

DATE: July 25, 2024  
TO: Bridge Manual Users  
FROM: DTSD – Bureau of Structures  
SUBJECT: **July 2024 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 5** – Added 2023 bridge cost data
- **Chapter 36** – Several updates on precast box culvert usage and box culvert details.
- **Chapter 45** – Revised load rating guidance for non-bridge-length culverts (assigned a C-number).
- **New Standard 14.06 – MSE Wall Details:** Details for MSE wall wrapped abutment and MSE wall slip joint.
- **New Standard 14.14 – Gravity Wall:** Gravity wall typical section, general notes, design data, and designer notes.

Additional Notes:

- Reminder - Civil 3D insert sheets are maintained with the most current information. MicroStation insert sheets have been achieved with this update.

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.

## July 2024 Bridge Manual Text Update Summary

<u>Chapter</u>	<u>Page Number(s)</u>	<u>Change</u>
4	5,9,11,14	Changed Context Sensitive Solutions (CSS) to Community Sensitive Design (CSD).
	9,10	Changed "Participating Items" to "Participating Amenities"
5	6-11	Removed 2018 cost data. Added 2023 cost data.
6	15	Added guidance for including "Scope of Work" list for rehab projects
	28	Minor: Inserted paragraph break "For slab bridges:"
	46,48	Clarified how to respond to preliminary plan comments. Responses shall either agree with the comment or disagree with an explanation why the comment will not be incorporated in the final design and plans
	48,50	Removed "Load Rating Input File" from submittal requirements
11	6	Removed "to determine when combined seals and footings are acceptable" from section 13.11.5 reference. Section 13.11.5 (or elsewhere) does not provide guidance.
	15,18	Fixed cross-reference links
	49	Updated Geotechnical Engineering Unit contact
12	37	Added Section 12.12 MSE Walls at Abutments
14	8,22,70,74,122	Updated contacts for Geotechnical Engineering Unit and BOS.
	131	Removed duplicate reference (FHWA-NHI-10-024)
	131	Added reference - Design and Construction of Mechanically Stabilized Earth (MSE) Walls (FHWA-NHI-24-002)
18	35	Removed "LRFD Input File" from list of items that do not need to be submitted as part of the final e-submittal to BOS for review.
28	3	Clarified criteria is provided in the following sections for placement of expansion devices.
30	8,14	Changed Context Sensitive Solutions (CSS) to Community Sensitive Design (CSD).
	11	Removed "For protective screening, the total height of parapet and fence need not exceed 8'-0"."
	11	Added "Most snooper trucks have a 10'-0" to 11'-0" vertical allowance to clear fences."
	12	Added guidance for protective screening height.
	17	Added "For highly vulnerable areas, 1" by 1" mesh size should be considered. "
	18	Added "The designer should coordinate fence height, fence shape (vertical or bent), and mesh size with the Region and all other applicable agencies."

	18	Added "See 37.3 Protective Screening for additional guidance on pedestrian overpasses."
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36	5	Added "Epoxy coated bars shall be used in the top slab of culverts with fills less than 2-ft supporting traffic. A minimum of 6-inches of backfill should separate the top slab of culverts and the bottom of the pavement."
	40	Updated backfill requirements
	43	Updated culvert Name Plate location to be similar to bridge guidance.
	45	Defined standard precast box culvert designs per ASTM C1577 (3ft x 2 ft thru 12ft x 12ft).
	45	Updated policy - Precast concrete box sections not allowed when depth of cover less than 2ft while supporting traffic load. CIP concrete box sections required.
	45	Updated policy - CIP concrete box sections are required for pedestrian underpasses.

40	16	Corrected spelling of "another"
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41	10	Defined Structures Certification Tool (SCT)
	10	Updated Section 41.3.2.1 - Optional Work Concept Review
	10,12	Replaced "Regional" with "BOS inspection and maintenance"
	10	Clarified final scope and timing decisions for structures work will be made by BOS asset management engineers.
	11	Clarified WisDOT Policy Item: replaced "structure" with "state-owned B-Structure"
	12	Updated contact for secondary structures work concepts
	13	Clarified BOSCD is no longer under development.
	14-15	Rewrite of Section 41.4 - Structures Programming Process (Local System)
	16	Added BOS Inspection and Maintenance Section roles and responsibilities
17	Removed Regional Structures Maintenance Units	

42	2	Removed average age of bridges in 2019
	6	Updated Condition Based Strategies
	7	Updated Table 42.4-1 Objectives and Performance Measures. Changed "Target/Goals" to Inventory Performance Measures. Added "Component/Element Reference" column.
	8	Updated Section 42.4.4 - Preservation Program Benefits
	9	Changed "PM" to "Preventative Maintenance"
	14	Updated Section 42.5.2 - Identification of Preservation Needs
	19,21	Added reference #4
	19	Updated Table 42.7-1 (NBI General Condition Ratings & Common Actions)

43		Updated metadata (no text update)
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45	24	Corrected spelling of "threshold"
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	49	Updated non-bridge-length culvert (assigned a C-number) load rating methods
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## **July 2024 Standard Details Update Summary**

### **Chapter 4**

- Std 4.01 ■ Changed "non-participating item (CSS)" to "non-participating amenity (CSD)"
- Std 4.02 ■ Changed "CSS funding" to "CSD funding"
- Std 4.03 ■ Changed "CSS funding" to "CSD funding"
- 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 ■ Corrected symbol locations for Designer Notes
- Std 9.02 ■ Replaced "#1 Concrete Coarse Aggregate" with "Coarse Agg. AASHTO No. 67"
- Replaced "#2 Concrete Coarse Aggregate" with "Coarse Agg. AASHTO No.4"
- Updated "Typical Section Thru Box Culvert" to better address shallow fill applications. Typical "Backfill Structure Type B" cover, measured between the top of box culvert and the bottom of pavement, should be 1'-0". A minimum cover of 6-inches may be used for shallow fill applications.
- Revised precast bedding note when precast elements are allowed.
- 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 ■ No revisions.
- 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 ■ No revisions.
- Std 13.11 ■ No revisions.

#### **Chapter 14**

- Std 14.02 ■ No revisions.
- Std 14.03 ■ No revisions.
- Std 14.04 ■ Replaced "#2 Concrete Coarse Aggregate" with "Coarse Agg. AASHTO No.4"
- Std 14.05 ■ Added Designer Note - See Std. 14.06 for "Alternate MSE wall at abutment with wrapped MSE wall" details.
- NEW** Std 14.06 ■ New MSE Wall Details - MSE Wall at abutment with wrapped MSE wall and C.I.P. concrete coping at MSE wall slip joint.
- Std 14.11 ■ Replaced "#1 Concrete Coarse Aggregate" with "Coarse Agg. AASHTO No. 67"  
■ Defined the "Reinforcement Length"
- Std 14.12 ■ No revisions.
- Std 14.13 ■ No revisions.
- NEW** Std 14.14 ■ Gravity Wall

#### **Chapter 15**

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

#### **Chapter 17**

- Std 17.01 ■ Removed horizontal diaphragm bars to match Std. 19.34 and Std. 19.35 details
- Std 17.02 ■ No revisions.
- Std 17.03 ■ No revisions.

#### **Chapter 18**

- Std 18.01 ■ No revisions.
- Std 18.02 ■ No revisions.
- Std 18.03 ■ No revisions.

#### **Chapter 19**

- Std 19.01 ■ No revisions.
- Std 19.02 ■ No revisions.
- Std 19.03 ■ No revisions.
- Std 19.04 ■ No revisions.
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- 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 ■ Corrected 16" Plate "C"/330 kip/Plate C - Dim 'Y' from 2 15/16" to 1 15/16"
- Std 27.05 ■ No revisions.
- Std 27.06 ■ No revisions.
- Std 27.07 ■ No revisions.
- Std 27.08 ■ No revisions.
- Std 27.09 ■ No revisions.
- Std 27.10 ■ No revisions.

### **Chapter 28**

- Std 28.01 ■ No revisions.
- Std 28.02 ■ No revisions.
- Std 28.03 ■ No revisions.
- 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 ■ No revisions.
- Std 30.08 ■ No revisions.
- Std 30.09 ■ No revisions.
- Std 30.10 ■ Corrected Adhesive Anchor reference from Std. Spec. 503.3.14 to 502.3.14.
- Std 30.11 ■ Updated Protective Screening reference to Section 30.3 (14)
- Std 30.14 ■ No revisions.
- Std 30.15 ■ Updated Protective Screening reference to Section 30.3 (14)
- Std 30.16 ■ No revisions.
- 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.
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- 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 Name Plate location to the Plan view.
  - Added Designer Note for Name Plate location
  - Moved undercut Designer Note to "Section C1". "(Typical undercut shown. See Standard 9.02 for alternatives and additional notes.)"
- Std 36.02 ■ Removed Name Plate location Designer Note
  - Updated Designer Note - Epoxy coated bars required in the top slab when fill is less than 2-ft while supporting traffic load. Past practice was to use epoxy bars when top slab was the riding surface (no fill over culvert).
  - Corrected Designer Note reference to "Standard 9.02"
- Std 36.03 ■ Corrected arrow pointing to #5 bars in "Vertical Construction Joint" detail.
  - Corrected arrow pointing to keyed joint for "Vertical Construction Joint" detail.
  - Updated note stating #5 bars required for keyed and saw cut joints in bot. slabs
- Std 36.04 ■ No revisions.
- Std 36.05 ■ Provided 3/4-inch maximum joint opening between box sections
  - Changed joint seal requirement from AASHTO M198 Type B on 3-sides to ASTM C990 on all sides.



- Added Designer Note regarding joint ties, which are only required between the last two barrel sections. The designer shall determine if additional joint ties are warranted.
- Std 36.06 ■ No revisions.
- Std 36.07 ■ No revisions.
- Std 36.08 ■ No revisions.
- Std 36.10 ■ No revisions.
- Std 36.11 ■ No revisions.
- Std 36.12 ■ Replaced "#2 Concrete Coarse Aggregate" with "Coarse Agg. AASHTO No.4"
- 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 ■ No revisions.
- Std 37.02 ■ No revisions.

### **Chapter 38**

- Std 38.01 ■ No revisions.

### **Chapter 39**

- Std 39.01 ■ No revisions.
- Std 39.02 ■ No revisions.
- Std 39.03 ■ No revisions.
- Std 39.04 ■ No revisions.
- Std 39.11 ■ No revisions.
- Std 39.12 ■ No revisions.
- Std 39.13 ■ No revisions.
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- Std 39.33 ■ No revisions.
- Std 39.34 ■ No revisions.
- Std 39.35 ■ No revisions.
- Std 39.36 ■ No revisions.
- Std 39.37 ■ No revisions.
- Std 39.38 ■ No revisions.

### **Chapter 40**

- Std 40.01 ■ No revisions.
- Std 40.02 ■ No revisions.
- Std 40.03 ■ No revisions.
- Std 40.04 ■ Added bid item 517.0901.S (Preparation and Coating of Top Flanges (Structure)) to Total Estimated Quantities

- Added Designer Note: "For joint repairs (and deck replacements) with steel girders, include bid item "Preparation and Coating of Top Flanges (Structure)."

- 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.
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- Std 40.40 ■ No revisions.
- Std 40.41 ■ No revisions.
- Std 40.42 ■ No revisions.