

A STUDY ON STRENGTH CHARACTERISATION OF SOILS MIXED WITH FLY ASH, SCRAP TYRE MATERIALS AND CEMENT

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In this study, the individual or combined effect of fly ash and tyre fibre on stress-strain-strength characteristics of two soils, a fine-grained residual lateritic soil (red soil) and granular riverbank sand (Brahmaputra sand), with or without cement was investigated. The fly ash content used in this study varies from 20% to 50% content by weight. Tyre buffings and tyre crumb which were used as scrap tyre materials were added to the soil mix varying from 5% to 10% content by weight. The amount of cement added ranges from 1% to 2% by weight of the various soil mixes. Specimens were statically prepared based on the maximum dry unit weight and optimum moisture content and then subjected to strength tests. For each mix, unconfined compression and triaxial compression test was carried out on the as-compacted specimen with curing period of 0, 3, 7, 14 and 28 days.

Inclusion of fly ash and tyre buffings to both the soil types reduces the dry unit weight. Improvement in unconfined compressive strength has been observed with the addition of fly ash to the sand and also with curing period which does not occur in case of the red soil mixes. Addition of tyre buffings to red soil-fly ash mixes reduces the strength, but increases the shear strength of sand-fly ash mixes especially in higher confining pressure. However, addition of cement to soil-fly ash-tyre fibre mixes can lead to considerable improvement of shear strength of the soil. Improvement in strength of different soil mixes is seen with the increase in curing period. Moreover, soil-fly ash-tyre buffing mixes containing 35% or 50% fly ash and 5% tyre buffing content along with cement have been found to have some potential for use in the construction of roads.