IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of October 29, 2021

Regular Members Present

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

Alternate Members Present

O. Smadi

Members with No Representation

J. Fantz
W. Weiss

Executive Secretary

V. Goetz

The meeting was opened on October 29, 2021 at 9:00 a.m. by Chair Dave Claman with an initial number of 13 voting members/alternates.

AGENDA

1. Agenda review/modification - New agenda item

Motion to Approve by R. Knoche 2nd by J. DeVries
Motion carried with 13, 0, 0

2. Minutes Approval from the September 24, 2021 meeting

Motion to Approve by W. Dotzler 2nd R. Koester
Motion carried with 13, 0, 0

3. LTAP 2021 Overview and 2022 Planning Update, Keith Knapp, Iowa State University (15 min)

4. **Final Report:** ST-008, Accelerated Innovation Deployment (AID) Demonstration Project: Increasing Pavement Performance through Pavement Foundation design Modulus Verification and Construction Quality Monitoring", David White, Ingios Geotechnics, Inc., $889,997.00, (15 Min).
   http://publications.iowa.gov/39532

Motion to Approve by R. Knoche, 2nd J. DeVries
Motion carried with 13, 0, 0

Member Left

5. **Final Report:** TR-742, "Validation of Gyratory Mix Design in Iowa – Phase II", Chris Williams, Iowa State University, $250,000, (15 Min).
   http://publications.iowa.gov/39495

   Motion to Approve by R. Knoche, 2nd W. Dotzler
   Motion carried with 12, 0, 0

6. **Proposal:** *"Impact of Legalized 25-Kip Axle Loads for Self-Propelled Implements of Husbandry on Iowa Bridges*", Justin Dahlberg, Iowa State University, $100,000 (SPR $139,231), (15 Min).

   Abstract
   Recent legislation in the State of Iowa has increased the allowable axle weight of certain implements of husbandry to 25 kips. This change poses a particular concern to those who oversee and manage the construction and preservation of bridge structures. Based upon initial estimates, it is expected that the resulting structural response of bridges will exceed that which would be otherwise seen from current legal loads. This project aims to identify the load response of Iowa bridges to the increased live load limit and develop recommendations for load factors, live load distribution factors, and impact factors for Iowa bridges. Additionally, an Iowa-specific notional vehicle to be used for load rating bridges for recently legislated 25 kip axle vehicles will be developed and proposed.

   Motion to Approve by C. Burke, 2nd R. Koester
   Motion carried with 11, 0, 1

7. **Proposal:** *"Base Stabilization of Iowa Granular Roads Using Recycled Plastics*", Halil Ceylan, Iowa State University, $349,960.

   Abstract
   Plastic waste is one of the greatest environmental challenges in not only Iowa but also other states. Recent bans on imported plastic waste into developing countries is forcing many US cities and states to take issues related to plastic waste more seriously. In addition, fiberglass-based(also known as glass-reinforced plastic or glass-fiber-reinforced plastic) wind turbine blades from wind powered generators in Iowa are being heaped up in piles in landfills instead of recycled. The objectives of this research are to determine the structural benefits and environmental suitability of using recycled plastics as a base stabilization agent and then to develop a practitioner's guide to document best practices to implement such a solution in Iowa's gravel road network. This will be achieved through the execution of the following primary tasks: (1) characterization of recycled plastic materials, including recycled wind turbine blade materials, (2) identification of innovative solutions of using recycled plastics to stabilize granular roads through comprehensive laboratory assessment, (3) construction and assessment of pilot test sections employing identified solutions through a set of field tests and surveys, (4) determination of the structural benefits and environmental suitability,(5) cost-effectiveness evaluation, and (6) development of best practice guidance documents and implementation recommendations. The successful outcomes of this research will not only help reduce landfill waste but also provide an innovative and less expensive alternative to strengthen the bases of Iowa's granular roads.

   Motion to Approve by R. Knoche, 2nd B. Wilkinson

Motion carried with 11, 0, 1
member joined

8. Matching Fund Proposal: “Helical Pile Foundation Implementation for Bridge Structures”, Justin Dahlberg, Iowa State University, $70,137, (15 min)

Abstract
Recent advancement in bridge construction technologies, especially with respect to bridge decks and superstructures have become commonplace in new bridge projects. Substructure construction has not made the same advancements, however. There are existing technologies that have potential for simplifying and expediting the construction of bridge substructures at the same or reduced cost using equipment that is more readily available. In this project, helical pile foundation implementation for bridges will be investigated and a design guide will be produced. This tool will give engineers direction for alternative deep foundation options on bridge structures. This is an advantage for any bridge project, but particularly for low-volume roads where budgetary considerations tend to be of specific priority.

Motion to Approve by W. Dotzler, 2nd J. DeVries
Motion carried with 11, 0, 2

9. **Matching Fund Proposal:** *“Accelerated Bridge Construction (ABC) Methods for Pile-Footing-Column Systems using Lightweight Precast Members”* Sri Sritharan, Iowa State University, $80,010

Abstract
Building on a previous project, the proposed research will advance the accelerated bridge construction method for bridge substructures using steel piles and precast pile caps and columns. The weight of the precast members will be reduced using hollow sections, 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 superstructure construction. The proposed research, funded jointly by the California Department of Transportation, will include a large-scale test unit which will incorporate both vertical and battered steel piles. 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 column and pile foundations will be examined systematically. Analytical models will be developed to realize the observed performance of the test unit and the components. 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 J. DeVries
Motion carried with 12, 0, 1

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10. RFP to be posted November 15: **IHRB-3402, Ultra High-Performance Concrete Repair of Steel Bridge Girder Ends**

Motion to Approve by O. Smadi, 2nd R. Knoche
Motion carried with 12, 0, 0

11. Innovative Project Ideas: Submit ideas by November 1 - https://ideas.iowadot.gov/subdomain/innovative-project-ideas/end/campaign_overview?qmzn=iKFrYf

Q. Are these the type of projects where you would spend up to 50k?
A. Yes, this year it is 60k.

12. New Business
    No new Business

13. Adjourn

The next regular meeting of the Iowa Highway Research Board is scheduled for Tuesday December 14, 2021 at 12:30 pm. Additional details forthcoming.

VG