

DATE: January 26, 2023  
TO: Bridge Manual Users  
FROM: DTSD – Bureau of Structures  
SUBJECT: **January 2023 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 6** – The final Site Investigation Report should be included in the final plan submittal.
- **Chapter 39** – Updated several areas and clarified contractor designed structures includes designing the anchor rods and the sign structure. Numerous updates were made to Example 39E-1.
- **Chapter 40** – Added guidance for deck replacements with staged construction. Additionally, noted bearing replacement projects should provide girder reactions for informational purposes. See Standard Detail 40.10 for additional information.
- **LRFD Standardized Overhead Sign Structure Plans** – MicroStation insert sheets have been converted to Civil 3D files and are available on the BOS website. MicroStation insert sheets have not been updated since August 2021 and will be archived at a later date.

Additional Notes:

- New Approved Products Lists (APL) for bid items: “Sheet Membrane Waterproofing for Asphalt Overlays (516.0600.S) and “Sheet Membrane Waterproofing for Buried Structures” (516.0610.S). Bid items should be used with asphaltic overlays (when approved by BOS) and when protecting pedestrian underpasses, respectively. The standardized special provisions have been updated accordingly.

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 2023 Bridge Manual Text Update Summary

| <u>Chapter</u> | <u>Page</u><br><u>Number(s)</u> | <u>Change</u>  |
|----------------|---------------------------------|--|
| 2              | 3                               | Updated Bureau of Structures organization chart  |
|                | 15                              | Added text "only one structure number for the site."   |
| 6              | 45                              | Changed "Subsurface" to "Site"   |
|                | 47                              | Changed "Subsurface" to "Site"   |
|                | 47                              | Added bullet point 3: "Final Site Investigation Report"  |
|                | 48                              | Added Section 6.5.7 - Locally-Funded Projects  |
|                | 49                              | Changed "Subsurface Exploration" to "Site Investigation"   |
| 19             | 44                              | Clarified only spans greater than or equal to 153 ft, as noted in Table 19.3-2, require a lifting check at 1/10 pts.   |
| 19E-4          | 2                               | Added note that "NOTE: A lifting check at the 1/10th point is only required for long spans, as discussed in Table 19.3-2 notes. Since this example is not considered a long span, the following lifting check at the 1/10th point is not required and should be used for informational purposes only." |
|                | 2                               | Changed girder length from 146 feet to 147 feet to match example E19-1   |
| 39             | 4                               | Updated text and tables for the Butterfly structures   |
|                | 5,18                            | Updated language for contractor designed structures. Contractor is responsible for designing the anchor rods and superstructure.   |
|                | 8                               | Changed Table 39.1-4 area from 240 Sq. Ft. to 200 Sq. Ft.  |
|                | 8                               | Changed Table 39.1-4 Butterfly from "Non-Standard" to "Standard"   |
|                | 5,8,12,15                       | Minor - Grammar and punctuation  |
|                | 14                              | Added "and median Butterfly"   |
|                | 17                              | Removed "Butterfly" type   |
|                | 19                              | Replaced "full span and cantilever" with "butterfly structures and"  |
| 39E-1          | 2,11                            | Updated image  |
|                | 3                               | Corrected barrier dimensions   |
|                | 5                               | Corrected moment equations to account for DL at shaft, and 2 shafts. Updated analysis case II description to match calculations.   |
|                | 5                               | Corrected $V_{y\_DC}$ to account for weight of the cap.  |
|                | 6                               | Corrected $\beta$ equation. Corrected #7 bar diameter. Corrected text in unity check.  |
|                | 7                               | Corrected text in unity check.   |
|                | 11                              | Corrected $M_x$ and $M_y$ equations for sign convention errors. Updated Case II description to clarify design requirements at top of shaft.  |
|                | 11                              | Increase to #9 bars  |
|                | 12                              | Updated $d_e$ equation   |
|                | 13                              | Corrected axial capacity check equations, $P_r$ , equations to show why LRFD equation for moment was used. Corrected $M_u$ equations for sign convention for moment check of top of shaft.   |

|    |           |   |
|----|-----------|---|
|    | 13,14     | Updated Interface Shear Calc at cap to barrier interface to account for filler between barrier and cap.                                       |
|    | 14-16     | Added interface shear check for top of shaft due to crash load  |
| 40 | 15,16, 21 | Updated PPC overlay eligibility requirements (i.e. lowered ADT)   |
|    | 30        | Added guidance for deck replacements with staged construction.  |
|    | 36        | Noted plans should provide girder reactions for bearing replacements  |
| 45 | 43        | Added guidance for single-lane distribution when using LFR for concrete slabs. Example 45E-5 was updated accordingly in the July 2022 update. |

## **January 2023 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 ■ No revisions.
- 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 ■ 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 ■ End View - Added 1'-6" min. dimension above 2'-0" pile embedment dimension  
■ Section A-A - Added note for #7 bars to be extended 1'-2" into cap
- 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 ■ 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 ■ No revisions.
- Std 17.02 ■ No revisions.
- Std 17.03 ■ No revisions.

#### **Chapter 18**

- Std 18.01 ■ Updated notes for staged and non-staged falsework removal
- Std 18.02 ■ Updated notes for staged and non-staged falsework removal
- Std 18.03 ■ Updated notes for staged and non-staged falsework removal

#### **Chapter 19**

- Std 19.01 ■ No revisions.
- Std 19.02 ■ No revisions.
- Std 19.03 ■ No revisions.
- Std 19.04 ■ No revisions.
- 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 ■ No revisions.
- Std 27.05 ■ No revisions.
- Std 27.06 ■ Revised temporary hold down anchor to be fully threaded
- 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 ■ Updated bid item to "Expansion Device"
- Std 28.02 ■ No revisions.
- Std 28.03 ■ Updated bid item to STSP "Expansion Device Modular"
- 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 ■ Updated chain link fence mounted on deck note "anchorage to be designed"

- Std 30.11 ■ No revisions.
- Std 30.14 ■ No revisions.
- Std 30.15 ■ No revisions.
- 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.
- 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 ■ No revisions.
- 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 ■ No revisions.
- Std 36.02 ■ No revisions.
- Std 36.03 ■ No revisions.
- Std 36.04 ■ No revisions.
- Std 36.05 ■ No revisions.
- Std 36.06 ■ No revisions.
- Std 36.07 ■ No revisions.
- Std 36.08 ■ Updated Standard to meet MASH 2016 crash-tested requirements
- 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 ■ No revisions.
- 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 ■ No revisions.
- Std 40.02 ■ No revisions.
- Std 40.03 ■ No revisions.
- Std 40.04 ■ Updated bid item to "Expansion Device"
- 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 ■ Added bridge jacking bid items to the Designer Notes
- 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.
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- Std 40.32 ■ No revisions.
- Std 40.33 ■ No revisions.
- Std 40.34 ■ No revisions.
- Std 40.40 ■ No revisions.
- Std 40.41 ■ No revisions.