



Intelligent Compaction

ICPF Technical Working Group Meeting

Web Meeting

Wednesday, June 24th 2009

11:00 a.m. – 12:30 p.m. E.D.T.

Attendees:

Project Team: George Chang – PI, Qinwu Xu, Bob Horan – Facilitator (Asphalt Institute), Larry Michael – Co-PI (LLM Asphalt Consultant)

FHWA: Lee Gallivan

MD SHA - HQ: Dan Sajedi, Gloria Burke, Frank Loratto, Lester Davis, and etc.
Joel Resh-Design Engineer. etc.

MD SHA – District 7: John Huchrowski, Devin Miller, Gerald Burgess, Bobbie Ray McCormick, Joel Resh, and etc.

Paving Contractors: Michael Day

Sakai: Stan Rakowski

Bomag: Chris Connolly, Dave Dennison

U MD: Prof. Charlse Schwartz

UTEP: Prof. Soheil Nazarian

Purpose – Final Planning for MD SHA IC Demo – July 20 to 24, 2009

- Review Schedule/Activities
- Coordinate Work/Responsibilities
- Review Experimental Plan

Summary and Action Items

Review Schedule/Activities

- The paving for the US 15 SB is scheduled to start on July 13. Therefore, the IC demonstration (which starts on July 20) will fall in the second week of the paving process.
- The demonstration project will be a mill-and-fill project with 1.5" of 12.5-mm Superpave mixture (with PG64-22 binder). The total production of HMA will be 25,000 tons for this 10-mile project. Daily HMA production will be 1500 to 2000 tons.
- It will be a day-time paving process starting around 9AM for about 10 hours (i.e., till approx. 7 PM). Lane closure will not be available outside of the 10-hour period.
- The training time for two roller operators (provided by the paving contractor, F.O. Day) for operating the IC rollers will take 1-2 hours. It is planned to conduct the training prior to the paving on Day 1 of this IC demonstration, i.e., Monday, July 20. (e.g. 7AM to 9AM)
- Preferably, the IC demonstration will be conducted for the slow lane and 10' shoulder paving since it may be safer than the paving for the 4' shoulder and fast lane.
- The Haywood road widening area will be paved prior to the IC demonstration. Therefore, it will not be available for subbase IC mapping.
- The daily IC demonstration area can be up to a 4-mile section and a GPS base station will need to be installed at the center (preferably at a higher elevation) of the test area.
- Daily briefing can be conducted on-site or a MD SHA field office to review the current day's operation and plan/adjust for the next day's operation.

- The candidate IC demonstration locations, contract details (including acceptance of densities, and possible removal of disincentive for the demonstration sections), daily IC roller storage location will be determined during a project meeting on Thursday, July 2 and Friday, July 10.

Coordinate Work/Responsibilities

MD SHA will provide

- A FWD and an operator (at designated locations on the milled HMA surface ahead of the paving). A relative calibration prior to the testing will be required. This is tentative and will depend on the time available and limitation due to paving traffic. Dan will explore this option. (confirmed)
- A non-nuclear density gauge (Transtech PQI) and an operator (measure HMA density after the break-down rolling at designated locations by the research team)
- A thermal camera to capture surface temperature (output as jpeg images) at designated locations (e.g. the RFID test section) by the research team.
- A hand-held survey-grade GPS (rover) and an operator (record all FWD test locations, nuclear density gauge measurement locations, each RFID tag locations, and PSPA test locations). The rover should be compatible with the Trimble GPS base station. Gloria will provide update on the GPS rover and its operator's availability, as well as its compatibility with the Trimble base station.
- An indoor presentation facility, a LCD projector and a projection screen for the first 2-hr Open House. It is normally expected to have ~40 participants. (It will be tentatively in the training room of the MD SHA district office)
- Promotion of the Open House to other MD SHA district offices, other MD county offices, VDOT, PennDOT, and FHWA. (Dan sent an example of last Open House. Gloria will update it for this Open House)

Contractor – F.O. Day - will provide:

- Two operators to operate IC rollers.
- A storage or park location for IC rollers during non-paving time. More details will be provided after the July 2 project meeting.
- A nuclear density gauge (Troxlner) and an operator (measure HMA density after the break-down rolling and/or finish rolling at designated locations by the research team)
- Cut HMA cores and perform lab test when needed.
- Promotion of the Open House to the F.O. Day staff.

Sakai will provide:

- A double-drum IC roller and technical support
- A Trimble GPS station
- Contact Trimble to possibly provide local tech support on Day 1 (Monday, July 20). (still waiting from Trimble's response)

Bomag will provide:

- A double-drum IC roller and technical support
- The GPS on the IC roller will need to be validated prior to the demonstration. (Bomag may use a Starfire GPS receiver as an alternative.)

RFID instrumentation (Chuck)

- RFID tags will be installed at horizontal grids within a 45 ft test section to measure HMA mat temperatures at a short time interval. At each grid point, 3 tags will be instrumented at bottom, mid-point, and surface of the HMA overlay – but redundancy will be provided by adding another type of tags. Many discussions were on the devices and potential pitfalls of the instrumentation esp. surface tags.
- The bottom tags will be glued to the milled HMA surface using adhesive (still researching). The tags at mid-depth will be supported by epoxy chairs.

- The RFID tags has been verified and tested in a lab and will be under a field trial at a parking lot project at the U MD campus prior to the IC demonstration.
- The data collection will be using a RFID reader at the road side wirelessly between the HMA paving and compaction. Eventually the readers can be installed on pavers or rollers.
- Due to the high price of the RFID tags, only one test section will be instrumented.

PSPA Test (Soheil)

- PSPA is recommended by the NCHRP 10-65 study for acceptance testing of HMA paving. It is used to measure the dynamic moduli of HMA layers. Surface temperatures of HMA mat will be taken using an infrared gun.
- The measurement for each PSPA test takes only 15 seconds. It is anticipated to conduct PSPA tests at the RFID tag locations and other locations designated by the research team. The research team may consider conducting PSPA measurements on milled HMA surface at selected locations (e.g. RFID tags). The PSPA measurement will need to be conducted after the HMA mat temperatures drop below 140°F (likely after the finishing rolling).

Review Experimental Plan

- An on-site briefing will be conducted first thing on Day 1. **The time and location will be determined after the July 2 project meeting and the July 10 meeting.**
- GPS Base Station, Roller Setup, operators' training (Day 1: prior to the paving)
- Mapping of existing subbase/In-Situ Tests (Day 1: prior to the paving) (tentative – Sakai stated that mapping the milled surface using the Sakai IC roller is possible.)
- HMA IC Production Rolling/In-Situ Tests (Days 1-4)
- RFID instrumentation and test. (Day 2)
- PSPA testing. (Days 2 and 3).
- Open House (Day 4, i.e. July 23) - 2-hr indoor presentation and 2-hr field demonstration. (more details, such as mobilization of visitors to the field site will be provided after the July 2 project meeting)
- The Sakai and Bomag IC rollers may used alternatively as the break-down roller and intermediate roller, and vice versa. Due to high production rates, the contractor may provide an additional roller for the operation. The research team will help adjust the operation according to the rollers and settings (weights, sizes, vibration frequencies/amplitudes).
- **The experimental plan will be updated by the research team. (and a Summary Field Sheet is added. More details on the day-to-day operations will be added by Bob and George)**

Logistics

- ▶ **Roller shipment and storage:**
 - All IC rollers will be shipped to the field site by Friday, July. 17. Note that the Sakai roller will be at the MS IC demonstration site the week before the MD SHA demonstration.
 - The shipping address is: F.O. Day's Frederick Asphalt Plant. 4120 Buckeystown Pike, Frederick MD 21701. **F.O. Day will need to provide a contact phone number to the research team and pass on to the shipping company. (It was provided: Larry Warfield, (301) 343-5652)**
- ▶ The research team and the IC roller vendors' tech support will be arriving on-site the day before the demonstration. **(The research team will meet at the Holiday Inn Express on Sunday night, July 19)** Most of the research team personals will stay for the entire week.