Announcing the Final Examination of Hamid Maherinia for the degree of Master of Science

Time & Location: March 28, 2013 at 8:00 AM in ENGR II 211
Title: Reflective Cracking Mitigation Methods on HMA Overlay Considering Florida’s Special Conditions

Hot Mix Asphalt (HMA) is one of major rehabilitation treatments for existing deteriorated pavements. Reflective Cracking (RC) is one of the most common distresses appearing in the HMA overlays. This type of distress structurally and functionally degrades the HMA overlay especially on high traffic level roads. Pavement Engineers have been working for more than two decades to prevent or delay the crack reflection on the overlay. However, the level of success varies from premature failure to good performance in the field. In this study, due to the complexity of the RC mechanism, extensive literature reviews have been conducted to identify current available RC mitigation techniques and key affecting parameters in their in-field performance. The key input parameters in selecting optimum mitigation techniques are 1) overlay characterization, 2) existing pavement condition, 3) base and subgrade structural condition, 4) environmental condition and 5) traffic level. To understand the current practices on the RC management on flexible pavements, a nationwide survey was conducted and distributed the survey questionnaire to all other highway agencies. Based on the responses, the most successful method of treatment is placing thick HMA overlay over the existing pavement. Crack arresting layer is considered to be in the second place among its users. Lack of cost analysis and low rate of successful practices raise the necessity of conducting more research on this subject.

Based on the RC mechanism study, existing pavement’s physical properties and success rate of the projects, two RC mitigation techniques have been proposed to be used as an interlayer on rigid and flexible pavements. Paving fabrics (geotextiles) and Stress Absorbing Membrane Interlayer (SAMI) have been found to be the most effective in retarding the RC on flexible and rigid pavements, respectively. To achieve the most practical solutions, considering special conditions of the Florida state, decision trees were developed to be used as a guideline.

Major: Structural and Geotechnical Engineering

Educational Career:
Bachelor's of Civil Engineering, BS, 2006, Isfahan University of Technology
Master's of Civil Engineering, Pavement and Transportation, MS, 2010, Islamic Azad University

Committee in Charge:
Boo Hyun Nam, Chair, Civil, Environmental & Construction Engineering
Amir Behzadan, Co-Chair, Civil, Environmental & Construction Engineering
Omer Tatari, Civil, Environmental & Construction Engineering

Approved for distribution by Boo Hyun Nam, Committee Chair, on March 11, 2013.

The public is welcome to attend.