

عنوان مقاله:

An experimental study of the effect of buried depth of pipe on uplift behavior in liquefiable sandy soil using shaking table test

محل انتشار:

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تعداد صفحات اصل مقاله: 8

نویسندگان:

Sima Bahram Ghannad - *Master student at University of Tabriz of Faculty of Civil Engineering*

Masoud Hajjalilue Bonab - *Professor of Faculty of Civil Engineering at University of Tabriz*

Maral Ghorbani Barazin - *Master student at University of Tabriz of Faculty of Civil Engineering*

خلاصه مقاله:

In an earthquake, buried pipes located in liquefiable soil deposits are susceptible to floating following due to excess pore pressure that builds up within soil. In this study, shaking table tests have been carried out to investigate the influence of buried depth of pipe by measuring the uplift displacement of buried pipe. Particle image velocimetry has been used to acquire the displacement vector fields and strain contours in the soil around pipe. Plexiglass rigid container was filled by sand pluviation method to prepare relative density (D_r) of 30%. The model pipe that has been used in this study was manufactured from pvc with outer diameter of 6cm and our container is rigid and plexiglass box with dimension of 100cm(length)×62cm(width)×64cm(height). To get complete saturated soil, deaired water was used after vacuuming soil. Different buried depths ($H=1.5, 2.5, 5D$) have been chosen to investigate the influence of buried depth. Results show by decreasing buried depth, the uplift of buried pipe increases and it can be seen that the soil flowed within a heart-shaped region around the pipe through PIV method. It is also considerable that the deformation range of the soil at the surface in the case of shallow buried pipe was about 5D-6D. Both upheave and settlement deformation could be observed on the ground surface.

کلمات کلیدی:

uplift, liquefiable soil, buried depth, shaking table test

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