

BASIC MODELLING OF ARCHITECTURE

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Abstract:

This book is a comprehensive guide designed for beginners exploring Autodesk Revit software in architectural modelling. It begins by explaining the Revit user interface, an essential aspect for users to familiarize themselves with the tools provided, their organization, and how to optimize efficiency. Subsequently, the book proceeds to modelling architecture, covering topics such as project creation, constructing elevation and gridlines, wall, and floor modelling, inserting doors and windows, constructing staircases, creating railings, ceilings, and roofs. Furthermore, this book guides users through inserting building components, creating sections, and generating construction documents complete with tagging, annotation, and scheduling features. At the end of this book, there are exercise questions that offer opportunities for practical application. In conclusion, this book offers hands-on learning experiences, empowering both students and beginners using Autodesk Revit Architecture to proficiently navigate Revit and produce detailed architectural models and documentation.

Keywords: designed for beginners exploring Autodesk Revit software, Revit user interface, modelling architecture



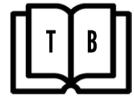
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PREFACE

With the grace of Allah SWT, I am thankful to announce the successful publication of the Basic Modelling of Architecture.

This book is published with the aim of providing guidance or reference for all students enrolled in courses or pursuing the Certificate of Competency in Building Information Modelling Autodesk Revit (BIM-AR) Architecture Design program, organized by the Professional Industry Training Centre (PITC) at the Faculty of Civil Engineering Technology, UTHM, which utilizes Autodesk Revit software.

The book consists of five (5) chapters with exercise examples, and each chapter contains subtopics. These chapters provide detailed explanations for creating 3D architecture models from scratch to the completion of a building.

Hopefully, this book will simplify the process for students in their pursuit of creating 3D models in architecture using Autodesk Revit software.

Thank you.

Ezza Yahya

TOPIC 1

REVIT USER INTERFACE

1.1 Becoming Familiar with the Revit User Interface

Revit has a similar interface as other Autodesk applications. The most important parts are the Ribbon at the top, as it provides access to a wide range of tools organized into various tabs and groups; and the Project Browser palette, as it provides a hierarchical view of the building elements and components within the current project. Figure 1.1-1 shows the names of the Revit User Interface (UI) Components.

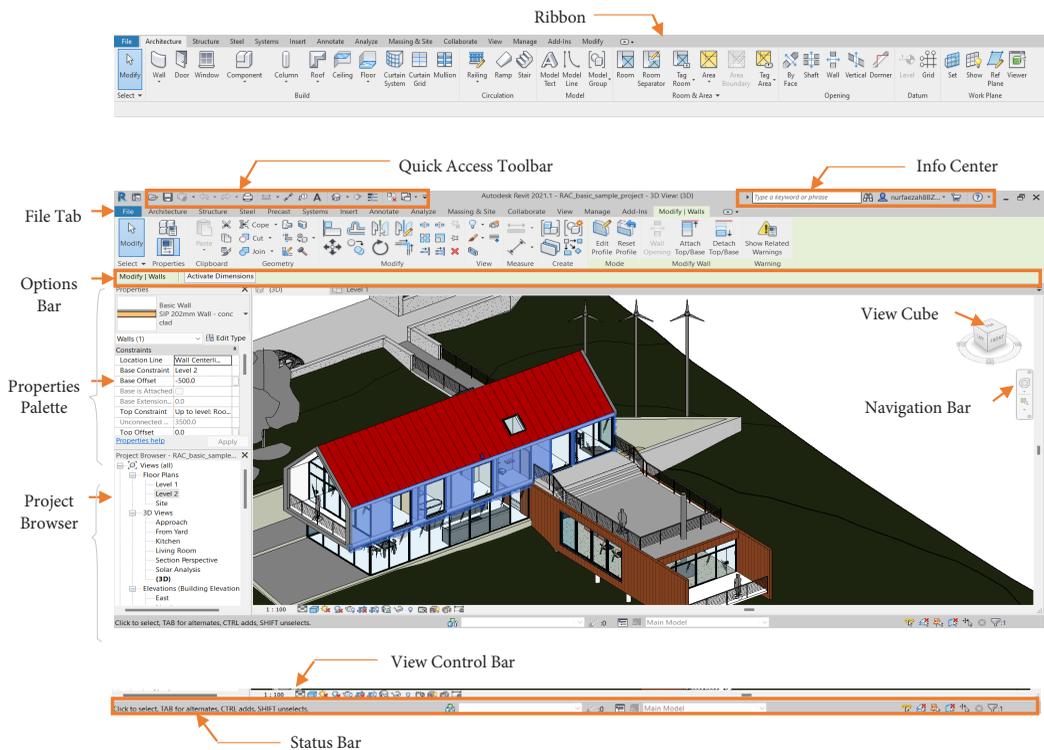


Figure 1.1-1: Revit User Interface (UI) Components

TOPIC 2

MODELLING ARCHITECTURE

2.1 Create New Project

Follow these commands to start a new project:

1. Create a folder on the **Desktop** and Rename **Sample Project**.
2. Double-click **Revit Icon** 
3. Click **New** on Models or **Press CTRL+N**, as shown in Figure 2.1-1.

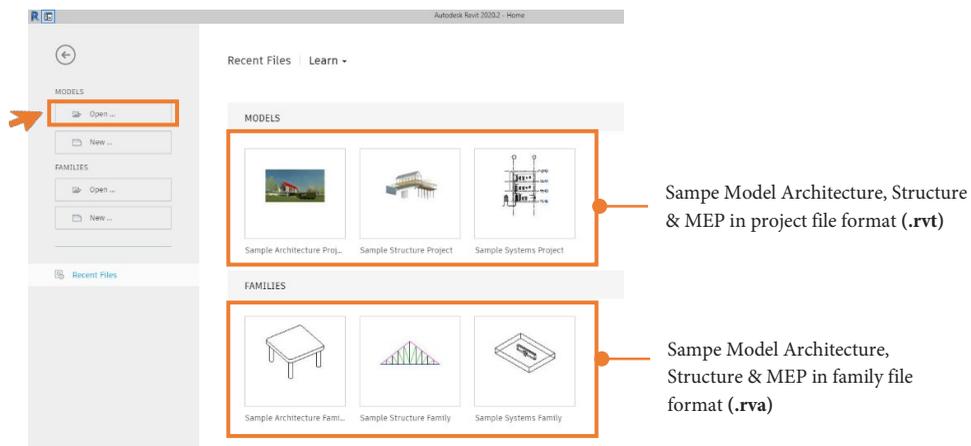


Figure 2.1-1: Homepage Autodesk Revit

There are three (3) main file formats:

- **Project files (.rvt):** Most of the majority work in the building model by adding elements, creating views, annotating views, and setting up printable sheets.
- **Family files (.rva):** Separate components that can be inserted in a project like stand-alone elements (e.g., table or mechanical equipment) or hosted in other elements (e.g., door or lighting fixture).
- **Template files (.rte):** Base files for any new project or family. It's designed to hold standard information and settings to create new project files.

TOPIC 3

INSERT BUILDING COMPONENTS

3.1 Introduction

Components are building elements typically delivered and installed on-site, such as furniture, plumbing fixtures, lighting, etc. These are loadable families that need to be added to the project from your content library.

There are freestanding components like furniture or equipment placed on a floor/level. Additionally, there are host-based components dependent on a building element, like a wall lamp attached to a wall. If the host (e.g., a wall) is moved or deleted, the dependent component is also moved or deleted. Typically, walls, floors, levels/work-planes, roofs, ceilings, or faces of objects serve as hosts for components.

3.2 Insert Plumbing Fixtures

Follow these commands to insert plumbing fixtures:

1. Click **Floor Plan: Ground Floor Level** at **Project Browser**.
2. Click on the **Architecture Tab**, then select **Component: Place a Component**, as shown in Figure 3.1-1.

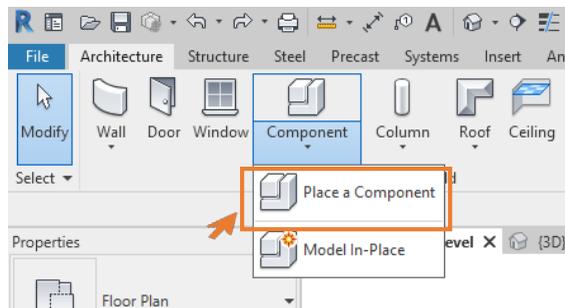


Figure 3.1-1: Component Button

TOPIC 4

CREATING SECTION

4.1 Introduction

Section views in Revit cut through a 3D model at a specified plane, providing a 2D orthographic projection. This is a crucial step in the design process, offering a visual representation of the building's layout from different angles.

4.2 Creating Section

Follow these commands to creating section on floor plan:

1. Click **Floor Plan: Ground Floor Level** at **Project Browser**.
2. On **View Tab**, click the **Section** ribbon under **Create Panel** as shown in Figure 4.1-1.

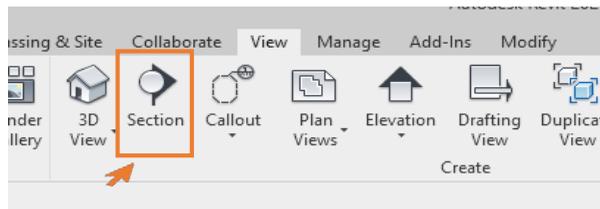


Figure 4.1-1: Section Button

3. At the **Bath 3** on **Ground Floor Level**, create vertical section by clicking first at the first point (top side) and then clicking at the second point (bottom point).
4. Click at the bottom based of the section line (**Black Coloured Box**) to display the range of the section view and the flip arrow as shown in Figure 4.1-2.

TOPIC 5

CREATING CONSTRUCTIONS DOCUMENTS

5.1 Tagging and Annotation

Follow these commands to tag description on wall, floor, door, window, etc.:

1. On **Annotate Tab**, click **Tag by Category** as shown in Figure 5.1-1.

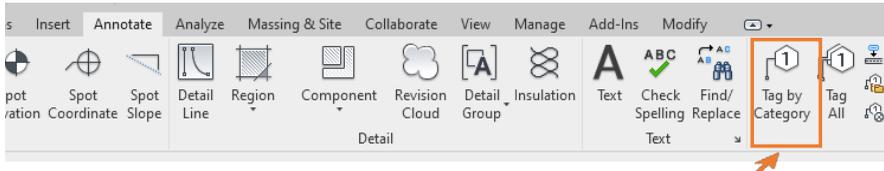


Figure 5.1-1: Annotate Tab

2. Tag on any part of the wall.
(example: tag the wall at **gridline E** as shown in Figure 5.1-2).



Figure 5.1-2: Tag of the Wall

BIOGRAPHY



Nur Faezah Binti Yahya has been serving as an Industry Fellow at the Department of Civil Engineering Technology, Universiti Tun Hussein Onn Malaysia (UTHM) in Johor, Malaysia, since 2018. She obtained her Bachelor's and Master's Degrees in Civil Engineering, as well as a Diploma in the same field, from UTHM. With five (5) years of industry experience in the construction field before joining UTHM, she brings valuable insights to her role. Additionally, she began utilizing her skills in Autodesk Revit in 2020. Her specialization lies in Civil Engineering and Construction Technology.



Mohd Sufyan Bin Abdullah is an Industry Fellow at the Department of Civil Engineering Technology, Faculty of Engineering Technology, UTHM. He holds a Master's degree in Civil Engineering from UTHM (2013) and a Bachelor's degree in Civil Engineering (Construction) from UTHM (2007). Specializing in construction processes, he has extensive expertise in this area. Additionally, he has served as Laboratory Manager for the Cluster of Civil Engineering Technology and Chemical Engineering Technology at the Laboratory Management Office since August 2023.



Peniel Ang Soon Ern is currently a Senior Lecturer at the Department of Civil Engineering Technology, Faculty of Engineering Technology, UTHM. She obtained her PhD in Construction Management at UTHM in 2015 and Bachelor in Technology Management (Construction) from the same University in 2010. Her research specialty and interests include Building Information Modelling (BIM), Industrialised Building System (IBS), ICT, Project Management, and Industrial Revolution 4.0 (IR 4) in Construction. She is currently the Certification and Competency Coordinator for BIM Unit in UTHM and Coordinator for Development and Professional Certification for the Faculty of Engineering Technology.



Mohamad Hairi Osman served as Industry Fellow in the Department of Civil Engineering Technology, Faculty of Engineering Technology, UTHM, accumulating 14 years of teaching experience. He holds a Bachelor's degree with honors in Civil Engineering (Construction) from UTHM (2006), a Master's in Civil Engineering from the same university (2012), and a Doctorate in Engineering Technology (2023). He has been recognized as a qualified Professional Technologist (Ts) by MBOT and has been registered as a Professional Engineer (Ir) by BEM since 2015.

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