

Porous Asphalt Pavement Performance in a Cold Climate

2008 M&RR

Author: Matthew Lebens

Background

Porous Asphalt Pavement is an emerging technology in the United States. It consists of standard bituminous asphalt with reduced fine particles and high (20 %) void content. The high porosity of the mix allows water to penetrate directly through the pavement surface. Beneath the pavement, a uniformly-graded stone bed allows water storage and slow infiltration into the subgrade soils. Filter fabric installed between the stone bed and the subgrade prevents migration of fine particles upward, and contamination of the stone storage layer.

Potential benefits of Porous Asphalt are compelling. The reduction of stormwater runoff volume and surges may greatly decrease the need for water mitigation structures, ponds, and associated right-of-way. Water quality may be improved by the tendency of the porous pavement to bind and contain heavy metals and other contaminants and by preventing direct runoff into surface water sources. Vehicle spray and noise has been observed to be significantly reduced with porous pavements.

Various Porous Asphalt mixes and construction methods have been developed in Europe, Asia, and in some areas of the United States – particularly Oregon and Texas. However, Porous Asphalt Pavement durability research in the seasonally diverse Minnesota climate is lacking. The purpose of this research is to study the durability, maintenance requirements, hydrologic benefits, and environmental considerations of a porous asphalt roadway in a cold climate.



Porous vs. Standard Asphalt



Porous Asphalt Surface Texture

Major Objectives

- 1 Construct a porous asphalt test section and an adjacent impermeable asphalt control section on the MnROAD Low Volume Road.
- 2 Monitor porous pavement performance and durability.
- 3 Monitor and compare the stormwater volume and water quality in both the porous asphalt and the impermeable comparison sections.
- 4 Document the porous pavement maintenance procedures and results.

Participants

Minnesota Local Road Research Board (LRRB)
Minnesota Department of Transportation



Current Status and Timeline

- * Preliminary Geotechnical Testing has been performed.
- * Mix Design and Construction of test sections to be performed Spring 2008.
- * Testing starts in spring of 2008.
- * Quarterly reports on findings and results.
- * The project ends in Fall of 2010.



NEED MORE INFORMATION ON THE POROUS ASPHALT PAVEMENT PERFORMANCE IN A COLD CLIMATE OR THE MINNESOTA ROAD RESEARCH PROJECT (Mn/ROAD)?

Contact: *Minnesota Department of Transportation*

OFFICE OF MATERIALS & ROAD RESEARCH

1400 GERVAIS AVE. MS 645

MAPLEWOOD, MN 55109

NAME: MATTHEW LEBENS (651)366-5526

EMAIL: MATTHEW.LEBENS@DOT.STATE.MN.US

WEBSITE: WWW.MRR.DOT.STATE.MN.US/RESEARCH/MNRESEARCH.ASP