



Table of Contents

1.5 Reporting Systems..... 2

 1.5.1 Introduction..... 2

 1.5.2 Structure Identification 2

 1.5.2.1 Bridges, Small Bridges, Noise Barriers, and Retaining Walls 2

 1.5.2.2 Sign Structures and Overhead Sign/Signal Support..... 3

 1.5.2.3 High Mast Lighting 3

 1.5.3 Element Levels..... 4

 1.5.4 National Bridge Inventory (NBI) 5

 1.5.5 Nonredundant Steel Tension Member 5



1.5 REPORTING SYSTEMS

1.5.1 Introduction

There are many different mechanisms available to record, organize, and catalog bridge inventory and inspection data. Over the years, several bridge management systems and tools have been developed to aid structure owners in cataloging their bridge inventories. Wisconsin has developed the Structures Highway Information System (HSIS) to house and maintain data on its inventory of bridges and ancillary structures. Wisconsin uses two distinctly different reporting systems in collecting and managing its structure inspection data: Element Level and National Bridge Inventory (NBI) System.

The WisDOT Highway Structure Information System (HSIS) is maintained by the Bureau of Structures (BOS) located in the Wisconsin Department of Transportation (WisDOT) Central Office and warehouses data on all public bridges in Wisconsin. This system consists of a database of inventory data, Inspection data (NBI and element level data), electronic directory and storage of supplemental information files (approved format such as .pdf, .doc, etc.), and is utilized to create the annual National Bridge Inventory (NBI) file. As mandated by the Federal Highway Administration (FHWA), the NBI file is created annually to submit Wisconsin's Bridge data in the format described in the FHWA Coding Guide for all public bridges in Wisconsin.

Beginning in October 2014, the FHWA required all State DOTs to begin collecting element level condition data in addition to the NBI file. All State DOTs were required to begin reporting element level inspections on NHS bridges to the FHWA by April 2015.

Although a hardcopy paper bridge file may be located at each region for state bridges and located at each county for their local bridges, the electronic file within HSIS shall be designated as the "Official Bridge File" following NBIS Metric #15: Inspection procedures: Bridge Files. It is imperative the bridge file is maintained accurately.

Bridge inspection data must be updated in the bridge file (inspection report completed in HSIS) within 3 months after the month the field portion of the inspection is completed. WisDOT requires the inspection report be created in HSIS within 28 days after the month the in which the field portion of the inspection is completed.

1.5.2 Structure Identification

The Wisconsin Department of Transportation (WisDOT) follows an alphanumeric coding system to identify the various bridge and ancillary structures in the WisDOT right-of-way. In some cases, multiple I.D. plaques are attached to designate the separate components of the structure, such as structure number, lighting circuit, and sequence decal. Refer to the WisDOT Facilities Development Manual (FDM), Chapter 16, Standard Detail Drawings (S.D.D.).

1.5.2.1 Bridges, Small Bridges, Noise Barriers, and Retaining Walls

These structures are identified using a name plaque. Refer to S.D.D. 12a3 in the WisDOT FDM for details of the plaque. The ID code found on the plaque is in the form "X-CC-NNNN-UUUU", where "X" identifies the structure type (B-bridge, C-small bridge, N-noise barrier, L-

High Mast Light pole, or R-retaining wall); “CC” is the two-digit county number; and “NNNN” is the unique four-digit structure number. However, if there are unused leading zeroes, these may be omitted (*i.e.*, B-40-60).

Some longer bridges are subdivided into units. On these structures, the ID code will be “X-CC-NNNN-UUUU” where “UUUU” is the unique four-digit unit identifier.

1.5.2.2 Sign Structures and Overhead Sign/Signal Support

Sign structures and overhead sign supports are identified using a structure plaque. The plaque is either in a vertical or horizontal configuration dependent on whether or not the sign bridge is structure mounted. Refer to S.D.D. 12a4 in the WisDOT FDM for details of the plaque. The ID code found on the plaque is in the form “S-CC-NNNN”, where “S” designates a sign bridge; “CC” is the two-digit county number; and “NNNN” is a four-digit region-provided location number.

If the sign bridge contains lighting, a circuit plaque and sequence decal will also be present. The circuit plaque is mounted to the sign bridge and the sequence decal is mounted to the luminaire. Refer to S.D.D. 10a3 in the WisDOT FDM for details of these plaques. The circuit plaque ID code is in the form “A-B-CD”, where “A” and “B” identify the two circuits that the structure is on; and “CD” identifies the distribution center. The sequence decal code is in the form “AZZ”, where “A” is the circuit pole and “ZZ” is the two-digit luminaire sequence number.



Figure 1.5.2.2-1: Structure Plaque and Circuit Plaque Mounted on a Sign Bridge. (Note that the location number “300” would read “0300” according to current convention.)

1.5.2.3 High Mast Lighting

High mast lights are identified using four separate plaques, the structure plaque, circuit plaque, luminaire sequence plaque, and the north plaque. The structure plaque and circuit plaque are mounted to the hatch door, the sequence decal is mounted to the luminaire and the north plaque is mounted to the light ring. Refer to S.D.D. 10a4 in the WisDOT FDM for

details of these plaques. The ID code found on the plaque is in the form “CC-NNNN”, where “CC” is the two-digit county number, and “NNNN” is a four-digit region-provided location number. The circuit plaque ID code is in the form “A-B-CD”, where “A” and “B” identify the two circuits that the structure is on; and “CD” identifies the distribution center. The sequence decal code is in the form “AZZ”, where “A” is the circuit pole and “ZZ” is the two-digit luminaire sequence number. The north plaque is simply a single letter “N”.



Figure 1.5.2.3-1: Structure Plaque and Circuit Plaque Mounted on a High mast Hatch Door.
(Note that the location number “028” would read “0028” according to current convention.)

1.5.3 Element Levels

Each structure element, (e.g., wing walls, steel girders, prestressed concrete beams, decks, slabs) has been assigned a unique element number. Structural elements are listed on the structure inspection form with their associated element numbers.

Each element has a list of possible defects associated with the element and its particular material (steel, concrete, timber, etc.). For instance, the defect “Exposed Prestressing” is found under prestressed concrete elements but absent from reinforced concrete elements.

Elements are then grouped into condition states that reflect the level of element deterioration as based on the defect condition states. All elements have a possibility of four condition states. These condition states are described in detail in Part 2 of this manual as well as in the WisDOT Bridge Inspection Field Manual.



1.5.4 National Bridge Inventory (NBI)

NBI is an acronym for National Bridge Inventory. NBI ratings are based upon the item numbers and conditions set forth in the Specifications for the National Bridge Inventory (*SNBI*). The NBI reporting system is presently used in Wisconsin to determine the sufficiency number for the bridge and not to rate the individual elements of each structure. An NBI inspection looks at the bridge differently than an element level inspection. Where an element level inspection considers each bridge element separately, the NBI inspection lumps all like-function elements together into a functional group. For example, on a steel girder bridge, the girders, floor beams, and stringers together would be considered the superstructure. Likewise, the abutments, piers and pier caps would be considered the substructure, and so on. Please see the SNBI found on the FHWA website for more information regarding the NBI.

1.5.5 Nonredundant Steel Tension Member

To aid the inspector in performing Nonredundant steel tension member (NSTM) Inspections, Wisconsin has developed NSTM Inspection Report Forms; DT2010 and DT2011. Other supplemental forms can be found in 1.3.5.5. These are supplements to the Bridge Inspection Report entry and can be uploaded into HSIS during inspection data entry. Form DT2010 allows for specific field inspection notes for each member/member component. The final inspection report may have several pages of this form. The inspector may utilize form DT2011 to sketch the bridge and identify the NSTM. Much of the required information for a NSTM Inspection is the same as that required for element level reporting.

Each NSTM shall have its condition recorded. If no deficiencies are noted, an “OK” should be recorded. Additional information should be recorded for serious deficiencies and placed on attachment inspection forms. Such information may be additional narrative, sketches or photographs. The description of such deficiencies should include exact location and detailed dimensions that could help in determining the overall condition rating of the bridge.



Structure Inspection Manual

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