

Development of Stabilizer for Accelerated Curing

Abstract

A laboratory experiment was conducted to evaluate the effect of two products designed to accelerate the strength improvement during the stabilization of a silty-sand (SM) material with nontraditional stabilizers. SM soil samples were mixed with various stabilization products and accelerators and compacted. Each sample was subjected to “wet” and dry testing following the designated cure period. Nine nontraditional stabilizers were evaluated in this experiment including lignosulfonates, polymers, silicates, and tree resins. Two accelerator products were evaluated including an acrylic polymer and Type I portland cement. Additional samples were stabilized with either an asphalt emulsion or cement to provide a comparison to traditional stabilizers under the same mixing, compaction, and curing conditions. The analysis of the data consisted of determining the average unconfined compressive strength (UCS) of three replicate samples of each mixture. The average UCS of the three replicates of each mixture was compared to the average strength results of the remaining mixtures, the traditional stabilization results, and a series of control samples that were not stabilized. The average UCS was determined at 1 and 7 days.