Arching in columnar inclusions-supported earth platform over soft soil

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Abstrak

This thesis presented a numerical study of the improvement of soft soil using columnar inclusions. Review of analytical studies has been concentrated to British Standard BS8006, modified Terzaghi theory, and arching theory. Numerical model in this study is using FLAC3D code to generate 3D model. The materials properties uses 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 lm 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% its depends on the considered parameters, but 10% is acceptable for most parameters. Study of stress distribution on column indicates 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 Sr and stress concentration ratio Er is obtained for the same value as Terzaghi analysis.