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Numerical Investigation of Embankment Settlement Improved by Method of Preloading by Vertical Drains

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Abstract : Time dependent settlement due to loading on soft saturated soils produces many problems such as high consolidation settlements and low consolidation rates. Also, long term consolidation settlement of soft soil underlying the embankment leads to unpredicted settlements and cracks on soil surface. Preloading method is an effective improvement method to solve this problem. Using vertical drains in preloading method is an effective method for improving soft soils. Applying deep soil mixing method on soft soils is another effective method for improving soft soils. There are little studies on using two methods of preloading and deep soil mixing simultaneously. In this paper, the concurrent effect of preloading with deep soil mixing by vertical drains is investigated through a finite element code, Plaxis2D. The influence of parameters such as deep soil mixing columns spacing, existence of vertical drains and distance between them, on settlement and stability factor of safety of embankment embedded on soft soil is investigated in this research.

Keywords : preloading, soft soil, vertical drains, deep soil mixing, consolidation settlement
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