

The Effect of Soil Reinforcement on Pullout Behaviour of Flat Under-Reamer Anchor Pile Placed in Sand

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Abstract : To understand the anchor pile behaviour and to predict the capacity of piles under uplift loading are important concerns in foundation analysis. Experimental model tests have been conducted on single anchor pile embedded in cohesionless soil and subjected to pure uplift loading. A gravel-filled geogrid layer was located around the enlarged pile base. The experimental tests were conducted on straight-shafted vertical steel piles with an outer diameter of 20 mm in a steel soil tank. The tested piles have embedment depth-to-diameter ratios (L/D) of 2, 3, and 4. The sand bed is prepared at three different values of density of 1.67, 1.59, and 1.50gm/cc. Single piles embedded in sandy soil were tested and the results are presented and analysed in this paper. The influences of pile embedment ratio, reinforcement, relative density of soil on the uplift capacity of piles were investigated. The study revealed that the behaviour of single piles under uplift loading depends mainly on both the pile embedment depth-to-diameter ratio and the soil density. It is believed that the experimental results presented in this study would be beneficial to the professional understanding of the soil-pile-uplift interaction problem.

Keywords : flat under-reamer anchor pile, geogrid, pullout reinforcement, soil reinforcement

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