



# WHRP

Wisconsin Department of Transportation  
Wisconsin Highway Research Program

## Request for Proposal

### *Evaluation of Penetrating Sealers Applied to Saw Cut Faces in Concrete Pavement Joints*

Questions submitted to [research@dot.wi.gov](mailto: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](mailto: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](mailto: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**

***Evaluation of Penetrating Sealers Applied to  
Saw Cut Faces in Concrete Pavement Joints***

**I. Background and Problem Statement**

For the last six years, the Wisconsin Department of Transportation (WisDOT) as part of the high performance concrete (HPC) pavement standard special provision has specified the use of a penetrating concrete sealer be applied to the saw cut faces in the joints. The HPC pavements on the Interstate 94 North-South corridor and the Interstate 41 corridor from Oshkosh to Green Bay have received this joint treatment. The specification requires the use of a silane or siloxane-based concrete penetrating sealer to be applied as soon as possible after the sawing operation is complete.

To date, a variety of different products have been used, a number of different application methods have been employed, and the rates of application have been variable. In addition, the construction process and the construction inspection have not been uniform or consistent statewide. Therefore, there is no assurance that WisDOT is accomplishing the goal of distress free joints and longer life of the pavement. Finally, there has been no assessment by WisDOT on whether there are benefits and cost effectiveness to doing this work.

**II. Goals and Objectives**

The goal of this project is to (1) evaluate the concrete sealers used to date and the construction methods employed to determine if the achievement of sealing concrete pavement saw cut faces is accomplished with effectiveness and uniformity. (2) Assess the work done to date to determine if we are achieving the goal of longer lasting concrete pavement joints. (3) Develop standard specification language for applying penetrating sealers to concrete pavement saw cuts along with construction inspection guidelines.

The objectives of this project are to:

- A. Evaluate the penetrating sealers being used and make an assessment on their impacts to the durability of the concrete.
- B. Assess the methods of construction and application in regards to the effectiveness of the seal and uniformity of application.
- C. Perform field studies to compare pavements with sealed saw cut faces to pavements that were not sealed.

- D. Recommend improvements in products and construction methods to assure the extension in the life of concrete pavement joints that is expected.
- E. Revise current specifications for construction.
- F. Recommend specifications for the future use of sealing sawed joints on WisDOT projects so benefits and cost effectiveness are improved.

### III. **Scope of Work**

Task 1: Researcher will perform a comprehensive literature search that summarizes state-of-the-art of using concrete penetrating sealers for concrete pavement saw cut faces and other highway agencies experiences, materials, specifications and benefits and costs. The researcher will publish the results of the literature search prior to moving on to Task 2.

Task 2a: Researcher will obtain project data from the projects on Interstates 94 and 41 and summarize the work in Wisconsin to date. This summary will include interviews with WisDOT representatives and contractors to understand the materials and equipment used in constructing this work.

Task 2b: Researcher will develop a laboratory study to assess the performance of products by various independent variables such as different chemical component (e.g., silane, siloxane, etc.) and different concrete materials (e.g., Portland cement, fly ash, slag, etc.) to understand the impacts of these products on the durability of the joints.

Task 2c: Researcher will perform a field study on projects constructed in Wisconsin to assess the effectiveness of sealing the concrete saw faces against pavements in which they were not sealed.

Task 3: Researcher will analyze and summarize the test results from Task 2 and make recommendations for improvements to materials, construction methods, specifications and/or the continued use of penetrating sealers being applied to sawed concrete joints in concrete pavements.

Task 4: Researcher will provide a draft final report, analyzing the work in Task 2 and include conclusions and recommendations from Task 3. The final report will include, but not be limited to, literature search, laboratory study results, field study results and proposed revisions to WisDOT specifications and policy. The draft final report will be submitted to the Rigid Pavement Technical Oversight Committee (TOC) in advance of the final presentation. The researcher will present the results of this project to the TOC in person. The researcher is expected to submit the final report after addressing or incorporating any TOC comments.

### IV. **Required Testing**

- A. Produce concrete in the lab, sample and cure samples using the following procedures:
  - i. Sampling freshly mixed concrete (AASHTO R60)
  - ii. Making and curing concrete test specimens in the field (AASHTO T23)
  - iii. Standard moist curing for concrete cylinders (AASHTO M201)

- B. Perform concrete testing meeting the following specifications:
- i. Concrete compressive strength (AASHTO T22). Cast 6 - 6"x12" cylinders per mix design. Test two specimens each at ages 3, 7 and 28 days.
  - ii. Air Content of Freshly Mixed Concrete by the Pressure Method (AASHTO T152)
  - iii. Determining Air Content in Hardened Concrete (ASTM C457)
  - iv. Resistance of Concrete to Chloride Ion Penetration (AASHTO T259)
  - v. Practice for Petrographic Examination of Hardened Concrete (ASTM C856)
  - vi. Determining Chloride Ions in Concrete and Concrete Materials by Specific Ion Probe (AASHTO T332)

**V. WisDOT/TOC Contribution**

- A. Expected level by staff/TOC members: Maximum of 40 hours. Project Oversight Committee (POC) members will consult with research team in selecting the projects to be sampled.
- B. WisDOT Equipment: The research team will not assume the availability of WisDOT equipment in the proposal. If equipment is donated by WisDOT or another entity, a letter of commitment must be included in the proposal.
- C. It is not anticipated that any WisDOT equipment will be needed as part of this study.
- D. Any traffic control, if needed, will be the responsibility of the researcher to coordinate with existing construction contractors and WisDOT personnel.

**VI. Required Travel**

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

**VII. Deliverables**

- A. Submittal and reporting of progress as required by the WHRP and WisDOT.
- B. Reporting Requirements. Six (6) hard copies and an electronic copy of the final report delivered to WisDOT by the contract end date.
- C. Presentation Requirements. All projects require the Principal Investigator to give a closeout presentation after submittal of the draft final report.

**VIII. Schedule and Budget**

- A. Proposed Project Duration is **24 months** starting around **October 1, 2017**.
- Deadline for submittal of draft final report is three months prior to contract end date to allow for report review activities.

- Deadline for research close out presentation is 4-6 weeks prior to contract end date.
  - Deadline for submittal of the Final Report is the contract end date.
- B. Project Budget shall not exceed **\$125,000**. Matching funds will not be considered in the proposal evaluation process.
- C. 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.

## **IX. Implementation**

Successful implementation of this research will be achieved through the development of the following items:

- A. This study will recommend changes to existing construction specifications and recommendations for use of sealing joint saw cut faces for the future.
- B. The researcher is expected to communicate the following:
- i. Do current Wisconsin concrete pavements benefit from the use of sealing the joint saw cut face? Would this benefit vary by highway type?
  - ii. If this is effective in extending life of the concrete pavement, what are the best materials, methods of construction and application rates to specify?