ACBA 4018
DIGITAL TECHNOLOGY & BIM : LEVEL 4

Working with Digital Technologies & BIM

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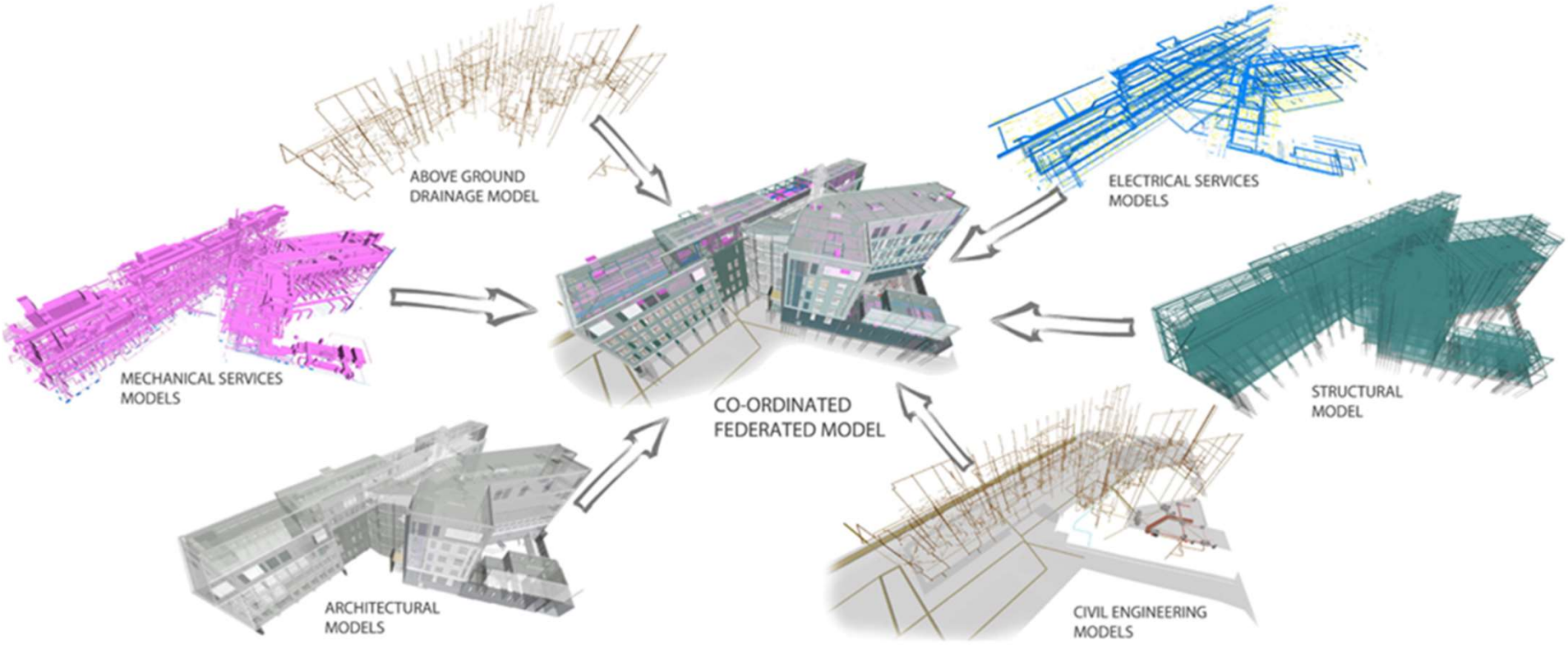


www.onecreativeenvironment.com

Gavin M Traylor RIBA

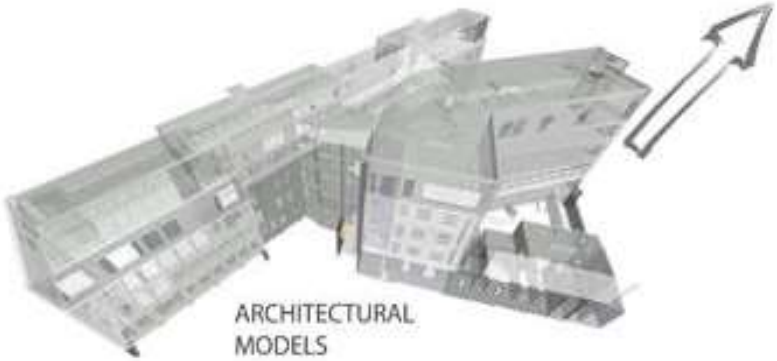
AUTODESK®
REVIT®

https://www.autodesk.com/education/edu-software/overview?_ga=2.119678017.834319708.1600961686-1615692111.1593105833&sorting=featured&page=1

How can we create data rich intelligent models?

Tools such as Revit enable intelligent 3D Modelling
that can be linked into a BIM Process.

AUTODESK®
REVIT®



Remember a Revit Model alone is not BIM

AUTODESK® REVIT® the basics

PART 1: MODEL

1-INTERFACE
2-SELECT
3-MODIFY
4-WALLS
5-LEVELS AND GRIDS
6-FLOORS
7-CEILINGS
8-ROOFS
9-DOORS
10-WINDOWS
11-CURTAIN WALLS
12-STAIRS
13-RAILINGS
14-COLUMNS
15-SITE
16-MATERIALS
17-ROOMS

PART 2: VIEWS

18-VIEWS
19-PLAN VIEWS
20-SECTIONS
21-ELEVATIONS
22-CALLOUTS
23-DETAILS
24-3D VIEWS
25-LEGENDS
26-VIEW TEMPLATES
27-VISIBILITY

PART 3: ANNOTATE

28-LINES
29-TAGS
30-TEXT
31-REGIONS
32-DIMEN -SIONS

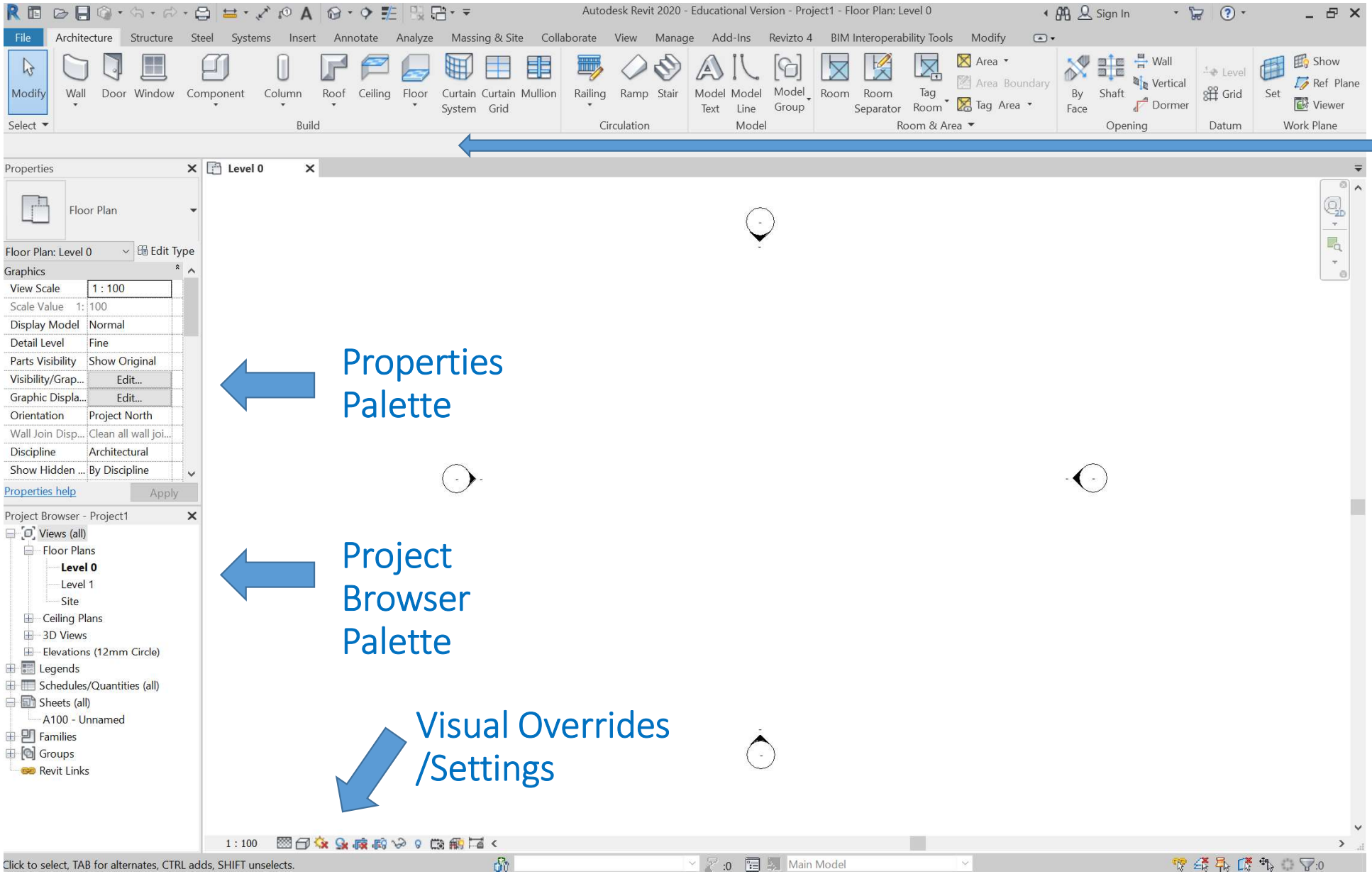
PART 4: PUBLISH AND COLLABORATE

33-SHEETS
34-REVISIONS
35-PRINT
36-CENTRAL FILES
37-LINK CAD
38-EXPORT CAD

PART 5: ADVANCED TOOLS

39-SCHEDULES
40-PHASES
41-WORKSETS
42-GROUPS
43-MODEL IN-PLACE
44-FAMILIES
45-DESIGN OPTIONS

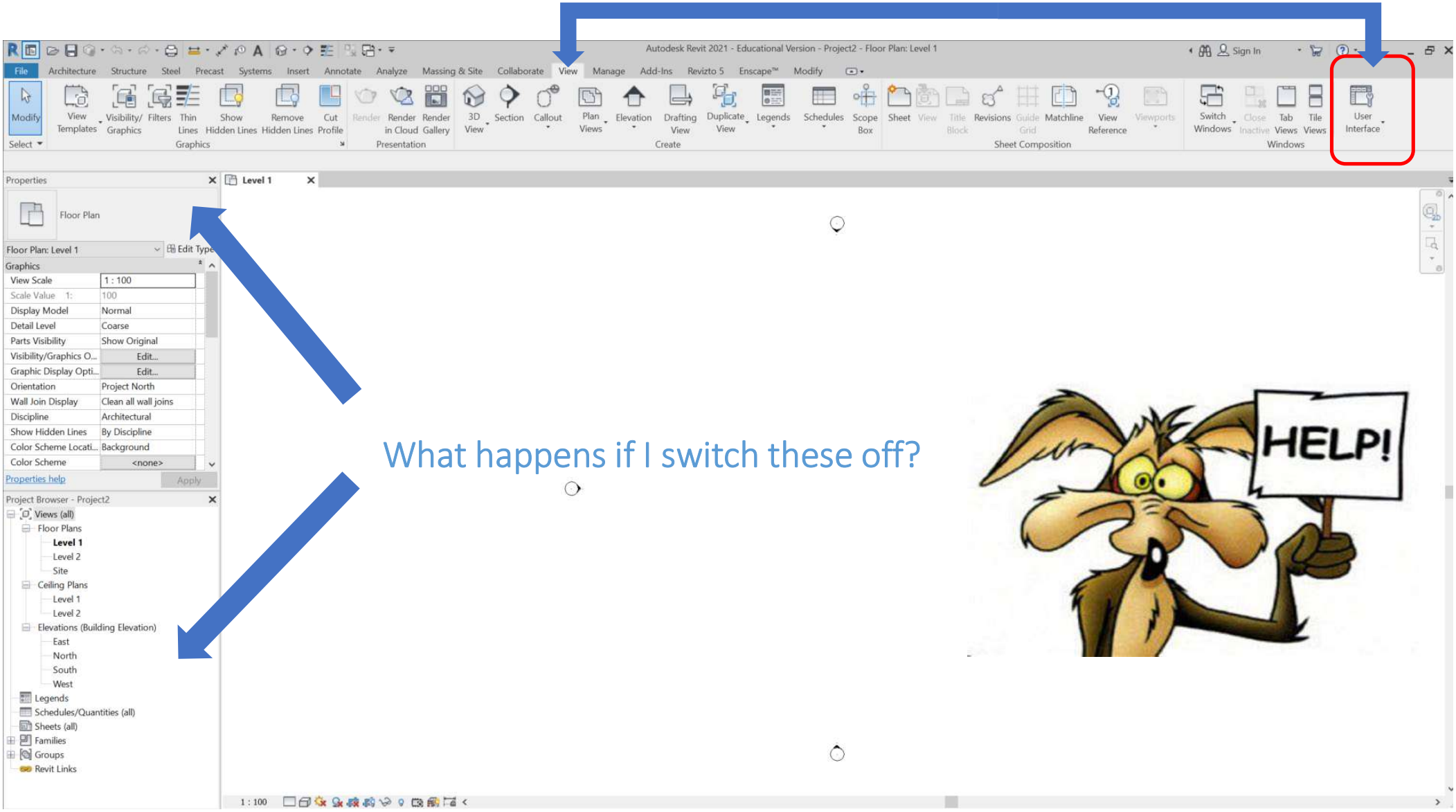
https://revitpure.com/basics
https://academy.autodesk.com/

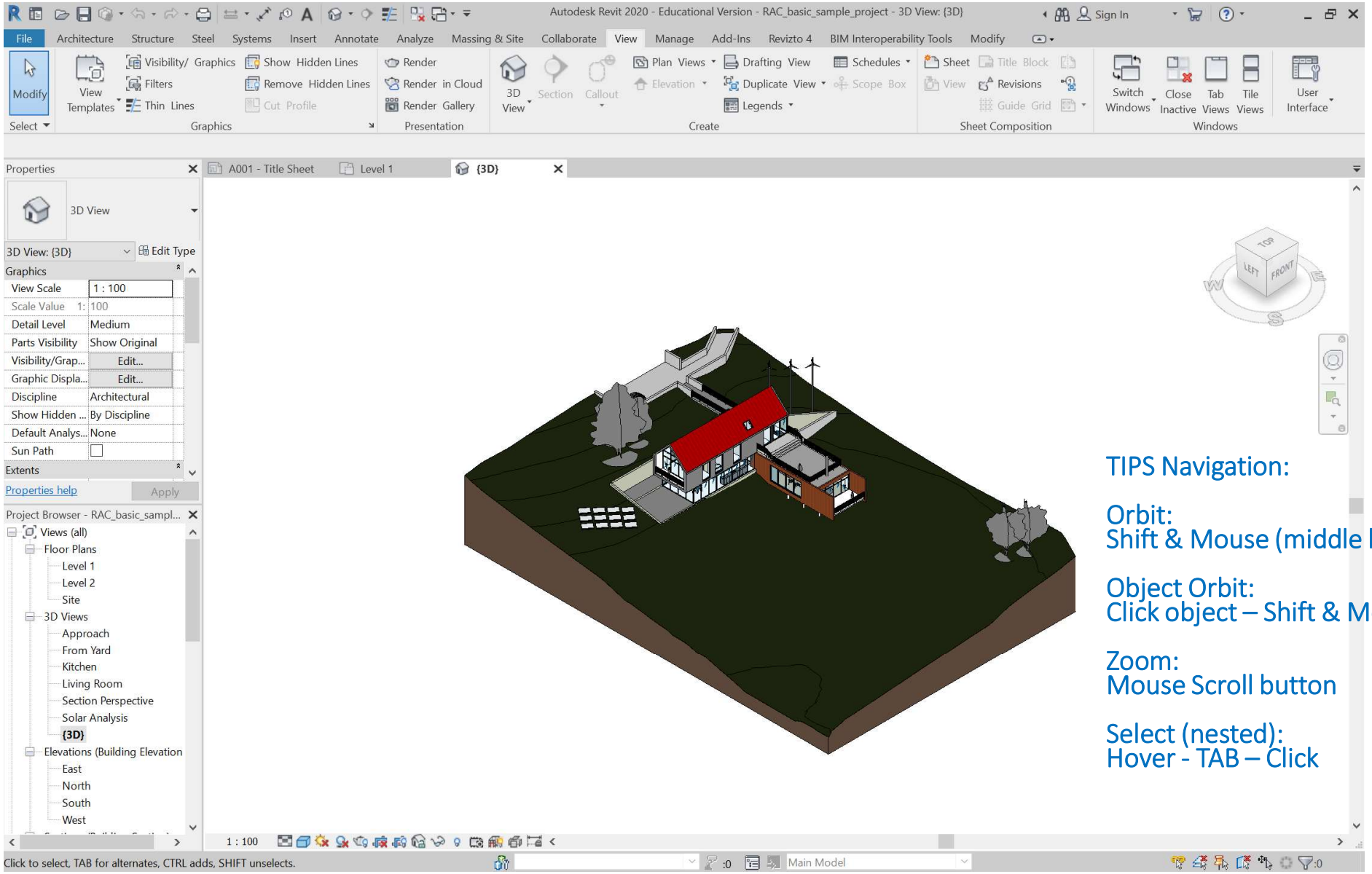


RIBBON

Sub options

AUTODESK® REVIT®


Autodesk Revit 2021 - Educational Version - Project2 - Floor Plan: Level 1
File
Architecture
Structure
Steel
Precast
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Add-Ins
Revizto 5
Enscape™
Modify
User Interface
Properties
Floor Plan
Floor Plan: Level 1
Edit Type
Graphics
View Scale
1 : 100
Scale Value 1:
100
Display Model
Normal
Detail Level
Coarse
Parts Visibility
Show Original
Visibility/Graphics O...
Edit...
Graphic Display Opti...
Edit...
Orientation
Project North
Wall Join Display
Clean all wall joins
Discipline
Architectural
Show Hidden Lines
By Discipline
Color Scheme Locati...
Background
Color Scheme
<none>
Properties help
Apply
Project Browser - Project2
Views (all)
Floor Plans
Level 1
Level 2
Site
Ceiling Plans
Level 1
Level 2
Elevations (Building Elevation)
East
North
South
West
Legends
Schedules/Quantities (all)
Sheets (all)
Families
Groups
Revit Links
Level 1
What happens if I switch these off?
HELP!
1 : 100



1-INTERFACE

2-SELECT

3-MODIFY

TIPS Navigation:

Orbit:
Shift & Mouse (middle button)

Object Orbit:
Click object – Shift & Mouse (middle button)

Zoom:
Mouse Scroll button

Select (nested):
Hover - TAB – Click

AUTODESK® REVIT®

Set up Levels

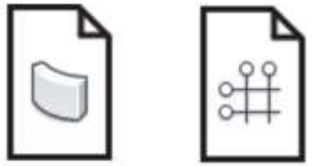
Exercise 1

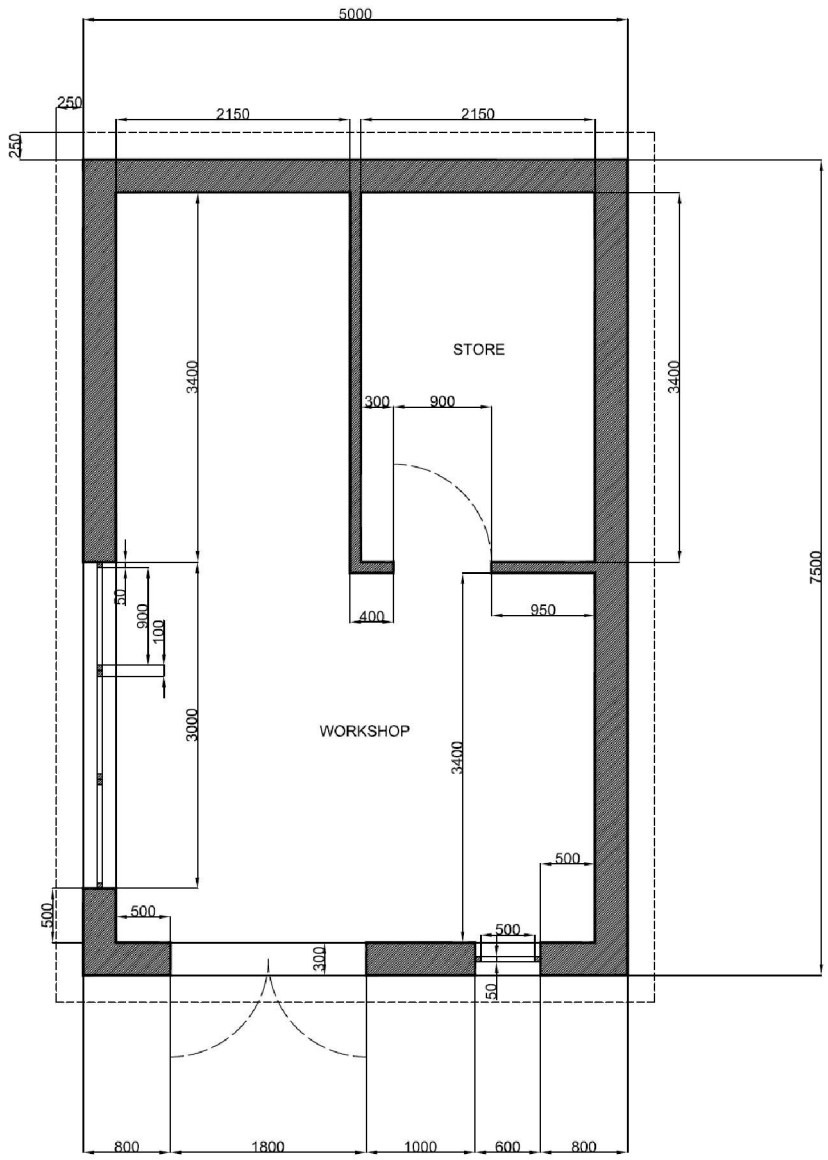
It's the Workshop again only this time in REVIT.
Set up your levels in Elevation view.
Distance between levels of 2500mm

EASY?

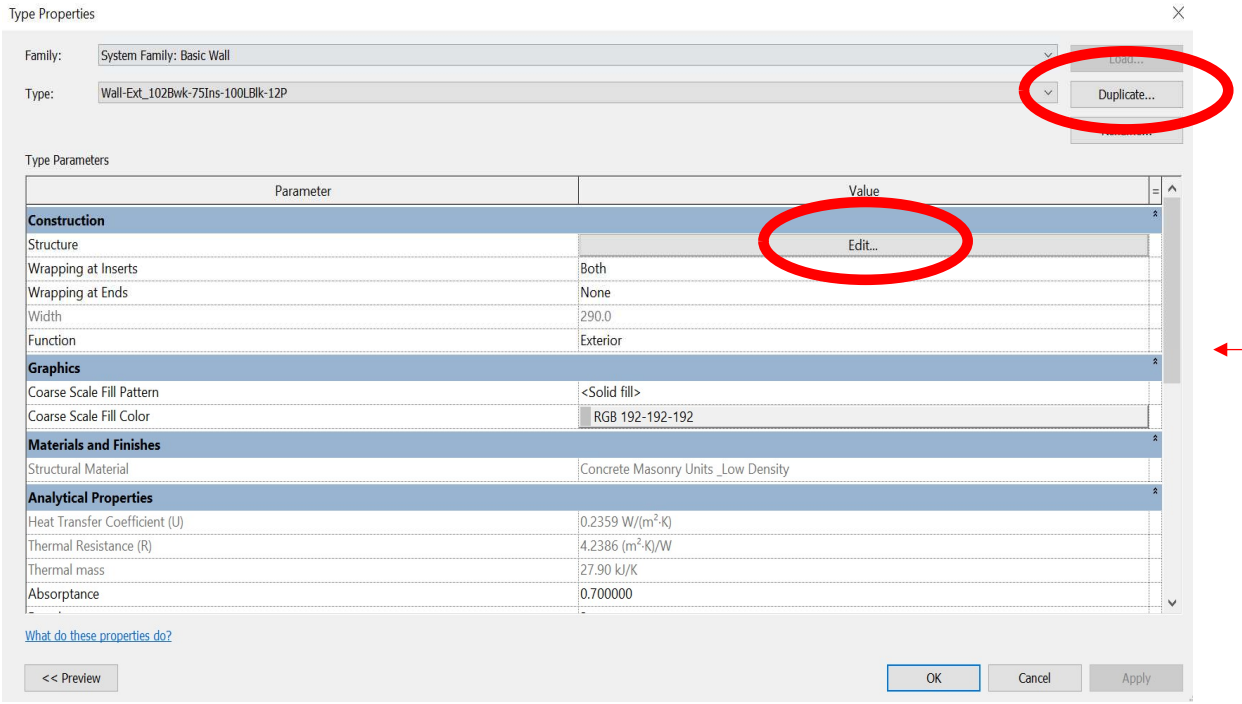
Assume the following:

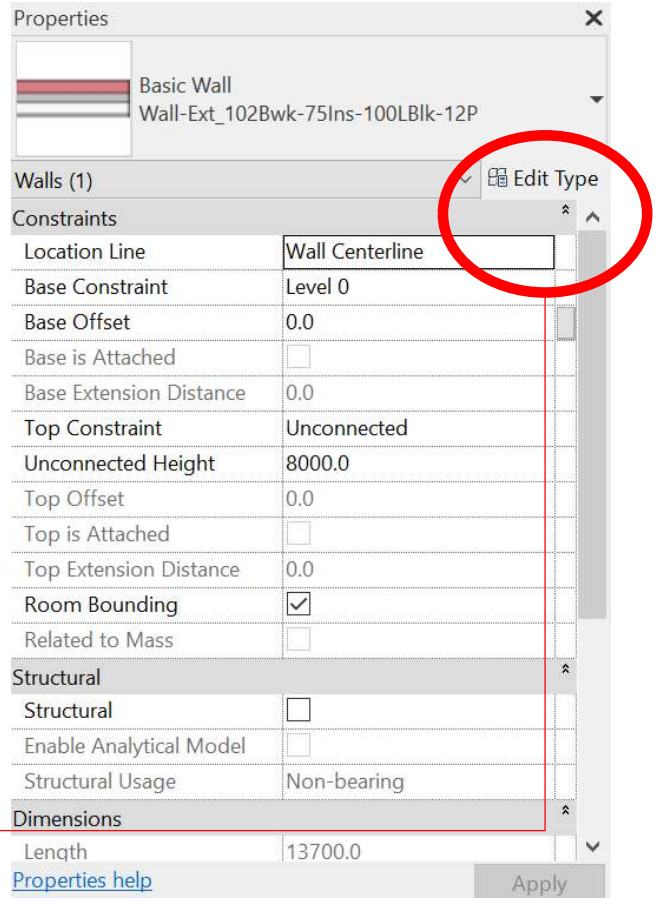
- High to Apex of roof is 5m
- Floor to ceiling height is 2.5m
- Floor slab is 300mm,
- Roof is 300mm thick
- Cill heights are 900mm
- Add Grid Lines



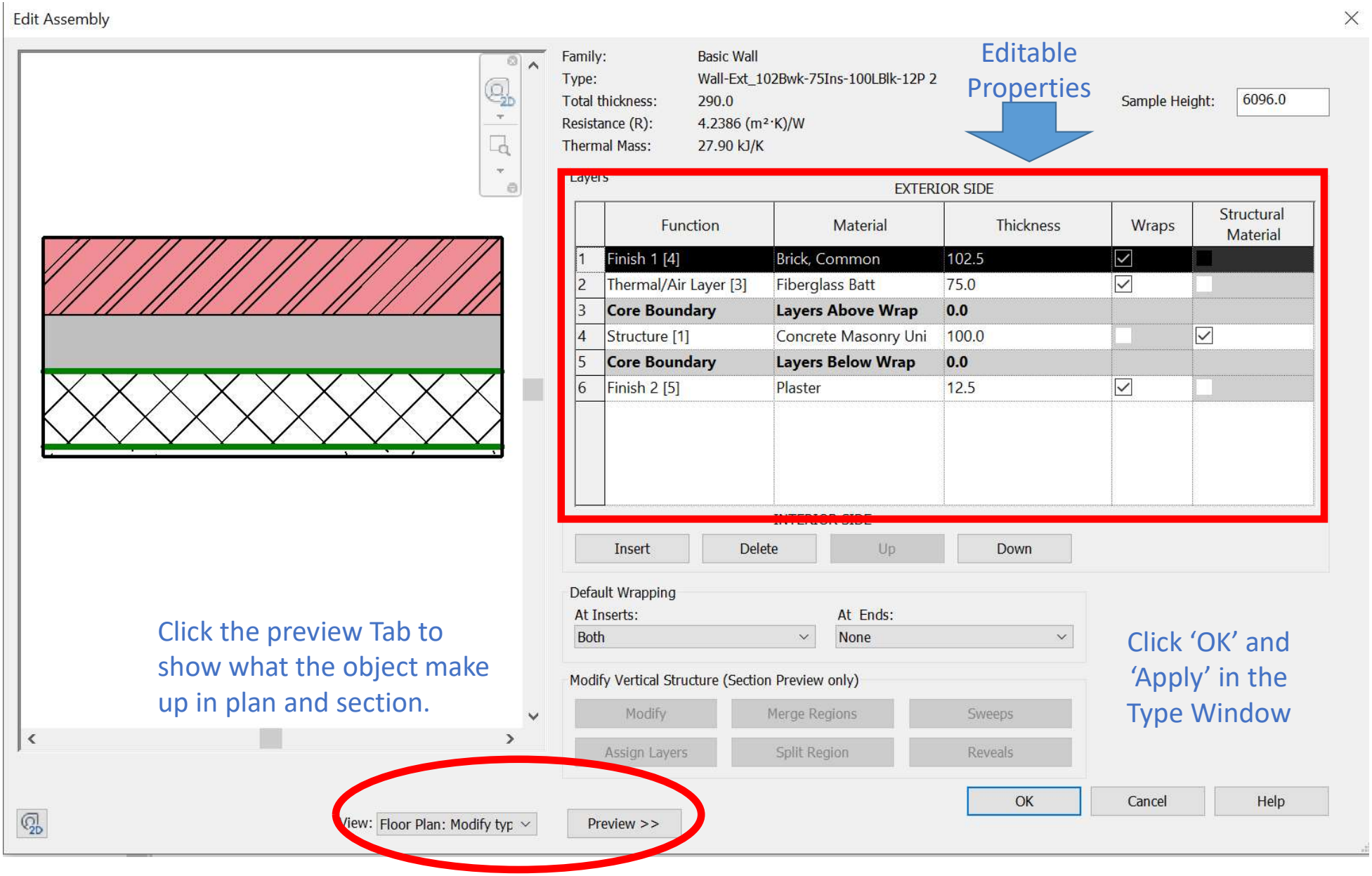


Creating /Editing





It is the same process for all fabric objects.
Select an object you want to edit.
In the properties click 'Edit Type'
In the 'Type Properties' Window click 'Duplicate'
Click Edit.. tab


Edit Assembly
Family: Basic Wall
Type: Wall-Ext_102Bwk-75Ins-100LBlk-12P 2
Total thickness: 290.0
Resistance (R): 4.2386 (m²·K)/W
Thermal Mass: 27.90 kJ/K
Editable Properties
Sample Height: 6096.0
Layers
EXTERIOR SIDE
Function
Material
Thickness
Wraps
Structural Material
1 Finish 1 [4] Brick, Common 102.5
2 Thermal/Air Layer [3] Fiberglass Batt 75.0
3 Core Boundary Layers Above Wrap 0.0
4 Structure [1] Concrete Masonry Uni 100.0
5 Core Boundary Layers Below Wrap 0.0
6 Finish 2 [5] Plaster 12.5
Insert
Delete
Up
Down
Default Wrapping
At Inserts: Both
At Ends: None
Modify Vertical Structure (Section Preview only)
Modify
Merge Regions
Sweeps
Assign Layers
Split Region
Reveals
Click the preview Tab to show what the object make up in plan and section.
Click 'OK' and 'Apply' in the Type Window
View: Floor Plan: Modify typ
Preview >>
OK
Cancel
Help

11-CURTAIN WALLS

12-STAIRS

13-RAILINGS

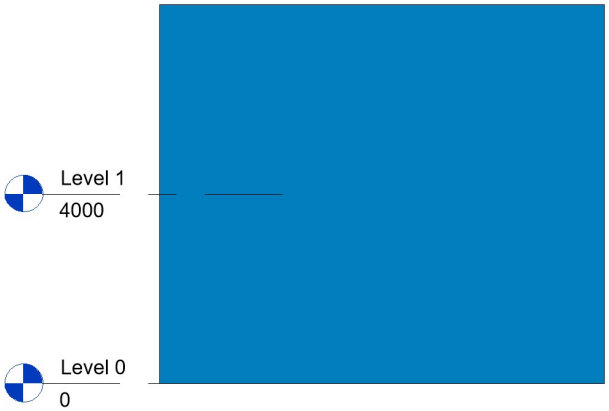
14-COLUMNS

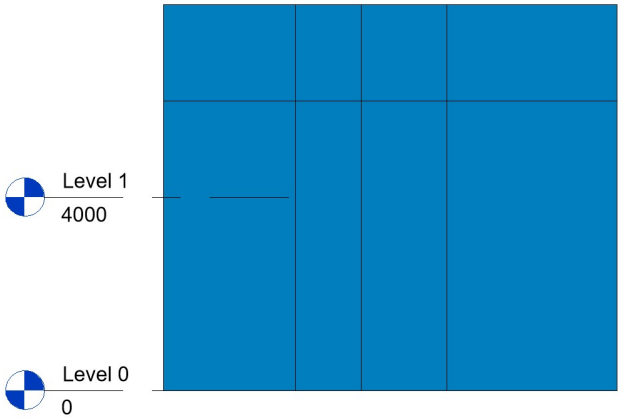
11-CURTAIN WALLS

Curtain Walling – By Wall

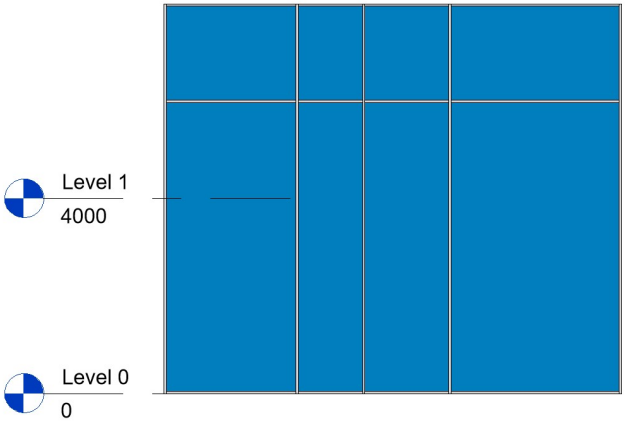
Draw a wall to set height (unconnected or to level) Using Curtain Wall EMPTY

Go to elevation view – change visibility to shaded



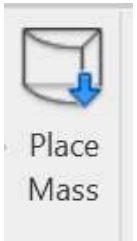


Add a Curtain Grid to your curtain wall to required horizontal and vertical spacing.

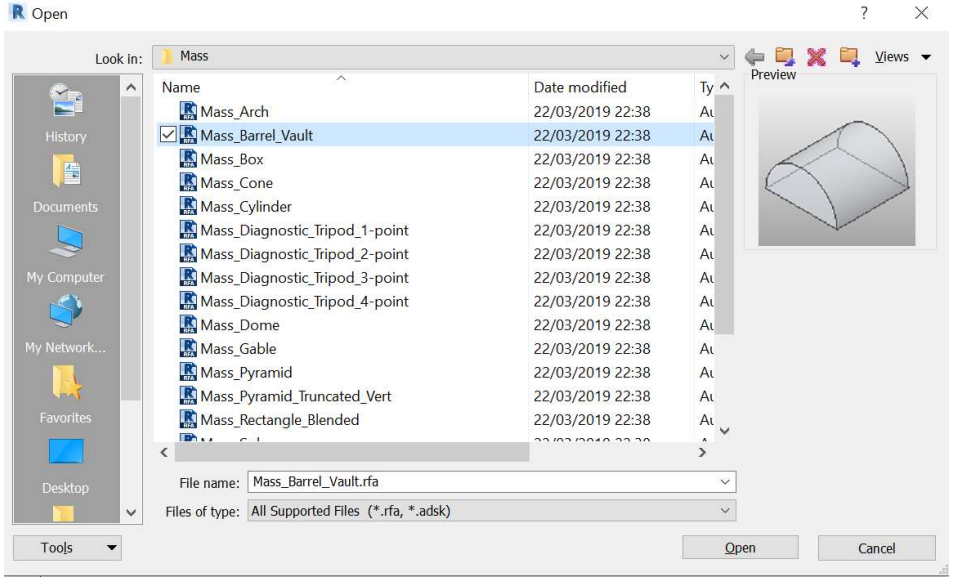


Change grid lines to Mullions by clicking the mullion icon.

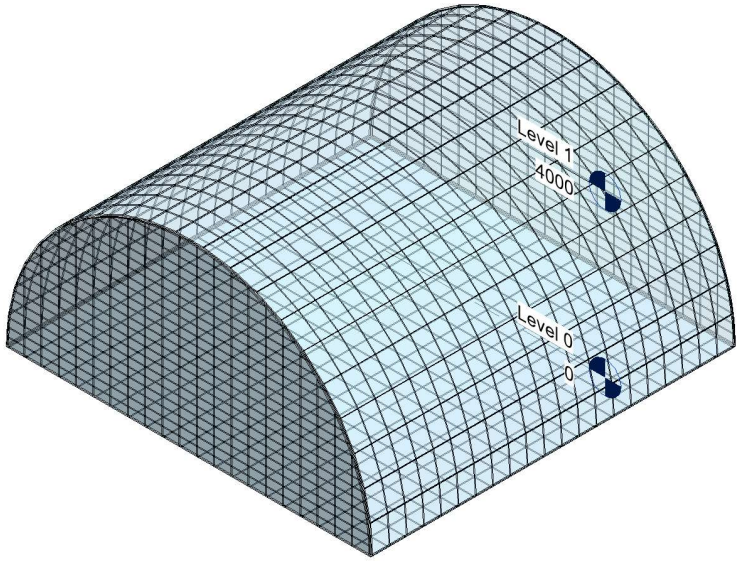
Load appropriate Mullion families.



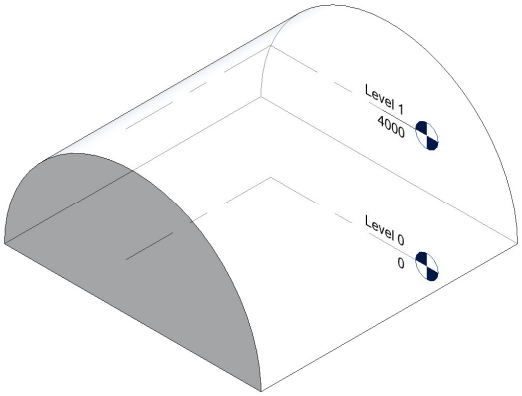
Curtain System by Mass.
Under Massing & Site selected Place Mass



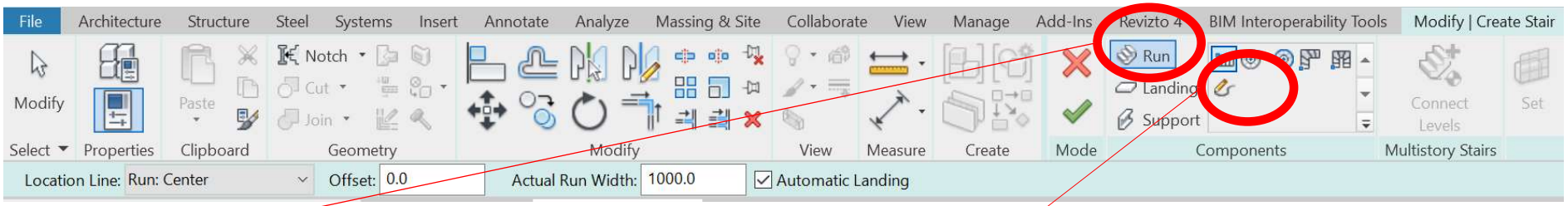
Click 'Curtain System' Select all faces of the mass. In the properties palette change the number of grids of the system. Once you have the appropriate number of grids click 'Create System'



Place the Mass in the appropriate Plan view.
Double Click the 3D view



12-STAIRS

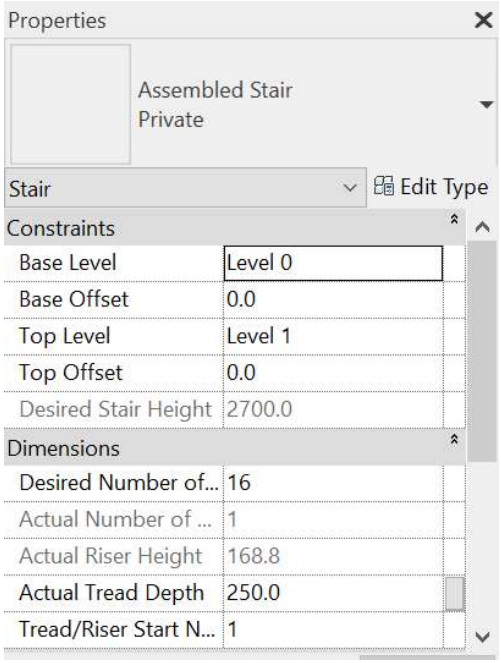


Create a Stair by Run.

Check Base level and top level in the Properties Palette. Change stair type as appropriate.

Click to start run and click to finish run once 0 risers remain.

Click the TICK



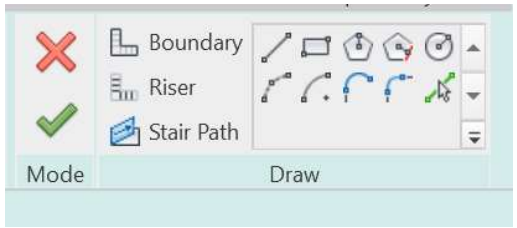
Create a Stair Sketch.

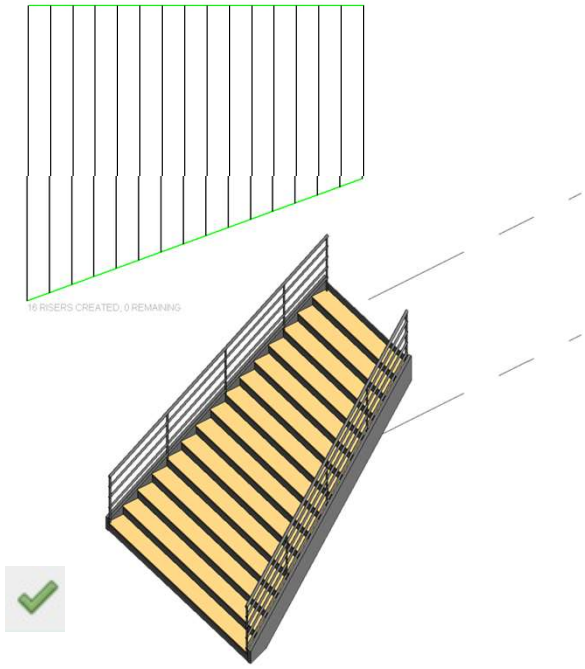
Check Base level and top level in the Properties Palette. Change stair type as appropriate.

Click Boundary (green lines) and draw boundary lines.

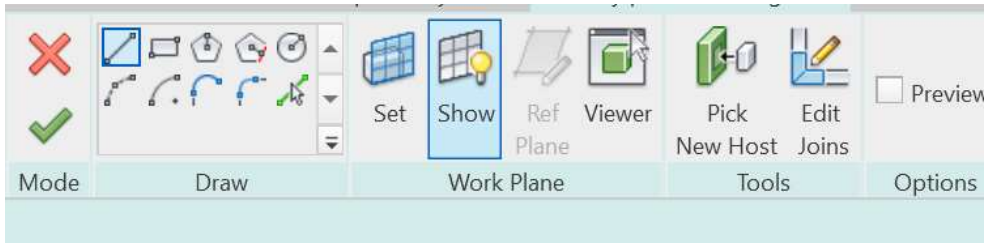
Click Riser (black lines) and draw risers until 0 risers remain.

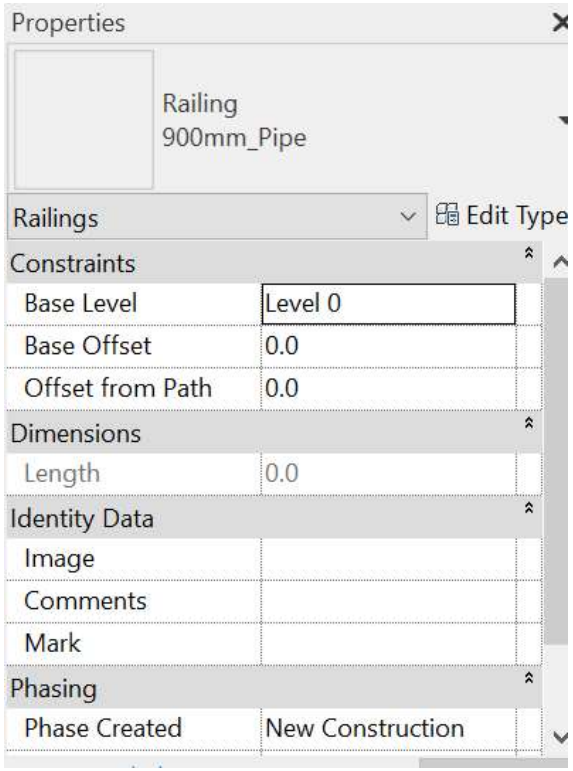
Note: risers must touch boundary lines.





13-RAILINGS



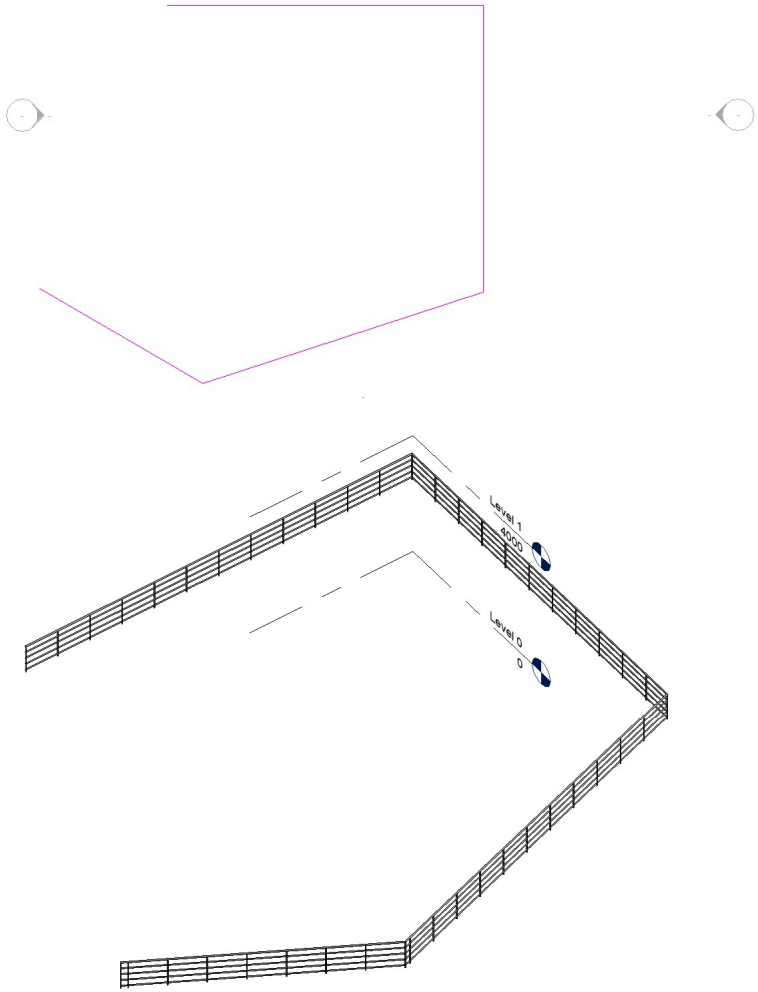


Create Railings by sketching lines

Check Base level in the Properties Palette. Change railing type as appropriate.

Draw a 'Chain' of lines in the sketch (magenta)

Click the TICK

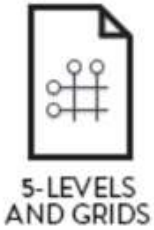


Exercise 2

Draw a 2 storey House.

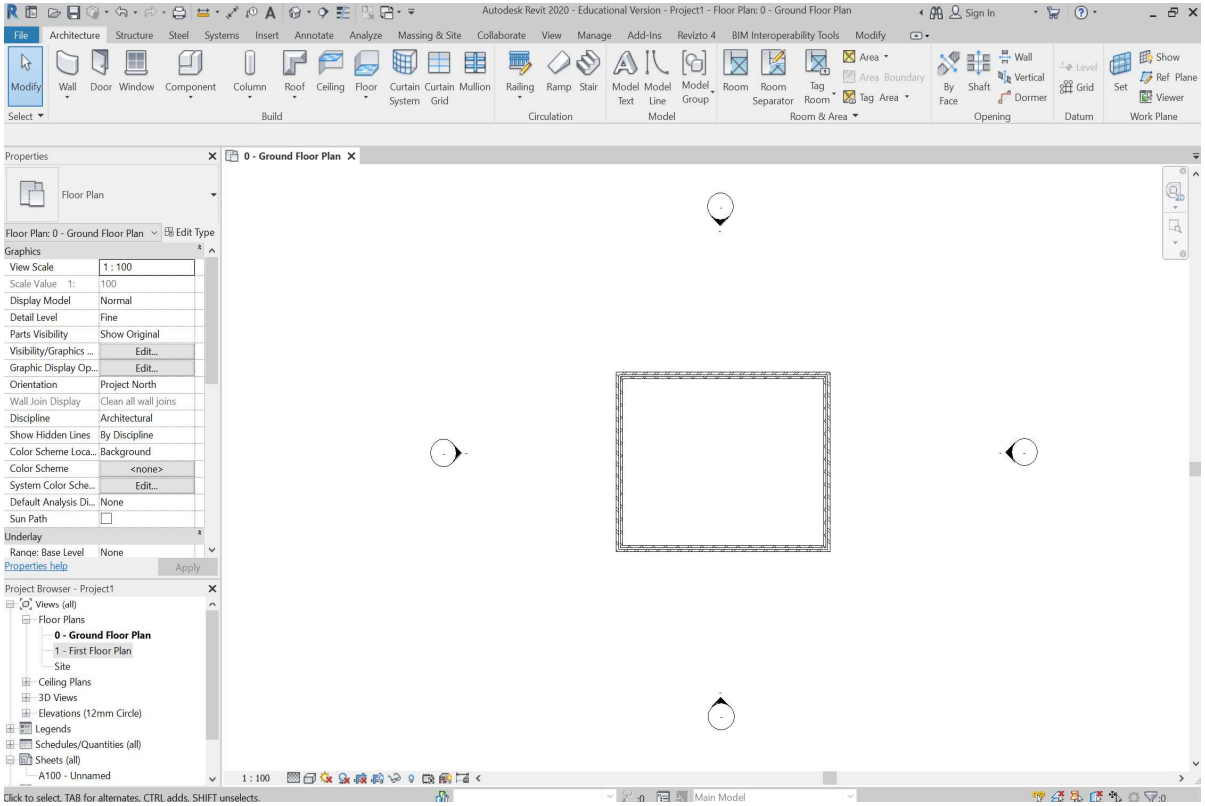
Set up your levels in Elevation view.
Distance between levels of 2700mm

Rename your levels.
0 – Ground Floor Plan
1 – First Floor Plan



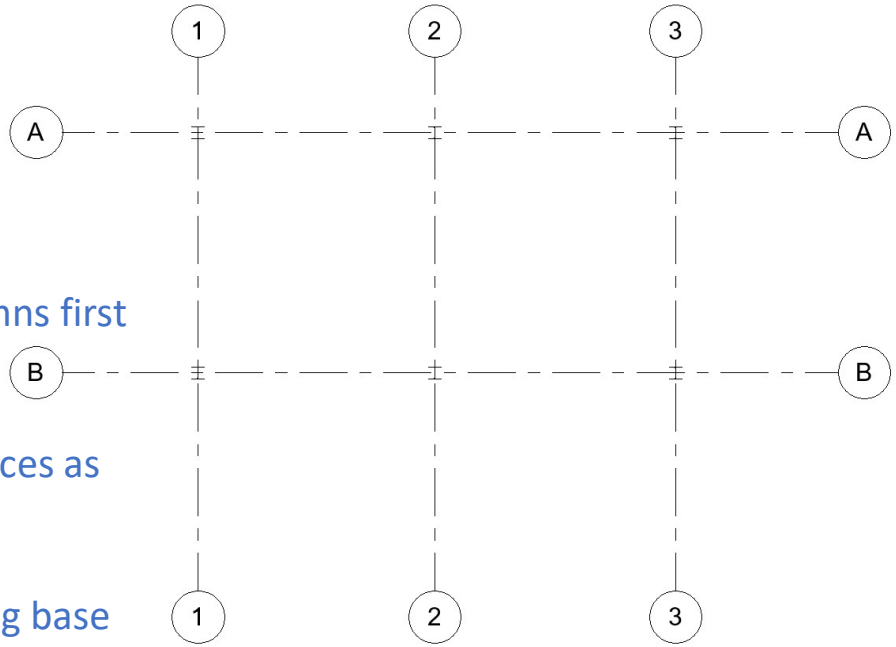
Draw a plan 10m wide by 8m deep, select or create your own wall type.

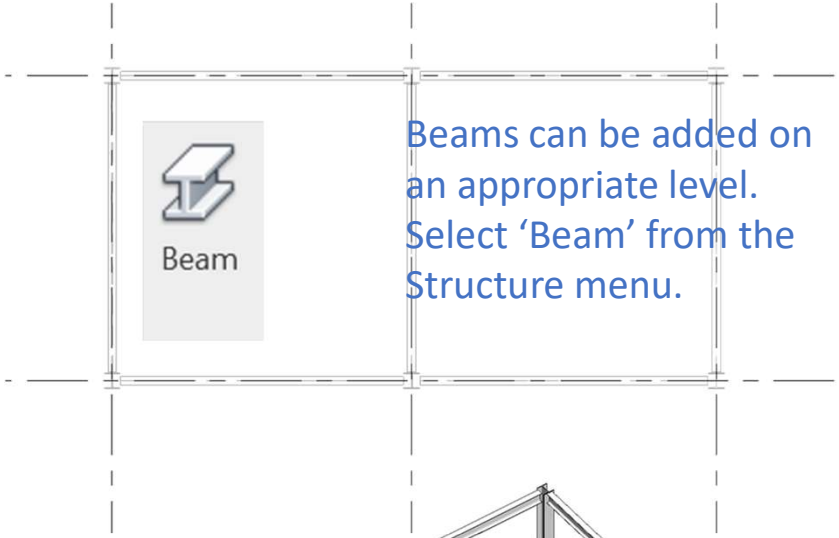
- Add internal walls to create rooms to the ground floor, such as Lounge, Kitchen diner, hallway, WC.
- Add internal walls to create rooms to the first floor, bedrooms, bathroom, landing – (make sure you leave some room for a staircase)
- Add, floors, ceilings, windows, doors and a roof.



14-COLUMNS

5-LEVELS AND GRIDS





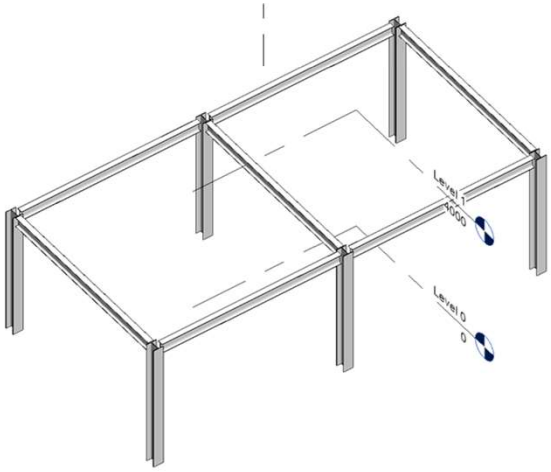
Beams can be added on an appropriate level. Select 'Beam' from the Structure menu.

Before placing Columns first start with a GRID

Rename grid references as appropriate.

Click Column - noting base level in the properties palette.

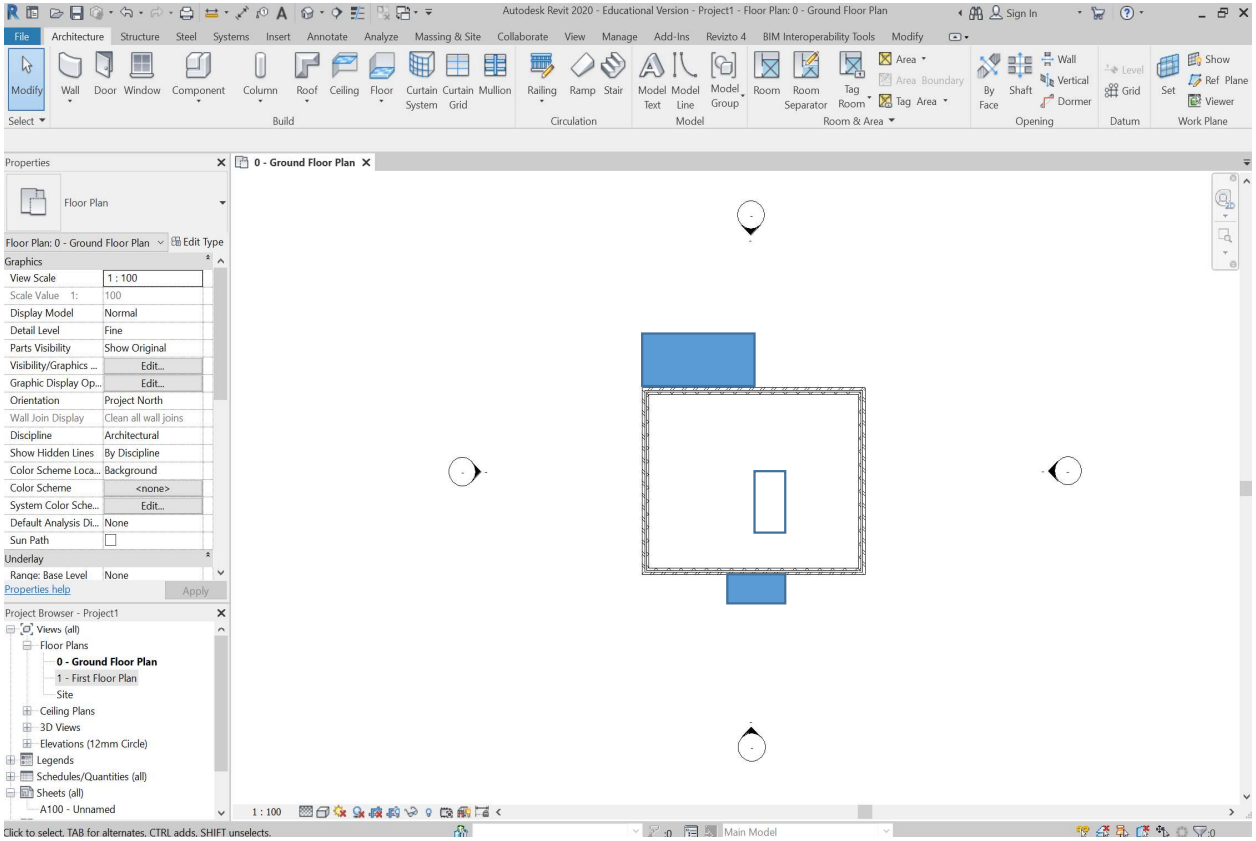
In the sub menu select 'Height' and Top Constraint (eg Level 1)



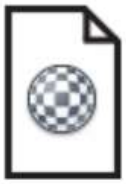
Exercise 3

In Your two storey house

- Add the staircase
- Add a porch with two columns and roof.
- Add a conservatory made from Curtain walls / Curtain roof



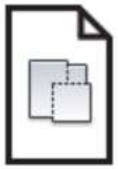
15-SITE



16-MATERIALS

17-ROOMS

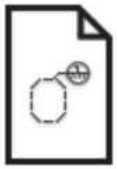
18-VIEWS



19-PLAN VIEWS

20-SECTIONS

21-ELEVATIONS



22-CALLOUTS

23-DETAILS

24-3D VIEWS

25-LEGENDS

26-VIEW TEMPLATES

27-VISIBILITY

15-SITE

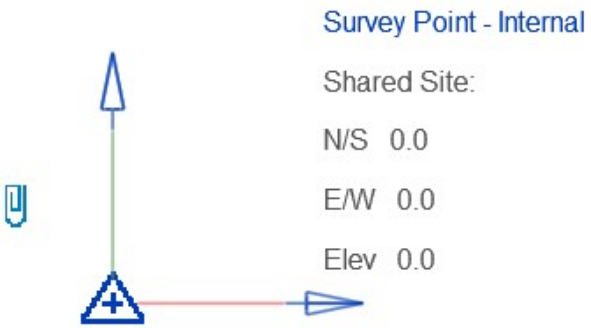
True North and Project North

Understanding the use of the coordinate system in Revit is essential for BIM.

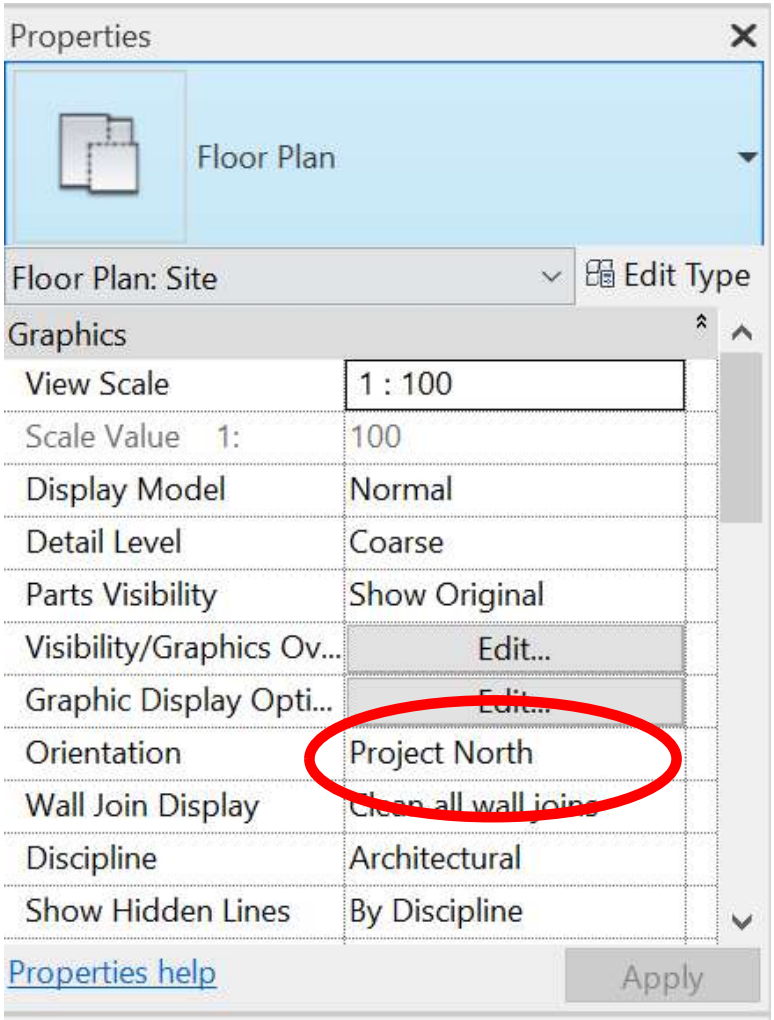
Shared coordinates / Project Base point from the outset enable consultants to coordinate information.

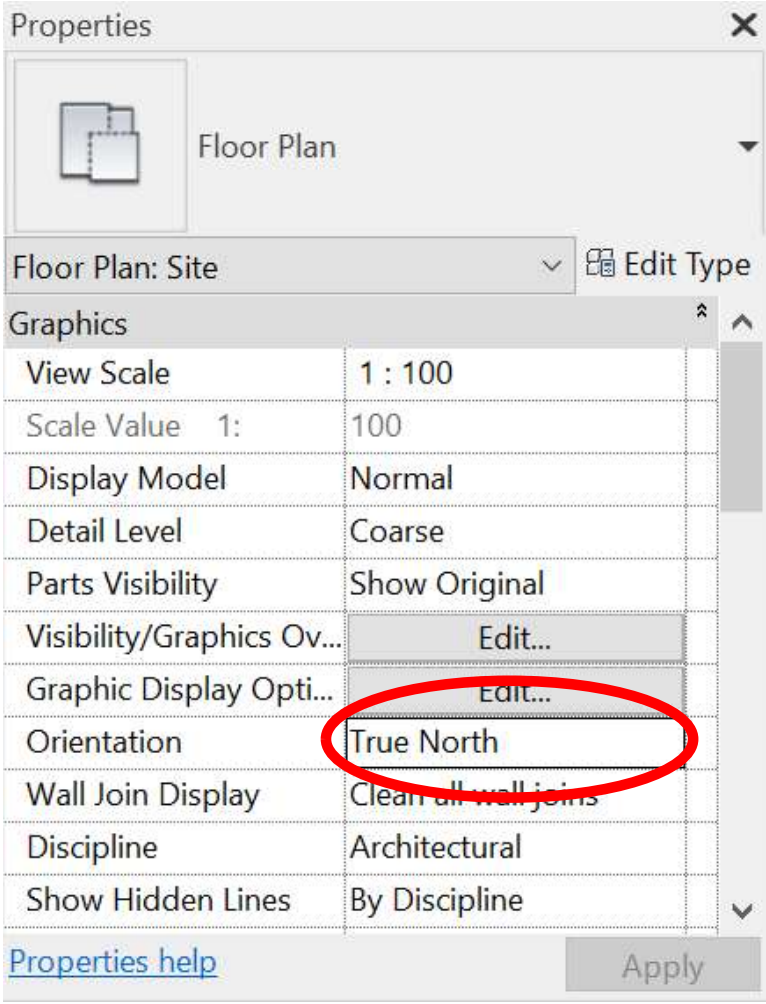
Although it helps coordination, it does not help presentation.

Revit can use True and Project North to orientate plans.

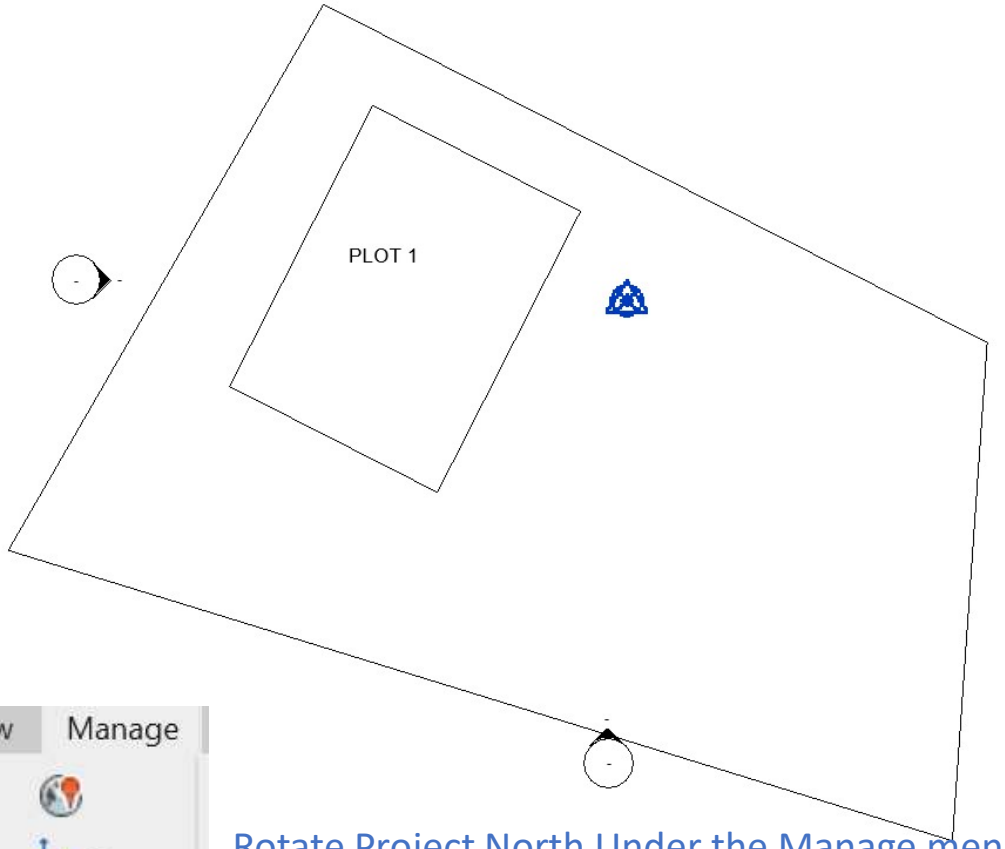


15-SITE

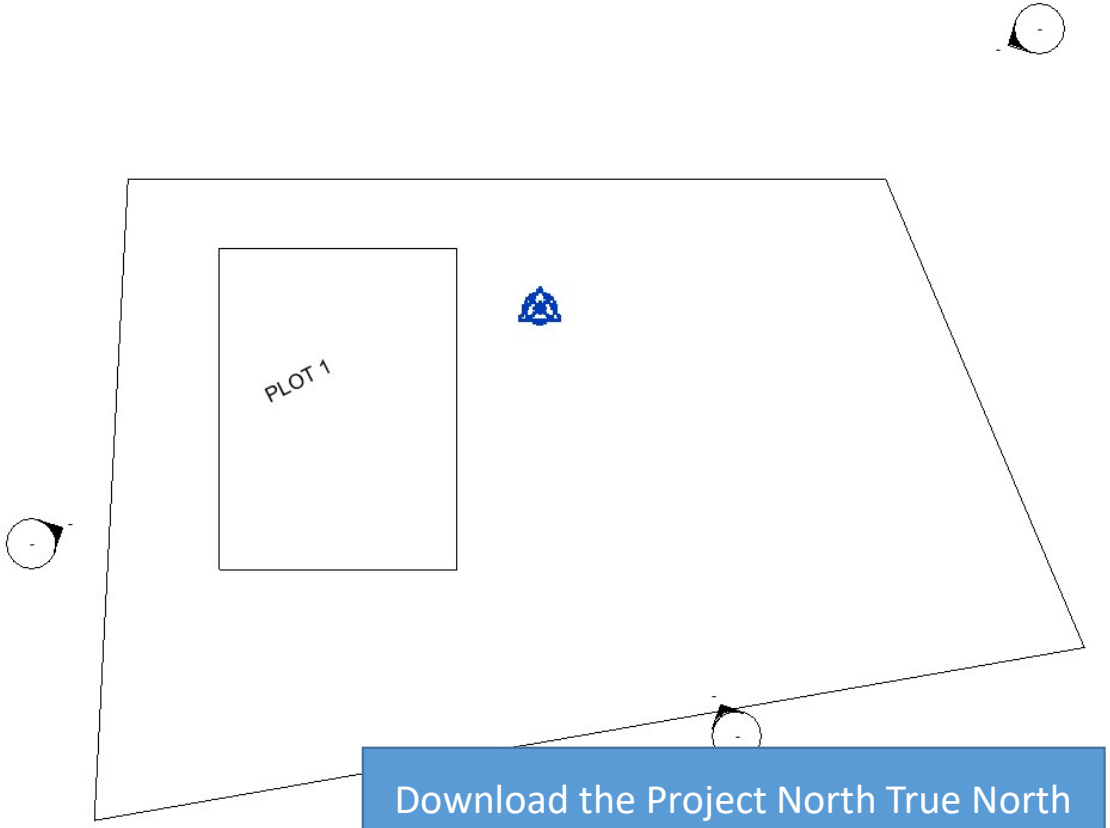

Properties
Floor Plan
Floor Plan: Site
Edit Type
Graphics
View Scale
1 : 100
Scale Value 1:
100
Display Model
Normal
Detail Level
Coarse
Parts Visibility
Show Original
Visibility/Graphics Ov...
Edit...
Graphic Display Opti...
Edit...
Orientation
Project North
Wall Join Display
Clean all wall joins
Discipline
Architectural
Show Hidden Lines
By Discipline
Properties help
Apply


Properties
Floor Plan
Floor Plan: Site
Edit Type
Graphics
View Scale
1 : 100
Scale Value 1:
100
Display Model
Normal
Detail Level
Coarse
Parts Visibility
Show Original
Visibility/Graphics Ov...
Edit...
Graphic Display Opti...
Edit...
Orientation
True North
Wall Join Display
Clean all wall joins
Discipline
Architectural
Show Hidden Lines
By Discipline
Properties help
Apply

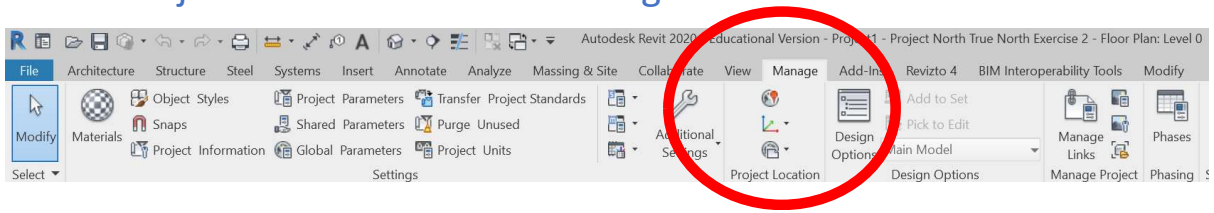
TRUE NORTH



PROJECT NORTH

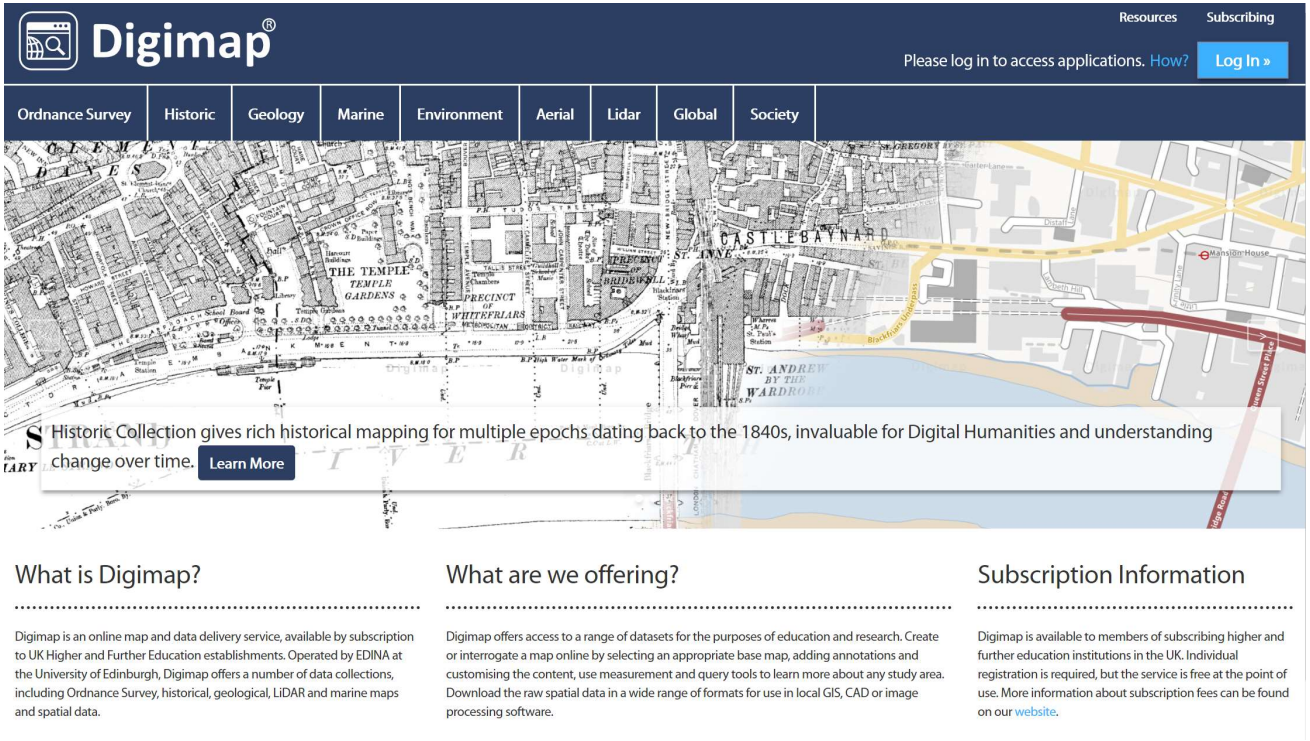


Rotate Project North Under the Manage menu



Download the Project North True North Exercise Projects 1 & 2 Teams Files

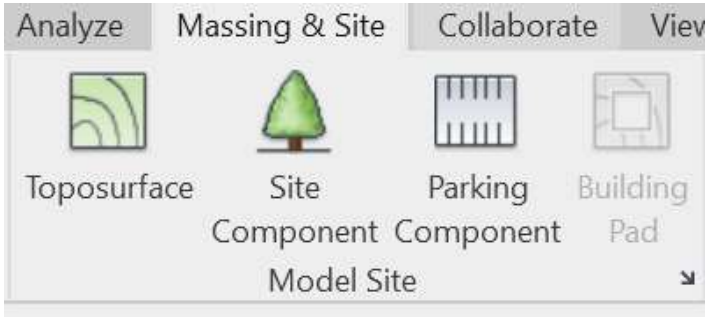
Topographical Surface – Use of Digimap



15-SITE

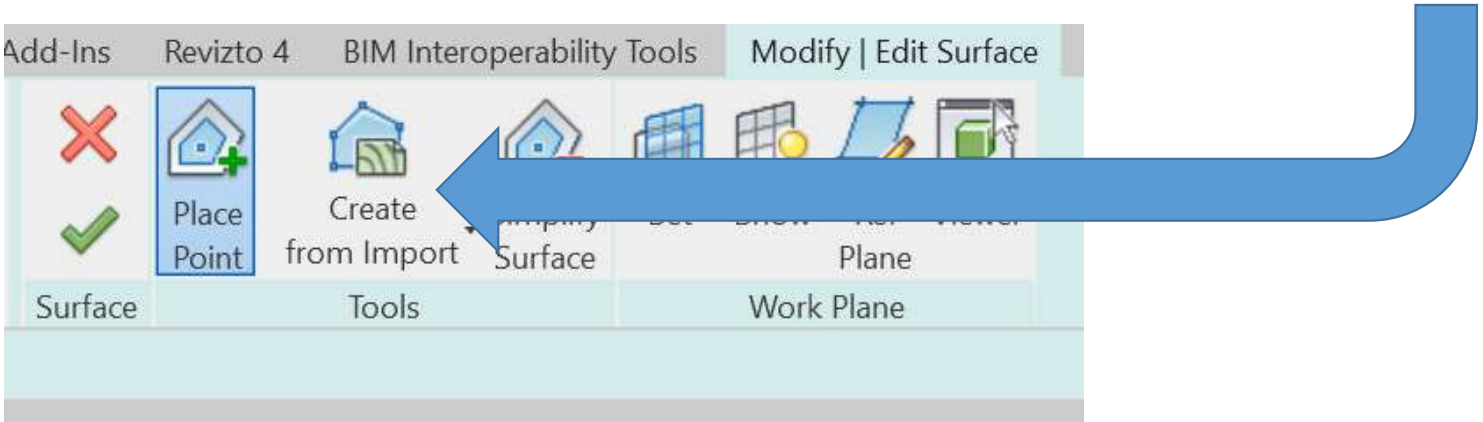
https://digimap.edina.ac.uk

15-SITE



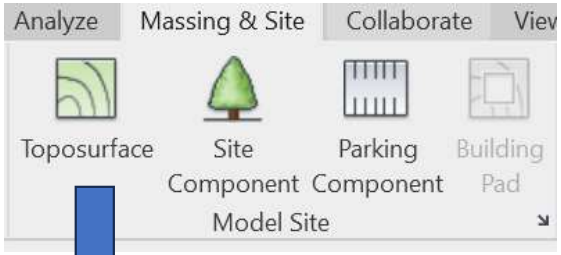
Topography can be created by placing points of the correct elevation value or from and imported site survey.

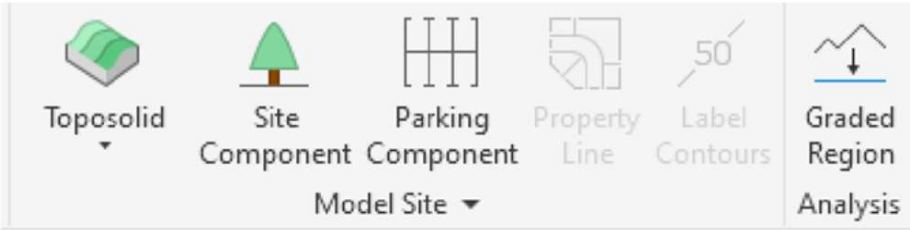
Use the digimap contours plan to create a toposurface for your house.

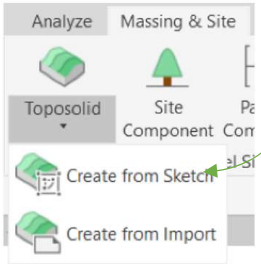


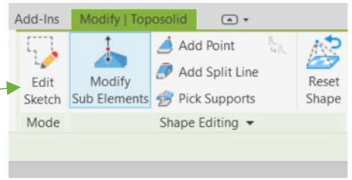
15-SITE

Revit 2024: Toposurface – replaced by Toposolid





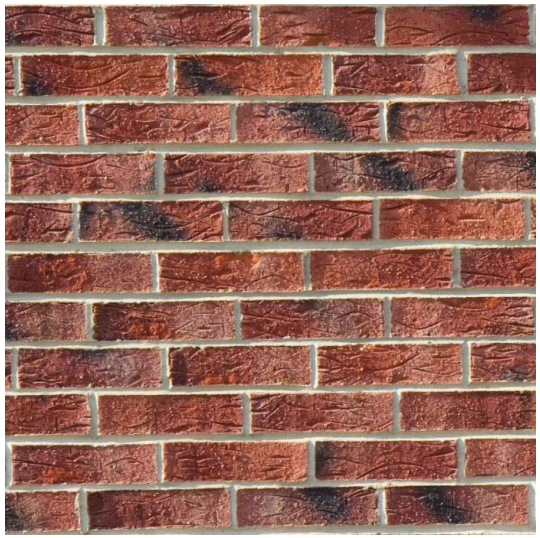


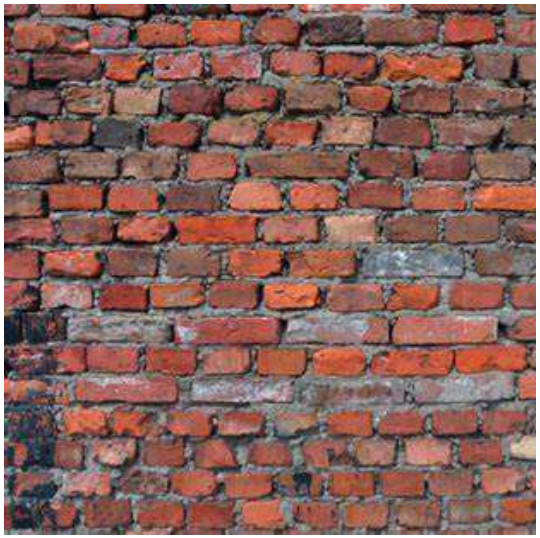


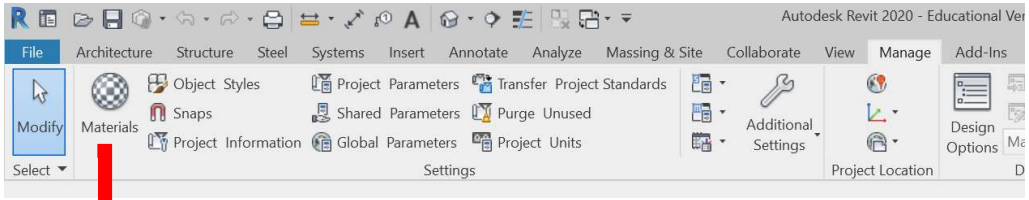
Topography can be created by placing points of the correct elevation value or from and imported site survey.

Use the digimap contours plan to create Toposolid. Download the sample file and Insert the Toposolid exercise from the Teams Files.

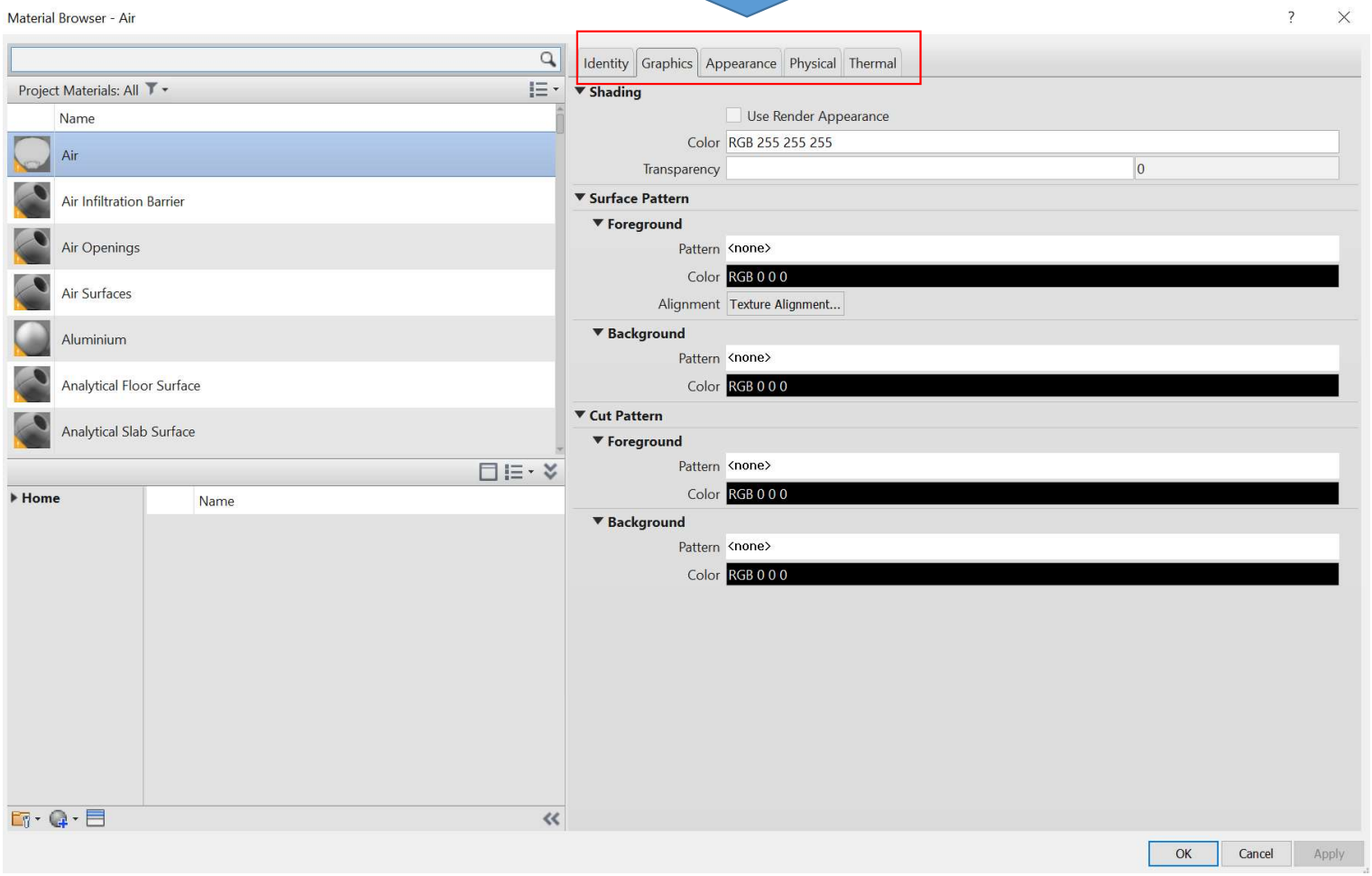
16-MATERIALS







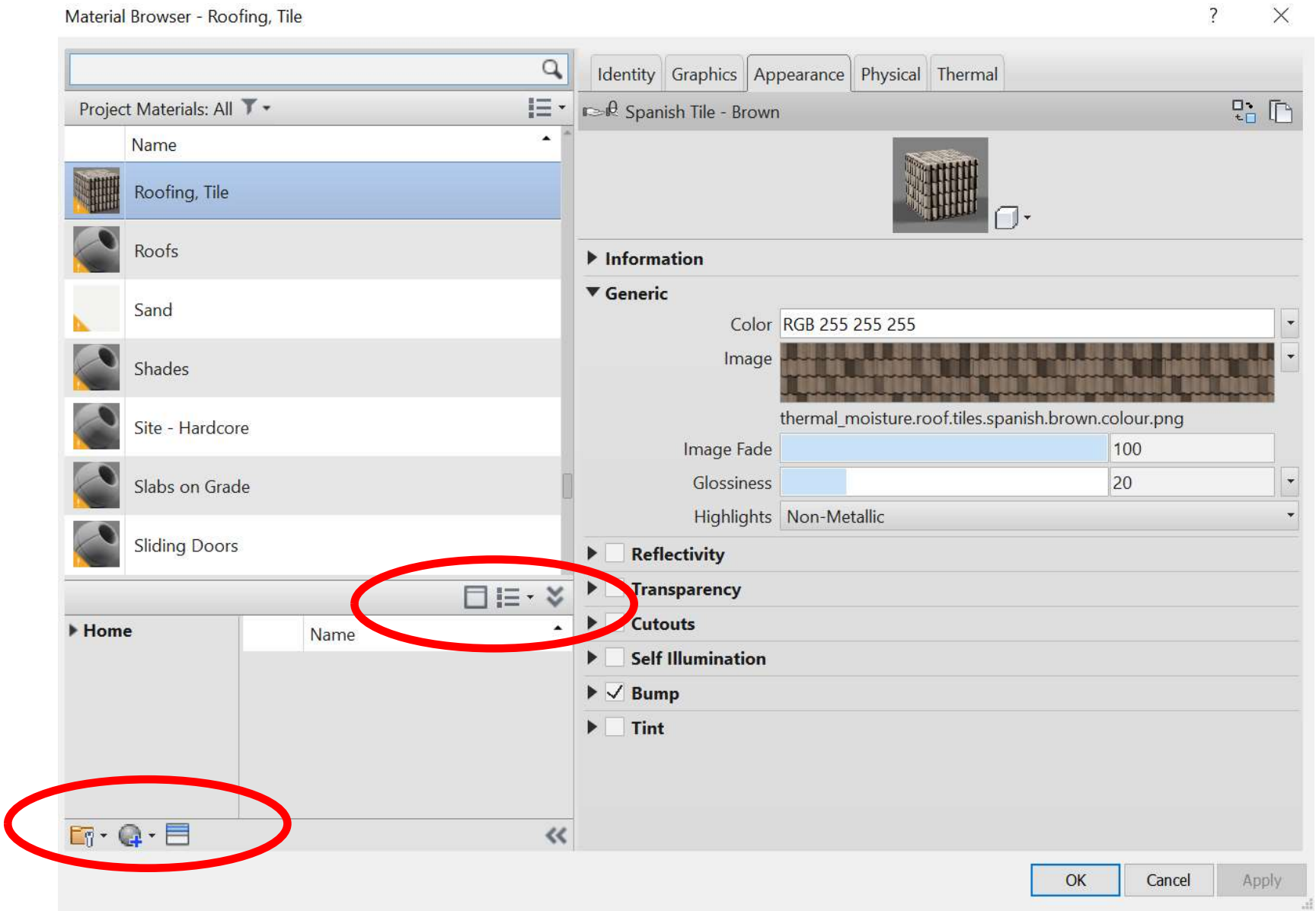
Properties of the Material



Materials Loaded within the project

16-MATERIALS

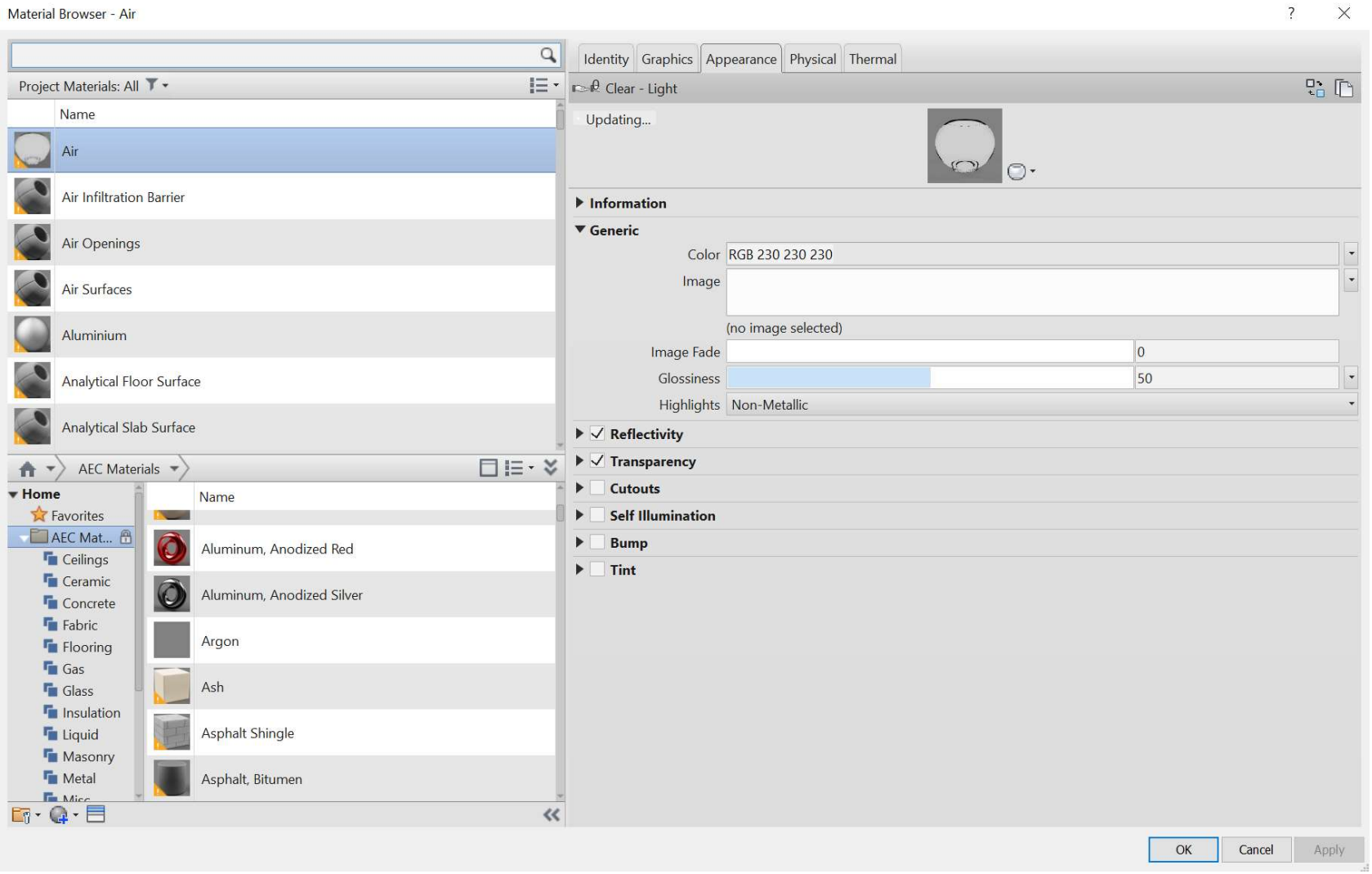
16-MATERIALS

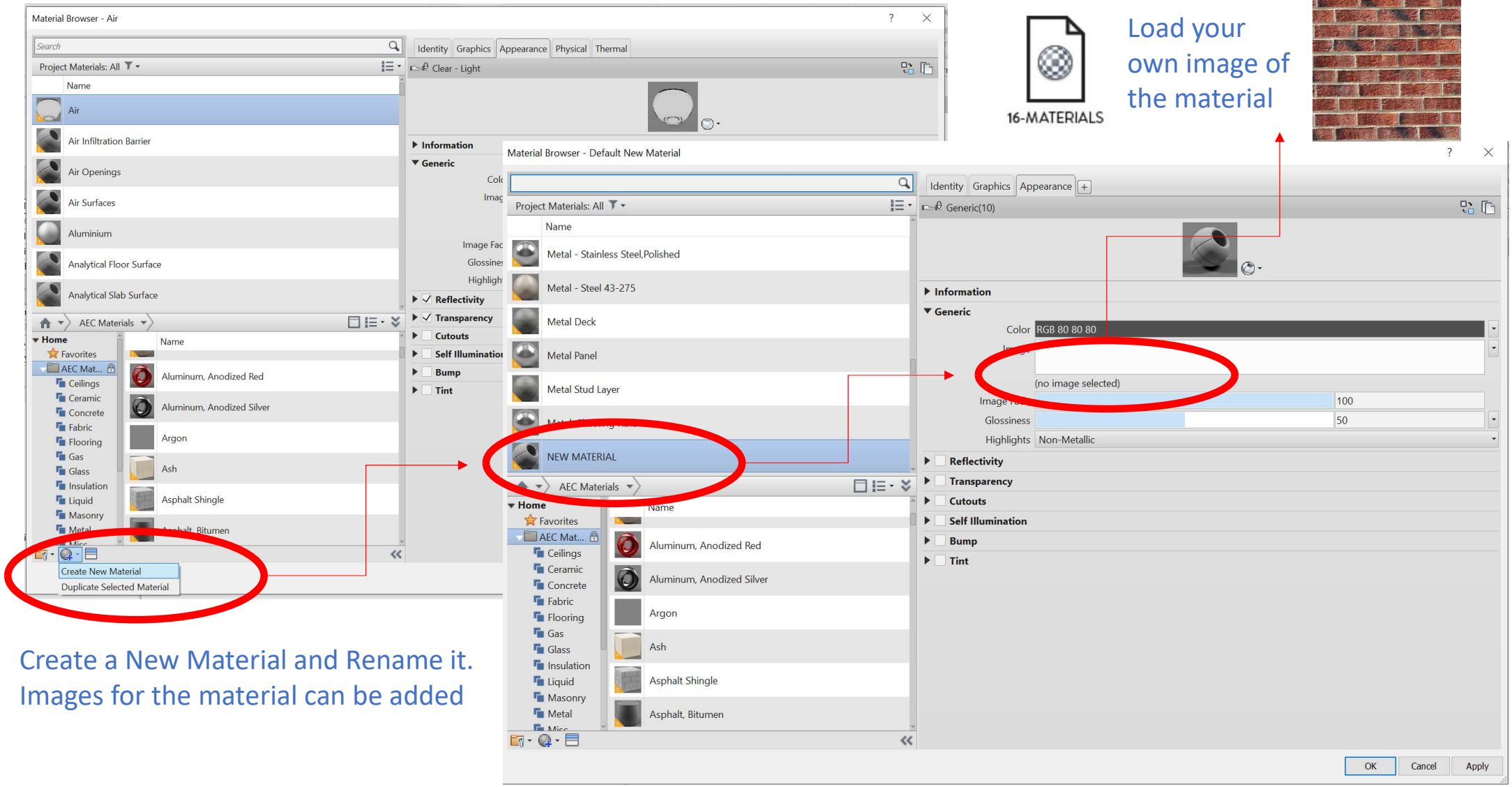


16-MATERIALS

Open the Home Menu to view AEC Materials Library

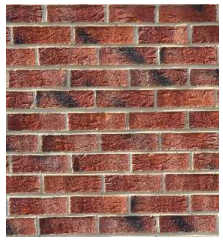
Additional Materials can be loaded in to the project.





16-MATERIALS

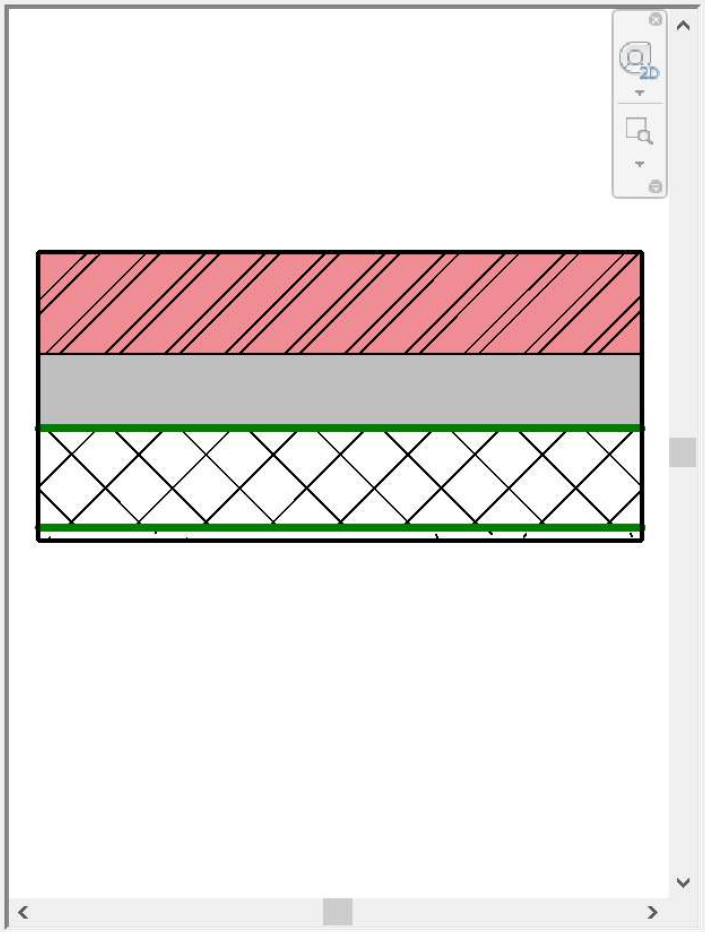
Load your own image of the material



Create a New Material and Rename it.
Images for the material can be added

16-MATERIALS

Edit Assembly



Family: Basic Wall
Type: Wall-Ext_102Bwk-75Ins-100LBlk-12P 2
Total thickness: 290.0
Resistance (R): 4.2386 (m²·K)/W
Thermal Mass: 27.90 kJ/K

Sample Height: 6096.0

Layers

EXTERIOR SIDE

	Function	Material	Thickness	Wraps	Structural Material
1	Finish 1 [4]	Brick, Common	102.	☑	■
2	Thermal/Air Laye [3]	Fiberglass Batt	75.0	☑	☐
3	**Core Boundary**	**Layers Above Wrap**	**0.0**		
4	Structure [1]	Concrete Masonry Uni	100.0	☐	☑
5	**Core Boundary**	**Layers Below Wrap**	**0.0**		
6	Finish 2 [5]	Plaster	12.5	☑	☐

INTERIOR SIDE

Insert | Delete | Up | Down

Default Wrapping

At Inserts: Both

At Ends: None

Modify Vertical Structure (Section Preview only)

Modify | Merge Regions | Sweeps
Assign Layers | Split Region | Reveals

View: Floor Plan: Modify typ

Preview >>

OK | Cancel | Help