

AASHTOWare Bridge Design-Rating (BrDR) Task Force Summary Meeting Minutes

October 28 - 29, 2014

Charleston, SC

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General Information – Meeting of the Bridge Design & Rating Task Force

Date: Tuesday, October 28, 2014

Participants:

AASHTO	Judy Skeen Bruce Johnson	AASHTO Oregon DOT	Project Manager SCOJD Liaison
BrDR Task Force	Todd Thompson Joshua Dietsche Jeff Olsen Dean Teal Tom Saad (by phone)	South Dakota, DOT Wisconsin DOT Montana DOT Kansas DOT FHWA Midwest Resource Center	Chair Bridge Design (BrR) Bridge Design (BrD) Bridge Design (BrD) FHWA Liaison
BrDR Contractor	Jim Duray Herman Lee	Baker Baker	BrDR Contractor BrDR Contractor

Notes Taker: Dean Teal / Judy Skeen

Agenda Item 0: Review Agenda/Assign Minutes Recorder

Todd Thompson opened the meeting at 8:00 AM. Dean Teal was assigned as the meeting minute recorder. Judy Skeen will also take notes and combine with the notes taken by Dean Teal.

Todd Thompson added agenda item 1c to discuss the SCOJD response to the funding request for high priority enhancements.

Agenda Item 1: Prior Business

1a. Review August Meeting Minutes
Minutes from the August 14, 2014 Task Force meeting in Traverse City, MI were reviewed. Minutes were approved with no changes.

1b. Review Action Items
Jeff reviewed the action items and updates were provided to the Task Force.

1c. SCOJD Response to the Funding Request for High Priority Enhancements

Todd forwarded the SCOJD response memo to the Task Force on October 21, 2014.

Bruce Johnson provided an overview of the status of the current AASHTOWare Capitalization Fund and the future.

Agenda Item 2: Financial Overview and Work Plan Summary

2a. Update on Phase 18 (FY2014)

Baker reviewed the budget report and budget tracking charts depicting spending v budget. As of the end of July, all tasks are out of development and are currently in alpha testing. All FP items are 100% complete except FP2. FP2 Prestress Concrete LRFD Design Tool development is 30% complete. Baker is working on the algorithm for the prestress design which should be sent to the TAG next week. Based on the revised requirements, the completion of the



identified tasks will not result in a completed project.

2b. Update on Phase 19 (FY2015)

Baker reviewed the budget report and budget tracking charts to depict spending v budget.

2c. Update on 6.7 Release Work Plan

Baker provided the update on the 6.7 release.

FP4 – 20% complete

FP7 – 20% complete

FP8 – 10% complete

FP10 – 30% complete

FP12 – 50% complete

FP13 – 40% complete.

FP14 – 50% complete.

FP16 – 50% complete.

2d. Update on Modernization

Baker is starting the effort to develop experiments on the database. User interface experiments will be conducted beginning next week.

2e. Update on FE Engine Modernization Work Plan

The project shows 10% complete; however, additional work has been completed but not yet invoiced. The contract end date is 09/31/15. Baker anticipates work on this effort to be completed by 06/30/15.

Agenda Item 3: Update on BrD/BrR Licensees (FY 2015)

3a. Product Report

Judy Skeen presented the product report which was developed from the Excel output from AASHTOWare Manager. The approach in developing the report was to minimize the data manipulation and eliminate manual data input following export from AASHTOWare Manager (to minimize the opportunity to introduce errors).

The detailed report was sorted by Agency Type / Agency Name / and Fiscal Year and provided

information on the sponsoring agency for all Special Consultant Option Licenses.

The Task Force approved the report format presented and directed Judy to post this report (Excel format) in the SharePoint Handouts folder for subsequent Task Force meetings. Judy will also post updated End User Designee licensee reports on the Br Design-Rating SharePoint site under BrDR Licensees at the beginning of each month.

3b. Service Unit Report

The Service Unit report was provided and reviewed by the Task Force. The 6.7 service unit donations from the member agencies were deducted from the agency totals following the service unit count carry forward from FY14. The service units donated were the following:

Michigan Enhancement Request - Cut Top Strand	8.50	Michigan DOT
Michigan Enhancement Request - Splayed Girders	2.25	Michigan DOT
Michigan Enhancement Request - Splayed Girders	2.25	Illinois DOT
R/C Slab System Estimate - Implement in Substructure	0.62	Kansas DOT
Gusset Plate Analysis	14.92	Oklahoma DOT
Culvert - Exposure Factor Enhancement VI 12213	0.80	Illinois DOT
Culvert - General Procedure Shear Computation Method VI 12181	1.30	Illinois DOT
Steel Girder - Splice Analysis	17.30	New York State DOT
	47.94	

3c. Licensing Options

The Task Force discussed options for universities to obtain BrDR licenses for DOT-sponsored research. Since the educational license does not support the use for research purposes, it was



decided that for this purpose, i.e. research for the DOT, the university should license the software under the Special Consultant Licensing Option. (Language to that effect will be added to the FY16 AASHTOWare Catalog.

3d. Evaluation Software Report

The Evaluation Software report was provided and reviewed by the Task Force. Surveys are being sent out at the end of the evaluation periods.

Agenda Item 4: Support and Maintenance Report

4a. Incident and Support Summary

Baker presented the Incident and Support Summary report. 64 bugs were added since last quarter totaling to 1720 bugs. There are also 265 BRASS bugs and 5 Madero bugs reported.

4b. Progress on Bug Resolution

Baker reviewed the Maintenance Progress reports for the 6.7 release. They were broken into two separate reports. There are currently 41 items assigned to be fixed in 6.7. 105 bugs have been resolved.

4c. Enhancement List Update

The Testing TAG Enhancement Buckets and BrDR Enhancement lists were reviewed. 9 new enhancements were added to the BrDR Enhancement list since the June Task Force meeting.

4d. Maintenance Issues

No discussion.

4e. Bug Policy

The draft Bug Policy document has been forwarded to the Task Force for review and comment. Dean Teal presented the current version of the document during the meeting. Once complete, the Bug Policy will be posted on the Baker support website and the RADBUG website.

Agenda Item 5: Update on 6.7

5a. Progress and Schedule Review

The current funding available for FP2, P/S Design Tool Enhancement (in the 6.6 work plan), will not support the completion of the defined scope of work. This functionality can be released as a separate module. If funding is available, the module could be released prior to the User Group meeting.

5b. TAG Update

Dates for beta testing will be discussed during the January Task Force meeting.

Agenda Item 6: Update on Modernization

6a. Architecture

Work on experiments is continuing. Baker distributed a high level cost summary for the modernization effort.

Assumptions:

- Estimated (by source file extension) 379 views, 654 dialogs - 1033 windows
- Assume all windows will need a mockup (mostly a screenshot of the existing) but for the most of them the changes will be minimal
- Assume only minor changes to the Domain Model
- Modernization estimate is based on features up through the 6.7 release
- Does not include conversion of import utilities (BAR7, BARS, BRASS)

Improvements:

- Store girder spacing - remove reference lines at the database level (all data entered by the user should be stored in the database)
- Changes to the current method for handling tolerances
- Inclusion of more graphics
- Improvements to the viewer
- Improve coverage for regression testing



- Modifications to the documentation
- Updates to the API
- Develop 20 training examples
- Multi-threaded influence lines

The AASHTOWare Bridge Design-Rating system contains roughly 8 million lines of code.

6b. Finite Element Engine

Work on this effort is progressing.

6c. Cost Estimate on Modernization

Baker provided an initial Modernization Estimate to the Task Force. It was broken down by Various major activities, along with sub-points of each major activity along with estimated hours and costs. It was divided into the Modernization itself, along with the Tier 1 user enhancements.

Agenda Item 7: Enhancements

7a. User Group Top 10

Baker presented a summary of the enhancements prioritized by the RADBUG. The Task Force directed Baker to develop estimates for the following. The Task Force made the decision to fund the enhancements noted below.

<u>TICKET</u>	<u>ENHANCEMENT</u>
JIRA 110 (BrR/BrD)	Copy Shear Reinforcement Ranges
VI 10778 (BrR/BrD)	Bending and Shear Capacity for Bend Over Bars
JIRA 135 (BrR/BrD)	Ability to run a 3D FEA analysis on Dead Load only
JIRA 138 (BrR)	NSG vehicle analysis on Floor System Superstructures
VI 2569 (BrR/BrD)	Linking engine error to GUI windows
JIRA 236 (BrR/BrD)	Consider development link of deck reinforcement

7b. Culvert Distribution Factors - email from Dean 10/15

Dean Teal presented an enhancement to add the capability for entering user-defined culvert live load distribution factor (LLDF) for LFR analysis, LRFR analysis and LRFD design review to the culvert engine. KDOT is willing to fund the enhancement via KDOT service units. It may be possible to get this item included in the 6.7 release.

7c. MCB Performance Improvement estimate - TF Conf Call 10/09

As a follow-up from the Baker/Caltrans conference call, Baker developed ballpark estimates to incorporate five MCB performance enhancements.

1. Allow user to pick which web to include in the full box analysis -OR- Don't analyze webs with linked stirrups if web thicknesses match
2. Control options to disable spec check output generation
3. Pre-compute MCB cross sections for use in later runs
4. Review cross sections and reinforcement algorithms
5. Decompose analysis and spec-checking to allow user to pick either or both

Agenda Item 8: Miscellaneous Topics

8a. Ability to copy and compare data between databases - 2014-BrDR-051

Baker presented an overview of possible approaches to develop a bridge comparison utility. The proposal would work similarly to the function available in the bridge workspace tree. The feature to determine how to compare disparate bridge data in order to "look ahead" to identify matching sections would be difficult to develop.



8b. PCI Stress-Strain Curve for Strands/Tendons

Baker presented an overview of the Strain-Compatibility Method in PS Beams in BrDR. The summary was developed following a series of discussions on the usage of the strain-compatibility method in BrDR between Baker, Scott Shoup (ILDOT) and Vinacs Vinayahamoorthy (Caltrans).

Baker recommends the following actions:

1. Remove the Collins curves.
2. Replace the Collins curves with the simplified General curve equation from "Stress-Strain Modeling of 270ksi Low-Relaxation Prestressing Strands", 1992 PCI Journal.
3. Allow the user to specify to use either the General or PCI Handbook stress-strain curves in the capacity computations.
4. Implement the PCI Handbook equations for stress-strain curves.
5. Baker does not recommend implementing the AASHTO Specification capacity equation articles as this is seen as a step backwards in producing accurate section capacities.

The Task Force made the decision that the incorporation of changes in this area is a low priority for the product overall given the minimal impact an enhancement in this area would have on the product. If ILDOT is interested in pursuing this as an ILDOT service unit funded enhancement, the Task Force would be willing to revisit their support for this enhancement.

8c. FP 8 - Update on Revising the Rating Factor Equation - T18

This task was to implement rating for both positive and negative LL demand regardless of the sign of the factored total demand.

A ballot item to revise the MBE article C6A.4.2 to recommend rating as requested in this issue was circulated among T-18 members. It is not known if this ballot item was actually voted on at the SCOBS meeting this year. This ballot item was not on the list of approved ballots that Baker received from Judy. So the MBE has not been changed for next year's edition to include this recommendation.

8d. Spec Updates - Revised Cost Estimate

Baker provided an overview of the estimate for the AASHTO LRFD Bridge Specifications and MBE Specification as per the 2014 Approved Ballot Items.

8e. Madero Engine

BridgeTech approached Tom Saad and Jeff Olsen to investigate opportunities for AASHTO to update the Madero tool and incorporate the Timber engine into BrDR. The Madero code is written in Fortran. However, the Task Force is not certain that BridgeTech has ownership of the Madero software. BridgeTech has access to the source code; however, whether or not they actually own the software is in question. Once ownership of the code is established, the Task Force will need to evaluate the functionality of Madero to determine which components should be pursued for incorporation into BrDR.

8f. SLI Parametric Study Results

The Task Force discussed results of the SLI Parametric Study and the need to get this information distributed to the users.

Agenda Item 9: Third Party Issues

No discussion.

Agenda Item 10: User Group

10a. Summary Minutes from August Meeting

Baker provided a summary of the meeting minutes from the Traverse City Task Force meeting for review and comment.



Agenda Item 11: Work Plan

11a. FY 2015 Draft Amendment 1

Baker presented an amendment to one existing fixed price item, three new fixed price tasks and FP8 was reduced as discussed in agenda item 8c all to be included as a contract modification to the 6.7 Project Work Plan. The amendment to FP4 (Gusset Plat Rating) are the result of TAG comments that will be incorporated in the 6.7 release.

11b. FY 2016 Work Plan

The FY 2016 Work Plan budget was presented

11c. Planning Estimates

No discussion.

11d. Future Work Plans

No discussion.

Agenda Item 12: FHWA Update

Tom Saad will provided the FHWA update which will be included below:

Performance Based Practical Design:

FHWA recently announced the release of resources that are designed to advance the practice of “Performance-Based Practical Design” (PBPD). These resources will equip you with information and tools on PBPD to meet the challenges of addressing system needs and performance measures in an era of financial limitations.

PBPD is an approach to decision-making that *encourages engineered solutions rather than relying on maximum values or limits found in design specifications*. PBPD is grounded in an analytic framework that enables States to utilize existing design flexibility and analysis tools in a way that maximizes benefits while minimizing costs.

The resources that are available include a PBPD webpage (www.fhwa.dot.gov/design/pbpd/)

that provides an overview of PBPD, a library of case studies and answers to frequently asked questions. PBPD workshops will be available to help our partners evolve toward a PBPD approach. Information about training and technical assistance can be found at <http://www.fhwa.dot.gov/design/pbpd/training.cfm>

FHWA/National Highway Institute Load Rating Training:

FHWA Course No. 130092, LRFR for Highway Bridges, was recently hosted by the Connecticut DOT. The four day course is being hosted in Huntington, WV beginning December 8th and in Topeka, KS beginning April 7th. You can find more information on course locations at http://www.nhi.fhwa.dot.gov/training/course_search.aspx?tab=0&key=130092&res=1

LRFR Webinar No. 13, Overload Permit

Evaluation:

FHWA hosted the 13th webinar in a series to promote quality load rating practices and the use of LRFR. This webinar provided information on *Overload Permit Evaluation*. The recorded webinar, along with previous webinars on a variety of topics can be found at <http://www.fhwa.dot.gov/bridge/loadrating/>

Additional Items:

The NBIS revisions that are mandated by MAP-21 are on scheduled to be published by December, 2014. The revisions will include, among other items, guidance on risk-based data-driven inspection frequencies, non-NHS bridge element level inspections, bridge inspection training certification and critical findings procedures.

FHWA is hosting the 3rd annual Long Term Bridge Performance (LTBP) Program State Coordinator’s meeting in October, as long-term data collection on hundreds of in-service bridges is underway in an effort to fully understand and



quantify bridge component performance, by collecting research quality data.

TBAR, a timber bridge analysis and rating software developed by the USDA Forest Service, can be downloaded at <http://www.fs.fed.us/eng/structures/>

Agenda Item 13: Five Year Projection for BrDR

Discussion was deferred.

Agenda Item 14: Licensing Issues

14a. International Licenses

No discussion.

14b. Special Consultant Option Licensees

No discussion.

14c. Third-Party Add-Ons

Todd Thompson received a request from BridgeSight on September 22, 2014 requesting inclusion of BridgeSight's PGSuper Professional software into the AASHTOWare software catalog. (The PGSuper Professional commercial product provides an enhanced version of the open source PGSuper program along with direct technical support.) PGSuper Professional provides a third party extension to BrDR software that allows users to export their PGSuper bridge data into BrDR to allow bridge engineers to check their computations using an independent method.

14d. Future of Bundling Modules (Post-Modernization)

The contractor was not aware of any issues with bundling modules. They needed some time to investigate and report back.

Agenda Item 15: Marketing Activities

15a. PennDOT

PennDOT is considering licensing BrR. BrR will be added to their "approved software list and will be their primary software for steel curved girder ratings.

Other marketing discussion followed:

- West Virginia is currently testing an evaluation version of BrR in-house.
- Georgia was identified as possibly looking at BrR

Agenda Item 16: Review Action Item list from this meeting

Dean reviewed the action items recorded during the meeting.

Agenda Item 17: Task Force Executive Session (as needed)

Executive session held 1:00 - 1:30pm on October 29.

The meeting was adjourned on October 29, 2014 at 5:00 PM.

