Effect of Size and Shape of Soil-Cement Specimens on Compressive Strength

A.Yoganathan, and N.H.Priyankara

Department of Civil and Environmental Engineering, Faculty of Engineering, University of Ruhuna, Sri Lanka.

Abstract

The increase in population and urbanization has resulted in a scarcity of land and it has induced Engineers to construct even in soft soil. Construction on soft soil is an arduous task due to its unfavorable behaviour. In order to improve soft soil, implementing an effective and economical method to overcome the problematic nature of soft soil has become more challenging. Installation of soil-cement columns is one of the most efficient and economical methods practiced in most developed countries. Compared to other stabilizing agents, cement enhances strength due to its pozzolanic reaction. In this research, the effect of the size and shape of the sample on compressive strength at different percentages of cement and different curing periods was analyzed. To improve the soft soil, rather than installing a soil-cement column, in-situ mixing is also an effective way. Comparison of compressive strength and the area improved through both in-situ mixing and installation of pre-cast soil-cement column methods have been investigated. Laboratory test results indicated that compressive strength obtained after 7 days is 0.75 to 0.85 times more than that of 28 days strength, and 1.0 to 1.1 times the strength of 28 days is obtained after 90 days. The compressive strength obtained for a cube is 0.96 times the strength obtained by a large cylinder at 10% cement dosage. Hence, it can be concluded that there is no significant effect of the shape of the sample on the compressive strength of soil-cement mixtures. Further, test results clearly illustrated that the larger the sample, the greater the strength. The strength of the in-situ sample is 4 times that of the precast sample due to more area improvement in in-situ mixing.

Keywords: *Compressive Strength, In-situ mixing, Soil-cement Columns, Stabilizing Agent.*

Corresponding Author: *yogdharshi2478@gmail.com*