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Research on Dynamic Analysis of RCC Columns with Different Cross Sections.

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Abstract—**The RCC Columns are the major component of building which carry and transfer the loads. Generally, regular (Rectangular, square or circular) shaped RCC columns are used for the construction. In order to improve the performance of traditional shaped reinforced concrete columns under the influence of Dynamic Forces (forces generated by a given ground motion), it will be replaced by the other various RCC column cross sections (L-shaped, +-shaped, T-shaped, Z-shaped) in model. The model will be executed in FEM software. The stress behavior of different cross sections of RCC columns in G+5 RCC framed structure will be analyzed by using FEM Software. The result will indicate the comparative analysis and study of regular shaped and other various shaped column cross sections.**

Keywords— RCC Columns, FEM Software, Dynamic Forces, T-shaped, L-shaped, +-shaped, and Z-shaped.

I. INTRODUCTION

In the last few years, the widespread damage to RCC structures due to Earthquake generated demand for seismic evaluation in Indian Sub-Continent. No structure can be entirely immune to damage from earthquake. Currently, there are several design philosophies in earthquake engineering, making use of experimental results, computer simulations and observations from past earthquakes to offer the required performance for the seismic threat at the site of interest. In recent years, different shaped column cross sections used won the national attention. Accordingly, there has been a lot of research on ordinary RCC framed structure with various shaped column cross sections. This article is about the study of existing research related to behavior of RCC columns due to dynamic forces.

Dynamic analysis are the effect of seismic forces for simple structures can be carried out manually, but for complex structures finite element analysis can be used to find dynamic displacement, time history and model analysis. In the present work, a symmetrical G+5 RCC structure of flat scheme has been consider with regular column cross section such as rectangular or square. The comparative study of regular columns with T-shaped, L-shaped, +-shaped and Z-shaped columns based on the graph derived by non-linear analysis, time history method and hinge formation in the different seismic zones.

II. METHODOLOGY

A. Time History Analysis

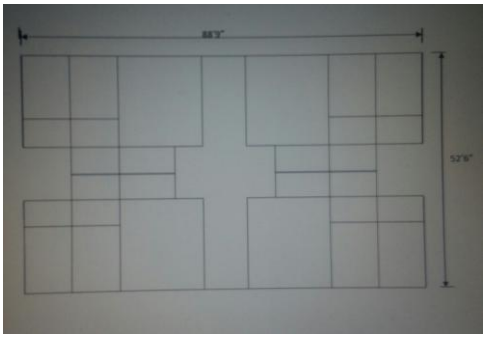
Time History Analysis provides for non-linear evaluation of dynamic structural response under loading which may vary according to the specified time function. It is step-by-step procedure used to determine the seismic response of a structure under dynamic loading of representative earthquakes. The analysis is done by considering the intensities of past earthquakes. Non-linear analysis has some variation according to state of structure that are non-linear dynamic analysis and non-linear static analysis.

B. Pushover Analysis

Pushover analysis is a non-linear static structure analysis, which enables presenting structure behavior caused by different types of loads resulting from an earthquake. It allows engineers to understand structure's non-linear behavior and progression of damage with increasing ground motion intensity. This method is very simple to perform with or without non-linear analysis software and does not require selection and scaling of ground motion.

III. DESCRIPTION OF MODEL

The RCC framed structure is considered for the dynamic analysis and will be modeled in E-Tabs software. A symmetrical G+5 building of flat scheme has regular shaped cross section of column. The modeling will be done with regular column and is analyzed, after that the regular shaped column section will be replaced by different column cross section and structure is analyzed. The Comparisons of all the results will be displayed in terms of graphs and tables.



IV. CONCLUSION

In the present study, various methods of analysis such as pushover analysis, time history analysis and hinge formation has been studied including the finite element software for analyzing the considered G+5 RCC framed structure.

The modeling and analysis of the structure is under process and result will be displayed very soon. Pushover analysis will be executed for displacement and base shear along x-direction and y-direction.

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