NATIONAL STEEL BRIDGE ALLIANCE

# AASHTO/NSBA Steel Bridge Collaboration

## Fall Meeting Minutes - Combined

Little Rock, AR

**October 21 – 23**

The AASHTO/NSBA Steel Bridge Collaboration is a joint effort between the American Association of State Highway and Transportation Officials (AASHTO) and the National Steel Bridge Alliance (NSBA) with representatives from state departments of transportation, the Federal Highway Administration, academia, and various industry groups related to steel bridge design, fabrication, and inspection. The mission of the Collaboration is to provide a forum where professionals can work together to improve and achieve the quality and value of steel bridges through standardization of design, fabrication, and erection.

# Contents


Task Group List ..... 1

Past Meeting Notes ..... 2

Current Meeting Notes ..... 3

TG 1 Detailing ..... 4

TG 2 Fabrication and Repair ..... 6

TG 4 QC/QA ..... 14

TG 8 Corrosion Protection ..... 21

TG 9 Bearings ..... 23

TG 10 Erection ..... 25

TG 11 Design ..... 30

TG 12 Design for Constructability and Fabrication ..... 35

TG 13 Analysis of Steel Bridges ..... 37

TG 14 Field Repairs and Retrofits ..... 40

TG 15 Data Modeling for Interoperability ..... 43

TG 16 Orthotropic Deck Panels ..... 45

TG 18 Duplex Stainless Steel ..... 48

TG 19 Movable Bridge ..... 51

MC Main Committee ..... 55

Appendix A - Collaboration Document Status ..... 61

Appendix B - Member Rosters Unofficial (2026 – 2027) ..... 63

TG 1 Detailing ..... 63

TG 2 Fabrication and Repair ..... 64

TG 4 QC/QA ..... 65

TG 8 Corrosion Protection ..... 66

TG 9 Bearings ..... 67

TG 10 Erection ..... 68

TG 11 Design ..... 69

TG 12 Design for Constructability and Fabrication ..... 70

TG 13 Analysis of Steel Bridges ..... 71

TG 14 Field Repairs and Retrofits ..... 72

TG 15 Data Modeling for Interoperability ..... 73

TG 16 Orthotropic Deck Panels ..... 74
TG 17 Steel Castings ..... 75
TG 18 Duplex Stainless Steel ..... 76
TG 19 Movable Bridges ..... 77
Main Committee ..... 78
Appendix C – TG16 Additional Meeting Material ..... 79

# Task Group List

| Group Name | Chair | Chair Company | Vice Chair | Vice Chair Company |
|---|---|---|---|---|
| TG 1 Detailing | Randy Harrison | W&W\|AFCO Steel | Gary Wisch | DeLong's, Inc. |
| TG 2 Fabrication and Repair | Heather Gilmer | Pennoni | Duncan Paterson | NSBA |
| TG 4 QC/QA | Jamie Hilton | KTA-Tator, Inc. | Robin Dunlap | High Steel Structures |
| TG 8 Corrosion Protection | Johnnie Miller | KTA-Tator, Inc. | Derrick Castle | Sherwin-Williams |
| TG 9 Bearings | Michael Culmo | CHA Consulting, Inc. | Ron Watson | RJ Watson, Inc. |
| TG 10 Erection | Brian Witte | Parsons | Jason Stith | Michael Baker International |
| TG 11 Design | Brandon Chavel | NSBA | Domenic Coletti | HDR |
| TG 12 Design for Constructability and Fabrication | Russell Jeck | GZA GeoEnvironmental Inc. | | |
| TG 13 Analysis of Steel Bridges | Deanna Nevling | HDR | Francesco Russo | Russo Structural Services |
| TG 14 Field Repairs and Retrofits | Kyle Smith | GPI | Nick Haltvick | Minnesota Department of Transportation |
| TG 15 Data Modeling for Interoperability | Aaron Costin | University of Florida | Grant Schmitz | HDR |
| TG 16 Orthotropic Deck Panels | Sougata Roy | SOCOTEC Engineering, Inc. | Frank Artmont | Modjeski & Masters, Inc. |
| TG 17 Steel Castings | Jennifer Pazdon | Cast Connex | Jason Stith | Michael Baker International |
| TG 18 Duplex Stainless Steel | Jason Provines | Virginia Department of Transportation | Nancy Baddoo | Steel Construction Institute |
| TG 19 Movable Bridge | George Patton | Hardesty & Hanover, LLC | Frank Artmont | Modjeski & Masters, Inc. |
| Main Committee | Ronnie Medlock | High Steel Structures | Natalie McCombs | HNTB |

## Past Meeting Notes

| Year | Meeting | Link |
|---|---|---|
| 2018 | Spring | Not Available |
| | Fall | Meeting Notes |
| 2019 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2020 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2021 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2022 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2023 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2024 | Spring | Meeting Notes |
| | Fall | Meeting Notes |
| 2025 | Spring | Meeting Notes |
| | Fall | This Document |

# Current Meeting Notes

# AASHTO/NSBA Steel Bridge Collaboration

## TG 1 Detailing

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This Task Group is specifically responsible for the creation and maintenance of guidelines and best practices for the creation of clear concise design and fabrication drawings.

**Task Group Leadership**
**Chair:** Randy Harrison - W&W|AFCO Steel
**Vice Chair:** Gary Wisch - DeLong's, Inc.

**Meeting Agenda: 10/22/2025 (3:00 PM - 5:00 PM CT)**

1. Chairperson's Welcome (3:00 PM – 3:10 PM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. G1.1 Approval Requirements (3:10 PM – 4:00 PM)
    a. Review of responsibilities of fabricators vs checkers/owners reviewers
    b. Review of comments for Section 4:
    c. 8 voted in favor in simplifiying/streamline document // To be reviewed by group outside of this meeting (Due Date: 1/31/2026)
        i. Brad Dillman to review A,B&C
        ii. Randy Harrison to review E&F
        iii. Gary Wisch to review G,H & I
        iv. Bill Laley to review J,K,L
        v. Brian to review M,NO
        vi. Entire document to be reviewed by Dom Coletti & Eric Rau
    d. Reference to Iowa DOT Review Checklist
3. G1.3 & G1.4 Combined drawings and review requested by TG (4:00 PM – 5:00 PM)
    a. Reviewed previous comments and addressed new suggestions

b. Page 2, Remove “Expect that stiffeners, intermediate and end crossframes and lateral bracing may be Grade 36”
c. Page 2, Remove that fabricator must have Fracture Critical endorsement and replace with current wording
d. Look at seperating engineer instructions from examples and comments.
e. Provide notes that are only required to be included, remove “example notes” and keep “notes for designer” …GUIDELINE FOR DRAWINGS (Randy)
f. Add General Note: Specify Material Grade, Bolt Grade
g. Remove Note under Steel Fabrication: “Fabricator of structural steel shall have the appropriate AISC Quality Certification”
h. Charpy V-Notch Note: Designer should specify Charpy- V Notch testing and specify which members
i. Small task group to review what is required for General Notes Section
    i. Brad, Bill L, Heather, Jessica W, Eric R and Randy to meet week of December 8
j. Girder Elevation Sheet – Remove Tension Flange Connection Detail
k. Connection Plate (Stiffener) vs Transverse Stiffener
    i. No Option 1 on Curved Girders
l. Standard Clip & Weld Termination Detail to be revised

4. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 2 Fabrication and Repair

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group aims to achieve quality and value in the fabrication of steel bridges through standardization of steel bridge fabrication across the nation.

**Task Group Leadership**
**Chair:** Heather Gilmer - Pennoni
**Vice Chair:** Duncan Paterson - NSBA

**Meeting Agenda: 10/21/2025 (9:00 AM - Noon CT)**

1. Chairperson's Welcome (9:00 AM – 9:10 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).

    Add Dallas Stevens, David Perez, Chris Livsey, and Daniel Trotta of ARDOT and Kay Jimison of Valmont as in attendance. They were not connected to the Zoom.

    Following introductions, Heather provided an overview of the documents that are directly and indirectly under the guidance of this Task Group.

    c. Approval of Previous Meeting Minutes.

    No discussion. Meetings minutes approved.

2. 2.AASHTO fabrication specification
    a. Check assemblies (Gilmer, Medlock, Patton)

    AASHTO Steel Bridge Fabrication Specification, Article 17.5.3

    - A ballot was previously proposed to revise Article 17.5.3 and its commentary; however, several AASHTO comments expressed concerns with the proposed changes.
    - The key issue is ensuring that owners retain the ability to require additional check assemblies when they deem necessary.

- Background and Discussion Points
- Comments were received from the Steel and Metals Technical Committee as well as the Committee on Bridges and Structures (COBS).
- Some provisions from the AASHTO Construction Specification have been relocated to the Fabrication Specification.
- The existing commentary suggested that inspectors could request a check assembly at any time—essentially at the owner's discretion.
- The draft revision introduced a provision allowing use of CNC fabrication in conjunction with limited check assemblies (used to verify fit prior to full production). Once fit was verified, subsequent assemblies were deemed unnecessary.

Owner Concerns

- During a call with the Steel and Metals Committee, several owners stated that the proposed language limited their ability to request additional assemblies as needed.
- The original assumption was that additional check assemblies would only be required if fit-up issues occurred; however, owners want the flexibility to specify additional assemblies in their own project or standard specifications.
- Owners also emphasized the importance of standardization across states, while maintaining the ability to state deviations clearly when needed.
- Clarifications and Recommendations
- Some owners feel that recent revisions to the Fabrication Specification may reduce owner control over certain aspects they previously managed. This was not the intent—the intent was only to address the possibility of "spur-of-the-moment" check assembly requests.

- Ronnie Medlock recommended clarifying in the specification that owners may include additional requirements in their own standard specifications (for example, requiring more assemblies than the minimum stated).
- It was agreed that the Fabrication Specification is not intended to serve as a consolidation of all state requirements, but rather to establish a baseline that states can build upon.
- Heather recommended adding this as a new business item focused on alternative methods, with interim acknowledgment in the commentary.
- It may be sufficient to provide GDOT with an explanation of the task group's direction rather than revising the specification language at this time.
- Alina Davidescu made a point to consider minimum versus overruling.
- Heather suggested adding "at least" language to the specification. Or "one or more". The attendee preferred "one or more". Owner specifies how many or if the owner does not specify, the fabricator can choose to take into consideration the possibilities of back charges should there be fit issues in the field.

Other Business

- Karl Frank suggested that virtual assembly should eventually be incorporated into the specification.
- Ronnie Medlock suggested that there be some mention of cross-frame assembly and fit. Right now, the specification excludes cross-frames from check assemblies.
- Heather suggested that the existing NSBA "Fit Document" be reviewed and updated as necessary.
- NCHRP synthesis collected information on state preferences for tolerances and erection. It was recommended that the task group review the synthesis and update the fabrication specification as necessary.

NCHRP Synthesis 603 — Practices for Steel Bridge Fabrication and Erection Tolerances (2023).

b. Scribing/etching of layout marks (Diarcangelo, Medlock, Michalk, McCullough, Wiersh)

Piece Marking of Steel During Fabrication

- Discussion focused on the use of plasma for marking layout lines, in contrast to deeper piece marks and match marks.
- Consensus from previous meetings remains that specification language is not practical or necessary, but that a commentary section on workmanship should be developed to provide guidance.

Current Specification Context

- The existing document already contains provisions related to piece marking, low-stress markings, and other identification methods; however, these sections could benefit from consolidation and clarification.
- There is currently no specific language addressing layout marks, particularly in relation to modern CNC fabrication practices.

Workmanship and Preservation of Marks

- Heather proposed including commentary language addressing workmanship requirements for different marking methods and reviewed preliminary draft text with the group.
- Additional commentary may be needed regarding the maintenance and preservation of marks through subsequent fabrication and coating processes.
- Current language indicates that marks should remain legible after coating; the group discussed whether this requirement should be strengthened with “shall” language.

- Consideration should also be given to offsite coating processes, such as galvanizing, to ensure marking visibility and orientation are maintained.

Future Topics

- Match mark orientation and related layout practices were identified as potential new business items for future discussion.
- Language related to the depth of the mark as it relates to marks that are overly deep should be considered. Differentiate between match marks that need to be visible throughout each step versus those that only need to be temporarily visible.
- Karl Frank said if you can compare the depth to the allowable for undercut. If you are not any deeper than the undercut limit or surface roughness might be a way to measure depth of a mark (i.e., validation of the depth).
- Add reference to Florida DOT marking study in the absence of specific guidance.
- Ronnie Medlock suggested that the equipment manufacturers perform some type of study or provide information related depth and consistency.
- Task group will table the topic for now. The task group should consider writing a research needs statement that would provide answers to the questions so that they may be better able to make recommendations.

**TODO:** Include attachment from Heather.

3. G2.2 - Guidelines for Resolution of Steel Bridge Fabrication Errors

The G2.2 document was originally developed to capture and preserve industry knowledge that might otherwise be lost as experienced personnel retire or leave the field. Its purpose is to document best practices and lessons learned to ensure that critical expertise is passed down to the next generation.

Next Steps

- Future updates should include input from fabricators and bridge owners, particularly regarding nonconformance reports (NCRs) or issues that may not currently be addressed in the existing guidelines.
- It was suggested that this effort could be initiated through the Fabrication Task Force within the AASHTO Steel and Metals Technical Committee, which would provide a structured channel for gathering feedback and proposed additions.

Future Topics

- Look for synergies with the G14.3 repairs database. Also consider how the recommendations in the G2.2 are affected by field application.

a. Improper preheat (Medlock, Gramlick, Niemann, Frank, Ocel, Provines, Roy)

   The concerns associated with improper preheat are porosity or cracking due to the presence of high hydrogen and high heat affected zone (HAZ) hardness due to rapid cooling. Therefore, the recommended remedy is as follows:

   - Do a visual inspection
   - Conduct MT
   - For CJP groove welds, conduct UT
   - Commentary: Check the HAZ hardness of the suspect area
   - Compare with PQR hardness results if they are available, or
   - Compare with similar areas that were properly preheated

b. Framing members too short (Paterson, Rau, Dillman, Elsayed, Svatora)

   Duncan Paterson created several sketchs. Next steps would be to write descriptions for the images.

   **TODO:** Include attachment from Heather.

c. Elements of rolled beams not aligning at a splice—or built-up members after applying depth tolerance (Wisch, Leonard)

Recall that the underlying goal is to provide guidance for something that should be simple but require an NCR and there is a possibility of design differences resulting from the addition of the filler plate. Application of correctio can apply to built-up plate girders, however it is less frequent.

**TODO:** Include attachment on repair recommendations from Heather.

d. General Updates for D1.5 changes, AASHTO Fab Spec, FC terminology, etc. (Gilmer)

We will continue to go over comments as time permits. If you want a preview, check out the bold comments in the draft, particularly starting at section 2.4, middle of case 3. Draft is here:

https://docs.google.com/document/d/1GTjsJ1HRHNnZSbgM6rKQihy1a1vJ0PYE/edit?usp=sharing&ouid=101686789017403472572&rtpof=true&sd=true

Specific action items from prior discussion:

- Do we have anyone who can redraw figures that need redrawing? The mislocated hole figures in particular probably need help. High Steel volunteered to redraw figures.
- 2.2: This sentence was moved from “recommendation” to “commentary”, but do we need it at all? Does anyone in our audience not know what a free edge is?
- A “free edge” is a rolled or thermally cut boundary not welded to another component. This includes the end or side edges of a flange, the end of a web, or any edge of a splice plate.

  Consider a similar approach in the general notes to concrete cover. For example, not allowing less, however more may be alright.

- 2.2The solution of neglecting the whole row and just adding a new one is in the figure, but there is no recommendation to do this.

- 2.4: Add subcase where the dimension of the hole is NOT within AASHTO oversize definition. Eric Rau and Geoff Swett volunteered.

4. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 4 QC/QA

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This task Group primarily focuses on the requirements for a Fabricator's quality control program, with emphasis on the development and implementation of a quality control plan and minimum requirements for an Owner's quality assurance program. At the same time the group acknowledges the need for a cooperative approach to quality, where the Owner's and Contractor's representatives work together to meet their responsibilities, resulting in the efficient fabrication of steel bridges meeting all contractual requirements.

**Task Group Leadership**
**Chair:** Jamie Hilton - KTA-Tator, Inc.
**Vice Chair:** Robin Dunlap - High Steel Structures

**Meeting Agenda: 10/22/2025 (8:00 AM - Noon CT)**

1. Chairperson's Welcome (8:00 AM – 8:10 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).

    New members Charlies and Jose to committee.

    c. Approval of Previous Meeting Minutes.
2. G4.1 - Steel Bridge Fabrication QA/QC Guidelines (8:10 AM – 8:20 AM) - Status update: ready for publication.

Document has completed typesetting and is awaiting a final cover which is being created by AASHTO Pubs group. Once that is done, the final document will receive a quick review and then be posted for download on both the NSBA and AASHTO websites.

3. S4.3 – Specification for Owners Inspection and Inspectors (8:20 AM – 11:30 AM)

Background

- The S4.3 Specification was balloted about a year ago, and many comments have already been addressed in previous meetings.

- The document originated from an older specification, which was restructured and refined to improve clarity, flow, and accuracy.
- The intent is to develop it as a standalone specification so that owners can incorporate it directly into their standard specifications for use with third-party inspectors.
- This meeting continued review of remaining TG ballot comments, building on progress from the Spring 2024 meeting.

Document Revisions and Status

- Table 3-1 will be corrected to ensure the required years of experience align with AISC requirements.
- Redundant sections are being consolidated where appropriate, without altering technical meaning.
- More than 60 comments remain unresolved and will continue to be reviewed in future meetings.

Discussion on Terminology and Definitions

- Heather Gilmer's comment on Section 5.5 raised questions about the use of "verify" and "monitor."
    - Both actions occur during inspection and are generally used appropriately.
    - However, the comment prompted a broader review for consistency and clarity, since these terms describe distinct inspection activities that could be misinterpreted in shop practice.
- The group agreed to also review terms like "inspection" for consistency throughout the document.
- Some of these actions result in specific work products (e.g., reports or checklists).
- The group recommended expanding the definitions section to include these terms and describe what each typically involves.

Recommendations and References

- Robin Dunlap suggested adding "notify" to the definitions list.

- Terry Logan noted that definitions for similar terms appear in ASQ documents and recommended using those as reference sources rather than creating entirely new definitions.
- Jamie observed that prior versions of this document sometimes developed their own terms but generally sought alignment with AISC terminology.
- Art Bustos mentioned that relevant definitions may be found in the AISC Code of Standard Practice, AISC 360, and AISC 270.
- Terry Logan emphasized selecting a single primary standard as the basis for definitions to avoid conflicts in interpretation or arbitration.
- Jamie proposed a structured review process:
    - Compare definitions with AISC first.
    - If not defined there, default to ASQ or another reputable source.
- Heather Gilmer added that any new definitions developed for S4.3 that do not appear elsewhere (e.g., in the AASHTO Fabrication Specification) should also be shared or pushed to those related documents.

Action Items

- Ronnie Medlock will help develop new and revised definitions, coordinating with staff at High Steel.
- Phil Sauser and Art Bustos will review existing definitions for consistency with AISC and ASQ terminology.
- If a term is not found in either reference, the current language will remain.

Discussion of Specific Sections

Sections 5.6.2 and 5.6.3 – NCR Submissions

- Heather's comment: "Review and confirm the Fabricator's proposed methods of repair and description of the existing material condition" appears twice (once in each section).
- The group discussed whether the more detailed version in 5.6.3 should replace the shorter one in 5.6.2.

- Heather suggested instead adapting Section 5.6.2 as commentary to accompany Section 5.6.3.
- Jamie recommended that both sections be reviewed and revised for consistency.
    - TODO: Heather Gilmer and Robin Dunlap will review these sections and suggest updates to address the original comment.

Section 6.3 – Owner Permission

- Review of Heather's related comment was deferred to a future meeting.

Section 7.2.1

- TODO: Heather will review this section and propose revised wording.

Section 7.2.3 – Signoff on MTRs (Mill Test Reports)

- Discussion focused on timing of MTR submission.
- In some cases, MTRs are provided after fabrication begins, particularly when work is staged.
- Ronnie expressed concern with the phrase "prior to start" under these conditions.
- Jamie proposed simplifying the text to:

*"The Owner's Inspector shall…"*
*followed by the list of required actions.*

- Heather recommended shortening the second bullet, but Terry cautioned against removing too much detail.
- Ronnie reminded the group that the document should reflect best practices, not state-specific procedures.
- The group agreed to remove the second half of the sentence and move additional context to the commentary section.
    - TODO: Jamie, Matt and Tereasa Michalk will assist with these edits.

Section 7.2.3 – Identifying Mark Placement

- Decision: move this bullet from mandatory text to commentary.

Section 7.2.3 – Buy America Commentary

- Decision: delete the commentary regarding Buy America and remove reference to aluminum, as it was deemed unnecessary.

Section 7.2.9 – Distribution of MTRs

- Decision: revise to include “Owner or Owner’s Inspector” to cover both possibilities for submittal.

Section 7.6.2.1 – Radiographic Testing (RT)

- Heather raised whether recommendations in this section were directed toward fabricators rather than inspectors.
- The group confirmed that S4.3 is written for inspectors.
- Terry noted this topic is covered elsewhere and, if retained here, should appear in commentary form with generalized language.
- The group also discussed that many inspectors do not witness RT firsthand, since it is often completed before their arrival.
- A suggestion was made to include conditional language such as “if witnessing” where applicable.
    - TODO: Jamie and Phil Saucer to edit.

Section 7.7 – Fastener Testing

- The group recommended expanding this section and commentary to include distributor testing and related cases.
- It was noted that some Owners require independent sampling and testing of fasteners.
    - TODO: Art Bustos will investigate and propose commentary additions.

4. G4.2 – Guidelines for the Qualifications of Structural Bolting Inspectors – (11:30 AM - 11:50 AM) start addressing new business from the AASHTO COBS ballot comments.

Review of Previous COBS Comments

- Jamie led the discussion of comments received during the previous COBS review. A recurring point of confusion among reviewers was the document’s use of “should”

and “shall.” Several comments reflected uncertainty about whether the document was intended to function as a formal specification or as guidance. The group clarified that while the document has a specification-like structure, its purpose is to serve primarily as guidance.

- Some state DOTs prefer a degree of flexibility rather than prescriptive requirements, and the document’s organization accommodates that approach. Ronnie Medlock suggested that commentary sections could be expanded to provide additional technical detail or examples, thereby satisfying agencies seeking more explicit direction without changing the main body of the text.

Section 3.3 – Experience Requirements

- The group discussed the experience requirements in Section 3.3, focusing on who is authorized to certify experience and whether such certification should have an expiration date. The consensus was that no expiration period should be imposed.

Section 4.1 – Requalification and Retesting

- The group reviewed Section 4.1 and agreed that inspectors who perform their work regularly should not be required to undergo periodic retesting. The intent is to avoid imposing requirements similar to those applied to welders, since this document applies specifically to inspectors. The section was revised to clarify these points and provide additional explanation of qualification expectations. These updates address comments submitted by Doug Cantrell (NYSDOT).

Section 5.4.3.1 – Determining Gaps

- The group agreed that a PIV (Pre-Installation Verification) test is not necessary for determining gaps. Accordingly, the related language will be removed. The commenter had referenced “Appendix A” without specifying a document; the group determined this likely referred to an older edition of S10.1. The corresponding sections no longer exist in the current edition. This comment was submitted by James Corney (Utah DOT).

Section 5.4.3.2 – Snugging

- Since PIV testing is no longer performed for DTIs, the comment related to snugging is no longer applicable. (Comment from James Corney, Utah DOT.)

Section 5.4.3.3 – Avoiding Redundant Requirements

- The group agreed that the document should not repeat existing requirements; therefore, no action will be taken in response to this comment. (Comment from James Corney, Utah DOT.)

Other Discussion

- It was noted that bolt installer qualification and training requirements are now covered under the updated RCSC Specification. The group agreed to wait for the next edition of RCSC to be published before considering any further changes related to these provisions. This would include adding the "combined method" to the Body of Knowledge. Should also consider adding a reference to the AASHTO LRFD Steel Bridge Fabrication Specifications Annex A – Common Provisions for Bolted Connections.

5. New Business/General open discussion (11:50 AM – Noon)

Next Steps and Coordination

- A virtual meeting will be scheduled to discuss remaining S4.3 comments once several of the assigned action items have been completed. Chris will provide periodic reminders to Jamie to help coordinate this session.
- The group discussed reestablishing a joint meeting with other Task Groups to address guidance related to bolting installer qualifications. It was noted that RCSC has developed training videos covering these topics, which are currently in post-production editing.
- Terry Logan cautioned against introducing overly prescriptive requirements and questioned whether a formal document specific to bolt installers is necessary within this group's scope.

6. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 8 Corrosion Protection

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This Task Group primarily focuses on the functions, operations, requirements and activities needed to achieve consistent quality in steel bridge corrosion protection systems. At the same time the group acknowledges the need for a cooperative approach to quality, where the Owner's and Contractor's representatives work together to meet their responsibilities, resulting in efficient steel bridges coatings that meeting all contractual requirements.

**Task Group Leadership**
**Chair:** Johnnie Miller - KTA-Tator, Inc.
**Vice Chair:** Derrick Castle - Sherwin Williams

**Meeting Summary: 10/22/2025 (1:00 PM - 3:00 PM CT)**

1. Chairperson's Welcome (1:00 PM – 1:10 PM)
    a. Approval of Previous Meeting Minutes.
2. Update of S8.1 document (1:10 PM – 1:15 PM)
    a. Chris provided a quick recap of the document balloting process. The document has been presented at AASHTO Steel and metals and is in their hands. Heather added that it was balloted through AMPP.
    b. Chris provided an update on the baseline testing that is underway with KTA Tator
3. Review S8.2 (1:15 PM – 1:45 PM)
    a. Jeff and Heather Gilmer went through the major changes to S8.2 and any significant changes are noted in the google document which will be reflected in the version that goes to ballot with TG8.
    b. A task group was formed to investigate and recommend changes to the document related to the bend test that Geoff Swett brought up. Jeff will organize a virtual meeting to discuss. The group consists of: Brad Dillman, Heather Gilmer, Brad Streeter, Kara Lorenz, Geoff Swett, Jason Stalnaker, and Teresa Michalk.
    c. After resolution is found related to the bend test discussion, a version of the proposed changes will be sent out for ballot to TG8 via specbuilder.

4. Review G8.4 (1:45 PM – 2:20 PM)
    a. Derrick provided an update from Alana Fossa regarding the progress of G8.4.
        i. UWS/50CR (Oct 1): met to discuss the overlap with UWS reference guide. Overall this section is going to refer to the NSBA Reference guide for Uncoated Weathering Steel. Jeff introduced the suggestion that Jennifer McConnell had about adding a general section to cover general recommendations for all bridge regardless of coatings. Ronnie, and the group, agreed that this is a good idea.
        ii. TSZ (Oct 3): trying to work around the status of CS-23 and S8.2. Will use the 2019 draft of CS-23, and latest draft of S8.2 as their references. Group will begin meeting monthly (Nov 12 next), and will focus only on items that are metallizing specific (avoid overlap with liquid coatings sections, except as noted).
        iii. Liquid Applied Coating (n/a): did not meet due to an issue with teams meeting (likely an issue on my end). Need to reschedule, but they are set with an agenda, etc.
        iv. HDG (Sept 29): document is in good shape, but it took us most of the meeting just to catch up on where the group left off. We are mostly gathering additional images and figured out how to clean up the comments we had already addressed or have since been addressed in S8.3. At our next meeting in Nov 20, we will start working through any final (but relatively few) remaining comments.
5. Update of Uncoated Weathering Steel guide - Tom Murphy (2:20 PM – 2:50 PM)
    a. Tom provided an update with a ppt. This document is going to be absorbed by TG8 as the FHWA will not be updating the FHWA Technical Advisory.
6. Open Discussion(2:50 PM – 3:00 PM)
    a. Jeff shared the updated relative cost of corrosion protection survey
    b. Randy Harrison asked if anyone had been instructed not to install studs prior to galvanizing, and whether alternatives were provided to prevent galvanizing of the top flange or if grinding was required to install the studs.
7. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 9 Bearings

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This Task Group is specifically responsible for the creation and maintenance of guidelines and best practices for steel bridge bearings.

**Task Group Leadership**
**Chair:** Michael Culmo - CHA Consulting, Inc.
**Vice Chair:** Ron Watson - RJ Watson, Inc.

**Meeting Summary: 10/23/2025 (8:00 AM - 10:00 AM CT)**

1. Chairperson's Welcome (8:00 AM – 8:10 AM)
    a. Approval of Previous Meeting Minutes.
2. Old Business (8:10 AM - 9:30 AM)
    a. Discussion on draft provisions for bearing maintenance.
        i. Mike summarized the intent of the new document and that it will be a new chapter to be added into G9.1.
        ii. Mike reviewed the current table of contents with the group.
        iii. Mike skimmed through the document to give the group an idea of what is included in the document.
        iv. He asked for volunteers to write various sections of the new document and he took notes on volunteers directly in the document.
        v. Brian Atkinson volunteered to review the FHWA training for bridge bearing inspection and see if there is anything in that training that could fit into this section.
        vi. Target May 2027 to get the first draft to Chris for Collaboration balloting. Then sent to AASHTO by September 2027.
        vii. Mike is requesting that the initial writing assignmetns are done and sent to him by end of February 2026.
    b. Discussion on draft document for large movement deck expansion joints

i. Mike reviewed the purpose for this document and what is planned to be included in the document.
ii. He went through the table of contents and discussed with the group about what is to be included in the document.
iii. Mike asked the group if we are biting off too much to be working on both documents. Ron didn't think that it we were doing too much and should continue.
iv. Mike asked for volunteers to write certain sections and took notes direclty in the document.
v. Target May 2027 to get the first draft to Chris for Collaboration balloting. Then sent to AASHTO by September 2027.
vi. Mike is requesting that the initial writing assignmetns are done and sent to him by end of February 2026.

c. Mike is requesting that everyone who is writing sections for both documents should email him the text so he can maintain the proper formatting of the word document.
d. He would like to use Bluebeam for reviewing the document and he will add everyone who is currently writing/reviewing to a new bluebeam session.

3. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 10 Erection

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group develops guidelines and specifications that establish and define the basic, minimum requirements for the transportation, handling and erection of steel bridge components to ensure safe steel erection as well as quality and value in the completed bridge structure.

**Task Group Leadership**
**Chair:** Brian Witte - Parsons
**Vice Chair:** Jason Stith - Michael Baker International

**Meeting Agenda: 10/23/2025 (10:00 AM - Noon CT)**

1. Chairperson's Welcome (10:00 AM – 10:10 AM) [done]
    a. AISC Antitrust Policy and Meeting Code of Conduct. [done]
    b. Introductions (as needed). [done]
    c. Approval of Previous Meeting Minutes. No comments, approved.
2. Brief introduction of proposed G10.2 document (10:10 AM – 10:35 AM)

    a. **Witte**: review of the intent of the document for new attendees. TG10 has had S10.1 for a long time and is written in spec language. G10.2 was conceived to provide more explanation and guidance for obervation of girder erection in the field: what is noteworthy, problematic, regular behavior, etc. Audience is field staff performing inspection who should know basic bridge terms (not for the engineer).

    Review of schedule that was set in 2024: final draft was due for end of 2025 – unfortunately not ready for ballot. Will need to update for realistic goals.

    b. **Co-branding Document with AASHTO and NSBA:** Does this guide need to be co-branded with AASHTO?

- **Russo**: could set a precident to undermine past efforts, cobranding adds weight of AASHTO, i.e. is "S" for cobranding, "G" for NSBA;
- **Stith**: differentiate between recommendations (Cobrand) and general information (NSBA).
- **Open discussion**: owner's perspective – document is valueable whether cobranded or not – if the information is good, it will be used. NSBA was formed to create consensus documents, what cobranding shows is who has looked at it and reviewed it, and to the point of the committee existing.
- **Garrell**: there are contractural agreements set in place if it is published by NSBA coming from this group. Based on how the document is intended to be used, in the field on a project, it makes more sense to have it go through the full review by AASHTO.
- **Witte**: Will go forward with the full review process based on discussion and co-brand the document.

3. Summarize interim meetings of G10.2 development since Spring 2025 (10:35 AM – 10:40 AM)
    a. **Witte**: have had 6 interim meetings, efectively monthly, with great participation. Group created 300 pages of content including 212 pages of examples. Please let Brian know if you have not seen the document yet. Intention of small group was to establish the overall architecture.

    *Models and graphics*: Authors requested to submit in native format for archiving by NSBA so that they can be updated or modified in the future as needed – they can be in whatever form you have them. Photo permission forms: need one for each photo; Witte to setup folders on Sharepoint site to house

    **Garrell**: will review to see if there are concerns with current format of graphics, to help keep in front of it, and provide guidance.

    *Comment Resolution*: have yet to close the comment loop with the authors. Witte accepted many changes that were clear or editorial, but many remain that need to be reseolved between the authors and the reviewers.

*Small group review*: some sectinos reviewed in more depth than others. This will be the focus for the remainder of the meeting (see bullet 5 below).

4. Review and discuss proposed schedule for G10.2 reviews and publication (10:40 AM – 10:45 AM)
5. Review comments from small group and TG10 members (10:45 AM – 11:45 AM)

    a. ***Document Size:*** Is this too big?

    - **Jeck**: Not too big; it's apparent that people using the manual will pick out the sections they need.
    - **Russo**: it is all in here because it has value.
    - **Stith**: present counterpoint - there are some spots where it is written for the wrong audience and may need some clean up where something could be removed.
    - **Conclusion:** Review all sections and clean up for audience, but leave repeated sections since it will not be read as novel, but rather a reference manual.

    b. ***Repetition of sections:*** seems to be repetition bewtween sections (3, 5, and 6 in particular), look for ways to combine things.

    - **Russo**: maybe extended deadline is helpful: have a person who hasn't written too much of the content do the edit review of the document for tone, conherence, and consistency. The post-meeting version of the document is the one to be reviewed and will be distributed,
    - **Cisneros**: younger engineers outside of NSBA group would be good to review as the intended audience.
    - **Coletti**: will help Russo with review.
    - **Witte**: look at titles, content looking for a home, arrangement of sections. *Bearings*: in 3, in 5.4, in 6.1 which looks rife for consolitiation.

    c. ***Reinforce best practices for Section 4 examples****:* some look good, but some need work.

- **Orton**: had added lots of things to consider as “should do” practices, should we cut those out?
- **Witte**: Clarified that “Best Practices” refers to layout and formatting of the content in Section 4 and not best practices in the field.
- **Stith**: but if this is intended to be used as a read what you need, then it might be best to repeat it different sections.
- **Davidescu**: And if going that way, have more descriptive titles.

**d.** ***3.9.3 conflict with AASHTO*****:**

- **Orton**: wasn’t aware of the requirement, but shoring elevation should be dependent on your fit condition.
- **Crampton**: this does appear to be different than what is being recommended in our document. Make sure reviewers pay attention to this.

e. ***Section 5 content*****:** can we move this into 6? Or can 5 be turned into measurement templates in Appendix?

f. ***6.1.2.5 misplaced*****:** should this be moved? Does not read like it belongs there or it need much more information.

- **Davidescu**: move to shoring and just have it as an extention of that.
- **Witte**: there is more jacking than just at shoring, could be in other directions and locations.
- **Orton**: is jacking an observation? Is it just good to state that an inspector should expect to see jacks?
- **Witte**: if you are erecting girders, then there are jacks on the project. But there is also certainly missuse of jacks. Need reminders that something that might look off is not necessarily a problem and jacking can be misused too.

g. ***Definitions*****:** we need a section for this. Should follow AASHTO convention, but there are other coloquial terms used, like the “steel dances.”

- **Davidescu**: could put definitions to the side in a commentary column.
- **Witte**: would be big formatting undertaking, additionally, this document is all commentary, not spec with commentary to the side.

h. ***Doust comments based on review of entire document*:**

- **Doust**: 2 main issues – (1) remaining comments – need consensus between writer and reviewer. *2.1.4*: section is missing, review recomends adding a section. Comments like this need time and may not be resolved immediately.
- **Witte**: it is also possible that this will resolve itself with the complete document review.
- **Doust**: (2) request for modification to figures.
- **Witte**: make sure we are following Best Practices style guide.
- **Russo**: all software output looks different, so it is what it is in most cases.
- **Coletti**: Witte can scan comments and flag critical prior to Coletti and Russo reviews. Some onus back on the reviewers to reevaluate the comments based on the most recent version of the document.

**i.** ***General discussion: handwringing on the review process…***

6. Open discussion for other topics (11:45 AM – Noon)
   - **Coletti**: for the record, the TG is not behind schedule. This is the process and based on experience the TG has done an amazing job!
   - **Witte**: many thanks to the authors and reviewers.
   - **General discussion**: Reminder of who the target audience it, all sections seem to be appropriate. Comment about taking out some isometric images – remember that these can be very helpful for the younger engineers who may not have the whole picture in their heads as well as the TG does. Please consider leaving them in the document – there is room for both. PennDOT volunteers to page through this after the Russo/Coletti review with their inspectors to provide another outside persepctive.

     *Should plate sizes be included in Section 4*: open for debate. Don't have to decide today.
7. Adjourn [12:55]

# AASHTO/NSBA Steel Bridge Collaboration

## TG 11 Design

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group aims to develop and maintain consensus guidelines to assist with the design of steel bridges and their components.

**Task Group Leadership**
**Chair:** Brandon Chavel - AISC
**Vice Chair:** Domenic Coletti - HDR

**Meeting Agenda: 10/22/2025 (1:00 PM - 3:00 PM CT)**

1. Chairperson's Welcome (1:00 PM – 1:10 PM) – start at 1:05 local
    a. AISC Antitrust Policy and Meeting Code of Conduct. [ done]
    b. Introductions (as needed). [done]
    c. Review of mission statement and current efforts
    d. Approval of Previous Meeting Minutes. [done – approved and seconded]
    e. announcements:
        i. IBC June 15-17 in National Harbor, MD. Abstracts are open until October 24th.
        ii. NASCC: Georgia World conference center. Reminder that there are registration stipends for owners to attend. Highlighted the WSBS workshop including bolting demonstrations and virtual welding stations. GA will have a featured owner session
        iii. Student Steel Bridge competition update for 2026. Always looking for volunteers. This is great workforce development opportunity.
        iv. NSBA Prize bridge awards are due October 30, 2025.
        v. Looking for bridge articles for MSC! Something that highlights use of steel for bridges are always welcome.
        vi. Last meeting Ted Zoli discussed deck removal and girder buckling. Helwig has put together a research statement (still under review). Notes from N.

McCombs: concern is real world conditions during construction; look at stiffening strategies; there is a period between interim and final status that may not be captured by current analysis recommendations; conditions well below yield state; web stabilization with additional stiffeners; other

**Saeed**: how we can be sure that web buckling (web failure) caused the failure? The pictures seem to show flange failure. **B. Chavel**: we are not sure, that is the point of the submitted research plan. **K. Frank**: this is vertical flange buckling that comes from having a very slender web. This can't be prevented by vertical stiffeners. Web does not support the flange at this condition. TH: the deck is the compression zone. It is a complex stress transition and there may be a host of things that we could do to prevent it. **M. Culmo**: AASHTO committee is looking into this too. Many states don't even require analysis. We need to talk to the owners that this should be a concern for them. **R. Jeck**: confirms his analysis of these problems show that the web support at the flange is not there, it is effectively an unbraced flange. **F. Russo**: girder is now in partly composite configuration with heavy concentration construction loads in proximity. **D. White**: Coopers work in 67 and 68, Owen 70 – experiments showed bucking of the flange into the web. They all showed reaching the yield moment before the buckling of the flange. Running an eigenvalue on this in a model is a good start, but if one runs a full FEM it will show much more complex behavior post buckling. **Bob C.:** this is great! **Open discussion**: there are a variety of possible funding sources to leverage.

2. Presentation (1:10 PM - 1:45 PM)
    a. TBD [n/a]
3. Guidelines for the Design of Cross Frames & Diaphragms (1:45 PM - 2:00 PM)
    a. Balloting process and comment discussion

    Chavel: update on ongoing effort. Thanks to members of TG11 who reviewed

and commented on the ballot! Comments were addressed by Chavel and Coletti. Main committee ballot was put through in July with additional comments. Gilmer went through with a big scrub that really helped improve the doc. AASHTO comments addressed by early Nov with responses before end of the year. In Jan 2026 will present responses to any major comments.

4. Phased Construction & Widenings (2:00 PM - 2:45 PM)

   Chavel: brief reminder of why the document was established. Last meeting reviewed the topics and organization of the proposed guide. This is volunteer effort, looking for volunteers to write the sections.

   a. Review organization of topics

      *i.* Review of volunteer assignments

      *Review of word document with the list of topics, see document.*

      **General Comments**: add integral bridge considerations to "other"? Have a specific section on long-narrow girder bridges? Add staged construction – cross-frame fit and differential deflection to skew and curved girder section. **F Russo**: this is derivative of some topics in other NSBA documents. Maybe we move a block of text from one of those documents to this one. **Chavel**: yes, but not to the extent needed. We can reference and not rewrite, but need everything in one spot. **Coletti**: is there a discussion on how to match existing geometry? **Chavel**: yes, under widening. **Cheng & Culmo**: add barrier design for temporary overhang (MASH compliance).

      *Assignments made in the word document*

      ii. Brainstorming on various topics and document needs

      First draft by end of January. 1-2 months for first round of reviews. Chavel will collect the sections and send them out. Will work from a shareable drive. Will mimic cross frame process.

5. Open Discussion (2:45 PM - 3:00 PM)

a. Design issue discussions

**M. Culmo**: bolt holes in tension flanges – research is going well

**D. White**: NCHRP 12-128 – curved girder topics, led Don know if you have any comments.

**Chavel**: standard plans for steel bridges, open discussion for comments. Fabricator members have been giving them to contractors for pricing. **Culmo**: very useful, looking forward to SIMON release. **A. Ream**: steel bridge design handbook being updated by HDR; under review and hope to be out by the end of 2025. Merged filed splice design as well as tub girder design and stability design. Examples are all updated as well. **Chavel**: two other documents in the works: grade crossing guideline document – in final review – and working with Valmont on press break tub girder design guide. **Culmo request**: change transition locations from dimension from left to a % of span. **Russo**: new input form for cross frame spacing. Grubb working with the software company to check the SIMON code and eventually they will give it to frank to rerun the standards to check for how the updates affect them.

**Jerry S.**: looking for guidance for sign structures attached to the facial of the girder.

**D White**: given standard plans, do the girder designs really need to change that much for skew? Asking about up to 60-degriees. **Chavel**: no, but cross frames will change. In NSBA presentations, discuss good to start with the standard plans still and then use those for refining analysis. **Saeed**: what is the target D/C ratio? **Russo**: the answer is 1.0, but they vary based on the needs of the design. If an owner needs something different, use your PE and adjust the design. These are only a starting point.

**K Frank**: considering tabulated bolts table and angle eccentrically loaded in compression. Would it be useful to have in the bridge industry? **General discussion**: currently use the AISC as a starting point, so would be good to have AASHTO version. What is the format that would be convenient? Spreadsheet

for pulling into other design tools or PODF table would both be good. TG11 supports the initiative.

6. Adjourn [2:45pm Central]

# AASHTO/NSBA Steel Bridge Collaboration

## TG 12 Design for Constructability and Fabrication

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group primarily focuses on addressing the questions that have been and are continually asked concerning the constructability of steel bridges according to the latest practice for steel mills, fabrication, detailing, erection, and design.

**Task Group Leadership**
**Chair:** Russell Jeck - GZA GeoEnvironmental Inc.
**Vice Chair:** - TBD

**Meeting Agenda: 10/22/2025 (9:00 AM - Noon CT)**

1. Chairperson's Welcome (9:00 AM – 9:15 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct. Done.
    b. Introductions (as needed). Done. Approximately 50 attendees total.
    c. Approval of Previous Meeting Minutes. Done.
2. Chesapeake Bay Bridge - Accelerated Construction Presentation by George Patton of H & H (9:15 AM - 10:15 AM) Done. Very interesting presentation. New exodermic deck. Complex constructability. Many questions afterwards.
3. Brooklyn Bridge - Damage from Ship Collision by Russ Jeck (10:15 AM - 10:45 AM) Done. Most of damage from the mast of the tall sailing ship collision was to the steel traveler system suspended under the bridge deck. There was minor damage to the bridge deck system. All damage will be repaired. Russ noted that trucks are not allowed to drive over the bridge due to posted 3 ton weight limit. Russ also noted that the structural floor system of the existing bridge is composed of relatively "light" built-up members.
4. Break (10:45 AM – 10:55 AM)
5. Future Items for Consideration in Next Document (10:55 AM - 11:30 AM)
    a. AASHTO Cross-frame bracing requirements for strength and stiffness during deck replacement

- If half-width deck is removed for replacement, and the remaining half of the deck continues to carry live load, the center cross-frame experiences significant differential deflection. Half of the bridge is composite and the other half is non-composite. Significant cross-frame forces occur in order to stabilize the non-composite girders against buckling and accommodate the differential buckling.
- Todd Helwig commented that the appropriate load factor to use for dead load is 1.25, not 1.40 (as Russ was requested to use by an Owner).
- Frank Russo commented that stability of the non-composite girders is not an issue as they are connected to a rigid half-deck, and that the concern should focus solely on the differential deflection.
- It was noted that the non-composite girder closest to the deck removal line can experience significant live load transfer from the traffic running on the adjacent half-deck.
- Karl Frank commented that excessive cross-frame forces during partial deck removal/replacement can be mitigated by strategically removing cross-frame diagonal members in the bay near the concrete removal line.
- Brandon Chavel noted that TG11 is addressing this in their cross-frame design guide, which will include phased construction including partial concrete deck removal/replacement (including appropriate load factors to use).
- Don White commented that the upwards rebound of the girders when the deck is removed could be considered a locked-in force, and if so, has a load factor of 1.0.

On a separate topic - Deck overhang brackets used to support concrete deck forms impart lateral load and rotation on the exterior girders. Kansas DOT uses a 1% rotation limitation on the exterior girder which is considered reasonable/appropriate. Russ suggested that this 1% limitation be stated in the design guide being developed for overhang brackets.

Russ stated that recent AASHTO 10th Edition updates may necessitate an update to our G12 document that was published a couple years ago. Frank Russo and Brandon Chavel said this is likely prudent. A discussion of this is being included in the cross-frame design guide being developed , so referring to it is likely a good option.

- Domenic Colleti mentioned that bolted field splice design/detailing recommendations should be included in the G12.1 document. Currently it is not. It was previousely discussed for inclusioon with Christina.

6. Open discussion - Designing for Future Needs (11:30 AM - Noon)
7. Adjourn Ended meeting at 11:40 am.

# AASHTO/NSBA Steel Bridge Collaboration

## TG 13 Analysis of Steel Bridges

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group focus has been the development of guidance on the issues related to steel girder bridge analysis and to educate Engineers so that they can better make decisions for their own projects.

**Task Group Leadership**
**Chair:** Deanna Nevling - HDR
**Vice Chair:** Francesco Russo - Russo Structural Services

**Meeting Agenda: 10/23/2025 (8:00 AM - 10:00 AM CT)**

1. Chairperson's Welcome (8:00 AM – 8:10 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
        i. Meeting minutes were approved by the TG.
2. General Announcements (8:10 AM – 8:25 AM)
    a. Conferences/Research/Publications
    b. NSBA Update – Brandon Chavel
        i. Brandon provided updates on various new NSBA publications and upcoming work by NSBA. Brandon also noted the Bridge Education efforts related to Steel Bridge Forums as well as the support of the Purdue Bridge Engineering Program.
    c. FHWA Update – TBD
    d. TRB AKB20 (Steel Bridges Committee) Update – Brandon Chavel
        i. Brandon noted that the TRB has undergone some changes and the committee structure has changed. The next meeting is in Januray 2026.
    e. AASHTO Bridge Update (T-14 Structural Steel Design) – Tony Ream

i. Tony updated the TG on the various ballot items that have gone through the AASHTO COBS Steels and Metals committee.
ii. Todd Helwig also talked about changes and improvements that will be upcoming for stability bracinng and lean on bracing guidance.

3. "Fern Hollow Collapse Analysis," Frank Armont (8:25 AM – 8:55 AM)
    a. Frank spoke about the analyses of the Fern Hollow bridge, explaining how the bridge collapsed. This included discussions on the field investigation, global static analysis, global collapse analysis, local analysis of the SW Column Leg, and the conclusions from the analysis. Analysis included models with section loss for the column leg. Section loss was based on 3D scan data of the members. Material stress-strain behavior based on FHWA test data for yield, ultimate, and fractiure.
    b. General conclusions included:
        i. Severe corrosion at base of frame leg was the most significant contributor to the collapse.
        ii. Global analysis used to determine demands at time of failure
        iii. Global collapse anaklysis was used to conform post-collapse bridge behavior assuming leg failure matched field observations.
        iv. Failure modes in the local and global aanalysis models were consistent with field observations.
    c. Local analysis conclusions included:
        i. Failure of the tie at the base of the leg would precipitate the collapse of the bridge
        ii. Alternate load path exists thru flange bending, but sudden failure of the tie plate would result in dynamic effects exceeding capacity
        iii. Results are sensitive to section loss and elongation capacity of the tie plate.
4. "Eigenvalue Buckling Analysis - Guidance in the New AASHTO Nonprismatic Steel Gider Design Guide," Don White (8:55AM to 9:25 AM)

a. Don's presentation revewied this new design guide. The deisgn contains 8 examples that address various different design attributes that can be encountered during design.
b. Don noted that the guide is only for LTB design verifications, not all design checks; and serves as a companion to the AASHTO LRFD BDS 10th edition. The guide uses moment diagrams and envelopes from bridge analysis at 1/10 span locations. There are full calculations for each example provided only when Method C (FEA linear bifurcation analysis) is used to obtain the elastic buckling load multiplier. Methods A and B illustrations focused solely on the corresponding elastic buckling load multiplier estimates, then showing just the results of the remaining full calculations.
c. Don also reviewed some of the examples that are part of the guide.

5. G13.2 Guidelines for Steel Truss Bridge Analysis (9:25 AM – 9:30 AM)
    a. Published!
        i. Deanna noted that this new guideline was published earlier this year.
6. Software Validation and Checking Complex Models (9:30 AM – 9:45 AM)
    a. Survey results white paper and MSC article
        i. Deanna briefly highlighted this effort. She will be sending out meeting invites soon to keep working on this effort.
    b. Checklist – review volunteers
        i. Deanna briefly noted that she will be asking for volunteers for this effort.
7. TG13 New Initiatives (9:45 AM to 10:00 AM)
    a. Deanna briefly noted these items below
    b. TG13.1 Updates
    c. Buckling and Global Stability Analyses
    d. Analysis of Arches
8. Adjourn
    a. Meeting adjourned at 9:58 AM

# AASHTO/NSBA Steel Bridge Collaboration

## TG 14 Field Repairs and Retrofits

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This Task Group primarily focuses on providing practical solutions for design and implementation of field repairs and retrofits of existing steel bridges.

**Task Group Leadership**
**Chair:** Kyle Smith - GPI
**Vice Chair:** Nick Haltvick - Minnesota Department of Transportation

**Meeting Agenda: 10/22/2025 (3:00 PM - 5:00 PM CT)**

1. Chairperson's Welcome (3:00 PM – 3:10 PM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
        i. There were no comments on the Spring Meeting minutes, thus approved.
2. TG-14 and G14.3 Overview (3:10 PM - 3:20 PM)
    a. Reviewed the mission statement and G14.1 and G14.2 guideline documents.
    b. G14.3 – discussed the approval process in place. It will not be a traditional Collaboration guideline, but a document that will be on the NSBA website.
3. Discuss G14.3 Detail Sheets (3:20 PM - 5:00 PM)
    a. Providing sample details "as-is" for users to review. Provide commentary on the details.
    b. Status – 1 User Guide is ready for ballot, 6 details ready for ballot. 8 detail sheets have been reviewed, and are awaiting revision. 5 detail sheets will be reveiwed today. 30 details received from DOT survey that need detail sheets to be developed.
    c. Will published when we have about 25 details ready.
    d. User Guide – no additional comments at the meeting
    e. Partial Length Girder Replacement Detail

i. Detailing – this is a custom detail
ii. Installation – Use a check on General contractor only
iii. Adjustability – leave as is
iv. Commentary
    1. Reviewed the comments and walked thru them one by one. In the Bluebeam file, Kyle noted the ones that the TG was in agreement with, and those that were deemed to not be persuasive.
    2. Brian W. – General comment – the commentary is too much. We should reduce it. Try to keep just to the detail as a starting point for engineers.
    3. Mike D. – some of the commentary may be repetitive from detail to detail. Perhaps, it is worthwhile to have some general commentary that applies to all details.

f. Overall Categories – the work Adjustability. Should this be Adaptability? The section needs clarified nonetheless.
    i. Should we use the term field adjustability?

g. Heat Straightening Detail
    i. Reviewed the comments and walked thru them one by one. In the Bluebeam file, Kyle resolved the comments based on input from the TG and made additional notes as needed.
    ii. Commentary should reference the FHWA manual and note jacking simultanesouly while applying the heat is not recommended.
    iii. Note that we may want to add – these are conceptual details that are porvided by an owner, and are to be used as a concept. Designer should evaluate the feasibility of the conceptual detail for their particular project.
    iv. Remove the detail for the crack arrest hole, and remove from the keywords section.

v. Consider additing a comment to inspect for cracks in the flange.

4. Adjourn
    a. Meeting ended at 4:48. Kyle noted some additional virtual meetings will be needed to resolve the comments.

# AASHTO/NSBA Steel Bridge Collaboration

## TG 15 Data Modeling for Interoperability

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This Task Group's primary focus is on facilitating the development of bridge industry consensus standards for data description, modeling, and interoperability for integrated design, construction, and lifecycle management of bridges (i.e. BIM).

**Task Group Leadership**
**Chair:** Aaron Costin - University of Florida
**Vice Chair:** Grant Schmitz - HDR

**Meeting Agenda: 10/23/2025 (10:00 AM - 1:00 PM CT)**

1. Chairperson's Welcome (10:00 AM – 10:10 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
        i. Approved
2. Announcements (10:10 AM – 10:20 AM)
    a. Overview of TG
3. Related Efforts Update (10:20 AM – 10:50 AM)
    a. Pilot projects
        i. FHWA Grants
            1. Iowa DOT
            2. PennDOT
    b. TPF BIM for Bridges Phase 2
    c. NSBA Involvement
        i. Current Working Group: Jessican Wang Caman,Russel Boss, Ben Arcinega Utah Pacific Randy Harrison W&W AFCO, Tom Beam High Steel Structures , Mike Worsh Stupp,
4. TG15 IDM (10:50 AM – 11:20 AM)

5. Data Dictionary Template Overview (11:20 AM – 11:50 AM)
    a. BuildingSMART Data Dictionary
        i. Bsdd
        ii. USDD
            1. Enhances current IFC Model
6. Working Group (11:50 AM – Noon)
7. Adjourn

# AASHTO/NSBA Steel Bridge Collaboration

## TG 16 Orthotropic Deck Panels

Embassy Suites
Little Rock
Room Name: Rock Island 3

**Task Group Mission:** This Task Group aims to establish an Orthotropic Steel Deck (OSD) panel design that can be cost effectively produced in the United States for the bridge market.

**Task Group Leadership**
**Chair:** Sougata Roy - SOCOTEC Engineering, Inc.
**Vice Chair:** Frank Artmont - Modjeski & Masters, Inc.

**Meeting Agenda: 10/21/2025 (9:00 AM - Noon CT)**

1. Chairperson's Welcome (9:00 AM – 9:10 AM)
    a. AISC Antitrust Policy and Meeting Code of Conduct. Done.
    b. Introductions (as needed). Done. 11 people total.
    c. Approval of Previous Meeting Minutes. Approved.
2. 3.General updates and announcements (9:10 AM – 9:20 AM)
    - Currently there appear to be no recent bridge OSDs fabricated in USA.
    - Regarding moveable bridges, steel grid deck is difficult to obtain, so the time could be good for using OSD.
    - Likely need some sort of OSD standard details in order for domestic fabricators to get interested.
    - Current steel tariffs could make it more attractive for domestic fabricators to do OSDs.
    - ISC (Gary IN), Stinger (AZ) and expansion joint fabricators seem to be good potential fabricators for OSD.
        a. Workshop at IBC, 2025 This went good overall. Next step is to potentially present or have a workshop at TRB. TRB is planned to take place on 1/11 – 1/15/26. OSD presentation should be considered for WSBS 2027 conference (Sougata). Also, should be considered to present at North Central States Bridge Consortium (Terry Logan), NSBA Steel Bridge Forums (Duncan Paterson), Moveable Bridge Conference (Keith Griesing), International Cable Supported Bridge Operators Conference (Frank Armont).
3. Review of mission statement: (9:20 AM – 9:30 AM) No comments, so stays the same.
4. Short Span Orthotropic Update (SSSBA) collaboration update (9:30 AM – 9:35 AM)
    - No update since Dan Snyder is not present. Justin Dahlberg also not present.

5. General update on ongoing projects/research (9:35 AM – 9:45 AM)

    - Frank Armont gave a presentation on the development of short (140' and under) span OSD bridge design standard details as part of the recent FHWA research project on Level 1 OSD design. Includes open rib deck, floorbeams, girders, barriers, and construction sequence. Can be hot-dip galvanized if desired. Wearing surface weight included in design. See attached slides.

6. Break (9:45 AM – 10:00 AM)

7. Presentation: (10:00 AM -10:45 AM)

    a. PPC Wearing Surface for Orthotropic Decks – Casey Rafter, VP, Sales, Sika

    - PPC = polyester polymer concrete.
    - Casey is proposing that PPC is an ideal material to be used for the OSD wearing surface. Showed history of use and performance.
    - He made comparisons to ROSPHALT and Epoxied Modified Asphalt Concrete.
    - PPC is cost competitive and claims to perform superior compared to other options.
    - See attached slides.

8. Review of Committee Revised Goals – Next steps. (10:45 AM -11:15 AM)

    a. Targeted presentations (20 minutes each) due date 02/01/24

        i. Owners – Sougata Roy (lead), Terry Logan

        ii. Designers – Frank Artmont (lead), Justin Dahlberg, Keith Greising, Sougata Roy

        iii. Fabricators – Terry Logan (lead), Chris Haberle, Ronnie Medlock

    - Done, as follows. Sougata quickly ran through the Powerpoint presentation (4 hours total) that was given at the IBC conference earlier this year. It covered all aspects of OSD bridge decks including history, fabrication, performance, past issues, welding, cost, etc. It was well received.

    b. MSC Article – Justing Dahlberg (lead), Frank Artmont, Duncan Patterson, Terry, Logan, Ronnie Medlock, Sougata Roy, Tom Murphy – published Article is done and published. It was well received.

    c. Filling the Knowledge Gaps No discussion.

    d. Rough plans for FHWA optional task, Justing Dahlberg – update: This has been done, as M&M has completed the optional tasks.

9. Discussion on State of Practice Synthesis Document (11:15 AM – 11:50 AM)

    a. Review sections

- Sougata reviewed the document outline and schedule for completing this document/guide. He emphasized that this outline has been "hanging around" for years and now needs to be completed.
- Sougata asked Terry Logan about completing the fabrication portion of this document, Terry said he has lost interest in working on this. He also stated that most fabricators are not interested in a long document such as this proposed one.
- Keith suggested we consider changing the focus of the document. Sougata's opinion was that this change of focus is not acceptable, however, a change in volume is acceptable.
- Frank Armont suggested that the document needs to be completed and obtain an AASHTO approval. He suggested that the document is essentially a written version of the Powerpoint presentation recently given at IBC.

b. Monthly webinar meetings schedule

10. Old business and additional discussion (11:50 AM – Noon)

11. Adjourn Meeting adjourned at 12:10 pm.

# AASHTO/NSBA Steel Bridge Collaboration

## TG 18 Duplex Stainless Steel

Virtual

9/30/25, 10:30am – 12:30pm EST

1. **Committee Business (10:30am - 10:50am)**
    a. **AISC Antitrust Policy and Meeting Code of Conduct**
    b. **Introductions of Attendees**
        - Catherine Houska
        - Jason Provines
        - Nancy Baddoo
        - Juan Sobrino
        - Andy Personett
        - Bret Clark
        - Gary Coates
        - Karl Frank
        - Randy Harrison
        - Francisco Meza
        - Peter Ault
        - Ted Bush
        - Heather Gilmer
    c. **Approval of Previous Meeting Minutes**
        - Gary had a question about welding interpass temperature. Jason said they would discuss this during the meeting.
        - Minutes were then approved.
    d. **Review of TG18 Specification Progress and Future Schedule**
        - Creation of six guide specifications for duplex stainless steel. All 6 will be a complete package for bridge owners to use if they desire to use duplex stainless steel.
        - The Duplex Materials (S18.1) and Duplex Design (S18.2) Specs (2 of the 6) are essentially completed and in the process of review/incorporation by AASHTO.
        - The Duplex Bolting and Welding Specification are next in line for completion.
        - Tony suggested that NSBA can promote Duplex Stainless Steel at Steel Bridge Forums. NSBA plans to hold 10+ Steel Bridge Forums in 2026 scattered throughout the country. Jason/Nancy to send Tony two (2) Powerpoint slides for him to use at the Michigan Steel Bridge Forum on 10/8/25.
    e. **S18.1 and S18.2 Cover Design Art**
        - Nancy showed the proposed cover to the specification document with a variety of duplex stainless steel photos during fabrication and installation. The same photos will be used for all of TG18 specifications to indicate that they are a family of specifications. Subtle differences will be made on each cover page to indicate that they are a different specification.

2. **Discuss Duplex Welding Spec (10:50am - 11:30am)**
    - The group agreed to move all handling and lifting procedures for duplex stainless steel from the Welding Spec to the Fabrication Spec to centralize cleaning and contamination control, which is critical given duplex steel's sensitivity to carbon contamination.
    - A clarification was made about wire brushes used for slag removal, specifying wire materials must have corrosion resistance equivalent to the base metal, preferably 316 stainless steel, 2205 duplex stainless steel, or nickel alloy 625, to avoid embedded contaminants causing corrosion or weld defects.
    - The group resolved to refer to D1.5 Bridge Welding Spec for weld undercuts, as these already establish appropriate tolerances and there is no strong evidence that undercuts cause crevice corrosion in bridge applications.
    - For mislocated holes, either weld repair or use of pre-tensioned bolts meeting duplex bolting specs is allowed, with emphasis on pretensioning to prevent moisture entrapment and improve fatigue resistance. A suggestion was made that the reference regarding the pretensioning of the bolt should be to the Design Spec.
    - The post-weld heat treatment limit was increased from 150°F to 200°F to better align with real-world conditions and avoid conflicts with environmental exposure, as highlighted by Gary and Karl.
    - Temporary marking materials like crayons are permitted during fabrication but must be fully removed prior to on-site welding and project completion, following AISC 370 guidance to avoid corrosion and aesthetic issues.
    - The group decided to retain plug and slot welding clauses with the caveat that such welds are only allowed if specified or approved by the engineer, reflecting current bridge code restrictions and concerns about fatigue and inspection challenges. These are also not issues specific to duplex stainless steel, so they need not be addressed in the duplex Welding Spec.
3. **Discuss Duplex Bolting Spec (11:30am - 12:20pm)**
    - The new bolting specification was developed as a standalone document modeled on ASTM F3125 to cover gaps in ASTM A1082 related to washers, lubrication, proof load testing, and tensile strength, aiming for clarity and usability by bridge engineers.
    - The specification will focus solely on imperial units, as supported by Karl and others, because most US and Canadian bridge bolts use inches, and metric introduces complications in thread pitch and tensioning.
    - A firm consensus was reached to require bolting assemblies to be supplied pre-lubricated, as lubrication is critical to prevent galling and ensure proper tensioning, with suppliers expected to provide lubrication and ROCAP test results confirming performance.
    - The TG18 specifications will initially only cover turn-of-nut installation, deferring combined method installation for future editions to avoid delaying publication, acknowledging combined method bolts and testing protocols are not widely available or standardized in the US.

- Feedback from supply chain contacts will be sought to confirm feasibility of requiring pre-lubricated assemblies, with no current objections expected based on supplier experience.
- The scope of the bolting spec will primarily address pretensioned bolted connections, as almost all structural bridge bolts require full pretension.
- Discussions highlighted the need for clear guidance on installation torque and testing, referencing ASTM F3125 protocols where applicable, to ensure field and shop tensioning meet design pretension values.
- The draft currently references ASTM F436 (carbon steel) for washer hardening, which was identified as inappropriate; the group suggested considering the guidance from AISC 370 specifying acceptable low-temperature carburization or equivalent treatments to avoid damage to duplex stainless steel washers.
- There is recognition that duplex stainless steel washers meeting ASTM A240 grade UNS S32205 are commonly used, manufactured by stamping or cutting from sheet stock, and must have hardness higher than bolts while maintaining corrosion compatibility.
- Ted Busch offered to share the exact washer, bolt, and nut material specifications used in past projects meeting Buy America requirements,
- The bolting spec will explicitly require compatibility of all components in terms of corrosion resistance and mechanical properties, ensuring assembly integrity and longevity under bridge service conditions.

4. **Discuss Duplex Fabrication Spec (12:20pm - 12:30pm)**
    - The Fabrication Spec is underway, closely based on AASHTO LRFD Steel Bridge Fabrication Specifications including 2024 and 2025 interim revisions, with supplementary duplex-specific modifications aligning with AISC 370 and IMOA guidelines.
    - The team aims to complete the draft within the next couple of months to accelerate the overall specification package delivery, anticipating the Construction Spec to be shorter and follow later.
    - Integration of the requirements in the Fabrication Spec with the requirements in the Welding Spec is critical, especially regarding maximum heating limits during processes like girder straightening, where temperatures may exceed the 200°F limit agreed for welding, presenting a potential conflict that requires resolution.
    - Expertise from TG18 members will be heavily relied upon to refine fabrication provisions, ensuring compatibility with duplex stainless steel's material sensitivities and welding constraints.
5. **Meeting Adjourned (12:30pm)**

# AASHTO/NSBA Steel Bridge Collaboration

## TG 19 Movable Bridge

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** This task group develops and maintains guidelines for the design and construction of movable steel bridges. The focus is on structurally efficient designs that minimize span weight and integrate effectively with machinery, lightweight decks, and other movable components. The guidelines also address constructability and achieving required machinery fits and tolerances during fabrication and erection. Mechanical and electrical systems are not covered.

**Task Group Leadership**
**Chair:** George Patton - Hardesty & Hanover, LLC
**Vice Chair:** Frank Artmont - Modjeski & Masters, Inc.

**Meeting Agenda: 10/23/2025 (12:00 PM - 1:00 PM CT)**

1. Chairperson's Welcome (Noon – 12:10 PM)
    a. AISC Antitrust Policy and Meeting Code of Conduct. [done]
    b. Introductions (as needed). [done]
    c. Approval of Previous Meeting Minutes. [n/a]

    **Paton**: Jim Philips will provide a summary of NCHRP 10-137.

    **J Phillips**: purpose of NCHRP 10-137 is to develop construction requirements for moveable bridges. The overarching goal is to implement the resulting document as an AASHTO Construction Specification. Project is now completed through interim report number 1 (Task 4 of 11). Initial Tasks, Literature review Key finding: *information needed is not in published documents, information will need to come from sample projects*. Project has no intent to recreate what is already in existing references. Summary for Task 3: proposed research plan has been proposed, and NSBA task group is noted as a stakeholder. Delivery outline is presented and is consistent with AASHTO format.

    Reach out to Jim if you are interested in seeing the details of the outline deliverable being proposed. The study will be focusing on 3 major bridge types:

bascule, swing, and vertical lift, and the most common configurations thereof. The owner questionnaire is still available to anyone who would like to fill one out to help with the project. The acknowledgement and disclaimer for the NCHRP project was presented in full.

*Q&A*: **Patton**: great introduction and opportunity for collaboration with this TG is great. **Carlson**: what is the difference between TG work and NCHRP project, can we establish that yet? **Patton**: that will be the topic for the remainder of our time at this meeting.

2. New committee open discussion (12:10 PM – 12:45 PM)
    a. Goals, objectives and future direction

    **Patton presentation**: develop standard practices, best practicies; also have a goal for education and understanding, leading to an NSBA guide docuemtn. Present a list of talking points:

    *Moveable bridge design*: aknoledge that many of us are using outdated information and practices (examples presented). Disadvanteage include complex fabrication and higher steel cost (others also mentioned). Transition to modern practices in other parts of the world (examples presented). Advantages include simplfied fab and erection, lower steel unit costs (other exaple presented). Visual example of bridges from 2002 (modern) and 2014 (detail intensive) and some European examples with more elegant detailing. Other types of cleaner detailing for trussess (e.g. perforated girders, gussetless).

    *NSTMs*: common on moveable bridges; can we eliminate them? Some strategies are presented. Appear to be oportunities to advantage of load path redundancy.

    *Other Important considerations*: Machine alignment; machine fit and finish; structural steel vs. machiery alignment; structural deformation effects on manhinery; machining of steel framing; machinery component positioning.

    *Types of bridges*: various needs for each type that Phillips discused

    *Turned Bolts*: custom bolting; reduction of bolt tensioning forces; other

considerations (e.g. fitup tolerances for large grips; coatings on faying surfaces; spot facing); strategies to minimize turned bolts. Discuss different types and locations where use of turned bolts could be evaluated.

Survey techniques; purpose and details of survey controls; what are critical dimensions; alignment of DOF; factors that affect alignment; measurments and documentsion; shop procedures; shop machining considerations; typical machine setups and measurements; best practices for machining; machinery fits and shrink fit options; measurements and documentations for surveys; best practices to reestablish shop alignment in the field; relationship between components; effect of structureal deformation on machinery; equalization of live load shoe reactions; erection procedures.

Q&A: **Griesling**: curbs – can't always match MASH, i.e. what are the exceptions/exclusions from AASHTO that are necessary. **Alsion**: presentation covered what the fabricators wanted to discuss; one we didn't mention is wire ropes. **Patton**: NSBA sugested that the goal is to work on the interface between machiner and the structure and not get too outside the scope of steel bridges. **Harrel**: shivs are a large and important part of moveable design and costruction and should be included. **Patton**: don't want to ignore machinery, just don't want it to be the focus. Another topic: what is importance of fit up of rack when there will be field deformations? **Jeck**: racks on a highway bridge are still a heavy lift system with many options for assembly. **Allison**: in light of the NCHRP and existing AASHTO document – should we concentrate on certain topics? **Patton**: can envision multiple outcomes: be consistent with other works; for action items, need team to help with guiding TRB through review, oportunity for much more commentary for theis TG to present good/best practices.

*Next steps*: smaller group interim meetings. Presentation can become the outline for an NSBA document; can use that for assignments. Goal for spring is to have that outline for the next meeting. Looking for volunteers to help with small group meetings to push thing forward. **Artmont**: abovious support for

NCHRP, but can focus on the design side “here is what you need to know for designing a moveable bridge” then after NCHRP publication, start to fill in the knoledge gaps. **Warncke**: Can we start with an analysis document; how to design moeble? **Harrell**: existing documents leave a lot of room for interpretation – think about a pocket combanion giude to the AASHTO document. **Open discussion**: Or even discuss how do ratings work? Don’t get too fancey with load ratings. Teach folks not to get too creative with interpretaion of structural systems. Is there room for seismic considerations? **Chavel**: BP for fabricators is likely the best target. Layout everything you want and then pick the top 15 items as a goal for the TG (looks like 20yrs of work that was just laid out!). Use the focus group to identify those priority topics. Patton: pleasee reach out with interest to work on the TG or the focus group.

   b. Ongoing related work by TRB/AASHTO
   c. Topics for movable bridge design guidelines
   d. Topics for movable bridge construction guidelines
3. Action items and assignments (12:45 PM – 1:00 PM)
4. Adjourn [1:01pm]

# AASHTO/NSBA Steel Bridge Collaboration

## MC Main Committee

Embassy Suites
Little Rock
Room Name: Rock Island 4-7

**Task Group Mission:** The Collaboration Main Committee provides oversight and guidance for all Task Groups. A meeting of the Main Committee will take place at the end of each Collaboration meeting.

**Task Group Leadership**
**Chair:** Ronnie Medlock - High Steel Structures
**Vice Chair:** Natalie McCombs - HNTB

**Meeting Agenda: 10/21/2025 (1:00 PM - 3:00 PM CT)**

1. Chairperson's Welcome (1:00 PM – 1:10 PM)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).

    Ronnie reviewed the origins and purpose of the Collaboration for the new attendees. This is the first time the Main Committee met on the first day of the week.

    c. Approval of Previous Meeting Minutes.

    Minutes were approved.

2. Task Group Reports - Approximately five minutes each (1:10 PM – 2:20 PM)
    a. TG 1 – Randy Harrison (W&W | AFCO Steel)
        - The group is currently working on two guidelines, including updates to G1.1, Approval of Shop Drawings. Discussion focused on whether certain detailing steps add value to the approval process. Randy distributed comments on the draft document to the group for review and discussion this week.
        - New design drawings (approximately six sheets) are being redrawn in AutoCAD, with comments collected and incorporated into the revisions. Geoff Swett reminded the group of issues related to presenting details on

separate sheets, noting that individual details or drawings may need to be sealed or stamped. The topic was tabled for further discussion during the TG1 meeting.

b. TG 2 – Heather Gilmer (Pennoni)
    - The group is working on two documents: the AASHTO Fabrication Specification and G2.2. A draft of the Fabrication Specification was submitted to AASHTO for review, and the task group has addressed several comments received. Discussion centered on check assemblies and owner concerns about potentially losing oversight, as well as match marking practices. This topic was tabled pending further discussion with machine manufacturers.
    - For G2.2, discussions included topics such as improper preheat and member misalignment. The group also plans to reproduce certain drawings in the document for improved clarity.
c. TG 4 – Jamie Hilton (KTA-Tator, Inc.)
    - G4.1, QC/QA Guidelines, is in the final stages of typesetting and awaiting a cover.
    - The group is also developing S4.3, a specification for Owner's Inspectors (third-party firms), intended to help owners incorporate inspection requirements into their own specifications. This document was previously balloted but pulled for further revision. The task group continues to work through comments received.
d. TG 8 – Johnnie Miller (KTA-Tator, Inc.)
    - Johnnie Miller was unable to attend, so Derrick Castle provided the update.
    - The task group has been renamed Corrosion Protection.
    - S8.1 has advanced to the AASHTO Steel and Metals Committee for review. The next focus will be S8.2, Thermal Spray Coatings.
    - The group is also developing guidance on detailing for coatings and understanding how coating systems influence design decisions.

- Additionally, the NSBA Uncoated Weathering Steel Guide has been provided to the AASHTO Steel and Metals Committee for preliminary review, with a target publication date of 2027 (COBS cycle).

e. TG 9 – Michael Culmo (CHA Consulting, Inc.)
   - G9.1 was last published in 2022. The group is developing a new chapter on inspection and maintenance, including sections on repair and replacement. Work has also begun on a new document covering large-movement expansion joints.
   - While small-movement joints are not unique to steel bridges, the group believes guidance is needed on girder detailing, tolerance adjustability, and maintenance access.
   - These topics are particularly relevant for long, continuous-span bridges. Volunteers will be solicited to draft specific sections.
   - A proposal to rename the task group to include the word “Components” was discussed but not approved.

f. TG 10 – Brian Witte (Parsons)
   - TG10 has been holding interim calls to develop G10.1, a collection of 24 case studies covering various plate girder bridge configurations.
   - Approximately 20–30 members are actively contributing, and a Task Group ballot is expected by late 2025 or early 2026.
   - The intent is for this to be published solely as an NSBA document, not through AASHTO COBS.

g. TG 11 – Brandon Chavel (NSBA)
   - G11.1 has been submitted to the AASHTO Steel and Metals Committee for comment. Once comments are reviewed and incorporated, an updated version will be posted in December.
   - The group is also developing a new phased construction guideline and will use the upcoming meeting to identify writers for individual sections.

h. TG 12 – Russell Jeck (GZA GeoEnvironmental, Inc.)

- The committee recently published its Straddle Bent document and is now refocusing on G12.1, ensuring consistency with updates introduced in the AASHTO LRFD 10th Edition.
- This week's meeting will include several presentations and discussions on staged construction challenges and overhang design guidance.
- Coordination between TG11 and TG12 may be beneficial given overlapping topics.

i. TG 13 – Deanna Nevling (HDR)
   - G13.1 was last published in 2019, and G13.2 (Truss Design) was published earlier this year.
   - Current work focuses on a software survey, a white paper, and a Modern Steel Construction article summarizing results.
   - The group is also developing a checklist for evaluating structural analysis software and will host two technical presentations during the meeting.
   - Future work may include a document on arch bridges.
   - Deanna also referenced a recent NCHRP Synthesis Report on Quality Processes for Bridge Analysis Models, which surveyed state DOTs on model review practices.

     NCHRP Synthesis 602 – *Quality Processes for Bridge Analysis Models*

j. TG 14 – Kyle Smith (GPI Construction Engineering)
   - The group currently has two published documents. G14.2 covers height adjustments and jacking.
   - Work is ongoing on G14.3, a database of repair details. Six detail sheets have been completed, with eight more nearing finalization; five will be reviewed this week.
   - Once 20–30 details are ready, the set will be balloted and published as an NSBA-only document (not through AASHTO COBS).

k. TG 15 – Aaron Costin (University of Florida)

- The group continues to collect data in support of an ongoing pooled-fund study.
- This effort aims to develop a standardized set of digital templates, adapted from European examples, to replace earlier Excel-based formats.
- These templates will be populated with data as the work progresses.

l. TG 16 – Sougata Roy (SOCOTEC Engineering, Inc.)

- The task group is developing a slide deck on Orthotropic Steel Decks (OSD) to educate owners and designers.

  Potential presentation venues include NSBA Steel Bridge Forums, NASCC, and Movable Bridge Conferences.

  Recent presentations included:
- Frank Artmont: Standard details for open-rib OSD.
- Casey Rafter (Sika): Polymer polymer-concrete (PPC) wearing surfaces.

  A set of OSD standard plans has been submitted to FHWA, though the public release date is not yet known.

m. TG 17 – Jennifer Pazdon (CAST CONNEX)

- TG17 did not meet this week; Jason Stith provided the update.

  The group is working on three priority topics related to custom steel castings:
  - Production welding procedures
  - Design and FEA analysis methods
  - Specialized NDT requirements for acceptance

n. TG 18 – Jason Provines (VDOT)

- TG18 did not meet in person this week but held a virtual meeting on September 30.
- Both S18.1 and S18.2 are nearing completion of typesetting.

  The group's current focus is on developing welding and bolting specifications, to be followed by a fabrication specification at a later stage.
- A draft of the bolting specification, modeled after ASTM A1082, has been completed.

o. TG 19 – George Patton (H&H)

- This was the first meeting for TG19. The discussion focused on defining the group's future direction and distinguishing its work from that of traditional steel bridge task groups.
- Topics include movable bridge design practices, alignment and fit tolerances, and coordination with the NCHRP construction specification update for movable bridges.
- The group emphasized the need to include maintenance-related guidance, particularly for eliminating outdated details common in older movable bridges.
- Their focus will be on the bridge structure itself, not machinery or electrical systems.
- Potential collaboration with AREMA was recommended. However it should be notes that this is an AASHTO committee and AREMA has its own committee.

3. Other Business (2:20 PM – 3:00 PM)
    a. Publication schedule

    A survey will be sent out to Task Group Chairs to get an update on

    b. Membership / participation discussion
1. Adjourn

# Appendix A - Collaboration Document Status

| Document | Status | Year Completed/Targeted | Task Group | Task Group Name | Document Title |
|---|---|---|---|---|---|
| G1.3.2002 | Released | 2002 | 1 | Detailing | Shop Detail Drawing Presentation Guidelines |
| G1.2.2003 | Released | 2003 | 1 | Detailing | Design Drawing Presentation Guidelines |
| G1.4.2006 | Released | 2006 | 1 | Detailing | Guidelines for Design Details |
| G1.1.2020 | Released | 2020 | 1 | Detailing | Shop Drawings Approval Review/Approval Guide |
| G1.3 | Update - In-Progress | Unknown | 1 | Detailing | Shop Detail Drawing Presentation Guidelines |
| G1.2 | Update - In-Progress | Unknown | 1 | Detailing | Design Drawing Presentation Guidelines |
| S2.1.2018 | Archived | 2018 | 2 | Fabrication and Repair | Steel Bridge Fabrication Guide Specification |
| G2.2.2016 | Released | 2016 | 2 | Fabrication and Repair | Guidelines for Resolution of Steel Bridge Fabrication Errors |
| G2.2 | Update - In-Progress | Unknown | 2 | Fabrication and Repair | Guidelines for Resolution of Steel Bridge Fabrication Errors |
| S4.1.2002 | Archived | 2002 | 4 | QC/QA | Steel Bridge Fabrication QC/QA Guide Specification |
| G4.4.2006 | Released | 2006 | 4 | QC/QA | Sample Owners Quality Assurance Manual |
| G4.1.2025 | Released | 2025 | 4 | QC/QA | Steel Bridge Fabrication QC/QA Guidelines |
| G4.2.2024 | Released | 2024 | 4 | QC/QA | Guidelines for the Qualification of Structural Bolting Inspectors |
| G4.4 | Update - In-Progress | Unknown | 4 | QC/QA | Sample Owners Quality Assurance Manual |
| S4.3 | Update - In-Progress | Unknown | 4 | QC/QA | Specification for Steel Bridge Third Party Quality Assurance |
| S8.1.2014 | Released | 2014 | 8 | Corrosion Protection | Guide Specification for Application of Coating Systems |
| S8.1 | Submitted to AASHTO Steel Committee for Comment | 2026 | 8 | Corrosion Protection | Guide Specification for Application of Coating Systems |
| S8.2.2017 | Released | 2017 | 8 | Corrosion Protection | Thermal Spray Coating Guide |
| S8.3 | Released | 2022 | 8 | Corrosion Protection | Galvanizing Guide Specification |
| G8.4 | New - In-Progress | Unknown | 8 | Corrosion Protection | Detailing for Coatings and Weathering Steel |
| G9.1 | Released | 2022 | 9 | Bearings | Steel Bridge Bearing Design and Detailing Guidelines |
| S10.1.2023 | Released | 2023 | 10 | Erection | Steel Bridge Erection Guide Specification |
| G8.X | Submitted to AASHTO Steel Committee for Comment | 2027 | 8 | Corrosion Protection | Uncoated Weathering Steel Reference Guide |
| G10.2 | New - In-Progress | 2027 | 10 | Erection | Behavior of Steel Bridges during Erection |
| G11.1 | Submitted to AASHTO Steel Committee for Comment | 2026 | 11 | Design | Guidelines for the Design of Cross-frame and Diaphragm Members |
| G12.1.2020 | Released | 2020 | 12 | Design for Constructability and Fabrication | Guidelines to Design for Constructability and Fabrication |
| G12.1 | Update - In-Progress | Unknown | 12 | Design for Constructability and Fabrication | Guidelines to Design for Constructability and Fabrication |
| G12.2 | Released | 2024 | 12 | Design for Constructability and Fabrication | Guidelines for Steel Bent Caps |
| G13.1.2019 | Released | 2019 | 13 | Analysis of Steel Bridges | Guidelines for Steel Girder Bridge Analysis |
| G13.2 | Released | 2024 | 13 | Analysis of Steel Bridges | Guidelines for the Analysis of Trusses |
| G14.1.2021 | Released | 2021 | 14 | Field Repairs and Retrofits | Maintenance Guidelines for Steel Bridges to Address Fatigue Cracking and Details at Risk of Constraint Induced Fracture |
| G14.2.2023 | Released | 2023 | 14 | Field Repairs and Retrofits | Guidelines for Field Repairs and Retrofits of Steel Bridges |
| G14.3 | New - In-Progress | NA | 14 | Field Repairs and Retrofits | Database of Sample Field Repair and Retrofit Details for Steel Bridges |
| G15.10 | On Hold | NA | 15 | Data Modeling for Interoperability | BrIM Process Model Definition for Steel Bridge Erection |
| G15.1 | On Hold | NA | 15 | Data Modeling for Interoperability | Designer/Fabricator Exchange |
| G16.1 | New - In-Progress | Unknown | 16 | Orthotropic Deck Panels | Guidelines for the Manufacture of Orthotropic Decks and State of Practice |
| S17.1 | New - In-Progress | Unknown | 17 | Steel Castings | Guide Specification for Cast Steel Connections |

| Document | Status | Year Completed/Targeted | Task Group | Task Group Name | Document Title |
|---|---|---|---|---|---|
| S18.1 | Submitted to AASHTO Publishing | 2025 | 18 | Duplex Stainless Steel | Guide Specification for Structural Duplex Stainless Steel Bridge Plate Materials |
| S18.2 | Submitted to AASHTO Publishing | 2025 | 18 | Duplex Stainless Steel | Guide Specification for Design of Structural Duplex Stainless Steel Bridges |
| S18.3 | New - In-Progress | Unknown | 18 | Duplex Stainless Steel | Guide Specification for Duplex Stainless Steel - Welding |

# Appendix B - Member Rosters Unofficial (2026 – 2027)

TG 1 Detailing

| First Name | Last Name | Company |
|---|---|---|
| Randall | Harrison | W&W\|AFCO Steel |
| Domenic | Coletti | HDR |
| Brad | Dillman | High Steel Structures |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Yuying | Hu | MnDOT |
| Zane | Keniston | QMC Auditing |
| Frank | Kingston | abs Structural Corporation |
| Dusten | Olds | HDR |
| Eric | Rau | HDR |
| Francesco | Russo | Russo Structural Services |
| Grant | Schmitz | HDR |
| Jason | Stith | Michael Baker International |
| Jonathan | Stratton | Eastern Steel Works, Inc. |
| Enhui | Tan | Minnesota Department of Transportation |
| Brian | Watson | HDR |
| Mike | Wiersch | Stupp Bridge Company |
| Brian | Wolfe | MDTA |
| Gary | Wisch | DeLong's, Inc. |

TG 2 Fabrication and Repair

| First Name | Last Name | Company |
|---|---|---|
| Heather | Gilmer | Pennoni |
| Frank | Adragna | TRC Solutions |
| Art | Bustos | AISC |
| Hannah | Cheng | New Jersey DOT |
| Robert | Connor | Purdue University |
| Donn | Digamon | Georgia Department of Transportation |
| Brad | Dillman | High Steel Structures |
| Jon | Edwards | DOT Quality Services |
| Jason | Gramlick | California Department of Transportation |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Randall | Harrison | W&W\|AFCO Steel |
| Jamie | Hilton | KTA-Tator, Inc. |
| David | Johnson | Industrial Steel Construction, Inc. |
| Zane | Keniston | QMC Auditing |
| Jason | Lloyd | Nucor |
| Kara | Lorenz | High Steel Structures, LLC |
| Ronnie | Medlock | High Steel Structures |
| Teresa | Michalk | Texas DOT Material and Tests Div. |
| Justin | Ocel | Federal Highway Administration |
| Eric | Rau | HDR |
| Sougata | Roy | SOCOTEC Engineering, Inc. |
| Phillip | Sauser | Slim Buttes Structural Engineering Services LLC |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Jonathan | Stratton | Eastern Steel Works, Inc. |
| Brad | Streeter | Scougal Rubber Corporation |
| Enhui | Tan | Minnesota Department of Transportation |
| Gary | Wisch | DeLong's, Inc. |
| Duncan | Paterson | NSBA |

TG 4 QC/QA

| First Name | Last Name | Company |
|---|---|---|
| Jamie | Hilton | KTA-Tator, Inc. |
| Mark | Alexander | NexGen Contracting |
| Art | Bustos | AISC |
| Jose | Capa Salinas | University of St. Thomas |
| Matthew | Conso | Massachusetts Department of Transportation |
| Heather | Gilmer | Pennoni |
| Chad | Hawkins | Infrastructure Consulting and Engineering |
| Robert | Horwhat | TRC Solutions |
| David | Johnson | Industrial Steel Construction, Inc. |
| Zane | Keniston | QMC Auditing |
| Terry | Logan | Atema, Inc. |
| Teresa | Michalk | Texas DOT Material and Tests Div. |
| Anna | Petroski | Atema, Inc. |
| Shawn | Potter | Contech Engineering |
| Phillip | Sauser | Slim Buttes Structural Engineering Services LLC |
| Charles | Smith | Kennedy Fabricating Operations LLC. |
| Jonathan | Stratton | Eastern Steel Works, Inc. |
| Brad | Streeter | Scougal Rubber Corporation |
| Maury | Tayarani | Pennoni |
| Gary | Wisch | DeLong's, Inc. |
| Robin | Dunlap | High Steel Structures |

TG 8 Corrosion Protection

| First Name | Last Name | Company |
|---|---|---|
| Johnnie | Miller | KTA-Tator, Inc. |
| Caroline | Bennett | University of Kansas |
| Kristen | Blankenship | Carboline |
| Jeremi | Day | Corrosion Innovations |
| Jon | Edwards | DOT Quality Services |
| Pete | Engelbert | Job Safety Associates |
| Alana | Fossa | American Galvanizers Association |
| Heather | Gilmer | Pennoni |
| Jamie | Hilton | KTA-Tator, Inc. |
| Zane | Keniston | QMC Auditing |
| Kara | Lorenz | High Steel Structures, LLC |
| Jennifer | McConnell | University of Delaware |
| Ronnie | Medlock | High Steel Structures |
| Teresa | Michalk | Texas DOT Material and Tests Div. |
| Thomas | Murphy | Modjeski and Masters |
| Justin | Ocel | Federal Highway Administration |
| Shawn | Potter | Contech Engineering |
| Brad | Streeter | Scougal Rubber Corporation |

TG 9 Bearings

| First Name | Last Name | Company |
|---|---|---|
| Michael | Culmo | CHA Consulting, Inc. |
| Robert | Brantley | STV Incorporated |
| Domenic | Coletti | HDR |
| Alina | Davidescu | BSC group |
| Zane | Keniston | QMC Auditing |
| Teresa | Michalk | Texas DOT Material and Tests Div. |
| Sougata | Roy | SOCOTEC Engineering, Inc. |
| Frank | Russo | Russo Structural Services |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Brad | Streeter | Scougal Rubber Corporation |
| Michael | Sullivan | CME Associates, Inc. |
| Enhui | Tan | Minnesota Department of Transportation |
| William | Wan | WSP |
| Gary | Wisch | DeLong's, Inc. |
| Ron | Watson | RJ Watson, Inc. |

TG 10 Erection

| First Name | Last Name | Company |
|---|---|---|
| Brian | Witte | Parsons |
| Brandon | Chavel | AISC |
| Robert | Cisneros | High Steel Structures |
| Bret | Clark | Halmar International |
| Domenic | Coletti | HDR |
| Douglas | Crampton | Wiss, Janney, Elstner Associates |
| Saeed | Doust | TYLin |
| David | Fish | Texas Department of Transportation |
| Christina | Freeman | FDOT |
| John | Gast | Consultant |
| Heather | Gilmer | Pennoni |
| Nickolas | Haltvick | Minnesota Department of Transportation |
| Matthew | Hellenthal | Benesch |
| Todd | Helwig | University of Texas at Austin |
| Russell | Jeck | Senior Project Manager |
| Jarret | Kasan | HDR |
| Natalie | McCombs | HNTB |
| Ronnie | Medlock | High Steel Structures |
| Dusten | Olds | HDR |
| Joshua | Orton | Brasfield & Gorrie, LLC |
| Frank | Russo | Russo Structural Services |
| Enhui | Tan | Minnesota Department of Transportation |
| Allie | Wagner | HNTB |
| Douglas | Whittaker | Michael Baker International |
| Brian | Wolfe | MDTA |
| Jason | Stith | Michael Baker International |

TG 11 Design

| First Name | Last Name | Company |
|---|---|---|
| **Brandon** | Chavel | AISC |
| Frank | Artmont | Modjeski & Masters, Inc. |
| Brian | Atkinson | HNTB |
| Francisco Javier | Bonachera Martin | Purdue University |
| Travis | Butz | Burgess and Niple |
| Nick | Cervo | HDR |
| Bradley | Dillman | High Steel Structures |
| Saeed | Doust | TYLin |
| Thomas | Eberhardt | HDR |
| David | Fish | Texas Department of Transportation |
| Barney | Frankl | DOWL |
| Corey | Greco | Hardesty & Hanover, LLC |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Todd | Helwig | University of Texas at Austin |
| Srinivasa | Kotha | HNTB |
| Alex | Lim | Oregon Department of Transportation |
| Natalie | McCombs | HNTB |
| Bryan | Miller | Pennsylvania Department of Transportation |
| Deanna | Nevling | HDR |
| Dusten | Olds | HDR |
| Joshua | Orton | Brasfield & Gorrie, LLC |
| Eric | Rau | HDR |
| Anthony | Ream | HDR |
| Frank | Russo | Russo Structural Services |
| Donald | Shaw | Indiana Department of Transportation |
| Kyle | Smith | GPI |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Jason | Stith | Michael Baker International |
| Brian | Watson | HDR |
| Donald | White | Georgia Institute of Technology |
| Brian | Wolfe | MDTA |
| Domenic | Coletti | HDR |

TG 12 Design for Constructability and Fabrication

| First Name | Last Name | Company |
|---|---|---|
| Russell | Jeck | Senior Project Manager |
| Frank | Artmont | Modjeski & Masters, Inc. |
| Allan | Berry | BCC |
| Travis | Butz | Burgess and Niple |
| Brandon | Chavel | AISC |
| Domenic | Coletti | HDR |
| Bradley | Dillman | High Steel Structures |
| Gregory | Dunn | Michael Baker International |
| Heather | Gilmer | Pennoni |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Randall | Harrison | W&W\|AFCO Steel |
| Todd | Helwig | University of Texas at Austin |
| Natalie | McCombs | HNTB |
| Ronnie | Medlock | High Steel Structures |
| Deanna | Nevling | HDR |
| Dusten | Olds | HDR |
| Duncan | Paterson | NSBA |
| Steve | Percassi | Genesis Structures, Inc. |
| Eric | Rau | HDR |
| Anthony | Ream | HDR |
| Frank | Russo | Russo Structural Services |
| Kyle | Smith | GPI |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Jason | Stith | Michael Baker International |
| Brian | Watson | HDR |
| Donald | White | Georgia Institute of Technology |
| Brian | Witte | Parsons |
| Brian | Wolfe | MDTA |

TG 13 Analysis of Steel Bridges

| First Name | Last Name | Company |
|---|---|---|
| Deanna | Nevling | HDR |
| Frank | Artmont | Modjeski & Masters, Inc. |
| Allan | Berry | BCC |
| Travis | Butz | Burgess and Niple |
| Nick | Cervo | HDR |
| Brandon | Chavel | AISC |
| Domenic | Coletti | HDR |
| Douglas | Crampton | Wiss, Janney, Elstner Associates |
| Saeed | Doust | TYLin |
| Thomas | Eberhardt | HDR |
| Christina | Freeman | FDOT |
| Todd | Helwig | University of Texas at Austin |
| Natalie | McCombs | HNTB |
| Dusten | Olds | HDR |
| Joshua | Orton | Brasfield & Gorrie, LLC |
| Eric | Rau | HDR |
| Anthony | Ream | HDR |
| Kyle | Smith | GPI |
| Gerard | Sova | Hardesty & Hanover, LLC |
| Jason | Stith | Michael Baker International |
| Jeff | Svatora | HDR |
| Brian | Wolfe | MDTA |
| Frank | Russo | Russo Structural Services |

TG 14 Field Repairs and Retrofits

| First Name | Last Name | Company |
|---|---|---|
| Kyle | Smith | GPI |
| Brian | Atkinson | HNTB |
| Travis | Butz | Burgess and Niple |
| Domenic | Coletti | HDR |
| Robert | Connor | Purdue University |
| Douglas | Crampton | Wiss, Janney, Elstner Associates |
| Joseph | Esposito | GPI |
| Heather | Gilmer | Pennoni |
| Hussam | Mahmoud | Colorado State University |
| Natalie | McCombs | HNTB |
| Joshua | Orton | Brasfield & Gorrie, LLC |
| Phillip | Sauser | Slim Buttes Structural Engineering Services LLC |
| Brian | Wolfe | MDTA |

TG 15 Data Modeling for Interoperability

| First Name | Last Name | Company |
|---|---|---|
| Aaron | Costin | University of Florida |
| Jerome | Atchison | abs Structural Corporation |
| Tom | Beam | High Steel Structures, LLC |
| Colby | Christensen | HDR |
| Bradley | Dillman | High Steel Structures |
| Randall | Harrison | W&W\|AFCO Steel |
| Frank | Kingston | abs Structural Corporation |
| Scott | Lecher | HNTB |
| Rob | McKenna | HDR |
| Ronnie | Medlock | High Steel Structures |
| Phillip | Sauser | Slim Buttes Structural Engineering Services LLC |
| Jason | Stith | Michael Baker International |
| Eric | Stone | HNTB |
| Jonathan | Stratton | Eastern Steel Works, Inc. |
| Enhui | Tan | Minnesota Department of Transportation |
| Grant | Schmitz | HDR |

TG 16 Orthotropic Deck Panels

| First Name | Last Name | Company |
|---|---|---|
| Sougata | Roy | SOCOTEC Engineering, Inc. |
| Frederic | Bergeron | CANAM Bridges |
| Domenic | Coletti | HDR |
| Justin | Dahlberg | Iowa State University |
| Karl | Frank | Consultant |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Terry | Logan | Atema, Inc. |
| Ronnie | Medlock | High Steel Structures |
| Duncan | Paterson | NSBA |
| Paul | Tsakopoulos | COWI Consulting, Inc. |
| Frank | Artmont | Modjeski & Masters, Inc. |

TG 17 Steel Castings

| First Name | Last Name | Company |
|---|---|---|
| Jennifer | Pazdon | Cast Connex |
| Nicholas | Altebrando | STV Incorporated |
| Frank | Artmont | Modjeski & Masters, Inc. |
| Carlos | de Oliveira | Cast Connex |
| Karl | Frank | Consultant |
| Heather | Gilmer | Pennoni |
| Jason | Gramlick | California Department of Transportation |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Greg | Hasbrouck | Parsons |
| Dawn | Lehman | University of Washington |
| Ronnie | Medlock | High Steel Structures |
| Thomas | Murphy | Modjeski and Masters |
| Justin | Ocel | Federal Highway Administration |
| Sougata | Roy | SOCOTEC Engineering, Inc. |
| Jason | Stith | Michael Baker International |

TG 18 Duplex Stainless Steel

| First Name | Last Name | Company |
|---|---|---|
| Jason | Provines | Virginia Department of Transportation |
| Ted | Bush | HDR |
| Brandon | Chavel | AISC |
| Gary | Coates | Nickel Institute |
| Karl | Frank | Consultant |
| Stan | Gingrich | Amentum |
| Randall | Harrison | W&W\|AFCO Steel |
| Ronnie | Medlock | High Steel Structures |
| Francisco | Meza | Steel Construction Institute |
| Rim | Nayal | NuScale Power |
| Justin | Ocel | Federal Highway Administration |
| Jennifer | Pazdon | Cast Connex |
| Juan | Sobrino | Pedelta |
| Carmen | Vertullo | Carver Labs |
| Nancy | Baddoo | Steel Construction Institute |

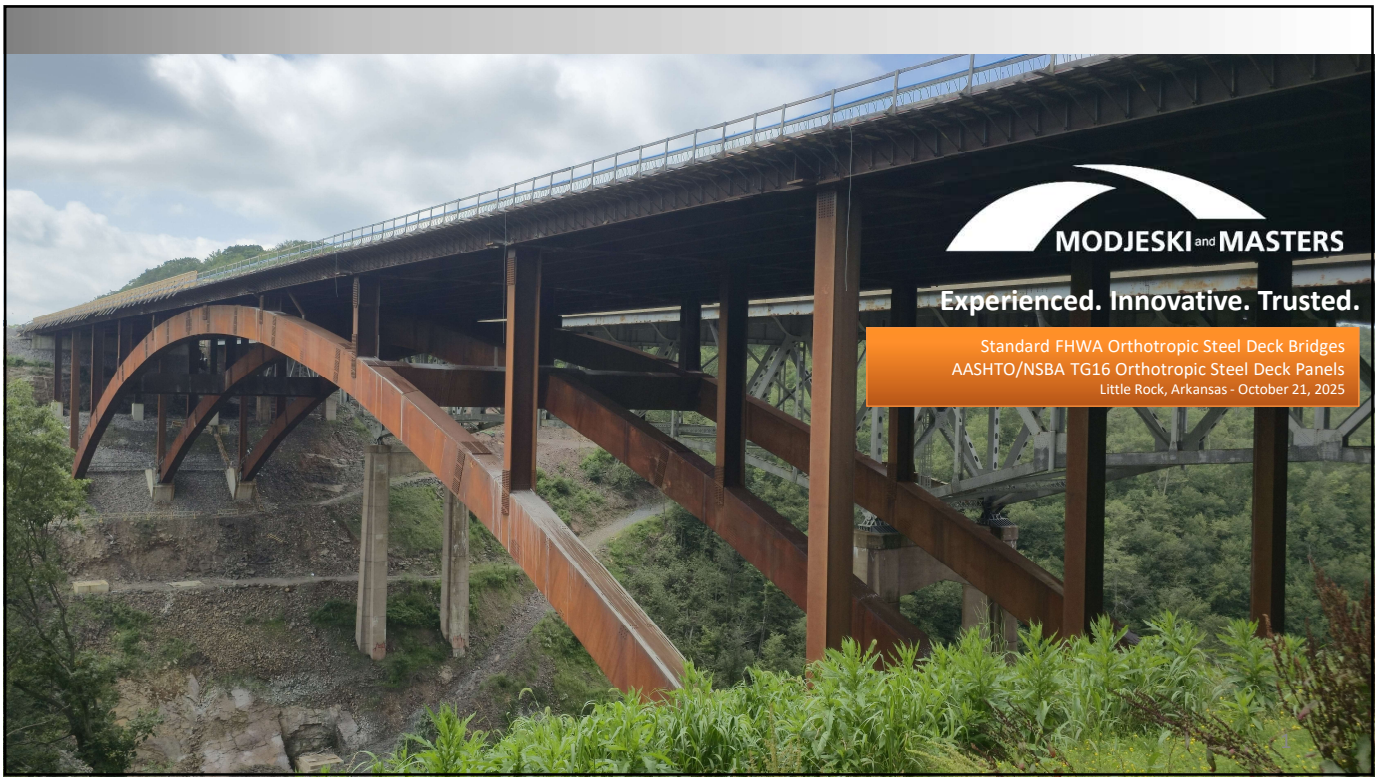
TG 19 Movable Bridges

| First Name | Last Name | Company |
|---|---|---|
| George | Patton | Hardesty & Hanover, LLC |
| James | Alison | Steward Machine Co. |
| Frederic | Bergeron | CANAM Bridges |
| Domenic | Coletti | HDR |
| Bret | Gist | G&G Steel |
| Keith | Griesing | Hardesty & Hanover, LLC |
| Gregory | Harrell | HNTB |
| Dale | Ison | Precision Build |
| Deanna | Nevling | HDR |
| Felix | Padilla | Florida Department of Transportation |
| Jim | Phillips | Hardesty & Hanover, LLC |
| Miguel | Ramirez | Florida Department of Transportation |
| Todd | Stephens | Modjeski & Masters, Inc. |
| Jordan | Warncke | HDR |
| Frank | Artmont | Modjeski & Masters, Inc. |

Main Committee

| First Name | Last Name | Company |
|---|---|---|
| Ronnie | Medlock | High Steel Structures |
| Frank | Artmont | Modjeski & Masters, Inc. |
| Allan | Berry | BCC |
| Brandon | Chavel | AISC |
| Domenic | Coletti | HDR |
| Aaron | Costin | University of Florida |
| Michael | Culmo | CHA Consulting, Inc. |
| Brad | Dillman | High Steel Structures |
| Karl | Frank | Consultant |
| Heather | Gilmer | Pennoni |
| Randy | Harrison | W&W\|AFCO Steel |
| Jamie | Hilton | KTA-Tator, Inc. |
| Russell | Jeck | Senior Project Manager |
| Johnnie | Miller | KTA-Tator, Inc. |
| Deanna | Nevling | HDR |
| Duncan | Paterson | NSBA |
| George | Patton | Hardesty & Hanover, LLC |
| Jennifer | Pazdon | Cast Connex |
| Sougata | Roy | SOCOTEC Engineering, Inc. |
| Francesco | Russo | Russo Structural Services |
| Phillip | Sauser | Slim Buttes Structural Engineering Services LLC |
| Kyle | Smith | GPI |
| Jason | Stith | Michael Baker International |
| Jonathan | Stratton | Eastern Steel Works, Inc. |
| Gary | Wisch | DeLong's, Inc. |
| Brian | Witte | Parsons |
| Brian | Wolfe | MDTA |
| Natalie | McCombs | HNTB |

# Appendix C – TG16 Additional Meeting Material

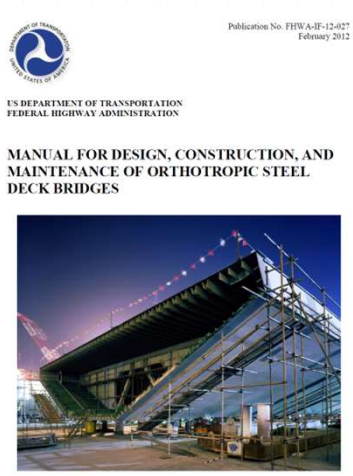


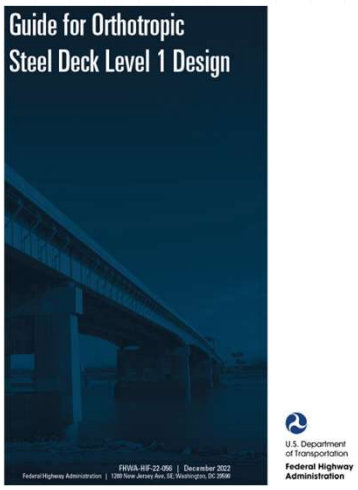

1

MODJESKI and MASTERS

## Background

- 2012 FHWA Guide
  - Has (almost) everything you need to know for all levels of design
  - Less accessible to OSD "newbies"
- 2022 FHWA Guide
  - Focuses on Level 1 Design
  - Contained two optional demonstration tasks




2

2

## Optional Demonstration Tasks

- Two tasks, each task for a real bridge project
  - Only one real project was identified
- For second optional task: make family of standard designs
- FHWA through Justin Dahlberg/Iowa State issued the following tasks
  - Task 1: Develop a preliminary design for a short span, two lane OSD bridge
  - Task 2: Develop a family of standard designs for short span OSD bridges
- Started in July 2025, finished in October 2025 (last week!)
- Start with FHWA standard designs, then talk about real life example

3

3

## FHWA Standard OSDB Designs - Key Goals

- Modular
  - Panels can be put together side-by-side to achieve the necessary width without changing design
  - Each panel has a welded steel plate girder at (or near its center)
- Repeatable
  - Details are the same between all panels, allowing for manufacturing rather than fabrication
- Versatile
  - Modularity allows for adjustments in width and length (only change is girder depth)
  - Field segments are small, allowing for shipping and hot-dip galvanizing if desired
- Accessible
  - Open rib design means more accessible fabrication (fillet welds!)
  - Steel plate girder superstructure accessible to all designers

4

4

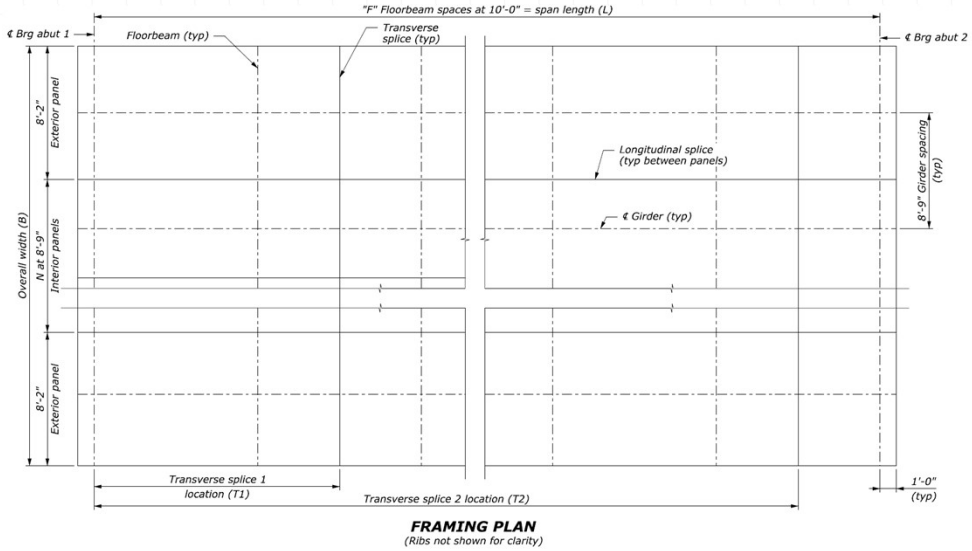
## Standard Design Features

- AASHTO LRFD using HL-93 live load
- Permanent wearing surface included
  - 3” at 150 pcf -> allows for bolted deck plate splices
- Additional future wearing surface (25 psf) also included
- Girder designs use 1.05 redundancy factor for NSTMs in two- or three-girder systems if desired
- All grade 50 steel
- Hot-dip galvanizing friendly!
  - Maximum segment length of ~50 ft
  - Bolted connections designed as Class C
- Steel railing system likely MASH TL-4

5

5

## Framing Plan




**FRAMING PLAN**
(Ribs not shown for clarity)

| BRIDGE LENGTH TABLE | | | |
|---|---|---|---|
| L (FT) | F (EACH) | T1 (FT) | T2 (FT) |
| 20 | 2 | N/A | N/A |
| 30 | 3 | N/A | N/A |
| 40 | 4 | N/A | N/A |
| 50 | 5 | N/A | N/A |
| 60 | 6 | 15 | N/A |
| 70 | 7 | 25 | N/A |
| 80 | 8 | 35 | N/A |
| 90 | 9 | 45 | N/A |
| 100 | 10 | 25 | 75 |
| 110 | 11 | 35 | 75 |
| 120 | 12 | 35 | 85 |
| 130 | 13 | 45 | 85 |
| 140 | 14 | 45 | 95 |

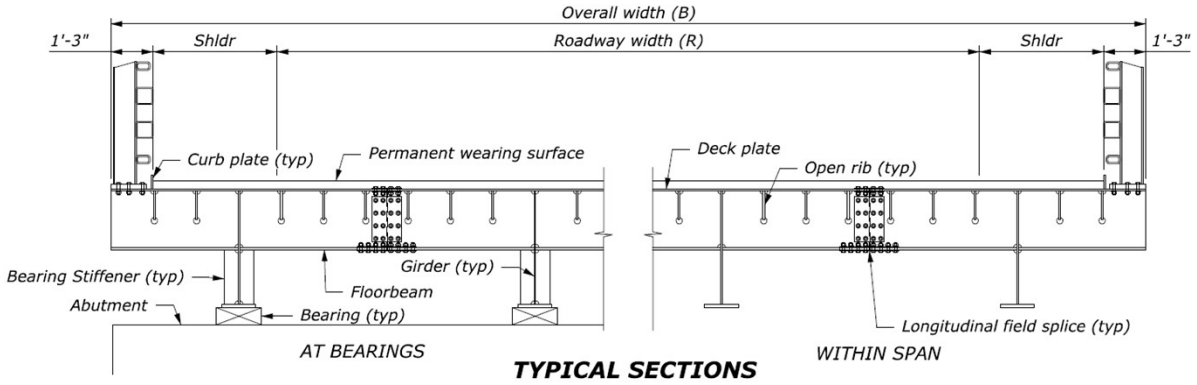
| BRIDGE WIDTH TABLE | | |
|---|---|---|
| N (EACH) | B (FT) | R (FT) |
| 0 | 16'-4" | 13'-10" |
| 1 | 25'-1" | 22'-7" |
| 2 | 33'-10" | 31'-4" |
| 3 | 42'-7" | 40'-1" |
| 4 | 51'-4" | 48'-10" |
| 5 | 60'-1" | 57'-7" |
| 6 | 68'-10" | 66'-4" |

6

6

MODJESKI and MASTERS

# Typical Sections



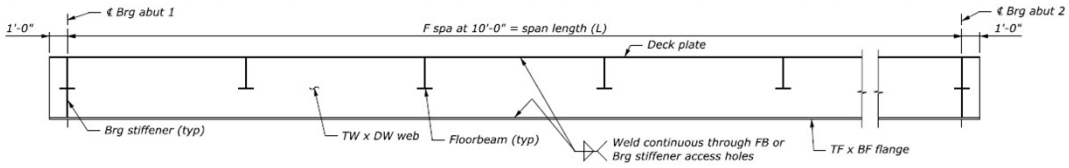

**TYPICAL SECTIONS**



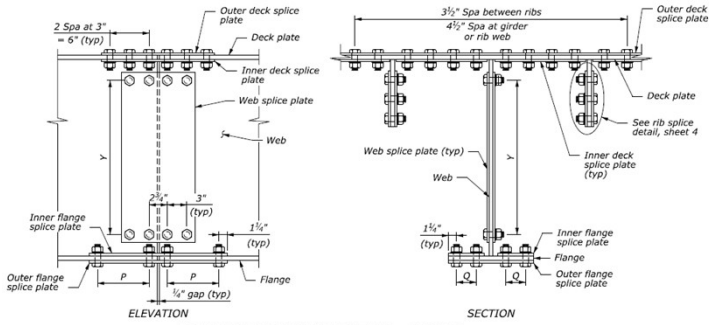


MODJESKI and MASTERS

# Girder Details



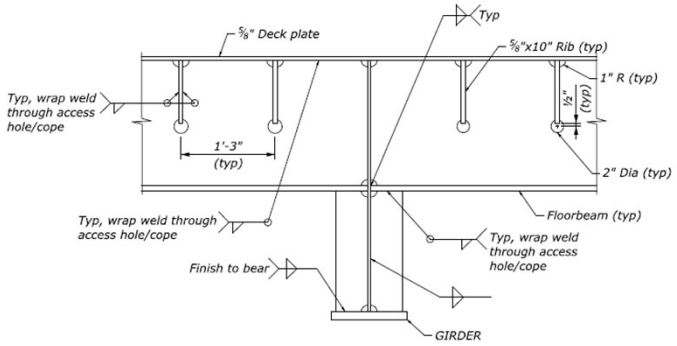

**GIRDER DETAILS**



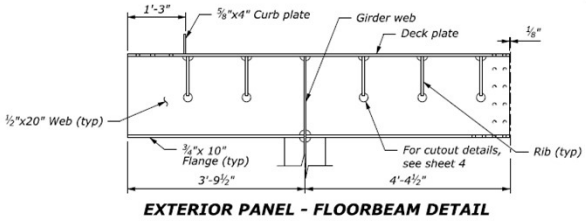

**TRANSVERSE SPLICE DETAIL - GIRDER**
(Bolted deck plate splice shown, see alternate welded detail on sheet 4)

| GIRDER AND SPLICE DIMENSION TABLE | | | | | |
|---|---|---|---|---|---|
| L (FT) | FLANGE (TF x BF) | WEB (TW x DW) | P | Q | Y |
| 20 | ¾"x10" | ½"x30" | NO GIRDER SPLICES | | |
| 30 | ¾"x10" | ½"x30" | | | |
| 40 | ¾"x10" | ½"x30" | | | |
| 50 | 1"x12" | ½"x30" | | | |
| 60 | 1"x16" | ½"x34" | 5 spa at 3" | 1 spa at 4" | 5 spa at 5½" |
| 70 | 1¼"x16" | ½"x38" | 8 spa at 3" | 1 spa at 4" | 6 spa at 5½" |
| 80 | 1¼"x20" | ½"x42" | 7 spa at 3" | 2 spa at 3" | 6 spa at 5½" |
| 90 | 1½"x20" | ½"x46" | 8 spa at 3" | 2 spa at 3" | 7 spa at 5½" |
| 100 | 1½"x20" | ½"x50" | 6 spa at 3" | 2 spa at 3" | 8 spa at 5½" |
| 110 | 1½"x24" | ⅝"x54" | 6 spa at 3" | 3 spa at 2¾" | 9 spa at 5½" |
| 120 | 1½"x24" | ⅝"x58" | 6 spa at 3" | 3 spa at 2¾" | 9 spa at 5½" |
| 130 | 1¾"x24" | ⅝"x62" | 8 spa at 3" | 3 spa at 2¾" | 10 spa at 5½" |
| 140 | 1¾"x24" | ⅝"x66" | 8 spa at 3" | 3 spa at 2¾" | 11 spa at 5½" |

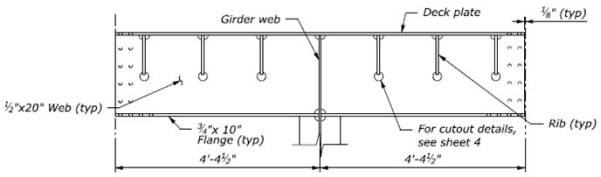
## OSD Panel Details




**TYPICAL OSDB DETAILS**




**EXTERIOR PANEL - FLOORBEAM DETAIL**

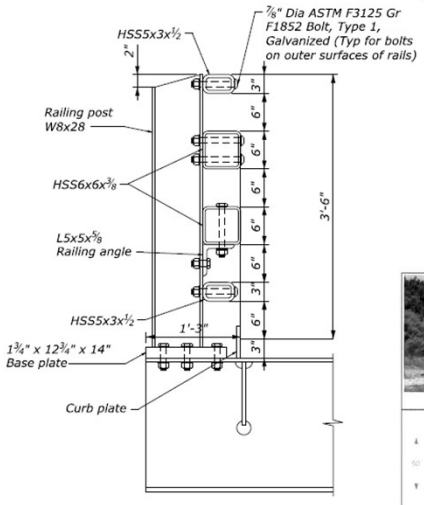



**INTERIOR PANEL - FLOORBEAM DETAIL**

9

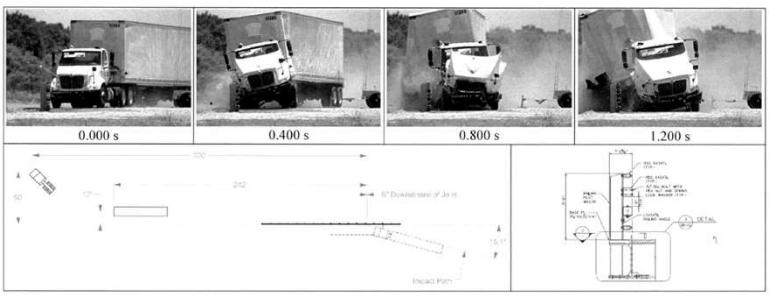
9

## Railing Details




**TYPICAL RAILING DETAIL**

- Based on TBTA Railing (FHWA Control No. B-274)
- Crash-tested railing uses 8’-3” spacing and achieved MASH TL-5
- Posts mounted on floorbeams spaced at 10’-0”
- Calculations show likely TL-4

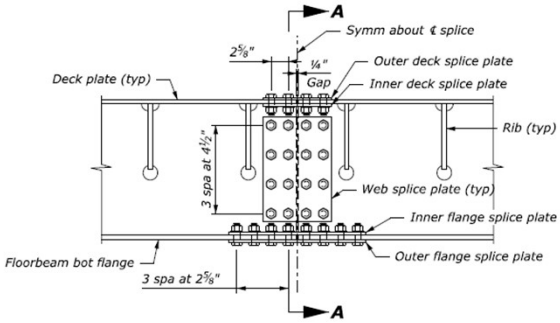



10

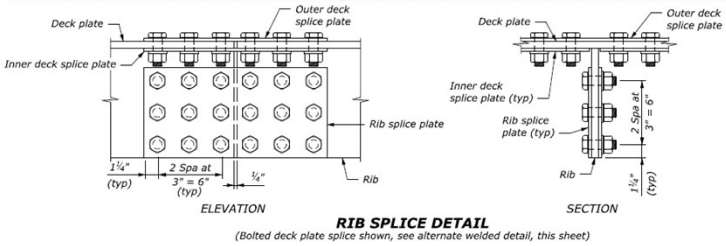
10

MODJESKI and MASTERS

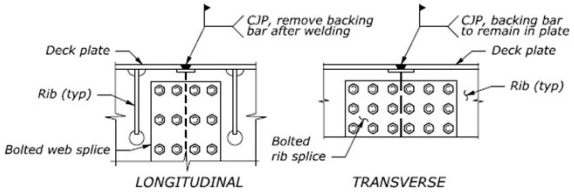
## Splice Details




**LONGITUDINAL SPLICE DETAIL**
(Bolted deck plate splice shown, see alternate welded detail, this sheet)




**RIB SPLICE DETAIL**
(Bolted deck plate splice shown, see alternate welded detail, this sheet)




**ALTERNATE WELDED DECK SPLICE DETAILS**





MODJESKI and MASTERS

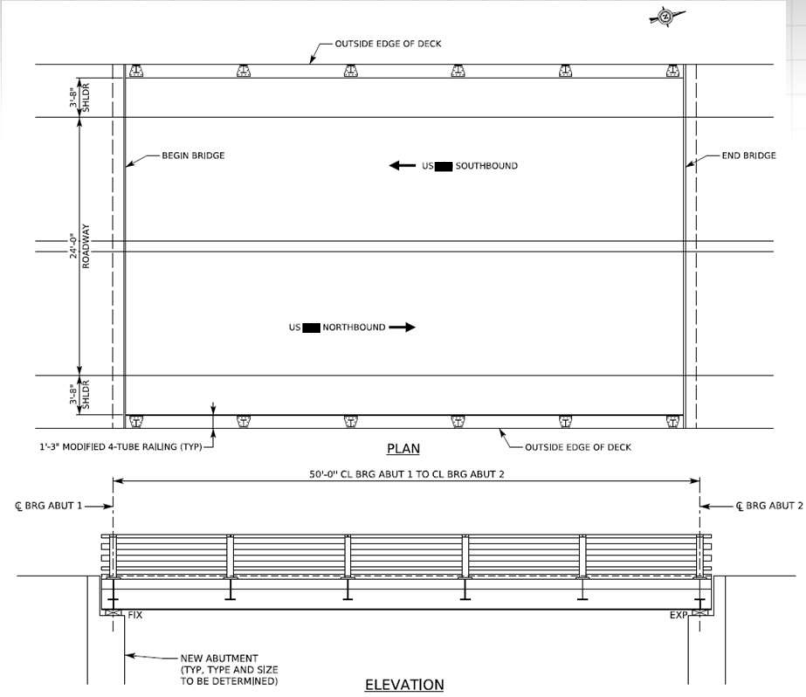
## Now, how to apply to real world?

- Potential (!) project
- 30-foot span with significant skew
- Adjacent concrete box beams with transverse tie rods
- US route in rural area with long detour
- Needs replacement due to condition

MODJESKI and MASTERS

# Plan and Elevation

- Increased span to 50 feet to remove skew
- Two lanes at 12 feet
- Shoulders at 3’-8”
- OSD details match those in FHWA standard plans

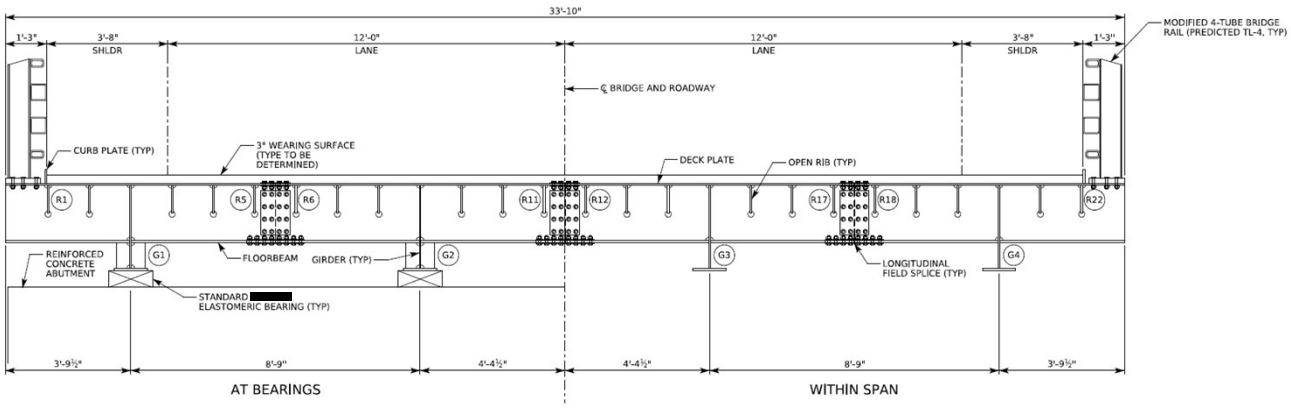





13

MODJESKI and MASTERS

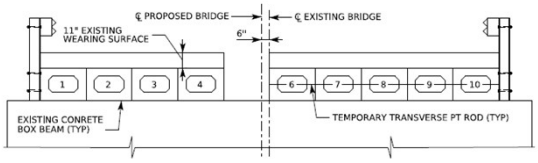
# Elevation and Typical Sections



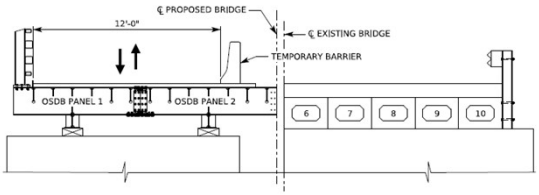



14

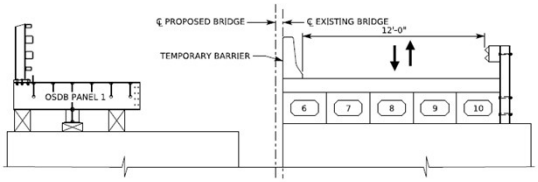
## Construction Sequence



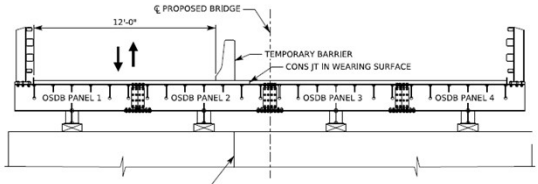

STAGE 1A




STAGE 2A




STAGE 1G




STAGE 2G

- Maintain bi-directional traffic over single lane with limited full closures

15

15

## Conclusions

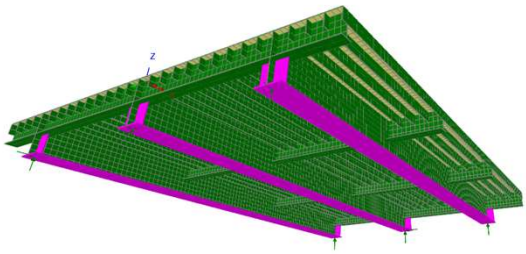
- Standardization and modularity
  - FHWA standard OSDB designs offer a modular, repeatable, and versatile solution for short-span bridges, making them accessible for a wide range of designers and manufacturers
- Ease of fabrication and installation
  - Open rib design and standardized details facilitate manufacturing, shipping, and hot-dip galvanizing
- Improved accessibility
  - Approach lowers barriers for new designers and streamlines the design and construction process for shot span OSDBs
- Real-world applicability
  - Potential demonstration project shows that standard designs can be adapted to real-world scenarios, such as rural bridge replacements

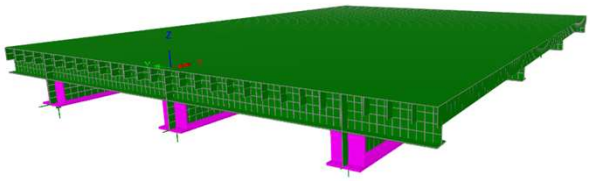
16

16

## Next Steps

- Standard designs all preliminary
  - Weld sizes not designed
  - Splice plate thicknesses assumed
  - Fatigue checked only for global details
- Check fatigue details and design
  - Level 1 means should be okay, but would need to verify before anything being built
- Verify 1D design assumptions through modeling
  - Effective width, distribution factors, etc.





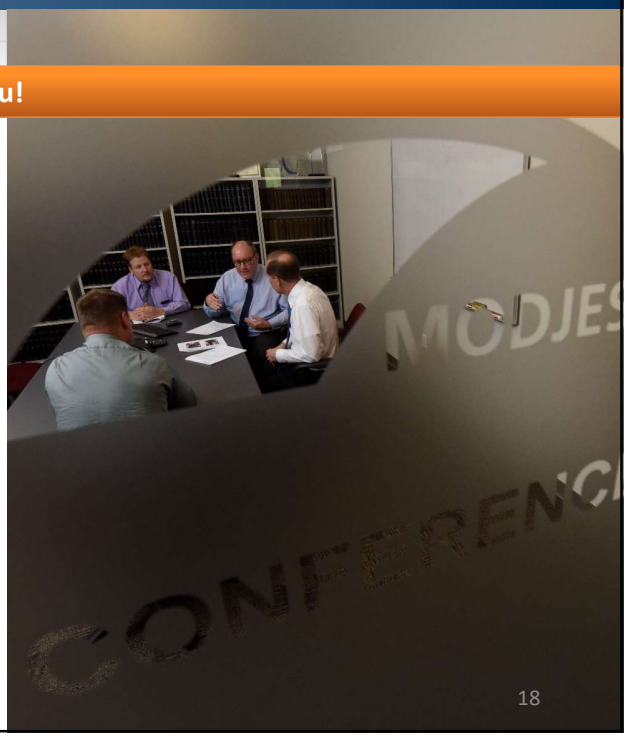
17

17

## Contact Information


- **Frank A. Artmont, PhD, PE**
  *Senior Engineer | National Bridge Group*
  100 Sterling Parkway, Suite 302
  Mechanicsburg, PA 17053
  FAArtmont@modjeski.com


**Thank You!**




18

18

# POLYESTER POLYMER CONCRETE WEARING SURFACES FOR ORTHOTROPIC STEEL DECKS

10/21/25, CASEY RAFTER

KWIK BOND POLYMERS, a SIKA Company

Watson Bowman Acme

KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# KWIK BOND POLYMERS
## PRODUCT OFFERING

High Molecular Weight Methacrylate (HMWM)

Polyester Polymer Concrete (PPC)

Hybrid Composite Synthetic Concrete (HCSC)

Thin Polymer Overlay Advanced (TPO AD)

High Friction Surface Treatment (HFST)

# KWIK BOND POLYMERS
## POLYESTER POLYMER CONCRETE

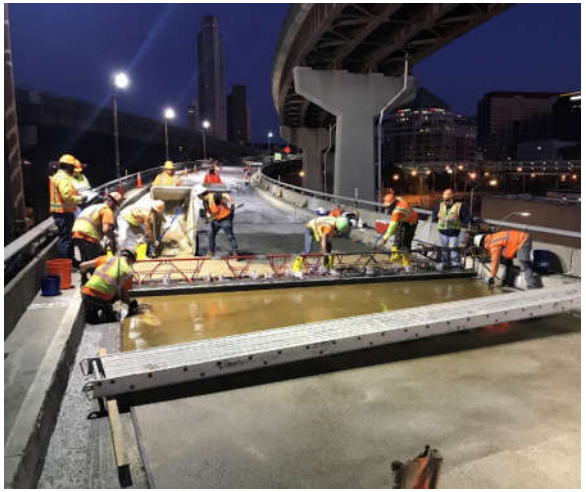
- PPC is a non-cementitious, polymer concrete installed like regular concrete
- Primary application is bridge deck overlay for preservation and rehabilitation
- Thousands of Joint Headers & Full Depth Joints
- Thousands of patches, partial to full
- Some closure pours (all successful)
- Overlays on Grid and Orthotropic Steel Decks
- >40 years of proven history
- >120,000,000 SF Bridge Deck Area nationwide

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika

# POLYESTER POLYMER CONCRETE
## HISTORY & DEVELOPMENT

- PPC development began in 1960's in California
- Caltrans and Oregon were leaders during trial period
- The same resins and aggregates used back then are used today
- Kwik Bond Polymers has direct lineage from the 1970's to today



Watson Bowman Acme

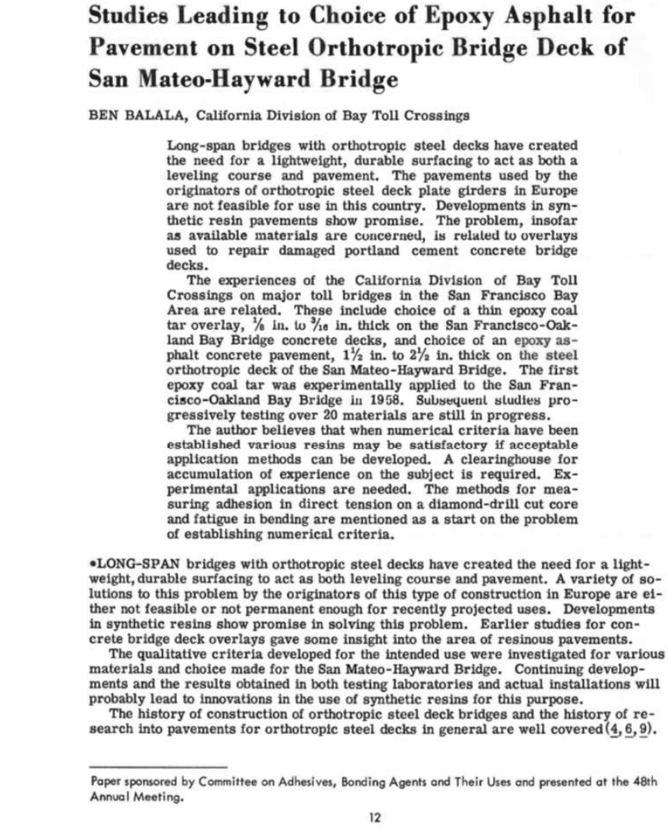
KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# POLYESTER POLYMER CONCRETE
## HISTORY & DEVELOPMENT



**Studies Leading to Choice of Epoxy Asphalt for Pavement on Steel Orthotropic Bridge Deck of San Mateo-Hayward Bridge**

BEN BALALA, California Division of Bay Toll Crossings

Long-span bridges with orthotropic steel decks have created the need for a lightweight, durable surfacing to act as both a leveling course and pavement. The pavements used by the originators of orthotropic steel deck plate girders in Europe are not feasible for use in this country. Developments in synthetic resin pavements show promise. The problem, insofar as available materials are concerned, is related to overlays used to repair damaged portland cement concrete bridge decks.

The experiences of the California Division of Bay Toll Crossings on major toll bridges in the San Francisco Bay Area are related. These include choice of a thin epoxy coal tar overlay, ⅛ in. to 3/16 in. thick on the San Francisco-Oakland Bay Bridge concrete decks, and choice of an epoxy asphalt concrete pavement, 1½ in. to 2½ in. thick on the steel orthotropic deck of the San Mateo-Hayward Bridge. The first epoxy coal tar was experimentally applied to the San Francisco-Oakland Bay Bridge in 1958. Subsequent studies progressively testing over 20 materials are still in progress.

The author believes that when numerical criteria have been established various resins may be satisfactory if acceptable application methods can be developed. A clearinghouse for accumulation of experience on the subject is required. Experimental applications are needed. The methods for measuring adhesion in direct tension on a diamond-drill cut core and fatigue in bending are mentioned as a start on the problem of establishing numerical criteria.

•LONG-SPAN bridges with orthotropic steel decks have created the need for a lightweight, durable surfacing to act as both leveling course and pavement. A variety of solutions to this problem by the originators of this type of construction in Europe are either not feasible or not permanent enough for recently projected uses. Developments in synthetic resins show promise in solving this problem. Earlier studies for concrete bridge deck overlays gave some insight into the area of resinous pavements.

The qualitative criteria developed for the intended use were investigated for various materials and choice made for the San Mateo-Hayward Bridge. Continuing developments and the results obtained in both testing laboratories and actual installations will probably lead to innovations in the use of synthetic resins for this purpose.

The history of construction of orthotropic steel deck bridges and the history of research into pavements for orthotropic steel decks in general are well covered (4, 6, 9).

Paper sponsored by Committee on Adhesives, Bonding Agents and Their Uses and presented at the 48th Annual Meeting.





good condition but it was necessary to obliterate the tile markers, which were slightly raised above the surface of the concrete in order to change the traffic pattern.

Studies at this time evaluated moduli of elasticity, coefficient of expansion, and adhesion for a number of aggregate-filled resins as well as for latex modified portland cement concrete.

The subject of resins had been broached to the Division of Bay Toll Crossings in 1958 by a test application of Guardkote 140 on the San Francisco-Oakland Bay Bridge upper deck with the cooperation of the Shell Chemical Company. Guardkote 140 was an epoxy coal tar formulation derived from basic patents held by the Pittsburgh Coke and Chemical Company.

At about this same time we were approached by the California Chemical Company, Oronite Division of Standard Oil Company of California, regarding use of a polyester resin for this purpose. The possibility of a polyester performing the same function as an epoxy at about half the cost sounded attractive. A further attraction was the fact that although the epoxies were truly two component materials requiring intimate mixing and precise proportioning, the polyesters were catalyzed only and less critical mixing would still produce the required end product.

Test installations of five materials each about 20 ft long and about 12 ft wide were placed on the lower deck of the San Francisco-Oakland Bay Bridge in 1962. There were two latex-modified concretes, three polyester resins, an epoxy asphalt, and a proprietary concrete floor system without an adhesive (2). The epoxy asphalt formulation used in this application never seemed to set up, and abraded quickly under the heavy traffic. The proprietary concrete floor system and the latex-modified concretes showed under hand hammer soundings, extensive rattly areas indicating general lack of bond. The three polyester resins were excellent. The only apparent difficulty or obvious drawback to the polyester resin applications was lack of a commerical method producing an acceptable riding surface.

It became necessary to terminate the test when the lower deck paving contract was awarded in 1964. All test areas other than the polyester resins were readily cleaned down to the original concrete deck which was the new unsurfaced lightweight concrete over the former interurban trackway. It was practically impossible to remove the polyesters without removing part of the concrete substrate, and they were covered by the new surfacing.

The surfacing chosen for the upper deck paving contract in 1963 and the lower deck in 1964 on the basis of cost, commercial quality of application equipment and material, convenience to traffic, and current availability of contractors and equipment was Shell Guardkote 140 (basically a flood coat of epoxy coal tar filled with clean, hard sand passing a number 10 screen), at that time under the control of Shell Chemical Company. This was not a perfect solution but with the state of knowledge at that time it fulfilled most requirements. It obliterated the tile markers satisfactorily, renewed the surface, obliterated the difference in texture between the new and old concrete slabs on the lower deck, and provided a construction method that was compatible with the complicated lane-scheduling procedure required to switch traffic from mixed bidirectional traffic on each deck to unidirectional mixed traffic on each deck. It did not, however, provide a new screedable surface since the placing procedure is somewhat similar to that for a seal coat in that it repeats to some degree the imperfections of the underlying pavement.

In addition, we became acquainted with the capabilities of resin producers and their statements, which we have no reason to doubt, that if we could tell them the physical characteristics of the material required for our use, they could produce it. Numerical criteria developed by future tests may yet produce an opportunity for the resin producers to fulfill their promises.

Shell representatives in 1962 also described their Epon asphalt system, but the half-inch average thickness proposed for the San Francisco-Oakland Bay Bridge due to weight limitations was not considered feasible for Epon asphalt, basically a 3/8-in. maximum asphalt-concrete aggregate mixture bound with an epoxy-asphalt compound.

There were countless products investigated that did not receive complete study due to lack of proper financial or technical backing by the vendor. A definite factor in deciding on a coal tar epoxy for the San Francisco-Oakland Bay Bridge was the furnishing of a bonded written guarantee for three years.

- 1969 study for San Mateo-Hayward OSD wearing surface included Polyester Concrete and Epoxy Asphalt Concrete.

- "The only apparent difficulty or obvious drawback to the polyester resin was lack of a commercial method producing and acceptable riding surface."

Watson Bowman Acme

KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# POLYESTER POLYMER CONCRETE
## PRODUCT OVERVIEW

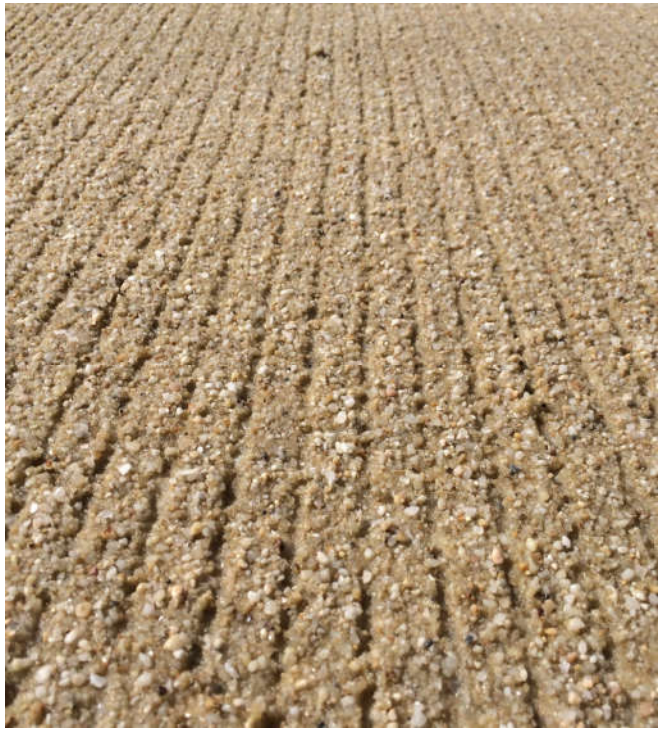
- Components
  - HMWM Primer
  - Graded Silica Aggregate
  - Polyester Resin Binder
  - Abrasive Top Sand
  - No cement or water

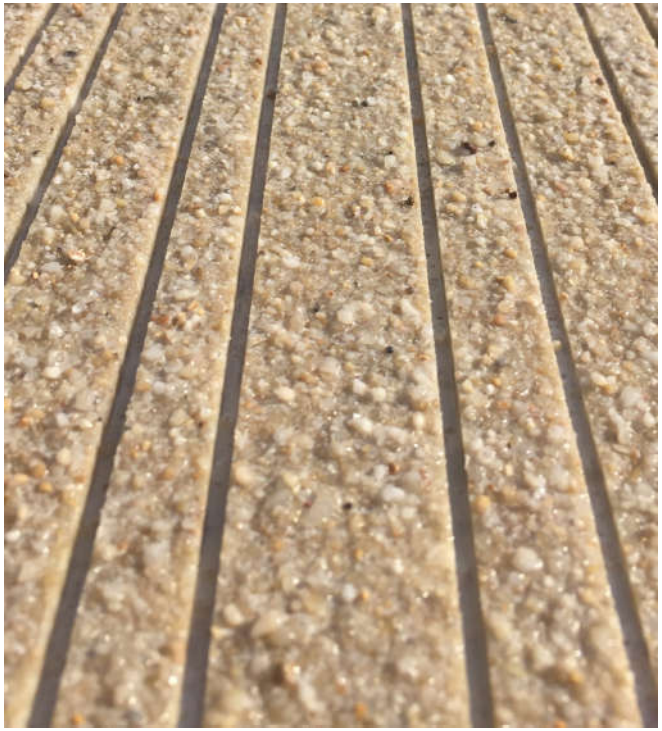
Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# POLYESTER POLYMER CONCRETE
## PRODUCT OVERVIEW

- Properties
  - 6,000 psi Compressive
  - 800 psi Tensile
  - 1,500 psi Flexural
  - 1,500 ksi MOE
  - 0 coulombs permeability
  - Similar CTE to PCC





Watson Bowman Acme

KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# POLYESTER POLYMER CONCRETE
## APPLICATIONS & ADVANTAGES

- Bridge Deck Overlays
- ABC Closure Pours
- Full-depth Patching
- Full-depth Joints
- Joint Headers
- Grade Correction

→ Any thickness >3/4”
→ 40-100 °F
→ 2-hr traffic return always
→ 0 coulombs permeability
→ 35+ year proven service

Watson Bowman Acme
KWIKBOND POLYMERS
KING

BUILDING TRUST
Sika®

# POLYESTER POLYMER CONCRETE
## INSTALLATION

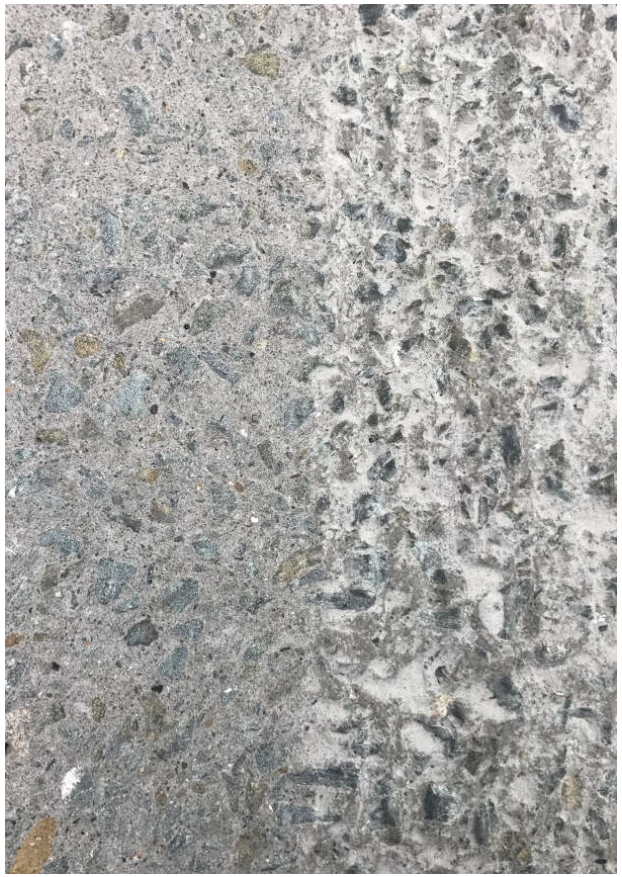
- Equipment
  - Shot Blaster
  - Volumetric Mixing Truck
  - Slip Form Paver
- Sequence
  - Surface Preparation
  - Install HMWM Primer
  - Catalyze & Mix PPC
  - Place and Finish


Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# POLYESTER POLYMER CONCRETE
## INSTALLATION

- Surface Preparation
  - Remove existing overlay
  - Using a Shot Blaster:
    - Clean
    - Sound
    - Visibly Dry



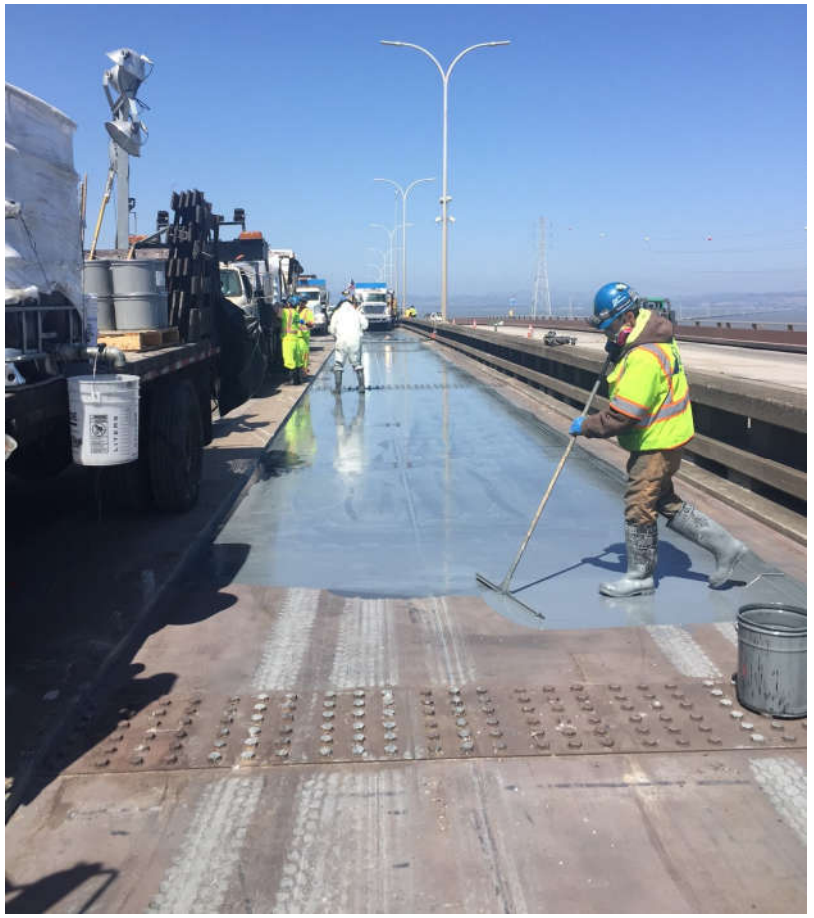
Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# POLYESTER POLYMER CONCRETE
## INSTALLATION

- Install HMWM Primer
  - Confirm deck temp is 40-100 F
  - Catalyze HMWM in buckets
  - Install with brooms/rollers
  - 100 SF/Gal

  - (Zinc added to HMWM for OSD as sacrificial anode)



Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# POLYESTER POLYMER CONCRETE
## INSTALLATION

- Catalyze & Mix PPC
  - Volumetric mixer truck
    - Hopper for Aggregates
    - 500-gal Tote for Polyester Resin
    - 10-gal containers for MEKP & ZC
  - Calibrated to PPC spec
  - Continuous auger mixes PPC
  - Computer print-out provides weights for pay item


Watson Bowman Acme
KWIKBOND POLYMERS
KING
BUILDING TRUST
Sika

# POLYESTER POLYMER CONCRETE
## INSTALLATION

- Place & Finish
  - Slip Form Paver
    - Distributes PPC material
    - Vibrates material as needed
    - Sets material to grade
    - Controls surface smoothness
  - Hand Finishing
    - Edges & touch-ups
  - Top Sand
    - Hand broadcasted
  - Texturing
    - Tines or saw-cut grooving

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# WEARING SURFACES
## FOR ORTHOTROPIC STEEL DECKS

Watson Bowman Acme

KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# OSD WEARING SURFACE OPTIONS

- Option #1 – Thin Polymer Concrete
- Option #2 – Cementitious Concretes
- Option #3 – Asphalt and Modified Asphalt (EAC)
- Option #4 – Thick Polymer Concrete

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# OSD WEARING SURFACE OPTIONS

- ~~Option #1 – Thin Polymer Concrete~~
- Option #2 – Cementitious Concretes
- Option #3 – Asphalt and Modified Asphalt (EAC)
- Option #4 – Thick Polymer Concrete

- **Thin Polymer Concrete**
  - Advantages
    - Less costly
    - Fast install
    - No pot-holes
    - Low permeability
  - Disadvantages
    - Does not stiffen composite deck
    - Adhesion issues
    - Wears quickly
    - Shorter service life
    - Thin placements only (<5/8” typically)

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# OSD WEARING SURFACE OPTIONS

- ~~Option #1 – Thin Polymer Concrete~~
- ~~Option #2 – Cementitious Concretes~~
- Option #3 – Asphalt and Modified Asphalt (EAC)
- Option #4 – Thick Polymer Concrete

- **Cementitious Concretes**
  - Advantages
    - More familiar
    - Static MOE
    - Significant stiffening capability
  - Disadvantages
    - Requires shear studs
    - Prone to cracking
    - Poor adhesion to steel deck
    - High dead load
    - High cost
    - High permeability

# OSD WEARING SURFACE OPTIONS

- ~~Option #1 – Thin Polymer Concrete~~
- ~~Option #2 – Cementitious Concretes~~
- Option #3 – Asphalt and Modified Asphalt (EAC)
- Option #4 – Thick Polymer Concrete

- **Regular Asphalt**
  - Advantages
    - More familiar
    - Inexpensive
    - Fast install
  - Disadvantages
    - Ruts and shoves
    - Does not stiffen composite deck
    - Shorter service life
    - High permeability
    - Higher dead load
    - Very temperature sensitive in service

- **Epoxy Asphalt Concrete**
  - Advantages
    - Proven performance history
    - Low permeability
    - Good compatibility with OSD
    - Stiffens composite deck
    - Resists rutting and shoving
  - Disadvantages
    - Difficult to produce
    - Extended cure times (Up to multiple days/weeks)
    - Inaccessible to some locations
    - Somewhat temperature sensitive in service
    - Small construction window due to temperature

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# OSD WEARING SURFACE OPTIONS

- ~~Option #1 – Thin Polymer Concrete~~
- ~~Option #2 – Cementitious Concretes~~
- Option #3 – Asphalt and Modified Asphalt (EAC)
- Option #4 – Thick Polymer Concrete

- **Thick Polymer Concrete (Polyester Polymer Concrete)**
  - Advantages
    - Proven Performance History
    - 0 coulombs permeability
    - Rapid install
    - Wider construction window
    - HMWM primer = excellent adhesion to steel
    - Less temperature sensitive during service
    - Stiffens deck greater than Asphalt/EAC
    - Cannot rut or shove
    - High abrasion resistance
  - Disadvantages
    - Shorter service life history
    - Less familiarity in OSD markets
    - Stiffens deck less than cementitious overlay + shear studs

# POLYESTER POLYMER CONCRETE
# FOR ORTHOTROPIC STEEL DECKS

**Evaluation of Wearing Surface Systems for the Orthotropic Steel Deck of the San Mateo Hayward Bridge**

**Final report prepared for the**
**California Department of Transportation**
**Project 59A0742, Contract Manager: Ric Maggenti**

**Vellore S. Gopalaratnam, Ph.D., P.E.**
**Professor of Civil Engineering**
**Ravi Sankar Chamarthi, M.S.**
**Department of Civil and Environmental Engineering**
**University of Missouri-Columbia**

**Report No.: MU Gopalaratnam 12-02**
**December 2012**

**University of Missouri-Columbia**

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
**TECHNICAL REPORT DOCUMENTATION PAGE**
TR0003 (REV. 10/98)

| 1. REPORT NUMBER | 2. GOVERNMENT ASSOCIATION NUMBER | 3. RECIPIENT'S CATALOG NUMBER |
|---|---|---|
| | | |

| 4. TITLE AND SUBTITLE | 5. REPORT DATE |
|---|---|
| Evaluation of Wearing Surface Systems for the Orthotropic Steel Deck of the San Mateo Hayward Bridge | December 21, 2012 |
| | 6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S)<br>Vellore S. Gopalaratnam and Ravi Shankar Chamarthi | 8. PERFORMING ORGANIZATION REPORT NO.<br>MU Gopalaratnam 12-02 |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Department of Civil and Environmental Engineering<br>University of Missouri-Columbia<br>E2509 Lafferre Hall<br>Columbia, Missouri 65211-2200 | 10. WORK UNIT NUMBER<br>11. CONTRACT OR GRANT NUMBER<br>Contract No. 59A0742 |
| 12. SPONSORING AGENCY AND ADDRESS<br>California Department of Transportation<br>Division of Engineering Services<br>1801 30th Street, Mail Stop 9-2/5I<br>Sacramento, California 95816-0001 | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final Report<br>11/05/2010 – 05/20/2012<br>14. SPONSORING AGENCY CODE |

15. SUPPLEMENTAL NOTES
Prepared in cooperation with the State of California Department of Transportation.

16. ABSTRACT

Performance under static and fatigue loads are evaluated for two different wearing surfaces for possible use on the steel orthotropic steel deck of San Mateo Hayward Bridge. The two wearing surface materials studied include a 2" thick (nominal) premixed polyester concrete (PC) and a 2" thick (nominal) epoxy asphalt concrete (EAC).

Tests on flexural specimens that comprise a "steel-plate - wearing surface" composite were conducted at several temperatures in the range 20°F – 120°F (in approximately 10°F increments) and at several different dynamic loading frequencies (0.0167, 1.0, 2.5, 5.0, 7.5, 10.0 and 15.0 Hz). Following these tests, fatigue tests were conducted on replicate EAC and PC composite specimens at each of room (70°F), cold (32°F) and hot (120°F) temperatures. Fatigue tests were conducted using sinusoidal loading at a 10 Hz frequency. Maximum loads used in the tests were more severe than design service loads and were computed based an idealized analysis of transverse bending of the orthotropic deck. Companion investigations that provided significant support data for the evaluation included static flexural and static failure tests, tensile pull-out tests, post-test crack inspection and mapping, and resistivity tests.

Effect of composite action and its implications to fatigue performance of the orthotropic steel deck as well as the wearing surface are detailed in the context of variations in the elastic modulus of the wearing surface as a function of temperature and rate of loading.

Both the wearing surface systems performed well at the cold temperatures, surviving 10 million fatigue cycles without any cracking or other types of deterioration (slip, debonding, and delamination) at maximum fatigue load levels that are significantly more severe than design service loads. Both wearing surfaces experienced cracking at the room and hot temperatures. Even while cracking occurred well within the limiting 10 million fatigue cycles, when tests on cracked specimens were carried out to the full 10 million fatigue cycles, these cracks did not result in wearing surface delamination or local debonding. In most instances these cracks were not visible in an unloaded state. Even while the service loading may be lower than those used in these fatigue test, cracking is likely in the service performance of both EAC and PC wearing surface materials and it is prudent to have a crack maintenance program in place.

| 17. KEY WORDS | 18. DISTRIBUTION STATEMENT | |
|---|---|---|
| Composite Action, Dynamic Behavior, Epoxy Asphalt Concrete, Fatigue Behavior, Fatigue Testing, Polyester Concrete, San Mateo Hayward Bridge, Static Behavior, Thermal Response, Wearing Surface | No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161 | |
| 19. SECURITY CLASSIFICATION (of this report)<br>Unclassified | 20. NUMBER OF PAGES<br>151 pages | 21. PRICE |

Reproduction of completed page authorized

Watson Bowman Acme

KWIKBOND POLYMERS

KING

BUILDING TRUST

Sika®

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE

- U of MC Research
  - Tests on flexural specimens that comprise a “steel plate-wearing surface” composite
    - Polyester Polymer Concrete (2”)
    - Epoxy Asphalt Concrete (2”)
  - Conducted at several temperatures from 20 – 120°F
  - Performed at several dynamic loading frequencies (0.0167, 1, 2.5, 5, 7.5, 10 and 15 Hz)
  - Fatigue tests to replicate EAC and PPC – steel composites at cold, room and hot temps using sinusoidal loading @ 10 Hz
  - Tensile pull-out, crack mapping and resistivity testing

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE

AASHTO LRFD Bridge Design Specifications related to orthotropic steel deck (OSD) bridges as detailed below.

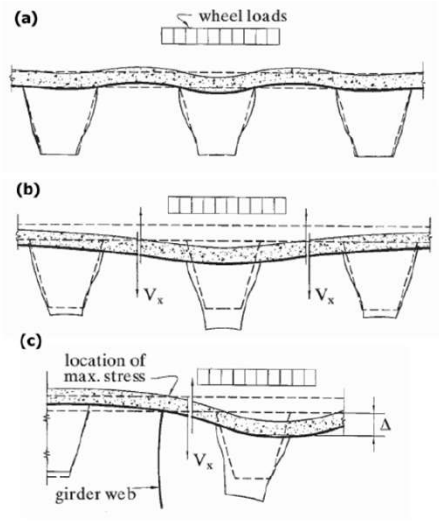



*Fig. 2.1* *Flexural response and shear forces on the wearing surface-steel composites caused by relative displacements and transverse bending. (a) Closer to floor beams (b) Midway between the floor beams (c) Near the main girder (Wolchuck, 2002)*

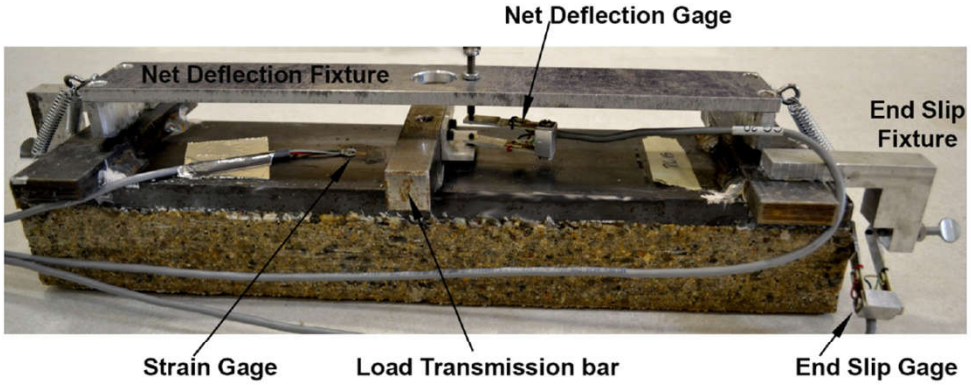



*Fig. 3.5 Composite specimen with displacement measurement and loading fixtures attached*

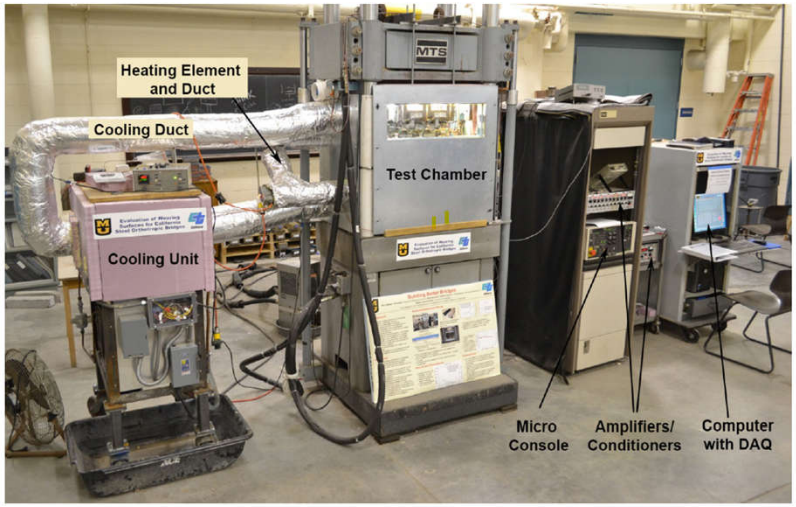



*Fig. 3.15 Overall fatigue test set-up*

Watson Bowman Acme
KWIKBOND POLYMERS
KING
BUILDING TRUST
Sika

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE

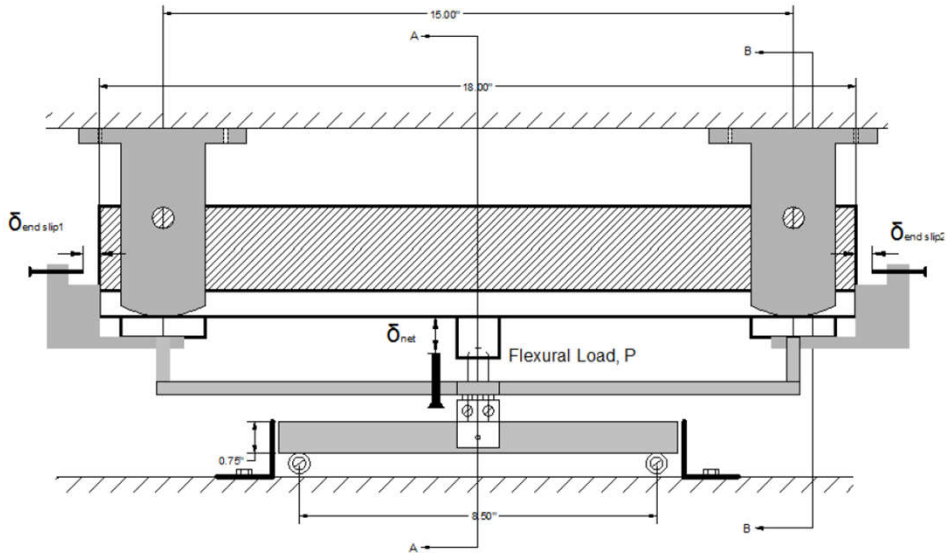
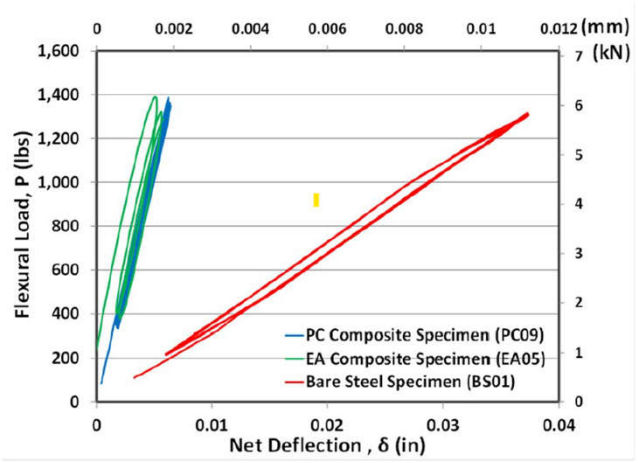



*Fig. 3.17 Schematic of the flexural test configuration (see sections AA and BB in Fig. 3.18)*

*Fig. 3.23* *(a) Set-up with top steel plate and other fixtures used for the static failure tests (b) MTS machine used for static failure tests*

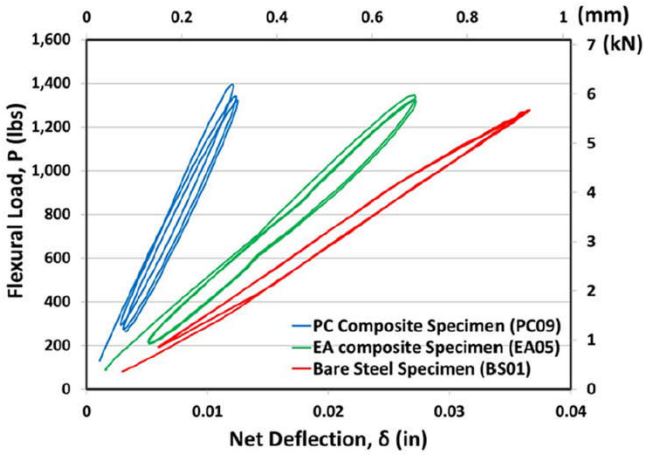
BUILDING TRUST

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE – STATIC LOAD DEFLECTION



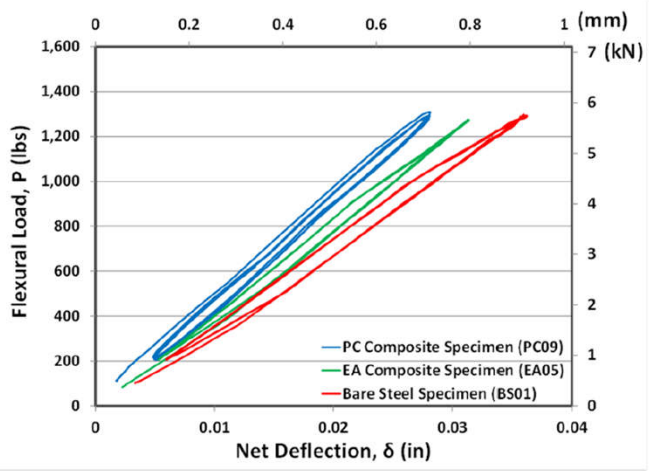

*Static load-deflection responses for bare steel and composite specimens temperature (Nominal 32°F)*

- COLD 32°F




*Static load-deflection responses for bare steel and composite specimens at temperature (Nominal 70°F)*

- ROOM 70°F




*Static load-deflection responses for bare steel and composite specimens at temperature (Nominal 120°F)*

- HOT 120°F

- Static load deflection responses at various temperatures
- Both PPC and EAC are *viscoelastic,* but PPC is stiffer than EAC

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE – STATIC LOAD DEFLECTION

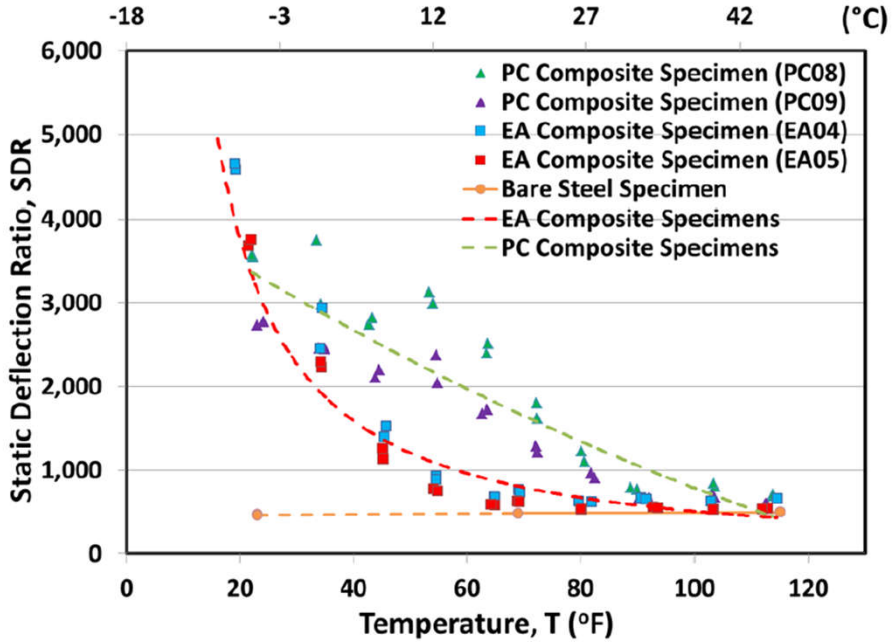


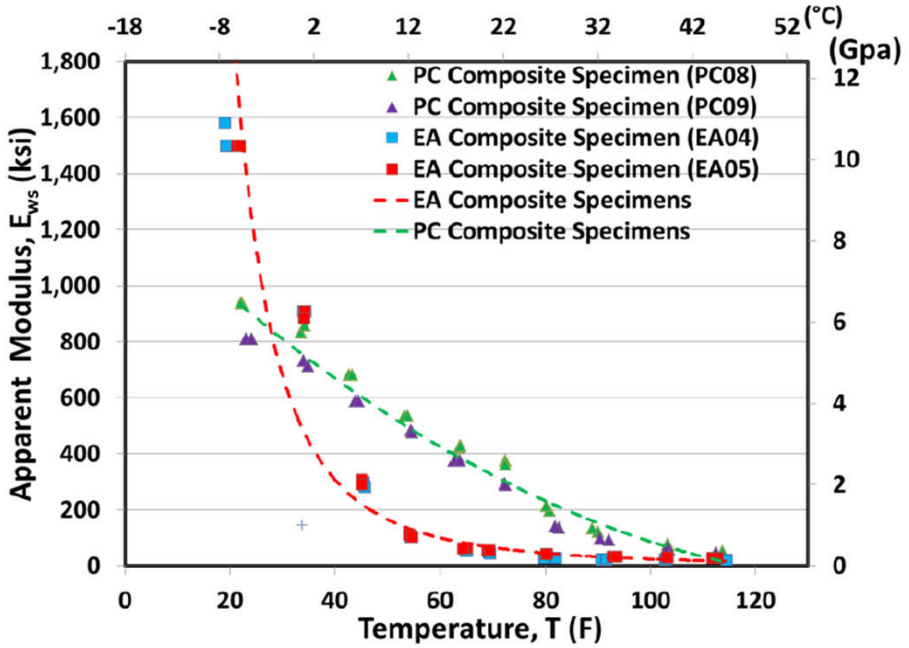

*Fig. 5.4 Static deflection ratio of wearing surfaces and bare steel specimens*

- In the temperature range of 30-80°F, PPC composites exhibit SDR values of 2-4 times higher than the EAC composite specimens

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE – STATIC LOAD DEFLECTION




*Apparent elastic modulus as a function of wearing surface temperature from composite EA and PC specimens.*

- In the 60-80°F temperature range, the apparent elastic modulus of PPC is approximately 6-8 times that of EAC

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE – PULL-OFF TESTING

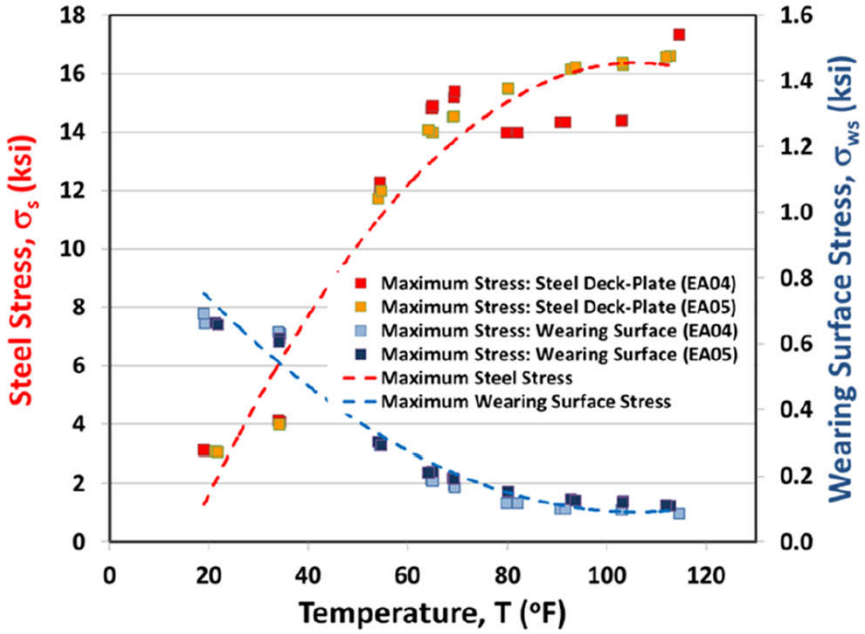
*Table 5-7 Summary of results from the tensile pull-out tests*

| Spec. No. | Core ID | Maximum Load (lbs) | Bond Strength[1] (psi) | Temp. (°F) | Failure Type | Bonding Agent | Additional Modifications |
|---|---|---|---|---|---|---|---|
| EA01 | A | 937 | 298 | 75 | 1, 2, 3[2] | Devcon 5 Min | Wedge Anchor |
| EA01 | B | 1,089 | 347 | 75 | 1, 2, 3[2] | Transpo T41 | Sleeve Anchor |
| EA01 | C | 1,105 | 352 | 75 | 1, 2, 3[2] | Transpo T41 | Sleeve Anchor |
| EA01 | D | 1,334 | 425 | 75 | 1, 2, 3[2] | Transpo T41 | 9 Holes[3] |
| EA01 | E | 1,779 | 567 | 75 | 1, 2, 3[2] | Loctite HD | None |
| EA01 | F | 1,672 | 532 | 75 | 3 | Loctite MC | None |
| EA02 | B | 2,008 | 639 | 75 | 4[4] | Loctite HD | Bolt Anchor |
| EA02 | F | 1,892 | 603 | 75 | 4[4] | Loctite HD | Bolt Anchor |
| PC06 | A | 3,730 | 1,188 | 32 | 5 | Transpo T41 | None |
| PC06 | B | 2,433 | 775 | 32 | 1, 2, 3[2] | Transpo T41 | None |
| PC07 | B | 2,667 | 849 | 32 | 1, 2, 3[2] | Transpo T41 | None |
| PC07 | F | 2,789 | 888 | 32 | 1, 2, 3[2] | Transpo T41 | None |
| PC06 | C | 3,102 | 988 | 75 | 5 | Loctite MC | None |
| PC06 | D | 3,036 | 967 | 75 | 1, 2, 3[2] | Loctite MC | None |
| PC06 | E | 3,137 | 999 | 75 | 5 | Loctite MC | None |
| PC06 | F | 1,397 | 445 | 122 | 5 | Transpo T41 | None |
| PC07 | A | 886 | 282 | 122 | 1, 2, 3[2] | Transpo T41 | None |
| PC07 | C | 1,335 | 425 | 122 | 5 | Transpo T41 | None |
| PC07 | E | 1,199 | 382 | 122 | 5 | Transpo T41 | None |

1. *Tensile bond strength only for the successful tests (shaded rows). For all other rows values in this column are the "lower bounds" for the tensile bond strength.*
2. *Failure comprising all three types (1, 2 and 3) of failure at the same time*
3. *Inclined holes filled with glue ensured increased bonded area and additional load transfer via bearing.*
4. *Failed at the head of the embedded bolt – not considered a successful pull-out test.*

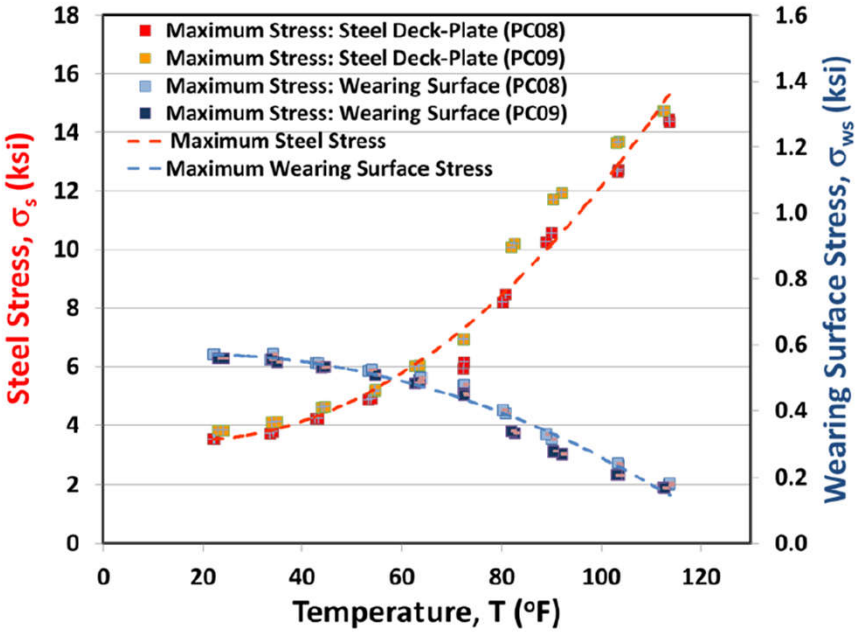

BUILDING TRUST

# PPC FOR ORTHOTROPIC STEEL DECKS
## SAN MATEO HAYWARD BRIDGE – EFFECTS OF TEMPERATURE




*Steel and wearing surface stress as a function of wearing surface temperature (from EA composite specimens evaluated at the maximum load of 1,350 lbs.).*

- **Epoxy Asphalt Concrete (EAC)**



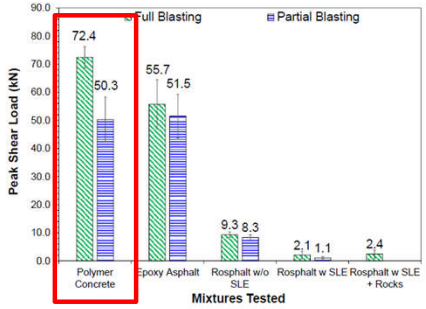

*Steel and wearing surface stress as a function of wearing surface temperature (from PC composite specimens evaluated at the maximum load of 1,350 lbs.).*

- **Polyester Polymer Concrete (PPC)**

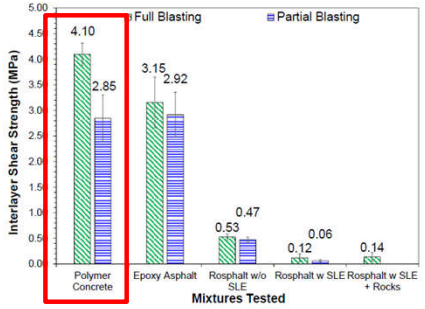
Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

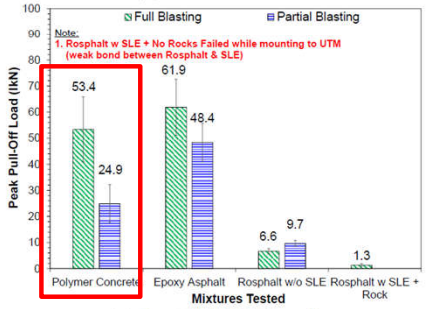
# PPC FOR ORTHOTROPIC STEEL DECKS
## ROWAN UNIVERSITY → EAC VS PPC VS ROSPHALT



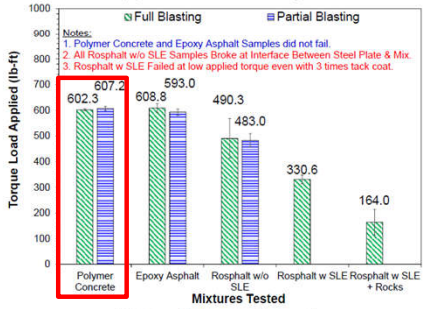

(a) Peak Shear Load




(b) Bond Shear Strength



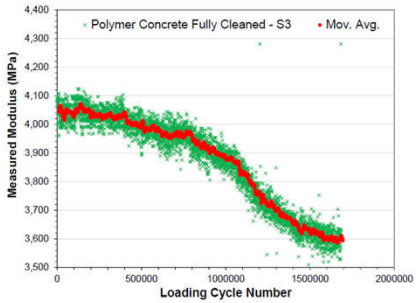

(c) Bond Pull-Off Strength



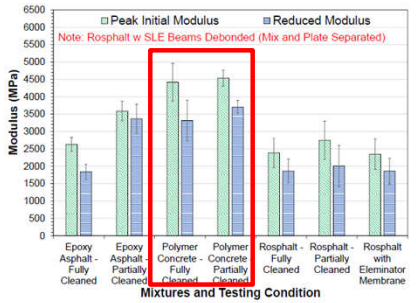

(d) Bond Torque Strength

**Figure 8. Shear, Pull-Off, and Torque Bond Strength Results.**

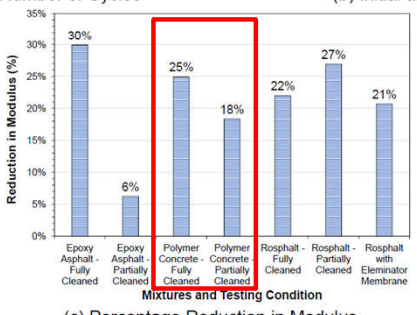





(a) Example Modulus vs. Number of Cycles




(b) Initial and Reduced Moduli




(c) Percentage Reduction in Modulus

**Figure 9. Cyclic Beam Fatigue Testing Results.**



Watson Bowman Acme · KWIKBOND POLYMERS · KING

BUILDING TRUST · Sika

# PPC FOR ORTHOTROPIC STEEL DECKS
## ROWAN UNIVERSITY → EAC VS PPC VS ROSPHALT

**SHEAR, PULL-OFF & TORQUE BOND STRENGTH**

- PPC was better than EAC in test (a) Peak Shear Load by 30%
- PPC was better than EAC in test (b) Bond Shear Strength by 30%
- PPC was tied to EAC in test (d) Bond Torque Strength (only due to maxing the device)
- PPC was worse than EAC in test (c) Bond Pull-off test by only 13%
  - (However, test results from UofMC report for Caltrans San Mateo shows PPC having 60% higher pull strength than EAC)

**CYCLIC LOAD FATIGUE TESTING**

- PPC had an 81% higher elastic modulus than EAC on fully cleaned substate
  - *30% reduction of EAC/Clean x 2600 MPa = 1820 MPa*
  - *25% reduction of PPC/Clean x 4400 MPa = 3300 MPa* → **81% higher than EAC/Clean!**

- PPC had an 69% higher elastic modulus than EAC on partially cleaned substrate
  - *6% reduction of EAC/Partial x 1700 MPa = 1598 MPa*
  - *18% reduction of PPC/Partial x 3300 MPa = 2706 MPa* → **69% higher than EAC/Partial!**

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

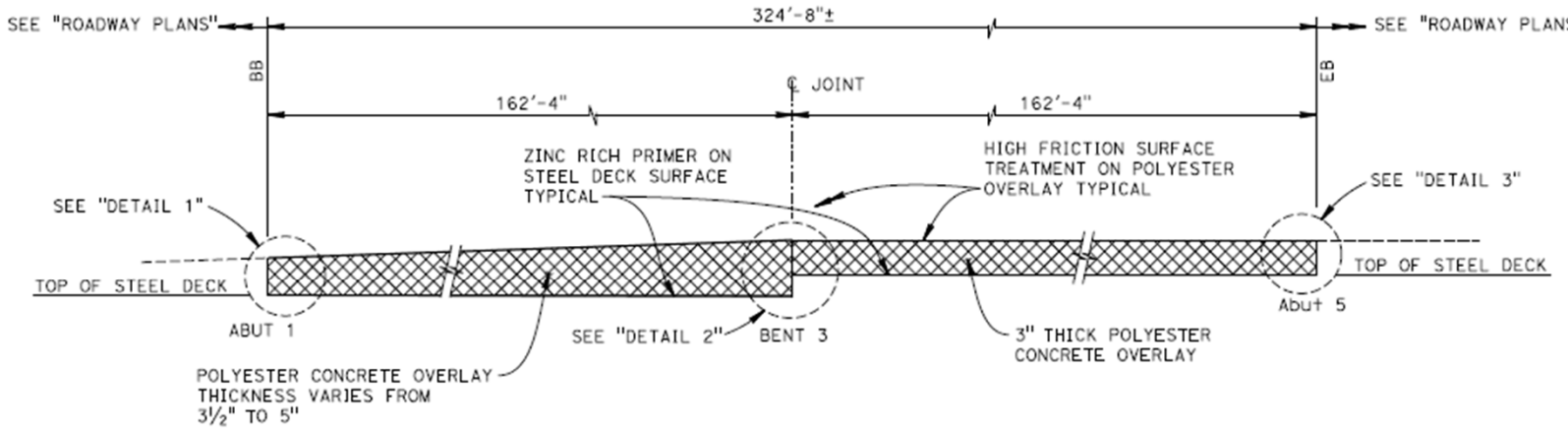
# PPC FOR ORTHOTROPIC STEEL DECKS
## EXAMPLES OF PPC WEARING SURFACES ON OSD

- San Mateo Hayward Bridge (2015)
  - 2.5” thick x 450,000 SF
  - Installed in 2015 during 2 each 55-hour weekend closures
- Poplar Street Bridge (2012 / Trial)
- Yukon River Bridge (2013 / Trial)
- Ben Franklin Bridge (2022 / Trial)
- Danziger Bridge (2019 and beyond, routine patching and repair)
- 680 in Alameda County (2023)
  - 3.5 to 5” thick in California

Watson Bowman Acme KWIKBOND POLYMERS KING

BUILDING TRUST Sika®

# PPC FOR ORTHOTROPIC STEEL DECKS
## EXAMPLES OF PPC WEARING SURFACES ON OSD




LONGITUDINAL SECTION
NO SCALE

NOTE:
For details 1, 2 & 3, see "DECK OVERLAY DETAIL 2" sheet.

REMOVE EXISTING AS
CONCRETE AND PLAC
POLYESTER CONCRET

**680 in Alameda, CA (2023)**

Watson Bowman Acme
KWIKBOND POLYMERS
KING
BUILDING TRUST
Sika®

# PPC FOR ORTHOTROPIC STEEL DECKS
## EXAMPLES OF PPC WEARING SURFACES ON OSD


**Danziger Bridge, LA (2019)**

BUILDING TRUST

Casey Rafter
VP Sales
Kwik Bond Polymers, a Sika Company
(703) 881-8883
rafter.casey@us.sika.com

Watson Bowman Acme

KWIK BOND POLYMERS

KING

BUILDING TRUST

Sika®