Meeting Minutes - Ancillary Structures Workgroup

Madison, WI – SW Region WisDOT
November 17, 2015 (9:30 am – 3:30 pm)

Attendance:

Anthony Stakston	Steve Katzner	Kyle Harris	Jay Hille
Dave Bohnsack	Pat Gavinski	Rick Marz	Ahmet Demirbilek
Joanna Bush	Tom Heydel	Travis McDaniel	Vu Thao
Joan Bonack	Ben Koeppen	Aaron Bonk	Brady Rades
Jason Zemke	Alex Crabtree	Ann Marie Kirsch	Derrin Wolford
Leah Barsch			

1. Introductions

2. Transportation Asset Management Plan (MAP-21)

a. TAM plan is required to be completed and certified by FHWA by October 1, 2016.

Sponsors:

Aileen Switzer	DTIM Administrator
Joe Nestler	DTIM Deputy Administrator
Joe Olson	DTSD Administrator
Dewayne Johnson	DTSD Deputy Administrator – Regions
Rebecca Burkel	DTSD Deputy Administrator – Bureaus

Steering Team:

Scot Becker	DTSD Director Bureau of Structures (chair)
Steve Krebs	DTSD Director Bureau of Technical Services
Rose Phetteplace	DTSD Director Bureau of Highway Maintenance
Jeff Gust	DTIM Director Bureau of State Highway Programs
Colleen Harris	DTSD Director NE Region
Don Gutkowski DTSD	Director Bureau of Traffic Operations
Kirk Fredrichs	FHWA Wisconsin Division
Angela Adams	SW Region Deputy Director
	Liaison to/from NCHRP Pooled Fund Study

b. Workgroups:

i. Roadway Pavement & Bridge Assets (Phase 1)

ii. Roadway Features (Phase 2) – BHM (Jim Hughes)

- Salt Storage
- Culverts
- Cable Barriers
- Crash Cushions
- Ramp Gates

iii. Roadway Assets (Phase 2) – BHM (Dan Mulder)

- Rest Areas
- Waysides
- SWEFs
- VWIMs
- Park & Rides,
- Truck Parking

iv. Traffic Features (Phase 2) – BTO (Bill McNary)

- Overhead signal structures w/trombone arms,
- Roadway luminaire arm light poles,
- Miscellaneous traffic operations structures,
- Camera mounted structures and
- Ramp meter structures

v. Structures (Phase2) – BOS (Rick Marz)

- Sign Bridges (S)
- Monotubes (G)
- Small Bridges (C)
- High Mast Lights (L)
- Retaining Walls (R)
- Noise Barriers (N)

If you are interested in more information regarding the workgroups please visit the SharePoint website and look under DTSD Asset Management. Or contact one of the steering team members above.

3. Short Bridges (C-Structures)

a. Updates on action Items from March, 2015 Meeting:

i. Revise Inspection Field Manual for Culvert Liner Definition (Dave Genson):

Revision has been submitted to Ben Koeppen and will be included in 2016 Inspection Field Manual.

ACTION - ALL: Any additional field manual comments should be submitted to Ben by January 1, 2016 for inclusion in the reprint this spring.

ii. Definition of C Structure (Dave Genson & Al Johnson).

- Effective date of new definition?
  Revised Definition:
  Small Bridge Structures require a unique structural design and have a clear opening of 20 ft or less measured along the centerline of roadway. This includes:
  - *Bridge like structures (i.e. Deck Girders, Flat slabs, etc.)*

- *Single and multi-cell box culverts (with opening 20 ft^2 or greater)*
- *Arches*
- *Rigid frames*
- *Structures without a floor slab*

Structures meeting this definition will be inventoried in the Highway Structures Information System (HSI), managed by the Bureau of Structures (BOS), and inventoried / inspected under the direction of the Regional Ancillary Inspection Engineers.

Changed definition to read: This includes, but is not limited to; Bridge like structures, single and multi cell box culverts (opening of 20 ft^2 or greater)

All arches, including steel plate pipe arches, are C-structures in the new definition.

ACTION - ALL: Request from BOS Maintenance for a new name for C structures that does not include culvert in the name. If you have any suggestions please forward to Travis McDaniel by December 1st, 2015.

Case by case decisions required on large culverts or structures installed via SPV (Gray area)

Discussion regarding the inspector requirements for C structures. Ben Koeppen was going to review the FHWA Online class for a shortened training for Team Members – SET, etc.

ACTION – Travis McDaniel: Policy Memo on final definition will be written by Travis McDaniel and sent in December of 2015 for an effective date of January 1st, 2016.

- What is the process for the existing C structures that do not meet this definition?
  - Transfer to Roadway Culvert (BHM – Roadway Maintenance) to inspect & Remove from HSI.
    Existing structures in HSI that do not meet the new definition will not be deleted, but will have status code changed such that these structures will not show up on future reports. As such, old numbers cannot simply because the culvert no longer falls into the definition of a C-structure.

    This will be completed after the policy memo is approved. BOS will have to coordinate with BHM to transfer the existing C structures that do not meet the new definition from HSI to the BHM Roadway Culvert Database per Region.

- M numbers for custom designed headwalls by BOS for "roadway culverts"?
  M number inspection frequency will be left up to the region program manager. Though inspection could/should occur through BHM and be recorded with the culvert in question.
  M structures represent a variety of miscellaneous structures in HSI.

b. Inspection Form: DT 2022 (NOT CURRENT) – USE HSI Form.
   It was requested that the inspection form be reduced to save paper.

Action: Travis McDaniel Look at reducing the form length in HSI for field inspections. He will send out a "reduced" for in spring for Inspectors to comment on.

c. HSI

i. Statewide Small Culvert Inspection Program (PILOT)
- Awaiting approval from DOA on procurement of database software.

ii. Updates –

Inspector Qualifications – Keep minimum qualification as Team Member, and leave up to Program Manager in Region to determine appropriate training for team members to adequately inspect. Could be either NHI Online Inspector course (14 hours) or field inspections with Team Leader (on the job training).

- If consulting out, should refine scope to require a Team Leader to ensure training requirements and experience are met.

d. Construction Issues
In some circumstances soil borings for large culverts may need to be completed during the design phase. E.g. C-21-06, STH 32 over Swanson Creek, Forest County

e. Maintenance

i. LOS for C Structures Workgroup – Waiting for determination and verification of C Structure Definition from Ancillary Structures Workgroup.

ACTION - Travis McDaniel: Once the revised C Structure Definition is approved, Travis will notify Tom Goodwyn to determine on moving forward with adding C Structures to the LOS Model. Possible discussion with adding R, N, and other ancillary structures to model as well.

4. Noise Wall (N)

a. Definition of N Structure

i. Structure Inspection Manual:

Noise barriers are generally classified into two categories: Ground-Mounted and Structure-Mounted. It is recommended that Structure-Mounted Noise Barriers be inspected during the routine inspection of the supporting structure. It is also recommended that Ground-Mounted Noise Barrier Walls be inspected at intervals not to exceed 48 months.

There are three subcategories for both Structure-Mounted and Ground-Mounted noise barriers: Double-Sided Sound Absorptive Noise Barriers; Single-Sided Sound Absorptive Noise Barriers; and Reflective Noise Barriers.

ii. Bridge Manual:

WisDOT has classified all noise walls (both proprietary and non-proprietary) into three wall systems. All proprietary systems must be pre-approved prior to being considered for use on WisDOT projects. The three noise wall systems that are considered for WisDOT projects include the following:

1. Double-sided sound absorptive noise barriers
2. Single-sided sound absorptive noise barriers
3. Reflective noise barriers

ACTION - Rick Marz: Discussion regarding R numbered structures on Private Property and the need for a signed permit/agreement to be included in the HSI file folder. Rick Marz was going to look and see if he can find the email stating the DOT will not maintain Retaining Walls / Noise Walls on Private property. Believes Jan Kinar had some guidance 10+ years ago.

b. Inspection Form: DT 2021
The new inspection form is in the test version of HSI and should be available for use with the spring update.

i. Draft Updated Inspection Form (SE Region – Jason Zemke)


DRAFT noise wall Inspection Form1.xls


Draft Inspection Forms - Summary of (

- Defects: Number of Defects in HSI (Complete or Abbreviated List)

- How do we capture post LET information (Contractor, Fabricator, Post LET Designed Structures – e.g. MSE Walls, Modular Block Retaining Walls).

  Fabricator, manufacturer, and post let design information needs to be captured with the initial inspection.

  Revise Statewide Pantry Form, and Statewide Finals Box Checklist. Item for discussion at Region Construction Conferences.

- Do we combine Retaining Wall & Noise Wall Forms?

  The form has been combined.

c. HSI

i. Structure Inventory Forms: Are they up-to-date? Including Fabricator / Manufacturer.

Fabricator and manufacturer information is now included in HSI. Should be up and running by March, 2015.

Action – All. Discussion regarding having a consultant contract for Ancillary Structures (R, N, C, etc.). Need to get an idea of the number of structures, time required to complete inspection. Get info to Dave Genson ASAP. NC indicated no need, SW-Madison is still working on inventory.
SE will have a consultant solicitation in early 2016 to get initial inspections of most of the remaining N, R, and C structures that were not included on the SE Regions 2015 Inspection Contract.

ii. Updates

d. Local Coordination for Inspections
Action – BOS Bridge Management? Local program managers may be trained to capture initial inventory information for walls for DOT lets. This should be completed prior to the 2016 Construction Season.

e. Construction Issues
   i. NONE

f. Maintenance
   i. NONE

5. Retaining Wall (R)

a. Updates on action Items from March, 2015 Meeting:

   i. Add the element for cut /fill for each retaining wall to HSI.
   Will be in HSI by March 2016.

b. Definition of R Structure

   i. Structure Inspection Manual:

   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.

   ii. Bridge Manual:

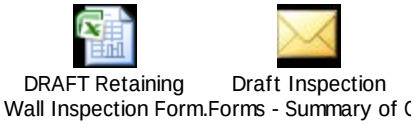
   Permanent retaining walls that are designed for a design life of 75 years or more should be identified by a wall number, R-XX-XXX as assigned by the Region unless otherwise specified below. For a continuous wall consisting of various wall types, the numbering system should include unit numbers so that the numbering appears as R-XX-XXX-001, R-XX-XXX-002, and so on. The first two digits represent the county the wall is located in and the next set(s) of digits represent the undivided wall.

   Retaining walls whose height exceeds the following criteria require R numbers:

- Proprietary retaining walls (e.g., modular block gravity walls, MSE walls, etc.):
    - MSE walls having a maximum height of less than 5.5 ft. measured from the bottom of wall or top of leveling pad to top of wall are deemed to be “minor retaining walls” and do not require an R number. Refer to FDM 11-55-5.2 for more information.
    - Modular block gravity walls having a maximum height of less than 4.0 ft. measured from the bottom of wall or top of leveling pad to top of wall are deemed to be “minor retaining walls” and do not require an R number. Refer to FDM 11-55-5.2 for more information.
- Non-proprietary walls (e.g., cast-in-place, sheet pile, and all other wall types other than those previously referenced):
    - Walls having an exposed height of less than 5.5 ft. measured from the plan ground line to top of wall may require an R number based on specific project features. Designer to contact the Bureau of Structures region liaison for more information.

c. Inspection Form: DT 2020

i. Draft Updated Inspection Form (SE Region)



- Defects: Number of Defects in HSI (Complete or Abbreviated List)
- How do we capture post LET information (Contractor, Fabricator, Post LET Designed Structures – e.g. MSE Walls, Modular Block Retaining Walls).
- Do we combine Retaining Wall & Noise Wall Forms?

d. HSI

i. Structure Inventory Forms: Are they up-to-date? Including Fabricator / Manufacturer.

ii. Updates

e. Construction Issues

f. Maintenance

6. Training

a. CWI – Certified Welding Inspector (February, 2016)

b. NHI: Inspection and Maintenance of Ancillary Highway Structures

c. Ancillary Structures QA & QC – 2016 Construction Season

ACTION – ALL. To set up training contact Dave Genson and Kristin Revello.

7. Regional Issues – Ancillary Structures Engineers & Central Office

a. Request for Structure Numbers Form – Statewide Form (Anthony Stakston)

ACTION – Anthony. Need to verify existing structure is on forms.

b. Ownership / Maintenance Responsibilities of Ancillary Structures constructed under DOT projects but will not be DOT owned. There are two kinds:

i. Those that have already been constructed without ownership identified. Notification to the local government with a permit or agreement is needed. Even if the permit or agreement is not signed, it should be written up and a copy sent to the local government establishing ownership.

ii. Those that are in the planning and design phases. Those that will be constructed should have an agreement that is signed by the local unit of government so they know they will be the owner. This is especially important for projects that involve roadway connections to WIDOT facility. Normally, DOT projects go back onto a sideroad "X" number of feet. Sometimes there are structures constructed in this area – ownership needs to be established early in the design process.

State Maintenance Agreement (SMA) – Look into modifying SMA to specify ancillary structures similar to bridges (Anthony Stakston). – Jurisdictional Transfer

DT 1504, Application/Permit for Connection to State Trunk Highway is a permit used to show municipalities they are responsible for their structures on their roadways even if built under a DOT project.

BOS Maintenance is looking into adding the Maintenance Agreements into HSI for border bridges, connecting highway structures, etc.

8. Sign Bridge (S) & Signal Sign Bridge(G)

a. Updates on action Items from March, 2015 Meeting:

i. BTO Electrician Checklist for Traffic Signals - Non S Structures(Joanna Bush):
Joanna working with Regions on this.

ii. Adding elements of who installed and who manufactured sign and signal structures in HSI .

Will be available with the spring version of HSI.

iii. Connecting Highway Sign Structures - If shield is located on the arm then it is WisDOT maintenance jurisdiction. If route marker on post then the structure still belongs to the locals (Anthony Stakston). Agreed.

iv. FY 2016 Let Contract for Sign Repairs/Replacements (SE, SW & NW and NE & NC).

v. SPVs for Rehab/Repairs (Vu Thao & Aaron Bonk):

Proposed Timeframe:
Draft: Late February / Early March
Review (BOS & BTO Staff): March / April
Completed: June / July

50% Complete and Draft should be completed by March, 2016.
SE Region 2016 let contract is a December 2015 PS&E and therefore, they are using present SPV's for Pay Items.

- Proposal for tightening anchor bolts on existing structures (SPV) to be included in 2015 Critical Sign Repair Contract. (Vu Thao).

ACTION – ALL. Send items to Vu Thao for 2016 Let Contract to verify any major revisions need to be added in this let contract for an SPV.
All Anchor Rods to be tightened – New nuts and Washers.

b. HSI

i. Revising the Feature On: in HSI from Sign Bridge (Majority), Single Sign Pole, Trombone Arm, Sign Monotube Cantilever, Overhead Support Sign, Signal Monotube, etc.

ii. Maintenance Items – Priority of Repairs and Estimated Costs for Repairs

ACTION – ALL. Comments should be submitted to Travis by January 1, 2016.

iii. Is there a need for the separate designations (S vs G) in HSI?
- Separate designations will be kept in HSI for now. Reminder to group to check both G and S when running reports for all.

iv. Shop drawings need to be included in HSI through submittal from Project Leader to Consultant Inspector / Ancillary Structures Engineer. – Same process as described in Noise/Retaining Walls. Will be addressed in spring construction meetings and regional materials guides and construction field guides.
Kristin Revello spoke on this at Design/Construction Teleconferernce. BOS is not getting shop drawings or inventory forms. Information coming in primarily from in-service inspectors.

v. Additional Updates

c. Local Coordination for Inspections

i. Permits for Sign / Signal Structures on State Roadways
- Need to include the permit in the HSI File Folder.
- Same requirements as DOT Sign Structures.

ii. Local Sign Structures – Sign Structure designed/constructed under any **DOT let project** would be assigned an S number to be tracked in HSIS, and an initial inspection would be completed by our consultant but the initial inspection would be charged to the project ID. Afterwards this information would be provided to the owner / maintainer (City, Village, Town, or County) for future inspections / maintenance.
- Anything installed on DOT R.O.W. by LET or Permit needs to follow DOT spec.

iii. Connecting Highways and Local Streets per TGM 2-15-52: NEED TO CLARIFY #2.

- On connecting highways WisDOT maintains only route markers and trailblazer assemblies, including overhead guide signs that contain interstate, U.S. and State route shields and their associated overhead sign supports or sign bridges. For any overhead guide signs that exclusively contain business route signing, the local unit of government would maintain the sign and associated overhead sign support.

- 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.

  - Guidance can be found in the Traffic Guidelines Manual (TGM) per Tom.

d. Construction Issues: DT2113, DT2114, DT2321, DT2322

i. Washer installation between Post / Mast Arm Connection and Suppliers (Regional Ancillary Structure Engineers) - Valmont.

- For construction projects, the Project Leader shall notify the contractor in writing that the washers are not acceptable. (USH 41 Projects)
- Has been addressed and no issues noted in the 2015 construction year.

ii. Option to bring Type 10 & 13 base designs into BOS and requiring special sheets in the plans for these structures designed by structural engineers (Alex Crabtree & Vu Thao).

- No action at this time. USH 441 project had the bases designed by a Structural Engineer due to conflicts with the wings on Type 13 bases.
- Corrugated pipe & steel casing are the only allowable stay-in-place form and needs to be approved by Alex Crabtree.
  - There is also a spread footing that Alex can approve (6.5’ x 6.5’).
- Update on new guidance for installing Type 10 & 13 bases (Alex Crabtree). Change in SDD – anchor bolts Type 13 – 10” and Type 10 – 9”.
- Discussion regarding STH 54 / CTH QQ Signal Monotube Failure (See Report).

Follow section 502 if a cold joint occurs during pouring. Watch for water table elevation on signal bases and sluffing of soils. Contact Alex Crabtree.

iii. Structure Inventory Form (Sign Structures) – Responsibility of completing and submitting to BOS for HSI / Fabrication Unit.

ACTION – Travis. Contractor Design Only. Travis to check with Fabrication Unit to see how they want these to be submitted. Need to capture this post-let information.

- NC Region Final Construction Checklist, and other regions Final Construction Checklists
- Revise TSS Project Testing Guide for Sign Structures to specify the calculations/computations should be submitted to BOS.
- Additional structures: Retaining Walls, Noise Walls, etc.

iv. Initial Consultant Inspections

- Under designed Sign Structure - 2 chord vs 4 chord (Kyle Harris)
  - Should the consultant inspector be verifying the sign structure was built in accordance to the contract plans?

  - Making contact plans and shop drawings available to inspector. Is it a requirement for inspector to re-drawing the structure and seal with PE stamp when plans are available? Is this an extra cost? See attached example.


Short-term – Collins reviews sign bridge shop drawings for SE and bills back to the construction contract let ID. Approximate Cost $350.00 per Sign Structure Review by Consultant Contract (Collins, Fish, Lambstar).

v. Bucket – Contractor vs. Electrician

- Adding Special Provision for all Sign Structures & Signal Monotubes to require access equipment for inspection similar to Structure Repainting General (Dave Genson & Dave Bohnsack).

C.2 Inspection

Supplement standard spec 105.9 as follows:

Furnish, erect and move aerial lift ~~scaffolding~~ and other appropriate equipment to permit the inspector the opportunity to closely observe all affected surfaces. The aerial lift ~~scaffolding~~, with appropriate safety devices, shall meet the approval of the engineer.

517-005 (20030820)

e. Maintenance

i. Verify the SWEF repairs were completed through the 2015 Sign Repair Contract (Bob Spoerl & Matt Rauch).

ii. FY 2017 Let Contract for Sign Repairs/Replacements – Separate Meeting?

ACTION – Travis. A meeting will be scheduled for January, 2016 regarding the 2017 projects, and future maintenance and replacement program. Travis will meet with Matt Rauch, Rick Marz, and David Genson to see what the process is and then a teleconference with Regional Ancillary Inspection PM's will be set up in Early January.

f. Work Orders – Process to verify Project IDs are authorized prior to charging. (Ben Koeppen) Include project LET date with list of initial inspections sent to Ben so he knows when to submit the work orders.

ACTION – ALL. Training – If the Regional Ancillary Structure Engineer sees a need for the Bolt Tightening Training please contact Carla Principe & Dave Genson to schedule the training for Winter/Spring 2016.

9. Other Structures: Miscellaneous Structure(M), Roadway Lighting Structure (L) & Impact Protection Systems

a. Updates on action Items from March, 2015 Meeting:

i. Impact Protection Systems: DT 2023 – Transfer ownership from BOS (Dave Genson) to BHM (Al Johnson).

ii. Ferries & Ferry Terminals: DT 2024 – Verify ownership and if any current inspections are performed. Need to discuss with Rails & Harbors (Travis McDaniel)

ACTION – Travis: will discuss with Rails/Harbors and get guidance.

Cassville Ferry: SW Region-La Crosse
Merrimac Ferry: SW Region-Madison
Bayfield Ferry: NW Region
Manitowoc Ferry: NE Region
Door County-Washington Island Ferry: NE Region

<u>Ferries not in Structure Inspection Manual Part 4, Chapter 9</u>
Milwaukee Ferry: SE Region
Rock Island – Karfi Ferry (People Only): NE Region

iii. Truck Weigh Scale Structures: DT 2025 (Bob Spoerl) –

- Need BOS direction on privately owned sign structures that hold WIM sensors regarding consultant inspection, specifically cost reimbursement (Dave Genson).

ACTION - Dave Genson & Travis: will meet with Bob Spoerl and provide an update in spring, 2016.

- Verify BHM (Bob Spoerl) supplied BOS (Dave Genson & Vu Thao) with copies of the sign structure shop drawings for the sign structures located at the SWEFs. ACTION – Travis and Dave. Not completed. Travis McDaniel will contact Bob Spoerl.

- Truck Weigh Scale Inspections completed in 2014 (Travis McDaniel & Bob Spoerl).
  Bridge Manual will be modified to remove Regional Bridge Engineer and BHM will be solely responsible for Truck Weigh Scales.

iv. SIA and Inspection Form for High Mast Lighting, and expected to be completed by the end of the year (Shiv Gupta).

b. Roadway Lighting Structure (L):

i. Updated Structures Inventory Data Form (Shiv Gupta) -
ACTION-TRAVIS will send out a copy of the draft data fields for the new Structures Inventory Data Form for Roadway Lighting Structure. Form to be finalized by January 1st, 2016.

c. Miscellaneous Structure (M):

i. Stormwater Structures (Michelle Reynolds & Robert Armstrong)

e.g. Assigned M numbers for Grit Chambers to be installed under Business 51 in the Village of Plover, Portage County.

- Need to discuss the maximum inspection intervals for grit chambers or other water quality structures (Robert Armstrong).
- Need to discuss who has maintenance authority.
- Need for inspection in HSI can be toggled.
- Need to determine inspection frequency and qualifications.

ii. Dam Structures on DOT ROW (Ann-Marie Kirsch)

d. HSI – Updates

e. Local Coordination for Inspections

f. Construction Issues

g. Maintenance

h. Discussion regarding Pedestrian Structures and inspection responsibilities and documentation in HSI. Request to add separate report for pedestrian bridge scheduling in HSI.

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.