

Three Dimensional Model of Full Scale Plate Load Test on Stone Column in Sabkha Deposit: Case Study from Jubail Industrial City - Saudi Arabia

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Abstract : Soil improvement by means of stone column method is used to improve sabkha soils in order to limit total and differential settlement and to achieve the required bearing capacity. Full-scale plate test was performed on site to confirm the achievement of required bearing capacity at the specified settlement. Despite the fact that this technique is widely used to improve sabkha soils, there are no studies focusing on the behavior of stone columns in such problematic soils. Sabkha soils are known for its high compressibility, low strength and water sensitivity due to loss of salt cementation upon flooding during installation of stone columns. Numerical modeling of plate load test assist to understand complicated behavior of sabkha - stone column interaction. This paper presents a three-dimensional Finite element model, using PLAXIS 3D software, to simulate vertical plate load tests on a stone column installed in sabkha. The predicted settlement values are in reasonable agreement with the field measure values and the field load - settlement curve can be predicted with good accuracy.

Keywords : soil improvement, stone column, sabkha, PLAXIS 3D

Conference Title : ICCSGE 2015 : International Conference on Concrete, Structural and Geotechnical Engineering

Conference Location : Amsterdam, Netherlands

Conference Dates : August 06-07, 2015