



A Review : Base Shear Reduction Using Diverse Dimension of Columns with Identical Concrete Grade in High Rise Structure Under Earthquake Loading

Sumant Patidar¹, Rahul Sharma²

¹PG Scholar, CED, Prashanti Institute of Technology and Science Ujjain, M.P., India E mail - patidarsumant30@gmail.com

²Assistant Professor, CED, Prashanti Institute of Technology and Science Ujjain, M.P., India E mail - rahulcivil.sharma@gmail.com

ABSTRACT

At the current existences the structure are prepared with lots of recent ethnicities like tall structure etc and there necessity is pleased by fresh modernization and latest thoughts. A multiplicity of innovators bounded by them used to build the structure with their own alternative and also the insist of market. The parameter of assessment of consequence such as displacement and storey drift are obtained in fundamentals of the any multistoried structure situated in earthquake Zone-III, earthquake effects are acting on the building under 7 diverse best sizes of column for decrease of base shear. For base shear decrease using the best dimension of column columns with same concrete grade in multistoried building under seismic loading, to study the decrease of base shear and inspect with the alliance of E-Tabs design software.

Keywords—concrete grade, Base Shear, Efficient size, Lateral Loading, Response spectrum analysis, Seismic Effects, E-Tabs

INTRODUCTION

The skyscrapers have highest floors in the building structures. They touch the sky and most of the skyscrapers are popular or famous in the world. In today's world they are in need. Their architectural look attracts the people. The multistoried building structures are also good in architectural look. But their strength and durability matter the utmost. The planning designing and execution of the multistory building also needs extra effort to protect the building from the external forces.

It is seems that when earthquake occurs the stability of the building affects utmost. And if the building is multistoried or skyscraper it need new ideas and technologies to protect it from earthquake load and wind load. The most of the people lives depend on that technologies therefore it is important to make new technologies and inventions in the field of highrise building design. The workers or people live in that multistory buildings affected by it therefore it is our responsibility to make structure stable and durable for the years so that the people live in there can live long life and stay safe. Therefore the new idea and technologies are increasing day by day in the field of multistorey building design. The software basis work is also increased in the design of modern building structures. First of all they are analysed on the basis of the structure then the execution is done. After analysis of the building it has been confirmed that building is safe against every kind of loads and forces or not then the ground work started. This method helps to find out building is safe or not and it also economically beneficial.

LITERATURE REVIEW

Literature review of the study describes the hard workmanship done in order to get the positive results for any kind of changes. Few of papers compare the work done on the use of types of structure like multistorey buildings. The chapter provides the details by using different angles on which the previously researchers had done work on a larger scale to get better results. Many research papers and some paper work have contributed a lot to this project work and they worked as the strong reference for the executed methodology and manage the results.

Overview of paper

After observing the various papers which has been related to seismic resistant multistorey building, the short explanation about methodology managing is discussed.

Literature review

Prabhulal Chouhan, Sagar Jamle, M.P. Verma

Now days to improve the strength of concrete there are many methods and new techniques available. Use of waste material is one of them silica fume, fly ash, blast furnace, steel slag is one of them. They also used as additional cementitious materials. The most popular and successful material is silica fume because of its property to increase the strength of concrete. It improves concrete tensile and flexural strength. In this research the cement is replaced by silica fume and many tests is done to find out the strength of concrete.

Tiwari Darshita, Patel Anoop

The concrete is the vastly used material in construction world. Many researches are done and many are in progress to strengthen concrete. We know that concrete needs fine aggregate like sand and sand availability is limited. It also harms our environment to take out more sand from rivers just to make construction. Therefore it is needed to replace that material from other material like "Spent Fire Bricks" and "Glass Powder". They can be used as that replaced material.

Prakash Mandiwal, Sagar Jamle

It is necessary now to strengthen concrete for the construction work. The concrete should be high in strength and durability. To increase its strength and durability a research has been done. In this research cement is replaced by polyethylene glycol-400 at different-different percentage and the results show that it gives more strength than concrete.

Masato SAKURAI, Hiroshi KURAMOTO, Tomoya MATSUI and Tomofusa

In this research the FEM analysis is conducted to imitate failure progress of shear wall with openings. The static loading tests on RC shear walls were conducted and investigated. The investigation is done on the basis of different-different number of the openings of shear walls. And the result shows that the number of openings affects the strength of shear wall.

Ms. Priyanka Soni, Mr. Purushottam Lal Tamrakar, VikkyKumharStructural

This paper presents the behaviour of shear wall against lateral loads. Shear walls provide strength to the structure against lateral loads like wind and earthquake loads. This research work is based on the study and analysis of various research works based on shear wall system.

Neeraj Patel, Sagar Jamle

Highrise buildings and skyscrapers are the need of today's modern world. The safety and security of these types of structures are on priority. This paper is based on the new preventing structural system like bracing system. As the structure height increases it is important to adapt some preventing systems and bracing system is one of them. By reviewing and analyzing we found that the bracing system is one of the best systems for high-rised structures/buildings.

PrafoollaThakre, Sagar Jamle, Kundan Meshram

Shear walls provide strength to the structure. Because of its importance we used it in highrise buildings. The buildings are of different-different shapes and different-different sizes which affect its strength with respect to seismic loads. Therefore a study and analysis is done on the safety of buildings against seismic loading and how shear wall helps to resist the seismic loads.

Critique

The literature review reveals that the work has been done for the analysis of multistoreybuildings. How this multistorey buildings get affected by seismic activities, examined at different parameters. The new work should be such that there has to be an implementation to upgrade the behavior and activities of multistorey buildings.

REFERENCE

- [1] Surendra Chaurasiya, Sagar Jamle (2019), "Twin Tower High Rise Building Subjected To Seismic Loading: A Review", International Journal of Advanced Engineering Research and Science, ISSN: 2349-6495(P) | 2456-1908(O), Vol-6, Issue-4, pp. 324-328, <https://dx.doi.org/10.22161/ijaers.6.4.38>.
- [2] Xilin Lu, Hua Yan, Jiang Qian, etc. (1997), Seismic Safety Analysis and Model Test of High-rise Building Structures, Proceedings of International Symposium on Engineering for Safety, Reliability and Availability, pp.187~194"<http://www.jstor.org/stable/29775699>.
- [3] Surendra Chaurasiya and Sagar Jamle (2019) "Determination of Efficient Twin Tower High Rise Building Subjected to Seismic

Loading”International Journal of Current Engineering and Technology, E-ISSN 2277 – 4106, P-ISSN 2347 – 5161, Vol.8,No.5,pp.1200-1203.

[4] Henry petroski(1996) “The PETRONAS twin towers” American Scientist, Vol. 84, No. 4 (JULY-AUGUST 1996), pp. 322-326.

[5] Wensheng LU and Xilin LU (2000), Seismic Model Test and Analysis of Multi-Tower High-Rise Buildings, the 12th International Conference on Tall Buildings, paper 0281, pp. 01-08.

[6] Wensheng Lu, Xilin Lu, Zhili Hu (1998), Shaking Table Test of a High-rise Building Model with Multi-tower and Large Podium, the 5th International Conference on Tall Buildings, pp. 814-819.

[7] Xilin Lu, Huiyun Zhang et. Al (1998), Shaking Table Testing of a U-Shaped Plan Building Model with Engineering Application, Asia-Pacific Workshop on Seismic Design & Retrofit of Structures, pp.114-191.

[8] MarkandayGiri, Sagar Jamle and Kundan Meshram (2020), “Response Spectrum Analysis”, LAP LAMBERT Academic Publishing, Mauritius

[9]Tak, N., Pal, A. and Choudhary, M. (2020). A Review on Analysis of Tower on Building with Sloping Ground. *International Journal of Advanced Engineering Research and Science*, 7(2), pp.84-87.

[10]Ahemad A., Pal, A. and Choudhary, M. (2020). Review Analysis on Determine the Best Locationof Porch in Multistory Building with and without Seismic Loading*International Journal of Advanced Engineering Research and Science*, Vol-7, Issue-1<https://dx.doi.org/10.22161/ijaers.71.25>ISSN: 2349-6495(P) | 2456-1908(O) pp 182-184

[11]Ahemad A., Pal, A. and Choudhary, M. (2020). Determine the Best Location of Porch in Multistory Building with Seismic Loading *International Journal of Current Engineering and Technology*, Vol.10, No.1 (Jan/Feb 2020) DOI: <https://doi.org/10.14741/ijcet/v.10.1.12> pp 72-77

[12]Kumawat, M., Pal, A. and Choudhary, M. (2020).Review Study-Use of Different Shapes of Twin Towers High Rise building under Seismic Loading *International Journal of Current Engineering and Technology* E-ISSN 2277 – 4106, P-ISSN 2347 – 5161 pp 37-39