

TDOT CAM PRE-BID MEETING NOTES

4/22/2022

Attendees:

• Amanda Gilliland – The Transtec Group	• Heather Hall – TDOT	• Monica Doebel – Weris, Inc.
• Brian Egan – TDOT	• Hong Park – TDOT	• Robert Hill – Harrison Construction Company
• Brian Marsh – Ford Construction Company	• James Rosen – TDOT	• Robert Streetman – Talley Construction Inc.
• Chad Norton – Ford Construction Company	• Jamie Fitzpatrick – TDOT	• Robert Taylor – Talley Construction Inc.
• Coby Lancaster – Rogers Group Inc.	• Johan Van Rensburg – Weris, Inc.	• Ryan Sweeney – TDOT
• Derek Gaw – TDOT	• Kiran Mohanraj – The Transtec Group	• Scott Samples – Talley Construction Inc.
• Eric Schulman – Weris, Inc.	• Mark Odom – Rogers Group Inc.	• Scott Thompson – Talley Construction Inc.
• George Monachino – Rogers Group Inc.	• Matthew Chandler – TDOT	• Shree Rao – Applied Research Associates
• Heath Thompson – Rogers Group Inc.	• Mike Nicely – Charles Blalock & Sons	• Warren Whited – Eubank Asphalt Paving and Sealing

1. BACKGROUND

- Derek Gaw:
 - CAM is part of FHWA’s EDC-6 TOPS initiative; selected by TDOT to help with reflective cracking
 - Purpose of CAM is to reduce reflective cracking and provide rut resistance
 - Other names for CAM include BRIC
 - Typically placed as interlayer 1 to 1 ½ inches thick
 - CAM creates opportunity to innovate and use additives not part of standard resurfacing
 - Looking toward performance testing to evaluate special mixtures
 - IDEAL-CT used to indicate crack resistance; Hamburg Wheel Tracking Test (HWTT) used to indicate rutting/stripping potential
 - TDOT conducted feasibility study to develop specifications. Wanted to use materials readily available
 - Looked at historical specifications and normal CAM gradations in creating aggregate structure

2. MIX DESIGN

- Hong Park:

- Design criteria developed based on tests presented in research paper from Texas A&M Transportation Institute (TTI)
 - Began with PG 64-22 (7% AC). Issues included bleeding/asphalt draindown
 - Next trial with PG 76-22 (7% AC)
 - Draindown reduced but still present
 - Used PG 76-22 AC in third trial batch and used cellulose fibers to reduce draindown
 - Final specimen with narrower range of air voids made results more reliable
 - Higher peak load tends to yield steep slope, lower peak load reduces slope and creates higher CT index
 - In general, specimen with higher air void is less steep. Mixture with lower steepness tends to have higher CT index.
- Test results: less than 4 mm after 20,000 cycles using HWTT
 - Developed test with mechanical testing equipment available
 - CAM mixture placed between dense graded mixtures
 - After 20,000 cycles at room temperature, no visible cracking observed on top of dense-graded mixture
- 2nd reflective cracking trial: Tested with 2 layers and with 1 layer. Tried to maximize bending stress and placed lower support where two specimens met. Test also didn't show clear cracks on surface
- 3rd test: similar to 2nd trial, but no support under. Were able to see cracks
- Tested CAM and 411-D simultaneously and checked every 3,000 cycles. Saw cracks on top and bottom of 411-D mixture more than CAM, and cracks were clearer
 - Drew conclusion that CAM performs better than 411-D under wheel loading
- Derek Gaw:
 - Special Provision 307CAM
 - Set minimum criteria to provide starting point for mixture design: 7% AC, PG 70-22
 - Production/acceptance testing in accordance with standard specs. Density testing for informational purposes only
 - No additional compensation under 407.20.C.1 for exceeding 7% AC content or for additives needed to meet required testing criteria

3. BACKGROUND ON EDC-6 TOPS

- Shree Rao:
 - Each Every Day Counts (EDC) project lasts a couple of years and promotes a group of pavement technologies
 - Close to a trillion dollars needed to restore roads/bridges
 - EDC ensures overlays are targeted to needs (e.g., crack attenuation) and location
 - Weris, ARA, Transtec, NCAT support FHWA on overlay products

4. EDC-6 TOPS TEAM CAM PRESENTATION

- Amanda Gilliland:
 - TDOT has shown trial designs; mix is achievable using common stockpile materials
 - CAM is an interlayer, not placed on surface but somewhere in pavement structure

- Intended to slow reflective cracking, a common issue in overlay construction
- CAM generally has fine gradation, high asphalt content, placed in thin lifts
 - Tested for rut resistance, as they are thin lifts close enough to surface to cause rutting concerns
- I-69 in Texas Houston District required frequent repairs prior to CAM overlay system
 - Only 3-4 years of life with traditional dense-graded mixtures
 - Only funded for overlays every 8 years
 - Worked with TTI to design CAM overlay system to reduce reflective cracking. 1 inch layer of CAM mix and 1 inch surface mix (also performance tested)
 - TxDOT using CAM system successfully on both concrete and asphalt surfaces
 - Major point is ensuring paving is being done on clean, dry surface
 - Some states have experienced blistering during construction (due to vapor being trapped)
- TxDOT specs include only 2 broadband requirements
 - Not many restrictions on blend
 - TxDOT has had success using fibers, stockpile materials readily available
- IDEAL-CT is one of simpler crack resistance tests, uses similar press to Marshall stability test
 - Many labs set up for Ideal-CT and HWTT
- NJ and TX require MTVs to minimize thermal/mix segregation. Not much time to get compacted. Need consistent mix to help with quality

5. Q&A

- William Smith: What is the reasoning behind specifying a minimum grade of PG 70-22 and not PG 76-22?
 - Derek Gaw: Saw benefits of grade bumping, results using PG 76. Not required to use PG 76, but wanted to provide PG 70-22 as an option if it can be done economically
- William Smith: Will weather/climate information be put in spec?
 - Matt Chandler: No. No construction practices have been changed, purely a design spec
- William Smith: Used wheel rutter when right machine was unavailable?
 - Matt Chandler: Yes, TDOT selected IDEAL-CT as cracking test of choice. Hong Park worked to recreate different cracking method than what IDEAL-CT tests for internal use as proof of concept
- William Smith: Having trouble finding aggregates. Are TX/NJ using washed aggregates to make CAM mix?
 - Kiran Mohanraj: No, because fines are needed, doesn't have to be washed
 - Amanda Gilliland: Many mixes TX uses allow up to 10-12 percent fines content
- Robert Taylor: In TN, pneumatic rubber tire roller is required on interlayers, but this equipment doesn't work well with high AC content. Will state remove that requirement?
 - Derek Gaw: Number and type of rollers is unspecified. Rubber tire not required
- Robert Taylor: Regarding bituminous index—will contractors be paid for anything over 7%?
 - Derek Gaw: Capped index up to 7%, didn't want to favor any particular method over another for meeting spec
- Matt Chandler: 2 testing labs in KY (Bluegrass, Blankenship Asphalt Testing), 1 in AL (NCAT at Auburn)

- Labs are aware of spec and are interested in helping
- Robert Taylor: Completion date on projects—If someone struggles to get mix design done, will state work with contractors? Multiple jobs to bid and sending to multiple labs will take time
 - Ryan Sweeney: Will be considered on contract-by-contract basis
 - Jamie Fitzpatrick: Also want to be mindful of temperatures
 - Region 4 projects have completion dates at end of October, Region 1 completion is at end of September
 - Will need to be mindful of higher elevations and weather when considering completion dates. Want to ensure it's laid when temperature is optimal