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Analysis of Multistory Building with and Without Column Floating Column Under Seismic Loading: Review

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ABSTRACT

Research literature reviews describe the hard work that has been put into obtaining results that provide positive feedback on any type of change. A few papers compare the work done outside the floating column with the work done for the various construction cases and all the numerical values shown and when the scale cases were analyzed the results were particularly good.

Keywords: Floating column, High rise Structure, Residential Building, Stress.

INTRODUCTION-

This chapter provides details on a floating column that researchers have undergone extensive work to obtain better results. Current literature research includes earthquake response to multi-story building frames with standard columns and a floating column. Some of the documents have focused on strengthening existing structures in earthquake-prone regions. Much of the research and paperwork contributed greatly to this project and served as a solid reference to the method used and the outcome of the conclusion.

Floating Column:

The floating column is a vertical member which rest on a beam and doesn't have a foundation. The floating column act as a point load on the beam and this beam transfers the load to the columns below it. But such column cannot be implemented easily to construct practically since the true columns below the termination level are not constructed with care and hence finally cause to failure.

There are many buildings in which floating columns are adopted, especially above the ground floor, where transfer girders are employed, so that more open space is available in the ground floor. This open space may be utilized as party hall, assembly hall and for parking purpose. The transfer girder has to be designed and detailed properly, especially in the earthquake zones. The column acts as concentrated load on beam. As far as analysis is concerned, the column is often assumed pinned and therefore taken as point load on the transfer beam.

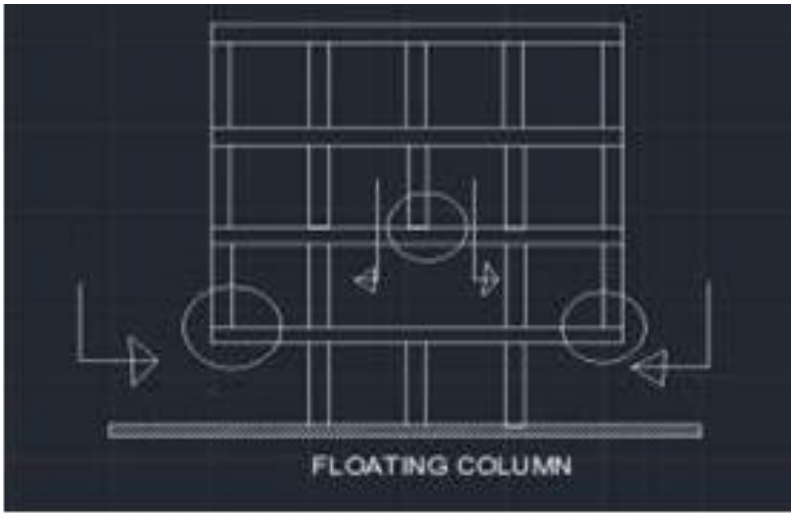

Fig 1- Floating column in building

PAPER REVIEW AND RESULTS

1) R. Chaurasia And A. Pal et all, [2019], Earthquake is a disturbance that occurs within the depths of the earth that is felt in earthquakes, jolts, movements and a small or destructive phase. Although the exact cause of the earthquake is not so easy to determine but the lucky part that can be very predictable. In some cases, it is not yet predictable, they usually come without warnings. What makes it a matter of discussion, every year affects human life with a high rate of destruction which brings the concern of many researchers to minimize its effects. India is a country that has seen the devastating effects of earthquakes resulting from land transfers. It has many weak areas that are very prominent under their influence. As it is said that life does not stop many efforts continue to overcome the great dangers that make it a blessing to fight such natural activities. We know that development is an ongoing process that is unaware of such activities that affect the country's infrastructure and cause great economic losses. Tall buildings stand all over the world. What if, if the building is so tall with complex and unstructured designs such as unusual design, equal structure, Moving Columns, balconies, guesses etc. An earthquake strikes, it will end its existence. Therefore, it is very important to protect human health and property as a first step. From there comes control measures. Various methods are available to stop the explosion, to migrate and to reduce shear prices. A variety of static methods and dynamics are available to study the performance of the structure and we have very selective results. One such method as Base-isolation is the fastest-growing method of dividing the building with ground speed and limiting structures against lateral opposition forces

2) R. Chaurasia And A. Pal et all, [2019], Tremors in earthquake zones can be a shocking sight. Shock has enough power to fall down a big building like a feather. Th shocks produce a ground speed that produces vibrations in all directions. This vibration can enter from the root of the building extending to the entire height of the structure. Vibration can be enough to shake a building and cause harm to humanity and all the important elements in the structure. The best suggestion is to build a simple and simple structure for good and safe construction. However due to population growth and growing demand for large spaces and the development of new strategies it has become an unsuitable game to deal with the risks and advances in the construction of floating columns which are one of the most needed but may not be safe with each design. So choosing the cheapest and most effective ways to withstand seismic activities has become a priority. Control strategies need to be adopted to get out of a persistent situation, because disasters do not end. The study focuses on a floating column as a structure, floating columns are sometimes unsuitable for construction in earthquake zones as they are illegal materials that attract earthquake energy which can be dangerous to life and may be expensive.

3) Deekshitha R. et all, [2017], make an effort to evaluate whether the building is safe with a floating column. Attempts are also being made to determine the feasibility of the design as it may save or not. The G + 5 model is designed to analyze the spatial structure of a floating column in the middle of a global phenomenon. Determining the parameter taken to assess building migration under different conditions and in economic analysis various factors are calculated in different contexts. The results of this study are many displays in building a floating column and improving the stability of lateral bracing or shear wall is necessary. And building with a floating column is not money.

4) Pradeep D. et all, [2017], the author has made an attempt to analyze the performance of the structure indicated in the lateral load under the effect of a floating column. The G + 5 structure is selected for the analysis of the structure with or without the column of the regular structure and the irregularly structured structure. The analysis was performed with a static analysis method related to the testing of various parameters against lateral loading. All cases are modeled with a floating column in all four corners on both standard and non-standard cases only on the first floor. The results show that the flow of news to any building varies in terms of the structure of the members and the unusualness of the structure. The storytelling of any building varies in terms of the layout of the members and the unusualness of the architecture. It is also evident that the erosion of matter is a function of lateral displacement and distortion or overthrow of the structure. Here the rise rises to 50% on the roof of the building.

5) Snehal Ashok Bhoyar, [2017], The review work was carried out in the study of various research projects previously performed in the field of floating building in the form of various loads and various layouts of the building plan. Other cases will make a difference in the amount of floating column and

various issues within the building. Some cases make changes to the floating column area inside the building. Different parameters are selected to test the performance of the structure under different conditions that can give a surprising conclusion. Various analytical methods namely linear static method, reaction spectrum method and historical time analysis method are used for structural analysis by various software such as etabs, staad pro. The conclusion of this study was that comparisons of earthquake parameters for a floating and floating structure with a different software analysis process 2000v17 to look for variance parameters.

6) Rupali Goud, [2017], This paper provides comparative studies of loading and floating columns with and without earthquake behavior. There are many views of damage caused by structural instability as direct indirect damage while earthquakes, seismic forces developed at different levels of the building need to be lowered to a low road, any deviation or ceasing to function as floating columns leads to poor structural performance. The purpose of this work is to compare the response of RC structures with floating columns with and without earthquake loading and under normal loading. It is proposed to determine the effect of seismic forces on different construction models at different parameters with the help of spectrum analysis. The idea is to reach a definite conclusion regarding the superiority of these structures over one another. Finally, the results of the analysis on construction such as erosion, floor migration, and the amount of metal required were compared in this study.

7) Jayashri Sarode et all, [2016], the purpose of this study was to analyze the effect of the quake on a floating column in a multistory building. Basically, three different cases were taken by comparing the comparison of different parameters under the seismic stimulus. In the first case a standard building is taken out of the floating column and in the second case a building with a floating column in some cases at all four corners. And in the third case the same structure with a floating column that provides integrated binding is analyzed by different parameters. The study shows that after granting the side grip of the column will strengthen the structure supported by the fact that the erosion of the story is reduced by the next rate of 18.28%. And all the other parameters indicate the importance of adding binding. But here again the cases are only taken in a floating column in a constant area that arises the need for consolidation.

8) Nakul A. Patil et all, [2016], the author analyzed the G + 5 structure with areas with earthquake floating columns V. The various parameters considered contained the basic shear, story escalation, story migration etc. to compare two cases measured with a floating column in the middle of the first story and external rotation of all floors at a time and a non-column building. Comparisons are made for all parameters in a straightforward static and historical way of the earthquake analysis of IS 1893 (Part 1): 2002. The results of this study conclude that time, migration and enlargement of matter are significantly greater in building with a floating column but lower shear compared to outside construction of the floating column.

9) S. B. Waykule et. al., [2016], research reveals other complex possibilities in the structure. Several cases are modeled with a combination consisting of a floating column on the ground floor in a different location, a floating column with a lower and lower rise and a floating column with a heavy load of earthquakes II and V-zone. that floating column under a heavy load, the ascent of the story by contact was unsuccessful and therefore not advisable. The transcript of the story differs greatly in the case of a combination of a floating column with an elevated height and a heavy load. And migration continues to grow at higher altitudes. It can also be concluded that floating is used only in some cases but without combination to reduce stiffness.

10) Badgire Udhav S. et all, [2015], conducted studies on a multi-storey building with a floating column in three cases involving the removal of the boundary column at the corners and analyzed in the same static manner. All cases consist of three stages in which a different plan is selected in the first phase and the lower stories are selected for parking, the middle stories are designed for residential purposes and the upper stories are designed for residential purposes but with different planning plans. Several parameters are taken for analysis and the results are concluded that the probability of failure is higher in a model that contains a floating column on the longitudinal side compared to the two short sides. Also the shear force values vary greatly in terms of column shape and shape. The results of the study are illustrated by the click-down mode of the various frames that contain story tracking of different heights in different cases taken and the number of nodes compared to the basic shear in the X, Y and Z guides:

11) Hardik bhensdadia et all, [2015], the author includes a comparative study of a typical structure without any floating column with a floating column in the story below in a simple frame with RCC beam frame to support a floating column on one side and a second composite beam. In this case the steel-framed steel is used for analysis compared to the standard RCC beam girder. Both the response spectrum and static analysis were performed against various parameters including story shaving, story flooding, migration, cutting power and the results obtained by that structure with a floating column and a combined beam obtaining a high migration indicating that the flexibility is very high in this case. composite is not found to be important. And in the analysis of the answer the structure finds the scale of the main story in the first story and decreases as the height of the structure rises in all cases.

12) Shiwli Roy,Gargi Danda de et all, [2015], RCC concrete column refers to cement concrete reinforced with steel, steel plates, with steel spaces etc. The word floating column means a floating column between two floors. Different types of structures G + 3, G + 5 and G + 10 of the RCC column and floating column are analyzed. The differences between the G + 3, G + 5 and G + 10 structures are illustrated by graphs and charts. Comparisons will be made at the moment of bending and force shaving between these structures. This paper presents the analysis of the floating column and the RCC column using STAAD PRO V8i

13) Keerthi Gowda B. S. et all, [2014], the author focuses on their study of comparisons with the behavior of earthquakes in a building with a floating column outside and outside. Four different cases with different floating numbers were announced. In this comparison work was done to look at the response of the RC framework for various cases under earthquakes and normal loading and also to assess different parameters depending on the various conditions in order to obtain a superior structure in these cases. This study concludes that story drift increases with the increase in the number of floating columns and drift is higher compared to the construction of a floating column. They also point out that providing a floating column is not important at a high seismic level.

14) Sreekanth Gandla Nanabala et all, [2014] In the present case buildings with floating columns are a common feature in modern architectural projects in urban India. Such types of construction are unpopular with construction built in incentive areas. This paper reads an analysis of the typical G + 5-storey building and the exterior floating G + 5-floating structure of external forces. The analysis was performed using SAP 2000. This paper also investigates the differences between the two structures using the magnitude of the previous earthquake, i.e., using ground motion in both of these structures, from which the historical time periods are compared. This study is to determine whether the building is safe or unsafe with a floating column when built in earthquake zones and to find the construction of floating columns is economical or not economical.

15) Pratyush Malaviya, Saurav et all (2014) The column should be a vertical member from the base level and send the load down. The word floating column is also a vertical object (due to the structure / status of the site) at its lowest level (completion level) rests on a vertical member beam. The beams also transfer the load to the other columns below it. There are many projects where floating columns are adopted, especially above ground, where girders are hired, in order to provide more open space at the bottom. These open spaces may be needed in the auditorium or for parking purposes. Transmission girders should be well designed and detailed, especially in earthquake zones. A column is a fixed load on a supporting beam. According to the analysis, the column is generally considered to be pinned down and is therefore considered a point load on the transmission beam. The STAAD Pro V8I can be used to perform analysis of this type of structure. Floating columns have enough capacity to carry the load of gravity but the transmission girder should have a sufficient size (Hardness) with very little deviation.

Conclusion and Need of the Present Study

From the review of the research conducted it has been shown that much of the work is done in a floating column of various scenarios but not in expanding its space within the building on various issues. In most cases the analysis is done on the lower or outer edges of the whole building at a time in all cases but not on different issues at the same time and in different places. The following is a draft of the proposed work taken from the conclusion of the above case studies:

1. The G + 20 new structure is taken for testing with or without a floating column not only in the lower extremities but also in the individual subjects at different locations within the structure to better understand the effects of the various earthquake parameters in that position wise. Analysis was performed for earthquake V site to assess the maximum number of effect parameters.

2. With such a long construction various parameter of earthquakes such as migration and drift are analyzed in all cases to assess functional variability.

3. Other determining parameters such as the bending time limit, shear force and axial force need to be analyzed to improve and finalize the various cases.

4. Finally, from the analysis of the above cases compared to the various parameters the ideal area of the floating column within the building will be proposed.

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