State of Wisconsin/Department of Transportation

RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: March 31, 2007

Program: SPR-0010(36) FFY99	**Part: II Research and Development**
Project Title: Field Validation of Wisconsin Modified Binder Selection Guidelines	**Project ID:** 0092-03-13
Administrative Contact: James McDonnell	**Sponsor:** Wisconsin Department of Transportatio
WisDOT Technical Contact: Len Makowski	**Approved Starting Date:** Jan 31, 2003
Approved by COR/Steering Committee: $125,006.00	**Original Ending Date:** Jul 31, 2007
Project Investigator (agency & contact): Hussain Bahia, UW Madison	**Current End Date:** Jul 31, 2007
	Number of Extensions: 0

Percent Complete: 91%

Project Description: The study will be conducted over 48 months, and be completed in 5 phases:

Task 1: Select Field Section and Define Grades to be Compared
Task 2: Collect Samples and Conduct Testing
Task 3; Monitor Performance of Sections
Task 4: Database Development
Task 5: Reporting

Progress This Quarter:

The progress for this quarter can be divided in three parts:

- BBR Testing for remaining binder
- Presenting results for compaction temperature in TRB committee.
- Database development
- Gathering information for database
- Meetings

BBR Testing

The BBR testing was completed with the testing of the last binder of the set. The binder was a PG 64-22 used in the project 4100-01-71. Three RTFO aged samples were tested for each temperature and the results are shown in table 1.

TABLE 1: Summary of BBR Testing Results

Project #	PG	Temperature	S(60)*	m(60)*
4100-01-71	64-22	-12 ºC	70	466
		-18 ºC	181	376
		-24 ºC	437	274

* The results shown are the average of three tested samples

Presentation at TRB AFK30 committee

During the last TRB meeting in Washington DC, in January this year, the results for the field report for the compaction temperatures were presented at the AFK30 committee (Characteristics of Nonbituminous Components of Bituminous Paving Mixtures). The presentation gathered a lot of interest from the committee members and

important positive feedback was obtained. The general comments indicated that the research is going in the right direction and the results are very important and innovative.

Database Generation

The main work of this quarter was focused on the generation of the database for field validation of binder performance. The work started by shaping the database and selecting the software to be used. After meetings with Dr. Bahia and Andrew Hanz, it was decided to build the database in Excel. This software is well known by a wide public, making it accessible and friendly. The capabilities of Excel are enough for the purpose of the database.

The database was divided in seven different areas, each one constituted by one excel sheet. The link between the different sheets is the project ID number, as given by the WISDOT. The different sections of the database are described as follows:

1 General Information. The general description and information about the project is containted in this section. It includes Project ID number, location, year of construction, project description and type of validation performed for the project (low temperature, rutting, fatigue or workability)

2 Pavement Structure. Description, materials and thickness of each of the pavement layers.

3 Binder Data. The laboratory testing results for the binders of the different projects are included in this sheet. The data includes the standard Superpave testing results and also the testing for modified binders that are the main focus of this research

4 Mixture Data. Description of type of mixture and volumetric properties.

5 Traffic. Traffic data for construction year, projected traffic and design ESALS.

6 Weather. Data of low temperatures and high temperatures for each project. All the temperature data relevant for the binder evaluation for rutting, low temperature cracking and fatigue will be obtained from the appropriate weather station and included in this section.

7 Performance. The pavement performance considering fatigue cracking, rutting and low temperature cracking will be included in this section. The information will be taken from the PIF database of the WISDOT. All the information available from the construction year until the present will be included in this section.

Gathering Information for Database

Some of the information for the database has been already gathered and entered. The actions taken for gathering that information are described as follows:

As built plans. For each project, the as build plans were obtained at the WISDOT. The as built plans provided basic description of the project, as well as traffic information, pavement structure, detailed location. The last one is essential for relating the project with the performance data. The traffic data and pavement structure data has already been entered in the database

Materials data and Superpave testing information. From the DOT materials database, detailed information about mixture and binder were obtained. The Superpave binder data was obtained from this database, to be compared with the new binder testing for modified binders.

Meetings

Two meetings were held during this quarter. The first one was between the research team and Andrew Hanz with the objective of defining the shape and general characteristics of the database. After that meeting and considering the valuable input from Mr. Hanz, the software and format of the database were decided.

The second meeting was held at the WISDOT between the research team, Andrew Hanz and Laura Fenley. Mrs. Fenley provided important information about the as build plans and allowed the research team to access the intranet of the WISDOT in order to get the plans.

Work Next Quarter:

The work for the next quarter will consist in finishing up the database and conclude all the project remaining tasks. Between these, the following can be mentioned:

- Analyzing the remaining of the compaction data at 300 kPa.
- Data analysis for low temperature cracking
- Fatigue testing
- Finishing up DTT testing
- Completing database
- reporting

Circumstances Affecting Progress/Budget:

Low temperature testing could not be completed because the testing instruments are currently not operative (at UW Madison and at the DOT). The DOT DTT testing device is expecting to be operative during the month of April. The DTT testing will be complete for the four remaining binders as soon as the equipment is available.

Gantt Chart:

PROJECT I.D.	STARTING DATE	COMPLETION DATE	MONTH	REPORT #	PERCENT OF			
PROJECT # 0092-03-13	**Jan-31-03**	**Jul-31-07**	**March - 07**	17				
CONSULTANT FIRM NAME		% TIME ELAPSED	TOTAL PROJECT FUNDING	CONTRACT FUNDING				
UNIV. OF WI - MADISON		94%	125.006	100%				
NAME OF STUDY								
FIELD VALIDATION OF BINDER GUIDELINES								

TASK *	YEAR / MONTH	2003 Qtr 1	2003 Qtr 2	2003 Qtr 3	2003 Qtr 4	2004 Qtr 5	2004 Qtr 6	2004 Qtr 7	2004 Qtr 8	2005 Qtr 9	2005 Qtr 10	2005 Qtr 11	2005 Qtr 12	2006 Qtr 13	2006 Qtr 14	2006 Qtr 15	2006 Qtr 16	2007 Qtr 17	2007 Qtr 18	Project Complete	Task Complete Last Report	Task Complete This Report	Project Complete
TASK 1 : Defiene binder grades																				10	8	2	10
Select field sections																							
TASK 2 : Collect samples																				50	45	2	47
Conduct testing																							
TASK 3 : Monitor performance of sections																				10	7	1	8
TASK 4: Database development																				15	8	4	12
TASK 5: Reporting																				15	13	1	14
PROGRESS SHOWN	SCHEDULED																			100	81	10	91
	COMPLETED																						