Pavement & Materials Partnering Committee
Work Product Scoping Document
New
Explore Partial-Depth Recycling as Possible Surface Wearing Course Using Binders Containing Recycled Materials
September 7, 2021

Task Group

Recycling Subtask Group, Asphalt Task Group

Problem Process

☐ Annual
☐ Expedited
☒ Emerging Initiative

Title

Explore Partial-Depth Recycling as Possible Surface Wearing Course Using Binders Containing Recycled Materials

Statement of Effort/Improvement

The Work Product Group (WPG) will explore the possibility of partial-depth recycling (PDR) as a wearing course using binders containing recycled materials in PDR applications. The effort proposes to perform a comprehensive review of available literature, technologies, binders, processes and develop a state-of-the-art document for Pavement and Materials Partnering Committee's (PMPC's) review and further action.

Purpose

The purpose of the WPG is to review available literature about the possibility of using binders containing recycled materials PDR surface courses. In the current PDR process, PDR is used as a base layer and requires capping with a wearing/surface course consisting of either hot-mix asphalt (HMA) Type A or rubberized HMA – gap graded (RHMA-G) layer. Current developments indicate that it might be possible to use binders containing recycled materials in the PDR process to place wearing/surface course. These binders containing recycled materials may present advantages in terms improved durability, performance and eliminate the use of HMA wearing course completely.

Background

Recycling is an increasingly important initiative for the California Department of Transportation (Caltrans). Recycling of existing asphalt in pavement rehabilitation and reconstruction projects can be facilitated on projects that are located outside of a viable distance from asphalt plants in efforts to reduce costs, greenhouse gas (GHG) emissions, and construction-related trucking of materials. Current recycling practices do require the placing of a surface

wearing course consisting of HMA or RHMA-G, produced using mostly virgin materials contributing to GHG emissions.

Approach

A working group will be assembled by the Recycling STG and they will develop a current State of the Art type document after reviewing literature and by interviewing personnel involved in PDR industry that have placed PDR wearing courses using binders containing recycled materials.

1. Street Ready Assurance

   N/A

2. Performance Tracking/Management

   N/A

3. Consistently Implemented

   N/A

4. Pilot Projects

   N/A

5. Research Needs

   N/A

Team Members (Indicate CT Chair and Industry Lead)

CT / Industry	Division / Firm Name	Member Name
CT – Chair	Office of Asphalt Pavements	Sri Holikatti
Industry – Lead	Coughlin Company	Darren Coughlin
Caltrans	Construction	Ragu Thangavelautham
Caltrans	Materials Engineering and Testing Services	
Caltrans	Office of Asphalt Pavements	Saeed Pourtahmasb
Industry	GMU Geo	Roger Schlierkamp
Industry	Aragon Geotechnical	Fernando Aragon

CT / Industry	Division / Firm Name	Member Name
Industry	Pavement Recycling Systems	Michael Concannon

Team should not include any more than 4 Caltrans staff and 4 members from Industry. See PMPC Standard Operating Procedures for more information.

Objectives/Deliverables/Due Dates

Description:

1. Literature review to determine the state of the practice of binders containing recycled materials-development and usage practices, may contact academic and other public and private agencies may be contacted as required.
2. Draft binders containing recycled materials State of the Art report.
3. Final report and recommendations.

Details:

Milestones	Name - Responsible Party	Due Date (Start/Complete)
1. Literature Search / Gathering, Interviews (where necessary)	Caltrans & Industry	06/15/2022 – 7/30/2022
2. Literature Review	Caltrans & Industry	8/15/2022 – 9/31/2022
3. Draft State-of-the-Art Report	Caltrans & Industry Co Chairs	10/1/2022 – 12/15/2022
4. Circulate and Review Comments	Caltrans & Industry Co Chairs	12/16/2022 – 1/31/2023
5.		
6. Submit Final Report	Caltrans & Industry Co Chairs	4/15/2023

*Some milestones listed above may not be necessary; final report is mandatory.

Resources To Develop and Implement

Work Scope	Caltrans Hours	Industry Hours
Literature Review, Draft Report, & Final State-of-the-Art	OAP: 0.3 PY	0.7 PY

Work Scope	Caltrans Hours	Industry Hours
	OCS: 0.2 PY METS: 0.2 PY	possibly

Benefits

- Explore the viability of using binders containing recycled materials in PDR as surface course
- Reduce GHG emissions associated with production and placing of HMA Type A/RHMA-G surface wearing courses
- Reduce waste in landfills by recycling waste materials into the highway network
- Promote more recycling strategies as directed by SB-1

Estimated Impact to Caltrans and Contractor

None at this time as the efforts are directed towards literature search, review, and information synthesis.

Impediments to Completion of Deliverables

No foreseen impediments to completion.

Recommendation and Approval

This scoping document for "*Explore Partial-Depth Recycling as Possible Surface Wearing Course Using Binders Containing Recycled Materials*" was prepared by the *Recycling Subtask Group* to address a priority issue with statewide significance and is within the Pavement & Materials Partnering Committee mission as described in the Pavement & Materials Partnering Committee Charter. The Subtask Group members have determined the scope, resources required and timeline for delivery of this project so that the deliverables are achievable. A signature here indicates that each Task Group and PMPC Executive Committee is committed to providing the resources to support this effort within the prescribed timeframes. Furthermore, it is everyone's responsibility to ensure that the final effort/improvement will be:

1) Street-Ready,
2) Monitored and reported for performance,
3) Successfully implemented statewide as appropriate.

Scoping Document Recommendation and Industry Concurrence by PMPC TG:

Caltrans Name (Recommendation)		**Industry Name (Concurrence)**	
Cathrina Barros Cathrina Barros, Acting Caltrans Task Group Chair Office of Asphalt Pavements	05/19/2022 Date	Patrick G. Imhoff Pat Imhoff Industry Task Group Member	05/19/2022 Date
Jacquelyn Wong Caltrans Task Group Member Office of Central Laboratories	06/01/2022 Date	phillip reader Phil Reader Industry Task Group Member	05/23/2022 Date
Joseph Dongo, Acting Caltrans Task Group Member Office of Construction Standards	05/27/2022 Date	Scott Dmytrow Industry Task Group Member	06/02/2022 Date
		Dennis McElroy Dennis McElroy (Jun 6, 2022 08:41 PDT) Dennis McElroy Industry Task Group Member	06/06/2022 Date

Scoping Document Approval and Industry Concurrence by PMPC EC:

Caltrans Name (Recommendation)

Tom Pyle — 06/10/2022
Tom Pyle — Date
Caltrans Executive Committee Chair
Pavement Program

Raymond S Tritt — 06/16/2022
Raymond Tritt — Date
Caltrans Executive Committee Member
Construction

Gudmund Setberg — 06/09/2022
Gudmund Setberg — Date
Caltrans Executive Committee Member
Structure Design

Keith Hoffman (Jun 9, 2022 16:12 PDT) — 06/09/2022
Keith Hoffman, Acting — Date
Caltrans Executive Committee Member
Materials Engineering and Testing Services

Industry Name (Concurrence)

Brandon Milar
Brandon Milar (Jun 9, 2022 18:52 EDT) — 06/09/2022
Brandon Milar — Date
Industry Executive Committee Member

Charles Rea
Charles Rea (Jun 16, 2022 10:48 PDT) — 06/16/2022
Charley Rea — Date
Industry Executive Committee Member

Approval Date: 06/16/2022

ATG-RSTG - SD - Explore PDR as Surface Wearing Course (05-05-22 ATG Approved)

Final Audit Report 2022-06-16

Created:	2022-06-09
By:	Ian Sun Chee Fore (s139817@dot.ca.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAAT6-Q9ro2aQvg0Qa1RvCp_dZrZerL-5Y_

"ATG-RSTG - SD - Explore PDR as Surface Wearing Course (05-05-22 ATG Approved)" History

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2022-06-09 - 10:12:46 PM GMT

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2022-06-09 - 10:12:46 PM GMT

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Email viewed by Keith Hoffman (keith.hoffman@dot.ca.gov)
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