



Recycled Materials Resource Center



University of New Hampshire



Federal Highway Administration

Research Project 32

Monitoring and Analysis of Leaching from Subbases Constructed with Industrial Byproducts

Project Objectives

This new project is a continuation of the previous study and has two objectives:

- C To continue monitoring the lysimeters and monitoring wells at the STH 60 test site for two more years so that additional leachate data can be collected.
- C To conduct additional laboratory studies such as batch and column leaching tests for the byproducts sections (other than the fly ash) with the purpose of determining if reliable predictions can be made for the byproducts.

Project Description

Despite the potential advantages, two key issues remain as significant barriers to more widespread use of industrial byproducts. These issues are a lack of knowledge regarding the long-term mechanical behavior of byproducts used in pavement, and the potential impacts on groundwater quality. To address these issues, Wisconsin DOT (WisDOT) constructed large test sections during reconstruction of State Highway (STH) 60 near Lodi, WI during the summer of 2000. Four of these test sections include a subbase layer constructed with industrial byproducts (fly ash amended soil, bottom ash from coal-fired power plants, and foundry sand and foundry slag from gray iron casting industries), whereas two other test sections were constructed with conventional earthen materials as controls. Each test section was instrumented for continuous monitoring of temperature and water content within the profile. In addition, two 3.5 m x 4.8 m lysimeters were installed in each test section to collect water draining from the subbase material.

More recently, groundwater monitoring wells were installed within the right of way adjacent to the test and control sections. However, the original WisDOT monitoring program has ended after three years.



This new project is a continuation of the previous study, and has two objectives. The first is to continue monitoring the lysimeters and monitoring wells at the STH 60 test site for two more years so that additional leachate data can be collected. This data will show whether the leachate concentrations in the field drop to low levels as predicted by the numerical model. The second objective is to conduct additional laboratory studies such as batch and column leaching tests for the byproducts sections (other than the fly ash) with the purpose of determining if reliable predictions can be made for the byproducts. These materials were not tested in the original project. To date, the field monitoring program has resumed and laboratory-based column testing has begun on the foundry sand, foundry slag and bottom ash.

Project Partners

University of Wisconsin at Madison

End Products

A detailed data set describing leaching from byproducts under full-scale conditions, along with basic batch and column test data on the industrial byproducts involved. Furthermore, the lysimeter data will confirm whether the tailing predicted by analytical models actually occurs in the field.

Further Information

The Recycled Materials Resource Center (RMRC), a cooperative agreement between the University of New Hampshire and the Federal Highway Administration, is a national center that promotes the appropriate use of recycled materials in the highway environment. Its focus is on the long-term performance and environmental implications of using recycled materials.

For detailed quarterly progress reports for Project 32, as well as all RMRC-funded research projects, please see: <http://www.rmrc.unh.edu/Research/researchlevel2.asp>.

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