

Engineering Overview of a Road Recycling Machine for Portland Cement Concrete Pavement



COMPLETE!

Recycled Materials Resource Center



University of New Hampshire



Federal Highway Administration

The final report for Project 20 is available on-line at:

<http://www.rmrc.unh.edu/Research/Rprojects/Project20/P20finalreport.asp>

Project Objectives

This Technical Problem Solving research project's goal was to establish engineering guidelines for the

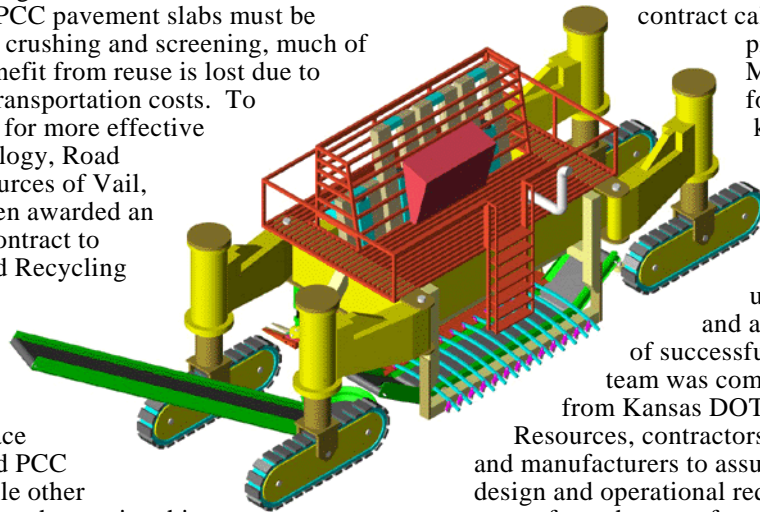
development of a full-scale, in-field, portland cement concrete pavement recycler.

Project Progress

Laboratory and field testing have shown that recycled concrete aggregate (RCA) makes an excellent material when used appropriately in unbound base course applications. So, it would seem that the recycling of Portland cement concrete (PCC) pavements would be a cost effective way to obtain high quality aggregate for road construction. However, if the PCC pavement slabs must be taken off site for crushing and screening, much of the economic benefit from reuse is lost due to processing and transportation costs. To address the need for more effective recycling technology, Road Processing Resources of Vail, Colorado has been awarded an SBIR research contract to develop the Road Recycling Machine. This machine is a one-step mobile processing system for in-place recycling of solid PCC pavements. While other types of mobile crushers exist, this one was designed from the ground up to be an integral part of the paving process. It is expected that the machine will be more cost effective, reclaim a greater percentage of the pavement as usable aggregate and cause less disturbance to

the sub-grade than current techniques.

Phase 1 of the SBIR contract required a comprehensive feasibility study to verify that the anvil-hammer technique for crushing concrete would work for solid pavement slabs, and to verify other technical details. Phase 2 of the contract calls for development of a prototype Road Recycling Machine. In preparation for Phase 2, Mr. Wojakowski was tasked with leading the team charged with identifying critical components and problem areas, proposing solutions to those problems, and assessing the probability of successful development. The team was composed of representatives from Kansas DOT, Road Processing Resources, contractors, component suppliers and manufacturers to assure compatibility of design and operational requirements. The final report from the team found that the design was viable and the construction of the prototype should proceed. The final report and drawings of the machine can be found on the RMRC website.



Project Partners

- Kansas State University
- Iowa DOT
- Michigan DOT

End Products

The development of a description of the economics of a one-step mobile concrete pavement recycling system. This information will be of interest to other State DOTs that use concrete pavements.

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. Please visit <http://www.rmrc.unh.edu>.

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