

**State of Wisconsin/Department of Transportation**  
**RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: Jun 30, 2001**

<b>Program: SPR-0010(36) FFY99</b>	<b>Part: II Research and Development</b>
<b>Project Title: Field Measurement of Water Cement Ratio for PCC - Phase II</b>	<b>Project ID: 0092-45-16</b>
<b>Administrative Contact: Nina McLawhorn</b>	<b>Sponsor:</b>
<b>WisDOT Technical Contact: Error! Bookmark not defined.</b>	<b>Approved Starting Date: Dec 6, 1999</b>
<b>Approved by COR/Steering Committee: \$55,510.00</b>	<b>Approved Ending Date: Feb 28, 2002</b>
<b>Project Investigator (agency &amp; contact): Steve Cramer: UW-Madison</b>	

**Description:** The objective of this study is to evaluate in the field, technologies previously identified that provide a relatively rapid, simple, and reliable method of determining in-place w/c for Portland cement concrete (PCC). It is anticipated that only one or two technologies from the laboratory study will show sufficient promise to warrant field evaluation. At least several construction projects that represent a range of concrete paving conditions will be identified and used as evaluation case studies. Construction projects will be identified with the assistance of the WisDOT and the Wisconsin Concrete Pavement Association. Comparisons between measured w/c ratios and ratios suggested by batch plant tickets will be conducted.

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date
<b>\$55,510.00</b>	<b>\$18,503.33</b>	<b>\$20,177.42</b>	<b>\$55,357.69</b>

**Progress This Quarter:**

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

During this quarter the final report for the project was drafted and submitted to WisDOT for review. Report preparation included data analysis and other report development. This report provides new information on the accuracy and the expected variability of the microwave oven and Troxler nuclear gage. Overall the microwave oven performed satisfactorily in obtaining the a real time field measurement of the water cementitious material ratio (w/cm) but the efficacy of measuring w/cm as a real time quality control measure has limitations.

**Work Next Quarter:**

Revise report based on TOC comments and submit the Final Report

**Circumstances affecting progress/budget:**

None.

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<b>Program: SPR-0010(36) FFY99</b>	<b>Part: II Research and Development</b>
<b>Project Title: Effects of Aggregate Coatings and Films on Concrete Performance</b>	<b>Project ID: 0092-00-07</b>
<b>Administrative Contact: Nina McLawhorn</b>	<b>Sponsor:</b>
<b>WisDOT Technical Contact: Error! Bookmark not defined.</b>	<b>Approved Starting Date: Oct 1, 1999</b>
<b>Approved by COR/Steering Committee: \$97,740.00</b>	<b>Approved Ending Date: Sep 30, 2002</b>
<b>Project Investigator (agency &amp; contact): Steve Cramer: UW-Madison</b>	

**Description:** This research will consider the impact of different types of coarse aggregate coatings and films on concrete strength and durability and the potential relation to concrete performance.

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date
\$97,740.00	\$32,580.00	\$2,757.19	\$29,553.02

**Progress This Quarter:**

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

The research during this quarter has primarily involved specimen preparation and data gathering from tests conducted on these specimens. As indicated in the gantt chart below over 50% of the concrete mixing and specimen preparation has been completed. These tests include measure of compressive strength, tensile strength, rapid chloride ion penetration, shrinkage and freeze/thaw durability. A significant portion of the concrete tests have also been completed. Tests of this concrete and preliminary analysis of the data so far have not revealed meaningful differences between coated and uncoated aggregates from a concrete performance perspective. This may prove to be a problem for this research and may require a re-examination of the materials and methods being pursued. The research team meets once per week to review progress and resolve problems.

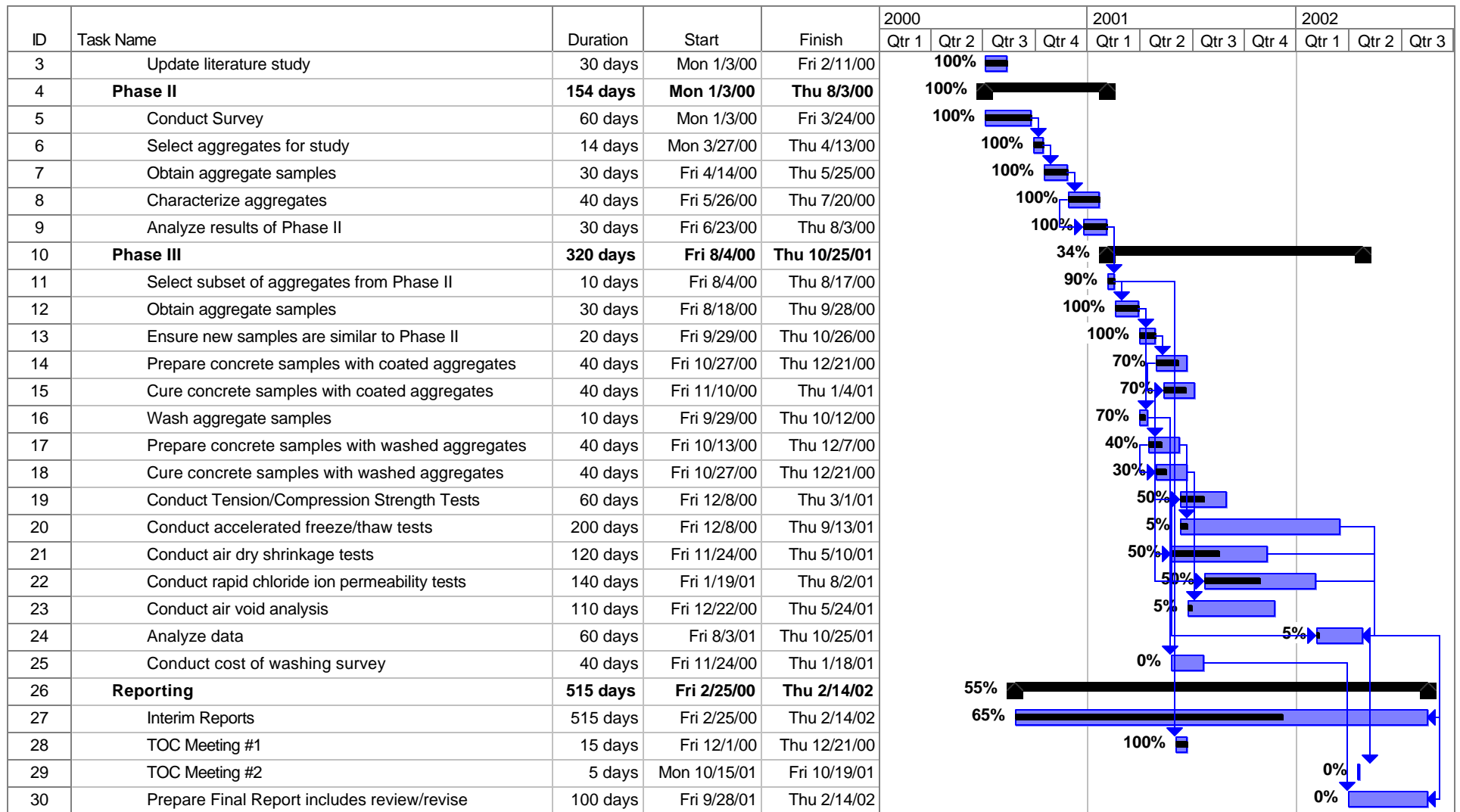
**Work Next Quarter:**

To complete the fabrication of and the short-term testing of specimens as identified in the gantt chart tasks below. We may need to bring additional test materials, specimen fabrication and testing into the project to be able to prove or disprove the research hypothesis.

**Circumstances affecting progress/budget:**

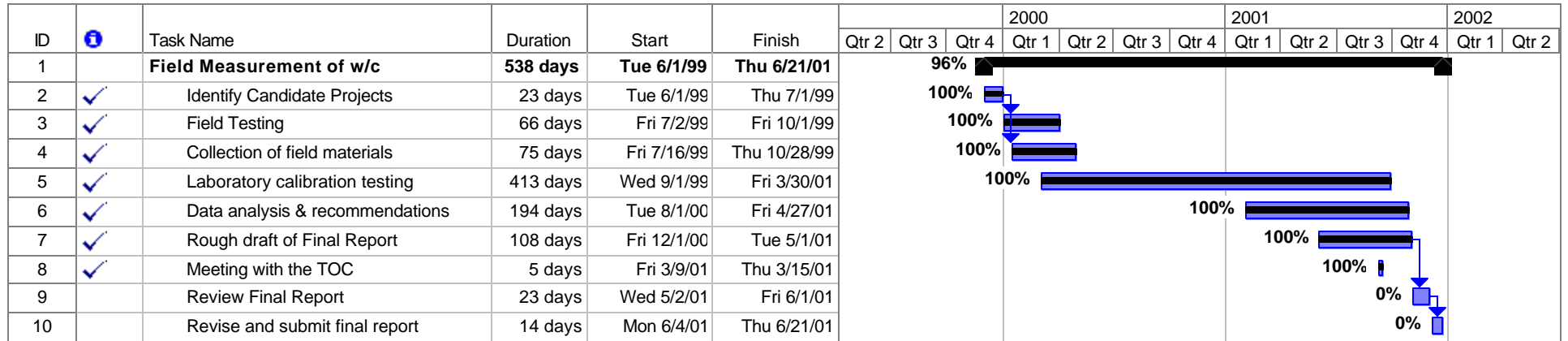
This project was originally estimated by the principal investigator to be completed at the end of February 2002 and a corresponding contract length was requested at the time. The gantt chart shown below was that included in the project proposal. For reasons unknown to the investigator the contract is set to end 9/30/01. In addition, there were significant delays early in this project in obtaining aggregates with coatings and completing x-ray diffraction related to identifying these coatings. A significant no-cost extension will be required to complete the project as proposed. We are attempting to identify a realistic completion date and will be requesting a no-cost extension during the coming quarter.

**Gantt Chart:**



**Note: Gantt chart shown in State Fiscal Year Quarters**

**Gantt Chart:**



**Note: Gantt chart shown in State Fiscal Year Quarters**

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**RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: Jun 30, 2001**

<b>Program: SPR-0010(36) FFY99</b>	<b>Part: II Research and Development</b>
<b>Project Title: Wet Pavements Accident Study of Longitudinal and Transverse Tined PCC Pavements</b>	<b>Project ID: 0092-00-08</b>
<b>Administrative Contact: Nina McLawhorn</b>	<b>Sponsor:</b>
<b>WisDOT Technical Contact: Error! Bookmark not defined.</b>	<b>Approved Starting Date: Dec 15, 1999</b>
<b>Approved by COR/Steering Committee: \$75,000.00</b>	<b>Approved Ending Date: Jul 31, 2002</b>
<b>Project Investigator (agency &amp; contact): Alex Drakopoulos: Marquette University</b>	

**Description:** Study would document relative safety characteristics of each type of tining to allow states to understand trade-off's made when departing from preferred transverse tining to a more quiet longitudinally tined pavement. Results would determine impact, either for or away from longitudinally tined pavements.

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date
<b>\$75,000.00</b>	<b>\$25,000.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

**Progress This Quarter:**

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

Analysis on data received from the Highway Safety Information System Lab continued. Evaluation of pavement surface information data availability and compatibility with crash databases continued.

**Work Next Quarter:**

Evaluation of feasibility of pavement information integration with the crash and geometry information received from the Highway Safety Information System Lab will be continued.

**Circumstances affecting progress/budget:**

Task 3 is 51% of the total project budget--completed part of task during the current quarter, indicated on the next page, totals 5.10% of the total project budget.

**Gantt Chart:**

TASK	2000												2001				
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
1. PCC Data and State Participation	50% completed																
2. Assembling Database and Interim Report	55% completed																
3. Analysis				45% completed													
4. Draft and Final Report																	

Note: Timeline is revised to reflect a January 2000 start date, replacing the originally anticipated December 1999 start date.

**Note: Gantt chart shown in State Fiscal Year Quarters**

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<b>Program: SPR-0010(36) FFY99</b>	<b>Part: II Research and Development</b>
<b>Project Title: Portland Cement Concrete Pavement over Rubblized PCC</b>	<b>Project ID: 0092-00-11</b>
<b>Administrative Contact: Nina McLawhorn</b>	<b>Sponsor:</b>
<b>WisDOT Technical Contact: Error! Bookmark not defined.</b>	<b>Approved Starting Date: Mar 28, 2000</b>
<b>Approved by COR/Steering Committee: \$39,857.00</b>	<b>Approved Ending Date: Nov 28, 2005</b>
<b>Project Investigator (agency &amp; contact): James Croveti: Marquette University-CEEN Hagg</b>	

**Description:** An analysis is needed to determine the cost effectiveness of paving a PCC pavement over a rubblized base. By tracking roadway performance and construction cost, the Department can determine if this type of application is feasible or beneficial to Wisconsin's roadway system. Research would be able to determine the economical and structural benefits of a PCC pavement over a rubblized base. Structural benefits such as increased serviceability or increased pavement life can be monitored and compared to historical data on typical Portland cement concrete pavements or asphalt concrete pavement over rubblized PCC.

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date
<b>\$39,857.00</b>	<b>\$5,693.85</b>	<b>\$0.00</b>	<b>\$16,216.53</b>

**Progress This Quarter:**

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

Computer analysis of PCC over rubblized PCC (RPCC) pavement systems continued for a wide range of pavement thickness/stiffness combinations.

**Work Next Quarter:**

Analysis of deflection testing data of PCC over RPCC pavement systems is anticipated using data requested from State agencies with these pavement types in place.

**Circumstances affecting progress/budget:**

None

**Gantt Chart:**

**Note: Gantt chart shown in State Fiscal Year Quarters**