

عنوان مقاله:

Upper Bound Solution for Ultimate Bearing Capacity with A Non-Linear Hoek–Brown Failure Criterion

محل انتشار:

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خلاصه مقاله:

Conventional calculations of ultimate bearing capacity of shallow foundations are based on a linear Mohr–Coulomb failure criterion. However, experimental data shows that the strength envelopes of almost all types of rocks are nonlinear over the wide range of normal stresses. In this paper, the strength envelope of rock mass is considered to follow a Hoek–Brown failure criterion that is a nonlinear failure criterion. Hoek-Brown failure criterion are introduced into the theorem of limit analysis. The plastic dissipation power in terms of kinematically admissible velocity fields and a nonlinear optimization formulation is obtained. Then using nonlinear finite element technique, the plastic limit loads and failure modes of frictional materials are calculated. The numerical results are compared to existing limit analysis solutions. The effects of the Hoek-Brown failure criterion parameters are then discussed at the light of these preliminary results.

کلمات کلیدی:

Upper bound, limit analysis, Hoek-Brown failure criterion, ultimate bearing capacity, rock mechanics

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