

عنوان مقاله:

Finite Element Analysis on Behavior of Single Battered Pile in Sandy Soil Under Pullout Loading

محل انتشار:

ماهنامه بین المللی مهندسی، دوره 35، شماره 6 (سال: 1401)

تعداد صفحات اصل مقاله: 8

نویسندگان:

M. S. Al-Tememy - *Civil Engineering Department, University of Technology, Baghdad, Iraq*

M. A. Al-Neami - *Civil Engineering Department, University of Technology, Baghdad, Iraq*

M. F. Asswad - *Civil Engineering Department, University of Technology, Baghdad, Iraq*

خلاصه مقاله:

Batter piles are the piles driven in the soil at an inclination with the vertical to withstand oblique loads or large horizontal loads and have been widely used to support high buildings, offshore buildings, and bridges. These constructions are risky because of the exposure to moments and overturning resulting from winds, waves, and ship impact. A 3D FEA using PLAXIS 3D software was used to investigate the effect of several variables that affect the behavior of single battered piles under pull-out loads. The study is achieved on a steel pipe pile model embedded in a dry sandy soil with three relative densities (loose, medium, and dense) at different inclination angles and three embedment ratios, L/D of ۲۵, ۳۷.۵, and ۵۰, respectively. The numerical results showed that the ultimate pull-out resistance of the battered pile raise as the battered angle increases reaches a maximum value, then decreases. The ultimate pull-out load capacity of a single battered pile is directly proportional to the slenderness ratio and relative density; the ultimate pull-out load increases with the increase in the ratio of slenderness and relative density. The ultimate uplift load of the battered pile was less affected by the free-standing length. Vertical and battered piles at a battered angle of (۱۰° and ۲۰°) and free-standing lengths equal to zero have higher ultimate pull-out capacity; by increasing the free-standing length, the ultimate pull-out capacity decreased.

کلمات کلیدی:

Battered pile, finite element analysis, Plaxis 3D, Pullout Capacity

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1437742>

