

AASHTO Steel Fabrication Specification



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WHAT DO WE HAVE NOW?

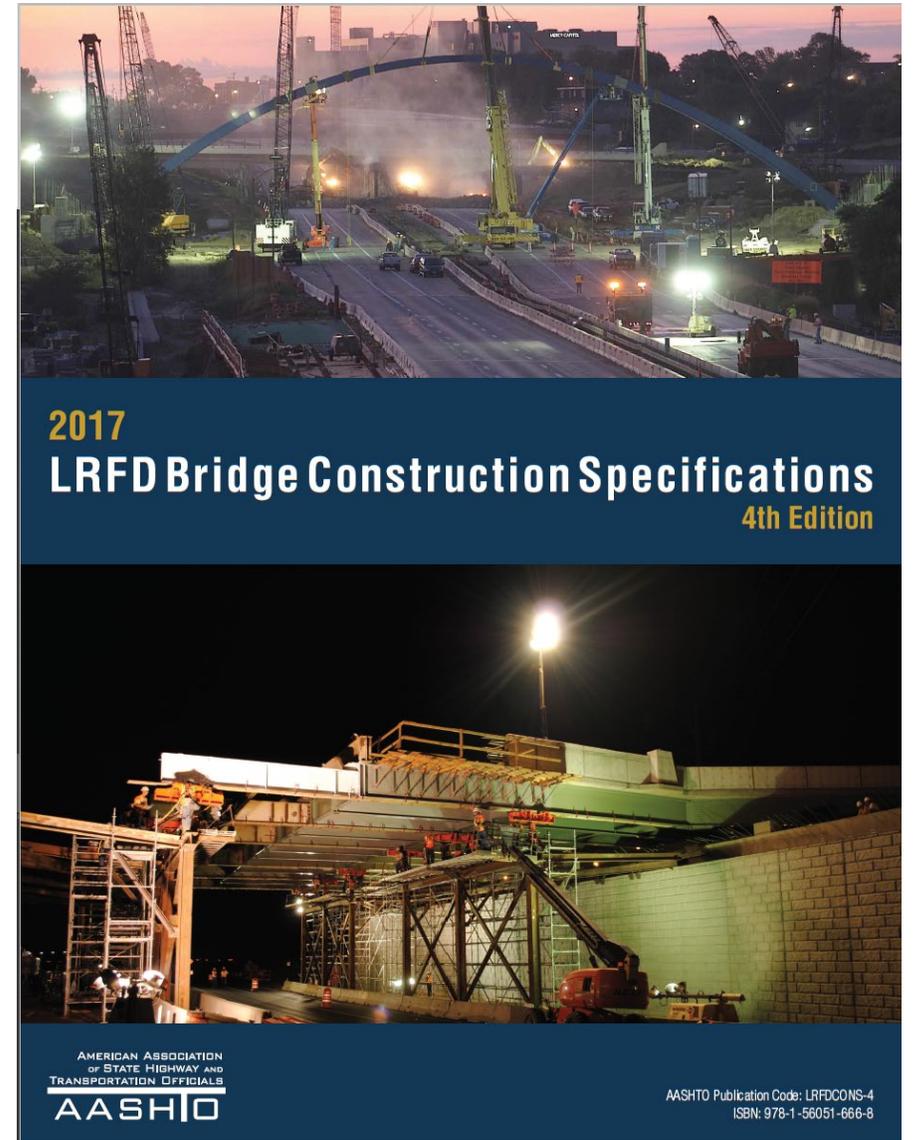
- Lots and lots of DOT steel fabrication specs
- AASHTO Bridge Construction Specs, Chapter 11
- AASHTO/NSBA Steel Bridge Collaboration S2.1
- Fabrication provisions in AASHTO/AWS D1.5

State (or other agency) Standard Specifications

- Many different ways of doing things
 - Makes errors more likely
 - Can be inefficient with no gain in quality
- Some states better than others at updating to state of the art

AASHTO LRFD Bridge Construction Specs, Chapter 11

- Until recently, not kept up to date
- As of 2017 edition, much better maintained
- Very few states adopt by direct reference
- Many use as source for state specs



S2.1

Steel Bridge Fabrication

Steel Bridge Fabrication Guide
Specification
S2.1-2018



AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS
AASHTO



American Association of State Highway and
Transportation Officials
National Steel Bridge Alliance
AASHTO/NSBA Steel Bridge Collaboration

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Objectives

- Standardize requirements and practices - try to do things one way instead of 50 ways
- Share resources and expertise - exchange information about best practices and technology and help agencies who have lost expertise and resources

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Background

- Discussions began March 1997
- Adopted by NSBA and AASHTO SCOBS, June 1997
- First meeting held in Cincinnati, September 1997

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Participants

- DOTs - designers, fabrication personnel, erection personnel
- Industry - fabricators, detailers, erectors, material producers
- FHWA - national, regional and division bridge and technology transfer engineers
- Academia
- Consultants - designers, inspection services

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Task Groups

- TG1: Detailing
- **TG2: Fabrication & Repair**
- TG4: QC/QA
- TG8: Coatings
- TG9: Bearings
- TG10: Erection
- TG11: Steel Bridge Handbook
- TG13: Analysis
- TG14: Field Repairs
- TG15: Data Modeling for Interoperability
- TG16: Orthotropic Deck Panels

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Process

- TG develops document (meetings, ballots)
- Online ballot to whole Collaboration
- Comment resolution with reballot as needed
- AASHTO T-14 review
- Comment resolution with reballot as needed
- Second T-14 review & approval for CBS ballot

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Standards

- “S” documents: Guide Specifications
 - More recently just “Specifications”
 - Written in spec-type language
 - Intended to be adopted by reference in their entirety (with or without exceptions—like D1.5)
 - Or “borrow” portions, use as source of good ideas

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: SBC Standards

- “G” documents: Guides
 - Recommendations
 - Best practices

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 2.2: Communication

2.2.3: During the project, maintain effective communications with the Owner's representatives. Address problems and concerns as early as possible in the work.



AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 2.2: Communication

2.2.4: On complex projects, start communication about special aspects of the job, including tolerances or other requirements, very early in the project.



AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 2.4: Prefabrication Meeting

Section 2.9: Progress Meetings

AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 2.5: Procedures

Includes list of processes
requiring written
procedures



AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 6.3: Specialty Structures

6.3.2: At a prefabrication meeting with the Contractor, Owner, and Erector, establish critical dimensions and tolerances required to ensure proper installation and performance of the structure.



AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Section 7.5: Alternate geometry control methods

Fabricators may propose alternate methods of geometry control for continuous girder bridges based on demonstrated accuracy that precludes the necessity for assembly.



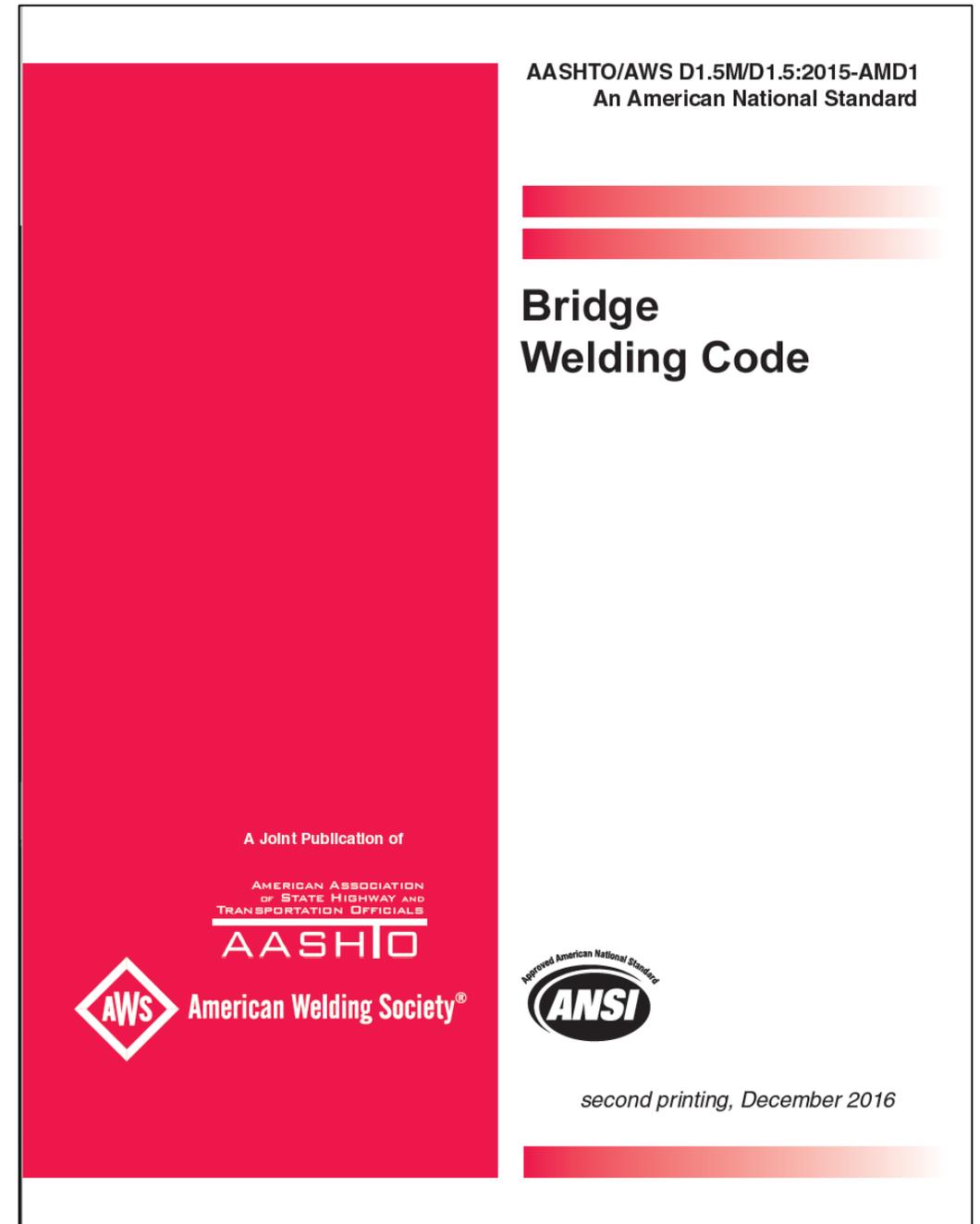
AASHTO/NSBA STEEL BRIDGE COLLABORATION S2.1: Notable Bits

Commentary

- Welding tubular members
- Extra end distance for bolted field splices
- Rotational capacity & preinstallation verification tests
- Shop assembly methods

AASHTO/AWS D1.5

- Base metal requirements
- Thermal cutting
- Dimensional tolerances
 - Welding distortion
- Bending/straightening
- Fracture-critical:
 - Definitions
 - Engineer responsibilities
 - Material requirements



HOW STANDARDS PROLIFERATE: (SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)



Source: <https://m.xkcd.com/927/>

FAB SPEC OF THE FUTURE

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PARTICIPANTS

- AASHTO T-17 owns
 - Was Welding
 - Now Metals Fabrication
- SBC TG2 will advise & maintain
 - Annual co-location
- AASHTO T-14

INGREDIENTS

- AASHTO LRFD BCS Ch. 11
- SBC S2.1
- D1.5
- RCSC
- AREMA
- AISC Certification Programs

SCOPE

- 1st Edition: Vehicular bridge superstructure only
- Later:
 - Tubular members
 - Pedestrian bridges
 - Transportation structures
 - Bearings

SEQUENCE

- Publish Fab Spec
- Archive S2.1
- Cut BCS Ch 11; leave erection
- Cut some D1.5 & refer to Fab Spec
- DOTs...

STATUS

- 1ST draft has gone to T-17
- Questions & outstanding issues have been discussed at T-17/SBC TG2 meetings
- 2nd draft in progress

TABLE OF CONTENTS

1. General (scope, definitions, certs)
2. Communication (notification; prefab & progress meetings)
3. Inspection (fabricator & owner roles)
4. Shop drawings
5. Written procedures

TABLE OF CONTENTS

6. Materials

- “Satisfy contract requirements”
- Most deleted

7. Handling and Storage

8. Cutting and Shearing Plates and Shapes

TABLE OF CONTENTS

9. Bending Plates

- Cold bending
- Heat-assisted mechanical bending
- Upset shortening

TABLE OF CONTENTS

10. Curving Beams and Girders

11. Cambering Beams and Girders

12. Straightening

TABLE OF CONTENTS

13. Application of Heat

- Upset shortening
- Heat-assisted mechanical forming
- AASHTO minimum radius equations

14. Thermal Treatments

TABLE OF CONTENTS

15. Tolerances

- **Cut Flange Width**
- ***Straightness***
- ***Camber***
- ***Sweep***
- ***Web Alignment***
- ***Web Flatness***
- ***Flange Warpage and Tilt***
- ***Depth***
- ***Fit of Stiffeners***
- **Abutting Joints**
- ***Alignment of Mechanically Connected Joints***
- **Facing of Bearing Surfaces**
- **Steel Pier Caps**

TABLE OF CONTENTS

16. Bolted Connections

- RCSC
- Torque test per contract

17. Surface Preparation of Uncoated Weathering Steel

18. Orthotropic Deck Superstructures (BCS)

TABLE OF CONTENTS

19. Pins and Rollers

20. Eyebars

21. Ultrasonic Impact Treatment

- Procedure moved to annex

TABLE OF CONTENTS

22. Marking and Shipping

23. Measurement for Payment (not payment)

24. References

INFORMATIONAL ANNEXES

- A. AASHTO BDS Designation of Primary and Secondary Members
- B. Sample Ultrasonic Impact Treatment Procedure (deleted from chapter)
- C. Items to be Specified in the Contract Documents

INFORMATIONAL ANNEXES

C. Items to be Specified in the Contract Documents

- Procedures & submittals
- Start of fabrication (cutting vs. welding)
- Torque test
- Other tolerances
- Additional testing
- Which measurement method (nominal or computed)
- Payment

Questions?

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