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Assessment of reinforced concrete building with soil structure interaction effect under vertical earthquake

Abstract

In past investigation, most of studies on seismic analysis for soil structure interaction effect are small and generally design building were considered to be fixed at their support. In actual condition, flexibility of the bases soil medium were generate some deformation in foundation element and will be shows detrimental effects on the system behavior. This can make a beneficial result on the overall structure response if flexible bases were considered during seismic analysis. The present study attempts to compare the behavior of reinforced concrete medium rise building with soil structure interaction effect and fixed bases under vertical earthquake. The eight-storey irregular 2D frame models were subjected to ground motion from 4 stations with peak ground acceleration ratios vertical to horizontal (V/H) between ranges 0.95 to 1.16. During simulation of simplified model, Impedance Function has been applied to calculate the stiffness of such spring. The structural response quantities were considered displacement histories and axial load variation. The result shows that the consideration of soil structure interaction effect may increase such response behavior.

Keywords

Reinforced concrete; Soil structure interaction; Vertical earthquake