



Researcher

Dr. Thomas Van Dam, P.E.
Adjunct Associate Professor
Department of Civil and
Environmental Engineering
Michigan Technological Uni-
versity

tvandam@mtu.edu
906.369.2524

Sponsor

University Transportation
Center-MiSTI with support
from LaFarge North Amer-
ica, We Energies and Min-
eral Resource Technologies

Project Title

Investigation of the Use of
Full Depth Reclamation with
Industrial Byproducts for
Stabilization of the Road
Base

Co-Investigators

Michigan Tech University
Anne Peairs, MS Student

Project Summary

Technology Transfer Outreach Publication

Investigation of the Use of Full Depth Reclamation (FDR) with Industrial Byproducts for Stabilization of the Road Base

The objective of this project is to compare different mixtures of class C fly ash, bottom ash, cement kiln dust, and asphalt emulsion for stabilizing reclaimed asphalt road bases. Different test sections will be compared to determine using visual assessment and a falling weight deflectometer to determine the effectiveness of each treatment.

Methodology

Each test section will be monitored using distress identification surveys and falling weight deflectometer testing. The use of periodic distress identification surveys will enable the assessment of pavement performance over time. Data from the falling weight deflectometer will be used to assess structural capacity through analysis of deflections to obtain back-calculated layer moduli. This will allow comparisons to be made between the sections with regards to predicted structural performance.

Research Findings

The anticipated research findings will include the following:

- Determination of the effectiveness of various combinations of industrial residuals in full-depth reclamation leading to long-term pavement performance.
- Broader understanding of full-depth reclamation using industrial residuals, leading to greater acceptance and use.

Project Summary

Technology Transfer Outreach Publication



University Facts

| | |
|---------------------|-------|
| Total Enrollment | 6,550 |
| Graduate Enrollment | 916 |
| Number of Faculty | 417 |
| Placement Rate | 95% |

Michigan Tech is located in Houghton, MI on the south shore of Lake Superior. This rural area is known for natural beauty, pleasant summers, abundant snowfall, and numerous all-season outdoor activities. In addition, the University maintains its own downhill and cross-country ski facilities and golf course. There are numerous cultural activities and opportunities on campus and in the community. Michigan Tech has also been rated as one of the safest college campuses in the United States, and the local community provides excellent resources conducive to an outstanding quality of life.

www.mtu.edu

Anticipated Implementation

Showing that full depth reclamation using fly ash, bottom ash, and/or cement kiln dust as stabilization material perform equal to or better than non-recycled roads will allow more implementation of this method, making effective use of material that is often considered a waste and land filled.

Benefits

The American Coal Ash Association 2005 survey recorded over 123 tons of coal combustion products produced that year. Finding viable uses of these and other industrial residuals decreases the amount that is wasted in landfills. Also, increased use of industrial residuals decreases the cost of road construction. Full depth reclamation decreases the amount of virgin aggregates needed saving resources, while fly ash and cement kiln dust increases the support for the pavement surface. All these factors lead to more sustainable transportation infrastructure.

Future Work

The test sections will be continually monitored by distress surveys and the falling weight deflectometer testing for a long-term analysis of the pavements.

This publication was produced by the U.S. Department of Transportation University Transportation Center for Materials in Sustainable Transportation Infrastructure (MiSTI) at Michigan Technological University under the program management of the Office of Research and Technology Administration-U.S. Department of Transportation. The contents of this summary reflect the views of the authors, who are responsible for facts and the accuracy of the information presented herein. This document is disseminated under the sponsorship of the Department of Transportation University Transportation Centers program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof. For more information or additional copies, visit the Center's Web site at www.misti.mtu.edu, call 906.487.3154, or write to MiSTI, 301 Dillman Hall, Michigan Technological University, Houghton, MI 49931