AASHTOWare Bridge Update

AASHTO SCOBS
General Session
Portland – June 2013
Rebranding Update

• Bridge Design and Rating
  ✓ Completed with the upcoming 6.5.0 release
  ✓ Rebranded Technical Support website will be launched in the summer

• Bridge Management
  ✓
Bridge Design and Rating Update

AASHTOWare Bridge Design and Rating Version 6.5.0 Upcoming Release July 2013!
Enhancements for 6.5.0

3D Curved Steel Multi-girder System

Design Review (LRFD) and Rating (ASR/LFR/LRFR)

Include live loading of diaphragms
Enhancements for 6.5.0

Reinforced Concrete Slab System
Design Review (LRFD) and Rating (ASR/LFR/LRFR)
Enhancements for 6.5.0

Non-standard Gage Vehicle LRFR Analysis

- Unlimited number of wheels and axles
- User-defined vehicle loading path
Enhancements for 6.5.0


<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Article Number</th>
<th>Summary of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>5.8.2.8</td>
<td>Consider increase in shear load in varying depth concrete beam. Compute slope along line or parabola and compute vertical component.</td>
</tr>
<tr>
<td>37, 39</td>
<td>5.11, 5.11.4</td>
<td>Adjust shear articles to include this vertical shear component. Control option for LRFD/LRFR RC beams (not PS since PS beams)? Implement in General Preferences.</td>
</tr>
<tr>
<td>38</td>
<td>5.5.3.2</td>
<td>Item #1: f_c up to 15 ksi is now allowed for strand and bar dev. many articles limited to f_c 10 ksi (reference App C5 in the Spec). We propose to handle this by adding a new article 5.4.2 that varies f_c and/or f_y &gt; 15 ksi and alert the user to the limited articles that are not considered.</td>
</tr>
<tr>
<td></td>
<td>5.5.4.2.1</td>
<td>Item #7A, #9A: Calculation of phi changed.</td>
</tr>
<tr>
<td></td>
<td>5.7.3.4</td>
<td>Item #12A: Revise calculation of f_s.</td>
</tr>
<tr>
<td></td>
<td>5.8.2.5</td>
<td>Item #17A: Limit f_y to 100 ksi.</td>
</tr>
<tr>
<td></td>
<td>5.8.4.1</td>
<td>Item #22: Limit f_y to 60 ksi in Eq. 5.8.4.1.3.</td>
</tr>
<tr>
<td>39</td>
<td>5.11</td>
<td>Add warning to text file containing LRFD development length bars or smaller in normalweight concrete with f_c up to 15.0 ksi.</td>
</tr>
<tr>
<td>46</td>
<td>Section 4</td>
<td>Change labels in the LRFD DF calcs text file.</td>
</tr>
</tbody>
</table>
Enhancements for 6.5.0

Enhancements for 6.5.0

- Option to Override Capacities at POI
- Corrugated Metal Deck Simple Span Model Rating
- Allow Top Flange Lateral Support at Point Locations
- Control option to allow LFD plastic analysis for cover plates
- Weld Fatigue Checks (LRFD Article 6.6.1.2.2)
- Web to Flange Weld Design (LRFD Article 6.13.3.2.4)
- Option to Consider Substructure Drilled Shaft Non-linear Cracked Stiffness
- Other User Requested Enhancements
Enhancements for 6.5.1

Post-tensioned and Reinforced Concrete Multi-cell Box

LRFR Rating
Enhancements for 6.5.1

Reinforced Concrete Slab System Integral with Pier

RC slab system definition is assigned to the superstructure and the pier will recognize the slab structure type is a RC slab system integral with the pier.
Enhancements for 6.6 (June 30, 2014)

- BrD PS design tool (Iterative design)
- Curved Girder Phase 3 (e.g. 3D model diaphragm spec checking)
- Steel girder simple for DL and continuous for LL
- Adjacent Vehicle Rating
- Culvert welded wire reinforcement
# BrD / BrR Top 2012 User Group Balloted Enhancements

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Incident</th>
<th>Description</th>
<th>Product</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9932</td>
<td>Display all entered decimal points</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>2</td>
<td>11153</td>
<td>Rate steel girders as simple for dead and continuous for live</td>
<td>BrR</td>
<td>Included in 6.6 Work Plan</td>
</tr>
<tr>
<td>3</td>
<td>11562</td>
<td>Allow top flange lateral support at point locations</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>4</td>
<td>9641</td>
<td>Cancel analysis event</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>5</td>
<td>2569</td>
<td>Linking analysis error to user interface</td>
<td>Both</td>
<td>Deferred to future Work Plan</td>
</tr>
<tr>
<td>6</td>
<td>10691</td>
<td>Weld design</td>
<td>BrD</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>7</td>
<td>10813</td>
<td>Shear Stirrup Wizard enhancements</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>8</td>
<td>11563</td>
<td>Copy bracing from one bay to multiple bays</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
<tr>
<td>9</td>
<td>6586</td>
<td>Bridge Explorer customization</td>
<td>Both</td>
<td>Deferred to future Work Plan</td>
</tr>
<tr>
<td>10</td>
<td>11533</td>
<td>Copy user-defined materials and beam shapes to library</td>
<td>Both</td>
<td>Included in 6.5 release</td>
</tr>
</tbody>
</table>
Near-term BrDR Goals

- Software modernization
- Gusset Plate Analysis
- Frame modeling and analysis
- Steel box girders
- More Iterative Design Tools
- Expand PT to other structure types
- Integral abutments
- Permitting and routing capabilities
- Truss user interface
- Stronger reporting tools
Modernization Update

Project Goal: To establish a modular architecture that supports easier updates in the future. The desired changes will result in improved efficiency and enhanced services to the users.

• Important attributes and architectural challenges to be considered will be identified via a Workshop which will include participants from all stakeholder groups, scheduled for August.
• The amount of design required for the modernization is dependent upon the high priority Quality Attributes identified during the Architecture workshop.
Bridge Design and Rating Licenses

**BrD**
- Agency Licenses = 21
- Consultant Licensees = 20
- Manitoba, Canada

**Map Key**
- Consultant Licensees = 20
- Agency Licenses = 21

**BrR**
- Agency Licenses = 33
- Consultant Licensees = 460
- Country: Manitoba, Canada

**Map Key**
- Consultant Licensees = 460
- Agency Licenses = 33

City/County/Territory:
- Phoenix, AZ
- Washington, D.C.
- Puerto Rico
Bridge Management Update

AASHTO Bridge Management Website
http://aashtowarebridge.com/
AASHTO Bridge Management

MAP-21
Signed

Element
Manual Vote
June 2013

Elements
in NBI
Oct. 2014

5.1.3
Release
April 2013

5.2.1
Release
Nov. 2013
Bridge Management 5.1.3

* Released in April 2013
* Web Based Bridge Management System

  Featuring
  * Complete NBI inventory
  * Supports Bridge Element Guide Manual
  * Supports Migration of Legacy Elements
  * Includes Risk Definition Framework
Element Inspection (AASHTO 2011)
Defining Bridge Risks
Defining Bridge Risks
Bridge Management 5.2.1

* Planned Release in November 2013
* Key Features
  * Google Mapping Functions
  * Utility Functions
  * Needs Prioritization
  * Support For 2013 Element Inspection Manual
    * If approved at June SCOBS Meeting
  * Support Element Submission to FHWA
    * If submission format is defined by FHWA soon
Utility Function Definitions
Google Mapping
Relocation of Bridges
AASHTO Bridge Management

MAP-21 Performance Measure
Spring 2015

Risk-based Plans Must Be Done
Oct. 2015

5.2.2 Release
Fall 2014

5.2.3 Release
Fall 2015
Bridge Management 5.2.2

* Planned Release in Fall 2014
* Key Features
  * New Deterioration Models
  * Improved Project Tracking
  * Support of External Project Tracking Systems
  * Bridge Level Multi-objective Decision Making
  * Project Level Multi-objective Decision Making
  * Life Cycle Cost Analysis
AASHTO Bridge Management

- MAP-21 Performance Measure: Spring 2015
- Risk-based Plans Must Be Done: Oct. 2015

5.2.2 Release
Fall 2014

5.2.3 Release
Fall 2015
Bridge Management 5.2.3

* Planned Release in Fall 2015
* Completion of 5.2 Project
* Key Additional Features
  * Network Trade-off Analysis
  * Network Budgeting
  * MAP-21 Performance Measure tools/support
Bridge Management Licenses

County/City | State
--- | ---
Los Angeles Co | CA
Santa Clara Co | CA
City of Phoenix | AZ
Penn. Turnpike | PA

Other Licensees:
FHWA, District of Columbia & Puerto Rico
State Licenses = 42

Map Key
<table>
<thead>
<tr>
<th>Non-Licensee</th>
<th>Licensee</th>
</tr>
</thead>
</table>

33
User Group Training Meetings

- **Bridge Design and Rating**
  August 6–7, 2013
  Virginia Beach, VA

- **Bridge Management**
  September 17–18, 2013
  Portland, OR
## AASHTOWare Bridge Task Force

<table>
<thead>
<tr>
<th>Chairperson</th>
<th>Tim Armbrecht</th>
<th>Illinois</th>
</tr>
</thead>
<tbody>
<tr>
<td>BrM TF – Vice Chair</td>
<td>Mike Johnson</td>
<td>California</td>
</tr>
<tr>
<td>BrM TF</td>
<td>Mark Faulhaber</td>
<td>Kentucky</td>
</tr>
<tr>
<td>BrM TF</td>
<td>Eric Christie</td>
<td>Alabama</td>
</tr>
<tr>
<td>BrM TF</td>
<td>Bruce Novakovich</td>
<td>Oregon</td>
</tr>
<tr>
<td>BrM Liaison</td>
<td>Wade Casey</td>
<td>FHWA</td>
</tr>
<tr>
<td>BrDR TF</td>
<td>Dean Teal</td>
<td>Kansas</td>
</tr>
<tr>
<td>BrDR TF</td>
<td>Bryan Silvis</td>
<td>Virginia</td>
</tr>
<tr>
<td>BrDR TF</td>
<td>Amjad Waheed</td>
<td>Ohio</td>
</tr>
<tr>
<td>BrDR TF</td>
<td>Todd Thompson</td>
<td>South Dakota</td>
</tr>
<tr>
<td>BrDR Liaison</td>
<td>Tom Saad</td>
<td>FHWA</td>
</tr>
</tbody>
</table>
Thank you for your continued support!