

学术报告

A Numerical Investigation on the Seismic Behavior of Underground Basin affected by Soil Liquefaction

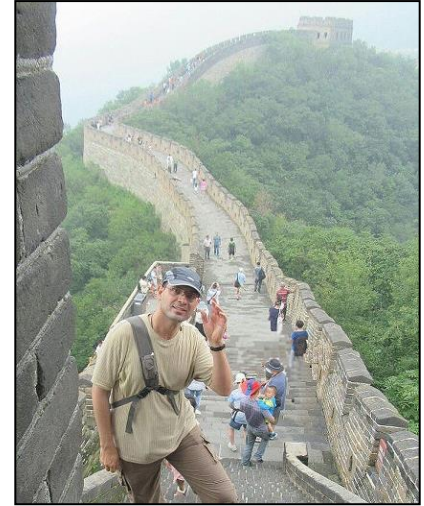
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报告摘要 (Abstract): Soil reclamation is a necessity in most marine projects especially when the site should be extended towards the seabed. In the southern part of Iran at the coastal region of Persian Gulf, an underground basin was constructed in the reclaimed area. The area was not sufficiently compacted. On the other hand, the seabed layers constitute loose to medium dense sand. Based on the seismic hazard studies, the area is located in a high-risk seismic region. Thus, the soil liquefaction is the first geotechnical matter which threatens the sanity of the basin. Simplified analysis proves the liquefaction incident, but there is no estimation of the deformations and displacement of the basin during the earthquake. In the present study, the seismic deformational behavior of the basin is studied by focusing on the liquefaction phenomenon of the soil layers and the reclaimed area. To this aim, numerical simulations were performed using two and three dimensional analyses. The codes Flac and Flac3D were implemented. The results show that the soil around and beneath the basin liquefies and the basin moves towards the sea side. To prevent this happening, several scenarios of soil improvement using jet grouting method were considered in order to limit the basin displacement. Comparison of the results indicates that the best solution is to consider jet grouting for deep soil layers around the basin.

报告人简介 (Bio.): Dr. Ehsan Seyedi Hosseininia is currently an Associate Professor in the Department of Civil Engineering at Ferdowsi University of Mashhad (FUM). He received his Ph.D degree in civil/geotechnical Engineering from University of Tehran (UT), Iran in December 2009. He got his Msc from UT too in 2004 and his Bsc from FUM in 2001. He has more than 20 international research publications on different aspects of geotechnical engineering such as ring footings, reinforced-soil retaining walls, liquefaction and simulation of granular materials behavior using Discrete Element Method (DEM). He is the supervisor of five PhD and eight Msc students at FUM. He has worked more than 15 years as a professional geotechnical engineer for several companies in the field of oil/gas and marine projects. He has several experiences in different fields of geotechnical engineering such as pile design and analysis (insitu and driving), retaining walls, marine geotechnics and geotechnical earthquake engineering. He is now engaged in some oil/gas projects as a geotechnical consultant.