Wisconsin Department of Transportation  
Wisconsin Highway Research Program

Request for Proposal

Non-Cementitious Repair Materials Study

Questions submitted to research@dot.wi.gov regarding the content of this RFP are due no later than 4:30 PM (CST) on December 12, 2016

Responses to questions will be posted to the WisDOT Research and Library website http://wisdotresearch.wi.gov/rfps-and-proposals by 4:30 PM (CST) on December 19, 2016

Proposers must submit a PDF version of their proposal by 4:30 PM (CST) on January 20, 2017 to: research@dot.wi.gov

Researchers will be notified of the proposal review decision by May 1, 2017

For more information regarding this RFP contact the WisDOT Research Program at: research@dot.wi.gov. This RFP is posted to the Internet at: http://wisdotresearch.wi.gov/rfps-and-proposals
Wisconsin Highway Research Program
Request for Proposals
Rigid Pavement Technical Oversight Committee

Non-Cementitious Repair Materials Study

I. **Background and Problem Statement**

As Wisconsin’s concrete pavements age and deteriorate, the Wisconsin Department of Transportation (WisDOT), as well as local agencies, continually search for technologies and methods of repair that not only correct the defects but preserve the roadway condition and consequently extend the serviceable life of those pavements.

This search has broadened as of recent as traffic demands on the State’s high order facilities necessitate the repairs be completed with minimal travel restrictions; routinely requiring lane closures be limited to off-peak travel times (typically 6 to 8 hours in duration at night). This short closure/construction window drastically limits the conventional repair methods available to the agencies. The conventional preservation repair methods for concrete pavements would be partial or full depth repairs that are cast in-place using conventional concrete mixtures. This requires concrete cure times that would not be permissible under the closure restrictions. To fit the limited closure times, concrete pavements repairs have been limited to those that utilize asphalt or rapid setting concrete materials. Neither method has shown to provide consistently reliable and durable preservation repairs.

In an effort to identify alternative repair methods, WisDOT has utilized non-cementitious concrete repair materials on facilities around the state. These non-cementitious repairs have experienced varying levels of success. In the repairs that have experienced failure, the failure is generally not attributed to the repair material or workmanship. Rather the failures appear to be the result of misapplication of the non-cementitious product. In several instances, the repairs failed due to the continued deterioration and poor condition of the concrete around it. Suggesting the non-cementitious products were applied in order to address traffic management concerns, rather than the pavement distress.

II. **Objectives**

The goal of the study is to make recommendations regarding the proper selection and application of non-cementitious concrete repair materials.

The objectives of this project are to:
- Evaluate availability and applicability of non-cementitious repair materials and products.
- Evaluate the processes used to identify the application of currently installed non-cementitious repairs.
• Evaluate the performance of the currently installed non-cementitious repairs.
• Develop protocols to identify application locations of non-cementitious repair materials and methods.
• Make recommendations to WisDOT specifications and manuals. Including, but not limited to: the Facilities Development Manual (FDM), the Concrete Pavement Rehabilitation Manual (FDM Chapter 14, Exhibit 10.1), and Construction and Materials Manual.

III. Scope of Work

Task 1: Synthesis of Current Practices and Research
Provide a comprehensive assessment of current use and practices of non-cementitious repair materials and products. The assessment should include (but is not limited to):
• Synopsis of other states’ DOT current specifications and pavement repair manuals
• Synopsis of research on non-cementitious repairs and their applications
• Summary and comparison of other state specifications and manuals to current WisDOT practice regarding repair of concrete pavements with non-cementitious materials
• Summary of the non-cementitious rapid repair materials and how they are being implemented on a national level.

Task 2: Work Plan Development
• Develop a work plan for evaluation of the currently installed non-cementitious repairs, and the processes used to identify the repairs as candidates for non-cementitious materials. Please note, WisDOT will need to be part of the process to identify the repair locations and provide documentation on the processes.
• Factors to consider at a minimum when developing the work plan should include:
  o Evaluation of pavement distresses before and after the repair

Task 3: Interim Presentation and Project Memorandum
Present findings from Task 1 and the proposed work plan to the Technical Oversight Committee (TOC).

Task 4: Execution of Work Plan and Analysis of Results
Any materials testing will use standardized test methods (ASTM/AASHTO) or tests that have yet to be standardized, but are accepted as current practice in the concrete community as agreed upon by the TOC.

Task 5: Final Report and Project Closeout Activities
Project Closeout Presentation: The researcher will present findings and recommendations to the TOC. The TOC will supply/document any comments or concerns regarding the final product of the research.
Final Report: The researcher is expected to address or incorporate any TOC comments prior to delivery of the final report in Wisconsin Highway Research Program (WHRP) format.

IV. **Required Testing**

- None
- Requirements for Laboratory/Technician Certifications: none

**Other Tests for Consideration:**
- Freeze-thaw durability
- Other testing proposed by the researcher

V. **WisDOT/POC/TOC Contribution:**

- Expected level by staff/TOC members: Maximum of 40 hours.
- WisDOT will identify projects where the material was applied. There is a possibility materials may be sampled, if the work plan requires, by WisDOT during 2017 construction for use in the study.
- The researcher is responsible for the development of a plan for traffic control. Any traffic control, if needed, will be the responsibility of the researcher to coordinate with existing construction contractors and WisDOT personnel.
- WisDOT Equipment: It is not anticipated that any WisDOT equipment will be needed as part of this study. The research team will not assume the availability of WisDOT equipment in the proposal. If WisDOT or another entity donates equipment, a letter of commitment must be included in the proposal.

VI. **Required Travel**

This project may require the PI to travel to Madison for a meeting to finalize the work plan with the POC. The PI is expected to report in person the final results of the study to the Rigid Pavement TOC.

VII. **Deliverables**

- Submittal and reporting of progress as required by the WHRP and WisDOT.
- Draft Final Report: The researcher is responsible for submitting a draft final report to the TOC. Conclusions and recommendations will specifically address WisDOT efforts to improve concrete durability and longevity through effective application of non-cementitious repairs as preventive maintenance.
• Any changes to existing practice should be addressed using the afore-mentioned value-based approach in an effort to balance performance and cost.
• Final Report Requirements. Six (6) hard copies and an electronic copy of the final report delivered to WisDOT by the contract end date.
• Presentation Requirements. All projects require the Principal Investigator to give a closeout presentation after submittal of the draft final report.

VIII. Schedule and Budget

• Proposed Project Duration is 18 months starting around October 1, 2017.
  o Deadline for submittal of draft final report is three months prior to contract end date to allow for report review activities.
  o Deadline for research close out presentation is 4-6 weeks prior to contract end date.
  o Deadline for submittal of the Final Report is the contract end date.
• Project Budget shall not exceed $80,000.
• The researcher is expected to submit the draft final report with quality technical writing and proper grammar. It is acceptable to include a technical editor on the research team to ensure these requirements are met.
• Matching funds will not be considered in the proposal evaluation process.

IX. Implementation

This research project, at its conclusion, should provide the following, at a minimum:

• Recommendations for potential changes in specifications.
• Recommendations for potential changes in concrete repair selection procedures.
• Impacts and language changes to the Facilities Development Manual, Standard Specifications, Construction and Materials Manual, and any other manuals that may be impacted.
• Draft for special provision or standard special provision language, if needed.