

عنوان مقاله:

Predicting ε_{50} for Lateral Behavior of Piles in Marine Clay Using an Evolutionary Based Approach

محل انتشار:

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خلاصه مقاله:

Analyzing piles subjected to lateral loads significantly depends on soil resistance at any point along the pile as a function of pile deflection, known as p-y curve. On the other hand, the deformation characteristics of soil defined as "the soil strain at 50% of maximum deviatoric stress (ε_{50})" has considerable effect on the generated p-y curve. In this research, several models are proposed to predict ε_{50} specifically for designing very long pile foundations of offshore oil and gas platforms in South Pars field Persian Gulf Iran. Herein, ε_{50} is evaluated from extensive soil data of marine clays including in-situ and laboratory test results using evolutionary polynomial regression (EPR). It is demonstrated that the normalized cone tip resistance, which is an indication of soil undrained shear strength, leads to more realistic ε_{50} values compared with the laboratory-derived undrained shear strength parameter. Furthermore, the results of full scale lateral pile load tests in different sites are used in order to validate the performance of the proposed models in predicting lateral pile behavior. The results of a numerical study on lateral pile-soil system also show the efficiency of the proposed model in predicting lateral pile response

کلمات کلیدی:

P-Y curve, Laterally loaded pile, Piezocone penetration test (PCPT), Marine clay, South Pars field

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