

Abstract for World of Coal Ash Conference, Lexington, Kentucky, May 4-7, 2009
Topics: CCPs and sustainable construction
Presentation as a Paper

Properties of Pavement Geomaterials Stabilized with Fly Ash

Lin Li¹, Tuncer B. Edil², Craig H. Benson²

¹Department of Civil and Environmental Engineering, Jackson State University, Jackson, MS 39217; ²Department of Civil and Environmental Engineering, University of Wisconsin-Madison, Madison, WI 53706

KEYWORDS: fly ash, soft soil, recycled pavement material, road surface gravel, pavement, falling weight deflectometer, stiffness, strength.

ABSTRACT

This paper describes an evaluation of mechanical performance of fly ash stabilized materials. Soft clay soil, asphaltic recycled pavement material (RPM), and road-surface gravel (RSG) were stabilized using Class C, off-specification, and high carbon fly ashes to create working platforms for construction of flexible and rigid pavements. Six field sites were conducted in Wisconsin and Minnesota to increase the strength and stiffness of the soft subgrade, RPM, and RSG. California bearing ratio (CBR), resilient modulus (M_r), and unconfined compressive strength (q_u) tests were conducted on the subgrade soil, RPM, and RSG alone and the stabilized soil, RPM, and RSG (S-PRM and S-RSG) to evaluate improvement of bearing resistance, stiffness, and shear strength due to fly ash stabilization. *In situ* measurements were also made with a soil stiffness gauge (SSG), dynamic cone penetrometer (DCP), and a falling weight deflectometer (FWD) during and after construction. Fly ash stabilization improved the stiffness and strength of most of the materials significantly. After 7 d of curing, CBR of the stabilized materials (10 to 150) was two to ten times the CBR of the materials alone (1 to 50). The M_r of the stabilized materials ranged between 20-200 MPa after 7 d of curing, whereas the M_r of the materials alone was 10~120 MPa. Unconfined compressive strength of the stabilized materials ranged between 150 kPa and 800 kPa, whereas the materials alone had unconfined strength of 1~200 kPa. Correlations between the CBR, M_r , q_u , SSG, and dynamic penetration index (DPI) for the fly ash stabilized materials are reported.

Submitted for consideration in the 2009 World of Coal Ash Conference, May 4-7, 2009