



STUDY ON EFFECTS OF STABILIZATION ON EXPANSIVE SOILS USING MARBLE DUST WASTE

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ABSTRACT

The aim is to improve the engineering properties of black cotton soil such that the pavement to be built on such type of soil can efficiently withstand to the applied loads. The main objective of this research is to investigate the possibility of utilizing waste marble dust in stabilizing problematic soils (especially swelling clays). Such soils swell when given an access to water and shrink when they dry out. Several attempts are being made to control the swell-shrink behaviour of these soils. Soil stabilization using chemical admixtures is the oldest and most widespread method of ground improvement. In this study waste marble dust, by-products of marble industry were used for stabilization of expansive soils. To achieve, higher strength, chemical stabilization such as addition of lime or other chemical additives are also used to increase the strength of the BC soils. Use of geo-synthetics is also another way of increasing strength. At last it was also found that engineering properties of black cotton soil substantially improved by addition of marble dust in different proportions from 1% to 4%.

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INTRODUCTION

Soil stabilization may be defined as the alteration or preservation of one or more soil properties to improve the engineering characteristics and performance of a soil. Stabilization, in a broad sense, incorporates the various methods employed for modifying the properties of a soil to improve its engineering performance. Soil stabilization refers to the procedure in which a industrial by product, cementing material, or other chemical materials are added to a natural soil to improve one or more of its properties. One may achieve stabilization by mechanically mixing the natural soil and stabilizing material together so as to achieve a homogeneous mixture or by adding stabilizing material to an undisturbed soil deposit and obtaining interaction by letting it permeate through soil voids. Soil stabilizing additives are used to improve the properties of less-desirable road soils. When used these stabilizing agents can improve and maintain soil moisture content, increase soil particle cohesion and serve as cementing and water proofing agents. A difficult problem in civil engineering works exists when the sub-grade is found to be clay soil. Soils having high clay content have the tendency to swell when their moisture content is allowed to increase.

SOIL STABILIZATION

Soil stabilization is one of the oldest and most widespread techniques among the ground improvement methods because construction on soft ground is a main problem in civil engineering. If the ground is untreated, it is not good enough for the construction, and the bearing capacity or slope failure may occur because of insufficient soil strength.

Stabilized soil is, in general, a composite material that results from a combination and optimization of properties in individual constituent materials. Well-established techniques of soil stabilization are often used to obtain geotechnical materials improved through the addition into soil of such cementing agents.