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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Use of Cold Recycling as Base for Concrete Pavement

Evaluating and implementing cold recycled materials in rigid pavement bases.

Pavement

November 2025

Project Title:
Partnered Pavement Research Center (PPRC) 23: Recycling

Task Number: 4391

Start Date: November 7, 2023

Completion Date: June 30, 2026

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WHAT IS THE NEED?

The California Department of Transportation (Caltrans) seeks sustainable, cost-effective strategies to extend the life of its concrete pavements and conserve natural resources. Using cold-recycled materials as a base layer can reduce reliance on virgin aggregates, lower construction costs, and shrink the carbon footprint of pavement projects. This task evaluates cold recycling as a base for jointed plain and continuously reinforced concrete pavements and develops field-ready guidelines.

WHAT ARE WE DOING?

The work breaks down into four main areas:

- Finalize laboratory testing procedures for cold-recycled (CR) materials.
- Test reference mixtures – cold central-plant recycled fly ash (CCPR-FA), CCPR-electric-arc furnace slag (CCPR-EA), and CCPR-cement (CCPR-C).
- Design and laboratory-test optimized CR mixtures (CCPR-FA and CCPR-EA) for concrete pavement bases.
- Prepare and instrument a pilot test track to validate CR base performance under real traffic.

WHAT IS OUR GOAL?

This main goal of this study is to establish validated CR base mixtures and pilot protocols that allow Caltrans to adopt cold recycling for rigid pavement foundations, achieving durable overlays, cost savings, and reduced environmental impact.

WHAT IS THE BENEFIT?

This task benefits Caltrans by promoting sustainability using

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cold recycled materials, resulting in significant savings, improved concrete overlay pavement performance, standardized guidelines, and reduced environmental impact associated with pavement construction and maintenance.

WHAT IS THE PROGRESS TO DATE?

The following progress has been made:

- Test protocols for cold-recycled materials have been finalized and approved.
- Reference CR base mixtures (CCPR-FA, CCPR-EA, CCPR-C) have been designed, and laboratory characterization testing is now in progress.
- Optimized CR base mixtures were developed and selected for field evaluation, with laboratory characterization now underway and test track preparation completed.
- The pilot jointed plain concrete pavement test slabs have been constructed with CR base materials, instrumentation is installed, and field performance monitoring has begun.