DATE: January 30th, 2013
TO: Bridge Manual Users
FROM: DTSD – Bureau of Structures
SUBJECT: January, 2013 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. Corresponding plan insert sheets have also been updated and posted online.

Of particular interest in this edition:

- **Chapter 4** – Entire aesthetics chapter was updated to provide further guidance regarding bridge structure aesthetics in Wisconsin. The previous iteration of this chapter contained ambiguities and did not provide tangible guidance pertaining to the process to be employed on WisDOT projects. This chapter will continue to expand in subsequent Bridge Manual Updates. **Note:** An interim policy on the use of aesthetic barriers on bridges has been developed and has been attached at the end of this document.

- **Chapter 7** – Updated section 7.1.4.2 regarding Geosynthetic Reinforced Soil - Integrated Bridge System technology. Two new standards were assembled for use with GRS-IBS structures (Standards 7.01 and 7.02) and an SPV is available for use on WisDOT projects.

- **New Standard 7.01 – GRS Abutments General Plan:** Details for GRS abutments when used on Accelerated Bridge Construction projects.

- **New Standard 7.02 – GRS Abutments Details:** Additional details to go along with Standard 7.01.

- **Chapter 11** – Clarified WisDOT Policy Item regarding redundancy and resistance factor adjustments for the Strength Limit State based on the number columns in a bent being supported by one drilled shaft.
• **Standard 14.04** – Updated notes regarding which bid items are to contain size 2 coarse aggregate and eye bolts for safety attachments. Provided guidance under Designer Notes regarding the placement of slope paving concrete on bridge plans in lieu of MSE retaining wall plans.

• **Chapter 19** – Revised text to show the two compressive stress checks required for Service I and added the compressive stress check for Fatigue I. AASHTO moved one of the stress limits from Table 5.9.4.2-1 and placed it in Article 5.5.3.1 as a compressive stress limit under fatigue loading.

• **Chapter 27** – Updated section 27.2.2.3 heading to High-Load Multi-Rotational Bearings to allow for disc-type bearings to be used in addition to pot-type bearings. Updated text accordingly and added typical bearing figures. An SPV is available for use on WisDOT projects.

• **New Standard 36.07 – Pipe Opening in Culvert Wall:** This Standard was developed in order to follow guidance from ACI regarding placing reinforcement around openings in concrete walls. Additional trim bars (vertical bars replacing those that are interrupted by the opening), opening bars (horizontal bars replacing those that are interrupted by the opening), and corner bars (bars placed on a diagonal at each corner) are to be provided.

Most other changes are fairly minor. Please use the example calculations with care (follow along in AASHTO). A couple of mistakes have been pointed out. Unfortunately, due to time/resource issues, the corrections were not made at this time.

If anything in a given chapter was edited, the date for the entire chapter was updated. A vertical black bar in the left margin notes all changes. Previous black bars were not removed from chapters which were not edited in this update.

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 30th, 2013

Distribution: Users of Wisconsin Department of Transportation Bridge Manual

RE: Interim Policy on the use of Aesthetic Barriers on Bridges

There is an increased frequency of the use of vehicle Barrier and Railing combinations on structures in Wisconsin that incorporates new and unique aesthetic details. There is also more information now available that addresses the Safety and Crash Worthiness of vehicle barriers (AASHTO Roadside Design Guide 4th addition - 2011, Manual for Assessing Safety Hardware- 2009, NCHRP Report 554, and other publications).

As the application of these new vehicle barrier are under consideration, design, and review, it is apparent that new policies need to be developed and applied to projects to promote safe vehicle barrier systems that are consistent with the improved understanding of desirable safety features as outlined in the updated testing and publications. The development of these new policies will require interpretation of the information from various documents relevant to the types of barrier and rail systems used in Wisconsin. Input from a number of stakeholders including FHWA, The Department’s Bureau of Project Development - Roadway Standards & Methods Section, Bureau of Structures - Development Section, and various research institutions will be required to interpret the documents and build consensus on emerging policies. This process will be ongoing and dependent on the release of new information and the process of policy development.

However, there is a clear need to define an interim policy that will aid in the development of projects currently underway. Therefore, The Bureau of Structures Development Section is issuing the following Interim Policy related to Concrete Barriers on Bridges.

Interim Policy related to Concrete Barriers and Aesthetics:

- All Concrete Vehicle Barriers must meet Crash Testing Guidelines as outlined in Chapter 30 of the Bridge Manual.
- The top surface of Concrete Vehicle Barriers must be continuous without raised features that can serve as a blunt end for impact or snag points for vehicles.
- For vehicle barriers on raised sidewalks with posted roadway speed of 40 MPH or lower, any raised feature (Pilasters or other) must be placed a minimum of one foot (1’-0”) behind the front face (roadway side) of a vertical faced barrier. If a railing is placed on the top of the concrete barrier, the railing should be continuous along the length of the barrier eliminating snag points for vehicles.
• For vehicle barriers on high speed roadway (posted greater than 40 MPH), any raised feature that could serve as a blunt end or snag point must be a minimum of two feet six inches (2’-6”) behind the front face toe of the barrier. Any railing placed on the top of the vehicle barrier must be continuous and meet crash testing criteria as outlined in Chapter 30 of the Bridge Manual.

• Any textures or patterns on the roadway face of a vertical face vehicle barrier are limited to a maximum depth of ½ inch and subject to the guidelines of NCHRP Report 554. Many of the typical aesthetic form liner patterns are not acceptable for use on the vehicle face of concrete barriers.

If you have any comments or questions regarding the interim policy please do not hesitate to Aaron Bonk, Development Engineer (608) 261-0261 or myself at (608) 266-0075.

Sincerely,

William Oliva, P.E.
Chief, Structures Development Section
WisDOT DTSD – Bureau of Structures

CC: Scot Becker, PE, Director, WisDOT, DTSD - Bureau of Structures
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January 2013 Standard Details Update Summary

Chapter 4
Std 4.01  ■ Revised notes for plywood backing on formliner

Chapter 7
NEW  Std 7.01  ■ GRS abutments general plan
NEW  Std 7.02  ■ GRS abutments details

Chapter 12
Std 12.01  ■ Revised note to add reference to rodent shield details in FDM
■ Clarified the dimension from C/L brg to B.F. abut. when structural approach slab is present

Std 12.03  ■ Revised note to add reference to rodent shield details in FDM

Std 12.05  ■ Revised note to add reference to rodent shield details in FDM

Std 12.08  ■ Revised note to add reference to rodent shield details in FDM
■ Clarified the dimension from C/L brg to B.F. abut. when structural approach slab is present

Std 12.10  ■ Revised note to add reference to rodent shield details in FDM and showed notch for footing on plan view.
■ Revised filler at beginning of approach parapet to 1.5” to match expansion filler at end of approach

Std 12.11  ■ Revised note to add reference to rodent shield details in FDM
■ Added designer note referring to the FDM Manual
■ Corrected symbol type to avoid duplication of already used symbol
■ Updated “T02” and “T03” notes to “top” of footing instead of “length” of footing

Chapter 14
Std 14.01  ■ Revised note to add reference to rodent shield details in FDM

Std 14.03  ■ Revised note to add reference to rodent shield details in FDM

Std 14.04  ■ Revised the bid item for which the eye bolt detail is to be paid under
■ Revised the bid item for which the size 2 coarse aggregate is to be paid under
■ Added a designer note stating that the slope paving is to be a part of the bridge plan (not retaining wall plan)

Std 14.05  ■ Revised note regarding maximum skew angle in wrapped MSE wall abutment detail

Chapter 17
Std 17.01  ■ Added symbol and text to provide paving notch dimensions for structural approach slab

Std 17.02  ■ Added “parapet/” in front of the word railing in two spots
Chapter 19
Std 19.31  ■ Added symbols and text to provide paving notch dimensions and dimension from C/L brg to B.F. abut. when structural approach slab is present

Std 19.33  ■ Added symbol to provide paving notch dimensions for structural approach slab at semi-exp. abut.

Std 19.36  ■ Moved holes in Detail B to match other side of detail

Std 19.37  ■ Changed 1/2" dia. Washer to 5/16" in Part Transverse Section

Std 19.51  ■ Changed wording in Notes from "Special Provisions" to "Standard Specifications"

Chapter 24
Std 24.12  ■ Revised Section Thru Expansion End detail clarification note

Chapter 27
Std 27.07  ■ Removed preliminary bearing size chart from standard

Chapter 28
Std 28.01  ■ Clarified when field splice is permitted in steel extrusions
  ■ Adjusted length of single slope barrier cover plate

Std 28.02  ■ Placed table on standard showing location for placement of the cover plate

Std 28.07  ■ Placed cover plate description for sloped face parapet on this standard

Chapter 30
Std 30.30  ■ Added 9 degree dimension to bar bend detail

Std 30.31  ■ Added 9 degree dimension to bar bend detail

Std 30.32  ■ Added 9 degree dimension to bar bend detail

Std 30.33  ■ Added 9 degree dimension to bar bend detail

Chapter 36
NEW  Std 36.07  ■ Pipe opening in culvert wall

Chapter 39
Std 39.02  ■ Added word "standard" to clarify type of hole required

Std 39.09  ■ Added word "standard" to clarify type of hole required

Std 39.10  ■ Added word "standard" to clarify type of hole required