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GEOSYNTHETIC REINFORCED PILE SUPPORTED EMBANKMENTS

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(09/8919)

Thesis submitted in partial fulfillment of the requirements for the degree of Master of

Engineering

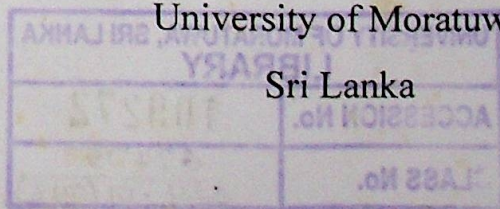
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Abstract of Thesis

The design of embankments on weak foundation soils is a challenge to the geotechnical Engineer. There are several issues related to bearing capacity failures, intolerable settlements and slope instability that need to be addressed. The piled embankments with the inclusion of a geosynthetic layer have proved to be one of the economic and effective techniques to handle such problems.

The inclusion of the geosynthetic reinforcement eliminates the need for inclined piles used in conventional piled embankments for resisting large lateral pressures. The geosynthetic layer enhances the load transfer mechanism and considerably minimizes the differential and maximum settlements.

This study attempts to analyze the various methods available today for the design of these structures. A numerical study is carried out. The effects of certain factors like pile modulus, stiffness of the geosynthetic reinforcement, height of the embankment, effect of the soil layer directly below the geogrid which are not considered by other available methods are studied using a finite element program – Plaxis 2D.

The results from two design methods are evaluated and compared with the results from Plaxis. It is found that numerical analysis was able to address many factors that were neglected by all the other available methods. It was also found to be more reliable than currently used methods. The German Draft Standard (EBGEO) approaches the numerical Plaxis calculations better than British Standard 8006

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