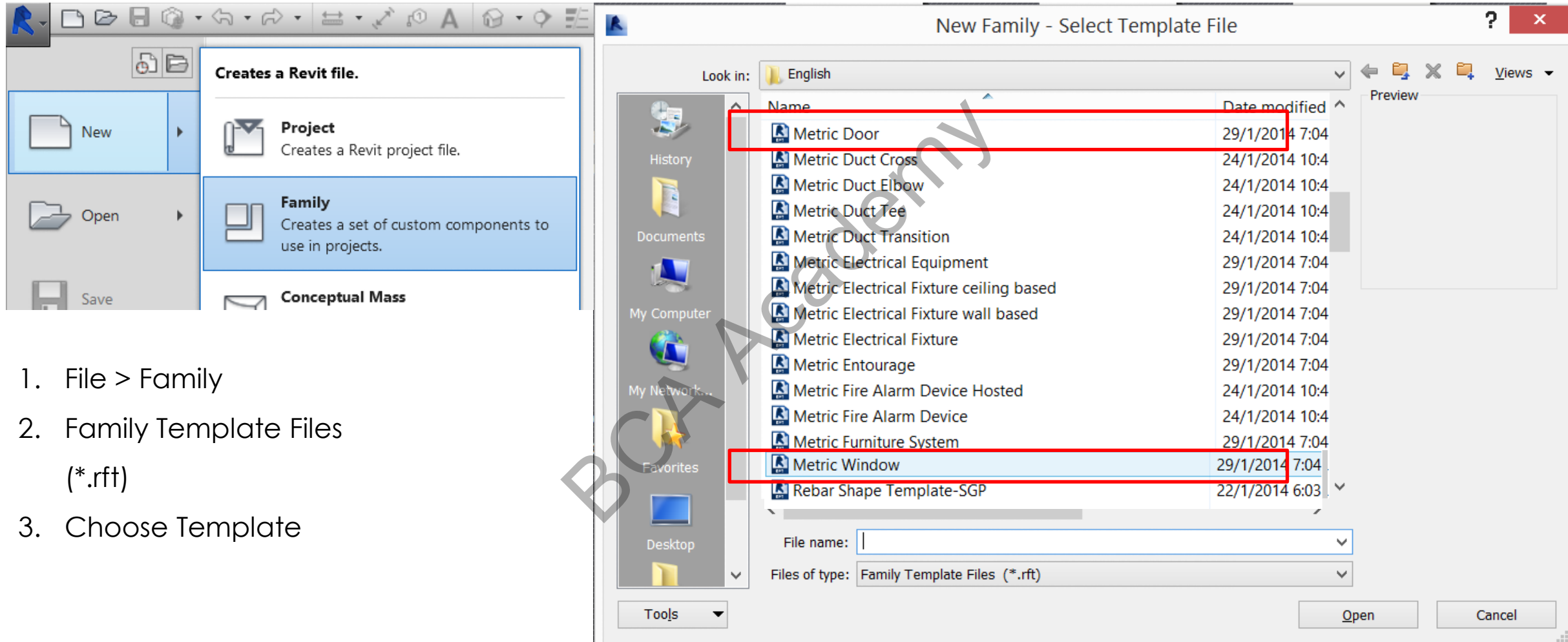
Lock, to lock the geometry to a controlled reference plane

EQ

Equal Symbol, to equally spaced the value dimension parameter from center to left and right

Reference Plane, control the Dimension Parameter of the family

Architectural Family Creation



1. File > Family
2. Family Template Files
(* .rft)
3. Choose Template

Architectural Family Creation

- Create Geometry using Different Forms
- Model Text
- Reference Plane
- Lock Geometry in a reference plane
- Dimension & Dimension Label (Parametric)
- Controlling the Graphics Visibility using Family Parameter, [Parameter Type](#) <Yes/No>
[Visibility Graphics Override](#)
- Model Line vs Symbolic Line

Architectural Family Creation

- Consider this list of requirements before creating a loadable family:
 - Will the family need to accommodate multiple sizes
 - How should the family display in different views
 - Does this family require a host
 - How much detail should be modeled
 - What is the origin point of this family
 - Will this family be used for a room calculation point

Architectural Family Creation

- **For best results when creating a family, use this workflow: Part 1**

- Before beginning family creation, plan your family. Identify requirements regarding family sizes, how the family displays in different views, whether a host is required, the detail level to be modeled, and the origin of the family. [Planning a Loadable Family.](#)
- Create a new family file with the appropriate family template. [Choosing a Family Template.](#)
- Define subcategories for the family to help control the visibility of the family geometry. [Creating Family Subcategories.](#)
- Create the family skeleton, or framework:
 - Define the origin (the insertion point) of the family. [Defining the Family Origin.](#)
 - Lay out reference planes and reference lines to aid in sketching component geometry. [Laying Out Reference Planes](#) and [Using Reference Lines.](#)
 - Add dimensions to specify parametric relationships. [Dimensioning Reference Planes and Lines.](#)
 - Label dimensions to create type or instance parameters or 2D representation. [Labeling Dimensions to Create Parameters.](#)
 - Test, or flex, the skeleton. [Flexing the Family Framework.](#)

Architectural Family Creation

- **For best results when creating a family, use this workflow: Part 2**
 - Define family type variations by specifying different parameters. [Creating Family Types.](#)
 - Add a single level of geometry in solids and voids, and constrain the geometry to reference planes. [Creating Family Geometry.](#)
 - Flex the new model (types and hosts) to verify correct component behavior. [Testing the Family.](#)
 - Repeat previous steps until the family geometry is complete.
 - Specify 2D and 3D geometry display characteristics with subcategory and entity visibility settings. [Managing Family Visibility and Detail Level.](#)
 - Save the newly defined family, and then load it into a project for testing. [Testing the Family.](#)
 - For large families that include many types, create a type catalog. [Creating a Type Catalog.](#)

Architectural Family Creation – 3D

Extrusion

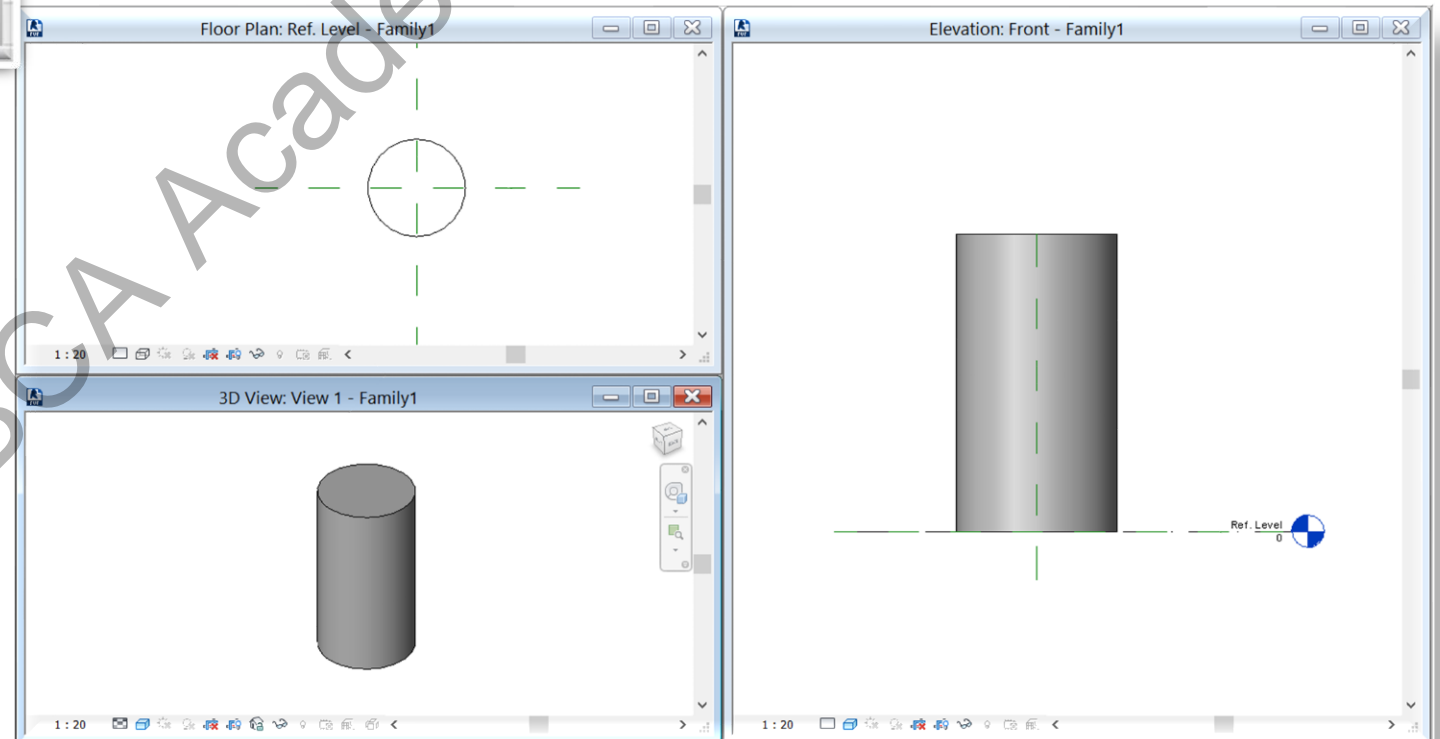
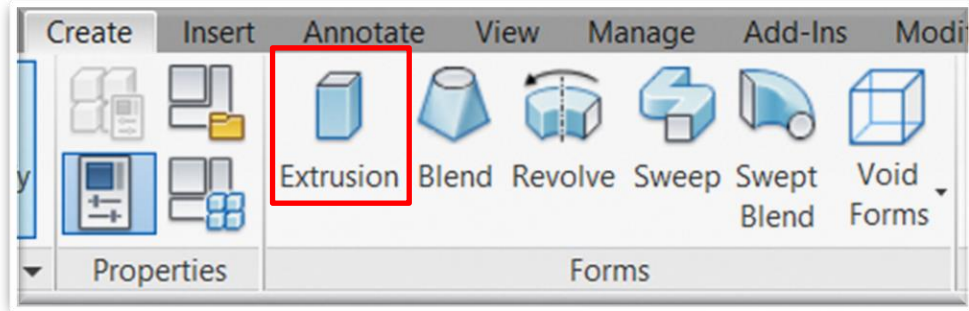
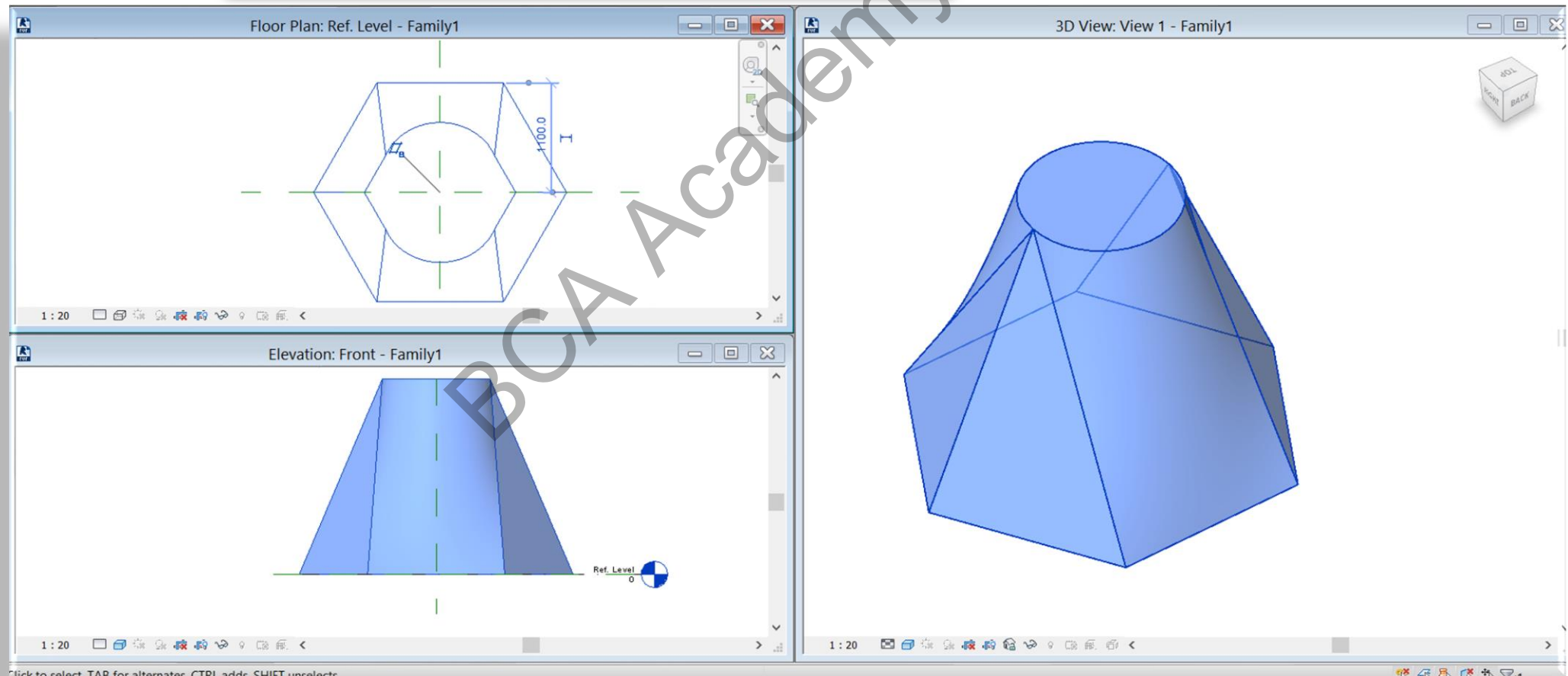
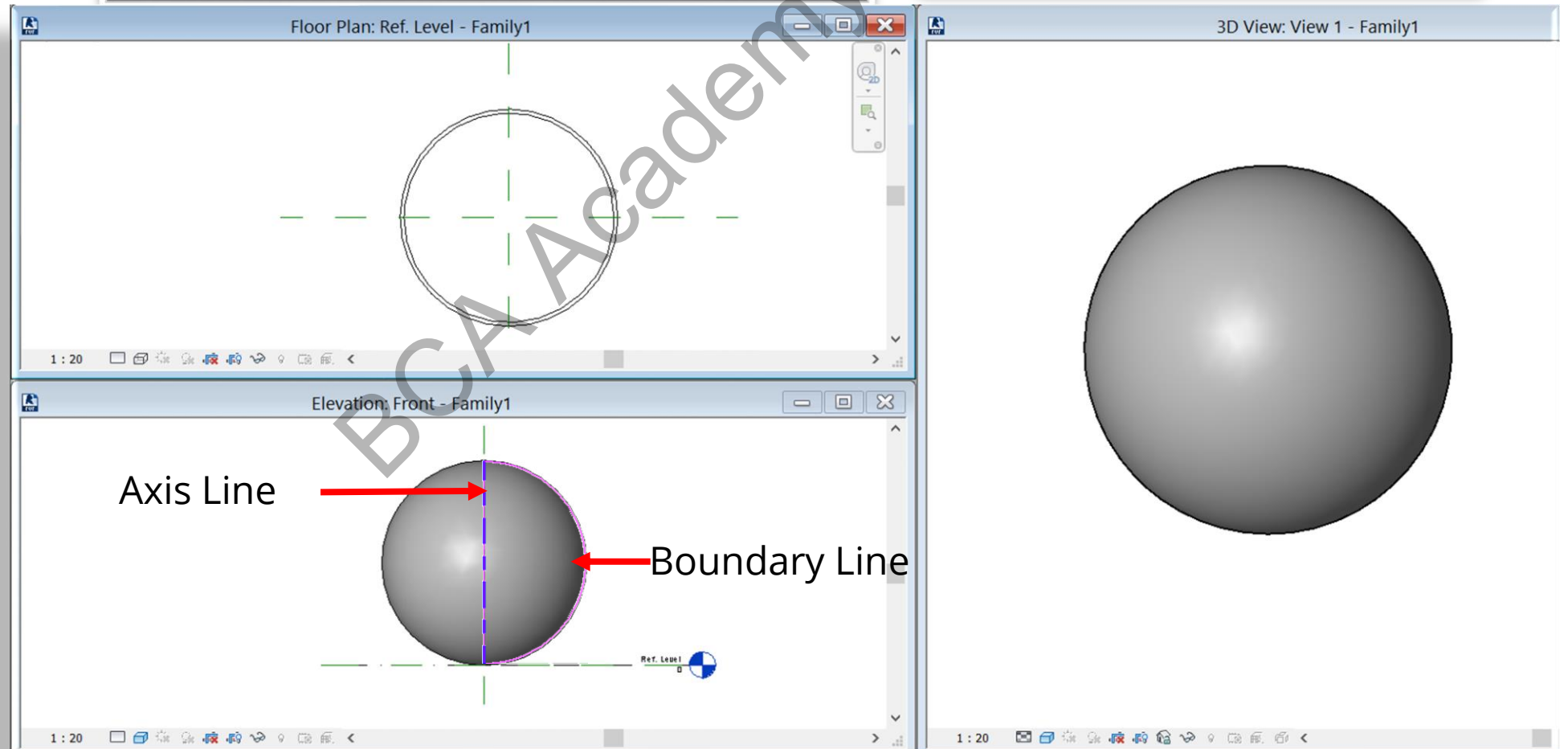
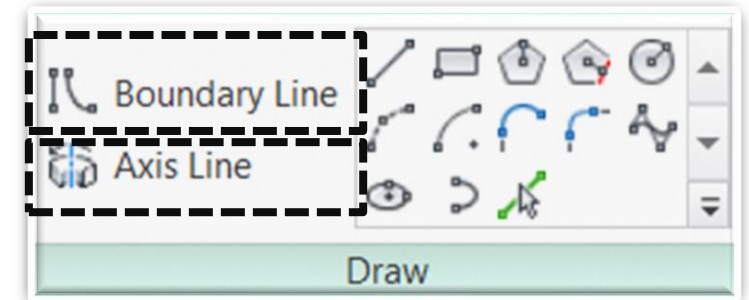
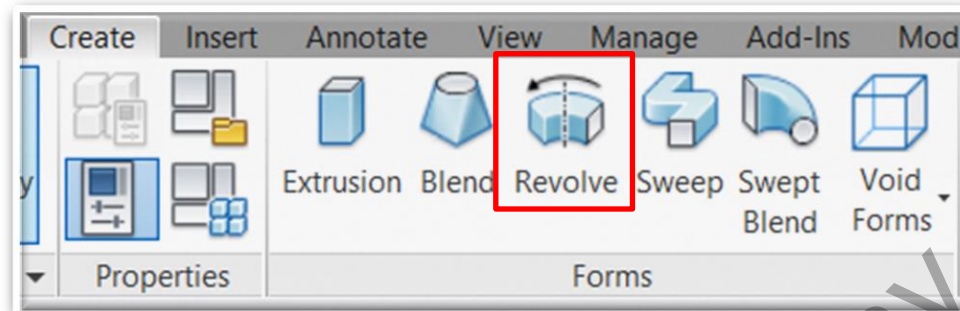


Figure 1.10: The Blend button in the ribbon



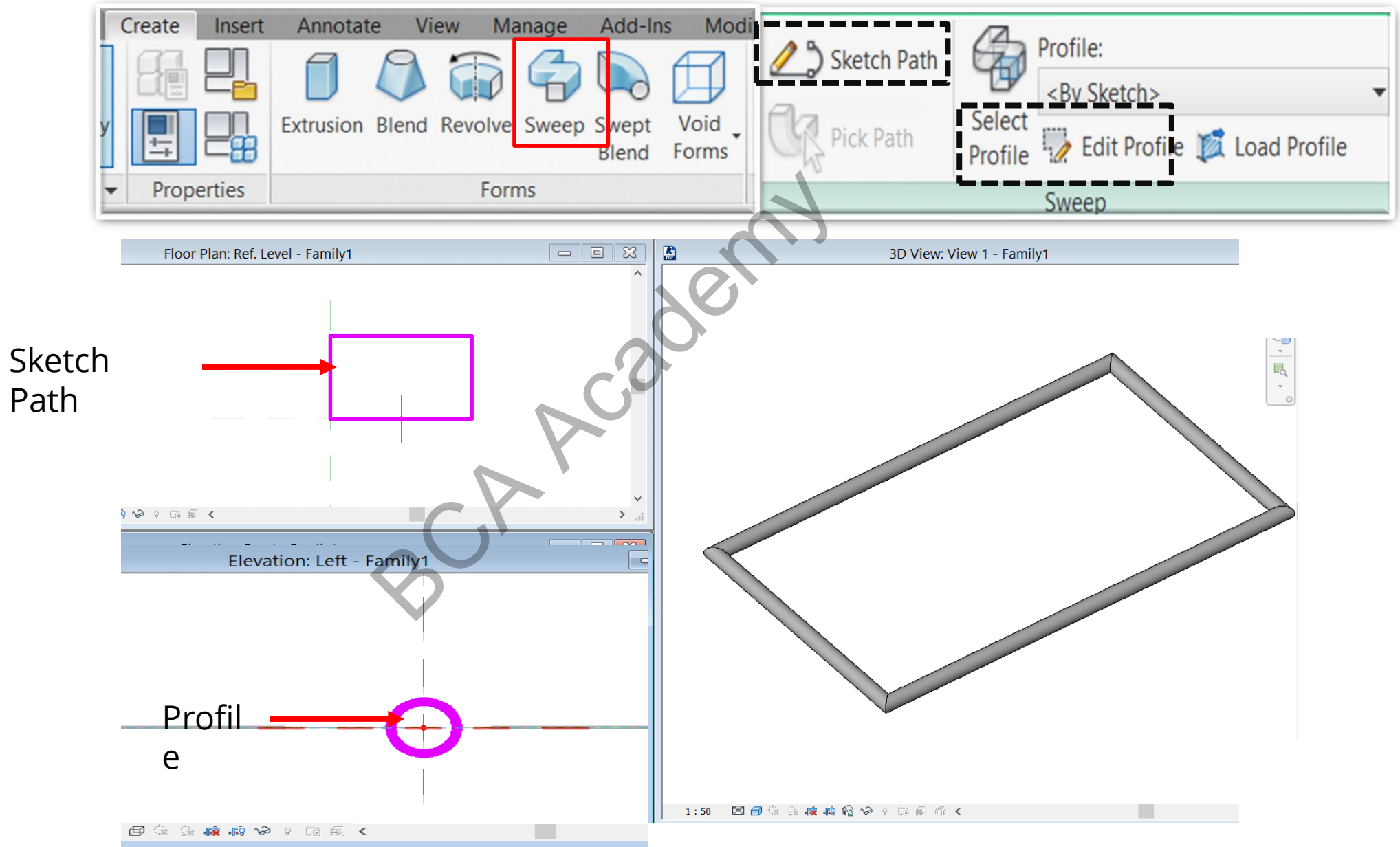
Architectural Family Creation

Revolve



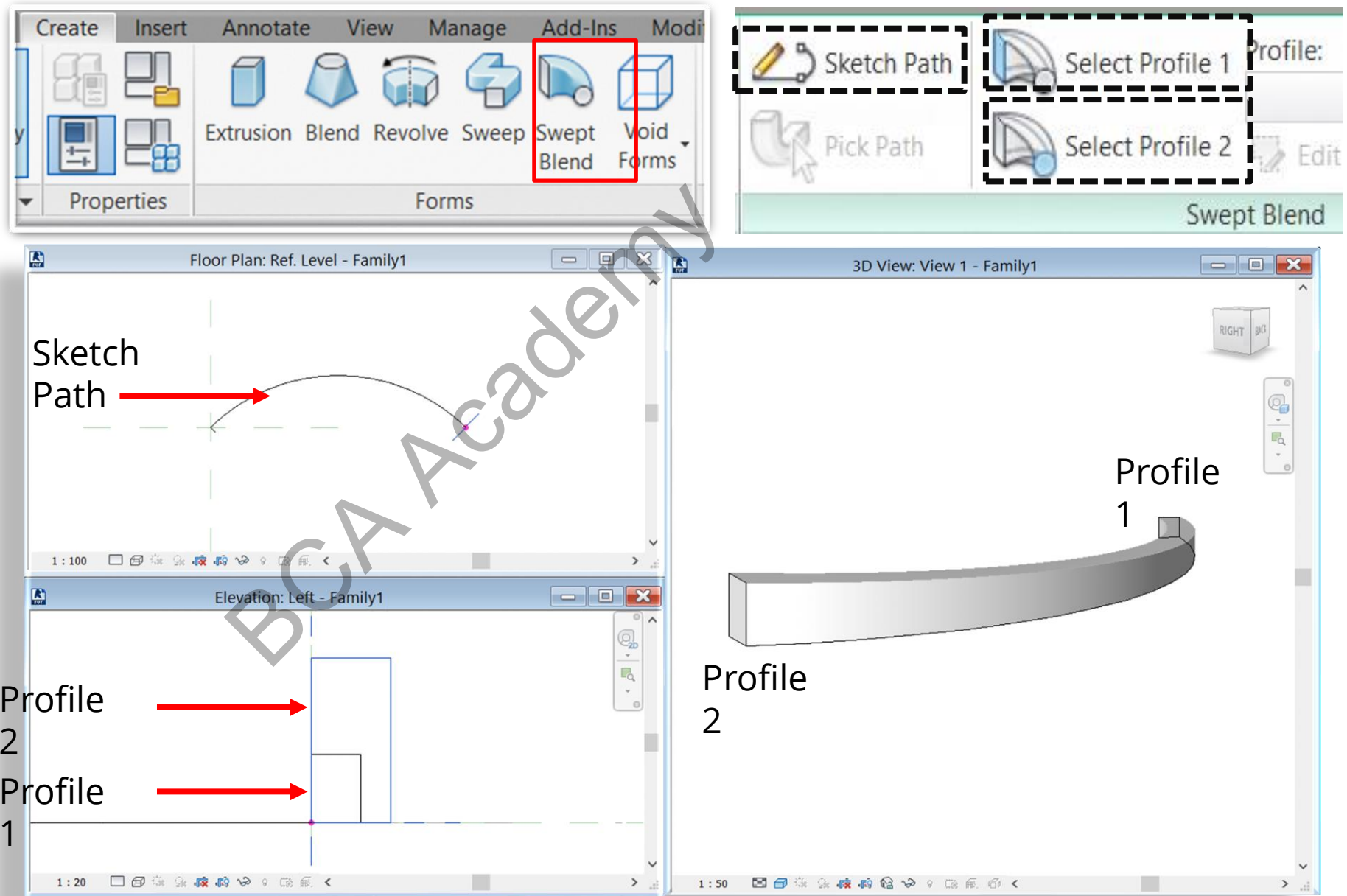
Architectural Family Creation

Sweep



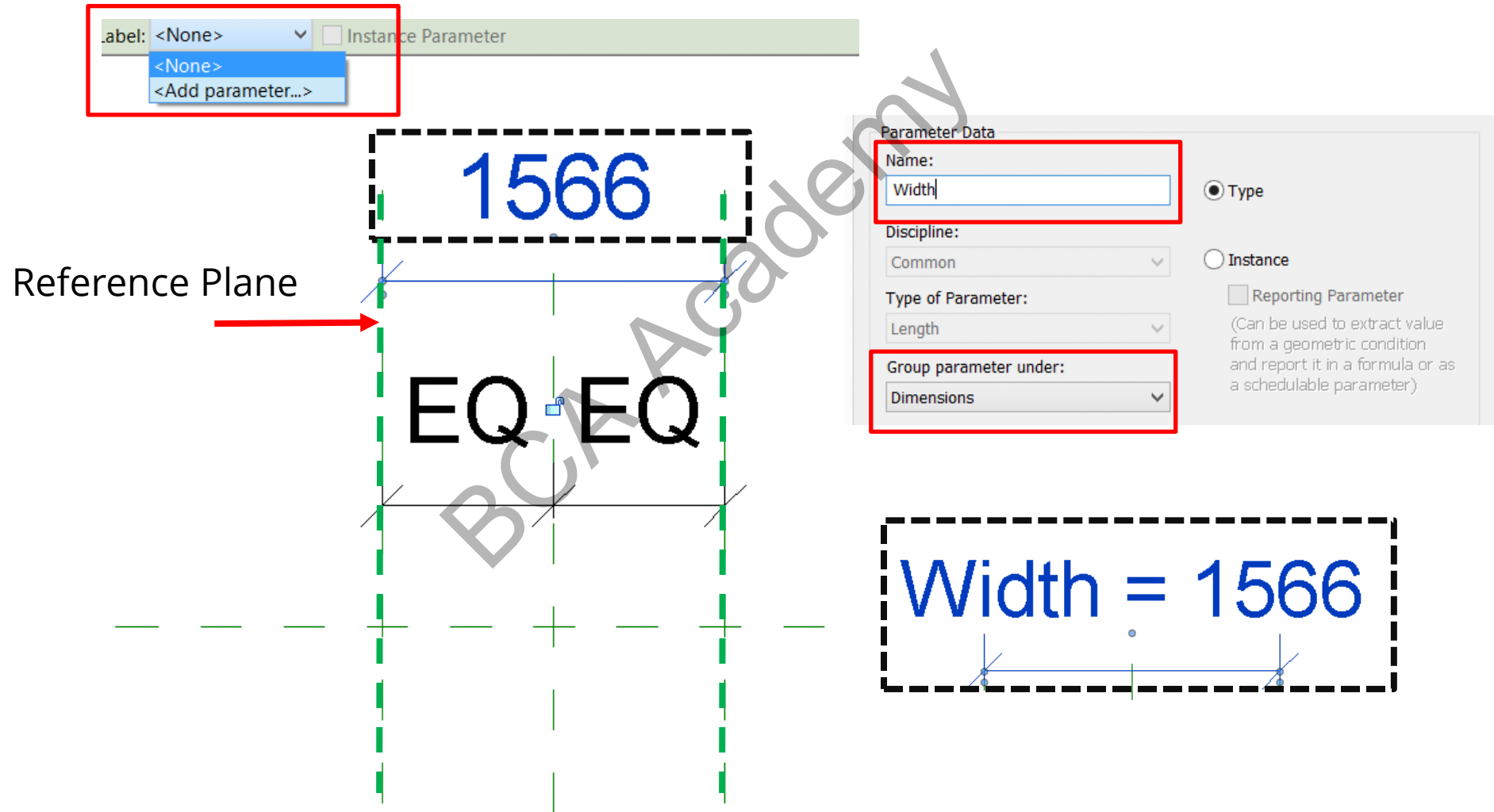
Architectural Family Creation

Swept Blend



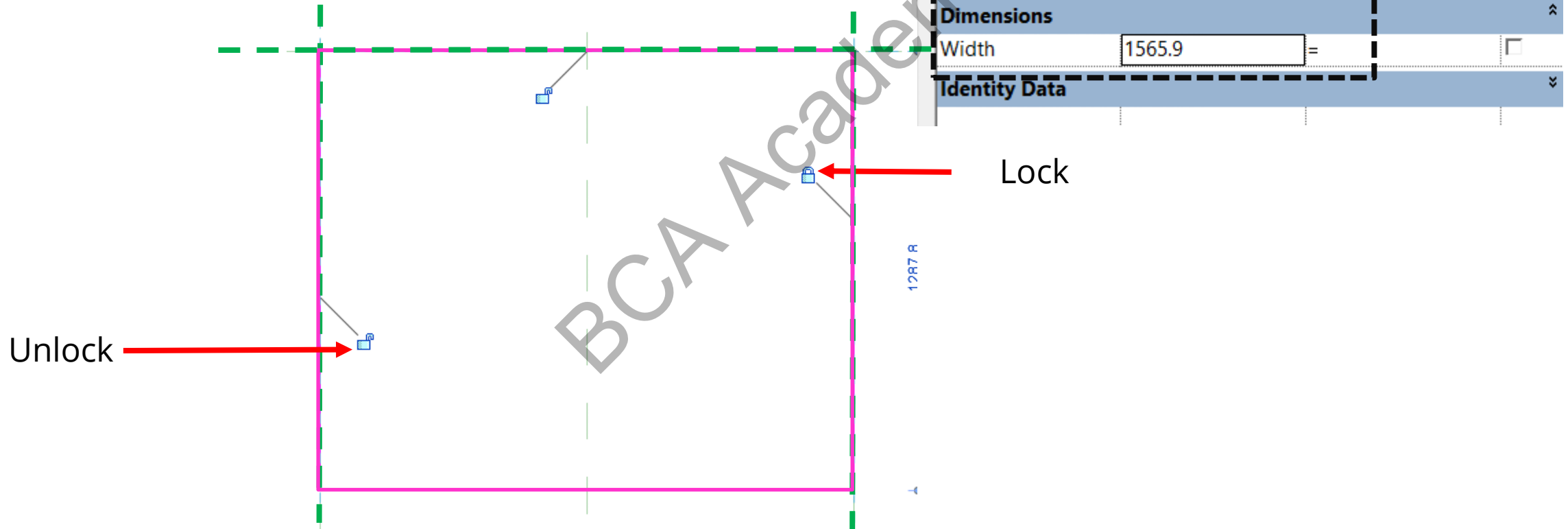
Architectural Family Creation

Reference Plane, Dimension Label (Parametric)



Architectural Family Creation

Lock Geometry to a Reference Plane

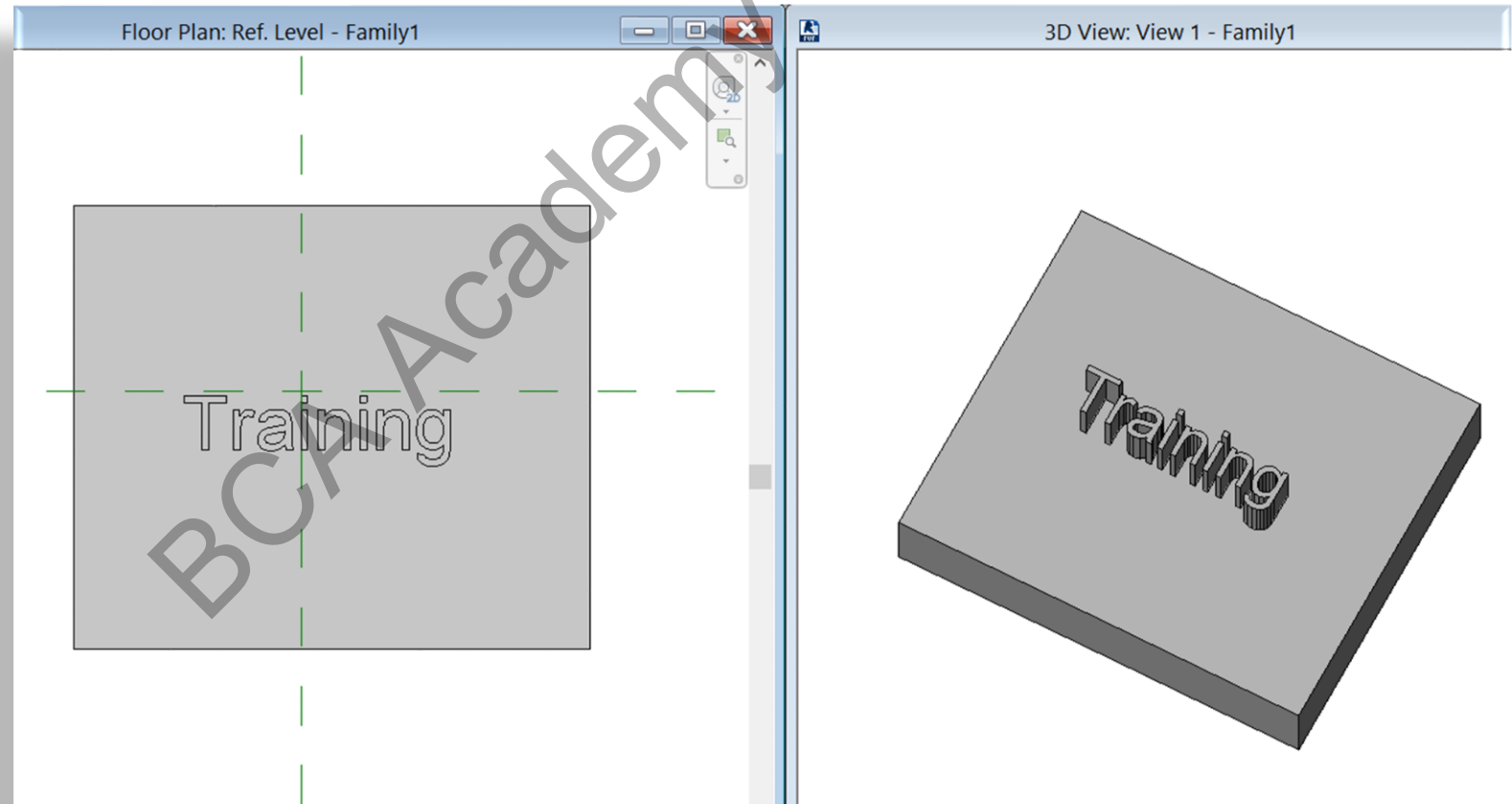


Architectural Family Creation

Model Text

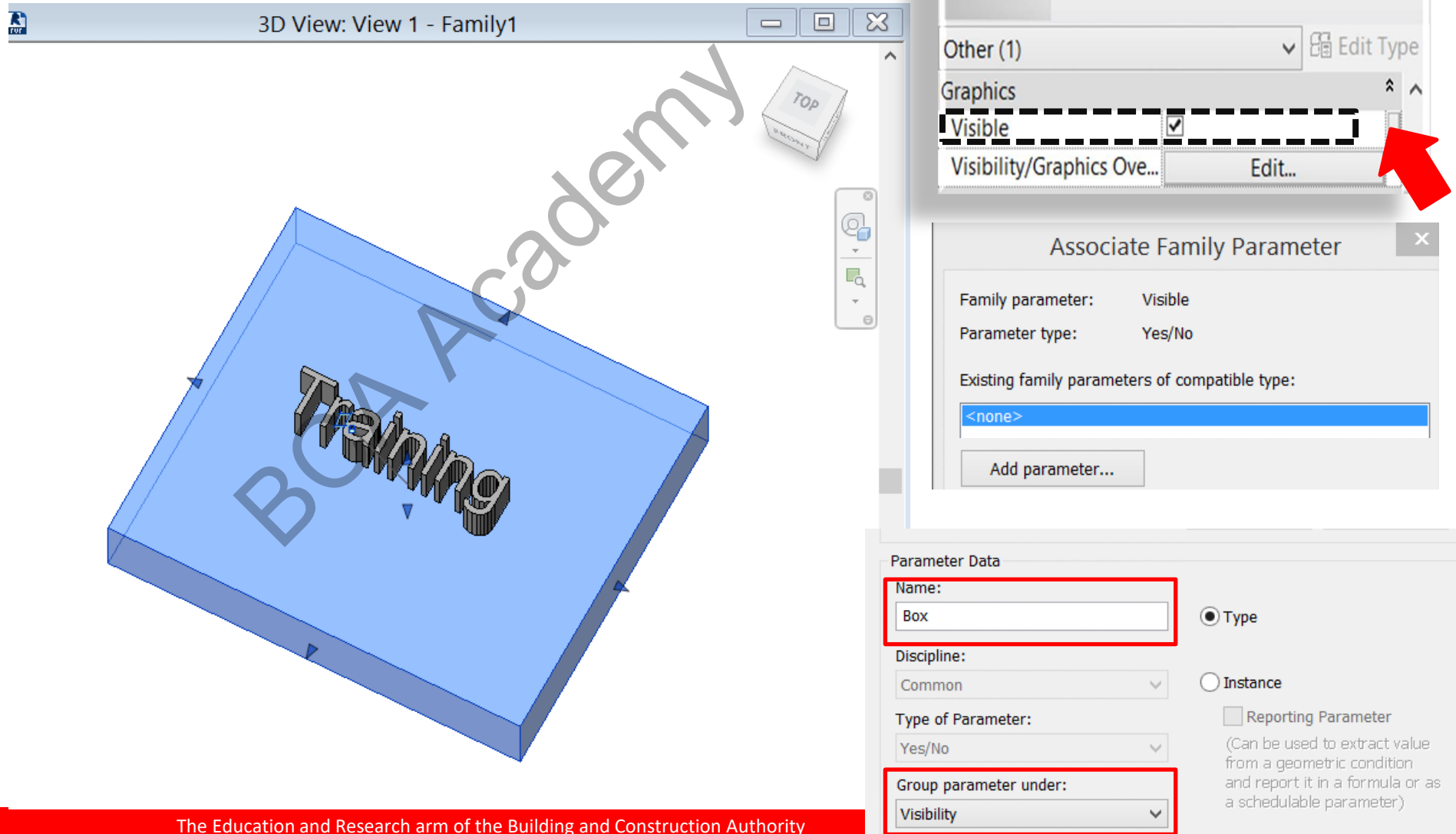


Model Text, Add 3D text to a building model



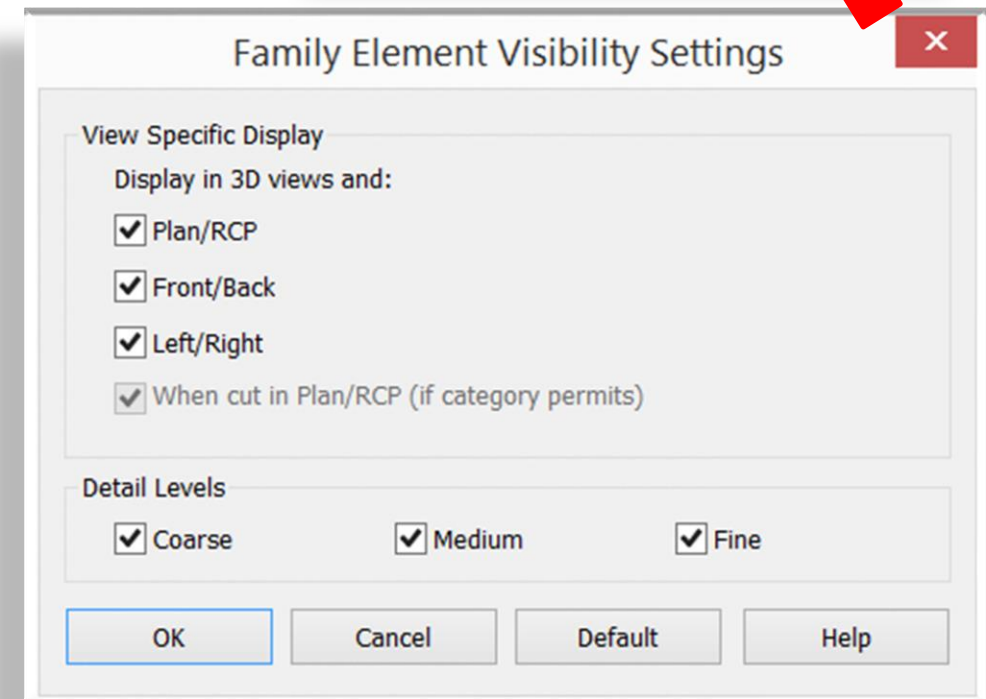
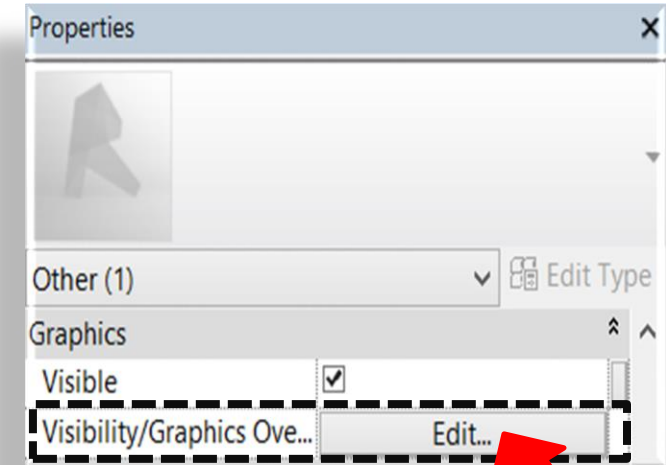
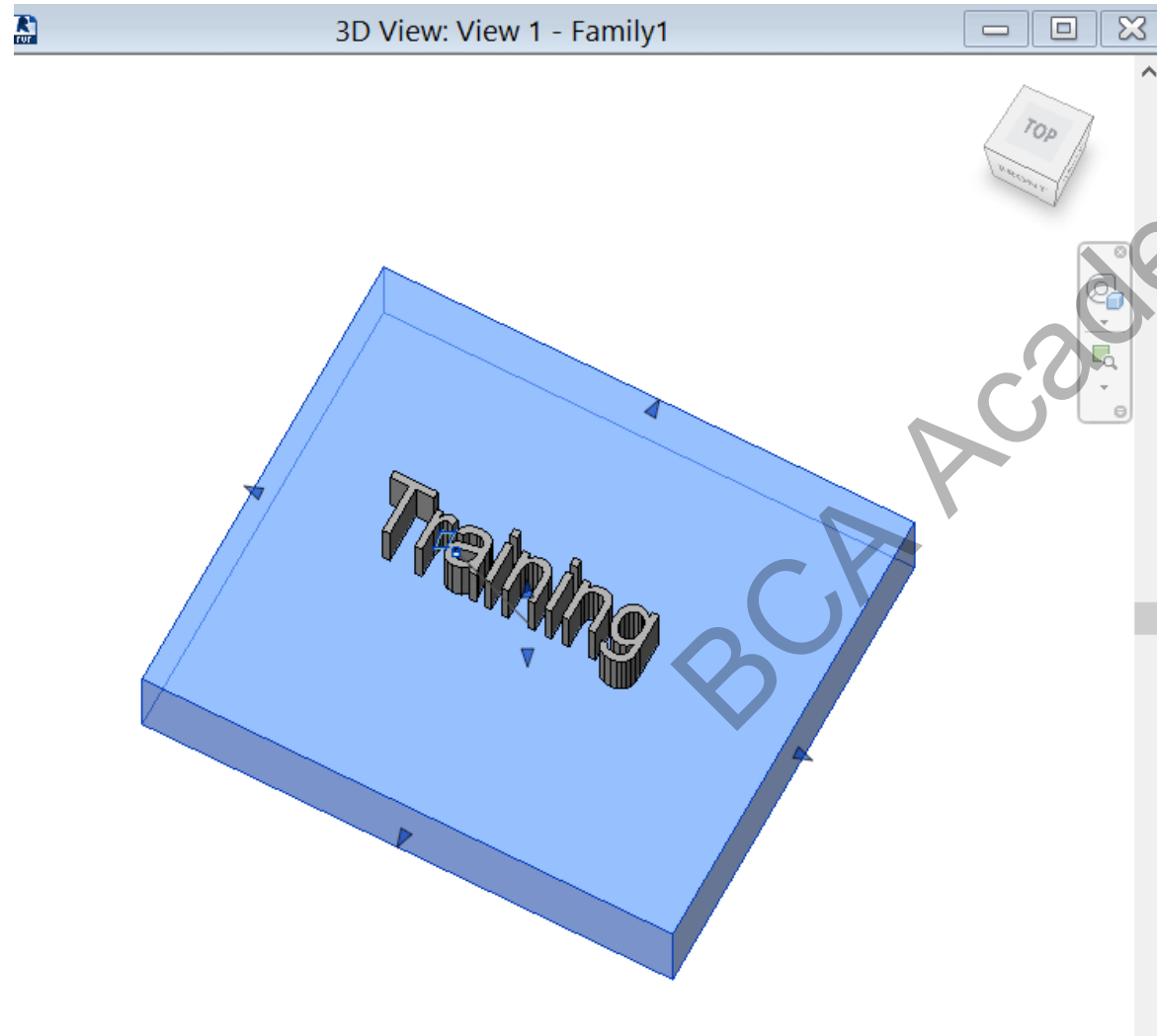
Architectural Family Creation

Visibility, <Yes/No> Parameter



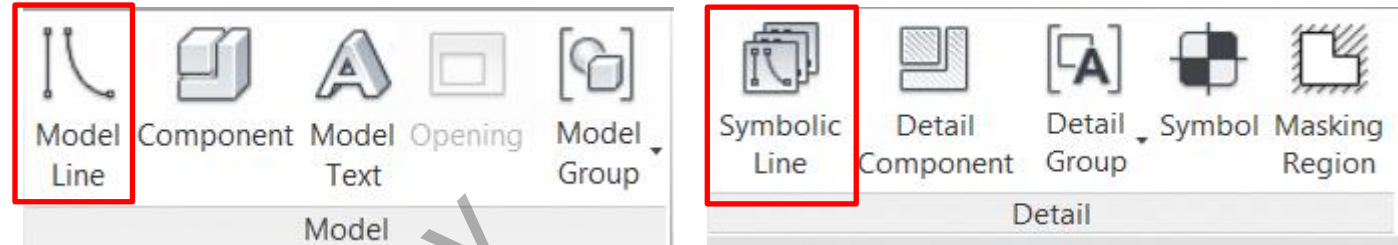
Architectural Family Creation

Visibility / Graphics Override



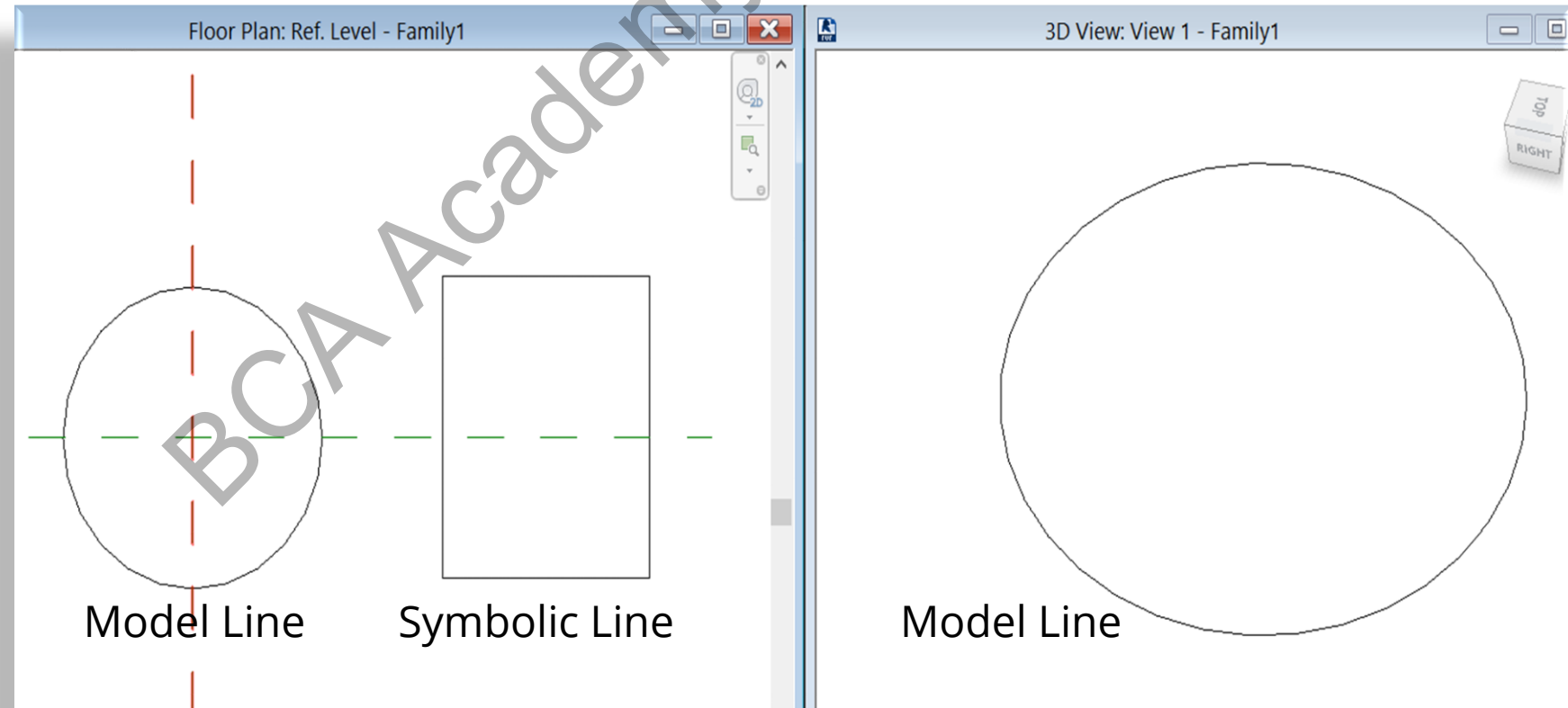
Architectural Family Creation

Model Line Vs Symbolic Line



Model Line, Create lines that exist in 3D space and are visible in all views

Symbolic Line, Create lines that are meant for symbolic use and are visible in the current view only

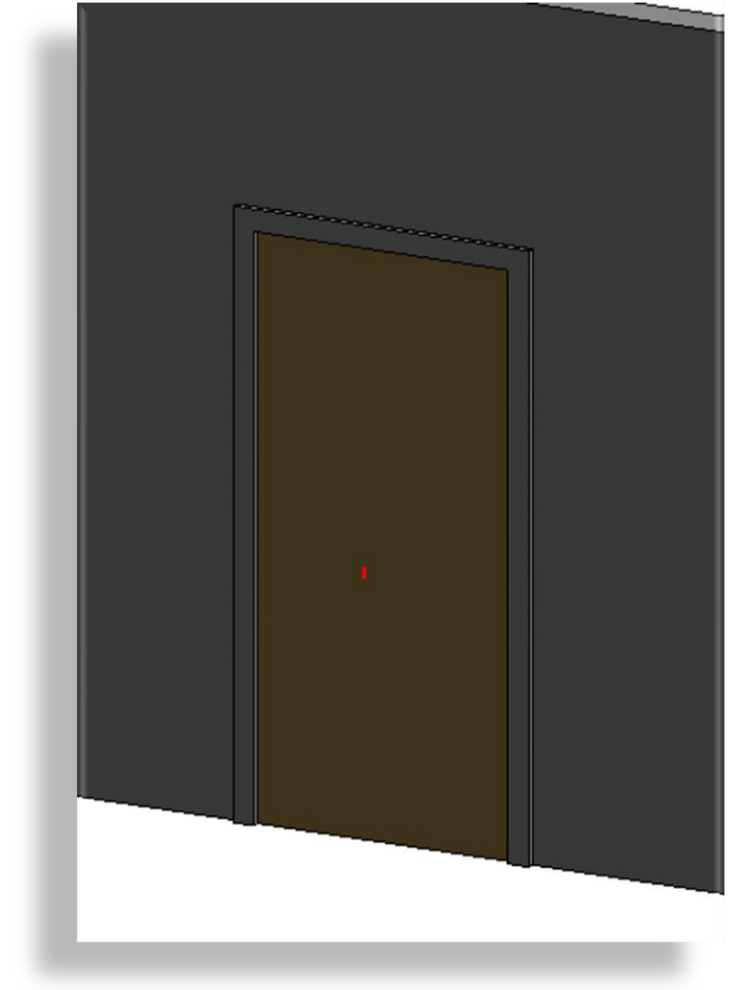
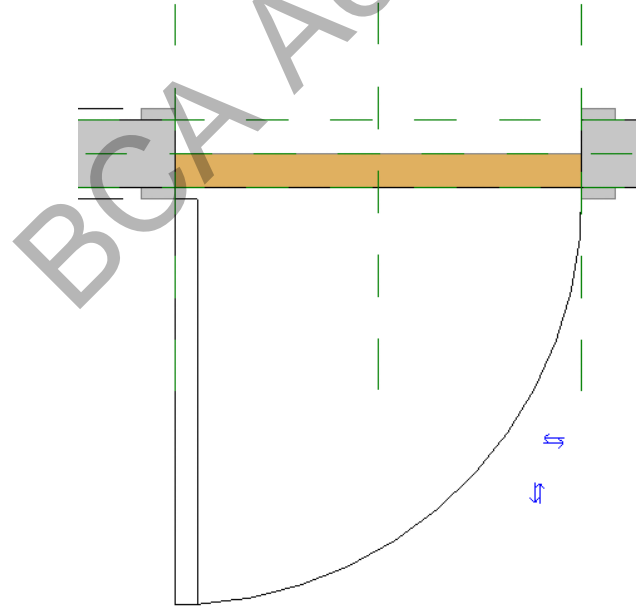


Simple Family Creation

Architectural Family Creation

Door Family

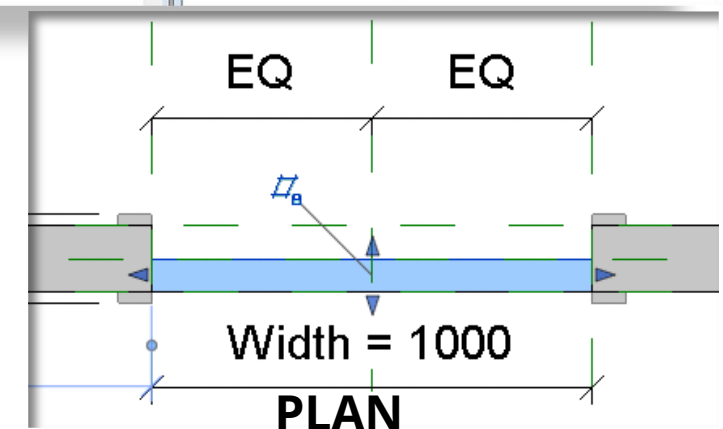
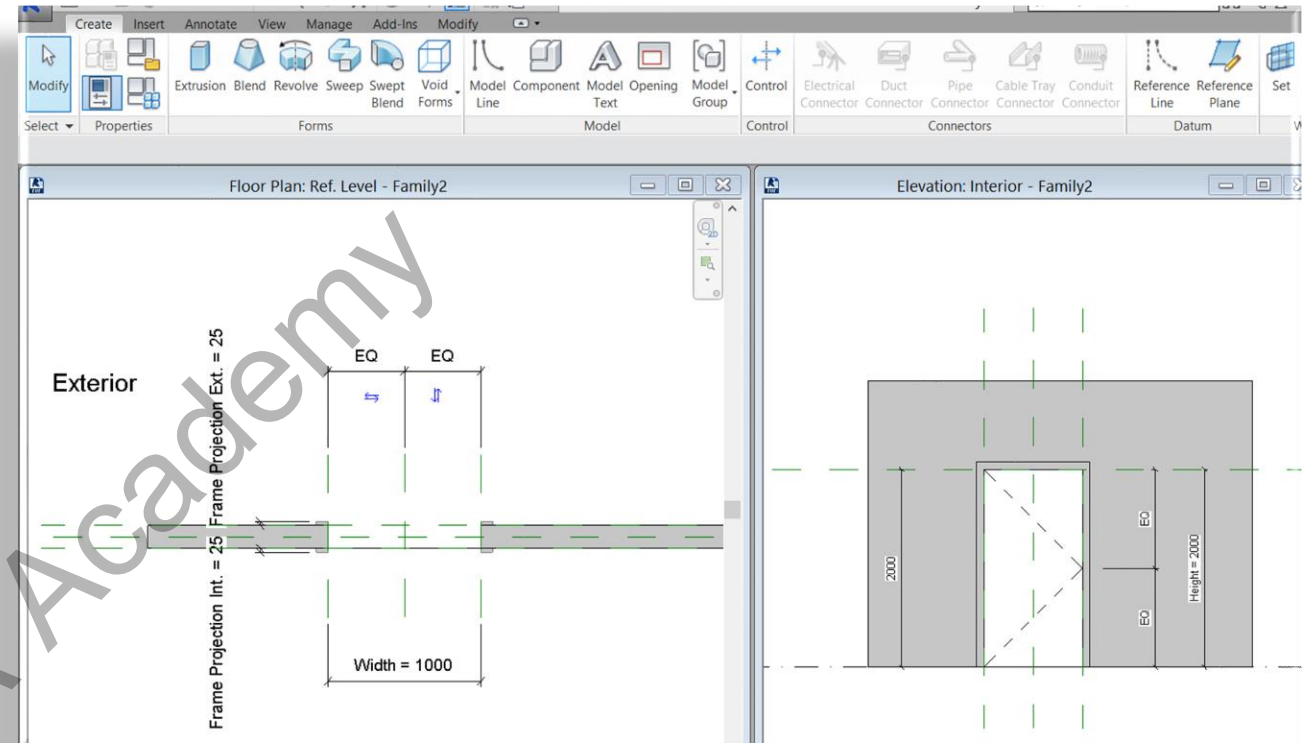
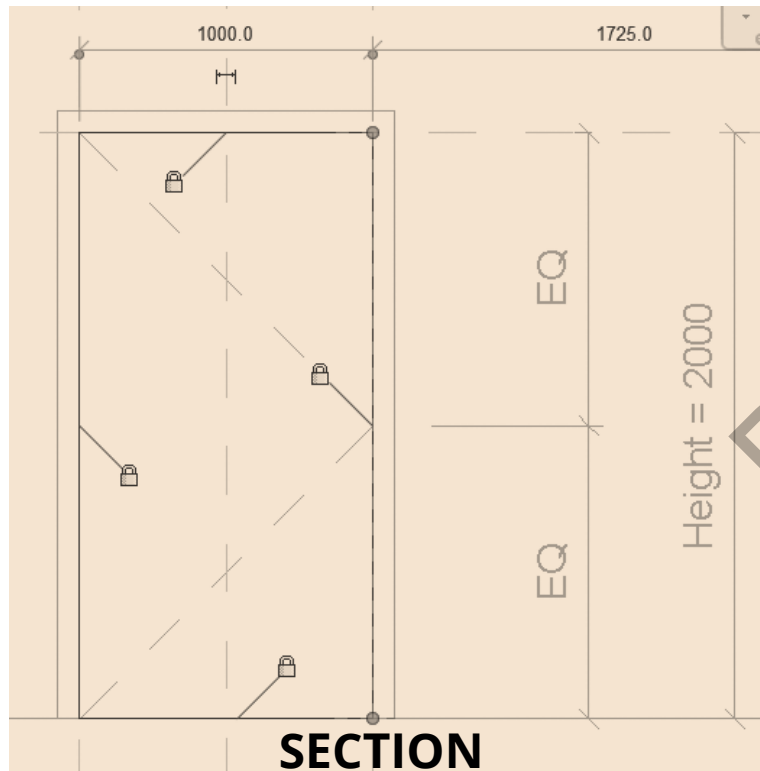
- Create Panel Door using the basic geometry
- Assign parametric dimensions
- Adding Material and Finishes parameter
- Override the visibility graphics of a Panel Door
- Adding symbolic line to show the Door Swing
- Adding Control parameter



Architectural Family Creation

Door Family

- In the Interior Elevation View, create a Door Panel using Extrusion
- Lock the lines in the Reference Lines
- Finish the Sketch



Architectural Family Creation

Door Family

Associate Family Parameter

Family parameter: Material

Parameter type: Material

Existing family parameters of compatible type:

<none>

Panel Finish

Add parameter...

OK Cancel

Parameter Properties

Parameter Type

☒ Family parameter
(Cannot appear in schedules or tags)

☐ Shared parameter
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)

Select... Export...

Parameter Data

Name: Panel Finish

Discipline: Common

Type of Parameter: Material

Group parameter under: Materials and Finishes

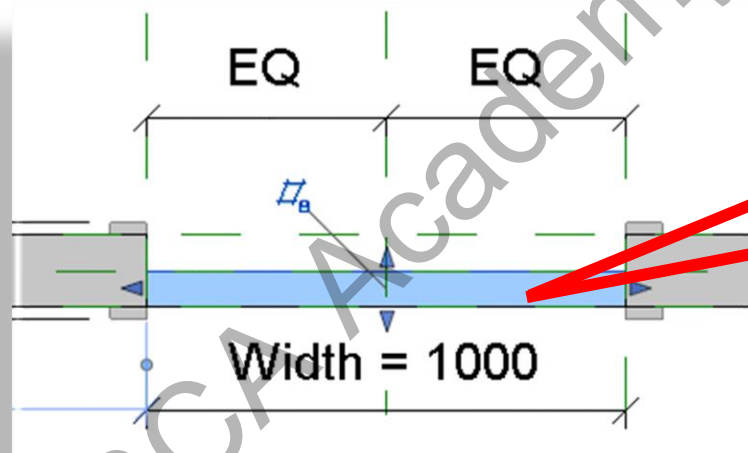
Tooltip Description: <No tooltip description. Edit this parameter to write a custom tooltip. Custom ...

Edit Tooltip...

☒ Type

☐ Instance

☐ Reporting Parameter
(Can be used to extract value from a geometric condition and report it in a formula or as a schedulable parameter)



Other (1) Edit Type

Extrusion Start -75.0

Work Plane Reference Plane : Interior

Graphics

Visible ☒

Visibility/Graphics Overrides Edit...

Materials and Finishes

Material <By Category>

Family Element Visibility Settings

View Specific Display

Display in 3D views and:

☐ Plan/RCP

☒ Front/Back

☒ Left/Right

☐ When cut in Plan/RCP (if category permits)

Detail Levels

☒ Coarse ☒ Medium ☒ Fine

OK Cancel Default Help

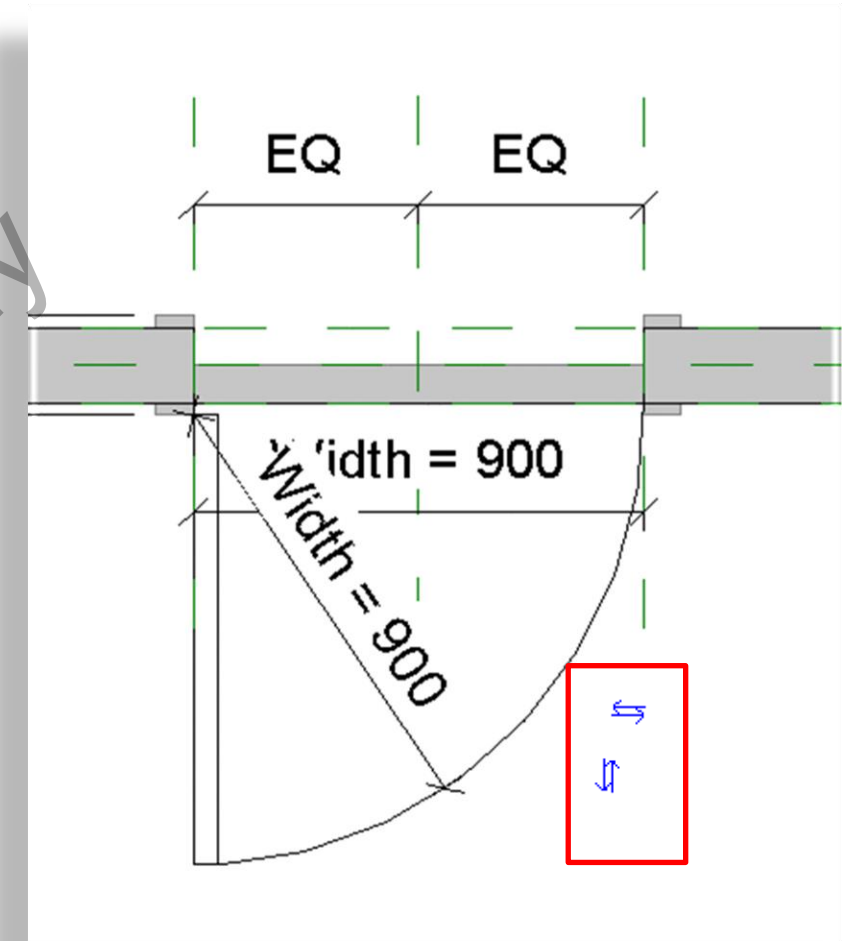
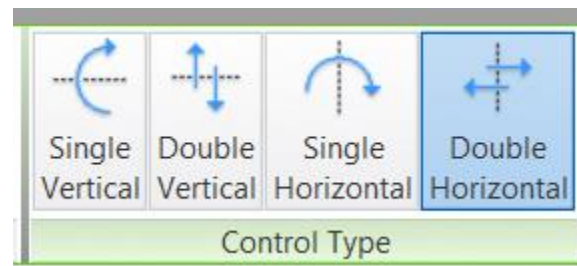
Assigning Material Finishes

Overriding Visibility Graphics

Architectural Family Creation

Door Family

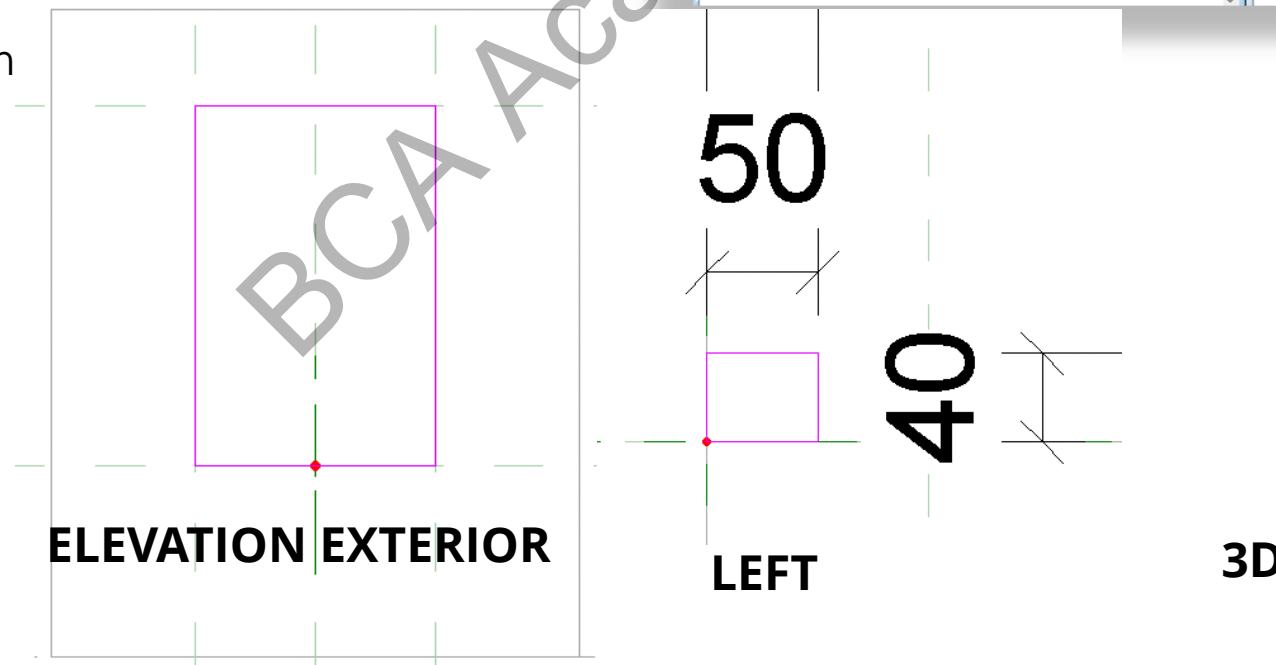
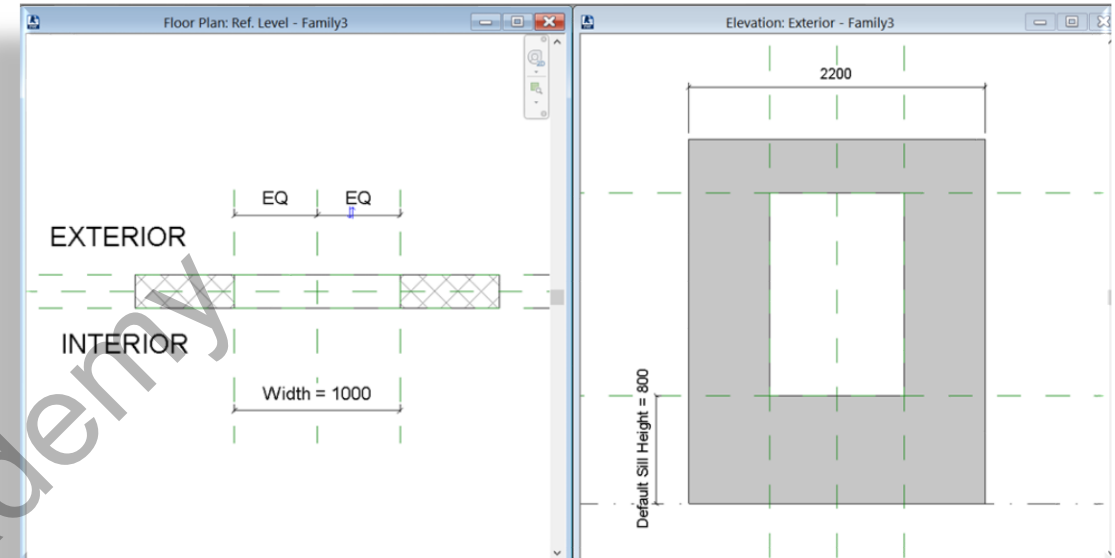
- Create Door Swing using Symbolic Line
- Draw the Door Panel (50 mm thick)
- Draw the opening swing using Center –end Arc
- Dimension the swing using Radial dimension
- Assign **Width** parameter in the dimension
- Test to change the Width dimension of the door in the Family parameter
- Add Control Flip using Double Vertical and Double Horizontal
- In Family Types, give New name Training Door and save as in desktop



Architectural Family Creation

Window Family

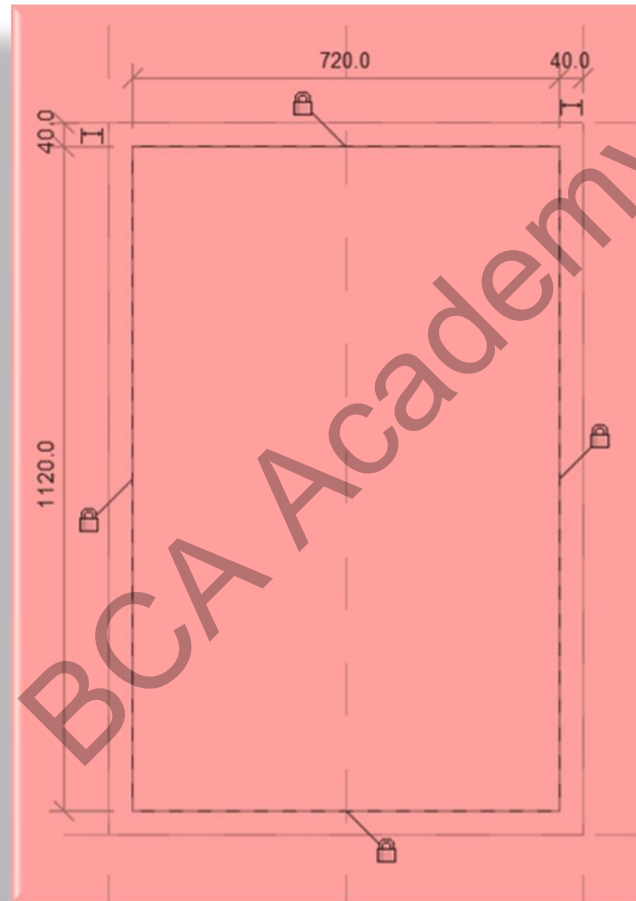
- Create the Window Jamb by Sweep, In the exterior elevation view **Sketch** the Path of the Jamb, Finish
- Edit profile of the window jamb in the left elevation, Finish..
- Select the jamb and add parameter Frame in material and finishes type parameter
- Select anodized aluminium



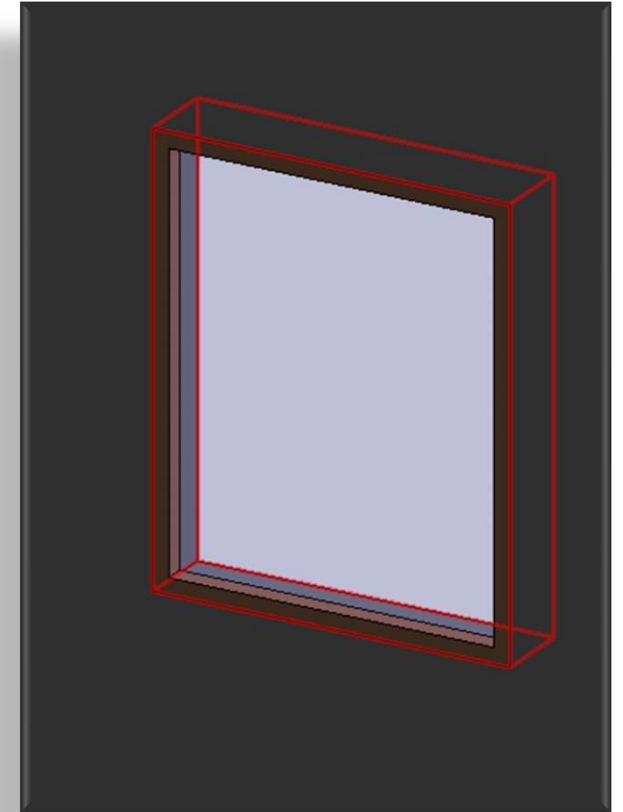
Architectural Family Creation

Window Family

- Create the Window Glass panel by Extrusion, sketch the panel aligned inside the window jamb and lock the lines
- Select the Panel and add the parameter Glass Frame in material and finishes Type Parameter
- Select Glass
- Test the Parameters



ELEVATION EXTERIOR

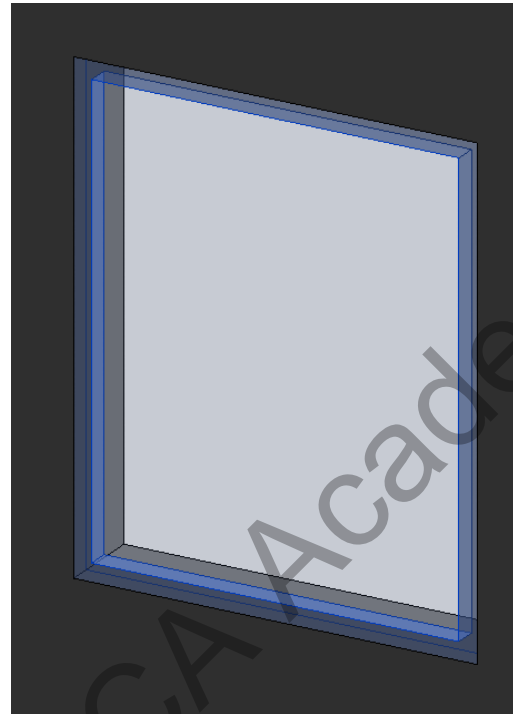


3D

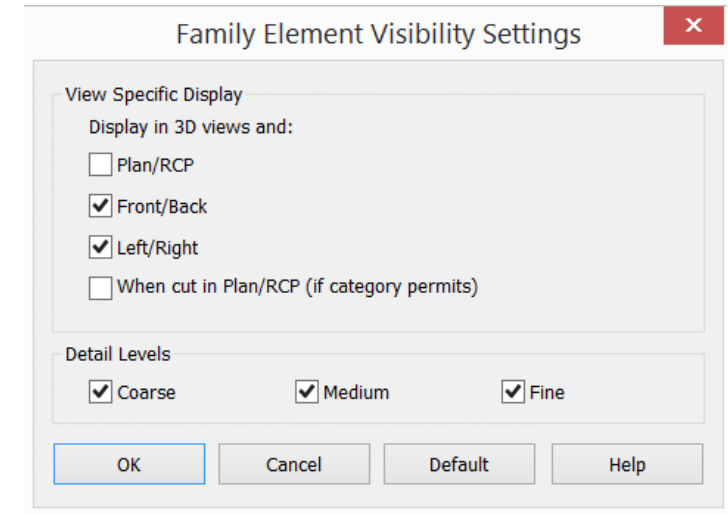
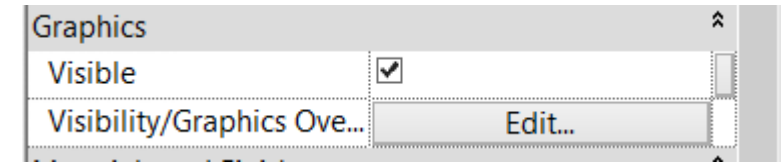
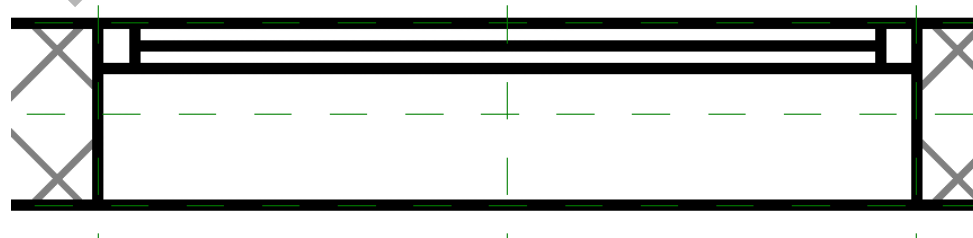
Architectural Family Creation

Window Family

- In 3D view select the jamb and glass frame
- To control the visibility of the 3D geometry in a particular view, Go to Property bar under Graphics select Visibility/ Graphics Override and unchecked the Plan/RCP and when in cut in Plan/RCP
- Create a sketch of the window projection using symbolic line in Ref level (Plan View)
- In Family Types give a New Family Name (Training Window) and save as in desktop




3D




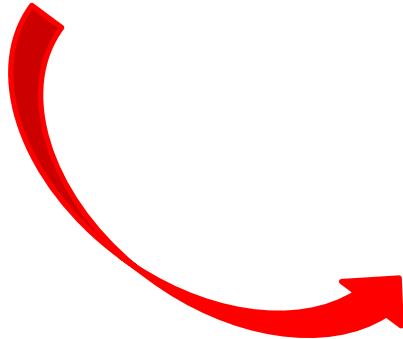
Project / Share Parameter

Window Family

Manage

 Project Parameters

 Shared Parameters



Parameter Properties

Parameter Type

☒ Project parameter
(Can appear in schedules but not in tags)

☐ Shared parameter
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)

Select... Export...

Parameter Data

Name:

Discipline:

Type of Parameter:

Group parameter under:

Tooltip Description:
<No tooltip description. Edit this parameter to write a custom tooltip. Custom tooltips ha...
Edit Tooltip...

☐ Type
☒ Instance

☐ Values are aligned per group type
☐ Values can vary by group instance

Categories

Filter list:

☐ Hide un-checked categories

- ☐ Analytical Spaces
- ☐ Analytical Surfaces
- ☐ Areas
- ☐ Assemblies
- ☐ Casework
- ☐ Ceilings
- ☐ Columns
- ☐ Curtain Panels
- ☐ Curtain Systems
- ☐ Curtain Wall Mullions
- ☐ Detail Items
- ☐ Doors
- ☐ Electrical Equipment
- ☐ Electrical Fixtures
- ☐ Entourage
- ☒ Floors
- ☐ Furniture
- ☐ Furniture Systems
- ☐ Generic Models
- ☒ Grids

Check All Check None

☒ Add to all elements in the selected categories

OK Cancel Help