

Research Notes

Program Steering Committee (PSC): Pavement

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Title: Performance of Recycled Asphalt Shingles in Hot Mix Asphalt

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Task Manager:

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TITLE:

Performance of Recycled Asphalt Shingles in Hot Mix Asphalt

WHAT IS THE NEED?

State highway agencies are increasingly interested in using recycled asphalt shingles (RAS) in hot mix asphalt (HMA) pavement applications, yet many agencies share common questions about the effect of RAS on the performance of HMA pavements. Previous research has allowed for only limited laboratory testing and field surveys. The complexity of RAS materials and lack of past experiences led to the creation of this pooled fund study.

WHAT ARE WE DOING?

This pooled fund project is a partnership of several state agencies with the goal of researching the effects of RAS on the performance of HMA applications. Agencies participating in the study include Missouri (lead state), California, Colorado, Iowa, Illinois, Indiana, Minnesota, Wisconsin, and the Federal Highway Administration.

The study addresses the following research objectives.

- 1) Address the concerns of QC/QA in the sourcing, processing, and incorporation of RAS to achieve final products meeting the quality requirements in HMA applications.
- 2) Investigate the behavior and performance of RAS in HMA at various locations through demonstration projects in participating states.
- 3) Create a comprehensive database of the performance of RAS in HMA applications.

WHAT IS OUR GOAL?

The primary goal of this study is to address research needs of state DOTs and environmental officials and determine the best practices for the use of RAS in HMA applications.

WHAT IS THE BENEFIT?

Each year, an estimated 10 million tons of RAS are placed in landfills in the United States. Utilization of this waste product presents an opportunity to replace virgin asphalt binder with the RAS binder while taking advantage of the additional fibers which can improve

performance. Thus a material that has historically been deemed a solid waste and has been placed in landfills can decrease pavement costs and reduce the burden on ever-decreasing landfill space.

WHAT IS THE PROGRESS TO DATE?

All tasks of the study have been completed and the final report was delivered in August 2013. FHWA issued a close out memo on May 27, 2014 and this project is now officially closed.

The demonstration projects showed that pavements using RAS can be successfully produced and meet state agency quality assurance requirements for hot mix asphalt applications. These mixes have very promising prospects since laboratory test results indicate good rutting resistance and fatigue cracking resistance. Another laboratory tests on the fracture properties of the mixes showed the addition of RAS materials to HMA is not detrimental to its fracture resistance, and fibers in the RAS could be contributing to the mix performance.

The pavement condition of the mixes in the field after two years corroborated the laboratory test results. No signs of rutting, wheel path fatigue cracking, or thermal cracking was exhibited in the pavements at the demonstration project sites.