NATIONAL STEEL BRIDGE ALLIANCE

AASHTO/NSBA Steel Bridge Collaboration

Spring Meeting Agenda Packet

Providence, RI

April 16 – 18

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.

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Task Group List

Group Name	Chair	Chair Company	Vice Chair	Vice Chair Company
TG 1 Detailing	Randy Harrison	W&W|AFCO Steel, Hirschfeld Division	Gary Wisch	DeLong's, Inc.
TG 2 Fabrication and Repair	Heather Gilmer	Pennoni	Duncan Paterson	Alfred Benesch & Company
TG 4 QC/QA	Jamie Hilton	KTA-Tator, Inc.	Robin Dunlap	High Steel Structures
TG 8 Coatings	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	Michael Baker International	Domenic Coletti	HDR
TG 12 Design for Constructability and Fabrication	Christina Freeman	Florida Department of Transportation	Russell Jeck	Siefert Associates
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	Consultant	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
Main Committee	Ronnie Medlock	High Steel Structures	Christina Freeman	Florida Department of Transportation

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	This Document

AASHTO/NSBA Steel Bridge Collaboration

TG 1 Detailing

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: 4/17/2024 (1:00 pm - 4:00 pm ET)

1. Chairperson's Welcome (1:00 pm – 1:10 pm)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes. Approved.
2. Announcing general completion of discussions of G 1.4 and asking for volunteers for small group discussions of box girder doors and hatches. (1:10 pm – 1:25 pm)
    This is the last outstanding topic for G1.4 revisions.
    Volunteers: Randy Harrison, Mike Culmo, Brad Dillman, Eric Rau.
3. Discussion of changes to G1.2 along with combining G 1.4 (1:25 pm – 4:00 pm)
    Randy has gone through G1.2 and made several comments. The time has come to combine/link the two documents. The plan is to address changes to sections in chunks, and to have a draft document by the Spring 2025 meeting.
    G1.2 Comments:
    - NSBA (Travis Hopper and Chris Garrell) to investigate the possibility of adding embedded links between G1.2 and G1.4.
    - Introduction
        - Add a paragraph about digital delivery.
    - Standard Abbreviations

    - Update redundancy terms, e.g., FCM to NSTM. Refer to NSBA white paper on redundancy changes.
    - Add horizontal and vertical curve abbreviations (e.g., PCC, PVI, PVC).
- Section 1 – Overall Design Presentation.
    - Add General Notes to bridge plan details bulleted list
    - Add Deck Plan to bridge plan details bulleted list.
- Section 2 – General Plan.
    - Need to update all metric to imperial US standard.
    - Add various flood elevations? The scope should focus on information that pertains to the structural steel that is part of the structure.
- Section 3 – Sections and Profile Information.
    - No comments
- Section 4 – Framing Plan and Girder Elevations.
    - Tubs/boxes to be added to the title.
    - Add required fit condition. If not on the plans, the fabricator will issue an RFI. Be cautious about saying that SDLF will always be used if not stated on the plans. Should also mention shop assembly requirements, likely in the General Notes.
    - Delete current girder elevation detail, bring in G1.4 details. See G1.4 pg 103 for Typical Girder Details and additional proposed revisions.
    - Reference G12.1 Section 2 – Girder Details.
- Section 5 – Standard Details.
    - Weld terminations details from G1.4. Could the X and Y dimensions be the same? And can the dimensions be simplified (e.g., ½" max)? Plan was to refer to G12.1 but does not appear that there is info there. Need to check any changes against AASHTO LRFD BDS 6.10.11.1. For now, suggest using ½" max and using a note for the designer to check against LRFD BDS and any other governing requirements.
- Section 6 – Camber Diagram

    - Change from Metric to US Imperial units.
    - Add a note for the designer to clearly state the units of any decimal values (i.e., inches or feet).
    - When revising the tables, use either camber or deflection for consistency, preferably camber. Currently, there is a mix of “camber” and “deflection” in the tables.
- Section 7 – Crossframes
    - Refer to G1.4 pages 108-111 and G12.1 Article 2.2.6.
- Section 8 – Field Splices Details
    - Move this section before Section 7 – Crossframes to keep with girder details.
    - Refer to G1.4 page 107 which will supersede what’s currently shown. Additional comments on G1.4 details.
- Tub and Box details
    - New section
    - Refer to G12.1 Section 3 – Boxes
- Commentary
    - C4.2d: update cost information in the last bullet
    - C8: update to US units. Change 4 to 6 millimeters to 1/8" to 1/4”.
- General Notes (new sheet)
    - Design and construction specifications
    - Coating requirements and specifications
    - Material specifications
    - Welding requirements. Welding specifications that are different than D1.5.

Volunteers for reviewing proposed changes: Mike Culmo, Jon Hagert, Gary Wisch, Brad Dillman, Domenic Coletti, Saeed Doust.

4. Adjourn. Ended at 2:30 pm.

AASHTO/NSBA Steel Bridge Collaboration

TG 2 Fabrication and Repair

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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 - Alfred Benesch & Company

Meeting Agenda: 4/16/2024 (3:00 pm - 5:00 pm ET)

1. Chairperson's Welcome (3:00 pm – 3:15 pm)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.

    Reviewed and approved.

    d. Reminder of documents currently under the task group's scope.

    Fabrication specification S2.1 replaced by AASHTO Fabrication Specification. TG2 still provides input in an advisory role. Previously AASHTO T17 meeting had colocated with TG2 every other meeting. Now fabrication-oriented members of the new AASHTO Steel and Metals committee are encouraged to participate in TG2.

    AASHTO Fabrication Specification was published in 2023 and is not on the same cycle as the AASHTO BDS or BCS. It was assembled from fabrication components that resided in other specifications like D1.5, AASHTO BCS, etc. They are in the process of being deleted from those other documents.

2. G2.2, Guidelines for Resolution of Steel Bridge Fabrication Errors

    a. Updates for D1.5 changes, AASHTO Fab Spec, FC terminology, etc.

    TO DO: Chair will distribute compiled comments and revisions prior to the next meeting. Will be discussed on "consent" basis—whatever is not requested for discussion will be taken as accepted.

    b. Improper preheat.

    The G2.2 document's purpose is to present scenarios of things that go wrong and what solutions work. At last meeting and previous meeting getting more HAZ hardness data was discussed. Chair said we are past doing additional research projects--there are known NCRs and responses for this case and we just need to list out some possible remedies.

    Jason Gramlick of Caltrans said that they had tried hardness testing on suspect welds and didn't get any meaningful results with regard to hardness differentiation. In the end they just went with extra NDT.

    Prior task group recommendation was along the lines of the following:

    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
    - 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
    - For CJP groove welds, conduct UT

TG2 consensus: G2.2 would make recommendations such as those in the bullet list below, with the HAZ moved to commentary. It was also decided that reference to "annealing" (in an earlier version of the above) should be removed.

Chair note: discussion in earlier years also brought up the "alternative preheat" annex in D1.5. This typically is not helpful for groove welds, so hasn't been part of recent discussions, but can be helpful for fillet welds so should be in the recommendation.

TO DO: TG to continue working on above proposal: Jason Gramlick (lead, Caltrans), Ronnie Medlock (High Steel), Todd Niemann (Fickett), Jeremy Rice (Veritas), Karl Frank, Justin Ocel (FHWA), David Stoddard (SSAB), Jason Provines (VDOT), Sougata Roy (ongoing TG, new members and lead added)

c. Framing members too short: Revised draft drawing has been submitted.

TO DO: Chair will circulate for review.

d. Rolled beam elements at splice - Plate girder tolerances going in opposite directions at splice, aligment of orthotropic dec ribs. Not discussed.

3. AASHTO fabrication specification

a. Scribing/etching of layout marks.

Consensus from previous meetings is that specification language is not practical or needed but "workmanship" commentary is being developed.

TO DO: TG for workmanship commentary : Michael Diarcangelo (lead, High Steel), Ronnie Medlock (High Steel), Teresa Michalk (TxDOT), Tim McCullough (FDOT), Jeremy Rice (Veritas), Michael Wiersch (Stupp) (Ongoing TG, new members and lead added)

b. Check assemblies.

Current language in C17.5.3 implies owner's inspector will dictate what is to be assembled at any time. Consensus in the room among fabricators and owners was that there are generally no additional check assemblies required once the procedure

is proved out through the initial set of check assembiles. Ronnie Medlock (High Steel) said the current practice has been partial assembly on each bridge in a project consisting of one line or one unit.

Consensus: delete from C17.5.3 as follows:

The check assemblies should be the first sections of each major structural type to be fabricated, e.g., the first three panels, segments or longitudinal chords; or of the entire first bent, tower face, or rigid frame produced. ~~At least one additional check assembly, ideally selected by the Owner, should be performed further along in the process to verify that the accuracy of the CNC procedures and equipment is being maintained. If problems are found by the second check fit, previously completed connections would need be checked to define the extent of the problem and correct errors to the Owner's satisfaction.~~

Individual check assembly plan by structure type was brought up. For example, truss versus stringer bridge.

Hannah Cheng (NJDOT) asked about the need for language about shop assembly for skewed bridges.

Chair Gilmer noted that the specification as written has very little in the way of specifics and it comes down to approval of the check assembly plan. Also, as previously discussed, the level of approval is up to the owner.

Frank Russo (Russo Structural) brought up that 17.5.3 still mentionds first three panels, when this has no longer been the case for non-CNC assembly for a long time.

Outstanding AASHTO comment from MnDOT still to be addressed: "CNC drilling has to address fabrication dimensional tolerances prior to acceptance."

TO DO: Task group to revise 17.5.3 to get away from "first three": Ronnie Medlock (High Steel), Hannah Cheng (NJDOT), Mike Wiersch (Stupp), Mike Leonard (MassDOT).

c. Web flatness.

Web flatness tolerances have been added to the AASHTO specification and are in the process of being deleted from D1.5 and being added to the AASHTO Specification. "New" proposal is something that was balloted to D1.5 years ago and died for non-technical reasons. (Proposal was distributed to TG2 members, correspondents, and registered guests before the meeting.)

TO DO – Everyone was asked to review before next meeting (will be circulated to TG2). Review will be on "consent" basis—anything not brought up for discussion will be considered to be accepted. Proposal will be redistributed to TG2.

d. Camber tolerances for steel bent caps.

D1.5 Section 5.5.3 includes camber tolerances +/- for cases where top embedded and not embedded in concrete. G12.2 includes an awareness of the cumulative effect of camber in bent caps. TG12 has sent these recommendations to TG2:

> For transverse, single-span caps with longitudinal I-girders or tub girders reamed into moment connections at the bent cap:
>
> -1/8" in., +3/4 in.
>
> For transverse, single-span caps with longitudinal girders CNC-drilled:
>
> -1/8 in., +3/8 in.
>
> For continuous multi-column, hammerhead, or cantilevered steel bent caps:
>
> -1/8 in., +3/8 in.

Ronnie Medlock (High Steel) suggested that there should be consideration for the effects of stacked versus integral configurations. Right now the tolerances do not say whether they relate to either or case. Frank Russo noted that we don't get a lot more play when it's stacked. Brad Dillman (High Steel) also mentioned that it is not known whether connections are CNC or reamed or some combination and how this figure into tolerances. Jon Edwards (DOT Quality Services) asked whether "reamed" in the

suggested language is literal or if this could also mean drilled in assembly. Medlock wondered why there would be a difference in tolerance in reamed vs. CNC. Hannah Cheng (NJDOT) also thought there should be some consideration for cantilever.

TO DO – Chair will follow-up with Christina Freeman (TG12 chair, FDOT) or other members of TG12 to provide greater context for these tolerances.

Discussion after meeting: Robin Dunlap (High Steel) brought up tolerances for WTs that are split in the shop. A6 tolerances can be hard to achieve and may not be needed.

e. DTIs.

Bolting should not be specific to when it done (shop versus field) so the bolting provisions are moving to an appendix that will be published in both the AASHTO fabrication spec and construction spec.

Current language in the AASHTO fabrication specification and draft appendix is the result of group consensus that included DTI manufacturers, but there are still concerns.

AASHTO has 0.005 inch inspection gap. Justification has been that connections in bridges are exposed and this will limit corrosion. However, given the structure of DTIs, how practical is this and is it achievable with DTIs? Per AASHTO, DTIs require one visible gap (no “dead flat”) and the condition is hard to achieve in combination with the 0.005 gap, particularly for coated DTIs that only allow one gap over 0.005". Zane Keniston (QMC) mentioned a Lehigh study related to stress relaxation that may have some relation to the gap value.

Randy Harrison (W&W|AFCO Steel) mentioned that the bump on DTIs may have recently changed.

Ronnie Medlock (High Steel) suggested this be discussed at the upcoming RCSC meeting in Pittsburgh, PA, on June 5–7.

TO DO: Chair will forward concerns to RCSC

DTIs with self-indicating features are not manufactured with the AASHTO gap in mind, so manufacturer instructions for the amount of liquid that is ejected during installation may not be appropriate—may need to "calibrate" and establish a different visual reference. Current fab spec does not explicitly allow these features for acceptance but has commentary for what owners might choose to do. Randy Harrison (W&W|AFCO Steel) mentioned that contractors are requesting them but do they not use them in the shop. Gilmer (Pennoni) said the shop she used to work for used these featuers for reference/convenience but not acceptance.

LaDOTD allows DTI with self-indicating features to be used for as the basis of acceptance.

Chair suggested we think about self-indicating features after the gap questions are resolved.

f. Masking (slip-critical, other): need to add to fab spec.

TO DO: Gilmer (Pennoni) will draft something

g. Formed girders with <5t radius.

5t radius was added to AASHTO BDS & BCS in 2012. Research was performed in Texas to look at the effect of heat and high strain levels, which often resulted in more brittle material that is more susceptible to cracking. Research for the prior smaller radii just looked at whether cracking had occurred but not material properties. Connection plates allow smaller radius per AASHTO. Press brake tub girder manufacturers are interested in using smaller radius.

TO DO – Ronnie Medlock (High Steel) will contact Ashley Thrall at Notre Dame who is working on the modified press brake for Indiana DOT and see if her work resulted in any new recommendation and follow-up with the group.

4. Other: Chair noted that these meetings will be 4 hours in the future.
5. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 4 QC/QA

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

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: 4/17/2024 (1:00 pm - 4:00 pm ET)

1. Chairperson's Welcome (1:00 pm – 1:15 pm)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. G4.2 – Guidelines for the Qualifications of Structural Bolting Inspectors (1:15 pm – 1:30 pm)
    a. Update on AASHTO balloting
    - Received 10 review comments from AASHTO on 4/14/24. We need to respond to each of the review comments by 5/5/24. Jamie plans to do this.
    - 1st comment from Paul Palarski (MnDOT) – Response: This document is currently a guideline, and appears to have limited use. Consideration will be given to making it into a specification in the future. Including a national exam will be kept in mind, but it is likely doubtful that it will be incorporated, as it would likely be difficult to get national approval/certification. Jamie plans to contact Paul to further discuss this issue and resolve it.

- 2nd & 3rd Comment from Doug Cantrell (NCDOT) – Response: The current requirements, regarding experience and passing an exam, in the document are deemed sufficient. However, consideration will be given to making the document more strict/rigid. Jamie will communicate this to Doug.
- If there is an exam required to be passed, where do the question/answers come from, and how difficult are they.
- A national exam could be beneficial and attractive to all DOT's, and would keep things simple and consistent nationwide. It could eliminate rework by each of the DOT's individual. It could make this document much more attractive to use for DOT's.
- These and all the other comments are being considered New Business at this point, and will be considered moving forward, but not for this interim update.

b. New business to be addressed from AASHTO Metals Committee comments

3. S4.X – Owners Inspection Requirements (1:30 pm – 3:00 pm) – Continue review of updated document and action items (see **Appendix C – Meeting Attachments** - TG 4 QC/QA)
   - This document is a specification.
   - Section 8.1.4 concerning use of "Buy America" or domesticity requirements and who is responsible to submit request for subsitution – Heather Gilmer to develop language and discuss with Jamie.

   a. Add commentary on good practice for photographs in reports – Halim Bas

   Halim provided comments regarding photographs and suggesting they include things like photographer credits, dates, location etc. Mike Leonard, Matt Conso and Heather.

   b. Action Item: Review 8.6.3 for technical clarity – Bob Stachel

   Bob had no comments. Okay as is.

   c. Action Item: Review 8.2.1 for technical clarity – Kent Nelson

   Kent also provided comments on Section 8.1.4 and will be incorporated.

d. Action Item: Review 8.4.1 for technical clarity – Phil Dzikowski

Phil had no comments other than to re-order a few items.

e. Reconsider the use of the term “verify” versus monitor or observe.

- Decided to leave “as-is”.
- Mike Leonard (MassDOT), Art Bustos (AISC) & Zane Keniston (QMC) will review this document, commentary, and report back to Jamie. (Jamie to determine what this pertains to specifcally)

4. G4.1 - Steel Bridge Fabrication QC/QA Guidelines (3:00 pm – 3:45 pm) – continue review
   a. Reviewed up to section 5.2.
   b. Action Item: All TG members to finish the review of proposed changes in document including the Introduction (updated) and from section 5.2 to the end.
   - Jamie added the word “Owner” to Inspector in many different locations in this section as it specifically pertains to the Owner.
   - Jamie changed everything to “Quality Manual”.
   - Jamie added “AMPP”, as it replaced NACE & SSPC.
   - Heather Gimer eliminated “NSTM” in the Fracture Control inspection sections and replaced it with “Members”.
   - “Issuing Authority” was deleted in several places and left as “Owner”.
   - “Engineer” is the same as “Owner”.
   - Section 11 – Phil Sauser and Jonathan Stratton will be reviewing and editing to clarify the intent of transferring permanent piece marks from larger members to portions that are cut off from it.
   - Several other somewhat minor edits were made to this section during the meeting. Each one was discussed and agreed upon by the group.
   - Section 17 – revised “avoid potential damage” to “avoid damage”. Jon Edwards will rewrite the sentence about final inspection and acceptance. Maury Tayarani to develop a list of what would be included in a final inspection and send it to Jamie.

5. New Business/General open discussion (3:45 pm – 4:00 pm)
6. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 8 Coatings

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

Task Group Mission: This Task Group primarily focuses on the functions, operations, requirements and activities needed to achieve consistent quality in steel bridge coatings. 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 Agenda: 4/17/2024 (10:00 am - noon ET)

1. Chairperson's Welcome (10:00 am – 10:10 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
2. Welcome the new TG8 Chair - Johnnie Miller (10:10 am – 10:30 am)
    a. Interest in vice chair position.
    b. Derrick Castle was nominated and approved and accepted by Johnnie Miller.
3. S8.1 Comments (See Appendix C – Meeting Attachments - TG 8 Coatings) (10:30 am – 11:15 am)
    a. Heather gave some history of the balloting process, especially the process with AMPP.
    b. Heather is going to check in with AMPP on their status and what we should do with this document.
    c. Heather led the discussion about comments and proposed resolutions to those comments.
        i. SSPC Paint 29 was added back in.
        ii. Method D of ASTM D4417 was added.

iii. Reference to blue and green colors for lubricants and what they represent was removed as it was deemed irrelevant.
iv. Modified recoat time in the topcoat table.
v. Rejected proposed language for defining pinholes (deemed unnecessary).
vi. Discussion ended at Section 3.4. A virtual meeting will be conducted to resolve the rest of the document, particularly better defining mist coats and how used, particulalry for top flanges (cocnerns with welding sheer studs) and avoiding pinholes in coating over IOZ.

d. For next edition, consider the following:
    i. More explicitly define scope of S8.1 (shop application, field application)
        1. Expand to include field application of intermediate/topcoats to shop-applied coatings.
    ii. Certification: delete QP1 from spec due to concerns about misinterpreting the language whereby a fabricator outsources the shop application to a QP1 contractor who applies the zinc primer and other coats in an outside environment: can't drag it outside and use QP1
    iii. What about staged that has been siting in the yard between coats
    iv. Box interior?
    v. Address top flange and maube define Mist coat. Travis Hopper said that he has done a lot of research into what states require for mist coats and he can be a good reference when we go down the road of defining mist coat.
    vi. Better describe "mist coat technique" for avoiding pinholes over IOZ.
    vii. Investigate whether or not we need to have SSPC Paint 29 referenced in the new version of document in section 3.5. We may need to reach out to Tom Calzone. We added it to the document, but look into why we deleted it.
    viii. What about topcoating lubricated ungalvanized fasterners?

e. The goal is to get this document to S & M committee by September 2024 so that they can put it on the ballot for COBS in 2025.
f. Johnnie will work with Heather to schedule a virtual meeting to continue reviewing S8.1 comments. Note that we stopped during 3.4, and we'll send the recommended changes (what Heather is proposing) with the meeting notice.

4. Proposal to review S8.2. (10: 15 am – 11:30 am)
    a. Heather said that we were originally waiting for CS 23.00 to be updated, but since it is taking too long we should continue with updating S8.2.
    b. We will send an email to the TG8 group and ask who wants to be a part of the task group to review S8.2.
5. Review state of G8.4. (11: 30 am – 11:45 am)
6. Feasibility and process for AASHTO to revise corrosion protection testing process/protocol. (11:45 am – noon)
    a. Johnnie proposed the idea to organize a pooled fund study to develop a better test protocol for steel bridge coatings. Travis Hopper said that NSBA has talked to FHWA and they supported it.
    b. Johnnie is going to reach out to Todd Bennett (MODOT) to developp a RNS with Travis Hopper and Jeff Carlson and see if Missouri would be a lead state.
7. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 9 Bearings

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

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: Mike Culmo - CHA Consulting, Inc.
Vice Chair: Ron Watson - RJ Watson, Inc.

Meeting Agenda: 4/16/2024 (3:00 pm - 5:00 pm ET)

1. Chairperson's Welcome (3:00 pm – 3:15 pm)

   Mike went over the mission, and provided an example of what TG does (G9.1). Mike reminded the group that this TG tries to avoid delving into bearing design, if possible.

   a. AISC Antitrust Policy and Meeting Code of Conduct.
   b. Introductions.
      i. Name.
      ii. Organization.
      iii. Role in your organization.
      iv. What are you looking to get out of this collaboration?
   c. Approval of Previous Meeting Minutes. Approved.
2. Task Group Membership (3:15 pm – 3:45 pm)
   a. Review existing members and participation. The TG roster is a little outdated. Several people requested to join the TG. They will contact Mike via e-mail. Mike will then work with NSBA to add them to the TG roster. Mike will then distribute the updated roster.
   b. Discussion on membership.

      Mike stressed the desire for representation from the following groups.

      i. State DOTs. The TG is looking for more participation from this category.
      ii. AASHTO Component Committee members.

iii. Manufacturers.

iv. Academia.

c. Volunteers to approach potential new members. For example, the AASHTO Components committee. See notes below on collaborating with this committee.

3. Old Business (3:45 pm – 4:30 pm)

a. Discussion on potential future enhancements to the G9.1 document.

i. Add provisions for the design of bridges for future jacking for bearing maintenance.

1. Approach to jacking details.
2. Jacking calculation approach.
3. Live load jacking?

TG 9 will study similar provisions for jacking that other task groups have included in their Collaboration documents, specifically TG 11 (Guidelines for the Design of Cross Frames and Diaphragms – under development) and TG 14 (G14.2 Section 6). The goal will be to enhance, supplement, and reference these provisions in G9.1, not duplicate them. Potential topics to include in G9.1 are:

- Provisions to account for tolerance differences between existing bearings and new replacement bearings (e.g., new elastomeric pads versus existing steel bearings).
- The amount of jacking that is appropriate (in inches).
- How to replace older style bearings.
- Ways to design new bridges to save time, effort, money, etc. in the future during bearing replacement.
- How to design and detail anchor rods with couplers to facilitate future bearing replacement.
- Guidance on appropriate dimensions of bearing components and seats.
- Construction guidance (get contractor input)

ii. Other ideas.

Other potential topics to include in G9.1 were discussed:

- Bearing detailing to prevent orientation mix ups. Doug Crampton provided an example where HLMR bearings were improperly installed because they were inadvertently detailed in a way that allowed orientation mix up.
- Corrosion protection and the effects on fabrication order of operations (Jon Hagert).
- Effects of elastomeric bearing tolerances on erection.
- Adding joints to the TG mission and a section on joints to G9.1 (Ron Watson and Phil Gase).
    - Joints and bearings work together to address thermal movement.
    - This is consistent with the new AASTHO COBS Components Technical Committee.
    - Ron Watson will collaborate with others to develop a list of potential joint-related topics to cover in the document.
    - Joint elimination
- A new Preservation and Rehabilitation section.

b. Potential future work of the Task Group.

i. Update on spreadsheet for elastomeric bearing design. The existing spreadsheet, which was developed a number of years ago, was set up with macros. The plan is to revise the spreadsheet to follow a trial-and-error approach rather than a macro-based approach.

c. Discussion on collaboration with new AASHTO COBS Components Committee.

i. Mike will look to make a presentation to that committee to start discussions on collaboration efforts. Mike is looking to get on their June meeting agenda.

ii. Look to get members of this committee on TG-9. Leslie Daugherty from Alaska DOT is the chair.

4. New Business (4:30 pm – 4:55 pm)
    a. Bearing research.
        i. Disc bearing provisions for AASHTO LRFD BDS? Ongoing.
        ii. Any ideas for new research?
            1. The necessity for attachment/connection of various bearing components. Mike noted that there has been past research on the need to restrain elastomeric bearings from sliding. MassDOT and others do not restrain bearings. Most states do restrain bearings, which comes at a cost. MassDOT also builds bridges without anchor rods. The PS concrete industry does not restrain bearings. There was research completed at UT Austin (Joe Yura), but it is over 25 years old. Mike will work with Gerry Sova on developing a Research Needs Statement. Mike will then work with the AASHTO COBS Components Committee to see if there is interest in sponsoring this RNS.
            2. Edge loading of bearings during construction due to camber before all the load is on the girder.
            3. Service life of bearings. What constitutes the end of service life? What does good/proper performance look like? Try to define the "failure" of a bearing for various bearing types.
5. Future meetings (4:55 pm – 5:00 pm)

   The next Collaboration meeting will be October 22-24, location TBD.
6. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 10 Erection

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: 4/18/2024 (8:00 am - 10:00 am ET)

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.
2. Presentation "Tower Crane Supports at the Gordie Howe Bridge" (8:10 am – 8:40 am)
    a. Presenters from Seifert & Associates were Andrew Ritter, Thomas Rabinko, and Julia McNamara
3. Working session on UPCOMING G10.2 guideline document (8:40 am – 9:50 am)
    a. Brian is going to reformat the document so that everyone can edit the document at once, because now it is difficult to work in.
    b. Brian discussed the intent of the document and referenced the notes from the fall 2023 meeting.
    c. Confirm author assignment, assign new authors as needed, and provide additional resources as needed.
    d. Domenic asked if it is possible to have dynamic pdfs in the document. Or at least a link to a youtube video or pdfs. Jeff asked Chris Garell about it and he said that it may be possible and he may have to alter how the final document gets

produced. Chris said that he can experiment with it if somebody has an example of a graphic.

e. Brian led a discussion about what format all of the graphics should be in. Some felt that it was OK if the graphics are created in different programs.
f. Domenic mentioned that he felt it would be helpful to have photos of the same bridge girders in the different fit conditions. And also felt it would be helpful to have photos of the same girder in the morning and afternoon that illustrates the effects of thermal movement.
g. Brian asked for suggestions for how get images or pictures for section 4. Joe said that he can help and several others also volunteered.
h. Brian wanted to meet in early June to keep working on the document.
i. Review and discuss new content.

4. Other topics for discussion (9:50 am – 10:00 am)
5. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 11 Design

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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 - Michael Baker International
Vice Chair: Domenic Coletti - HDR

Meeting Agenda: 4/17/2024 (10:00 am - noon ET)

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.
2. Announcements and Administrative Items (10:10 am - 10:15 am)

Brandon reviewed the mission statement given the number of new attendees and mentioned that TG11 is wrapping up the new cross-frame guide. He then mentioned upcoming conferences, specifically IBC in San Antonio, TX June 3 – 5, 2024 and NASCC which will be April 2 – 4, 2025 in Louisville, KY.

3. Presentation (10:15 am - 10:40 am)

Brandon took this time to review the upcoming AASHTO 10th Edition changes. He began by reviewing the balloting and review process every changes follows from AASHTO Steel and Metals committee through the COBS meeting. Presentation material can be found in Appendix C – Meeting Attachments: TG 11 Design.

4. Guidelines for the Design of Cross Frames & Diaphragms (10:45 am - 11:30 am)

Cross-frame design guide has recently completed final review and Brandon is addressing comments from that. They are now going to pursue this as a new Collaboration document through the COBS process. They are targetting June for the TG ballot.

a. Discussion on any final items

b. Timeline

The following figure shows the anticipated schedule for this document. Volunteers were selected to provide final review. This include Mike Culmo – CHA, and ….

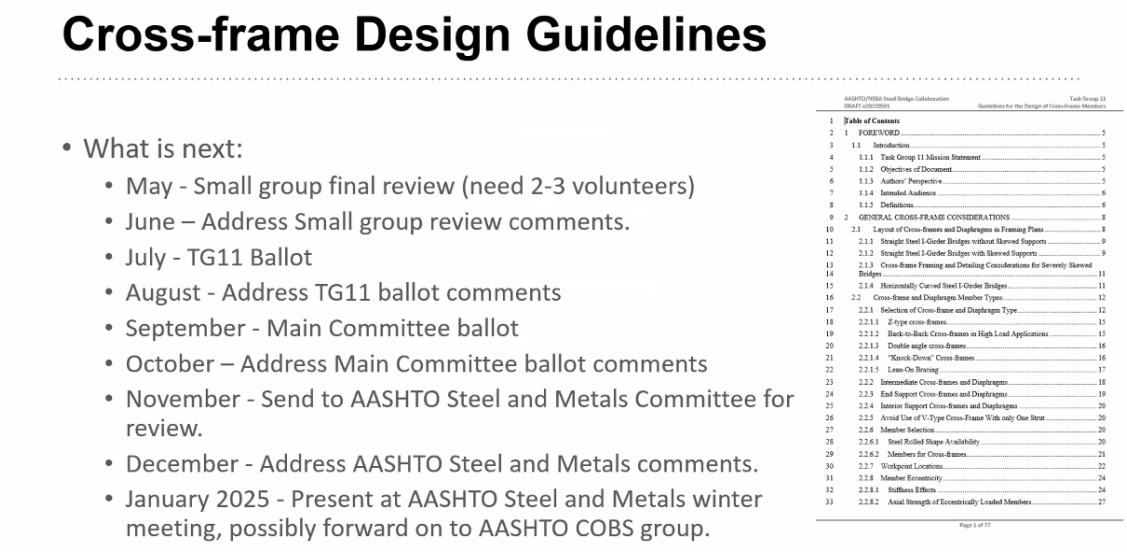

Figure 1: Cross-frame Guide Schedule.

5. General Open Discussion (11:30 am - noon)

    a. Next potential items for the next design TG task.

    b. Lateral Bracing

    c. Stability and Strength computations for cross-frames

Narrow system and their stability has been a challenge. It was suggested that this becomes an addition to Steel Bridge Handbook with an example. Mike Culmo – CHA thought widenings, where additional girders cannot be connected to the existing bridge, could use some better guidance. Frank Russo – Russo Structural, discussed some of his finding while creating the NSBA plate girder standards which required the addition of laterial bracing in some of the longer span cases.

It should be noted that the examples that were originally a part of the G11.1 document will not be part of the final document. They will continue to be reviewed and altered for consitency for consideration in an update.

The group voted on next task to pursue. The choices were: 1) Phased construction for widening, 2) cross-frame design examples, 3) constructability investgation. An informal survey of the attendees indicated that “1” was the choice.

6. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 12 Design for Constructability and Fabrication

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: Christina Freeman - FDOT
Vice Chair: Russell Jeck - Siefert Associates LLC

Meeting Agenda: 4/16/2024 (9:00 am - 10:30 am ET)

1. Chairperson's Welcome (9:00 am – 9:10 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. Emergency Repairs NJ Turnpike Interchange 7 Ramp over Route 204 (9:10 am – 9:55 am)

    Presented by Brian J. Atkinson, PE (HNTB)

    On Thursday evening, March 10, 2022, an over-height tractor trailer, which had become separated from its escort vehicle, was traveling in the center lane of US Route 206 SB and struck Turnpike Bridge No. 53.28B. Ramp traffic was immediately diverted until the bridge could be inspected and deemed safe, which created extensive backups and ultimately forced the New Jersey Turnpike Authority (the Authority) to close Interchange 7. Four of the eight girders (W36 rolled beams with cover plates) in the bridge span over Route 206 SB were found to be severely damaged as a result of the impact, prompting the NJDOT to close Route 206 SB.

    HNTB's inspection and design staff responded promptly and worked diligently to reopen Route 206 SB by Friday evening, March 11 (24 hours from the incident). A

cross-over and detour for the ramp traffic was designed and constructed by 5pm Sunday, March 13, leading to the reopening of Interchange 7, less than 72 hours after the initial bridge strike. Once the interchange was reopened, the Authority tasked HNTB to investigate repair and replacement options for the damaged bridge span.

From the initial incident through construction, HNTB worked through procurement issues to provide the Authority with a new span that increased the vertical clearance, making it possible to complete the emergency repairs and fully open the bridge to traffic on October 7 – a week ahead of schedule and more than $1.5 million under budget.

- 4 of 8 beams severely damaged with cracks, tears, distortions, and significant sweep.
- Bridge was closed until reduced underclearance (due to torn portion of bottom cover plate hanging down) was remediated.
- Bridge was sufficient to carry one lane of traffic only in current state,
- Several steel fabricators provided options for replacing some of the beams, including fabricated plate girder option, and 50 or 50W steel.
- Heat straightening and bolted repair options were considered.
- Full superstructure replacement was also considered, recommended, and accepted by the Tollway Authority.
- Extremely accelerated bridge replacement project.
- Utility coordination/relocation was critical.
- New painted rolled steel beams were delivered to the bridge site within 15 weeks from time of collision.
- Bridge superstructure replacement was completed within 7 months from time of collision.
- Identifying critical path of response early on.
- Relationships developed thoughout your career are very important in coordinating responding to situations like this.

- Existing beams were W36. New beams are W33, so vertical underclearance was slightly improved.
- The Tollway Authority has had very good performance from using uncoated 50W steel, and continue to prefer it.

3. Plate Availability Table (Note updated NSBA Plate Availability Page) (9:55 am – 10:10 am)

- Preference is to refer to the NSBA Plate Availability Page in the G12 document instead of physically inserting the rather large tables into the G12 document. This will avoid having to update the G12 document whenever the tables are updated. There appeared to be overall consensus on this from the group.
- Request was made to combine the MSC article with the updated tables so it is all in one place on the NSBA website.

4. Discussion (10:10 am – 10:20 am)
    a. Issues that members have experienced and that could be addressed at future meetings
    b. Closing Remarks
5. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

Combined TG 1 Detailing, TG 11 Steel Bridge Handbook, TG 12 Design for Constructability and Fabrication

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

Task Group Mission: This group is focused on the development of guidance for the detailing, fabrication, design and construction of steel straddle bents.

Task Group Leadership
Chair: Christina Freeman - FDOT
Vice Chair: Brandon Chavel - Michael Baker International

Meeting Agenda: 4/16/2024 (10:30 am - noon ET)

1. Chairperson's Welcome (10:30 am – 10:40 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. Redundancy of Triple I-Section Bent Caps (10:40 am – 11:20 am)
    a. Presentation by Michael Culmo, PE (CHA)
    - Focuses on straddle bent cap types, not single column bents.
    - Applicable to integral and stacked type straddle bents.
    - Fabricate center girder first, then longitudinal stiffeners for girder continuity, then outside girders attached. Access holes need to be provided.
    - Less expensive to fabricate than single box section and not considered to be a confined space.
    - AASHTO redundancy factor is 1.2 for straddle bent caps, but Mike contends that this is very conservative for the Triple I-Girder concept. Mike suggests using a factor of 1.0 as it is load path redundant (3 girders).
    - If there is a concern using a factor 1.0, evaluate using the AASHTO System Redundancy Guide Specification.

- For stacked-type bent cap, there are individual bearings under each of the girders at each end. For the integral bent cap, there is one large bearing at each end of the girders that each of the 3 girders bears on.
- It is recommended the the inside surfaces of these 3-girder caps be painted for inspection purposes.
- These type straddle bent caps can typically handle larger loads compared to PT concrete straddle bent caps, for instance when the adjacent spans are 200’ or longer.
- Need to provide screening/doors to prevent birds from getting inside. Also need to provide openings so moisture can drain out.

b. Discussion

3. Discuss NYSDOT comments on G12.2 – Guidelines for Steel Bent Caps (11:20 am – 11:50 am)
    a. Single I-section bent cap
        - Several edits were made to discuss the single I-section bent cap pros/cons.
    b. High Performance Steel
        - Added that using HPS steel for nonredundant steel bent caps should be considered. However, striking out this comment was discussed in detail and is seriously being considered.
    c. System Factor
        - This is in the Manual of Bridge Evaluation, and only applies to non-redundant members. As such, this would not apply to a 3 – girder bent cap system. The AASHTO Manual of Bridge Evaluation needs, and is, in the process of being synced-up with the AASHTO Bridge Specifications.
    d. Web Tensile Zone Designation for Composite Bent Cap
4. Open Discussion (11:50 am – noon)

a. Issues that members have experienced and that could be addressed at future meetings
    - Ronnie Medlock asked if there was interest in this group developing a "Best Practices" document for arch and cable bridges.
b. Closing Remarks

5. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 13 Analysis of Steel Bridges

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: 4/16/2024 (1:00 pm - 3:00 pm ET)

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

    60 attendees; industry updates; Don White presentation; G13.2; software validation survey. Minutes approved.
2. General Announcements (1:10 pm – 1:25 pm)
    a. Conferences/Research/Publications.

    WTS, IBC, COBS, AASHTOWare BrR RADBUG.
    b. NSBA Update – Travis Hopper.
        i. University-level bridge course: content done, corresponding recordings are in-progress by Frank Russo.
        ii. University of Delaware Durability Study – Phase 2 (Jennifer McConnnell): Specimens are currently undergoing accelerated lab testing. Chris Garrell and Travis Hopper recently visited UDel to see the testing. The testing will conclude sometime this summer.
        iii. Press brake tub girder guideline document: This document is in-progress and will be done in next couple of months.

iv. Railroad standard designs for short spans (< 60')
    1. A feasible design concept has been developed.
    2. NSBA is working with the Railroads on fabrication and construction.
    3. A prototype will be studied at the MXV test site starting this fall/winter.
v. B2P: NSBA is looking for one more DOT participant.
vi. WSBS 2025: call for abstracts is open.

c. FHWA Update – Dayi Wang, FHWA Steel Specialist.
   Dayi gave an update on two FHWA projects. The first is an ongoing project being performed at Purdue. The researchers are developing a simplified procedure for analyzing the internal redundancy of tied arch bridges. The second is a new project that will be updating a 1986 FHWA document on fracture critical bridges. One of the main goals of this project is to develop simplified methods to determine load path redundancy, e.g., for 3-girder systems, floorbeams, and straddle bents. The project has been awarded and will start soon.
d. TRB AKB20 (Steel Bridges Committee) Update – Mike Culmo.
   Mike is taking over AKB20 and is focused on developing Research Needs Statements and working with AASHTO and NSBA.
e. AASHTO Bridge Update (T-14 Structural Steel Design) – Tony Ream.
   The new committee's name is Steel and Metals. The committee has met twice already under the new name. Potential upcoming changes include prying force, reduced design yield resistance for tub/box flange splices, revised effective in-plane girder stiffness for stability bracing, revisions on welded connection design, and lean-on bracing.

3. "Curved Steel Plate Girders: Analysis Techniques and Comparisons," Chris Duncan and Christpoher Fuller (1:25 pm – 1:45 pm)
   Chris Duncan and Chris Fuller gave a presentation about a recent project they completed. Key takeaways from the presentation included:

- Client was TxDOT; 2 interchanges; Beaumont, TX; DBB project delivery.
- Widening I-10 from 4 to 6 lanes; widened approaches from 2 to 3 lanes; adding frontage roads, relocating ramps, removing a bridge.
- General Requirements: 3517 ft of total bridge length; steel unit with 5 girders; 3 spans, 800 ft long, 38 ft width, ~2000 ft radius curve.
- Analysis: full 3D in CSiBridge; independent review and check in MDX.
- 3D model: mixed model – shells and beam elements; A709 50W; mixed bearing fixity
- Lanes: 3 lanes
- Construction Staging: nonlinear construction staging analysis; "guide structure" feature to match deflected shapes; 11 stages for both steel erection and pour sequence; shore towers modeled sequentially in the construction stage analysis.
- CSi vs MDX: spring constants required in MDX to account for substructure flexibility; results compared well; the main comparison was for DL, LL was also selectively compared, no deflection comparisons were made.

4. "Streamlining Analysis of Tied Arches," Jeff Svatora (1:45 pm – 2:15 pm)

   Cancelled, Jeff was sick.

5. "Tightly Curved Steel Bridges: Issues and Limitations of the Analysis Software " Saeed Doust (TY Lin) (1:45 pm – 2:15 pm)

   Saeed gave a presentation to fill in for Jeff's time slot. Key takeaways included:

   - Earhart-Causeway Interchange, Jefferson Parish, LA.
   - Ramp NW: 170' – 210' – 170', horizontally curved R=258' (almost 90 degree turn).
   - 6 girder cross section.
   - Deck pour sequence included.
   - CSiBridge model issues:
     1. Issue 1 – released movement direction, individual angles for each girder at each support. Finger joint orientation.

2. Issue 2 – live loads on variable width, number of lanes change along the length.
3. Issue 3 – wind loading: wind load not modeled accurately as specified by AASHTO LRFD BDS.
4. Issue 4 – fluctuation of shear, moment, and deflection diagrams.
5. Issue 5 – model elevations: elevations at bents are approximate and not accurate.
6. Issue 6 – elastomeric bearing stiffness: bearing stiffnesses in 6 DOFs are needed for accurate analysis.

6. G13.2 Guidelines for Steel Truss Bridge Analysis - COBs review (2:15 pm – 2:25 pm)
   Deanna gave an update on the status of this document. COBS comments (71) were received 4/14. The majority are editorial comments. Responses and updates are due 5/3. Caltrans had a significant number of comments: topics for future documents, guidance for hinge eccentricity, complex/irregular gusset plates, truss hinges, double-deck trusses carrying hybrid load types (e.g., highway one deck and railroad on another deck), wind loads, truss arch bridges. Most of these are considered out of the scope of G13.2 and will likely not be addressed in the document. Typesetting and formatting will happen after comments are addressed. Targeting end of 2024/early 2025 for publishing.
7. Software Validation and Checking Complex Models - Survey Results (2:25 pm – 2:50 pm)
   TG 13 is collaborating with software vendors to develop a standard of care document. The objective is to have a standard of care for the software user that includes software topics such as examples, analysis theory manuals, verification, validation, etc. The responsibility of design and analysis still falls on the EOR, not the software vendor. There has been participation from a number of the software vendors already. The 1st step was a software user survey, which was sent out late 2023 and closed early 2024. Deanna has gone through the initial survey results – background, experience, type of bridge, type of analyses, owner requirements, product documentation, and training material.
   Volunteers to help with summarizing survey results:

- Grouping results by background: Natalie McCombs
- Software Tools, need to compile responses for software most commonly used: Greg Dunn
- Product Documentation, summarize the following output (anything not listed above that you think are important elements in product documentation): Dusten Olds
- Training Material: Cervo
- Develop Summaries for technical support, software updates documentation, analysis results validation: Alina Davidescu (MassDOT), Brenda Brown (MassDOT), Domenic Coletti

The plan to complete the survey portion of this project is to schedule a small group meeting in May 2024, finalize the results in July 2024, and develop a draft paper by October 2024.

Next steps: develop the standard of care, finalize what is desired from the vendors.

A question/comment was raised: Can we request minimum software output requirements? For example, types of output, format, intermediate step output validation (e.g., section properties).

8. New document topics (2:50 pm to 3:00 pm)
    a. Buckling and Global Stability Analyses. This would be part of G13.1.
        i. Goal is to kick off this topic at the next Collaboration meeting.
        ii. Volunteers to help: Frank Russo
        iii. Education product(s) should be a large part of the effort - when and how to use different analysis types?
        iv. Focus would be on girders (since it will be part of G13.1) but could expand in the future to other bridge types.
    b. Arch Analysis
        i. Suggested to wait until after the previous topic (buckling and stability) is completed.
9. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 14 Field Repairs and Retrofits

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: 4/17/2024 (8:00 am - 10:00 am ET)

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.

    Finalizing the template for G14.2

2. Announcements - G14.2 Released (8:10 am – 8:20 am)

Reviewed mission statement given the number of new people attending. Currently have G14.1 and G14.2 published and working on the new G14.3. G14.3 is a catalog and a companion to the two existing documents.

3. G14.3 Discussions (8:20 am – 10:00 am)
    a. Discuss the approval process at a high-level.

    The intent is that this would only be an NSBA document and not be an official AASHTO publication. The document is going to be updated regularly with new details added. The document will still go through the Collaboration balloting process with the goal of having both ballots (TG and MC) completed prior to the fall meeting so that comments could be resolved. This cycle would be repeated each year. Individual PDFs for each detail (?). Characterization of the detail (how to identify), more specific details and finally specification and attachments relevant to the details.

b. Discuss what the “final format” will be.

Kyle reviewed an example of a typical detail. At this time there are 21 detail sheets that are under review.

c. Discuss/vet any available details.

Group suggests developing an instruction document that describes the layout of the sheets, acts as a user guide, and provides a place to include NSBA legal text. Consider including a field for references to the G14.1, G14.2 and/or any other Collaboration documents that may discuss the design, analysis and/or detailing considerations for the detail in question. All details are being provided as-is and not being modified from their original source. For example, if details came from NJDOT, it would be published as it was provided. We will only be providing commentary on the document and offering the user some additional things to consider if they intend to adapt the detail.

IME02.01: This sheet addresses collision damage by replacing girder section between splices. Josh Orton - Brasfield & Gorrie, LLC asked how the field section would be delivered to the field and if it would be predrilled or if it would be field drilled. Consider adding a comment regarding when holes should be drilled as part of notes or provide reference to relevant portions of G14.2 that discuss field vs. shop drilling for field repairs. This is especially important when re-using the existing splice plates. The detail presented was eventually adapted in the field with the owner noting that the detail was not constructible as detailed. There was no mention of why. Domenic Coletti – HDR thought maybe there was a need to jack longitudinally to get pieces to fit. He suggested there be a warning to the account for some adjustability to accommodate existing field conditions.

IME03.01: This sheet addresses partial girder and deck replacement for box sections. Joe Esposito – GPI thought the current detail looks like it is for the positive region while implying it is only applicable in the negative moment region. This is a non-redundant system; the designer should look at system stability. Needs to be clearer

about what parts/portions of the tub girder is being repaired (i.e., limits of repair). Consider providing context for what lead to the damage in the first place and the need for repair. Another comment was, if the bridge is to remain under traffic during or prior to the repair, then there should be some considerations for the overhang capacity (which was previously deck spanning between girders). Natalie McCombs – HNTB suggested there be a redefined list of keywords that are used across all details. Josh Orton thought maybe there would be a need for a classification that mentions whether field welding, match drilling, etc.

IME04.01: Brian Witte – Parsons said there should be a clear differentiation between damage versus deformed. Each may require a different level of repair which may not be appropriate for the detail being recommended. Damage could imply fracture from the minor to the extreme. Differentiate between repairs and retrofits versus replacements. All sheets should include a reference to relevant Collaboration documents and specific sections. In the future consider adding a capability to upload an image. Shane Beabes– AECOM mentioned the importance of having a date and region for context. Sammy Elsayed - OHLA USA questioned the need, relevance, or value for cost information and whether it should be removed. The repair itself could be inexpensive, however the related costs for the entire project cost may be much higher. All the repair details should reference a preface like a user guide explaining things like the characterization classifications.

TODO: Chris Garrell will research how much identifying information should be provided on each sheet. What about including a picture of the project repair itself? We also need a boiler plate release statement.

TODO: Kyle Smith will send Chris a completed detail sheet that can be used as the basis of discussion with AISC to ensure that they are comfortable with a level of detail that can identify designers, DOTs, etc.

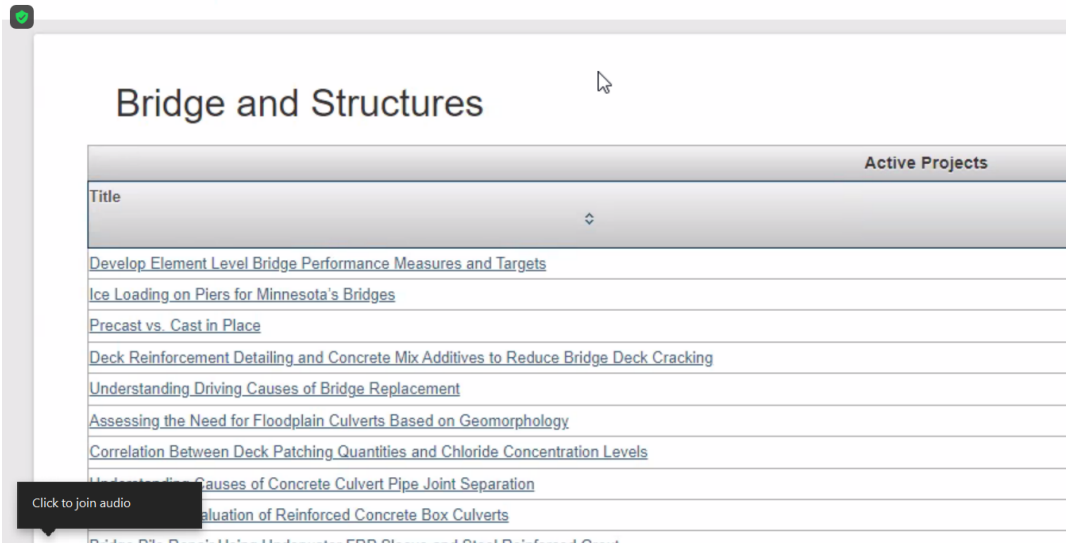

Figure 2: Example Website Layout.

IME05.01: Girder replacement for non-composite members between field splices. Related to the wood blocks and diagonal detail. Consider making relevant notes clearer or easier to identify on the sheet. Jon Edwards – DOTQS questioned whether there was enough information regarding the demolition of the concrete deck and maintenance or continuity of reinforcement. Should this information be provided or is the detail specific to the steel girder only. The plans included a note for how to handle deck reinforcement. Move "future use" comments to the "Collaboration Comments" section. Collaboration Notes should discuss how to handle the interface between the existing non-composite deck and new steel beam to prevent corrosion since the cohesion will be lost.

4. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 15 Data Modeling for Interoperability

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

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: 4/16/2024 (1:00 pm - 3:00 pm ET)

1. Chairperson's Welcome (1:00 pm – 1:10 pm)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. Pooled Fund Projects Update (1:10 pm – 1:20 pm)
    a. BIM for Bridges.
        i. Aaron shared an update on the pooled fund study. Which recently concluded phase 1.
            1. https://bimforbridgesus.com
        ii. Phase 2 kicked off
            1. https://www.pooledfund.org/Details/Study/755
    b. BIM for Infrastructure.
        i. Similar pooled fund study for other infrastructure. That group is looking to the BIM for Bridges group as guidance.
            1. https://pooledfund.org/Details/Study/707
3. Process Map and IDM (1:20 pm – 1:50 pm)
    a. buildingSMART International (bSI) released new technology and methodologies
        i. https://www.buildingsmart.org/standards/bsi-standards/

ii. https://technical.buildingsmart.org/projects/information-delivery-specification-ids

b. Identify who can review and provide the data requirements to the Owner and GC exchanges.
    i. Grant asked if there is a way to get advanced copies of the data dictionary out for the industry to use before buildingSMART publishes it.
    ii. Jeff asked the group if it would be helpful if AISC hosted a national webinar on the status of the IDM and data dictionary for fabricator members and also a separate one (or the same one) for owners. Everyone thought that the webinar should be geared toward everyone. Not just fabricators. Some questions include:
        1. Should we include the pooled fund?
        2. Should it be a workshop with multiple webinars?
        3. Could we host a hybrid workshop - a combination of virtual meetings and in person meeting at the next collaboration meeting?
    iii. Action item – Connect with owners and contractors to help finalize the TG15 IDM. Some may include
        1. Iowa
        2. Utah
        3. New Jersey
        4. Minn
        5. New Mexico
        6. California
        7. Pennsylvania
        8. New York
        9. Pooled Fund
        10. And maybe some contractors whom Vin is reaching out to.

c. Need to form a working group to review outstanding items needed to finalize the IDM (Owner to Contractor exchanges)

4. Data Dictionary (1:50 pm – 3:00 pm)
    a. Overview.
    b. Working group for the reorganization of fabrication terms.
    c. Discussion.
5. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 16 Orthotropic Deck Panels

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

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 - Consultant
Vice Chair: Frank Artmont - Modjeski & Masters, Inc.

Meeting Agenda: 4/16/2024 (9:00 am - noon ET)

1. Chairperson's Welcome (9:00 am – 9:10 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
    d. Updates and Announcements - Workshop at IBC, 2024.
2. Review of Mission Statement.
    a. The group discussed the revised mission statement based on feedback from the main committee, and subsquent input from the members..
    b. The proposed revised mission statement is: This Task Group aims to establish cost-effective design, fabrication and construction approaches for Orthotropic Steel Decks (OSD) to facilitate their use for bridges in the United States.
3. Dayi Wang gave an FHWA update
    a. Working on the optional follow up tasks to the Level 1 design guide, which include limited funding for the design of two demonstration projects. Looking for additional funding for construction and owner partners. Working with SSSBA. Seeking additional funding through FHWA AID; no decision yet. Justin Dahlberg is leading efforts.
    b. Lehigh finishing another project, final report, should be published as ATLSS report eventually with accompanying FHWA tech brief

4. Technical presentation (George Pappas - Thorton Thomasetti, Qi Ye – Chi Consulting Engineers – Ed Koch Queensboro Bridge, Upper Level Redecking)
5. Review of Committee Revised Goals – Action Items.
    a. Targeted presentations (20 minutes each) due date 02/01/24
        i. Owners – Sougata Roy (lead), Terry Logan.
            1. Small group met in February and they discussed the presentations.

        ii. Designers – Frank Artmont (lead), Justin Dahlberg, Keith Greising, Sougata Roy.
            1. Frank put together a draft and emailed it. He took Justin Dahlberg's WSBS presentation and adapted it. Frank shared it during the meeting. It focused a bit on the design guide.
            2. Keith suggested that this presentation should start on the basics. The lay of the land for orthotropic deck systems. And he felt that we should start there to help decision makers be more comfortable with the first presentation.
        iii. Fabricators – Terry Logan (lead), Chris Haberle, Ronnie Medlock.
            1. Terry shared his screen and what he has come up with thus far.
            2. Frederic Bergeron from Canam volunteered for the effort.
        iv. Jeff to propose to the 2025 WSBS organizing committee for a session containing the presentations at the the 2025 WSBS.
        v. Target to finish 95% draft of the presentation by Fall 2024 meeting.
    b. MSC Article – Justing Dahlberg (lead), Frank Artmont, Duncan Patterson, Terry, Logan, Ronnie Medlock, Sougata Roy, Tom Murphy – due date 11/30/23.
        i. Justin shared draft with the group for review
        ii. Sougata will touch base with Jeff and Jeff will put Sougata in touch with MSC editors.
        iii. Target completing the article ASAP.

6. Discussion on State of Practice Synthesis Document
    a. Review sections
        i. Sougata shared that we really need to get this document moving forward and finished soon.
        ii. Paul T to add information in the shared google doc. Target 5/31/04.
        iii. Frederic Bergeron (Canam volunteered to contribute)
    b. Monthly webinar meetings schedule
    c. Target to complete 75% draft by Fall 2024 meeting. All participants requested to complete/input their contributions ASAP.
7. Short Span Orthotropic Update (SSSBA) collaboration update
    a. Working on implementing short span OSD bridges - funding is the problem. Working with Justin Dahlberg.
    b. AISI to help with material donation.
8. General update on ongoing projects/research - None
9. Old business and additional discussion
    a. Fatigue Rating of Orthotropic Decks
        i. NJDOT had a question regarding the rating of orthotropic decks. Committee to consider this as a new activity in the future.
10. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 17 Steel Castings

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

Task Group Mission: The mission of this Task Group will be to develop and disseminate resources specific to the US steel bridge community to support the increased and effective use of castings in steel bridges. The targeted community includes design engineers, DOT professionals, steel fabricators, steel erectors, inspectors, general contractors, and detailers.

Task Group Leadership
Chair: Jennifer Pazdon - Cast Connex
Vice Chair: Jason Stith - Michael Baker International

Meeting Agenda: 4/17/2024 (8:00 am - 10:00 am ET)

1. Chairperson's Welcome (8:00 am – 8:15 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
2. Review of Draft S Document (See **Appendix C – Meeting Attachments** - TG 11 Design

4. TG 17 Steel Castings) (8:15 am – 9:45 am)
    a. Jennifer took notes directly in the document.
    b. Reach out to Alex Bardow (or someone from MassDOT) and ask them to present on Appleton bridge, and also to get the drawings from that bridge project. Matt Wiedel is likely the best person to talk to regarding this project. Jennifer thought that he registered for this meeting so his contact info may be available.
5. Notes for Guideline
    a. Castings Design
        i. Contraint induced fracture
        ii. Hardening of surface at weld locations (example of sheave hardened to reduce cable wear)
        iii. Pre-heating
        iv. Note that WPS-PQR does not cover all considerations for welding. Reference AWS D1.1 2025 eith cast steel grades included.
    b. Casting Manufacturer
        i. Casting production welding – summarize ASTM standard requirements for toughness requirements
        ii. How Fracture Control plan is satisfied by these requirements
        iii. Clause 12, AWS D1.5 specifies a FCP
6. Next Steps and Action Items (9:45 am – 10:00 am)
7. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

TG 18 Duplex Stainless Steel

Omni Providence Hotel
Providence, RI
Room Name: Narragansett B

Task Group Mission: This Task Group will include experts from the carbon steel and stainless steel communities and will work together to develop standalone material, design, welding, fabrication, and construction guide specifications for using duplex stainless steel for vehicular plate girder bridges. These guide specifications will be largely based on existing duplex stainless steel design and fabrication specifications (such as AISC 370), but will be revised to provide the same formatting and flow as the standards typically used in the steel bridge community, such as AASHTO LRFD or AASHTO/AWS D1.5.

Task Group Leadership
Chair: Jason Provines - Virginia Department of Transportation
Vice Chair: Nancy Baddoo - Steel Construction Institute

Meeting Agenda: 4/18/2024 (8:00 am - 10:00 am ET)

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. Approved.
2. Announcements and Administrative Items (8:10 am - 8:15 am)
    a. Task Group Mission
        - The TG's basic mission is to develop a cohesive set of specifications that would allow for 2205 duplex stainless steel to be used for bridges. It has great strength and toughness. It has been used in Europe and Asia over the past 20 years for many vehicular and railroad bridges. There are multiple USA based suppliers of 2205 duplex stainless steel. Multiple fabricators are present in USA and welding technology/methods are also available. Note that a slightly different variety of duplex stainless steel rebar is commonly used in bridges thoughout USA.
3. Duplex Materials Specification (8:15 am - 8:45 am)

a. Final Comments Before Beginning Balloting Process
    - Overall tried to make this Materials Spec similar to ASTM A709.
    - ASTM A240 & A480 both are currently used to specify duplex stainless steel. This Materials Spec provides the additions/revisions required to those specifications to use duplex stainless steel for bridges.
    - Two different CVN limits/requirements at 2” thickness division. Higher CVN values are desired to increase the toughness in the heat affected zone of welds. Currently specifying 70 ft-lb @ -40 degrees F for thicknesses 2” and under. It was discussed whether 70 was actually needed or not, and if it should be reduced. Current typical CVN requirements for building construction is 40 ft-lb @ -40 degrees F. Requiring 70 could inflate the material cost if it is not needed for engineering performance. Jason will re-evaluate this issue (and check with Ted Bush) and determine if any changes should be made.
    - Section 3.1 – Consider eliminating definition of NSTM, IRM & SRM and just refer to the AASHTO Standard Bridge Specifications.
    - Currently, the specifications state that tensile and CVN shall be longitudinal, but that transverse testing is allowed as long as their results meet the requirements. Stainless plate producers typically test in the transverse direction because it is conservative and it means less material waste for testing. Will add language to refer to the S1 annex for CVN testing orientation.
    - Balloting on this specification is planned for later this year (2024). These current comments being voiced during this meeting will be incorporated prior to being distributed for balloting.
    - Section 6.1.2 – Make distinction between as-rolled plate or coil cut to length, and the required testing frequency desired.

4. Duplex Design Specification (8:45 am - 9:45 am)

a. Updates Since Last Meeting

- Nancy Baddoo and Francisco Meza gave an overview presentation of the current state of the Duplex Design Specification.
- Mike Grubb reviewed the specification and provided comments that have now been incorporated.
- Rules for the shear resistance of stainless steel bolts are the same as those given in the AASHTO BDS. However, the scope is limited to bolts with Fub<= 120 ksi.
- Reduction equation to avoid concrete crushing in composite I-section beams with compact duplex stainless steel beams were derived following the same methodology used in the AASHTO BDS for carbon steel composite I-section beams.
- Austenitic stainless steel studs can be stud welded to duplex stainless steel plates. When calculating the their resistance, the equation that will be included in the 10th edition of the AASHTO BDS was shown to be applicable for calculating the resistance to stud failure. Also, because austenitic stainless steel studs are stronger than carbon steel studs, it was decided to keep the resistance equation (included in the 9th edition of the AASHTO BDS) that accounts for concrete failure around the stud. Carbon steel studs cannot be reliably stud welded to duplex stainless steel plates, and therefore are not covered in the Guide Specification. Duplex stainless steel studs also cannot be stud welded and therefore are not covered.
- The planned timetable for balloting is as follows:

1 April – 26 April '24	Pre-ballot sharing with committees (4 weeks)
	Respond to pre-ballot comments
20 May –	TG18 Ballot (4 weeks)

27 June ‘24	
	Respond to TG18 ballot comments
26 Aug – 3 Oct ‘24	MC Ballot (with introductory presentation in w/c 26 Aug) (4 weeks)
	Respond to MC ballot comments
4 Nov ‘24	Ready for delivery to AASHTO Metals Committee!

- Still under consideration is developing a side-by-side design comparison example between carbon and duplex stainless steel. Dan Snyder asked if there were any specific plans in the works to develop this design comparison, and Nancy said nothing specific at this point.
- Nancy presented an overview of the presentation she gave in March 2024 at the NASCC Conference. It showed the cost comparison between a carbon and duplex 2-span steel girder vehicular bridge. It looked at initial and long-term costs. Duplex initial cost was about 30% more than carbon steel when looking at overall bridge cost. The duplex stainless steel cost is about 80% more than carbon steel cost. When looking at long term maintenance costs, duplex stainless steel looks better than painted carbon steel regarding cost and environment over a 75 year life for certain locations, e.g. bridge over a railway. The essence is that repainting is very costly. Also, when 50W steel is able to be used, it is typically the best choice regarding cost and environment.

5. Duplex Welding Specification (9:45 am - 10:00 am)
    a. Updates Since Last Meeting
        - Stan Gingrich had been working on this.

- Ted Bush (HDR) had also developed a duplex SS welding specification for a current project on the Golden Gate Bridge he has been working on.
- These two efforts are in the process of being combined into a Duplex welding specification for this TG. Jason has some more work yet to complete on this before sending it to our committee for review/comment. He will be coordinating with Heather Gilmer to make sure it is aligned with AWS D1.5 and the new AASHTO Fabrication Spec as much as possible.

6. Adjourn

AASHTO/NSBA Steel Bridge Collaboration

MC Main Committee

Omni Providence Hotel
Providence, RI
Room Name: Narragansett A

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: Christina Freeman - FDOT

Meeting Agenda: 4/18/2024 (10:00 am - noon ET)

1. Chairperson's Welcome (10:00 am – 10:15 am)
    a. AISC Antitrust Policy and Meeting Code of Conduct.
    b. Introductions (as needed).
    c. Approval of Previous Meeting Minutes.
2. Task Group Reports - Approximately five minutes each (10:15 am – 11:40 am)
    a. TG 1 - Randy Harrison (W&W|AFCO Steel)

    The Task Group is currently updating/redoing G1.4 guidelines for design details. Only remaining work was hatches and doors for tubs and boxes. Randy has created small working groups that will meet to address these specific items. The plan is to merge 1.4 into 1.2. Randy mentioned that he would like to have better linking between different documents. TODO – Talk with Randy to get more specific information about this.

    b. TG 2 - Heather Gilmer (Pennoni)

    Discussed items relevant to the AASHTO Fabrication Specification which will be forwarded to AASHTO Steel and Metals committee. The other part of the meeting dealt with G2.2. This included discussing CNC assembly practices and needs; web flatness; scribing layout marks. Camber tolerances for straddle bents, which will be

discussed in more detail with the members of TG12. DTIs are handled differently by AASHTO and have Justin Ocel and RCSC provide some thoughts. The plan is to go with 4 hours for future meetings.

c. TG 4 - Jamie Hilton (KTA-Tator, Inc.)

Received comments for G4.2 from AASHTO COBS. Comments are substantive but were not related to the scope of work. Tone implies more "bite" or less vagueness. These comments will be taken on as new business. The new document will be a specification for owner inspection to assist with for 3rd party inspectors. The group is targeting 2025 COBS for this. G4.1, is going through a 5-year update. Mostly editorial.

d. TG 8 – Johnnie Miller (KTA-Tator, Inc.)

Johnnie Miller has taken over as the new Chair of TG8. The Vice Chair position will be filled by Derrick Castle – Sherwin Williams. S8.1 completed a TG ballot, and the group is working through the comments. Johnnie plans to schedule a follow-up call with the group to complete the review of the comments. This is a joint effort with AMPP. S8.2 is now about 7 years old, and the task group is beginning the process of reviewing it with plans to update. The new guide for detailing continues to be a work in progress. The group also discussed possible new or alternative corrosion testing standards. The plan is to develop an RNS for a pooled fund study; Johnnie will get with Todd Bennett. TODO – Invite someone from AMPP to future Collaboration meeting to participate in TG8 (e.g., Brad.Wilder@ampp.org)

e. TG 9 - Michael Culmo (CHA Consulting, Inc.)

G9.1 was released in 2022 and plans to enhance it. This guide is specific to new bridges, however the group thought there was room to include preservation and repair. The group will work with TG14 since there is overlap with G14.2. Ron Watson suggested that there be a new document on bridge joints. Ron will develop a bullet list to discuss at the next meeting and then decide whether this is an addition to G9.1 or a new document. Detailing the steel girders themselves to accommodate joints is

also important. The group still plans on creating a bearing spreadsheet. Mike will work with AASHTO COBS (Components Committee) to get members to attend future TG9 meetings. Mike is also planning to develop an RNS to look at restraint of elastomeric bearing (i.e., floating bearings). He plans to work with the AASHTO Components committee to gain their support. As a point of reference, MassDOT currently does not use anchor rods.

f. TG 10 - Brian Witte (Parsons)

Presentation about tower crane support. The group is currently working on the new G10.2 which is focused on the behavior of steel girders during erection. The audience for the document would be relatively inexperienced engineers. At this point they have an outline and about 50 to 60 pages completed.

g. TG 11 - Brandon Chavel (Michael Baker)

Brandon began the meeting by reviewing the upcoming 10th Edition BDS changes. Currently finishing up the G11.1 cross-frame guide and completing the review of the comments. Will have a small group to perform a final review prior to balloting sometime in June. The group voted on the next task to pursue. The choices were: 1) Phased construction for widening, 2) cross-frame design examples, 3) constructability investigation. An informal survey of the attendees indicated that "1" was the choice.

h. TG 12 - Christina Freeman (FDOT)

Christina Freeman was unable to attend in person. Russ ran the meeting. Presentation about emergency repair project on NJ Turnpike. Review the plate availability table and make sure there are no conflicts with the new NSBA plate tables.

i. Joint TG 1 Detailing, TG 11 Design, TG 12 Constructability – Christina Freeman (FDOT)

Christina Freeman was unable to attend in person. Brandon Chavel ran the meeting. The focus was on the comments received on the straddle bent guide. Primarily these were the comments from NYDOT. Many of the comments received would be deferred

as they were outside scope. The remaining editorial comments accepted. Culmo gave a presentation on the three-girder straddle bent and discussed redundancy of that.

j. TG 13 - Deanna Nevling (HDR)

Probably the largest attendance for this group. Had industry updates. Two presentations on curved steel girder analysis. Discussed comments on G13.2 which many are editorial. Others were outside the scope of the document at this time and will be deferred until a future edition. Software validation work is still ongoing and processing the data. This will become a summary document and eventually a validation document that software providers can follow. They are targeting October for the summary. Plans are to update G13.1 and global stability and also start work on a new arch document.

k. TG 14 - Kyle Smith (GPI Construction Engineering)

TG14 is working on the new G14.3 catalog of repair and retrofit details. Primarily focused on formatting of detail sheets. Currently have 21 in draft form or which three were discussed. The intent is to release batches of details every year. These will be NSBA documents and will not go to AASHTO COBS.

l. TG 15 - Aaron Costin (University of Florida)

The meeting began with an overview. The group is actively working with ongoing pooled fund studies.

m. TG 16 - Sougata Roy (Consultant)

The group reworked the mission statement to remove the word “promote” in favor or “facilitate”. The group aims to develop presentation material for owners, and fabricators to better educate them on orthotropic decks and dispel typical misconceptions. Additionally, there are plans for NASCC and IBC sessions next year. The group also continues its work on a guide document. Members of the TG are also working on an article on level 1 design guide from FHWA. Hannah Cheng also suggested some guidance on how to rate orthotropic decks.

n. TG 17 - Jennifer Pazdon (CAST CONNEX)

Working on new guide specification and spent the meeting time reviewing portions of it. The plan going forward is to meet monthly virtually.

o. TG 18 - Jason Provines (VDOT)

Focused on material design and welding specification. Initial conversation was on updating instances of fracture critical. There was discussion about CVN values and whether higher values are necessary. Next discussed the design specification which Mike Grubb has completed a review of the document to check compatibility with the AASHTO BDS. Plan to create design example, however the time commitment may make it prohibitive. Nancy presented the material she presented at the recent NASCC.

3. Other Business (11:40 am – Noon)

Next meeting is October 22 – 24.

4. 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
G1.4	Update - In-Progress	2025	1	Detailing	Guidelines for Design Details
S2.1.2018	Released	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
G4.4.2006	Released	2006	4	QC/QA	Sample Owners Quality Assurance Manual
G4.1.2019	Released	2019	4	QC/QA	Steel Bridge Fabrication QC/QA Guidelines
G4.1	Update - In-Progress	2025	4	QC/QA	Steel Bridge Fabrication QC/QA Guidelines
G4.2.2021	Released	2021	4	QC/QA	Guidelines for the Qualification of Structural Bolting Inspectors
G4.2	Submitted to AASHTO COBS for Comment	2024	4	QC/QA	Guidelines for the Qualification of Structural Bolting Inspectors
G4.4	Update - In-Progress	2025	4	QC/QA	Sample Owners Quality Assurance Manual
S4.X	New - In-Progress	2025	4	QC/QA	Specification for Steel Bridge Third Party Quality Assurance
S8.1.2014	Released	2014	8	Coatings	Guide Specification for Application of Coating Systems
S8.1	Completed Task Group Ballot	2025	8	Coatings	Guide Specification for Application of Coating Systems
S8.2.2017	Released	2017	8	Coatings	Thermal Spray Coating Guide
S8.3	Released	2022	8	Coatings	Galvanizing Guide Specification
G8.4	New - In-Progress	Unknown	8	Coatings	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
G10.2	New - In-Progress	2027	10	Erection	Behavior of Steel Bridges during Erection
G11.1	New - In-Progress	2025	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	2026	12	Design for Constructability and Fabrication	Guidelines to Design for Constructability and Fabrication
G12.2	Submitted to AASHTO COBS for Comment	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	Submitted to AASHTO COBS for Comment	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	2025	14	Field Repairs and Retrofits	Database of Sample Field Repair and Retrofit Details for Steel Bridges
G15.10	On Hold	Unknown	15	Data Modeling for Interoperability	BrIM Process Model Definition for Steel Bridge Erection
G15.1	On Hold	Unknown	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	2026	17	Steel Castings	Guide Specification for Cast Steel Connections
G18.1	New - In-Progress	Unknown	18	Duplex Stainless Steel	Guide Specification for Duplex Stainless Steel - Material
G18.2	New - In-Progress	Unknown	18	Duplex Stainless Steel	Guide Specification for Duplex Stainless Steel - Design
G18.3	New - In-Progress	Unknown	18	Duplex Stainless Steel	Guide Specification for Duplex Stainless Steel - Fabrication

Appendix B – Member Rosters (2024 – 2025)

TG 1 Detailing

First Name	Last Name	Company	Professional Title	Primary Business Type
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Yuying	Hu	MnDOT	Assistant Fabrication Methods Engineer	Bridge Owner
Zane	Keniston	QMC Auditing		Inspection Services
Frank	Kingston	abs Structural Corporation	President	Detailer
Jihshya	Lin	MnDOT	Bridge Evaluation and Fabrication Methods Engineer	Bridge Owner
Eric	Rau	HDR	Senior Bridge Engineer	Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant
William	Salle	LB Construction		Contractor
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Brian	Watson	HDR	Senior Bridge Engineer	Consultant
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator

TG 2 Fabrication and Repair

First Name	Last Name	Company	Professional Title	Primary Business Type
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Art	Bustos	AISC	Certification Program Analyst	Trade Organization
Hannah	Cheng	New Jersey DOT	Project Engineer	Bridge Owner
Robert	Connor	Purdue University	Professor	Academia
Donn	Digamon	Georgia Department of Transportation	Bridge Design Group Leader	Bridge Owner
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
Jon	Edwards	DOT Quality Services	Technical Director	Inspection Services
John	Gast	Consultant	Steel Bridge Erection Consultant	Consultant
Jason	Gramlick	California Department of Transportation	Associate Steel Inspector	Bridge Owner
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Jamie	Hilton	KTA-Tator, Inc.	Vice President	Inspection Services
Dave	Johnson	Industrial Steel Construction, Inc.	0	Fabricator
Zane	Keniston	QMC Auditing	0	Inspection Services
Jihshya	Lin	MnDOT	Bridge Evaluation and Fabrication Methods Engineer	Bridge Owner
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Teresa	Michalk	Texas DOT Material and Tests Div.	Transportation Engineer	Bridge Owner
Eric	Rau	HDR	Senior Bridge Engineer	Consultant
Sougata	Roy	Consultant	0	Consultant
Phillip	Sauser	UH Services Group	0	Inspection Services
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
David	Stoddard	SSAB Americas	Senior Application Engineer	Material Producer
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Brad	Streeter	Scougal Rubber Corporation	Quality Manager	Fabricator
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator
Duncan	Paterson	Alfred Benesch & Company	Technical Manager	Consultant

TG 4 QC/QA

First Name	Last Name	Company	Professional Title	Primary Business Type
Jamie	Hilton	KTA-Tator, Inc.	Vice President	Inspection Services
Art	Bustos	AISC	Certification Program Analyst	Trade Organization
Matthew	Conso	KTA-Tator, Inc.	Engineer/Project Management Specialist	Inspection Services
Terry	Cummings	TRC Solutions	Project Manager	Inspection Services
Melissa	Dawson	WSP	Structural Engineer	Consultant
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Chad	Hawkins	Infrastructure Consulting and Engineering	Materials Laboratory Manager	Consultant
Robert	Horwhat	TRC Solutions	Director – Structural Materials Inspection	Inspection Services
Dave	Johnson	Industrial Steel Construction, Inc.		Fabricator
Zane	Keniston	QMC Auditing		Inspection Services
Terry	Logan	Atema, Inc.	VP and Director of Overseas Operations	Inspection Services
Teresa	Michalk	Texas DOT Material and Tests Div.	Transportation Engineer	Bridge Owner
Anna	Petroski	Atema, Inc.	President	Inspection Services
Shawn	Potter	Contech Engineering	Senior Quality Engineer	Fabricator
Jeremy	Rice	Veritas Steel	Process Improvement Coordinator	Fabricator
Phillip	Sauser	UH Services Group		Inspection Services
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Brad	Streeter	Scougal Rubber Corporation	Quality Manager	Fabricator
Maury	Tayarani	Pennoni	Senior Engineer	Inspection Services
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator
Robin	Dunlap	High Steel Structures	Quality Control Manager	Fabricator

TG 8 Coatings

First Name	Last Name	Company	Professional Title	Primary Business Type
Peter	Ault	Elzly Technology/KTA Tator		Inspection Services
Caroline	Bennett	University of Kansas	Associate Professor	Academia
Derrick	Castle	Sherwin Williams		Coatings
William	Corbett	KTA-Tator, Inc.	Chief Operating Officer	Consultant
Terry	Cummings	TRC Solutions	Project Manager	Inspection Services
Jon	Edwards	DOT Quality Services	Technical Director	Inspection Services
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Jamie	Hilton	KTA-Tator, Inc.	Vice President	Inspection Services
Zane	Keniston	QMC Auditing		Inspection Services
Kara	Lorenz	High Steel Structures, LLC	Specifications Specialist	Fabricator
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Teresa	Michalk	Texas DOT Material and Tests Div.	Transportation Engineer	Bridge Owner
Shawn	Potter	Contech Engineering	Senior Quality Engineer	Fabricator
David	Stoddard	SSAB Americas	Senior Application Engineer	Material Producer
Brad	Streeter	Scougal Rubber Corporation	Quality Manager	Fabricator
Maury	Tayarani	Pennoni	Senior Engineer	Inspection Services
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator
Johnnie	Miller	KTA-Tator, Inc.	Senior Project Engineer	Inspection Services

TG 9 Bearings

First Name	Last Name	Company	Professional Title	Primary Business Type
Michael	Culmo	CHA Consulting, Inc.	Chief Bridge Engineer	Consultant
Robert	Brantley	STV Incorporated	0	Consultant
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Zane	Keniston	QMC Auditing	0	Inspection Services
Jihshya	Lin	MnDOT	Bridge Evaluation and Fabrication Methods Engineer	Bridge Owner
Teresa	Michalk	Texas DOT Material and Tests Div.	Transportation Engineer	Bridge Owner
Abbas	Mokhtar-zadeh	Westinghouse, Stone & Webster	0	Contractor
Sougata	Roy	Consultant	0	Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
Brad	Streeter	Scougal Rubber Corporation	Quality Manager	Fabricator
Michael	Sullivan	CME Associates, Inc.	Senior Project Manager	Consultant
Yonghai	Wan	WSP	0	Consultant
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator
Ron	Watson	RJ Watson, Inc.	President	Fabricator

TG 10 Erection

First Name	Last Name	Company	Professional Title	Primary Business Type
Brian	Witte	Parsons	Vice President, Construction Engineering	Contractor
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner
David	Fish	Texas Department of Transportation		Bridge Owner
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Douglas	Whittaker	Michael Baker International		Consultant
Eric	Rau	HDR	Senior Bridge Engineer	Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
John	Gast	Consultant	Steel Bridge Erection Consultant	Consultant
Joshua	Orton	Brasfield & Gorrie, LLC	Senior Design Engineer	Consultant
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Maury	Tayarani	Pennoni	Senior Engineer	Inspection Services
Natalie	McCombs	HNTB	Senior Bridge Technical Advisor	Consultant
Nickolas	Haltvick	Minnesota Department of Transportation		Bridge Owner
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Russell	Jeck	Senior Project Manager	Siefert Associates	Contractor
Stephen	Percassi	Genesis Structures, Inc.	Senior Structural Engineer	Consultant
Todd	Helwig	University of Texas at Austin	Professor	Academia
Zane	Keniston	QMC Auditing		Inspection Services
Jason	Stith	Michael Baker International	Technical Manager	Consultant

TG 11 Design

First Name	Last Name	Company	Professional Title	Primary Business Type
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant
Brian	Atkinson	HNTB		Consultant
Shane	Beabes	AECOM	Associate Vice President	Consultant
Allan	Berry	HDR	South Florida Structures Section Manager	Consultant
Travis	Butz	Burgess and Niple	Senior Bridge Engineer	Consultant
Nicholas	Cervo	HDR	Structural Engineer	Consultant
Robert	Connor	Purdue University	Professor	Academia
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
Thomas	Eberhardt	HDR	Columbus Bridge Section Manager	Consultant
David	Fish	Texas Department of Transportation		Bridge Owner
Karl	Frank	Consultant	Consultant	Trade Organization
Bernard	Frankl	DOWL		Consultant
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Todd	Helwig	University of Texas at Austin	Professor	Academia
Srinivasa	Kotha	PGH Wong Engineering, Inc	Bridge Engineer	Consultant
Alex	Lim	Oregon Department of Transportation	Steel Bridge Standards Engineer	Bridge Owner
Natalie	McCombs	HNTB	Senior Bridge Technical Advisor	Consultant
Bryan	Miller	Pennsylvania Department of Transportation		Bridge Owner
Deanna	Nevling	HDR	Senior Bridge Engineer	Consultant
Dusten	Olds	HDR	Senior Bridge Engineer	Consultant
Joshua	Orton	Brasfield & Gorrie, LLC	Senior Design Engineer	Consultant
Stephen	Percassi	Genesis Structures, Inc.	Senior Structural Engineer	Consultant
Taylor	Perkins	Stantec		Consultant
Anthony	Ream	HDR	Senior Bridge Engineer	Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant

First Name	Last Name	Company	Professional Title	Primary Business Type
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Jeff	Svatora	HDR	Bridge Engineer	Consultant
Brian	Watson	HDR	Senior Bridge Engineer	Consultant
Donald	White	Georgia Tech		Academia
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Domenic	Coletti	HDR	Principal Professional Associate	Consultant

TG 12 Design for Constructability and Fabrication

First Name	Last Name	Company	Professional Title	Primary Business Type
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant
Allan	Berry	HDR	South Florida Structures Section Manager	Consultant
Travis	Butz	Burgess and Niple	Senior Bridge Engineer	Consultant
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Bret	Clark	Flatiron	Construction Engineer	Contractor
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
David	Fish	Texas Department of Transportation		Bridge Owner
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Greg	Hasbrouck	Parsons	Complex Bridge Technical Specialist	Consultant
Todd	Helwig	University of Texas at Austin	Professor	Academia
Frank	Kingston	abs Structural Corporation	President	Detailer
Natalie	McCombs	HNTB	Senior Bridge Technical Advisor	Consultant
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Deanna	Nevling	HDR	Senior Bridge Engineer	Consultant
Dusten	Olds	HDR	Senior Bridge Engineer	Consultant
Duncan	Paterson	Alfred Benesch & Company	Technical Manager	Consultant
Stephen	Percassi	Genesis Structures, Inc.	Senior Structural Engineer	Consultant
Eric	Rau	HDR	Senior Bridge Engineer	Consultant
Anthony	Ream	HDR	Senior Bridge Engineer	Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant
Grant	Schmitz	HDR	Bridge Engineer	Consultant
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Brian	Watson	HDR	Senior Bridge Engineer	Consultant

First Name	Last Name	Company	Professional Title	Primary Business Type
Donald	White	Georgia Tech		Academia
Brian	Witte	Parsons	Vice President, Construction Engineering	Contractor
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Russell	Jeck	Senior Project Manager	Siefert Associates	Contractor

TG 13 Analysis of Steel Bridges

First Name	Last Name	Company	Professional Title	Primary Business Type
Deanna	Nevling	HDR	Senior Bridge Engineer	Consultant
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant
Zeynep	Bayam	OpenBrIM	Vice President, Strategic Growth	Software
Shane	Beabes	AECOM	Associate Vice President	Consultant
Allan	Berry	HDR	South Florida Structures Section Manager	Consultant
Travis	Butz	Burgess and Niple	Senior Bridge Engineer	Consultant
Nicholas	Cervo	HDR	Structural Engineer	Consultant
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Douglas	Crampton	Wiss, Janney, Elstner Associates, Inc.	Associate Principal	Consultant
Thomas	Eberhardt	HDR	Columbus Bridge Section Manager	Consultant
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner
Todd	Helwig	University of Texas at Austin	Professor	Academia
Dongzhou	Huang	Atkins	Consulting Engineer	Consultant
Natalie	McCombs	HNTB	Senior Bridge Technical Advisor	Consultant
Dusten	Olds	HDR	Senior Bridge Engineer	Consultant
Joshua	Orton	Brasfield & Gorrie, LLC	Senior Design Engineer	Consultant
Eric	Rau	HDR	Senior Bridge Engineer	Consultant
Anthony	Ream	HDR	Senior Bridge Engineer	Consultant
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Gerard	Sova	Hardesty & Hanover, LLC	Structural Engineer	Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Jeff	Svatora	HDR	Bridge Engineer	Consultant
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Francesco	Russo	Russo Structural Services	Principal	Consultant

TG 14 Field Repairs and Retrofits

First Name	Last Name	Company	Professional Title	Primary Business Type
Travis	Butz	Burgess and Niple	Senior Bridge Engineer	Consultant
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Robert	Connor	Purdue University	Professor	Academia
Douglas	Crampton	Wiss, Janney, Elstner Associates, Inc.	Associate Principal	Consultant
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Nickolas	Haltvick	Minnesota Department of Transportation		Bridge Owner
Hussam	Mahmoud	Colorado State University		Academia
Joshua	Orton	Brasfield & Gorrie, LLC	Senior Design Engineer	Consultant
Phillip	Sauser	UH Services Group		Inspection Services
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner

TG 15 Data Modeling for Interoperability

First Name	Last Name	Company	Professional Title	Primary Business Type
Jerome	Atchison	abs Structural Corporation	IT	Detailer
Yash	Chowdhury	Hayduk Engineering		Consultant
Colby	Christensen	HDR	Bridges & Structures Digital Delivery Lead	Consultant
Aaron	Costin	University of Florida	Assistant Professor	Academia
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Hanjin	Hu	Michael Baker International		Consultant
Frank	Kingston	abs Structural Corporation	President	Detailer
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Abbas	Mokhtar-zadeh	Westinghouse, Stone & Webster		Contractor
Phillip	Sauser	UH Services Group		Inspection Services
Grant	Schmitz	HDR	Bridge Engineer	Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Eric	Stone	HNTB	Technologist (Bridge)	Consultant
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Cheng	Yu	University of North Texas		Academia

TG 16 Orthotropic Deck Panels

First Name	Last Name	Company	Professional Title	Primary Business Type
Sougata	Roy	Consultant		Consultant
Frederic	Bergeron	Canam Bridges	Senior Structural Engineer	Fabricator
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
William	Collins	University of Kansas		Academia
Karl	Frank	Consultant	Consultant	Trade Organization
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Christian	Haberle	Haberle Steel	Vice President	Fabricator
Jamie	Hilton	KTA-Tator, Inc.	Vice President	Inspection Services
Terry	Logan	Atema, Inc.	VP and Director of Overseas Operations	Inspection Services
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Duncan	Paterson	Alfred Benesch & Company	Technical Manager	Consultant
Anna	Petroski	Atema, Inc.	President	Inspection Services
David	Stoddard	SSAB Americas	Senior Application Engineer	Material Producer
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant

TG 17 Steel Castings

First Name	Last Name	Company	Professional Title	Primary Business Type
Jennifer	Pazdon	Cast Connex	Vice President	Fabricator
Nicholas	Altebrando	STV Incorporated	National Director of Bridge Engineering	Consultant
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Carlos	de Oliveira	Cast Connex	President	Fabricator
Karl	Frank	Consultant	Consultant	Trade Organization
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Jason	Gramlick	California Department of Transportation	Associate Steel Inspector	Bridge Owner
Keith	Griesing	Hardesty & Hanover, LLC	Chief Technical Officer	Consultant
Greg	Hasbrouck	Parsons	Complex Bridge Technical Specialist	Consultant
Tom	Hickman	Hickman Consulting		Fabricator
Dawn	Lehman	University of Washington		Academia
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Thomas	Murphy	Modjeski and Masters	Vice President / Chief Technical Officer	Consultant
Sougata	Roy	Consultant		Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant

TG 18 Duplex Stainless Steel

First Name	Last Name	Company	Professional Title	Primary Business Type
Jason	Provines	Virginia Department of Transportation	Senior Research Scientist	Bridge Owner
Ted	Bush	HDR	Principal Bridge Engineer	Consultant
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Gary	Coates	Nickel Institute	Manager	Trade Organization
Karl	Frank	Consultant	Consultant	Trade Organization
Leroy	Gardner	Imperial College London	Professor	Academia
Stan	Gingrich	Amentum	Director	Consultant
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Justin	Ocel	Federal Highway Administration	Structural Steel Research Program Manager	FHWA
Jennifer	Pazdon	Cast Connex	Vice President	Fabricator
Juan	Sobrino	Pedelta	CEO	Consultant
Nancy	Baddoo	Steel Construction Institute	Associate Director	Trade Organization

Main Committee

First Name	Last Name	Company	Professional Title	Primary Business Type
Ronnie	Medlock	High Steel Structures	VP - Technical Services	Fabricator
Frank	Artmont	Modjeski & Masters, Inc.	Engineer – Structures	Consultant
Brandon	Chavel	Michael Baker International	Area Technical Manager - Bridge	Consultant
Domenic	Coletti	HDR	Principal Professional Associate	Consultant
Aaron	Costin	University of Florida	Assistant Professor	Academia
Michael	Culmo	CHA Consulting, Inc.	Chief Bridge Engineer	Consultant
Brad	Dillman	High Steel Structures	VP of Engineering	Fabricator
Karl	Frank	Consultant	Consultant	Trade Organization
Heather	Gilmer	Pennoni	Senior Engineer	Inspection Services
Randy	Harrison	W&W|AFCO Steel	Manager Bridge Drafting	Fabricator
Jamie	Hilton	KTA-Tator, Inc.	Vice President	Inspection Services
Deanna	Nevling	HDR	Senior Bridge Engineer	Consultant
Duncan	Paterson	Alfred Benesch & Company	Technical Manager	Consultant
Jennifer	Pazdon	Cast Connex	Vice President	Fabricator
Sougata	Roy	Consultant		Consultant
Francesco	Russo	Russo Structural Services	Principal	Consultant
Phillip	Sauser	UH Services Group		Inspection Services
Kyle	Smith	GPI	Assistant Vice President / Director of Structural Engineering	Consultant
Jason	Stith	Michael Baker International	Technical Manager	Consultant
Jonathan	Stratton	Eastern Steel Works, Inc.	Managing Partner	Fabricator
Gary	Wisch	DeLong's, Inc.	Vice President, Engineering	Fabricator
Brian	Witte	Parsons	Vice President, Construction Engineering	Contractor
Brian	Wolfe	MDTA	Deputy Director of Engineering	Bridge Owner
Christina	Freeman	Florida Department of Transportation	Structures Research Engineer	Bridge Owner

Appendix C – Meeting Attachments

TG 4 QC/QA

Document Link: S4.X Owner Inspector.docx

TG 8 Coatings

Document Link: S8_1_TG_Ballot_Summary_v03.xlsx, S8.1_Zinc-Rich Coatings (v2024) - Ballot.docx

TG 11 Design

AASHTO/NSBA Steel Bridge Collaboration

TG11

Design

American Association of State Highway and Transportation Officials AASHTO

National Steel Bridge Alliance NSBA Founded 1995

Smarter. Stronger. Steel.

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Agenda

1. Introductions (10:00 to 10:10)
    1. Welcome
    2. AISC Antitrust Policy and Meeting Code of Conduct
    3. Approval of Previous Meeting Minutes
2. Announcements and Administrative Items (10:10 to 10:15)
    1. IBC, others
3. Presentations (10:15 to 10:45)
    1. AASHTO LRFD BDS 10th Edition Revisions (Chavel)
4. Guidelines for the Design of Cross Frames & Diaphragms (10:45 to 11:30)
    a. Discussion on any final items
    b. Timeline
        i. April & May - Small group final review
        ii. June – Address Small group review comments.
        iii. July - TG11 Ballot
        iv. August - Address TG11 ballot comments
        v. September - Main Committee ballot
        vi. October – Address Main Committee ballot comments
        vii. November - Send to AASHTO Steel and Metals Committee for review.
        viii. December - Address AASHTO Steel and Metals comments.
        ix. January - Present at AASHTO Steel and Metals winter meeting, possibly forward on to AASHTO COBS group.
5. General Open Discussion (11:30 to 12:00)
    1. Design issue discussions
    2. Next task?
        1. Lateral Bracing
        2. Stability and Strength computations for cross-frames
6. Adjourn

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AISC Antitrust Policy, Conflict of Interest and Code of Conduct

Please honor AISC's policies regarding antitrust, conflict of interest, and conduct

ANTITRUST

Please remember that discussion among competitors of plans, consensus arrangements, agreements, strategies, and the like may be unlawful if they relate to any of the following:

- Current or future pricing or bidding information;
- Limits on production or product lines;
- Allocating customers or territories;
- Individual company marketing strategies, projections, or assessments; or,
- Establishing a practice of dealing with customers or suppliers.

CONFLICT OF INTEREST

Please consult the meeting Chair and Secretary before participating in this meeting if you are, or an organization with which you are affiliated is:

- Contemplating or currently doing business with AISC;
- Involved in litigation, arbitration, or another form of dispute resolution, the outcome of which could be affected by an action of this group on an issue before it; or,
- Otherwise subject to circumstances that could impair or appear to impair your judgement on an issue before this group.

CONDUCT

Please behave appropriately and refrain from discrimination and harassment.

AISC's full policies relating to these matters are available at https://www.aisc.org/about-us/

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Approval of Previous Meeting Minutes

AASHTO/NSBA Steel Bridge Collaboration

Fall Meeting Minutes - Combined

Tampa, FL

October 24 – 26

TG 11 Design

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 – Michael Baker International
Vice Chair: Domenic Coletti - HDR Engineering Inc.

1. Chairperson's Welcome (8:00 am – 8:15 am)
   a. AISC Antitrust Policy and Meeting Code of Conduct.
   b. Introductions (as needed).
   c. Approval of Previous Meeting Minutes.

   No comments. Notes approved.
2. Announcements and Administrative Items (8:15 am to 8:20 am)

   Brandon Chavel was unable to attend. Domenic Coletti ran the meeting in his absence.
3. Presentation (8:20 am to 8:50 am) – "Effective Cross-Frame Arrangements for Straight Skewed I-Girder Bridges" – Don White (Georgia Tech)

   Alternative to contiguous cross-frames that can eliminate unnecessary or optimize cross-frame layout for greater economy and speed. This work complements existing work by Todd Helwig and guide under development by this group. Don spoke about the computational tools during TG13. He spoke more about the design method itself in TG11 beginning with the method for layout. Offset from obtuse corners as far as possible, then extend a line perpendicular from that point, then equally divide lengths into unbraced lengths. Generally try to achieve a uniform distribution of cross-frames across bridge; avoid having cross-frames bunched together, especially in the obtuse corners, since such a framing pattern will attract forces.

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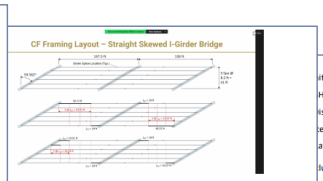
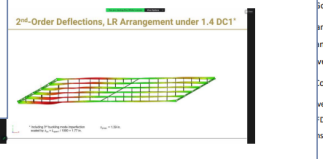


onstrated this method with actual numbers. Current practice is to then put ss-frames across the bridge. However, it can be seen as wasteful. He then to create a "subway tile" layout by eliminating about a quarter of the cross- bridge, resulting in smaller cross-frame forces and fewer cross-frames. In plying lean-on in a checkerboard scheme can also result in a significant ss-frames. Don then presented some examples from Texas. Comparing a out to a checkerboard, while there are more full cross-frames in the subway re are fewer cross-frames (including strut type) overall. Don then presented yout on global buckling and deflection of the system. He also compared the ces of both layout methods; all configurations were working well. Don also ateral bending forces for each system.



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ittee ballot completed no later than end of May.
HTO Committee on Steel and Metals no later than mid June.
iscussion (9:30 am to 10:00 am)
ential items for the next design TG task.
ateral Bracing

lude discussion and guidance in light of upcoming stability bracing ovisions being added to the AASHTO LRFD BDS. Concern was raised en it comes to erection and whether it is properly addressed anywhere. ilarly, wind load effects should be considered. Bob Cisneros mentioned ennDOT BD620M that may address erection and/or be a good erence. Someone mentioned NYSDOT recommendations (45 deg angle for out, fill plates to keep lateral bracing below SIP metal forms). Brian tte mentioned the need to consider when lateral bracing is installed; if ming plan shows lateral bracing only in the exterior bays, and the ctor erects from Girder 1 to Girder X, there may be a case where all but last exterior girder is erected but only one bay's worth of lateral acing is in place.

Good Steel Girder Design – Using the new NSBA Standard Designs

ndon suggested developing guidance on how to best use the NSBA ndard Designs that Frank Russo is working on. As of this meeting, the velopment of the NSBA Standard Designs is still ongoing.

Construction Investigations by Designers

velop guidance on how to check constructability (as required by the AASHTO D BDS), as well guidance for designers about investigating other issues and siderations associated with construction of steel girder bridges.

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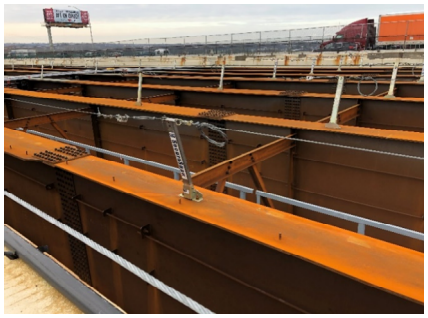
TG11 Mission

- This Task Group aims to develop and maintain consensus guidelines to assist with the design of steel bridges and their components.
  - *Developing Cross-frame design guidelines.*
  - *Joint task group with TG1 and TG12 for steel straddle bents.*



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Announcements

- International Bridge Conference
  - June 3-5, 2024
  - Marriott Rivercenter, San Antonio, TX
  - https://eswp.com/bridge/bridge-home/

- NASCC: Steel Conference – 2025
  - April 2-4, 2025
  - Louisville, KY
  - Call for abstracts should be soon

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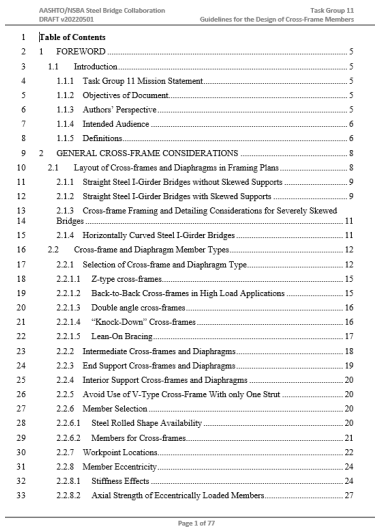
Cross-frame Design Guidelines

- Where are we
  - TG review last summer
  - Chavel addressed comments
  - Coletti reviewed, provided more comments
  - Chavel finishing addressing these Coletti comments



AASHTO/NSBA Steel Bridge Collaboration — Task Group 11
DRAFT v20220501 — Guidelines for the Design of Cross-Frame Members

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Presentations

1. AASHTO LRFD BDS Revisions for 10th Edition
   - Brandon Chavel

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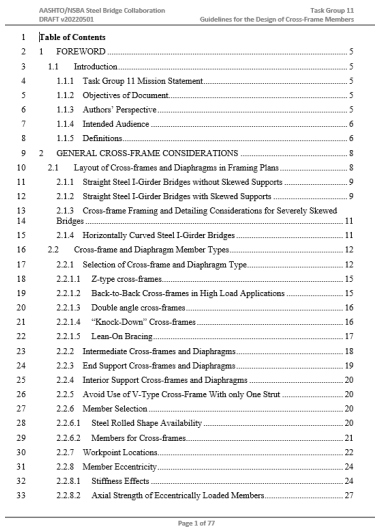
Cross-frame Design Guidelines

- What is next:
  - May - Small group final review (need 2-3 volunteers)
  - June – Address Small group review comments.
  - July - TG11 Ballot
  - August - Address TG11 ballot comments
  - September - Main Committee ballot
  - October – Address Main Committee ballot comments
  - November - Send to AASHTO Steel and Metals Committee for review.
  - December - Address AASHTO Steel and Metals comments.
  - January 2025 - Present at AASHTO Steel and Metals winter meeting, possibly forward on to AASHTO COBS group.



AASHTO/NSBA Steel Bridge Collaboration — Task Group 11
DRAFT v20220501 — Guidelines for the Design of Cross-Frame Members

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Next task?

- What design guideline should TG11 develop next?
  - 1) Construction Investigations by Designers
    - Lateral Bracing
    - Stability and Strength computations for cross-frames
  - 2) Phase construction and widening
  - 3) Cross-frame design examples
  - Other?

10

AASHTO/NSBA Steel Bridge Collaboration

TG11

Design

American Association of State Highway and Transportation Officials

AASHTO

National Steel Bridge Alliance

NSBA

Smarter. Stronger. Steel.

11

Updates to the AASHTO LRFD Bridge Design Specifications (LRFD BDS Section 6)

Task Group 11

Brandon Chavel, PhD, PE

April 17, 2024

Michael Baker INTERNATIONAL | *We Make a Difference*

1

Recognition

Michael Baker INTERNATIONAL

- The general content for this presentation has been previously developed by Mike Grubb, PE.
  - Mike leads ballot process for many of the updates that occur in the AASHTO LRFD BDS for the steel chapter, and has had in role in this area for atleast the last 30 years.
  - At this year's NASCC, Mike received AISC's J. Lloyd Kimbrough Award -which recognizes the pre-eminent steel designers of their era. Mike is just the 13th person to receive the Kimbrough Award since 1941.

M.A. Grubb & Associates, LLC

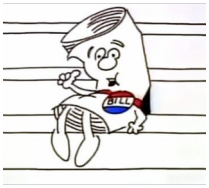
We Make a Difference 2

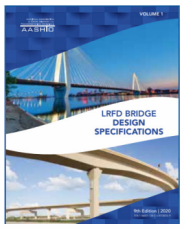
2

AASHTO LRFD BDS Ballot Process

Michael Baker INTERNATIONAL

- How a ballot becomes a provision in the AASHTO LRFD specification…
  - Research/change in methods
    - Ballot development
  - AASHTO Committee of Bridges and Structures (COBS)
    - Steel and Metals Technical Committee
    - Discussion / changes / adjustments / rework
    - Voting
  - AASHTO COBS – all 50 States
    - Voting and approval
  - AASHTO Publication





3

Look-Ahead to the AASHTO LRFD 10th Edition BDS (2024)

4

T-14 Ballot Items Rolled Over from the 2020 to the 2021 COBS Meeting

- Revisions to the provisions for determining the flexural resistance of I- or H-shaped members and channels *subject to flexure about their weak axis* in order to bring the provisions up-to-date with the latest provisions given in the AISC Specification.
- Introduction of a creep reduction factor, K_c, of 0.80 in the determination of the nominal slip resistance of a galvanized faying surface (Class C) or a duplex coated faying surface utilizing a coating producing a higher slip coefficient over a galvanized subsurface.
- Revisions to the AASHTO IRM Guide Specification to incorporate angle-only and two-channel axially loaded tension members, along with some necessary revisions & updates to the design examples.

5

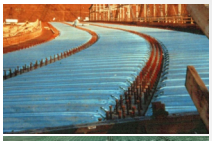
Revisions to Shear Stud Design Provisions (2021)

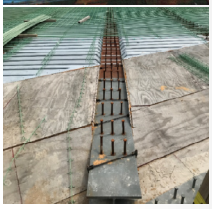
- Deleted all reference to channel shear connectors.
- Reduced the minimum center-to-center pitch of studs from 6*d* to 4*d*.
- Added a pitch correction to account for shear lag across clustered studs.
- Revised the equation for the nominal shear resistance, Q_n, of a stud shear connector at the strength limit state (somewhat more conservative).
- Changed the slope of the fatigue resistance curve for studs in the finite-life region from -3.00 to -5.00. Maintained the constant amplitude threshold, $(\Delta F)_{TH}$, at 7.0 ksi.

6

Revisions to Shear Stud Design Provisions (2021)

- Revised the fatigue detail Table 6.6.1.2.3-1 as follows:
  - Changed the exponent in the general equation for the finite-life fatigue resistance from 1/3 to 1/*m*, and added the "growth constant", *m*, to Table 6.6.1.2.3-1 for all fatigue details.
  - Added the fatigue resistance data for studs and high-strength bolts to Table 6.6.1.2.3-1. Streamlined Article 6.10.10.2.
  - Added the values of the 75-year $(ADTT)_{SL}$ equivalent to infinite life for each detail to Table 6.6.1.2.3-1, and eliminated Tables 6.6.1.2.3-2, 6.6.1.2.5-1, and 6.6.1.2.5-3.
  - Changed Table 6.6.1.2.3-1 from portrait to landscape format.

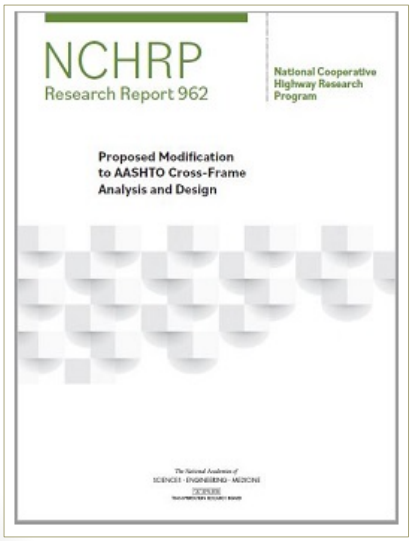




7

Revisions from NCHRP Project 12-113 (2021)

"Proposed Modifications to AASHTO Cross-Frame Analysis and Design"



8

Revisions from NCHRP Project 12-113 (2021)

"Proposed Modifications to AASHTO Cross-Frame Analysis and Design"

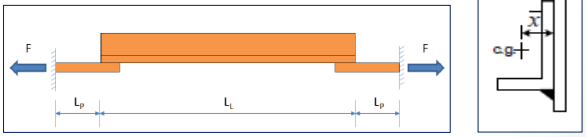
- Revisions to improve the prediction of fatigue force ranges in cross-frame members
  - Specific fatigue truck loading requirements for refined analyses to better predict the fatigue force ranges in cross-frame members.
    - Article 6.6.1.2.2
  - Multiply Fatigue I and Fatigue II load factors by 0.65 for cross-frames.
    - Article 3.4.5

9

Revisions from NCHRP Project 12-113 (2021)

"Proposed Modifications to AASHTO Cross-Frame Analysis and Design"

- Revisions to the *R* factor in Section 4 to better reflect the flexibility of cross-frame member end connections (angles and WTs) in composite bridge systems *in the analysis*.
  - Article 4.6.3.3.4:
    - 0.65AE for non composite
    - 0.75AE for composite
  - Accounts for member end eccentricity
  - Accounts for reduced stiffness at member end



10

Revisions from NCHRP Project 12-113 (2021)

"Proposed Modifications to AASHTO Cross-Frame Analysis and Design"

- Addition of minimum stability bracing strength and stiffness requirements for cross-frame and diaphragm members in I-girder bridges during the deck placement (similar to the requirements in AISC Appendix Article 6.3.2).
  - AASHTO 6.7.4.2.2

$$(\beta_T)_{act} \geq (\beta_T)_{req} \qquad \text{(6.7.4.2.2-1)}$$

$(\beta_T)_{req}$ = required stiffness of the torsional brace system (kip-in./rad) calculated as follows:

- For diaphragms and cross-frames, whose depth is at least 0.8 times the beam or girder depth, attached to full-depth connection plates positively attached to both flanges:

$$= \frac{2.4L}{\phi_{sb} nEI_{yeff}} \left(\frac{M_u}{C_b}\right)^2 \qquad \text{(6.7.4.2.2-2)}$$

- Otherwise:

$$= \frac{3.6L}{\phi_{sb} nEI_{yeff}} \left(\frac{M_u}{C_b}\right)^2 \qquad \text{(6.7.4.2.2-3)}$$

11

Revisions from NCHRP Project 12-113 (2021)

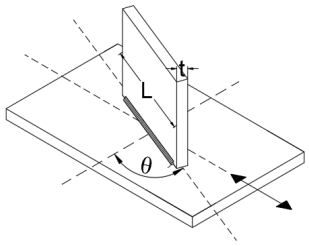
"Proposed Modifications to AASHTO Cross-Frame Analysis and Design"

- Recommendations to improve the prediction of cross-frame forces in 2D grid models, and the prediction in general of cross-frame forces in heavily skewed and/or curved bridges.
  - Article 6.7.4.1
  - Article 4.6.3.3.2

12

Fatigue of Obliquely Oriented Welded Attachments & Introduction of Half-Round Bearing Stiffeners (2021)

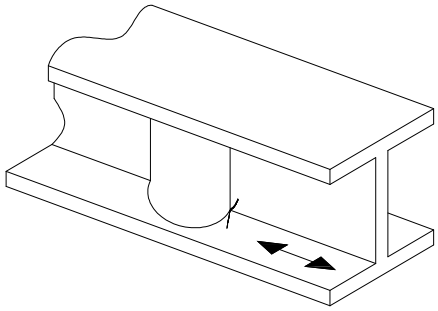
- Fatigue characterization of obliquely oriented welded attachments
  - Research at Purdue University
  - New Condition 7.3: fatigue categories transitioning between C' and E are proposed as a function of the skew angle, θ (for attachments longer than 4 inches and less than 1-inch thick attached by groove or fillet welds)
  - AASHTO Table 6.6.1.2.3-1



13

Fatigue of Obliquely Oriented Welded Attachments & Introduction of Half-Round Bearing Stiffeners (2021)

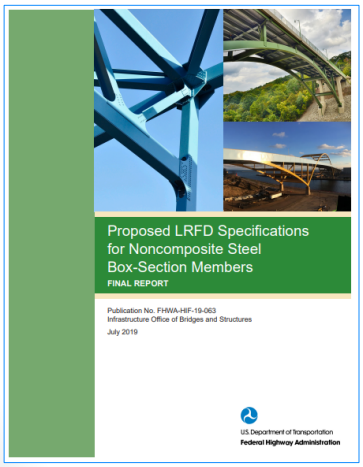
- Research from University of Texas at Austin
- Introduction & fatigue characterization of half-round bearing stiffeners (New Condition 4.2: Category C')
  - AASHTO Table 6.6.1.2.3-1

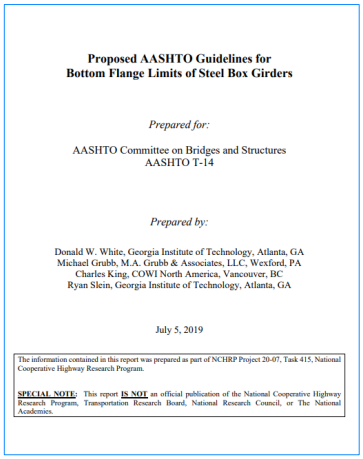


14

Revisions to Tub-Girder Specifications– Article 6.11 (2022)

- Implement advancements from the FHWA noncomposite box section research, and NCHRP 20-07 Task 415 research on bottom flange proportioning limits, into the design provisions for composite box sections in flexure, as applicable.





Proposed AASHTO Guidelines for Bottom Flange Limits of Steel Box Girders

Prepared for:

AASHTO Committee on Bridges and Structures
AASHTO T-14

Prepared by:

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Ryan Slein, Georgia Institute of Technology, Atlanta, GA

July 5, 2019

The information contained in this report was prepared as part of NCHRP Project 20-07, Task 415, National Cooperative Highway Research Program.

SPECIAL NOTE: This report **IS NOT** an official publication of the National Cooperative Highway Research Program, Transportation Research Board, National Research Council, or The National Academies.

15

Revisions to Tub-Girder Specifications– Article 6.11 (2022)

- Implement advancements from the FHWA noncomposite box section research, and NCHRP 20-07 Task 415 research on bottom flange proportioning limits, into the design provisions for composite box sections in flexure, as applicable.
- Benefits:
  - Greater consistency between the design of composite bridge box girders and the other types of bridge members and components by the AASHTO LRFD provisions.
  - New bottom flange b/t limits that will place practical bounds on the use of bottom flanges with extremely large slenderness (particularly in tension) that can result in difficulties during fabrication, construction, and service.
  - Revised bottom-flange compressive resistance equations (that account for post-buckling resistance) that will allow for use of thinner unstiffened flanges where the previous conservative elastic buckling resistances required larger thicknesses or longitudinal stiffening for design.

16

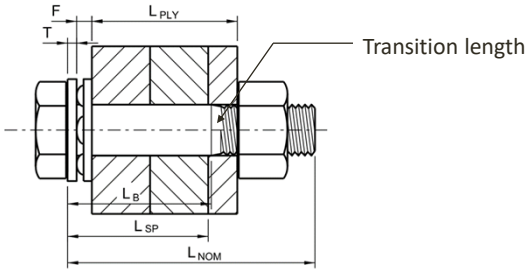
Revisions to Tub-Girder Specifications– Article 6.11 (2022)

- Benefits, cont'd:
  - A new constructibility and service plate-buckling requirement that will place additional restrictions on the use of thinner bottom flanges to avoid potential difficulties during construction or in service.
  - New provisions for longitudinally stiffened bottom flanges in Appendix E6 that will lead to additional economies and eliminate the dramatic increase in the longitudinal stiffener moment of inertia required in the current provisions when the number of stiffeners exceeds one and transverse stiffening is not provided.
  - New primary and secondary member designations for tub-girder bracing members in Table 6.6.2.1-1.

17

Shear Resistance of High-Strength Bolts – Threads Included or Excluded (2022)

- Shear planes located in the transition length of high-strength bolts should be considered shear planes with the threads included (*AASHTO LRFD* Article 6.13.2.7 - 10th Edition).



- Guidance will be provided for determining whether threads are excluded from or included in the shear plane considering the bolt transition length (*AASHTO LRFD* Article C6.13.2.7 – 10th Edition).

19

Slip-Critical vs. Bearing-Type Connections Bracing Members (2022)

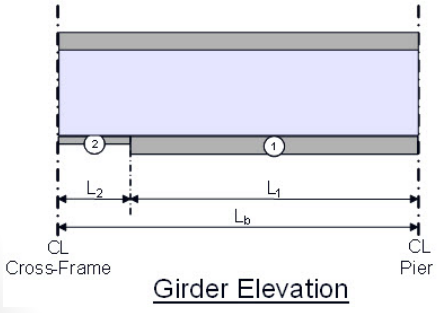
- Joints of diaphragm, cross-frame, and lateral bracing members in beam or girder bridges with pretensioned high-strength bolts installed in standard holes should be designed only as bearing-type connections (*AASHTO LRFD* Article 6.13.2.1.1 - 10th Edition).
- Field experience has indicated that slip in these connections is not likely and that any slip that may occur in these connections is not anticipated to be detrimental to the geometry or serviceability of the structure.

20

Lateral Torsional Buckling of Nonprismatic Unbraced Lengths (2022)

- Agreement AS 20-0026 between AASHTO and Modjeski and Masters, Inc.: *Flexural Capacity of Steel I-Girders over Interior Piers*

Georgia Tech:	Don White, Ryan Slein, Ryan Sherman, others…
University of Texas at Austin:	Todd Helwig, Matt Reichenbach, Mike Engelhardt, others…
Lehigh University:	Richard Sause, Ian Hodgson



Girder Elevation

Current 9th Edition AASHTO LRFD BDS Article 6.10.8.2.3:

For unbraced lengths containing a transition to a smaller section at a distance less than or equal to 20 percent of the unbraced length from the brace point with the smaller moment, the lateral torsional buckling resistance may be determined assuming the transition to the smaller section does not exist provided the lateral moment of inertia of the flange or flanges of the smaller section is equal to or larger than one-half the corresponding value in the larger section.

21

Lateral Torsional Buckling of Nonprismatic Unbraced Lengths (2022)

- Agreement AS 20-0026 between AASHTO and Modjeski and Masters, Inc.: *Flexural Capacity of Steel I-Girders over Interior Piers*

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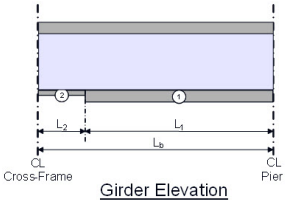

Girder Elevation

Goals:

- Replace the approximate approach with more accurate and robust alternatives for determining the structural capacity of steel I-girders in negative moment regions over interior piers with nonprismatic unbraced lengths, including variable web-depth members.
- Allow for a more accurate computation of the elastic lateral-torsional buckling resistance of longer nonprismatic unbraced lengths of noncomposite I-section members during temporary construction conditions.

22

Lateral Torsional Buckling of Nonprismatic Unbraced Lengths (2022) – cont'd

Article D6.6 (Appendix D6 - 10th Edition) – Elastic Lateral-Torsional Buckling Load Ratio, γ_e, for Nonprismatic Unbraced Lengths of I-Section Members

METHOD A (Article D6.6.2)

Based generally on procedures in AISC Design Guide 25 (2nd Edition) with some modifications. Can also be used as an alternative for investigating reverse-curvature bending in a more refined manner in certain cases. Can be used for constant and variable web depths.

METHOD B (Article D6.6.3)

Based on the use of a weighted-average section approach; i.e., using a prismatic unbraced length with effective section properties to "replace" the nonprismatic unbraced length. Can be used for constant and variable web depths.

METHOD C (Article D6.6.4)

Refined analysis – estimate γ_e as the eigenvalue from an elastic buckling analysis using a thin-walled open-section member model or an elastic three-dimensional shell-element model that captures the significant effects of the nonprismatic geometry (e.g., SABRE2 or ABAQUS). Use where Method A or B are not applicable or to get a more refined (and likely less conservative) estimate of the member resistance.

23

Lateral Torsional Buckling of Nonprismatic Unbraced Lengths (2022) – cont'd

Other significant revisions:

- Replacement of the current equation for the moment-gradient modifier, C_b, with the quarter-point equation given in the AISC Specification:

$$C_b = \frac{12.5M_{\max}}{2.5M_{\max} + 3M_A + 4M_B + 3M_C}$$

Methods to handle reverse curvature are discussed in the Commentary.

- Replacement of the current equation for the compact unbraced length limit, L_p, with the equation given in the AISC Specification for general I-section members (in both Articles 6.10.8.2.3 and A6.3.3):

$$L_p = 1.1 r_t \sqrt{\frac{E}{F_{yc}}}$$

Current eqtn:

$$L_p = 1.0 r_t \sqrt{\frac{E}{F_{yc}}}$$

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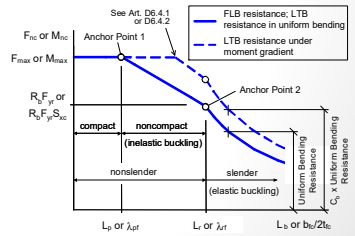
Lateral Torsional Buckling of Nonprismatic Unbraced Lengths (2022) – cont'd

Other significant revisions:

- Removes error in Appendix A6 related to the current approximate approach for estimating the LTB resistance of nonprismatic unbraced lengths.
- For welded sections, revision of the definition of F_{yr} for LTB from a variable value, often equal to $0.7F_{yc}$ in previous Specifications, to $0.5F_{yc}$ for longitudinally unstiffened webs, and to the minimum of $0.5F_{yc}$ and F_{crw} for I-girders with longitudinally stiffened webs, to provide a more uniform level of reliability consistent with the target levels in the AISC and AASHTO LRFD Specifications. The value $0.7F_{yc}$ is retained for rolled sections.



25

Revise 'FCM' to 'NSTM (2023)

- Revise 'Fracture-Critical Member (FCM)' to 'Nonredundant Steel Tension Member (NSTM)' in the AASHTO LRFD BDS.
- The National Bridge Inspection Standards (NBIS) were revised in May 2022 and eliminated the term Fracture-Critical Member (FCM) in favor of the term Nonredundant Steel Tension Member (NSTM) because of its implicitly negative connotation and because it was frequently misunderstood by those that did not work regularly with the NBIS.
  - Until such time as other specifications are revised, for consistency, the terms FCM and NSTM are to be considered synonymous.
  - Also, the term Load Path Redundant Member (LPRM) is to be considered synonymous with the term nonfracture-critical member.

26

Revise 'FCM' to 'NSTM (2023)

- What does this mean????

~~*Fracture-Critical Member (FCM)*—A steel member in tension, or with a tension element, whose failure would probably cause a portion of or the entire bridge to collapse, as per the NBIS (23 CFR 650.305).~~

Nonredundant Steel Tension Member (NSTM) — A primary steel member fully or partially in tension, and without load path redundancy, system redundancy or internal redundancy, whose failure may cause a portion of or the entire bridge to collapse.

Load Path Redundant Member (LPRM)—A primary steel member fully or partially in tension, that has load path redundancy.

27

Revise 'FCM' to 'NSTM (2023) - cont

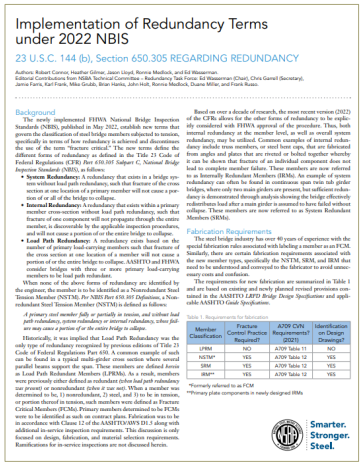
- *AASHTO LRFD Article 6.6.2.2 – Nonredundant Steel Tension Members* -> The Engineer shall classify primary steel members fully or partially in tension that are without load path redundancy, system redundancy, or internal redundancy as Nonredundant Steel Tension Members (NSTMs).
  - For flexural members, only the portions of the member located in designated tension zones under Strength Load Combination I shall be classified as an NSTM. Such members or the portions of a flexural member located in the designated tension zones, as applicable, shall be identified on the contract plans as an NSTM.
  - Fracture Control (FC) practice shall apply for NSTMs.

Fracture Control (FC) Practice—Practice required for materials and fabrication of NSTMs, newly designed SRMs, and primary plate components in newly designed IRMs. For flexural members, FC Practice only applies in the portions of the member located in designated tension zones under Strength Load Combination I where the preceding classifications apply.

28

Revise 'FCM' to 'NSTM (2023)

- What should a designer do?
- See the NSBA paper - Implementation of Redundancy Terms under 2022 NBIS
  - https://www.aisc.org/globalassets/nsba/technical-documents/redundancy/b012-23.pdf



Implementation of Redundancy Terms under 2022 NBIS

23 U.S.C. 144 (b), Section 650.305 REGARDING REDUNDANCY

Authors: Robert Connor, Heather Gilmar, Jason Lloyd, Ronnie Medlock, and Ed Wasserman.
Editorial Contributions from NSBA Technical Committee – Redundancy Task Force: Ed Wasserman (Chair), Chris Garrell (Secretary), Jamie Farris, Karl Frank, Mike Grubb, Brian Hanks, John Holt, Ronnie Medlock, Duane Miller, and Frank Russo.

Background

The newly implemented FHWA National Bridge Inspection Standards (NBIS), published in May 2022, establish new terms that govern the classification of steel bridge members subjected to tension, specifically in terms of how redundancy is achieved and discontinues the use of the term "fracture critical." The new terms define the different forms of redundancy as defined in the Title 23 Code of Federal Regulations (CFR) *Part 650.305 Subpart C, National Bridge Inspection Standards* (NBIS), as follows:

- **System Redundancy:** A redundancy that exists in a bridge system without load path redundancy, such that fracture of the cross section at one location of a primary member will not cause a portion of or all of the bridge to collapse.
- **Internal Redundancy:** A redundancy that exists within a primary member cross-section without load path redundancy, such that fracture of one component will not propagate through the entire member, is discoverable by the applicable inspection procedures, and will not cause a portion of or the entire bridge to collapse.
- **Load Path Redundancy:** A redundancy exists based on the number of primary load-carrying members such that fracture of the cross section at one location of a member will not cause a portion of or the entire bridge to collapse. AASHTO and FHWA consider bridges with three or more primary load-carrying members to be load path redundant.

When none of the above forms of redundancy are identified by the engineer, the member is to be identified as a Nonredundant Steel Tension Member (NSTM). *Per NBIS Part 650.305 Definitions*, a Nonredundant Steel Tension Member (NSTM) is defined as follows:

A primary steel member fully or partially in tension, and without load path redundancy, system redundancy or internal redundancy, whose fracture may cause a portion of or the entire bridge to collapse.

Historically, it was implied that Load Path Redundancy was the only type of redundancy recognized by previous editions of Title 23 Code of Federal Regulations Part 650. A common example of such can be found in a typical multi-girder cross section where several parallel beams support the span. These members are defined herein as Load Path Redundant Members (LPRMs). As a result, members were previously either defined as redundant (*when load path redundancy was present*) or nonredundant (*when it was not*). When a member was determined to be, 1) nonredundant, 2) steel, and 3) to be in tension, or portion thereof in tension, such members were defined as Fracture Critical Members (FCMs). Primary members determined to be FCMs were to be identified as such on contract plans. Fabrication was to be in accordance with Clause 12 of the AASHTO/AWS D1.5 along with additional in-service inspection requirements. This discussion is only focused on design, fabrication, and material selection requirements. Ramifications for in-service inspections are not discussed herein.

Based on over a decade of research, the most recent version (2022) of the CFRs allows for the other forms of redundancy to be explicitly considered with FHWA approval of the procedure. Thus, both internal redundancy at the member level, as well as overall system redundancy, may be utilized. Common examples of internal redundancy include truss members, or steel bent caps, that are fabricated from angles and plates that are riveted or bolted together whereby it can be shown that fractures of an individual component does not lead to complete member failure. These members are now referred to as Internally Redundant Members (IRMs). An example of system redundancy can often be found in continuous span twin tub girder bridges, where only two main girders are present, but sufficient redundancy is demonstrated through analysis showing the bridge effectively redistributes load after a main girder is assumed to have failed without collapse. These members are now referred to as System Redundant Members (SRMs).

Fabrication Requirements

The steel bridge industry has over 40 years of experience with the special fabrication rules associated with labeling a member as an FCM. Similarly, there are certain fabrication requirements associated with the new member types, specifically the NSTM, SRM, and IRM that need to be understood and conveyed to the fabricator to avoid unnecessary costs and confusion.

The requirements for new fabrication are summarized in Table 1 and are based on existing and newly planned revised provisions contained in the AASHTO *LRFD Bridge Design Specifications* and applicable AASHTO *Guide Specifications*.

Table 1. Requirements for fabrication

Member Classification	Fracture Control Practice Required?	A709 CVN Requirements? (2021)	Identification on Design Drawings?
LPRM	NO	A709 Table 11	NO
NSTM*	YES	A709 Table 12	YES
SRM	YES	A709 Table 12	YES
IRM**	YES	A709 Table 12	YES

*Formerly referred to as FCM
**Primary plate components in newly designed IRMs

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Other Revisions for 10th Edition

- Eq 6.11.2.2-3 shall only apply to built-up tub section members (2021):

$$t_f \geq 1.1 t_w$$

- Revisions to Article 6.8.2.2 and 6.13.5.2 – i.e., further "clean-up" of Table 6.8.2.2-1 containing the shear lag factor, U, for tension members – are made (2021).
- Revisions to various articles regarding the minimum thickness of steel and miscellaneous connection design issues are made (2021).
- Addition to Article C6.6.1.2.4 summarizing the conditions associated with susceptibility to constraint-induced fracture at welded details along with a brief discussion of intersecting welds (2021)

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Other Revisions for 10th Edition

- Mixed faying surfaces utilizing an unsealed pure zinc thermal-sprayed coating mating with a hot-dip galvanized surface are classified as a Class D surface condition for slip (2022).
- References to the new AASHTO *LRFD Steel-Bridge Fabrication Specifications* are added to the *AASHTO LRFD* BDS (2022).
- Significant revisions to the cross-frame/diaphragm and lateral bracing requirements for steel tub girders based on research conducted over the last few years at the University of Texas at Austin. Also allow for offset top flanges and shallower web inclinations if desired (2023).
- Allow for optional inclusion of the longitudinal deck reinforcement in the bolted splice design if the reinforcement is also considered in the moment design of the girder section (2023).

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Potential upcoming changes – 11th edition

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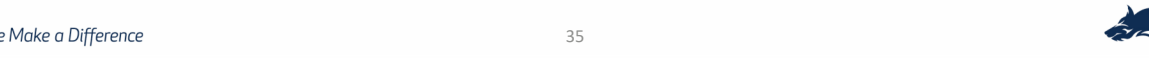
- Prying force design requirements
  - developed based on streamlining current AISC method
- Reduced design yield resistance for tub/box flange splices governed by compression
- Revision to Effective In-Plane Girder Stiffness Requirement for Stability Bracing, β_g
- Revisions to Article 6.13.3 on Welded Connection Design to Align with 2022 AISC Specification
- Lean-on Bracing Requirements
- Web Splice Design Requirements for Splices in High-Moment Areas



Questions

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TG 17 Steel Castings

Document Link: S17.1 Steel Castings for Transportation Structures.pdf