



Rehabilitating/Upgrading Low-Volume Roads with Waste Shingles

Project Number 2010-01

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Problem The Blue Earth County Highway system includes over 300 miles of gravel roads that provide all-weather access to the county's rural agricultural areas. These roads are dusty, bumpy, and prone to severe damage during the spring thawing period. They are also costly to maintain, requiring regular blading and replacement of gravel surfacing. Paving these gravel roads is not an affordable solution, so the county has been searching for alternatives for providing a hard, smooth driving surface.

Solution Blue Earth County completed a gravel road stabilization project on a section of County State Aid Highway (CSAH) 48 using a blend of recycled asphalt shingles (RAS) and recycled asphalt pavement (RAP) rather than the typical stabilizing binder used in past projects. This mix required almost a third less asphalt emulsion than bituminous stabilized gravel roads.

Procedure In partnership with Waste Management and Road Science, Blue Earth County applied a mix of 65 percent RAP, 15 percent RAS, 18 percent gravel, and 2 percent asphalt emulsion on a 1-mile segment of CSAH 48. County maintenance crews spread the RAP and RAS on the roadway surface and used a reclaiming machine to mix the two together. They then injected the asphalt emulsion before compacting and blading the surface.

Initially, crews used two hot in-place recycling (HIR) machines to heat the mix in two 3-inch lifts, but this proved slow and ineffective. The HIR machines were then used only on the final lift and were effective in reducing surface voids and sealing the roadway. After compaction was completed, crews placed a seal coat to further protect the surface from raveling.

Results To date, the roadway is performing well with no significant raveling or rutting. To ensure sufficient time for the seal coat to cure, future projects should be completed in the first half of the summer. In addition, the HIR machines were costly and not effective in placing the mix, but they did appear to contribute to a more tightly sealed top surface. In future projects, it would be useful to demonstrate a section without using the HIR machine.

Approximate Cost \$120,000

OPERA Funding \$10,000

Implementation The county plans to observe the performance of the shingle mix for one to two years. If it continues to perform well and funds are available, additional projects may be completed.

Status Complete

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