

Seismic Soil-Pile Interaction Considering Nonlinear Soil Column Behavior in Saturated and Dry Soil Conditions

Authors : Mohammad Moeini, Mehrdad Ghyabi, Kiarash Mohtasham Dolatshahi

Abstract : This paper investigates seismic soil-pile interaction using the Beam on Nonlinear Winkler Foundation (BNWF) approach. Three soil types are considered to cover all the possible responses, as well as nonlinear site response analysis using finite element method in OpenSees platform. Excitations at each elevation that are output of the site response analysis are used as the input excitation to the soil pile system implementing multi-support excitation method. Spectral intensities of acceleration show that the extent of the response in sand is more severe than that of clay, in addition, increasing the PGA of ground strong motion will affect the sandy soil more, in comparison with clayey medium, which is an indicator of the sensitivity of soil-pile systems in sandy soil.

Keywords : BNWF method, multi-support excitation, nonlinear site response analysis, seismic soil-pile interaction

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