

**OFFICE OF RESEARCH AND BEST PRACTICES
 RESEARCH PROJECT DESCRIPTION FORM
 FY YEAR**

COMPLETED BY SUBMITTING AGENCY

PROJECT TITLE					
CRITICAL ISSUE CODE			MDOT PROJECT CATEGORY (See below)		
PROJECT MANAGER					
PROJECT DESCRIPTION					
OBJECTIVE/PURPOSE					
SCOPE					
PRODUCTS/DELIVERABLES					
IMPLEMENTATION PLAN					
SUBMITTING AGENCY					
AGENCY NAME			CONTACT NAME		
TELEPHONE #			FAX #		
EMAIL ADDRESS					
BUDGET INFORMATION					
TOTAL BUDGET (Breakdown by FY)	FY1	FY2	FY3	FY4	INDIRECT COST RATE

CRITICAL ISSUE CODES

- 0 - ADMINISTRATION
- 1 - CONGESTION: Increasingly congested facilities across all modes
- 2 - EMERGENCIES: Vulnerability to terrorist strikes and natural disasters
- 3 - ENERGY & ENVIRONMENT: Extraordinary challenges
- 4 - EQUITY: Burdens on the disadvantaged
- 5 - FINANCE: Inadequate revenue
- 6 - HUMAN & INTELLECTUAL CAPITAL: Inadequate investment in innovation
- 7 - INFRASTRUCTURE: Enormous, aging capital stock to maintain
- 8 - INSTITUTIONS: 20th century institution mismatched to 21st century missions
- 9 - SAFETY: Lost leadership in road safety

MDOT PROJECT CATEGORIES

- 1 - Bridges & Structures
- 2 - Asphalt Pavements
- 3 - Concrete Pavements
- 4 - Traffic & Safety

MDOT 5303 (01/08)
5 - ITS & VII Congestion Management
6 - Environment
7 - Miscellaneous

**OFFICE OF RESEARCH AND BEST PRACTICES
RESEARCH PROJECT DESCRIPTION FORM
FY YEAR 2008**

COMPLETED BY SUBMITTING AGENCY

PROJECT TITLE
Improved Performance of JPCP Overlays

CRITICAL ISSUE CODE 7	MDOT PROJECT CATEGORY (See below) 3
--------------------------	--

PROJECT MANAGER
David Smiley C&T

PROJECT DESCRIPTION
The study will evaluate the performance characteristics of JPCP, used as concrete overlays for distressed rigid and flexible pavements. In particular, the relationship between temperature and moisture gradients in concrete overlay slabs and their effects on stress development that leads to premature cracking will be investigated. The finding analysis is intended to lead to alternate designs and/or preventive measures that can nullify these effects.

OBJECTIVE/PURPOSE
The study objectives are: (1) Conduct a comprehensive evaluation of past concrete (JPCP) overlay projects, especially MDOT's 2003 I-75 Demonstration Project, to determine the effectiveness of design features and their contribution to distress (cracking) development, (2) Develop new designs or modifications of current designs for concrete overlays that are not prone to causes that initiate premature distress, (3) Determine appropriate preventive actions to extend the service life of future overlays and their respective cost savings and any time gains to construct.

SCOPE
Past research has shown that early cracking of a concrete pavement is related to the severity of temperature curling and moisture warping tendencies. The study will focus on these relationships - study tasks are: (1) Literature review to find the benefits of similar study efforts, (2) Extensive analysis with a dedicated finite element program that predicts stress development in a concrete slab from temperature/moisture effects as part of a multi-layer system, (3) A comprehensive field site investigation to compare empirical results of past projects, (4) Evaluation of alternate designs and/or preventive measures to nullify the adverse tendencies of temperature/moisture changes in concrete slabs.

PRODUCTS/DELIVERABLES
The primary deliverables are study reports and technology transfer to improve MDOT's underlying knowledge base of concrete pavement performance.

IMPLEMENTATION PLAN
The study will hopefully produce the basis for improved concrete overlay designs and construction practices that nullify current causes related to premature slab cracking. These improvements will hopefully reduce design costs and lessen construction time. Implementation will likely include training and purchase of the forementioned finite analysis program by MDOT for future investigative needs.

SUBMITTING AGENCY

AGENCY NAME University of Michigan	CONTACT NAME Dr. Will Hansen
---------------------------------------	---------------------------------

TELEPHONE # 734-763-9660	FAX # 734-764-4292
-----------------------------	-----------------------

EMAIL ADDRESS whansen@umich.edu

BUDGET INFORMATION

TOTAL BUDGET (Breakdown by FY) \$269,541	FY1 \$127,983	FY2 \$105,686	FY3 \$35,872	FY4	INDIRECT COST RATE 52%
--	------------------	------------------	-----------------	-----	---------------------------

CRITICAL ISSUE CODES

- 0 - ADMINISTRATION
- 1 - CONGESTION: Increasingly congested facilities across all modes
- 2 - EMERGENCIES: Vulnerability to terrorist strikes and natural disasters
- 3 - ENERGY & ENVIRONMENT: Extraordinary challenges
- 4 - EQUITY: Burdens on the disadvantaged
- 5 - FINANCE: Inadequate revenue
- 6 - HUMAN & INTELLECTUAL CAPITAL: Inadequate investment in innovation

**OFFICE OF RESEARCH AND BEST PRACTICES
STATE ADMINISTRATIVE BOARD AGENDA QUESTIONS**

Answers to these ten questions must be provided in the agenda description for those contracts/authorizations that require State Administrative Board (SAB) approval. Question numbers 5, 7, and 8 do not require a response from the Project Manager (PM). The remaining questions require a written answer from the PM, and should be submitted as part of the document packet to the Contract Services Division.

Spell out all acronyms and use full names of all municipalities. Please do not use abbreviations or jargon. This must make sense to non-MDOT people. Your Contract Administrator (CA) writes the full description in addition to your answers below, and decides how best to use your responses, so please provide more information rather than less whenever possible. The answers you provide below will also be included in the SAB description, but they may be adjusted.

Effective with the May 15, 2007, SAB agenda and all subsequent agendas, the question regarding the Criticality of a project will need to be addressed. Effective with the June 5, 2007, SAB the Criticality must include why the project cannot be deferred to a later Ad Board agenda.

E-mail your responses to these questions as an attachment to the Office of Research and Best Practices.

-
1. **CRITICALITY:** (What is the reason this item is deemed critical?) (Example: Independent evaluations of MDOT work zones are critical. Earlier this year a five vehicle crash occurred in one of the regions work zones, resulting in two fatalities. MDOT needs the expertise of this consultant to advise them regarding the quality of MDOT's work zones. As a result, this contract cannot be deferred until a later State Administrative Board agenda.)
-
2. **PURPOSE/BUSINESS CASE:** (Paragraph on what the project is, why MDOT wants to do it and what is new - if this is an amendment or revision. This is a brief summary of the scope, and will need the longest answer of all the questions. Use complete sentences.)
-
3. **BENEFIT:** (What are all possible benefits of doing this project this way and doing it at this time? Use one or two sentences.)
-
4. **FUNDING SOURCE:** XX% Federal Highway Administration Funds and XX% State Restricted Trunkline Funds.
-
5. **COMMITMENT LEVEL:** The hourly costs are fixed, however, the number of hours to perform this work has been estimated.
-
6. **RISK ASSESSMENT:** (What are all possible costs and problems associated with not doing this project this way and at this time? Use one or two sentences.)
-
7. **COST REDUCTION:** Costs in professional services contracts are based on an actual cost plus fixed fee basis not to exceed the contract maximum amount. Hours are negotiated based on needed service.
-
8. **SELECT:** (Qualifications - based selection, low bid selection, etc.)
-
9. **NEW PROJECT IDENTIFICATION:** (Generally, this answer should be "This is a new project" or "This is not a new project." The PM will ask "Will new physical assets result from this project?" For projects with partially new assets, such as an additional lane, indicate them here.)
-
10. **ZIP CODE:** (For the major portion of the project work. If several, use primary one only. For statewide projects, use 48909).
-

**OFFICE OF RESEARCH AND NATIONAL BEST PRACTICES
STATE ADMINISTRATIVE BOARD AGENDA QUESTIONS**

Answers to these ten questions must be provided in the agenda description for those contracts/authorizations that require State Administrative Board (SAB) approval. Question numbers 5, 7, and 8 do not require a response from the Project Manager (PM). The remaining questions require a written answer from the PM, and should be submitted as part of the document packet to the Contract Services Division.

Spell out all acronyms and use full names of all municipalities. Please do not use abbreviations or jargon. This must make sense to non-MDOT people. Your Contract Administrator (CA) writes the full description in addition to your answers below, and decides how best to use your responses, so please provide more information rather than less whenever possible. The answers you provide below will also be included in the SAB description, but they may be adjusted.

Effective with the May 15, 2007, SAB agenda and all subsequent agendas, the question regarding the Criticality of a project will need to be addressed. Effective with the June 5, 2007, SAB the Criticality must include why the project cannot be deferred to a later Ad Board agenda.

E-mail your responses to these questions as an attachment to the Office of Research and National Best Practices.

1. **CRITICALITY:** (What is the reason this item is deemed critical?) (Example: Independent evaluations of MDOT work zones are critical. Earlier this year a five vehicle crash occurred in one of the regions work zones, resulting in two fatalities. MDOT needs the expertise of this consultant to advise them regarding the quality of MDOT's work zones. As a result, this contract cannot be deferred until a later State Administrative Board agenda.)

Independent evaluations of MDOT restricted Right-Turn-In/Right-Turn-Out Access Management are critical. MDOT needs the expertise of this consultant to advise them of the safety impact of restricting driveway access.

2. **PURPOSE/BUSINESS CASE:** (Paragraph on what the project is, why MDOT wants to do it and what is new - if this is an amendment or revision. This is a brief summary of the scope, and will need the longest answer of all the questions. Use complete sentences.)

To access the magnitudes of the positive and negative impacts of restricting access; evaluate the outcomes of the restrictions in several specific situations where the technique has been (or could have been) applied; and develop general guidelines for when the technique should be considered.

3. **BENEFIT:** (What are all possible benefits of doing this project this way and doing it at this time? Use one or two sentences.)

The department will be provided a written report containing detailed analysis, results, and corresponding data. It will also include guidelines for using turning restrictions along with an indication of likely positive and negative impacts of such restriction in different situations.

4. **FUNDING SOURCE:** XX% Federal Highway Administration Funds and XX% State Restricted Trunkline Funds.

80% Federal Highway Administration Funds and 20% State Restructed Trunkline Funds

5. **COMMITMENT LEVEL:** The hourly costs are fixed, however, the number of hours to perform this work has been estimated.

6. **RISK ASSESSMENT:** (What are all possible costs and problems associated with not doing this project this way and at this time? Use one or two sentences.)

We currently don't have data regarding the safety impact of access management. The department needs to have crash histories of selected sites and several similar sites where the restrictions have been applied compared to sites where the restrictions have been established to compare the safety impact of the access management restriction.

7. **COST REDUCTION:** Costs in professional services contracts are based on an actual cost plus fixed fee basis not to exceed the contract maximum amount. Hours are negotiated based on needed service.

8. **SELECT:** (Qualifications - based selection, low bid selection, etc.)

9. **NEW PROJECT IDENTIFICATION:** (Generally, this answer should be "This is a new project" or "This is not a new project." The PM will ask "Will new physical assets result from this project?" For projects with partially new assets, such as an additional lane, indicate them here.)

This is not a new project.

10. **ZIP CODE:** (For the major portion of the project work. If several, use primary one only. For statewide projects, use 48909).

48909

APPENDIX C: Research Project Management



Michigan Department
Of Transportation
5305 (05/08)

OFFICE OF RESEARCH & BEST PRACTICES MDOT RESEARCH PROJECT REPORT FORM FISCAL YEARS 2008-2009

PROJECT TITLE _____

FUNDING SOURCE: SPR, Part II (____ %) FHWA (____ %) MFUNDS (____ %) NCHRP (____ %) OTHER (____ %)

PROJECT MANAGER _____

CONTRACT/AUTHORIZATION #		PROJECT START DATE	
SPR NUMBER		COMPLETION DATE (Original)	
ORBP NUMBER		COMPLETION DATE (Revised)	
RESEARCH AGENCY			
PRINCIPAL INVESTIGATOR			

FY 2008 QUARTER

1st (Oct 1 – Dec 31) 2nd (Jan 1 – Mar 31) 3rd (Apr 1 – Jun 30) 4th (July 1 – Sept 30)

BUDGET STATUS

Total Budget			FY 2009 Estimated Budget		
TOTAL COST	(Original)*		TOTAL		
	(Revised)**				
EXPENDED FUNDS TO DATE***			SALARIES		
FY 2008 Budget			EQUIPMENT (Expendable)		
FY FUNDS	(Original)****		EQUIPMENT (Non-expendable)		
	(Revised)*****		TRAVEL		
FY EXPENDITURE			OTHER		
% PERCENT COMPLETE (By Budget)			PERCENT COMPLETE (By Work)		

PURPOSE AND SCOPE

FISCAL YEAR 2007 ACCOMPLISHMENTS

FISCAL YEAR 2008 ACCOMPLISHMENTS TO DATE

FISCAL YEAR 2009 PROPOSED ACTIVITIES

JUSTIFICATION(S) FOR REVISION(S) (List the approval date for the revision(s))

SUMMARY OF THE IMPLEMENTATION RECOMMENDATION (Required the last year of the project)

*The original authorized total budget amount of the project
 **The authorized total budget amount as revised, if applicable
 *** The project life to date expenditure
 ****The current fiscal year's original budget amount
 *****The revised fiscal year budget amount, if applicable

Michigan Department
Of Transportation
5305 (04/08)

**OFFICE OF RESEARCH & BEST PRACTICES
STATEWIDE PLANNING AND RESEARCH (SPR), PART II
FISCAL YEARS 2008-2009**

PROJECT TITLE Ultra-High Performance Concrete for Michigan Bridges - Material Performance - Phase I

FUNDING SOURCE SPR, Part II

PROJECT MANAGER Roger Till			
CONTRACT/AUTHORIZATION #	2003-0063/A21	PROJECT START DATE	6/9/06
SPR NUMBER	101685	COMPLETION DATE (Original)	6/9/07
ORBP NUMBER		COMPLETION DATE (Revised)	9/9/07
RESEARCH AGENCY	MTU		
PRINCIPLE INVESTIGATOR	Dr. Tess Ahlborn		

FY 2008 QUARTER

1st (Oct 1 – Dec 31) 2nd (Jan 1 – Mar 31) 3rd (Apr 1 – Jun 30) 4th (July 1 – Sept 30)

BUDGET STATUS

Total Budget			FY 2009 Estimated Budget		
TOTAL COST	(Original)*	\$58,916.74	TOTAL		
	(Revised)**				
EXPENDED FUNDS TO DATE***		\$52,946.89	SALARIES		
FY 2008 Budget			EQUIPMENT (Expendable)		
FY FUNDS	(Original)****	\$5,969.85	EQUIPMENT (Non-expandable)		
	(Revised)*****		TRAVEL		
FY EXPENDITURE		0	OTHER		
PERCENT COMPLETE (By Budget)		95%	PERCENT COMPLETE (By Work)		
			95%		

PURPOSE AND SCOPE

This research provides a better understanding of ultra-high performance concrete behavior and its applicability to Michigan bridges. The new material could provide additional strength and long-term durability over current materials used today for highway structures. The project includes experimental testing and analysis with recommendations for implementation.

FISCAL YEAR 2007 ACCOMPLISHMENTS

Experimental studies for material behavior and durability were completed. Analysis was conducted and data compared with previous research. Results are being summarized. In addition, a simplified life cycle cost analysis has been completed. Recommendations are listed for the potential use of UHPC in Michigan highway structures.

FISCAL YEAR 2008 ACCOMPLISHMENTS TO DATE

The final report is in progress (10/1-12/31/07) and will be submitted to the panel for review, then revised prior to final delivery.

FISCAL YEAR 2009 PROPOSED ACTIVITIES

JUSTIFICATION(S) FOR REVISION(S) (Date justification(s) for revision(s))

Specimens of the UHPC are to be subjected to freeze/thaw testing. A time extension is needed for the project because of unforeseeable problems with the freeze/thaw testing machine. Results of the freeze/thaw testing are critical to the recommendations for using the ultra high performance concrete.

*The original authorized total budget amount of the project
 **The authorized total budget amount as revised, if applicable
 *** The project life to date expenditure
 ****The current fiscal year's original budget amount
 *****The revised fiscal year budget amount, if applicable

MICHIGAN DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH AND BEST PRACTICES
QUARTERLY REPORT EVALUATION FORM

Project Manager:

Do you approve of the attached quarterly report form: Yes No

If no, please explain why:

Must be returned to ORBP within 10 working days

MICHIGAN DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH AND BEST PRACTICES
UNIVERSITY CONTRACT
INVOICE APPROVAL FORM

Please review the attached invoice and approve or disapprove.

RETURN TO ANNETTE NEALEY (E020).

Project Manager: R. Till **Invoice #:**

Date Invoice Received:

Date Invoice Sent to PM:

Title of Project:

University/Consultant: Michigan State University

Contract #: 06-0411 **Authorization #:**

Project #:

Notes: Invoice is for the period of .

Project Manager's Signature of Approval:

Date:

University Research Administrator's Signature of Approval:

Date: