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ΣΕΜΙΝΑΡΙΟ

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ΘΕΜΑ: **FLYASH: A RESOURCE MATERIAL**

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΕΙΧΗΜΥΘ-ΙΤΕ

ΗΜΕΡΟΜΗΝΙΑ: Τετάρτη, 1 Αυγούστου 2001

ΩΡΑ: 19:00

ΠΕΡΙΛΗΨΗ

The construction of many coal-fired power plants, as a result of the energy crisis of the 70's, had yielded the attendant by-product of flyash and the Environmental Protection Agency of the U.S. government mandated its safe disposal and/or beneficial utilization. As a part of the latter, flyash found its way in the stabilization of expansive soils derived from shales, in its role as a binding agent for mixed aggregate base courses, in the solidification of drilling fluid wastes, in reducing the deleterious effects of acid mine drainage and reclaiming land damaged by oil-drilling operations, not to mention concrete mixes.

This seminar presents some of our findings and experiences at the University of Oklahoma in these areas. An expansive shale roadbase, stabilized with flyash, received a 200 mm asphaltic concrete surface layer and after six years of operation showed better than average performance. Field samples indicated an amelioration of texture and less plasticity and pavement deflections were well controlled. XRD studies showed reduction of the clay mineral areas under the peaks and the SEM observations reveal a dense degree of packing and reduction of the void-domain area.

The benefit of adding flyash to various types of fine and coarse aggregate pavement mixes is attested by compressive strength gain, as high as 11 MPa. XRD measurements indicated massive formation of ettringite, transforming to monosulfoaluminate and the crystallized hydrated phases of C-A-H, C-A-S-H, and C-S-H. SEM observations depict progressive packing and densification of the skeletal matrix.

Water based drilling muds typically contain clays, barite, lime, caustic soda and polymers. Land disposal of these wastes raises the possibility of groundwater pollution which can be abated when the waste is solidified with flyash through cementation. EP toxicity tests showed primarily arsenic, barium and lead were controlled. Acid mine drainage (AMD) is being recognized as a major pollution source to surface water. Heavy trace metals emanating from abandoned mines are continuously being released and contaminating surrounding lakes and

streams. By applying fluidized bed ash to the polluted water in an actual field in Oklahoma, it was possible to meet the U.S. EPA water quality criteria for effluent standards for total iron, manganese, suspended solids and pH. The minimization of the environmental import of AMD, in another field area, was attained by injecting flyash in slurry form into the mine and notable results were observed in terms of pH increase and total metal concentrations decrease.

Flyash and fluidized bed ash have been successfully used as a partial replacement of portland cement in concrete and in liners for solid waste landfills, but cracking has to be controlled or somehow regulated.

CURRICULUM VITAE OF JOAKIM G. LAGUROS

Joakim Laguros was born in Istanbul in 1924. He received his B.S.C.E. degree from Robert College in 1946 and his Ph.D. degree from Iowa State University, Ames, Iowa, in 1962. He has taught at Robert College, Iowa State University, Ohio University, and for 31 years at the University of Oklahoma. For the year 1974-1975 he was a Visiting Professor at the University of Patras with the primary mission to organize the Department of Civil Engineering. From 1946 to 1951 he worked in the field in highway construction and from 1951 to date he devoted his time to teaching, research and consulting in geotechnical engineering and highway construction materials with the last 20 years emphasizing the utilization of flyash. His research has been funded primarily by the Oklahoma Department of Transportation and the Federal Highway Administration. He has 105 publications to his credit primarily in the area of highway materials, expansive soils and their stabilization, and flyash.

He received numerous awards and honors (Fulbright 1954, Phi Kappa Phi 1955, Sigma Xi 1962, Halliburton Distinguished Lecturer 1981, Engineering Dean's Merit Service 1989, Provost's Outstanding Academic Advising 1992) culminating in the David Ross Boyd Distinguished Professorship (1984). He has been very active in the American Society of Civil Engineers, Fellow grade, holding numerous offices and the presidency of the Oklahoma Section in 1988. He is a member of the National Committee of the Pipeline Division.

He has also been very active with the Transportation Research Board, National Research Council, of which he was the University representative from 1966 to 1991. As a member of the Committee on the Physicochemical Phenomena of Soils 1969-1991, he served as its Chairman for the period 1973-1979.

Although retiring in 1994, he has been asked to do some teaching and he is currently a member of the Research Council of the Oklahoma Department of Transportation.

Για περισσότερες πληροφορίες μπορείτε να επικοινωνείτε με την Κλεάνθη Ζαχαροπούλου
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