

Field Tests and Numerical Simulation of Tunis Soft Soil Improvement Using Prefabricated Vertical Drains

Authors : Marwa Ben Khalifa, Zeineb Ben Salem, Wissem Frikha

Abstract : This paper presents a case study of “Radès la Goulette” bridge project using the technique of prefabricated vertical drains (PVD) associated with step by step construction of preloading embankments with averaged height of about 6 m. These embankments are founded on a highly compressible layer of Tunis soft soil. The construction steps included extensive soil instrumentation such as piezometers and settlement plates for monitoring the dissipation of excess pore water pressures and settlement during the consolidation of Tunis soft soil. An axisymmetric numerical model using the 2D finite difference code FLAC was developed and calibrated using laboratory tests to predict the soil behavior and consolidation settlements. The constitutive model impact for simulating the soft soil behavior is investigated. The results of analyses show that numerical analysis provided satisfactory predictions for the field performance during the construction of Radès la Goulette embankment. The obtained results show the effectiveness of PVD in the acceleration of the consolidation time. A comparison of numerical results with theoretical analysis was presented.

Keywords : tunis soft soil, radès bridge project, prefabricated vertical drains, FLAC, acceleration of consolidation

Conference Title : ICGIGEA 2022 : International Conference on Ground Improvement, Geotechnical Engineering and Applications

Conference Location : Istanbul, Türkiye

Conference Dates : May 05-06, 2022