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ARCHITECTURAL MODELING USING REVIT

MODEL IN PLACE

MODEL IN PLACE

In-place elements are custom elements that you create in the context of a project.
It is used to create a component that is unique to the project,
The component exists only in the context of current project and it cannot be loaded in to the other projects Lets know about Model-in place

General Procedure:

Generally you have to perform the following steps to create a model in place

1. Open a project.
2. On the ribbon, go to…
   - Architecture tab ➤ in Build panel ➤ click on Component drop-down ➤ select (Model In-Place)
3. In the Family Category and Parameters dialog, select a category for the element, and click OK.
   The category that you choose will be the category under which the family for the in-place element will display in the Project Browser, in which it will schedule, and in which you can control its visibility.
   Here am selecting "generic model" category
4. In the Name dialog, type a name, and click OK.
   The Family Editor opens.
5. Use the Family Editor tools to create the in-place element.
6. When you finish creating the in-place element, click Finish Model.

Let's see the family editor tools one-by-one
Here we are having various tools in forms as displayed on the screen
First of all let's know about **extrusion** tool

SOLID EXTRUSION

It creates a 3d solid by extruding a 2d profile

To create a solid or void extrusion

1. In the Family Editor, on the Create tab ➤ Forms panel, do one of the following: i.e...
   - Click on (Extrusion). (or)
   - Click Void Forms in drop-down ➤ select (Void Extrusion).

   Note: If necessary, set the work plane before you sketch the extrusion. Click Create tab ➤ Work Plane panel ➤ (Set).

1. In the ribbon available, click (Set). Or Create tab ➤ Work Plane panel ➤ (Set)
2. In the Work Plane dialog, under Specify a new Work Plane, select any one options

If you choose

- **Name**—choose an available work plane from the list, and click OK.

The list includes levels, grids, and named reference planes.

- **Pick a plane**—Revit creates a plane coincident to the selected plane. Select this option and click OK. Then move the cursor over the drawing area to highlight available work planes, and click to select the desired plane.

You can select any plane that can be dimensioned, including wall faces, faces in linked models, extrusion faces, levels, grids, and reference planes.

- **Pick a line and use the work plane it was sketched in**—Revit creates a work plane that is coplanar with the work plane of the selected line. Select this option and click OK. Then move the cursor over the drawing area to highlight available lines, and click to select one.

2. Use the sketching tools to sketch the extrusion profile:
   - To create a single solid form, sketch a closed loop.
   - To create more than one form, sketch multiple, non-intersecting, closed loops.
3. On the Properties palette, specify the extrusion properties:
   - To extrude the profile from the default start point of 0, under Constraints, for Extrusion End, enter a positive or negative extrusion depth.

   This value changes the endpoint of the extrusion.
   Note: The extrusion depth is not retained after you create the extrusion. If you need to make multiple extrusions with the same endpoint, sketch the extrusions, select them, and then apply the endpoint.
   - To extrude the extrusion from a different start point, under Constraints, for Extrusion Start, enter a new point.
   - To set the visibility of a solid extrusion, under Graphics, for Visibility/Graphics Overrides, click Edit, and specify the visibility settings.
   - To apply a material to a solid extrusion by category, under Materials and Finishes, click in the Material field, click ..., and specify a material.
   - To assign a solid extrusion to a subcategory, under Identity Data, for Subcategory, select a subcategory.
   - Click Apply.

   Note: You can specify the depth of extrusion from options bar as will you can specify offset and radius to the sketch while drawing
4. Click Modify | Create Extrusion tab ➤ Mode panel ➤ ✔ (Finish Edit Mode).
   Revit completes the extrusion and returns you to the view in which you started the extrusion.
5. To view the extrusion, open a 3D view.
6. To resize the extrusion in the 3D view, select it and use grips to edit it.

The next tool is **Solid Blend**

SOLID BLEND

It Create a solid 3D shape that changes along its length, blending from a starting shape to an ending shape.

The Blend tool blends 2 profiles (boundaries) together. For example, if you sketch a large rectangle and a smaller rectangle on top of it, Revit blends the 2 shapes together.

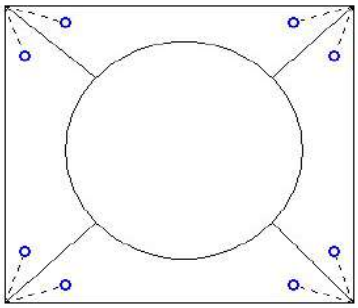
To create a solid or void blend

1. In the Family Editor, on the Create tab ➤ Forms panel, either do
   - Click (Blend)

   (Or)
   - Click Void Forms drop-down ➤ (Void Blend).

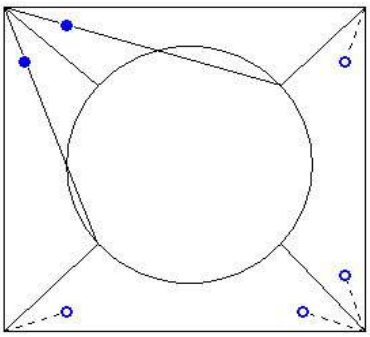
   Note: If necessary, set the work plane before you sketch the blend. Click Create tab ➤ Work Plane panel ➤ (Set).
2. On the Modify | Create Blend Base Boundary tab, use the Draw tools to sketch the base boundary of the blend, for example sketch a square.
3. To specify the depth of the blend, on the Properties palette, do either
   - Specify a depth that is calculated from a default start point of 0, under Constraints, for Second End, by entering a value.
   - Specify a depth that is calculated from a start point other than 0, under Constraints, enter Second End and First End values.

   Note: If specified, Revit does not retain the end point value during creation of the blend. If you need to make multiple blends with the same endpoint, first sketch the blends, then select them, and then apply the end point.
4. When finished with the base boundary (make use of draw tools for sketching), on the Modify | Create Blend Base Boundary tab ➤ Mode panel, click (Edit Top).
5. On the Modify | Create Blend Top Boundary tab, sketch a boundary for the top of the blend, for example another square.
6. If necessary, edit the vertex connections to control the amount of twist in the blend:
   - On the Modify | Create Blend Top Boundary tab, click Mode panel ➤ (Edit Vertices).
   - Vertex points become available on one of the blend sketches.



The dotted lines with blue open-dot controls are suggested connections. Each control is a switch between adding and removing connections.

- To display the vertex points on the other blend sketch, on the Edit Vertices tab ➤ Vertex Connect panel, click (Controls on Base) or (Controls on Top) - whichever option is currently unselected.
- Click a control, and the line becomes a solid connection. A filled blue control displays on the connection.



- Click a solid control to remove a connection; the line reverts to a dashed line with an open dot control.
- As you click the controls, some possible edges disappear and other ones appear.
- On the Vertex Connect panel, click (Twist Right) or (Twist Left) to twist the selected blend boundary in a clockwise or counter-clockwise direction.

7. On the Properties palette, specify the blend properties like
   - To set the visibility of a solid blend, under Graphics, for Visibility/Graphics Overrides, click Edit, and specify the visibility settings.
   - To apply a material to a solid blend by category, under Materials and Finishes, click in the Material field, click , and specify a material.
   - To assign a solid blend to a subcategory, under Identity Data, for Subcategory, select a subcategory.
   - Click Apply.
8. Click Modify | Create Blend Top Boundary ➤ Mode panel ➤ (Finish Edit Mode).
9. To view the blend, open a 3D view.
10. To resize the blend in the 3D view, select and use grips to edit it.

The next tool is **Solid Revolve**

SOLID REVOLVE

A revolve is a form that you create by revolving a shape around an axis. You can revolve the shape in a circle or any fraction of a circle. If the axis touches the revolve shape, the result is a solid.

If you sketch away from the axis, the resulting geometry has a hole in it.

You can use solid revolves to create family geometry like door and furniture knobs, columns, and dome roofs etc.

The following procedure is a general method for creating revolved geometry. Steps may vary depending on your design intent.

To create a solid or void revolve

1. In the Family Editor, on the Create tab ➤ Forms panel, do either
   - Click (Revolve). (or)
   - Click Void Forms drop-down ➤ (Void Revolve).

   Note: If necessary, set the work plane before you sketch revolve. Click Create tab ➤ Work Plane panel ➤ (Set).
2. Place an axis of revolution:
   - On the Modify | Create Revolve tab ➤ Draw panel, click (Axis Line).
   - Specify the start and endpoint of the axis at the desired orientation.
3. Use the Draw tools to sketch a shape to revolve around the axis:
   - Click Modify | Create Revolve tab ➤ Draw panel ➤ (Boundary Line).
   - To create a single revolve, sketch a closed loop.
   - To create more than one revolve, sketch multiple, non-intersecting, closed loops.

   Note: If the axis touches the revolve shape, the result is a solid. If the axis does not touch the revolve shape, the revolve will have a hole in it.
4. On the Properties palette, change the properties of the revolve such as
   - To change the start and end points of the geometry to revolve, enter a new Start and End Angle.
   - To set the visibility of a solid revolve, under Graphics, for Visibility/Graphics Overrides, click Edit.
   - To apply a material to a solid revolve by category, under Materials and Finishes, click in the Material field, and click to specify a material.
   - To assign a solid revolve to a subcategory, under Identity Data, for Subcategory, select a subcategory.
   - Click Apply.
5. On the Mode panel, click (Finish Edit Mode).
6. To view the revolve, open a 3D view.
7. To resize the revolve in the 3D view, select and use grips to edit it.

   Note: You cannot drag the start and end faces of a 360-degree revolve.

The next tool is **Solid Sweep**

SOLID SWEEP

It creates a 3d shape by sweeping a 2d profile along the path
In this tool you have to sketch a path and profile to sweep

To create a solid or void sweep

1. In the Family Editor, on the Create tab ➤ Forms panel, do one of the following.
   - To create a solid sweep, click (Sweep).
   - To create a void sweep, click Void Forms drop-down ➤ (Void Sweep).

   Note: If necessary, set the work plane before you sketch the sweep. Click Create tab ➤ Work Plane panel ➤ (Set).
2. Specify the sweep path:
   - To sketch a new path for the sweep, click Modify | Sweep tab ➤ Sweep panel ➤ (Sketch Path).

   The path can either be a single closed or single open path. You cannot have multiple paths. The path can be a combination of straight lines and curves.
   - To select an existing line for the sweep, click Modify | Sweep tab ➤ Sweep panel ➤ (Pick Path).

   You can use the **Pick Path** tool to make a sweep that uses multiple work planes. To select edges of existing geometry for path segments, click **Pick 3D Edges**. Or pick existing sketch lines, watching the status bar to know what you are picking.
   This method of picking automatically locks the sketch lines to the geometry you are picking and allows you to sketch the path in multiple work planes, allowing for a 3D path.
3. On the Mode panel, click (Finish Edit Mode).
4. Load or sketch a profile.

To load a profile

a. Click Modify | Sweep tab ➤ Sweep panel, and select a profile from the Profile list.
   If the profile you need is not already loaded in the project, click Modify | Sweep tab ➤ Sweep panel ➤ (Load Profile) to load the profile.
b. On the Options Bar, use the X, Y, Angle, and Flip options to adjust the position of the profile.
   Enter values for X and Y to specify the offset for the profile.
   Enter a value for Angle to specify the angle of the profile. The angle rotates the profile around the profile origin. You can enter negative values to rotate in the opposite direction.
   Click Flip to flip the profile.
c. Click Apply.
d. Select the path, and in a 3D view, zoom in to see the profile.

To sketch a profile

1. Click Modify | Sweep tab ➤ go to Sweep panel, select verify <By Sketch> is displayed, and then click (Edit Profile).
2. If the Go To View dialog displays, select the view where you want to sketch the profile, and click OK.
   For example, if you sketched the path in a plan view, you would choose an elevation view to sketch the profile. The profile sketch can be a single-closed loop or multiple closed loops that do not intersect. Sketch the profile near the intersection of the profile plane and the path.
3. Sketch the profile. Profiles must be closed loops.
4. Click Modify | Sweep ➤ Mode ➤ (Finish Edit Mode).
5. On the Properties palette, specify the sweep properties.
   - To set the visibility of a solid sweep, under Graphics, for Visibility/Graphics Overrides, click Edit, and specify the visibility settings.
   - To apply a material to a solid sweep by category, under Materials and Finishes, click in the Material field, click , and specify a material.
   - To assign a solid sweep to a subcategory, under Identity Data, for Subcategory, select a subcategory.
   - Click Apply.
6. On the Mode panel, click (Finish Edit Mode).

The next tool is **Solid Swept Blend**

SOLID SWEPT BLEND

The Swept Blend tool allows you to create a blend that has 2 different profiles and then sweep it along a path.

The shape of a swept blend is determined by the 2D path you either sketch or pick and the 2 profiles you either sketch or load.

The following procedure is a general method for creating a swept blend. Steps may vary depending on your design intent.

To create a solid or void swept blend

1. In the Family Editor, on the Create tab ➤ Forms panel, do one of the following:
   - To create a solid swept blend, click (Swept Blend).
   - To create a void swept blend, click Void Forms drop-down ➤ (Void Swept Blend).
2. Specify the path for the swept blend.

Note: If necessary, set the work plane before you sketch or pick the path for the swept blend. Click Create tab ➤ Work Plane panel ➤ (Set).

Do one of the following on the Modify | Swept Blend tab ➤ in Swept Blend panel:

- Click (Sketch Path) to sketch a path for the swept blend.
- Click (Pick Path) to pick existing lines and edges for the swept blend.

3. Sketch or pick the path.
   To select edges of other solid geometry, such as extrusions or blends, click Pick Path. Or pick existing sketch lines, watching the status bar to know what you are picking. This method of picking automatically locks the sketch lines to the geometry you are picking and allows you to sketch the path in multiple work planes, hence allowing for a 3D path.
   Note: A swept blend path can only have one segment.
4. On the Mode panel, click (Finish Edit Mode)
5. Load or sketch Profile 1.

The end point for Profile 1 on the swept blend path is highlighted.

To load a profile:

a. Click Modify | Swept Blend tab ➤ Swept Blend panel, and select a profile from the Profile drop-down.
   If the profile you need is not already loaded in the project, click (Load Profile) to load the profile.
b. Zoom in to see the profile.
c. Use the X, Y, Angle, and Flip options to adjust the position of the profile.
   Enter values for X and Y to specify the offset for the profile.
   Enter a value for Angle to specify the angle of the profile. The angle rotates the profile around the profile origin. You can enter negative values to rotate in the opposite direction.
   Click Flip to flip the profile.
d. Click Apply.

To sketch a profile:

a) On the Swept Blend panel, verify that <By Sketch> is selected and click (Edit Profile).
b) If the Go To View dialog displays, select the view where you want to sketch the profile, and click OK.
c) Use the tools on the Modify | Swept Blend > Edit Profile tab to sketch the profile. Profiles must be closed loops.
d) On the Mode panel, click (Finish Edit Mode).

6. Click Modify | Swept Blend tab ➤ Swept Blend panel ➤ (Select Profile 2).
7. Load or sketch Profile 2 using the steps above.
8. Optionally, edit the vertex connections. By editing vertex connections, you control the amount of twist in the swept blend. You can edit vertex connections in plan or 3D views.
   a. On the Modify | Swept Blend tab ➤ Swept Blend panel, click (Edit Vertices).
   b. On the Edit Vertices tab ➤ Vertex Connect panel, select (Controls on Base) or (Controls on Top).
   c. In the drawing area, click the blue controls to move the vertex connections.

d. On the Vertex Connect panel, click the (Twist Right) and (Twist Left) tools to twist the swept blend.

9. When finished, click Mode panel (Finish Edit Mode).
10. On the Properties palette, specify the swept blend properties like
    - To set the visibility of a solid swept blend, under Graphics, for Visibility/Graphics Overrides, click Edit, and specify the visibility settings.
    - To apply a material to a solid swept blend, under Materials and Finishes, click in the Material field, click , and specify a material.
    - To assign a solid swept blend to a subcategory, under Identity Data, for Subcategory, select a subcategory.
    - Click Apply.