

Experimental Investigations on Group Interaction Effects of Laterally Loaded Piles in Submerged Sand

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Abstract : This paper aims to investigate the group interaction effects of laterally loaded pile groups driven into a medium dense sand layer in submerged state. Static lateral load tests were carried out on pile groups consisting of varying number of piles and at different spacings. The test setup consists of a load cell (500 kg capacity) and an LVDT (50 mm) to measure the load and pile head deflection respectively. The piles were extensively instrumented with strain gauges so as to study the variation of soil resistance within the group. The bending moments at various depths were calculated from strain gauge data and these curves were fitted using a higher order polynomial in order to get 'p-y' curves. A comparative study between a single pile and a pile under a group has also been done for a better understanding of the group effect. It is observed that average load per pile is significantly reduced relative to single pile and it decreases with increase in the number of piles in a pile group. The loss of efficiency of the piles in the group, commonly referred to as "shadowing" effect, has been expressed by the use of a 'p-multiplier'. Leading rows carries greater amount of load when compared with the trailing rows. The variations of bending moment with depth for different rows of pile within a group and different spacing have been analyzed and compared with that of a single pile. p multipliers within different rows in a pile group were evaluated from the experimental study.

Keywords : group action, laterally loaded piles, p-multiplier, strain gauge

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