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| Subject:  | <b>Building Information Modelling<br/>with Revit Architecture</b> |
| Course:   | <b>Revit Night Course</b>   |
| Session:  | <b>Spring 2018</b>  |
| Lecturer: | <b>Philip O'Shea</b><br><b>Paul Vesey BEng, MIE, HDip</b>         |

## **Assignment 3 (33%) - Miscellaneous Activities in 4 Parts (Total 7 Files)**

|                         |                     |
|-------------------------|---------------------|
| <b>Issue Date:</b>      | As stated on Moodle |
| <b>Submission Date:</b> | As stated on Moodle |

### **Assignment Outline**

In these exercises you are required to create a number of new items and modify the existing designs created during Assignment 2 and Assignment 3. This assignment consists of 4 parts, each of which has its own set of deliverables and submission file or files.

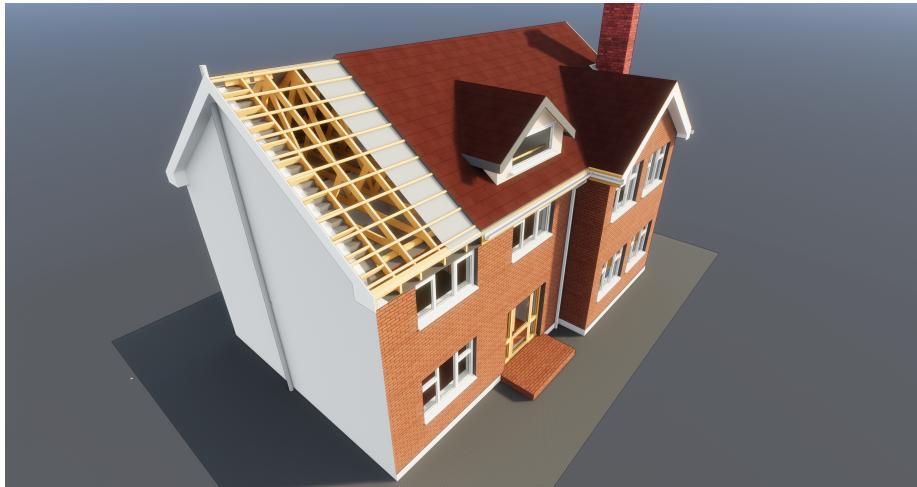


Figure 1: Domestic Building

## Part 1 - Domestic Building Details

Using the Residential model developed for Assignment 1, make the following amendments to your design.

1. Roof: Change the roof name to Domestic Roof with Conc Tile finish, and change the roof make-up to
  - 30mm Concrete roofing tile on,
  - 38mm (Wood Lumber) Battens on,
  - 2mm Roofing Felt on,
  - 166mm Truss
2. First Floor: Add 12mm Oak Flooring layer on top of the suspended timber floor make-up
3. Ground Floor: Edit and Duplicate the ground floor type and rename as 'Ground Floor - Domestic w Oakwood Finish'. Edit the construction to reflect the following build-up:
  - 6mm Oakwood Flooring finish on,
  - 80mm Sand & Cement Screed on,
  - 100mm Rigid Insulation on,
  - 150mm In-situ Concrete on,
  - LDPE DPM / Radon Membrane on,
  - 50mm Sand on,
  - 200mm Site Hardcore
4. Roof: Hide the West gable and cut back the roof and place 4 Roof Trusses into the roof (Leave exposed).

5. Produce the following 3D View and 3 Call-out views. Place these views on a new sheet, A105. Include annotations and dimensions as necessary.

- 3D View of the house as completed in the previous item 4
- Call-out Detail of the Roof / External Wall interface @ 1:20
- Call-out Detail of the First Floor / External Wall interface @ 1:20
- Call-out Detail of the Ground Floor / External Wall / Foundation interface @ 1:20

Make use of the Masking and Component tools, and the 'Repeating Detail' functionality in Revit. Annotations should include, at a minimum, the construction information outlined in items 1, 2 and 3.



Figure 2: Commercial Building

## Part 2 - Commercial Building Details

Using the Commercial Building model developed for Assignment 2, make the following amendments to your design.

1. Roof: Create a curved extruded roof similar to the diagram shown in Figure 2
2. 3D Views: Create 3 Autodesk 360 rendered images and import them into a new sheet, B107.
  - External view of the building looking through the curtain wall glazing
  - Internal view of one retail unit facing the curtain wall, and picking up the stairs
  - Internal view of your choice from the First Floor landing
3. Solar Study: Create a solar study for the 16<sup>th</sup> of June 2018 and place a view of 14:30 hours onto sheet B107. Render your image using the 'shaded' setting; do not fully render.
4. Walk-throughs: Create the following walk-throughs using the 'Shaded' setting. Do not fully render the animation. The maximum number of frames required is 300.
5. Sloping Toposurface: Create a sloped topographical surface (approx 80m x 90m) incorporating a slope from approx 5m hight at the rear, and 8.0m out from the building, to -225mm at the front of the building, and over the front area of the site.
  - Create a Building Pad incorporating an 8.0m hard-stand area to the rear and sides of the Retail Unit block and approx 15.0m at the front

- Create a parking area for cars to the front of the building
- Provide an access road from the edge of the Site to the car park.
- Add street lighting, trees, and other components from the 'Entourage', 'Site' and 'Planting' libraries as necessary



Figure 3: Building from Building Mass

### Part 3 - Building Mass

In this part you will create a 10 storey building, typical FFL to FFL of 3.0m. The following information is provided

- Top Floor height = 30,000mm
- Flat roof height = 33,000mm
- Overall height = 34,200mm to top of parapet wall
- The shape is a six sided polygon
- The model should include Walls, Floors, Roof, Parapet & Capping, Lift shaft and stairs
- The stairs should have no more than 16 risers in any flight
- The walls should be a mixture of solid walls and glazed curtain walls, with doors, glazing pattern and mullions
- Include Foundations, Structural supports, Toposurface, Building pad, Car-parking, Access road & planting
- 430mm Insulated external walls (4 Part Stacked wall or standard)
- Insulated concrete ground floor slab and suspended Concrete upper floor construction.

## **Part 4 - Interoperability (File Exchange formats)**

Using the Week 2 Original Sample Building, create or export the following file types from Revit

1. Export the floor plan in Autocad .dwg format
2. Export the site view in .adsk format. An Autodesk Exchange file (.adsk) contains building and site models with data for the import into Civil Engineering design applications
3. Export the floor plans in .gbXML format, used in Energy Analysis
4. Make a .pdf of the floor plan

The exported filename should be of the form *Semester + Year + Project No.+ Part + First Initial + Surname + K-Number*. An example would be '**Spring18P04-1PVeseyK00123456.rvt**'. Do not use spaces in the filenames.