

عنوان مقاله:

Evaluating Partial Safety Factors for Shear Strength in Bearing Capacity Calculations for Cohesionless Soils

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خلاصه مقاله:

Calculating bearing capacity is critical when designing shallow foundations. Many countries use limit state design (LSD) as the standard method for geotechnical design. The paper aims to develop realistic LSD partial factors for bearing capacity calculations of shallow foundations on cohesionless soils based on full-scale model tests. The experimental setup consisted of a hydraulic jack, concrete footing, sand samples, and pressure cells placed in a cylindrical wall. Fifteen sand samples were tested and classified by gradation and relative density. Settlement curves were plotted for each sample under an increasing load. The measured ultimate bearing stresses were found to be higher than theoretical values calculated using traditional methods. This indicates that the traditional approach is conservative. The suggested safety factor for the internal friction angle in cohesionless soils ($\gamma \tan(\phi) = 1.10$) is notably lower than the values specified in Eurocode 7 at 1.25 and the Egyptian code of practice at 1.30. The proposed LSD partial factors allow for more economical designs than traditional factors while maintaining safety. The full-scale model-testing approach is novel and provides realistic factors directly applicable to Egyptian codes. The results are satisfactory and reasonable for the geotechnical design of shallow foundations on cohesionless soils. Doi:

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کلمات کلیدی:

.Full Scale Model; Limit State Design; Working Stress Design; Partial Safety Factor; Calibration

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