

عنوان مقاله:

Numerical investigation of soil stress state variations with time around a penetrating cylindrical object

محل انتشار:

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خلاصه مقاله:

Penetration of piles and CPT cones in saturated clays lead to significant changes in main state variables of the surrounding soil during and after installation. The stress state variations results in significant changes in the pile capacity with time which is of great importance in engineering practice. Therefore, evaluation of soil stress state alterations with time around a penetrating cylindrical object is the main objective of this paper. A finite element code is used to simulate the penetration. The numerical model is verified by some results from (1) a physical model in the lab and (2) a test pile at the site. Then pore pressure, horizontal effective stress and coefficient of lateral earth pressure variations around the cylindrical object are evaluated with time. The results indicate that the coefficient of lateral earth pressure variations along the pile shaft is negligibly small at any time step. However this coefficient increases with time along the pile shaft. The coefficient has shown significant alterations around the pile tip. The results have also shown that the stress state is approaching the initial conditions at a distance of approximately 10 to 15 times the cylinder radius.

کلمات کلیدی:

Soil stress state, Clay, Numerical modeling, Penetration

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