

State of Wisconsin/Department of Transportation
RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: March 31, 2008

Program: SPR-0010(36) FFY99		Part: II Research and Development	
Project Title: EVALUATION OF INTELLIGENT COMPACTION TECHNOLOGY FOR DENSIFICATION ROADWAY SUBGRADES AND STRUCTURAL LAYER		Project ID: 0092-08-07 ARA Project No: 18375	
Administrative Contact: Nikki Hatch		Sponsor: Wisconsin Department of Transportation	
WisDOT Technical Contact: Robert Arndorfer,, Leonard Makowski		Approved Starting Date: Dec 26, 2008	
Approved by COR/Steering Committee: \$50,000		Original End Date: September 2009	
Project Investigator (agency & contact): Harold Von Quintus, P.E. Applied Research Associates, Inc. Attn: Chetana Rao 100 Trade Center Drive, Suite 200 Champaign, IL 61820-7233 Ph: 217-356-4500 (O) 217-239-9575 (direct)		Current End Date: September 2009	
		Number of Extensions: None	

Percent Complete: 5%

Request a No Cost Time Extension (Please Select One): YES NO

Reason for No Cost Time Extension: N/A

Project Description:

The project involves collecting information and data on the use of IC technology for Wisconsin Department of Transportation (WisDOT) to make an informed decision on any useful application of the IC technology – its validity and accuracy. To accomplish this overall goal, three objectives will need to be accomplished within this study:

1. Identify the advantages and limitations of the IC technology.
2. Determine the material types and conditions that might cause inaccurate decisions or output from the IC roller (e.g., the accuracy of the outputs regarding layer stiffness). As part of this objective, the output values or responses from the IC rollers, that are manufacturer dependent, will be correlated to density and modulus of the material during the compaction process.
3. Provide recommendations to WisDOT on the use and implementation of IC technology for pavement construction.

The scope of the project is divided into nine (9) tasks, which are as follows:

- Task 1 Literature Review of IC Technology and Database
- Task 2 Coordinate with WisDOT and Contractors to Select Candidate Field Projects
- Task 3 Develop Preliminary Field Work Plan
- Task 4 Prepare and Submit Interim Report
- Task 5 Conduct the Field Work Plan
- Task 6 Laboratory Testing
- Task 7 Analyze Data from Field and Laboratory Tests and Provide Recommendations
- Task 8 Prepare and Submit Draft Final and Final Report
- Task 9 Presentations and Meeting Attendance

Progress This Quarter:

ADMINISTRATIVE ISSUES

The subcontract with the University of Wisconsin, Milwaukee (UWM) was finalized in January 2008.

The project coordinated with WHRP staff to conduct a kick-off meeting with key DOT personnel involved in this project during the 87th Annual Meeting of the Transportation Research Board at Washington D.C. in January 2008. The PI and PM met with Robert Arndorfer and, Leonard Makowski during TRB and discussed the overall scope of the project and other specific details about coordination required in task 2 (discussed below).

Wisconsin DOT recently decided to join the pool-fund study sponsored by FHWA for IC. Mr. Bob Horan, with the Asphalt Institute, is the coordinator of this pool fund study. Mr. Von Quintus made contact with Mr. Horan and Lee Gallivan, with the FHWA, to determine the location of other IC projects that are expected to be completed this construction year for both HMA and unbound layers. In addition, Mr. Von Quintus discussed adding these projects planned for this year in Wisconsin to the pool fund study with Mr. Robert Arndorfer. The decision to forward these projects to the pool fund study is left up to the COTRs for this Wisconsin project, Mr. Robert Arndorfer and Mr. Leonard Makowski.

PROJECT TASKS

Task 1 Literature Review of IC Technology and Database

This task has been completed to a significant extent during this quarter. National and international literature have been collected and reviewed in the context of this project. The project team members have also made personal contacts with individuals carrying out other national level and state level research in evaluating and implementing IC technology for construction. In particular, key members of the ongoing National Council of Highway Research Program (NCHRP) project 21-09 have been contacted to learn about their findings and to get their inputs, especially, with regard to correlating field data to laboratory test results. The literature review interim task activity memorandum is being prepared or grouped into four basic sections to answer the following questions:

- What progress have other States in the U.S. and particularly those in the Midwest made with regard to evaluating and implementing IC technology?
- Does IC lead to better and more uniform compaction than conventional compaction methods?
- Is the effectiveness of this technology influenced by material parameters, such as subgrade type, moisture content in unbound layers, granular layers vs. subgrades, HMA mix design?
- Are draft specifications developed so far by other agencies applicable for use at WisDOT?

A pool fund study was also formalized late last year to study IC and sponsor a series of demonstration projects across the U.S. The experimental plan for this pool fund study has been obtained and will be incorporated into the literature review interim activity task report. As noted above, the Wisconsin DOT is now a member of the pool fund study. The experimental plan will be reviewed in terms of how it may relate to the projects and testing planned for this project in Wisconsin.

The project team also sought approval from WisDOT to attend a national workshop titled "Intelligent Compaction of Soils and Hot Mix Asphalt (HMA)" in April 2-4, 2008 at Iowa. The workshop will be attended by representatives from design, construction, materials, and research areas of twenty (20) state Departments of Transportation and FHWA. The goal of the workshop is to identify and discuss the status of the intelligent compaction of soils and HMA, brainstorm on the future needs regarding intelligent compaction, and discuss what is needed to be accomplished in order to make these transitions. The PI is attending this meeting and information gathered during this meeting will be very useful in understanding the current progress made by other agencies and to identify current gaps in technology. Mr. Robert Arndorfer also attended the workshop.

Project activities to develop the database for the field work have yet to be commenced.

Task 2 Coordinate with WisDOT and Contractors to Select Candidate Field Projects

During the kick-off meeting with WisDOT, the PI and Co-PI discussed specific details about the selection of construction projects to be utilized for the evaluation of the IC. In particular, the team emphasized the importance of coordination issues amongst the DOT, paving contractors, ARA, UWM, and IC manufacturers/distributors. The DOT offered to share a list of proactive contractors willing to evaluate the IC technology and a potential list of 2008 construction season projects that meets the experimental design considerations proposed in the work plan. The project team will proceed with this task after receiving the relevant information from WisDOT.

Work Next Quarter:

Task 1 Literature Review of IC Technology and Database

The project team expects to complete the literature review and submit an interim task activity report. This task activity report will be prepared so that it can be easily inserted into the final report near the end of the project. Details of the project IC database will also be initiated and completed. Specifics of the database will be coordinated with the pool fund study to ensure consistency between the data collected within this study and the data collected within the pool fund study. Transtec (contractors for the pool fund study) will be contacted for information of the database regarding the pool fund study.

Task 2 Coordinate with WisDOT and Contractors to Select Candidate Field Projects

Immediately up on receiving information from WisDOT, the project team will initiate coordination among the various members of the project as well as paving contractors and IC equipment suppliers to discuss field testing for the project.

Task 3 Develop Preliminary Field Work Plan

If the project team has the opportunity to meet with the contractors and discuss scope of individual construction projects within the State for Summer 2008, the project team will prepare a detailed field testing plan for each construction project.

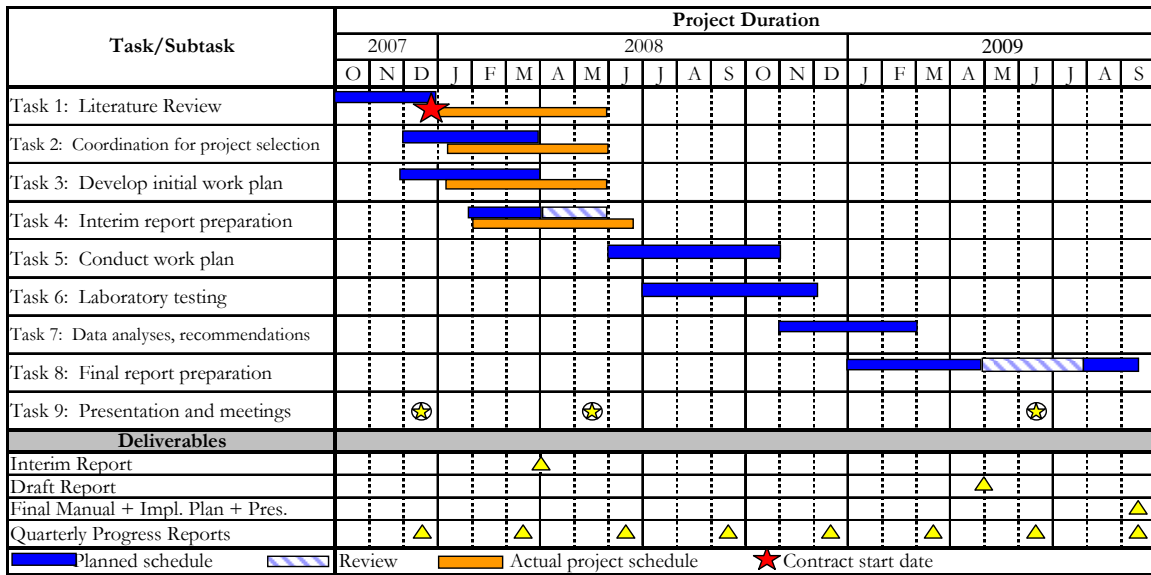
Task 4 Prepare and Submit Interim Report

Depending on the schedule for accomplishing tasks 2 and 3, the project team plans to prepare an interim report detailing the work plan for the panel to review prior to starting field testing.

Circumstances Affecting Progress/Budget:

None foreseen at this stage. However, coordination with the contractors and IC suppliers during the next quarter, will be essential to keep the project progress within budget and on schedule.

Gantt Chart:



Cc: Dr. Sam Helwany, University of Wisconsin-Milwaukee