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Effect of synthetic Fibers on consolidation and Shear Strength of Clayey Soil

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Soft soils are well known for their low strength and high compressibility. Several techniques such as reinforcement are usually used for increasing the strength and reducing deformation characteristics of this kind of soil. Reinforcement of clayey soils with reeds, straw and other natural fibers has been practised before. This paper presents the results of an experimental study on the influence of short, discrete and randomly distributed fibers on the shear strength and consolidation of a clayey soil. Soil specimen types used in this study were consisted of clayey soil as the control treatment and clay mixed with different weight fractions of synthetic Fibers, 10, 20, & 30 percent. Series of triaxial compression tests were conducted in a conventional triaxial cell. Comparison of the results of triaxial compression tests show that the strength of clay soil increased with increasing the proportion of fibers. Consolidation tests were conducted according to ASTM tests to determine the consolidation settlement of samples. The results of consolidation tests show that the settlement and preconsolidation pressure of samples increased and decreased correspondingly with increasing the proportion of fibers.

Key words: clayey soil, synthetic fiber, shear strength, consolidation