



Inelastic Seismic Behaviour of RC Buildings with floating Columns Considering Soil Structure Interaction

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Abstract

In recent times, the construction of buildings with irregularities is increased in the comeliness point of view and also to acquire more space at parking areas for movement. However, from the post-earthquake investigations, it is noticed that the construction of such irregular buildings is vulnerable to seismic forces although the soil-structure interaction (SSI) is not accounted for in the design process. In this study, the nonlinear seismic behavior of multi-storey buildings with and without floating columns considering structure interaction is investigated. Nonlinear time history analysis was conducted on buildings with floating columns resting on medium soil strata. Impedance functions such as stiffness and damping coefficients were computed and assigned at the base of the building to account for the effects of SSI. Incremental dynamic analysis was performed using SAP2000 and the inelastic response of the building was quantified. Seismic fragility curves are plotted and the probabilities of damages are estimated. The comparison of probabilities of damages between the buildings with and without floating columns considering soil-structure interaction effects is studied and presented.

Keywords: Floating columns, Soil structure interaction (SSI), Incremental dynamic analysis, Fragility curve