

# Structures Inspection Program Technical Bulletin

ISSUE 10 – JULY 2024



*Wisconsin River Bridge at Lone Rock*

**This bulletin is dedicated to updating and informing those involved with the Wisconsin structure inspection program.**

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## LATE INSPECTION NOTIFICATION

There is a new FHWA compliance requirement for delayed inspection notification. All states must notify FHWA of an inspection delay prior to the inspection due date plus the allowable tolerance to receive FHWA approval. The inspection interval tolerance is 2 months for less than 24 months interval and 3 months for 24 months or greater interval. Examples:

- (1) A June inspection due date (last day of the inspection) on a 24-month inspection interval must have requested FHWA approval by September 30th (3 months beyond the month the inspection is due).
- (2) A March inspection due date on a 12-month inspection interval must have requested FHWA approval by May 31st (2 months beyond the month the inspection is due).



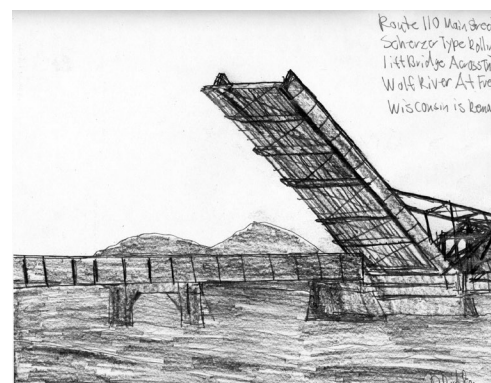
**To keep in compliance, please notify the region or statewide program manager as soon as you are aware that the inspections will not be completed on time.**

## MOVEABLE BRIDGE TEAM

WisDOT recently created a Lift Bridge Team. This new team has been created to provide inspection, repair, and maintenance assistance for all lift bridges in Wisconsin. This team will also serve as a resource for questions or concerns of the lift bridge owners. The team has experience in design review, inspection, repairs, maintenance, and remote operations. The team has numerous national contacts in engineering, construction, and inspection disciplines which can be provided to lift bridge owners for additional assistance.

The team is currently working on a number of initiatives:

- Create lift bridge inspection standards;
- Create lift bridge asset management standards;
- Review the connecting highway policy;
- Develop best practices on lift bridge maintenance;
- Inspection QC/QA reviews on both local and state-owned lift bridges - inspection QC/QA process will help educate inspectors and owners in addition to providing consistent inspections and maintenance programs for the lift bridges throughout Wisconsin.



Please contact Jim McDowell (920-360-5792-Cell), Bureau of Structures Lift Bridge Program Manager or Jason Lahm (920-360-2374 -Cell), Bureau of Structures Lift Bridge Supervisor with any questions regarding the team or lift bridges.

## UNDERWATER PROFILES

Underwater profile activity interval maximum of 96 months was implemented for the 2024 inspection cycle and going forward. The monthly scheduling reports do not include bridges with underwater profile activities due based on the new 96-month interval. This will not be flagged by HSIS until the next routine inspection is completed. Because it is not on the scheduling report, some are only being found once the next routine inspection is entered into HSIS. The Region PMs provided the local PMs with a list of bridges that are likely to need a underwater profile based on the information in HSIS. If an underwater profile activity was missed during the routine inspection this year, **please have the activity completed in the next 12 months.**

## UNDERWATER DIVE INSPECTIONS - WATER DEPTHS NEAR 4'

Reviews of bridge inspection records have found some bridges with regular occurring water depths greater than 4' at substructure units without a required underwater dive inspection per SIM 1.3.7. Inspectors should notify the bridge specific PM when the water depths at substructure units are greater than 4'. PMs should look at the bridge records to determine if the water depths are regularly over 4' during the routine inspections. Records of water depths are recorded on the underwater probing form as part of the Routine inspection. PMs can look at the historical records and site conditions to determine if there is a better time of year to perform the underwater probing activity when the water may be less than 4'. If the water is regularly over 4 feet, a dive inspection must be completed.

NOTE TO INSPECTORS – Significant condition changes, concerns, recommended reduced inspection intervals, inspection recommendations (such as type, access needs, equipment needs), and maintenance actions should be noted on the inspection but also brought to the PM and owner's attention. PMs and bridge owners do not always have time to review the inspection reports in detail.

## UNDERWATER DIVE INSPECTION PROCEDURES

Reminders to underwater dive inspection team leaders.

### Level I or II Inspection Effort must be consistent with Marine Growth Present/Cleaned on Dive Log

The identification of inspection effort must be consistent with the presence of marine growth and cleaning. The dive log documentation must identify the level of inspection effort and the presence of marine growth and cleaning. A routine underwater bridge inspection normally includes a 100% Level I effort and a 10% Level II effort. Level I inspection is a visual inspection detailed enough to detect obvious defects and deterioration. Level II inspection includes partial cleaning marine grown. When a Level II inspection is completed, the dive log must be marked "yes" for the presence of marine growth and "yes" for cleaning. See Part 1 Chapter 3 in the SIM and [FHWA Publication FWHA-NHI-10-027 Underwater Bridge Inspection](#) for more information.

### Document the Dive Team Roles and Responsibilities

Clearly document all dive team members roles and responsibilities in the inspection report and on the forms. HSIS has been updated to enter more specific information about team members and their roles when creating an inspection report, on the Edit tab under Team Personnel.

## STRUCTURE SPECIFIC INSPECTION PROCEDURES

Structures requiring an NSTM, In-Depth, Special, Underwater Dive, Complex (including Moveable), or Tunnel inspection must have written structure specific inspection procedures. Structure specific inspection procedures go beyond the general inspection procedures found in WisDOT's Structure Inspection Manual (SIM). There are unique aspects based on the specific structure and the inspection type being performed that must be addressed.

The structure specific inspection procedures are to be reviewed by the inspection TL prior to an inspection. As appropriate, the procedures must be updated and revised after the inspection is completed. The procedures should be written in a manner that is useful to the inspection team. The updated/revised procedures are to be included with the inspection report loaded into HSIS (the official bridge file) for use during future inspections. Procedures can be entered in to HSIS in the separate field for each inspection type or uploaded as a separate attachment. More information about structure specific inspection procedures can be found in WisDOT's Structure Inspection Manual (SIM), the AASHTO MBE, and the FHWA Bridge Inspection Reference Manual (BIRM).

The inspection procedures must address any of the following areas that are relevant to the specific bridge and the specific inspection type being performed:

- Provide procedures for specific types of inspections (NSTM, In-Depth, Special, Underwater Dive, Complex, and Tunnel).

- Identify the NSTM elements, the complex features, underwater members, any elements that need special attention, during those inspections.
- Address those items that need to be communicated to an inspection team leader to ensure a successful bridge inspection related to that specific structure and inspection type.
- Provide procedures to document special access needs, inspection equipment, structural details, inspection methods, and any special qualifications required of inspection personnel.
- If there are items unique to that structure that are not covered in the general inspection procedures, provide written procedures specific to that inspection type or activity.
- Provide information regarding the proximity necessary for each detail, such as “arm’s length” or “hands-on.” And the inspection interval for each element or detail.
- Contact information for stakeholders.
- Identify specific risk factors that impact safety and serviceability of the bridge.
- Traffic control needs.
- Railroad coordination.
- Other information that is important to the inspection that would assist the inspection TL and team members.

## BRIDGES INVOLVED IN A FLOOD EVENT

Nearly all bridges which cross waterways have some vulnerability to scour damage caused by a flood event. An underwater profile activity is intended to ensure monitoring for structural stability and stream instability during and after a flood event. The following is guidance for when underwater profiles are to be performed:

- Required at bridges with an implemented scour plan of action (POA) after a triggering flood event. These have historically been bridges classified as “scour critical”.
- Recommended at bridges over a waterway when the bridge experiences any of the following:
  1. A flood event when the bridge or the roadway approach is overtopped; \*
  2. A river system reaches flood stage at a bridge; \*
  3. The presence of highwater flow velocities which could cause scour; or
  4. If determined by the bridge owner or inspection program manager.

\*Advanced Hydrologic Prediction Service provides flood predications and flood stages for river systems throughout Wisconsin.

- Required at any bridge over a waterway when there are signs of channel movement, degradation, or aggradation after a flood event.

SIM Section 1.3.6 provides additional information on underwater profiles. A flood event may require review of condition assessments or ratings for elements or components affected. These would be Special or Damage Inspections completed by a TL.

## MAXIMUM BRIDGE HEIGHT (SNBI B.G.13)

FHWA provided a correction related to measuring the maximum bridge height (B.G.13) for buried bridges (box and pipe culverts and other bridges under fill, excluding closed spandrel arches).



Measure the maximum bridge height from top of slab, or top of pipe, to water surface elevation. When there is no waterway feature, measure to inside bottom of pipe, inside of floor slab, or ground line when the bottom is unexposed or the bridge is bottomless. Do not include any extra header wall height.



For closed spandrel arches measure from top of roadway surface.

## ARCHES VS CULVERTS (SNBI B.SP.01 AND B.SP.06)

The SNBI has created questions about whether arch culverts (installed on footings without a floor) should be classified as an arch or a pipe culvert. WisDOT believes the guidance in the SNBI and in the updated Bridge Inspector's Reference Manual (BIRM) is ambiguous. These structures will be considered an arch for B.SP.06 Span Type. This will also affect B.SP.01 Span Configuration Designation.

- B.SP.01 code M## (Main) or A## (Approach)
- B.SP.06 code A01 – Arch – under fill without spandrel

This aligns with WisDOT's past guidance for arch vs. culvert elements as explained in [WisDOT Structures Inspection Field Manual](#).



### B. Superstructure

- The basic purpose of the superstructure is to transfer loads from the deck across the span and to the substructure.
- The superstructure supports the deck or riding surface of the bridge, as well as the loads applied to the deck.
- Superstructure elements may be categorized by their function (truss members will transmit mainly axial loads; girders will transmit mainly shear and flexure, etc.).
- Loads may be transmitted through tension, compression, bending, or a combination of these three.
- These elements typically do not include bracing components such as diaphragms, laterals, and cross bracing.
- Prefabricated structures (CON/SPAN or similar) without a floor should be coded with the appropriate arch element. Prefabricated structures with a floor should be coded with the appropriate culvert element. In either case, prefabricated structures that retain fill to support the roadway shall use the appropriate Wall Element instead of Assessment 9248 - Culvert End Treatment. The wall element shall be quantified and evaluated from end of wingwall to end of wingwall regardless of skew or construction joints located along length.
- Elements located above the fixed/moveable bearings should be coded using superstructure elements.

## CRITICAL FINDINGS REMINDER

Some inspectors have had to follow the new [critical findings procedure](#) (Oct 2023) and HSIS entry since it was implemented. There are some learning curves with this new procedure and the related HSIS tab. Following are definitions of the terms within the Critical Findings Procedure to help clarify intent and what should be included:

- *Temporary action* - the immediate action taken to restrict or close a bridge, temporary short-term measures to restrict traffic that will be replaced with more robust traffic control measures.
- *Final-Immediate action* - generally the more robust closure or restriction method to keep the bridge closed or restricted for a longer term than the temporary action. The Final-Immediate action can also be the permanent repair instead of placing a long-term restriction.
- *Final-Long Term action* – typically a future rehabilitation or bridge replacement.

Notifications using HSIS to send emails needs further clarification. The Notification section will first appear as seen in the screen shot below without the SEND button showing (identified as ②). To get the SEND button to appear, information must be entered in the Comment section, ①, followed by clicking outside of the Comment box. Once SEND is selected, an email will be sent to the person/email address entered as the recipient and another box will appear for the next recipient.

The screenshot shows the HSIS interface for a critical finding. The 'Critical finding type' is 'Full Closure' and the 'Critical finding inspector' is 'Bohnsack, Dave (5015)'. The 'Critical finding description' states: 'Crack found in gusset plate of NSTM. Bridge has been closed immediately until further analysis and repair is completed.'

The 'Actions' section contains three entries:

#	Type	Action summary	Est complete	Complete
1	Temporary	Temporary barricades installed to close bridge to traffic.	06/20/2024	06/20/2024
2	Underway	County hwy department to place barricades and signage at bridge and nearest intersection in each direction. County to install concrete barrier across roadway on approach for hard closure.	06/21/2024	06/dd/2024
3	Planned	Analyze structure considering conditions found. Develop repair plan so bridge can be reopened to traffic.	06/24/2024	06/dd/2024

The 'Notifications' section shows one notification:

#	Recipient	Comment	Date
1	La Crosse(32) Program Manager Local Bridges dot91 (Joe Langeb)	Called Joe to notify him of CF.	

Annotations: A red circle '1' points to the 'Comment' field, and a red circle '2' points to the 'send' button.

This close-up shows the 'Notifications' section with a new entry:

#	Recipient	Comment	Date
1	StateWide Program Manager Bridges ditd2b (David Bohnsack)	Called Dave to notify him of CF.	06/20/24

A red arrow points to the recipient field of the first notification entry.

## THIN ELASTOMERIC BEARING PAD RATING

WisDOT has a long-standing inspection policy that thin elastomeric bearing pads (1/2" to 1" thick) installed under girders are not assessed as a bearing element but are assessed as part of the superstructure element (SIM 2.4.8.1). Since WisDOT does not recognize this as a bearing element, SNBI Item B.C.07 Bridge Bearing Condition Rating with these pads should be reported as "N" (not applicable).

The SNBI Commentary notes that in cases where the bearing device is not visible, the condition can be assessed based on indirect indicators. For these pads, WisDOT does not recognize them as bearings, so N is appropriate.

## ELASTOMERIC BEARINGS (ELEMENT 310)

The condition rating for elastomeric bearing elements will no longer consider the corrosion defect or steel protective coating for any steel that make up the elastomeric bearing. This includes the steel sole plate, steel masonry plate, or other steel portions of the elastomeric bearing assembly. The condition and maintenance issues related to any steel portion of the elastomeric bearing are to be recorded in the bearing element narrative and maintenance actions, as necessary and not considered when rating the elastomeric bearings.



## BRIDGE JOINTS

Existing bridge joints that are covered or not visible are to be assessed as an inspection element and condition reported as SNBI Item B.C.08 Bridge Joint Condition Rating. If the joint is covered or not visible, the condition can be assessed from the underside and with other indicators. If a joint element does not exist on the bridge then code Bridge Joint Condition Rating as N.

## AGENCY DEFINED DEFECTS

Agency defined defects (ADD) listed below do not roll up into the national bridge elements (NBE). ADDs are for data gathering purposes and are not submitted to FHWA. If there is an underlying NBE defect (corrosion, cracking, spalls, delamination, etc), it should be coded along with the ADDs listed below. Some examples –

- (1) MIC is present with section loss – report defect 8901 MIC and 1000 Corrosion; i.e. the presence of 8901 MIC in CS4 also requires defect 1000 Corrosion in CS4 (structural review required);
- (2) Precast concrete connection is spalling – report defects 8906 Precast Concrete Connection and 1080 Delaminations/Spalls
- (3) Discoloration on the underside of the deck has a measurable crack – report 8904 Discoloration and 1130 Cracking.

An ADD does not need to have an underlying NBE defect. Some examples -

- (1) Concrete culvert connections are separated but no NBE defect is present – report only defect 8907 Concrete Culvert Connection. If a connection is significant, the condition should be reflected in the NBI Culvert Condition;
- (2) Discoloration on the underside of the deck with no visible or detectable defects – report 8904 Discoloration only.

Current ADDs that do not roll up:

- 8901 Microbial Induced Corrosion
- 8904 Discoloration
- 8905 Chloride Concentration
- 8906 Precast Concrete Connections
- 8907 Concrete Culvert Connections

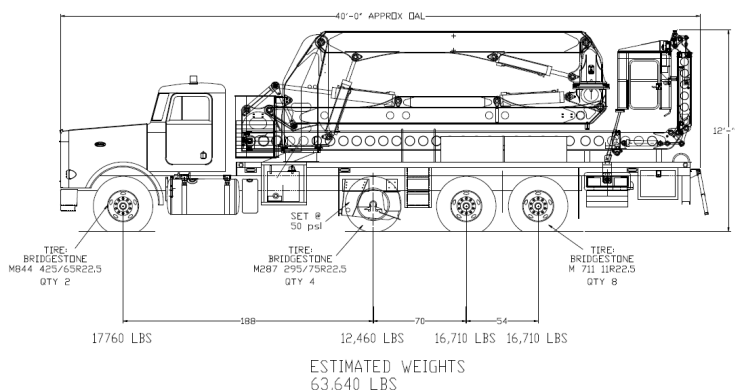
NOTE: Wingwalls are not an NBE so the ADD 8902 Wingwall Movement and 8903 Wingwall Deterioration do roll up and additional NBE defects are not required.

## LOCAL SMALL STRUCTURES INSPECTION PROGRAM

The Wisconsin Counties Association (WCA) is seeking interested qualified WI certified bridge inspectors to conduct inspections on city, village, and town owned small structures greater than 6 feet but 20 feet or under in length. The inspections must adhere to the guidelines in the [Local Structures 6 – 20ft: Program Overview](#). Additional information about the WCA’s Request for Qualifications can be found on [BOS webpage](#) or the WCA website. A Statement of Qualifications, not exceeding 10 pages, must be received by 3 pm on July 10, 2024. Inspections and inspection entry into HSIS must be completed by December 31, 2025.

## UNDER-BRIDGE ACCESS (REACH-ALL/SNOOPER TRUCK)

Under-bridge vehicles are essential for accessing many bridges for inspection and maintenance activities. However, because of the size of the vehicles, some bridges have limitations, especially for loading. WisDOT’s trucks range in weight from 31 to 39 tons. Bridges load posted below the weights of these trucks require other access considerations and options.



Other options for the bridge owner to provide inspection access:

- Lighter access equipment - Anderson Under-bridge HP35 trailer is around 9.5 tons and is self-propelled. Rent is approximately \$1,300 per day.
- Contract with a bridge inspection consultant that is [SPRAT](#) trained (climb using ropes).
- Use ladders and/or scaffolding.

Snooper trucks sizes:

Truck	Weight	Height	Length	Arm Reach
A52	31 tons	13'	40'	52'
U62	32 tons	12.8'	40'	62



U62T	39 tons	13'	40.8'	62
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## INSPECTION PROGRAM CONTACTS

Coverage	Name	Phone	Cell	Email	Role
Statewide	David Bohnsack	608-785-9781	608-792-6084	<a href="mailto:David.bohnsack@dot.wi.gov">David.bohnsack@dot.wi.gov</a>	Statewide Program Manager
Statewide	Matt Coupar	608-266-5083		<a href="mailto:Matthew.Coupar@dot.wi.gov">Matthew.Coupar@dot.wi.gov</a>	Assistant Statewide Program Manager
North Unit	Tom Hardinger	715-421-8356	715-459-4269	<a href="mailto:Thomas.hardinger@dot.wi.gov">Thomas.hardinger@dot.wi.gov</a>	Inspection & Maintenance Unit A (NC, NE, NW Region) Supervisor
South Unit	Julie Brooks	262-521-4431	414-750-1539	<a href="mailto:Julie.brooks@dot.wi.gov">Julie.brooks@dot.wi.gov</a>	Inspection & Maintenance Unit B (SE, SW Region) Supervisor
Insp & Repair Unit	Jason Lahm	920-492-5998	920-360-2374	<a href="mailto:Jason.lahm@dot.wi.gov">Jason.lahm@dot.wi.gov</a>	Structure Inspection & Repair Unit Supervisor
Statewide	Steve Doocy	608-261-6063		<a href="mailto:Steve.doocy@dot.wi.gov">Steve.doocy@dot.wi.gov</a>	Statewide Ancillary Inspection Program Manager
Statewide	Anthony Stakston	715-421-8345	715-459-2624	<a href="mailto:anthony.stakston@dot.wi.gov">anthony.stakston@dot.wi.gov</a>	Statewide Structures Maintenance Program Manager
Statewide	Ryan Bowers	608-267-3577		<a href="mailto:Ryan.bowers@dot.wi.gov">Ryan.bowers@dot.wi.gov</a>	Bridge Management Engineer / HSI Contact
SE Region	Scott Reay	262-548-6715	414-750-1504	<a href="mailto:Scott.reay@dot.wi.gov">Scott.reay@dot.wi.gov</a>	SE Region Bridge Inspection Program Manager
SW Region-Madison	Michael Williams	608-516-6484	608-246-3250	<a href="mailto:michael.williams@dot.wi.gov">michael.williams@dot.wi.gov</a>	SW Region Bridge Inspection Program Manager
SW Region-La Crosse	Craig Fisher	608-785-9946	608-668-1390	<a href="mailto:Craig.fisher@dot.wi.gov">Craig.fisher@dot.wi.gov</a>	SW Region Bridge Inspection Program Manager
NC Region	Mariah Krueger	715-421-7380	715-315-2680	<a href="mailto:Mariah.krueger@dot.wi.gov">Mariah.krueger@dot.wi.gov</a>	NC Region Bridge Inspection Program Manager
NE Region	Brady Rades	920-492-4152	920-366-5684	<a href="mailto:Brady.rades@dot.wi.gov">Brady.rades@dot.wi.gov</a>	NE Region Bridge Inspection Program Manager
NW Region-Superior	Travis McDaniel	608-266-5097	608-419-8672	<a href="mailto:travis.mcdaniel@dot.wi.gov">travis.mcdaniel@dot.wi.gov</a>	NW Region Bridge Inspection Program Manager
NW Region-Eau Claire	Kyle Harris	715-579-3516	715-579-3516	<a href="mailto:Kyle.harris@dot.wi.gov">Kyle.harris@dot.wi.gov</a>	NW Region Bridge Inspection Program Manager
FHWA	Joe Balice	608-829-7528	608-609-5025	<a href="mailto:Joe.balice@dot.gov">Joe.balice@dot.gov</a>	FHWA Bridge Engineer