

# **IOWA HIGHWAY RESEARCH BOARD (IHRB)**

*Minutes of June 2, 2017*

## **Regular Board Members Present**

A. Abu-Hawash  
K. Jones  
C. Poole  
D. Sprengeler  
S. Okerlund  
R. Knoche  
P. Hanley  
W. Weiss

R. Stutt  
L. Bjerke  
B. Billings  
K. Mayberry  
A. McGuire  
T. Kinney  
W. Klaiber

## **Alternate Board Members Present**

Paul Geilenfeldt III

## **Members with No Representation**

## **Secretary – V. Goetz**

## **Visitors**

Tammy Bailey  
Danny Waid  
Yang Zhang  
Brent Phares  
Bora Cetin  
Alice Alipour  
Sunghwan Kim  
Basak Bektas  
Ashley Buss  
Halil Ceylan  
Micah Loesch  
Gordon Smith

Iowa Department of Transportation  
Iowa County Engineers Association  
Iowa State University  
Iowa State University  
Iowa State University  
Iowa State University  
Iowa State University  
Iowa State University  
Iowa State University  
Iowa State University  
Federal Highway Administration  
Iowa Concrete Paving Association

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, June 2, 2017. The meeting was called to order at 9:00 a.m. by Ahmad Abu-Hawash with an initial number of 13 voting members/alternates at the table.

## **1. Agenda review/modification**

## **2. Motion to approve Minutes from the April 2017 meeting**

**Motion to Approve** by R. Knoche; 2<sup>nd</sup> R. Stutt  
Motion carried with 13 Aye, 0 Nay, 0 Abstaining

\*\*\* Two Members joined the table

**3. Match Funding Proposal:** “Advanced Testing and characterization of Iowa Soils and Geomaterials”, Bora Cetin, Iowa State University, (\$250,000)

**BACKGROUND**

The actual performance of geomaterials is highly dependent on the anisotropic behavior of materials used in pavement foundation systems. The current testing methods do not consider this. Current test methods only simulate the shear strength, MR and permanent deformation under wheel load. However, previous research shown that the continuous rotation of principal stresses, which occur in the field due to rolling nature of wheel loads. Proposed innovative advanced material characterization, which will be called as CYCELL, will be able to determine the anisotropic MR, shear strength, and permanent deformation of geomaterials in the laboratory at various applied stress states. CYCELL will be able to simulate applied stresses on a pavement at any location and direction. Standard test methods are overestimating the stiffness, permanent deformation, and shear strength of geomaterials which result in unreliable pavement performance predictions. It is clear that results obtained from current test methods are not fully representative of field conditions. Thus, it is very important to determine the anisotropic behavior of geomaterials for pavement designs.

**DISCUSSION**

The objectives of the proposed research are to:

*1) Build an Advanced Geomaterial Testing and Characterization Device*

This objective will be achieved by building the machine possessing the capability to:

- a) Evaluate the anisotropic behavior of materials under dynamic/static load conditions.
- b) Evaluate material performance under different climatic conditions.
- c) Evaluate pore pressure change in all directions.

*2) Evaluate the Anisotropic Behavior of Geomaterials*

This objective will be achieved via constructing a series of laboratory tests on geomaterials samples collected from Iowa including coarse-grained and fine-grained soils, and recycled materials. Anisotropic (in all directions) modular ratios will be calculated. Modular ratios will be determined for MR, shear strength, angle of friction, cohesion, and permanent deformation parameters.

*3) Determine the Relationships Between the Modular Ratios of Geomaterials and Geomaterial Qualities*

In this part of the study design charts will be developed between the modular ratios and Abrasion Resistance (for coarse grained geomaterials), Bulk Stress, Freeze-Thaw resistance, Shear Stress Ratios, Shear Strength and Shear Stress Ratio .

These charts will enable Iowa engineers to be able to predict the performance of pavement foundation layers and unpaved road materials based on the measurements of certain material properties.

*4) Determine the Performance of Geomaterials under Different Climatic Conditions*

Specimens will be tested under different temperature conditions via help of environmental chamber to determine the actual field performance of materials in the laboratory test.

**Motion to Approve by W. Weiss; 2<sup>nd</sup> K. Jones**

Motion carried with 15 Aye, 0 Nay, 0 Abstaining

**4. RFP:**

- a. **IHRB-16-11:** “Performance Evaluation of Recent Improvements of Bridge Abutments and Approach Backfill, (\$50,000).

**Motion to Approve by K. Jones; 2<sup>nd</sup> R. Knoche**  
Motion carried with 15 Aye, 0 Nay, 0 Abstaining

- b. **IHRB-17-01:** “Next Generation Life Cycle Cost Analysis Tool for Bridges in Iowa, (\$90,000).

**Motion to Approve by R. Knoche; 2<sup>nd</sup> D. Sprengeler**  
Motion carried with 15 Aye, 0 Nay, 0 Abstaining

- 5. Innovative Project Award Recipient Presentation:** “Enhancing the Fundamental Knowledge and Use of Asphalt Emulsions Using Systematic Scientific and Engineering Approaches”, Ashley Buss, Iowa State University.

**DISCUSSION**

Q. Do the emulsions have a shelf life?

A. It depends on the formulation.

- 6. 2017 STIC Excellence Award Nominations,** Micah Loesch, Federal Highway Administration.

**DISCUSSION**

Q. Would this be for specific projects?

A. In general, this award is for groups that embrace a culture innovation. We would explain how the Iowa Highway Research Board promotes innovation in the transportation communities, as part of that we can highlight a couple major projects that we have done.

Q. This can be any of our project not necessarily STIC projects?

A. Correct, any research that you have done, it does not matter how it was funded.

Q. Is this a nomination of the STIC council?

A. Yes

Q. Can we have the list of projects that have been selected by federal Highway already?

A. Yes

V. Goetz stated to the board that if there are any innovative projects that stick out in their mind that we could highlight, let her know.

**7. STIC and AID Projects**

- a. **AID Grant Requests to IHRB for Local Governments and MPO’s are due July 7:**

<https://www.cognitoforms.com/IowaDOTResearch/IowaAdvancedInnovationDeploymentGrantProjectRequests>

b. **STIC Implementation Project Requests are due July 7:**

<https://www.cognitoforms.com/IowaDOTResearch/IowaSTICIncentiveFundRequests>

V. Goetz stated that there are two opportunities to apply through the Iowa Highway Research Board to rank projects for AID grants and STIC funding. Currently, Iowa has one AID grant submitted that is still awaiting FHWA review for Box Beam/UHPC Project. We have not heard from FHWA if the grant application was accepted or denied.

The current AID opportunity right now is for sub recipients through the State such as City, County Government and MPOs can apply up to one million dollars on a project. We have until September to apply for the federal fiscal year 2017. These topics are due by July 7, 2017, the Iowa Highway Research Board will prioritize and rank those projects during the July meeting. The number one ranked project will be invited to submit for federal fiscal year 17. The number two ranked project will be invited to prepare an application for October 1<sup>st</sup> for federal fiscal year 2018, unless the board directs otherwise.

V. Goetz stated that the STIC implementation project requests are also due July 7, 2017. The STIC Incentive fund is \$100,000 with the 20% match up to \$120,000 total. This current solicitation is to rank projects proposed to apply starting October 1, 2017 for federal fiscal year 2018.

V. Goetz stated the board in February decided that for the federal fiscal year 18, STIC projects will be limited to advancing Every Day Counts technologies, primarily round four but if there are projects submitted with previous everyday counts technology available those will be up for consideration.

**8. FY18IHRB New Project Voting**

New Projects Ranked and Selected for further consideration and development in FY18

<b>Topic Number</b>	<b>Project Title</b>
IHRB-18-01	Evaluate development and costs to operate an Urban Service Bureau
IHRB-18-02	Development of Iowa Secondary Roads Operations Management System
IHRB-18-03	Evaluation of Slab Stabilization Practices Effectiveness in Iowa Concrete Pavement Restoration and Repair Strategies
IHRB-18-04	Evaluation of Penetrating Sealers for Concrete
IHRB-18-05	Optimal Timing to Perform Crack Sealing in HMA Pavement
IHRB-18-06	Use of Unmanned Aerial Vehicles (Drones) in Surveying and Construction Works for Iowa Transportation Infrastructure System
IHRB-18-07	Late life low cost deck overlays
IHRB-18-08	Galvanized and Painted Steel Piling
IHRB-18-09	Evaluation of the use of Precast Deck Panels with Precast BulbT Beams
IHRB-18-10	Fiber-Reinforced Concrete in Bridge Decks

IHRB-18-11	Cost-Effective Pavement Foundation Design Alternatives to Resist Seasonal Freeze-Thaw Effects
IHRB-18-12	Light-emitting diode (LED) lighting
IHRB-18-13	Benefit cost of full depth full width paved shoulders at bridge approaches
IHRB-18-14	Design and Detailing Requirements for Columns Under Collision
IHRB-18-15	Two Way Left Turn Lane (TWLTL) Width and Context Sensitive Design and Regular Lane Width and Safety/Operational Impacts

**Motion to Approve** by K. Mayberry; 2<sup>nd</sup> R. Knoche  
Motion carried with 15 Aye, 0 Nay, 0 Abstaining

## 9. New Business

V. Goetz stated the traveling meeting for the 27<sup>th</sup> had 10 of the Iowa Highway Research Board members that were planning to attend. This is enough for a quorum so we can cancel the June Meeting. A group will be leaving from Ames early in the morning. We will then head to the Muscatine area for the tour in the morning and then head to Illinois for the afternoon and then come back to Ames late. Keith Knapp with Iowa LTAP will send out additional details.

\*\*\* Update 6/12/2017 \*\*\* With several board members no longer able to travel on June 27<sup>th</sup>, the plan to cancel the June meeting has changed. The IHRB will plan to meet on June 30<sup>th</sup>.

## 10. Adjourn

The next meeting of the Iowa Highway Research Board will be held Friday, June 30, 2017 in the East/West Materials Conference Room at the Iowa DOT. The meeting will begin promptly at 9:00 a.m.

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**Vanessa Goetz, IHRB Secretary**