

Settlement Performance of Soft Clay Reinforced with Granular Columns

Authors : Muneerah Jeludin, V. Sivakumar

Abstract : Numerous laboratory-based research studies on the behavior of ground improved with granular columns with respect to bearing capacity have been well-documented. However, information on its settlement performance is still scarce. Laboratory model study on the settlement behavior of soft clay reinforced with granular columns was conducted and results are presented. The investigation uses a soft kaolin clay sample of 300 mm in diameter and 400 mm in length. The clay samples were reinforced with single and multiple granular columns of various lengths using the displacement and replacement installation method. The results indicated that that no settlement reduction was achieved for a short single floating column. The settlement reduction factors reported for L/d ratios of 5.0, 7.5 and 10.0 are in the range of 1 to 2. The findings obtained in this research showed that the reduction factors are considerably less and that load-sharing mechanism between columns and surrounding clay is complex, particularly for column groups and is affected by other factors such as negative skin friction.

Keywords : ground improvement, model test, reinforced soil, settlement

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