

Utilization of Silo Stored and Pondered Class C Fly Ash in Road Bases

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Class C fly ashes are being increasingly produced by coal burning utilities that use sub bituminous coal from Wyoming. These ashes are characterized by their self-cementing property and, therefore, they can be used for clay sub-grade improvement as cement surrogates or as road sub-grade material. This paper focuses upon the laboratory evaluation of, (1) the stabilization characteristics of clay soils blended with Class C fly ash, and (2) residual self-cementation capacities of pondered Class C fly ash. Our previous testing has shown that the stabilization characteristics are closely related to the soil mineral type and plasticity. To examine these effects, ideal clay soils with known mixtures of kaolinite and montmorillonite are used. Results are presented for strength gain behavior with curing period and curing condition for the various soil-fly ash blends. For this purpose, the compacted samples are cured in three environments: (1) stored in plastic bags and cured at 40 °C, (2) in a moist chamber with humidity controlled at 80% at a temperature of 27 °C, and (3) in a less controlled laboratory environment with atmospheric humidity and temperature variations. The samples cured under the first conditions are used to investigate the strength and stiffness development behavior of stabilized clays by performing unconfined compression tests at 3, 7, 14, 28, 56 and 112 days of curing. The strength and stiffnesses obtained from samples cured under other two conditions are compared at 7 and 28 days. In addition, the residual self-cementation capacities of pondered Class C fly ash are investigated through unconfined compression and CBR tests performed at 7 and 14 days of curing.

Reference:

Misra, A. (1998), "Stabilization Characteristics of Clays using Class C Fly Ash," Transportation Research Record, No. 1611, 46-54.