World Academy of Science, Engineering and Technology
International Journal of Geotechnical and Geological Engineering
Vol:14, No:12, 2020

Seismic Bearing Capacity Estimation of Shallow Foundations on Dense Sand Underlain by Loose Sand Strata by Using Finite Elements Limit Analysis

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Abstract : By using the lower- and upper- bound finite elements to limit analysis in conjunction with second-order conic programming (SOCP), the effect of seismic forces on the bearing capacity of surface strip footing resting on dense sand underlain by loose sand deposit is explored. The soil is assumed to obey the Mohr-Coulomb's yield criterion and an associated flow rule. The angle of internal friction (ϕ) of the top and the bottom layer is varied from 42° to 44° and 32° to 34° respectively. The coefficient of seismic acceleration is varied from 0 to 0.3. The variation of bearing capacity with different thickness of top layer for various seismic acceleration coefficients is generated. A comparison will be made with the available solutions from literature wherever applicable.

Keywords : bearing capacity, conic programming, finite elements, seismic forces
Conference Title : ICSMGE 2020 : International Conference on Soil Mechanics and Geotechnical Engineering
Conference Location : Sydney, Australia
Conference Dates : December 03-04, 2020