

Review of Comparison of Subgrade Soil Stabilised with Natural, Synthetic, and Waste Fibers

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Abstract : Subgrade soil is an essential component in the design of road structures as it provides lateral support to the pavement. One of the main reasons for the failure of the pavement is the settlement of the subgrade and the high susceptibility to moisture, which leads to a loss of strength of the subgrade. Construction over weak or soft subgrade affects the performance of the pavement and causes instability of the pavement. If the mechanical properties of the subgrade soils are lower than those required, the soil stabilisation method can be an option to improve the soil properties of the weak subgrade. Soil stabilisation is one of the most popular techniques for improving poor subgrade soils, resulting in a significant improvement in the subgrade soil's tensile strength, shear strength, and bearing capacity. Soil stabilisation encompasses the various methods used to alter the properties of soil to improve its engineering properties. Soil stabilisation can be broadly divided into four types: thermal, electrical, mechanical, and chemical. The most common method of improving the physical and mechanical properties of soils is stabilisation using binders such as cement and lime. However, soil stabilisation with conventional methods using cement and lime has become uneconomical in recent years, so there is a need to look for an alternative, such as fiber. Although not a new technique, adding fiber is a very practical alternative to soil stabilisation. Various types of fibers, such as natural, synthetic, and waste fibers, have been used as stabilising agents to improve the strength and durability of subgrade soils. This review provides a comprehensive comparison of the effectiveness of natural, synthetic, and waste fibers in stabilising subgrade soils.

Keywords : subgrade, soil stabilisation, pavement, fiber, stabiliser

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