

Debris' Effect on Bearing Capacity of Defective Piles in Sand

Authors : A. M. Nasr, W. R. Azzam, K. E. Ebeed

Abstract : For bored piles, careful cleaning must be used to reduce the amount of material trapped in the drilled hole; otherwise, the debris' presence might cause the soft toe effect, which would affect the axial resistance. There isn't much comprehensive research on bored piles with debris. In order to investigate the behavior of a single pile, a pile composite foundation, a two pile group, a three pile group and a four pile group investigation conducts, forty-eight numerical tests in which the debris is simulated using foam rubber. 1m pile diameter and 10m length with spacing 3D and depth of foundation 1m used in this study. It is found that the existence of debris causes a reduction of bearing capacity by 64.58% and 33.23% for single pile and pile composite foundation, respectively, 23.27% and 24.24% for the number of defective piles / total number of pile =1/2 and 1 respectively for two group pile, 10.23%, 19.42% and 28.47% for the number of defective piles / total number of pile =1/3,2/3 and 1 respectively for three group pile and, this reduction increase with the increase in a number of defective piles / a total number of piles and 7.1%, 13.32%,19.02% and 26.36 for the number of defective piles / total number of pile =1/4,2/4,3/4 and 1 respectively for four group pile and decreases with an increase of number of pile duo to interaction effect.

Keywords : debris, Foundation, defective, interaction, board pile

Conference Title : ICSMGE 2023 : International Conference on Soil Mechanics and Geotechnical Engineering

Conference Location : Venice, Italy

Conference Dates : June 15-16, 2023