DATE: 09/25/2020  PROJECT AREA: Design

TITLE: AASHTO 93 and PavementME inputs for Hot In-place Recycling

PROBLEM STATEMENT:
Hot In-place Recycling (HIR) is slowly gaining traction in Arkansas. It has been an alternative for a mill and inlay on four jobs (020616, 100886, 100904, and 100905) and was constructed on AR18 in District 10 (100886). However, while it has been assumed that HIR will provide equal or greater structural capacity than an asphalt concrete layer, there has been no research to confirm this. This research proposes the development of a structural coefficient for HIR (for AASHTO 93 design) and an evaluation of HIR on the inputs for PavementME. The inputs for PavementME will include Level 1 (dynamic modulus, indirect tensile strength, creep compliance, and thermal contraction on the HIR mixture) and Level 2 (dynamic modulus on the binder and RAP properties). Four roads will be identified for a potential HIR application, a full mix design will be performed on each road, and the structural coefficient and PavementME inputs for Level 1 and Level 2 will be calculated. The resulting structural number and PavementME distress analysis will be compared to traditional asphalt concrete to establish a relationship between asphalt concrete and HIR.

OBJECTIVES:
This research will have three objectives. First, a literature review will determine if other agencies or organizations have evaluated the structural capacity of HIR. Second, four highways in Arkansas will be selected, cores will be taken, and the structural coefficient and PavementME inputs for Level 1 and Level 2 will be determined. Third, the ARDOT pavement design criteria will be updated to include coefficients of relative strength, and recommendations for the pavement design procedure will be updated to include HIR as an alternative to a mill and inlay. This will add another maintenance treatment to ARDOT’s maintenance toolbox.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:
This research will introduce HIR as an alternative to a mill and inlay for maintaining state highways. After the research is completed, the necessary structural coefficients and PavementME inputs for HIR will be determined so that moving forward, a more informed comparison of a mill and inlay versus HIR can be performed. Based on the AR-18 HIR plus micro surfacing, Arkansas saved approximately $500,000 for the ten mile, five lane (plus shoulders) job, there is opportunity for significant costs savings using HIR plus a surface treatment on future jobs in Arkansas.

Estimated Project Duration: 24 Months

PREPARED BY: Andrew Braham and Zahid Hossain

AGENCY: University of Arkansas

PHONE: (479) 575-6028  REVIEWER: JD Borgeson and Sanghyun Chun

Standing Subcommittee Ranking             Advisory Council Ranking             Statement Combined with Statement Number(s)
3/4                                      25                          ___________________________