

EFFECT OF RANDOM INCLUSION OF BAMBOO FIBERS ON STRENGTH BEHAVIOUR OF FLYASH TREATED BLACK COTTON SOIL

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ABSTRACT

This paper describes the compaction and strength behaviour of fly ash treated black cotton soil (BC soil) reinforced with bamboo fibers. The optimum percentage of fly ash was found to be 20% by weight of soil. Bamboo fiber of average diameter 0.45 mm and 25 mm length is used in this study. It was randomly included into the fly ash treated soil at four different percentages of fiber content, i.e. 0.25, 0.5, 0.75 and 1% (by weight). The reinforced soil samples were subjected to unconfined compression test and compaction tests. It is found that strength properties of optimum combination of BC soil-fly ash specimens reinforced with bamboo fibers is appreciably better than untreated BC soil. An optimum fiber content of 1% (by weight) is recommended for strengthening flyash treated BC soil.

Key words: bamboo fiber, flyash, maximum dry density, unconfined compressive strength.

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1. INTRODUCTION

Construction of foundation for structures on black cotton soil (BC soil) is highly risky on geo-technical grounds because such soil is susceptible to differential settlements, poor shear strength and high compressibility. Chemical stabilization is one of the oldest methods of stabilization of problematic soil. In recent days it has been investigated that addition of fibers will improve the ductility behaviour of the soil there by reducing the development of crack during shrinkage.

Extensive study has been carried out on the stabilization of expansive soils using various additives such as lime, cement, flyash, industrial waste products etc., and also with random inclusion of fibers such as coir, sisal, polyester fibers etc. Randomly oriented tensile inclusions incorporated into soil to improve its load–deformation behaviour by interacting with the soil particles mechanically through surface friction and