AASHTOWare Bridge Update

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Chair, AASHTOWare Bridge Task Force
Presented to the AASHTO SCOBS General Session
Columbus, Ohio - June 25, 2014
Bridge Design and Rating Update

AASHTOWare Bridge Design and Rating Version 6.6.0
Upcoming Release July 2014!
Enhancements for 6.6

Reinforced Concrete Multi-cell Box Beam

- LRFD Spec Checking
- LRFR
- User-defined box cross sections
- Line girder analysis, full box or web-lines
- Integral with pier
Enhancements for 6.6

Post-tensioned Concrete Multi-cell Box LRFR Rating

- LRFR
- User-defined box cross sections
- Line girder analysis, full box along with web-lines
- Integral with pier
Enhancements for 6.6

Permit Analysis with Adjacent Lane Traffic

- Design review and rating analyses
- User-defined adjacent vehicle LL factor
- Live load distribution factor approach in LRFD Article 4.6.2.2.5
Enhancements for 6.6

Steel Girder Superstructure Continuous for Live Load Rating

Member Alternative Description

- Member Alternative: G2
- Description: Retrofitted continuous for live load
- Material Type: Steel
- Girder Type: Plate
- Default Units: US Customary
- End bearing locations:
  - Left: 6.0000 in
  - Right: 6.0000 in
- Default rating method: LFD
- Simple DL, continuous LL

Self Load

- Load case: Engine Assigned
- Additional self load = kip/ft
- Additional self load = %
Enhancements for 6.6

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

Curved Girder Enhancements

- Live load analysis of bottom flange lateral bracings
- Reuse dead load analysis results and influence surfaces
- Additional finite element nodes for modeling diaphragm
- Display bearing of curve at supports in Superstructure Alternative window
- 3D Model Viewer enhancements
# Enhancements for 6.6

User Group Top Enhancements from Aug. 2013 Meeting

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Description</th>
<th>Status</th>
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<tbody>
<tr>
<td>1</td>
<td>Bridge Explorer customization</td>
<td>Included in 6.6 release</td>
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<tr>
<td>2</td>
<td>Option to specify composite self-load and concrete deck load</td>
<td>Included in 6.6 release</td>
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<td>3 / 7</td>
<td>User-entered PS shape section properties for finite element models and self-load computation</td>
<td>Included in 6.6 release</td>
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<tr>
<td>4</td>
<td>Option to specify sufficiently connected PS box beam for live load distribution factor calculations</td>
<td>Included in 6.6 release</td>
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<td>5</td>
<td>Linking analysis error to user interface</td>
<td>Deferred to modernization effort</td>
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<tr>
<td>6</td>
<td>Feet-and-inches input for length and dimension</td>
<td>Included in 6.6 release</td>
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</table>
Enhancements for 6.6

Specification Updates

- AASHTO LRFD Specification updates (7th Edition)

What’s coming in 2015 ...

• Prestressed Concrete Design Tool
• Truss gusset plate rating
• Steel splice analysis
• LRFR for floor systems
• LRFR for longitudinal steel trusses
• LRFD and MBE specification updates
• System is nearly 15 years old - first released April 1999

• Software tools for development have significantly improved

• User expectations have matured

• Hardware has improved, need to take full advantage of new hardware capabilities
Modernization Update

Migration to a new architecture using the latest development tools

- Improve analysis performance by taking advantage of the latest hardware and software advances - multi-threading
- Improve the user interface - easier to use for beginners without losing modeling flexibility for advanced users
- Improve reporting capabilities
- Reduce maintenance costs
- Reduce implementation time for new features
Modernization Update

Architecture Design is Underway

- Conducted a workshop to identify the requirements that drive the architecture design
- Currently working on the high-level architecture design
- Evaluating the user interface requirements
- Work has started on the modernization of the finite element engine
- Solicitation for funding early next year
Bridge Design and Rating Licenses

BrD

BrR
AASHTO Bridge Management Website
http://aashtowarebridge.com/
Bridge Management 5.2.1

- Released in Spring 2014
- Key Features
  - Google Mapping Functions
  - Utility Functions
  - Needs Prioritization
  - Support For 2013 Element Inspection Manual
  - Cross-Browser Support
  - Key User Requests
Bridge Management 5.2.1+

- To be released Fall 2014
- Key Features
  - Support Element Submission to FHWA
    - Based on timing of FHWA submission format definition
  - Crystal Reports 2013
  - High Priority Requests
Bridge Management 5.2 Stages

- Development on 5.2 is rapidly moving forward with coordinated efforts between the Task Force, TRT, and Contractor
- Phased releases
  - Version 5.1.2/5.1.3 (Mar 2012 / May 2013)
    - New inspection and inventory functionality, integration with mapping
  - Version 5.2.1 (Feb 2014)
    - Core program framework, risk assessments, integrated utility functions, network corridors
  - Version 5.2.2 (Mid-2015)
    - Implementation of new deterioration models and multi-objective analysis
  - Version 5.2.3 (Planned 2016)
    - Integrated project and program planning
    - All administrative features
Bridge Management 5.2 Stages

- Inspection
- Bridge Groups, Risk, Utility Functions
- Deterioration Modeling, Preservation Action, and Projects
- Project/Program Planning and Administration Features

5.1.2  5.1.3  5.2.1  5.2.2  5.2.3
Bridge Management 5.2.2 Highlights

- Spring 2015
- Deterioration Modeling
- New Inspection Screen
- Project Planning/Analysis
- Program Stubs
- GUID Implementation
- API integration
- Metric/English Conversion
Main Project Screen
Bridge Management 5.2.3

• Planned Release in 2016
• Completion of 5.2 Project
• Key Additional Features
  • Enhanced Life Cycle Cost Analysis
  • Enhanced Project/Program Scenarios/Recommendations
  • Tunnels
  • Security Enhancements
  • Enhanced Help Documentation
• High Priority Requests
FY2014 Licensees

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

41 State Departments of Transportation + Manitoba, FHWA, District of Columbia & Puerto Rico

Map Key
- Non-Licensee
- Licensee
• Bridge Design and Rating
  August 12-13, 2014
  Traverse City, MI

• Bridge Management
  September 16-17, 2014
  Rapid City, SD
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<thead>
<tr>
<th>Role</th>
<th>Name</th>
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Questions & Comments

Thank you for your continued support!