HR-232 Reducing the Problem of Transverse Cracking

Key Words: Transverse cracking, Asphalt pavement , Crack prevention, Engineering fabric

ABSTRACT

The Iowa Department of Transportation (DOT) is continually improving the pavement management program and striving to reduce maintenance needs. Through a 1979 pavement management study, the Iowa DOT became a participant in a five state Federal Highway Administration (FHWA) study of "Transverse Cracking of Asphalt Pavements". There were numerous conclusions and recommendations but no agreement as to the major factors contributing to transverse cracking or methods of preventing or reducing the occurrence of transverse cracking. The project did focus attention on the problem and generated ideas for research. This project is one of two state funded research projects that were a direct result of the FHWA project.

Iowa DOT personnel had been monitoring temperature susceptibility of asphalt cements by the Norman McLeod Modified Penetration Index. Even though there are many variables from one asphalt mix to another, the trend seemed to indicate that the frequency of transverse cracking was highly dependent on the temperature susceptibility. Research project HR-217 "Reducing the Adverse Effects of Transverse Cracking" was initiated to verify the concept. A final report has been published after a four-year evaluation. The crack frequency with the high temperature susceptible asphalt cement was substantially greater than for the low temperature susceptible asphalt cement. An increased asphalt cement content in the asphalt treated base also reduced the crack frequency.

This research on prevention of transverse cracking with fabric supports the following conclusions:

1. Engineering fabric does not prevent transverse cracking of asphalt cement concrete.
2. Engineering fabric may retard the occurrence of transverse cracking.
3. Engineering fabric does not contribute significantly to the structural capability of an asphalt concrete pavement.