

CHARACTERISTICS OF PROPERTY CHANGES OF TWO STAGE LIME-CEMENT STABILIZED EXPANSIVE SOILS

C. LUCIAN

Lecturer, School of Real Estate Studies (SRES),
ARU. P.O. Box 35176, Dar es Salaam.

Abstract

This paper investigates changes in geotechnical properties of two stage lime-cement stabilized expansive soils. The report illustrates the basic reactions that occur between these stabilizers and soil and the mechanisms that result in stabilization. To maximize the effect of short term reactions in reducing plasticity and increasing workability of expansive soils, the mellowing period was determined. To establish the minimum lime content consumed in the initial ion exchange reaction in a soil-lime mixture, the Initial Consumption of Lime (ICL) was ascertained. Equally, the optimum cement content required for remix after the mellowing period in order to achieve a homogeneous mixture was determined. Because the initial consumption of lime (ICL) of 3.5% with the mellowing period of 4 hours was established for the expansive soils, the lime stabilization of 4%, 6%, 8% and 10% of lime by weight of dry soil was added to the soils and cured for 7, 14 and 28 days. Cement contents of 2%, 4% and 6% were used for the lime-modified soils. Both treated and untreated soil specimens were tested in the laboratory to examine the mechanisms of geotechnical property changes. The Unconfined Compressive Strength (UCS) increased considerably with increase in lime content and curing period. The results of this study show that the overall behavior of expansive soil can be successfully stabilized by the combined action of lime and cement in a two-stage reaction process.

Keywords: Expansive Soils; Mellowing Period; Initial Consumption of Lime (ICL); Stabilization