AUTODESK REVIT BIM Boot Camp

To start Revit go to Start > All Programs > Autodesk > Revit 2016 > Revit 2016

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Image: Architecture Project

Sample Architecture Project

Sample Structure Family

Sample Structure Family

Image: Image:

To start project go Projects > New...

In the New Project dialog box select Template File > Architectural Template.

Click [OK].

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This is the basic architectural template with elevations and basic grids already set up.



window select the dwg ile called BIM_Contour.dwg located in Scratch > BIM

Click [Open]

BOOTCAMP > BIM_Contour.

appear on the floor plan.

Project Browser > Floor Plans > Level 1



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Topography

Now to model the contour surface, it is easiest to work from the 3d view. Navigate in the Project Browser > 3D Views > Work.

Go too; Massing & Site > Model Site > Toposurface.



Now in the green temporary banner go; Modify | Edit Surface > Tools > Create from Import > Select Import Instance.

Select the dwg file.

In the Add Points from Selected Layers dialog insure all layers are checked and Click [OK]



To finish the site surface select Modify | Edit Surface > Surface > Finish Surface.

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Levels

Now to sort out the floor levels before modeling it is easiest done through a elevation. Navigate too Project Browser > Elevation (Building Elevation) > South.

Go too; Architecture > Datum > Level, and draw two new levels above Level 2.



Once drawn the distance between the levels can be modified by selecting the level to be shifted. Using the temporary blue dimension input the values as shown. 2200 for Level 2 and 3000 for the other two levels.

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The top Level may move out of the crop region. The crop can be adjusted by selecting the crop box and moving the blue nodes.

The levels are complete.

(Level 2 becomes the ground floor. You may rename these levels in the Project Browser to make it easier to navigate.)



Grids

To aid with modeling we will now set up the grids.

First Navigate to the Ground Floor; Project Browser > Floor Plans > Level 2.

Go too; Architecture > Datum > Grids



Using the grids from the template draw three more vertical and one horizontal grids with the dimensions as shown.

Move the grids by using the temporary blue dimensions to input the required values.



Wall

To model the walls go to Architecture > Build > Wall.



In Properties > Basic Wall select an appropriate wall (e.g. 90T_40Cld_13Gb)

Set the wall height to Level 3 under; Modify | Place Wall > Height > Level 3.

The method for drawing a wall can be adjusted at; Modify | Place Wall > Location Line. For this purpose select Finish Face: Exterior



Draw the walls onto the grids 1, 3, 5, and A as shown.

Add interior walls as you wish. Select an appropriate interior wall type under Properties > Basic Wall.

Note: the walls can be modified further under Properties > Edit Type.



Ground Slab

To make the ground floor slab go too; Massing & Site > Model Site > Building Pad.



To draw the boundary select the pick line method. Modify | Create Pad Boundary > Draw > Pick Lines.

Note: the pad can be modified further under Properties > Edit Type.



Click on the exterior side of the exterior walls. A pink line will appear.

To finish select Modify | Create Pad Boundary > Mode > Finish Edit Mode.

Optional: each time you draw a line you can click the lock to link the edge of the slab to the walls.

To draw the floor plan on Level 3 Navigate too; Project Browser > Floor Plans > Level 3.

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As for the Level 2 floor plan, select appropriate wall type, wall height too Level 4 and Location Line.

Draw the walls onto the grids 1, 4, 5, and A as shown.



Floor

To model the floor on Level 3 go too; Architecture > Build > Floor.

In Properties > Floor Select an appropriate floor type (e.g. 250T_19PBd).

To draw the boundary select the pick line method. Modify | Create Floor Boundary > Draw > Pick Lines.





Click on the exterior side of the exterior walls, a pick line for the boundary will appear.

To finish select Modify | Create Floor Boundary > Mode > Finish Edit Mode.

Note: the floor can be modified further under Properties > Edit Type.

Core E Core Structure Systems Inset Annot #B <\ & ☆ & hhi Wall Door Window Commonweak H No P 10 H B F T (D 22 0. k • 88 Ec Q 2 4 Level 3 3 Would you like walls that go up to this level to attach to its bottom? 0 Yes Views (Structu - Floor PL Level Level Level 4 Site iling P \odot Elevations
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A Revit dialog box will appear asking 'Would you like walls that go up this floor's level to attach to it's bottom?' Click [Yes].



Roof

To model the roof go too; Architecture > Build > Roof > Roof by Footprint.



In Properties > Basic Roof Select an appropriate floor type (e.g. 150T_50Pur_ CGI).

To draw the boundary select the line method. Modify | Create Floor Boundary > Draw > Line.



To set the height of the roof set the base level at Level 4. Properties > Constraints > Base Level > Level 4.

Note: the roof can be modified further under Properties > Edit Type.



To adjust the roof overhangs. Select the line to be shifted and use the blue temporary dimensions to make adjustments.





To create a pitched roof select one of the boundary lines check Properties > Constraints > Defines Roof Slope.

Adjust pitch to 5 degrees in Properties > Constraints > Dimensions > Slope.

Note: by selecting more then one boundary line you can create hipped and gable roofs.

Navigate to the 3D View. Project Browser > 3D Views > Work.

To close the gap between the wall and roof select all the Level 3 wall and select Modify | Walls > Modify Wall > Attach Top/Base.





Select the roof, the gap will then be closed

Curtain Wall

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To create a curtain wall select the front wall. Under Properties select a curtain wall.

Note: Scroll down to the bottom of the wall types.



Curtain Grid

First add a curtain grid to the curtain wall. Go too; Architecture > Build > Curtain Grid.



Add a grid as desired by clicking on the edge of the curtain wall panel.



Mullions

To add mullions to the curtain wall go too; Architecture > Build > Mullion.



In Properties select an appropriate mullion type (e.g. Rectangular Mullion > 50 x 150mm).

The placement method of the mullions can be selected from Modify | Place Mullion > Placement.



Click on the grid lines and mullions will be added to the curtain wall.

Note: the mullions can be modified further under Properties > Edit Type.



Window

To add standard windows start from Architecture > Build > Window.



To place a window 1200 x 600 select the closed sized window from Properties, (e.g. FL 1 Aluminum-Grooved (NZ) > 1000 x 600).



First adjust the head height to 2000 under Properties > Other > Head Height.

To adjust size go too; Properties > Edit Type.

In Type Properties dialog click [Duplicate...]

In Name dialog call window '1200 x 600'. Click [OK]

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Adjust height and width in Type Properties dialog under Dimension > Height and Width.

Click [OK].

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Click on the exterior side of the walls to place the windows.

Use the temporary blue dimensions to adjust the location.



Door

To add a entrance door navigate to Project Browser > Floor Plans > Level 2.

For door go too; Architecture > Build > Door.

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In Properties select an appropriate exterior door type (e.g. Ext Single Out-Aluminium_Grooved (NZ) > 910 x 2030).

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Click on the side of the wall you wish the door to swing from.

The door can be flipped later by selecting the door and using the flip handles as highlighted.

Note: the door can be modified further under Properties > Edit Type.

In order to add a row of columns for the cantilever add grid lines as shown. Architecture > Datum > Grid.





Column

To model the columns go too; Architecture > Build > Column > Column: Architectural.



In Properties select an appropriate column type (e.g. Column-Rectangular (NZ) > 300 x 300mm).

Set the height to Level 3; Modify | Place Column > Height > Level 3.



To place the columns, click at the intersection of the two grid lines.

Note: the column can be modified further under Properties > Edit Type.

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Layout Sheet

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Modify the drawing scale to 1:100 as shown for floor plans Level 2 and Level 3.

Note: feel free to adjust to suitable scales here in order to fit on the layout sheet for all plans, elevations, etc.



The drawing will be too large for the layout to we need to crop out the site. Click Show Crop Region and Crop View as circle.

Select the crop region and resize to the floor plan

Optional: to tidy up later the crop region can be hidden to remove the frame.



To start laying out your drawing navigate to the drawing sheets. Project Browser > Sheets (all) > A101 - Unnamed.

Select the title block select Properties > Edit Type.

In Type Properties click [Load]. In Open search Architecture > Annotations > Title Blocks > Titleblock A1 metric (NZ). Click [Open]. Then Type Properties > [OK]





Elevations

Open Elevations, set scale to 1:200 as shown.

The Crop region may need to be adjusted to fit in the building as well



Feel free to adjust the visual style as shown. Shaded view has been selected here.

Drag these to the layout sheet. Project Browser > Sheets (all) > A101 -Unnamed.



Section

To create a section navigate to Level 2. Project Browser > Floor Plans > Level 2.

For section go too; View > Create > Section.

Draw section line through desired part of the building.





Navigate to the section drawing. Project Browser > Section (Building Elevation) > Section 1.

Adjust the scale to 1:200 as shown.

Hide Crop Region.

Drag to the layout sheet. Project Browser > Sheets (all) > A101 - Unnamed.



3D Section

To create 3D section select to Project Browser > 3D Views > Work > (*Right click*) Duplicate View > Duplicate.

Rename new 3D view to '3D Section'.



Under Properties > Extents check Section Box.



Select the section box and move the nodes to produce the desired.

With the section box selected right click and select Hide in View > Elements to hide the box.

Drag 3D Section into the layout sheet.

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Exploded Axonometry are created similarly to a 3D section with the section box.

Create two new 3D views for the top and bottom floor Project Browser > 3D Views > Work > (Right click) Duplicate View > Duplicate.

Rename '3D axo 1 and 3D axo 2'.

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Hide section box; right click and select Hide in View > Elements to hide the box.

Turn off contours; View > Visibility/Graphics and uncheck Visibility > Topography.

You may have to hide the dwg contours.



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Change the view type to Hidden Line as shown.

Do this process to the upper floor and drag to the layout sheet.



For the upper drawing select drawing and switch of title in the Properties window and select Viewport > No Title.



Camera

To set up a camera go too; View tab > 3D View > Camera.



Click where you want the camera to be, then click where the subject is.

The easiest way to edit a camera is with tiled views; View tab > Windows > Tile.

To show camera, right click the camera's view in the Project Browser and Show Camera. The camera will now appear on the floor plan.



Rendering

Navigate to View tab > Graphics > Render.

Here you can adjust the quality, resolution and lighting of the render (the lower the resolution the quicker the render).

You can save the render to the project, or you can export it as an image file. Rendering > Image > Save to Project... Or Export...



Publishing

Place all drawings to the layout sheet.

To print to PDF go to the Revit logo to the top left corner > Print and select a pdf printer



Appendix





Select foot print Modify | Line > Select > Modify.

Create solid by going to Modify | Lines > Form > Create Form > Solid Form.



Navigate to the 3D view Project Browser > 3D Views > Work.

Start modeling the form by selecting the surfaces and edges and moving them around.

Complete modeling by selecting Modify | Lines > In-Place Editor > Finish Mass.



Navigate to a elevation Project Browser > Elevations.

Add appropriate levels to the building to appropreate floor levels between each floor. Architecture > Datum > Levels.



Navigate back to the 3D view Project Browser > 3D View > Work.

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To Create internal floor select the mass and select; Modify | Mass > Model > Mass Floors.

In the Mass Floor window select the appropreate floors and click [OK].



Now to model wall, floors, and roofs.

Go to Architecture > Build > Wall > Wall by Face as shown and click on the surface in the 3D view. Follow this process with the floor and roof tool.





Importing Rhino Models

Create your rhino geometry

Make sure the geometry is 1:1 scale and is located close to the model basepoint (0,0,0 grid location)



Select the geometry and go to file > export selected and save the file as ACIS .sat file.

In Revit go to Massing & Site > In-Place Mass > OK

While in the Mass In-Place Editor go to Insert > Import CAD > Select the .sat file > Open

Your Model should now be in Revit and can be edited as a Revit Mass

Refer to tutorial chapter: Modelling from Mass for instructions on how to create walls, roofs, and floors from a mass.





Annotate Drawings

Go to the cross section created earlier.

Change the scale to 1:50 and the detail level to Fine



To insert dimensions go to the Annotate tab > Dimension > Aligned

Click the horizontal grid lines to place level height dimensions.

Click the corners or faces of revit elements to place specific demensions



To insert notes go to the Annotate Tab > Text and then click where you want to place the note

To add a text leader click on the text and go to Modify Text Notes the click on one of the the add leader icons



The location of the leader can be adjusted in this tab

Click the end of the leader and drag it to the correct location

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Detailing

Before drawing the Roof Eave detail we should add a gutter and fascia to the model.

Go to the Project Browser > Work View to view the model in 3D

To add the gutter and fascia to the roof go to the Architecture Tab > Roof > Fascia

Click the edge of the roof to place the gutter and fascia

Note; the components can be modified in the properties tab which can be accessed by clicking on model element



To create a detail view open the cross section and go to the View Tab > Callout and then click drag a window around the eave area

To access the detail view go to the project browser > sections > callout 1

Change the scale of the drawing to 1:10 and turn off the view extent window



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Detailing

To turn off the grid and level go to the Properties Tab > Visibility / Graphics Overrides > Annotation Categories and untick Grids and Levels



To lower the gutter and fascia below the roofing line click on the model elements and go to Properties > Vertical Profile Offset and enter - 40.0



To draw in a timber top plate go to the Annotate Tab > Detail Lines and draw a 90x45 rectangle in the framing space.

Select the rectangle and change the line style to Wide Lines



Then select the Thin Lines Style in the drop down box and draw in a diagonal from corner to corner



To make the top plate a Detail Group, select all the lines and go to the Annotate Tab > Detail group > Create Group

Name the group 90x45



Repeat the workflow to add 70x45 roof purlins and 150x45 blocking between the rafters



To indicate roofing underlay and soffit lining go to the Annotate tab > Detail lines

Use the Thin Dashed Style for the underlay and the Thin Lines Style for the soffit lining

To indicate insulation go to the Annotate Tab > Insulation and draw it like a line. Change the width to 140 by clicking on the insulation and going to the properties tab

Note Line Styles can be edited by going to Manage > Additional Settings > Line Styles



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