Modelling and Layout of Single Stored Building using RIVET

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ABSTRACT

Architects may use Autodesk Revit, a building information modeling program. Autodesk developed designers, contractors, MEP engineers, landscape architects, and structural engineers. It enables users to obtain building data from the building model's database, annotate the model with 2D drawing elements, and construct a building and its structure and components in 3D. With the ability to design and monitor every step of a building's lifetime, from conception to construction to maintenance or destruction, Revit is a 4D BIM tool. We completed the modeling and layout of a single-story building for this assignment. The architect is typically in charge of the building's functional needs and aesthetics, while the structural designer oversees the structure's economy, serviceability, durability, and safety. A single-story home design may provide a typical family with plenty of room. It could even be the perfect size, with enough square footage for formal dining rooms, master bedrooms, and outside areas. With an abundance of windows and reflecting surfaces, this single-story building seems considerably larger.

Keywords: Construction site planning, site layout modeling, modelling constructs, REVIT architecture, AutoCAD.

1. INTRODUCTION

Technology is made for good and easy life for the human being. Each person talking about new technology of different sectors. This paper describes the introduction of Autodesk Revit within a construction technology and the modelling of G +1 building.

Revit is BIM software produced by Autodesk. It is similar to software such as AutoCAD or sketch up exist in its ability to construct a simulated 3D model of a building. Revit allows elements within a building to be parametrically linked. The components of such a model are defined and characterized by adjustable parameter.

Revit is made use within BIM development which tends the employers to search for an expert with some experience in software program.

Autodesk Revit is a building information modelling software which helps for Structural engineers, Architects, MEP engineers, designers and contractors. It allows users to design

a building and structure and its components in 3D, annotate the model with 2D drafting element, and access building information from building model database. Revit is capable to plan and track the various stages in building's life cycle: from designing stage to

construction and the later demolition. Revit is more comfortable to create structure depending on requirements and determine real-world elements which are useful for building and construction.

1.3 FEATURES OF REVIT

Parametric components, work sharing, design options, set schedules, documentation, phasing of project, interoperability, linked file, performance, work in perspective view, improved integration between Revit and structural analysis software. Revit helps designers to design, simulate visualise and collaborate in order to capitalize on the advantages of the interconnected data within BIM Model. One can quickly create and modify multi-story buildings by connecting stairs to the levels in your project.

This paper shows the Autodesk Revit implementation in a 2-storey building. The construction stage and life cycle of a building can be studied using the software which helps inexecution.

1. LITERATURE REVIEW

G Uma Maheshwari and BT Shyamala (2017): worked on modelling of three-star hotel in Revit architecture software. This project gives realistic and accurate families ranging from furniture to lighting fixtures using Revit architecture software. Revit architecture, built specifically for Building Information Modelling, helps to capture and analyse design concept and more accurately, maintain our vision through design, documentation and construction.

E Rakesh Reddy, S Kailash Kumar (2019): worked on designing and modelling of G+5 commercial building using Autodesk Revit architecture software. To accomplish the project, that is, for design and modelling, they made use of architecture template Revit architecture window. According to them, Revit architecture gives you an exact vision of the building via design, construction and documentation.

A S Shivsharan, Dr Reddy (July 2017): worked on modelling and energy analysis of residential buildings using BIM tool. This paper is based on Autodesk BIM and Revit capabilities to perform 3D modelling and energy analysis of G+9 residential building. Closer the model is to reality, greater the chance to create high performing reality.

Soundharya R and Uma (July 2017): worked on BIM modelling of two-storey building using Autodesk Revit architecture and the Autodesk Naviswork manage. This paper shows the Autodesk Revit and Naviswork manage implementation in a two-storey building. The construction stage of building can be studied by using Revit software. Autodesk Revit helps in 3 D modelling of the structure and helps to manage the project in an efficient way.

Sneha Kumbhar, Pratiksha Mane (2018): Application of BIM in cost of residential building construction. In paper, the process of 3D modelling includes 3D data acquisition, modelling and rendering. Revit is Autodesk solution of BIM to create structure of building for the analysis of cost of construction project.

2. LAYOUT PLANING AND MODELING:

Model building components, analyse and simulate systems and structures, and iterate designs. Generate documentation from Revit models. In Revit software we create 3D building model by using Revit families i,e. Door, Wall ,Window, Floor etc.. An experienced user can create realistic and accurate families ranging from furniture's to lighting fixtures as well as import existing models from other programmes. We created a 3D Model of G+1 Building with use of System families and Loading families. Each component you create in Revit BIM software has parametric qualities. This means your elements are 3D, but you can also modify the associated 2D planes to change the 3D model.

The intension of our project was to introduce the Revit software by modelling of G+1 building and to familiarize with major tool. The Revit architecture software will give the plan view, 3d model with excellent elevation in Revit we can have these all 2D, 3D sections view elevation, side view and detailing drawing etc. in one sheet. The 3D realistic view gives the clear picture about building to be constructed in efficient way.

3.1 INTRODUCTION TO REVIT SOFTWARE:

Autodesk Revit is a software which help the create the modeling and layout of the tree dimensional building information modeling software for architects, landscape architects, structural engineering ,layout engineers, designers and contractors developed by Autodesk. It allows users to design a building and structure and shape of the 3d model by defaults furniture setup and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database.[2] Revit is 4D BIM capable with tools to plan and track various stages in the

building's lifecycle, from concept to construction and later maintenance and/or demolition

Modelling in Revit revealed itself to be both intuitive and challenging. The fact that the user places representations of building elements in the model adds to the sense of progress and purpose of the design process, because as the modelling progresses, it resembles the finished building more and more closely. The proposed exercise to the student consisted in developing the architecture model of a small building, from drawings defined in AutoCAD as a way to train a new BIM-based tool, shows the 3D view of the project all modelled in Revit Architecture (Fig 3). The structure of the building is also apparent, with the bottom floor being partially underground. The 3D viewing environment allows the user to turn the whole model in whichever direction is intended and it is also possible to obtain top view of different levels of the project.
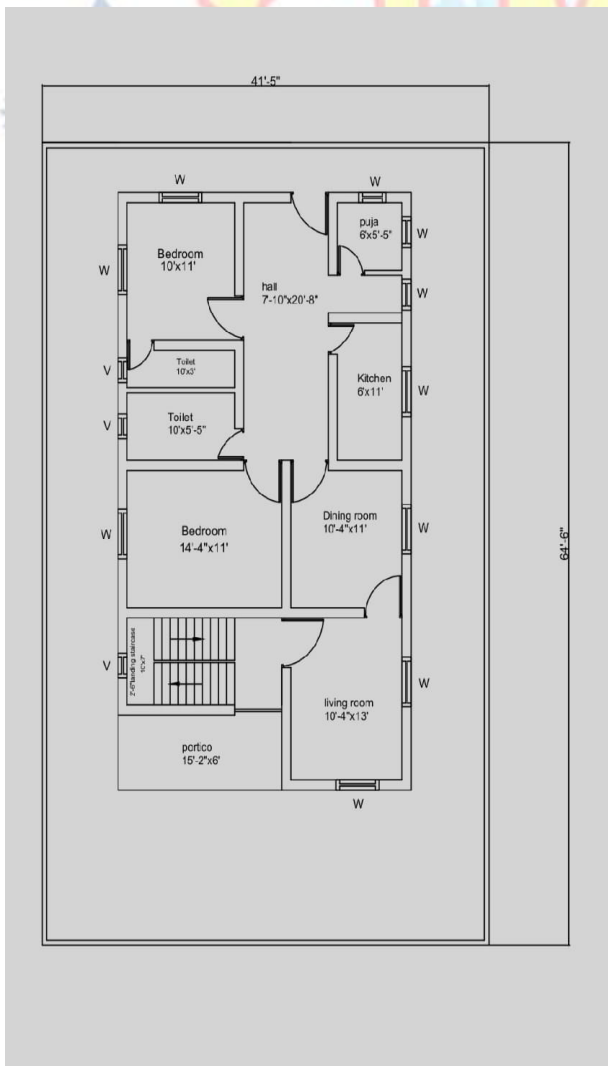
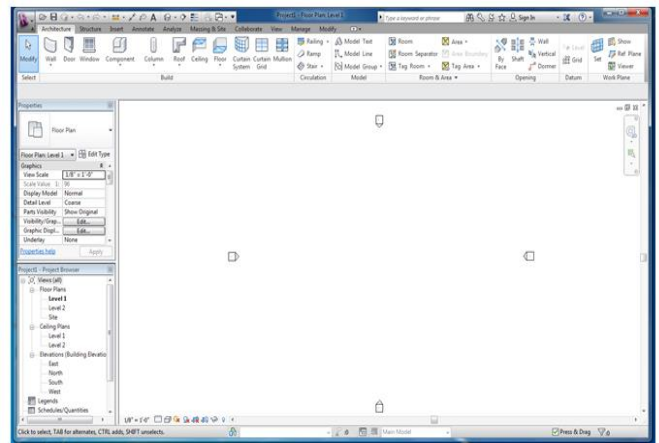### 3.3 ARCHITECTURAL LAYOUT DRAWING :

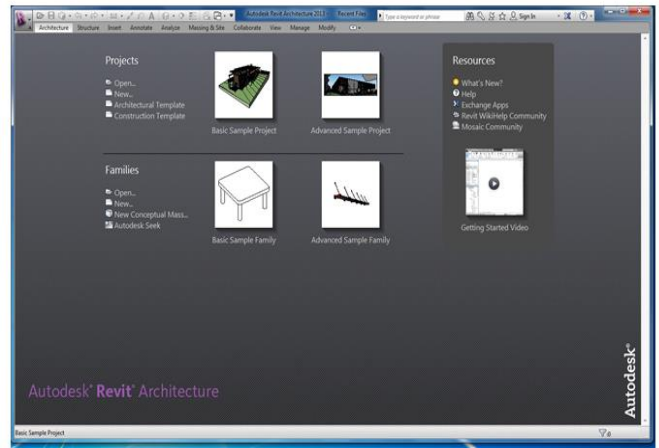

Figure 1: building plan
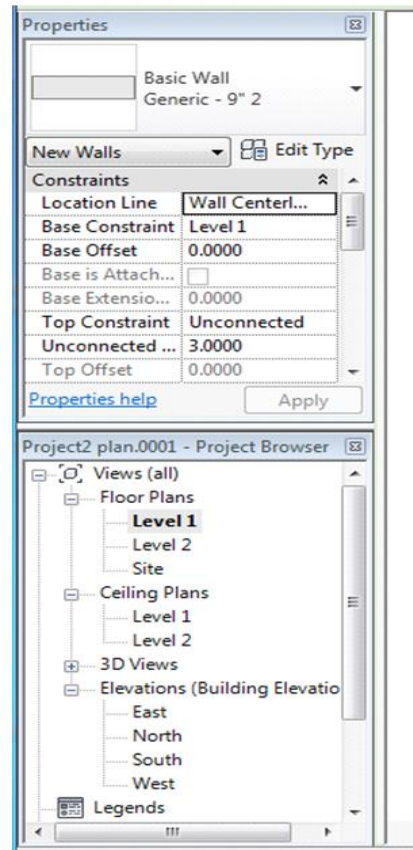

Figure 2: Architecture model with directions
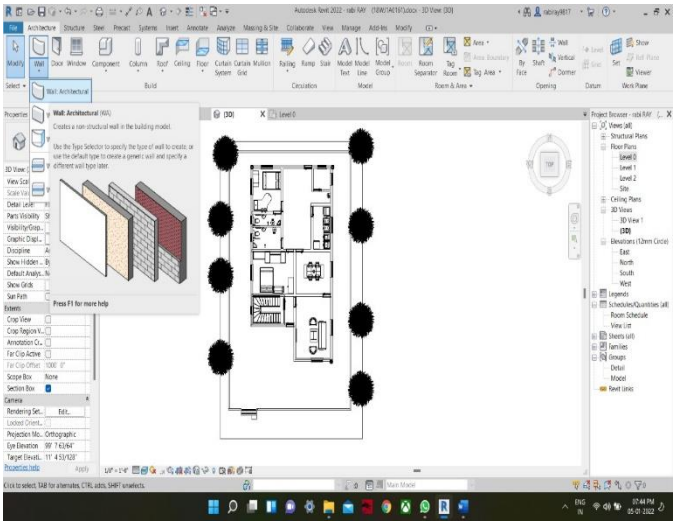

Figure 3: Level Creations
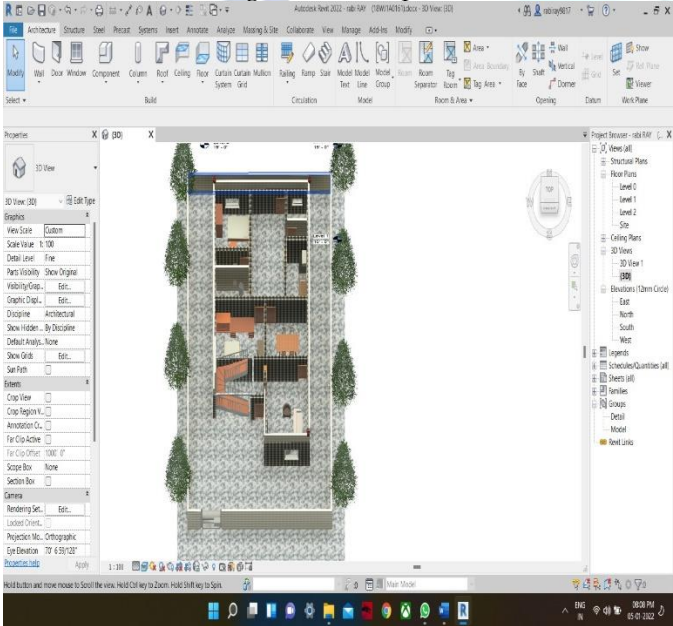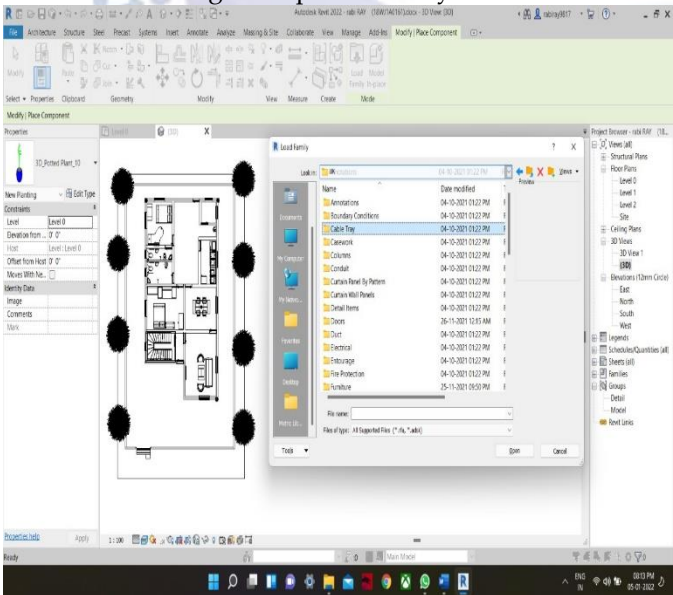
Figure 4: Rivet plan

Figure 5: plan with layout

Figure 6: loading liberary
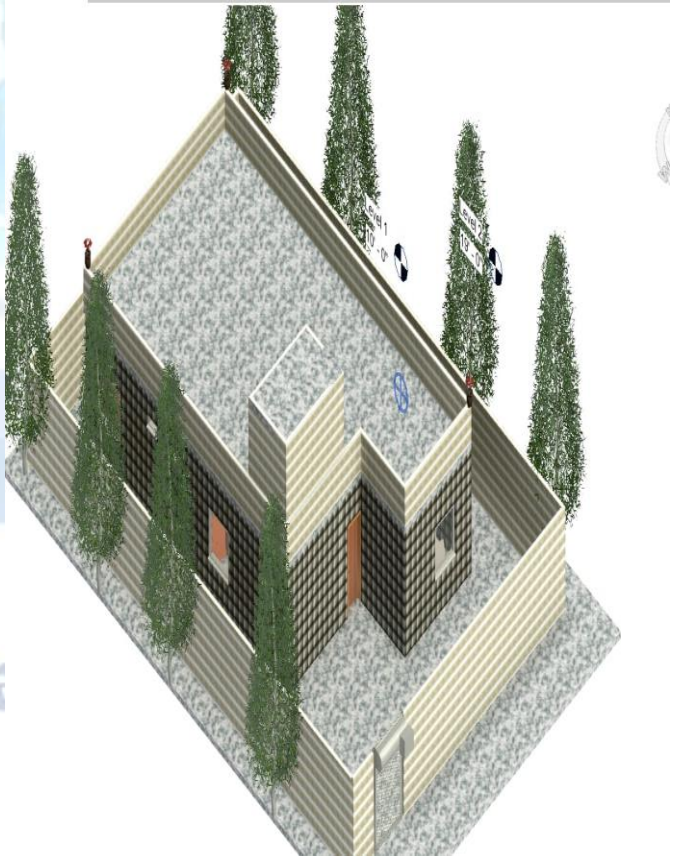

Figure 7: Building plan with layout

Figure 8: Model of the Single storey building

3. CONCLUSIONS

The conclusion is that a BIM model of a contemporary home is constructed, and many components are included in the design by using a variety of software tools. It is just as important to use Building Information Modeling (BIM) as a tool to update the flow of information throughout a project as it is to do it the first time. Despite the fact that BIM tools will continue to improve in terms of their capacity to be simplified, the procedures that are now in place enable a construction manager who is empowered with BIM to execute jobs with a pretty high level of efficiency. Additionally, the speed at which these activities are completed will increase as individuals become more adept with the program and the process by which the software is applied. This project allows for the realistic modeling of buildings and accurate families, which include everything from furniture to lighting fixtures. Additionally, it allows for the import of models that are already present in other software applications, such as AutoCAD. During the course of this project, we have not only built families for this contemporary structure, but we have also done planning, modeling, and scheduling of doors.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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