

Effect of Infill Walls on Response of Multi Storey Reinforced Concrete Structure

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Abstract : The present research work investigates the seismic response of reinforced concrete (RC) frame building considering the effect of modeling masonry infill (MI) walls. The seismic behavior of a residential 6-storey RC frame building, considering and ignoring the effect of masonry, is numerically investigated using response spectrum (RS) analysis. The considered herein building is designed as a moment resisting frame (MRF) system following the Egyptian code (EC) requirements. Two developed models in terms of bare frame and infill walls frame are used in the study. Equivalent diagonal strut methodology is used to represent the behavior of infill walls, whilst the well-known software package ETABS is used for implementing all frame models and performing the analysis. The results of the numerical simulations such as base shear, displacements, and internal forces for the bare frame as well as the infill wall frame are presented in a comparative way. The results of the study indicate that the interaction between infill walls and frames significantly change the responses of buildings during earthquakes compared to the results of bare frame building model. Specifically, the seismic analysis of RC bare frame structure leads to underestimation of base shear and consequently damage or even collapse of buildings may occur under strong shaking. On the other hand, considering infill walls significantly decrease the peak floor displacements and drifts in both X and Y-directions.

Keywords : masonry infill, bare frame, response spectrum, seismic response

Conference Title : ICEES 2015 : International Conference on Environmental Earth Sciences

Conference Location : Tokyo, Japan

Conference Dates : May 28-29, 2015