

Effect of Footing Shape on Bearing Capacity and Settlement of Closely Spaced Footings on Sandy Soil

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Abstract : The bearing capacity of closely spaced shallow footings alters with their spacing and the shape of footing. In this study, the bearing capacity and settlement of two adjacent footings constructed on a sand layer are investigated. The effect of different footing shapes including square, circular, ring and strip on sandy soil is captured in the calculations. The investigations are carried out numerically using PLAXIS-3D software and analytically employing conventional settlement equations. For this purpose, foundations are modelled in the program with practical dimensions and various spacing ratios ranging from 1 to 5. The spacing ratio is defined as the centre-to-centre distance to the width of foundations (S/B). Overall, 24 models are analyzed; and the results are compared and discussed in detail. It can be concluded that the presence of adjacent foundation leads to the reduction in bearing capacity for round shape footings while it can increase the bearing capacity of rectangular footings in some specific distances.

Keywords : bearing capacity, finite element analysis, loose sand, settlement equations, shallow foundation

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