IOWA HIGHWAY RESEARCH BOARD (IHRB)
Minutes of April 25, 2008

Regular Board Members Present

A. Abu-Hawash
J. Adam
J. Alleman
J. Berger
V. Dumdei
S. Gannon
J. Joiner
J. Krist
B. Moore
J. Rassmussen
J. Waddingham
D. Waid

Alternate Board Members Present

H. Lee for Keri Hornbuckle
S. Rinehart for District 3 County Member

Members With No Representation

M. Nahra

Secretary - M. Dunn

Visitors

Max Grogg	Federal Highway Administration
Tami Bailiff	Iowa Department of Transportation
Ed Engle	Iowa Department of Transportation
Sandra Larson	Iowa Department of Transportation
Mary Starr	Iowa Department of Transportation
Ryan Evans	Iowa State University/CTRE
Omar Smadi	Iowa State University/CTRE
Paul Wiegand	Iowa State University/CTRE

The meeting was held at the Ames Holiday Inn Conference Center, 2609 University Blvd., Ames, Iowa. The meeting was called to order at 9:00 a.m. by Chairperson Jeff Krist with an initial number of 12 voting members/alternates at the table. Two Members joined the table later bringing the final voting total to 14.

Agenda

No changes were made to the Agenda.

Approval of the minutes

Motion by J. Berger to approve minutes from the February 29, 2008 meeting. 2nd by J. Alleman.
Carried 12 aye, 0 nay, 0 abstaining.

FINAL REPORTS

Final Report TR-550, "Performance Evaluation of Rubblized Pavements in Iowa," Halil Ceylan, Iowa State University/CTRE ($46,212)

PROBLEM
During the first phase of the Iowa Highway Research Board (IHRB) Project TR-473, "Rehabilitation of Concrete Pavements Utilizing Rubblization and Crack and Seat Methods," completed recently, researchers studied the effects of PCC rubblization and crack-and-seat operations on the HMA overlay thickness necessary to achieve the desired design life. That final report recommended that the performance of the instrumented trial project and other rubblized pavements be continuously monitored for validation of the design procedure developed during Phase I. More structural condition assessment data from existing rubblized pavements is required to validate the HMA overlay thickness design procedure and provide layer coefficient recommendations for future design of rubblized concrete pavements.

OBJECTIVES
- Evaluate the structural condition of existing rubblized concrete pavements across Iowa
- FWD, DCP tests, & visual pavement distress surveys
- Establish design modulus for rubblized PCC layer
- Provide AASHTO layer coefficient recommendations for rubblized PCC layer
- Validate Phase I study findings based on the results

CONCLUSIONS
Results of the analyses show that Iowa's rubblized pavement sections are performing very well. The predominant distresses exhibited on hot mix asphalt (HMA) overlaid rubblized Portland Cement Concrete (PCC) sections are non-load associated distresses such as low temperature and/or longitudinal cracking. The analyses verified that the M-E design methodology developed during Phase I of this research can estimate the HMA overlay thickness reasonably well to achieve long-lasting performance of HMA overlay pavements with rubblization. It is recommended that Iowa DOT continue to use PCC rubblization as a valid pavement rehabilitation strategy.

Q: Were you surprised by your results?
A: We have never conducted a study in Iowa using the AASHTO design methodologies; it really is necessary to do field studies to confirm the findings. The only way to determine the 'K' value is to conduct a study of this kind. Rubblization was introduced in the early 1990s. Everyone wants to know if the assumptions made were correct. Everything is working well and this study presents a confirmation of that.

Showing the defining stresses, we're able to see where improvements in the mix design are needed, rather than the structural design of the rubblized pavement sections. One of the significant findings from this study is that the design isn't 'over-designed.'

Q: One of the slides used the term 'coarse rubblization' – the report says you used two passes with a vibratory roller. Between the process where the pavement if first crushed and then broken to smaller pieces, how do you know how far to break it down?
A: There are guidelines on what the maximum size of the fractured PCC slab pieces should be; they should not exceed 5-6 inches in diameter. It can be adjusted after the rubblization. The contractor knows what equipment should be used for optimum results.

Motion to Approve
Motion by Vicki Dumdei. 2nd by J. Rassmussen.
12 aye, 0 nay, 0 abstaining.

FINAL REPORT TR-565, "SUDAS and Iowa Specifications, Phase II – Implementation of Recommendations Into SUDAS Specifications," Steve Klocke, Snyder & Associates ($188,929)

PROBLEM
This project proposed to implement the recommendations from Phase 1 for selected sections of the technical specifications and standard drawings, and incorporate them into the State Urban Design and Specifications (SUDAS). Phase II focused on revising those areas identified by the Phase 1 committee as being the highest priority for the DOT's successful utilization of the SUDAS Specifications which included: trench and backfill, trenchless construction, storm and sanitary sewers, water mains, manholes, intakes, sidewalks, recreation trails, and driveways.

OBJECTIVES
- Eliminate conflicts
- Update language to match new Iowa DOT 2009 spec book language
- Update format to AASHTO-type format
- Update figures in SUDAS manual to match what Iowa DOT has for standard Road Plans

Review and update the following SUDAS Divisions:

1. Division 3: Trench, Backfill, and Trenchless
2. Division 4: Sewers and Drains
3. Division 5: Water Main and Appurtenances
4. Division 6: Structures for Sanitary and Storm
5. Section 7030: Recreational Trails, Sidewalks, and Driveways
6. Standard Drawings
7. Division 8: Being written as another IHRB research project to be included in SUDAS and Iowa DOT specs

CONCLUSIONS
Most inconsistencies have been reviewed and changed; in the original report over 900 items were addressed. Large portions have been finished or are underway.

The Iowa DOT intends to publish a new specification manual in early 2009. Ideally, the remaining items identified during the Phase 1 project would be addressed before issuing this manual. In order to accomplish this, a third phase of this project may be proposed.

Q: What is the schedule for completion? When will the SUDAS and Iowa DOT spec books match?
A: There is some discussion when and if that will happen. In 2009 the new Iowa DOT specification manual should be complete. It is unclear at this time what other items need to be changed. There may be another proposal to complete work in other sections.

Q: Is there a schedule for the 2009 Iowa DOT book?
A: It should be released in the spring of 2009 to be ready for the autumn construction season.

Motion to Approve
Motion by J. Joiner. 2nd by J. Adam.
12 aye, 0 nay, 0 abstaining.

*** Two Members joined the Table***

PROPOSAL AMENDMENT for TR-568, "Modified Sheet Pile Abutments for Low-Volume Bridges (IRHB 06-05) for Demonstration Projects (design and construction)," Phase II, David White (presented by Wayne Klaiber), Iowa State University ($212,000)

BACKGROUND
Project TR-568 was initiated in January 2007 to investigate use of sheet pile abutments. TR-568 work has progressed including collecting existing information on similar structures, interviewing product manufacturers and engineering consultants, performing field reconnaissance of 14 different sites in Iowa, conducting a detailed geotechnical investigation at one site, investigating design strategies, and developing three distinct sheet pile abutment designs for three different site conditions.

The next step is to construct the demonstration projects, instrument the various elements, and monitor the three different substructures during construction and when they are subjected to service live loads. The three Iowa counties targeted for demonstration projects that have expressed willingness to participate in the investigation are Black Hawk, Boone, and Tama. A portion of the cost of the abutments (materials and construction) would be covered with this supplementary funding from the Iowa Highway Research Board, and the other part would be covered by the counties in which the demonstration projects are constructed.

DEMONSTRATION PROJECTS
In Black Hawk County to replace a 40-foot single span bridge over a small creek near La Porte City. The substructure design will be completed by ISU, while the superstructure design and construction will be performed by Black Hawk County.

In Boone County, the current structure to be replaced is a 100-foot three-span steel girder bridge. The replacement superstructure will be a steel girder bridge and is being designed by Boone County engineers. The proposed abutment would consist of a reinforced earth backfill and sheet pile wall.

In Tama County the bridge to be replaced is a 60-foot, two-span bridge constructed on timber piles. The superstructure consists of steel girders that support a deck of wooden planks. The replacement bridge superstructure will be composed of Rail Road Flat Cars (RRFC's). The abutment system for the replacement bridge will consist of an axially loaded sheet pile abutment similar to that of Black Hawk County; however, it will be combined with higher modulus sections, a feature that will provide greater bearing capacity and resistance to lateral loads.

BENEFITS **(TR-568)**
Benefits can be evaluated in terms of recommendations from study results, including the development of cost effective alternatives for Low-Volume Roads (LVR) bridge abutments. A second evaluation criterion will be the number of counties that adopt the guidelines presented. It is anticipated that the sheet pile bridge abutment will be cost effective and improve the performance of the substructure components in LVR bridges compared to conventional systems. Additionally, a compilation of other alternative abutments systems from the literature will be summarized and may provide a benefit to future abutment construction in Iowa.

Q: What percentage are materials to the total budget cost?
A: This is an addition. We're asking for $212,000. Materials will be 75%; instrumentation of pile testing 25%. In Phase I we did not ask for any money for instrumentation (it was in the original $153,000), the additional is to complete the remaining two bridges. The counties are contributing a portion of the abutments and all of the superstructure and construction costs.

Motion to Approve at 100% County by J. Berger. 2nd by S. Gannon.
14 aye, 0 nay, 0 abstaining.

2008 Preliminary Project Ranking and Topic Selection

Mark: The ranking will be done by each member or alternate having 20 votes. Up to four votes can be used for one individual project. We do have a couple projects that are relatively the same, so I've combined them: For topics 5.07 and 5.19, all votes will go to 5.07. Also, with a few projects we've already identified some matching funds. Topic 7.09 has matching federal funding identified by Iowa State University; 4.06 has $20,000 matching funds from The University of Iowa and 1.05 has in-kind materials pledged. Some voting was done by proxy because the Members' presence was needed in their district due to recent flooding.

For topic 7.02 the request was to purchase the equipment in order that a more thorough study can be made.

Q: Will 7.02 be an open RFP even if matching funds are available?
A: That depends on if the funding is sole source.

IHRB Member Brian Moore spoke briefly about proposed Project 10.09, *Replacing Deteriorating Highway Bridge Decks and Approach Slab Panels Using Precast Concrete Composed of UHPC with GFRP* (Brian Moore, Wapello County, IA)

Q: Will the bridge be built in your county?
A: Yes, we have a bridge on a paved road that is ideal for rehabilitation; it's a 50-year old precast bridge. The deck is shot. In this case we'd need to rebuild the abutment but utilize the deck slab. We will pay the cost to build the bridge abutment. LaFarge is working with a company in Nebraska on manufacturing costs to produce these here. In our last project, the beams were produced in Winnipeg and trucked to Iowa. I haven't heard any preliminary cost estimates from LaFarge yet.

Q: From a research standpoint, will some structural monitoring be done?
A: Monitoring long term performance, lab tests and developing design procedures would be done. A symposium is going to be held next month to develop this idea.

Q: Is this something that could be used on Low-Volume (LVR) Roads?
A: Canada's project was a 100-foot bridge over one of the main arterials in a city; we'd like to start small over a LVR but the idea can be expanded to use this material in a deck with the constructability to use it under traffic. Potentially, it could be used on the state highway system.

Q: How does the weight compare to a standard deck?
A: It's going to be lighter but has the potential to carry a heavier load.

VOTING: The Members/Alts present then voted for 2008 project ranking of submitted ideas.
Mark: The results will be posted on the web site.

NEW BUSINESS

Mark: Our Travel Meeting to see the MNRoad project (Highway Agricultural Loads on LVR) would be better if planned for September; vehicle load testing will be in progress then. We will look at the possibility of shifting the date of the meeting if necessary. We'll have more information at the next meeting. It will be a multiple day event with at least one overnight stay. We still need to be in contact with MN.

ADJOURN
Motion to Adjourn
Motion by J. Joiner. 2nd by J. Rassmussen.
Motion carried with 14 aye, 0 nay, 0 abstaining.

The May 2008 meeting of the Iowa Highway Research Board will be held **FRIDAY, April 25, 2008 at 9:00 a.m. at the Ames Holiday Inn Conference Center, 2609 University Avenue, Ames, Iowa.**

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Mark J. Dunn, IHRB Secretary