DRISI

Caltrans Division of Research, Innovation and System Information

Research Notes

RHMA-G Layer Thickness Limits

Development of Testing Procedures and Criteria to assess Rubberized Hot Mix Asphalt-gap Graded (RHMA-G) layer thickness limits

Pavement

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Project Title:
RHMA-G Layer Thickness Limits

Task Number: 3760

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Completion Date: September 30, 2023

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WHAT IS THE NEED?

This is a continuation of current research to assess RHMA-G layer thickness limits. Caltrans design procedures and specifications currently limit the thickness of RHMA-G layers to 0.2 ft and only allow RHMA-G to be used in surface layers. These requirements are based on earlier higher costs of RHMA G mixes and concerns with rutting. The cost of RHMA-G is now similar to conventional HMA mixes and rutting performance has been improved by changes to mix design procedures, testing requirements and quality control, and tighter compaction specifications.

WHAT ARE WE DOING?

This task will determine the expected performance, cost and environmental impacts of pavements with rubberized asphalt layers thicker than the current 0.2 ft (60 mm) limit. The phased study will continue mechanistic analysis using existing materials information and models, and Accelerated Pavement Testing (APT) to assess different maximum aggregate sizes, lift thicknesses, and layer thicknesses to determine whether it is necessary to specify maximum thickness allowed for RHMA-G layers, either as the surface layer of a new pavement or as an overlay on an existing pavement.

WHAT IS OUR GOAL?

The goal is to develop guidance for use of thicker RHMA-G layers, to update CalME design procedures with RHMA-G materials, and to conduct and document Life-Cycle Cost Analysis (LCCA) and Life-cycle assessment (LCA) of cost and environmental impacts of change in design practice.

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WHAT IS THE BENEFIT?

Thicker or multiple layers of RHMA-G might offer comparable performance to conventional HMA layers, but will increase the use of recycled tires, and thus reduce maintenance costs and decrease environmental impacts leading towards more sustainable pavements.

WHAT IS THE PROGRESS TO DATE?

As of February 2022, the research team has made the following progress:

- Continuing to test on Section 698-HC (0.2 ft. of 3/4 in. RHMA-G with no RAP). Continuing dynamic modulus testing of cores from each section to monitor performance property changes over time. Completed preparation of Section 799-HC (0.4 ft. of 3/4 in. RHMA-G with no RAP) for next test
- Started CalME simulations. Investigate some inconsistencies in stiffness data between RAP and no-RAP mixes
- Continuing to prepare project report as data becomes avaialble