

Effect of Cavities on the Behaviour of Strip Footing Subjected to Inclined Load

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Abstract : One of the important concerns within the field of geotechnical engineering is the presence of cavities in soils. This present work is an attempt to understand the behaviour of strip footing subjected to inclined load and constructed on cavitied soil. The failure mechanism of strip footing located above such soils was studied analytically. The capability of analytical model to correctly expect the system behaviour is assessed by carrying out verification analysis on available studies. The study was prepared by finite element software (PLAXIS) in which an elastic-perfectly plastic soil model was used. It was indicated, from the results of the study, that the load carrying capacity of foundation constructed on cavity can be analysed well using such analysis. The research covered many foundation cases, and in each foundation case, there occurs a critical depth under which the presence of cavities has shown minimum impact on the foundation performance. When cavities are found above this critical depth, the load carrying capacity of the foundation differs with many influences, such as the location and size of the cavity and footing depth. Figures involving the load carrying capacity with the affecting factors studied are presented. These figures offer information beneficial for the design of strip footings rested on underground cavities. Moreover, the results might be used to design a shallow foundation constructed on cavitied soil, whereas the obtained failure mechanisms may be employed to improve numerical solutions for this kind of problems.

Keywords : axial load, cavity, inclined load, strip footing

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