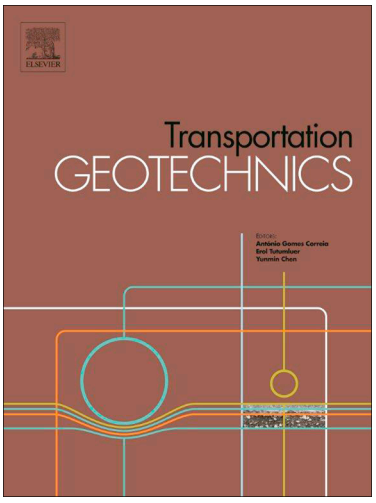

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Evaluating the Performance of Very Weak Subgrade Soils Treated/Stabilized with Cementitious Materials for Sustainable Pavements

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ABSTRACT: This paper presents the results of laboratory tests that were conducted to determine the proper treatment/stabilization recipe of very weak subgrade soils at high moisture contents, and to evaluate the corresponding performance-related properties [e.g., the resilient modulus and permanent deformation] for use in the design of sustainable pavement structures. Four different subgrade soil types of different plasticity indices were considered in this study. Three different moisture contents were selected at the wet-side of optimum that correspond to a raw soil strength value of 172 kPa (25 psi) or less. All the soils were treated with different combinations of class C fly ash (or Portland cement type I) and hydrated lime to achieve a 7-day target strength values of 345 kPa (50 psi) to create a working platform and 690 kPa (100 psi) to stabilize the subgrade for subbase application. Repeated load triaxial (RLT) tests were performed on laboratory molded specimens to evaluate their resilient modulus and permanent deformation behavior under cyclic loading. The AASHTO T-307 procedure was followed in this study to conduct the resilient modulus tests. A good correlation was observed between the water/additive ratio and the resilient modulus/permanent deformation, such that the soil specimens prepared at low water/additive ratio showed better performance than those prepared at high water/additive ratio. The results of laboratory tests showed that the use of direct correlation between unconfined

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