



## Effect of thickness of liquefiable foundation on the seismic performance of earth dams

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### ABSTRACT

Earthquake induced liquefaction continues to be a major threat to many civil engineering structures on the earth. Among these structures are earthfill dams. There are two major causes for the seismically inadequacy of a statically stable earthfill dams around the world. These are the liquefaction of the foundation layer and shell of the dams. In order to gain a better understanding of the seismic performance of earthfill dams on liquefiable foundation layer, a numerical model of an earthfill dam with mixed clay core founded on a liquefiable foundation subjected to earthquake is being studied. The properties and thickness of the liquefiable layer are varied to determine the related effects on the overlying earthfill dam.

In order to explore the effect of the varying depth and thickness of liquefiable layer on the seismic response of earthfill dams, the total foundation thickness is divided into three equal layers so that the properties of each layer can be varied and studied. A finite difference numerical code, FLAC3D is used during the study. Results and discussions related to the significance of the depth and thickness of liquefiable layer in the foundation and resulting damage to the earthfill dam and hence the seismic performance of earthfill dam are presented.

Keywords: Earthquake, liquefaction, earthfill dams, seismic performance, varying depth.