



TXDOT PREFERRED PRACTICES FOR STEEL UPDATE

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Table of contents

1 What are the Preferred Practices?

2 Current Preferred Practices

3 Draft 2018 Revisions

4 Discussion

What Are the Preferred Practices?

- Provides guidance to help steel bridge designers working on TxDOT projects achieve optimal quality and value in steel bridges.
- Document reflects the Texas Steel Quality Council's agreements. The council consists of Designers, fabricators, academics, steel mill representatives, etc.
- Available on-line at ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/steel_bridge.pdf
- Maintained by TxDOT Bridge Division.
- Currently checking if updates are needed
- Revisions in progress

Preferred Practices for Steel Bridge Design, Fabrication, and Erection

February 2015



Current Preferred Practices: Overall Chapters

- Chapter 1 - Revision History
- Chapter 2 - Design
- Chapter 3 - Fabrication
- Chapter 4 - Erection/Construction
- Appendix A - Frequently Asked Questions About Paint
- Appendix B - Paint Durability Questionnaire

Current Preferred Practices: Chapter 2-Design

- **2.1 - Preliminary Design Considerations** - Steel Grades, Span Configuration, Expansion Joint, Girder Spacing, Available Length of Material
- **2.2 - Plate Girders** - Flange Widths, Flange Thicknesses, Flange Splice Locations, Web Depth, Web Thickness, Web Splice Locations, Web-to-flange Welding, Stiffeners, Bearings, Field Splices.
- **2.3 - Rolled Beam Sections** - Sections, Stiffeners, Bearings, Field Splices, Camber.
- **2.4 - Tub Girder Sections** - Flanges, Webs, Stiffeners, Top Flange Lateral Bracing, Diaphragms and Cross Frames, Field Splices, Bearings, Electrical Service and Inspection Access.

Current Preferred Practices: Chapter 2-Design (Cont.)

- **2.5 - Box Girders for Straddle Bents** - Flanges, Webs, Stiffeners, Bearings, Field Splices, Flange-to-Web Welding.
- **2.6 - Diaphragms and Cross-Frames** - Member Selection, Stage Construction and Skews, Diaphragm and Cross-Frame Orientation.
- **2.7 - Bolted Connections** - Slip Coefficient, A325 vs. A490 bolts.
- **2.8 - Anchors Bolts and Rods**
- **2.9 - Shear Connector Studs**
- **2.10 - Design Details**
- **2.11 - Bearing Replacement**
- **2.12 - Bent Locations for Replacement or Widening**

Current Preferred Practices: Chapter 3-Fabrication

- **3.1 - Shop Drawings** - Shop Drawing Review, Distribution of Approved Shop Drawings, Shop Camber Checking
- **3.2 - Non Destructive Testing** - Use of Edge Blocks for Radiographs.
- **3.3 - Cleaning and Painting** - Painting Box and Tub Girder Interiors, Painting of Faying Surfaces

- 4.1 - Shipment of Bolts
- 4.2 - Condition of Weathering Steel Bolted Splice Faying Surfaces

- **Appendix A - Frequently asked Questions About Paint**
 - A.1 - What is Paint?
 - A.2 - Steel Paint
 - A.3 - Containment
 - A.4 - Hazard Waste
 - A.5 - Galvanized Steel
 - A.6 - Colors
 - A.7 - Concrete Paint
 - A.8 - Anti-Graffiti Coatings
- **Appendix B - Paint Durability Questionnaire**

DRAFT 2018 UPDATES

Draft 2018 Revisions - 2.1.3 Paint

- Will Allow for System III-B Paint System in northern part of the state if road salt is a concern in specific cases.
- Current - TxDOT Standard Specification requires the inside of all tub and box girders to be painted with a light colored paint (white polyamide cured epoxy) to facilitate crack detection for FC inspection.
- Starting to see cases of poor performance of above system for inside of tubs and boxes:



Draft 2018 Revisions - 2.1.3 Paint

- May specify a more robust paint system for interior of boxes and tubs, which is to be determined.



Draft 2018 Revisions - 2.1.5 Expansion Joints

- Currently allow use of finger joints
- Will encourage use of SEJ's over finger joints, including using inverted tees as stated now.



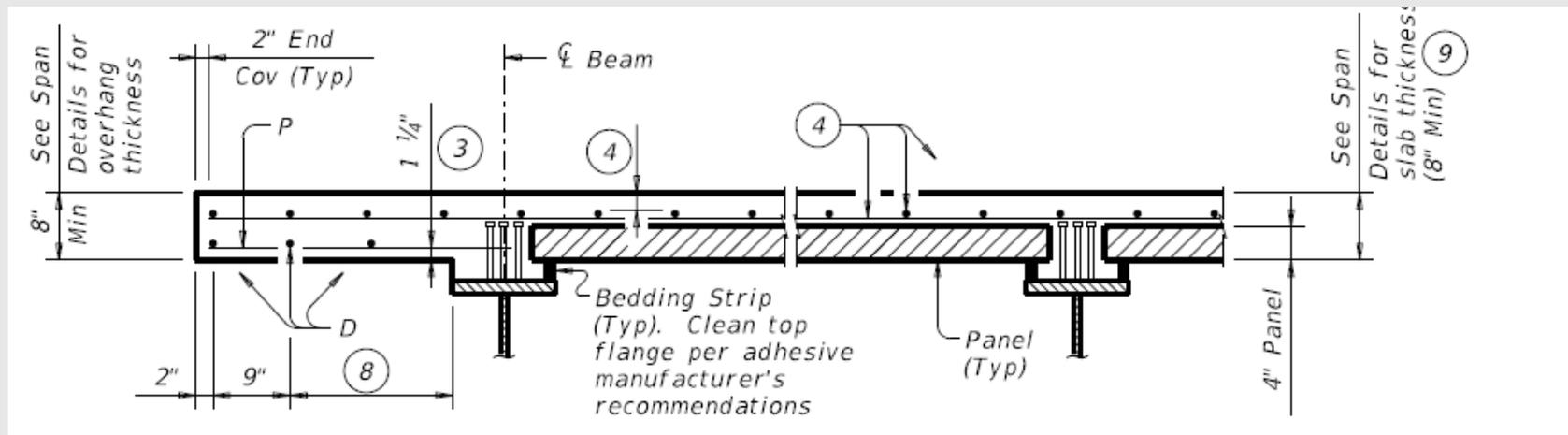
Draft 2018 Revisions - 2.1.6 Girder Spacing

- Current TxDOT practice does not allow Precast Concrete Panels on curved girders.
- Under discussion to allow precast concrete panels in curved girders
- TxDOT Research Project 0-6816: Partial Depth Precast Concrete Deck Panels on Curved Bridges



Draft 2018 Revisions - 2.2.1 Flange Width

- Currently recommends minimum flange width of 15"
- Add explanation that this is to permit precast concrete deck panel placement. Currently for straight girders only.
- Designer is still responsible for checking if PCP's will fit.



Draft 2018 Revisions - 2.2.2.6 Curved Flanges

- Currently Encourages designers to permit heat curving
- Adding reminder to check AASHTO Bridge Construction Specification 11.4.12.2.2 for limitations of heat curving based on flange thickness, width, and radius



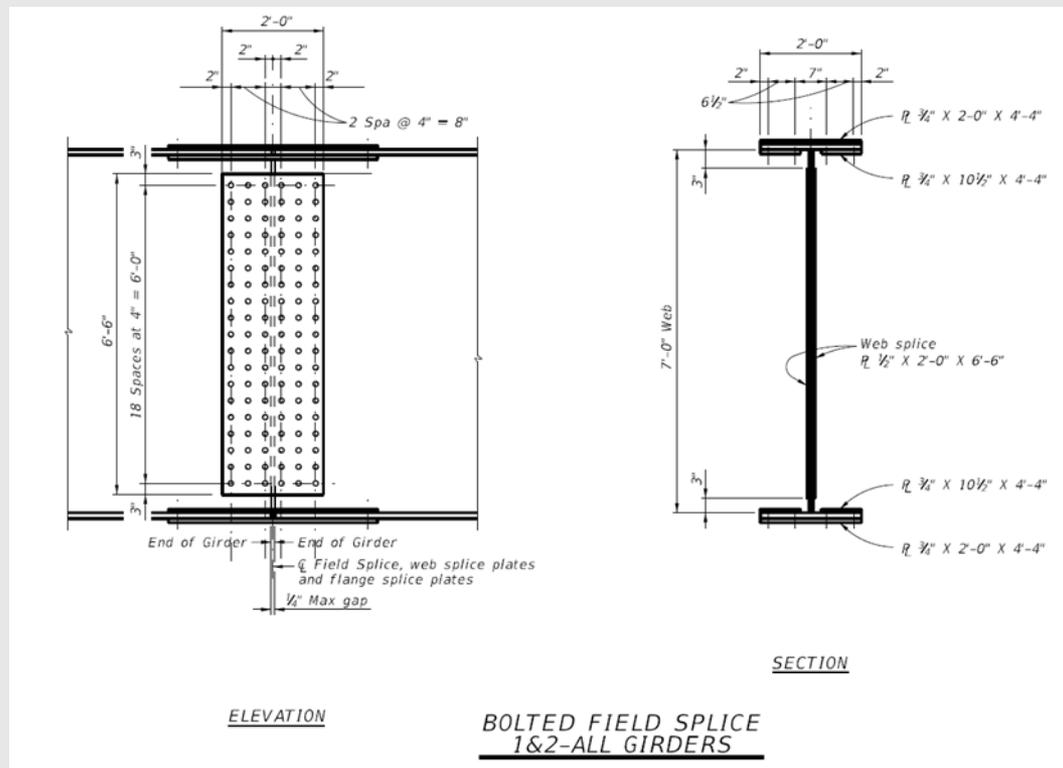
Draft 2018 Revisions - 2.2.4.1 Dapped Webs

- Suggest dapping if difference in approach span depth and steel girder depth is $>1.5'$ for aesthetic reason (Will remain in document).
- Adding language to consider the extra fabrication cost of dapping and look at other alternatives to prevent the need for a dap.
- In below case, would the earwall have mostly obscured tall bearing seat buildups if the steel plate girder wasn't dapped?



Draft 2018 Revisions - 2.2.10 Field Splices

- Currently Preferences state to detail field splices as welded and provide bolted splices as optional.
- Change to be consistent with new version of TxDOT Bridge Design Manual (released July 2018).
- Use bolted field splices as the primary method and include the weight of the splice plates in the steel weight for payment.



Draft 2018 Revisions - 2.4.1 Flanges (For Tub Girder Sections)

- Currently states that bottom tension flanges and tension portion of web of two girder spans are classified as Fracture Critical.
- New language will allow design for system redundancy per FHWA June 2014 Memo Clarification for Requirements for Fracture Critical Members. Currently would require case by case acceptance by TxDOT Bridge Division.



Draft 2018 Revisions - 2.4.2. Webs (For Tub Girder Sections)

- Currently refers to same web recommendations as for plate girders.
- In some cases dapped and severely skewed end tub girders have to be re-designed per fabricator request.
- Add language to not dap tub girders with severely skewed ends? Or eliminate completely?



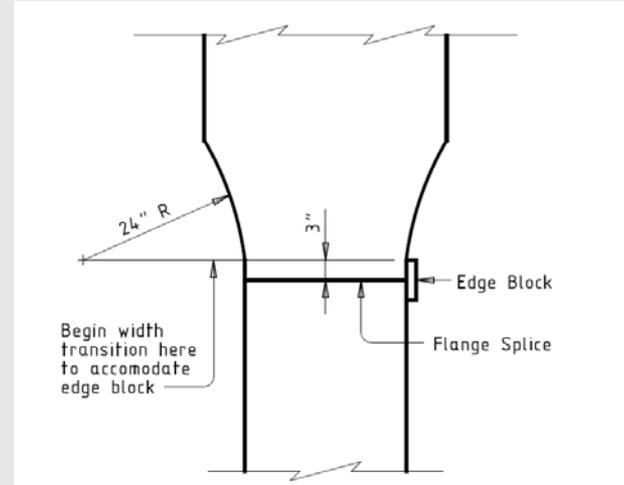
Draft 2018 Revisions - 2.7 Bolts

- Update language for bolt spec (F3125).
- Add recommendation that for bridges with unusual geometry and curved bridges, erection bolts should be checked.
- Update slip coefficient for Class A surface condition to be consistent with AASHTO LRFD 8th Edition (Change from 0.33 to 0.30).
- Discussing whether to allow A490 bolts for erection bolts only, however cannot have A490 galvanized bolts for painted structures.

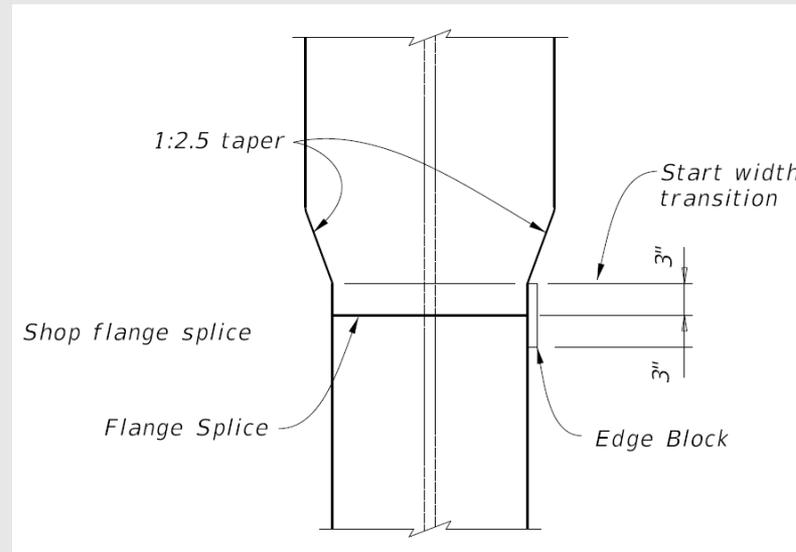


Draft 2018 Revisions - 3.2.1 Use of Edge Blocks for Radiographs

- Currently shows a radial width transition at flange width transition



- Update to show tapered detail from TxDOT SGMD Standard



Draft 2018 Revisions - Appendix A

- Revised by Johnny Miller, TxDOT Materials and Test Division
- Retitled from “Frequently asked Questions about Paint” to “TxDOT Painting Practices”
- More information on TxDOT Specifications and Department Material Specifications dealing with paint and finishes for steel.
- Includes map of where to use which paint system (for both existing and new steel bridges).

Draft 2018 Revisions - Appendix B

- Revised by Johnny Miller, TxDOT CST
- Retitled from “Paint Durability Questionnaire” to “Hazardous Materials FAQ’s”.
- New version outlines which projects require inspections for asbestos-containing materials (ACM).
- Outlines types of project that require inspection/testing for lead containing paint and ACM.
- Standard operation procedures for getting lead and asbestos in bridge coatings inspected and abated.

Discussion

- Paint issues on the insides of tubs and box girders?
- Web Dapping of I-girders. Alternatives and fabrication cost?
- Limiting dapping of skewed end tub girders? Limits?
- Allowing A490 bolts for erection bolts only?
- Other Items in the Preferred Practices? Concerns?

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