International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Earthquake Analysis of High-Rise Structure under Base Shear Reduction Using Changing the Beam Size

Jayprakash Gupta [a] **, *Priyanka Dubey*** [b]

[a]*M.Tech. scholar,Dr. A P J Abdul Kalam University, Indore Madhya Pradesh, India*
[b]*Assistant Professor,Dr. A P J Abdul Kalam University, Indore Madhya Pradesh, India*

A B S T R A C T

India is the fastest growing economy in the world and infrastructure plays a very important role in it. The Construction of Highrise buildings in India is growing day by day. Nowadays the building has been renovated in many modern ways and there is a need for it to be filled with new ideas and ideas. Base shear reduction is necessary for long life of building The diversity of the founders surrounded by those who were accustomed to do construction of their own choice and persist in the market. parameter of the outcome test such as migration and access level is available for the needs of any multi-story building located in the Zone-III seismic zone, seismic effects are applied to the construction of less than 6 standard timber logs to reduce shear. Structure should be safe from various parameter. Shear foundation deployment using a large beam size on the upper floors of a six-story building to analyze shear foundation depletion and test the integration of E-Tabs design software.

Keywords:Base Shear, Efficient size, Lateral Loading, Response spectrum analysis, Seismic Effects, Staad pro software,

1. Introduction

The world is growing faster and the need of the world is that the new ideas and technologies in construction area. The multistory buildings and skyscrapers are the today's world need. To make them safe, secure, durable and convenient it is very needed to add new ideas of construction in it. The reduction of base shear under seismic loading is the new method In this study we know about the base of the shear base and the reduction of the shear base by changing the size of the beam from the bottom up. to improve the basic structure of the foundation a basic shave is required. With the help of a high-rise building we can solve the housing problem. In recent days high altitude is much needed because of its construction and construction, in an earthquake zone. Therefore, we should be in the standard text for applicable parameters when this type of structure is in contact with earthquake loads. All six cases are modeled on ETabs software. Details of the case structure of the multi-story building are shown in Table A and Table B. Top views and previews of the various cases of the G + 17 building shown with the help of statistics. In this paper up to 17 floors with 6 different sides. After the effective case of each parameter and its markings are drawn below each of the parameters. The most effective grain size will be analyzed after all parameters have been taken. There are 6 different sizes of planks arranged in the middle ground under an earthquake load of earthquake III.

2 Objective

1.1. A review of the literature reveals that work has been done on the analysis of multiple buildings.
1.2. How are these multi-chambered structures affected by earthquakes affected by different parameters.
1.3. The new work must be done in such a way that there must be implementation to improve the performance and performance of high quality buildings.
1.4. Above the research paper indicates the potential for reduction of basic shear. Base shear should be reduced to upgrade any high-rise building.
1.5. Reduction of shear base, we read the paper due to the reduction in column size at a higher level in the high-rise building indicates a reduction in shear base, that is possible by reducing the size of the component part of the structure.how to assess target access.
1.6. We use different software to calculate base shear such as Staad Pro, ETABS etc.

3 Result and Discussion

The study obtained by using ETABs software. The results are shown in Graphs and different constraints are shown in tabular form.

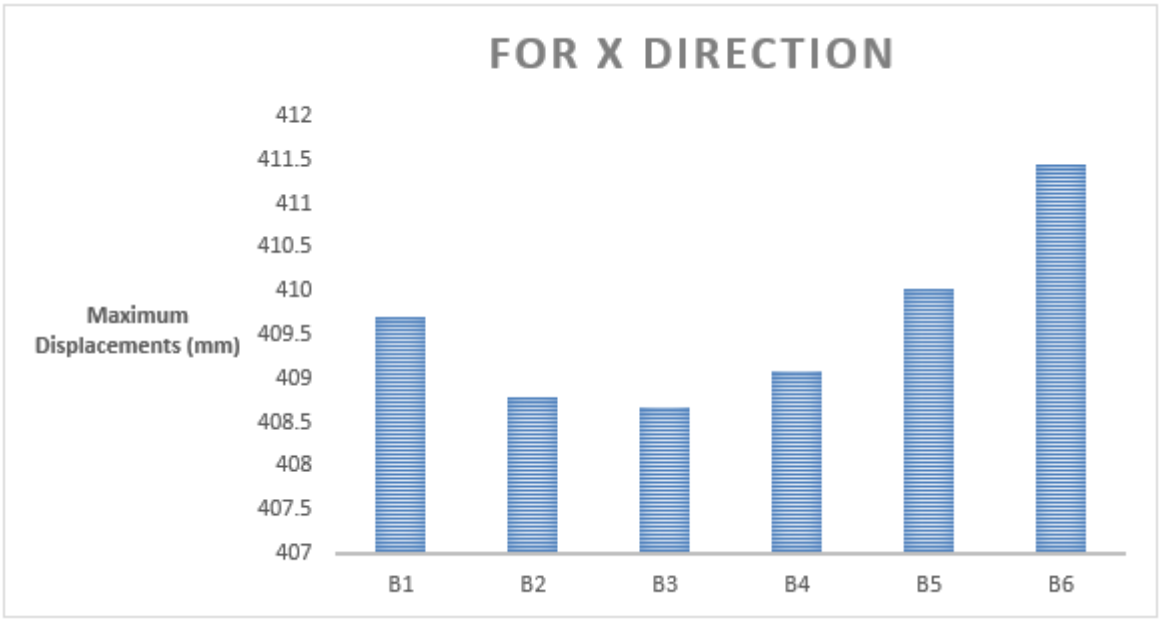

Fig. 1: Maximum Displacement shown in X direction Zone III

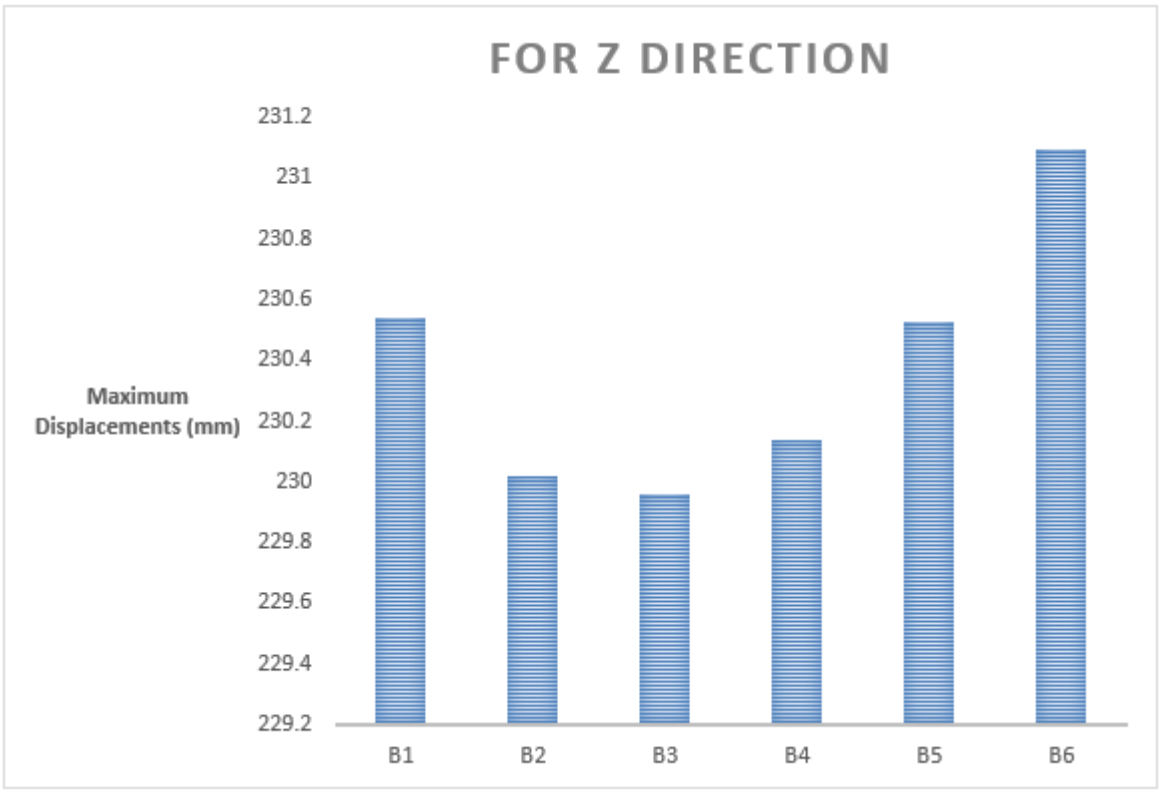

Fig. 2: Maximum Displacement shown in Z direction Zone III

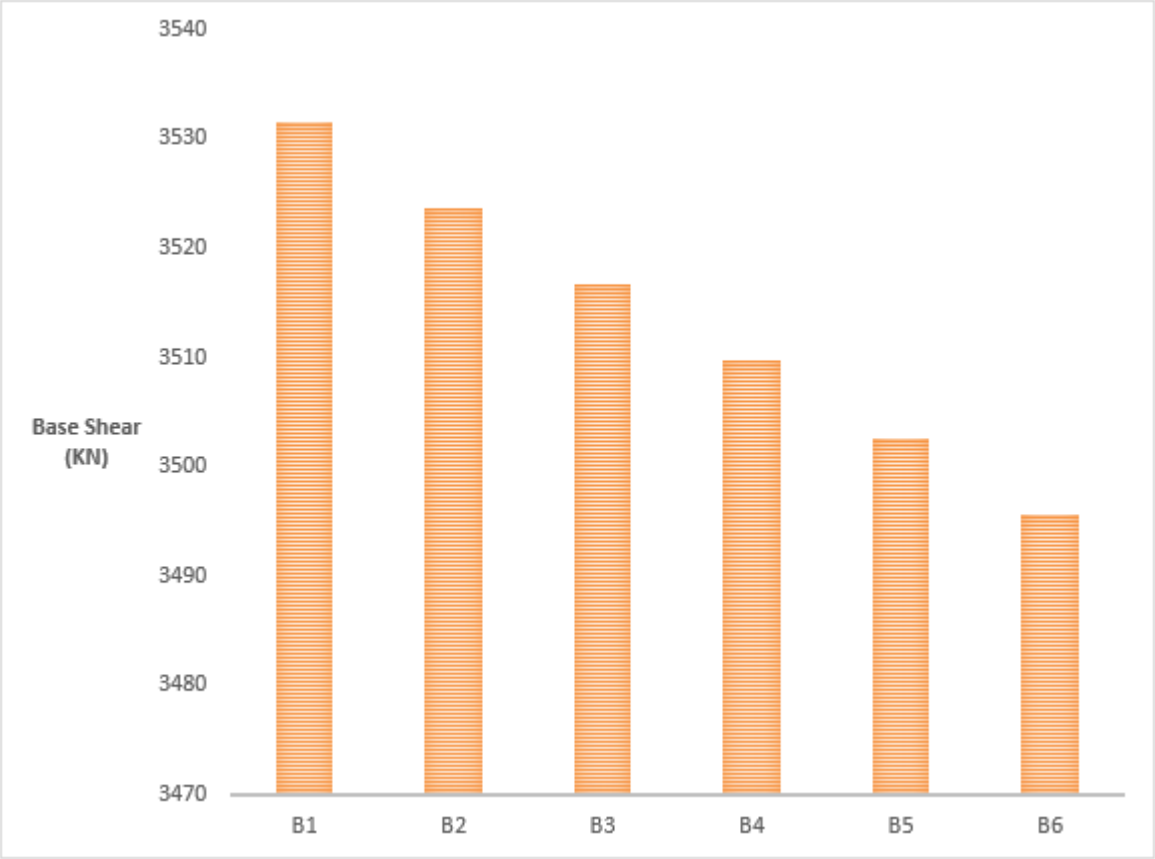

Fig. 3: Base Shear shown for all Building

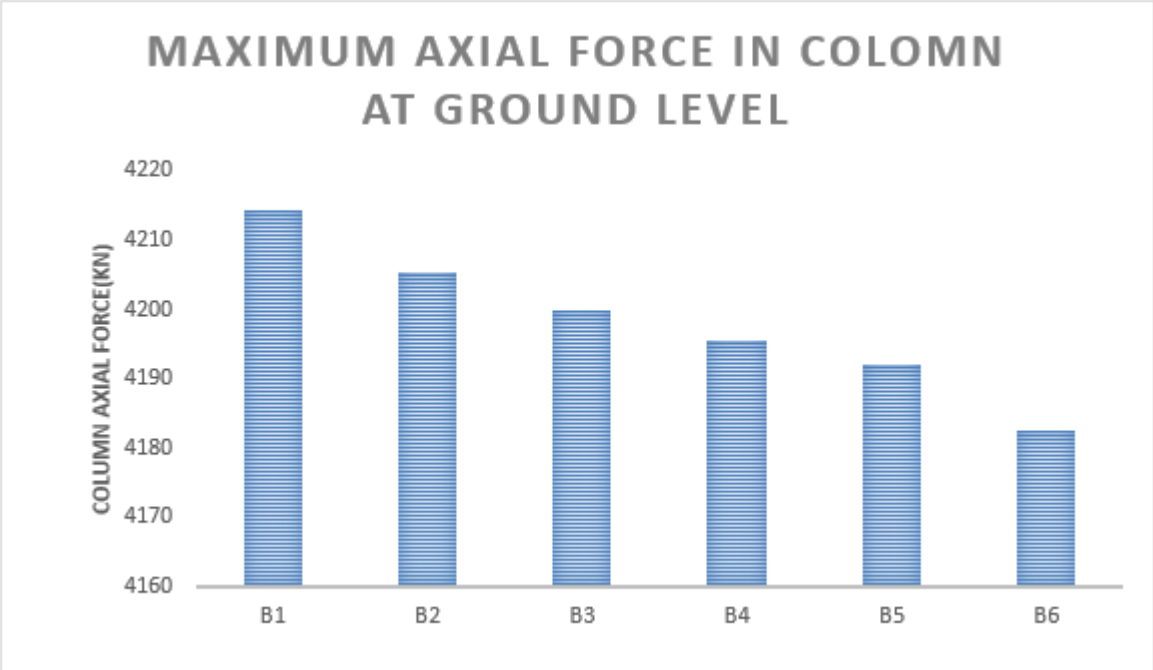

Fig. 4: Maximum Axial Forces shown in Column at ground level for all Building cases

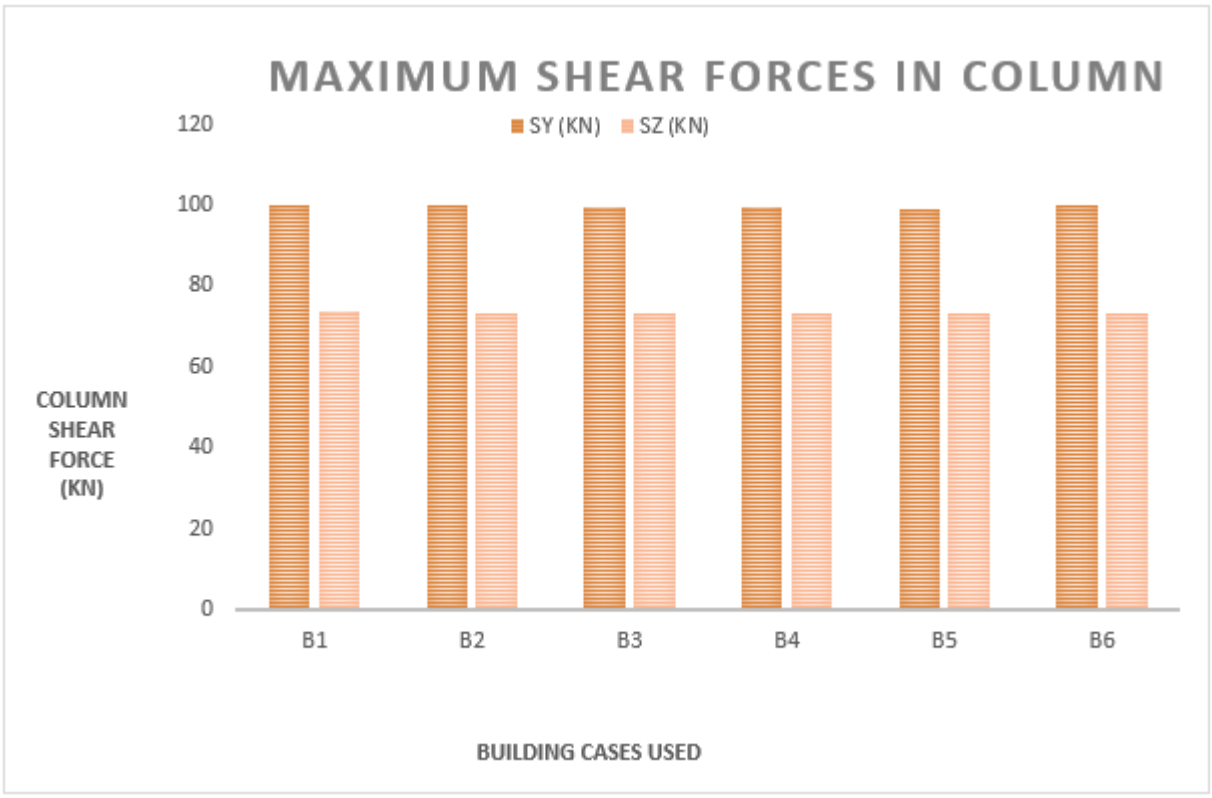

Fig. 5: Maximum Shear Forces shown in Columns for all Building cases

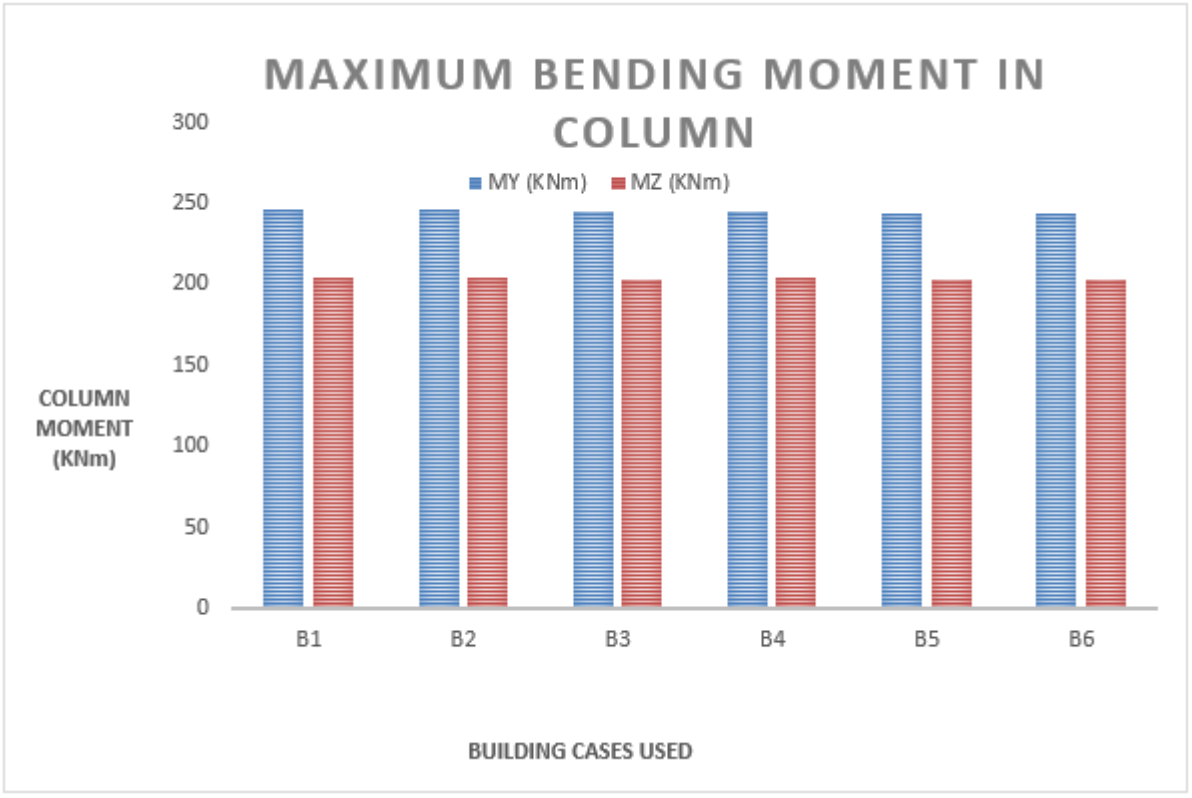

Fig. 6: Maximum Bending Moment shown in Columns for all Building cases

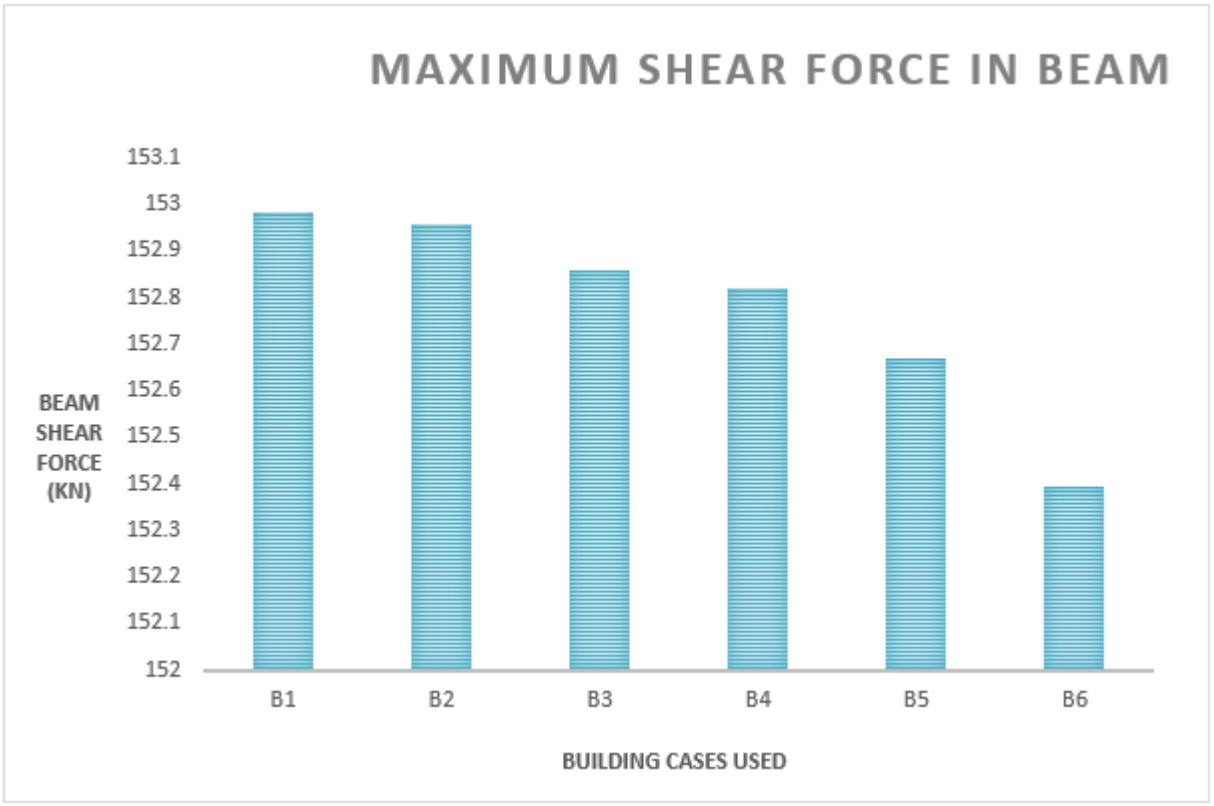

Fig. 7: Maximum Shear Force shown in beam all Building cases

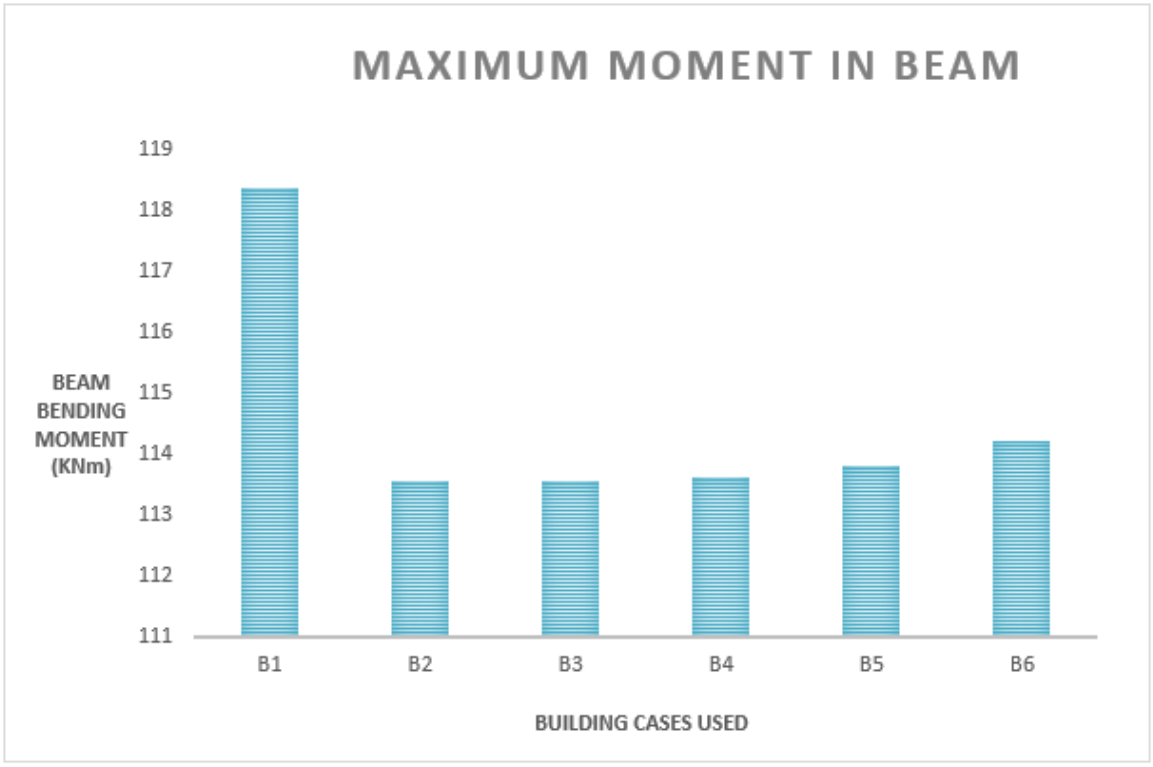

Fig. 8: Maximum Bending Moment shown in beams Building cases

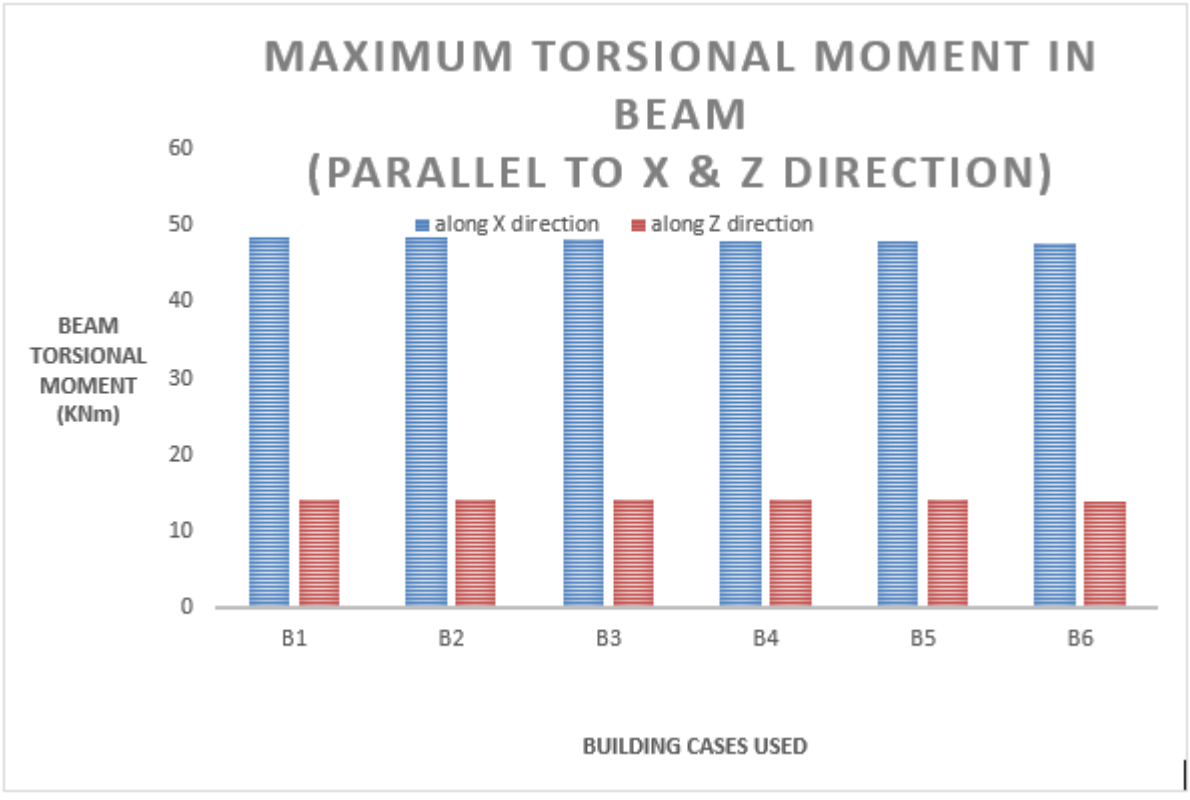

Fig. 9: Maximum Torsional Moment in beams Building cases

4 Conclusion

Reduction of base shear by optimum size of beam in top floor in multistory building at different level As we analysis about the reduction of base shear six different cases of structure prepared and here are such a range of conclusion concerning every cases for optimizing the low base shear in the structure. In term of mentioned cases following result are take out from this comparative analysis.

1. On comparing all six cases it has been concluded that the maximum displacement in B3 case in X direction.
2. On comparing all six cases it has been concluded that the maximum displacement in B3 cases in Z direction.
3. As per comparative results in Base Shear, Case B6 is very effective than other cases.
4. As per comparative results in axial force, Case B6 is very effective than other case.
5. Comparing the column shear force for all cases , Case B5 and Case B6 is the optimum than other cases respectively in X and Z direction.
6. As per comparative results in column bending moment, Case B6 and Case B5 is the optimum than other cases respectively in X and Z direction.
7. Comparing the beam shear force in all cases base shear B6 is the effective than other cases.
8. Comparing the beam shear force in all cases, case B6 is the effective than other cases.
9. Comparing the beam bending moment in all cases, case B3 is the effective than other cases.
10. On analyzing the Torsional Moment in beams along X direction and Z direction Case B6 is efficient.

As per comparative results in all parameters case B6 is very efficient in all cases.

REFERENCES

[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] Markanday Giri, 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 Location
of Porch in Multistory Building with and without Seismic Loading International Journal of Advanced Engineering Research and Science, Vol-7, Issue-1https://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