Comparison Of Earthquake Resisting Structure Using Different Shear Wall -Reviews

Yogita Anil Jain #[1], Shekhar Milind Baviskar #[2]
[#1] *PG Students, Civil Engineering Department, Sandip University Nashik, Nashik*
[#2] *Assistant Professor, Civil Engineering Department, Sandip University Nashik, Nashik*

***Abstract*— Shear wall is a structural system composed of shear panels to counter the effects of lateral load acting on the structure. Wind Load and seismic loads are the most common loads for which the shear walls are designed for Resist. The basic function of shear wall is to increase the rigidity for lateral load resistance along with providing adequate stiffness and strength to the structure. Reinforced concrete shear wall provides a significant amount of strength and stiffness to the building in the direction of their orientation which considerably reduces lateral sway of the building.**

A shear wall resists lateral Force. The diaphragm (D) shear walls and other vertical elements of the Earthquake force resisting system. Shear walls are generally rigid framed walls with shear wall panels, reinforced concrete walls.

The G+20 story structures are situated in earthquake zones III and IV will be considered for study. All frames are designed under same gravity loading. Response spectrum method is used for seismic analysis. ETABS software is used and the results are compared.
The results were obtained in the form of Earthquake story displacement, Story drift and Base shear.

Key Words: dumbbell shaped shear wall, response spectrum, story Drift etc.

I. INTRODUCTION

General Introduction

Shear wall is a structural system composed of shear wall panels to counter the effects of lateral load acting on the structure. wind and seismic loads are the most common loads for which the shear walls are designed for resist lateral load. The basic function of shear wall is to increase the rigidity for lateral load resistance along with providing adequate stiffness and strength to the structure. Reinforced concrete shear wall provides a significant amount of strength and stiffness to the building in the direction of their orientation which considerably reduces lateral sway of the building.

They are usually conceived as vertical plates supported at the foundation and are expected to function only under the action of in-plane horizontal and vertical forces. However, depending upon the architectural planning and structural framing of the structure, shear walls follows important role in structure. Often the walls are of a central core forming boxes, or are cast between two columns leading to I or dumbbell shapes. Shear wall must need criteria for strength of structure, stiffness and in earthquake zone, also for ductile. Depending on the moment to shear ratio at horizontal wall section of the wall, the behavior can be controlled by shear force and torsion also.

II. LITERATURE REVIEWS

1. O. Esmailis, Epackachi M., Samadzad and S.R. Mirghaderi [1]: studied shear walls and tube structures are the most appropriate structural forms, which have caused the height of concrete buildings to be soared. In this paper; they some especial aspects of the tower and the assessment of its seismic load bearing system with considering some important factors will be discussed. lastly, after the study of ductility levels in shear walls; we will have concluded the optimality and conceptuality of the tower design.
2. Richa Gupta, AlfiaBano [2]: examined earthquake engineering has a vital role to play. As and when an earthquake occurs, we encounter something new and the profession grows to accommodate it. The work presented in this paper focuses on the performance of various shapes of shear wall in zone 5 namely: L-shaped, I-shaped, Rectangular-shaped & C shaped. In this study G+6, G+16 and G+25 storied building is modeled and analyzed for lateral displacement story stiffness, and story drift using ETABS-2016 software. The analysis and design of the building is done by response spectrum method and the results obtained from method.

3. Burcu Burak and Hakki Gurhan Comlekoglu [3]: evaluated the effect of shear wall area to floor area ratio on the seismic behavior of midrise RC structures. Main parameters considered in this study that affect the overall seismic performance of the buildings are the roof and inter story drifts and the base shear responses. The results indicate that at least 1.0% shear wall ratio should be provided in the design of medal class buildings to control the drift in structure. In addition, when the shear walls ratio increases beyond 1.5%, it is observed that the improvement of the seismic performance is not as significant.
4. Mahendra Kumar [4]: analysis based on software result was being comparison between top stores of building discuss about display displacement top story. The effect of shear walls at building and better location of shear wall.
5. Mishra et. al (5) Studied necessary to construct high rise buildings so as to cater the needs of the people as per living standard. Considering the past records of earthquakes, there is an urgent demand of earthquake resisting building which might be consummated by providing the shear wall systems within the building. In tall constructions, Shear walls form external walls that are straight, generally framing a box which will be providing all of the lateral support for the building. Shear walls when designed and constructed for resisting lateral load, will have the strength and stiffness to resist the horizontal forces.
6. Basu Dhakal (6) Buildings will always have some kind of irregularity about them. The main goal of this study is to compare the seismic performance of buildings with regular and irregular Structure. The current research analyses models of RCC buildings with G+9 story's and both regular and irregular floor plans. Using the ETABS Software, we do a Response spectrum study of the model. Final comparisons of seismic response findings are made between various time periods; base shear, story shear, member forces, overturning moments, displacement, stiffness, and drifts.
7. Minal Dnyaneshwar Jadhav (7) In general, the earthquake has a lengthy history of fatal devastations in the past. The results have been observed for the universal axis as well as the standard limit given by the code. The findings contrasted both pushover and dynamic time history analyses and to quantify the outcomes developed the performance indices. The pushover analysis is the primary source of the structural performance. it defines the growing base shear for displacement. To quantify the whole labor done for both types of analysis, the ranges from the original analysis and pushover analysis to standard codes must be presented in a suitable manner. As The functioning of the building relies primarily on certain findings for the study of time history.
8. Mohammed Abdul Razzak Ghori (8)- Shear wall is a structural member designed to counteract the lateral forces acting on a structure. They study used analytical software called ETABS software to provide a full perspective of the static technique and a tall building's reaction spectrum analysis with same model, in various zones. Using software to do the study has been beneficial.

III. CONCLUSIONS

In the present study, Analysis of RCC structure with dumbbell shape of shear wall building i e. regular shear wall and dumbbell shaped shear wall building with G+20 story building.

The structures are analyses for earthquake zone III and IV with medium soil and Results Compare. It has been made on different structural parameters viz. base shear, Earthquake displacement, story drift, story force and modal mass participations etc.

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