Modelling of a Modern House by Rivet Softwares

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ABSTRACT

Autodesk Revit is a building information modeling software for architects. landscape architects, structural engineers, MEP engineers, designers and contractors developed by Autodesk. It allows users to design a and its structure and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. Revit is 4D BIM capable with tools to plan and track the various stages in building's lifecycle, from concept to construction and later maintenance or demolition.

In this project we have done modelling and layout of Single storey Building. This building has the functional requirements and aspects of aesthetics are locked into normally be the architect while the aspect of the safety, serviceability, durability and economy of the structure are attended by structural designer.

A Single storey Building house design can provide ample space for the average family. With plenty of square footage to include master bedrooms, formal dining room and outdoor spaces, it may even be the ideal size. Plenty of windows and reflective surfaces give this Single storey Building a much bigger feel.

Key Words: Families, Floor plan, Ceiling plan, 3D view, Elevation.

1. INTRODUCTION

Residential building means a building (other than a dwelling house, ancillary unit, pair of maisonettes or extended residential building) or portion of a building used, constructed, designed or adapted to be used for human habitation together with such outbuildings as are ordinarily used therewith, and includes a block of flats, or duplex flats, boarding house, hotel (other than a licensed hotel), residential club and hostel, but does not include any building mentioned whether by way of inclusion or exclusion in the definitions of "place of instruction" and "institution". 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.

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.

Before beginning the exercises, install the software and register it as either demo or subscription. Demo mode serves as a no-cost viewer, allowing you to export, print, or plot projects that have not been edited.
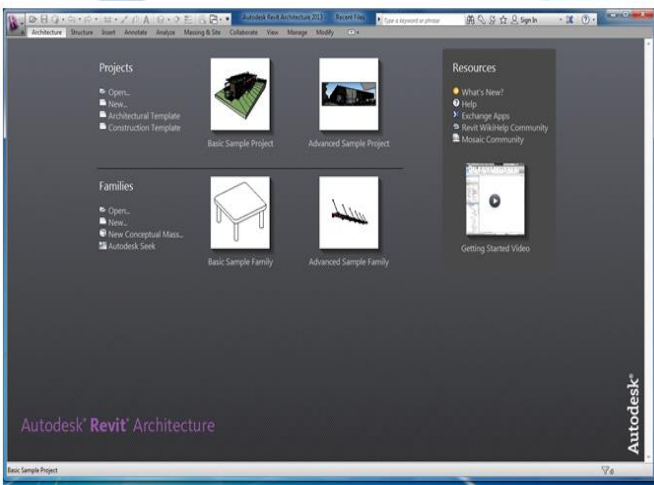

Figure 1: Architecture template

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. PLANING LAYOUT 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 section 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.

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.
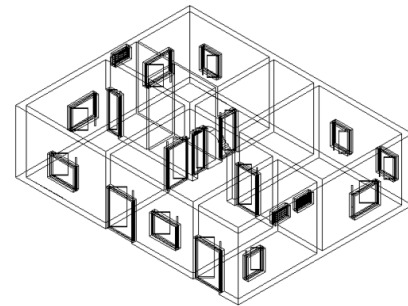
3.2 Residential building requirements:

1. Strength and Stability
2. Dimensional Stability
3. Sound
4. Durability
5. Lighting and Ventilation
6. Comforts and Conveniences
7. Economy
8. Resistance to Fire
9. Heat Insulation
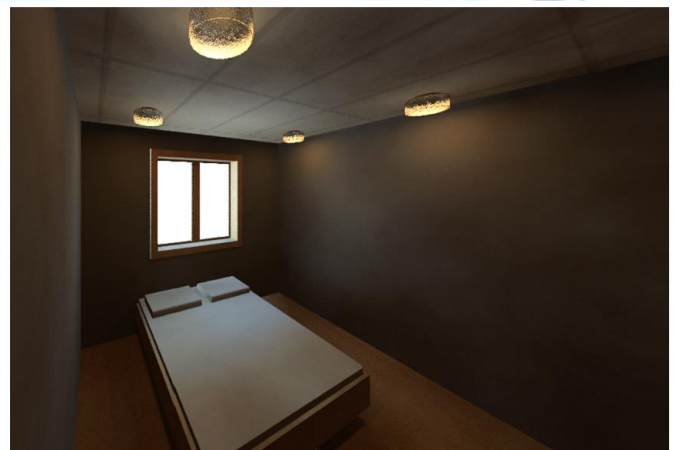10.Protection from Termite
11.Security against Burglary
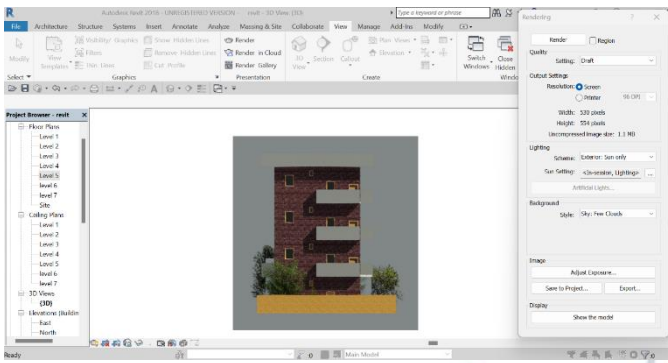
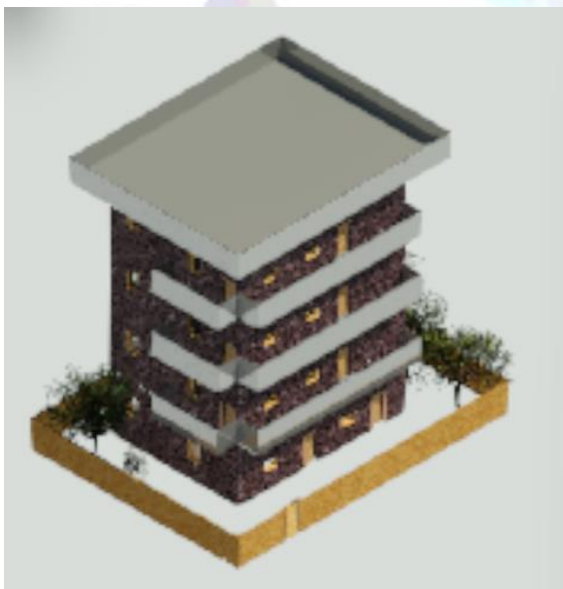### 3.3 ARCHITECTURAL LAYOUT DRAWING
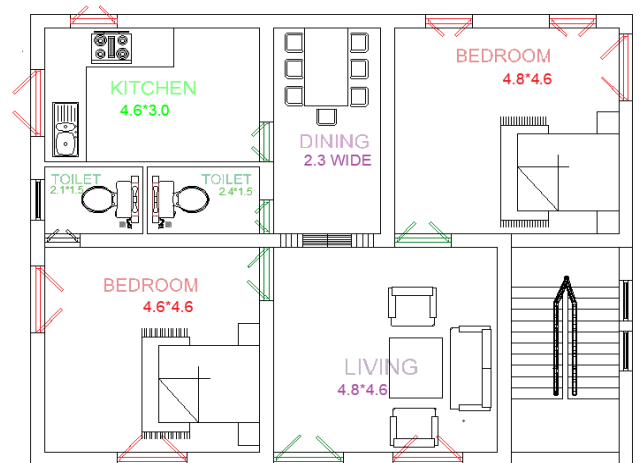
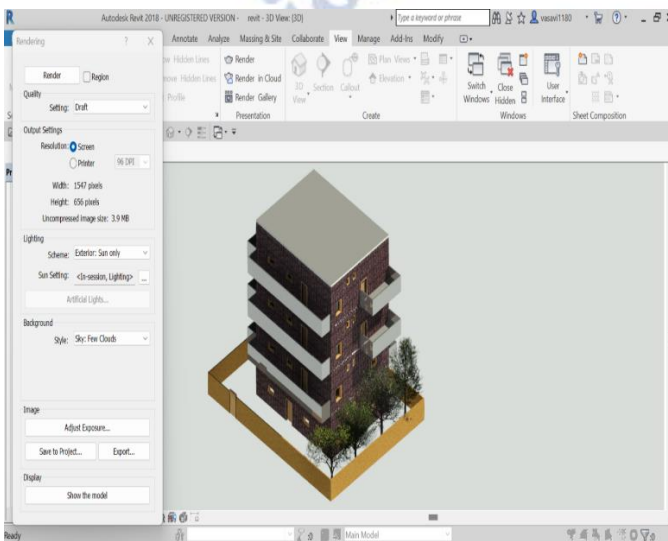**SPECIFICATION**

Render Image

Isometric View

3. CONCLUSIONS

conclude that BIM model of an modern house is created and different components are implemented in the design using different tools in software. Using BIM as a tool to update the flow of information during a project is just as critical as doing it the first time. BIM tools will continue to develop in their ability to be streamlined, but current processes allow a BIM-enabled construction manager to complete tasks with relatively good efficiency. As users become more proficient with the

software and the process to which the software is applied, these tasks will be even faster.This project gives the realistic modeling of building and accurate families ranging from furniture. To lighting fixtures, as well as import existing models from other softwares like Auto CAD etc. In this Project we have done planning, modeling, scheduling of Doors and we have created families also for this modern building

Scope for future work This project gives clear design and modeling of a modern building with the efficient structural and architectural plans. It provides the overall knowledge of material take off and schedule quantities in the model of the building defined in the project. 3 D realistic view give the clear picture about the family and the components placed with in the build

Conflict of interest statement

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

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