AASHTOWare Bridge Design & Rating Update

Todd Thompson, PE – SD DOT
Chair, AASHTOWare Bridge Task Force

Presented to the
RADBUG
Albany, New York
August 4, 2015

Agenda

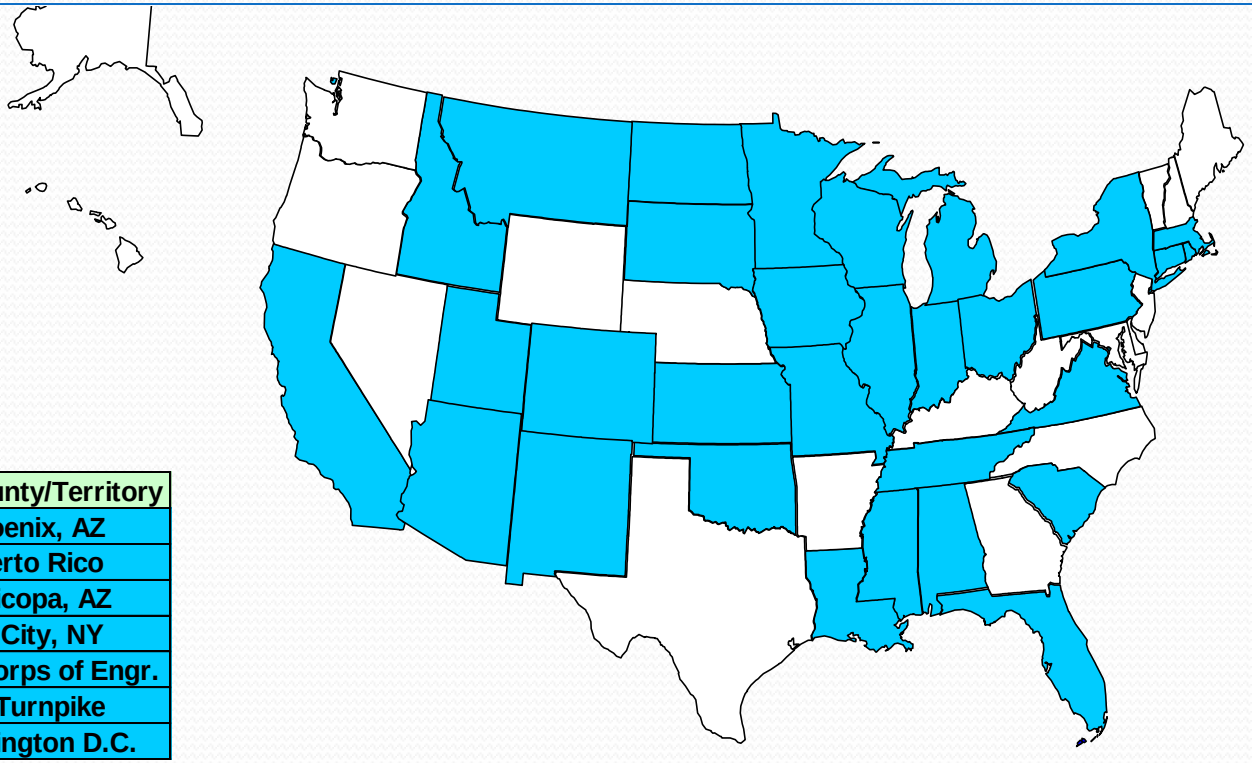
- Bridge Rating and Design Update
- Task Force Members

AASHTOWare Bridge Rating Design Update

AASHTO Bridge Design Rating
Website http://aashto.mbakercorp.com

AASHTOWare Bridge Rating

Current Participation



City/County/Territory
Phoenix, AZ
Puerto Rico
Maricopa, AZ
NY City, NY
Army Corps of Engr.
NJ Turnpike
Washington D.C.

Country
Manitoba, Canada

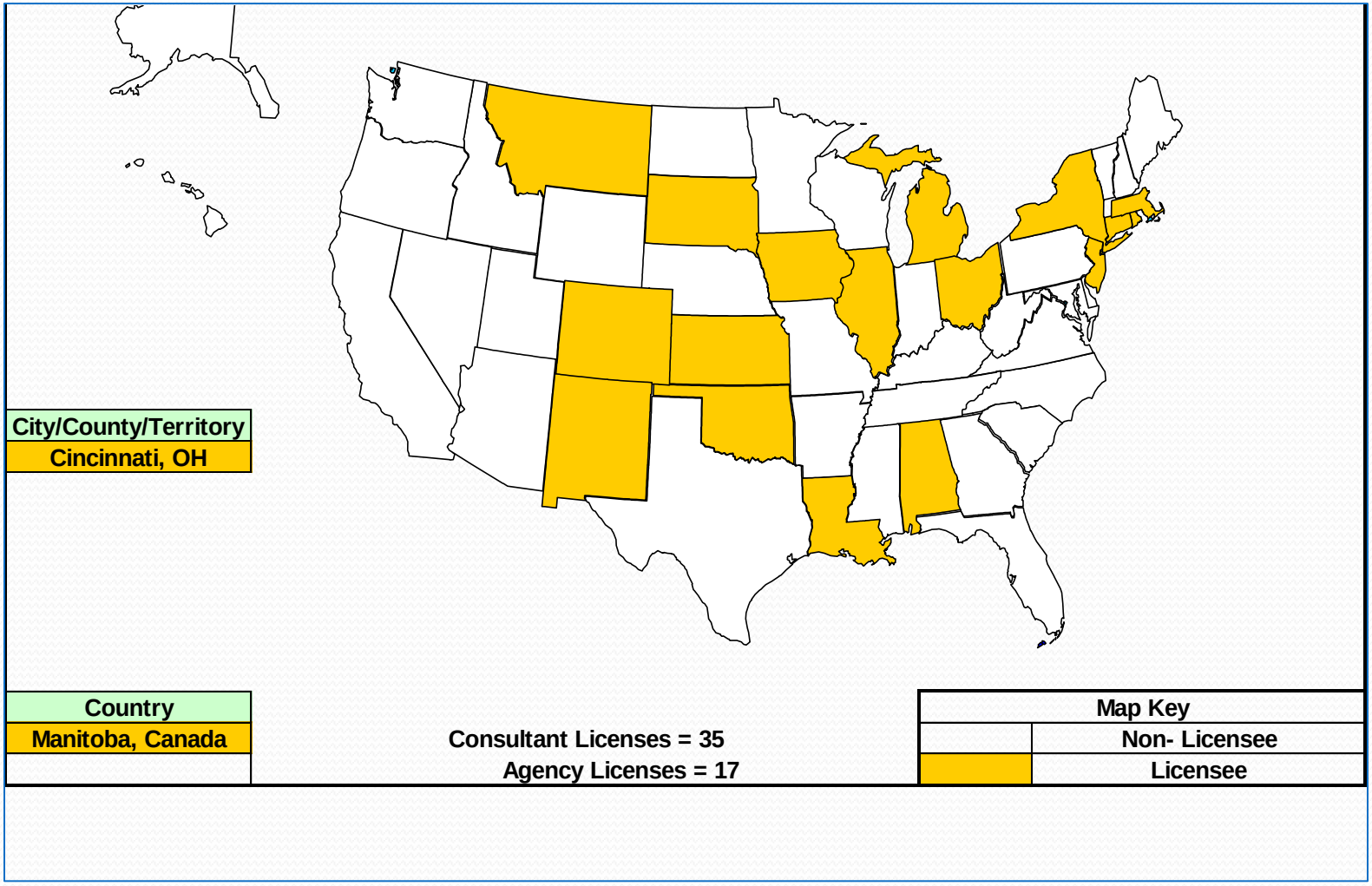
Consultant Licenses = 573

Agency Licenses = 39

Map Key	
	Non- Licensee
	Licensee

AASHTOWare Bridge Design

Current Participation



Comprehensive Bridge Software

AASHTOWare Bridge Design and Rating

"A Software Success Story"

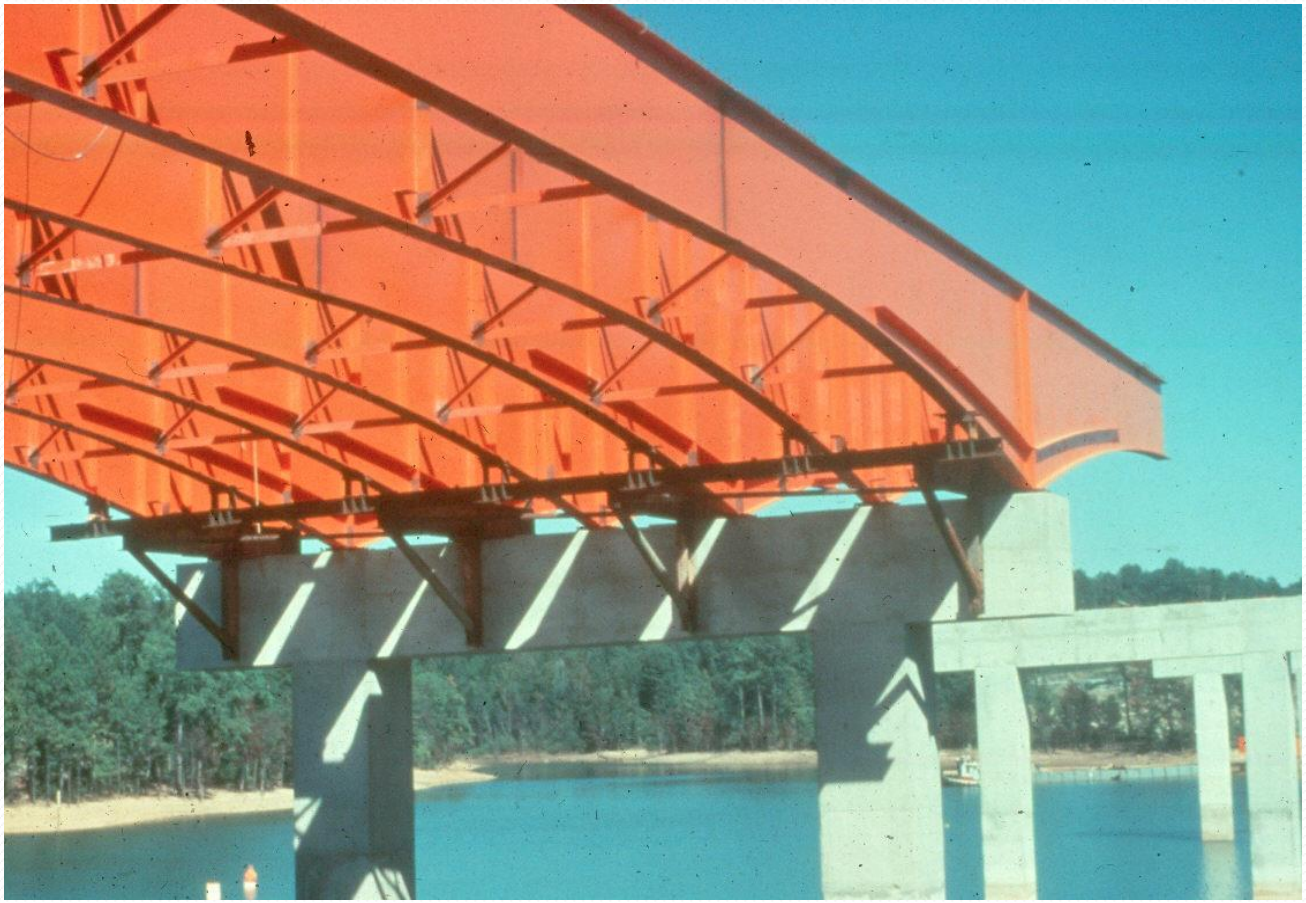
A 16 year history of the development progression

from common to complex bridge analysis

for more than 40 agencies and 600 consultants!

Steel Girder Superstructures

- Rolled shapes
- Welded plate girders
- Built-up I-shapes



P/S Concrete Superstructures

Precast shapes

- I beams
- Boxes
- Multi-stem Tee
- U beams

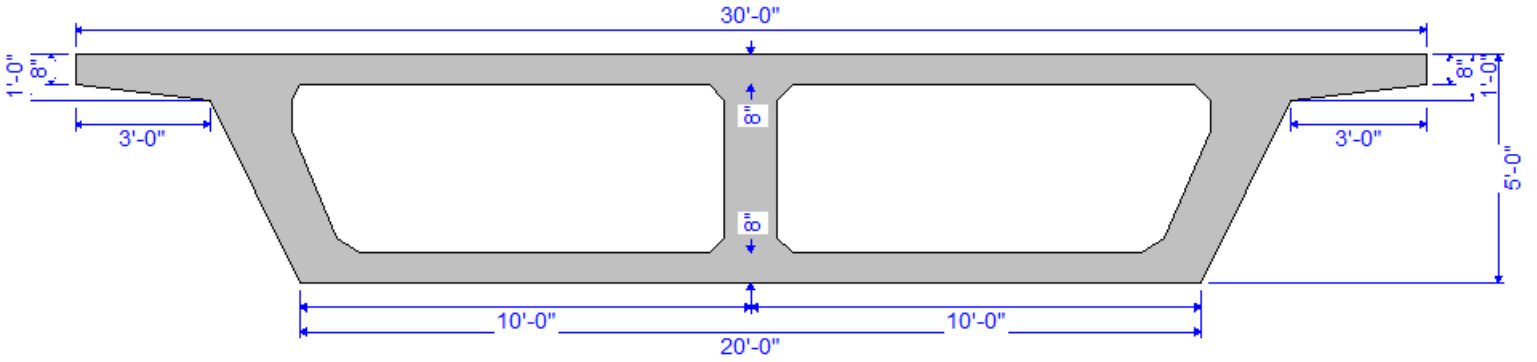
Reinforced Concrete Superstructures

- Tee beams
- Slabs
- I beams

Multi-cell boxes

Reinforced Concrete

Post-tension Concrete



Trusses

- Deck
- Through
- Combination
- Counters

Floor Systems

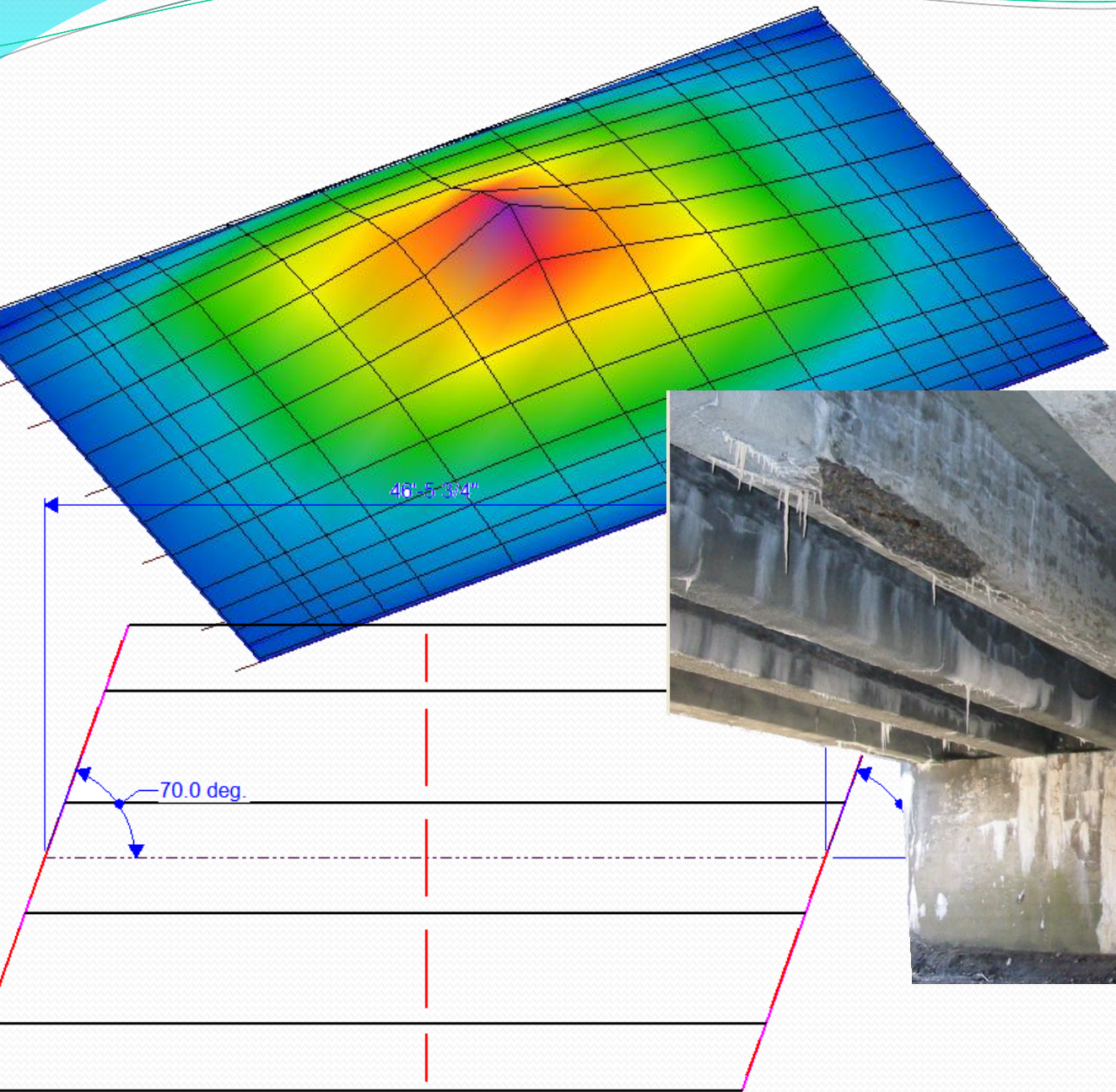
- Girder-Floorbeam-Stringer
- Girder-Floorbeam
- Truss-Floorbeam-Stringer
- Truss-Floorbeam
- Floorbeam-Stringer

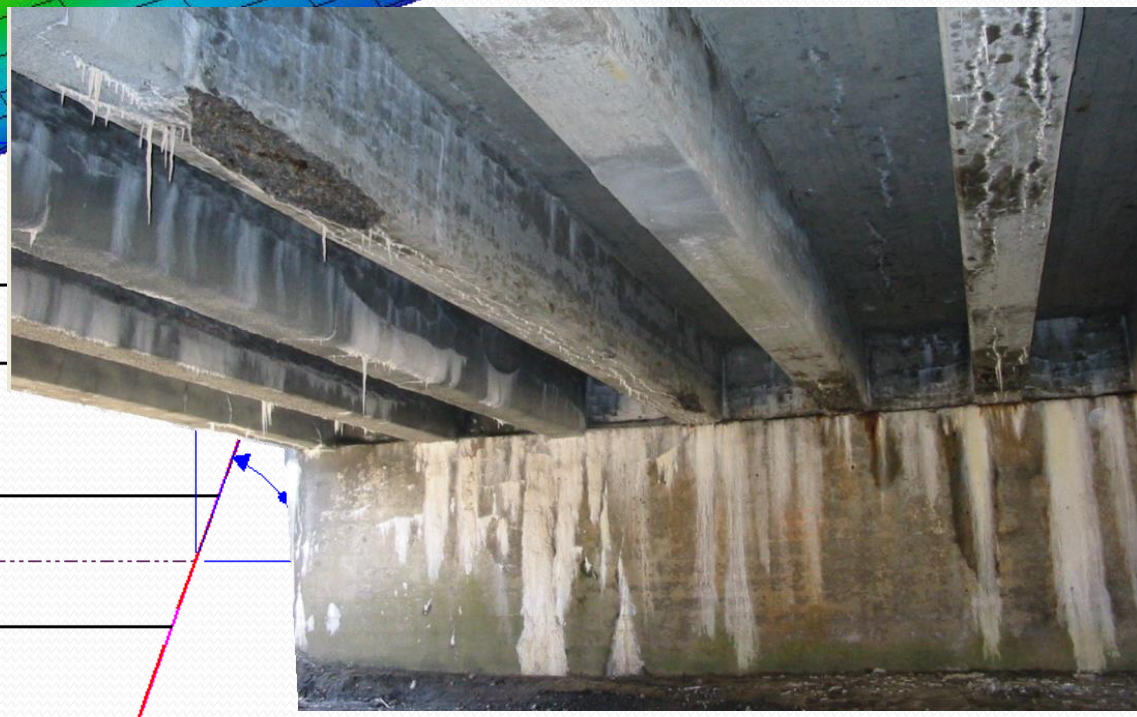
Floor Systems

- Floor trusses

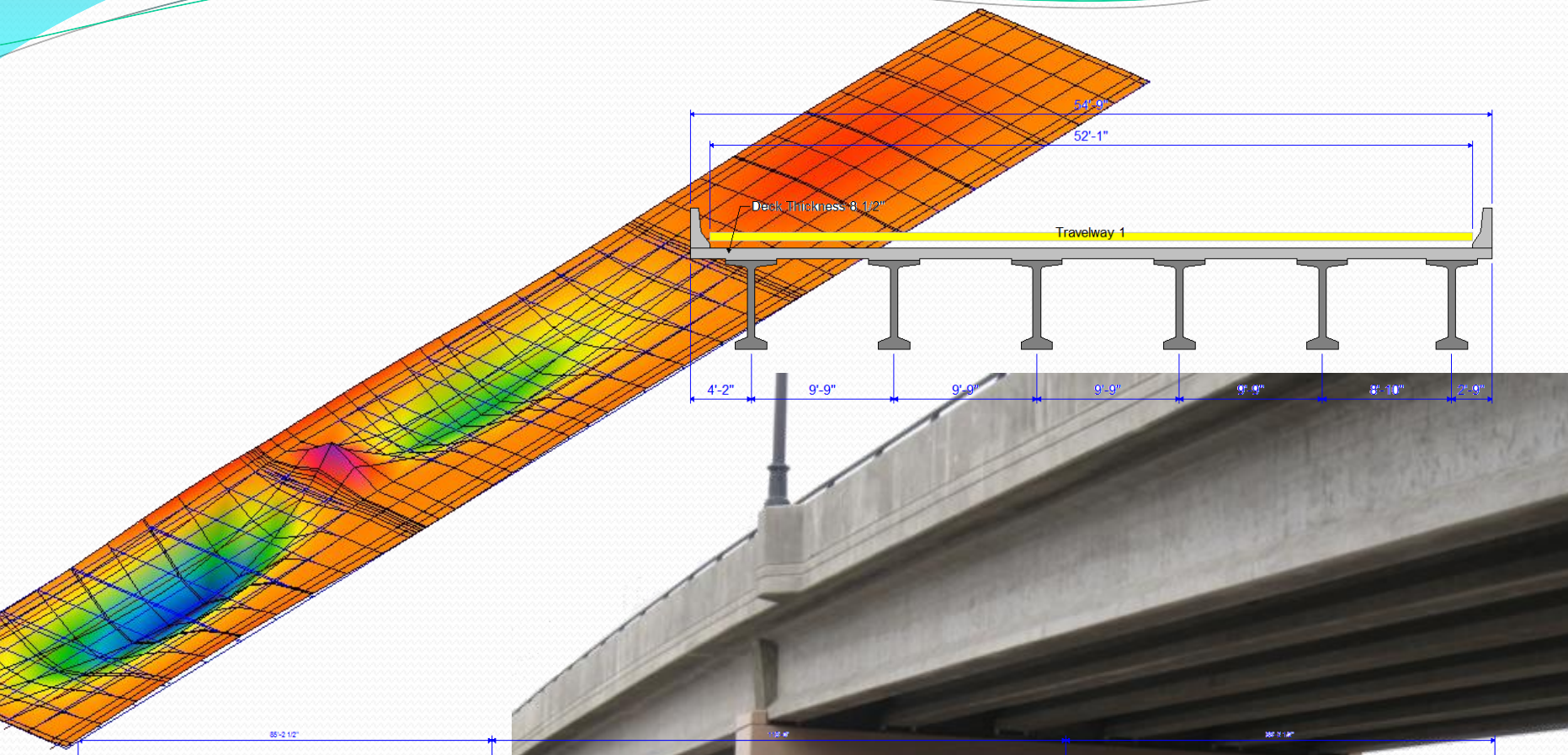
R/C Box Culverts

3D Analysis – R/C Multi-girder



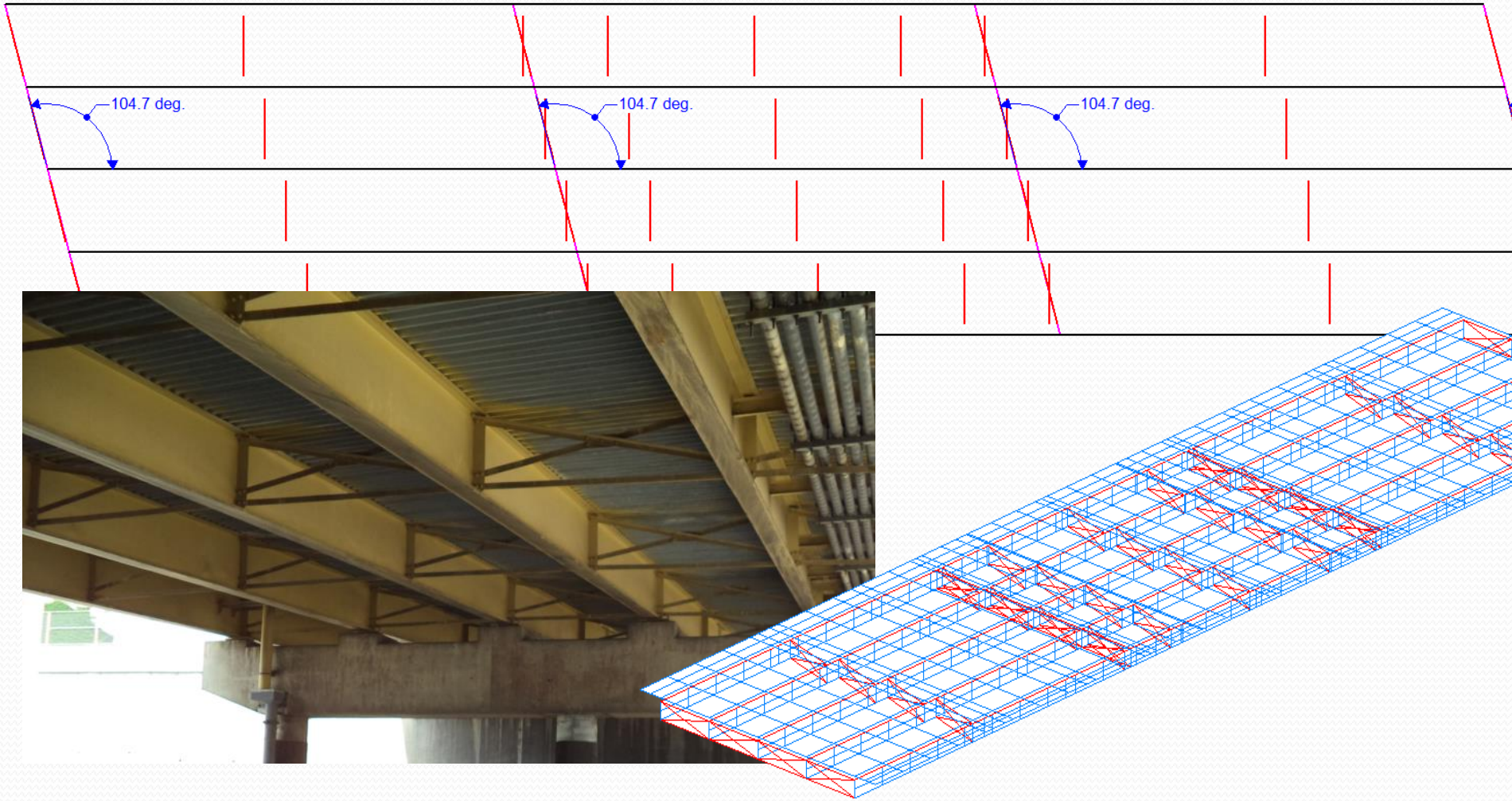


3D Analysis – P/S Multi-girder

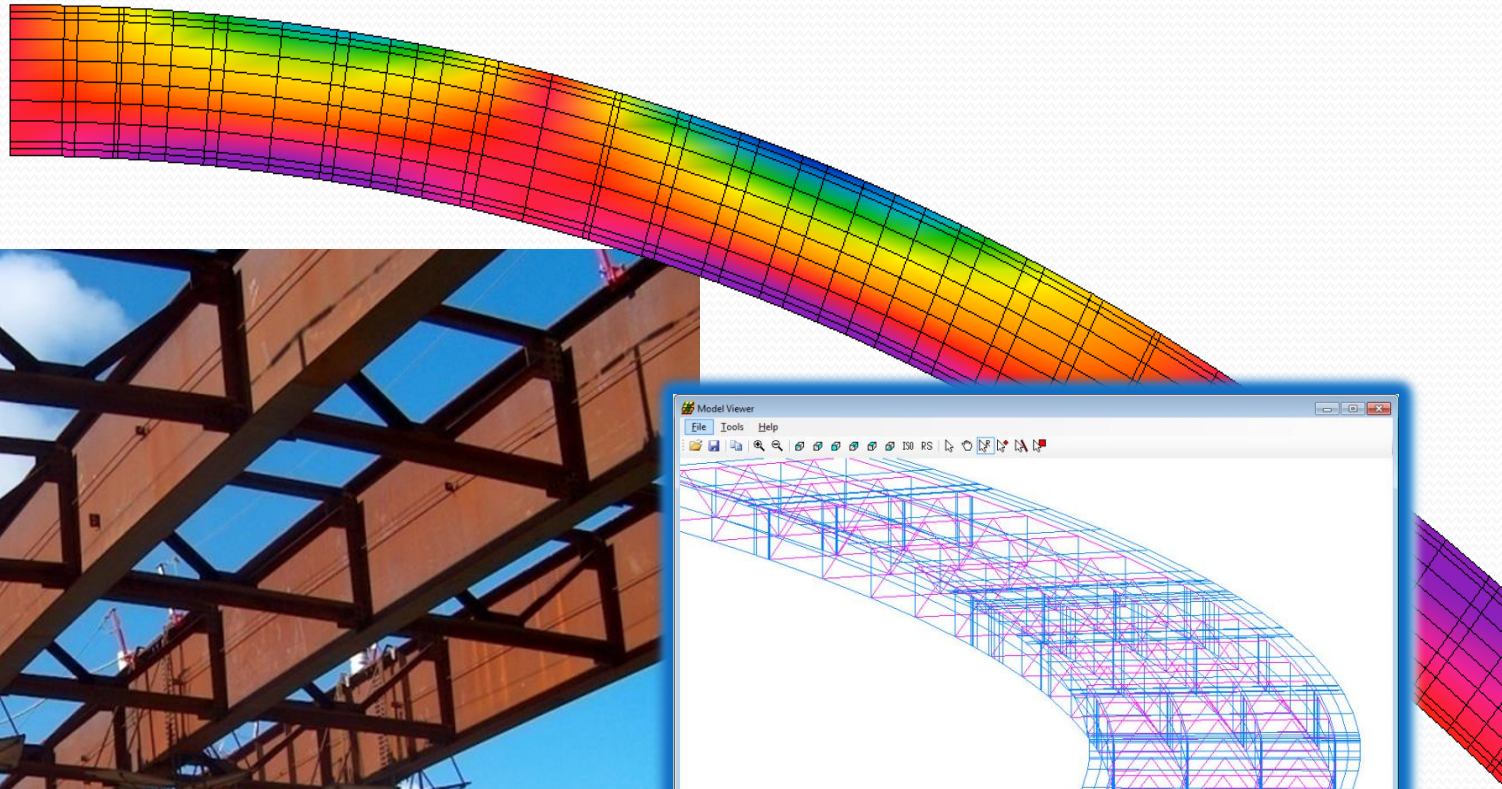


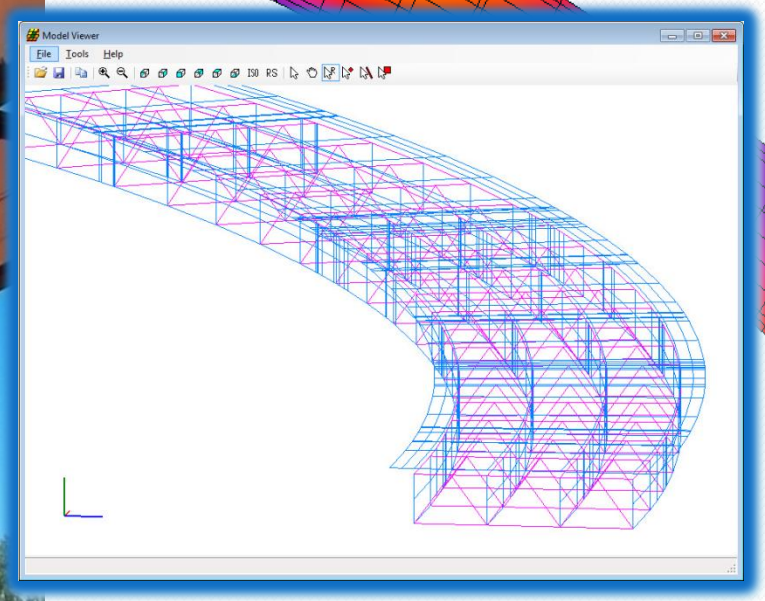
3D Analysis - Steel Multi-girder

Straight – 3D

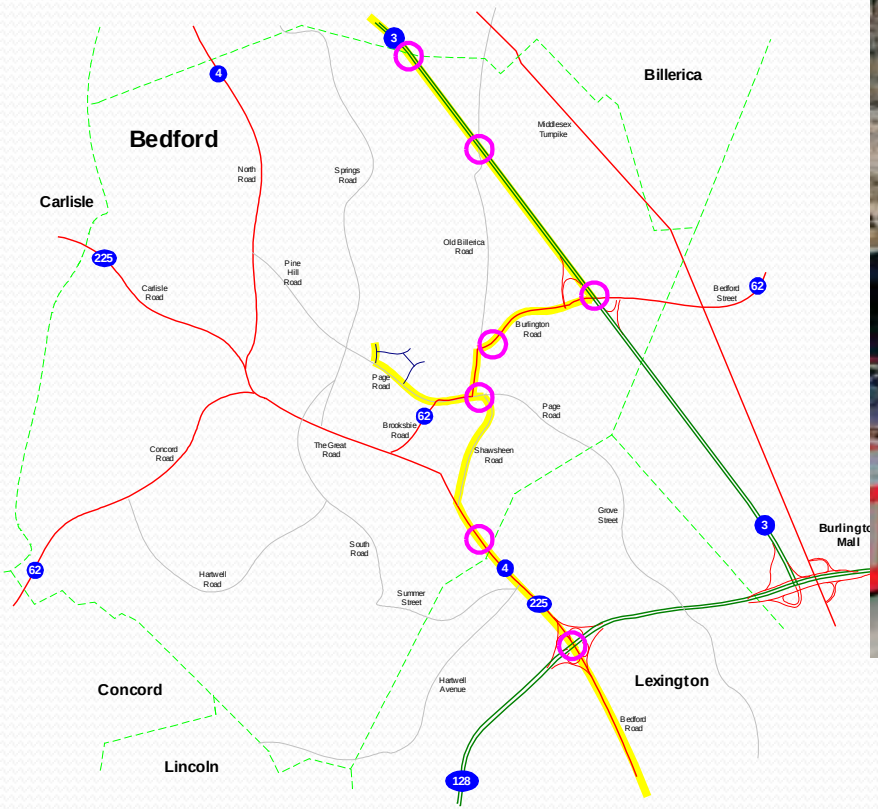


3D Analysis – Curved Steel Girder

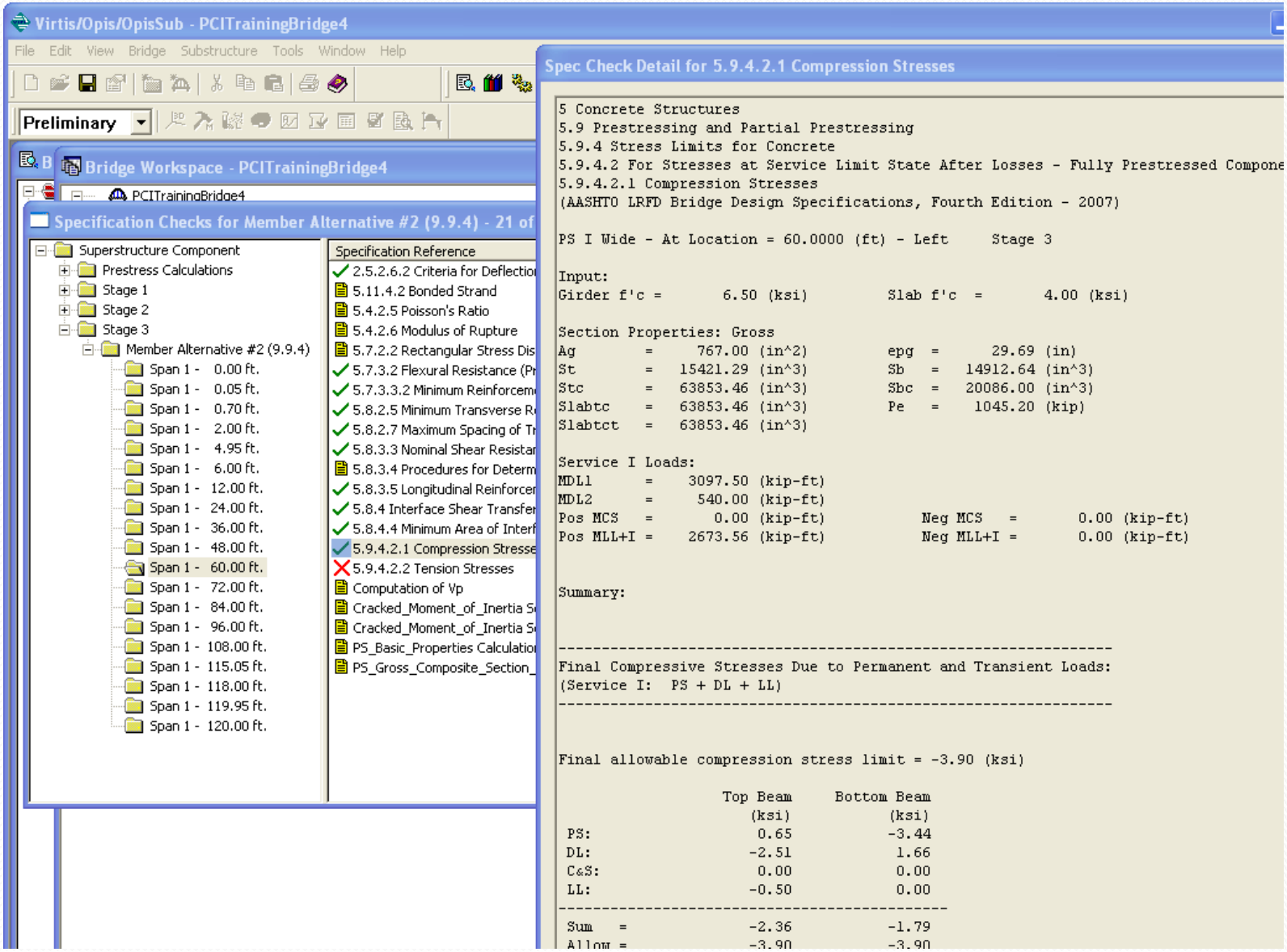




Permit Routing & Nonstandard Gage

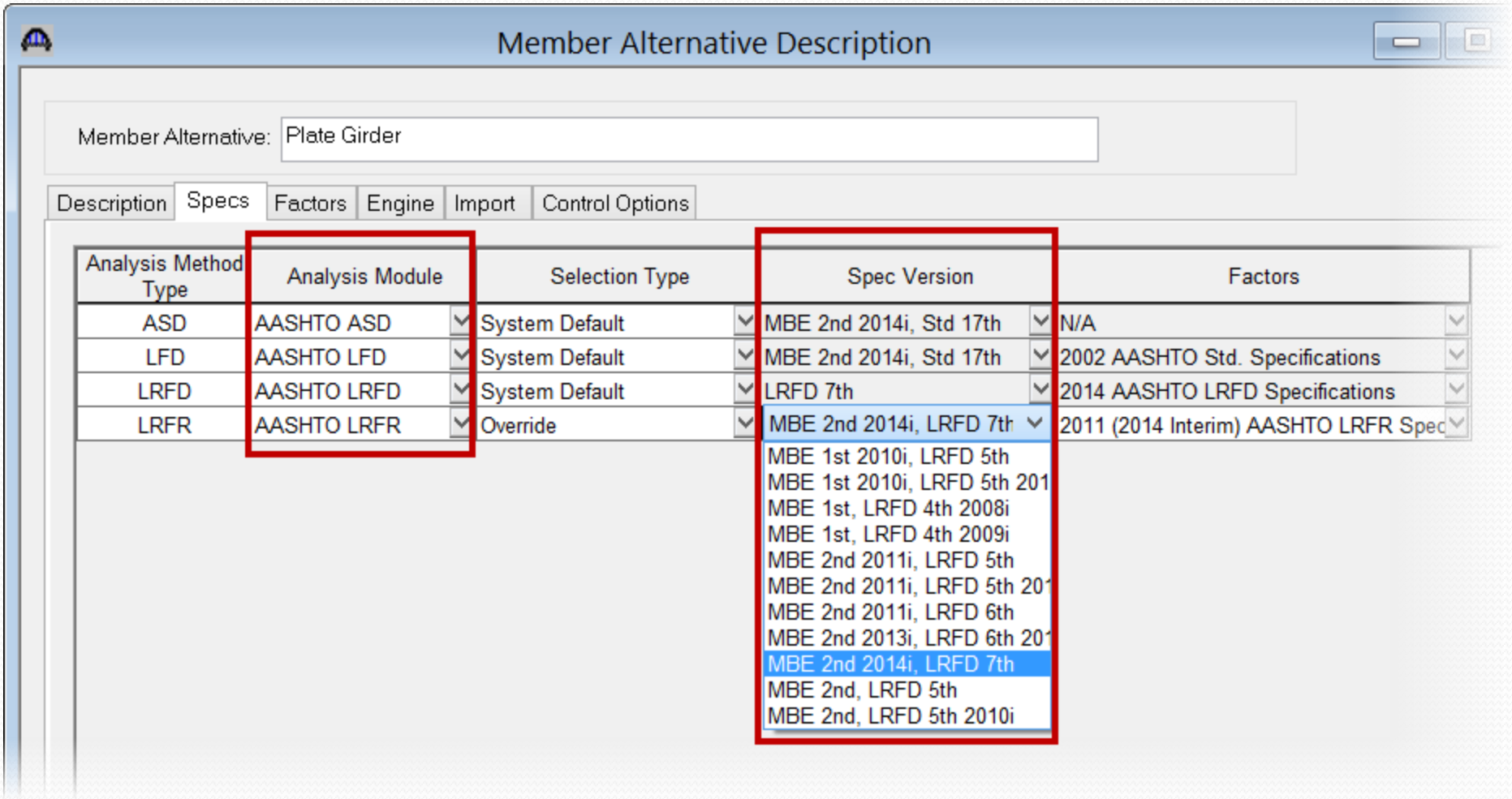


AASHTO Spec Checking



AASHTO Spec Checking

Multiple versions supported…



Enhancements for 6.7 – June 2015

User Group Top Enhancements

Bridge Design / Bridge Rating - Top User Group (RADBUG) Balloted Enhancements

Ranking	Description	Status
1	Copy and paste shear reinforcement ranges	Included in 6.7 release
2	Consider sloped portion of bent longitudinal reinforcement in bending and shear capacities	Included in 6.7 release
3	Perform 3D FEM analysis for dead load and/or live load only	Included in 6.7 release
4	Non-standard gage vehicle analysis on floor system superstructures	Included feasibility study of 3D floor system model in 6.8 Work Plan
6	Revise culvert LFD LL distribution computation	Included in 6.7 release
14	Consider development length of deck reinforcements	Included in 6.7 release

Enhancements not in 6.7 – June 2015

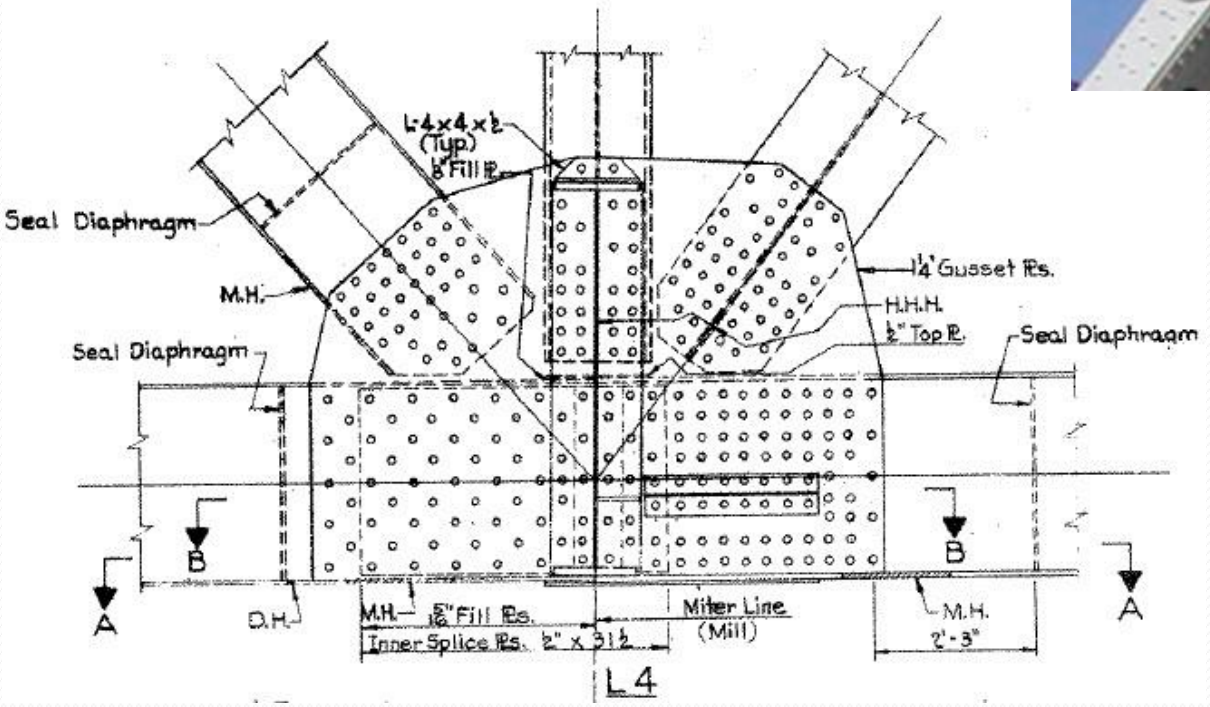
User Group Top Enhancements

Combined Ranking	BrR Ranking	BrD Ranking	Description	Status
5	4	19	Timber Design and Rating	Consider in Modernization
7	7	40	Linking engine error to GUI Windows	Consider in Modernization
8	13	5	Analysis of Trusses	Consider in Modernization
9	5	65	Pull ADT from BrM	
10	18	9	Avg Kg to calculate LLDF when different for both sides	

Enhancements for 6.7 – June 2015

Gusset Plate Rating

- Includes LRFR Truss Rating



Enhancements for 6.7 – June 2015

Splice Analysis and Rating for Steel Girders

- LRFD, LRFR, LFR
- Hybrid splices
- Splices for Curved Girders
- Simple for Dead Load, Continuous for Live Load

Enhancements for 6.7 – June 2015

- Cut Top Strand for Prestress Concrete Beams
- Splayed Girder Computation of Distribution Factors
- Implement RC Slab System in Substructure
- LRFR for Floor System
- AISC Steel Shape Update

Enhancements for 6.7 – June 2015

- LRFR Lateral Flange Moment Report

- AASHTO Engine Specification updates
  - MBE 2nd Edition, 2015 interim
  - LRFD 7th Edition 2015 interim

- Other Maintenance Improvements
  - Allow negative epsilon in concrete shear computation
  - Report actions for both sides of a point-of-interest
  - User-defined DL distribution by percentage

Design Tools - Update

Automated Prestressed Concrete Beam Design

- Completed the software design
  - Phase 1 – Single Beam Design
  - Phase 2 – Framing Plan Design

- Nearly complete with the user interface development for Phase 1

- Release of Phase 1
  - 1st quarter 2016

Enhancements for 6.8 – June 2016

- User Requested Enhancements (from this meeting)
- Specification updates from SCOBS 2015 meeting
- Maintenance Items
- Bug Fixes

Enhancements for 6.8 – June 2016

- LFD DF 1994 Guide Spec (Michigan DOT)
- NSG for Floor Systems
- Curved Steel Girder – Diaphragm Spec Checking
- Strain Compatibility Modification for PS Beam Capacity

Design Tools Update

Steel Plate Girder Design Optimization

- Software design is in progress
  - Defining requirements
  - Preparing user interface mockups
  - Formulating the steel design algorithm

Additional Items

- Creation and Updated FAQ
- https://aashto.mbakercorp.com/Pages/FAQs.aspx

2014 Non-voters Discussion

- Successful
- Generated a lot of good ideas and questions

Things the Task Force learned

- Not everybody is getting the information they need
  - Quarterly Email updates in addition to annual newsletter and web page updates (email list is over 700 folks)
- Not everybody is aware of the capabilities of software
  - FAQ, web page updates, quarterly email updates
- Still a lot of enhancement ideas
  - Suggest that consultants work with their DOT agencies so all are on the same page
- Not everybody had access to JIRA
  - Created a read only user so everybody can see incidents

2015 Survey

- Bridge Rating is primary load rating software for most respondents
- Bridge Design is more limited or secondary design software
- Bridge Rating is used to load rate bridges in design phase also

2015 Survey

- There were a lot of respondents that didn't know 6.7 had been released
  - Survey sent on 6/23/2015
  - Email status update sent on 7/7/2015
  - Agencies notified about download on 7/6/2015
  - So depending on when one responded to the survey determined if they knew it was out

2015 Survey

- Speed of Analysis (3D)
  - Discuss in Modernization presentation
- Reports
  - Discuss in Modernization presentation
- Speed of multiple bridges for permitting
  - Shannon will have a presentation on an approach

AASHTOWare Bridge Task Force

Chair	Todd Thompson	South Dakota
Vice Chair	Eric Christie	Alabama
Member – BrM	Bruce Novakovich	Oregon
Member – BrM	Thomas Martin	Minnesota
Member – BrM	Mark Faulhaber	Kentucky
Member – BrM	Beckie Curtis	Michigan
FHWA Liaison – BrM	Derek Constable	FHWA
Member – BrR	Joshua Dietsche	Wisconsin
Member – BrD	Jeff Olsen	Montana
Member – BrD	Dean Teal	Kansas
Member – BrR	Amjad Waheed	Ohio
FHWA Liaison – BrDR	Tom Saad	FHWA

AASHTOWare Bridge Task Force

- How to become Task Force Member
  - Active with the product – user group officer, TAG
  - Willing to volunteer your time
  - Support of your DOT management
  - Technical Expertise
  - Leadership and Management Skills
  - Employed by AASHTO Member State

AASHTOWare Bridge Task Force

- How to become Task Force Member
  - When there is an opening
  - Email sent to all regarding the opening
  - Need to submit a resume
  - Need to submit management approval
    - Travel and time demands
  - AASHTO Project Manager, SCOJD liaison and current Chair review and interview and recommend the new member(s) to SCOJD
  - SCOJD appoints all task force members and chairs

Contact Information

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Questions & Comments

Thank you for your continued support!