

DATE: January 29, 2021  
TO: Bridge Manual Users  
FROM: DTSD – Bureau of Structures  
SUBJECT: **January 2021 Bridge Manual Update**

The Bridge Manual revisions to text and standards are now complete and posted online for this six-month cycle. Please see the attached sheets for a list, with brief explanation, of the Text and Standards that were revised.

Of particular interest in this edition:

- **Chapter 24:** Providing guidance on System Redundant Members (SRM) with regards to requirements for double steel tub girder design. A brief description of the general approach, screening criteria and design methodology is given.
- **Chapter 29:**
  - Updated recommendation for floor drain usage from “not recommended for structures less than 400 ft.” to “not recommended for structures less than 200 ft.”.
  - Reference the Facilities Development Manual for rainfall intensity (i), where values are stated for each county in Wisconsin. This replaces the average rainfall intensity (i) of 6”/hr. that had been used throughout the state to calculate floor drain spacing. --- Referenced FDM Sect. 13-10, Attachment 5.4.
- **Chapter 36:** Updated guidance on the use of precast box culverts and precast aprons.
- **Chapters 40-42:** Provided guidance for optimizing deck sealing and thin-polymer overlays.
- **Standards 19.03 & 19.04:** Note that the 36” prestressed girder (older shape) is being discontinued. It will be moved to Chapter 40 in the future, and corresponding language in Chapter 19 will be updated.

Most other changes are fairly minor. Please use the example calculations with care (follow along in AASHTO). A vertical black bar in the left margin notes all text changes.

The user’s feedback regarding the Bridge Manual is important to us as that is where we get many ideas for corrections, clarification and new ideas for enhancement.

## January 2021 Bridge Manual Text Update Summary

<u>Chapter</u>	<u>Page Number(s)</u>	<u>Change</u>
6	34-36, 43	Updated Removing Structure and Debris Containment section. New bid items will be added to the 2022 Std. Spec. and STSPs will be retired. Items will be bid as "Each" rather than "Lump Sum".
	41	Updated piling bid items and removed timber pile reference
	42	Updated pay item limits for expansion devices
8	9, 15, 19	Mirror update (e.g. added a comma)
	12-14, 27	Removed Water Surface Profiles (WSPRO) modeling discussions
	17, 50, 54	Updated HEC-18 to 5th edition
	17	Added information on FHWA's Hydraulic Toolbox and added weblink
	22-23	Added NCHRP Project 24-20 methodology to assess abutment scour
	22-23	Removed Froelich and HIRE equations. See HEC-18 for equations.
	17,51,54	Updated HEC-20 reference to 4th edition
54	Updated HEC-23 reference to 3rd edition	
11	16	Removed duplicate reference to 11.3.1.6
	24	Updated CIP steel pile yield strength from 35 ksi to 45 ksi
	41-43	Added Note 11 for required driving resistance (R <sub>dyn</sub> ) values controlled by driving. Values are based on 70% of the specified yield strength of the steel shell to avoid overstressing the pile.
17	73	Updated guidance on the use of protective deck seals.
	76	Note that there is a STSP for deck panels, rather than contacting BOS for a SPV.
24	91-93	Revised steel tub girder policy regarding System Redundant Members (SRM's) based on recent Purdue study.
27	2	Clarified temperatures for different bearings for steel and prestressed girders
29	2	Changed structure length for when floor drains are not recommended from less than 400 ft to less than 200 ft
	3	Referenced the Facilities Development Manual for rainfall intensity (i), where values are stated for each County in Wisconsin. This replaces the average rainfall intensity (i) assumed to be used throughout the state to calculate the floor drain spacing. --- Referenced FDM (Sect. 13-10, Attachment 5.4)
	9	Used rainfall intensity (i) from FDM (Sect. 13-10, Attachment 5.4) in the Design Example

36	43-45	Updated guidance for the usage of precast concrete box sections and precast concrete apron elements.
39	9	Changed ASTM A595 from Grade 55 to Grade A (Fy = 55 ksi)
	9	Changed ASTM A575 to ASTM A572
	9	Removed duplicate ASTM references (2 sentences below table)
	20	Added lateral deflection design parameter (1.0 inch at Service I)
40	6-8,11,24	Updated the "Bridge Preservation Policy Guide (BPPG)" to "Chapter 42 - Bridge Preservation"
	13	Added guidance on TPO usage and deck sealing reference
	24-25	Added Section 40.5.5.1 Deck Sealing with sealing frequency table
	72	Added two WHRP references
41	19-20	Added "Reseal Deck" to treatment schedules
42	7,8,10	Updated deck sealing objective from every 4 years to 3 - 5 years
	7,8	Updated deck sealing target from 25% to 20% of eligible decks
	7,8	Updated deck sealing performance from 4-year to 5-year intervals
45	27	Corrected "LFR Live Load Factors" to "LFR Load Factors"
	64	Removed the emergency vehicle 2 condition from the 3rd bullet point

## **January 2021 Standard Details Update Summary**

### **Chapter 4**

- Std 4.01 ■ No revisions.
- Std 4.02 ■ No revisions.
- Std 4.03 ■ No revisions.
- Std 4.04 ■ No revisions.
- Std 4.05 ■ No revisions.

### **Chapter 7**

- Std 7.01 ■ No revisions.
- Std 7.02 ■ No revisions.
- Std 7.03 ■ No revisions.
- Std 7.04 ■ No revisions.
- Std 7.05 ■ No revisions.
- Std 7.06 ■ No revisions.
- Std 7.07 ■ No revisions.

### **Chapter 9**

- Std 9.01 ■ Added 1:1.5 backslope note to base aggregate dense limits at the sleeper slab
- Std 9.02 ■ No revisions.
- Std 9.03 ■ No revisions.

### **Chapter 11**

- Std 11.01 ■ No revisions.

### **Chapter 12**

- Std 12.01 ■ No revisions.
- Std 12.02 ■ No revisions.
- Std 12.03 ■ No revisions.
- Std 12.04 ■ No revisions.
- Std 12.07 ■ No revisions.
- Std 12.08 ■ No revisions.
- Std 12.09 ■ No revisions.
- Std 12.10 ■ Added T804 bar bend detail and updated Bill Of Bars
- Std 12.11 ■ No revisions.
- Std 12.12 ■ No revisions.
- Std 12.13 ■ No revisions.

### **Chapter 13**

- Std 13.01 ■ No revisions.
- Std 13.02 ■ No revisions.
- Std 13.03 ■ No revisions.
- Std 13.04 ■ No revisions.
- Std 13.05 ■ No revisions.
- Std 13.06 ■ No revisions.
- Std 13.07 ■ No revisions.
- Std 13.08 ■ No revisions.
- Std 13.09 ■ No revisions.
- Std 13.10 ■ Changed adhesive anchors to No. 6 bars from 3/4-inch.  
■ Changed foundation material reference in elevation view from std. 30.11 to 13.11
- Std 13.11 ■ Changed adhesive anchors to No. 6 bars from 3/4-inch.

#### **Chapter 14**

- Std 14.02 ■ No revisions.
- Std 14.03 ■ No revisions.
- Std 14.04 ■ No revisions.
- Std 14.05 ■ No revisions.
- Std 14.11 ■ No revisions.
- Std 14.12 ■ No revisions.
- Std 14.13 ■ No revisions.

#### **Chapter 15**

- Std 15.01 ■ No revisions.
- Std 15.02 ■ No revisions.
- Std 15.03 ■ No revisions.

#### **Chapter 17**

- Std 17.01 ■ Changed adhesive anchors to No. 4 bars from 1/2-inch.
- Std 17.02 ■ Added "Cross Section Thru Edge of Deck" detail for parapets
  - Updated "Designer Notes" and "Notes" for concrete sealing
  - Added designer note "Refer to std. 40.01 for resealing concrete surfaces"
- Std 17.03 ■ No revisions.

#### **Chapter 18**

- Std 18.01 ■ No revisions.
- Std 18.02 ■ No revisions.

#### **Chapter 19**

- Std 19.01 ■ No revisions.
- Std 19.02 ■ No revisions.
- Std 19.03 ■ Note that the 36" girder (older shape) is being discontinued
- Std 19.04 ■ Note that the 36" girder (older shape) is being discontinued
- Std 19.11 ■ No revisions.
- Std 19.12 ■ No revisions.
- Std 19.13 ■ No revisions.
- Std 19.14 ■ No revisions.
- Std 19.15 ■ No revisions.
- Std 19.16 ■ No revisions.
- Std 19.17 ■ No revisions.
- Std 19.18 ■ No revisions.
- Std 19.19 ■ No revisions.
- Std 19.20 ■ No revisions.
- Std 19.31 ■ No revisions.
- Std 19.32 ■ No revisions.
- Std 19.33 ■ No revisions.
- Std 19.34 ■ No revisions.
- Std 19.35 ■ No revisions.
- Std 19.36 ■ No revisions.
- Std 19.37 ■ No revisions.
- Std 19.38 ■ No revisions.
- Std 19.50 ■ No revisions.
- Std 19.51 ■ No revisions.
- Std 19.52 ■ No revisions.

- Std 19.53 ■ No revisions.
- Std 19.54 ■ No revisions.
- Std 19.55 ■ No revisions.
- Std 19.56 ■ No revisions.

### **Chapter 23**

- Std 23.01 ■ No revisions.
- Std 23.02 ■ No revisions.
- Std 23.03 ■ No revisions.

### **Chapter 24**

- Std 24.02 ■ No revisions.
- Std 24.03 ■ No revisions.
- Std 24.04 ■ No revisions.
- Std 24.06 ■ No revisions.
- Std 24.08 ■ No revisions.
- Std 24.09 ■ No revisions.
- Std 24.10 ■ No revisions.
- Std 24.11 ■ No revisions.
- Std 24.12 ■ No revisions.

### **Chapter 27**

- Std 27.02 ■ Updated spec reference for anchor bolts and pintles
- Std 27.05 ■ No revisions.
- Std 27.06 ■ Updated spec reference for anchor bolts
- Std 27.07 ■ No revisions.
- Std 27.08 ■ Updated spec reference for anchor bolts and pintles
- Std 27.09 ■ Updated spec reference for anchor bolts and pintles
- Std 27.10 ■ No revisions.

### **Chapter 28**

- Std 28.01 ■ No revisions.
- Std 28.02 ■ No revisions.
- Std 28.03 ■ Changed adhesive anchors to No. 5 bars from 5/8-inch.
- Std 28.04 ■ No revisions.
- Std 28.05 ■ No revisions.
- Std 28.06 ■ No revisions.
- Std 28.07 ■ No revisions.
- Std 28.08 ■ No revisions.

### **Chapter 29**

- Std 29.01 ■ No revisions.
- Std 29.02 ■ No revisions.
- Std 29.03 ■ No revisions.

### **Chapter 30**

- Std 30.02 ■ No revisions.
- Std 30.04 ■ No revisions.
- Std 30.05 ■ No revisions.
- Std 30.07 ■ Updated "Plan of Parapet" to clarify parapet and wing faces
- Std 30.08 ■ No revisions.
- Std 30.09 ■ No revisions.

- Std 30.10 ■ No revisions.
- Std 30.11 ■ No revisions.
- Std 30.14 ■ No revisions.
- Std 30.15 ■ No revisions.
- Std 30.16 ■ Clarified Legend Note #11 to avoid confusion as to which elements had slotted holes.
  - Changed Legend Note #2 to specify oversized holes instead of slotted holes
  - Changed Legend Note #6 to specify min. dimension for washer size
  - Changed rail opening at abutments for field erection to a range of (1/4" to 3/4") and also applied this change to field erection joints
  - Changed bolt holes in Section A-A from slotted holes to round holes
  - Changed note in Field Erection Joint Detail to require drain holes at both ends of rail sections
  - Changed note below Anchor Bolt detail to allow tack welding to be used in the field for any anchor assembly if req'd. for constructability
- Std 30.17 ■ No revisions.
- Std 30.18 ■ No revisions.
- Std 30.19 ■ No revisions.
- Std 30.20 ■ No revisions.
- Std 30.21 ■ No revisions.
- Std 30.22 ■ No revisions.
- Std 30.24 ■ No revisions.
- Std 30.25 ■ No revisions.
- Std 30.26 ■ No revisions.
- Std 30.27 ■ No revisions.
- Std 30.28 ■ Changed orientation of Bolt #13 used at End Post for NY4 Railing
- Std 30.29 ■ No revisions.
- Std 30.30 ■ No revisions.
- Std 30.31 ■ No revisions.
- Std 30.32 ■ No revisions.
- Std 30.33 ■ No revisions.
- Std 30.34 ■ No revisions.
- Std 30.35 ■ No revisions.
- Std 30.36 ■ No revisions.
- Std 30.37 ■ No revisions.

### **Chapter 36**

- Std 36.01 ■ Added a Note and Designer Notes to reference Std. 36.02
- Std 36.02 ■ Updated Notes and Designer Notes clarifying precast culvert usage.
- Std 36.03 ■ No revisions.
- Std 36.04 ■ No revisions.
- Std 36.05 ■ Updated Designer Notes clarifying precast culvert usage.
  - Added Material Properties for precast box
  - Added minimum long. reinforcement area per ASTM C1577
  - Removed As6 rein. references (long. distribution steel outside face top slab) from standard. This was discontinued in ASTM C1577-14a.
- Std 36.06 ■ Added Joint Detail for precast wing and precast box joint.
  - Added Designer Note for "Box Culvert Apron Data" table
- Std 36.07 ■ No revisions.
- Std 36.08 ■ No revisions.
- Std 36.10 ■ No revisions.
- Std 36.11 ■ No revisions.

- Std 36.12 ■ No revisions.
- Std 36.13 ■ No revisions.
- Std 36.14 ■ No revisions.
- Std 36.15 ■ No revisions.
- Std 36.16 ■ No revisions.

### **Chapter 37**

- Std 37.01 ■ Added "Curb Detail" requiring a waterstop when construction joints are used.
- Std 37.02 ■ No revisions.

### **Chapter 38**

- Std 38.01 ■ No revisions.

### **Chapter 39**

- Std 39.02 ■ No revisions.
- Std 39.03 ■ No revisions.
- Std 39.09 ■ No revisions.
- Std 39.10 ■ No revisions.
- Std 39.11 ■ No revisions.
- Std 39.12 ■ No revisions.
- Std 39.13 ■ No revisions.

### **Chapter 40**

- Std 40.01 ■ Added two additional options (No. X Bar) for adhesive anchor plan notes.
  - Added bid item: "Protective Surface Treatment Reseal"
  - Added bid item: "Pigmented Surface Sealer Reseal"
  - Added "Notes" for concrete seal bid items
  - Added Designer Note "Refer to Std. 17.02 for typical sealing locations"
  - Removed "Cleaning Parapets" bid item. Surface preparation is included in the "Reseal" bid items.
- Std 40.02 ■ Updated cathodic protection Notes and Designer Notes for payment and usage.
- Std 40.03 ■ No revisions.
- Std 40.04 ■ No revisions.
- Std 40.05 ■ No revisions.
- Std 40.06 ■ No revisions.
- Std 40.07 ■ No revisions.
- Std 40.08 ■ No revisions.
- Std 40.09 ■ No revisions.
- Std 40.10 ■ No revisions.
- Std 40.11 ■ No revisions.
- Std 40.12 ■ No revisions.
- Std 40.13 ■ No revisions.
- Std 40.14 ■ No revisions.
- Std 40.15 ■ No revisions.
- Std 40.16 ■ No revisions.
- Std 40.17 ■ No revisions.
- Std 40.18 ■ No revisions.
- Std 40.19 ■ No revisions.
- Std 40.20 ■ No revisions.
- Std 40.21 ■ No revisions.
- Std 40.22 ■ No revisions.
- Std 40.23 ■ No revisions.

- Std 40.24 ■ No revisions.
- Std 40.25 ■ No revisions.
- Std 40.26 ■ No revisions.
- Std 40.27 ■ No revisions.
- Std 40.28 ■ No revisions.
- Std 40.31 ■ Added guidance on overlay limits for existing open steel railings.
- Std 40.32 ■ No revisions.
- Std 40.33 ■ Added Designer Note on the removal of previously overlaid decks.
- Std 40.34 ■ No revisions.
- Std 40.40 ■ No revisions.
- Std 40.41 ■ No revisions.