

# IOWA HIGHWAY RESEARCH BOARD (IHRB)

*Minutes of June 24, 2005*

## **Regular Board Members Present**

J. Adam	J. Joiner
S. Dockstader	J. Krist
R. Ettema	C. Marker
T. Fonkert	M. Nahra
R. Gould	R. Schletzbaum
J. Ites	C. Schloz
L. Jesse	

## **Alternate Board Members Present**

E. Kannel for L. Greimann  
D. Short for L. Brehm  
A. Abu-Hawash  
J. Berger  
M. Kerper

## **Board Members with No Representation**

None

## **Secretary**

M. Dunn

## **Visitors**

Bob Libra	<i>Department of Natural Resources - Geological Survey</i>
Sara Buseman	<i>Iowa Department of Transportation</i>
Ken Dunker	<i>Iowa Department of Transportation</i>
Ed Engle	<i>Iowa Department of Transportation</i>
Norm McDonald	<i>Iowa Department of Transportation</i>
Robert Abendroth	<i>Iowa State University</i>
Vern Schaefer	<i>Iowa State University</i>
Mike LaViolette	<i>Iowa State University/Bridge Engineering Center</i>
F. Wayne Klaiber	<i>Iowa State University/CCEE Department</i>
Steve Andrie	<i>Iowa State University/CTRE</i>
Brent Phares	<i>Iowa State University/CTRE</i>
Paul Wiegand	<i>Iowa State University/CTRE</i>
Gary Taylor	<i>Iowa State University Extension &amp; CRP</i>
James Jensen	<i>Iowa State University Extension - Henry County</i>
Mohamed Elhakeem	<i>The University of Iowa</i>
Thanos Papanicolaou	<i>The University of Iowa</i>

The meeting was held in the East/West Materials Conference Room at the Iowa Department of Transportation (Iowa DOT), Central Complex, in Ames, Iowa. The meeting was called to order at 9:00 A.M. by Larry Jesse with 14 voting members/alternates at the table.

### **Member/Alternate information**

- Dr. Ed Kannel, Iowa State University (ISU), acted as the alternate for Dr. Lowell Greimann, ISU, for the June meeting. Since the meeting, a letter confirming Dr. Greimann's replacement to the Board announced that Dr. Ed Jaselskis will serve as the interim ISU member until Dr. James Alleman, newly selected Chair of the ISU Department of Civil, Construction, and Environmental Engineering, is able to start his service to the Board in January 2006. Dr. Alleman will join ISU August 16; however, he has been honored with a Fulbright Fellowship to Greece for the fall 2005 semester and will return mid-December.
- With Gary Bishop moving out of District 5, Jim Armstrong, Appanoose County Engineer, has been named as the alternate for Roger Schletzbaum.
- With Will Stein leaving the Iowa DOT, Mark Kerper, Office of Location and Environment, will serve as Larry Jesse's alternate.

### **Agenda review/modification**

- None.

### **Approval of the minutes**

- Jon Ites moved to approve the minutes as submitted from the May 20, 2005 meeting. Charles Marker seconded. Carried with 14 yes, 0 no, and 0 abstaining.

### **Extension Proposal for TR-498, "Field Testing of Railroad Flat Car (RRFC) Bridges"**

- Dr. F. Wayne Klaiber, ISU, reviewed the previous RRFC projects, TR-421 and TR-444, plus the objective, research plan, value, RRFC TR News article, implementation, budget and time frame of the proposed extension.
- It was discussed that there is a need to measure the members, but with the information available on distribution factors, things are in place for simple span RRFC bridges to be done without making all the individual calculations.
- Mark Nahra moved to approve the extension proposal. John Adam seconded. Carried with 14 yes, 0 no, and 0 abstaining.

### **Final Report for TR-506, "Determination and Evaluation of Alternate Methods for Managing and Controlling Highway-Related Dust, Phase II - Demonstration Project"**

- Dr. Vern Schaefer, ISU, presented the objectives; scope; demonstration sites, including the selection criteria; components of the test sections; method of dust collection; dust monitoring of test sections; graphs of results; overall observations; and recommendations of the completed research.

- It was mentioned that there was not a great difference in a cost comparison of the different dust control materials.
- It was explained that the process used was a surface application that treated all the material on the road; the fines were not treated separately followed by loose aggregate being added.
- It was mentioned that in eastern Iowa, there are 2 applicators of lignin products, one uses material with high residual sugars and one with low - bought from different sources. The one with 15% residual sugar (high) is more effective than the other. It was thought it would be useful to know the residual sugar level of the material used in this research.
- It was clarified that the variance in the traffic counts came from the number that the county had listed (lower number) versus the number that was actually counted as part of this research.
- In regard to material lost (not dust reduction), the results of the research showed that it was more cost effective to replace the aggregate every 2 years rather than to try to reduce the amount of material lost with the use of dust reduction material and stretch the time before the aggregate is replaced.
- The report was complimented for providing useful information, especially on a county level.
- During the presentation one additional voting member joined the table.
- Charles Marker moved to approve the final report. Mark Nahra seconded. Carried with 15 yes, 0 no, and 0 abstaining.

#### **Final Report for HR-399, “Field Testing of Integral Abutments”**

- Dr. Robert Abendroth, ISU/ Center for Transportation Research and Education (CTRE), discussed the research tasks; structure of the final report, which included a written report and a Microsoft Excel spreadsheet; bridge monitoring, including specifics on bridges and instrumentation; charts showing results of monitoring; results from laboratory tests; finite element models; integral abutment design aspects, such as pile cap design, pile strength - limit state, pile ductility - limit state, and maximum bridge length; and summary of the design recommendations and guidelines included in the report.
- Mark Nahra moved to approve the final report. Rob Ettema seconded. Carried with 15 yes, 0 no, and 0 abstaining.

#### **Proposal, “The Effects of Headcut and Knickpoint Propagation on Bridges in Iowa”**

- Dr. Thanos Papanicolaou, The University of Iowa (U of I), explained the objectives, impacts and definitions of headcuts and knickpoints, importance of research, findings of current literature review, tasks, research plan, methodology, instrumentation for monitoring, products, outcomes, time schedule, and conclusions of the proposed research.
- It was clarified that the research would cover 2 wet weather seasons.
- The type of soil will be recorded at the different research locations.

- Roger Schletzbaum moved to approve the proposal. Jon Ites seconded. Carried with 14 yes, 0 no, and 1 abstaining.

### **Proposals for development of updated/combined slab and concrete beam standards for Iowa DOT and county bridges**

- There was discussion on some of the main aspects of the following proposals: “Continuous Concrete Slab Bridge Standards”, from Stanley Consultants, Inc.; and “Three Span Prestressed Concrete Beam Bridge Standards”, from WHKS & Co.
  - Over view of different lengths, skews, and widths.
  - Changes the slab standard lengths for the counties from 12 ½’ increments to match the Iowa DOT’s 10’ increments.
  - Option was added for timber pile.
  - Keep black steel option.
  - Got rid of 126’ beam bridge and spread footings underneath pedestal piers (pile bent piers can be used).
  - The standards will be laid out very similar to the way the sheets are done currently to keep things consistent for the staff that uses them.
  - Incorporate updates on the precast beam series; LXA, LXB, and LXC standards; improved paving notch design; and open barrier rail standard.
- Both consultants are considered “statewide consultants” and are used frequently by the Iowa DOT. WHKS & Co. has written a program that puts some of the plans together by entering the parameters without having to do some of the drafting. Stanley Consultants, Inc. has done a lot of work on previous standards. Both companies are very familiar with this type of work.
- The desire to consider having the WHKS & Co. program modified, down the road, for county use was expressed.
- Stanley Consultants, Inc. is developing a software program, as part of this project, to convert the MicroStation plans to AutoCAD format. The software will be available for use in the future. It was also asked that PDF format are also made available on-line for consultants and contractors.
- To receive federal aid, all new superstructure designs, beginning October 2007, must be done by Load and Resistance Factor Design (LRFD). The anticipated completion date for both projects is approximately March 2007.
- The costs were estimated at \$390,000 for “Continuous Concrete Slab Bridge Standards” and \$720,000 for “Three Span Prestressed Concrete Beam Bridge Standards.”
- There is \$200,000 available through the Iowa DOT Consultant Services to be applied to the Primary portion of costs for the projects. The rest of the Primary portion is proposed to be covered by IHRB funds.
- Ron Meyer, Iowa DOT, reviewed the different configurations of the standards and thought the split of those used predominately by Iowa DOT or counties lined up as 1/3 and 2/3 respectively.
- After discussion, it was agreed that the funding split be 1/3 Primary (including the available \$200,000 Consultant Services amount) and 2/3 Secondary.

- The Primary amount is obligated all at one time; the Secondary amount is taken from their balance as the amounts are actually paid. The balance in the Secondary Road Research Fund is capable of handling the project, especially over the 2005 - 2007 timeframe.
- Both of these proposals were thought to be very good and the end products will be a great benefit to the Iowa DOT and counties.
- Mark Nahra moved to approve the Stanley Consultants, Inc. proposal for “Development of Continuous Concrete Slab Bridge Standards” with the funding split of 1/3 Primary and 2/3 Secondary. Clark Schloz seconded. Carried with 15 yes, 0 no, and 0 abstaining.
- Mark Nahra moved to approve the WHKS & Co. proposal for “Development of Three Span Prestressed Concrete Beam Bridge Standards” with the funding split of 1/3 Primary and 2/3 Secondary. Clark Schloz seconded. Carried with 15 yes, 0 no, and 0 abstaining.

### **Review/Finalize RFPs for 1<sup>st</sup> Solicitation for FY 2005-2006**

#### ***IHRB-05-01, “Use of Prefabricated Bridge Elements for Rapid and Reduced Cost Installations”***

- Mark Dunn, Iowa DOT, explained that a literature search on the subject produced multiple projects which have been completed on variations of this topic. A clear project scope could not be determined from the description submitted. A summary of the literature search was provided in the Board packet to allow for discussion on the intended direction of the project.
- From the Primary stand point, a need was seen for rapid construction in high traffic volume routes to minimize closures and disruption of traffic.
- From the county stand point, the use of precast elements with respect to being able to stay within the guidelines and continue use of federal funds was discussed. A need for a precast “plank”, to allow for an all concrete system which is more resistant to deterioration, was mentioned as an example.
- The state and county goals may be quite different. It was wondered if it would be better to develop 2 RFPs from this topic.
- After discussion, it was suggested that a committee be organized to review the information available, decide what the needs are specific to Iowa, and help direct the scope of the project. It was recommended that the committee consist of the Bridges and Structures Research Focus Group, who submitted the topic for ranking, and include personnel from the Maintenance, Construction and Design Offices of the Iowa DOT. It was thought that Wayne Sunday, Office of Construction, would provide beneficial input. Jon Ites, Mark Nahra and Charles Marker said they would be involved in the committee.

#### ***IHRB-05-02, “Development of Self-Cleaning Box Culvert Designs”***

- It was reviewed that this is an expensive county and state, on-going maintenance problem.
- It was suggested it may be worth addressing the idea of a temporary addition, possibly until a heavy rainfall is received, not just permanent fixtures.
- Due to issues outside of the right of way, it was recommended to stay focused at the culvert area and not work on possible solutions up stream.

- Laboratory analysis was thought to be a good approach to the study. It was mentioned that a follow-up field study would be beneficial.
- After discussion, it was decided that the project should have an estimated budget of \$120,000 to \$150,000 and time frame of 18 to 24 months.
- Jon Ites said he would be willing to be a technical contact. It was also recommended that Mark Dunn check with Dave Claman on being a technical contact.

***IHRB-05-03, “Revision to the SUDAS Traffic Signal Design Guide”***

- In the third paragraph the RFP refers to “unique design elements”, it was suggested to add a more clearly stated research component such as “a review of the possible elements.” With one of the goals of having current technology brought into the SUDAS Guide, it was said it needed to be more clearly stated so it was not just an update to the SUDAS Guide, but research activity with a benefit to Iowa transportation.
- In comparing the anticipated level of effort needed for the project to other IHRB research, it was suggested that the estimated budget be set at \$80,000.

***IHRB-05-04, “Investigation of Electro-Magnetic Gauges for Determination of In-Place Density of HMA Pavements”***

- It will be added to the RFP that the Iowa DOT owns the gauges and that the equipment does not need to be purchased.
- Mark Dunn will clarify if the testing of the cores can be done at the Iowa DOT Materials Lab or if the researchers need to have the testing done elsewhere; this detail will also be added to the RFP.
- It is likely that the testing can all happen within one construction season. With the proposals not being reviewed until the end of September, next spring was thought to be the earliest timeframe for the testing. A 9 to 12 month schedule was agreed to be adequate for the project. The estimated budget was set at \$50,000.
- Mark Dunn will discuss with the Materials Lab staff to see if they have a feel for accuracies on cold in-place (CIP) pavements and possibly consider testing CIP as well as HMA.

***IHRB-05-05, “Investigation of the Impact of Rural Development on Secondary Road Systems”***

- Mark Dunn explained that an additional topic (livestock facilities), which was lower on the prioritization list, had differences from the housing development topic, however was similar enough to have the two topics reviewed parallel to one another because it allowed for efficiencies in research.
- It was agreed that the two topics should be included in one project, however it was requested that the effects of housing developments be addressed first in the RFP due to its higher ranking.
- Roger Schletzbaum volunteered to serve on the advisory committee.
- It is anticipated that this study focus on the policy portion of the issue. It will serve as a credible source for the engineers to quantify the impact on the road system and better understand, justify and explain service levels.

- The estimated time frame was set at 12 to 18 months and the estimated budget was set at \$80,000.

***IHRB-05-06, “Roadway Design Standards for Rural and Suburban Subdivisions”***

- It was requested that it be checked to see if this can be tied into the SUDAS Guide and have that aspect added to the RFP.
- It was recommended that the project advisory committee have representation from the Iowa County Zoning Administration Association and Larry Stevens from CTRE/SUDAS.
- It was recommended that with all the comparison work involved, that the estimated funding be set at \$100,000 to \$120,000 and an estimated time frame set at 12 to 18 months.
- Roger Schletzbaum volunteered to be the technical contact.

**New Business**

- Due to Dr. Lowell Griemann’s retirement from ISU, his service as a Board member has now ended. He started as an alternate member in 1993 and as a regular member in 1996. His faithful service has positively impacted the IHRB as well as many advancements which has helped make Iowa one of the leading states in the nation in research. Thank you Dr. Greimann.

**Charles Marker moved to adjourn the meeting. Clark Schloz seconded. Carried with 15 yes, 0 no, and 0 abstaining.**

**Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, SEPTEMBER 30, 2005 AT 9:00 A.M. IN THE EAST/WEST MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.**

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Mark Dunn, IHRB Secretary