Decision support system for optimum soft clay improvement technique for highway construction projects

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Abstract

Identifying a soft clay improvement strategy is a main challenging in highway construction projects due
to the various conditions involved. Hence, the objective of this paper is to present a Decision Support
System (DSS) to select the optimum soft clay improvement technique for this type of projects. Value
Engineering (VE) is integrated with Analytical Hierarchy Process (AHP) for the proposed (DSS). Using
the AHP provides a robust means of identifying the relative importance of any criteria or factors for soft
clay improvement alternatives. The scope of this study includes four of the most commonly used techniques
for soft clay improvement: soil replacement, pre-loading, vertical drains, and the construction
of embankments on piles. The proposed methodology was verified using four case studies of highways
under construction in northern Egypt. The results show that the proposed (DSS) successfully predicted
the optimum soft clay improvement technique in three out of the four cases.

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