

# WisDOT HMA IC Demonstration

IH 39, Mosinee, WI, May 10 to 13, 2010

## On-Site Contact List

Last name	First name	Affiliation	Telephone	Email
<b>ICPF Project Team</b>				
Chang	George	Transtec Group	C 512-659-1231	gkchang@thetranstecgroup.com
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<b>State DOT and etc.</b>				
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<b>Roller/Components Vendors</b>				
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Hanes	Bruce	Trimble		bruce_hanes@trimble.com
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Kmiecik	Mike	Positioning Solutions	262-798-5252	mikek@1psc.com
<b>Paving Contractors</b>				
Eslinger	Matt	Mathy	715-299-0245	meslinger@mathy.com
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## Onsite Meetings

### Monday, May 10:

- 7AM: IC Research team, Mathy, WsiDOT project manager, Sakai, GPS tech supports will meet at the beginning of the job (**1 mile north of Hwy 153 on I-39**) at 7AM, Monday, May 10.
- 8AM: WisDOT FWD operator (Craig Vils) arrives on site.
- 9AM: WisDOT nuclear gauge operator (Bob Schiro) arrives on site.

### Daily Briefing:

- IC research team will inform all parties on the ad hoc briefing onsite.

## Onsite Safety



WisDOT requires all onsite participants to observe safety rules:

- Ingress and Egress to and from the work zone, vehicles shall be equipped with yellow flashing lights.
- Location to park vehicles.
- Location for people to safely observe operations.
- Adequate safety equipment provided for all personnel within the work zone. (safety vests, shoes, etc.)



# Roller Shipment

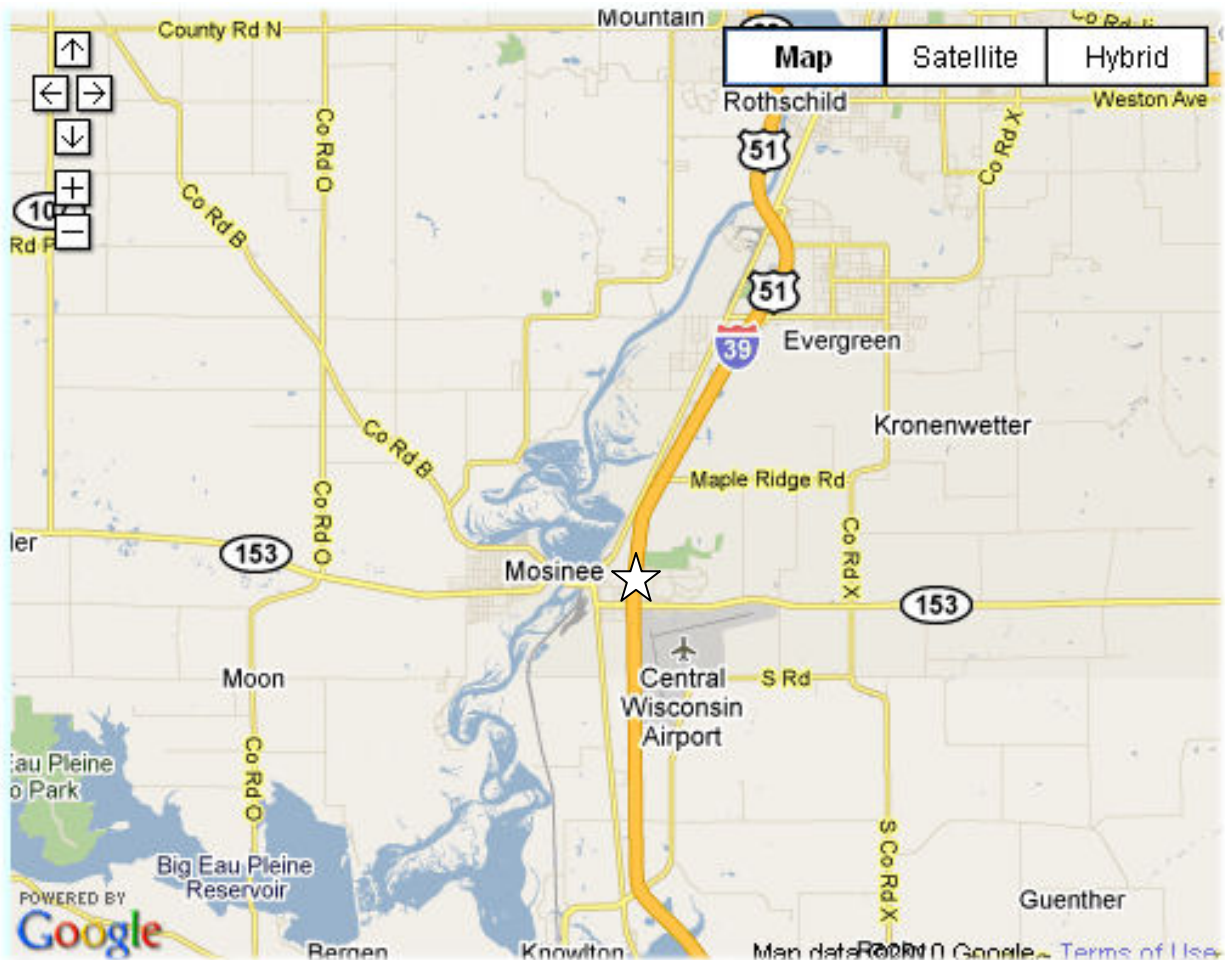
The shipping address is: **1116 Happy Hollow Rd., Mosinee WI 54455**

Contacts: **Matt Eslinger, 715-299-0245**

ETA: **Friday (May 7, 2010).**

## Site Map

It is a HMA overlay project on rubblized PCC located at IH 39 in Mosinee, WI at the junction of IH39 and 153.



## On-site Activities

Schedule	Activities
Days 1-2 (Monday AM to Tuesday AM)  <b>Travel lane</b>	<ul style="list-style-type: none"> <li>• Setup the GPS base station set up and IC roller system. Conduct GPS validation tests with a GPS rover.</li> <li>• Train the IC roller operator.</li> <li>• Map of existing rubblized PCC surface using the IC roller measurement system within a 1000-ft test strip.</li> <li>• Conduct in-situ point testing of the existing surface using FWD within the test strip and measure each test location with a GPS rover.</li> <li>• Compact the 25-mm HMA base course. Conduct in-situ point testing of the existing surface using a nuclear gauge after the breakdown compaction and other devices within the test strip (~ 20 locations) and measure each test location with a GPS rover.</li> <li>• Compact the 19-mm HMA intermediate course. Conduct in-situ point testing of the existing surface using a nuclear gauge after the breakdown compaction and other devices within the test strip and measure each test location with a GPS rover.</li> </ul>
Days 2-3 (Tuesday night to Wednesday night)  <b>Driving lane</b>	<ul style="list-style-type: none"> <li>• Repeat the Days 1-2 operations for the driving lane.</li> </ul>
Day 4	<ul style="list-style-type: none"> <li>• Analyze and report the IC and in situ results, generating a preliminary report and presentation of results for the Open House.</li> </ul>

Note:

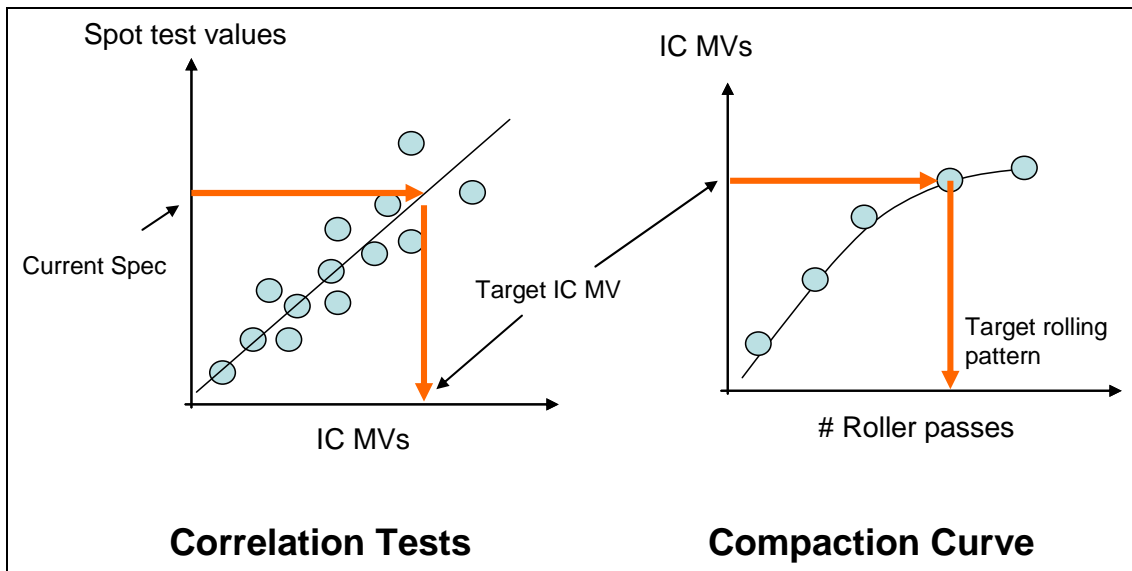
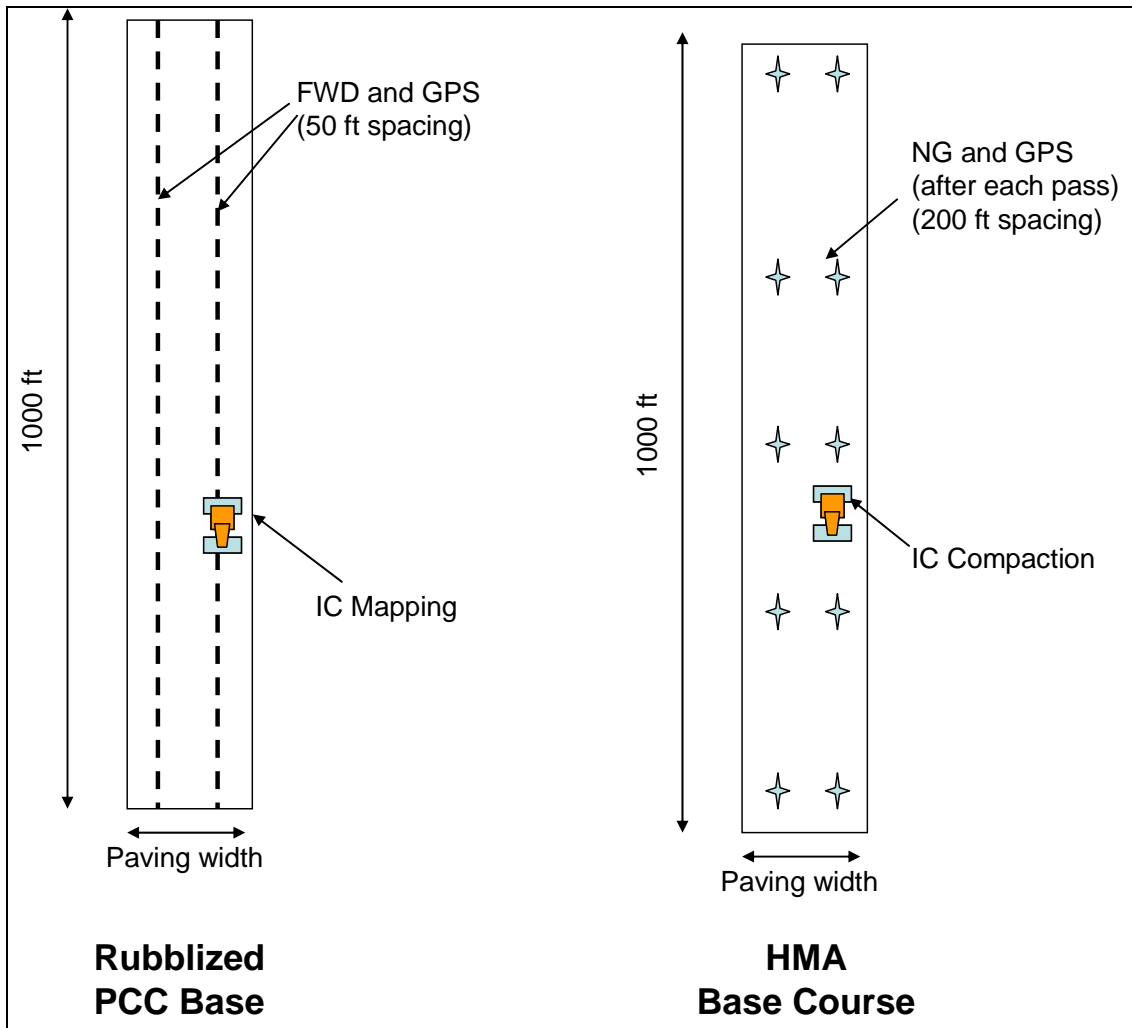
- Each daily operation include: Milling of existing HMA overlay, rubblization underlying concrete, paving of the 25-mm HMA base course, and paving of the 19-mm intermediate course.
- Two Sakai double-drum IC rollers (SW880 and SW990) will be used for this demo as the break-down roller and intermediate roller. Either SW880 or SW990 will also be used for mapping the rubblized PCC prior to the HMA overlay. GPS receiver and control panels may be removed from the IC rollers at the end of each daily paving operation.

## Test Settings

Date	TB	Machine	Amp (mm)	Spot Tests	Notes/Comments
5/9					Arrive on site.
5/10-11	1	Sakai	0.3 (low) at 3000 vpm	FWD, GPS	<p><b>Machine and GPS setup and validation runs. Operator's training.</b></p> <p><b>Mapping of Existing Base.</b>            1. Map the existing base for 1000 ft.            2. Spot test with FWD and GPS within the test strip.</p> <p><b>Compaction for HMA base course.</b>            1. Verify the roller temperature measurements            2. Compact HMA overlay with normal roller passes.            3. Detailed spot test with nuclear density gauge and other devices within the test strip after breakdown.</p> <p><b>Compaction for HMA intermediate course.</b>            1. Verify the roller temperature measurements            2. Compact HMA overlay with normal roller passes.            3. Spot test with nuclear density gauge and other devices within the test strip.</p>
5/11-12	2	Sakai	0.3 (low) at 3000 vpm	FWD, GPS	<p><b>Mapping of Existing Base.</b>            1. Map the existing base for 1000 ft.            2. Spot test with FWD and GPS within the test strip.</p> <p><b>Compaction for HMA base course</b>            1. Verify the roller temperature measurements            2. Compact HMA overlay with normal roller passes.            3. Detailed spot test with nuclear density gauge and other devices within the test strip.</p> <p><b>Compaction for HMA intermediate course</b>            1. Verify the roller temperature measurements            2. Compact HMA overlay with normal roller passes.            3. Spot test with nuclear density gauge and other devices within the test strip.</p>
5/13					Open House –presentation of preliminary results and roller demonstrations.

- Sakai SW880 and SW990 will be used as the break-down and intermediate rollers.
- TB #1: Travel lane
- TB #2: Driving lane
- FWD: Falling weight deflectometer
- LWD: Light weight deflectometer
- GPS: hand-held Global Position System rovers
- NG: Nuclear density gauge

# Test Strips



# Sakai Double Drum IC rollers



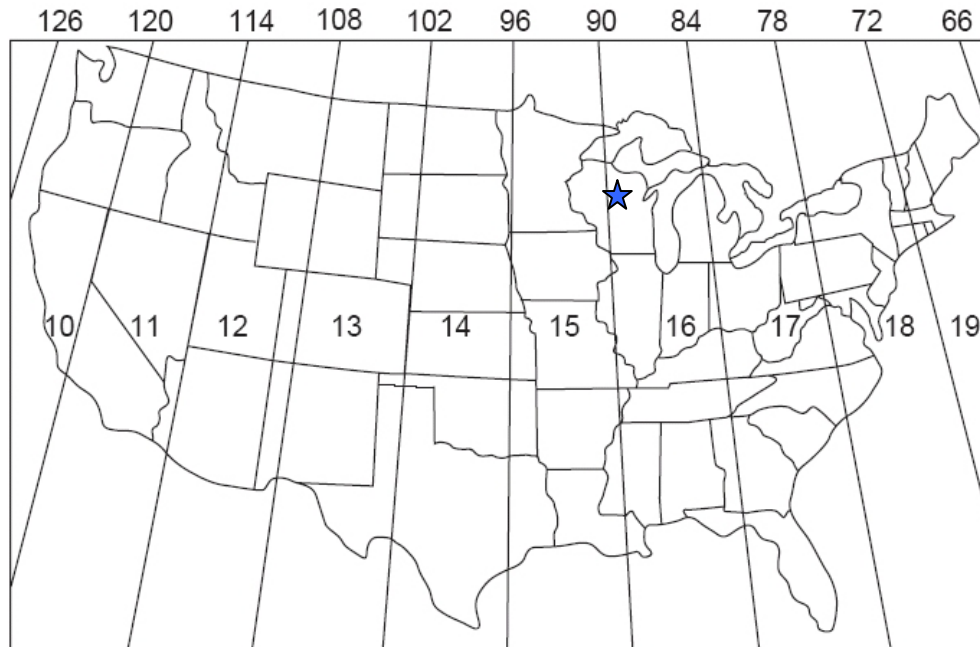
**Table 1. Features of the Sakai SW880 and SW990 Tandem IC Rollers.**

Manufacturer/ Vendor	Sakai America	Sakai America
Model Name	Exact Compact System (ECS)	Exact Compact System (ECS)
Model Number	SW880	SW990
Drum Width	79"	84"
Machine Weight	29,560 lbs (~ 14 tons)	30,800 lbs (~ 15 tons)
Amplitude Settings	0.013", 0.025" ( 0.33 to 0.64 mm)	0.013", 0.026" (0.33 to 0.66 mm)
Frequency Settings	High amp. 2500 or 3000 vpm Low amp. 2500, 3000, or 4000 vpm	High amp. 2500 or 3000 vpm Low amp. 2500, 3000, or 4000 vpm
Auto-Feedback	No	No
Measurement System	CCV with temperature and passes mapping	CCV with temperature and passes mapping
Measurement Value	Compaction control value (Sakai CCV)	Compaction control value (Sakai CCV)
Measurement Unit	Unitless	Unitless
GPS Capability	Yes (RTK)	Yes (RTK)
Temperature Measurement	Infra-red sensor at front	Infra-red sensor at front
Documentation System	Compaction Information System (CIS)	Compaction Information System (CIS)

# Global Position System

## Grid Reference

UTM 16-N is the preferred grid reference. State plane coordinate is the second choice.



**Figure 1. UTM Zones in the US.**

## Trimble GPS

- A Trimble GPS receiver and a radio will be mounted on the Sakai SW880 machine.
- A Trimble GPS base station will be setup to provide RTK correction signals.
- A hand-held Trimble GPS rover will be used for in-situ point measurements.

## TopCon GPS

- A TopCon GPS receiver and a radio will be mounted on the Sakai SW990 machine.
- A TopCon GPS base station will be setup to provide RTK correction signals.
- A hand-held TopCon GPS rover will be used for in-situ point measurements.



# In-Situ Point Testing and Other Tests

## WisDOT/FHWA-WI

- Provide a FWD and an operator for testing on 1000-ft test strips of rubblized PCC prior to the HMA overlay for both days of operations.
- Provide a nuclear density gauge and an operator for testing on 1000-ft test strips of HMA overlay course for both days of operations.
- (FHWA-WI) Assist the Open House by inviting WisDOT district engineers, cities/counties, Universities, local asphalt paving associations, and others.
- (post-construction tests) Conduct FWD testing at the approximately locations on the finished surface course where previous FWD tests were conducted in the rubblized PCC base (spray paint markings on the shoulders may help locate the original test points).

## FWD Test

- Platen Size: 5.9" radius (rigid plate)
- Geophone positions: 0, 12, 24, 36, 48, 60, 72 inches (7 sensors)
- Test patterns: every 50-ft on designated 1000-ft test lines
- Drops/Loads: Save 2 drops at targeting 9,000 and 12,000 lbs.
- File format: F25, DDX, MDB, or any text format (including load history)

## Mathy Constructions

- Provide two personnel to operate the Sakai IC rollers.
- Mobilize the IC rollers if necessary: including moving the Sakai IC roller between mapping and compaction operations, to/from storage site, and to the parking area of the Open House location.
- Provide one nuclear density gauge and an operator.
- Conduct LWD tests on the intermediate course at the approximate locations of FWD testing.
- Conduct corings of finished pavement as instructed by the research team.

## FHWA Asphalt Mobile Labs

- Conduct various asphalt tests such as: simple performance tests, E\*, flow number, etc.

## IC Research Team

- Conduct GPS rover measurements along side with any in-situ point tests (e.g. FWD tests and nuclear density gauge measurements) and coring locations.

## Open House



- **Time:** 9:00 AM to noon, Thursday, May 13, 2010
- **Location:** American Asphalt of Wisconsin, 832 Hwy 153, Mosinee WI 54455
- **Session 1** - 9:00AM to 11:00AM - Indoor Presentation
- **Session 2** - 11:00AM to noon - Roller Demonstration