

IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of December 14, 2021

Regular Members Present

D. Claman
W. Dotzler
J. DeVries
C. Burke
R. Koester
R. Knoche
A. Bradley
D. Sanders
W. Weiss
T. Roll
J. Fantz
B. Wilkinson
M. Rydl
A. McGuire
T. Kinney

Alternate Members Present

J. Hauber

Members with No Representation

Executive Secretary

V. Goetz

The meeting was opened on December 14, 2021 at 9:00 a.m. by Chair Dave Claman with an initial number of 13 voting members/alternates.

AGENDA

1. Agenda review/modification

Motion to Approve by T. Kinney 2nd by R. Knoche

Motion carried with 13, 0, 0

2. Minutes Approval from the October 29, 2021 meeting

Add Allen Bradley to minutes

Motion to Approve by R. Knoche 2nd by T. Kinney

Motion carried with 15, 0, 0

****Members Joined****

3. Final Report: TR-724, [“Self-Heating Electrically Conductive Concrete Demonstration Project”](#), Halil Ceylan, Iowa State University, \$358,870.

Discussion

Q. Are the electrodes energized by the controller or does it start heating when there is moisture?

A. There are probes that sense the droplets. PLC controller makes the system smart, gives you remote access.

Q. How quick does it heat up to start melting?

A. It depends on the weather conditions. Turning on the system two hours in advance when precipitation comes, it will melt away.

Q. For a normal sized bridge, how much or what percentage would the cost be?

A. If you were going to implement this heated concrete at the airport at all the gates, it was only going to increase a ticket price 60 cents. This is going to be cost effective.

Motion to Approve by W. Dotzler 2nd by J. Fantz

Motion carried with 15, 0, 0

Member Left*

4. Final Report: TR-747, [“Use of Waste Quarry Fines as a Binding Material on Unpaved Roads”](#), Jeremy Ashlock, Iowa State University, \$75,000.

Discussion

Q. When comparing to the test sections, was the control section constructed with the same compacted effort as the test sections?

A. They were all constructed on recent built up bases.

Motion to Approve by T. Kinney 2nd by R. Koester

Motion carried with 13, 0, 1

5. Final Report: TR-767, “Fiber-Reinforced Concrete for Bridge Decks”, Behrouz Shafei, Iowa State University, \$120,000.

<http://publications.iowa.gov/39850>

Motion to Approve by J. DeVries 2nd by W. Dotzler

Motion carried with 14, 0, 0

6. Proposal: [“Beam End Repair for Prestressed Concrete Beams – Phase II”](#), Behrouz Shafei, Iowa State University, \$141,866.

Abstract

The ultimate goal of the proposed research project is to provide cost-effective/high-performance cementitious materials to repair the deteriorated ends of precast prestressed concrete beams (PPCB). Based on the outcome of the small- and large-scale investigations performed as part of the Phase I of this project, ultra-high performance, and high-early strength concrete mixtures were developed and tested to repair the beam ends in the laboratory setting. In the proposed Phase II of this project, the developed patching materials will be applied to a bridge structure identified by the Iowa DOT’s Bridges and Structures Bureau. This candidate bridge, which is located in Fort Dodge, has many beams in many differing states of deterioration.

Thus, it would be an appropriate bridge to apply and evaluate the performance of the identified patching materials in a real field setting. The scope of work for the proposed project involves both short- and long-term investigations. The short-term investigations will primarily cover the practical aspects and considerations that must be figured out to successfully apply the patches in the field. On the other hand, the long-term investigations will closely monitor the integrity and overall condition state of the repaired beam ends over time. For this purpose, a dense array of instrumentation will be utilized, while regular inspections will be conducted in parallel. The

outcome is expected to identify the patching materials, procedures, and practices that have the highest promise of success to address the long-standing issue of deterioration of beam ends.

Discussion

Q. Does this project include development of a DOT Specification?

A. This is for testing several different materials, another phase would need to be done to get specific specifications.

Motion to Approve by R. Knoche 2nd by T. Kinney

Motion carried with 13, 0, 1

7. Proposal: [“Accelerated Bridge Construction \(ABC\) Methodology for Integral Abutments”](#), Sri Sritharam, Iowa State University, \$330,000.

Abstract

Building on a previous bridge substructure project, the proposed research will advance the accelerated bridge construction method for integral bridge abutments supported on steel piles and constructed using prefabricated and in-situ concrete along with other advanced construction techniques (3D printing) and materials as appropriate. The weight of the prefabricated members will be reduced using hollow or shell elements, which in turn will improve both construction tolerances and constructability. The hollow sections will be filled with in-situ concrete. The piles will be designed with temporary collars, which will eliminate the need to wait for the concrete to cure before continuing with the assembly of the abutment and placement of the girders. The proposed research, funded jointly by the California Department of Transportation, will include two large-scale outdoor test units, which will incorporate both vertical and battered steel piles. One test unit will model an integral abutment while the second unit will replicate a seat type abutment with other details. The testing of the system will incorporate service level and extreme loads and ensure dependable performance of the new system and its components. As part of the testing program, the performance of the abutments will be examined systematically. Analytical models will be developed to replicate the observed performance of the test unit, the components and the connections. Using the combination of analytical and experimental observations and findings from the previous phase of the project, appropriate design recommendations will be developed for improving bridge construction.

Motion to Approve by R. Knoche 2nd by D. Sanders

Motion carried with 11, 0, 0

****Members left****

8. New business

a. Membership for next Year.

Dave Claman’s term ends 12/31, thank you Dave for serving on the IHRB. Ahmad Abu- Hawash has left the DOT, Jim Hauber from Bridges and Structures is the alternate member today and will become the regular member in January. Ashley Buss has been selected to be the new alternate for Jim.

William Dotzler’s term ends 12/31, thank you William for serving on the IHRB. Dustin Skogerboe will be member the new regular DOT member in January. Zach Gunsolley will be the alternate for Dustin.

Ron Knoche & John Joiner were appointed by APWA – Iowa for another three-year term.

Bret Wilkinson's term ends 12/31, thank you Bret for serving on the IHRB. William Rabenberg will become the member, as of now we do not have an alternate.

Todd Kinney's term ends 12/31, thank you Todd for serving on the IHRB. Anthony Bardgett will be the new member and Derek Snead as the Alternate.

Andrew McGuire is the vice Chair of IHRB, next year he will become the Chair. IHRB rotates chairmanship by agency type. The next role to serve as a Vice Chair would be a University Term, David Sanders will be Vice Chair for 2022 and then Chair of the board for 2023.

- b. In 2024 IHRB Research Board will be celebrating 75 years in business.
- c. Iowa County Engineers Association is the local host for [TRB's 13th International Low Volume Roads Conference](#), this will be held in Cedar Rapids Iowa, July 23-26, 2023. IHRB is providing financial support for the conference.
- d. [Innovative project ideas campaign](#). There were twelve ideas that were submitted, IHRB over the last month did an initial ranking. The top eight ideas were invited to submit a maximum three-page pre-proposal. Proposals are due by December 22nd. IHRB members will rank the submittals and select the top four which will be invited to present a proposal during the February meeting for funding considerations.

9. Adjourn

Motion to Approve by J. DeVries 2nd by R. Knoche
Motion carried with 9, 0, 0

The next regular meeting of the Iowa Highway Research Board is scheduled for February 25, 2022.

VG

