

**OHIO COAL DEVELOPMENT OFFICE
ANNUAL PROJECT ABSTRACT
AS OF DECEMBER 2004**

- | <p>1. <u>Project Sponsor</u>
The Ohio State University
470 Hitchcock Hall
2070 Neil Avenue
Columbus, Ohio 43210</p> <p>3. <u>OCDO Grant No.</u> CDO/D-00-5</p> <p>5. <u>Project Title:</u> Full Scale Testing of Coal Combustion Product (CCP) Pavement Sections Subjected to Repeated Wheel Loads</p> <p>6. <u>Project Term:</u> From: <u>December, 1, 2001</u> To: <u>June 30, 2005</u></p> <p>7. Project Update <u> X </u> OR Final Report <u> </u></p> <p>8. <u>Budget:</u></p> <table border="0" style="width: 100%;"><thead><tr><th style="text-align: left;"><u>Co-Sponsor's Name</u></th><th style="text-align: right;"><u>Cost Share</u></th></tr></thead><tbody><tr><td>OCDO</td><td style="text-align: right;">\$868,055</td></tr><tr><td>The Ohio State University</td><td style="text-align: right;">\$579,009</td></tr><tr><td>Ohio University</td><td style="text-align: right;">\$292,844</td></tr><tr><td style="text-align: right;">TOTAL PROJECT VALUE</td><td style="text-align: right;"><u>\$1,739,908</u></td></tr></tbody></table> | <u>Co-Sponsor's Name</u> | <u>Cost Share</u> | OCDO | \$868,055 | The Ohio State University | \$579,009 | Ohio University | \$292,844 | TOTAL PROJECT VALUE | <u>\$1,739,908</u> | <p>2. <u>Project Manager</u>
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|--|--------------------------|-------------------|------|-----------|---------------------------|-----------|-----------------|-----------|---------------------|--------------------|---|
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ABSTRACT

9. OVERVIEW OF PROJECT & OBJECTIVES: The goal of the proposed program is to establish field-verified relationships for the service performance, structural, and environmental behavior of flexible and rigid pavements constructed of CCPs. This goal will be accomplished with a coordinated program of testing and analyzing small-scale laboratory tests, and construction, instrumentation, and monitoring of full-scale CCP pavements under accelerated loading. The accelerated pavement loading tests under controlled conditions of temperature and moisture will allow the research team to predict the 10-year highway traffic response of CCP pavements in time frames of 4-6 months. This will allow us to evaluate the long-term effect of traffic loads on CCP pavements in time periods typical of laboratory experiments. Current educational and technology transfer efforts with state and national regulators, and potential users of CCPs for highway applications, will be strengthened in collaboration with the CCP Extension Program at The Ohio State University.

As a result of this project, we will be able to answer several critical questions about the response of flexible and rigid pavements constructed of fly ash, bottom ash, and FGD materials. These

critical questions include: how does the response of pavements constructed of CCPs compare with those of natural materials, what is the expected service life of CCP and conventional pavements, what effect does subsurface moisture infiltration have on the response of pavements, and what is the quality of the leachate that may be released from CCP and conventional pavements.

10. WORK TO DATE & CONCLUSIONS: Small-scale laboratory tests were carried out to determine the optimal mix of CCPs for flexible and rigid pavement components. The design mixes were used to construct six pavement sections (four CCPs and two control mixes) at the Accelerated Pavement Load Facility in Lancaster, Ohio. The sections were instrumented with structural and environmental monitoring devices. The sections were subjected to 20 years of highway traffic (1 million ESALs) and the response as well as performance of the sections was measured as a function of the loading.

11. PLANS FOR COMING YEAR: The full-scale pavement sections will be subjected to environmental loads and additional wheel loads of up to 1 million ESALS (20 years of State Route traffic). The structural, serviceability, and environmental performance of CCP and control sections will be measured. Laboratory chemical and engineering tests on small-scale samples collected during pavement construction will continue. Presentations will be made to prospective users of this technology as well as at technical conferences. Articles will be written for publication in archival journals.

12. HIGHLIGHTS/ACCOMPLISHMENTS: Developing economical alternatives to landfilling coal combustion products is of vital importance to the State of Ohio. The identification of these materials as acceptable safe alternatives to natural materials currently used in flexible and rigid pavements, could result in more durable infrastructure for Ohio and significantly reduce the cost of electric power and help conserve the state's natural resources.

13. ARTICLES/PRESENTATIONS:

Walker, H., Cheng, C.M., Taerakul, P., Butalia, T.S., and Wolfe, W.E., Environmental Monitoring of Full-Scale Coal Combustion Product (CCP) Pavements During Accelerated Loading, 21st Annual International Pittsburgh Coal Conference, Osaka, Japan, September 13-17, 2004