



Investigation on Influence of Embedment Depth of Shallow Foundation on Seismic Response of Building Considering Soil - Structure Interaction

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Abstract

Embedment depth of foundation plays significant role on the seismic response of the superstructures. The present study investigates the effect of embedment depth of shallow foundation on the seismic response of building through the scaled down test. A scaled-down model of five storey and shallow foundations of different embedment depth (75, 150, 300, and 600 mm) has been used in the present study. All the model tests are conducted through shake table testing in laminar shear box. The model is subjected to scaled down earthquake motions. The seismic response of the building has been estimated and expressed in terms of amplification ratio, maximum lateral displacement, interstorey drift, and rocking of the foundation. The test results indicate that the change in embedment depth of the foundation has a significant effect on lateral displacement, interstorey drift and rocking of the foundation. It is found that lateral displacement, interstorey drift and rocking of the foundation for the maximum embedment depth (600 mm) is reduced by 70%, 74%, and 41%, respectively, when compared with smallest embedment depth of foundation (75 mm).

Keywords: Shake table, Model, Shallow foundation, Earthquake, Seismic amplification