

Pavement

FEBRUARY 2022

Project Title:
Mechanistic Empirical (ME) Design:
Standard Materials

Task Number: 3809

Start Date: September 1, 2020

Completion Date: September 30,
2023

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Mechanistic Empirical (ME) Design: Standard Materials

Updating and Improving the Standard Materials Library for ME Design

WHAT IS THE NEED?

In order to accomplish its mission of providing an efficient transportation system to enhance California's economy and livability, Caltrans is encouraging innovations in pavement materials to improve efficiency and increase sustainability. These new materials need to be characterized in terms of their mechanical behavior before they can be effectively used in pavement designs.

In addition, California is a large state with diverse geological conditions. The materials used in any given project are dominated by the available local quarries, refineries, and asphalt mixing plants. These local materials behave differently than materials from other localities when used in pavements and therefore materials representative of each region need to be characterized.

WHAT ARE WE DOING?

This task is a continuation of the Standard Materials Library project. This task will test and include additional regional and new materials from the field including partial- and full-depth recycled materials, Performance Grade (PG)+5 mixes, bonded concrete overlays, and Asphalt Concrete (AC) projects using performance related specifications. It will expand the focus on aged properties of the mix. The field or laboratory data will then be used to characterize the material so that it can be added to the Standard Materials Library in CalME (Caltrans' Asphalt Concrete pavement design method). The updated Standard Materials Library will allow Caltrans engineers to effectively use materials available in their District within CalME software for future pavement designs.



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WHAT IS OUR GOAL?

The goal of this project is to characterize new or otherwise additional materials so that Caltrans can use them effectively in pavement designs and achieve its goals of efficiency and sustainability. These additional materials will become part of the growing materials library that the University of California Pavement Research Center (UCPRC) is developing for Caltrans.

WHAT IS THE BENEFIT?

Caltrans is looking to expand the use of mechanistic-empirical (M-E) methods for flexible pavement design and rehabilitation throughout California. Compared to empirical methods, M-E method is better at accommodating new materials and construction processes.

To have accurate material properties will help Caltrans to expand the use of M-E methods for flexible pavement design and rehabilitation throughout California, and thus reduce maintenance costs and create savings by maintaining longer-lasting pavements.

WHAT IS THE PROGRESS TO DATE?

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

- Continuing to identify gaps in Standard Materials Library, with focus on polymer modified mixes and RHMA-G mixes with PG 70-10 base binders review and identify
- Completed production and most of the testing of the SAC-5 AC Long Life project for standard materials library. Started production and testing a newly sampled polymer modified mix produced for overlay on SBO-2
- Continuing to test previously sampled raw materials to develop master aging curve. Continue development of aging framework for performance testing

- Continuing to address comments regarding the report on surrogate tests for asphalt mix stiffness and fatigue cracking, and presented results to Caltrans. Inclusion of data from the SAC-5 reconstruction was requested to be included
- Document production testing