Review on Dynamic Analysis of RCC Building With Floating Column

Mr.Rahul Sudam Khomane[1], Prof. Aparna Patil[2]
[1]Dept of Civil Engineering
[2]Guide, Assistant Professor, Dept of Civil Engineering
[1, 2] JSPM'S RajarshiShahu College of Engineering, Pune

Abstract- *In urban India floating column building is a typical feature in the modern multi-storey construction. Floating columns buildings are adopted either for architectural aspect or when more free space is required in the ground floor. Such features are highly undesirable in seismically active area. In the project studies the analysis of G+5, G+7, G+9, G+11 and G+13 storey building with floating column and without floating is carried out. The analysis is done by using STAAD Pro V8i software by using Response spectrum analysis. The paper deals with the results variation in displacement of structure, base shear, Seismic weight calculation of building from manual calculation and STAAD pro V8i. For building with floating column and building without floating column, finding the variation between the response parameters of earthquake and describe what happens when variation may be high or low. The study is carried out to find whether the floating column structures are safe or unsafe when built in seismically prone areas, and also find out commercial aspects of floating column building either it is economical or uneconomical.*

I. INTRODUCTION

A typical Column is a vertical structural member which support to horizontal structural members by means of their weights, moments, shear force, axial load etc., to keep the structure in safe condition and transfer these loads to the ground. But now a days some columns are designed in such a manner that it does not reach to the ground, because of various architectural aspects. In those cases the columns transfer above loads as a point load on a beam. This type of column is termed as Floating column. This Point load increases too much bending moment on beam so that area of steel required will be more in such cases. While earthquake occurs, the building with floating columns damages more as compared to the building without any floating columns because of discontinuity of structure & load transfer path.

The overall size, shape and geometry of a structure play a very important roll to keep structure safe while earthquake occurs. As theory and practical study on buildings says that, earthquake forces developed at different floor levels in a building needs to be brought down along the height to the ground by the shortest path; any deviation of discontinuity in this load transfer path results in poor performance of the building. In Earthquake analysis the main response parameters are storey displacement, Store ydrift, storey shear. These parameters are evaluated in this paper and critical position of floating column building is observed. In this critical position the effect of increasing section of beam and column in irregular building and regular building has been observed.

The Response of a structure to the ground vibration is a function of the nature of foundation soil; materials, form, size and mode of construction of structure; and the duration and characteristics of ground motion. IS 1893 (part I):2002 specifies the various criteria for design of structure considering earthquake zones, type of structure, soil type, Importance factor of structure, response reduction factor etc. The basic criteria of earthquake resistant design should be based on lateral strength as well as deformability and ductility capacity of structure with limited damage, but no collapse.

II. STATE OF DEVELOPMENT

Prof. A V Asha & Prof. K C Biswal In this thesis 2D frames with and without floating column having same material property and dimension were analyzed under same loading by using FEM (finite element method) and software STAAD pro. And compatible time history as per spectra IS 1893 (part 1): 2002 applied on the structures. It concluded that, with increase in ground floor column the maximum displacement, inter storey drift values are reducing. The base shear and overturning moment vary with the change in column dimension.

Nakul A. Patil, Riyaz Sameer Shah In this paper they summarized, comparative study of seismic analysis of building with and without floating column and they also give output results will be expressed in terms of storey displacements, inner-storey drift and comparison of amount of steel and concrete required in different cases by using ETABS software. Following same graphs of result. It was concluded

that, with floating column not preferable in higher earthquake zones because of high value displacements according to code.

Joshi Shridhar D, TandeShrirang N In this paper floating column provided different floor where location center of building was analyzed is carried out using FEM and ETABS software. And they study about importance of explicitly recognizing the presence of the floating column in the analysis of building. For the present study response spectrum and time history analysis are carried out to know the various structural parameters like base shear, storey shear, storey displacement. It was concluded that, Increase in size of beams and columns improve the performance of building with floating column by reducing the values of storey displacement. And Fundamental time period and base shear of normal building is maximum compared with all other floating column buildings.

S.B Waykule, Dr. C.P. Pies at al In this paper compare base shear, storey drift, Storey displacement and maximum displacement of each storey and also compare response of all the models(mode shape, time period, frequency) using LSM and sap2000 in building is without and with floating column. It was concluded that, 1. It was observed that in building with floating column has less base shear as compared to building without floating column 2. It was observed that displacement of floating column building was more as compared to without floating Column building. 3. It was observed that building with floating column has more storey drift as compared to building without Floating column. 4. From dynamic analysis it was observed that floating column at different location results into variation in Dynamic response.

Sukumar Behera et. al. In this paper involve stiffness balance of first storey and the storey above are studied to reduce irregularity occurs due to presence floating column. To study response of structures under different earthquake excitation having different frequency content keeping the PGA and time duration factor constant they develop FEM codes for 2D frames with and without floating column. The behavior of building frame with and without floating column is studied under static load, free vibration and forced vibration condition. The finite element code has been developed in MATLAB platform. The time history of floor displacement, inter storey drift, base shear, overturning moment are computed for both the frames with and without floating column. The dynamic analysis of frame is studied by varying the column dimension. It is concluded that with increase in ground floor column the maximum displacement, inter storey drift values are reducing. The base shear and overturning moment vary with the change in column dimension.

Shrikanth M.K et. al. In this paper study is all about to compare the behaviour of a building having only floating column and having floating column with complexities. High rise building is analyzed for earthquake force. For that purpose created four models and analyzed for lower and higher seismic zones for medium soil condition. Analysis was carried out by using extended 3 dimensional analysis of building system ETAB version 9.7.4 software. results are presented in terms of Displacement, soft story, storey drift for these four models and tabulated on basis of linear seismic analysis.

T.rajasekhar et. al. The behavior of building frame with and without floating column is studied under static load, free vibration and forced vibration condition. The results are plotted for both the frames with and without floating column by comparing each other time history of floor displacement, base shear. The equivalent static analysis is carried out on the entire project mathematical 3D model using the software STAAD Pro V8i and the comparison of these models are been presented. This will help us to find the various analytical properties of the structure and we may also have a very systematic and economical design for the structure.

A.p.mundada et. al. In this paper study is done for architectural drawing and the framing drawing of the building having floating columns. For comparison G+7 existing residential building with and without floating column are taken for carry out entire project work. by using STAAD ProV8i 3D 3 model are created .equivalent static analysis of these model are done by using STAAD Pro V8i .Different parameters such as axial load ,moment distribution, importance of line of action of force and seismic factors are studied for models. This will help them to find the various analytical properties of the structure and also have a very systematic and economical design for the structure.

Hardik Bhensdadia et. al. In this study an attempt is made to reveal the effects of floating column & soft storey in different earthquake zones by seismic analysis. For this purpose Push over analysis is adopted because this analysis will yield performance level of building for design capacity (displacement) carried out up to failure, it helps determination of collapse load and ductility capacity of the structure. To achieve this objective, three RC bare frame structures with G+4, G+9, G+15 stories respectively will be analysed and compared the base force and displacement of RC bare frame structure with G+4, G+9, G+15 stories in different earthquake zones like Rajkot, Jamnagar and Bhuj using SAP 2000 14 analysis package.

Sabari. S, Mr. Praveen J.V et. al. this paper refers to the seismic analysis of multi-storey building with floating column in which the FEM analysis is carried out for 2D and 3D multi-storey frames with and without floating columns studying the responses of the structure with different seismic excitations where the RC frames are of with different stiffness on floor wise and height of the building, that are considered in the analysis keeping PGA and time duration factors as constants having different frequency and highlighting with alternative measures involving stiffness balance to reduce the irregularity in the first and storey above which is introduced by the floating columns. The time history analysis is done by considering the whole system of frames of the building to Bhuj earthquake excitations, and is provided to compare the results obtained from the analysis of all types of frames using the SAP2000 software. This paper thus concluded as results obtained using present finite element code for the static and free vibration are validated and the dynamic analysis of frame is studied by varying column size dimension and is concluded that by increasing the column size the maximum displacement and inter storey drift values are reducing.

Sreekanth GandlaNanabala et. al. This paper refers as Seismic Analysis Of A Normal Building And Floating Column Building in which the analysis of a G+5 storey normal building and G+5 storey floating column building for external lateral forces using SAP2000, is done. This paper studies the variations of both buildings such as time history values by applying the intensities such as ground motions of the past earthquakes. Such that the study highlights whether the structure with floating columns are safe or unsafe in seismically active areas and also observe the structure is economical or uneconomical. This paper studies the G+5 storeybuilding with all columns that is a normal building and the other building without edge columns in the ground floor that is a floating column building's behavior when excited to the lateral loads. After the comparison of the buildings it is found that the G+5 without edge columns is not safe in seismic zone as the lateral displacement in a floating column building is higher than a normal building, so the floating column building is unsafe in seismic areas. When the lateral stiffness of both the buildings are compared then it is observed that the building with floating columns will suffer extreme soft storey effect where on the other side the normal building is free from soft storey effect completely. In the analysis carried out between the buildings the quantity of steel and concrete are 40% and 42% more in floating column building than the normal building. Hence it is concluded that the floating column building is unsafe and uneconomical and not preferable for construction when compared with the normal column building.

Shaikh Abdul Aijaj Abdul Rahman, et. al. Investigated the proportional distribution of lateral forces evolved through seismic action in each storey level due to changes in stiffness of frame on vertically irregular frame. As per the Bureau of Indian Standard (BIS) 1893:2002(part1) provisions, a G+10 vertically irregular building was modeled as an simplified lump mass model for the analysis with stiffness irregularity at fourth floor. To response parameters like storey drift, storey deflection and storey shear of structure under seismic force under the linear static & dynamic analysis was studied. This analysis shows focuses on the base shear carrying capacity of a structure and performance level of structure under severer zone of India. The result remarks the conclusion that, a building structure with stiffness irregularity provides instability and attracts huge storey shear. A proportionate amount of stiffness is advantageous to control over the storey and base shear

Ravikumar C M et. al. studied two kinds of irregularities in the building models namely plan irregularity with geometric and diaphragm discontinuity and vertical irregularity with setback and sloping ground. These irregularities are created as per clause 7.1 of IS 1893 (part1)2002 code. In Oder to identify the most vulnerable building among the models considered, the various analytical approaches are performed to identify the seismic demands in both linear and nonlinear way. It was also examined the effect of three different lateral load patterns on the performance of various irregular buildings in pushover analysis. This study creates awareness about seismic vulnerability concept on practicing engineers.

Sadashiva V. K V. K. et. al.studied a simple and efficient method of determining structural irregularity limits for structures designed using different analysis procedure as an example the methodology was applied to simple models of shear type structure with different amounts of mass irregularity located at different locations within the structure all designed in accordance with the Equivalent Static Method of NZS 1170.5, including P-Delta effects. These models were then analyzed using inelastic dynamic time history analysis for the 20 SAC 10 in 50 earthquake records for Los Angeles. The additional median inter storey drift responses due to mass irregularity was computed which can be limited to an acceptable level Irregularity limits for use in design can then be defined for a specified level of confidence

Dr. Dubey S. K. et. al. To understand different irregularity and torsion response due to plan and vertical irregularity and to analyze "T"-shaped building while earthquake forces acts and to calculate additional shear due to torsion in the columns. Additional shear due to torsion

moments needs to be considered because; this increase in shear forces causes columns to collapse. So in design procedures this additional shear must be taken into account.

C.M. Ravi Kumar et. al. Discussed the performance evaluation of Reinforced Concrete buildings with vertical irregularity. The study as a whole makes an effort to evaluate the effect of vertical irregularity on RC buildings, in terms of dynamic characteristics. Also, the analysis has been carried out for various zones of India and soil conditions taken in to consideration to identifies the influencing parameters which can regulate the effect on Base Shear, Time Period, Storey Displacement & Storey Drift.

Konakalla Ramesh, Ramesh DuttChilakapati et. al.:studied four types of 20- Storied 3-D frames i.e., a symmetrical elevation configuration throughout its height and three other frames with unsymmetrical vertical configuration starting from tenth floor, placed at corner, at the center and at edge of the plan respectively, it is focused to study their response using Linear Static Analysis. From the studied results of the analysis of four frames, it was observed that in the regular frame, there was no torsional effect in the frame because of symmetry. The response for vertically irregular buildings was different for the columns which are located in the plane perpendicular to the action of force. This was due to the torsional rotation in the structure.

Sharma Ankeshet. al. (2013)here the present works problem taken are on a G+30 storied regular building. The static and dynamic analysis has done on computer with the help of STAAD-Pro software using the parameters for the design as per the IS-1893- 2002-Part-1 for the zones- 2 and 3 and the post processing result obtained has summarized and It can be concluded that the results as obtained for the Dynamic Analysis are higher than the values as obtained by Static Analysis for the same points and conditions.

Sapate Onkar V. et. al. (2012) Studied a G+15 storied high rise building with different architectural complexities was analyzed for various earthquake zones. In overall study of seismic analysis, critical load combinations are found out. For these critical load combinations, zone wise variation in moments on columns at ground floor level are compared and significant co-relationship between these moment values were established. Mathematical models developed can be used with reasonable accuracy.

NautiyalPrerna et. al. This paper aims to investigate the effect of a floating column under earthquake excitation for various soil conditions and as there was no provision or magnification factor specified in I.S. Code, hence the determination of such factors for safe and economical design of a building having floating column. Linear Dynamic Analysis was done for 2D multi storey frame with and without floating column to achieve the above aim. The responses and factors for safe and economical design of the structure under different earthquake excitation.

Dennis C.K. et. al. La project provides an excellent example of the structural design under challenging condition including the lateral force-resisting system, sloping outer concrete columns, long span post-tensioned transfer girder and other design challenges The design team achieved economical structural solutions without compromising aesthetic design integrity. The result was a beautiful new landmark for the City of Shenzhen.

Ravikumar C M et. al. There was two kinds of irregularities in the building models namely plan irregularity with geometric and diaphragm discontinuity and vertical irregularity with setback and sloping ground. These irregularities were created as per clause 7.1 of IS 1893 (part1)2002 code. In Oder to identify the most vulnerable building among the models considered, the various analytical approaches were performed to identify the seismic demands in both linear and nonlinear way. It was also examined the effect of three different lateral load patterns on the performance of various irregular buildings in pushover analysis. This study creates awareness about seismic vulnerability concept on practicing engineers.

Arlekar Jaswant N et. al. Highlighted the importance of explicitly recognizing the presence of the open first story's in the analysis of the building. This paper argues for immediate measures to prevent the haphazard use of soft first storys in buildings, which are designed without regard to the increased displacement, ductility and force demands in the first storey columns. Alternate measures, involving stiffness balance of the open first storey and the storey above, are proposed to reduce the irregularity introduced by the open first story. The effect of soil flexibility on the above was also discussed in this paper.

Poonam, Kumar Anil et. al. Studied the response of a 10-storyed plane frame to lateral loads was studied for mass and stiffness irregularities in the elevation. These irregularities are introduced by changing the properties of the members of the storey under consideration. The mass irregularity is introduced at different storey levels—fourth and seventh levels. The effects of floating columns as well as of unusually tall first storey on the dynamic response were also studied. Conclusions were derived regarding the effects of the irregularities on story-shear forces, storey drifts and deflection

of beams. It was found that the mass and stiffness criteria of the IS code results in moderate increase in response quantities of irregular structures compared to regular structures. Results of the numerical analysis indicate that any story, especially the first story, should not be softer than the story's above or below. Based on these findings, some guidelines are proposed to make buildings safer to seismic excitations.

Ali Ugur Ozturk et. al. Studied the dynamic response of semi-rigid frames by using a computer program. The connection flexibility was modeled by linear elastic rotational springs. Having the same geometry and cross-section; semi-rigid frames, with different spring coefficients, were examined. The reducing coefficients and lateral rigidity values, representing the real behavior of frames, are determined for each frame. To represent the real behavior, all deformations of a frame are accounted for a dynamic analysis. Response characteristics of five different multistory frames are compared with reference to their modal attributes. The study indicates that connection flexibility tends to increase vibration periods, especially in lower modes, while it causes vibration frequencies decrease.

Maison Bruce F. et. al. Members of ASCE have performed the computer analysis of an existing forty four storey steel frame high-rise Building to study the influence of various modeling aspects on the predicted dynamic properties and computed seismic response behaviors. The predicted dynamic properties were compared to the building's true properties as previously determined from experimental testing. The seismic response behaviors are computed using the response spectrum and equivalent static load methods.

Maison Bruce F. et. al. Members of ASCE computed dynamic properties and response behaviors of thirteen-storey z building. Results are compared to the true values as determined from the recorded motions in the building during two actual earthquakes. From this paper it was shows that state-of-practice design type analytical models can predict the actual dynamic properties.

Sharma Ankeshet. al. Told during an earthquake, failure of structure starts at points of weakness. This weakness arises due to discontinuity in mass, stiffness and geometry of structure. The structures having this discontinuity are termed as Irregular structures. Irregular structures contribute a large portion of urban infrastructure. Vertical irregularities are one of the major reasons of failures of structures during earthquakes. For example structures with soft storey were the most notable structures which collapsed. So, the effect of vertically irregularities in the seismic performance of structures becomes really important. Height-wise changes in stiffness and mass render the dynamic characteristics of these buildings different from the regular building. IS 1893 defines the Vertically Irregular Structures. Recorded data from recent earthquakes which provided evidence that ground motions in the near field of a rupturing fault differ from ordinary ground motions, as they can contain a large energy, or ‘‘directivity” pulse. This pulse can cause considerable damage during an earthquake, especially to structures with natural periods close to those of the pulse.

Shehal Ashok Bhoyar et al. This project is only focused on the corner floating columns. This was done for external lateral force Using ETABS shear base storey drift and lateral displacement of both the buildings wascompared. The method adopted for above analysis is equivalent static method. It was found the buildings with floating column (both regular and irregular) are more prone to failure. Performance of the building varies to according to position and orientation of floating column.

Bhavya B S et. al. G+7 structure situated in seismic zone III and V on a medium soil (type II). The plan was remodeled into 12 different models. Equivalent seismic analysis and Response Spectrum Method were used for analysis by ETABS 15.2.0 software. The effect of shear wall infill walls with diagonal structure and bracings were introduced in the building to improve the seismic performance of building along with floating column in seismic areas. The results found that the displacement and story shear of building increases from lower zones to higher zones. Story shear reduces in the building with floating column. The building with shear wall configuration exhibits more stiffness compared to other models. On comparison with other configurations, building with shear wall is much preferred.

K.V. Sudheer Aet. al.16 story building is analyzed for story shear lateral displacement and story drift using ETAB. Floating columns were introduced from 11th story By applying various loads and combinations study is done to find out whether the structure is safe or not Extreme story drift was calculated at 5th and 6th stories of the building also floating column building was found uneconomical.

Shiwli Roy et. al.de Studied about the floating columns in different multistoried buildings. Floating columns in G+3 G+5 and G+10 structures were analyzed. Comparison was done on bending moment and shear force between these structures. Analysis of the frame structures was done on STAAD PRO V8i. Conclusion from the analysis was found that shear force and bending moments are same for all the columns on same floor but it increases with increase in height of the structure. The variation in bending moment and

structure shows that bending moment is max for column on ground floor. For comparison of floating column in a G+3 structure the variation in shear force shows that shear force is max in floating column located at ground floor. The shear force of normal columns is less than floating column. Bending moment is max in floating column on 1st floor.

Trupanshu Patel et. al. The entire work consisted of 29 models, modeled and analyzed using SAP 2000. Analysis was done for the location of Surat city which belongs to zone III, medium soil condition. The 29 models were divided into 4 categories a) Model 1: without floating column and infill walls. b) Floating columns at corner, internal and center locations of GF, FF, SF. c) Increment in live load on ¼ portion of typical floor above the discontinued columns on the corner, internal and centre floating columns at GF, FF, SF. d) Similar as model 1-10 with infill walls. It was found that floating columns at corners on any floor shows poor performance compared to others. The incremental load considered in model on one side gives 5% increase in eccentricity which does not make major changes in displacement. Infill walls provide seismic strengthening and reduce seismic response of building. Infills also reduce horizontal displacement by 182.26% and vertical displacement by 140.03% in the floors. Provision of infill walls reduces the use of cement concrete as the size of structural member's decreases thus makes the structure economical.

Umesh P. Patil et. al. In the paper G+5 story RCC structure was considered for earthquake analysis. For comparison three models were used, one with normal structure, second with shear walls and third with masonry infill walls. Three methods Equivalent static method, response spectrum and time history method were used for analysis using ETABS2013 Software. The structure was assumed to be situated in earthquake Zone III on a medium soil (type II). The parameters evaluated were Base shear, Story drift and Displacement. Out of all the three methods used to evaluate base shear and story drift, Multi-story building with shear walls has performed exceedingly well when compared with normal multi-story and shear walls. While in case of displacement, building with masonry infill walls has performed better.

IshaRohilla, S.M. Gupta et. al. In this paper, the critical position of floating column in vertically irregular buildings was discussed for G+5 and G+7 RC buildings for zone II and zone V. medium soil conditions were used for analysis. Also the effect of size of beams and columns carrying the load of floating column had been assessed. The response of building such as story drift, story displacement and story shear had been found. To evaluate the results ETABS software was used. From the analysis the author concluded that: Floating columns should be avoided in high rise building in zone 5 because of its poor performance while they are safe in zone2. Story displacement and story drift increases due to presence of floating column. Story shear decreases in presence of floating column because of reduction mass of column in structure. Increase in size of beams and columns improve the performance of building with floating column by reducing the values of story displacement and story drift. Increasing dimensions of beams and columns of only one floor does not decrease story displacement and story drift in upper floors so dimensions should be increased in two consecutive floors for better performance of building.

Y.Abhinay, Dr. H.Sudarsana Rao et. al. In the analysis, residential buildings with 6 Storeys and 12 Storeys are analyzed with column, Beams & Slabs. The buildings are analyzed & designed with and without edge columns at base storey. The Buildings are analyzed in two earthquake zones III and V according to IS 1893-2002 with soil type I and III. Static Load combinations and Response Spectrum Analysis is done to compare the results. Results are compared in the form of Storey displacements, Storey Shear, Storey Over turning Moments with & without columns at base storey in both Static and Dynamic Analysis. ETABS 2013 has been utilized for analyzing the above Building Structure. Zone wise results are presented using tables and graphs. Three cases were made Case 1: Normal building without floating column, Case 2: Building with floating column, Case 3: Building with floating column and with changed dimensions of beams and columns. It was found that the displacement, shear and moment is more when the floating column is provided to reduce the displacement the section properties of the building are changed for better performance.

Susanta Banerjee et. al. This paper presents the effect of stiffness of infill wall to the damage occurred in floating column building when ground shakes. Modelling and analysis are carried out by nonlinear analysis programme IDARC-2D. Damage occurred in beams, columns, storey are studied by formulating modified Park & Ang model to evaluate damage indices. Overall structural damage indices in buildings due to shaking of ground are also obtained. Dynamic response parameters i.e. lateral floor displacement, storey drift, time period, base shear of buildings are obtained and results are compared with the ordinary moment resisting frame buildings. Formation of cracks, yield, plastic hinge, are also observed during analysis. from this it is concluded that lateral floor displacement, storey drift of floating column building with infill wall are reduced than floating column building without infill wall. Also it is concluded that fundamental time

period, lateral floor displacement of floating column building are higher than ordinary moment resisting frame.

Jayesh Rathi, et. al.A ten storeybuilding was considered for this study and various structural responses such as Storey Displacement, storey Drift, Storey Shear and Time period were evaluated and compared. For dynamic analysis response spectrum method was used and analysis was done using ETABS software. From this study he concluded that: 1) Storey displacement increases with introduction of floating column. 2) Story drift increases with increase in story displacement since they are directly proportional to each other 3) Story forces are less in the building with floating column compared to normal building as number of columns are less 4) Time period is more for the building with floating column compared to normal building.

BadgireUdhav, Shaikh A. N et. al. Selected G+10 structure for his analysis. Model was prepared using STAAD Pro software and analysis was done using equivalent static method. This study was done on a preliminary basis with three different cases namely Case1: Modeling & Analysis of G+10 RCC building with floating columns located outer periphery (4 Sides), Case2: Modeling & Analysis of G+10 RCC building with floating columns located outer periphery (2 Longer Sides) and Case3: Modeling & Analysis of G+10 RCC building with floating columns located outer periphery (2 Shorter Sides). From this study it was concluded that the difference in probabilities of failure with floating column (Case2) is more than that of floating column (Case3). In case 2 and 3 the values of column shear increases or decreases significantly depending upon position and orientation of column.

SuchitaHirde, Dhananjay Rahangdaleet. al. Author had compared seismic performance of building conventional floating columns building for various seismic zones in case of medium soil. For this purpose they adopt Pushover to get performance point and hinge pattern in a multi-story buildings. To achieve this objective, they create model of G+7 story normal building and building with different locations of floating columns.

A.L. Ramírez-Márquez, A. Benavent-Climentet. al. In this paper a numerical experiment was conducted in which several idealized prototypes representing RC frame structures of school buildings damaged during the Port-au-Prince earthquake (Haiti, 2010) were hypothetically strengthened by adding elements representing masonry infill walls arranged in different configurations and studied under non-linear dynamic analysis. Each configuration had a different ratio Rm of area of walls in the direction of the ground motion (in plan) to the total floor area. The nonlinear response of the models under three major earthquakes which PGA 0.5g was estimated numerically. The results were summarized in tentative relationships between Rm and interstory drift, Park&Ang damage indexes, and dissipated energy. For Rm_4% computed interstory drift ratios did not exceed 1.5%.and conclude that This work investigated a potential retrofitting alternative for RC frame structures that have been damaged by severe earthquakes. It consists in adding masonry infill panels (preferably with reinforcement). The main advantages of using masonry infill panels instead of other solutions such as dampers or RC walls are the ease of construction, the low cost, and the minimum technology involved.

Gourav Sachdeva, et. al. They had represent a comparative analysis carried out to evaluate the performance of RCC frame building with different position of floating column along with the seismic analysis. Different models were structured up by using the software STAAD Pro V8i., each being sub-divided into various sub-models, showing the different positions of floating column at each storey. Through this analysis, the best position of the floating column is located in each case on the basis of Parameters taken. Also the equations are formulated such that the Maximum Displacement (in X & Z direction) along with Minimum Reaction (in Y direction) can be calculated up to 6 storey's SMRF (Special moment resisting frame) Building. And finally concluded that when the floating column provided near ground level is most hazardous. Therefore the best position of floating column is the top Storey

D Annapurna et. al. In this paper examine is improved the architectural drawing and the framing drawing of the building having floating column. For examination G+7 existing private building with and without floating column are taken for carry out whole extend work by utilizing STAAD ProV8i 3D 3 demonstrate are made identical static examination of these model are finished by utilizing STAAD Pro V8i. Different parameters, for example, axial load moment distribution, significance of line of activity of force and seismic variables are contemplated for models. This will enable them to locate the different investigative properties of the structure and furthermore to have an exceptionally orderly and economical design for the structure.

Nikhil Bandwal, Anant Pande, et. al. This observes implies at the exceptional varieties of irregularities like floating column at one-of-a-kind degrees and vicinity. Systems are basically analyzed for impact of earthquake. Earthquake load as indicated in is 1893 (element 1): 2002 are considered inside the analysis of building. A G+06 storied constructing with numerous architectural complexities, for

example, inner floating columns, external floating column, and aggregate of inner and outside floating columns is analyzed for exclusive earthquake zones. In fashionable research of seismic examination, vital load mixes are discovered. For these crucial load combos, case astute range in distinctive parameters like moments, forces and displacements on columns and beams at exceptional floor level are looked at and memorable co-connection between those characteristics are installation with graphs. On this constructing design & have a look at with help of staad-pro software.

C. P. Pise et al (2017), a study in which static analysis is done for a multi-story building with and without floating columns. Different cases of the building are studied by varying the location of floating columns to different storeys. The analysis is carried out using software sap2000. The study revealed that in buildings as we introduce floating column at 1st floor we observe a rapid fall in the base shear of such buildings as compared to the buildings that uses no floating columns. It also reveal that base shear first decreases at 1st floor and then it increases from 1st floor to upwards & the displacement of floating column building is more as compared to without floating column building.

S. G. Nanabala, P. K. Ramancharla et al (2014) a study to find whether the structure which uses floating column is safe or unsafe when built in seismically active areas and also find out whether it is economical to build floating column building in seismically active areas. They concluded that floating column building will suffer extreme soft story effect where normal building is free from soft story effect by observing the lateral stiffness at each floor. Due to which the floating column building is considered dangerous. Total quantity of steel and concrete used in both the structures is then compared with each other and found out that the building which uses floating column has around 45% more reinforcement and around 50% more concrete quantity than a normal building. So the floating column building is uneconomical when compared with a normal building.

Awkar J. C. and Lui E.Met. al. Studied responses of multi-storey flexibly connected frames subjected to earthquake excitations using a computer model. The model incorporates connection flexibility as well as geometrical and material nonlinearities in the analyses and concluded that the study indicates that connection flexibility tends to increase upper stories' inter-story drifts but reduce base shears and base overturning moments for multi-storey frames.

BehelaS et. al. (2012) In his paper studied the behaviour of multi-story buildings with floating columns under the action of seismic excitations. Finite element technique is used to explain the calculations and equations; under various earthquakes loading of fluctuating frequency content Linear time history investigations are performed for the buildings. To advance the solution in time Newmark Integration approach is used. He determined, with the rise in ground level column, inter story displacement and various drifts of the different storeys starts dipping also overturning moments and shearing base reaction fluctuates with column dimensions.

Roy S, de Danda G et. al. (2015) Analyzed the various building models considering floating columns. Comparisons are done in between these structural models on the basis of bending moments and shear forces. It is concluded that, with the orientation and alignment of the column and condition, the column shear varies and bending moment's at all single floors rises and shearing force also rises but it is identical for each and every floor column.

Mohamed AqeebF,et al (2016) Studied earthquake behaviour of reinforced concrete buildings by means of non-linear static analysis by considering presence of floating columns. Linear analysis practices of structures give a decent suggestion of elastic ability of the structures and designate where first yielding will occur. Using nonlinear analysis procedure, the model integrates directly the force-deformation characteristics of individual parts of structures and fundamentals due to in-elastic physical behaviour and response. Several models were prepared and analyzed for non-linear responses. They concluded that overall strength capacity of the building totally depends on the applied forces and the base-shear capacity. It was considered that, shear of the story depends on the mass of the structural model.

Sasidhar T, et al (2017) Performed the analysis of buildings using program ETABS. They considered a housing building G+5 and different cases of elimination of columns in dissimilar positions and in various floors of the housing building. Equivalent analysis is done on a mathematical model and results are related or compared with the existing building model. It was concluded that, the use of floating columns results in increased shear, increased bending moments and increased steel requirements of the building

III. CONCLUSION

This paper focuses only on the literature review of previously published studies. The findings of this paper are with increase in ground floor column the maximum displacement; inter storey drift values are reducing. The base shear and overturning moment vary with the change in column dimension. With floating column not preferable in higher

earthquake zones because of high value displacements according to code. The floating column is provided to reduce the displacement the section properties of the building are changed for better performance. overall strength capacity of the building totally depends on the applied forces and the base-shear capacity. It was considered that, shear of the story depends on the mass of the structural model. The building with shear wall configuration exhibits more stiffness compared to other models. On comparison with other configurations, building with shear wall is much preferred.a building structure with stiffness irregularity provides instability and attracts huge storey shear. A proportionate amount of stiffness is advantageous to control over the storey and base shear.When the lateral stiffness of both the buildings are compared then it is observed that the building with floating columns will suffer extreme soft storey effect where on the other side the normal building is free from soft storey effect completely.

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