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Seismic Analysis and Design of Multi - Storey Building in STAAD Pro for Zone II

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***Abstract*- Building construction necessitates careful planning, design, and administration since building are susceptible to numerous dead load live loads. a living load force of the wind the force of the earthquake Because earthquake have such a negative impact on building, it is critical to do a seismic analysis. This study discusses how a building reacts when it is subjected to a seismic load. Story drift can demonstrate this reaction. Using the STAAD pro software, a base shear seismic analysis was done on a (G+4) building in zone 2 in accordance with IS 1893 part 1 (2002).**

Key Words: A seismic investigation, Structure Analysis, Base Shear, Story Drift, Response Spectrum, STAAD pro.

1. INTRODUCTION

A natural disaster is an earthquake. that causes significant loss of life and property. Several people become homeless, children lose their parents, women become widows, and the economy of a country suffers greatly. It takes many years to recover and pay for the losses caused by earthquake. The vibrations of an earthquake can be felt from a long distance away from the epicentre.

Earthquakes, in which the earth's surface shakes, are one of the most catastrophic natural Disasters, due to the release of seismic energy from a fault's scale. Building are harmed by earthquakes, Scale generates seismic waves that propagate to the earth's surface. Seismographs and the Richter scale are used to measure seismic waves. When building are subjected to seismic waves.

The foundation of the structure begins to shake, and it quickly collapses. Seismic analysis is used to determine how a building will respond in the event of an earthquake. Construction of multi-storey building is now required for both residential and commercial uses. The high raised structures are not well – designed for lateral force resistance. It could lead to the structure's complete failure. The earthquake resistant structure is created based on a number of elements, including the structure's natural frequency, damping factor, type of foundation and the building's relevance. In this study, the seismic analysis of G+4 is used to determine the ductility of the structure. The response of the building in zone II has been described and shown in the from of storey drift and base shear. The analysis was performed using STAAD pro in accordance with IS 1893 code for seismic parameters.

2. OBJECTIVE OF THE PROJECT

- To conduct seismic analysis on structures in zone II.
- To investigate the impact of loads on the structure.
- To check that the building is safe from earthquake in zone II.
- To observe the effects of an earthquake on a structure.
- To determine the result of base shear storey drift and building movement

3. LITERATURE REVIEW

Reddy A. Et Al (2015) [1], Breakdown reaction of structure in seismic zone V is subjected to a directed diagnostic assessment for both regular and sporadic structures. A 15-story skyscraper is considered, with ETABS programming being used to demonstrate and mimic the building's reaction. For the purpose of study, static and dynamic methodologies are examined. When compared to general structure, the report concluded that uncertain structures have unpredictable behaviour.

Mukundan H. Et. Al. (2015) [2], The newly the building's found shear divider arrangement has shown to be effective and efficient. The use of fortified solid shear dividers in a In Zone IV, there is a 10-story skyscraper. is being tested by reduce the repercussions of earthquake tremors. The results are presented after the model has been broken down using ETABS programming and the RSA method has been applied. The thickness of shear dividers was also investigated by the researchers. In a traditional/irregular structure, shear dividers are thought to be more resistant to parallel loads, and for a more secure plan, the shear dividers are used. From 150mm to 400mm.

Mayuri D. Bhagwat Et Al. (2014) [3], Using time history analysis and reaction range investigation, a multi-story RCC building with a G+12 rating with the tremors in Koyna and Bhuj have been completed. The seismic response of such a structure is almost considered and represented with the ETABS programming assistance. There have been two time accounts (Koyna and Bhuj). To generate different suitable criteria, this method is used (storey uprooting, storey floats, base shear).

4. CONCLUSION

An earthquake is the shaking of the earth caused by a sudden release of energy in the lithosphere of the earth, which results in seismic waves. A natural disaster is an earthquake. that causes significant loss of life and property. Several people become homeless, children lose their parents, women become widows, and the economy of a country suffers greatly. It takes many years to recover and pay for the losses caused by earthquake. The vibrations of an earthquake can be felt from a long distance away from the epicentre. Richter scale are used to measure seismic waves The foundation of

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the structure begins to shake, and it quickly collapses. Seismic analysis is used to determine how a building will respond in the event of an earthquake. Construction of multi-story building is now required for both residential and commercial uses.

REFERENCES

[1] Mukundan H. and Manivel S., Effect of Vertical Stiffness Irregularity on a Multi- Storey Shear Wall-Framed Structure Using Response Spectrum Analysis. IJIRSET, Vol. 04, No. 03, pp. 58-62 2015

[2] Mayuri D. Bhagwat and Dr. P.S. Patil, Comparative Study of RCC Mutistory Building Performance For Koyna and Bhuj Earthquakes, IJATES, Vol:02 issue : 07, pp. 67-72, 2014.

[3] Mahdi, T., and Soltangharaie, V., Static and Dynamic Analysis of Asymmetric Reinforced Concrete Frame, Lisboa: the 15th World Conference on Earthquake Engineering, 2012.

[4] Ryan J. Williams, Paolo Gardoni, and Joseph M. Bracci, Decision analysis for seismic retrofit of structures, structural Safety 31, pp. 188-196, 2009.

[5] IS :1893 (part-1) 2002 Design Criteria for Earthquake Resistant Structures New Delhi: Bureau of Indian Standards, 2002.