A STUDY ON THE PERFORMANCE OF LIME SLURRY STABILIZED KAOLIN CLAY

BY

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ABSTRACT

Clay soil can be stabilized by the addition of small percentages, by weight, of lime, thereby enhancing many of the engineering properties of the soil and producing an improved construction material. As lime stabilization is most often used in relation to road construction, the tests were chosen with this in mind. This study describes a study on the performances of lime slurry stabilized kaolin clay. This study, effect of lime on kaolin clay soil has been investigated. The lime slurry was used in this study. The kaolin clay was mixed with various additions of lime slurry in four different proportions which are 10%, 20%, 30% and 40% lime slurry. The samples were cured from immediate to 14 days. In order to illustrate the strength of the samples, unconfined compressive stress tests were conducted by its curing period. The results of the study show that the soil maximum dry density is found to decrease while the optimum water content is found to increase with increase in the lime slurry content. The unconfined compressive stress increases with increasing addition of lime slurry and the time length of curing the samples. From the results the optimum mixture of lime slurry for kaolin clay was found at 20% addition lime slurry.

Key word: Kaolin clay, Lime stabilization, and Unconfined Compressive test.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The addition of lime to soils to improve their use for construction purposes has a very long history. For instance, *(McDowell, 1959)* mentioned that stabilized earth roads were used in ancient Mesopotamia and Egypt, and that the Greeks and Romans used soil-lime mixtures. More recently the first tests involving soil stabilization were carried out in the United States in 1904 *(Clare and Cruchley, 1957).* Lime was first used as a stabilizing agent of soil in modem construction practice in 1924 on short stretches of highway strengthened by the addition of hydrated lime *(McCaustland, 1925).* With the expansion of roads to cater for the growth of motor traffic in the 1930s, the use of stabilization of soils began to increase. It was extensively used during the Second World War for road and runway construction. Today stabilization of clay soil by incorporation of lime is a technique widely used throughout the world to improve its use in construction. It is used in road construction to improve sub-bases and subgrades, for railroad and airport construction, for embankments, as soil exchange in unstable slopes, as backfill for bridge abutments and retaining walls, as canal linings, for improvement of soil beneath foundation slabs and for lime piles *(Anon, 1985, 1990).*