

Pavement & Materials Partnering Committee
Work Product Scoping Document
New
Hamburg Wheel Track Test for RHMA-G
12/05/2018

Task Group:

Asphalt Task Group: Asphalt Subtask Group

Title:

Hamburg Wheel-Track Test for RHMA-G Mixes

Problem Process

- Annual
- Expedited
- Emerging Initiative

Statement of Effort/Improvement

Industry and the Asphalt Subtask Group, a subcommittee of the Pavement Materials Partnering Committee, have identified concerns with Hamburg Wheel-Track (HWT) test variability and the specified number of passes to maximum rut depth for rubberized hot mix asphalt-gap graded (RHMA-G) mixes.

Purpose:

The purpose of this effort is to reduce variability of the HWT test and to develop specification tolerances for number of passes to maximum rut depth for RHMA-G mixes while ensuring the continued construction of long-lasting, quality pavements throughout the state.

Background:

There are concerns with the variability in HWT test results. Industry has expressed concerns that they are struggling to meet rut depth within HWT testing requirements and specifications. There is also evidence that split samples coming from the same boxes of material can produce both failing rut depth results on one set of briquettes and passing rut depth results on the other set of briquettes. There are published studies through the UCPRC's, "*Support for Superpave Implementation: Round Robin Hamburg Wheel-Track Testing*", and NCHRP Report 10-87-2B, "*Precision Estimates of AASHTO T 324, 'Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)'*", identifying variability in the HWT with the use of dense grade HMA, but there is no published research to date that addresses the use of RHMA-G. It is reported that there is greater variability in RHMA.

Approach

1. Street Ready Assurance

It is intended that California Test 389 (CT 389) and the recommended specification changes will be "street ready" through consideration of the most recent technical studies and

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national standards, and upon approval and issuance through the PMPC, California Test, and specification review processes.

2. Performance Tracking/Management

The Asphalt STG will monitor feedback on CT 389 and the recommended specification changes received from both Caltrans and Industry for 1 year after implementation. The Independent Assurance Program/METS will also conduct round-robin testing on HMA and RHMA to validate the performance of CT 389.

3. Consistently Implemented

The specification changes and CT 389 will be implemented through amendments for projects in the bid process, and Revised Standard Specifications for future projects. The Independent Assurance (IA) Program will work to ensure that CT 389 is consistently implemented through standardized IA written exams and practical exam checklists. The new test method will be shared by METS at the District Materials Engineer Meeting and through outreach to District IA staff.

4. Pilot Projects (if anticipated)

NA

5. Research Needs (if necessary)

N/A

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Hamburg Wheel Track Test for RHMA-G Mixes

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Team Members (Indicate CT Chair and Industry Lead)

| CT/Industry | Division/Firm Name | Member Name |
|-------------|---|---------------------------|
| CT | DES / METS | Maged Armanuse (Chair) |
| CT | HQ Construction | Raguparan Thangavelautham |
| CT | District 11 - Materials Engineer | Al Ochoa |
| CT | District 4 - Pavement and Materials Engineering | Venu Gopal |
| IN | Granite Construction | Hongbin Xie (Lead) |
| IN | Vulcan Materials | Pascal Mascarenhas |
| IN | George Reed Construction | Phil Reader |
| IN | Sully-Miller Contracting | Don Vivant |

Team should not include no more than 4 Caltrans staff and 4 members from Industry. See PMPC Standard Operating Procedures for more information.

Objectives/Deliverables/Due Dates

The work product group will approach the effort, objectives, and deliverables as follows:

1. Review historical documents from previous HWT efforts including the draft CT 389, AASHTO T 324, available project HWT test data, RHMA HWT Reference Sample Program results, and studies (e.g. UCPRC, NCHRP, RPC HWT Small Working Group, etc.) as identified by the work product group that assess the application and variability of the HWT test. An evaluation of HWT equipment will also be reviewed.
2. Review Caltrans and national HWT specifications
 - a. Review Caltrans HWT specification requirements for RHMA-G mix
 - b. Review HWT specification requirements from other state Departments of Transportation (DOT)

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3. Develop a report with recommended specifications for the appropriate number of passes to maximum rut depth for RHMA-G mixes
 - a. Support recommended number of passes based on existing national research, other state DOT specifications, California RHMA-G experiences, and design considerations
 - b. Evaluate the elimination of stripping/inflection point requirement
 - c. Update Section 39 specification modifications to AASHTO T 324 (Modified)
 - d. Update AASHTO T 324 (Modified) with CT 389 as modified by the work product group
4. Review current version of AASHTO T 324 to identify any additional equipment requirements
 - a. Conduct surveys to identify impacts to Caltrans and Industry labs
 - b. Develop a plan to mitigate impacts, and purchase or refurbish existing equipment as needed
5. Finalize and publish California Test 389
 - a. Understand and work within the Caltrans CTM process
 - i. Work with METS Pavement Technology Committee as owner of the CTM
 - b. Incorporate the current version of AASHTO T 324, and any necessary changes as a result of work product group findings. At a minimum:
 - i. Evaluate the elimination of the stripping/inflection point
 - ii. Agree to target air voids and air void tolerance for briquettes
 - iii. Evaluate the test method with respect to sample conditioning, molding of specimens and other details to reduce the variability in testing.
 - c. Route CT 389 per the CTM Process, finalize, and publish.
 - d. Work with the Independent Assurance Program Manager to implement standardized IA written exams and practical exam checklists prior to specification implementation
6. Work with the Independent Assurance Program/METS to develop a work plan for conducting round-robin testing to validate the performance of CT 389 as a follow-up to the work performed under this scoping document.

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| Milestones | Name - Responsible Party | Due Date (Start/Complete) |
|--|---|----------------------------------|
| Review historical documents from previous HWT efforts, and other pertinent studies | All Work Product Group Members | 01/31/2019 |
| Review Caltrans and national HWT specifications | All Work Product Group Members | 01/31/2019 |
| Develop recommended specifications for number of passes | All Work Product Group Members | 02/28/2019 |
| Review current version of AASHTO T 324 to identify any additional equipment requirements | Maged Armanuse / Industry Work Product Group Member | 02/28/2019 |
| Submit Section 39 changes to Office Engineer | Maged Armanuse / Industry Work Product Group Member | 04/01/2019 |
| Finalize and publish California Test 389 | Maged Armanuse / Industry Work Product Group Member | 04/30/2019 |
| Develop Round Robin Work Plan | Maged Armanuse / Industry Work Product Group Member | 6/30/2019 |

Resources To Develop and Implement

| | Caltrans Hours | Industry Hours |
|-----------------|-----------------------|-----------------------|
| Development | 600 hrs. | 600 hrs. |
| Other Resources | TBD | TBD |

Benefits

- Better understanding of test method variability
- Consistency in HWT test implementation statewide
- Improved planning for future Caltrans and Industry needs
- Develop specification tolerances for number of passes to maximum rut depth for RHMA-G mixes

Estimated Impact to Caltrans and Contractor

- Improved HWT test and specifications
- Improved consistency between Contractor and Caltrans HWT test results
- Decrease in project costs
- Decrease in District/HQ resources
- Decrease in testing disputes, construction delays, and Contractor claims

Impediments to Completion of Deliverables

- Schedule constraints and availability to participate in work product group efforts
- Caltrans resources – personnel and financial
- Scope Creep
- Lack of data to support sound engineering decisions

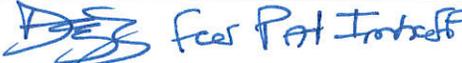
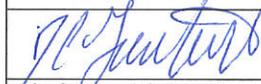
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Recommendation and Approval

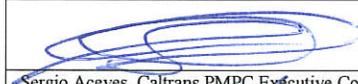
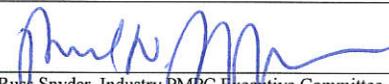
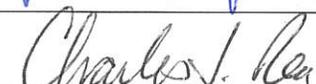
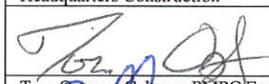
This scoping document for *Hamburg Wheel Track Test for RHMA-G* was prepared by *Asphalt Task Group: Asphalt Subtask Group* to address a priority issue with statewide significance and is within the Pavement & Materials Partnering Committee mission as described in the Pavement & Materials Partnering Committee Charter. The Subtask Group members have determined the scope, resources required and timeline for delivery of this project to attempt to ensure 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 (name and date):

| Caltrans Name (Recommendation) | Date | Industry Name (Concurrence) | Date |
|---|---------|--|---------|
|  Tom Pyle, Caltrans Task Group Chair | 12-5-18 |  Pat Imhoff, Industry Task Group Lead | 12/5/18 |
|  Blair Anderson, Caltrans Task Group Member | 12/5/18 |  Tracy Zubek, Industry Task Group Co-Member | 12/5/18 |
|  Tim Greutert, Caltrans Task Group Member | 12/5/18 | | |

Scoping Document Approval and Industry Concurrence by (name and date):

| Caltrans Name (Approval) | Date | Industry Name (Concurrence) | Date |
|---|----------|--|---------|
|  Sergio Aceves, Caltrans PMPC Executive Committee – Chair Pavement Program | 12/11/18 |  Russ Snyder, Industry PMPC Executive Committee | 12/6/18 |
|  Ray Hopkins, Caltrans PMPC Executive Committee Headquarters Construction | 12/6/18 |  Charley Rea, Industry PMPC Executive Committee | 12/6/18 |
|  Tom Ostrom, Caltrans PMPC Executive Committee Structures Policy and Innovation | 12/6/18 | | |
|  Dan Speer, Caltrans PMPC Executive Committee Materials Engineering and Testing Services | 12/6/18 | | |

Approval Date: _____