

A Review Study on Dynamic Analysis of Hostel Building Using E-Tabs

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INTRODUCTION:

We are aware of the problem and challenges posed by housing in the present age of shrinking space, shrinking time and rising expectation. It has become common for any institution, providing hostel facility nearby for students. To accommodate 250 students, we have designed G+8 building with staircase and lift as well. The model is prepared in ETABS software. It is the great software which can handle high rise building and most complex structures. It can analyze all the members like beam, column, slab, shear walls etc. The results can be downloaded after it is analyzed without any errors with ETABS, we can easily analyze different materials like concrete, steel, reinforced concrete etc., It has the facility of generating gravity loads, lateral loads, self-weights automatically. Structural design is art and science of designing with economy and elegance, a safe serviceable and a durable structure, primarily to meet the functional requirements and economy of the structure for its intended use over the life span of the structure are looked by the structural designer. There are many types of buildings exist in this world. Such as RCC, steel, timber and composite buildings etc. But the common types are RCC buildings constructed because the designing and construction of RCC buildings are easier. Availability of materials, labours and machinery are easier in this field. All these factors help in timely construction and economic buildings. But on the structural design point of view many structures are constructed without design or on the guidance of lay men. This practice is not good for the buildings. Due to lack of awareness, buildings are not safe for earthquake and other forces. Due to construction of dams, mining and underground explosions buildings are not stable. For the safety and stability of the building structural design is must. Now days, most

of the buildings are designed and analysed by the software. STAAD. pro is the easy software used to designed buildings. Buildings are designed by the static method due to lack of time. On the other hand, dynamic analysis is a time-consuming process and requires additional input related to mass of the structure, and an understanding of structural dynamics for interpretation of analytical results.

ETABS is the present day leading design software in the market. Many designs company's use this software for their project design purpose. The innovative and revolutionary new ETABS is the ultimate integrated software package for the structural analysis and design of buildings. Incorporating 40 years of continuous research and development, this latest ETABS offers unmatched 3D object-based modeling and visualization tools, blazingly fast linear and nonlinear analytical power, sophisticated and comprehensive design capabilities for a wide-range of materials, and insightful graphic displays, reports, and schematic drawings that allow users to quickly and easily decipher and understand analysis and design results. From the start of design conception through the production of schematic drawings, ETABS integrates every aspect of the engineering design process. Creation of models has never been easier - intuitive drawing commands allow for the rapid generation of floor and elevation framing

LITERATURE REVIEW

[1] Mrs. R. Hymavathi et. al.

1) ORGANISATION OF THESIS:

The first chapter of thesis covers the introduction, objectives of the project, scope of study, methodology, analysis methods employed and finally design technique involved. The first chapter shows the importance of seismic analysis of

structures and the requirement of an efficient design technique. It provides an overview of the analysis methods followed along with the importance of ductility-based design. The second chapter encompasses the literature survey carried to gain an idea about research work done by various researchers and scientists on topics related to the project. This included works by various researchers from 1997 to 2012. The third chapter involves the results and discussions of analysis methods and design method followed. Firstly, response spectrum analysis was carried for three types of irregular structures namely mass irregular, stiffness regular and vertically geometry irregular and the storey shear forces were compared to that of a regular structure. Secondly, time history analysis was carried out for irregular structures considering three different kinds of ground motion namely low(Imperial),intermediate(IS code) and high frequency(San Francisco) and the results were compared. Lastly, design of irregular structures as per IS 13920 corresponding to Equivalent static analysis and Time history analysis was performed and the design results were compared. The fourth and final chapter covers the conclusion and references of project. Under conclusion, the results have been presented in brief manner and references cover the papers, journals etc related to the project.

[2]. Anita Devi et. al.

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static method due to lack of time. On the other hand, dynamic analysis is a time-consuming process and requires additional input related to mass of the structure, and an understanding of structural dynamics for interpretation of analytical results. [3] P. Guruswamy Goud. et.al. We are aware of the problem and challenges posed by housing in the present age of shrinking space, shrinking time and rising expectation. It has become common for any institution, providing hostel facility nearby for students. To accommodate 250 students, we have designed G+8 building with staircase and lift as well. The model is prepared in ETABS software. It is the great software which can handle high rise building and most complex structures. It can analyze all the members like beam, column, slab, shear walls etc. The results can be downloaded after it is analyzed without any errors with ETABS, we can easily analyze different materials like concrete, steel, reinforced concrete etc., It has the facility of generating gravity loads, lateral loads, self-weights automatically. (varalakshmi V et al-2014). Structural design is art and science of designing with economy and elegance, a safe serviceable and a durable structure, primarily to meet the functional requirements and economy of the structure for its intended use over the life span of the structure are looked by the structural designer. The design of the structure must satisfy three basic requirements:(S. Brahma Naidu et al -2018). Stability: To prevent overturning, sliding or buckling of the structure or parts of it under the action loads. Strength: To resist safely the stress induced by the load in the various structural members. Serviceability:

To ensure satisfactory performance under service load condition which implies providing adequate stiffness to contain deflection, crack width, vibrations within acceptable limit and providing in permeability, durability ect., economic buildings. But on the structural design point of view many structures are constructed without design or on the guidance of lay men. This practice is not good for the buildings. Due to lack of awareness, buildings are not safe for earthquake and other forces. Due to construction of dams, mining and underground explosions buildings are not stable. For the safety and stability of the building structural design is must. Now days, most of the buildings are designed

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additional loading condition primarily for irregular buildings.

2.2 OBJECTIVES

1. Modelling and understanding the structural behavior of structural members .
2. To determine shear and lateral force distribution theoretically and by using software.
3. To determine story drift and story displacement from dynamic loads.
4. To determine the ductile detailing of RC structural elements from dynamic analysis.

METHODOLOGY

- A. Site Survey: First visiting the site and check the site condition.
- B. Structural Plan: Draw the plan in Auto cad software and import to ETAB software.
- C. Analysis and Design in ETAB: Analysis and design the structure by using ETAB software
- D. Verification by Manual Method: Using manual calculation check the software result.
- E. Detailing and 3D Modeling and Rendering

CONCLUSION

We prepare the G+8 Hostel building plans has been drawn in AUTOCAD software and the results obtained from ETAB (2022) software. The static and dynamic analysis are different for code IS 1893-2002 and IS 1893- 2016 respectively and dead load, live load, are referred using IS:875-1987 part I part II and designed according to the IS:456-2000 by considering concrete grade of M25 and Fe 415 steel are used.

REFERENCE

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