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DEVOLOPING SPECIFICATIONS FOR WASTE GLASS, MUNICIPAL WASTE COMBUSTOR ASH AND WASTE TIRES AS HIGHWAY FILL MATERIALS (CONTINUATION) Volume 1 of 3 (Municipal Waste Combustor Ash)	APRIL 1995
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P. J. Cosentino, E. H. Kalajian, C-S. Shieh and H. H. Heck	
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15. Supplementary Notes

16. Abstract

A two year study was conducted as a continuation project for the Florida Department of Transportation (FDOT) to evaluate Municipal Waste Combustor (MWC) ash, Waste Glass, and Waste Tires for use as general highway fill. Initial studies conducted at Florida Tech concluded that MWC ash and waste glass possess engineering properties required for highway applications and the environmental characteristics were satisfactory for field deployment. The results of these studies are presented in three volumes. Volume I summarizes the findings for MWC Ash, Volume II summarizes findings for Waste Glass and Volume III summarizes findings for Waste Tires.

During this continuation study field demonstration projects using MWC ash and waste glass indicated that conventional construction methods and techniques were applicable. A comprehensive literature review was completed on the waste tires and their use as highway fill by state DOT's. It revealed that waste tires are highly compressible, but with adequate processing they can be used as highway fill.

For the field demonstration project involving the MWC ash a 82 foot (25 m) long, 32 foot (9.8 m) wide, 4 foot (1.2 m) high embankment was constructed using treated combined ash. A runoff and leachate collection system were installed for environmental monitoring. The geotechnical properties showed that combined ash exhibits high strength while being relatively free draining. An environmental analysis of 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) indicated that the leachate and runoff concentrations were below surface water standards and below drinking water standards for all elements except an initial peak of selenium.

Laboratory studies conducted on combined ash from all 12 Florida waste-to-energy facilities indicated it would classify as either a well graded or poorly graded sand (SW or SP according to United Soil Classification System). The combined ash meets engineering criteria established by FDOT for use as a highway subgrade material.

The investigation of the environmental properties of waste glass revealed it can be cleaned to meet EPA drinking water standards at a reasonable cost. An outdoor reactor system was used to evaluate the environmental characteristics of waste glass leachate and waste glass cleaning methods. Prior to handling, the waste glass was crushed at a materials recovery facility. The waste glass was cleaned using two methods; direct rainfall and recirculating rinse water. Leachate from the system was analyzed for BOD5, TKN, and Phosphorus. These techniques produced leachate that initially exceeded drinking water standards, but that became clean within a reasonably short time.

For the field demonstration project involving the waste glass a 300 foot (91.5 m) section of subgrade was stabilized to a depth of 6 inches (2.4 cm) on a residential street using approximately 15% waste glass by volume. The subgrade stabilization was accomplished by mixing the waste glass with both the highly deteriorated pavement surface plus the existing base. Subgrade CBR, density and moisture contents data were collected. The construction process produced an acceptable subgrade.

Shredded tires exhibit engineering properties that are favorable for use in highway construction. They are a lightweight, free draining material, however, they undergo large initial displacements upon loading. The waste tire literature indicated that a major concern with waste tire fills was combustion. Fills in Washington and Colorado have combusted, causing numerous environmental concerns and hazards. Combustion can be avoided by proper sizing and placement. The state wide survey revealed that less than 1% of the nearly 14 million scrap tires generated yearly in Florida are available for use as highway fill. The majority of the tires are burned in either waste-to-energy facilities or in the tire-derived-fuel facility.

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