

PERMANENT DEFORMATION OF STABILIZED SUBGRADE SOILS

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ABSTRACT

Stabilization methods are often utilized to improve the performance of road pavement subgrades which are weak or whose performance is susceptible to small changes in moisture content. However, whilst a variety of performance models for natural materials have been developed and incorporated within road pavement design methodologies little research attention has been given to the characterization of similar performance models for stabilised subgrade soils. To address this, the research reported herein focuses on the permanent deformation characteristics and the development of associated models of performance for treated subgrade soils. The performance of three subgrade soils at varying moisture contents, each stabilised with lime and cement, is compared with those of naturally occurring soils. The results demonstrate an improvement in the performance of the stabilised material compared to their untreated natural state, albeit this improvement decreases with increased deviatoric stress. A statistical procedure is used to select the most appropriate models of material performance for the treated soils considered, by comparing the results of the permanent deformation with a number of performance models available in the literature. Thereafter the usefulness of the models for road pavement structural design is demonstrated via an analytical design procedure incorporating a finite element of the road pavement and the performance models.