

Effects of Pile Installation Method on Uplift Capacity of Piles in Sand

ABDULLAH I. AL-MHAIDIB* and TUNCER B. EDIL**

* *King Saud University, Riyadh, Saudi Arabia*

** *University of Wisconsin-Madison, Wisconsin, USA*

ABSTRACT. An experimental program using large-scale model piles (embedded length of about 2 m and a diameter of 89 mm) in a large sand test pit was conducted to study the load capacity and displacement under uplift loads. The piles were installed by three methods in the test pit: driving, jacking, and a reference undisturbed method. The sand bed was prepared either in a loose or a dense state. Over thirty tests were conducted and the experimental results were analyzed statistically. The results indicate that initial sand density and method of pile installation is the first and the second most significant factor affecting uplift capacity, respectively. Methods that tend to disturb the sand most result in lower uplift capacity (as low as 50%). The pile head displacement at the ultimate uplift load is in the range of 5 to 12.5 mm and primarily dependent on method of pile installation.