

Thesis Title	Effect of Delayed Compaction on Strength of Soil Cement
Thesis Credits	12
Candidate	Mr. Wanchai Yordrit
Supervisor	Prof. Dr. Teeracharti Ruenkairergsa
Degree of Study	Master of Engineering
Department	Civil Engineering
Academic Year	1998

Abstract

This thesis is the study of the effect of the delayed time before compaction, from 0 to 240 minutes, to the strength of soil cement, comparative to its strength under normal testing condition (no delay). The samples of soil in this study are collected from different sources in the southern and the northeastern regions of Thailand. There are four kinds of soil, i.e. Breccia, Lateritic Soil, Decomposed Granite and Silty Sand. The samples of soil cement is prepared by mixing those kinds of soil with Portland cement contents of 2, 4, 4 and 4 percent, respectively. Then they are tested and compared for the Unconfined Compressive Strength (UCS), California Bearing Ratio (CBR) and Initial Tangent Modulus (E_i). The test is performed by using Modified Proctor Compaction method after 7 days curing period. In UCS and CBR testing, the step of delayed time before compaction is added at 30, 60, 90, 120, 180 and 240 minutes. Furthermore, the same series of test is also performed with those samples of soil mixed with Silica cement at the same cement contents as those of Portland cement to study the effect of cement type to the strength of soil cement.

From the study of the samples of soil mixed with Portland cement and those mixed with Silica cement, it is found that as the delayed time before compaction is increased, the values of UCS, and Unsoaked CBR are decreased. This indicates that the delayed time before compaction effects the bearing efficiency of soil cement. The relationship between UCS and Unsoaked CBR is considered to be a straight line. This relationship on the samples of soil from Silty Sand is less scattered than those from Breccia, Lateritic Soil and Decomposed Granite. In addition, kinds and categories of soil samples of soil cause little difference in the decrease of the

UCS and Unsoaked CBR. That is, samples of Granular soil (Breccia and Lateritic Soil) has more decreasing rate than those of Cohesive soil (Silty Sand and Decomposed Granite). This shows that soil-particle size effects the decrease of UCS and Unsoaked CBR.

The straight line indicating the relationship of CBR and the delayed time before compaction at 0, 30, 60, 90, 120, 180 and 240 minutes from samples of soil mixed with Portland cement has more slope than that of samples mixed with Silica cement. The straight line indicating the relationship of Unsoaked CBR and the delayed time before compaction also shows the same pattern. This indicates that mixing of soil sample with Portland cement reduces the strength of UCS and Unsoaked CBR more than that of those mixed with Silica cement.

Keywords : Delayed Compaction / Soil Cement / Soil Stabilization