

RMRC



Recycled Materials Resource Center



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Research Project 46

Engineering Properties of Recycled Materials for Unbound Applications

Project Objectives

- Summarize the current state of knowledge regarding the mechanical behavior of RCA, RAP and blends of these materials
- Analyze the effect recycled materials have on resilient modulus values, stress state sensitivity, and overall material degradation

Project Summary

This research Project consists of several task reports prepared at the University of Wisconsin-Madison, collected and presented by the Recycled Materials Resource Center as a single report on the physical and chemical properties of recycled asphalt pavement and recycled concrete aggregate. This was done to achieve more organization on the knowledge available of recycled asphalt pavement and recycled concrete aggregate as well as condensing all the available sources, papers, and reports conducted at the University of Wisconsin-Madison into a single location where anybody desiring to learn more about each of the recycled materials can access more information easily in one spot.

The task reports included in the project are:

- Literature Search and Report on Recycled Asphalt Pavement and Recycled Concrete Aggregate
- The Usage, Storage and Testing of Recycled Materials – Results of a Survey
- Relationship between Resilient Modulus and Composition of RCA or RAP
- Scaling and Equivalency of Bench-Scale Test to Field-Scale Conditions
- Climate Effects (Freeze-Thaw Cycles)
- Climate Effects (Hydraulic Properties of RAP and RCA)
- Compaction Level and Assessment
- Field performance: Falling Weight Deflectometer Data Analysis
- Materials Control
- Leaching Characteristics: pH-Dependent
- Leaching of Trace Elements from RCA

Project Partners

Minnesota Department of Transportation

End Results

At low confining pressures, pure aggregate and 50%-50% blends of RAP and aggregate has an equivalent stiffness, but at high confining pressures the 50%-50% blends have a higher stiffness than the pure aggregate. It's also found that pure specimens of RAP and RCA have higher resilient moduli than pure virgin aggregate specimens and that specimens of pure aggregate had higher shear strength than pure RAP or RCA specimens.

Further Information

The Recycled Materials Resource Center (RMRC) is a national center that promotes the appropriate use of recycled materials in the highway environment. It focuses on the long-term performance and environmental implications of using recycled materials