



Pavement

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Recycling

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Improved Guidance and Specifications for Full-Depth Reclamation

Continued development of guidelines for project selection and mechanistic-empirical design of full-depth reclaimed pavement in California

WHAT WAS THE NEED?

In-place pavement recycling is an evolving field of pavement engineering. Using the full and/or partial-depth reclamation of existing distressed pavements is becoming more popular in the United States and internationally, as it provides a rapid rehabilitation solution with minimal disruption to traffic while recycling in-place materials with only limited additional virgin materials. Caltrans has been using full-depth reclamation (FDR) as a rehabilitation strategy since 2001 and strive to develop detailed guidance on mix design and pavement design for FDR projects.

In response to the growing demand regarding FDR and related different recycling approaches and technologies, a team of Caltrans engineers and University of California Pavement Research Center researchers was formed to review and update the current guidance and specifications for FDR. A comprehensive guideline for using FDR was produced as part of the final delivery.

WHAT WAS OUR GOAL?

The goal of this project is to develop a comprehensive guideline for the rehabilitation design of pavements using all full-depth reclamation techniques.



Caltrans provides a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

WHAT DID WE DO?

The research team continued long-term performance monitoring of existing and new field experiments. Laboratory testing on FDR stabilized with asphalt emulsion (FDR-AE) were conducted to evaluate a series of performance and mechanistic parameters.

In addition, the study updated life cycle assessment (LCA) and life cycle cost analysis (LCCA) parameters for FDR-AE. The new FDR guidance and Specifications for Full-Depth Reclamation documented and summarized the laboratory test factorial, test methods, test results, mix design procedures, and proposed mechanistic design and performance model parameters.

WHAT WAS THE OUTCOME?

The final delivery is the Improved Guidance and Specifications for Full-Depth Reclamation in California. The study updated the 2017 version of the guide (UCPRC-GL-2017-04) including the guide to include cold central plant recycling (CCPR), inclusion of mechanistic-empirical design procedures (CalME) in the design chapter, and inclusion of a provisional laboratory procedure for mix designs for full-depth recycling with cement (FDR-C).

WHAT IS THE BENEFIT?

The new guidance and specifications for IPR (PDR and FDR) can guide design engineers, contractors, and project specification writers on how to decide on the optimal recycling strategy. The guideline will also guide engineers to the appropriate pavement rehabilitation approach for the situation and be used to update standard, plans, and specifications. In addition, the study result can be used for project selection in pavement management system.

LEARN MORE

When the reports are published, it can be found at the following link:

<https://dot.ca.gov/-/media/dot-media/programs/maintenance/documents/office-of-asphalt-pavements/469fdpdr-guidestg6ada.pdf>