

A Review on Analysis of Residential Building

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Abstract- ETABS stands for Extended Three Dimensional Analysis of Building Systems. The main purpose of this software is to design multi-storied building in a systematic process. The effective design and construction of earthquake resistant structures have great importance all over the world. This project presents multi-storied residential building analyzed and designed with lateral loading effect of earthquake using ETABS.

Keywords- ETABS, software, manual, Auto cad etc

I. INTRODUCTION

Building construction is the engineering deals with the construction of building such as Residential houses. In a simple building can be define as an enclose space by walls with roof, food, cloth and the basic needs of human beings. In the early ancient times humans lived in caves, over trees or under trees, to protect themselves from wild animals, rain, sun, etc. as the times passed as humans being started living in huts made of timber branches. The shelters of those old have been developed nowadays into beautiful houses. Rich people live in sophisticated condition houses. Buildings are the important indicator of social progress of the county. Every human has desire to own comfortable homes on an average generally one spends his two-third life times in the houses. The security civic sense of the responsibility. These are the few reasons which are responsible that the person do utmost effort and spend hard earned saving in owning houses.[1]

Nowadays the house building is major work of the social progress of the county. Daily new techniques are being developed for the construction of houses economically, quickly and fulfilling the requirements of the community engineers and architects do the design work, planning and layout, etc, of the buildings. Draughtsman is responsible for doing the drawing works of building as for the direction of engineers and architects. The draughtsman must know his job and should be able to follow the instruction of the engineer and should be able to draw the required drawing of the building, site plans and layout plans etc, as for the requirements. A building frame consists of number of bays and storey. A multi-storey, multi-paneled frame is a

complicated statically intermediate structure. A design of R.C building of G+6 storey frame work is taken up. The building in plan (40*28) consists of columns built monolithically forming a network. The size of building is 40x28m. The number of columns is 85. it is residential complex. The design is made using software on structural analysis design (Etabs). The building subjected to both the vertical loads as well as horizontal loads. The vertical load consists of dead load of structural components such as beams, columns, slabs etc and live loads. The horizontal load consists of the wind forces thus building is designed for dead load, live load and wind load as per IS 875.

II. LITERATURE SURVEY

At present ETABS and Build Master are the leading designing and modeling software in the market. We are analyzing our structure using ETABS and modeling it done on Build Master. By analysis on ETABS we studied various forces and factors affecting on the structure. By Build Master we get the 3D model of structure, quantities of steel and other materials. [2]

Abhay Guleria (2014) presents the analysis of the multistoried building using ETABS reflected that the storey overturning moment varies inversely with storey height. Moreover, L- shape, I- shape type buildings give almost similar response against the overturning moment. Storey drift displacement increased with storey height up to 6th storey reaching to maximum value and then started decreasing. From dynamic analysis, mode shapes are generated and it can be concluded that asymmetrical plans undergo more deformation than symmetrical plans. Asymmetrical plans should be adopted considering into gap.

Arpit A. Bhusar and Ashish R. Akhare (2014) shows Building information models let structural engineers design, visualize, simulate, analyze, document and build projects more efficiently, accurately, and competitively. Among the most important benefits of BIM for structural engineer are productivity, coordination and consistency of data, and improved visualization and simulation of problems and situations. Structural engineers can easily spend more time

coordinating a project than performing the structural analysis. With the use of BIM, the time spent in coordination is reduced, allowing structural engineers to focus all their efforts in solving problems, instead of having to constantly be checking for errors or coordinating changes made. [3]

Sonia Longjam et.al. (2014) publishes the paper that presents the plan, model, analyze and design of a vertical irregular shopping mall structure of G+10 storey and investigate its performance under various lateral loading conditions. The main goal is to assess current Indian Standard design practice and to provide design guidelines using ETABS, presents the manual design calculation satisfying the necessary requirements as per BIS specification as well as various Indian standard code specifications. The project is comparative study on design and analysis of multistoried building (G+10) by Etabs software. Etabs is one of the leading software for the design of structures. G+10 building is analyzed for finding the shear forces, bending moments, deflections & reinforcement details.[4,5]

The inflatable flexible membrane dams (IFMD, or rubber dams) were developed in the early 1950s - Flexidam - Imbertson. They are installed in stream and river beds, generally being bolted into a concrete foundation. They are used to divert water for irrigation, temporarily raising existing dams, flood control, water retention for aquifer recharge, reducing or preventing salt water intrusion into fresh water areas, protect low-lying coastal areas from tidal flooding, enabling fish passage past diversion works, by deflation, and for sewage retention/separation during flood events.

Structural components of building (such as Beams, columns & slabs) to develop the economic design. ETABS is also a leading design software in present days used by many structural designers. Analyzed the same structure using ETABS software for the design. Finally, an attempt to define the economical section of G+10 multistoried building using both Etabs and ETABS comparatively. By the intensive study come to know that the “economical sections” was developed using ETABS software.

S. Vijaya Bhaskar Reddy et. al. (2015), published a paper which describes the salient features of ETABS (i.e., Extended Three-Dimensional Analysis of Building Systems) and its various applications in civil engineering. In this paper, using E tabs software the analysis of two multi storied buildings is carried out with different heights (15m and 10m). Thus, it can help the consulting engineers, construction experts, research scientists and students in the analysis of concrete structures. The essential feature of ETABS is explained and the capability of the important concepts of effective memory management, plot options and user interface

are described. Design of Flat Slab by Using ETABS Software, concludes that flat plate/slab can be designed and built either by conventional reinforced concrete or posttensioning. However, due to issues mentioned above with post-tensioning construction in India and its higher cost, conventional reinforced concrete design should be preferred choice for spans up to 10 meters.

Nisarg M. Mistry et.al (2014) worked on Software for Building Information Modeling (BIM) for Project Management and Controlling. It can be concluded that Build Master helps to provide immediate competitive advantage, better coordination and quality, and can contribute to higher profitability for architects and the rest of the building team. It can also be concluded that BIM is an efficient and reliable tool of project management. Project management can be done more effectively by using this type of tool. Wei Peng (2014), the art of architecture refers to the law of beauty, and uses the unique architectural art language, so the building image has cultural value and aesthetic value, with symbolic and formal beauty, reflecting the national character and sense of the times. This paper takes the BIM building information modeling as integrated platform, through the Build Master data interface, and uses 3Ds max software to design the art shape of building structure.

Shashank R. Chandak (2016), presents the cost of optimization of construction projects using BIM Software Build Master. The projects conclude that by using BIM method 80% reduction in time to generate estimates 10% saving on construction cost through clash detection. 20% saving through construction cost simulation. Based on the afore-mentioned literature review it is observed that ETABS and Build Master are user friendly software's. Hence, we have decided to do analysis, designing, modeling and quantity estimation of a residential structure by ETABS.

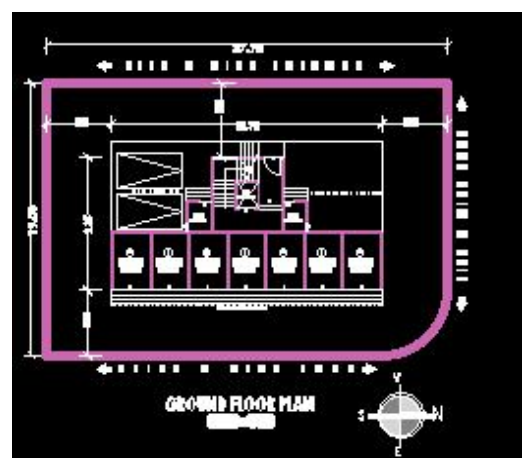


Figure 1 :- Ground floor plan in AutoCAD.

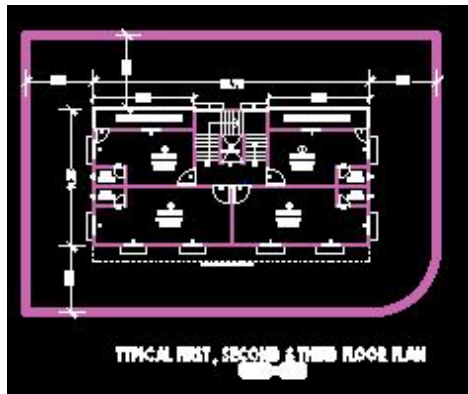


Figure 2: Typical 1st , 2nd & 3rd Floor plan in AutoCAD.

III. CONCLUSIONS

The project is an analysis, design and modeling of multi-storied building (G+3). by using ETABS and Autodesk. The auto cad plotting no.1 represents the plan of a G+3 building. The plan clearly shows that it is a combination of apartments. We can observe there is a combination between each and every apartment. The Apartments are located at gachibouli which is surrounded by many apartments. In each block the entire floor consists of a three bed room house which occupies entire floor of a block. It represents a rich locality with huge areas for each house.

It is a G+3 proposed building, So for 5 blocks we have $3 \times 3 = 9$ flats. The plan shows the details of dimensions of each and every room and the type of room and Orientation of the different rooms like bed room, bathroom, kitchen, hall etc. The entire plan area is about 1570 sq.m. There is some space left around the building for parking of cars. The plan gives details of arrangement of various furniture like sofa etc. The plan also gives the details of location of stair cases in different blocks.

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