

Ancillary Structures Workgroup
Madison, WI – SW Region WisDOT
December 8, 2014 (9:30 am – 3:30 pm)

Meeting Minutes / Notes – FINAL (1/15/15)

Attendance:

Anthony Stakston	Kyle Harris	Pat Gavinski	Brady Rades
Dave Bohnsack	Jason Zemke	Leah Barsch	Tom Heydel
Dave Genson	Joel Alsum	Vu Thao	Travis McDaniel
Al Johnson	Matt Rauch	Joanna Bush	Jeff Kern
Glenn Unger	Derrin Wolford	Kelly Laabs	
Ann-Marie Kirsch (via Teleconference)			

1. Introductions

See Attendance for Workgroup Members.

Need to include a Local Program Representative. **Action:** Anthony will contact Local Program to determine their representative to BOS. **COMPLETED 12/11/14** – Adetoye Adeniyi and Joan Bonack are Local Program Representatives for BOS. Both are from the SE Region, Joan is a Project Manager and Adetoye is the Supervisor.

2. Ancillary Structures Overview

- a. Who is responsible for ramp gates? Camera poles? High Mast Lighting. Ancillary Structures or Ancillary Highway Assets? **Action:** Need to discuss at the next meeting.
- b. Moratorium on beam guard – may need to consider tracking this asset. – **Action:** Al will provide an update at the next meeting.
- c. Inspections – All ancillary structures will be using AASHTO element based with associated defects except Sign Structures. Sign Structures will continue to be inspected using the current inspection process.
- d. SE Region is using a consultant in 2015 to complete the C structure, Retaining Walls (R), & Noise Walls (N). Looking to revise SE Region Inspection forms to be used for Statewide Form. **Action:** Jason will send SE Region Ancillary Structures Forms for an example. **COMPLETED** – See below.



DRAFT noise wall Inspection Fo... DRAFT Retaining Wall Inspectio...

There is a section for recommended maintenance items in the inspection forms that still needs input on what to put there, so those suggestions would be very helpful.

SE Region also has a draft culvert inspection form, but they plan on updating our culverts in HSIS and using the inspection forms off of HSI for those inspections.

Action: All members please review and send me your comments prior to January 22, 2015 on the Draft Retaining Wall & Noise Wall Inspection Forms.

3. Sign Bridge (S)

a. Definition of Sign Bridge

i. What is a sign bridge versus an overhead sign support? **Action:** Tom will provide a list of how he differentiates between the two.

ii. Trombone Arm – Sign Structure? (See Attached Definitions)

1. YES. Including ones that have beacons on them. Should be added to HSI and given sign structure number and inspected on 4 year cycle.
2. Traffic needs to look at our policy for handling trombone arm inspection. Clamp arm and anchor bolts are the two issues to be looked at. Visual inspection. Work with BOS to create inspection checklist. Best to catch at initial inspection. **Action:** Joanna to follow up with Collins and Fish to find out what they are currently doing.

iii. Signal Monotubes

1. First signal monotubes were installed in 2009. They are required to due to Federal Requirements for a signal head over every through lane. i.e. Multiple through lanes at traffic signal will require signal monotubes.
2. DTIs were added this year. Been a huge learning curve across the state. Who is QA? Is it PDS? If so, how do we get them to show up? Who pays for second QC?
3. Certification – BTO is looking at requiring certification for installation. **Action:** Joanna will provide an update at the next meeting.

b. Consultant Inspection – Collins, Fish & Associates, Lambstar – Master Contract

- i. Inspector has 2 weeks to get out there from notification. Challenge is these are typically last to be installed and road gets opened before inspection occurs.

c. HSI

- i. BOS Contact for Revisions – Travis McDaniel or Shiv Gupta
- ii. **Action:** Travis will look at adding elements of who installed and who manufactured sign and signal structures in HSI.

d. Local Coordination for Inspections

- i. Connecting Highways – DOT Maintained and Inspected for sign structures covered per TGM 2-15-52. Shield needs to be located on overhead sign support and not post. **Action:** SW Region (Pat & Dave) & NC Region (Anthony) shall have to assign S numbers and inspect in 2015 the sign structures added due TGM 2-15-52. TGM 2-15-52 was modified in approximately 2005 to include connecting highway sign structures with shields on them.

Note: Per Joel Alsum, anchor bolt test for old structures can be expensive if steel type is not known.

- ii. Need to clarify at the next meeting:
 - 1. TGM 2-15-52: On local streets, upon coordination with the local unit of government, WisDOT would maintain only those trailblazer assemblies that are installed and/or approved by WisDOT.
- iii. Local Signs – Assign S number and complete “initial” inspections with connecting highway installations not covered per TGM 2-15-52. **Action:** Need to discuss at the next meeting.

e. BTO Grant

- i. 2014: 2 Monotubes in NC Region & 26 Monotubes in NE Region
- ii. 2015: \$10 Million Stand Alone Signal Appropriation – if you have signals installed with this money, be prepared to work with traffic unit to determine who is doing QA and how it is paid for.
 - 1. **Action:** Joanna will send out of the final list of signal structures in early January. She will work with Travis to get these into HSI initially.

- f. Sign Plaques – DOT (BTO) or Contractor Supplied (BOS): Who should supply stickers for structures? **Action:** BOS (Dave Genson) & BTO (Joanna Bush & Matt Raush) will determine if sign plaques are DOT supplied or contractor supplied.
- g. Design
 - i. Standard Special Provisions for Rehab/Repairs – **Action:** Vu Thao & Joel Alsum will put together standard special provisions for Rehab/Repair Type work to be included in BOS Special Provision. Collins has been writing them for SE Region. **Action:** Tom Heydel will contact Collins to get existing specifications and provide to BOS.
- h. Construction Issues: DT2113, DT2114, DT2321, DT2322
 - i. Bucket – Contractor vs. Electrician. **Action:** Need to discuss at upcoming meeting.
 - ii. DTI: See attached email from Joel Alsum, 12/11/14 regarding a new issue.

New issue.msg
 - iii. Washers – Between Post / Mast Arm Connection – UPDATE
 - 1. AASHTO says yes, but CO-BOS doesn't support. Existing can remain, but do not allow new structures this way. Valmont has been told not to supply structures with washers. Reject shop drawings outright. A490 bolts too. These shop drawings should be rejected. If installed under old spec, and properly tensioned, can be accepted. If installed under new spec and has washer between plates, should be rejected. Vu Thao is adding section into CMM regarding this issue. **Action:** Vu Thao shall provide update on this issue.
 - iv. Lock Washers – Not allowed to be used with a leveling nut. They may be allowed when the base plate is located on concrete with manufacture's design. Should be verified by CO BOS (Vu Thao) prior to installation.
 - v. Vertical Clearance – Single-Span, Cantilever, Single Pole, Structure-Mounted Sign Support, Long Mast Arm & Trombone Arm. NE Region has a great example to share with the other regions to put in their construction pantry. **Action:** Brady will send NE Region Sign Vertical Clearance for an example. COMPLETED 12/11/14



UniqueStructureVSignBridgeSignalRSignBridgeSignalLSignBridgeVertical
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- vi. A490 Bolts are not allowed. A490 have been installed in the splices in the past when they were not allowed. Need to revise to A325.
 - vii. 2015 Regional Construction Meeting: **Action:** Anthony will work on completing a short powerpoint presentation including all current construction issues: Anchor Bolts, Washers, Lock Washers, DTI – tightening, testing & DTI/Bolt Radius (per Joel Alsum email), A490 Bolts, Bases (water table, sonotube, etc.), etc. regarding sign structures.
 - viii. BOS (Vu & Joel) are facilitating a contractor /fabricator meeting on January 5th at Hill Farms – Room 363 regarding Sign Structures. **Action:** Vu & Joel shall provide an email update after the meeting.
- i. Maintenance
- i. Anchor Bolts - existing structures aren't hitting verification torque value. Should inspection include checking torque value? What about 48 hour test? Don't put jamb nut on until after 48 hour test has passed – **Action:** Vu Thao & Joel Alsum are working on a proposal for this issue.
 - ii. Bolt Replacement – 4 Bolts or less needs to be supported during replacement.
 - iii. State Master Contract – Only used for Emergency Maintenance Items. **Action:** Region Ancillary Structures Engineers need to submit to Matt Rauch their emergency maintenance priority work lists.
 - iv. State Master Let (2015): SE Region Sign Structures will only be repaired in 2015 Let Contract. BTO & BOS are discussing options for 2016 Let Contract. Statewide Contract? Region Contract? Who does oversight? **Action:** Dave Genson & Matt Rauch will provide update at next meeting.
 - v. Design Life – New structures are designed with a 50 year design life. Aluminum would be 25 years. Shiv is working on a report from HSI regarding this issue. **Action:** Travis will provide an update on this report at the next meeting.
- j. Bases – Assigned to Alex Crabtree (BOS) – Type 10 & 13 bases have been problematic – especially with issues of high water tables. Soil borings are not currently required.

- i. Vu Thao and Alex Crabtree (BOS) are talking about an option to bring these designs into BOS and requiring special sheets in the plans for these structures signed by structural engineers. **Action:** Vu will provide an update on this option at the next meeting.
- ii. Sonotubes should not be allowed to remain unless designed by engineer.
- iii. All stay in place forms – need to be designed and approved by an engineer.
- iv. How should contractors be installing these bases? Need guidance from BOS. Construction joint below the wing is being allowed by BOS. **Action:** Vu shall provide an update on the new guidance at the next meeting.

4. Culvert (C)

- a. Definition of C Structure – discussion was held regarding the definition of a C structure and Roadway Culvert. BOS (Dave Genson) and BHM (Al Johnson) are working on revising the definition of a C structure and Roadway Culvert. Dave Genson requested any suggestions for a new name for C Structures preferable with the first letter C. **Action:** Al Johnson will provide a draft definition for both types of culverts.
- b. HSI
 - i. Inspection Interval – 4 Years
 - ii. Element: Coating – Galvanized Protection is assumed for all steel culvert pipes, and therefore 8518 Galvanization is not needed for steel culvert pipes.
 - iii. 8902 – Culvert Liner – Needs existing narrative changed from “Element 8802 – Culvert Liner will typically consist of reinforced concrete.” **Action:** Travis McDaniel will add revision to list for updated Bridge Inspection Field Manual.
 - iv. UW-Dive for C Structures? HSI will be updating to include an activity for Underwater Dive. **Action:** Travis will revise HSI to include Activity: Underwater Dive.
 - v. UW Dive (Diver vs ROV): When submitting list of C structures to be dove, include in list if Diver (> 36” available room) or ROV will need to be utilized. BOS Maintenance will look into a statewide list of C structures and roadway culverts that will need to be inspected using an

ROV. In addition, it may be beneficial to looking into installing a side view/down imaging capabilities onto ROV.

- vi. SI&A – Not Needed. A list will be created by BOS CO with Wearing Surface Item to located C Structures with Bridge Elements (Guardrail, End Treatments, Etc.) for SIA. **Action:** Travis will create this list for the next meeting.
- vii. BOS Contact for Revisions - Travis McDaniel or Shiv Gupta
- viii. Routine Inspection w/ or w/o UW-Probe: Inspections will be coded similar to Bridges including UW-Probe as needed per Bridge Inspection Manual.
- ix. Statewide Small Culvert Inspection Program (PILOT) – SE Region and NC Region will be piloting a new roadway culvert inspection process using tablets and utilizing county forces for the inspections. Al Johnson is the lead person on this pilot project. Al Johnson offered to possible demonstrate the Pilot Program at the next meeting. BHM will be providing a roadway culvert inspection program in the future under this pilot program.

c. Local Coordination for Inspections

- i. Stormsewer inspection (≥ 5 Feet): Who is responsible for these inspections. Need to verify with the State Municipal Agreement for each location to verify the local unit of government is responsible for the stormswear.

d. Construction Issues

- i. Precast Sections settled after installation – SE Region during fast track installation. The precast sections were fixed during the project.

e. Maintenance

- i. LOS for C Structures Workgroup – A workgroup has been formed by Tom Goodwyn looking into adding C structures to the LOS model.

5. Dams – Ann Marie Kirsch gave an update regarding a situation in the SW Region where a dam is located on DOT ROW and appears to be owned by the DOT. She is trying to locate a GIS map with DOT ROW to overlay onto DNR known dams to determine the locations on any dams on DOT ROW. **Action:** Ann Marie will give an update at the next meeting with her findings.

6. Retaining Wall (R)

- a. Definition of R Structure – Need to revise the Bridge Inspection Manual and WisDOT Bridge Manual for definitions to match. **Action:** Need to discuss at next meeting to determine the appropriate definition of R structure.
- b. HSI
 - i. Structure Completion Report – Region Ancillary Structures Engineers need to submit their completed Structure Completion Report for ancillary structures so they can be updated in HSI to built.
 - ii. BOS Contact for Revisions- Travis McDaniel or Shiv Gupta
 - iii. Need to include a data element for cut / fill for each retaining wall.
Action: Travis will add this element to HSI.
 - iv. R Number Assignment – Separate R number for each wall type located in one continuous wall. Therefore, an MSE wall with a cast in place wall on each end would be assigned three R numbers (1 – MSE Wall, 1 – Cast in Place Wall – North, and 1 – Cast in Place Wall – South).
- c. Construction Issues
 - i. MSE Wall Failure – USH 41 – Brady Rades gave a short description of the failure on USH 41.
- d. Maintenance
 - i. Contact Supplier of MSE Wall for repairs. Anthony Stakston discussed a tipping MSE wall at STH 29 & STH 13, and looking at potential repairs.
Action: Anthony needs to send pictures to Lee Schuchardt of tipping MSE walls for repair recommendations and data collection.

Meeting was stopped at 3:30 PM at this location. The remainder will be discussed at the next meeting in late February / early March.

- 7. Other Structures: Sound/Noise Barrier (N), Miscellaneous Structure(M), Roadway Lighting Structure (L), Signal Sign Bridge(G) & Impact Protection Systems
 - a. Definition of Structure (N, M, L & G)
 - i. M – Monument, Railing on Retaining Wall, Stormsewer Structures
 - b. Inspection Form:

- i. Sound/Noise Barrier: DT 2021
 - ii. Roadway Lighting Structure: DT 2019
 - iii. Impact Protection Systems: DT 2023
 - iv. Signal Sign Bridge: DT 2018 (Sign Bridges – S)
 - v. Ferries & Ferry Terminals: DT 2024
 - vi. Truck Weigh Scale Structures: DT 2025 – Bob Sproel (BHM) inspects with consultants?
 - vii. Miscellaneous Structure:
 - 1. Stormwater Structures (Michelle Reynolds & Stormwater Engineer)
 - c. HSI
 - i. BOS Contact for Revisions
 - ii. Updates
 - d. Local Coordination for Inspections
 - e. Construction Issues
 - f. Maintenance
- 8. Training
 - a. CWI – Certified Welding Inspector (February, 2015 & Deadline – January 19, 2015)
 - b. NHI: Inspection and Maintenance of Ancillary Highway Structures
 - c. Ancillary Structures QA & QC
- 9. Regional Issues – Ancillary Structures Engineers & Central Office
 - a. Request for Structure Numbers Form – Statewide Form

NEXT MEETING: late February/ early March

STATE based on HSI (12/4/14)

SW Region:

C: 1,887
R: 200
S: 450
N: 3
M: 0
L: 0
G: 90

SE Region:

C: 99
R: 308
S: 874
N: 31
M: 0
L: 7
G: 595

NE Region:

C: 551
R: 139
S: 436
N: 18
M: 0
L: 0
G: 55

NC Region:

C: 435
R: 109
S: 106
N: 1
M: 3
L: 0
G: 37

NW Region:

C: 4182
R: 57
S: 201
N: 1
M: 0
L: 0
G: 1

Item:	Maximum Inspection Interval	Chapter Number and Title
Traffic Operations Structures: Steel Trusses Aluminum Cantilever Trusses Traffic Operations Appurtenances: Structure Mounted Signs, Monotubes, Mast Arms, Monitoring Poles	48 months 24 months 48 months	Chapter 2: Traffic Operations Support Systems
Roadway Lighting Structures: High Mast Light Towers Roadway Lighting Appurtenances: Luminaire Arm Light Poles>50 feet	48 months* 48 months	Chapter 3: Roadway Lighting
Retention Structures: Retaining Walls <5 feet exposed height ≥5 feet exposed height Dockwalls	No regular interval 48 months* 48 months*	Chapter 4: Earth Retention Structures
Noise Barrier Structures: All Structures	48 months*	Chapter 5: Noise Barriers
Culverts: 20 feet > structure length > 10feet 10 feet > structure length > 5feet Tunnels:	48 months 48 months 24 months	Chapter 6: Culverts & Tunnels
Impact Protection - Water: All Systems Impact Protection - Land: All Systems	60 months ** 60 months **	Chapter 7: Impact Protection Systems
Structures Over Roadways: All Structures	24 months	Chapter 8: Other Structures over Roadways
Ferries: Ferry Terminals:	12 months 60 months	Chapter 9: Ferry Terminals
State Patrol Facilities: Weigh Scale, Pit and Appurtenances	48 months	Chapter 10: Truck Weigh Scale Structures

* 24 month interval for structures that would encroach on the roadway, roadside, publicly used areas or private property.

** An Impact protection system shall be inspected during the inspection of the adjacent structure that it is protecting or after damage from impact.

Figure 4.1.2-1: Recommended Inspection Intervals for Miscellaneous Support Systems.

Definitions per Structures Inspection Manual, 2003

Sign Structures (S):

There are four basic types of overhead support structure used in the State of Wisconsin: the simple-span sign support, the cantilever sign support, the single pole or “Butterfly” sign support, and the structure-mounted sign support frame.

Other Overhead Support Structures:

Long Mast Arm:

Mast arm structures are comprised of a single cantilever support post and a single cantilever arm.

Trombone Arm:

Trombone arms are comprised of two members clamped to the single cantilever support post.

Roadway Lighting Structure (L):

A structure is used to increase visibility at night. The two primary roadway lighting structures are high mast light towers and light poles. High mast light towers are considered structures, while Wisconsin Department of Transportation (WisDOT) categorizes light poles as structural appurtenances. Structure numbers are only assigned to high mast light towers.

Retaining Walls:

There are four main types of earth retention structures, which are defined by how they create stability. These structures are often referred to as walls and include: Rigid or Gravity; Cantilever; Anchored; and Mechanically Stabilized Earth (MSE).

Earth retention structures have an “R” number (RW for some older walls) assigned if the vertical height from the top of the footing to the top of the wall is greater than 4 feet at any point along the structure’s length. This is true for all newly constructed walls; however, older walls may not necessarily have been assigned numbers. It is recommended, particularly if the exposed vertical height is greater than 5 feet, that these structures be inspected at intervals not to exceed 48 months.

Noise Barriers:

Noise barriers are generally classified into two categories: Ground-Mounted and Structure-Mounted.

Ground-mounted noise barriers are appurtenances founded on soil. There are three basic types in this category: Noise Barrier Berms; Noise Barrier Walls; and a combination of the two.

Structure-mounted noise barrier walls are systems attached to a structure or integrally constructed with the structure.

Culvert Structures:

Culvert structures are those from 10 feet up to 20 feet in span length.

Pipe Culverts:

Pipe culverts are those from 5 feet up to 10 feet in span length. Pipe culverts are not necessarily round in shape.

Culverts that meet any of the following criteria shall be inspected:

1. Any culvert with a hydraulic opening of approximately 25 square feet or greater **for each cell or barrel.** This corresponds to a 5 foot by 5 foot cell, or a pipe with a diameter slightly greater than 5 feet. Openings of this minimum size can generally be entered by an inspector with proper equipment.

Impact Protection Systems:

Impact Protection Systems are structural appurtenances that are often located adjacent to structures, such as bridges and traffic operations support systems.

It is recommended that Impact Protection Systems be inspected at the time the associated structure is inspected, but at intervals not to exceed 60 months.

Waterway Impact Protection Systems:

Cell Dolphins
Pile Cluster Dolphins
Fender Systems – Independently Supported & Substructure Supported
Jetties
Floating Protection Systems – Cable Net Systems, Anchored Pontoons, Camels.

Roadway Impact Protection Systems

Cable Guard
Steel Plate Beam Guard
Crash Cushions and Impact Attenuators
Concrete Barrier Walls
Concrete Crash Walls

Other Structures Over Roadways:

Railway Bridges: Supplemental Inspections Only.

Pedestrian Bridges: Pedestrian bridges over roadways should be inspected at a 24-month maximum interval with interim inspections for problem areas.

Pipelines: Pipelines should be inspected at 24-month intervals with interim inspections for problem areas.

Ferries and Ferry Terminals:

There are currently five ferry lines in the State of Wisconsin. The ferries operate between Cassville, WI and Turkey Creek, IA on the Mississippi River; between Bayfield, WI and LaPointe Harbor, WI on Lake Superior; between Manitowoc, WI and Ludington, MI on Lake Michigan; between Merrimac, WI and Okee, WI on the Wisconsin River; and between Northport, WI and Detroit Harbor, WI on Green Bay. The Merrimac line is owned and operated by the State, the Cassville line is owned and operated by the Village of Cassville, and the remaining three are privately owned and operated. The Wisconsin Department of Transportation (WisDOT) is responsible for inspecting and maintaining all ferry terminals, or docking facilities, located on the Wisconsin ends of the ferry lines, as well as the Merrimac ferry vessel itself. The Merrimac Ferry on-board vessel inspection is unique because it is a cabled-vessel, thus it is inspected by WisDOT personnel instead of United States Coast Guard (USCG) personnel.

It is recommended that the land based ferry terminals be inspected above and below water on an interval not to exceed 60 months. The ferry vessels should be inspected on an interval not to exceed 12 months. It is also recommended that the operator of the vessel perform a cursory inspection once a month while the vessel is in operation. Free-floating vessels shall be inspected per USCG regulations. Although all free-floating vessels are required to be inspected in accordance with USCG and American Bureau of Shipping (ABS) standards on routine intervals, it is recommended that the WisDOT representative also be present during the vessel inspection or review the vessel inspection reports as part of the WisDOT's overall inspection program.

Truck Weigh Scale Structures:

Truck Static Weigh Scale Structures are the main component of the Safety and Weight Enforcement Program run by the Wisconsin State Patrol. Safety and weight enforcement facility infrastructure is managed and maintained by the Bureau of Highway Operations and their agent. There are thirteen Weight & Inspection Facilities located in the State, shown in Figure 4.10.1-1.

It is recommended that Truck Weigh Scale Structures be inspected, for structural integrity, at intervals not to exceed 48 months.

Highway Maintenance and Roadside Management staff will coordinate with appropriate Region Bridge Maintenance Engineers to have these structural inspections completed within prescribed timeframes. Region Bridge Maintenance Engineers will forward completed inspection reports to Highway Maintenance and Roadside Management staff.