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Settlement Performance of Granular Column Reinforced Soil

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Abstract : The vibrated column has been widely used over the last three decades to improve the performance of soft ground and engineered compacted fill. The main reason for adopting this technique is that it is economically viable and environmental friendly. The performance of granular column with regards to bearing capacity has been well documented; however, information regarding the settlement behavior of granular columns is still limited. This paper aims to address the findings from a laboratory model study in terms of its settlement improvement. A 300 mm diameter and 400 mm high kaolin clay model was used in this investigation. Columns of various heights were installed in the clay bed using replacement method. The results in relation to load sharing mechanism between the column and surrounding clay just under the footing indicated that in short column, the available shaft resistance was not significant and introduces a potential for end braing failure as opposed to bulging failure in long columns. The settlement improvement factor corroborates well with field observations.

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