

DATE: January 31, 2018
TO: Bridge Manual Users
FROM: DTSD – Bureau of Structures
SUBJECT: **January 2018 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. Most corresponding plan insert sheets have also been updated and posted online.

Updates based on the recent release of the AASHTO LRFD Bridge Design Specifications – 8th Edition will be included in the July 2018 edition of the Bridge Manual. All steel design changes based on the AASHTO 8th Edition will be incorporated by BOS. If designers wish to incorporate these changes prior to July, that is acceptable.

Of particular interest in this edition:

- **Chapter 7 & 13 and Standards 7.05, 7.06, & 7.07:** Updated policy for Precast Piers usage. Pier shall be determined by providing the most efficient CIP concrete pier design, unless approved otherwise. When the CIP design can accommodate a precast option, include a noted allowance.
- **Chapter 12:** Updated policy for structural approach slabs: Required for all IH and USH bridges and recommended for all bridge with AADT greater than 3500.
- **Chapter 12 and Standards 12.02 & 12.04:** Wing length to extend 2'-0" past what is required for grading. This provides a better bench for beam guard posts and should help with problematic erosion issues. Round wing lengths in 2 feet increments.
- **Standards 12.05 & 12.06:** Archived in Chapter 40 as new standards 40.40 & 40.41 Abutments A4 are no longer allowed for use.
- **Standard 27.07:** A better explanation is provided for when tapered plates for elastomeric bearings are required and how to calculate the value.
- **Various Chapter 30 standards:** Removed 5" chamfer at end of wing for the bottom 6". This was done to facilitate matching into a curb when one is present, preventing maintenance issues.

- **Various Chapter 40 standards:** Updated bid items and notes regarding overlays
- **New Standard 9.02 – Structure Backfill Limits and Notes 2:** Structure Backfill Limits and Notes was divided into two standards to provide more clarification. It now shows a 1½:1 excavation slope.
- **New Standard 9.03 – Wing Fill Sections at Wing Tips:** Views are shown for how the fill should be placed at a variety of wing tips. This new standard works with the changes to Standards 12.02 and 12.04 (noted above) to reduce problematic erosion issues.
- **New Standard 17.03 – Edge of Deck Flashing:** Details for stainless steel flashing attachment to the edge of existing or new decks with open rails. Use of this detail is at the discretion of the Region’s Bridge Maintenance Engineer.

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 2018 Bridge Manual Text Update Summary

<u>Chapter</u>	<u>Page</u> <u>Number(s)</u>	<u>Change</u>
6	15,27,29	Added labeling guidance for new and rehab projects.
	42	Added HMA and PMA overlay guidance for estimating quantities.
7	8	Updated Policy Item for precast pier usage. Pier configurations shall be determined by providing the most efficient CIP concrete pier design, unless approved otherwise. When the CIP concrete design can accommodate a precast option, include a noted allowance.
9	4	Removed A4 abutment reference. Clarified epoxy coated bar usage.
	6, 20	Added figure for typical development lengths for standard hooks in tension
	6-8, 20-23	Re-numbered figures
	27	Updated Policy Item for the implementation of revised tension development and lap lengths. Changed implementation date from July of 2018 to January of 2019.
11	34	Removed A4 abutment reference.
12	6	Removed A4 abutment references and updated figure.
	11-13	Updated wing length requirements for wings parallel to roadway. Finished grade to be level for the last 2 feet for erosion control protection. Round wing lengths in 2 feet increments.
	20	Re-inserted link for Figure 12.7-1
	20	Removed A4 Abutment from Figure 12.7-1
	36	Updated Policy Item for structural approach slabs: Required for all IH and USH bridges and recommended for all bridges with AADT greater than 3500.
	37	Removed discussion on structural approach slab standard from policy item. Removed A4 abutment reference.
13	3	Updated Policy Item for precast piers usage. See 7.1.4.1.2 for policy guidance.
14	49	Removed duplicate "Erosion"
	72	Updated Figure 14.6-1. Defined embedment depth reference, added failure surface for compound stability, and added reinforced soil limits.
15	2	Updated slope paving types and added that selected crushed materials is preferred.
17	5	Added a revised wind speed to the Policy Item box for during a deck pour.
	49	Added note to Fig 17.5-1 to miss shear connectors with long. #4 bars

19E -1	13-14	Updated estimated prestress losses calculations and discussion.
	14,16, 29	Replaced "at 50 years" with "at service" or "after losses"
19E - 3	12-13	Replaced "at 50 years" with "at service" or "after losses"
	14	Updated estimated prestress losses calculations and discussion.
24	21	Reference revised Policy Item box in Chapter 17 regarding wind speed during a deck pour.
30	2	Clarify MASH requirements. This was sent as a Design Memo on 9/14/17.
36	37	Clarified required steel for wing heights over 7 feet. Optimal steel should be provided in each section.
40	5	Added section 40.2.4 - Funding Eligibility and Asset Management
	6	Updated entire section 40.3. Removed bridge replacement criteria and referenced the WisDOT Bridge Preservation Policy Guide (BPPG) for future guidance.
	7	Updated section 40.4 introduction. Removed FHWA review requirement and outdated FHWA terminology.
	13,18	Removed 3R project reference
	13	Clarified minimum requirements for STN bridges "does not include local roadways over STN routes"
	14	Updated WisDOT Policy Item: removed "greater than HS18" condition
45	16	Noted what is done to records once a bridge is removed from service
45E -1	8, 10, 12	Clarified "ds" calculation
45E - 4	5,7	Corrected haunch dimension to 3.75"
	7	Corrected reference to E45-4.1-4
	9	Updated table number "Table E45-4.2-2"
45E -5	6	Clarified "ds" calculation

January 2018 Standard Details Update Summary

Chapter 4

- Std 4.01 ■ No revisions.
- Std 4.02 ■ No revisions.
- Std 4.03 ■ No revisions.
- Std 4.04 ■ Revised parapet width (missed in last update)
- Std 4.05 ■ No revisions.

Chapter 7

- Std 7.01 ■ No revisions.
- Std 7.02 ■ Added "Section Thru Abutment for Girders"
 - Updated reinforcement spacing below and behind abutments
- Std 7.03 ■ Revised boxed note for optional precast pier usage. See 7.1.4.1.2 for updates.
- Std 7.04 ■ No revisions.
- Std 7.05 ■ Removed boxed note for optional precast pier usage. See 7.1.4.1.2 for updates.
- Std 7.06 ■ Removed boxed note for optional precast pier usage. See 7.1.4.1.2 for updates.
- Std 7.07 ■ Removed boxed note for optional precast pier usage. See 7.1.4.1.2 for updates.

Chapter 9

- Std 9.01 ■ Updated backfill pay limits slope from 1:1 to 1.5:1
 - Added two abutment details for calculating backfill quantities
 - Updated backfill notes to clarify estimated quantities and payment
 - Updated geotextile note to clarify length requirement
 - Added two abutment details at MSE walls
 - Moved box culvert, retaining wall, and MSE retaining wall details to Std. 9.02
- NEW** Std 9.02 ■ Structure Backfill Limits and Notes 2
 - Updated backfill notes to clarify estimated quantities and payment
 - Updated box culvert backfill pay limits slope from vertical to 1.5:1
 - Updated retaining wall backfill pay limits to top of wall and 3'-0" beyond concrete
- NEW** Std 9.03 ■ Wing Fill Sections At Wing Tips

Chapter 11

- Std 11.01 ■ No revisions.

Chapter 12

- Std 12.01 ■ Clarified W and A1 bar embedment requirements
 - Added reinforcement at abutment ends
 - Better description in "DESIGNER NOTE" for sloped beam seat calculations
- Std 12.02 ■ Revised finished grade line to terminate 2'-0" short of wing tips
 - Updated standard for consistency.
 - Added reinforcement at abutment ends
- Std 12.03 ■ Clarified W and A3 bar embedment requirements
 - Reference to Stds 12.01 & 13.01 for sloped beam seats and details
 - Removed A4 reference
 - Moved Vert. Cont. Joint detail from former Std 12.05.
- Std 12.04 ■ Revised finished grade line to terminate 2'-0" short of wing tips
 - Updated standard for consistency.
 - Added reinforcement at abutment ends
- Std 12.05 ■ **Now archived as Std 40.41. A4 no longer allowed for use.**
- Std 12.06 ■ **Now archived as Std 40.40. A4 no longer allowed for use.**
- Std 12.07 ■ No revisions.

- Std 12.08 ■ No revisions.
- Std 12.09 ■ Removed A4 reference
- Std 12.10 ■ Removed A4 reference
- Std 12.11 ■ Removed A4 reference
- Std 12.12 ■ Removed A4 reference
- Std 12.13 ■ Removed A4 reference

Chapter 13

- Std 13.01 ■ Better description in "DESIGNER NOTE" for sloped beam seat calculations
- 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 13.10 ■ No revisions.
- Std 13.11 ■ No revisions.

Chapter 14

- Std 14.02 ■ No revisions.
- Std 14.03 ■ No revisions.
- Std 14.04 ■ Clarified "Abutment Anchorage" payment
- 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 ■ Removed A4 reference
- Std 15.03 ■ Removed A4 reference

Chapter 17

- Std 17.01 ■ No revisions.
- Std 17.02 ■ No revisions.
- NEW* Std 17.03 ■ Edge of Deck Flashing

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 ■ 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 ■ Removed A4 reference
- 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 ■ Updated bottom stirrup horizontal leg
- Std 19.51 ■ Updated bottom stirrup horizontal leg
- Std 19.52 ■ No revisions.
- Std 19.53 ■ No revisions.
- Std 19.54 ■ Revised stress pocket depth from 8" to 5"
■ Added 2" dimension to compressible sealer for "shear key detail"
- 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 ■ Removed unequal weld leg requirement for connection stiffener
- Std 24.03 ■ No revisions.
- Std 24.04 ■ Changed Diameter symbol to "DIA." in Table D
- 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 ■ Spelling correction (accommodate) in Designer Notes

Chapter 27

- Std 27.02 ■ No revisions.
- Std 27.05 ■ No revisions.
- Std 27.06 ■ No revisions.
- Std 27.07 ■ Better define when tapered top plates are required in "DESIGNER NOTES"
- 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 ■ Removed reference to Std 12.05
- 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 ■ Removed obsolete notes for "Bicycle Parapets" in upper left corner
- Std 30.08 ■ No revisions.
- Std 30.09 ■ No revisions.
- Std 30.10 ■ No revisions.
- Std 30.11 ■ No revisions.
- Std 30.12 ■ No revisions.
- Std 30.13 ■ No revisions.
- Std 30.14 ■ Updated Anchorage Detail
 - Added "Std. Hook" to S508 bar bend detail
- 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 ■ Corrected exp. fittings at SE joint detail
 - Corrected location of gasket cut out in Section A-A
 - Added "Std. Hook" to S504 bar bend detail
- 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 ■ Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.31 ■ Clarified outside face in Section A.
 - Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.32 ■ Clarified R503 bars at Outside Elevation. Clarified outside face in Section A.
 - Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.33 ■ No revisions.
- Std 30.34 ■ Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.35 ■ Clarified R509 bars at Outside Elevation. Clarified outside face in Section A.
 - Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.36 ■ Clarified R503 bars at Outside Elevation. Clarified outside face in Section A.
 - Removed 5" chamfer at the bottom of parapet for 6"
- Std 30.37 ■ Removed A4 reference

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 ■ No revisions.
- Std 36.10 ■ Minor - modified title font
- 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 ■ Updated "Concrete Masonry Deck Repair" from SPV.0035 to 509.2100.S
- Updated "Sawing Pavement Deck Prep. Areas" from SPV.0090 to 509.0310.S
- Std 40.02 ■ No revisions.
- Std 40.03 ■ Updated "Sawing Pavement Deck Prep. Areas" from SPV.0090 to 509.0310.S
- 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 40.31 ■ Added "(STRUCTURE)" to bid item 509.9005.S
- Std 40.32 ■ Updated Designer Notes and possible bid items for concrete patching
 - Updated "Concrete Masonry Deck Repair" from SPV.0035 to 509.2100.S
 - Added Designer Note "Polymer Overlays shall not be placed on concrete approaches"
 - Updated "Sawing Pavement Deck Prep. Areas" from SPV.0090 to 509.0310.S
- Std 40.33 ■ Updated and moved guidance for HMA estimated quantities to Section 6.4.42
 - Updated asphaltic bid items for HMA overlays. Asphaltic material is now included in the "HMA Pavement (Type)"
 - Updated "Concrete Masonry Deck Repair" from SPV.0035 to 509.2100.S
 - Added "(STRUCTURE)" to bid item 509.9005.S
 - Updated "Sawing Pavement Deck Prep. Areas" from SPV.0090 to 509.0310.S
- NEW** Std 40.40 ■ Std 12.05 Abutment A4 Pile Footing is no longer allowed for use
- NEW** Std 40.41 ■ Std 12.06 Abutment A4 Pile Footing is no longer allowed for use