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<b>16. ABSTRACT</b> <p>Additions of byproduct chemicals, such as fly ash or cement kiln dust, have been shown to increase the unconfined compression strength (UCS) of soils. To be considered effective, the soil must exhibit a strength increase of at least 50 psi. Many current design methods base chemical additive percentage recommendations on the results of Atterberg Limit tests which do not always properly characterize the soil stabilization response. For example, Atterberg limit tests may reveal the same AASHTO classification of soil at two different sites, but one site may require more than twice the additive percentage of a chemical to achieve the desired UCS increase.</p> <p>This study examined the relationship between soil physico-chemical parameters and unconfined compression strength in various fine-grained soils to determine if other soil parameters have significant effects on predicting the strength of a soil treated with a given additive and additive content. The results of this study suggest that the surface area and shrinkage properties of the soil, combined with the Atterberg limit results, present a better picture of a given soil and will allow for better predictions of the amount of chemical stabilizer needed to adequately stabilize the soil.</p>			
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