

IOWA HIGHWAY RESEARCH BOARD (IHRB)

Minutes of December 9, 2004

Regular Board Members Present

J. Adam	L. Jesse
L. Brehm	C. Marker
R. Ettema	M. Nahra
T. Fonkert	G. Parker
R. Gould	C. Schloz
L. Greimann	C. VanBuskirk
J. Ites	

Alternate Board Members Present

J. Joiner for J. Krist	A. Abu-Hawash
G. Miller for J. Selmer	R. Schletzbaum

Board Members with No Representation

None

Secretary

M. Dunn

Visitors

Ed Engle	<i>Iowa Department of Transportation</i>
Mike Heitzman	<i>Iowa Department of Transportation</i>
Sandra Larson	<i>Iowa Department of Transportation</i>
Sara Buseman	<i>Iowa Department of Transportation</i>
Travis Konda	<i>Iowa State University</i>
Mike LaViolette	<i>Iowa State University</i>
Brent Phares	<i>Iowa State University</i>
F. Wayne Klaiber	<i>Iowa State University/CCEE</i>
Steve Andrle	<i>Iowa State University/CTRE</i>
Terry Wipf	<i>Iowa State University/CTRE</i>
Brain Moore	<i>Wapello County</i>

The meeting was held in the East/West Materials Conference Room at the Iowa Department of Transportation, Ames, Iowa. The meeting was called to order at 1:00 P.M. by Greg Parker with 14 voting members/alternates at the table.

Agenda review/modification

- It was noted that agenda item 5 and item 7 would be switched to accommodate a meeting schedule conflict for one of the presenters.

Approval of the minutes

- Mark Nahra moved to approve the minutes from the October 29, 2004 meeting. Christy VanBuskirk seconded. Carried with 14 yes, 0 no, and 0 abstaining.

Announcement of new member and alternate appointments for 2005

- *Mark Dunn announced the changes to member and alternate member seats for the counties.*
 - Christy VanBuskirk, Keokuk County, had finished her Board term and was presented with a Certificate of Appreciation for her years of service, January 1999 - December 2004.
 - Roger Schletzbaum, Marion County, was announced as the new regular member for District 5.
 - Gary Bishop, Van Buren and Davis Counties, was announced as the new alternate member for District 5.
 - Todd Fonkert, Bremer County, had finished out the current term for a previous member and has been reappointed for another 3-year term. Danny Waid, Howard County, will continue as the alternate for District 2.
- *Greg Parker announced the changes to member and alternate member seats for the cities..*
 - Greg Parker announced that he has accepted the Johnson County Engineer position and would no longer be serving as a city member on the Board. He was presented with a Certificate of Appreciation for his years of service to the IHRB, July 2002 - December 2004.
 - Information provided since the meeting has verified that John Joiner, City of Ames, will finish the term for the city seat vacated by Greg Parker. An alternate for the seat is yet to be announced.
- *Mark Dunn announced the changes to member and alternate member seats for the Iowa DOT..*
 - John Selmer, Iowa DOT District 4 Engineer, had completed his term and, at the time of the meeting, information was yet to be received saying if he would be reappointed or if another district engineer would serve the next term.
 - Information provided since the meeting has announced that Scott Dockstader, Iowa DOT District 1 Engineer, would serve as a regular member. Bob Younie, Iowa DOT District 1 Construction Engineer, will serve as the alternate for that seat instead of the seat for which he had been an alternate.
 - The DOT seats have been reorganized so that the member and alternate paired together are representing similar areas within the Highway Division (i.e. bureau or district; one seat is a combination of 2 bureaus).
 - Due to the above reorganization, Glen Miller, Iowa DOT District 4 Construction Engineer, has completed his alternate member term as a DOT District representative.
 - Will Stein, Iowa DOT Office of Design, will fill the vacated alternate seat and serve as Larry Jesse's alternate.

- A new member and alternate member list will be included in the January Board packet and will also be available on the Research website at the following address:
www.dot.state.ia.us/materials/research/ihrb/iowa_highway_research_board

Election of Chair and Vice-Chair for 2005

- Mark Nahra nominated Larry Jesse, Iowa DOT Office of Local Systems, to serve as IHRB Chair for 2005. Lyle Brehm seconded. Carried 13 yes, 0 no, and 1 abstaining.
- Mark Nahra nominated Jon Ites, Buena Vista County, to serve as IHRB Vice-Chair for 2005. Lyle Brehm seconded. Carried 13 yes, 0 no, and 1 abstaining.

Final Report TR-467, “Investigation of the Modified Beam-in-Slab Bridge System (MBISB)”

- Dr. Terry Wipf, Iowa State University (ISU), presented the project overview; the criteria for development, including cost effectiveness, constructability by county forces and spans in excess of 65 feet; the 2 main construction modifications on which were focused - transverse arch and alternative shear connector; the lab investigation purpose; the model bridge results and conclusions; the field test bridges locations, diagrams and photos; the field test results; the MBISB Design Methodology; the contents of the 3 volume final report; the application of the design aids; the conclusions; and the acknowledgements for the completed research.
- An additional voting member joined the table during the presentation, bringing the voting member/alternate count to 15.
- Charles Marker moved to approve the final report. Glen Miller seconded. Carried with 15 yes, 0 no, and 0 abstaining.

Proposal, “Construction and Evaluation of a Prestressed Concrete Bridge Constructed Using Ultra High-Performance Concrete (UHPC)”

- Dr. Brent Phares, ISU/Center for Transportation Research and Education (CTRE), introduced the research team and gave the following background information of the proposed project: Wapello County, with assistance from the Iowa DOT and the ISU Bridge Engineering Center, had submitted an application to the Federal Highway Administration (FHWA) Innovative Bridge Research and Construction (IBRC) Program for support in constructing this bridge. In 2003, the proposal was accepted. The initial design was completed mostly by the Iowa DOT with some assistance from ISU. With this being the first bridge in the United States being constructed using UHPC beams, the bids came back higher than expected. IHRB assistance is being requested to help complete this innovative research and cover the additional funding needed.
- Dr. Phares continued with discussing the definition of UHPC (samples were passed around); the contents of normal concrete versus UHPC; the project objectives; the research plan; and the information of the 12 proposed tasks, including funding, Wapello County approval, seminars on UHPC, bridge design (copies of preliminary plans were passed out), development of an experimental test plan, fabrication of UHPC beams, lab beam tests, revision of bridge beam design (if needed), testing of small scale beams, construction of UHPC bridge (summer/fall 2005), testing/monitoring of field bridge (2 years), and final report including cost analysis and unique/problematic features of the proposed work.

- Brian Moore, Wapello County, showed pictures and discussed the behavior of the concrete in the mixing process. It was stated that there were no problems with fibers balling in the mixing process.
- The material costs about 10 times that of conventional concrete.
- The beams are being cast in Canada. It was believed that the U.S. companies contacted may have been more concerned with the risk; the U.S. bids were approximately double that of the Canadian bid accepted.
- It was mentioned that a construction contractor has not yet been determined.
- Part of the economic analysis will include factoring in the procedure for casting the beams. There is no sheer steel cost and no time/manpower going into using a vibrator or screed; it consists of just mixing it and pouring it into the form.
- It was said that the unit weight doesn't vary much from traditional concrete; it's about 150 lbs/ft³.
- This project bridge is located over a stream and there will not be any testing on lateral impact to the beams. It was felt however, that by reducing the section, it is reduced in all directions and it could be a concern and should be studied at some point.
- The issue of corrosion was discussed. There may be surface corrosion of the fibers that are sticking out. There should not, however, be internal corrosion, because the material is impermeable. Which leads to another interesting feature of the material, not all the cement hydrates, some of it acts as an aggregate, so if there is cracking in the material and it gets wet, some of that cement should hydrate and fill the cracks.
- It was also mentioned that air tests are not run on the material; the only test that is run is a flow test.
- The strength gain characteristics were discussed as well; at 36 hours it is at 50 percent, then heated, and at 48 hours it is at 100 percent.
- Mark Nahra moved to approve the proposal. Glen Miller seconded. Carried with 15 yes, 0 no, and 0 abstaining.

Extension Proposal TR-474, "Validation of the Mix Design Process for Cold-In-Place Rehabilitation Using Foamed Asphalt"

- Mike Heitzman, Iowa Department of Transportation, requested the extension due to a scheduling conflict for Hosin "David" Lee, The University of Iowa. Mike Heitzman highlighted aspects of the first phase of the project and discussed the following progress of and changes to the second phase including:
 - the collection of 7 recycled asphalt pavement (RAP) samples instead of 6 (one additional source was available)
 - the characterization of the 7 different RAPs (i.e. gradation, binder content, age, shape of RAP particles)
 - the study of the particle compaction without an additional modifier,

- the mix designs nearing completion on all 7 RAPs (expanded from 3 to 5 different binder contents to show greater distinctions in the growth of the density and strength curves), and
 - the additional mix design tests which were run by increasing the temperature and shortening the time the mixes sat in the oven (this has added an additional variable of laboratory curing to the project).
- The following were then presented as reasons for the proposed time extension:
 - The performance testing has not been done yet. This is due to the first supplier not providing the equipment. There has now been a new agreement negotiated for the equipment, however it will not be delivered until March. The performance tests will take approximately 5-6 months to complete.
 - There is more time needed to perform the dynamic modulus and static creep tests due to them being done at three different temperatures instead of one as originally planned.
 - The addition of the laboratory curing process has provided some useful information and there is the desire to study that further prior to doing the performance testing. This work can be started now. This is in addition to what was originally proposed.
 - The field demonstration project, which was included in the original proposal, is scheduled for this summer.
- The final issue was the importance of keeping the same graduate students for the entire project. The continuity of the study greatly improves if the same students doing the work in Phase I and Phase II (up to this point) can continue through the completion of Phase II. Technically, Board funding for the students ends at the end of the year (2004) and it was requested that funding be available to keep the students for the 9 month extension.
- The requested extension is for 9 months and \$42,044.
- It was agreed that there was a consistency benefit to the study with keeping the same graduate students; however, it was questioned if that was the responsibility of the Board to fund.
- A concern was expressed with the shift in the project scope with the additional tests being added. Mike Heitzman answered that the project intent is to develop a mix design procedure. There are no standardized tests for this; the tests are being developed as the project progresses. The addition of testing being done at three temperatures was a change in breadth of the project, not overall direction. There have been two steering committee meetings and the group agreed with the importance of looking at laboratory curing.
- It was asked if the laboratory curing issue should have been brought as a separate proposal. Mike Heitzman responded that with the RAPs already collected and the testing all directed at the development of a mix design procedure, it was felt that it was more economical and more appropriate to group it with the current Phase II research.
- In regards to the graduate student issue, it realized that it may be a part of the business of research, but there was a concern expressed if the students would be kept busy during the time prior to the equipment getting delivered. Mike Heitzman stated that the laboratory curing study could be done immediately.
- There was concern that the additional funds requested were quite substantial compared to the original Phase II budget of \$98,798. It was an increase of over 40 percent. This led to the concern if some of the additional expenses of the project have been covered by the original funds.

Mike Heitzman said that graduate students are not paid by the hour. They have been doing more testing due to the breadth that was added with increased samples and increased testing procedures (i.e. from three binder contents to five). The testing of the idea of the laboratory curing was additional.

- The delay on the equipment and related extension was understood. The Board, however, wanted a more clear understanding of the increase in the expense and what it is going to since it is such a substantial increase. Having more information will help see if the board feels that it is beneficial to approve that kind of expansion of the project at this point.
- Motion and second:
 - *Lyle Brehm moved to table the proposal until Dr. Lee could attend the meeting to discuss some of the mentioned concerns. Glen Miller seconded.*
- Concern was expressed about the increase in samples and moving ahead with additional testing without coming to the Board, when taking on more testing would likely mean the need for more funds. The Board was concerned that this information was just getting to them now.
- It was understood that the PIs need to work with the steering committees, but the concern was that the adjustment made to this research project resulted in such a high budget increase. It was also questioned if the steering committee fully understood the impact that the increase in testing would have on the project budget.
- It was felt that the steering committee's decision to increase the number of samples and expand the tests provided the ability to look at the new results with confidence.
- It was mentioned that if the equipment had arrived on time, there would have likely been a need to ask for only a small extension due to the 5-6 months needed for the performance testing.
- Vote
 - *Carried with 12 yes, 1 no, and 2 abstaining.*

Annual Report

- Mark Dunn informed the Board that the Annual Report for FY 2003-2004 is now available.

New Business

- Mark Dunn presented the IHRB logo to the Board. With the unique work that is done by the Board, it was hoped that this would help raise the profile of the Board as the logo becomes more widely used. It was appreciated that there is now a logo to represent the group as a whole since the Iowa DOT logo is normally the only one seen on Board most items; the new logo is more representative of the state, county and city IHRB cooperation.
- Mark Dunn made the announcement that as of November 5, 2005, the Research Office has been transferred from the Office of Materials to the Research and Technology Bureau. Once the physical office has moved, a note will go out to the Board, researchers, and service organizations notifying everyone of the location change. This will not affect the meeting location, the staff phone numbers or the activities of the Board.

- Greg Parker thanked the Board for the opportunity to serve as Chair for 2004. He in turn, was thanked for her service as Chair.

Mark Nahra moved to adjourn the meeting. Glen Miller seconded. Carried with 15 yes, 0 no, and 0 abstaining.

Date of Next Meeting: THE NEXT MEETING WILL BE HELD FRIDAY, JANUARY 28, 2004 AT 9:00 A.M. IN THE EAST/WEST MATERIALS CONFERENCE ROOM AT THE IOWA DOT, CENTRAL COMPLEX, IN AMES, IOWA.

Mark Dunn, IHRB Secretary