



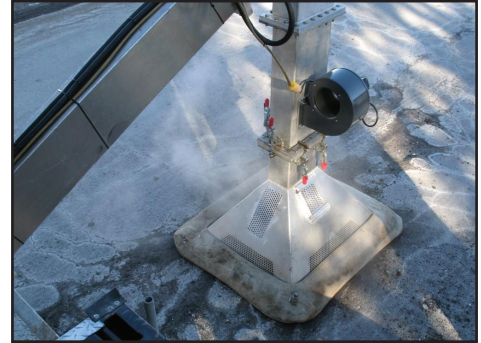
Taconite-Enhanced Pothole Repair Using Portable Microwave Technology

Project Number 2009-01

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Problem Cold-weather pothole repairs that use conventional cold-patch mixes and methods can be unreliable and prone to early failure. Public works and transportation maintenance departments need a more effective and longer-lasting winter repair option.

Solution Anoka County partnered with St. Louis County and the University of Minnesota Duluth's Natural Resources Research Institute (NRRI) to test the effectiveness of mobile microwave technology for the repair of potholes and other damaged pavements. To make the repairs, the agencies used compounds containing recycled/byproduct materials, including recycled asphalt pavement (RAP)/millings, microwave-absorbing taconite materials, and recycled asphalt shingles (RAS).

Procedure Cold-weather field testing was completed at NRRI and select locations in Anoka County and St. Louis County using a portable microwave unit provided by Microwave Utilities Inc. Crews first preheated the pothole to melt any ice or snow and soften the pavement. Then, the mixture of RAP/millings, taconite materials, and RAS was placed in the pothole and heated to at least 230 degrees Fahrenheit using the mobile microwave equipment. Heating took an average of 8 to 12 minutes. A portable compactor was then used to compact the heated mixture.

Results RAP/millings that were minimally contaminated with sand and gravel worked best. The taconite materials significantly enhanced microwave absorption, and the RAS enhanced the binding characteristics of RAP. The microwave equipment quickly heated and softened the pavement surrounding the pothole, which was critical for providing a good bond and repair.

Approximate Cost \$20,000

OPERA Funding \$10,000

Implementation The technology shows excellent potential for more effective pothole repair. The project also demonstrated that inexpensive and abundant material such as RAP, taconite, and RAS can be combined to make an effective pavement repair compound. The next generation of mobile microwave technology, currently under development, will be higher-powered for more rapid heating and be designed for easier placement over the pavement repair target. The objective is to achieve an effective and permanent repair in about five minutes.

Status Complete

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