Sinking/floatation of pipelines and other objects in liquefied soil under waves - DTU Orbit (10/12/2018)

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This paper presents the results of an experimental study where the sinking and floatation of a pipeline and other objects (namely, a sphere and a cube) in a silt bed was investigated. The bed was exposed to progressive waves. Two kinds of experiments were made: The undisturbed-flow experiments, and the experiments with the structure model (a pipeline, a sphere, and a cube). In the former experiments, the pore-water pressure was measured across the soil depth. The pore-water pressure built up, as the waves progressed. The soil was liquefied for wave heights larger than a critical value. Regarding the experiments with the structure model, the displacement of the structure (sinking or floatation) was measured simultaneously with the pore-water pressure. The influence of various parameters (such as the initial position of the object, the specific gravity, the soil layer thickness, and the wave height) was investigated. It was found that while the pipe sank in the soil to a depth of 2-3 times the pipe diameter, the sphere sank to even larger depths. The pipe with a relatively small specific gravity, initially buried, floated to the surface of the soil. The drag coefficients for the objects sinking in the liquefied soil were obtained. (C) 1999 Elsevier Science B.V. All rights reserved.

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