

BEHAVIOURAL ASSESSMENT ON INFLUENCE OF ADJACENTLY PLACED STRIP FOOTINGS AT DIFFERENT EMBEDMENT LEVEL

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Abstract

The footings laid in close proximity imposes a definite change in the behaviour of the adjacent footing, subsequently changing the behaviour of the nearby footings. The present study emphasises the behaviour of the nearby strip footings embedded at a different level by adopting the commercially available finite element analysis program, ABAQUS. The load-settlement behaviour, ultimate bearing capacity (UBC), and the failure patterns of adjacent strip footings are assessed by considering the Mohr-Coulomb failure criterion. The UBC of the nearby footings (left and right) are estimated and represented in terms of interference factors (ξ_L/ξ_R) defined as the UBC of a footing in the presence of adjacent footing to that of same considered for equivalent isolated footing. The results reveal that a significant influence of the adjacent footing is experienced when the spacing between the footings (S/B) is lesser, and they behave as the single footing of greater width at $S/B = 0.25$ irrespective of the level of embedment depth. Furthermore, the influence of interference increases with the increase in the embedment depth of adjacent footing. It is found that the ξ_L is significantly more for a lower level of embedment depth, and the same increases with an increase in the embedment depth of the right footing but on the contrary ξ_R decreases. The increase in the peak interference factor, ξ_{L-max} for $D_L/B = 0.5$ is 2.1% and 4.2% when $D_R/B = 0.75$ and $D_R/B = 1.0$, respectively.

Keywords: Interference of footings; Embedment depth; Ultimate bearing capacity; Load-settlement behaviour.