AASHTO/NSBA Steel Bridge Collaboration

Spring Meeting Minutes - Combined

St. Louis, MO

May 3 – 5





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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Tuesday, May 3
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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	TUV Rheinland Industrial Solutions	Duncan Paterson	Alfred Benesch & Company	
TG 4 QC/QA	Jamie Hilton	KTA-Tator, Inc.	Robin Dunlap	High Steel Structures	
TG 8 Coatings	Paul Vinik	GPI Construction Engineering (GPI)	Johnnie Miller	Texas Department of Transportation	
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	Tutor Perini Corp.	
TG 13 Analysis of Steel Bridges	Deanna Nevling	HDR	Francesco Russo	Russo Structural Services	
TG 14 Field Repairs and Retrofits	Kyle Smith	GPI Construction Engineering (GPI)	Jonathan Stratton	Eastern Steel Works, Inc.	
TG 15 Data Modeling for Interoperability	Aaron Costin	University of Florida	Jonathan Stratton	Eastern Steel Works, Inc.	
TG 16 Orthotropic Deck Panels	Sougata Roy	Rutgers	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	

TG 1 Detailing

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, Hirschfeld Division Vice Chair: Gary Wisch - DeLong's, Inc. Secretary: Vin Bartucca - NSBA

- 4. Chairperson's Welcome (3:00 PM 3:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes. Approved
- Discussion of comments for Updating of the G1.4 Guidelines for Design Details (3:10 PM– 4:30 PM) Review and discuss comments on drawings, 1st 7 pages to be reviewed in this meeting. Each comment will be reviewed but more meetings will be required to also redetail sheets. Sheets for Designers – example dwgs.
 - a. Page 101 Index of Sheets What to specify and where
 - b. Page 102 General Notes Structural Steel Comments to be reviewed

individually. Subtask group & Brad to pull comments to review if needed.

- i. Remove "ro-cap"
- ii. Remove "Buy-America"
- iii. Include General note on grade of material and commentary
- iv. Charpy V-Notch Section-
- v. Heather/Dom C to review comments on general notes
- vi. Comments by Jihshya Lin (MnDOT)/ virtual type of general notes should be decided by owners that also design bridges like MnDOT. We separate the info between design plans and specifications/special provisions with clear definition in our design manuals. FC members and components are defined in MnDOT bridge design manual following FHWA definition, also the CVN requirements for Zone 3 in MnDOT.We define fabrication details

in MnDOT standard Specifications for Construction, not in the design plans.

- vii. Specify State Tension areas for CVN, FCM
- viii. AASHTO Fab spec section place holder
- ix. Field connections remove and specify bolt size in material section at top
- x. Reference State specification
- xi. Replace "painting" with "coatings" to cover all coatings in addition to painting
- xii. Brad to share document with Randy for example notes with various systems that can be incorporated
- c. Page 103 Typical Girder Details I
 - i. Remove "Bearing Area" note
 - ii. Intermediate Stiff. Note No change, as is
 - iii. Note H No change
 - iv. Note E Remove plate width sizes
 - v. Standard Clip Detail $+1/8 \frac{1}{4}$ inch for added tolerance for fabricator
 - vi. Pre-bevel remove note
 - vii. Note for Design Drawings -Comments (Right side of dwg sheet)
 - 1. "Normal to flange"
 - 2. No change
 - viii. Note to Designers -Comments (Right side of dwg sheet)
 - a. Editoral comment
 - b. Remove note
 - c. Ref G12 Document, if width tranistion is required, inlcude bevel option
 - d. Remove Note, draw web symettrical in detail , remove case 1 & case 2
- Page 104 Typical Girder Details II & Flange Slabbing and Stripping Details Not reviewed at this time

- e. Page 105 Typical Girder Details III Not reviewed at this time
- f. Page 106 Typical Girder Details IV Not reviewed at this time
- g. Page 107 Standard Bolted Field Splices Not reviewed at this time
- 6. Adjourn Group acknoledged Walter Gatti's contributions as past chair to this group

TG 2 Fabrication and Repair

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 - TUV Rheinland Vice Chair: Duncan Paterson - HDR Engineering Inc. Secretary: Christopher Garrell - NSBA

- 1. Chairperson's Welcome (10:00 AM 10:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.

There were no comments on the previousl meeting minutes.

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

There are two documents. S2.1 Fabrication and G2.2 Guidelines. S2.1 is being superceeded by a new AASHTO Specification. Comments from AASHTO CBS are being addressed right now. It is being baloted by AASHTO this summer. The S2.1 will likely be added to a Collaboration archive page. For states that adopted S2.1, the transition to the new AASHTO Specification should be seemless. Recommend adopting the standard and note exceptions.

- e. AASHTO steel fabrication specification status update
- 2. G2.2, Guidelines for Resolution of Steel Bridge Fabrication Errors
 - a. Improper preheat

Not proving whether preheat was done or not, but the process was incorrect and how to resolve the problem that may have been created (e.g., cracking, hardness, and hydrogen). These problems need to be prioritized. There was some basic research related to hardness, however that work was not conclusive. Karl Frank mentioned there was some other research on hardness effects. A Kansas study (Will Collins at UK) of hardness as it relates to preheat could capture data that could be used for comparison of field values that may give an indication of whether proper preheat was used. Where the harness test is performed

was also studied. The Task Group should take some time to review the study. Karl Frank is currently part of the review panel for this research and will let the group know when it is available. It may be useful to wait until that is completed before moving forward. Keep in mind that this only answers the question about heat effective zone hardness, but not hydrogen control. The question was posed if there was any usefulness for post heat after some time (say a day later) or might it cause other issues. Portable hardness test is available, and the results are good. These are electronic and the data can be logged. Surface still needs to be prepared or polished before performing the test. Make weld without preheat and see if there is high hardness and if it could be detected with the hardness tester. Originally it was planned to locate a tester and perform some basic testing a various fabrication shops. It is based on Rockwell scale testing and do not damage the surface. So, if the results show it is to hard, what do you do next? For example, post weld heating? Or cutting out the weld? This data/testing would at least provide a means of saying whether more invasive correction is needed. Customary practice has been to check preheat with a handheld heat gun. It should be noted that a blanket statements or recommendations cannot be made and often the material strength should be considered. Should a set of recommendation be developed that excludes high strength steels like HPS 100 which is not common in the bridge market and may hold-up the recommendations for material that is more common. The task group may want to look at the Kansas study before having any informal study amongst fabricators looking at toughness measurements. It may provide some insight into where and how measurements should be taken. The Kansas study may take about a year before it is available. To speed this up, Karl will provide guidance based upon the report so that the fabricator research project can take place. Besides the handheld measurements of hardness, the values will also need to be backed up by formal laboratory studies/validation. The task group needs to identify how many tests need to be performed so that any fabricators that volunteer know how much work is expected before participating and the material types that will be needed. Duncan Paterson mentioned that the engineer may be reluctant to approve a case where the specification was not met. This information will be useful in helping to address those questions with

more latitude rather than simply "yes" and "no" it does not meet the specification and needs to be corrected. Keep in mind that the shop inspector will not be able to make that judgment. See <u>https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3647</u> also.

b. Framing members too short

Need to start a draft with what to do and what the concerns are. Duncan Paterson and John Edwards will lead this effort. **TODO:** Heather wants to send out a reminder in a month.

c. Exceeding maximum interpass temperature

Karl Frank proposed this as a new item. D1.5 has information related to steel grades and maximums. The focus for this group should be on what to do when the maximum interapss temperature has exceeded, what it means and what steel grades it relates to. Frank Russo suggested that this information be add to the code commentary and have this document reference it. Temperatures were historically kept low for QT steels, and this may have inadvertently led to hydrogen. However, once welding is started, the temperature will exceed it, so what does the maximum actually mean? This means you would have to wait for the temperature to drop before a second pass is performed. High Steel has results from a study they can share. **TODO:** Follow-up with Robin Dunlap for information on this work. Gerry Sova had a question about the benefits of peening when it came to this. The conclusion of discussions was that it did not have benefit as a corrective measure in this context.

d. Hydrogen diffusion postheat not performed

What are the consequences of not performing post heat? It is understood that post heat is intended to help control cracking in most cases. However, in this case the focus is not on fillet welds but rather groove welds. If post heating was intended for crack control, and it was not done, and testing (100% RT or UT) shows no cracks there likely will be no issue. However, does the current guidance allow this? If the thing something is intended to

prevent did not happen and can be proved, it should not be an issue. **TODO:** Heather will start a draft.

- 3. AASHTO fabrication specification (formerly S2.1)
 - a. Scribing/etching of layout marks.

From last meeting there was a recommendation to not restrict where layout marks will be made and provide recommendations only when they are not consumed in the welding process. Heather is recommending this be commentary language for the next edition, however if it is cautionary should it be code. This will go through T17 and T14 before review and approval by AASHTO CBS. Marking methods might potentially have different concerns, for example plasma marking. A stylist method did not seem to have any detrimental effect on fatigue. However, there is a difference between layout and piece marking. Relative location with respect to welds is something else to consider. Florida DOT has some language about marking that might be useful to review/consider. **TODO:** Task Group members have been asked to consider the ramifications and identify their potential concerns before the next meeting.

b. Applying A6 Table X4.2 (old cold bending radii) to the 1.5t case for bending connection plates.

How best this should this information be presented and basic assumptions. For example likelihood that a specific material grade would be used for a connection plate and bent.

- c. Continuing work on slip coefficients, especially regarding metallizing and combination of different coatings in same connection.
- d. Transverse members in assembly for skewed as well as curved
- e. Other Business

Karl Frank wants the task group to consider how casting are integrated into the specification. Ideally the castings task group should propose the language for this group and AASHTO to consider. Terry Logan recommended letting TG17 finish their work before starting any discuss in TG2.

Christina Freeman asked a question about cambering of rolled sections. **TODO:** Russel Jeck will provide some further information.

4. Adjourn

TG 4 QC/QA

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.

Task Group Leadership

Chair: Jamie Hilton - KTA-Tator, Inc. Vice Chair: Robin Dunlap - High Steel Structures Secretary: Vin Bartucca - NSBA

- 1. Chairperson's Welcome (1:00 PM 1:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct. Completed VB
 - b. Introductions (as needed). Completed
 - c. Approval of Previous Meeting Minutes.
- G4.2 Guidelines for the Qualifications of Structural Bolting Inspectors (1:10 PM 1:30 PM) Review of open items
 - a. RCSC HG Need to combine new method, Jason Gramlick CalTrans will help Heather
- 3. Other bolting applications to add to G4.2 Jeremy Rice/Heather Gilmer
 - a. Previous ballot "new business" considerations JH- to send
- S4.1 Steel Bridge Fabrication QC/QA Guide Specification (1:30 PM 2:00 PM) Want to put into archives, Chris G will archive S4.1, old will be watermarked and add intended use language (to be completed by HG)
- 5. At Fall meeting we agreed the stripped-down version was not worth incorporating as an updated standalone version of S4.1.
- Status of G4.4 Sample Owners QA Manual: To be rolled in/incorporated with S4.1
 Part C and revised to third party (QA/QV?) inspection requirements: Jamie Hilton, Heather Gilmer, Phil Dzikowski. Intent is for owners' use. Not completed yet, JH, RD &HG (Phil D to be removed). Teresa Michalk TxDOT will join this effort
- Status of archiving on the NSBA and or AISC website and provide guidance to users – "buyer beware": Subcommittee of Phil Dzikowski, Ray Monson, Teresa Michalk.

- 8. G4.1 Steel Bridge Fabrication QC/QA Guidelines (2:00PM 2:30 PM
- Status of review and updating. Open editional items were corrected at last meeting, no additional comments at this time, Jaime
- c. Sub Task Group to review G4.1 and update definitions and replace with the terminology that is referenced in newly published AISC 207-20, AISC Standard for Certification Programs : Jamie Hilton, Teresa Michalk, Heather Gilmer & Jeremy Rice
 - Compare both documents regarding the definitions used. Consider reviewing definitions to see what should be included in G4.1, OR reference AISC 207- -(TM & HG) Action Item**
 - ii. Definitions reviewed from both documents. Confilcts between G4.1 vs 207 definations.
 - iii. "SSPC" replaced by "AMP" throughout document,
 - iv. John Stratton shared QSM AASHTO NTPEP
 - v. Action Item:review document for changes -
- 11. d. Section 10 has been updated to include previous "new business" comments from original ballot.
- 12. e. Do we want to start a complete review of the document for the 20xx update?
- Discussion of AISC 207 Chapter 4 Bridge Fabricator Requirements (2:30 PM 2:50 PM)
 - a. Jaime Hilton will chair AISC 207 document. Offered to reveiw chapter 4 fabricator requirements comments/concerns - no comments at this time, Heather had commnets previously and will be readdresed.
 - Add presentation that covers shop drawings, layouts etc and who is responsible for..G1.3 Detailing NSBA documents
- 14. New Business?
 - a. No new business at this time.
- 15. Adjourn

TG 8 Coatings

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: Paul Vinik - GPI Construction Engineering Vice Chair: Johnnie Miller - Texas Department of Transportation Secretary: Jeff Carlson - NSBA

- 1. Chairperson's Welcome
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
- S8.3 Update on Specification for the application galvanizing on steel bridges Medlock
 - a. Ronnie went through comments from AASHTO as it is going to AASHTO for voting in June.
 - b. Paul added that he has written many specifications, no different than most others in this room. I think we all realize how much effort and time is required to complete a specification. Gaining consensus, multiple revisions and iterations that sometimes go back forth. I want to extend my sincere appreciation to the team that has gotten this specification almost to the finish line. This document is essentially complete and will now go for ratification and implementation.
 - c. Thank you to Jon Edwards, Tom Neal, Tom Langill, Rich Collins, and Ronnie Medlock.
- 3. Follow Up on Misconceptions of Chemically Grouping Coatings
 - Paul gave an update on this topic that he brough up at the last meeting and said it tied into the following presentation from LADOTD.

- 4. LADOTD High Performance Coatings Study (9:15 AM 9:45 AM)
 - a. Francisco Gudiel (LADOTD) gave an in-depth presentation providing the results and economic modelling associated with the exposure of 17 coating systems tested side by side through 15,000 hours of accelerated weathering. This testing was needed to establish a high performance approved material list.
- 5. Jeff gave a few updates on various initiatives.
 - a. UWS manual is nearly finished and will be published soon
 - b. The SIOZ synthesis has started and the first observations were positive
 - c. Phase 1 of Jennifer McConnells performance study is complete and she presented the preliminary results at the 2022 WSBS
- 6. G8.4 Detailing for Corrosion Protection Systems
 - a. The group discussed the status of the various chapters of the Detailing for Coating systems document. Each task group has gathered basic concepts and ideas and the goal for next meeting is to have a rough draft of the document put together.
 - b. The various task groups are summarized below:
 - i. Uncoated weathering steel/50CR Heather Gilmer, Jason Lloyd, Jeff Carlson
 - ii. Thermal spray Paul Wagar, Heather Gilmer, Ronnie Medlock, Dave Johnson, Bernardo Duran, Kevin Irving
 - iii. Liquid applied coatings Derrick Castle, Johnnie Miller, Pete Ault, Brian
 Fridley
 - iv. Galanizing Jon Edwards, Tom Neal, Tom Langill, Rich Collins, and Ronnie Medlock.
 - c. It was noted that this document should NOT address application as that is covered in other documents.
- Mike Hyzak from TXDOT asked a question about maintaining wrought iron bridges.
 One option is to simply leave the components exposed as it behaves much like UWS.
- 8. Adjourn

TG 10 Erection

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 Secretary: Anthony Peterson - NSBA

- 1. Chairperson's Welcome (1:00 PM 1:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Review action items from previous meeting</u>.

Brian Witte went through the action items from previous meeting and there were no exceptions taken by the attendees.

2. Field Reaming (20 min)

a. Review text proposed by Eric Rau

TxDOT 441 policy used as a guideline and starting point. The 10% (of bolts in a connection) and 1/8'' (larger than the bolt diameter) comes from the TxDOT document. Likely needs to be modified to accommodate 1'' and larger diameter bolts, as the standard hole is already 1/8'' larger than the bolt diameter.

Reviewed what several DOT specifications currently have (TxDOT, FDOT, VDOT, NYSDOT, MnDOT).

No significant changes required for the text as written

Agreeded that 1/8" greater than bolt diameter and not relative to bolt hole

diameter because hole diameter size relative to bolt size is not constant

Twist-ream bit/process assumed for reaming.

NO ACTION

3. Broken Fasteners Open Discussion (20 min)

a. Update/discussion on proposed text

Discussed that it can be an installer and/or material issue. Stated that if a bolt is broken, it must be replaced. If there are many broken bolts (many not being defined, could be 10+), it needs to be brought to the Engineers attention. There was discussion about what should be included in the commentary but Rob Connor suggested that perhaps is best to leave without commentary. The thinking being that replacing a few bolts is not a big deal but significant number of bolts breaking will be investigated with or without guidance from this document.

ACTION – Brian to review location of the text to ensure it fits with the flow of the document

- 4. G10 & AASHTO Bridge Construction Specification (10 min)
 - Discuss small group meeting results from Nov 2021
 Not discussed at meeting
 - b. Quick review of AASHTO BCS Chapter 11
 Technical issues prevented sharing AASHTO BCS through Zoom so this topic was not discussed.
- 5. Bearing Section 5 rewrite (10 min)
 - a. Any comments on draft language?

Need clarification regarding what to do if a beam seat elevation(s) are not correct, and steel geometry is not correct and/or not connecting properly depending on phase of construction. Owner/Engineer/Contractor need to be involved. Still in discussion regarding language describing when/how the Engineer should be involved. Dominic Colletti suggested that we could reference another document but that may add unnecessary complications. ACTION – Brian, Jason Stith and Dominic Colletti to discuss if simplified supplemental TG10 document about how the behavior of bridges through construction changes would be beneficial. 6. Wind Load on Girders during Erection (5min)

Christina Freeman advised that FDOT continues to work with T5 and T14 AASHTO committees to revise wind load provisions during construction but nothing substantial was reported.

NO ACTION

7. Bolting for Bolters update (5 min) All bolting videos have been filmed at High Steel, however, final editing is still in progress but is taking longer than expected. Hopefully the videos will be ready for us to view at the Fall Collaboration.

NO ACTION

8. Beam Clamp Loading (20 min)

a. Address concerns about included language and sketch Concerns include adding another un-needed check by the Engineer. However, Bob Cisneros (High Steel) stated that he thought the added language/figure are beneficial and appropriate. Sometimes this situation is an item of concern, but depends on the flange geometry and clamp specifics. Extended opinions from several individuals were voiced regarding this topic and the need for it. Concern about singling out a particular type of clamp with diagram. Most opinions stated that clamps needed to be used appropriately (proper weights and flange thicknesses, and maintained). This topic needs a smaller group discussion to decide path forward (Witte, Cisneros, Orton, others).

ACTION - Brian to send email to TG10 members and advisors for straw poll on this topic to determine if it should be added to the S10 document or remain silent.

- New topics for consideration (10 min) None proposed.
- 10. Review & assign action items (10 min)

Plan is to move this document forward for Collaboration balloting in summer 2023 with final documents sent to AASHTO in November 2022 for publication in 2023

11. Adjourn

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. Secretary: Christopher Garrell - NSBA

- 1. Chairperson's Welcome (3:00 PM 3:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
- 2. Announcements and Administrative Items (3:10 PM to 3:15 PM)

Brandon reviewed the mission statement and the current work tasks. TG 11 is specifically working the development of a new cross-frame guide and partnering with TG1 and TG12 on a steel straddle bent guide. The NSBA World Steel Bridge Symposium currently has a call for abstracts for the 2023 conference. These are being accepted through May 13. Lastly, the International Bridge Conference will take place in Pittsburgh, PA from July 17 – 20.

- 3. Presentations (3:15 PM to 3:45 PM)
 - a. What's new in the NSBA Steel Bridge Design Handbook (10 minutes) Chavel

Brandon provided a brief review of the updated handbook. The entire handbook (19 chapters and 6 design examples) was brought current to the 9th Edition AASHTO BDS and to reflect current practices and knowledge. Chapter can be downloaded individually or as a single ZIP file. More significant changes in chapters, 1, 4, 9 and 13 were discussed. For example, chapter 1 was updated to reflect more current materials, new bolt specification designations, update of CVN tables, etc. Chapter 9 now incorporates reference to and discussion of the IRM and SRM AASHTO guides. It was also necessary to update the design examples.

 b. FHWA Publication Evaluation of Steel Bridge Details for Susceptibility to Constraint-Induced Fracture & Interactive Assessment (20 minutes) – Coletti

Domenic provided a brief overview of the new CIF publication which is intended to clarify some misconceptions associated with intersecting welds. Based upon existing research and literature. An important feature of the new report is a procedure established to evaluate a detail (Section 5.1 1 General CIF Evaluation Procedure) for susceptibility to CIF. Domenic reviewed the procedure with the group. Domenic then went through examples and demonstrated the evaluation process. The document can be found here: *FHWA report on evaluating steel bridge details for susceptibility to CIF.* Domenic noted that NSBA is preparing an abridged version of the FHWA report (evaluation procedure and examples only) intended to serve as a design guide.

- 4. Guidelines for the Design of Cross Frames & Diaphragms (3:45 to 4:45 PM)
 - a. Review major revisions based on past comments and additions

Brandon touched on major aditions/revisions based on comments he has recived so far. It should be noted that this guide when completed will be chapter 20 of the steel bridge handbook and not a Collaboration document. The major sections revisions discussed today were: 1) discussion on special angles or uncommon angles, 2) eccentrically loaded members were separated by section type, 3) removed almost all calculations with exceptions of text items related to bolted connectionsand connection plates, 4) new section added on bolt threads in shear planes, and 5) review and update references as needed.

- b. One final review by same reviewers?
- c. Schedule

Next review cycle will take place between May 15 - June 30. Corrections will then be made in July followed by a TG meeting in August. Brandon broke the document up into 8 sections and assigned reviewers. Reviewers will be sent reminders following the meeting.

- 5. General Open Discussion (4:45 to 5:00 PM)
 - a. Design issue discussions

Frank Artmont asked if there would be any interest in developing a standard of care of guidelines for checking engineering calculations. Frank Russo thought there may have been a document developed by ASCE at some point. However, most engineering firms simply have their own internal process. Alternative delivery methods are impacting the care and time taken on reviewing design calculations. Brian Witte mentioned that the practice and level of detail differs between the US and Canada. Canada has become overly prescriptive.

- b. Other potential items for the next design TG task.
 No discussion was had on this topic.
- 6. Adjourn

TG 12 Design for Constructability and Fabrication

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 - Tutor Perini Corp. Secretary: Jeff Carlson - NSBA

1. Chairperson's Welcome

- a. AISC Antitrust Policy and Meeting Code of Conduct.
- b. Introductions (as needed).
- c. Approval of Previous Meeting Minutes.
- 2. Bob gave a presentation on steel bent caps
 - a. He showed 4 case studies that High Steel has worked on recently.
- 3. Miscellaneous Comments on G12.1-2020, Guidelines to Design for Constructability and Fabrication
 - a. Christina went through comments
 - i. Length of rolled beam in section 1.1 to be changed to 120 ft.
 - ii. Proper camber of rolled girders is going to be deffered to TG2.
 - iii. Shipping splice girder plates
 - Revise figure to show 2 rows of bolts on either side of the splice with large hole on inside
 - Bob suggested adding the following language: "If this option is selected by the erector it needs to coordinated by the project team in an RFI".
 - 3. Be clear that this detail/method is optional and designers may get requests to do this, but it's not a normal thing to consider.
 - The group concluded that this detail NOT be included in the document.
- 4. Adjourn

TG 13 Analysis of Steel Bridges

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 Secretary: Christopher Garrell – NSBA

NOTE: Additional supporting materials can be found in Appendix C – Meeting Attachments.

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

Deanna reviewed the mission of the task group and also summarized the curent goals for the new truss guide.

c. Approval of Previous Meeting Minutes.

Deanna briefly reviewed the highlights of the last meeting.

- 2. General Announcements (1:10 PM 1:25 PM)
 - a. Conferences/Research/Publications
 - WTS International Conference May 18 -20 | Seattle, Washington
 - AASHTO Committee on Bridges & Structures Annual Meeting June 20 -23 | Pittsburgh, Pennsylvania
 - International Bridge Conference July 17-20 | Pittsburgh, Pennsylvania
 - b. NSBA Update Chris Garrell

The collaboration will be bringing forward S8.3 S8.3 Hot Dip Galvanizing Specification and G9.1 Steel Bridge Bearing Guidelines for ballot at the AASHTO CBS meeting in June. The next Collaboration meeting will take place October 11 - 13 at a location to be determined. The TG was reminded that the updated Steel Bridge Design Handbook is now available for download. It reflects the 9th Edition AASHTO Bridge Design Specification and current research and advice. Late last year, a project

to develop teaching materials for a collegiate level class dedicated to highway steel bridge design kicked off. This is a collaborative effort between the AISC education department and NSBA. The teaching materials will include a course syllabus and a presentation for each lecture with speaker notes. This project is expected to be completed by early 2023. The NSBA is funding a Single Cost Inorganic Zin (SIOZ) synthesis study. This study has set three goals: first, collect and summarize existing research related to the performance of SIOZ; second, investigate and document the performance of existing highway bridges that use SIOZ as their sole corrosion protection system; and third, provide recommendations for research to fill knowledge gaps and facilitate use of SIOZ. This project kicked-off late last year and is expected to conclude later this year. The resulting information from this study will be organized into a single document that will be used to educate owners and promote the use of SIOZ as a sole corrosion protection solution. A 60% draft of the new lean-on bracing guide was received in April and is currently being peer reviewed. The next submission is expected to be delivered in October with a targeted completion by the end of the year. Three Need for Speed projects are at different stages of completion. The weathering steel guide is currently wrapping up. The standardization of girder bridge designs is expected to be completed in 2023. And the project execution guide has completed and is awaiting posting to the website.

c. FHWA Update – Dayi Wang, FHWA Steel Specialist

Dayi Wang summarized recent activities and updates. The new FHWA report on evaluating steel bridge details for susceptibility to CIF is now available (<u>link</u>). A new bridge geometry manual was also completed and posted for download (<u>link</u>). Another report on heat straightening and cold forming is expected to be completed later this year. Lastly, work on standardized orthotropic decks at Iowa State will also be completed soon (<u>link</u>). Dayi also reminded the group of the upcoming changes to the NBIS relating to FCM (<u>https://www.fhwa.dot.gov/bridge/nbis2022.cfm</u>).

d. TRB AKB20 (Steel Bridges Committee) Update – Jamie Farris

Jamie Farris was unable to attend and provided slides summarizing ongoing activities related to AKB20. For reference, Jamie's slides have been included with these notes.

e. AASHTO Bridge Update (T-14 Structural Steel Design) – Tony Ream

Tony Ream gave an update on the T14 related specification changes being balloted at the upcoming AASHTO CBS meeting in Pittsburgh. More specific information can be found in Tony's slides which have been included with these notes. Lastly, Tony also mentioned that the 10th Edition AASHTO BDS will be delayed by a year and will likely be released in 2024.

- 3. Presentation (1:25 PM 2:10 PM)
 - a. Frank Artmont Modjeski and Masters: Frank gave a presentation on the Evaluation and Retrofit for the Second Widening of the P.R. Olgiati Bridge. This is a 15 span multi girder bridge built in 1953 having parallel structures sharing a common substructure. The first widening happened in 1998 and added four girder lines. This widening would add two more beams and necessitate the widening of the steel cap beams. Two alternate retrofits were proposed and evaluated. The first involved several PT bars passed through the existing pier which was abandoned due to the complexity of construction. The other was a concrete fill steel tubes (i.e., struts) extending diagonally from the pier to support the cantilever portion of the cap beams. The strut option was eventually chosen and the focus of the remaining portion of Frank's presentation which can be found with these notes.
 - b. Travis Butz Burgess & Niple: Travis gave a presentation on the Design and Construction of the Olentangy Trail – Arena District Connector Bridge. This is a new pedestrian bridge in Columbus, Ohio constructed of inclined Vierendeel trusses using round HSS. The original budget was set at \$2 million. Travis went over the design and fabrication challenges and fabrication associated with the tube construction. This presentation can be found with these notes.
- 4. G13.2 Guidelines for Steel Truss Bridge Analysis (2:10 PM 2:30 PM)
 - a. Volunteer Reviewers

A small group has been meeting bimonthly and the document is at 90 to 95% completion and in need of volunteer reviewers. Deanna broke the into small sections for reviewers and Deanna would like to have more than one reviewer per section for a total of 21 reviewers. Deanna proceeded to asked for volunteers. Deanna will follow-up with all reviewers after the meeting and supply them with a link to the document.

Section	Reviewer #1	Reviewer #2	Reviewer #3	
Chapter 1, 2.1, 2.2	Jerry Sova	Kyle Smith	Eric Rau	
2.3, 2.4 and Chapter 3	Frank Armont	Brandon Chavel	Dustin Olds	
4.1 - 4.4	Natalie McCombs	Nick Cervo	Bob Cisneros	
4.5.1 - 4.5.3	Travis Butz	Tony Ream	Russ Jeck	
4.5.4 - 4.5.10	Frank Artmont	Domenic Coletti	Grant Schmitz	
4.6 and 4.7	Josh Orton	Frank Russo	Daniel Baxter	
Chapter 5	Doug Crampton	Frank Russo	Frank Artmont	Daniel Baxter

b. Schedule

Comments are to be received by June 15. Ideally this document would be sent to AASHTO for consideration in either 2023 or 2024. While 2023 might be challenging, depending on how quickly comments are resolved it could be possible if Collaboration related ballots could be successfully completed before November. The document still needs to be reviewed by the task group members, finalized, balloted by the task group members and then by the broader task group before being sent to AASHTO T14 for their meeting in January. Regardless, it was suggested that the document be shared with AASHTO T14 so that they can familiarize themselves with the new guide before it becoming an official ballot item.

- 5. New TG Initiative (2:30 PM 3:00 PM)
 - a. Software Validation and Checking Complex Models -Domenic Coletti

Domenic is proposing an NCHRP synthesis for validating software and checking analysis results. Deanna will look to form a small task force to discuss the matter in more detail.

6. Adjourn (3:00 PM)

TG 14 Field Repairs and Retrofits

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.

<u>Task Group Leadership</u> Chair: Kyle Smith - GPI Vice Chair: Jonathan Stratton - Eastern Iron Works Secretary: Jason Lloyd - NSBA

1. Chairperson's Welcome (9:00 AM – 9:15 AM)

Kyle welcomed everyone to St. Louis and being in person.

- a. AISC Antitrust Policy and Meeting Code of Conduct was read aloud to the group and was shown to all those present virtually and in-person.
- b. Introductions of everyone in-person were made with name and company being announced.
- c. <u>Approval of Previous Meeting Minutes</u>.
- 2. TG-14 Overview (9:15 AM 9:30 AM)

Kyle gave an overview of the G14.1 document that is currently being published and the G14.2 (Guidelines for Repair) document that is close to being ready for ballot. G14.3 was also discussed for what is coming next down the line.

3. G14.1/G14.3 Update (9:30 AM – 10:00 AM)

G14.1 is currently in publication with AASHTO and should be complete hopefully in the near future.

- 4. G14.2 (10:00 AM 12:00 AM)
 - a. Discussion of unresolved task group comments.

Considerations of Riveted Construction was discussed first for G14.2, Heather had the comment that the section is pretty involved for an intro chapter and it looks a lot like it is directly from G14.1. Jason thought that it is good information but he would be open to changing the approach and wanted to see the entire section. Kyle brought up the document in its entirety to show the layout of Intro, Tensile and Shear Capacity, In Situ Testing of Rivets for Material Properties, etc. Jason assured everyone that this was new and not from G14.1. The rivet section was agreed to by the group to be moved to section 2.

Plating Repairs Using Bent Plate was discussed next. The specific sentence states "prevent the degradation of the toughness of the steel in the region..." and Jon Edwards comment is to replace with "avoid fracturing in the outside face." Note: a 2t bending radius creates a 20% strain for ½" plate, so toughness is less of a concern than fracture parallel to the bend line in the outside face. Heather replied it depends on the radius. The newish limit of 5t to prevent the degradation of the toughness. The older limit which 2t calls back to is to prevent fracture. Heather volunteered to wordsmith this portion of the text again.

Multiple Bent Plates was discussed next showing a detail (see below) with multiple plates that can be used to meet bend radii limits specified in the AASHTO LRFD Construction Specifications (and others). Rob thought pack rust was not an issue with this detail but he wasn't sure how great of a retrofit detail it actually is because perhaps it leads individuals to be concerned about fatigue and fracture. Others voiced it is a good option for the tool box and to provide some stitch and ceiling requirements with discussion for the considerations that go into the detail and service life of the retrofit. Are we trying to capture 90% of the time or 10% of the time with this detail was posed to the group. This could be an effective solution even though this is not used all the time and could provide 25-30 years before pack rust would develop with a high chloride/oxidation environment. The group came to consensus that this is a viable option to consider for G14.2.



Anchor Rods the written text of "Existing anchor rods often have exposed threads deformed after the nut is installed to prevent loosening." Heather commented that she remembered discussing this but can't recall exactly what that was. Do we want to make a statement about whether this is a recommended or not recommended practice? What are the most common ways to address anchor bolts? A. Install new rods B. Reuse existing rods C. Drill out and install new rods in the same location. D. Other. Brian Witte voiced that option C. is a good one that is used often. The rods can become the primary problem for bearing replacements and routine maintenance. This topic stimulated much discussion including the substructure type and best means and

I have not been able t

I have not been able to hear all of this conversation, but does the method depend on the substructure? For instance, MnDOT typically uses Option A at abutments as we are less concerned with coring through abutment rebar. We would typically go with B or C at a pier since the rebar is more critical

Me to NICK HALTVICK (Direct Message)



I will work with Josh to incorporate your perspective on the substructure.

methods.

Reorder sentence first sentence to deflate thread quality issue. JO & NH to address this as well.

Bearing Replacements was discussed next including 1) What guidance do you use to make up differences in bearing height? For example, replacing an older rocker bearing with an elastomeric and 2) Illinois Department of Transportation Structural Services Manual offers the following:

1. < 6" then use shim plates

2. 6"-12" then use steel bolster detail (see below)

3. > 12" then use concrete pedestal



Has anyone seen any other guidance or experience with this. Grout was mentioned as an option with or without a reinforced pedestal. Field drilling can be difficult to maintain precision for the plates and the aligned drilled holes within the plates. Steel bolsters aren't used as often unless it is a very large rocker bearing or it is potentially being hit. The Bolsters have holes in them and can be fabrication intensive. JO & KS to work on this. Considerations to strip off numbers and bullet options and include additional options such as UHPC, Castings. Consider a reference to G9.1. The discussion concluded and a break was given to attendees until 10:30 AM.

Shear Connector Welding prior to installing...the comment concerning the following text "AASHTO/AWS D1.5 prohibits welding at ambient temperatures below 0 degrees Fahrenheit. The comment concerning this clause was do we need this here? And the reply back to this was I think it is helpful to include this as many inspectors/designers are not aware of these limitations. This reduces a step needed to look this up. I can remove it if others desire it out. And the reply back to this was there is a lot in D1.5 that needs to be followed, some of which is more important than this, which is more of a welder comfort/distraction issue than a metallurgical one. Nick spoke up that this was from a MnDOT standard and that he is sensitive to this as he has found contractors and designers that are unaware of this but that he is flexible to make this a national guideline standard. Additionally, MnDOT is a "no field welding" state and he is approaching it from that background. Heather voiced that we could discuss the staging (adding a purpose) around this and Nick really liked that idea.

4.4.2 Welded Stiffener Plates ``Additionally, consider requiring an on-site qualification test for difficult welding positions or when the quantity of repair locations is significant." The comment concerning this sentence, is it worth noting that the designer should consider weldability of the existing steel depending on the age of the bridge. Nick provided background for the statement and Jon Stratton voiced that this seems repeated from elsewhere in the document and Heather thought we could point back to section 2.1.8 Use of Mockups. Nick agreed that this would address it and that the sentence would be moved. No further follow ups on this and consensus was reached.

For Attachments Bolted or Welded "With this approach, it is recommended that lengths be detailed slightly longer than required to allow for field modifications. The additional length can be based on code tolerances for fabrication." Is this true for any type of strengthening detail or just particular types? This is true for any type of repair. I left it in to see how this would be covered in other portions of the document. It would probably be better in section 2, but I do not recall using this within that section. Nick is good with moving it back there and would like some feedback as to where within the section makes sense. Perhaps it would make sense to outline a specific example with this statement in mind. There was some further discussion on the matter and Heather asked, what exactly are we talking about here. Kyle brought up the document for all to see the full context of the attachments being discussed. This was written up for a stiffener situation specifically. The first bullet on finishing to bear could be taken as a similar guidance described in a different way from this sentence in question and Heather thinks we should revamp them to be one bullet. Nick offered to take another look and give it another shot at consolidating the two similar bullets. Stiffeners are added here for shear capacity, for bearing, and this got rolled up into one item so as to not sound repeated. Consider adding a Dimension verification, but it needs to go somewhere else. Kyle recommended that this discussion continues offline on the matter with Nick and Heather. Recommend a subgroup of Nick, Heather, Kyle to finalize offline.

5.5.2.1.1 Welded Connections – "Fillet welds should be used wherever possible to simplify construction, although it may be necessary to use complete joint penetration (CJP) welds." Should we offer guidance as to where CJP welds are necessary? It was recommended by Heather to change "CJP welds" to "groove welds." Is there any frame of reference for this specifically? If you are welding a T-section the flange and web may be CJP, rather than groove welded. Figure 5-6

and 5-7 were discussed further with regard to this discussion for what makes sense to convey. They had to cut the flange of the I-section and use two bars to complete the repair. Heather thought we want fillets first and foremost if we can and not have the designer gravitate towards other welds first (unless needed). Does anyone have a good detail of this situation, was asked to the group and some more discussion took place? Consider dropping the second half (of paragraph?, sentence?) Need to include details for bolted and welded connections in section 5.5.2.1 Doug Crampton to cleanup detail.



Fig. 5-7 Full Depth Removal (Maryland Transportation Authority)

Section Loss was discussed next. Could we just refer back to Figure 3-37 Illustration of Section Repair Modified from Connecticut DOT. It was thought that we could as long as there was some discussion on the figure.

Partial Beam Replacement – One minor comment was discussed and quickly resolved.

b. Discussion for needed figures/photos
The following figures/phones are needed:
-Bearing Replacement
-Cross Frame Modifications for Jacking

-Partial Girder Replacement

-Pin/Hanger Connection Replaced with Bolted Splice - Gary Wisch to provide a detail.

-Line Boring During a Pin/Hanger Replacement

-Saw Cut Damage Or Repairs

-General Impact Damage Repairs

Kyle asked for everyone to scour their project files, photos, and details and to please provide them to Jon or himself or Devin if you have something that may be of value for G14.2.

- c. Open discussion for questions/comments was brief.
- d. Recap path forward was already discussed.
- 5. Meeting was adjourned.
TG 15 Data Modeling for Interoperability

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: Jonathan Stratton - Eastern Steel Works, Inc. Secretary: John Hastings – NSBA

- 1. Chairperson's Welcome
 - a. AISC Antitrust Policy and Meeting Code of Conduct was read aloud to the group and was shown to all those present virtually and in-person.
 - b. Introductions of everyone in-person were made with name and company being announced.
 - c. Approval of Previous Meeting Minutes.
- 2. Update

Gave an overview of the task of this group

Balloted IDM and it was approved by T14 waiting on T19

3. Bridge Data Dictionary

Information is broken down into 9 groups

Marina went through ontology software

Dictionary is one source of truth for all software

Talked about collections and subsections (G1~G1A, G1B, etc.)

4. Closing Discussion

TG 16 Orthotropic Deck Panels

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.

<u>Task Group Leadership</u> Chair: Sougata Roy - Rutgers University Vice Chair: Frank Artmont - Modjeski & Masters, Inc. Secretary: Jeff Carlson - NSBA

- 1. Chairperson's Welcome (8:00 AM 8:10 AM)
 - i. AISC Antitrust Policy and Meeting Code of Conduct.
 - ii. Introductions (as needed).
 - iii. Approval of Previous Meeting Minutes. Summary was approved.
- 2. General updates and announcements review of mission statement:
- 3. "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."
- 4. Discussion on Fabrication Tolerances Contd. from Previous Meeting
 - Most changes to the tolerance document were recorded in Sougata's document. Some general thoughts and discussion items are below:
 - Sougata went through some history regarding the fabrication tolerance discussions.
 - iii. Karl Frank asked about panel squareness and suggested changes to language related to root opening.
 - iv. Terry Logan brought up shop assembly. And Karl pointed out that you have to match mark shop pieces so they fit up the same way in the field.
 - v. Sougata shared a document about fabrication toleranace from TBTA and Terry Logan. There seems to be different language in the TBTA document and what was included in the TG16 document for deck joints. Karl Frank believes we should just say it should fit up and not put requirements in the document about flatness after erection.
 - vi. Karl also suggested some additions to the commentary about overlays.

- vii. The group discussed backing bars. Some felt that we can leave the backing bar in place for the longitudial joints in lieu of removing the bar, back gouging, and rewelding. There was a large discussion about welding the backing bar in the shop at the root. One thing to consider is the detail at the intersection . Both the weld and back bar. Also want to ask a fabricator best practice for this detail. Terry also wanted to point out that welding in the shop vs welding in the field are different.
- viii. Discussion about what type of document this would end up being
 - Talk to Heather and seek input from her work on fabrication specification. Could this be an appendix to her document. It could also be a "recommended practices". Talk to Ronnie for his thoughts on what this document should "live".
 - ii. Dayi gave an update on work at Iowa State and Lehigh University. Some of the work is related to fatigue issues resulting from grinding. Dayi mentioned that he was in support designing and building some smaller orthotropic bridges and HDR and M&M were also working on this initiative.
- 5. Task Group updates
 - i. State of Practice Synthesis Document
 - Sougata went through the responsibilities for various sections in the document and is going to be a renewed effort to develop this rought draft.
 - ii. Karl Frank suggested looking into what building industry is doing with nut installed on the inside of a tube and how it could be applied to OSB.
 - ii. Monthly webinar meetings schedule
 - i. Jeff and Sougata will set up monthly or every other month for the synthesis document.
 - iii. Short Span Orthotropic Update (SSSBA) collaboration

- i. Dan said that CAG and WAG were meeting in a couple of weeks. And Dan asked how those groups can support TG16?
- 6. Old business and additional discussion
 - Terry asked if we should promote the HNTB/TBTA document in order to get some guidance in the public soon. Sougata will bring this up with Ronnie in the General meeting. Perhaps AISC can include a short writeup in our weekly bulletin items and more importantly in our monthly member update emails.
 - ii. Keep track of task groups and who is on each group.
 - i. <u>State of the practice synthesis document (Sougata)</u>
 - ii. Orthotropic Deck Tolerances (Ronnie Medlock/Haberle)
 - Sougata will propose TRB session on Orthotropic Decks and work with Chris.
 Lecturn session and 3 speakers. "State of the Art for Steel Deck Construction"?
- 7. Review Action Items
 - i. Propose TRB Session on Orthotropic Deck Bridges Sougata
 - ii. Collaborate with a fabricator regarding best practices for welding the deck to deck backing bar and the intersection of the transverse and longitudinal joints. – Ronnie/Sougata
 - iii. Set up monthly, or every other month, virtual meetings Sougata/Jeff
 - iv. Consider promotion of HNTB/TBTA document to fabricators and also to general public. Sougata to bring up at General Collaboration Meeting. – Sougata/Jeff
- 8. Adjourn

TG 17 Steel Castings

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 Secretary: Devin Altman - NSBA

- 1. Chairperson's Welcome
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions were made.
 - c. Approval of Previous Meeting Minutes.
- 2. Review of Mission, Goals and Timeline were shown to the group.
- 3. Short "Refresher" Presentation on Steel Castings for Bridge Structures given by Jennifer Pazdon. The presentation highlighted the enhanced overall structural performance and efficiency when utilizing steel castings. How many different casting suppliers are there was asked to the group, and Jennifer answered probably a handful in the world for bridges. Diana spoke up as the representative of the Steel Founders Society of America, and both her and Jennifer explained that a company such as CASTCONNEX works as a liason to a steel foundry in order to help structural engineers size and come up with the proper metallurgical applications and chemistry for the steel castings. The discussion continued to help the group understand how steel castings are designed and manufactured in the USA. There was some misunderstanding if steel castings are produced in the USA, Carlos and Jennifer showed visual evidence of many steel castings being developed in the USA including a very large one in Kansas City, not very far away. Europe is a bit more progressively ahead of the USA by about 30-40 years in terms of steel castings being designed and utilized in society. The steel casting supplier will test the integrity and stressors of the steel casting via RT, UT, MT, visual examination in terms of planar, volumetric

(shrinkage), or porosity discontinuities.

Someone voiced that the process needs to be very transparent for everyone to know and understand the process of how to specify but also how to trust the steel casting's integrity as well. Carlos went on further to discuss the acceptance criterian and the ASTM standards to alleviate these concerns. How does the owner write what they want for the steel castings without knowing what they are and how they are used? The group continued to discuss this matter further and strong opinions were voiced. More discussion on the finite element modeling of steel castings was commenced and how connection design may be delegated to a third party. Some were skeptical that this could happen with bridges in the USA, but there has been evidence that steel castings can be successful in the USA as projects have shown including the recently completed Sofi Stadium where the superbowl was played this year.

The acceptance criteria is a key component to helping steel castings being used more readily in the bridge market of the US. Carlos voiced that it would be very inappropriate and there could not be just a standard blanket criteria of nondestructive testing for steel castings. Jason Stith thought we could still quanitify this or come up with the factors of safety to provide some general guidance for the nondestructive testing. Carlos explained that steel casting welding is not structural welding, it is like manufacturing welding. Someone interjected that if it is a fracture critical member or connection component repair welding is not allowed and could not work like steel castings in buildings or the bridges in Europe. Who is going to do the review of the steel casting was posed to the group and it seems it should be someone besides the supplier.

 Review of Comments on Guide Specification
 Jennifer showed the glossary, casting supplier, foundry, owner, and steel fabricator sections layed out in the current guideline specifications and the commentary adjacent to the specifications themselves. Ronnie and Jennifer have been working on the guideline specifications and have made a great deal of progress. The guideline specification is available to TG17 members on the GDrive in this <u>location</u>. For those who have not been able to review the content, you are encouraged to do so and provide any meaningful feedback and/or content for the greater good of developing the guideline specifications.

5. Adjourn

TG 18 Duplex Stainless Steel

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 Secretary: Anthony Peterson - NSBA

- 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. Administrative Items (1:15 PM to 1:45 PM)
 - a. Mission To develop Guide Specifications (material, design, fabrication, welding, construction) for the use of Duplex Stainless Steel "DSS" in steel plate girder bridges).

Jason showed a presentation describing his role at VDOT, bridge corrosion issues/costs in Virginia, and the different types of steels and coatings currently being considered for use. VDOT has used 50CR steel in approximately five new bridges and one bridge repair so far. However, 50CR steel is currently being produced by only one mill, which leads to higher price and long lead times. 50CR weld consumables produced in USA are also challenging to find.

b. Scope

Duplex stainless steel 2205 (22% chromium, 5% nickel) has 65 ksi yield strength and high toughness. No coating is required to prevent corrosion. There are existing specifications for design, fabrication and welding of duplex SS, including AISC 370, AWS D1.6, etc. Discussed potential bridge candidates for duplex SS, such as signature bridges, low water crossings, coastal areas, bridges where maintenance would be very difficult and expensive, bridges where salt spray and the tunnel effect exists, etc. Duplex SS creates a steel competitor for concrete bridges that use SS rebar and SS or CFRP prestressing strand.

Duplex (or austenitic-ferritic) grades are unique because their metallurgical structure consists of two phases, <u>austenite</u> (face-centered cubic lattice) and <u>ferrite</u> (body centered cubic lattice) in roughly equal proportions. They are designed to provide better corrosion resistance, particularly chloride stress corrosion and chloride pitting corrosion, and higher strength than standard austenitic stainless steels such as Type 304 or 316. The main differences in composition, when compared with an austenitic stainless steel (like 304 or 316) is that the duplex steels have a higher chromium content, 20–28%; higher molybdenum, up to 5%; lower nickel, up to 9% and 0.05–0.50% nitrogen. Both the low nickel content and the high strength (enabling thinner sections to be used) give significant cost benefits.

- 3. Duplex Materials Specification (1:45 PM to 2:30 PM)
 - Presentation on proposed specification by Jason Provines
 Develop a standalone specification similar to A709. Jason had started developing
 a materials specification, but needs to continue working on it before sharing a
 draft copy with the group in the near future.
 - b. Discussion

Members of the meeting generally liked the idea of including the DSS specification into A709 if possible. This possibility could be explored in conjunction with developing a standalone specification.

There was a lot of discussion on bolting. Austenitic or duplex bolts exist and could be used with DSS. Much of the focus would likely center around duplex bolts, particularly either 2205 or 2507 bolts. Stainless steel bolt manufacturers are producing duplex bolts which can be fabricated to the same dimensions as Grade A325 or A490 bolts. Jason and Nancy have submitted a research needs statement to RCSC to develop a stainless steel bolting guide. If this research gets funded, it would provide assistance to the needs of this TG too.

Currently there is not enough information for the turn-of-the-nut installation method to be used with duplex fasteners because limited test data exists. The

combined installation method (initial torque + rotation angle) method could be used, but also lacks test data. The AISC 370 and AISC Design Guide 27 guidance provides a method for determining installation parameters, such as nut rotation on turn-of-the-nut. This guidance suggests that the stainless bolting manufacturer conduct these tests to provide installation parameters to the contractor and engineer on the project. Could follow a similar procedure until standardized installation parameters are developed. TG will contact DSS bolt manufacturers to get their assistance in developing these parameters.

Bolting discussion also included the blasting requirements for faying surfaces. Current AISC 370 specifications require that faying surfaces be blast cleaned with stainless steel grit. Stainless steel grit is used to avoid iron contamination. There aren't specifications for unblasted faying surfaces yet.

There was some discussion on the NDE requirements of DSS welds. It is important to establish the NDT/NDE requirements for the welding specification. Since there are no existing specifications, the requirements can be developed from scratch.

Cost could be a challenge to DSS being used on bridges. One potential solution to this is to use DSS only where it is needed, like in select locations where deterioration risk is high. This could lead to dissimilar metal bridges, like on beam ends or over water spans.

2205 DSS is readily available among stainless steels, and cost efficient, according to suppliers. 2507 "Super" DSS seems to be a readily available alternative for consideration in highly corrosive environments with members under high load. 2507 could be used for bolts or rods that need to be tensioned.

Align with FHWA and other guidance regarding the term "fracture critical" in these new specifications.

DSS could be of interest for use by railroads on their bridges. Similar to highway bridges, it would have a higher initial cost, but would reduce maintenance cost long term.

One DSS supplier asked what percentage cost of a bridge is attributed to the steel material. One estimate was given: the total bridge cost is approximately 50% steel material.

- 4. Duplex Design Specification (2:30 PM to 3:15 PM)
 - a. Presentation on duplex design by Nancy Baddoo Nancy works for SCI (Steel Construction Institute) and works to assist with helping with steel construction. DSS has high strength (70 ksi), good toughness, good strain hardening. When using DSS, it is important to minimize weight of material in design since it is relatively expensive. Cannot use elastic modulus for calculating deflections (unconservative due to material softening that occurs). Provided overview of AISC 370, which covers stainless steel design for buildings and was modeled after AISC 360. Notes that further research is needed on composite girders made with DSS.
 - b. Discussion

DSS bridges in Europe have been designed and constructed, but there are no official design rules/specifications. Previous DSS bridges have been designed mostly using carbon steel design rules with some modifications. The Eurocode may have some additional design policies to follow.

DSS shear stud welding will be challenging. 316 SS headed studs (austenitic) were welded to DSS (top flanges) on some DSS bridges constructed in Toronto Canada. Currently DSS shear studs are not commercially available. Research or testing needs to be done to verify the fatigue performance and corrosion performance of austenitic SS studs to DSS top flanges. Some research is being conducted on this in Europe.

- 5. Duplex Welding Specification (3:15 PM to 4:00 PM)
 - a. Presentation on duplex welding by Stan Gingrich
 Stan has 30+ years in the steel and welding industry. He started with a draft of the upcoming new chapter in AWS D1.5 devoted to A709-50CR. Modifications

were made as needed and appropriate for DSS. The specification is applicable for DDS 2205 base material only. The draft specification includes joint preparation and pre-cleaning, consumables, and post-weld cleaning.

b. Discussion

Heather Gilmer suggested using the AWS D1.6 specification as a guideline, howevert, subsequent discussion convinced her to reconsider. The best path forward was agreed to be to take applicable portions of both D1.6 and D1.5 and combine them to develop the new DSS welding specification.

Stan's initial draft did not include include any NDE/NDT requirements yet. Need to add an new section focused on NDE. Need to establish acceptable testing procedures and acceptance criteria. (See previous discussion above on this topic.)

There was more discussion centered on shear studs. Shear stud welding with "stud guns" has the potential to lead to low corrosion resistance, but this needs to be verified with research and testing. Studs will very likely not be DSS. More likely that studs will be austenitic 316 SS since these are commercially available. Research required to verify performance of shear studs welded to DSS plate.

There was a lot of discussion on cleanliness of DSS during fabrication and erection. If bare carbon steel comes in contact with DSS during fabrication and erection, it can likely cause iron contamination on the surface of the DSS. This iron contamination could cause accelerated long-term corrosion of the DSS. All suspected iron contaminated areas of DSS should be cleaned appropriately to avoid accelerated corrosion. Cleaning might have to be chemical or abrasive and could be expensive or time consuming. This concern, and topic, likely does not belong in the DSS welding specification, but in the DSS construction specification. Further research or investigation is needed in this area to determine if carbon steel tools, like lifting hooks, can be used during erection without causing accelerated corrosion.

- 6. General Discussion (4:00 PM to 5:00 PM)
- 7. Adjourn

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

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 **Secretary:** Jeff Carlson - NSBA

- 1. Chairperson's Welcome
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 2. Presentation on Box Fabrication and Erection by Bob Cisneros Bob gave this presentation during the TG12 meeting.
- 3. Review and Discuss Comments on G11.2-2023, Guidelines for Steel Bent Caps
 - a. The group went through comments directly in the document and any revisions not summarized below are in the document.
- 4. Adjourn

Combined TG 1 Detailing, TG 15 Data Modeling for Interoperability

Task Group Mission: This Joint Task Group's focus is to produce the data requirements needed for the development of Model View Definitions (MVDs) related to steel bridge detailing and fabrication that will be used in the Industry Foundation Classes (IFC).

Task Group Leadership

Chair: Aaron Costin - University of Florida **Secretary:** John Hastings – NSBA

- 1. Chairperson's Welcome
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 2. Discussion (IDM)

Discussed information delivery manual

Looked at data dictionary and combined them into one

4 models we are looking at (Bid, Detailing, CNC,)

Looked at M,N, O's for several items.

3. Closing Discussion

Main Committee

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.

<u>Task Group Leadership</u> Chair: Ronnie Medlock - High Steel Structures, LLC Vice Chair: Christina Freeman - FDOT Secretary: Christopher Garrell - NSBA

- 1. Chairperson's Welcome (12:30 PM 12:40 PM)
 - 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 (12:40 PM 2:20 PM)
 - a. TG 1 Randy Hasrrison (W&W|AFCO Steel)

Working on an update G1.4 design details guidelines last updated in 2004. Solicited details from all members such as typical girder details. Currently working through comments. Drawings were originally created by Tensor and will need to be redrawn. The drawings will need to align to G12.1 and in some instances, references will be made directly to G12.1 instead. Ronnie Medlock thought there may be value in adding railroad bridge details also since DOTs are also responsible for rail bridges.

b. TG 2 - Heather Gilmer (TÜV Rheinland)

Currently responsible for two documents. The S2.1 will become the new AASHTO Fabrication Specification. TG2 will continue in an advisory role going forward. Fabrication errors document will include new topics such as improper preheat, short framing members, interpass temperature. Need involvement of metallurgist to provide input on potential issues when any of these issues occur. There were some issues for consideration in the fabrication specification, for example methods for layout marks and bending radius. The group also gave some thought to castings, however will wait to see what results from TG17 work.

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

Short meeting focsed on a few new items. Plan on posting old S4.1 on a new archive page which will be added to the NSBA Collaboration page. Will take Part C from S4.1 combine with G4.4. G4.1 and G4.2 updates forthcoming.

d. TG 8 - Paul Vinik (GPI Construction Engineering)

Reviewed the status of S8.3 and comments received from AASHTO CBS. G8.4 detailing corrosion protection systems, is making progress. NSBA Uncoated Weathering Steel and SIOZ projects were presented. Francisco presented research done at LADOT to establish a high-performance coatings specification. Corrosion protection of wrought iron bridges was also discussed.

e. TG 9 - Michael Culmo (CME Associates, Inc.)

This task group did not meet. G9.1 is currently being ballotted by AASHTO CBS this year and expected to be published later this year or early next.

f. TG 10 - Brian Witte (Parsons)

Would like to publish and update to S10.1. Major updates would include discsion on transportation and bearings topics. The group would like to put this through Collaboration balloting this year for consideration by AASHTO in 2023. Comparing what is in the AASHTO Construction Specification to what is in the Collaboration documents. Depending on the duture of the Construction Specification, the group may incorporate portions in to the S10.1.

g. TG 11 - Brandon Chavel (Michael Baker)

TG 11 is specifically working the development of a new cross-frame guide and partnering with TG1 and TG12 on a steel straddle bent guide. Brandon provided a brief review of the updated handbook. The entire handbook (19 chapters and 6 design examples) was brought current to the 9th Edition AASHTO BDS and to reflect current practices and knowledge. Domenic provided a brief overview of the new CIF publication which is intended to clarify some misconceptions such as intersecting

welds. Brandon touched on major additions/revisions to the cross-frame guide based on comments he has recived so far. It should be noted that this guide when completed will be chapter 20 of the steel bridge handbook and not a Collaboration document.

h. TG 12 - Christina Freeman (FDOT)

TG12 had a presentation by Bob Cisneros on box girder fabrication and erection. There were a handfull of comments from the G12.1 2020 that were discussed. Karl Frank suggested expanding information on steel arches as a new section for G12.1.

i. TG 13 - Deanna Nevling (HDR)

The TG13 meeting began with update preentations from NSBA, FHWA, T14 and TRB AKB20. They had two bridge project presentations. The first was by Frank Artmont who presentated on the Evaluation and Retrofit for the Second Widening of the P.R. Olgiati Bridge and the second was by Travis Butz on the on the Design and Construction of the Olentangy Trail – Arena District Connector Bridge. The new G13.2 Guidelines for Steel Truss Bridge Analysis is about 90% complete. Deanna broke the document into small sections for reviewers and proceeded to assign volunteers. Comments are to be received by June 15. Under other business, Domenic proposed an NCHRP synthesis for validating software and checking analysis results. Deanna will look to form a small task force to discuss the matter in more detail.

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

Update on the status of three documents the group is working on. G14.1 is in publishing, G14.2 has been main focus and G14.3 which will be a database of sample details has not been started. G14.2 is in draft at this point. About a month to process remaining comments. Hopeful that they will finish comments in enough time for consideration in 2023.

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

Group had a handfull of new attendees. Aaron reviewed the current data dictionary which is being migrated over to the TBD

I. TG 16 - Sougata Roy (Rutgers University)

TG16 has a short agenda and primarily focused on fabrication tolerances. The group also discussed backing bars. Some felt that we can leave the backing bar in place for the longitudial joints in lieu of removing the bar, back gouging, and rewelding. Lastly, consideration was given to what type of document this would end up being. For example, would it be part of the fabrication specification. Karl Frank recommended a session at TRB with co-sponsorship with AKB20 on the state of the art for OSD. HNTB/TBTA ("Cost Effective Decks" contact Karl Redmond for more information) developed a document in order to get some guidance in the public soon. Perhaps AISC can include a short writeup in our weekly bulletin items and more importantly in our monthly member update emails. FHWA is completing work at lowa State.

m. TG 17 - Jennifer Pazdon (CAST CONNEX)

This meeting was the first in-person meeting which also included several new attendees. The meeting began with a short refresher on casting. Jennifer introduced a draft of their new guide specification. This will be distributed to memberand for further review and revised based on the comments this week.

n. TG 18 - Jason Provines (VDOT)

This was the first meeting for this task group. Presentation overview and background of task group. Set mission going forward: develop set of guide specification for the use of material in bridge applications including material, welding, design and erection. Nancy is leading the design portion of the group. Stan is leading the welding specification portion. Duplex has been used in building applications and internationally on bridges. So, the group is not starting from scratch and will adopt from these other specifications and guides.

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

Group is still processing coments on the straddle bent guide. Depending on how that goes, the group would still like to target 2023 for an AASHTO CBS ballot.

 p. Joint TG 1 Detailing, TG 15 Data Modeling for Interoperability – Aaron Costin (University of Florida)

Group is focused on using BIM standards for detailing of bridges. IDM was approved by the collaboration already.

- 3. Other Business (2:20 PM 2:30 PM)
- 4. Adjourn

First Name Last Name Company Nicholas Altebrando STV Incorporated Devin Altman NSBA Anousone Arounpradith Missouri Department of Transportation Frank Artmont Modjeski & Masters, Inc. Peter Ault Elzly Technology/KTA Tator Steel Construction Institute Baddoo Nancy Vin Bartucca **NSBA** Shane Beabes AECOM Todd Bennett Missouri Department of Transportation Ted Bush HDR AISC Art **Bustos** Travis **Burgess and Niple** Butz Jeff **NSBA** Carlson Sherwin Williams Derrick Castle Nicholas Cervo HDR Brandon Chavel **Michael Baker International** Hannah New Jersey DOT Cheng Bob High Steel Structures, LLC Cisneros HDR Domenic Coletti **Purdue University** Robert Connor Costin University of Florida Aaron Crampton Wiss, Janney, Elstner Associates, Inc. Doug Wiss, Janney, Elstner Associates, Inc. Douglas Crampton Steel Founders Society of America Diana David Carlos de Oliveira **Cast Connex** Stainless Structurals America Mattia Del Giacco Brad Dillman **High Steel Structures** Bernardo International Zinc Association Duran Tom Eberhardt HDR Jon Edwards **DOT Quality Services** David Fish **Texas Department of Transportation** American Galvanizers Association Alana Fossa Karl Frank Consultant Christina FDOT Freeman John Gast Consultant Heather Gilmer **TUV Rheinland Industrial Solutions** Stan Gingrich Amentum Gorrill George STV Incorporated Gramlick California Department of Transportation Jason Keith Hardesty & Hanover, LLC Griesing Gudiel Louisiana Department of Transportation Joaquin Nick Haltvick Minnesota Department of Transportation

Appendix A – Attendee List

First Name	Last Name	Company
Randy	Harrison	W&W AFCO Steel, Hirschfeld Division
Ed	Hartwell	Pennoni
John	Hastings	NSBA
Matt	Hebdon	University of Texas at Austin
Todd	Helwig	University of Texas at Austin
Nate	Hicks	HDR
Jamie	Hilton	KTA-Tator, Inc.
Catherine	Houska	Catherine Houska Consulting LLC
Mark	Hudson	Sherwin Williams
Michael	Hyzak	Texas Department of Transportation
Kevin	Irving	International Zinc Association
Cathleen	Jacinto	FORSE Consulting, LLC
Russell	Jeck	Tutor Perini Corp.
Jarret	Kasan	HDR
Sri	Kotha	PGH Wong Engineering, Inc
Daniel	Kucz	HNTB
Jihshya	Lin	MnDOT
Jason	Lloyd	Nucor
Terry	Logan	Atema, Inc.
Kara	Lorenz	High Steel Structures, LLC
John	Marcanik	HDR
Michael	Marks	EIC Group LLC
Natalie	McCombs	HNTB
Bill	McEleney	Consultant
Ronnie	Medlock	High Steel Structures
Teresa	Michalk	Texas DOT Material and Tests Div.
Brian	Mileo	
marina	muller	University of Florida
Deanna	Nevling	HDR
Todd	Niemann	Fickett Engineering
john	O'Quinn	High Steel Structures, LLC
Elizabeth	Okenfuss	HDR
Dusten	Olds	HDR
Joshua	Orton	Brasfield & Gorrie, LLC
Duncan	Paterson	Alfred Benesch & Company
Jennifer	Pazdon	Cast Connex
Steve	Percassi	Genesis Structures, Inc.
Taylor	Perkins	Stantec
Anthony	Peterson	NSBA
Anna	Petroski	Atema, Inc.
Chris	Poynter	Stupp Bridge
Jason	Provines	Virginia Department of Transportation
Eric	Rau	HDR

First Name	Last Name	Company
Tony	Ream	HDR
Sougata	Roy	Rutgers
frank	russo	Russo Structural Services
Phil	Sauser	US Army Corps of Engineers
Grant	Schmitz	HDR
Ryan	Shaw	HDR
Kyle	Smith	GPI Construction Engineering (GPI)
Dan	Snyder	Steel Market Development Institute
Juan	Sobrino	Pedelta
Gerard	Sova	Hardesty & Hanover, LLC
Jason	Stith	Michael Baker International
David	Stoddard	SSAB Americas
Jonathan	Stratton	Eastern Steel Works, Inc.
Brad	Streeter	Scougal Rubber Corporation
Gregory	Turco	HDR
Paul	Vinik	GPI Construction Engineering (GPI)
Paul	Wagar	
Dayi	Wang	Federal Highway Administration
Brian	Watson	HDR
Gary	Wisch	DeLong's, Inc.
Brian	Witte	Parsons
Brian	Wolfe	MDTA
Matthew	Wombacher	HDR

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	2024	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	2023	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	Update - In-Progress	2024	4	QC/QA	Guidelines for the Qualification of Structural Bolting Inspectors
G4.4	Update - Not Started	Unknown	4	QC/QA	Sample Owners Quality Assurance Manual

Appendix B – Document Release Schedule and Status

		Year			
Document	Status	Completed/Targeted	Task Group	Task Group Name	Document Title
SA X	New - Not Started	Unknown	А		Specification for Steel Bridge Third
54.7		Onknown	+		Party Quality Assurance
S8.1.2014	Released	2014	8	Coatings	Guide Specification for Application of Coating Systems
S8.1	Update - In-Progress	Unknown	8	Coatings	Guide Specification for Application of Coating Systems
S8.2.2017	Released	2017	8	Coatings	Thermal Spray Coating Guide
S8.3	Passed Collaboration Ballot	2022	8	Coatings	Galvanizing Guide Specification
G8.4	New - In-Progress	Unknown	8	Coatings	Detailing for Coatings and Weathering Steel
G9.1.2004	Released	2004	9	Bearings	Steel Bridge Bearing Design and Detailing Guidelines
G9.1	Passed Collaboration Ballot	2022	9	Bearings	Steel Bridge Bearing Design and Detailing Guidelines
S10.1.2019	Released	2019	10	Erection	Steel Bridge Erection Guide Specification
S10.1	Update - In-Progress	2023	10	Erection	Steel Bridge Erection Guide Specification
G11.1	New - In-Progress	2021	11	Design	Guidelines for the Design of Cross- frame and Diaphragm Members
G11.2	New - In-Progress	2023	11	Design	Guidelines for Straddle Bents
G12.1.2020	Released	2020	12	Design for Constructability and Fabrication	Guidelines to Design for Constructability and Fabrication
G12.1	Update - In-Progress	2023	12	Design for Constructability and Fabrication	Guidelines to Design for Constructability and Fabrication
G13.1.2019	Released	2019	13	Analysis of Steel Bridges	Guidelines for Steel Girder Bridge Analysis

Document	Status	Year Completed/Targeted	Task Group	Task Group Name	Document Title
G13.2	New - In-Progress	2024	13	Analysis of Steel Bridges	Guidelines for the Analysis of Trusses
G14.1.2021	Submitted to AASHTO Publishing	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	New - In-Progress	2023	14	Field Repairs and Retrofits	Guidelines for Field Repairs and Retrofits of Steel Bridges
G14.3	New - In-Progress	2024	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
G16.2	New - Not Started	2023	16	Orthotropic Deck Panels	Cost Effective Orthotropic Decks

Appendix C – Meeting Attachments

TG 13 Analysis of Steel Bridges



AKB20 Steel Bridge Committee Update

MAY 2022



NSBA Collaboration Meeting

Committee Scope

This committee is concerned with the total system performance and behavior of steel bridges and their components, with regard to design, construction, assessment, maintenance, and rehabilitation/repair/retrofit.



NSBA Collaboration Meeting

2022 TRB Annual Meeting

- Committee meeting: Jan. 10th
- Subcommittee meeting: Jan. 11th
- Workshop: Steel Bridge Corrosion Prevention Coatings
- Lectern Session: Innovative Steel Bridge Research



2022 TRB Annual Meeting

- Co-Sponsored Workshops and Lectern Sessions:
 - Workshop 1007 BIM for Bridges and Structures: From Design to Construction
 - Workshop 1025 Innovative Materials to Preserve, Strengthen, and Extend the Useful Life of Bridges
 - Lectern 1164 Advances in Fabrication of Steel Transportation Structures



NSBA Collaboration Meeting

2022 TRB Annual Meeting

 Agenda, Presentations, and Meeting Notes at: <u>https://sites.google.com/vi</u> <u>ew/trbakb20</u>



Welcome to the home of the TRB Standing Committee on Steel Bridges, AKB20 (formerly AFF20)!

AKB20 is concerned with the total system performance and behavior of steel bridges and their components and with relating knowledge of performance to criteria and procedures for design, rating, constructability, maintainability and rehabilitation.

Any opinions, findings, or conclusions expressed on this website are those of the authors and do not necessarily reflect the views of the Transportation Research Board or The National Academies of Sciences, Engineering, and Medicine.



Research Needs Statements (RNS)

- 8 RNS were balloted by AKB20
- Top 3 submitted to AASHTO T-11 Research Committee:
 - Field Studies in Steel Girder Fit-up
 - Impact of Tension Flange Holes on Strength and Ductility of Composite Steel Girders
 - Application of Adhesives in Steel Bridges





Triennial Strategic Plan (TSP)

- Documents the committee's mission and scope, plans a course of action, and establishes goals and strategies.
- Every 3 years, committees must reevaluate their TSP
- Early 2022 AKB20 members worked together to update
- Final sent on 3/28/22
- Awaiting approval





NSBA Collaboration Meeting

TRB Webinars

Please consider submitting a Webinar topic

Submittal due dates:

	Webinar forms submitted between	Have webinars scheduled between
	March 16 – July 15	September 1 – December 31
, , , , , , , , , , , , , , , , , , ,	July 16 – November 15	January 1 – April 30
	November 16 – March 15	May 1 – August 30

- Webinar can be 90 or 120 minutes
- Please contact Jamie Farris if you have an idea for a topic



NSBA Collaboration Meeting

Research Papers

- Paper review timeline:
- August 1 all papers submitted by authors to TRB
- August 15 Chair appoints reviewers for each paper
- September 15 Paper reviews due by this date


Committee Liaison Reports

AASHTO COBS T-4 Construction AASHTO COBS T-5 Loads and Load Distribution AASHTO COBS T-11 Research AASHTO COBS T-14 Structural Steel Design AASHTO COBS T-17 Metals Fabrication AASHTO COBS T-19 Software and Technology AASHTO Publications AASHTO Publications AASHTO/NSBA Bridge Collaboration and NSBA AISI - Welding Advisory Group AREMA Committee 15 Steel Structures ASCE SEI Steel Bridges AWS American Welding Society SSRC Structural Stability Research Council TRB AKB00(3) ABC Subcommittee TRB AKB10 Innovative Highway Structures and Appurtenances TRB AKB50 Seismic Design and Performance of Bridges TRB AKC20 Project Delivery Methods TRB AKC40 Construction of Bridges and Structures TRB AKC70 Fabrication and Inspection of Metal Structures TRB AKC70 Fabrication and Inspection of Metal Structures TRB AKC70 Structures Maintenance TRB AKT40 Structures Maintenance TRB AKT40 (4) Corrosion Subcommittee TRB AKT50 Bridge and Structures Management TRB AKT60 Bridge Preservation TRB AR050 Railroad Infrastructure Design & Maintenance TRB AR060 Rail Transit Infrastructure Design & Maintenance TXSQC Texas Steel Quality Council Mid-Atlantic States Structural Comm. for Economical Fabrication



Future Activities

- 2023 Annual Meeting Workshop Proposals
 - Due to TRB by May 20
 - Include title, time length, description, attendance estimate
 - Please send ideas to Jamie Farris
- AKB20 Mid-Year Virtual Meeting
 - June or July 2022 TBA



NSBA Collaboration Meeting

Let's Be Friends!

- How do I become a Friend of the Committee?
 - Go to MyTRB.org
 - Log in or create an account
 - Click on the Committees tab, then Become a Friend of a Committee





NSBA Collaboration Meeting



Contact Info: Jamie Farris Jamie.Farris@TxDOT.gov



NSBA Collaboration Meeting









AASHTO T-14: Structural Steel Design 2022 ballots (not ratified): Discussion of wind loading on girders before deck Updates to primary/secondary Table 6.6.2.1-1 Minor curvature, box girder bracing Updated slip requirements for connections Straight or curved girder bracing with standard holes Lateral bracing Defined factored construction load

• Tub girder compression flange capacity (6.11)



AASHTO T-14: Structural Steel Design

- 2022 ballots (not ratified):
 - Updated/clarified WT flexural capacity (6.12.2.2.4)
 - · Language on excluding threads from bolt shear planes
 - · Include rebar for negative moment field splice design
 - Add ASTM F3148 bolts (splined end bolts)
 - Major I-girder LTB updates:
 - Nonprismatic (changing flange or web depth)
 - Refined hand methods (multiple options)
 - Discussion of method using finite element analysis
 - + Update C_b factors similar to AISC

Design and Construction of the Olentangy Trail – Arena District Connector Bridge

Presenter: Travis Butz, PE

BURGESS & NIPLE

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	Olentangy Trail Bridge	e HEM DESCRIPTION	TOTAL QUANTITY	UNIT	2017 UNIT PRICE	I UTAL 2017 CONSTRUCTION COST
		Mar.	0	EACH	00.02	0.2
	A A A A A A A A A A A A A A A A A A A	D SHEETING	1	LS	\$30,000.00	\$30,000
	VILLE CASE	NT MOBILIZATION	1	LS	\$20,000.00	\$20,000
State of the second	A REAL PROPERTY OF	FURNISHED	1780	FT	\$32.09	\$57,110
	A CONTRACTOR OF THE OWNER	2, DRIVEN	1580	FT	\$13.18	\$20,820
	a start and a start and a	3HOES, AS PER PLAN	42	EACH	\$99.51	\$4,190
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(M Shumbles	0000 0000 (90	CRETE MIRC CONCRETE ADUTMENT THOUST DUOCKS	120	CY	\$9/5./8	\$75,040
	Willowger	ACRETE ABUTMENT INCLUDING FOOTING	67	CY	\$572.92	\$38,340
	CONTRACTOR OF THE OWNER	INCRETE FOOTING	32	CY	\$479.21	\$15,330
Real Provide State	ALCONTRACTOR AND	ONCRETE WITH QC/QA. PIER ABOVE FOOTINGS	83	CY	\$1,113.52	\$92,790
All and a second s		AL STEEL MEMBERS, LEVEL 1	62020	LB	\$1.68	\$104,350
	la	TING STRUCTURAL STEEL, INTERMEDIATE COAT SYSTEM OZEU	7640	SF	\$3.62	\$27,670
	Wer See	NTING STRUCTURAL STEEL, FINISH COAT	7640	SF	\$3.02	\$23,040
Google	. N	MISC.: STEEL	550	FT	\$275.00	\$151,250
					the second se	

ACH SLABS, MISC.: APPROACH SLAB WITH MARKER AL - STRUCTURE, MISC.: HANGERS AND CONNECTORS AL - STRUCTURE, MISC.: GLULAM BRIDGE MEMBER

1

Contingency %: 20% \$290,430 \$1,742,580 TOTAL COST:

\$10,750

\$183,900 \$471,200

\$0

\$1,452,150

\$250.00

\$2.50 \$58,900.00 \$0.00

Subtotal:

43

73560

8

0

SY

LB

EACH

EACH











- Inclined Vierendeel trusses using round HSS sections
- Floorbeams are I-beams, field bolted moment connections to trusses
- Conventional composite concrete deck on SIP forms, span between floorbeams
- Variable deck haunch included to control the deck profile
- Deck is flat in cross section, positive drainage achieved by longitudinal grade





- Vierendeel truss is a moment frame with fully welded connections
- End panels are filled with welded web plates to help resolve the forces at the ends of the bridge
- Trusses were designed to come out in 3 pieces, connected by CJP field welds
- Ohio Structures constructed the truss lines full length in the shop, eliminated field splices

- Midas Civil used to calculate member forces
- Beam elements for truss members & floorbeams, shell elements for deck and web plates
- Multi-stage analysis examined deck construction, wind before & after the deck is placed



- Upper chord is braced by the bending stiffness of the truss web members
- Linear & nonlinear buckling analysis for construction and final conditions
- Considered the combined effects of wind, vertical loads







- Detailed analysis of the end panel to examine crushing / local buckling of the tube sections
- Tube members and plates modeled using shell elements
- Nonlinear analysis, verified factored stresses remained below yield limits



- Tubular truss members are generally controlled by the design of the connections
- Not in AASHTO
- Covered in Chapter K of AISC Specification for Structural Steel Buildings





(b) Shear yielding (punching) of the chord.

TABLE K4.1 Available Strengths of Round HSS-to-HSS Moment Connections					
Connection Type	Connection Available Flexural Strength				
Branch(es) Under In-Plane Bending T-, Y- and Cross-Connections	Limit State: Chord Plastification $M_{p,qp}\sin\theta = 5.39F_{\gamma}t^2\gamma^{0.5}\beta D_p O_t$ (K4-1)				
	φ = 0.90 (LRFD) $Ω = 1.67$ (ASD) Limit State: Shear Yielding (punching), when $D_b < (D - 2t)$				
	$M_{n,\phi} = 0.6F_y t D_b^2 \left(\frac{1+3\sin\theta}{4\sin^2\theta}\right) $ (K4-2)				
	$\varphi = 0.95 \text{ (LRFD)} \qquad \Omega = 1.58 \text{ (ASD)}$				
Branch(es) Under Out-of-Plane Bending T-, Y- and Cross-Connections	Limit State: Chord Plastification $M_{n-op} = \frac{F_y t^2 D_b}{\sin \theta} \left(\frac{3.0}{1-0.81\beta}\right) Q_r \qquad (K4-3)$ $\phi = 0.90 \text{ (LRFD)} \qquad \Omega = 1.67 \text{ (ASD)}$				
	Limit State: Shear Yielding (punching), when $D_b < (D - 2t)$ $M_{n-op} = 0.6F_y t D_b^2 \left(\frac{3 + \sin\theta}{4\sin^2\theta}\right)$ (K4-4)				
For T-, Y- and cross-connections, with brand and out-of-plane bending, or any combinati	φ = 0.95 (LRFD) $Ω = 1.58$ (ASD) ch(es) under combined axial load, in-plane bending, ion of these load effects:				
LRFD: $[P_{\nu}/(\phi P_{n})] + [M_{r,ip}/(\phi M_{n,ip})]^{2} + [M_{r,ip}/(\phi M_{n,ip})]^{2}$	$p/(\phi M_{n-op})] \le 1.0$ (K4-5)				
ASD: $[P_{a}/(P_{n}/\Omega)] + [M_{r,ip}/(M_{n-ip}/\Omega)]^{2} + [M_{r,op}/(M_{n-op}/\Omega)] \le 1.0$					
ϕP_n = design strength (or P_n/Ω = allowa $\phi M_{n,p}$ = design strength (or $M_{n,p}/\Omega$ = allow ϕM_{n-op} = design strength (or M_{n-op}/Ω = allow $M_{n,p}$ = M_{u+p} for LRFD; M_{a+p} for ASD	ble strength) obtained from Table K3.1 wable strength) for in-plane bending wable strength) for out-of-plane bending				

 $M_{r-op} = M_{u-op}$ for LRFD; M_{a-op} for ASD

- Welding of tubular members is not covered in AWS D1.2 (Bridge Welding Code)
- Requirements are in chapter 9 of AWS D1.1 (Structural Welding Code)
- Figure 9.11 deals with PJP welds of tubular members





NOTES:

1. PARTIAL PENETRATION GROOVE WELDS BETWEEN TUBULAR MEMBERS SHALL BE PERFORMED ACCORDING TO AWS D1.1 (2015) FIGURE 9.11. SEE GENERAL NOTES FOR ADDITIONAL WELDING AND TESTING REQUIREMENTS.









Ψ = 75°-60°

TRANSITION OR HEEL





Figure 9.11 (Continued)—Prequalified Joint Details for PJP T-, Y-, and K-Tubular Connections (see 9.10.1)





















Questions?

Bridge\$1.76 MLighting\$0.26 MTotal Project\$2.63 M

BURGESS & NIPLE



AASHTO/NSBA Update – Spring 2022

Christopher Garrell, PE National Steel Bridge Alliance



1



AASHTO/NSBA Steel Bridge Collaboration Document Status



AASHTO/NSBA Collaboration

Development and Publishing Schedule – Current

- Available Documents
 - 4 Guide Specifications: Fabrication, Erection and Coatings
 - 11 Guidelines: Detailing, Fabrication, QA/QC, Bearings, Constructability and Analysis.
- Download Posting
 - AASHTO Bookstore: store.transportation.org/
 - NSBA Website: www.aisc.org/nsba/



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AASHTO/NSBA Collaboration

Development and Publishing Schedule – Past (2021)

Document	Status	Expected Release
G4.2 Qualification of Bolting Inspectors	Completed	Posted September
G14.1 Repair Guidelines - Fatigue and Fracture	In Editing	Q3 2022



AASHTO/NSBA Collaboration

Development and Publishing Schedule – Future

• 22 Documents in Development.

	Target Year	Count	
	2021*	1	-
	2022	2	
	2023	6	_
	2024	4	
	Not Specified	9	
×.		L.	-

Ballot Item - 2022

S8.3 Hot Dip Galvanizing Specification

• About this Document

This guide presents information for owners, designers, and fabricators to yield better results and more durable steel bridges. It represents best practices for design and fabrication as well as providing information on properties of hot-dip galvanizing, types of materials suitable for hot-dip galvanizing, welding procedures, venting and draining, distortion control and more.

About this Version

New document intended for adoption directly in state DOT standard specifications.

• Intended Use

Intended for adoption by owners, designers, and fabricators for specifying hot dip galvanizing for bridges and other highway structures.
Ballot Item - 2022

G9.1 Steel Bridge Bearing Guidelines

About this Document

Focuses on cost effective detailing for steel bridge bearings with design guidance on the connection of the bearing to the girders. It is intended to supplement the design requirements in the AASHTO LRFD BDS.

About this Version

Update of previous document that was adopted and published by AASHTO in 2004.

Intended Use

This document will be useful to designers in developing cost effective details for steel bridge bearings, and owners for developing standard details and policies for steel bridge bearing.

7



Ballot Items - 2022

Ballot Items - 2022

AASHTO CBS Pre-Balloting Phase

Designati on	Title	CBS Comments Received [*]
S8.3	Hot Dip Galvanizing Specification	29
G9.1	Steel Bridge Bearing Guidelines	3

* Comment resolution must be completed before May 13.



AASHTO/NSBA Steel Bridge Collaboration

Fall 2022 Meeting

- October 11 13.
- Location to be determined.

2023 Meetings

- Survey to be distributed in October.
- Identify dates for both spring and fall meetings.





Design Resources Updates

11

Designer Resources

Released

- Released 2021
 - LRFD Simon Updated
 - Preliminary analysis and design of straight plate and box girder bridges with limited skew.
 - Includes 30 different updates, changes and fixes.
 - See revision history in user's guide for more information.
 - NSBA Guide to Navigating Routine Steel Bridge Design New.
 - Complement AASHTO LRFD Bridge Design Specifications.
 - Addresses the design of steel superstructures for "routine steel I-girder bridges."
 - Illustrates applicable provisions of the AASHTO LRFD BDS.
- Released 2022
 - Steel Bridge Handbook Updated
 - 9th Edition AASHTO Bridge Design Specification.
 - Reflects current research and advice.



Designer Resources

Expected

- Expected Late 2022 / Early 2023
 - Heat Curve Evaluator New.
 - AASHTO LRFD BDS Article 6.7.7.2 requires that Engineers indicate if heat curving is permitted.
 - Assists with evaluation of AASHTO LRFD Bridge Construction Specification Article 11.4.12.2.2.
 - Currently awaiting posting to website.
 - Lean-on Bracing Design Guide New.
 - Show bridge designers how to implement lean-on bracing in routine bridge designs
 - Address the most common concerns cited by designers and owners.
 - 60% draft currently under review.
 - University Steel Bridge Course New.
 - Develop materials for a collegiate level class on steel highway bridge design.
 - Materials include course syllabus, and presentation slides with speaker notes for each lecture.
 - Content based upon Steel Bridge Design Handbook.

Designer Resources

Need for Speed

- Guide to Executing an Effective Bridge Project Final Publishing
 - Develop a guide to help streamline bridge projects by outlining best practices for executing steel bridge projects, especially as it pertains to fabrication schedule.
- Reference Manual for the Design, Detailing, and Maintenance of Uncoated Weathering Steel in Bridges – Wrapping-up
 - Provide current information on where and when it's appropriate to use.
 - Include information on the proper detailing.
- Girder Bridge Design Standards Expected 2023
 - Develop a national standard that provides a "catalog" of solutions for single, two, three, and four-span bridges with standard rolled shapes and built-up plate girders.





Academic Research On-going and completed

15

Academic Research

Coatings Durability Study

- Research at University of Delaware led by Jennifer McConnell, PhD, with the support of Clara Chen, PhD and graduate research assistant Julie Giannino.
- 2-year research project on the durability of modern liquid applied corrosion protection systems.
- Cyclical laboratory accelerated corrosion testing was intended to represent 80years of exposure in a relatively severe environment.
 - 1-coat inorganic zinc (IOZ) paint.
 - 3-coat organic zinc (OZ) paint system.
 - · Metallizing.
 - · Hot dipped galvanizing.
 - Uncoated weathering steel (Grade 50W).
- Completed January 2022 and awaiting final publishing.
- Research was intended to help close knowledge gaps regarding the true expected life of modern coatings solutions and act as building block for design guidance.

Academic Research

Single Coat Inorganic Zinc

- Fund a synthesis study to evaluate the performance of the existing bridges that have utilized the system.
 - Started November 2021.
 - Completion fall of 2022.
- Anticipate visiting bridge sites and visually assess performance.
 - 1 bridge in Virginia.
 - 2 bridges in Washington.
 - 25 bridges in Missouri.
- Recommendations future testing/research to fill in any gaps in the estimated performance of the system
- Recommend guidance documents for decision makers.

Academic Research

AISC Milek Fellowship

- Background
- 2022 Holistic Design and Behavior of Adhesive Steel-to-Steel Connections.
 - Kara Peterman at University Of Massachusetts Amherst.
 - Investigate installation procedure, structural behavior, creep performance, and performance under elevated temperatures.
 - Expected 2026.
- 2021 Innovative Steel Deck System for Highway Bridge Applications.
 - William Collins at University of Kansas.
 - Develop a steel deck system for highway bridges capable of competing for market share with traditional cast-in-place and precast concrete bridge decks.
 - · Expected 2025.
- 2020 Behavior of Hot Rolled Asymmetric Steel I-Beams.
 - Matt Yarnold at Texas A&M.
 - Evaluate steel hot rolled asymmetric I-beams (AIBs) for future use in composite floor systems.
 - · Expected 2024.



Upcoming Events Conferences, Webinars and Others

19

Upcoming NSBA Events

Upcoming Steel Bridge Forums

- Kansas (Topeka) May 19
- Montana (Helena) May 24
- North Carolina (Raleigh) October 27
- South Carolina (Columbia) TBD
- New York TBD



Visit <u>www.aisc.org/nsba/steel-bridge-forum/</u> for more information

NASCC: The Steel Conference

2023 World Steel Bridge Symposium

- April 12 14.
- Charlotte Convention Center- Charlotte, NC.
- Call for abstracts.
 - Online submission form.
 - Submissions due by COB May 13.
- Symposium speakers receive complementary registration and travel support.
- Contact Jeff Carlson (<u>carlson@aisc.org</u>) for more information.







Ba	ackground – P.R. Olgiati Bridge
>	15 span steel multi-girder bridge in Chattanooga, TN
>	Owner: Tennessee DOT
>	Total Length: 2645 feet
>	Originally built in 1953
>	Two side-by-side 2 girder systems supported on a common substructure
>	River crossing portion consisted of five spans
	> 177.75'/276.5'/375.0'/276.5'/177.75'
	Middle three spans were continuous







<section-header> Forte Wideneing A cenabilitated and widened in 1998 A cena girder lines added (two each side) A circle r lines were five-span continuous A core piers were "widened" by adding two steel cap beams to each existing concrete wall pier A peen longitudinal joint between two original structures eliminated B rovision made for future widening by single girder line each side



6



Widening htly, the planned second widening was being considered hally, TDOT raised concerns about the distribution of live load in the e beams case where vehicles rested only on one side of the cantilever was of
ntly, the planned second widening was being considered nally, TDOT raised concerns about the distribution of live load in the e beams case where vehicles rested only on one side of the cantilever was of
nally, TDOT raised concerns about the distribution of live load in the e beams case where vehicles rested only on one side of the cantilever was of
case where vehicles rested only on one side of the cantilever was of
ease there termeres rested only on one side of the cantileter that en
I was asked to perform an evaluation of the as-built system to mine if the saddle beams would possibly be overloaded under ent live load positioning
1 1 6

JESKIMASTERS **Evaluation of As-Built Condition** LUSAS three-dimensional finite element model was used Cap beams, saddle beams, and lower portion of the pier (b-regions) were represented by shell elements Upper portion of pier (d-region) was represented by solid elements Load beams and bracing were represented by beam elements Symmetric boundary conditions were used to analyze only half the pier Line girder analyses were used to determine reactions at load beams





Example in the set of th































MODJESKI

Proposed Construction Procedure

- 1. Construct notch in existing pier.
- 2. Install CFST, pre-filled with concrete, on anchor rods.
- Align strut using temporary brace and adjustment of leveling nuts.
- 4. Place grout pad below strut.
- 5. Align and position load beam between cap beams and install.





Modifications to Proposed Sequence

DJESKI~MASTERS

- M&M had planned for struts to be filled upright, brought to the site, and hoisted into place
- Contractor preferred to lift struts empty, and fill in-place
- To ensure a full fill up to the bearing plates for the jacks, contractor added vent tubes at the highest elevation regions of the area beneath the angled bearing plates
- Pumping would stop when concrete flowed from the vent pipes



























Conclusions Existing structure was evaluated using advanced analysis techniques Confirmed that the existing saddle beams could be overstressed Determined that alternate load paths could not be counted on due to deformation incompatibilities Developed retrofit options and ultimately chose CFST struts to transform cantilever beams into propped cantilevers Assisted with construction where necessary





Appendix D – Meeting Schedule and Agendas

Schedule Overview

NOTE: All times are shown as Eastern Time Zone

Tuesday, May 3

Meeting	Secretary	Chair	Vice Chair	Start (CT)	End (CT)
TG 16 Orthotropic Deck Panels	Jeff Carlson	Sougata Roy	Frank Artmont	8:00 AM	12:00 PM
TG 14 Field Repairs and Retrofits	Devin Altman	Kyle Smith	Jonathan Stratton	9:00 AM	12:00 PM
TG 4 QC/QA	Vin Bartucca	Jamie Hilton	Robin Dunlap	1:00 PM	3:00 PM
TG 10 Erection	Anthony Peterson	Brian Witte	Jason Stith	1:00 PM	3:00 PM
TG 17 Steel Castings	Devin Altman	Jennifer Pazdon	Jason Stith	3:00 PM	5:00 PM
TG 1 Detailing	Vin Bartucca	Randy Harrison	Gary Wisch	3:00 PM	4:30 PM

Wednesday, May 4

Meeting	Secretary	Chair	Vice Chair	Start (CT)	End (CT)
TG 8 Coatings	Jeff Carlson	Paul Vinik	Johnnie Miller	8:00 AM	10:00 AM
TG 15 Data Modeling for Interoperability	John Hastings	Aaron Costin	Jonathan Stratton	8:00 AM	10:00 AM
TG 2 Fabrication and Repair	Christopher Garrell	Heather Gilmer	Duncan Paterson	10:00 AM	12:00 PM
Combined TG 1 Detailing, TG 15 Data Modeling for Interoperability	John Hastings	Aaron Costin		10:00 AM	12:00 PM
TG 13 Analysis of Steel Bridges	Christopher Garrell	Deanna Nevling	Francesco Russo	1:00 PM	3:00 PM
TG 18 Duplex Stainless Steel	Anthony Peterson	Jason Provines	Nancy Baddoo	1:00 PM	5:00 PM

Thursday, May 5

Meeting	Secretary	Chair	Vice Chair	Start (CT)	End (CT)
TG 12 Design for	loff Carlson	Christina	Russell Jeck	8:00 AM	9:00 AM
Constructability and Fabrication		Freeman			

Meeting	Secretary	Chair	Vice Chair	Start (CT)	End (CT)
Combined TG 1 Detailing, TG 11 Steel Bridge Handbook, TG 12 Design for Constructability and Fabrication	Jeff Carlson	Christina Freeman		9:00 AM	12:00 PM
MC Main Committee	Christopher Garrell	Ronnie Medlock	Christina Freeman	12:30 PM	2:30 PM



AASHTO/NSBA Steel Bridge Collaboration

TG 1 Detailing Union Station Hotel St. Louis, MO Room Name: Regency C

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, Hirschfeld Division Vice Chair: Gary Wisch - DeLong's, Inc. Secretary: Vin Bartucca - NSBA

Meeting Agenda: 5/3/2022 (3:00 PM - 4:30 PM CT)

- 7. Chairperson's Welcome (3:00 PM 3:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 8. Discussion of comments for Updating of the G1.4 Guidelines for Design Details (3:10

PM-4:30 PM)

- a. Page 101 Index of Sheets
- b. Page 102 General Notes Structural Steel
- c. Page 103 Typical Girder Details I
- d. Page 104 Typical Girder Details II & Flange Slabbing and Stripping Details
- e. Page 105 Typical Girder Details III
- f. Page 106 Typical Girder Details IV
- g. Page 107 Standard Bolted Field Splices
- 9. Adjourn



AASHTO/NSBA Steel Bridge Collaboration

TG 2 Fabrication and Repair Union Station Hotel St. Louis, MO Room Name: Regency AB

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 - TUV Rheinland Vice Chair: Duncan Paterson - HDR Engineering Inc. Secretary: Christopher Garrell - NSBA

Meeting Agenda: 5/4/2022 (10:00 AM - 12:00 PM CT)

- 4. Chairperson's Welcome (10:00 AM 10:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
 - d. Reminder of documents currently under the task group's scope
 - e. AASHTO steel fabrication specification status update
- 5. G2.2, Guidelines for Resolution of Steel Bridge Fabrication Errors
 - a. Improper preheat
 - b. Framing members too short
 - c. Exceeding maximum interpass temperature
 - d. Hydrogen diffusion postheat not performed
- 6. AASHTO fabrication specification (formerly S2.1)
 - a. Scribing/etching of layout marks.
 - b. Applying A6 Table X4.2 (old cold bending radii) to the 1.5t case for bending connection plates.
 - c. Continuing work on slip coefficients, especially regarding metallizing and combination of different coatings in same connection.
 - d. Transverse members in assembly for skewed as well as curved
- 7. Adjourn



AASHTO/NSBA Steel Bridge Collaboration

TG 4 QC/QA Union Station Hotel St. Louis, MO Room Name: Regency AB

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.

Task Group Leadership

Chair: Jamie Hilton - KTA-Tator, Inc. Vice Chair: Robin Dunlap - High Steel Structures Secretary: Vin Bartucca - NSBA

Meeting Agenda: 5/3/2022 (1:00 PM - 3:00 PM CT)

- 16. 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.
- 17. G4.2 Guidelines for the Qualifications of Structural Bolting Inspectors (1:10 PM –
 1:30 PM)
 - a. RCSC other bolting applications to add to G4.2. Jeremy Rice/Heather Gilmer
 - b. Previous ballot "new business" considerations
- 18. Obsolete S4.1 Steel Bridge Fabrication QC/QA Guide Spec (1:30 PM 2:00 PM)
 - a. Status of G4.4 Sample Owner's QA Manual to be incorporated in with S4.1 Part
 C and revised to third party (QA/QV) inspection requirements. Jamie
 Hilton/Heather Gilmer/Phil Dzikowski
 - b. Status of archiving the obsolete S4.1 on the NSBA or AISC website and provide buyer beware guidance. Phil Dzikowski/Ray Monson/Teresa Michalk
- 19. G4.1 Steel Bridge Fabrication QC/QA Guidelines (2:00 PM 2:30 PM)
 - a. Status of review and updating

- Review G4.1 definitions and potentially replace with AISC terminology that is referenced in AISC 207-20 Standard Certification Programs. Jamie Hilton/Teresa Michalk/Heather Gilmer/Jeremy Rice
- ii. Start reviewing for the 2024 update
- 20. Discussion of AISC 207 Chapter 4 Fabricator Requirements (2:30 PM 2:50 PM)
- 21. Other New Business?
- 22. Adjourn


TG 8 Coatings Union Station Hotel St. Louis, MO Room Name: Regency AB

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: Paul Vinik - GPI Construction Engineering (GPI) Vice Chair: Johnnie Miller - Texas Department of Transportation Secretary: Jeff Carlson - NSBA

Meeting Agenda: 5/4/2022 (8:00 AM - 10:00 AM CT)

- 9. Chairperson's Welcome (8:00 AM 8:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
- S8.3 Update on Specification for the application galvanizing on steel bridges Medlock (8:10 AM - 8:20 AM)
- 11. G8.4 Detailing for Corrosion Protection Systems (8:20 AM 8:50 AM)
 - a. Members of the other corrosion protection groups were identified. They are:
 - i. Uncoated weathering steel/50CR Heather Gilmer, Jason Lloyd, Jeff Carlson
 - ii. Thermal spray Paul Wagar, Heather Gilmer, Ronnie Medlock, Dave Johnson, Bernardo Duran, Kevin Irving
 - iii. Liquid applied coatings Derrick Castle, Johnnie Miller, Bill Corbett, Brian
 Fridley
- 12. Update on UWS Initiatives Carlson (8:50 AM 8:55 AM)
 - a. UWS Manual is finished. Will be posted on the AISC website soon.

- 13. Single Coat IOZ Synthesis Update Carlson (8:55 AM 9:05 AM)
- 14. University of Delaware Performance Study Presented at 2022 WSBS (9:05 AM 9:10 AM)
- 15. Follow Up on Misconceptions of Chemically Grouping Coatings Vinik (9:10 AM 9:15 AM)
 - a. What, if anything, can this group do to help provide a resolution for this issue?
- 16. LADOTD High Performance Coatings Study (9:15 AM 9:45 AM)
- 17. Follow Up on AMPP S8.1 Revisions Bill Corbett, Kevin Irving, Heather Gilmer, Jeff Carlson (9:45 AM 9:50 AM)
- 18. Open discussion/New business (9:50 AM 10:00 AM)
- 19. Adjourn



TG 10 Erection Union Station Hotel St. Louis, MO Room Name: Regency C

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 Secretary: Anthony Peterson - NSBA

Meeting Agenda: 5/3/2022 (1:00 PM - 3:00 PM CT)

- 12. Chairperson's Welcome (1:00 PM 1:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Review action items from previous meeting</u>.
- 13. Field Reaming (20 min)
 - a. Review text proposed by Eric Rau
- 14. Broken Fasteners Open Discussion (20 min)
 - a. Update/discussion on proposed text
- 15. G10 & AASHTO Bridge Construction Specification (10 min)
 - a. Discuss small group meeting results from Nov 2021
 - b. Quick review of AASHTO BCS Chapter 11
- 16. Bearing Section 5 rewrite (10 min)
 - a. Any comments on draft language?
- 17. Wind Load on Girders during Erection (5min)
- 18. Bolting for Bolters update (5 min)
- 19. Beam Clamp Loading (20 min)
 - a. Address concerns about included language and sketch
- 20. New topics for consideration (10 min)

- 21. Review & assign action items (10 min)
- 22. Adjourn



TG 11 Design Union Station Hotel St. Louis, MO Room Name: Regency AB

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. **Secretary:** Christopher Garrell - NSBA

Meeting Agenda: 5/4/2022 (3:00 PM - 5:00 PM CT)

- 7. Chairperson's Welcome (3:00 PM 3:10 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 8. Announcements and Administrative Items (3:10 PM to 3:15 PM)
- 9. Presentations (3:15 PM to 3:45 PM)
 - a. What's new in the NSBA Steel Bridge Design Handbook (10 minutes) Chavel
 - b. FHWA Publication Evaluation of Steel Bridge Details for Susceptibility to Constraint-Induced Fracture & Interactive Assessment (20 minutes) – Coletti
- 10. Guidelines for the Design of Cross Frames & Diaphragms (3:45 to 4:45 PM)
 - a. Review major revisions based on past comments and additions
 - b. One final review by same reviewers?
 - c. Schedule
- 11. General Open Discussion (4:45 to 5:00 PM)
 - a. Design issue discussions
 - b. Other potential items for the next design TG task.
- 12. Adjourn



TG 12 Design for Constructability and Fabrication Union Station Hotel St. Louis, MO Room Name: Regency AB

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 - Tutor Perini Corp. Secretary: Jeff Carlson - NSBA

Meeting Agenda: 5/5/2022 (8:00 AM - 9:00 AM CT)

- 7. Chairperson's Welcome (8:00 AM 8:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
- 8. Miscellaneous Comments on G12.1-2020, Guidelines to Design for Constructability and Fabrication (8:10 AM 9:00 AM)
- 9. Adjourn



TG 13 Analysis of Steel Bridges Union Station Hotel St. Louis, MO Room Name: Regency AB

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 Secretary: Christopher Garrell - NSBA

Meeting Agenda: 5/4/2022 (1:00 PM - 3:00 PM CT)

- 6. 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.
- 7. General Announcements (1:10 PM 1:25 PM)
 - a. Conferences/Research/Publications
 - b. NSBA Update Chris Garrell
 - c. FHWA Update Dayi Wang, FHWA Steel Specialist
 - d. TRB AKB20 (Steel Bridges Committee) Update Jamie Farris
 - e. AASHTO Bridge Update (T-14 Structural Steel Design) Frank Russo
- 8. Presentation (1:25 PM 2:10 PM) TBD
- 9. G13.2 Guidelines for Steel Truss Bridge Analysis (2:10 PM 2:30 PM)
 - a. Volunteer Reviewers
 - b. Schedule
- 10. New TG Initiative (2:30 PM 3:00 PM)
 - a. Software Validation and Checking Complex Models -Domenic Coletti
- 11. Adjourn (3:00 PM)



TG 14 Field Repairs and Retrofits Union Station Hotel St. Louis, MO Room Name: Regency C

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: Jonathan Stratton - Eastern Steel Works, Inc. Secretary: Devin Altman - NSBA

Meeting Agenda: 5/3/2022 (9:00:00 AM - 12:00:00 PM CT)

- 1. Chairperson's Welcome (9:00 AM 9:15 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 2. TG-14 Overview (9:15 AM 9:30 AM)
- 3. G14.1/G14.3 Update (9:30 AM 10:00 AM)
- 4. G14.2 (10:00 AM 12:00 AM)
 - a. Discussion of unresolved task group comments (if applicable)
 - b. Discussion for needed figures/photos
 - c. Open discussion for questions/comments
 - d. Recap path forward.
- 5. Adjourn.



TG 15 Data Modeling for Interoperability Union Station Hotel St. Louis, MO Room Name: Regency C

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: Jonathan Stratton - Eastern Steel Works, Inc. Secretary: John Hastings - NSBA

Meeting Agenda: 5/4/2022 (8:00:00 AM - 10:00:00 AM CT)

- 1. Chairperson's Welcome (8:00 AM 8:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 2. TG1/15 Updates (8:10 AM 8:30 AM)
- 3. U.S. Data Dictionary (8:30 AM 9:00 AM)
 - a. Overview
 - b. Demonstration
- 4. Bridge Data Dictionary Working Group (9:00 AM 9:50 AM)
 - a. Updates
 - b. Review outstanding comments
 - c. Plan for reorganization
- 5. Closing Discussion (9:50 AM 10:00 AM)
- 6. Adjourn



TG 16 Orthotropic Deck Panels Union Station Hotel St. Louis, MO Room Name: Regency AB

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 - Rutgers University Vice Chair: Frank Artmont - Modjeski & Masters, Inc. Secretary: Jeff Carlson - NSBA

Meeting Agenda: 5/3/2022 (8:00 AM - 12:00 PM CT)

- 9. Chairperson's Welcome (8:00 AM 8:10 AM)
 - i. AISC Antitrust Policy and Meeting Code of Conduct.
 - ii. Introductions (as needed).
 - iii. Approval of Previous Meeting Minutes.
- 10. General updates and announcements review of mission statement:
- 11. "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."

- 12. Discussion on Fabrication Tolerances Contd. from Previous Meeting
- 13. 15 min break
- 14. Discussion on Fabrication Tolerances Contd.
- 15. Task Group updates
 - i. State of Practice Synthesis Document
 - ii. Review sections
 - iii. Review author assignments
 - iv. Monthly webinar meetings schedule
 - v. Short Span Orthotropic Update (SSSBA) collaboration
- 16. Review Committee Goals
- 17. Old business and additional discussion
- 18. Review Action Items

19. Adjourn



TG 17 Steel Castings Union Station Hotel St. Louis, MO Room Name: Regency AB

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 Secretary: Devin Altman - NSBA

Meeting Agenda: 5/3/2022 (3:00 PM - 5:00 PM CT)

- 6. 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.
- 7. Review of Mission, Goals and Timeline (3:15 PM 3:25 PM)
- 8. Review of Comments on Guide Specification (3:25 PM 4:25 PM)
- 9. Review of White Paper Draft/Comments (As Time Allows)
- 10. Adjourn



TG 18 Duplex Stainless Steel Union Station Hotel St. Louis, MO Room Name: Regency C

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 Secretary: Anthony Peterson - NSBA

Meeting Agenda: 5/4/2022 (1:00 PM - 5:00 PM CT)

- 8. 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.
- 9. Administrative Items (1:15 PM to 1:45 PM)
 - a. Mission
 - b. Scope
 - c. Schedule
- 10. Duplex Materials Specification (1:45 PM to 2:30 PM)
 - a. Presentation on proposed specification by Jason Provines
 - b. Discussion
- 11. Duplex Design Specification (2:30 PM to 3:15 PM)
 - a. Presentation on duplex design by Nancy Baddoo
 - b. Discussion
- 12. Duplex Welding Specification (3:15 PM to 4:00 PM)
 - a. Presentation on duplex welding by Stan Gingrich

- b. Discussion
- 13. General Discussion (4:00 PM to 5:00 PM)
- 14. Adjourn.



AASHTO/NSBA Steel Bridge Collaboration Combined TG 1 Detailing, TG 11 Steel Bridge Handbook, TG 12 Design for Constructability and Fabrication Union Station Hotel St. Louis, MO Room Name: Regency AB

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

Secretary: Jeff Carlson - NSBA

Meeting Agenda: 5/5/2022 (9:00 AM - 12:00 PM CT)

- 1. Chairperson's Welcome (9:00 AM 9:10 AM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. <u>Approval of Previous Meeting Minutes</u>.
- 2. Presentation on Box Fabrication and Erection by Bob Cisneros (9:10 AM 9:20 AM)
- Review and Discuss Comments on G11.2-2023, Guidelines for Steel Bent Caps (9:20 AM - 9:50 AM)
- 4. Break (9:50 AM 10:00 AM)
- Review and Discuss Comments on G11.2-2023, Guidelines for Steel Bent Caps (10:00 AM - 11:50 AM)
- 6. Discuss Next Steps (11:50 AM 12:00 PM)
- 7. Adjourn



MC Main Committee Union Station Hotel St. Louis, MO Room Name: Regency AB

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, LLC (rmedlock@high.net) Vice Chair: Christina Freeman - FDOT (christina.freeman@dot.state.fl.us) Secretary: Christopher Garrell - NSBA (garrell@steelbridges.org)

Zoom Information

Meeting Agenda: 5/5/2022 (12:30 PM - 2:30 PM CT)

- 5. Chairperson's Welcome (12:30 PM 12:40 PM)
 - a. AISC Antitrust Policy and Meeting Code of Conduct.
 - b. Introductions (as needed).
 - c. Approval of Previous Meeting Minutes.
- 6. Task Group Reports Approximately five minutes each (12:40 PM 2:20 PM)
 - a. TG 1 Randy Hasrrison (W&W|AFCO Steel)
 - b. TG 2 Heather Gilmer (TÜV Rheinland)
 - c. TG 4 Jamie Hilton (KTA-Tator, Inc.)
 - d. TG 8 Paul Vinik (GPI Construction Engineering)
 - e. TG 9 Michael Culmo (CME Associates, Inc.)
 - f. TG 10 Brian Witte (Parsons)
 - g. TG 11 Brandon Chavel (NSBA)
 - h. TG 12 Christina Freeman (FDOT)
 - i. TG 13 Deanna Nevling (HDR)
 - j. TG 14 Kyle Smith (GPI Construction Engineering)
 - k. TG 15 Aaron Costin (University of Florida)
 - I. TG 16 Sougata Roy (Rutgers University)

- m. TG 17 Jennifer Pazdon (CAST CONNEX)
- n. TG 18 Jason Provines (VDOT)
- o. Joint TG 1 Detailing, TG 11 Design, TG 12 Constructability Christina Freeman (FDOT)
- p. Joint TG 1 Detailing, TG 15 Data Modeling for Interoperability Aaron Costin (University of Florida)
- 7. Other Business (2:20 PM 2:30 PM)

Adjourn