

Key Parameters for Controlling Swell of Expansive Soil-Hydraulic Cement Admixture

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Abstract : Expansive soils are more complicated than normal soils, although the soil itself is not very complicated. When evaluating foundation performance on expansive soil, it is important to consider soil expansion. The primary focus of this study is on hydraulic cement and expansive soil mixtures, and the research aims to identify key parameters for controlling the swell of the expansive soil-hydraulic cement mixture. Treatment depths can be determined using hydraulic cement ratios of 4%, 8%, 12%, and 15% for treating expansive soil. To understand the effect of hydraulic cement percentages on the swelling of expansive soil-hydraulic admixture, performing the consolidation-swell test σ^{ics} is crucial. This investigation primarily focuses on consolidation-swell tests σ^{ics} , although the heave index C_h is also needed to determine total heave. The heave index can be measured using the percent swell in the specific inundation stress in both the consolidation-swell test and the constant-volume test swelling pressure. Obtaining the relationship between swelling pressure and σ^{icv} determined from the "constant volume test" is useful in predicting heave from a single oedometer test. The relationship between σ^{ics} and σ^{icv} is based on experimental results of expansive soil behavior and facilitates heave prediction for each soil. In this method, the soil property "m" is used as a parameter, and common soil property tests include compaction, particle size distribution, and the Atterberg limit. The Electricity Generating Authority of Thailand (EGAT) provided the soil sample for this study, and all laboratory testing is performed according to American Society for Testing and Materials (ASTM) standards.

Keywords : expansive soil, swelling pressure, total heave, treatment depth

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