Aggregate Retention in Chip Seal

Shahidul Islam¹, Elaine Lamm², Haritha Musty³ and Mustaque Hossain⁴

Abstract

Chip seal is a widely-used preventive maintenance treatment of flexible pavements. One of the major issues with chip seal is the damage caused by loose aggregates from newly-placed chip seals. Lack of compatibility between aggregate and asphalt emulsion results in chip loss. Normally, local aggregates are always preferred for chip seal construction. Selection of proper aggregate and asphalt emulsion is important to maximize aggregate retention in chip seal. In this study, limestone and gravel (both precoated and uncoated), recycled asphalt pavement (RAP), and synthetic lightweight aggregates were used with two polymer-modified asphalt emulsions to find the aggregate-emulsion combination that would result in maximum aggregate retention. A statistical analysis was conducted to study the compatibility between different types of aggregates and emulsions. The results showed RAP has the lowest chip retention.

Key words: Chip Seal – Polymer Modified Asphalt Emulsion – Recycled Asphalt Pavement – Synthetic Light Weight Aggregate - Aggregate Retention

¹ Graduate Research Assistant, University of Illinois at Urbana Champaign, Civil Engineering, 205, North Mathews Ave, Urbana, IL- 2352, Tel: 217-333-8038, Fax: 217-333-9464
² Graduate Research Assistant, Kansas State University, Civil Engineering, 2118 Fiedler Hall, Manhattan, KS – 66506, Tel: 785-532-5862, Fax 785-532-7717, Email: nnassim@k-state.edu
³ Graduate Research Assistant, Kansas State University, Civil Engineering, 2118 Fiedler Hall, Manhattan, KS – 66506, Tel: 785-532-5862, Fax 785-532-7717, Email: nnassim@k-state.edu
⁴ Professor, Kansas State University, Civil Engineering, 2124 Fiedler Hall, Manhattan, KS-66506, Tel: 785-532-1576, Fax: 785-532-7717, Email: mustak@ksu.edu