A DVANCED
C ONSTRUCTION
I NFORMATION
D EVELOPMENT

Revit Architectural Course Content

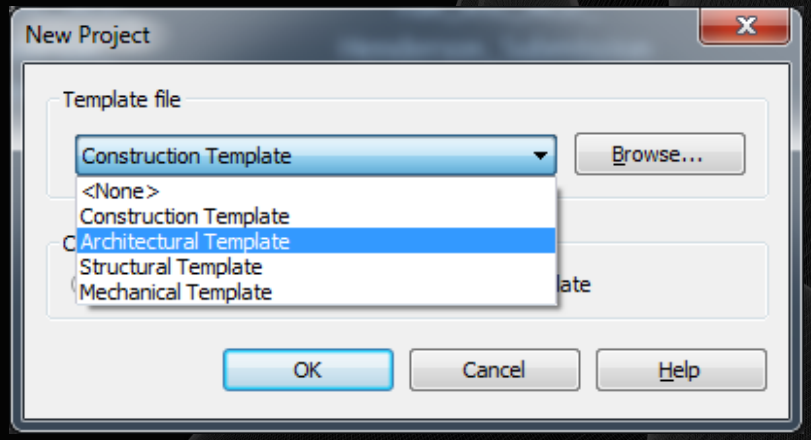
Presented by

David Fung

▪ 1.0 Starting a Project

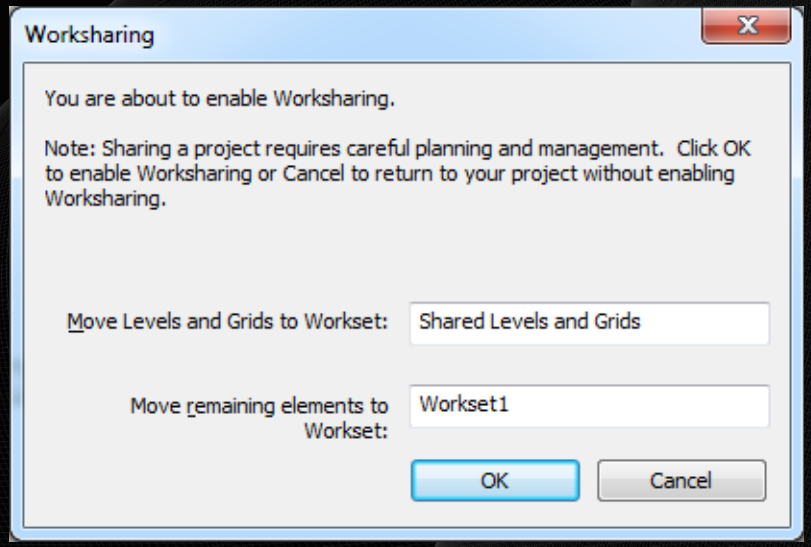
1.1 Creating a new project from a template

Select XXX Template. rte, Click Open, and then click OK.



1.2 Accessing multiuser Worksharing projects

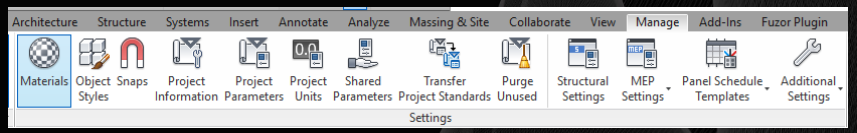
Worksharing is a design method that allows multiple team members to work on the same project model at the same time.



▪ 1.0 Starting a Project

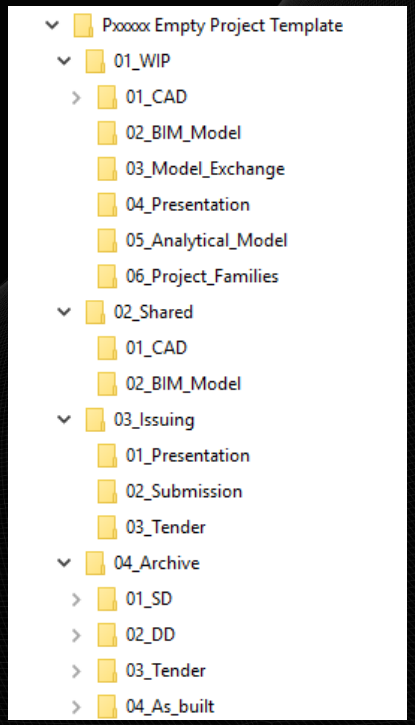
1.3 Configuring project settings

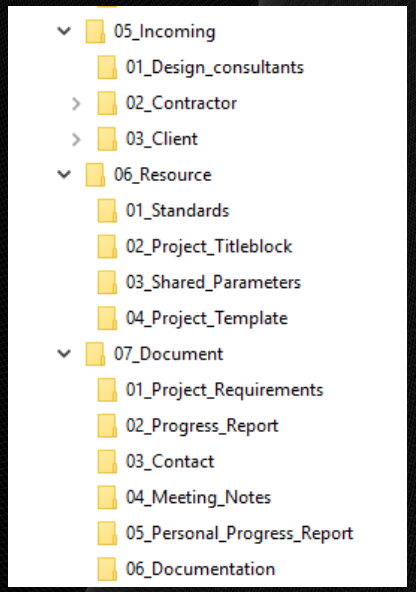
Specify options for project customization, including project units, materials, fill patterns, line styles, and more.



1.4 Folder Structure

The following folder structure is provided as an example arrangement, designed to encourage compliancy with the strategies contained within this standard.

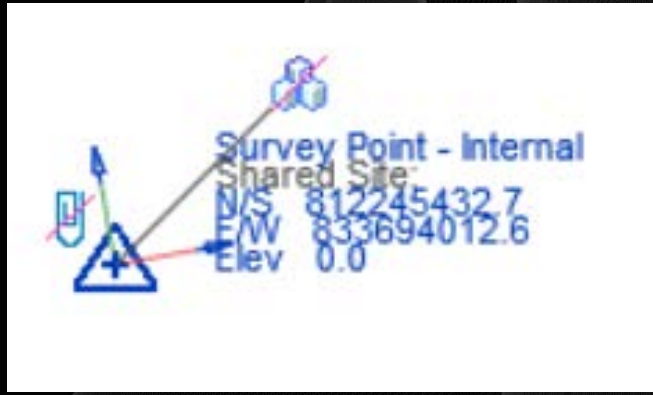




▪ 1.0 Starting a Project

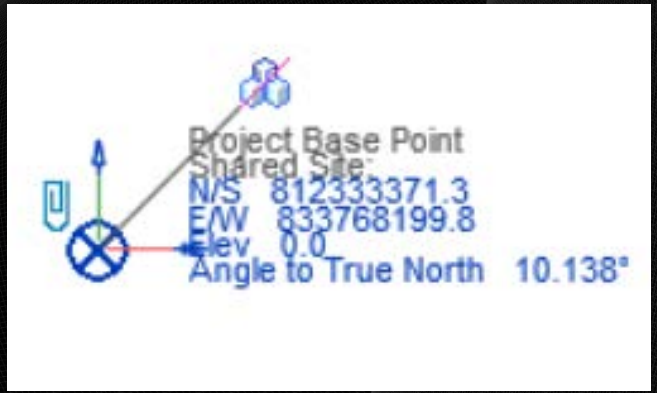
1.5 Setting up Survey Point

Actual Geographical location according to survey plan



1.6 Setting up Project Base Point

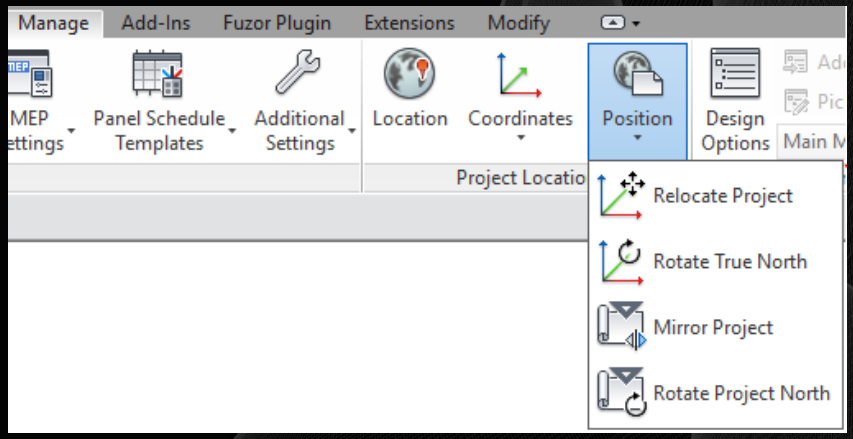
Common point for Linking File (Usually Cross of Gridline)



▪ 1.0 Starting a Project

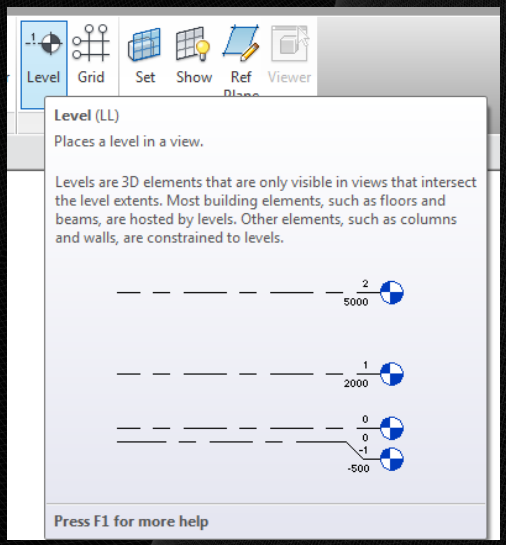
1.7 Set up Project North and True North

To provide the proper context for the building in relation to the building lot, specify True North in relation to Project North.



1.8 Adding Levels

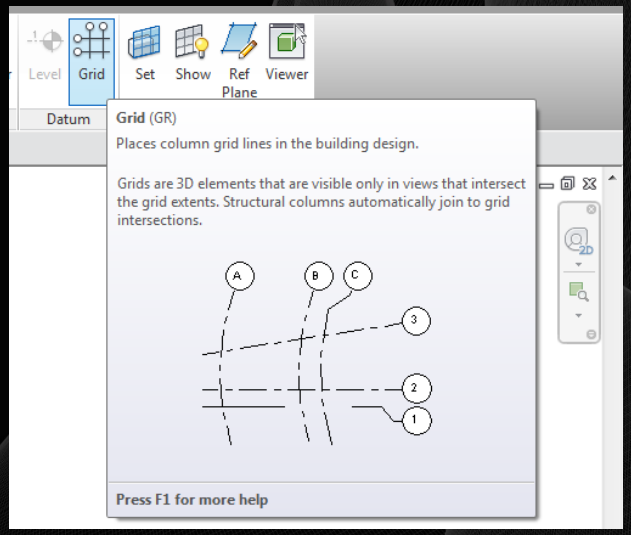
In addition to creating a level for each story in a building, you can also create reference levels, such as sill level.



▪ 1.0 Starting a Project

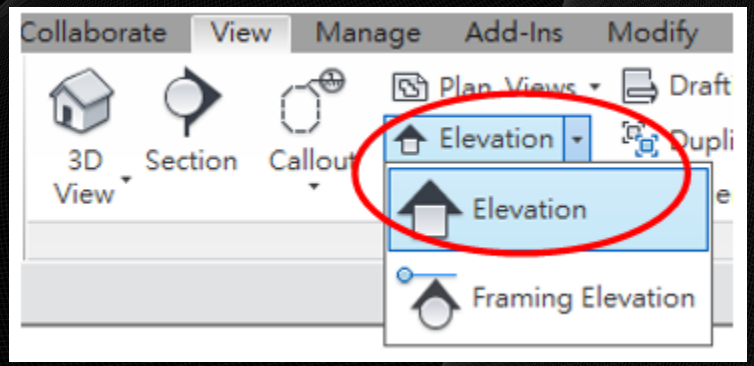
1.9 Adding grids

Grids are annotation elements that help organize your design.



1.10 Adding Elevation

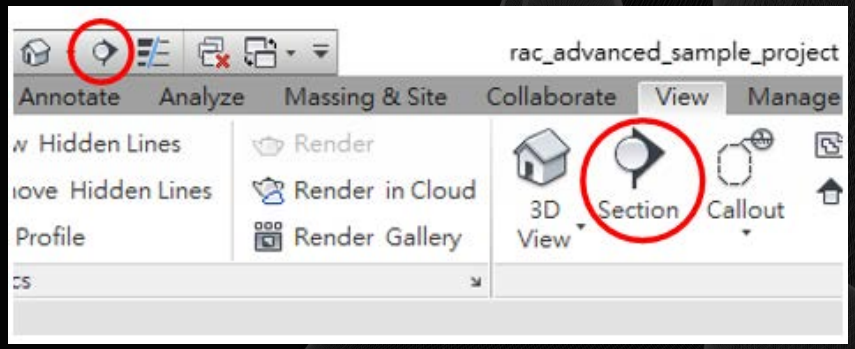
View your model from numerous elevation perspectives.



▪ 1.0 Starting a Project

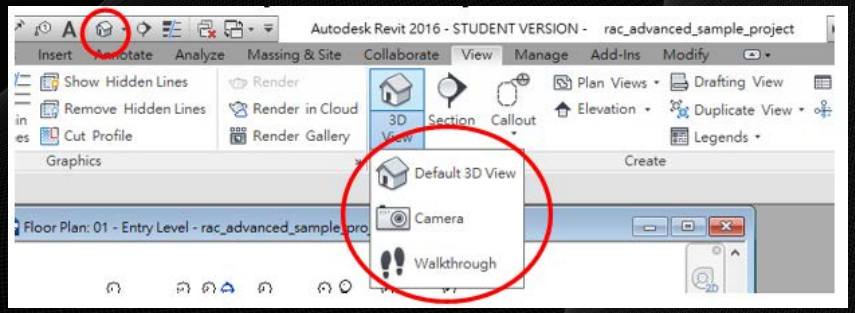
1.11 Adding Section

Draw Section Mark in plan, section, elevation, and detail views. Section views display as section representations in intersecting views.



1.12 3D View

Create perspective and orthographic 3D views, and enhance them by adding a background, adjusting the camera position or extents, or changing view properties.



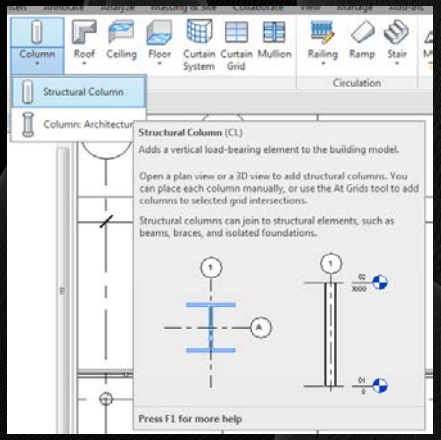
▪ 2.0 Modeling Basics

2.1 Adding Columns

1.Click Architecture tab → Build panel → Column drop-down → Column: Architectural

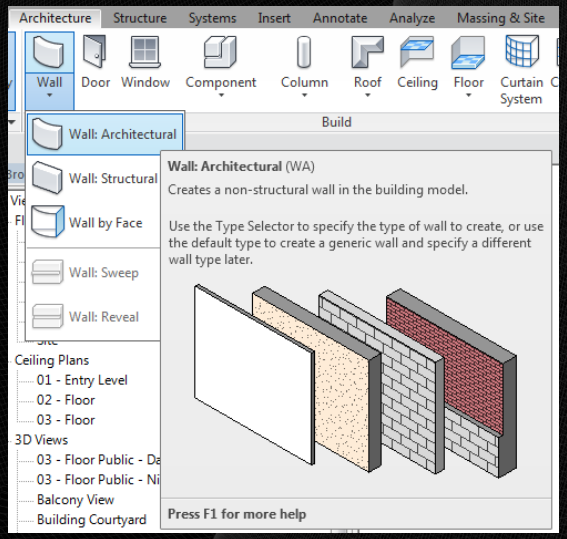
2.Click in the drawing area to place the column.

If you need to move the column, select it and drag it to a new position.



2.2 Adding walls

After selecting the Wall tool, the Options Bar displays the different options for drawing the wall segments. Select the rectangular shape to draw the external walls.



2.0 Modeling Basics

2.3 Using Snaps

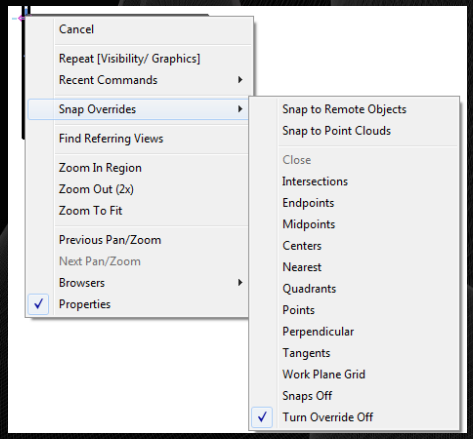
1.Choose the element to place.

For elements that require more than one pick (such as a wall), select the element and make the first pick.

2.Do one of the following:

Type the keyboard shortcut. These shortcuts are listed in the Snaps dialog.
Right-click, click Snap Overrides, and select an option.

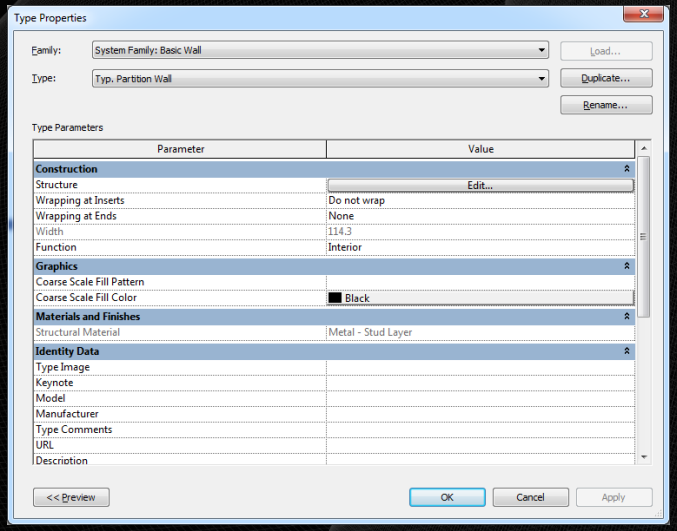
3.Finish placing the element.



2.4 Wall properties and types

Change wall type properties to modify its structure, wrapping behavior, function, and more.

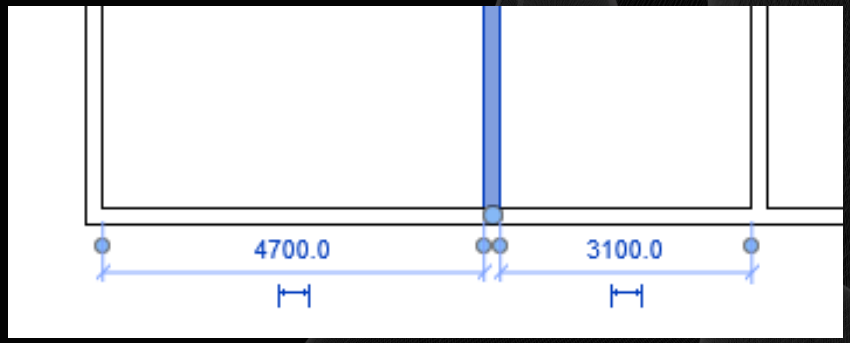
To change type properties, select an element and click Edit Type in Properties panel



▪ 2.0 Modeling Basics

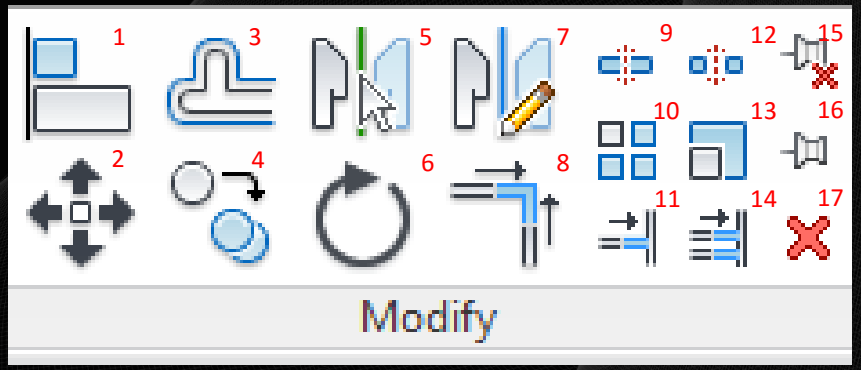
2.5 Location walls

Temporary dimensions between walls will be shown by moving the selected wall.



2.6 Using the modify tools

1. Align
2. Move
3. Offset
4. Copy
5. Mirror – Pick Axis
6. Rotate
7. Mirror – Draw Axis
8. Trim/Extend to Corner
9. Split Element
10. Array
11. Trim/Extend Single Element
12. Split with Gap
13. Scale
14. Trim/Extend Multiple Elements
15. Unpin
16. Pin
17. Delete

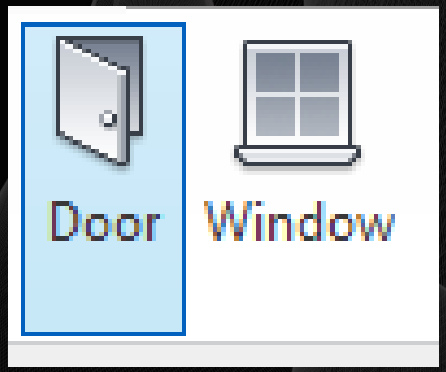


▪ 2.0 Modeling Basics

2.7 Adding doors and windows

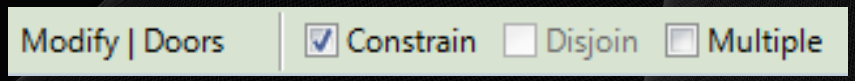
Click Architecture tab → Build panel → Door

Click Architecture tab → Build panel → Window



2. 8 Using constraints

If you move or copy more elements, it can using constrains to control model.

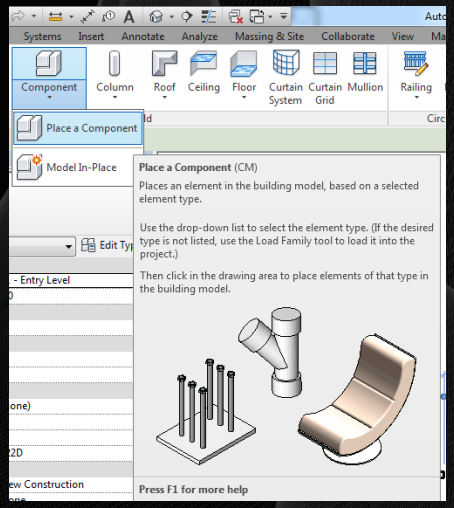


▪ 2.0 Modeling Basics

2.9 Adding plumbing fixtures and other components

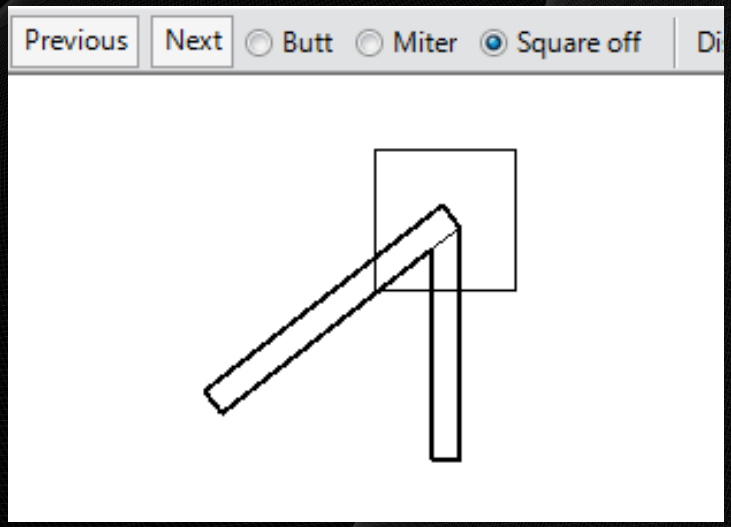
Using Autodesk Seek :

http://seek.Autodesk.com/



2.10 Wall joins

When walls intersect, Revit creates a butt join by default and cleans up the display in plan view by removing visible edges between the walls and their corresponding component layers.



▪ 3.0 Links, Imports and Groups

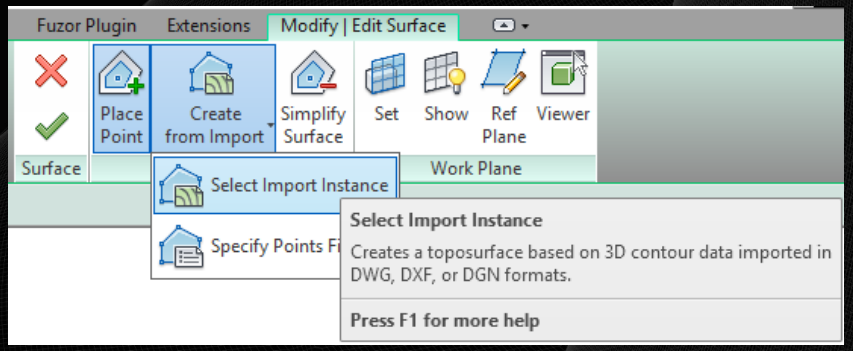
3.1 Understanding CAD inserts

You can import or link vector data from other CAD programs into a Revit project

3.2 Creating topography from a DWG link

Map a ground plane in 2-dimensions in AutoCAD and import file directly into REVIT

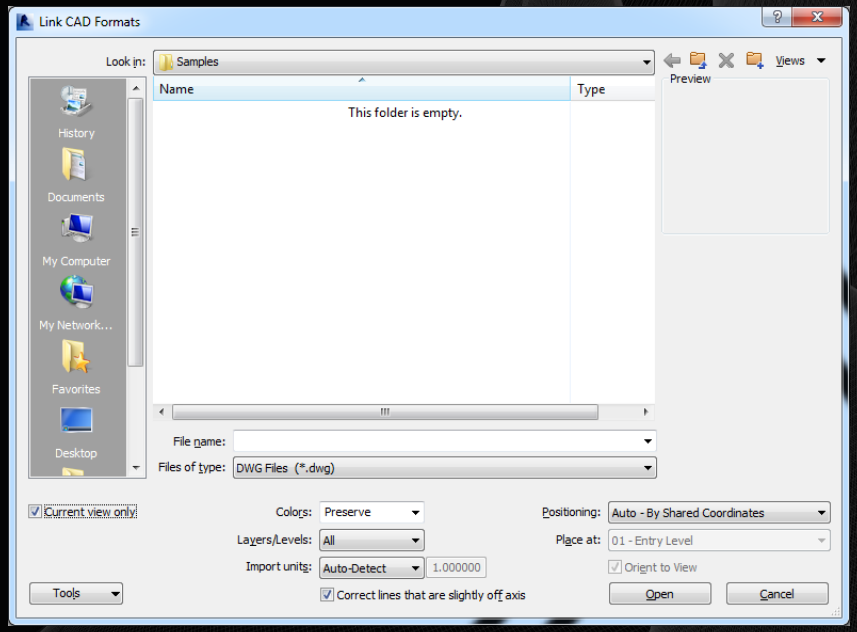
then transition 2-dimensional ground plane into 3-dimensional topography



▪ 3.0 Links, Imports and Groups

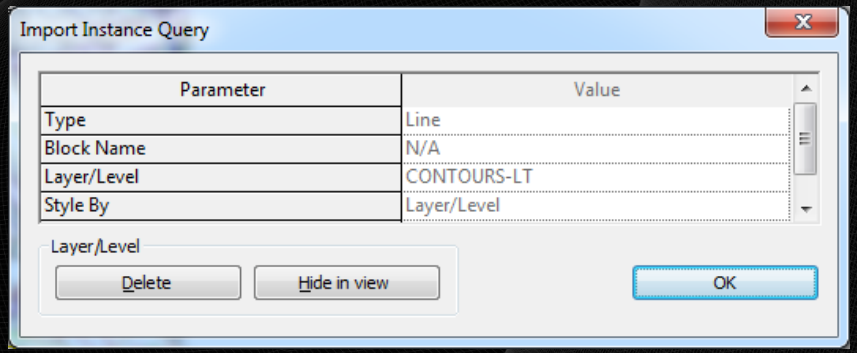
3.3 Linking AutoCAD DWG files

Click Insert tab → Import panel → Import CAD, or Insert tab → Link panel → Link CAD



3.4 Import tips

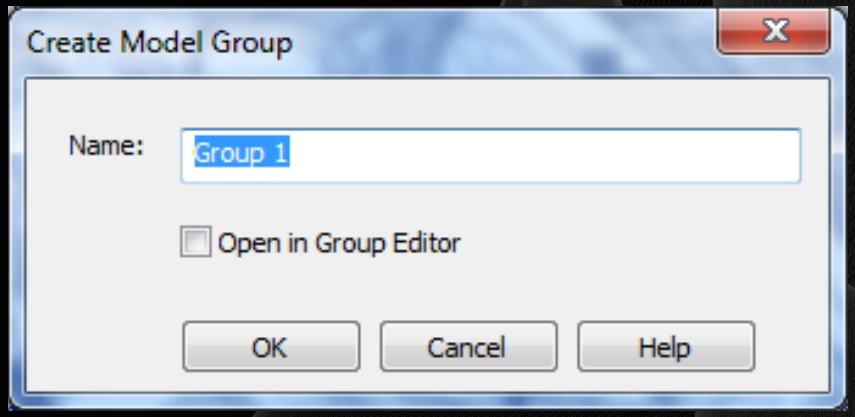
This allows you to determine the identity of an object and the layer on which it resides. You can also hide the object's layer or delete it.



▪ 3.0 Links, Imports and Groups

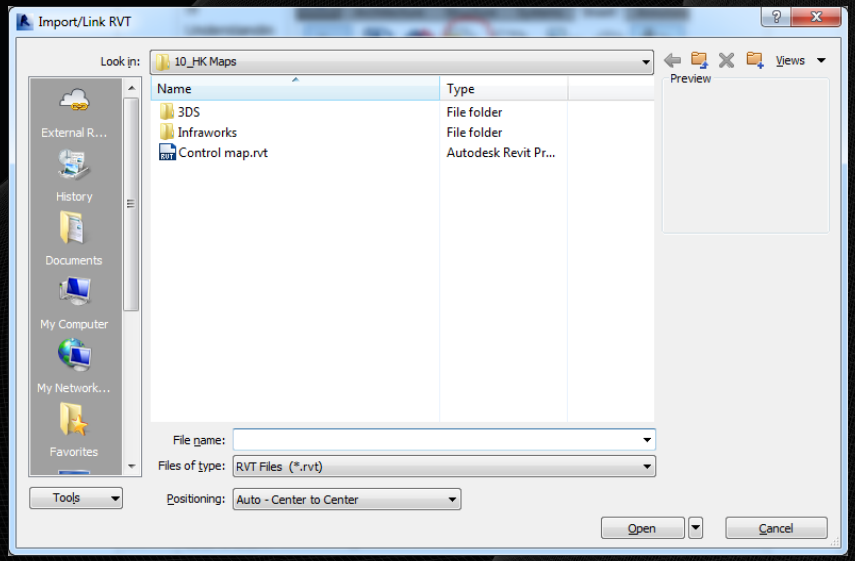
3.5 Creating a group

Create a group by selecting elements or existing groups, and using the Create Group tool.



3.6 Import Revit links

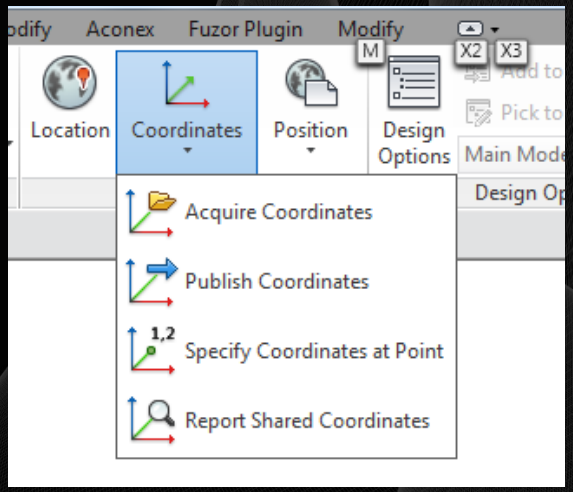
Click Insert tab → Link panel → Link Revit



▪ 3.0 Links, Imports and Groups

3.7 Establishing shared coordinates

Use the Specify Coordinates at a Point tool or enter the coordinates on the Site tab of the Building Site Export dialog, using the coordinates provided by the civil engineer.

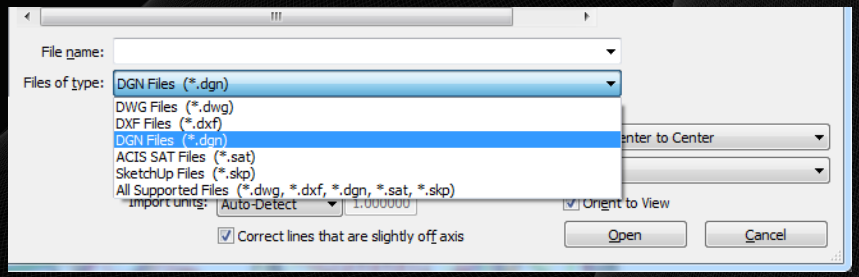


3.8 Understanding file formats

CAD formats: DGN, DWF™, DWG™, DXF™, IFC, SAT, and SKP

Image formats: BMP, PNG, JPG, AVI, PAN, IVR, TGA, and TIF

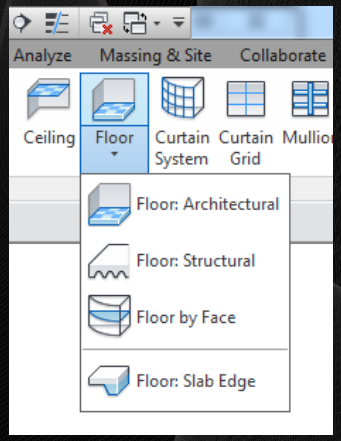
Other formats: ODBC, HTML, TXT, MDB, XLS, and gbXML



▪ 4.0 Sketch-Based Modeling Components

4.1 Working with floors

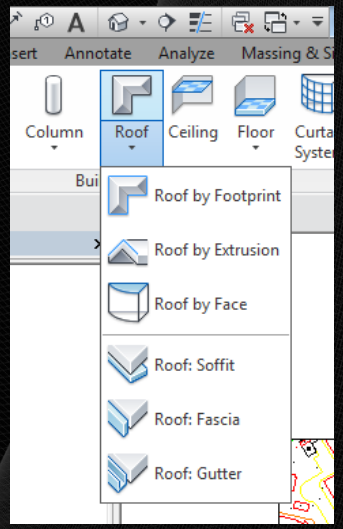
Use the floor-based template for components that will be inserted into floors. Some floor components (such as a heating register) include openings, so that when you place the component on a floor, it cuts an opening in the floor.



4.2 Working with footprint roofs

Creates a roof using the building footprint to define its boundaries.

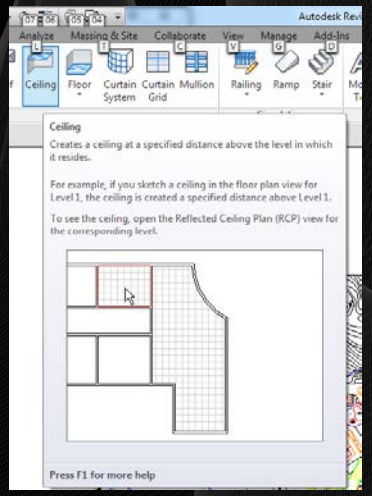
Architecture tab → Build panel → Roof drop-down → Roof by Footprint



▪ 4.0 Sketch-Based Modeling Components

4.3 Working with ceilings

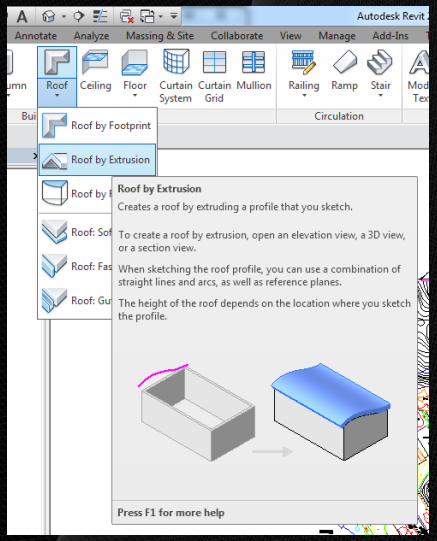
Use the ceiling-based templates to create components that will be inserted into ceilings. Some ceiling components include openings, so that when you place the component on a ceiling, it cuts an opening in the ceiling. Examples of ceiling-based families include sprinklers and recessed lighting fixtures.



4.4 Working with extrusion roofs

Creates a roof by extruding a profile that you sketch.

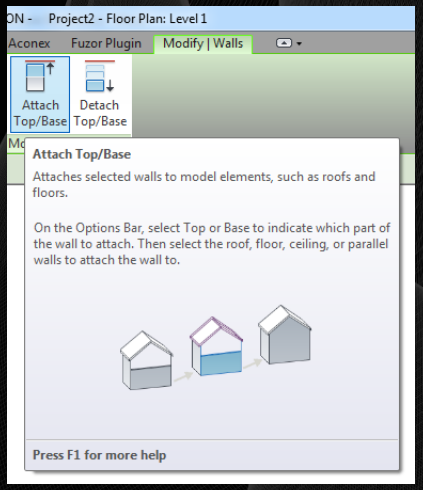
Architecture tab → Build panel → Roof drop-down → Roof by Extrusion



4.0 Sketch-Based Modeling Components

4.5 Attaching walls to roofs

After placing a wall, you can override its initial top and base constraints by attaching its top or base to another element in the same vertical plane.

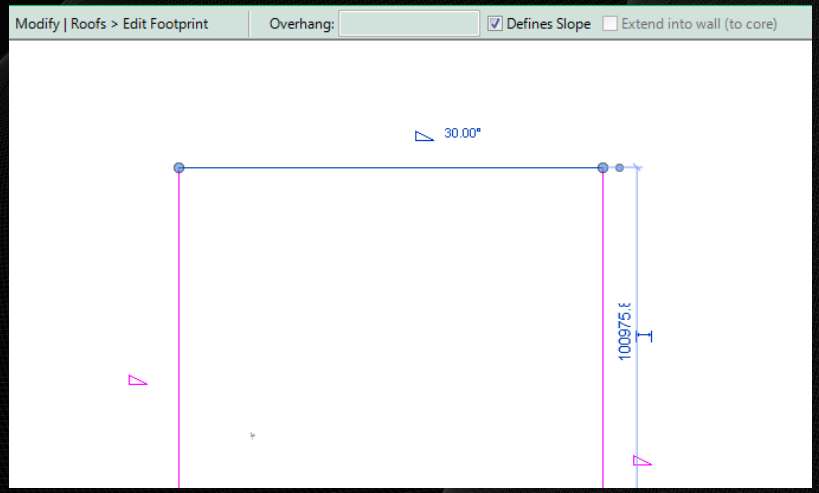


4.6 Using the shape editing tools to create a flat roof

Specify slope defining lines. To change the slope definition of a line, select the line and, on the Properties palette, click Defines Roof Slope. You can then change the slope value.

4.7 Working with slope arrows

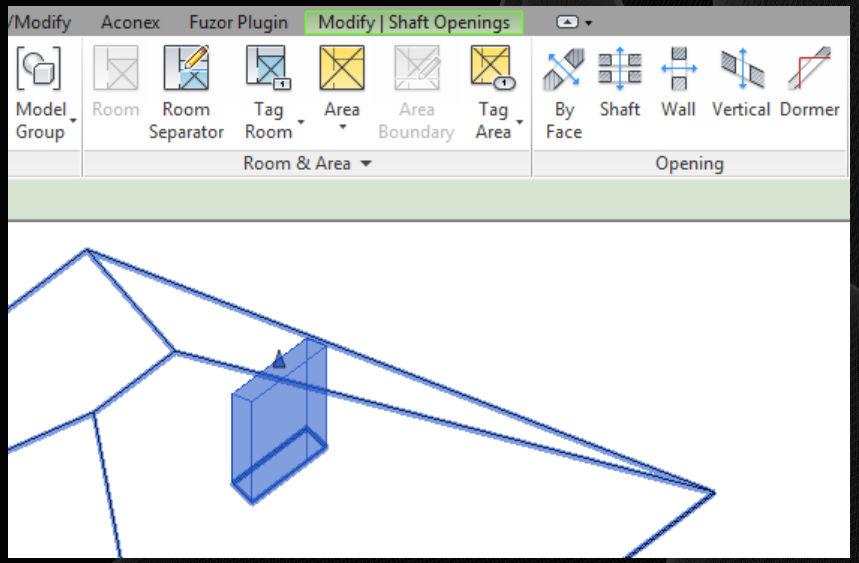
When a roof line is set to slope defining, this  symbol appears adjacent to it



▪ 4.0 Sketch-Based Modeling Components

4.8 Adding openings

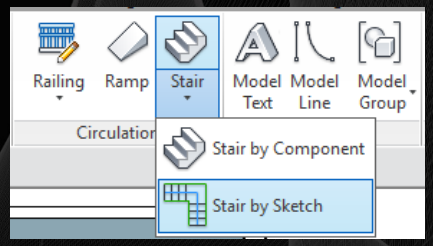
Use an Opening tool to cut openings in walls, floors, ceilings, roofs, structural beams, braces, and structural columns.



▪ 5.0 Stairs

5.1 Working with stairs

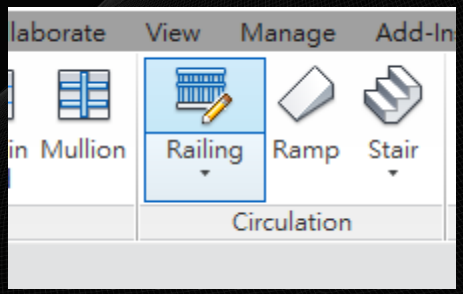
Architecture tab → Circulation panel → Stair drop-down → Stair by Sketch

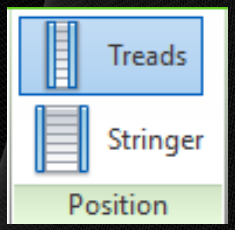


5.2 Adding sketch railings

Create railings that is free-standing such as floors, ramps, or stairs

Architecture tab → Circulation panel → Railing drop-down → Sketch Path



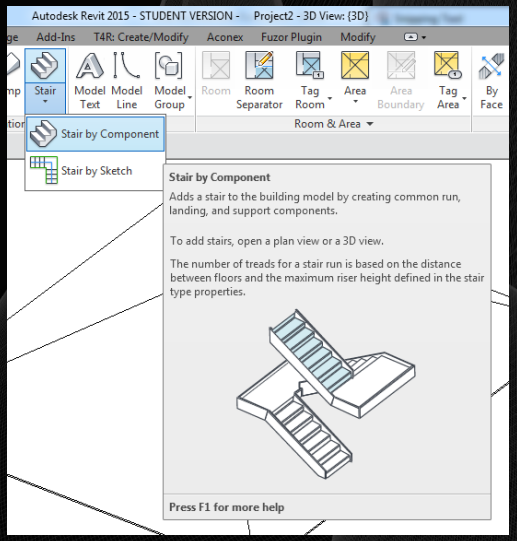


▪ 5.0 Stairs

5.3 Working with component-based stairs

Create a stair by assembling common run, landing, and support components.

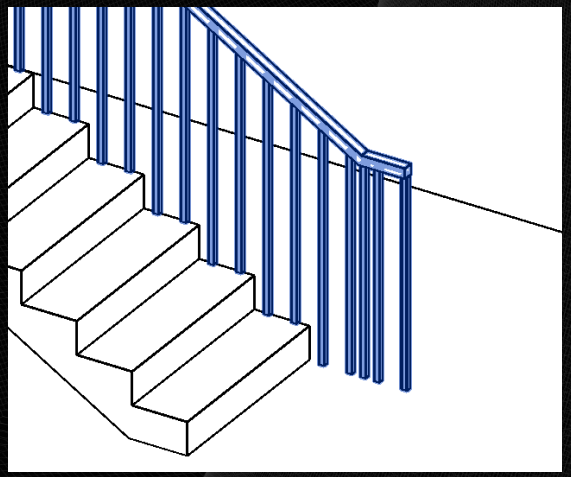
Architecture tab → Circulation panel → Stair by Component



5.4 Adding a railing on a host

Create railings that is attached to hosts such as stairs.

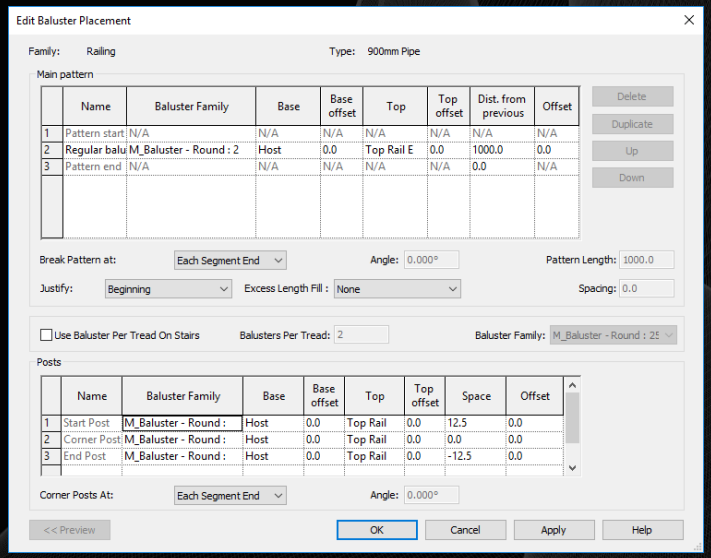
Architecture tab → Circulation panel → Railing drop-down → Place on Host



▪ 5.0 Stairs

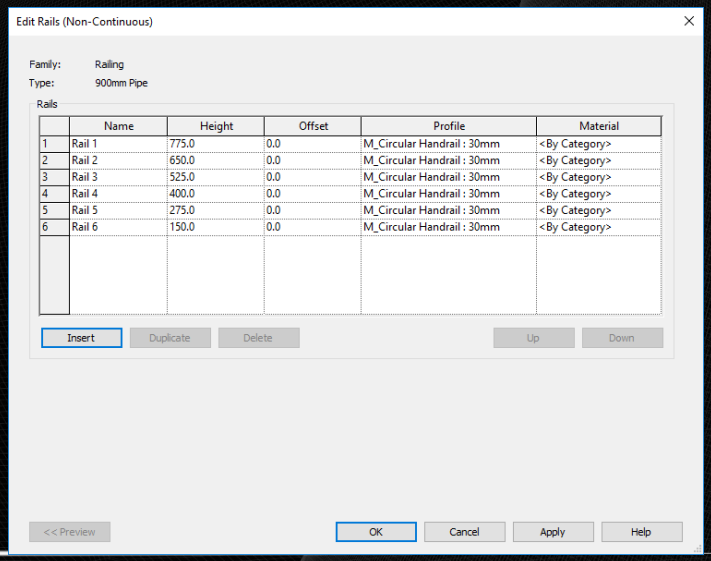
5.5 Edit Baluster Placement

Use the Main Pattern section of the Edit Baluster Placement dialog to customize balusters for railings.



5.6 Edit Rails (Non-Continuous)

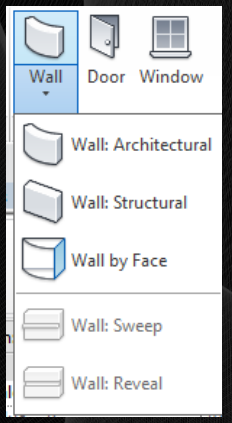
In the Type Properties dialog, for Rail Structure (Non-Continuous), click Edit.



6.0 Complex Walls

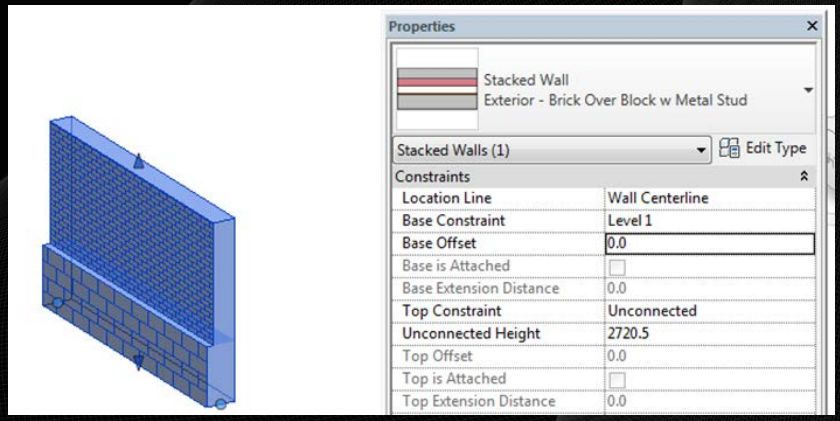
6.1 Creating a custom basic wall type

To change the wall type assigned to an existing wall, select the wall in the drawing area and then change the Type Selector setting.



6.2 Understanding stacked walls

To place inserts in a vertically stacked wall, you may need to use the Pick Primary Host tool to switch between the vertically stacked wall and one of the walls that compose it.

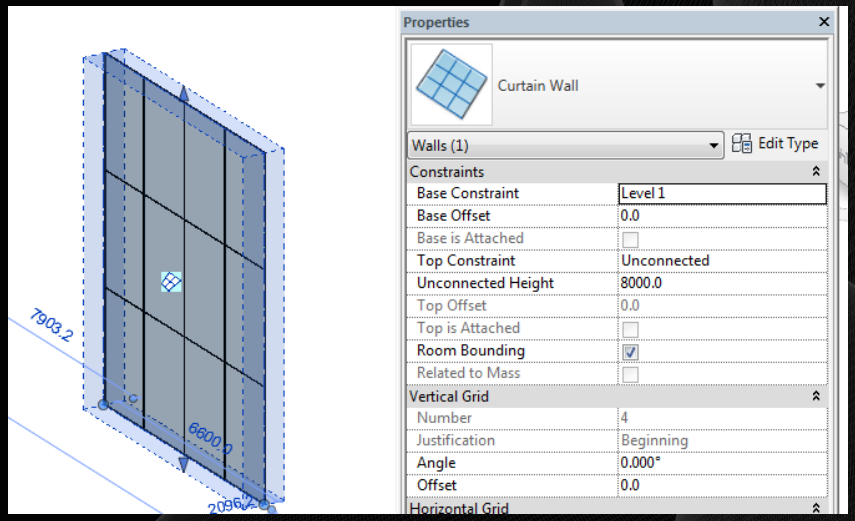


6.0 Complex Walls

6.3 Adding curtain walls

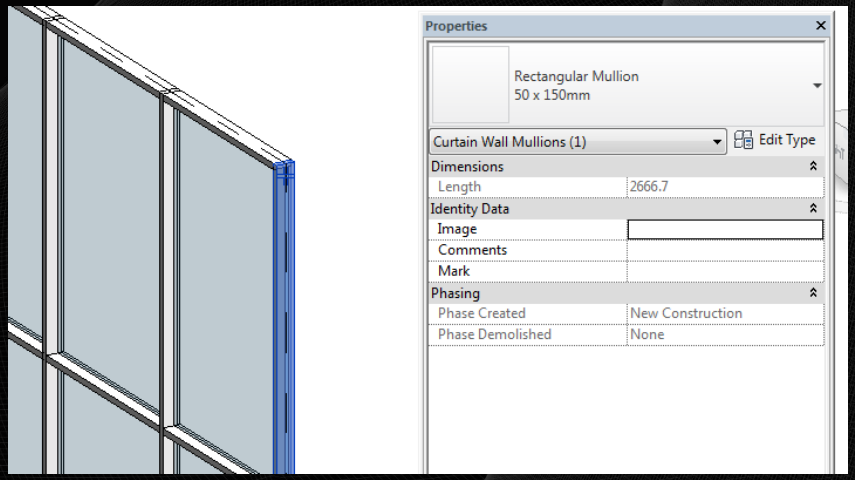
Use curtain element tools to create building facades.

1. Architecture tab → Build panel → Wall drop-down → Wall: Architectural
   On the Type Selector, choose a curtain wall family.
2. Architecture tab → Build panel → Curtain System or Curtain Grid or Mullion
3. Massing & Site tab →Model by Face panel → Wall by Face



6.4 Adding curtain grids, mullions, and panels

After building the curtain wall, properties of curtain grids, mullions and panels can be modified in Edit Type.



▪ 6.0 Complex Walls

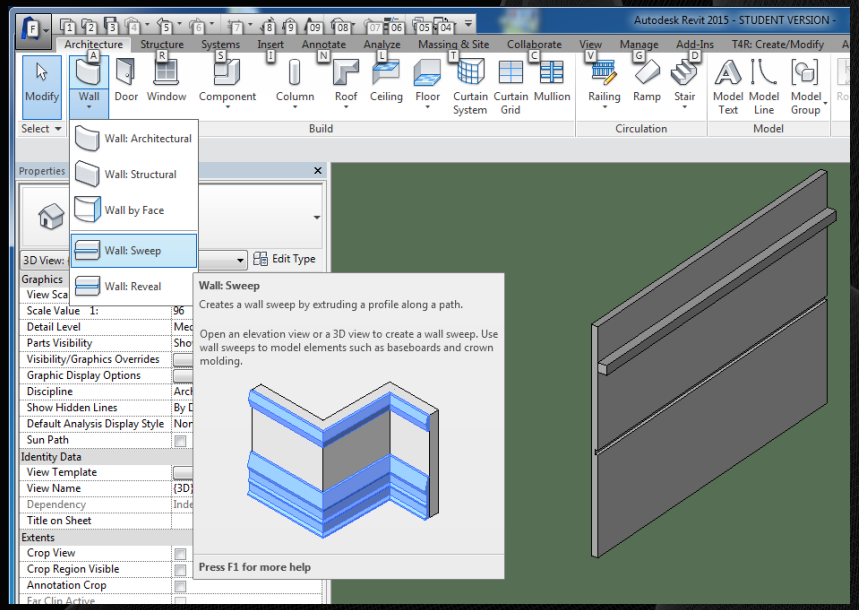
6.5 Creating wall sweeps and reveals

Use the Sweep tool to add a baseboard, crown molding, or other type of decorative horizontal or vertical projection to a wall:

Architecture tab → Build panel → Wall drop-down → Wall: Sweep

Use the Reveal tool to add a decorative horizontal or vertical cutout to a wall in an elevation or 3D view:

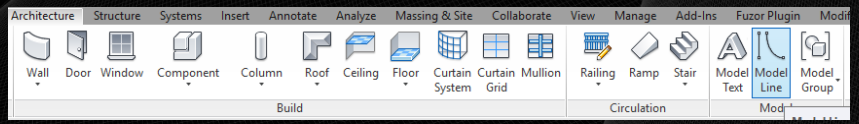
Architecture tab → Build panel → Wall drop-down → Wall: Reveal



6.6 Model lines

Architecture tab → Model panel → Model Line

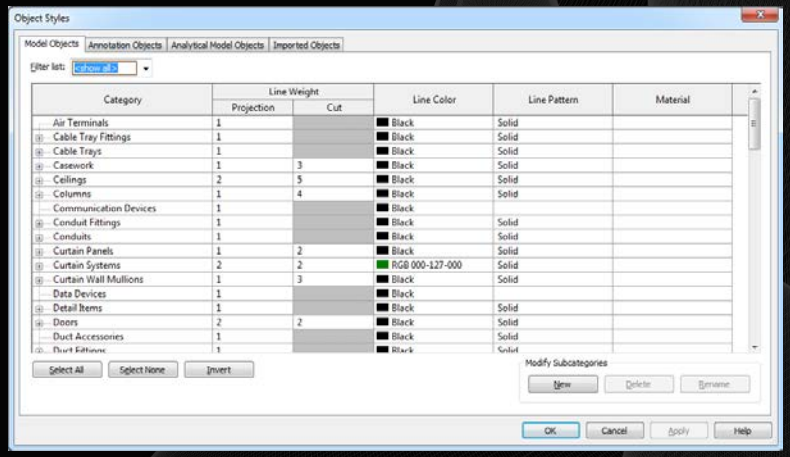
Structure tab → Model panel → Model Line



▪ 7.0 Visibility and Graphic Controls

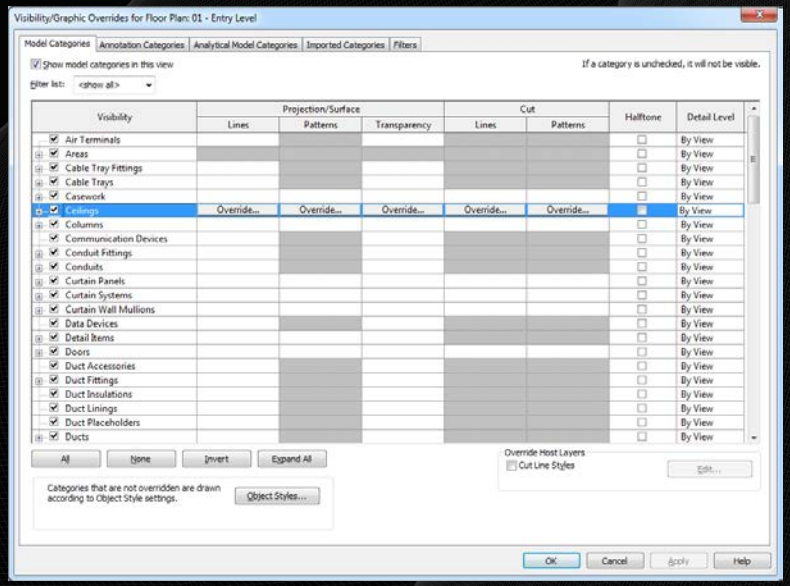
7.1 Using object styles

The Object Styles tool specifies line weights, line colors, line patterns, and materials for different categories and subcategories of model objects, annotation objects, and imported objects in a project.



7.2 Working with visibility and graphic overrides

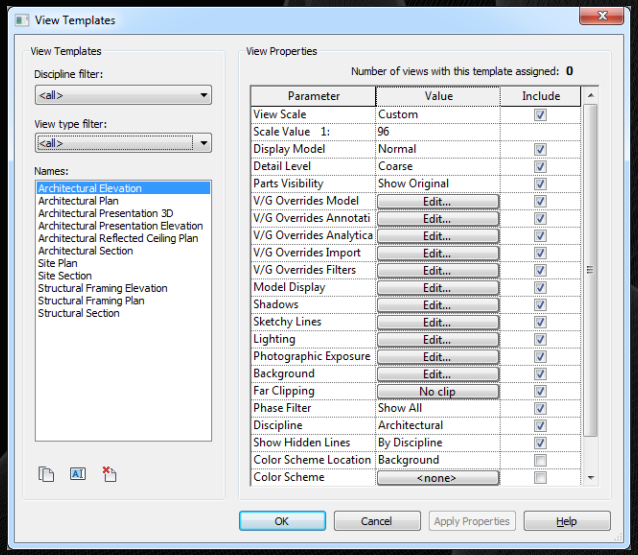
Most overrides for visibility and graphic display are made in the Visibility/Graphics dialog. The exception is for individual element overrides; these are made in the View-Specific Element Graphics dialog.



7.0 Visibility and Graphic Controls

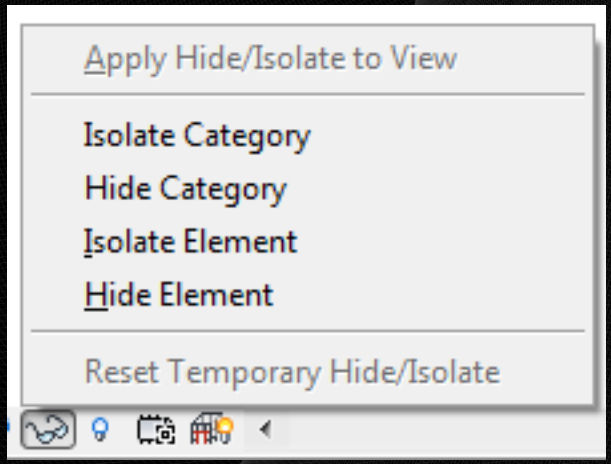
7.3 Using view templates

A view template is a collection of view properties, such as view scale, discipline, detail level, and visibility settings.



7.4 Hiding and isolating objects in a model

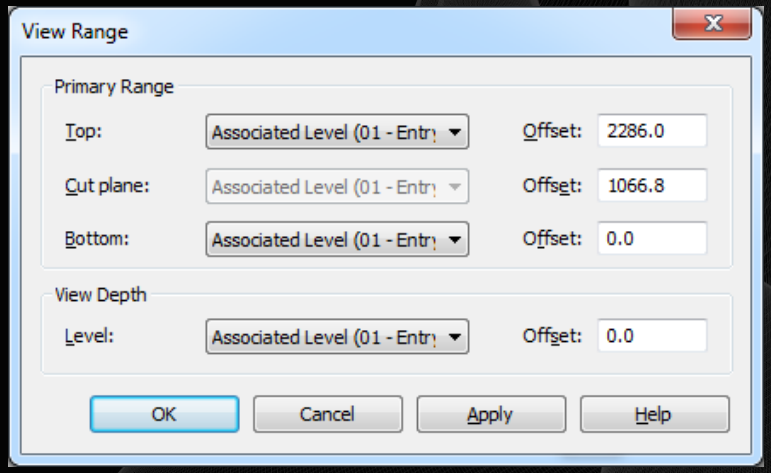
Temporarily hiding or isolating elements or element categories may be useful when you want to see or edit only a few elements of a certain category in a view.



▪ 7.0 Visibility and Graphic Controls

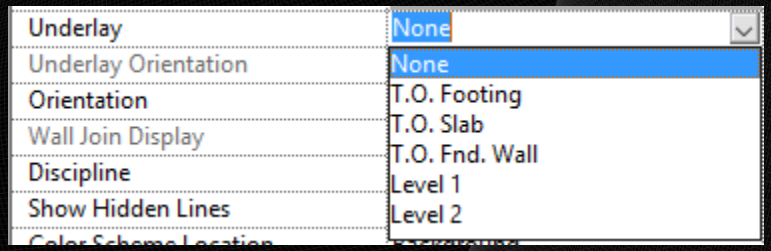
7.5 Understanding view range

The view range is a set of horizontal planes that control the visibility and display of objects in a plan view.



7.6 Displaying objects above and below in plan views

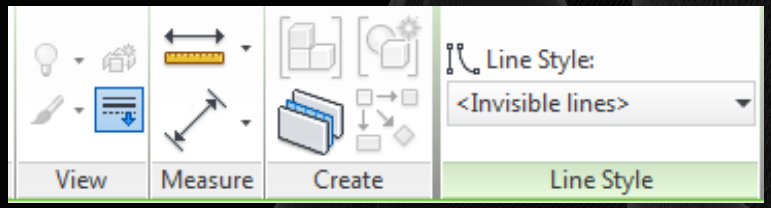
Revit lets you control the line weight and pattern used for underlays, and the brightness of halftone elements.



7.0 Visibility and Graphic Controls

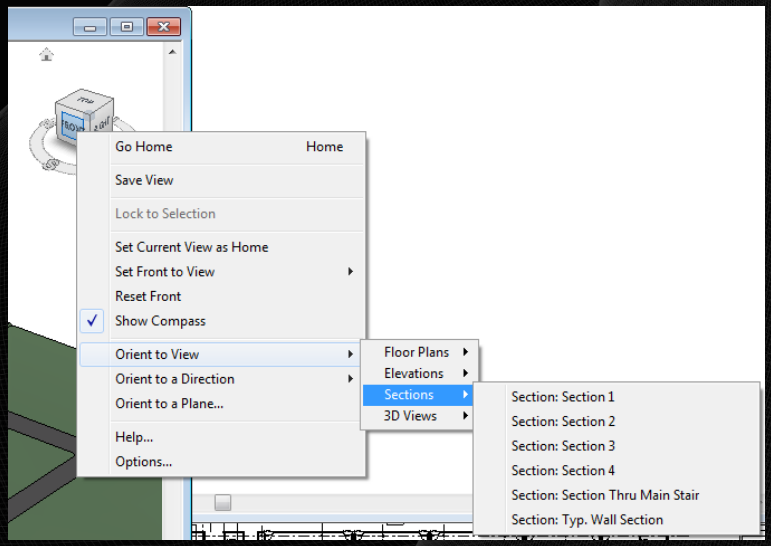
7.7 Using the Linework tool

The Linework tool does not create new model or detail lines in the view. Instead, it overrides the current line style of the selected line and applies a different line style.



7.8 Using cutaway views

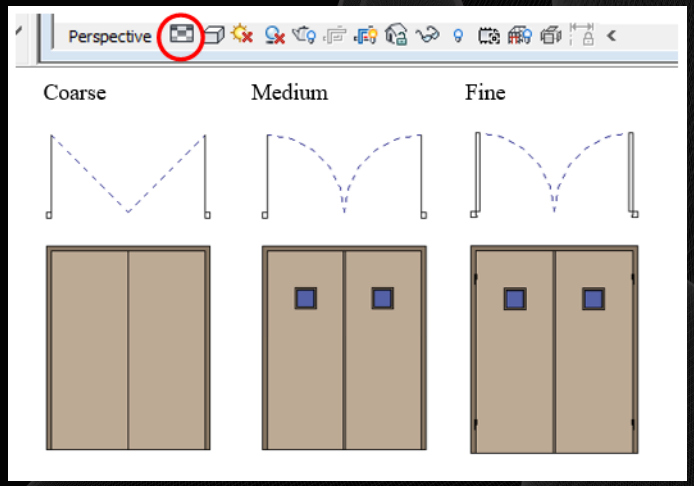
Using the ViewCube, you can orient a 3D view to any plan, elevation, section or 3D view in the project.



7.0 Visibility and Graphic Controls

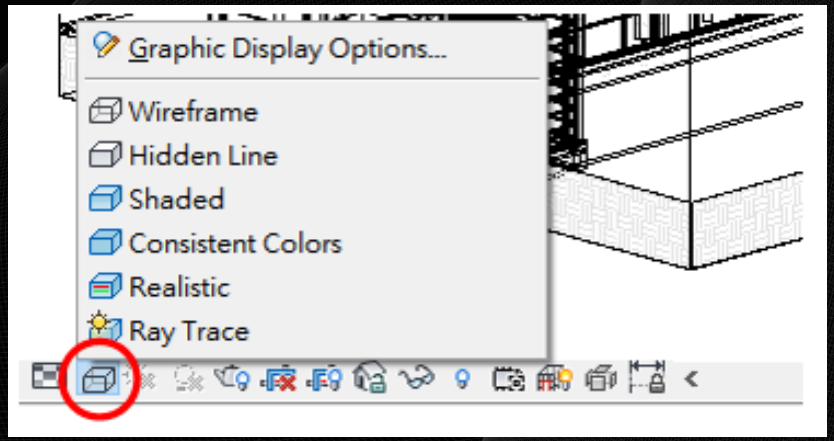
7.9 Detail Level

You can set the detail level for newly created views based on a view scale.



7.10 Visual Styles

The Wireframe style displays the image of the model with all edges and lines drawn, but with no surfaces drawn.

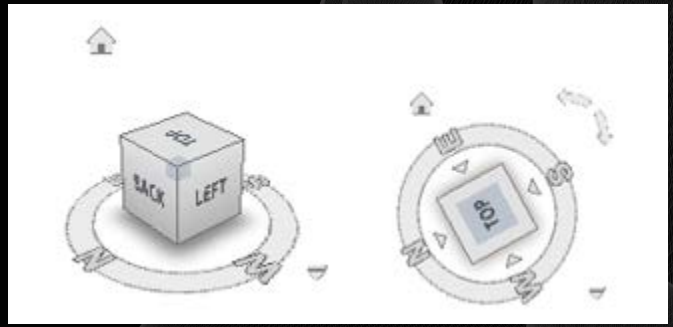


7.0 Visibility and Graphic Controls

7.11 View Cube

ViewCube is used to reorient the current view of a model. .

You can reorient the view of a model with the ViewCube by clicking pre-defined areas to set a preset view current, click and drag to freely change the view angle of the model, and define and restore the Home view.



7.12 Steering Wheels

Steering Wheels are tracking menus (that follow your cursor) from which you can access different 2D and 3D navigation aids from a single tool.

7.13 Navigation Bar

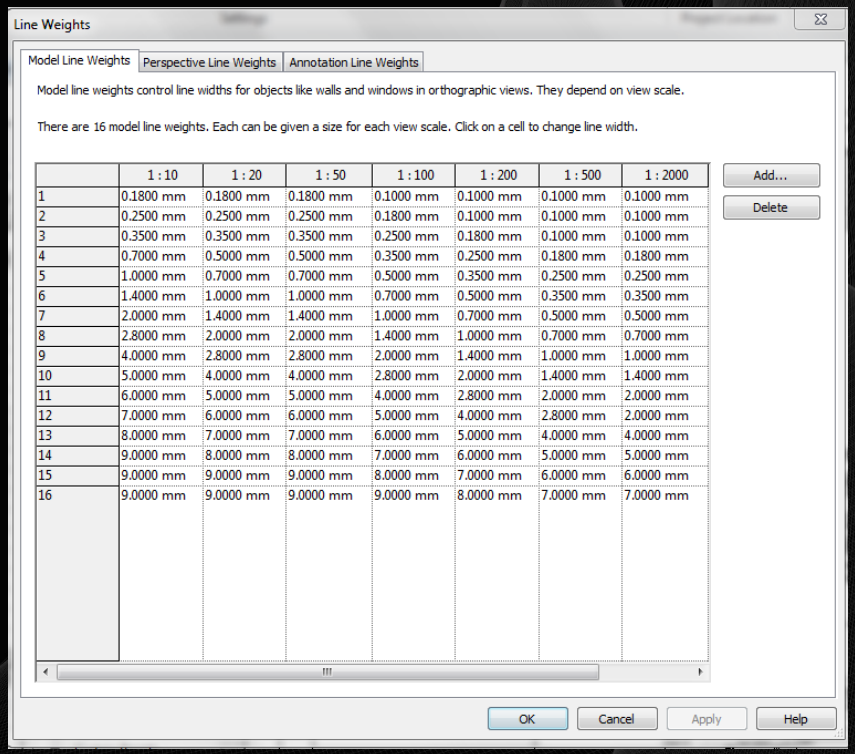
The navigation bar displays in the drawing area, along one of the sides of the current model's window. The navigation bar is activated by default.

▪ 7.0 Visibility and Graphic Controls

7.14 Setting up Line Weights

Use the Line Weights dialog to define the width of the pen used to draw lines in views.

Manage tab → Settings panel → Additional Settings drop-down → Line Weights



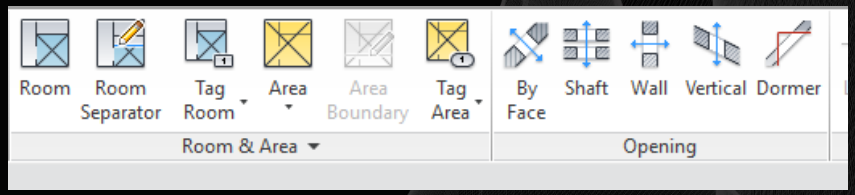
	1 : 10	1 : 20	1 : 50	1 : 100	1 : 200	1 : 500	1 : 2000
1	0.1800 mm	0.1800 mm	0.1800 mm	0.1000 mm	0.1000 mm	0.1000 mm	0.1000 mm
2	0.2500 mm	0.2500 mm	0.2500 mm	0.1800 mm	0.1000 mm	0.1000 mm	0.1000 mm
3	0.3500 mm	0.3500 mm	0.3500 mm	0.2500 mm	0.1800 mm	0.1000 mm	0.1000 mm
4	0.7000 mm	0.5000 mm	0.5000 mm	0.3500 mm	0.2500 mm	0.1800 mm	0.1800 mm
5	1.0000 mm	0.7000 mm	0.7000 mm	0.5000 mm	0.3500 mm	0.2500 mm	0.2500 mm
6	1.4000 mm	1.0000 mm	1.0000 mm	0.7000 mm	0.5000 mm	0.3500 mm	0.3500 mm
7	2.0000 mm	1.4000 mm	1.4000 mm	1.0000 mm	0.7000 mm	0.5000 mm	0.5000 mm
8	2.8000 mm	2.0000 mm	2.0000 mm	1.4000 mm	1.0000 mm	0.7000 mm	0.7000 mm
9	4.0000 mm	2.8000 mm	2.8000 mm	2.0000 mm	1.4000 mm	1.0000 mm	1.0000 mm
10	5.0000 mm	4.0000 mm	4.0000 mm	2.8000 mm	2.0000 mm	1.4000 mm	1.4000 mm
11	6.0000 mm	5.0000 mm	5.0000 mm	4.0000 mm	2.8000 mm	2.0000 mm	2.0000 mm
12	7.0000 mm	6.0000 mm	6.0000 mm	5.0000 mm	4.0000 mm	2.8000 mm	2.0000 mm
13	8.0000 mm	7.0000 mm	7.0000 mm	6.0000 mm	5.0000 mm	4.0000 mm	4.0000 mm
14	9.0000 mm	8.0000 mm	8.0000 mm	7.0000 mm	6.0000 mm	5.0000 mm	5.0000 mm
15	9.0000 mm	9.0000 mm	9.0000 mm	8.0000 mm	7.0000 mm	6.0000 mm	6.0000 mm
16	9.0000 mm	9.0000 mm	9.0000 mm	9.0000 mm	8.0000 mm	7.0000 mm	7.0000 mm

8.0 Rooms

8.1 Adding rooms

Create rooms in a plan view with the Room tool, or add them to a schedule to be placed in the model later.

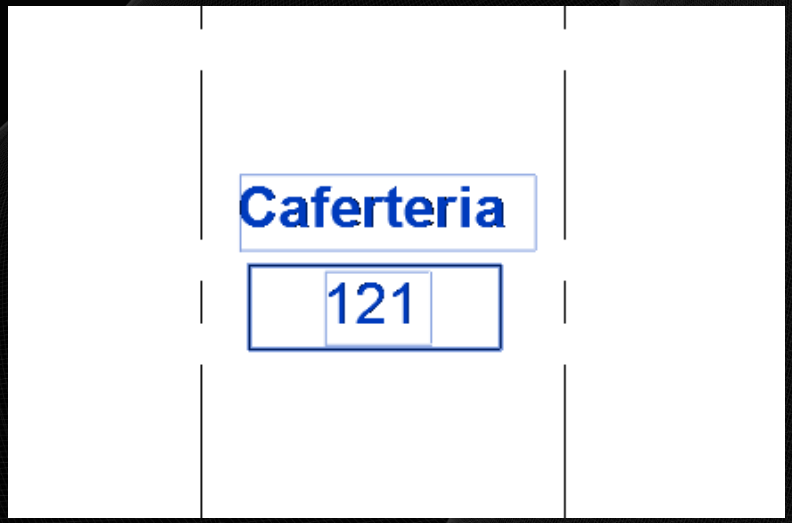
Architecture tab → Room & Area panel → Room



8.2 Controlling room numbering

Use this reference to review the specifications for the Number of Rooms check.

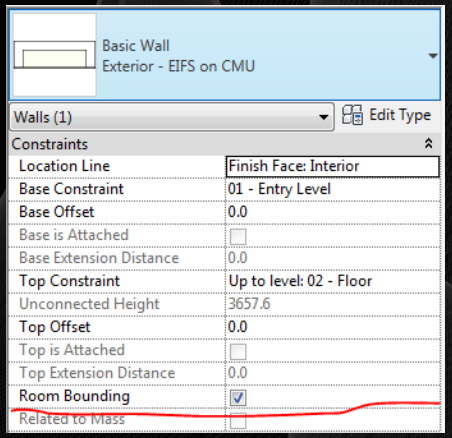
The number of rooms check counts the number of rooms.



8.0 Rooms

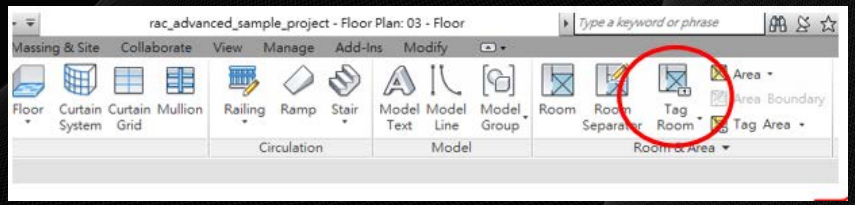
8.3 Understanding room bounding elements

To indicate that an element should be used to define the boundaries of a room for room area and volume computations, you must specify that the element is room-bounding.



8.4 Tag Room

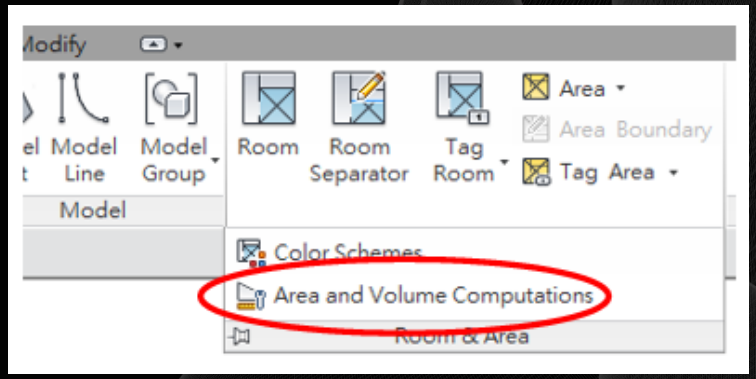
Rooms and room tags are separate but related Revit components.



▪ 8.0 Rooms

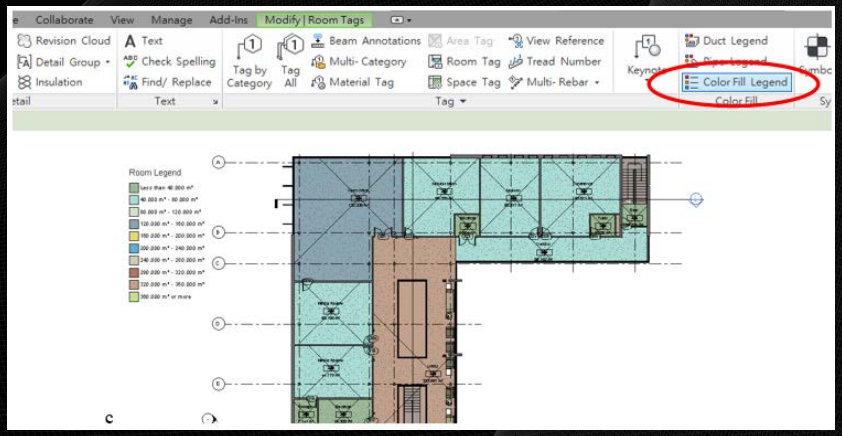
8.5 Modify Area and Volume

Click Architecture tab → Room & Area panel drop-down → Area and Volume Computations



8.6 Color Fill Legend

Click Annotate tab → Color Fill panel → Legend

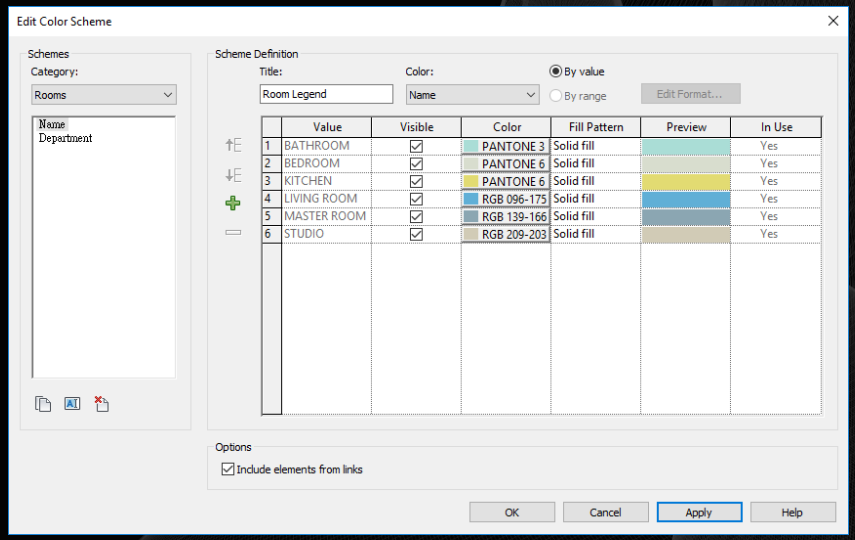


8.0 Rooms

8.7 Edit Color Scheme

If the color fill legend that displays does not reflect the color scheme that you want to use, do the following:

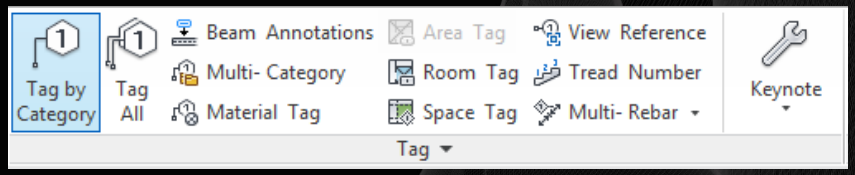
1. In the drawing area, select the legend.
2. Click Modify Color Fill Legends tab → Scheme panel → Edit Scheme
3. In the Edit Color Scheme dialog, select a different color scheme from the list, and click OK.



9.0 Schedules and Tags

9.1 Understanding tags

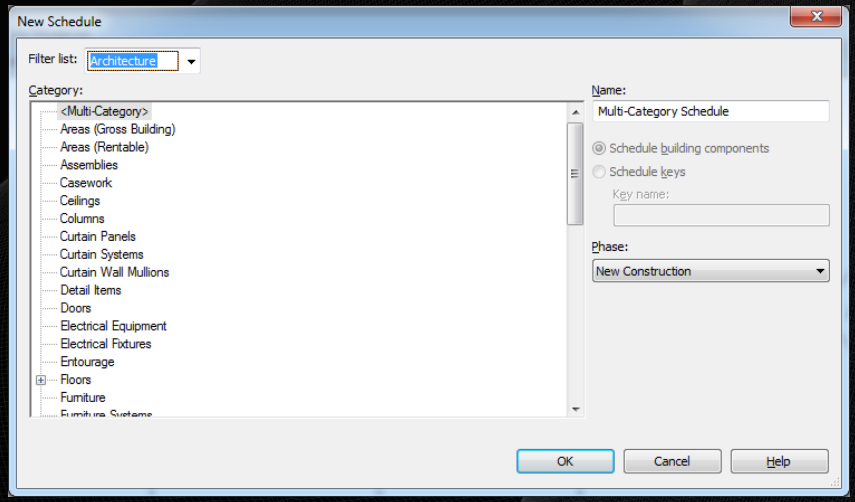
To apply tags to elements based on their categories, use the Tag by Category tool.



9.2 Adding schedule

Display lists of any type of element in a project.

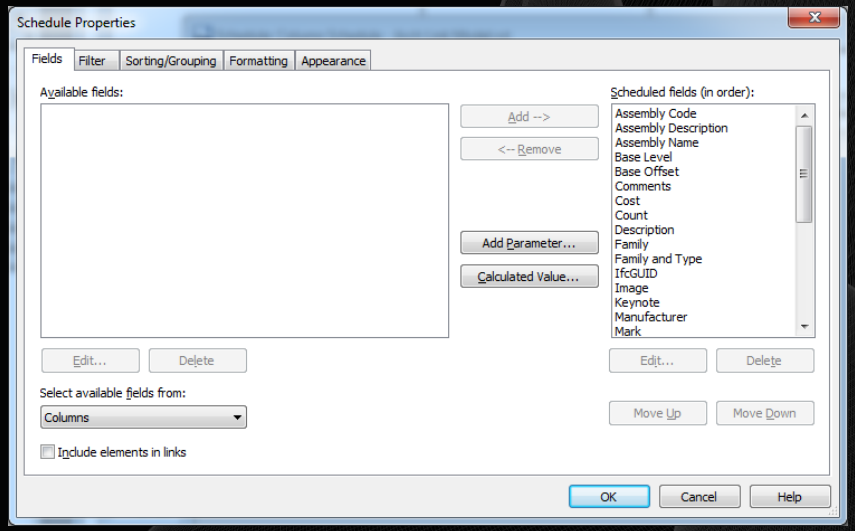
A schedule is a tabular display of information, extracted from the properties of the elements in a project. A schedule can list every instance of the type of element you are scheduling, or it can collapse multiple instances onto a single row, based on the schedule's grouping criteria.



9.0 Schedules and Tags

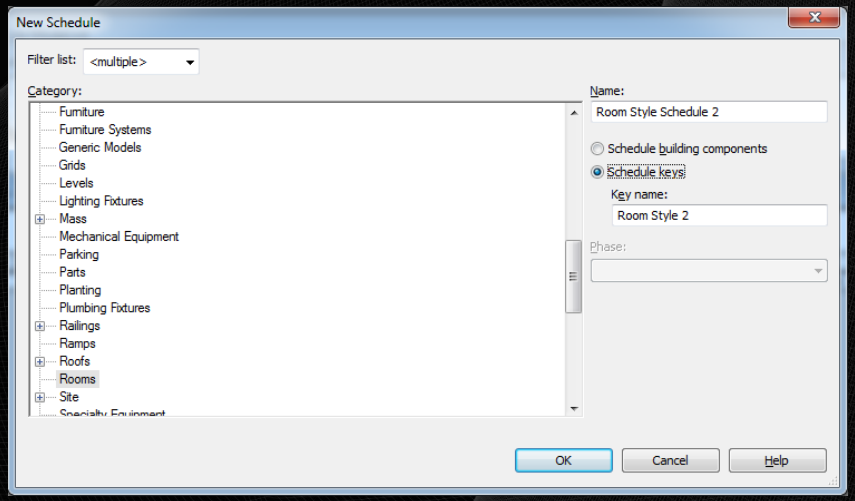
9.3 Modifying schedule views

You can modify and format schedules to improve readability and to keep them up to date with changes in your project.



9.4 Creating a key schedule

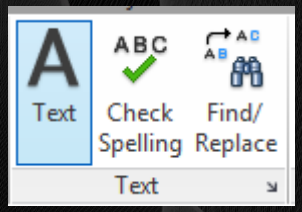
Define and use keys to automate the addition of consistent schedule information.



10.0 Annotation and Details

10.1 Adding text

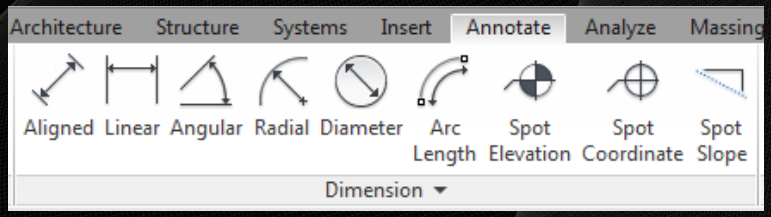
Add explanatory, instructional, technical, or other text annotations to your drawings.



10.2 Adding dimensions

Dimensions show measurements in a project

Annotate tab → Dimension panel

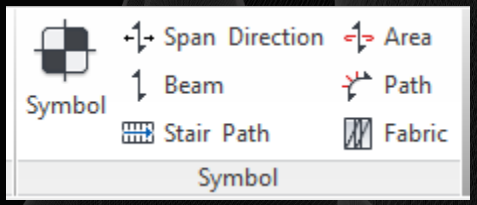


10.0 Annotation and Details

10.3 Adding symbols

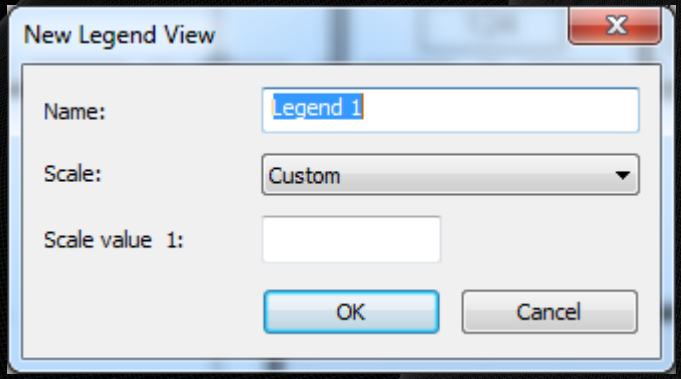
Use the Symbol tool to place 2D annotation symbols in views of the project.

Annotate tab → Symbol panel → Symbol



10.4 Adding legend view

Legend views list model components and annotations used in a project.

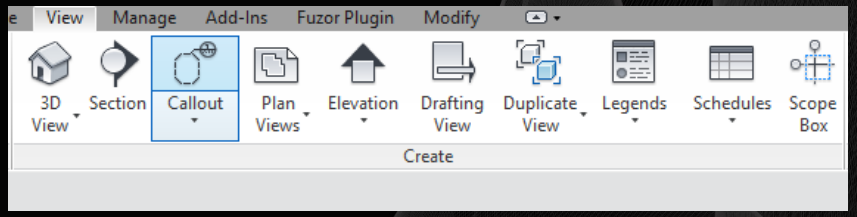


10.0 Annotation and Details

10.5 Creating a detail callout

A callout shows some portion of another view at a larger scale.

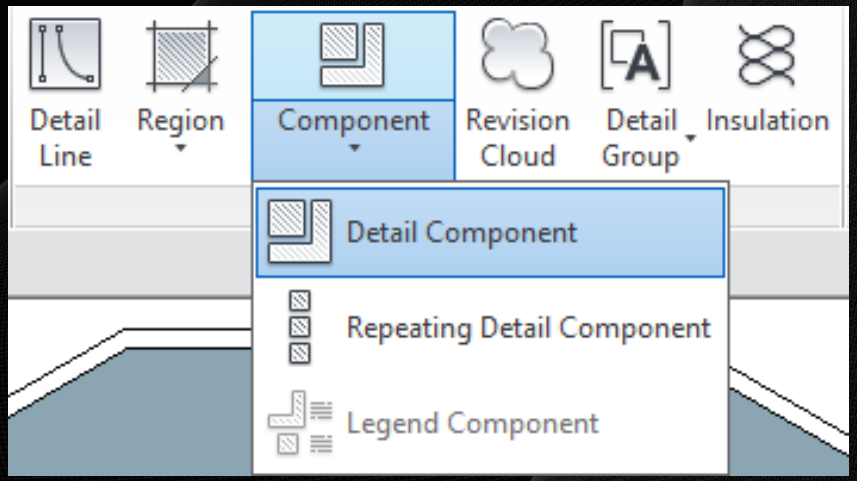
In a construction document set, use callouts to provide an orderly progression of labeled views at increasing levels of detail.



10.6 Adding detail components

Use detail components to enhance model geometry, providing construction details or other information.

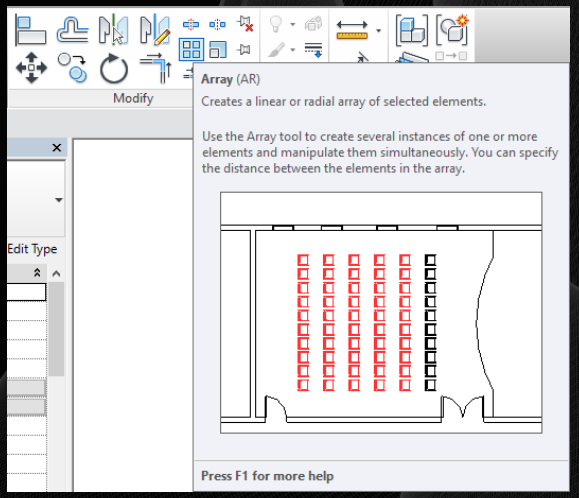
Annotate tab → Detail panel → Component drop-down → Detail Component



▪ 10.0 Annotation and Details

10.7 Using arrays to duplicate objects parametrically

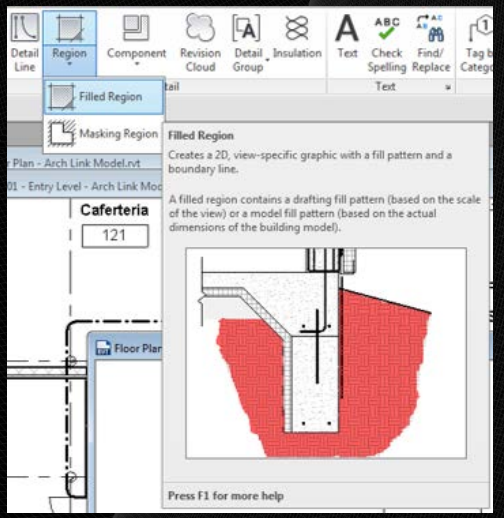
The elements of an array can follow a line (a linear array), or they can follow an arc (a radial array).



10.8 Adding filled and masking regions

Create a view-specific graphic that fills an area with a pattern. You can use filled regions when detailing a view or creating an annotation family.

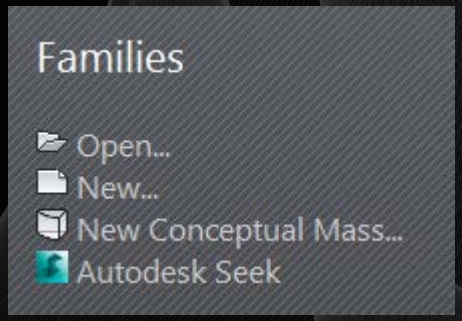
Masking regions are view-specific graphics that can be used to obscure elements in a view.



11.0 The Basics of Families

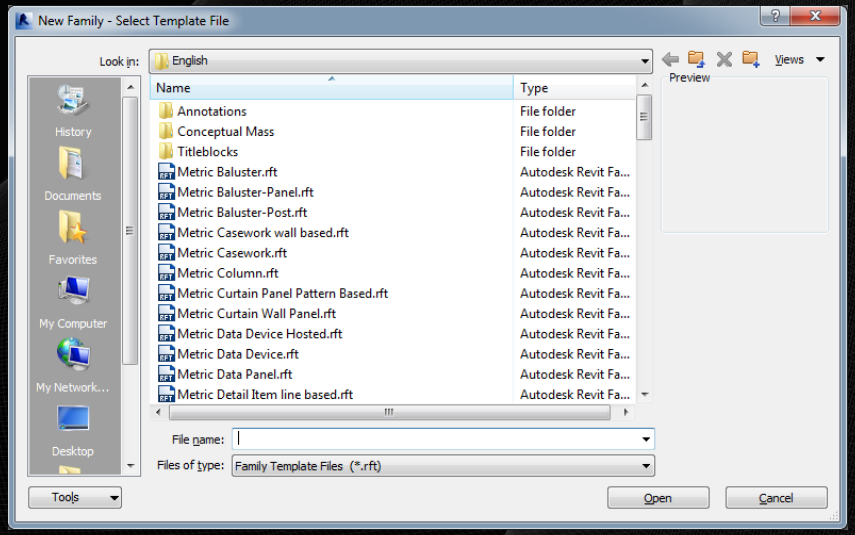
11.1 Understanding families

A family is a group of elements with a common set of properties, called parameters, and a related graphical representation.



11.2 Select suitable template and unit during create new family

When you create a family, you are prompted to select a family template that corresponds to the type of element that the family will create.

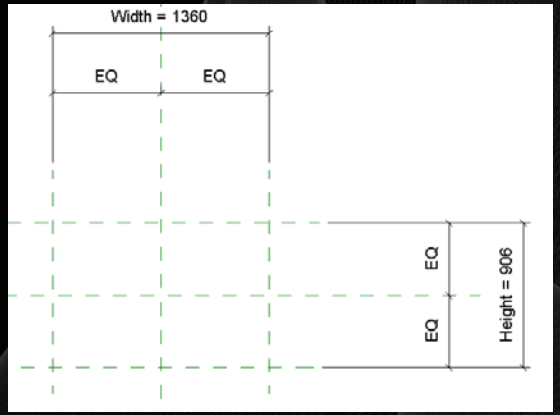


11.0 The Basics of Families

11.3 Using reference planes /line, parameters and constraints

Reference planes are an integral part of family creation. Reference planes display in each plan view that you create for a model.

Create a reference line that you can use when creating model geometry, or to create constraints for the geometry.



11.4 Adding solid geometry

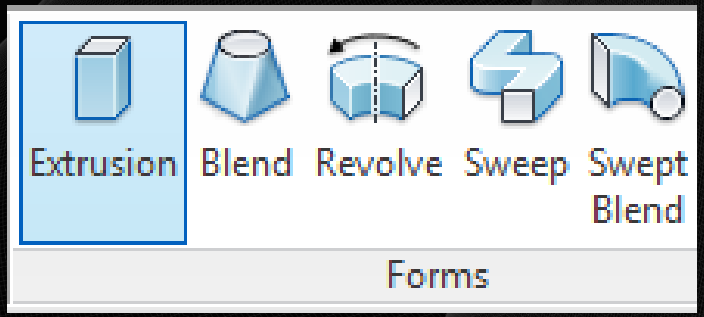
Extrusion Form: Create a 3D solid by extruding a 2D profile.

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

Revolve Form: The line in the revolve defines the axis around which the shape is revolved to create the 3D form.

Sweep Form: Create a sweep form from a line and a 2D profile sketched perpendicular to the line.

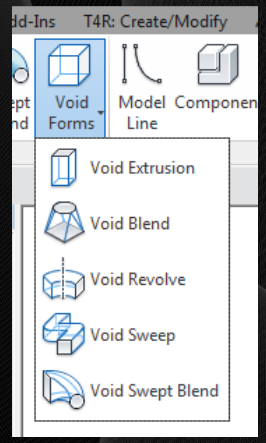
Swept Blend Form: Create a swept blend form from a line and 2 or more 2D profiles sketched perpendicular to the line.



▪ 11.0 The Basics of Families

11.5 Cutting holes using void geometry

Create negative geometry (voids) to cut solid geometry with the Create Void tool.



11.6 Follow F.L.I.P Guidelines to naming family

http://aiab.org/index.php/flip-guideline

Format

<Functional Type> - <Sub-type> - <Originator> - <Descriptor 1> - <Descriptor 2>

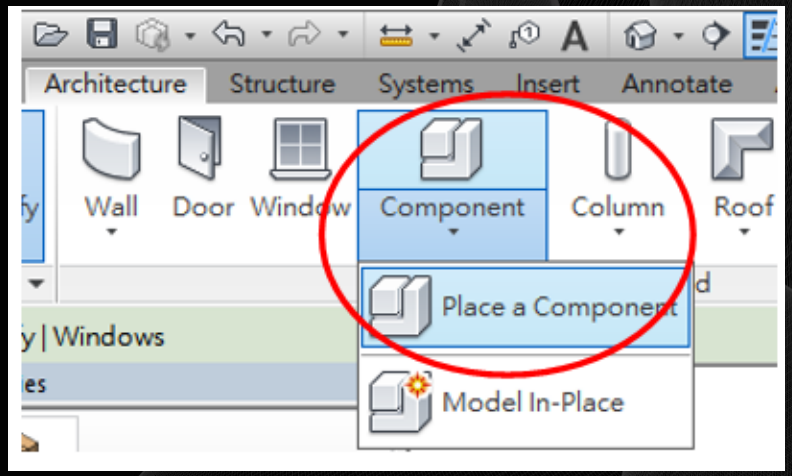
Family Name	DOR – SGL – AEC – Wood – w_Louver .rfa	Descriptions
Functional Type*	**DOR** – SGL – AEC – Wood – w_Louver .rfa	A Door, DOR is the short form of the functional type **"door"**
Sub-Type*	DOR – **SGL** – AEC – Wood – w_Louver .rfa	A Single Door, SGL is the short form of the sub-type **"single"**
Originator	DOR – SGL – **AEC** – Wood – w_Louver .rfa	AEC is the short form of the default **Architecture -Engineering -Construction Industry**. It can be replaced by the name of the creator in short form of three characters. (e.g. MTR, CLP, HKU)
Descriptor 1	DOR – SGL – AEC – **Wood** – w_Louver .rfa	A door is made of **Wood**. An optional descriptive text.
Descriptor 2	DOR – SGL – AEC – Wood – **w_Louver** .rfa	A door is built **with Louver** This text further describes the Family
File Extension	DOR – SGL – AEC – Wood – w_Louver **.rfa**	Revit **Fa**mily File Extension

** **Note:** Refer to the FLIP Master Type List for information on approved Function Type and Sub-type. In the library webpage of FLIP, a user can look for a Family by searching the keyword appears on any field of the Family file name or by filtering the Functional Type and Sub-type of the Family.*

▪ 11.0 The Basics of Families

11.7 Component

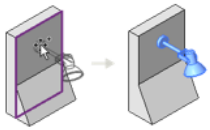
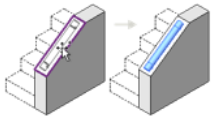
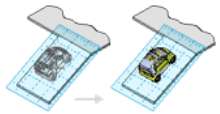
Components are used to model building elements that are usually delivered and installed on site, such as furniture and plumbing fixtures.



11.8 Defined as face-based or work plane-based

You can move a work plane-based or face-based component or element to a different work plane or face.

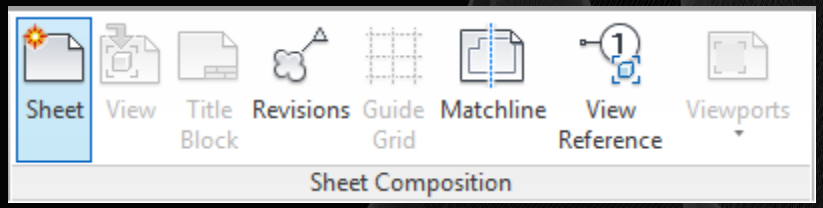
Work plane-based elements include lines, beams, model text, and family geometry.

Place on Vertical Face.	This option is only available for some components and allows placement only on vertical faces.	
Place on Face.	This option allows placement on faces regardless of orientation.	
Place on Work Plane.	This option requires an active work plane to be defined in the view You can place the component anywhere on the work plane.	

12.0 Sheets, Plotting, and Publishing

12.1 Adding sheets

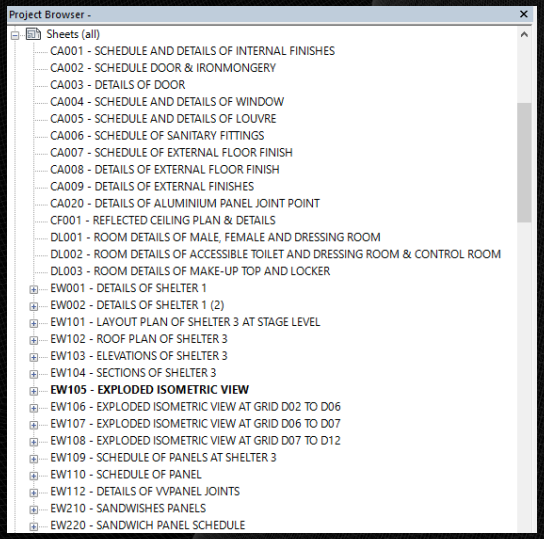
In Revit, you create a sheet view for each sheet in the construction document set. You can then place multiple drawings or schedules on each sheet view.



12.2 Working with placeholder sheets

Once created, leave placeholder sheets as-is to represent consultant sheets, or you can convert them into project sheets.

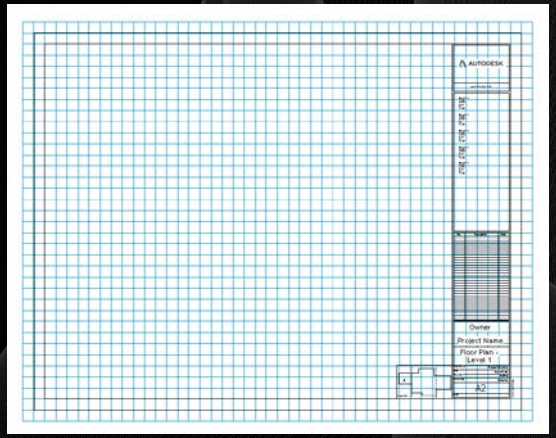
You can add new rows in a Sheet List to create placeholder sheets.



▪ 12.0 Sheets, Plotting, and Publishing

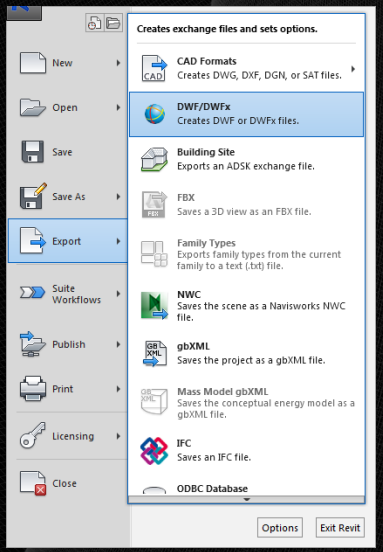
12.3 Aligning views with a guide grid

Guide grids help arrange views so that they appear in the same location from sheet to sheet.



12.4 Outputting sheets to a DWF file

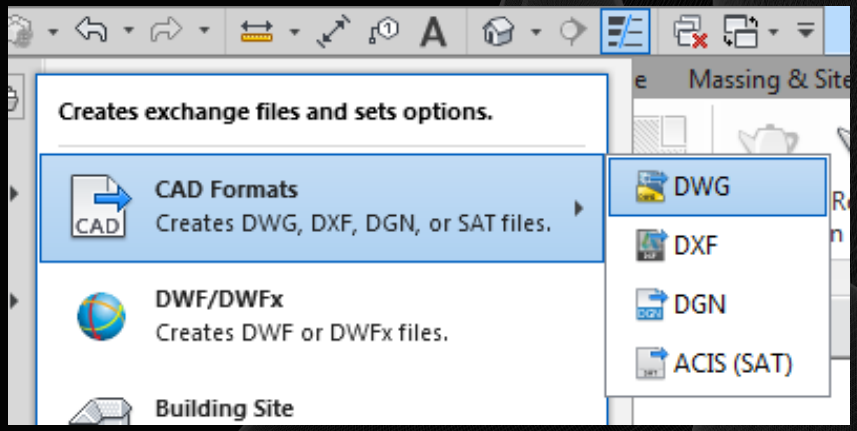
DWF™ is the Autodesk method of publishing design data. It offers an alternative to printing to PDF (Portable Document Format).



12.0 Sheets, Plotting, and Publishing

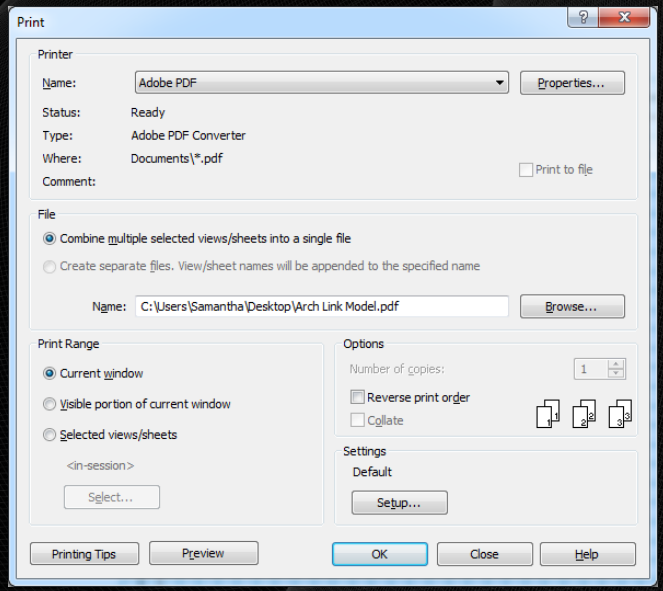
12.5 Exporting to AutoCAD

You can export a Revit model to several CAD formats for use with other software.



12.6 Plotting and creating a PDF

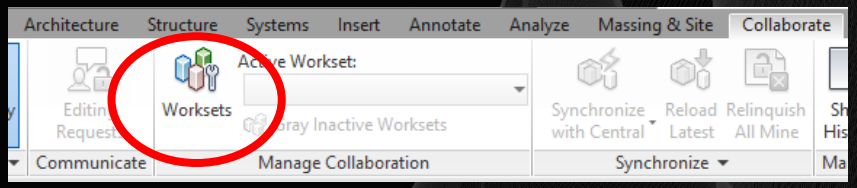
To share construction documents with other team members for printing and online viewing, you can save them to PDF (Portable Document Format).



▪ 13.0 Project Delivery

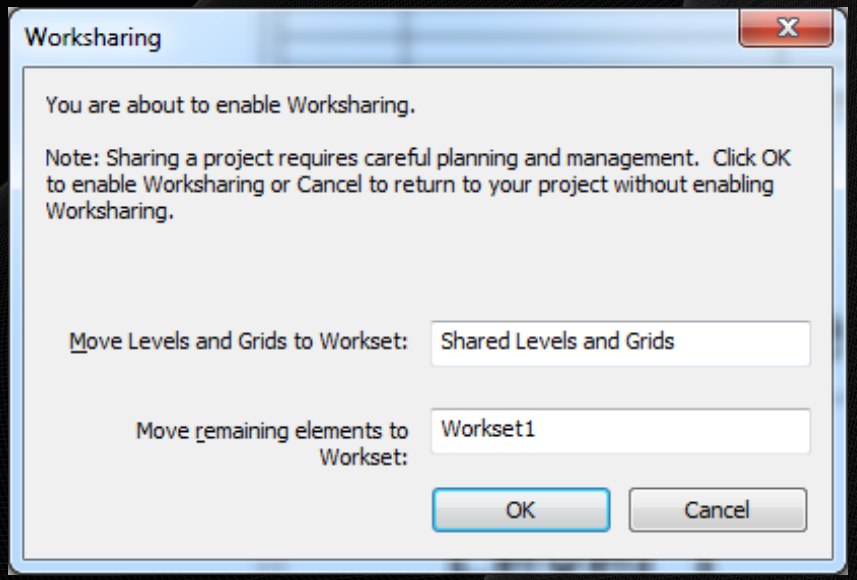
13.1 Manage Collaboration

To share construction documents with other team members for printing and online viewing, you can save them to PDF (Portable Document Format).



13.2 Creating & Saving a Local Copy

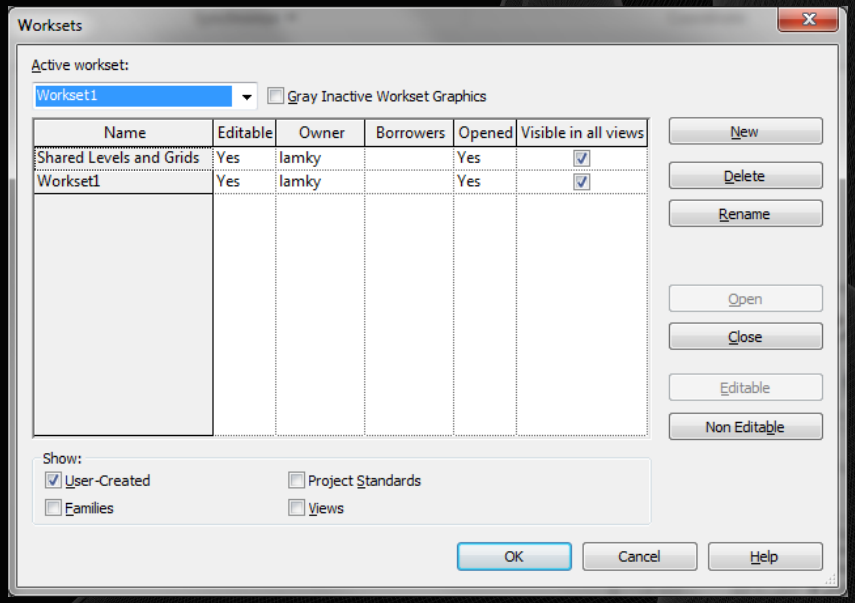
Worksharing is a design method that allows multiple team members to work on the same project model at the same time.



13.0 Project Delivery

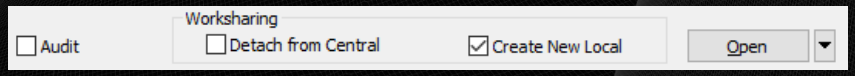
13.3 Setting up Workset

A workset is a collection of elements in a workshared project.



13.4 Working with a Central File

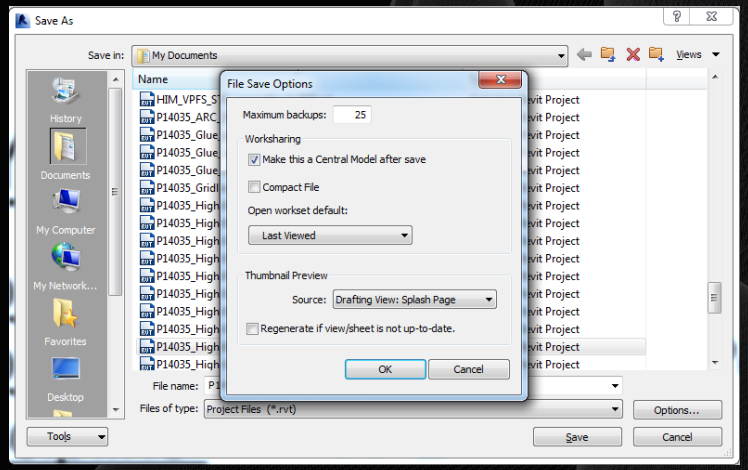
When you are working with a local copy of a project file, check the corresponding tab of the Central File Access pane to see whether the central file has been updated by others.



▪ 13.0 Project Delivery

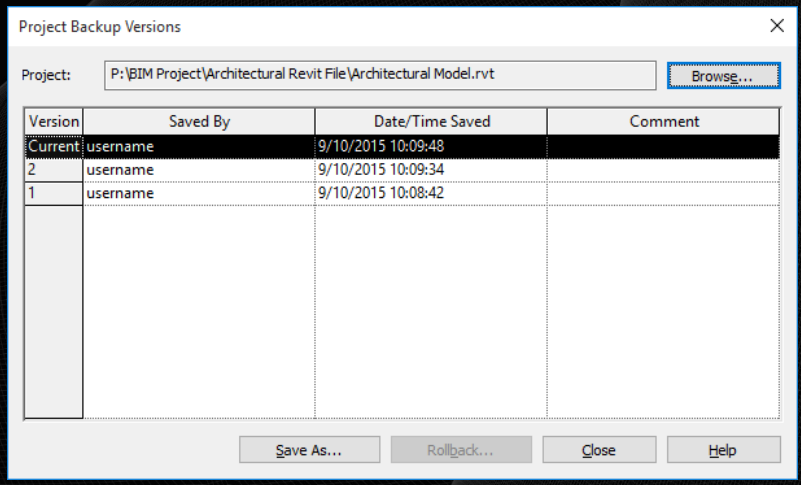
13.5 Model Maintenance

With server-based worksharing, team members can continue working in their local files, creating new elements and editing elements that are already in their possession.



13.6 Restoring a Backup

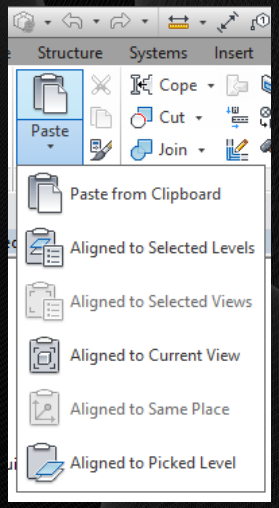
All backup operations (such as copying, purging, and so on) occur when you save changes to a project. If necessary, you can use backup files to roll back the latest changes to a project, restoring the project to a previously saved state.



13.0 Project Delivery

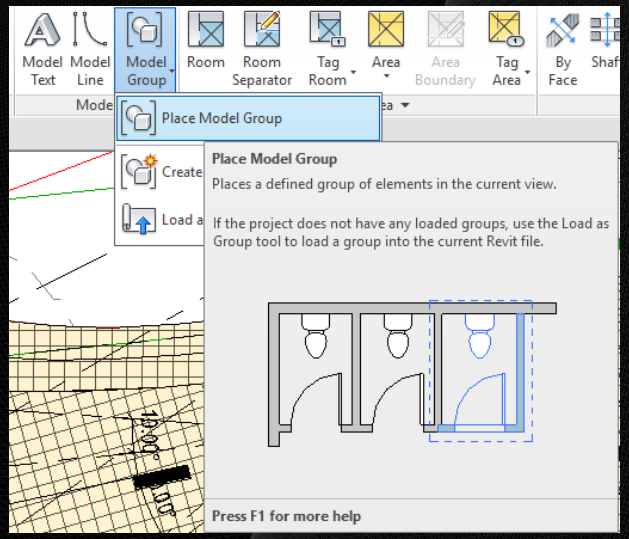
13.7 Copying Model Elements to Clipboard

The Copy to Clipboard tool copies one or more elements to the clipboard. You can then use the Paste from Clipboard or Paste Aligned tools to paste copies of the elements in the drawing or in another project.



13.8 Working with Model Groups

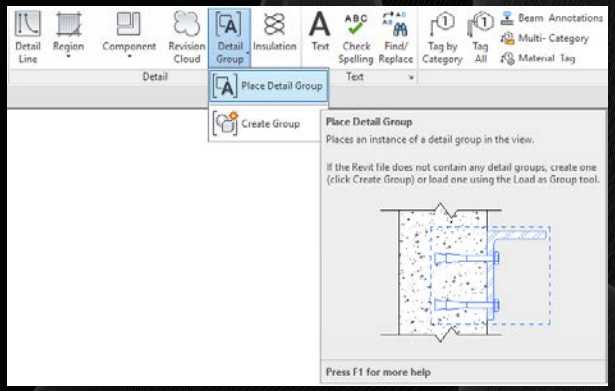
You can convert groups to linked Revit models, and you can convert linked Revit models to groups.



▪ 13.0 Project Delivery

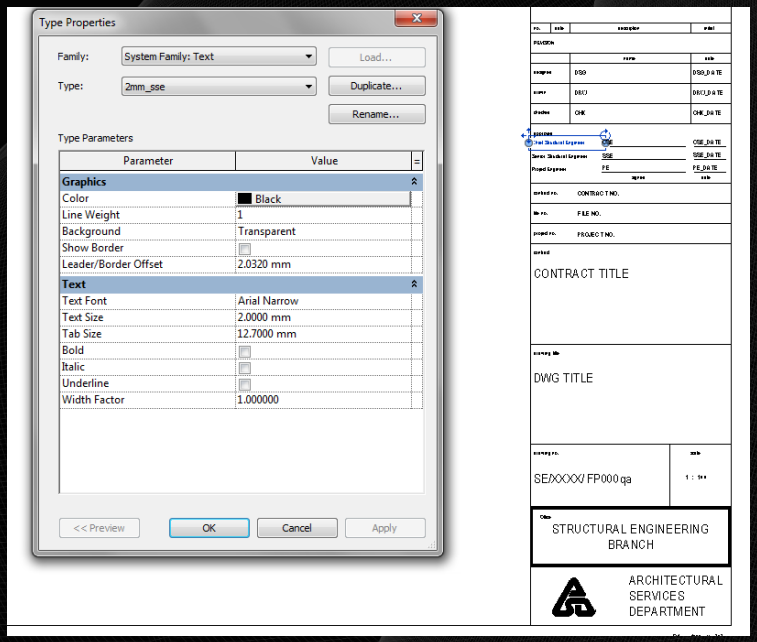
13.9 Using Detail Groups

A group cannot contain both model and detail (view-specific) elements. If you select both types of elements and then try to group them, the detail elements are placed into an attached detail group for that model group.



13.10 Filling Out Title Blocks & Title Tags

Title blocks define the size and appearance of a drawing sheet.



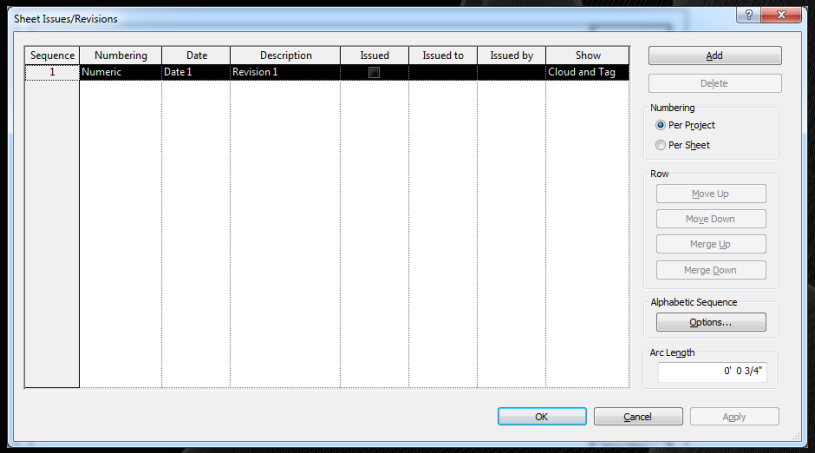
▪ 13.0 Project Delivery

13.11 Revision Bubbles and Deltas

Revision tracking is the process of recording changes made to a building model after sheets have been issued.

Track revisions using revision clouds, tags, and schedules.

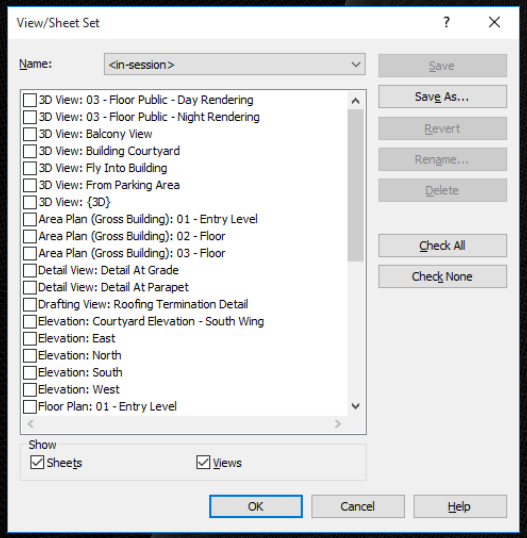
View tab → Sheet Composition panel → Sheet Issues/ Revisions



13.12 Publishing a Sheet Set

To create or modify view/sheet sets, first open the related Export dialog:

Click upper left → Export → CAD Formats, and select the desired format for export. Use the following tools in the Export dialog.



Thank you !