

SWELLING CHARACTERISTICS OF LIME-TREATED EXPANSIVE SOILS

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ABSTRACT

This paper presents a direct evaluation of the optimum lime content for treatment of expansive soils. Over fifty overburden swell tests were conducted in which samples treated with different percentages of hydrated lime were subjected to similar laboratory tests and the optimum lime content was determined. The test results indicated that the addition of lime is effective up to 2%, after which it starts to give a reverse effect on the swell characteristics of the tested soil. The swell percentage was twice that of the untreated soil for both 4% lime and 6% lime and about 1.75 that of the untreated soil for 8% lime. Curing time was found to reduce the amount of swell especially when the samples were treated with high percentage of lime. A new parameter termed the Lime Treatment Swell Ratio (LTSR) is introduced and used for characterizing the effectiveness of lime treatment. Both volume change and swell pressure were found to be minimal for lime content of 1%. This is significantly lower than the 4% to 6% lime usually obtained based on the results of consistency indices, pH, and unconfined compressive strength tests.