IT in Construction

Lecture #9 Building Information Modeling

Introduction to Autodesk Revit Part 2

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Construction Engineering and Management



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Outline

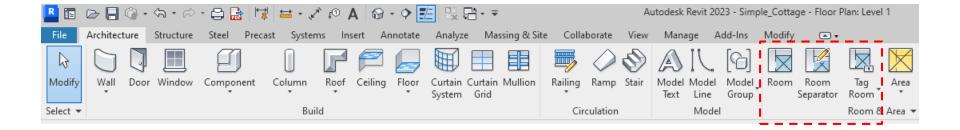
Room and spaces

- Annotations
- Schedules
- Parameters



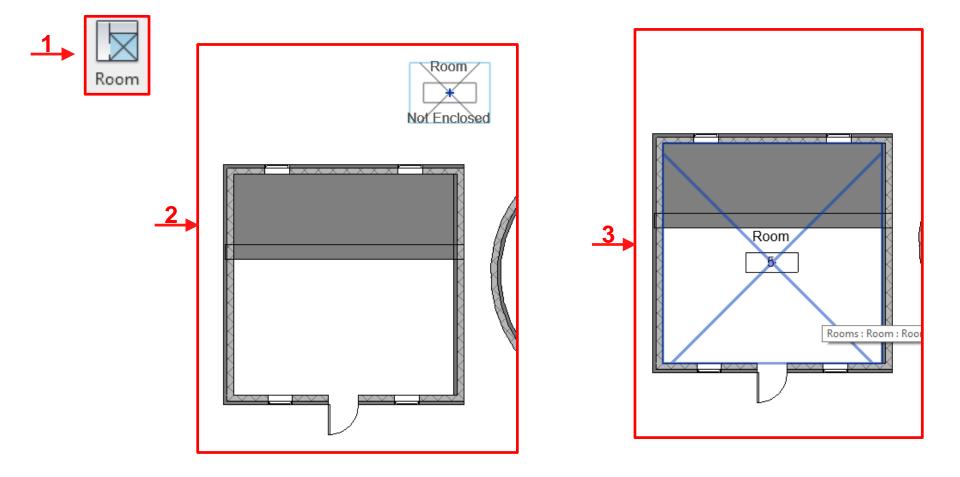
Introduction

Rooms are subdivisions of buildings defined by elements such as walls, floors, roofs and ceilings.



Defining rooms

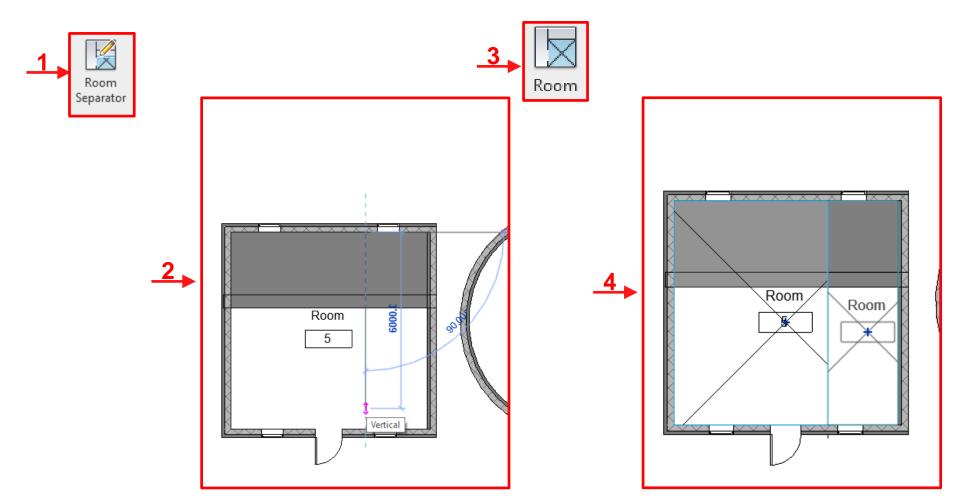




Defining room separator

6

Use room separators for separating on room into more room spaces.

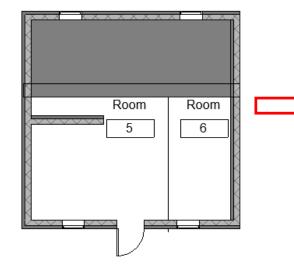


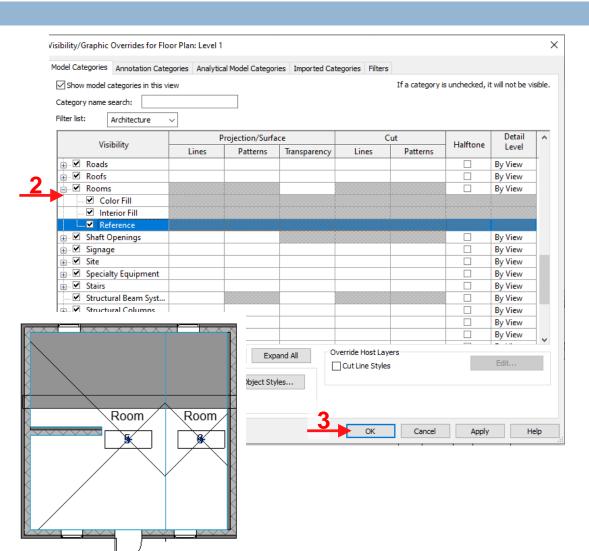
Visibility/ Graphic override-Room

7

Properties

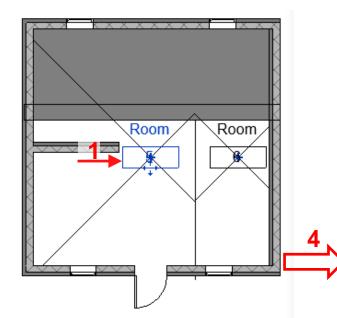
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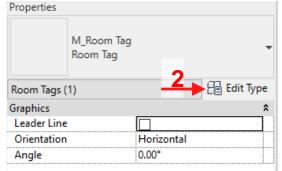


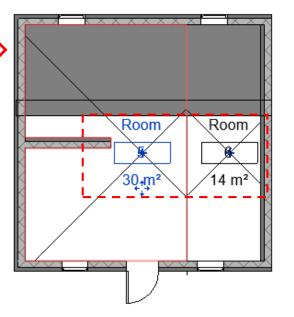


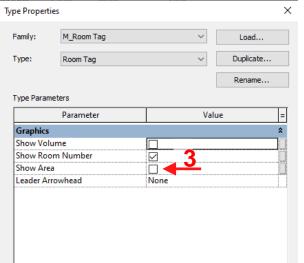
Room tag properties

8







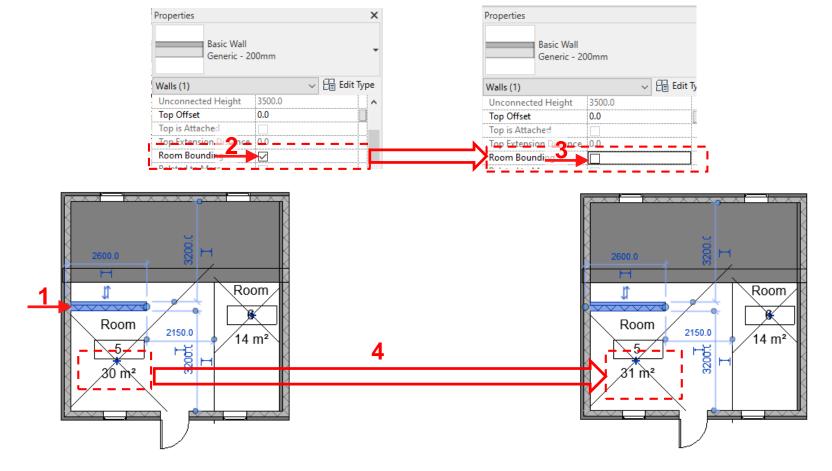


What do these properties do?

<< Preview	OK	Cancel	Apply
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Room bounding walls/ elements

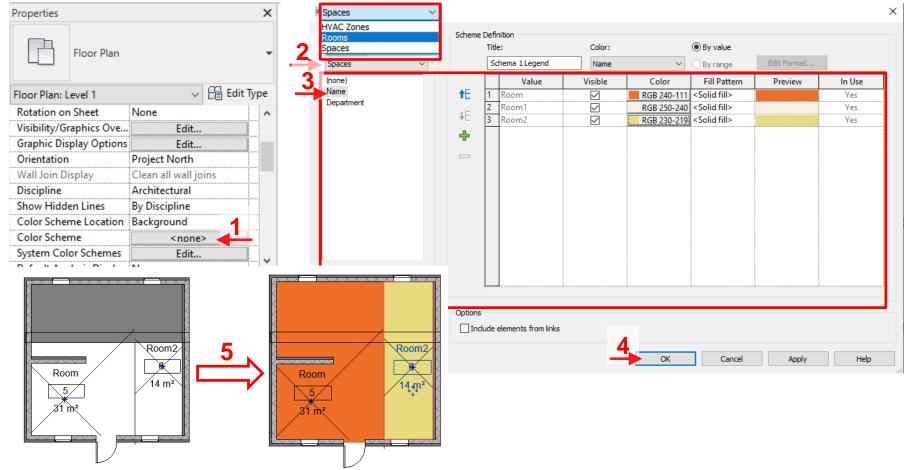
Area of Room-bounding elements are deducted from the the room area!



Room color scheme

10

Room colors are used to distinguish one room from the other!



11

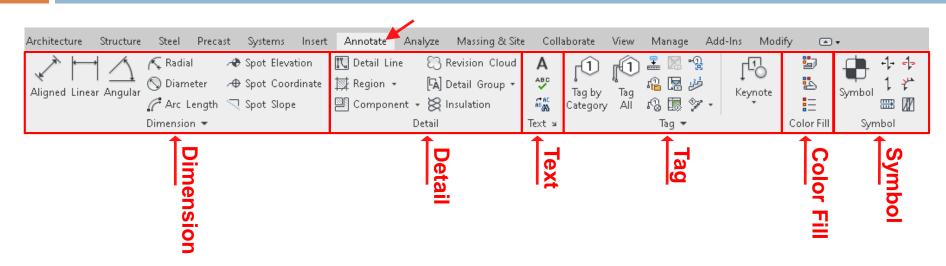
Annotations

Introduction

- Annotations are combination of graphics and texts used for explaining or "annotating" different parts of the Revit models,
- Name several types of explanations that we might need to use in our models!
 - Dimensions, areas, volumes, element type names, materials, colors, room numbers, comments

Annotation Toolbar

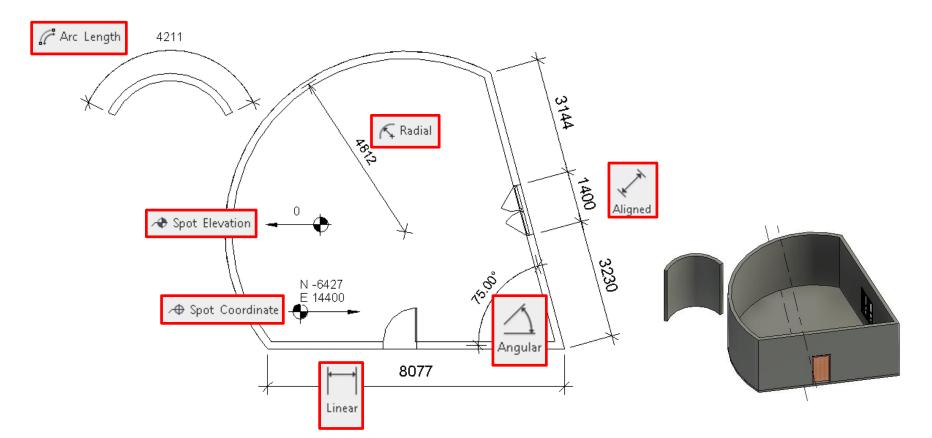




Annotation Toolbar-Dimension

14

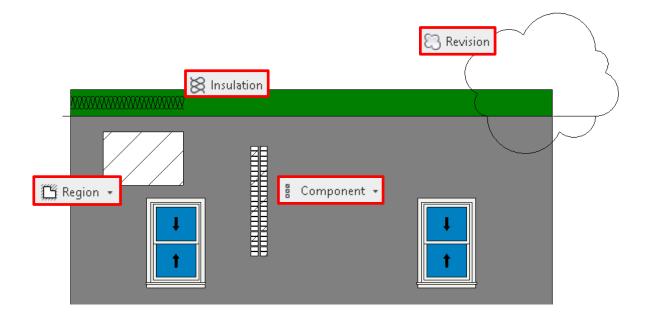
Dimension keys are used for adding dimension of different parts of the model in each view!



Annotation Toolbar-Detail

15

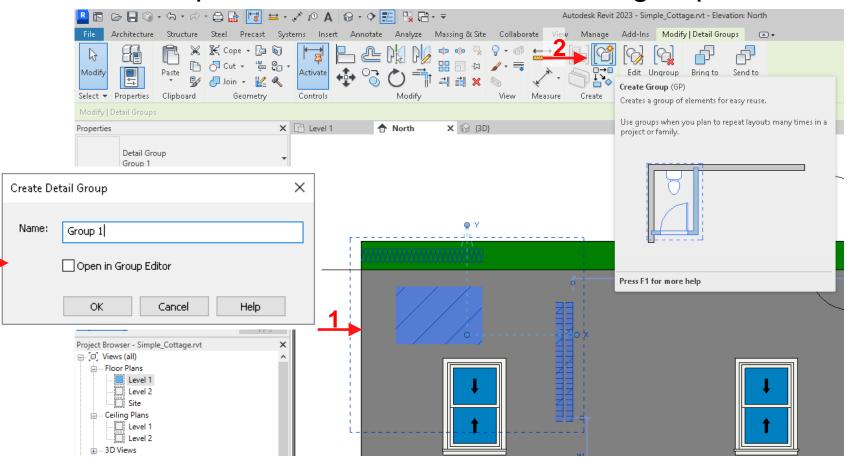
Use the detail part for adding 2D graphical detail, e.g., highlighting, removing, clouding, elaborating, on different parts!



Annotation Toolbar-Detail

16

Select multiple detail elements and create group,



Annotation Toolbar-Detail

- Select multiple detail elements and create group,
- Then you can place them in different areas!

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Annotation Toolbar-Text

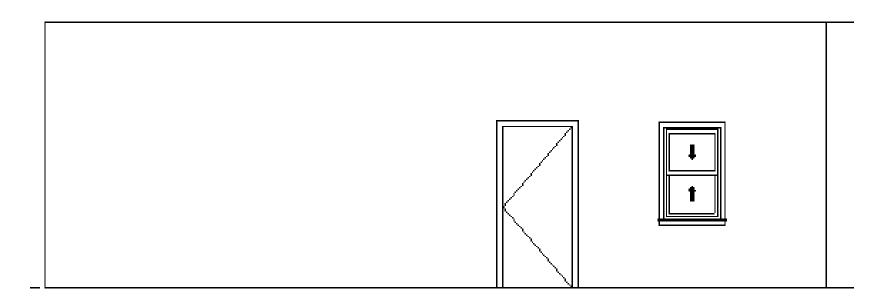
18

Use the Text part for adding comments and explanaitions

on different parts of the model!



This is the curvy house



Annotation Toolbar-Tag

19

A tag is an annotation for identifying different model elements and spaces in a drawing!

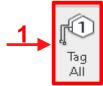
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Annotation Toolbar-Tag

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Tag all:



Tag All Not Tagged

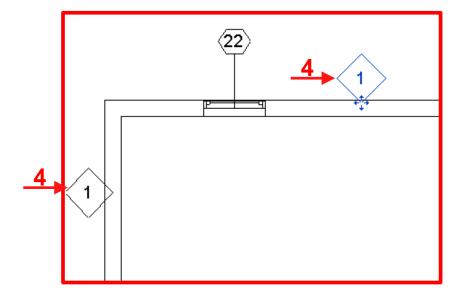
Select at least one Category and Tag or Symbol Family to annotate non-annotated objects:

All objects in current view

Only selected objects in current view

Include elements from linked files

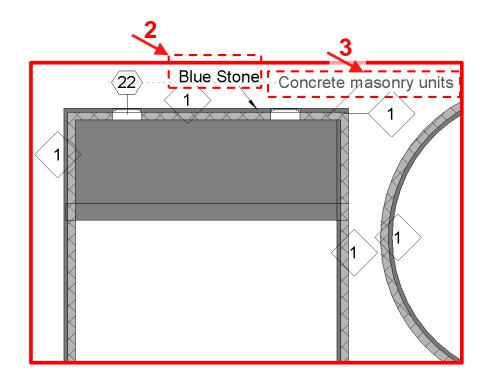
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Annotation Toolbar-Tag

Material Tag:

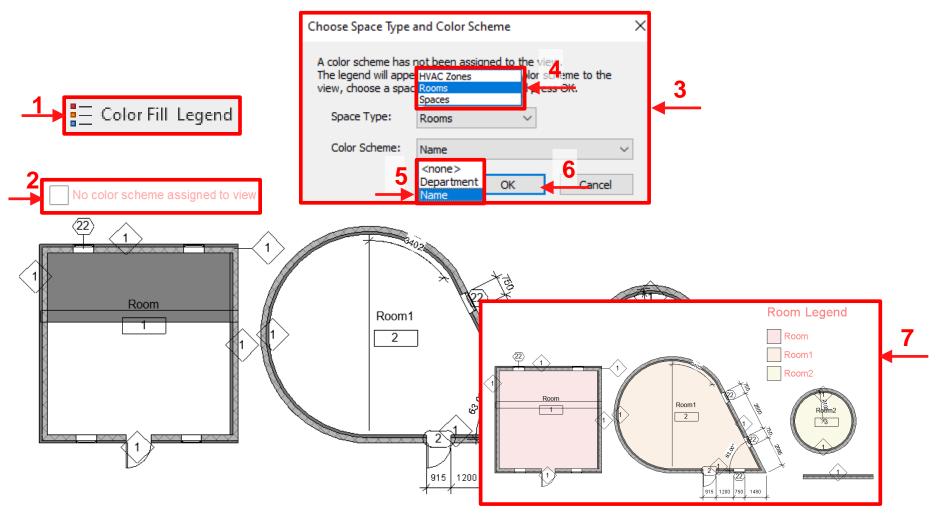




Annotation Toolbar-Color Fill

22

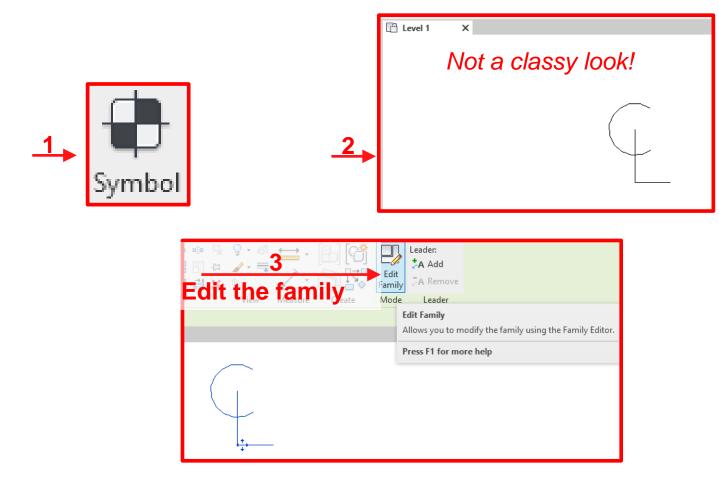
Create color fill legend for room and space area,



Annotation Toolbar-Symbol

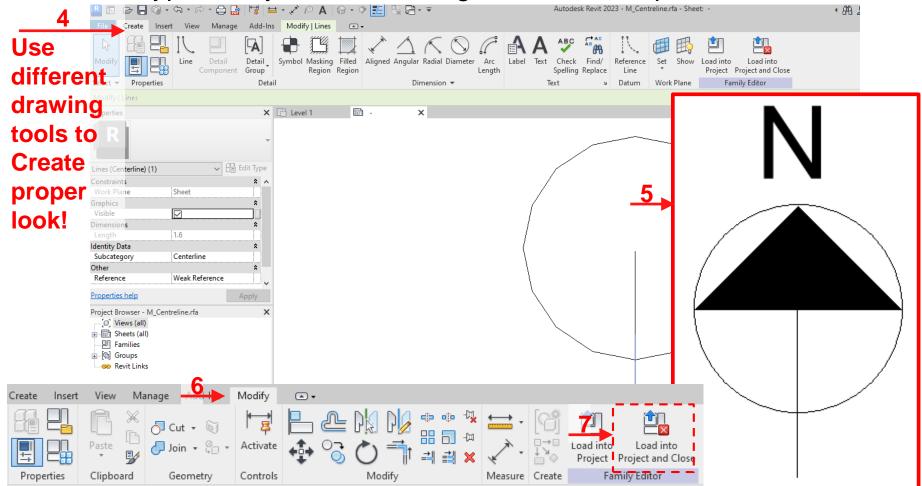
23

Different types of symbols including directions are places in this section,



Annotation Toolbar-Symbol

Different types of symbols including directions are places in this section,



25

Revit Schedules

Revit Schedules

 Revit schedules are your tools for aggregating/ collecting information embedded in different parts of the model!

Wame some of the information embedded underneath the Revit Models?

- Total volume of a component type, e.g., wall, column
- Total area of a component type, e.g., wall, window, floor
- Total weight of a component type, e.g., steel beam, hss, plate
- Number of a component type, e.g., door, electrical outlet
- Total Volume of a material type, e.g., concrete, gypsum

Revit Schedules

What BIM applications can benefit from this feature the most?

- Revit schedules are used for reporting project specifications.
- Revit schedules are the Revit tool for quantity takeoff.
- They help us to create tables of quantities, similar to MS Access tables or Excel spreadsheets!
- Properly define the column-headings, table rows are automatically filled based on the model component information,
- Formulas and parameters can also be defined for calculating new values based on the existing information.
- The achieved schedule results can be exported to Excel spreadsheets for the complementary processing, formatting, presentation and assessment!

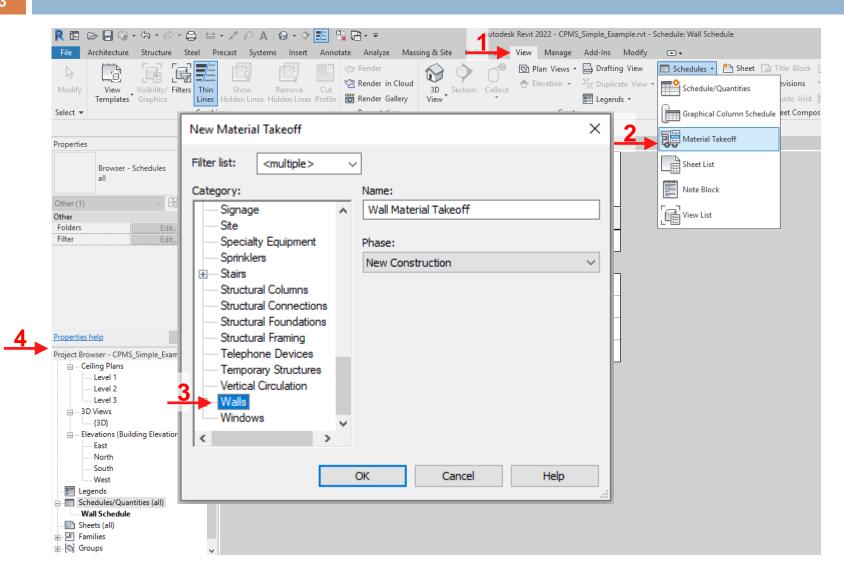
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Creating Schedules-Materials

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roperties help Apply	Basic Wall: SharifCl	12 m²	3.02 m ^a	Concrete Masonry	1.74 m³	12 m ²
	, Basic Wall: SharifCl	11 m²	2.92 m³	Concrete Masonry	1.68 m ³	11 m ²
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Level 3	Basic Wall: SharifCl	25 m²	6.60 m³	Concrete, Sand/Ce	1.27 m ³	25 m²
B 3D Views	Basic Wall: SharifCl	12 m²	3.02 m³	Concrete, Sand/Ce	0.58 m ^s	12 m ²
(3D)	Basic Wall: SharifCl	11 m²	2.92 m³	Concrete, Sand/Ce	0.56 m ^s	11 m ²
Elevations (Building Elevation)	Concrete, Sand/Cer	ment Screed: 4			3.63 m ^s	73 m²
South	Basic Wall: SharifCl	24 m²	6.34 m³	Gypsum Wall Board	1 0.73 m ^s	49 m ²
West	Basic Wall: SharifCl	25 m²	6.60 m³	Gypsum Wall Board	1 0.76 m ³	51 m²
	Basic Wall: SharifCl	12 m²	3.02 m³	Gypsum Wall Board	1 0.35 m³	23 m²
Schedules/Quantities (all)	Basic Wall: SharifCl	11 m²	2.92 m³	Gypsum Wall Board		22 m²
Wall Material Takeoff	Gypsum Wall Board	: 4			2.18 m ^s	145 m ²
Sheets (all)	Grand total: 16				18.88 m ³	363 m²
■ I Families						

Wall Material Quantity Takeoff

Creating Schedules-Excel Export

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Creating Schedules-Excel Export



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Creating Schedules-Excel Export

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5 Basic Wall: SharifClassWall	25 m²	6.60 m³	Ceramic Tile	0.76 m³	25 m²					
6 Basic Wall: SharifClassWall	12 m²	3.02 m ³	Ceramic Tile	0.35 m³	12 m²					
7 Basic Wall: SharifClassWall	11 m²	2.92 m ³	Ceramic Tile	0.34 m³	11 m²					
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10 Basic Wall: SharifClassWall	24 m²	6.34 m ³	Concrete Masonry Units	3.66 m³	24 m²					
11 Basic Wall: SharifClassWall	25 m²	6.60 m ³	Concrete Masonry Units	3.81 m³	25 m²					
12 Basic Wall: SharifClassWall	12 m²	3.02 m ³	Concrete Masonry Units	1.74 m³	12 m²					
13 Basic Wall: SharifClassWall	11 m²		Concrete Masonry Units		11 m²					
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23 Basic Wall: SharifClassWall	25 m²		Gypsum Wall Board	0.76 m ³	51 m ²					
24 Basic Wall: SharifClassWall			Gypsum Wall Board	0.35 m ³	23 m ²					
25 Basic Wall: SharifClassWall	11 m²		Gypsum Wall Board	0.34 m ³	22 m ²					
26 Gypsum Wall Board: 4				2.18 m ³	145 m ²					
27 Grand total: 16				18.88 m ³	363 m ²					



41

 Cost-wise, do you recommend using BIM for building material quantity takeoff or you prefer the manual calculations? 42

Revit Parameters

Introduction

- Revit parameters form the information aspect of the BIM in the Revit model!
- Make sure that you have a proper <u>plan</u>, e.g., as a part of your project information system, before starting creating and using parameters in your file.
- An ad hoc approach for creating and using project parameters is going to create a long list of useless parameters, just complicating the your project management!!!

Different Types of Revit Parameters

- System Parameters
- Family Parameters
- Project Parameters
- Shared Parameters
- Global Parameters

System Parameters

- System parameters include the embedded System parameters, or properties, of different objects.
- □ All object properties, including Instance parameters and

<u>Type</u> parameters, are system parameters!

Revit system parameters can not be modified or removed, if permitted, only their values can be changed!

System Parameters

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- □ Family parameters are defined to control family specifications,
- □ They control variable values of the family and nested families,
 - such as dimensions (Width, Height, and Depth) or materials.
- They are specific to the family and can not be used in project schedules and tags.

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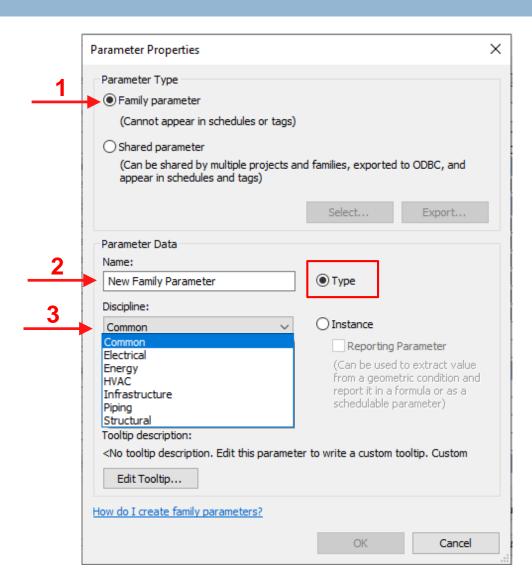
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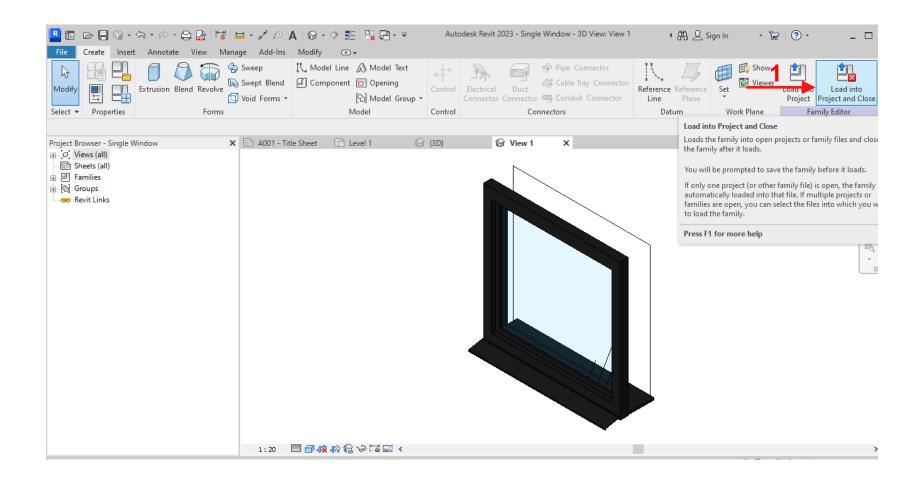
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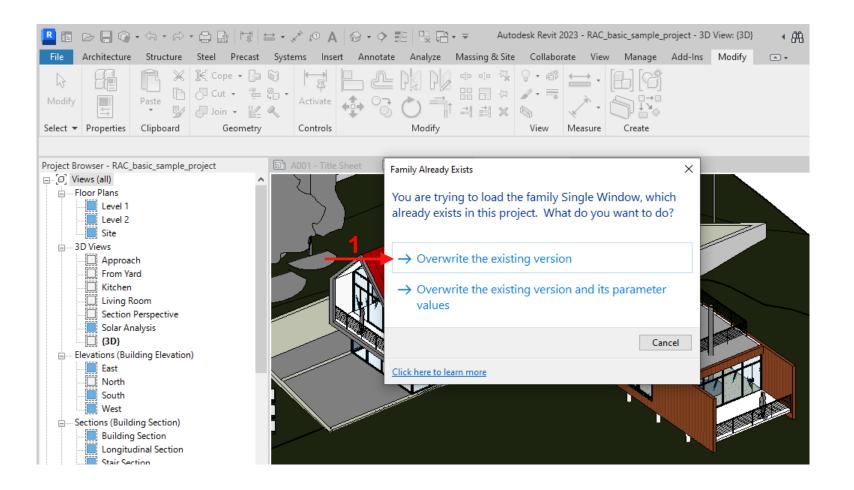
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- Project parameters are used for scheduling, sorting, and filtering in a Revit project, however, they are not used in tags!
- □ They can be assigned to multiple families used in the project

at once, and they are easy to use

But, they are Not transferable to other Reivt projects,

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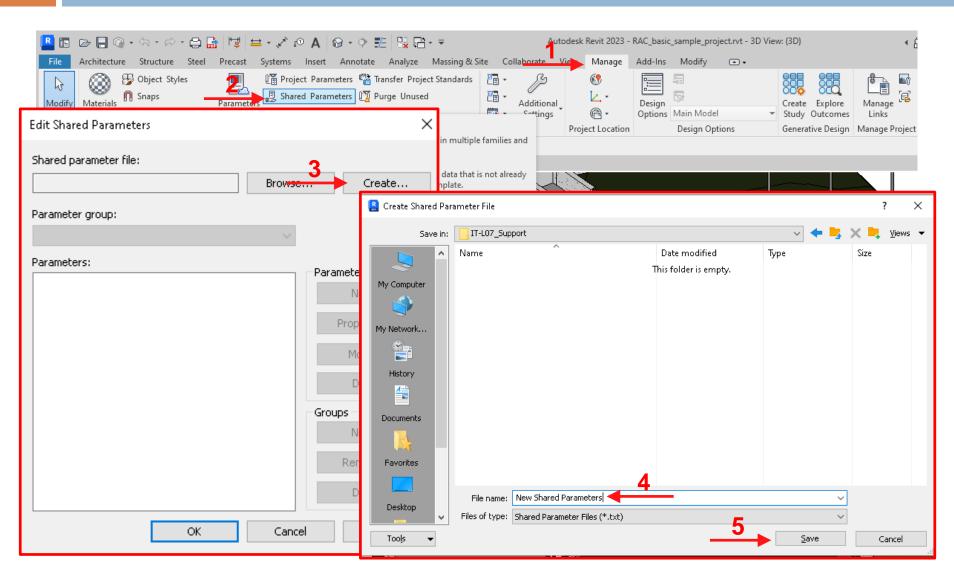
Shared Parameters

- Shared parameters are stored in a text file independent from Revit families or projects,
- □ As a result, they can be referenced by multiple families and projects,
- They can be used in project schedules and tags,
- Use shared parameters when you need to use them in multiple families or projects!



When do you recommend use shared parameters?

Use of shared parameters are specially recommended when organizations have set parameters to be implemented in their different families and projects as a part of their MIS!



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When shared parameters are defined the text file is updated based on the predefined format in Revit:

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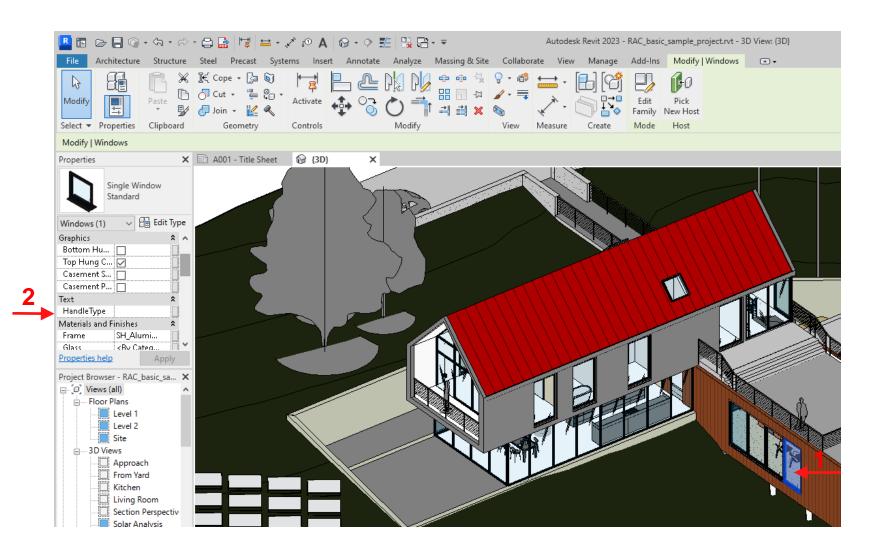
The defined shared parameter can be assigned to different project families using <u>Family parameter</u> or <u>Project parameter</u> features!

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Rough Width 1500.0		
Rough Height 2700.0		
Height 2700.0		
Width 1500.0		
Properties help		
Project Browser - RAC_basic_sample_pro 	4 ▲ ▲ ▲ ▲ ▲ ▲ ▲	
Level 2 Site		
Walls : Basic Wall : Retaining - 300mm C	How do I r New Parameter ameters? OK Cancel	· · · · · · · · · · · · · · · · · · ·

Parameter Properties			×	
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Parameter Type		Categories
O Project parameter		Category name search:
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INTER A CALLED A SETORE S		Check All Check None
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Project Parameters	×
Parameter Name Search:	
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Parameters available to elements in this project:	3 items
HandleType Occupant Recycled Content	
/ 1 E 1	Cancel



Global Parameters

- Global parameters are user-defined parameters that can be used to control object properties in a project,
- Global parameters are not assigned to project object as properties,
- They are accessible from different objects in the model,
 including object instances and tags and can control
 values of object properties for multiple objects!

Defining Global Parameters

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	How do I manage global para	meters? OK	Cancel Apply				

Defining Global Parameters

Parameter	Value	Formula	
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Using Global Parameters

