

Numerical Investigation on Load Bearing Capacity of Pervious Concrete Piles as an Alternative to Granular Columns

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Abstract : Pervious concrete combines considerable permeability with adequate strength, which makes it very beneficial in pavement construction and also in ground improvement projects. In this paper, a single pervious concrete pile subjected to vertical and lateral loading is analysed using a verified three dimensional finite element code. A parametric study was carried out in order to investigate load bearing capacity of a single unreinforced pervious concrete pile in saturated soft soil and also gain insight into the failure mechanism of this rather new soil improvement technique. The results show that concrete damaged plasticity constitutive model can perfectly simulate the highly brittle nature of the pervious concrete material and considering the computed vertical and horizontal load bearing capacities, some suggestions have been made for ground improvement projects.

Keywords : concrete damaged plasticity, ground improvement, load-bearing capacity, pervious concrete pile

Conference Title : ICAGE 2018 : International Conference on Advanced Geomechanical Engineering

Conference Location : London, United Kingdom

Conference Dates : July 26-27, 2018