Numerical study of the bearing capacity for two interfering strip footings on sands

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Abstract

Current studies of bearing capacity for shallow foundations tend to rely on the hypothesis of an isolated footing. In practice a footing is never isolated; it is mostly in interaction with other footings. This paper focuses on a numerical study using the finite-difference code Fast Lagrangian Analysis of Continua (FLAC), to evaluate the bearing capacity for two interfering strip footings, subjected to centered vertical loads with smooth and rough interfaces. The soil is modeled by an elasto-plastic model with a Mohr–Coulomb yield criterion and associative flow rule. The interference effect is estimated by efficiency factors, defined as the ratio of the bearing capacity for a single footing in the presence of the other footing to that of the single isolated footing. The efficiency factors have been computed individually to estimate the effects of cohesion, surcharge, and soil weight using Terzaghi's equation, both in a frictional soil with surcharge pressures and in a cohesive-frictional soil with surcharge pressures. The results have been compared with those available in the literature.

Keywords : Strip footing; Bearing capacity; Interference; Efficiency factors; Vertical loads.

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