

Numerical analysis of the improvement of soft soil using columnar inclusions with fixed based end condition

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Abstrak

This thesis continues the same research last year with a different condition. It presented a numerical study of the improvement of soft soil using columnar inclusions with Fixed Base End Condition. In this new condition the inclusions are assumed reach rock like layer condition. Review of analytical studies has been concentrated to British Standard BS8006, modified Terzaghi theorem, and arching theorem. Numerical model in this study is using FLAC3D code to generate 3D model. The materials properties used in this model refer to typical values. Some of important design variables have been considered in our parametric study. The most efficient platform thickness is 1m for loading 30kPa or more, in point of view to minimize the proportion stress on soft soil or to maximize ratio of load transferred to columns. Optimal area ratio A , is in range from 5% to 10% it depends on the considered parameters, but 10% is acceptable for most parameters. Study of stress distribution on column indicate that the negative friction will act on top part of column in any level of loading. Due to the mechanism of stress distribution, inclusion system could settle as a group. The maximum of stress reduction ratio S , and stress concentration ratio E , is obtained for the same value as Terzaghi analysis.