

CALIFORNIA WMA STUDY: SPECIFICATIONS, PRODUCT APPROVALS, AND IMPLEMENTATION

Joseph Peterson, PE
California Department of Transportation

Global Warm Mix Asphalt Workshop
Coralville Iowa, October 2013



Summary

- Introduction
- Specifications
- Product approval
- Implementation
- Conclusions



Introduction

- Rapid growth in the use of WMA
- In 2006, limited research to back up claims
- Better understanding required before full implementation
- Combined initiative between
 - Caltrans
 - UC Pavement Research Center
 - Contractors
 - WMA technology providers



Introduction



Introduction



Summary

- Introduction
- Specifications
- Product approval
- Implementation
- Conclusions



Specifications

- Caltrans has three levels of AC construction
 - QC/QA, Standard, and Method
- QC/QA
 - Contractor responsible for materials and compaction
 - May use WMA from approved list. Must include WMA technology on JMF
 - Mix design does not include WMA
 - No restrictions except mat temperature for opening
 - All QC/QA testing done on plant produced mix (with WMA)
 - Includes Hamburg and ITS (minimum wet and dry strengths)



Specifications

- Standard
 - As for QC/QA, but Caltrans can specify that a WMA technology is used
 - WMA must be selected from the approved list
- Method
 - Typically for OGFC
 - Caltrans does mix design and can specify WMA
 - Contractor must meet mix design requirements
 - Contractor chooses WMA from approved list
 - Contractor follows method, no compaction measured

Summary

- Introduction
- Specifications
- Product approval
- Implementation
- Conclusions



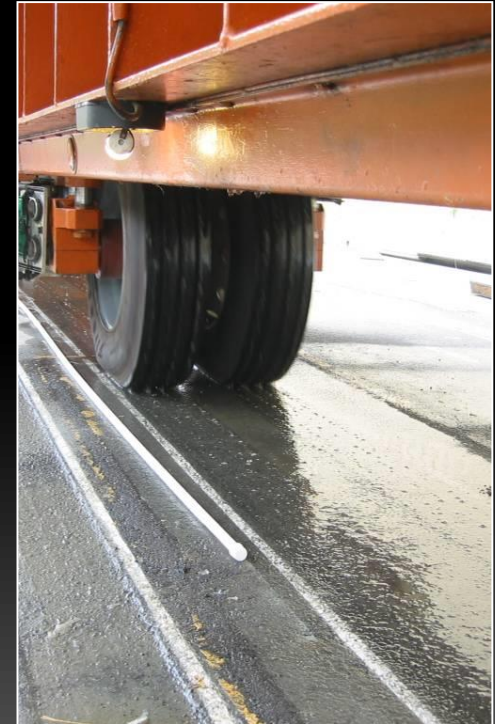
Product Approval

- No national “approved list”
- Varying levels of assessment in other states
- Concerns over
 - Unexplained poor performance (technology gets blamed)
 - New technologies and “combination technologies”
- Caltrans set up state approval process as an interim measure
 - Nine technologies approved to date
 - One in process



Product Approval

- Summary report covering the following:
 - Technology overview
 - Safety data sheet
 - Material-plant quality plan compliance
 - Laboratory testing against HMA Control
 - Rutting test
 - Cracking test
 - Hamburg and TSR
 - OGFC durability
 - Field testing against HMA Control
 - Three test sections
 - >10,000 AADT, >10% trucks
 - One section can be ALT



Summary

- Introduction
- Specifications
- Product approval
- Implementation
- Conclusions



Implementation

- Pilot projects 2007 through 2011
- Specification approved in 2011
- >1 million tons placed in 2011
- >1.5 million tons placed in 2012
- Less placed in 2013 due to spec changes
- Will probably increase again in 2014



Implementation – Case Study

- Interstate 5, south of Sacramento
- 27km (17miles), 6 lanes, \pm 200k AADT
- Jointed plain concrete pavement, no dowels
 - Badly cracked, numerous slab replacements required
- Program
 - Slab replacements
 - Done with WMA (Evotherm)
 - Allowed rapid placement, compaction, and opening to traffic
 - Lower temperatures allowed cooling to opening temperatures in a reasonable time



Implementation - Case Study



Implementation - Case Study



1st lift



Implementation - Case Study



Final Lift

215F

92.25%



Implementation – Case Study

- Program
 - Slab replacements
 - Crack and seat
 - Overlays
 - 225mm of AC, including R-OGFC, all with Evotherm
 - Over 600,000 tons placed
 - All night paving, towards end of paving season
- WMA advantages
 - Faster slab replacement rate, longer work time
 - Better haul management
 - Less emissions/odors in residential area
 - Good compaction
 - Longer paving window



Summary

- Introduction
- Specifications
- Product approval
- Implementation
- Conclusions



Conclusions

- Comprehensive, systematic study to guide implementation of WMA in California
- Confirmed equal performance can be obtained on typical projects, better performance on long haul and cold coastal projects
- WMA now considered as “standard practice” in California



THANK
YOU!



Joseph Peterson
joe_peterson@dot.ca.gov

Global Warm Mix Asphalt Workshop
Coralville Iowa, October 2013

