

*Review Article*

# A Review on Base Shear Reduction by using same Grade of Concrete by Optimizing Size of Column Member

Aasif Khan\* and Ankit Pal

Civil Engineering Department, Oriental University, Indore

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## Abstract

India is the fastest growing economy in the world and infrastructure plays a very important role in it. The Construction of high rise buildings in India is growing day by day. Therefore new ideas and venture are needed to make the building safe, economic and durable. The base shear reduction by using Optimum Size of column in Top Floors in Multistoried Building under seismic loading is the one of them. It reduces the size of column at the top levels of the building to reduce its self-weight.

**Keywords:** Base shear reduction, shear wall, column, multistory building

## 1. Introduction

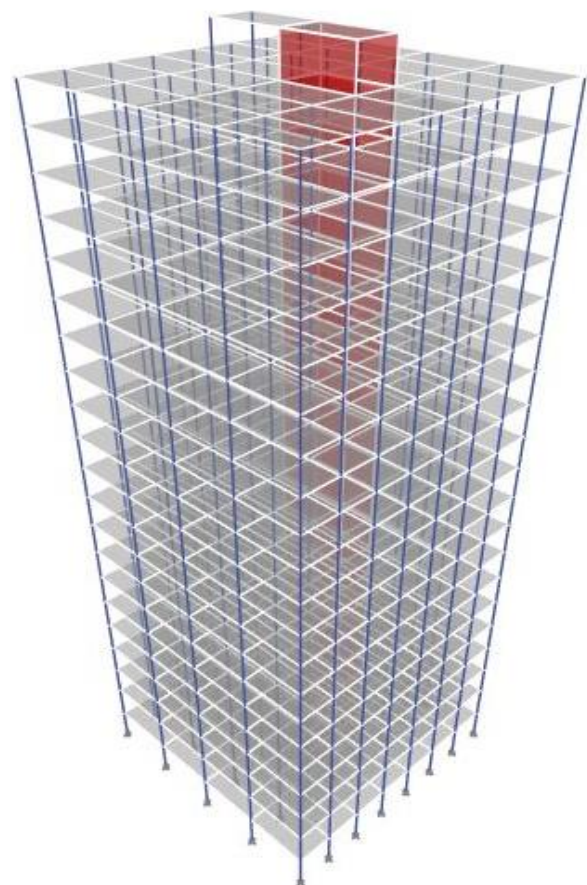
The world is growing faster and the need of the world is that the new ideas and technologies in construction area. The multistorey buildings and skyscrapers are the today's world need. To make them safe, secure, durable and convenient it is very needed to add new ideas of construction in it. The reduction of base shear under seismic loading is the new method. In this method the column size of the building top floors are reduced which helps to reduce the base shear of the building under seismic loading. It also makes the building economic and reduces the dead load of the building.

**Column:** Column is the structure member which helps to transfer load to one end to another. It is made up of reinforced cement concrete. Its main advantage is that it resists compressive load.

**Shear wall:** It is a structural member used to resist lateral forces i.e. wind force, seismic force. In other words, Shear walls are members to resist the horizontal forces on structures. Shear wall provides strength to the structure.

**Multistorey building:** When the structure or building has multiple storey's it is known as multistorey building. And it contains vertical circulation in the form of lifts, stairs and ramps. The multistorey buildings are the need of today's modern world because it carries more loads and provide more strength than single storey buildings. It reduces the land use and therefore makes

overall cost minimum. There is figure below showing plan of multistorey building.



**Fig. 1:** 3D view of Multistoried Building

Corresponding author **Aasif Khan** is a M.Tech Scholar (ORCID ID: 0000-0002-6890-6971); **Ankit Pal** is working as Assistant Professor DOI: <https://doi.org/10.14741/ijcet/v.10.2.14>

## 2. 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.

### Priyanka Soni, Purushottam Lal Tamrakar, Vikky Kumhar Structural

This paper presents the behavior 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.

### Prafoolla Thakre, 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.

### Conclusion

By reviewing and analyzing above literatures I found that no one have discussed and work on Base Shear Reduction by Using Optimum Size of column in Top Floors of multistorey building. Reducing the column size on the top floor of the building is the new way of reducing cost as well as dead load of the structure. And there are more efforts and work is needed on this top

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