VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JanaSangama, Belagavi-590018

INTERNSHIP REPORT ON

"REVIT ARCHITECTURE"

[04-04-2022 TO 04-05-2022]

Submitted in partial fulfilment of the Requirement for the Award of

Bachelor of Engineering
in
CIVIL ENGINEERING

Submitted by

G THIPPESWAMY

1SJ18CV033

Internship carried out at
Educadd, Yelahanka

Under the Guidance
of

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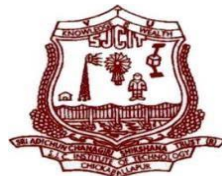
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DEPARTMENT OF CIVIL ENGINEERING

S J C INSTITUTE OF TECHNOLOGY

CHICKBALLAPUR – 562 101

2021-22

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CHICKBALLAPUR – 562101, KARNATAKA

DEPARTMENT OF CIVIL ENGINEERING

CERTIFICATE

This is to certify that the Internship Work entitled **"REVIT ARCHITECTURE"** bonafide work carried out by **G THIPPESWAMY (1SJ18CV033)** is bonafide student of SJC Institute of Technology in partial fulfillment for the award of Bachelor of Engineering in Civil Engineering in Visvesvaraya Technological University, Belagavi during the academic year 2021-22. It is certified that they have completed the Internship satisfactorily.

Signature of Guide	**Signature of Coordinator**	**Signature of HOD**
Mr. SATHISH Y A	Mr. KAMATH G M	Dr. G NARAYANA
Assistant Professor	Assistant Professor	Professor & HOD
Dept. of Civil Engg, SJCIT	Dept. of Civil Engg, SJCIT	Dept. of Civil Engg, SJCIT

EXTERNAL VIVA

Name of the Examiner:

Signature of the Examiner:

1.

2.

ACKNOWLEDGEMENT

With great pride I would like to express my gratitude to S J C Institute of Technology. The temple of learning for providing us the required platform for the fulfillment of the internship.

Remembering with reverence, I offer my pranamas at the lotus feet of **Byravaikya Padmabhushana Paramapoojya Jagadguru Sri Sri Sri Dr. Balagangadharanatha Mahaswamiji.**

Submitting devout pranamas and seeking the blessings of his holiness **Paramapoojya Jagadguru Sri Sri Sri Dr. Nirmalanandanatha Mahaswamiji and poojya Sri Sri Mangalanatha Swamiji.**

I express my sincere thanks to **Dr. G T Raju**, Principal of SJCIT, Chickballapur for providing us with excellent infrastructure to complete the internship.

I express wholehearted gratitude to **Dr. G. NARAYANA** who is the respectable HOD, CIVIL ENGINEERING Department. We wish to acknowledge the support for making my task easy by providing us with all valuable help and encouragement.

I thank my Internship Coordinator **Mr. KAMATH** for his guidance, encouragement and valuable suggestion.

It is my privilege to thank my Guide **Mr. SATHISH Y A** for his guidance, encouragement, support and valuable suggestion for completion of my internship.

And last but not the least, I would be very pleased to express my heartfelt thanks to **EDU CAAD LEARNING SOLUTIONS, YELAHANKA** for their guidance and support provided to complete the internship.

I also thank all those who extended their support and co-operation while bringing out this internship.

Finally, I would like to thank my family members and friends for their kind co-operation and motivation to proceed in my internship work.

<div align="right">

G THIPPESWAMY
1SJ18CV033

</div>

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26-May-2022

INTERNSHIP CERTIFICATE

This is to certify that **Mr. G THIPPESWAMY,** a under-graduate student of SJC INSTITUTE OF TECHNOLOGY (Dept of Civil Engineering) with USN : **1SJ18CV033**, He has successfully completed internship on software " **Revit Architecture** " in the month of (4-04-2022 TO 4-05-2022) at **Educadd Learning Solutions,Yelahanka**. After completing the software training, he worked on projects related to Revit Architecture . His training includes focus priorities on learning and developing new skills and giving knowledge related to software application.

During the internship period we found him intelligent, motivated, and hardworking person.

We wish him very best in his future endeavor.

From EDUCADD learning solutions (yelahanka)

EduCADD Learning Solution
2332, 1st Floor,
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Poojashree P (Centre Manager)

ABSTRACT

The Autodesk Revit software is a powerful Building Information Modeling (BIM) program that works the way architects think. The program streamlines the design process through the use of a central 3D model, where changes made in one view update across all views and on the printable sheets.

This training guide is designed to teach you the Autodesk Revit functionality as you would work with it throughout the design process. You begin by learning about the user interface and basic drawing, editing, and viewing tools. Then you learn design development tools including how to model walls, doors, windows, floors, ceilings, stairs and more.

Finally, you learn the processes that take the model into the construction documentation phase. Since building projects themselves tend to be extremely complex, the Autodesk Revit software is also complex. The objective of the Autodesk Revit 2015 (R1): Architecture Fundamentals training guide is to enable students to create full 3D architectural project models and set them up in working drawings.

This training guide focuses on basic tools that the majority of students need to work with the Autodesk Revit software. Topics Covered: Understand the purpose of Building Information Management (BIM) and how it is applied in the Autodesk Revit software. Navigating the Autodesk Revit workspace and interface.

Working with the basic drawing and editing tools. Creating Levels and Grids as datum elements for the model. Creating a 3D building model with walls, curtain walls, windows, and doors. Adding floors, ceilings, and roofs to the building model. Creating component-based and custom stairs.

Adding component features, such as furniture and equipment. Setting up sheets for plotting with text, dimensions, details, tags, and schedules. Creating details. Prerequisites: An understanding of architectural terminology is an asset.

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1. ABOUT THE ORGANISATION

Figure 01: Official EduCADD logo

EduCADD is an Authorized CAD/CAM/CAE, Multimedia & Project Management company. In existence for over 22 years we offer end to end solutions in CAD (Computer Aided Design), CAE (Computer Aided Engineering) and CAM (Computer Aided Manufacturing). To meet the growing demand in CAD/CAM/CAE industry and to meet our expansion plans we committed to Franchising model in 2004. Since then we have carefully and strategically spread our wings to over 70+ locations in India and abroad.

"To touch lives by empowering individuals through training" Exponential growth in the economy and new developments in CAD/CAM/CAE in the last decade has created a very competitive market place for job seekers and employers alike. We at EduCADD realized the wide skill gap between fresh engineers and the caliber of people required by industry. Most of our engineers are not ready for the industry even after scoring higher grades in UG program. Quality training delivery, better training techniques and tools and industry internships are the key to address the issue. Our Courses and its innovative training approach covers in-depth understanding to various industry verticals like Mechanical, Civil, Architectural, Electrical, Automotive, Aerospace, Shipbuilding, Heavy & General Engineering Industries and enables the students to have hands on experience. EduCADD has wide range of courses that are designed to meet the needs of businesses in different domains. Over two decades of experience enables us to provide excellent training solutions for students. We are proud of being acknowledged as one of the top training providers in the field of CAD/CAM/CAE/Multimedia/Project Planning & Management Courses within such short span of time.

Values

- We conduct ourselves and our business to empower individuals andnarrow socio economic divide.

Vision

- To become the most trusted training Company in our domain.
- To develop EduCADD as a global leader in training, knowledge empowerment and consultancy.

Mission

- To help our franchisees achieve extraordinary business results for their clients and for themselves by continually improving the brand's reputation for excellence in content, delivery and franchisee support.

1.TIMELINE OF INTERNSHIP

WEEK	DATE	DESCRIPTION
Week 1	4 Apr 2022 – 12 Apr 2022	Introduction to RevitArchitecture & BIM
Week 2	13 Apr 2022 – 20 Apr 2022	Starting the project & Building the model
Week 3	21 Apr 2022 – 28 April 2022	Detailing of the model
Week 4	29 April 2022 –4 May 2022	Finishing the model

Table 01: Internship timeline

1.AUTODESK REVIT ARCHITECTURE

Figure 02: Autodesk Revit Architecture

Overview

Revit- a very popular product from Autodesk is a design software used by architects, engineers and interior designers to draw, map and create construction documents and rendered images and also collaborate with other design teams. Architects use Revit to design homes, commercial buildings, landscapes and Interior designers use it to design 3D layouts that include both geometric and non-geometric information. Civil and mechanical engineers also use Revit to design bridges, roads, tunnels and other structures with specific instructions. The advantage of creating a building design model with Revit Architecture is that each design model can be stored in a single database file in a digital format.

Prerequisites:

Revit Architecture training course is suitable for architects, civil/Arch engineering students & professionals, interior designers and AutoCAD draftsmen pursuing Revit BIM jobs. Working knowledge on architectural design, drawing and other engineering experience are recommended.

Figure 03: Autodesk Revit Architecture

Course Objective:

Revit Architecture course empower you with the powerful features of Revit. Course aims to make participants more productive by giving them the ability to produce drawings and redefine images of buildings and help navigate user interface, architectural objects such as floor, walls, roofs, windows, and stairs. This course will assist in the creation of schematic design through construction documentation. Aer completing this course students and professionals can work with BIM technology and look for designations such as Revit technicians (Architecture) or Revit BIM modellers and Interior BIM professionals.

key Contents:

- Introduction to Revit Architecture

- Building Information Modeling

- Starting a Project

- Project Settings

- Modeling Basics

- Wall, Door, Components, Windows

- Roof, Floor and Slab

- Railing, Ramp, Stairs

- Linking Revit and CAD Files

- Import CAD files

- Room Areas and Openings

- Annotation Details

- Dimensions /Detail View and Sheet Composition

- Walkthrough and Render

- Massing & Site

- The Basics of Family

- Extrusion, Blend, Revolve Sweep and Blend Sweep

Figure 04: Autodesk Revit

WEEK 1
4 APRIL 2022 –12 APRIL 2022

1. WEEK 1: INTRODUCTION TO REVIT ARCHITECTURE& BIM

What is Revit Architecture:

Figure 05: Official Autodesk logo

- The Revit platform for building information modeling is a design and documentation system that supports the design, drawings, and schedules required for a building project.

- Revit, a very popular product from Autodesk, It is a design software used by architects, engineers and interior designers to draw, map and create construction documents and rendered images and also collaborate with other design teams.

- Civil and mechanical engineers also use Revit to design bridges, roads, tunnels and other structures with specific instructions.

- Architects use Revit to design homes, commercial buildings, landscapes and Interior designers use it to design 3D layouts that include both geometric and non-geometric information.

- The advantage of creating a building design model with Revit Architecture is that each design model can be stored in a single data base file in a digital format.

Building Information Modelling:

Figure 06: Autodesk Revit BIM

Building Information Modeling (BIM) in the foundation of digital transformation in the architecture, engineering, and construction (AEC) industry. As the leader in BIM Autodesk is the industry's partner to realize better ways of working and better outcomes for business and the built world.

Building Information Modeling (BIM) is the holistic process of creating and managing information for a built asset. Based on an intelligent model and enabled by a cloud platform, BIM integrates structured, multi-disciplinary data to produce a digital representation of an asset across its lifecycle, from planning and design to construction and operations.

4.2.1 What is BIM used for:

BIM is used for creating and managing data during design, construction, and sperate pr BIM iterates a disciplinary data to create detailed digital presentations that are managed in an open stood platform-time cellulate Using Wild gives you greater vilify, better decision making, mate stable, a co-ring on ABC.

What is the process of BIM?

The process of BIM supports the creation of intelligent data that can be used throughout the lifecycle of a building or infrastructure project.

A. Plan:

Inform project planning by combining reality capture and real-world data to generate context models of the existing built and natural environment.

Figure 07: Plan

A. Design:

During this phase, conceptual design, analysis, detailing and documentation are performed. The preconstruction process begins using BIM data to inform scheduling and logistics.

Figure 08: Design

B. Build:

During this phase, fabrication begins using BIM specifications. Project construction logistics are shared with trades and contractors to ensure optimum timing and efficiency.

Figure 09: Build

C. Operate:

BIM data carries over to operations and maintenance of finished assets. BIM data can be used down the road for cost-effective renovation or efficient deconstruction too.

Figure 10: Operate

Why is BIM important?

According to the UN, by 2050 the world's population will be 9.7 billion. The global AEC industry must look to smarter, more efficient ways to design and build not just as a means to keep up with global demand but to help create spaces that are smarter and more resilient too.

BIM not only allows design and construction teams to work more efficiently, but it allows them to capture the data they create during the process to benefit operations and maintenance activities. This is why BIM mandates are increasing across the globe.

User Interface:
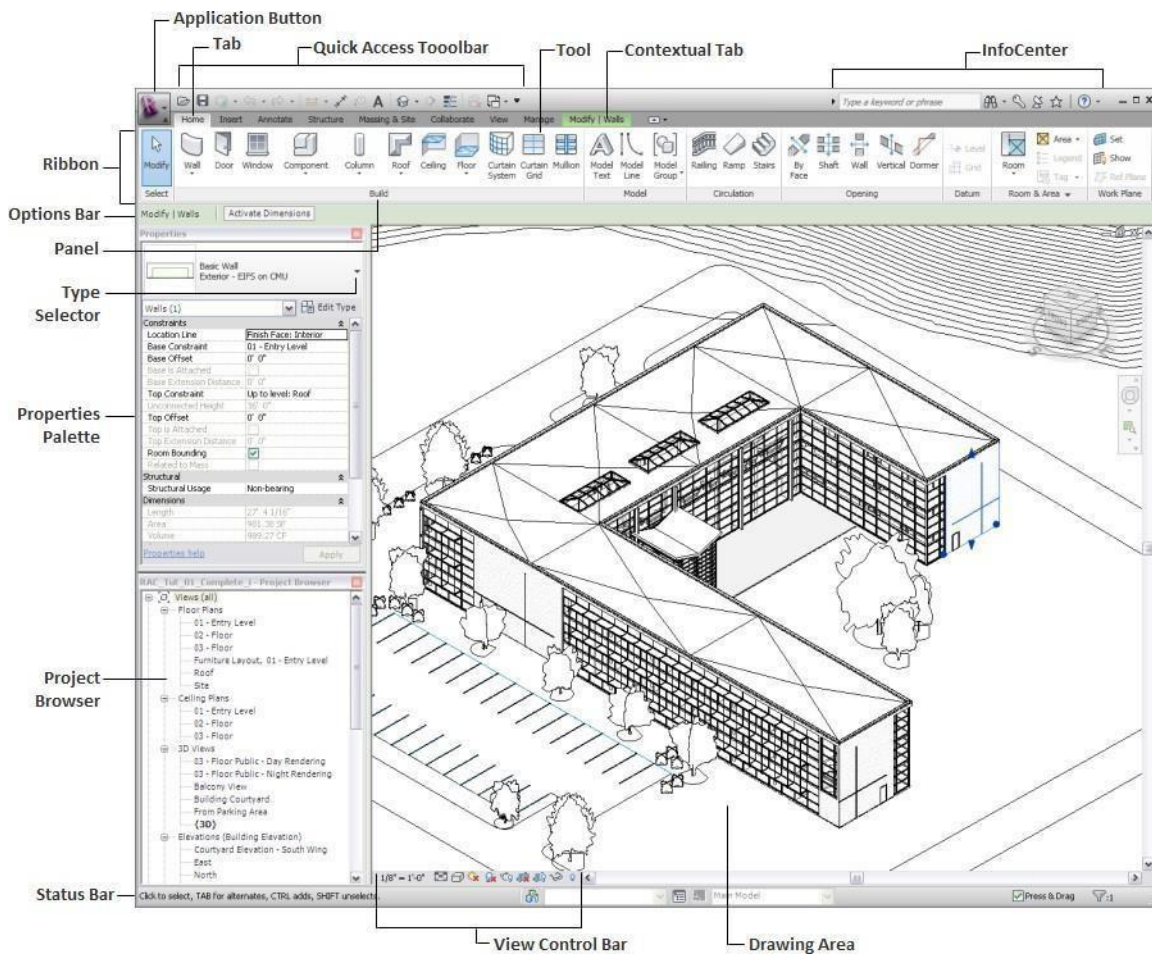
Figure 11: User Interface of Revit Architecture

1. Application button   7. Ribbon

2. Tab   8. Options bar

3. Quick Access toolbar   9. Project browser

4. Tools   10. Properties

5. Contextual tab   11. Status bar

6. Info center   12. Type selector

Tabs & Tools widely used in my model:

A. Quick Access Toolbar:

The Quick Access toolbar contains a set of default tools. You can customize this toolbar to display the tools that you use most often.
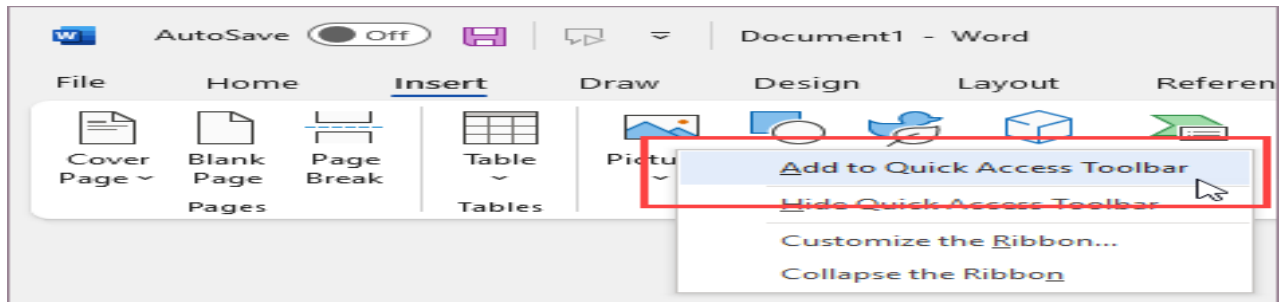
Figure 12: Quick Access toolbar

B. Ribbon:

The ribbon displays when you create or open a file. It provides all the tools necessary to create a project or family.

As you resize the Revit window, you may notice that tools in the ribbon automatically adjust their size to fit the available space. This feature allows all buttons to be visible for most screen sizes.

Figure 13: Ribbon
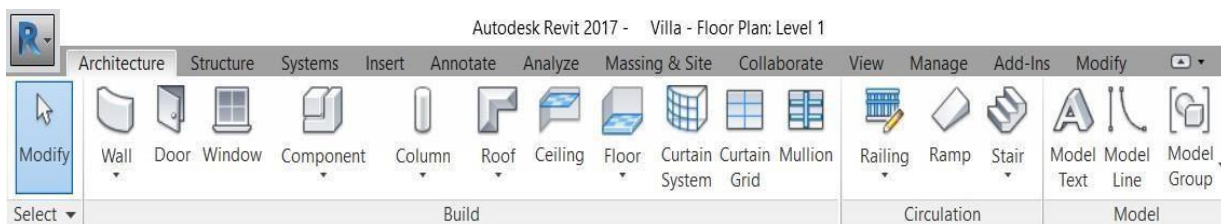
C. Contextual ribbon tabs:

When you use certain tools or select elements, a contextual ribbon tab displays tools that relate to the context of that tool or element. In many cases, the contextual tab merges with the Modify tab. A contextual ribbon tab closes when you exit the tool or clear the selection.

You can specify whether a contextual tab automatically comes into focus or the current tab stays in focus.

You can also specify which ribbon tab displays when you exit a tool or clear a selection.
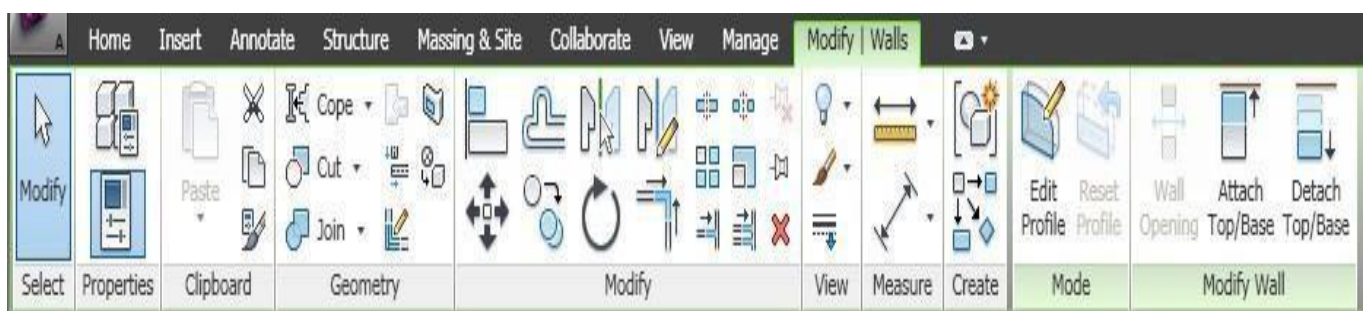
Figure 14: Contextual ribbon tabs

C. Project Browser:

The Project Browser shows a logical hierarchy for all views, schedules, sheets, families, groups, linked Revit models, and other parts of the current project. As you expand and collapse each branch, lower-level items display.

➢ To change the size and location of the Project Browser

➢ To show the Project Browser, click View tab

➢ User Interface panel, and select the Project Browser checkbox.

➢ To hide the Project Browser, click View tab. User Interface panel, and clear Project Browser, or click the Close button (the red X) at the top of the browser.

➢ To resize the Project Browser, drag one of its borders.

➢ To move the Project Browser, drag the browser's title bar within the Revit window. As you move the cursor, an outline indicates where the browser will move to, and what its shape will be.

➢ Release the mouse button to place the browser in the desired location. You can also drag the Project Browser outside the Revit window to the desktop.
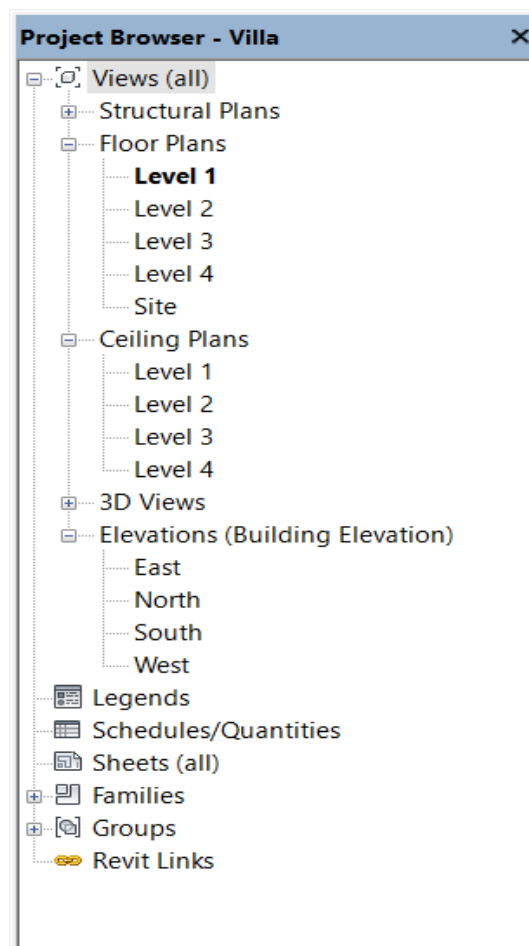
Figure 15: Project browser

D. Properties Palette:

The Properties palette is a modeless dialog where you can view and modify the parameters that
 define the properties of elements in Revit.

Opening the Properties Palette

When you start Revit for the first time, the Properties palette is open and docked above the
Project browser.

On the left side of the drawing area. If you subsequently close the Properties palette, you can reopen
it using any of the following methods:

■ Click Modify tab ➤ Properties panel ➤ (Properties).

■ Click View tab ➤ Windows panel ➤ User Interface drop-down ➤Properties.

■ Right-click in the drawing area, and click Properties.

You can dock the palette to either side of the Revit window and resize it horizontally. You can resize
it both horizontally and vertically when it is undocked. The display and location of the palette will
persist from one Revit session to the next for the same user. Typically, you keep the Properties
palette open during a Revit session so that you can

■ Select the type of element you will place in the drawing area, or change the type of elements
already placed.

■ View and modify the properties of the element you are placing or of elements selected in
the drawing area.

■ View and modify the properties of the active view

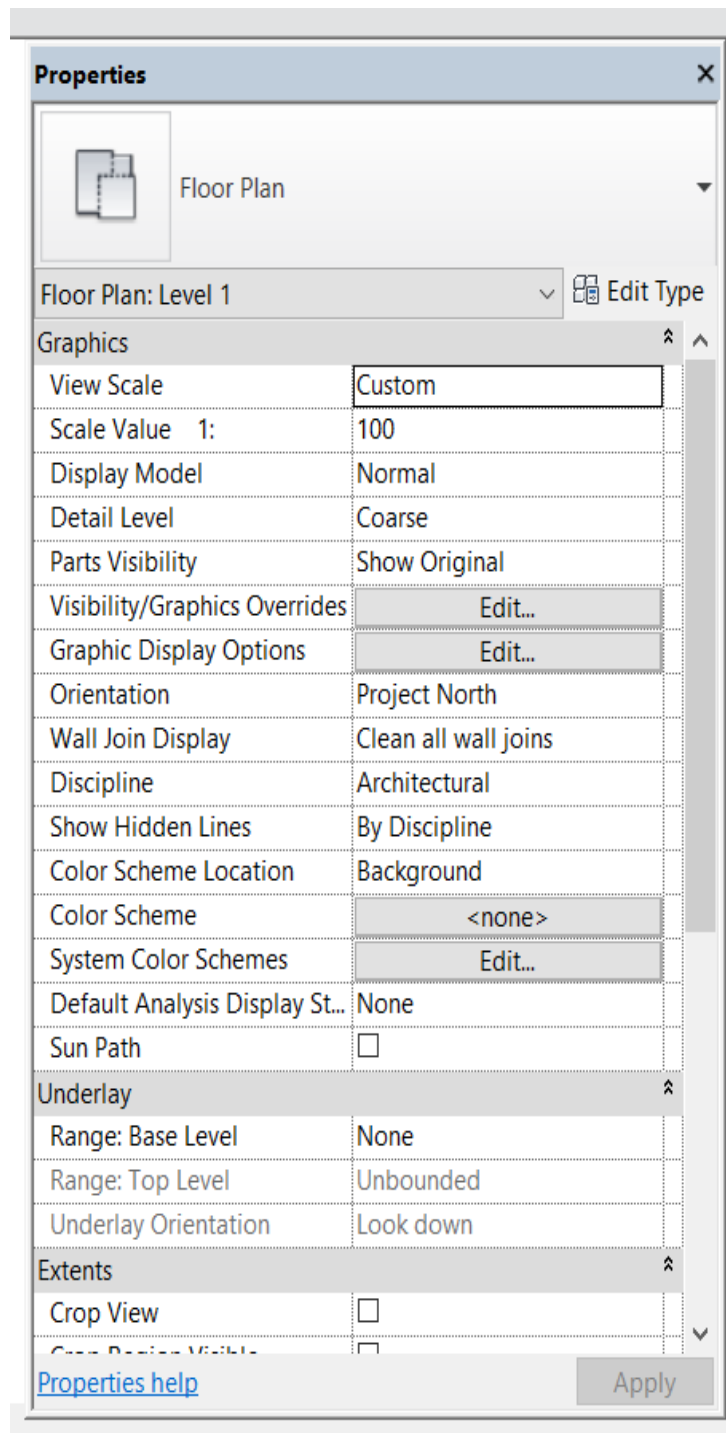■ Access the type properties that apply to all instances of an element type

Figure 16: Properties palette

E. Drawing Area:

The drawing area of the Revit window displays views (and sheets and schedules) of the current project. Each time you open a view in a project, by default the view displays in the drawing area on top of other open views. The other views are still open, but they are underneath the current view. Use tools of the View tab.

➤ Windows panel to arrange project views to suit your work style. The default color of the drawing area background is white; you can invert the color to black.
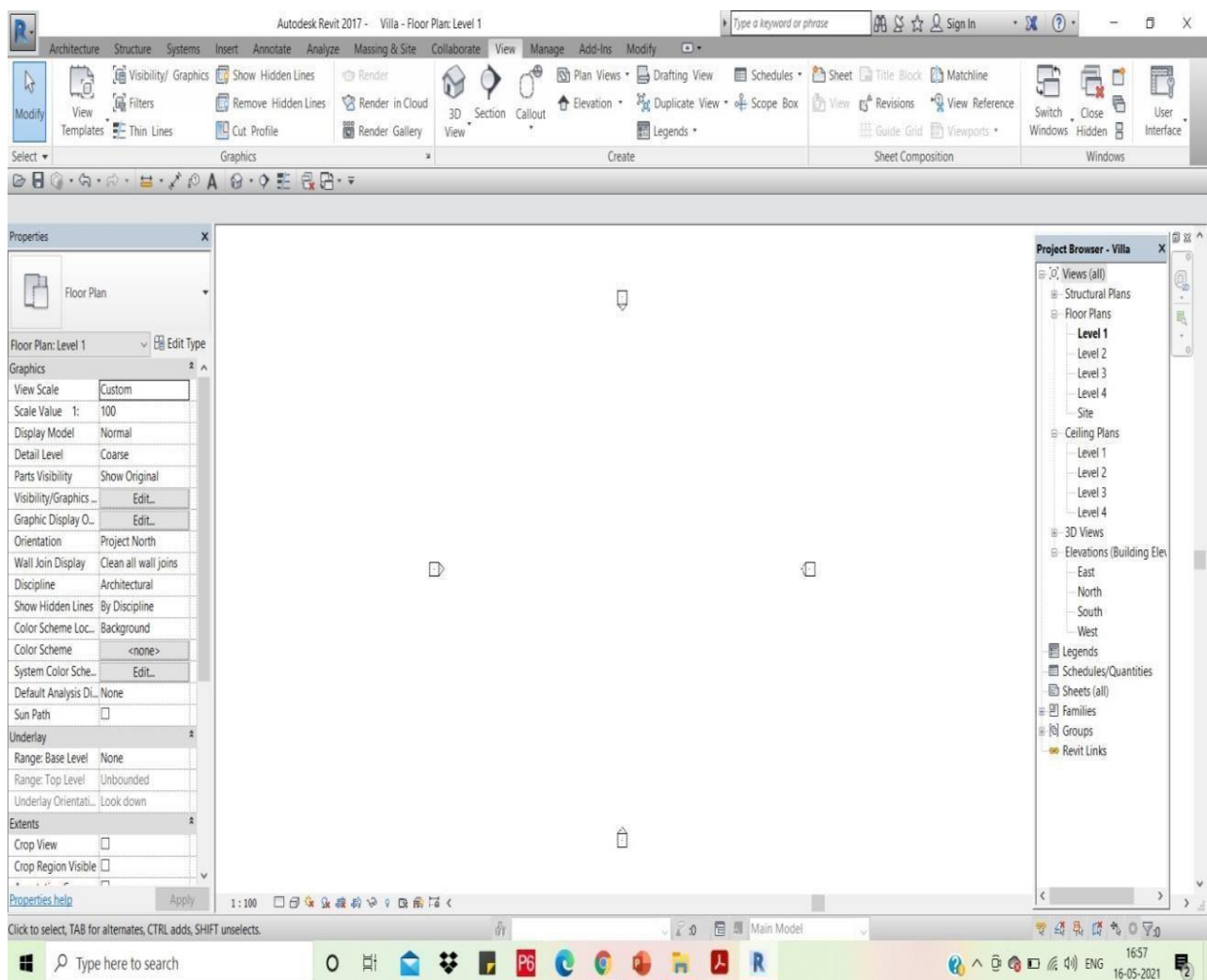
Plate 01: Drawing area

WEEK 2

13 April 2022 – 20 April 2022

5. WEEK 2: STARTING THE PROJECT & BUILDING THE MODEL

AIM : To Create a 2 storey 3BHK villa model using Autodesk revit architecture

Figure 17: 3BHK Villa model

Line diagram of all floor plans:
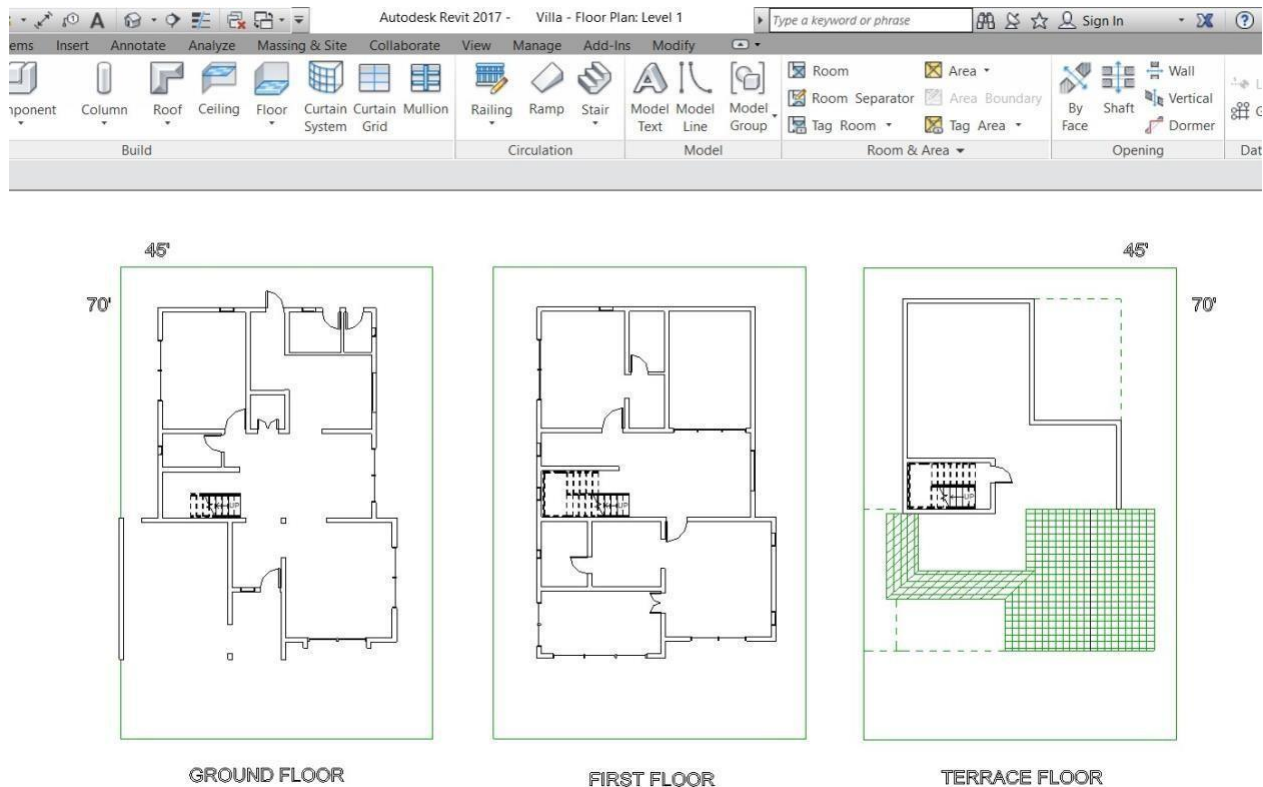
Plate 02: Line diagram

How I created the Line diagram:

1. Setting the Units to Feet and Inches

2. The site dimension is 45 X 75 ft

3. Creation of ground, first and terrace floors in level 1, 2 & 3 respectively.

4. The floor height given for each floor is 10ft Using the Wall tool, the line diagram for ground, first and terrace floor is created.

Figure 18: Wall, Door & Window tool

5. Doors, Windows and Staircase to all 3 floors are added using Door, Window and
    Staircase tools in the toolbar.

6. The glass windows for living area and bed rooms have been created using Store front wall.

7. The text tool is used to all the 3 floors using model text tool.

Figure 19: Railing, Stair & Model text tool

Floor plans created using Autodesk AutoCAD:

Figure 20: Floor plans created using AutoCAD

Step 1 – 8 together into a model in 3D (Elevation - West):
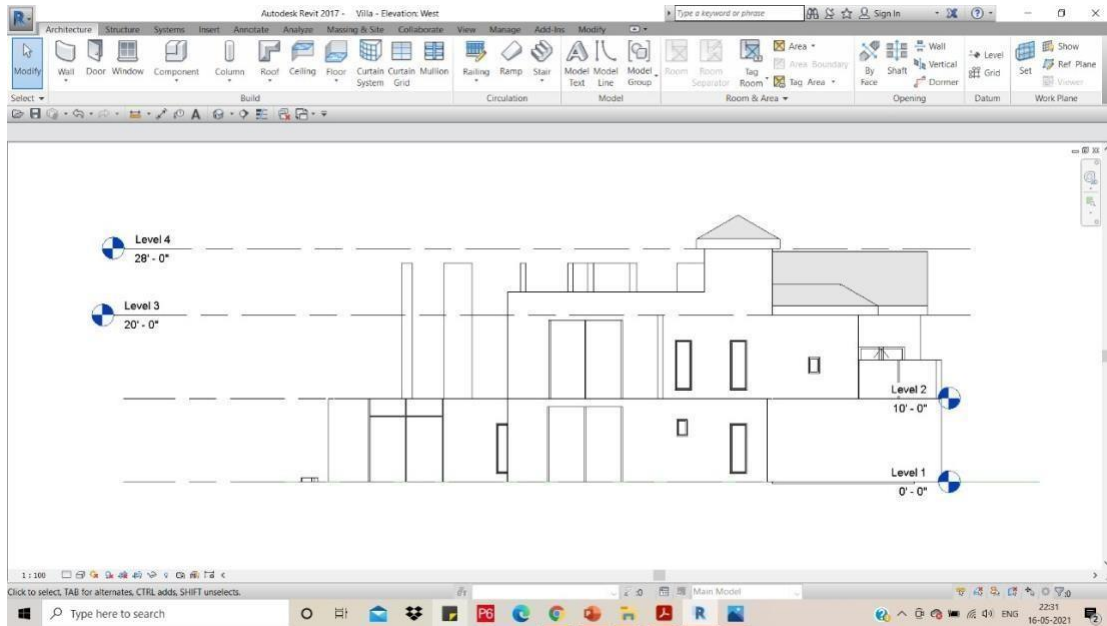
Plate 03: 3D model (Elevation view)

Step 1 – 8 together into a model in 3D (corner view):
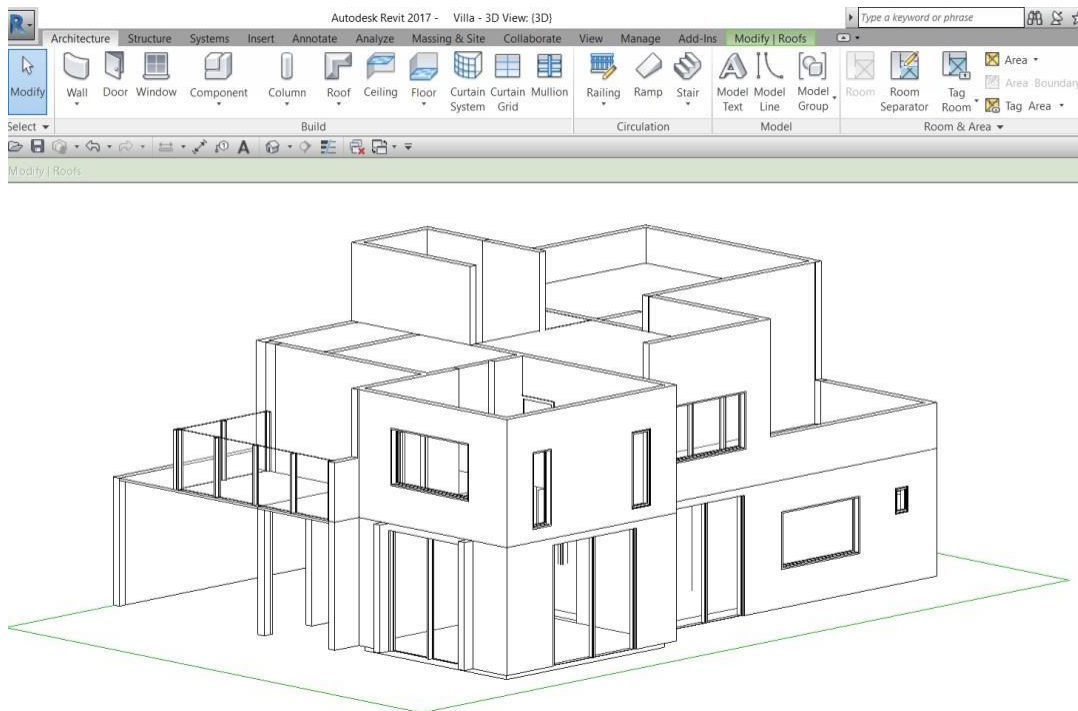
Plate 04: 3D model (corner view)

WEEK 3

21 April 2022 – 28 April 2022

6. WEEK 3: DETAILING OF THE MODEL

Adding Flooring, Ceiling, Roofing and Balcony:

- Flooring is provided to the required area using the Floor tool in the toolbox.

- Ceiling is provided to all the floors as and when it is required using Ceiling tool in the toolbox

- Later, Roofing is provided by using Roof by footprint option to give as loping effect on the roof

- A glass railing of required length is provided along the length of the balcony
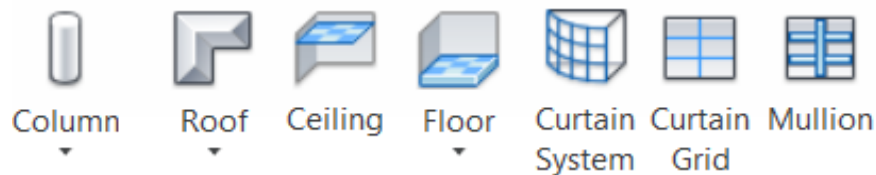
Figure 21: Roof, Ceiling & Floor too
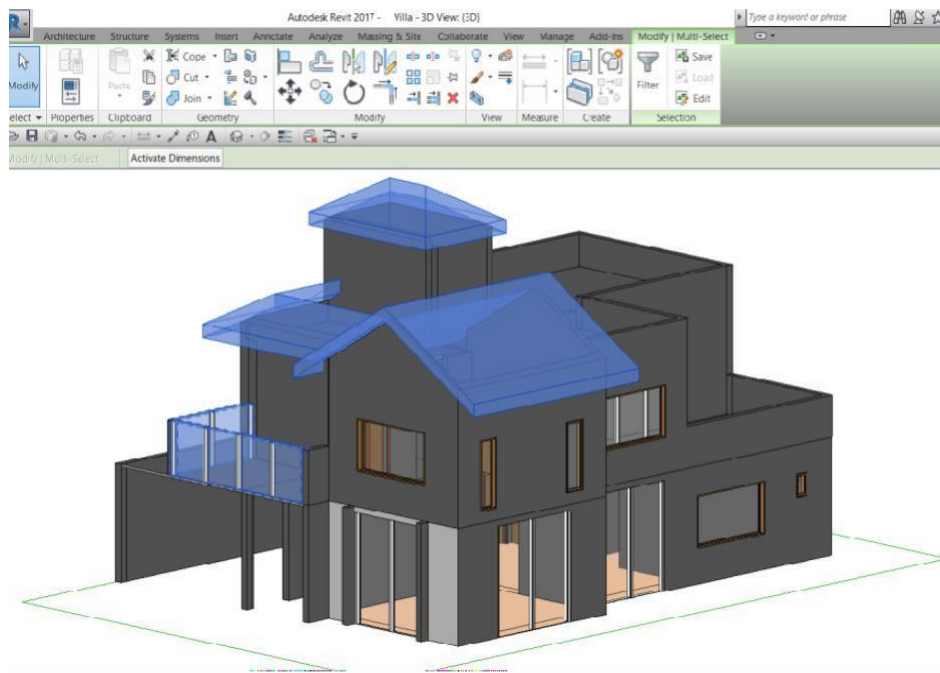
Plate 05: 3D model for flooring, ceiling & Roofing

Material application & New material:

1.   The material for the flooring in the interiors of the house was provided with Cherry material with 6 inches thick & the flooring material for car parking is concrete, also with 6 inches thick.

2.   The material for the ceiling is provided with Compound ceiling with 6inches thickness.

3.   A new material for the sloped roofing has been provided based on the requirement to a Maroon colored roof tile.
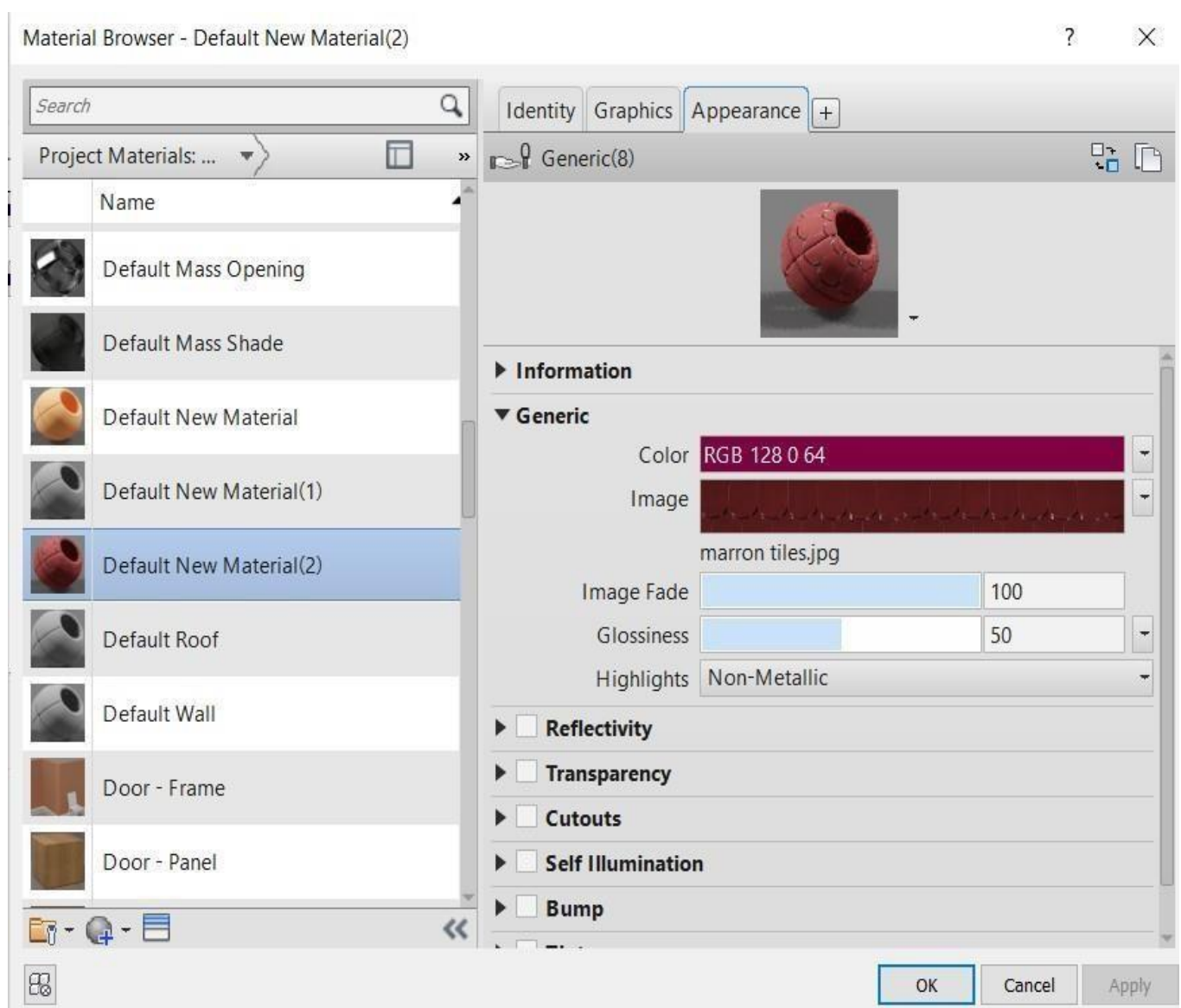

Plate 06: Material application

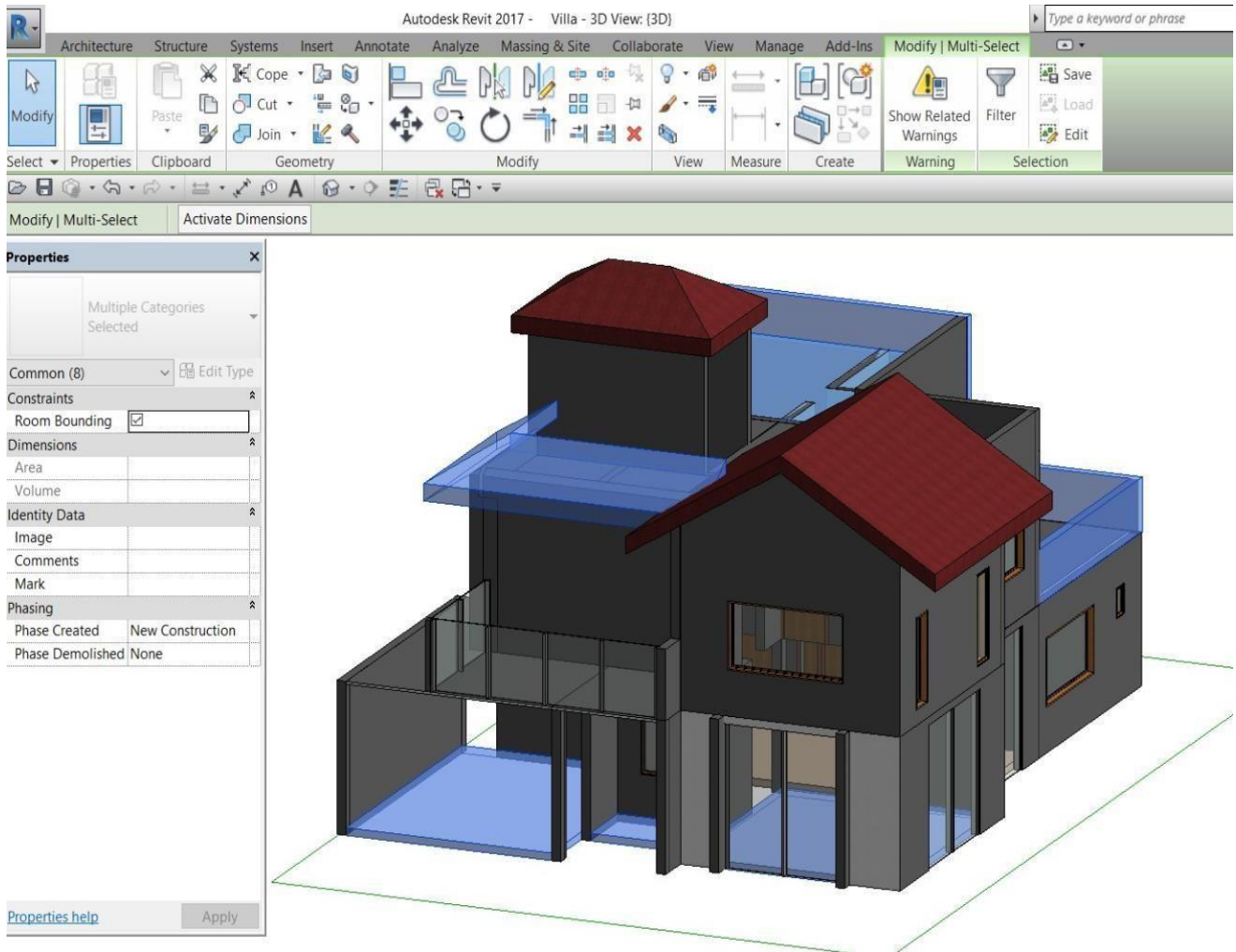## Step 1 – 3 Together into a model in 3D (corner view):

Plate 07: 3D model (corner view)

Massing & Site: Topo surface, Site component:

1. Massing is basically the sense of space which the building encloses, and helps to define both the interior space and the exterior space of the building.

2. A topo surface was created using the tool topo surface from the toolbar.

 This surface is created to provide a bottom surface for the model to stand and to place required site components.

3. Site components are those which enhances the naturality of the model.

4. Site components such as plants, flower pots, trees, street lights have been created in the required levels as shown in the below figure.
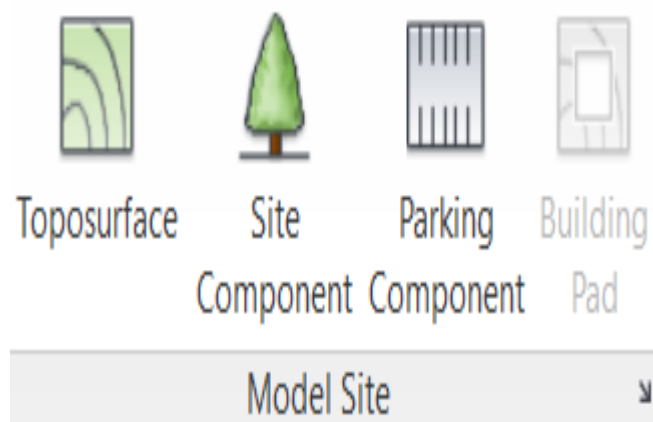

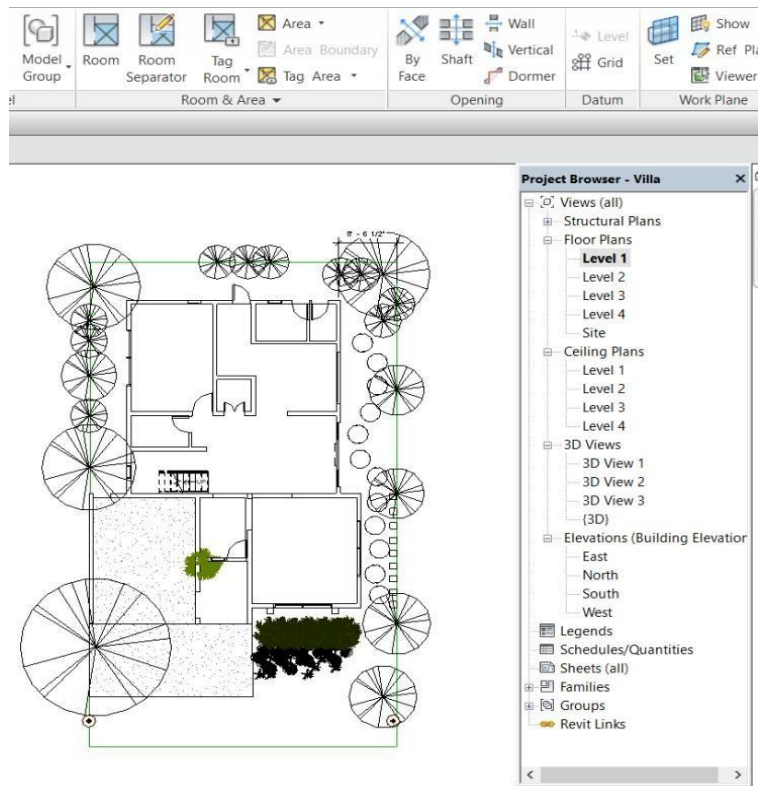**Figure 22: Topo surface, Site component tool**
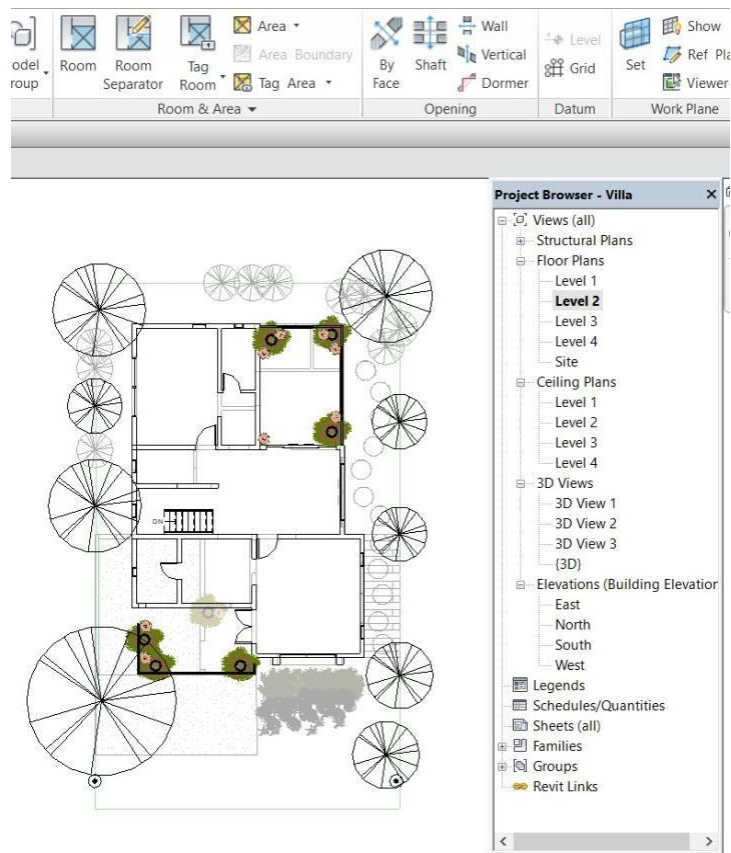
Plate 08: Level 1 floor plan

Plate 09: Level 2 floor plan

6.3.1 3D Model of the house with Massing & Site components:
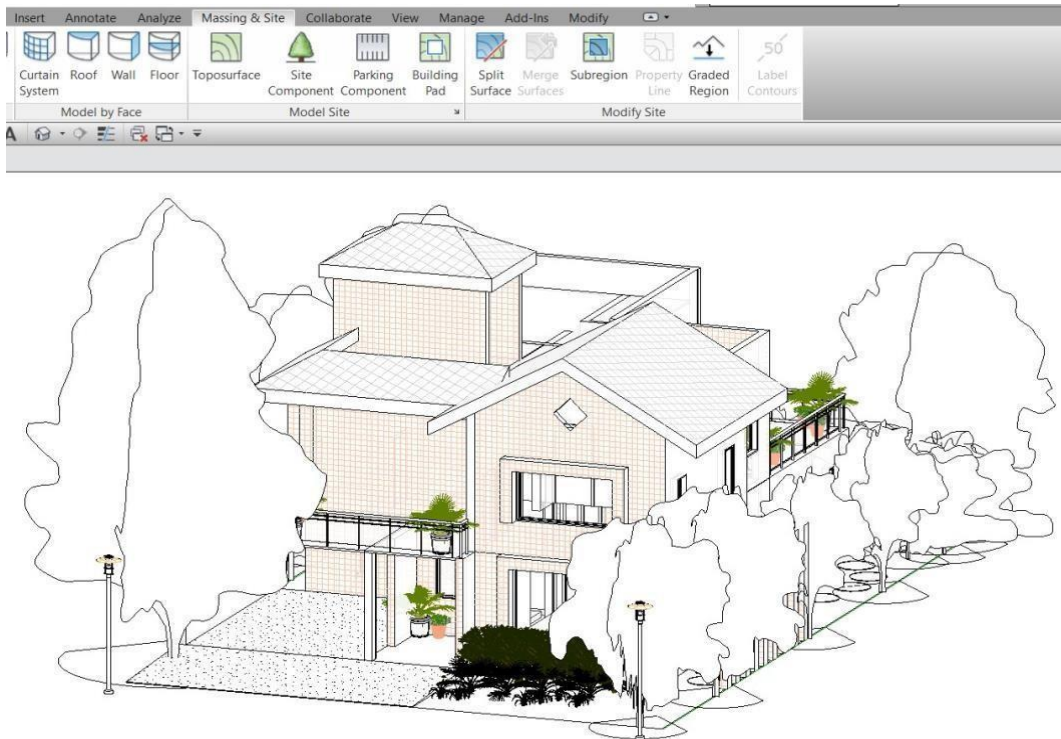

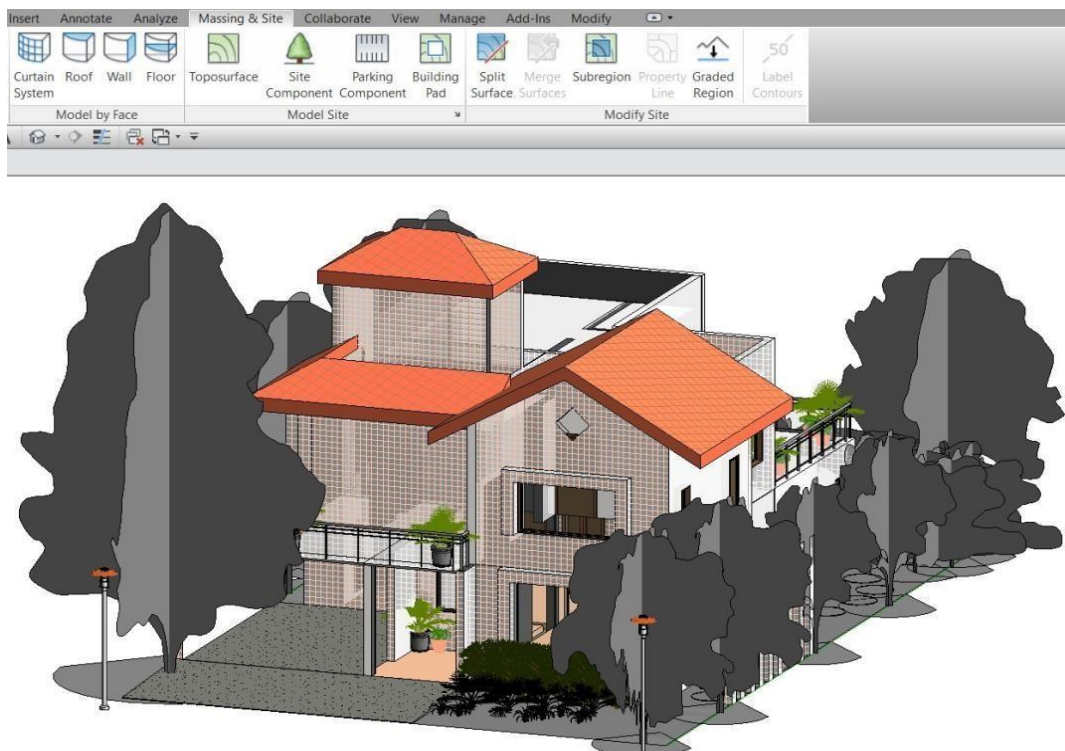**Plate 10: 3D model in hidden lines**

Plate 11: 3D model in shaded effect

Extrusions and opening:

1. Extrusions are solid or void structures that are very easy to create on a work plane and then extrude that profile perpendicular to the plane on which it is sketched to obtain the required design.

2. Wall openings are created based on the design requirement by selecting the wall, where the opening has to be created and then using the tool Wall openings, the desired shape opening wall is created.
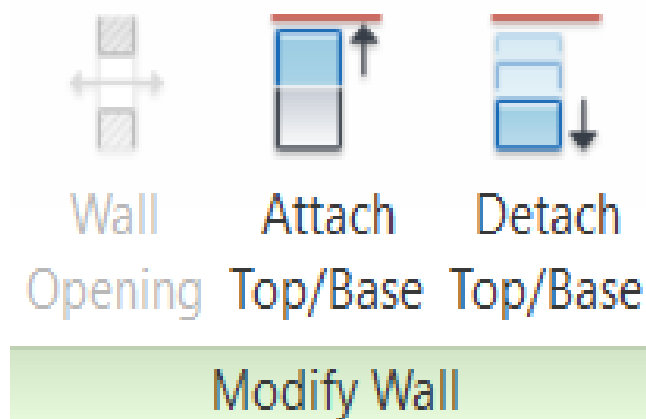
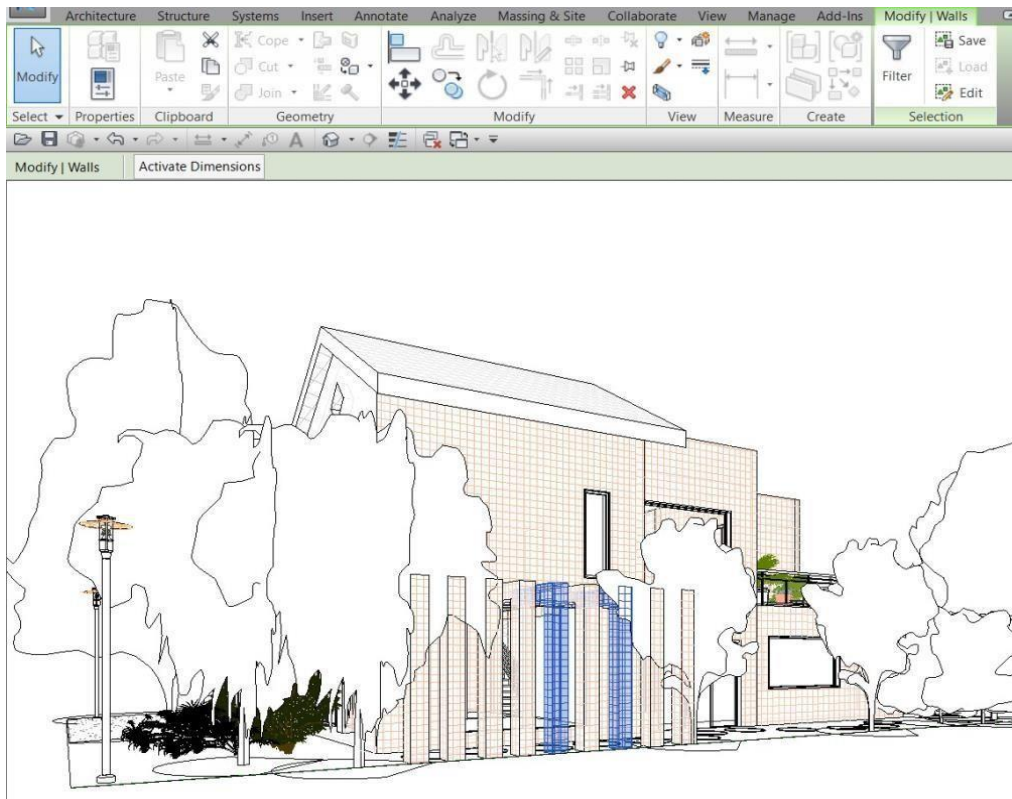**Figure 23: Extrusion tool**

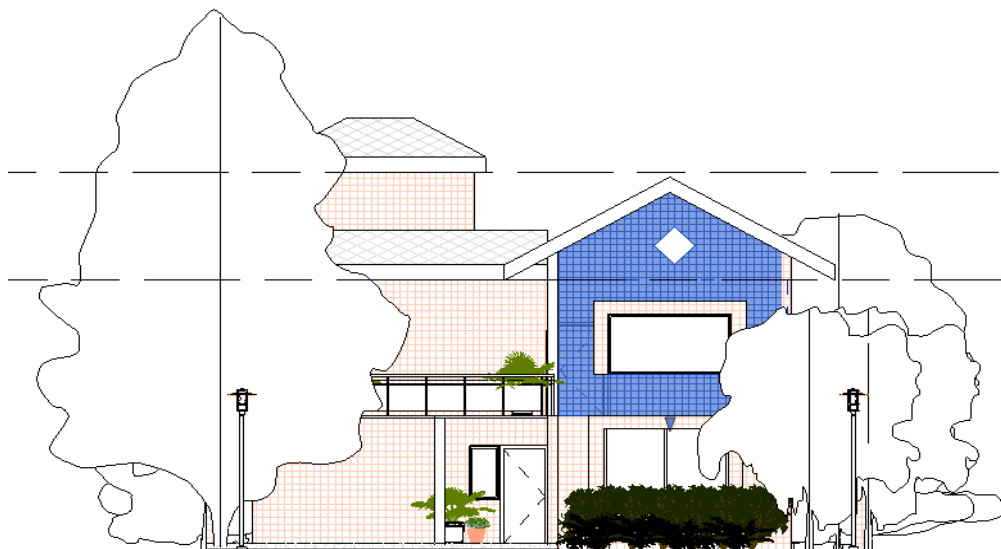**Figure 24: Wall opening tool**
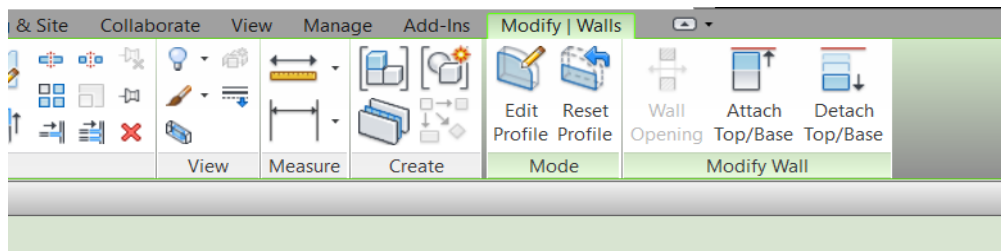
Plate 12: Extrusion

Plate 13: Wall opening

WEEK 4

29 April 2022 – 4 May 2022

7. WEEK 4: FINISHING THE MODEL

Rendering:

1.   Rendering is done after the completion of the entire model

2.   The model is rendered to create a photorealistic image of the 3D model

3.   Revit Architecture begins the rendering process, rendering the entire image progressively.

4.   Render the view to create a photorealistic image of the 3D model.

5.   Before starting the render process, see best practices for rendering for information about how you can improve performance.

6.   After preparing the 3D view and using the Rendering dialog to select desired settings, click Render to render the image.

7.   Revit begins the rendering process, rendering the entire image progressively. Revit displays a progress dialog, which shows information about the rendering process.

Note: To cancel the rendering process before it completes, click Stop. When the rendering process is complete, Revit displays the rendered image in the drawing area. You can then do the following:

- Change render settings, and render the image again.

- Adjust exposure settings, and render the image again.

- Save the rendered image as a project view.

- Export the rendered image to a file.

- Display the building model in the drawing area.

- In the Rendering dialog, click Show the model. To display the rendered image again, click Show the rendering.
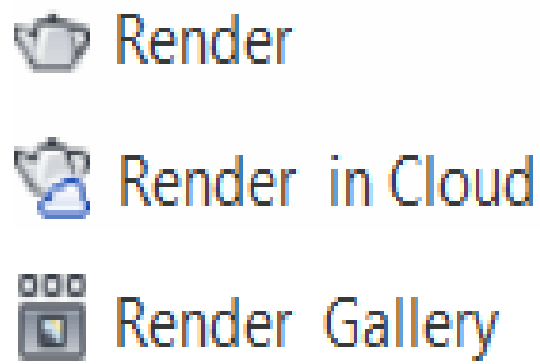
Figure 25: Rendering tool

Figure 26: 3D model before rendering

Camera:

1. A camera is used to create/capture a perspective 3D view of our model as we want to see through our eyes.

2. The Perspective option controls whether a 3D view displays as perspective instead of orthographic.

    Open a plan, section, or elevation view.

- Click View tab ➤ Create panel ➤ 3D View drop-down ➤ Camera.

Note: If you clear the Perspective option on the Options Bar, the view that is created is an orthographic 3D view and not a perspective view.

- Click in the drawing area to place the camera.
- Drag the cursor to the desired target and click to place it.
- Revit creates a perspective 3D view and assigns a name to the view:3D View1, 3D View2, and so on. To rename the view, in the Project Browser right-click it, and select Rename.

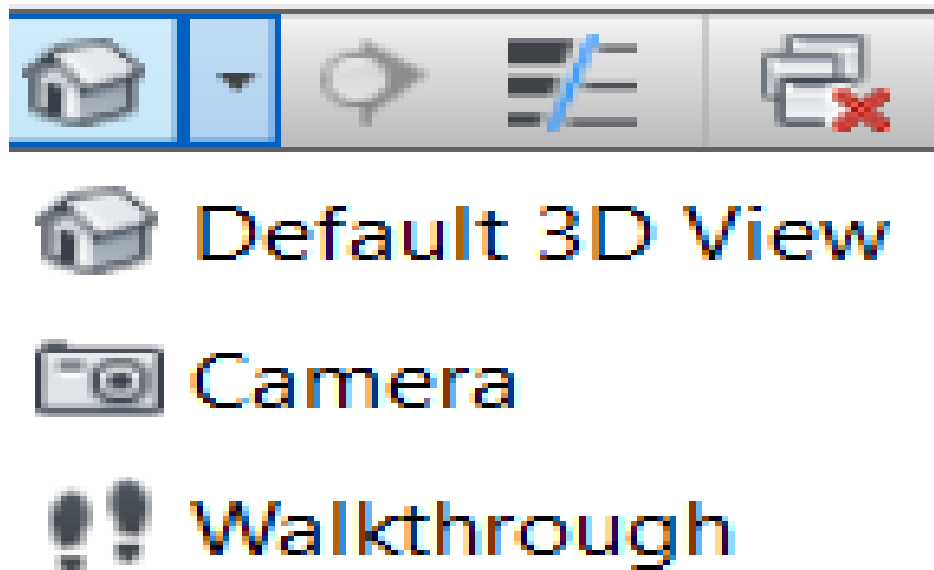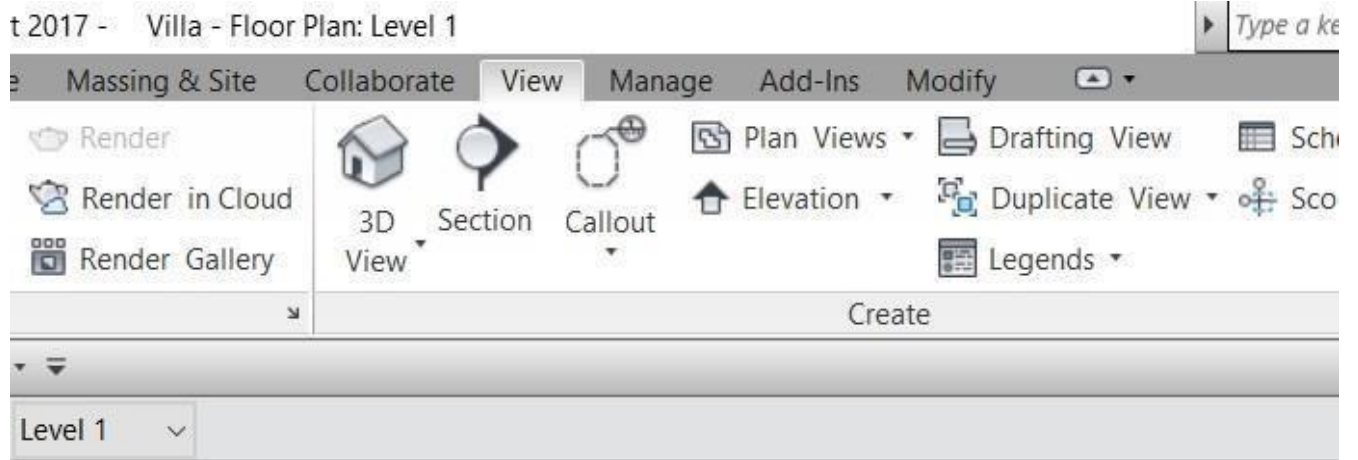**Figure 27: Camera tool**

Plate 14: Camera focused onto the model

Figure 28: 3D camera view (South)

Figure 29: 3D model camera view (corner)

Figure 30: 3D model camera view (East)

Figure 31: 3D model camera view (West)

Figure 32: 3D model camera view (North)

Figure 33: 3D model camera view (corner)

Walkthrough:

1. A walkthrough is a path through a created building model and create an animation or a series of images to present the model to team members or clients.

2. Walk through can be created inside or around the building.

3. A walkthrough is a simulated tour of a site or building using camera positions placed along a path that you define. Create a walkthrough to present your model to clients or team members.

The walkthrough path consists of camera frames and key frames. A key frame is a frame that can be modified to change the direction and position of the camera. By default, walkthroughs are created as a series of perspective views, but you can also create them as orthographic 3D views.

The following image shows an example of a walkthrough path. The red dots indicate key frames. The blue triangular shape shows the field of view, which defines the width and depth of the camera view.
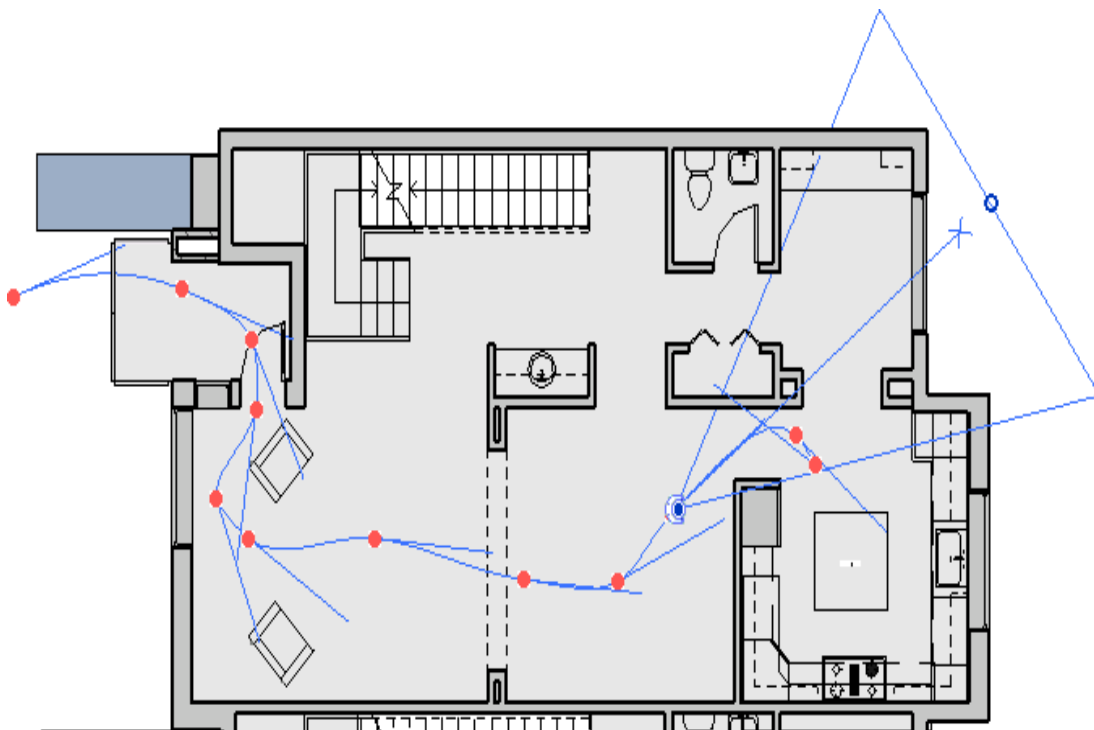
Figure 34: Walkthrough

After you've created a walkthrough, export it to share with others.

When exporting the walkthrough, you can create a series of static images or a video file. When someone views the video, they can't change the path through the model or the camera angles. The walkthrough provides a pre- defined experience of the model.

If you need a real-time walkthrough experience, use Revit Live instead. Revit Live allows you to navigate anywhere in the model without creating a path or setting up camera views. Revit Live does not create a movie file as the Walkthrough feature does, however.

Autodesk 3ds Max modeling and animation software is another alternative to the Revit Walkthrough feature. It allows you to have more control over camera movement and to animate elements in the scene, such as a door opening and closing.
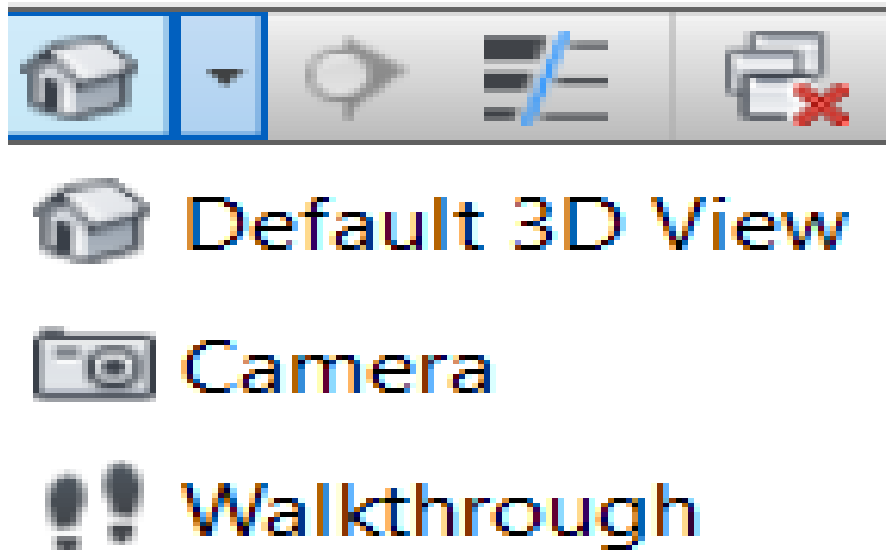

Figure 35: Walkthrough tool

8. SKILLS LEARNED & ENHANCED DURING THE INTERNSHIP PERIOD

Professional Skills:

- ➢ 2D Floor planning using Revit Architecture
- ➢ Creation of 3D model of a house
- ➢ BIM
- ➢ Learned to design, simulate, visualize and collaborate a model
- ➢ Loading families into the model
- ➢ Rendering & walkthrough of the model

Personal Skills:

- ➢ Helped me to understand the importance of BIM
- ➢ Creative thinking while planning & designing of a model
- ➢ Strong hold on AutoCAD & better reading of the drawings

9. REFERENCES

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[2]   fig (2) Autodesk Revit Architecture, fig (3) Official Autodesk logo, fig

     (4) Autodesk Revit 2021, fig (5) Autodesk Revit Architecture, fig (6)Autodesk Revit BIM,

     www.autodesk.in

[3]   fig (7) User Interface, fig (8) Quick access toolbar, Ribbon & Contextual tab, fig (9)

     Properties browser, fig (10) Project browser, fig

     (12) Wall, Door & Window tool, fig (13) Stair, Ramp &Railing tool, fig

     (15) Roof, Ceiling & Floor tools, fig (16) Topo surface, Site component tool, fig (17) Extrusion & Wall openings, fig (18) Render tool, fig (20) Camera tool, fig (27) Walkthrough tool, Revit Architecture 2011 User's guide

[4]   Pt (1) Drawing area, Pt (2) Line diagram, Pt (3) 3D model in Elevation view, Pt (4) 3D model in corner view, Pt (5) 3D model of the house, Pt
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[5]   fig (11), 3BHK Villa, **www.villas.com**

[6]   fig (14) Floor plans created using AutoCAD, **Autocad 2017.**