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Bearing capacity evaluation of footing on a layered-soil using ABAQUS

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In this paper, finite element method (FEM) is applied to calculate bearing capacity of a strip footing on one-layer and two-layer soil. Computations are carried out using commercial finite element software, ABAQUS to assess effect of various geotechnical and geometric parameters on soil failure mechanism under the footing. Soil profile contains two soil types including sand and clay. Soil behaviour is represented by the elasto-plastic Drucker-Prager model and footing material is assumed isotropic and linear elastic. For a homogenous soil profile, the effect of soil properties such as dilation angle and initial condition as well as footing roughness are assessed on soil failure mechanism under the footing. For this case, the bearing capacity is also obtained which has a good agreement with Terzaghi's calculation. For a layered soil, soft-over-strong soil, the effect of layer thickness, soil shear strength and material property on bearing capacity value and failure mechanism is studied. It is concluded that the bearing capacity of footing decreases as the height of clayey soil increases whilst the displacement under footing increases. However, the stronger bottom layer does not affect ultimate bearing capacity value of footing and displacement of footing after some thickness of clayey soil on top.

Biography

Ahdyeh Mosadegh is a PhD candidate at Curtin University working on soil behavior, numerical and experimental aspects. Cyclic behavior of pipe-soil interaction is the main part of her research. She graduated with a master degree in Geotechnical Engineering from Ecole National des PontsetChausees in France 2010. Previously, she finished her first master in Road & Transportation from University of Tehran, 2007. Her research area was on soil stabilization for road construction purposes.

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