A STUDY OF BERA VIOUR OF IDGH RISE BUILDINGS WITH TRANSFER LEVEL UNDER DYNAMIC LOADING

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Abstract

Earthquake resistant structures are not mandatory in countries located away from earthquake prone zones such as Sri Lanka. However after the occurrence of 2004 Tsunami, and considering possible environmental changers and recently observed small scale ground motions, it is advisable to consider Sri Lanka as low seismic zone. With the current trend of "Mixed Development Concept" high- rise buildings with transfer plates are common form in the vicinity as far as apartment buildings are concerned. The consequences in an event of an earthquake can be serious or even fatal for this type of highly irregular buildings and adoption of earthquake detailing alone would not adequate. Therefore, approach is needed in order to enhance the earthquake resistance at the conceptual design stage. This study has been carried out in order to identify the effects on the seismic performance of the building when the level of the transfer plate changes. Accordingly, five number of thirty five storied apartment buildings with transfer plate located at different levels were considered in the analysis. It is observed that building codes provide criteria to classify the vertically irregular structures and suggest dynamic analysis to arrive at design lateral forces. In this context, the buildings under this study were subjected to response spectrum analysis according to the design spectrum given in the UBC 97. Computer simulation has become an efficient tool in the analysis of structures under extreme loading. Therefore, three dimensional computer models generated with the help of SAP 2000 were used in this study. The transfer floor was located at the tenth floor level of the thirty five storied building as the first case. The analysis was repeated by changing the level of the transfer plate to below and above the tenth level. Results obtained for buildings with transfer plate located at different levels were compared. From the comparison of Response Spectrum Analysis results of this study it , was found that, when the level of the transfer floor moves towards the ground it enhances the earthquake resistance of such buildings. Further, it was found that the variation of the base shear, maximum absolute accelerations, maximum absolute displacement and the inter story drift is marginal with respect to the change in level of the transfer plate for this particular building.

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T. J. JAYASUNDARA

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DECLARATION

I, T. J. Jayasundara, hereby declare that the content of this thesis is the original work carried out by me. Whenever others' work is included in this thesis, it is appropriately acknowledged as a reference.

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