

A Review on High Rise Structure with Transfer Floor

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ABSTRACT

As the population goes on increasing land requirement goes on increasing to resolve such issue transfer floor concept is best to provide the all the facilities and land requirement in one area to number of families. A floor system which supports load resisting system i.e. lateral as well as vertical load and loading is transferred to the different below system. The load is distributed from lower span of column to long span of column. A number of author's publications is studied to get the brief knowledge about the transfer structure and the experiment done on it. The main objective of this paper review is to highlight the behavior of transfer structure under various seismic zones and which factors affect the structure.

Keywords: Transfer Structure, Transfer Floor, Plate, Seismic Analysis, Response Spectrum Analysis.

I. INTRODUCTION

A floor system which supports load resisting system i.e. lateral as well as vertical load and loading is transferred to the different below system. Change in column and wall layout proclaim to needs for serviceable, inventive or planning[1]. Nowadays the modern buildings in the world are constructing with numerous uses and demands of public [12]. In different seismic zones the uses of buildings is different, as the buildings in the lower zones normally used for function halls, parking, gardens, children's playground etc. while the buildings in the high zones usually use for offices, apartment. Transfer floor has a major drawback, is the sudden change in the lateral stiffness in the neighborhood of level of buildings [13].

II. LITRATURE SURVEY

Y.M. Abdlebasset, et al (2016), As architectural requirements in many multistory buildings results in irregular configuration of vertical elements of the structure between the different stories of the building. To board such disordered vertical elements a transfer floor transmit the loads of upper floors and lower floors i.e. lateral and vertical loads. The comparative result of linear and non-linear time history analysis shows that lateral and drift displacement are more in linear time history analysis by 20 to 35%, and the story moment, shear force, results are also more By 10 to 30%. It is considered that the elastic response spectrum analysis is more stable than linear time history analysis. The cracked inertia of 1.2 Icr, can be used for the design of high rise building with transfer floor.

Y. Zhua, et al (2008), In the modern development of buildings and in between the low seismic zone and high seismic zone of multistory building establishment of transfer floor structure gain the popularity and sometimes even imminent. The behavior of the structure was analyzed on the basis of previous results of numerical analysis and practical tests. Models of building with transfer floor were tested on shaking table test and the results shows that the structure remain elastic and no cracks were occur under affect earthquake attack and the natural frequency remain constant of the models. Huge cracks occurred in the environs of the structure when models were tested under the limited earthquake's and damages the models also 46% natural frequency was decreases and the 4.5-7.5% damping ratio of structure was increased. At the exterior wall above the transfer floor was found as the source of shear concentration for the local flexural deformation of the transfer floor structure.

R.K.L. Su (2008), for the shaking table tests extensively record of the Taft & El-Centro earthquake were used, the records of earthquake were used for the seismic analysis of building & considered that it could lead to past reactionary guess behavior of building under various seismic condition in HONGKONG. In minor earthquake model of building in test shows that there were no crack occurred in the model and there were no decrease in the natural frequency.

Kong Wei-yi, et al (2018), a four story model with large transfer girder in first floor of RCC structure was used for the analysis on ABAQUS software under different fire conditions, to inspect the internal forces of the model which is in the contact to fire and the vertical loads on coupling. As the time of heating increased then there will be change in the internal force & there were production of increased in internal force of the supporting beam of the transfer structure

column model and the forces get reorganized, the reorganization is too clear and harsh ahead 90 minutes of heating. There is a slight change in B.M's when the heating uniformly & over from fire floor to the first floor with transfer girder and deliver the forces. There may be the exceed forecast design for room temperature in the internal force superposition between the entire process of heating.

Yasser M. Abdlebasset, et al (2016), a model of building with transfer floor was used for the numerical analysis and the performance, movement, forces, process of design, effect of time dependent on properties of material were explored by operating the analysis on construction stages, the analysis verified that from the overall total load 45% load is due to the effect of the time dependent, due to which it undergo the attention of shrinkage & creep effect of the structural analysis of multistory building. The displacement due to shrinkage is less than the value of creep value. Internal forces values gets affected due to analysis on construction stage also affects the distribution of forces and due to analysis it is found that there is increase in the dead load within factor of safety. There will not be change in displacement distribution either it is considered or not in the construction stage analysis.

Mohammed Abdul Sameer, et al (2019), two model of building with transfer plate were studied to check the seismic behavior of the buildings with variable heights of buildings and transfer floor using the software SAP 2000 in which push over analysis of the model structures were checked. The depth of the plates taken ranges from 1-3 meters at variable heights by considering as per the architectural requirements for the transfer plate in the structure, on that basis base shear , displacement ,drift, natural frequency , time period such factors were studied. From the analysis result author by comparing the moment resisting frame and shear wall frame

concluded that the SWF model behavior is much better than moment resisting frame in load capacity and stiffness and the result were also good for drift, displacement and base shear.

Neelkanth D. Joshi, et al (2018), due to lack of space, by considering development rules high rise structures construction with columns at long distance to provide the parking, function hall, garden, those amenities which required in day today life buildings with the help of transfer girder constructed. Author investigate analytically, variation effect of stiffness of the transfer girder under the lateral load on the frame lateral stiffness. The analysis on frame structure with transfer girder was studied on Software STAAD-PRO. The result occurred that there were change in the stiffness of the transfer girder while the condition of the soft story floating frame not changed. The column with separate foundation have more lateral stiffness than the floating column on the transfer girder. When transfer girder was placed in such a way that frame is in the center then the result occur was the variation in the stiffness of the frame was directly proportional to the stiffness variation of the transfer girder and when frame is placed eccentrically then it is directly proportional to the support deflection and stiffness variation of the transfer girder.

Mehair Yacoubian, et al (2017), construction of buildings with many features in one place with transfer structure become popular in busy metro cities cited in low seismic region areas. Authors investigated the behaviour of structure with transfer slab when earthquake comes. The behaviour of the building with transfer plate was determined in the two component that is transfer plate bias and both motion of the substructure of the building i.e. rotational and translational motion.

Tamrazyan A., et al (2012), construction of multi-storey buildings become essential in highly populated

countries or in the urban areas. Authors investigated the danger appraisal in analysing the multi-storey structure with transfer floors and try to search the result of main structural members when the any sudden event inability occurs, then for such condition how to control the stability of the structure is determined. There were change in the internal forces and the changeover was vital when the drift angle analysis was done between the floor below & the upper the changeover. When the height of the transfer floor is high then drift angle between floors and the change in internal forces will be greater.

Yong L., et al (2016), authors suggested that while designing the structure if irregularities in structure not considered then then irregularities may cause the series damage to the structure when it comes in contact with the earthquake. Due to that vertical irregularity damage will occurs at floor between two different load resisting systems in building during rare earthquake also.

III.CONCLUSION

While designing the building with transfer floor irregularities in structure should be considered to prevent the structure from serious damages and the column which having the separate footing having higher lateral stiffness than the floating columns on transfer floor. In minor earthquakes there will not be any formation of cracks and structure remain elastic.

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