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1.2 INSPECTION PROGRAM OVERVIEW

1.2.1 Introduction

The goal of the Wisconsin Department of Transportation (WisDOT) Structures Inspection Program is to compile accurate inventory and condition data, along with the functional, structural, maintenance, and safety conditions of transportation-related structures in the state in order to provide a safe and economically prudent infrastructure. The information in these records is gathered through thousands of structure inspections conducted at regular intervals. Standardized and consistent methods must be used to inspect and report on these structures if the program database is to be of any substantial use. Without a standardized system of inspection methods, inspection intervals, and inspection reporting systems, the likelihood of vital information being overlooked or misreported increases dramatically. An inaccurate assessment or an overlooked problem can result in increased long-term maintenance costs and the consequences associated with failure of the structure. Therefore, the primary aim of this program is to provide the structure inspector with a framework that promotes consistency and uniformity in the methods used to inspect and document the condition of highway structures throughout the state.

1.2.2 Program Summary

The Structure Inspection Program operates under the directives of the Federal Highway Administration (FHWA) and the WisDOT Bureau of Structures (BOS). The mission of the program is three-fold:

1. Ensure public safety.
2. Provide the most efficient use of resources for maintaining the serviceability of Wisconsin's transportation-related structures.
3. Maintain compliance with all federal and state laws, rules, and policies.

The Structure Inspection Program in Wisconsin is composed of three separate programs: bridges, tunnels, and ancillary structures.

1.2.2.1 Bridge Inspection Program

The WisDOT Bridge Inspection Program is federally mandated and has been in effect since 1971. The policies of the bridge inspection program are based upon the National Bridge Inspection Standards (NBIS) which are published in the Code of Federal Regulations, 23 CFR 650, subpart C. Bridge Inventory data inspection reports and records are warehoused by WisDOT in an electronic database, the Highway Structures Information System (HSIS). Inventory and inspection data from HSIS for all bridges open to public vehicular traffic in Wisconsin are compiled and forwarded to the FHWA in a prescribed format on an annual basis. This submittal to FHWA includes element level data for those bridges requested by FHWA. Refer to the other portions of Part 2 of this Manual for further specific discussions on bridge inspections.

23 CFR Part 650 defines a bridge as:

“A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. Refer to figures 1.2.2.1 – 1 and 1.2.2.1 – 2 for examples on measurement used to define a bridge.

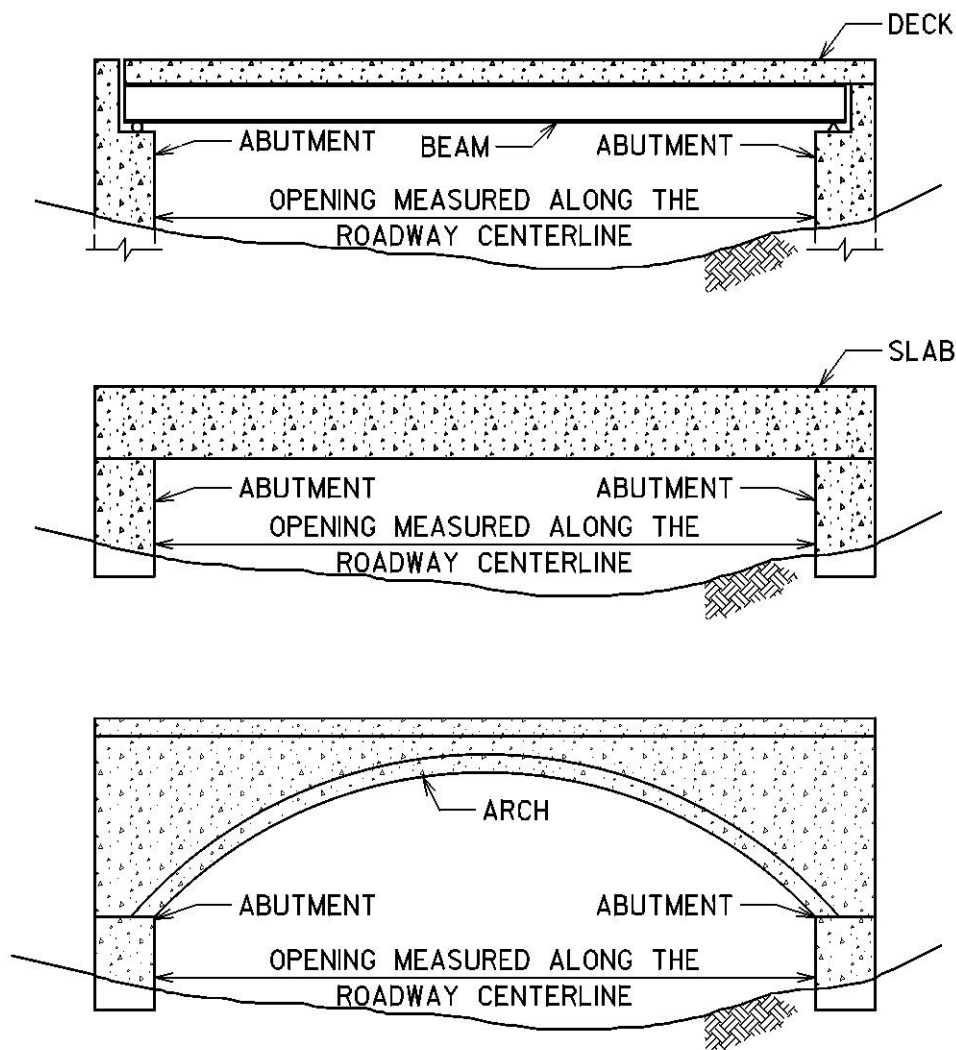


Figure 1.2.2.1-1: Measurement for Definition of a Bridge.

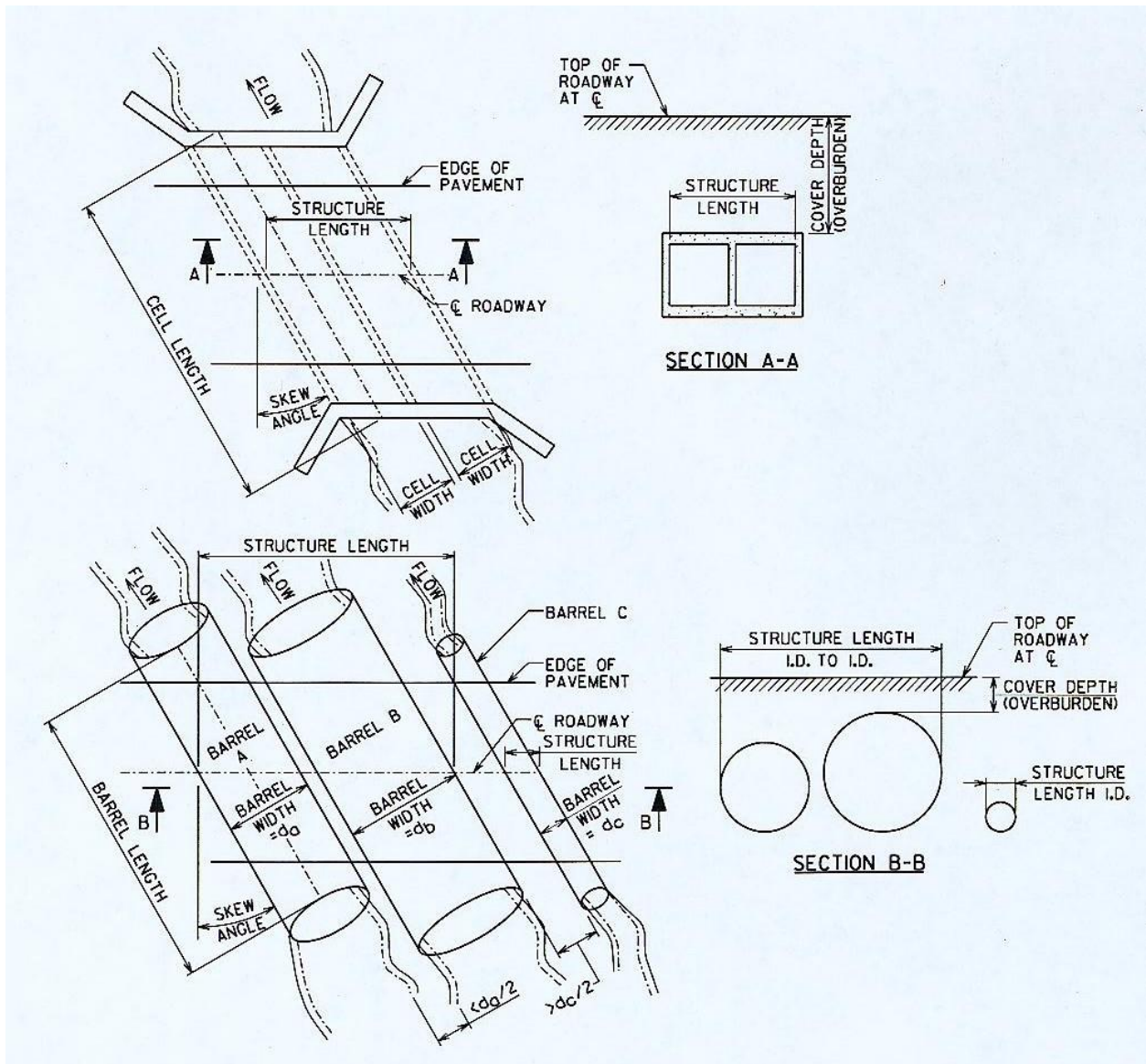


Figure 1.2.2.1-2: Measurement for Definition of a Culvert Structure.

1.2.2.2 Ancillary Structures Inspection Program

There currently is no national standard for the inspection of ancillary highway structures. WisDOT recognizes that neglecting the inspection of ancillary highway structures can result in increased maintenance costs and pose a safety risk to the traveling public. As a result, WisDOT has created a program for the routine inspection and maintenance of State-owned ancillary highway structures. Refer to Part 4 of this Manual for further specific discussions on the inspection of ancillary highway structures.



1.2.2.3 Tunnel Inspection Program

The WisDOT Tunnel Inspection Program (WiTIP) is federally mandated and was developed in 2021. The policies of the tunnel program are based upon the National Tunnel Inspection Standards (NTIS). Tunnel inventory data, inspection reports and records are warehoused by WisDOT. Inventory and inspection data for all publicly owned tunnels in Wisconsin are compiled and forwarded to the FHWA in a prescribed format on an annual basis. Refer to the other portions of Part 5 of this Manual for further specific discussions on tunnel inspections.

1.2.3 Program Leadership and Organization

There are several levels of administration or management for the statewide structure inspection program. WISDOT BOS, more specifically the Chief Structures Maintenance Engineer, is charged with administering the Statewide Structure Inspection Program. Therefore, the Chief Structures Maintenance Engineer also holds the title of Statewide Structure Inspection Program Manager. The Assistant Statewide Program Managers (ASPM), Region Program Managers (RPM), and County Program Managers (CPM) follow under the leadership of the Statewide Structure Program Manager (SPM).

The organization of the state structure inspection program is shown in Figure 1.2.3-1 and described in detail later in this chapter.

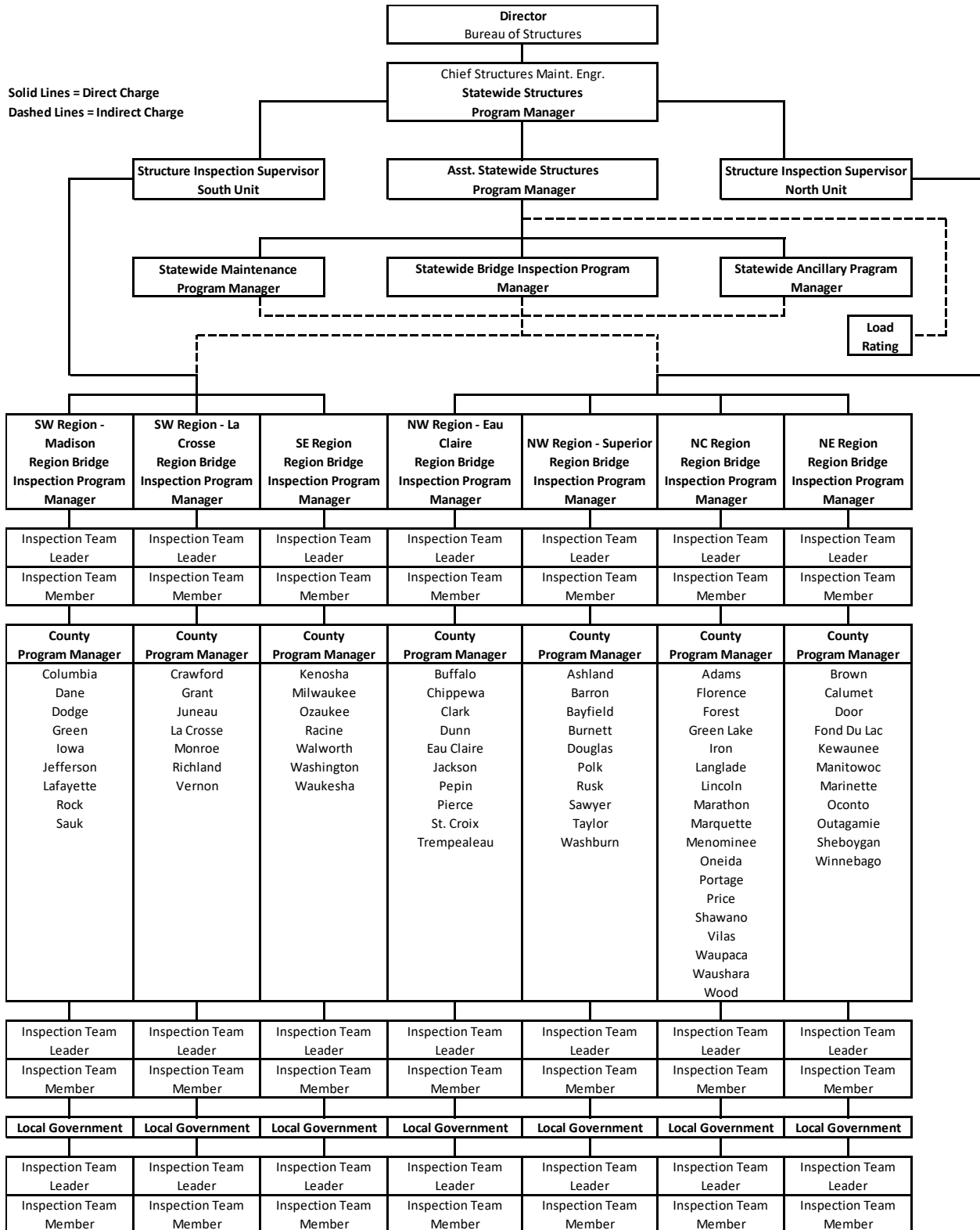


Figure 1.2.3-1: Structure Inspection Program Organization.

**1.2.3.1 Management Qualifications**

For the safety of the public, it is important that qualified personnel inspect Wisconsin's transportation facilities. Structure inspectors are required to render judgments pertaining to the safety and integrity of the structures they inspect. Inspection program managers make important decisions ranging from suggestions regarding the allocation of scarce rehabilitation dollars to the decision to close a major structure. Therefore, it is important that inspectors and program managers are highly trained and adept individuals who understand the mechanics, behavior trends, and economics of a wide variety of structure types. WisDOT has adopted strict criteria for the qualification of structure inspectors and inspection program managers. In addition, all structure inspectors and inspection program managers are expected to be thoroughly familiar with this Manual.

The rest of this chapter primarily deals with the bridge inspection program. For more information on the Ancillary Program, see Part 4. For more information on the Tunnel Program, see Part 6.

The SPM, ASPM, CPM and RPM must have the following minimum qualifications (shown also in Figure 1.2.3.1-1): as detailed in NBIS 23 CFR Part 650 National Bridge Inspection Standards Section 650.309 (a)

1. Either a registered Wisconsin licensed professional engineer or have ten-years of bridge inspection experience that includes a minimum:
 - a. 200 or more bridge inspections over a 10-year period and 5 years of other bridge experience.

OR

 - b. 400 or more bridge inspections over a 10-year period.
2. Complete an FHWA-approved comprehensive bridge inspection training course as described in 23 CFR Part 650 Section 650.309(h) and score 70 percent or greater on an end-of-course assessment. The National Highway Institute (NHI) course "Safety Inspection of In-Service Bridges" (National Highway Institute (NHI) Course Number 130055), or the course "Safety Inspection of In-Service Bridges for Professional Engineers" (NHI) Course Number 130056) are approved courses;
3. Complete a cumulative total of 18 hours of FHWA approved bridge inspection refresher training over each 60-month period.
4. Maintain documentation supporting the satisfaction of the above requirements.

| LEVEL | QUALIFICATIONS | COMMENTS |
|-------|----------------|----------------------|
| SPM | | WisDOT Policy & NBIS |
| ASPM | | |



| | | |
|------------|---|--|
| RPM CPM | Registered Wisconsin licensed professional engineer, Or have ten-years of bridge inspection experience as described above; Successfully complete NHI 130055 “Safety Inspection of In-Service Bridges” or NHI 130056 “Safety Inspection of In-Service Bridges for Professional Engineers”; Complete a cumulative total of 18 hours of FHWA approved bridge inception refresher training over each 60-month period; Maintain documentation supporting the satisfaction of the above requirements. | |
|------------|---|--|

Figure 1.2.3.1-1: Program Manager Qualifications

Statewide Inspection Program Manager

The Statewide Program Manager (SPM) is responsible for the organizational unit management of structure inspections, inventory, and reporting. The SPM is responsible for the overall supervision of the inspection teams in the field. The SPM advises on technical issues concerning problems or deficiencies discovered during the inspection. The SPM also assists the Assistant Statewide Program Manager (ASPM) or Inspection Team Leader (ITL) to determine what, if any, maintenance or repair actions are appropriate. Decisions regarding load posting and long-term bridge closures require the approval of the SPM or delegate.

A sound background in structure inspections, rehabilitation, and maintenance is required for the SPM to be an efficient and effective manager. On occasion, specialized knowledge and skills in fields such as structural design, construction, mechanical systems, electrical systems, soils, construction materials, and emergency repair techniques will be required.

The SPM is the liaison between the FHWA and WisDOT. The SPM is responsible for ensuring that WisDOT complies with Federal directives regarding structure inspection and maintenance. This includes making sure that all structures are inspected at the proper intervals and that the state structure files are kept up-to-date and accurate. This person is responsible for the Leadership and overall management of the statewide structure inspection and inventory program, statewide structure load posting program, statewide structure maintenance program, and statewide training of structure inspectors. The SPM has overall responsibility for personnel supervision; scheduling of structure inspections, maintenance, securing inspection and repair specialists; and scheduling the use of WisDOT-owned underbridge access machines. The responsibilities of this position that pertain directly to structure inspection and maintenance are described in more detail below:

1. Program leadership and management of the statewide structure inspection, inventory, and maintenance programs.



- a. Monitor federal structure inspection requirements and recommend policy changes to assure that Wisconsin's program complies with all federal directives.
 - b. Ensure that inspection data is uploaded to centralized data file within mandated timeframes.
 - c. Review and confirm that all structures in the state are inspected at an interval and by a method consistent with the National Bridge Inspection Standards, Section 84.17 SS, and Administrative Rule Trans. 212.
 - d. Leadership and the oversight of quality assurance reviews of region and local (County) inspection program operations and bridge inspectors. Coordinate with federal, state, and local governmental agencies.
 - e. Leadership and management of special inspection and in-depth inspection programs for structures with nonredundant steel tension members (NSTM), underwater members or unique or special features requiring additional attention during inspection to assure the safety of such structures.
 - f. Conduct annual inspections of state border bridges in company with the respective state's personnel and region offices to determine required maintenance efforts or other courses of action and then lead the effort to accomplish Wisconsin's portion of the required maintenance or action.
 - g. Negotiate and coordinate updates to border bridge agreements with bordering states on the inspection, maintenance and repair of border bridges. Responsible for budgeting, tracking, and invoice approval for work performed by bordering states on Border Bridges.
 - h. Manage and provide oversight of the moveable bridge aid programs.
2. Program leadership and management of the statewide load posting program.
 - a. Oversee monitoring of the signing of bridges statewide that require load posting.
 - b. Review and confirm that load posted structures receive required inspections as required by federal and state laws, rules, and policy.
 - c. Oversee quality assurance reviews with personnel from region offices and local units of government to assure that proper signing is in place for structures that require load posting.
3. Leadership and management of related programs.
 - a. Coordinate and provide technical support for the inspections and repairs of the Merrimac Ferry to ensure safe and available service to the traveling public.
 - b. Act as liaison between the Bureau of Transit, Local Roads, Railroads and Harbors and the BOS to accomplish the state-owned railroad bridge inspections.



- c. Work with staff and regions to furnish inspectors to accomplish the above.
 - d. Assist Regional Program Manager (RPM) in arranging vehicles and equipment as necessary for additional testing of railroad bridges.
 - e. Manage a technological transfer program for inspection of bridges and ancillary structures on the state-owned short line railroads.
 - f. Coordinate and provide technical support for the inspection and certain maintenance activities involved with weigh scale buildings, pits, and platforms.
- 4. Training of statewide bridge inspection, maintenance, and repair specialists to perform their duties.
 - a. Develop, monitor, and update training programs for state, county, city, village, town, and private consultant structure inspectors in bridge inspection, maintenance, and repair techniques.
 - b. Arrange or conduct structure inspection, maintenance, and repair training programs throughout the state.
 - c. Assist the region offices in giving refresher structure inspection and maintenance training programs.
- 5. Leadership and management of bridge inspection, maintenance, and repair personnel.
 - a. Manage structure inspectors, structure inspection specialists, and structure repair specialists to meet the needs of the statewide structure inspection and repair program.
 - b. Manage the WisDOT-owned under-bridge access equipment to assist in the inspection, maintenance, and repair of structures statewide.
 - c. Manage inspection and repair activities to assure proper staffing by region and county personnel. Retain the services of private consultants or contractors to supplement region or county staff, as needed, to perform specialized inspection, testing or repair techniques.
 - d. Provide budget and training for personnel on proper access, equipment operation, and safety procedures.
- 6. Leadership in the determination, formulation, and administration of programs and policies.
 - a. Develop, implement, and evaluate policies, standards, procedures, and programs.
 - b. Analyze federal and state legislation, administrative rules, and national and industry standards for incorporation in programs and policies.



- c. Recommend the revision of legislation and participate in new legislation development.
7. Leadership and overall responsibility for prompt, decisive, and effective responses to emergencies (e.g., floods, major bridge damage, and bridge failures).
8. Determination, development, and management of inspection and maintenance budgets for the Structures Maintenance Section within BOS.

Assistant Statewide Program Manager

The Assistance Statewide Program Manager (ASPM) assists the SPM in the management and oversight of the state's inspection program. The ASPM is a statewide expert for bridge safety inspections; providing alignment, uniform interpretation, and application of the requirements to ensure compliance with State and Federal Highway Administration (FHWA) regulations. General responsibilities include tracking statewide compliance with FHWA Bridge Inspection Program Inspection Program metrics, participating in field reviews and file audits, assisting in the development and implementation of Plans of Corrective Action, providing reports to FHWA, assisting with policy development, and managing consultant projects related to inspection services.

The ASPM assists in management of the state inspection program which includes working with region, and local (county) programs for compliance with federal and state laws and policies regarding structure inspection. The responsibilities of this position that pertain to structure inspection are described in more detail below:

1. Program leadership and management of the statewide structure inspection, inventory, and maintenance programs.
 - a. Assist with statewide oversight of state and local agency bridge inspections by performing monthly, quarterly, and annual data checks, and coordinate with bridge owners and bridge inspectors to address deficiencies.
 - b. Serves as a statewide technical resource for complex, non-redundant, fracture critical, fatigue sensitive, underwater, damage, in-depth, and scour monitoring inspections.
 - c. Leads the implementation of NSTM, In-depth, and Special inspection requirements and providing state, local agency, and private bridge owners with the support and guidance necessary to achieve compliance.
 - d. Administer bridge inspection consultant contracts and perform project management functions.
 - e. Possess and maintain Team Leader (TL) and NSTM TL status.
 - f. Evaluate and approve a potential Team Leader's overall bridge inspection experience.
2. Assist with program management of the structures inspection, inventory, and maintenance programs.



- a. Monitor region and staff performance of structure inspection procedures and methods to assure policy compliance and statewide continuity.
 - b. Assist with and if necessary lead quality assurance reviews of region and local (county) program inspection programs. Coordinate with federal, state, and local governmental agencies.
 - c. Support Regional Program Managers (RPM) in the oversight of the inspection of local structures including recommendations for posting load restrictions, closing of structures, replacement, and interval of inspections.
 - d. Coordinate the relationships between the inspection program, bridge management engineer, and the structure replacement, structures maintenance, and structure asset management programs.
 - e. Innovation: Analyze and evaluate new methods and equipment for incorporation in the inspection procedures.
 - f. Provide direction and oversight on which structures should receive an in-depth inspection, underwater inspection, or other special inspection procedures.
 - g. Manage the consultant contracts for structure inspections related needs.
 - h. Manage the inspector certification program; assigning inspector numbers and maintaining credentials on bridge inspectors.
 - i. Statewide technical resource for routine, NSTM, special, underwater, damage, in-depth, and scour monitoring inspections.
3. Planning and directing the establishment and implementation of policies, programs, manuals, training, and services for the region and local structures maintenance and inspection programs.
 4. Leadership and delegation of prompt, decisive, and effective responses to emergencies (e.g., floods, major bridge damage, and bridge failures).
 5. Provide assistance and recommendations in the development and management of inspection and maintenance budgets.
 6. Provide recommendations to the SPM on inspection and maintenance budget issues for the Structures Inspection & Repair Unit.

Region Program Manager

The WisDOT Region Program Managers (RPM) are responsible for all state-owned bridges in their respective regions. The RPM has oversight responsibility for all bridges; including county bridges, city bridges, village bridges, and township bridges in their geographic region. County Program Managers (CPM) report to the RPM on matters related to structure inspection policy and procedures. The RPM is responsible for the following items:



General

1. Wisconsin statutes delegate the Inspection program manager responsibilities for locally owned bridges to county program managers where the county program manager meet the qualifications for inspection program managers as described previously or their designee.
2. Inspection: the inspections of all state-owned bridges are scheduled and coordinated by the RPM. The RPM is responsible for the Quality Control (QC) of inspections on state owned bridges. The RPM is responsible for the oversight of the County inspection programs in their geographic region and monitoring the completion and timeliness of local bridge inspections.
3. Maintenance: All maintenance required on state-owned bridges is arranged by the region staff working with the RPM, typically through the counties. All maintenance items required on locally-owned bridges are the responsibility of the bridge owner and should be acted on in a timely manner as identified by the RPM in consultation with the SPM. If critical, serious or safety related maintenance items on locally-owned bridges are not dealt with in a timely manner, the region has authority to order the county to instigate the necessary repairs or close the bridge entirely or partially to traffic.

State-Owned Bridges

1. Maintain up-to-date and accurate inventory and inspection data in HSIS for all state-owned bridges in their region.
2. Coordinate and assure compliance with structure inspection policies and procedures for all state-owned bridges in their region. As part of this process, the RPM shall:
 - a. Ensure that all bridges under their jurisdiction are receiving timely and appropriate inspections by qualified personnel.
 - b. Ensure all structure inspection results are entered in accordance with section 1.2.5.7.
 - c. Ensure that all state-owned bridge inspection results are entered into WisDOT Highway Structures Information System (HSIS).
 - d. Ensure Load posted verification forms are entered into HSIS for any new or updated posting signage.
3. Coordinate and ensure compliance with bridge replacement and rehabilitation procedures for all state-owned bridges in the region. For this process, the RPM, or their designee, shall determine which bridges are eligible for replacement or rehabilitation, and prioritize those bridges.
4. Budget, Schedule, and Coordinate maintenance activities on state owned structures. Institute Bridge Preservation activities as directed by Bridge preservation policies.
5. The region shall submit an annual update of its structure inventory (Completion list) to the Statewide Structure Management Engineer in the Development Section of BOS



denoting new structures and structures no longer in service, as well as construction work completed on bridges.

Locally-Owned Bridges

1. The region does request information from county managers, and those county managers are required to fulfill such requests in a timely manner as defined by the RPM in consultation with the SPM.
2. Keep the SPM and ASPM informed of changes to county Highway commissioners and CPM's
3. Monitor timeliness of local structure inspections through automated scheduling reports and coordinate with the CPM to ensure inspections are getting completed and inspected on time. Keep the SPM and ASPM informed of the status and reasoning for inspection that are late or past-due. As part of this process, the RPM shall:
 - a. Ensure that all bridges are receiving timely and appropriate inspections by qualified personnel.
4. Ensure all structure inspection results are entered in accordance with section 1.2.5.7.
5. Serve as the appeals administrator should a county not agree with a bridge inspection report or its recommendations.
6. Review county program manager qualifications. In counties where the County Commissioner does not meet the criteria for program managers, as set forth in Figure 1.2.3.1-1, the RPM must have on file a written agreement with the county commissioner that details and delegates the administrative responsibilities for the county program to a qualified program manager. Forward a copy of this agreement to the SPM.
7. Maintain a schedule of and assist with regular quality assurance (QA) evaluations of the county programs. See Section 1.2.6 for details and information on the QA Program.

County Program Manager

The WisDOT delegates to the county commissioners all inspection, load posting and maintenance responsibility for local owned structures on county, city, village, and town roads in their county. The county commissioner may be the county program manager (CPM) for structure inspections. The county manager is responsible for the following items and must meet the qualifications set forth previously for Inspection program manager. If a county commissioner does not meet the qualifications, then he/she shall make a formal, written agreement with a qualified individual to serve as county inspection program manager. The county commissioner shall file a copy of this agreement with the RPM, who will forward a copy to the SPM.

1. WisDOT does request information from county program managers. County program managers are required to fulfill such requests in an efficient and timely manner.
2. Maintain an up-to-date library of all locally-owned bridge records for the county. The county program manager shall coordinate and assure compliance with structure



inspection procedures for all locally-owned bridges in the county. As part of this process, the county program manager shall:

- a. Notify each local unit of government, in writing, that all local bridges shall be inspected at an interval as defined in section 1.3.3.3 of the Structure Inspection Manual.
 - b. Ensure that all bridges are receiving timely and appropriate inspections by qualified personnel.
 - c. Ensure all structure inspection results are entered in accordance with section 1.2.5.7.d. Provide guidance and assistance as necessary to the local units of government.
3. Provide for Quality Control (QC) of the inspection program in the county.
 4. Coordinate and ensure compliance with bridge replacement and rehabilitation procedures for all locally-owned bridges in the county. For this process, the county program manager, with the approval of the county commissioner, shall:
 - a. Notify each local unit of government, in writing, of the eligible local bridges and ask that they priority rate these bridges.
 - b. Meet with each local unit of government for eligible bridges to discuss their bridge stewardship responsibilities.
 5. Serve as the appeals administrator should a local unit of government not agree with a bridge inspection report or its recommendations.
 6. Coordinate and assure compliance with TRANS 212.10 requirements for load posted or closed locally-owned bridges in the county. Ensure current load posted verification forms are entered into HSIS when posting signage is erected or updated.

City, Town, and Village Manager

Wisconsin Trans 212 places responsibility for locally owned bridges within counties with that county's Highway Commissioner. Though cities, villages, and towns within a county may have staff or consultant perform inspections, qualify as inspection program managers, and/or perform maintenance on bridges; Wisconsin does not recognize inspection programs below the county level.

Load Rating Engineer

The load rating engineer is an individual responsible for determining and maintaining current and accurate load carrying capacity for a bridge through data obtained from existing plans and pertinent condition and defect information provided from the inspection report. Responsibilities include reviewing inspection reports for changed conditions that warrant revisions to load ratings on file through automated reporting, revising load ratings where required, creating load rating files for new bridges, and ensuring that the findings from load ratings are implemented.



Qualifications

The minimum qualifications for a Load Rating Engineer are established in the 23 CFR Part 650 National Bridge Inspection Standards, Section 650.309 (d): which states:

Load ratings must be performed by, or under the direct supervision of, a registered professional engineer.

1.2.3.2 Field Inspection Team Qualifications and Responsibility Attributes

The field inspection team consists of the personnel who are in the field doing the majority of the hands-on inspection work. These personnel typically include Inspection Team Leaders (ITL) and Inspection Team Members (ITM), both of which are explained in detail below. County, Region and Statewide Program Managers are automatically qualified to do field inspection as an ITL because the job requirements for those positions encompass the job requirements for the ITL, as described below. As an ITL, the Program Manager must meet the qualification stated above in section 1.2.3.1.

For Sign/Signal Structure Inspection Team Leaders, Including High Mast Light (HML) poles, see SIM 4.1.1 for TL qualifications.

Inspection Team Leader (ITL)

The ITL is responsible for leading the structure inspection team and planning, preparing, and performing structure inspections. The ITL is ultimately responsible for reviewing the inspection report or form and signing it. The ITL is also responsible for the content of any written inspection report and serves to ensure the quality of any inspections they lead. The ITL shall be familiar with this Manual and preferably have a strong background in such areas as structural engineering, structure behavior trends, bridge maintenance, and rehabilitation techniques. The ITL is also responsible for the general safety of the work site. Safety items can include obtaining and monitoring any required traffic control, ensuring each ITM complies with safety procedures, proper use of access equipment, and more. There must be at least one ITL at the structure site at all times during each field inspection. A more complete discussion of the duties and responsibilities of the ITL are in Section 1.4.2.

Federal and State laws and rules define the qualifications and duties of the inspection team leader. People who sign inspection reports without meeting those qualifications, or who sign reports without being at the structure site and participating in the inspection as defined in the American Association of State Transportation and Highway Officials (AASHTO) Manual for Bridge Evaluation, may be subject to prosecution for forgery or fraud under Wisconsin Statutes §§943.38 and 943.39 or other applicable state or federal laws.

ITL Qualifications

A bridge inspection team leader (TL) for all bridge inspection types must meet the qualifications of 23 CFR Part 650 Section 650.309 (b) and WisDOT experience requirements. Additional requirements exist for TL for NSTM, Underwater Dive, and Complex bridge inspection team leaders.:

The methods to qualify as a bridge inspection TL are as follows:



1. Pass the FHWA approved National Highway Institute (NHI) comprehensive bridge inspection training course (NHI #130055 or #130056).
2. Meet at least one of the following:
 - a. Wisconsin PE and 6 months bridge inspection experience that includes a minimum:
 - i. 20 or more bridge inspections over the last 3 month to 3-year period and 3 months of other bridge experience
OR
 - ii. 40 or more bridge inspections over the last 6-month to 3-year period
 - b. Bachelor's degree in engineering from an ABET accredited college or university, a passing score on the Fundamentals of Engineering Exam and 2 years bridge inspection experience that includes at a minimum:
 - i. 40 or more bridge inspections over the last 1-5-year period and 1 year of other bridge experience
OR
 - ii. 80 or more bridge inspections over the last 2-5-year period
 - c. Associates degree in engineering or engineering technology from an ABET accredited college or university and 4 years bridge inspection experience that includes a minimum:
 - i. 80 or more bridge inspections over the last 2–8-year period and 2-years of other bridge experience
OR
 - ii. 160 or more bridge inspections over the last 4–8-year period
 - d. 5-years or more bridge inspection experience that includes a minimum:
 - i. 100 or more bridge inspections over the last 2.5–10-year period and 2.5 years of other bridge experience
OR
 - ii. 200 or more bridge inspections over the last 5–10-year period
3. Complete a cumulative total of 18 hours of FHWA-approved bridge inspection training over each 60-month period. Submit together all refresher training certificates in one PDF document on WisDOT [website](#).
4. Most recent annual WisDOT Structure Inspection Refresher Training.

NSTM, Underwater Dive, and Complex Bridge Inspection Team Leader Additional Requirements

- *Non-redundant steel tension member (NSTM)* Team Leader must have taken and passed the NHI NSTM inspection training course. NSTM TL's who have taken and passed NHI 130078 Fracture Critical training do not have to complete the new NSTM NHI course to remain NSTM TL.
- *SRM/IRM* - Team Leader must have NSTM qualification to inspect these members.
- *Underwater Dive* Team Leader must have taken and passed the NHI Underwater Bridge Inspection training course. Underwater TL's who have taken and passed NHI 130091 Underwater Bridge Inspection/Underwater Inspection of Bridges do not have to complete the current Underwater NHI course to remain underwater TL.
- *Complex Bridge* in Wisconsin is classified as Moveable or Cable Stay bridges. *Moveable bridge inspection TL* must meet the qualifications outlined in SIM 3.1.3.



Cable stayed bridge inspection TL must be a qualified TL for in-service bridge inspections and NSTM TL qualified.

Inspection and Other Bridge Experience

An individual's inspection experience from any state must include active participation in bridge or small bridge* inspections in a team member role using NBIS procedures provided it develops the skills necessary to properly perform an NBIS bridge inspection. Documentation of the inspection experience must be provided. Provide a list of the structure IDs with month/year of inspection. When a list of structure ID with month/year is not available, provide an affidavit from the NBIS team leader affirming and explaining the inspection experience or other acceptable documentation showing proof of inspection experience.

*Inspection of Small Bridges (WisDOT defined C type structures) following NBIS inspection procedures may be used for up to 50% of the required inspection experience. Documentation of the inspection experience must be provided.

Other bridge experience includes bridge design, bridge load rating, bridge maintenance, and bridge construction experience. An affidavit or letter of validation must be provided from a peer or supervisor directly involved with the experience of the applicant. Railroad bridge inspections do not count towards inspection experience but does count as other bridge experience.

Evaluation of an individual's other bridge experience for compliance with the requirements for a team leader will consider the following:

- a. The relevance of the individual's actual experience, i.e., has the other bridge experience enabled the individual to develop the skills needed to lead properly a bridge safety inspection.
- b. Exposure to the problems or deficiencies common in the types of bridges being inspected by the individual.
- c. Complexity of the structures being inspected in comparison to the knowledge and skills of the individual gained through their prior bridge experience.
- d. The individual's understanding of the specific data collection needs and requirements.
- e. Demonstrated ability to lead bridge safety inspections.
- f. The level of oversight and supervision demonstrated by the individual in prior experience.

Supplemental Qualification Guidance

WisDOT may consider an inspector's qualifications earned from another state DOT. WisDOT may factor equivalent experience when the inspector's qualifications relate to complex and/or signature bridges. Meeting one or more of the following may be considered as experience for an inspection team leader (TL).

1. Inspector reciprocity: WisDOT may consider an inspector's TL status obtained from another state DOT if the qualification or examination process is acceptable to WisDOT. The determination will be on a case-by-case basis if granting Wisconsin TL status.



2. Inspector experience with complex or signature bridge(s): WisDOT may consider inspection team member involvement with complex or signature bridges to be equivalent to a portion or all of the required inspection participation experience listed under SIM 1.2.3.2. Inspector must submit inspection experience explaining in detail the involvement with the structure inspection of complex or signature bridges, specifically related to the team member role using the NBIS procedures. The determination will be made on a case-by-case basis when granting TL status.

TL Application

TL applicants need to fill out [DT2001](#) and will require:

1. The TL or PM applicant must provide their full name, home address, telephone number, email address, current employer, employer address and employer telephone number.
2. Copies of completion certificates from bridge inspection training courses. If certificates are not available, the PM will conduct an interview and share information with FHWA division office for concurrence.
3. A list of inspected bridges with corresponding month/year. When lists of inspected bridges is not available, provide an affidavit from NBIS team leader validating the inspection and other bridge experience,
4. A description of other bridge experience including time periods with dates and Name and Telephone # for reference during each period of work. [DT2001](#) Applications and credentials shall be submitted on our [website](#).

ITL Desirable Physical Attributes

1. Uncorrected visual acuity of at least 20/40 based on the Jaeger Chart or have a corrected visual acuity of at least 20/40 based on the Jaeger Chart with the mandatory use of a corrective device (glasses, contact lenses, etc.) during the course of any inspection field work.
2. A bridge inspector should be able to perform the following physical tasks:
 - a. Walk on riprap and steep slopes;
 - b. Climb over fences;
 - c. Work comfortably at heights;
 - d. Work comfortably in confined spaces;
 - e. Work comfortably close to live traffic;
 - f. Work comfortably in or near water; and
 - g. Perform other similar field tasks.

**Inspection Team Member (ITM)**

This individual assists the ITL in the field. It is expected that this person, at a minimum, is familiar with appropriate parts of this Manual and has a competency level sufficient to follow the directives of the ITL. To ensure competency, all ITMs should be encouraged to take the two-week FHWA “Safety Inspection of In-Service Bridges” course. ITMs are essentially apprentices and should have the goal of becoming ITLs. ITLs and supervisors should provide appropriate training and guidance to assure the ITMs progress toward this goal. ITMs do not have the authority to sign inspection forms and should never do so. However, ITMs shall have their name entered on the inspection form under team members to document their participation and experience. They shall also maintain a log of their experience for future reference.

ITM Qualifications

1. Have the competency and ability to carry out the duties assigned by the ITL (see Figure 1.2.3.2-1).

ITM Desirable Physical Attributes

1. Uncorrected visual acuity of at least 20/40 based on the Jaeger Chart or have a corrected visual acuity of at least 20/40 based on the Jaeger Chart with the mandatory use of a corrective device (glasses, contact lenses, etc.) during the course of any inspection field work.
2. A bridge inspector should be able to perform the following physical tasks:
 - a. Walk on riprap and steep slopes;
 - b. Climb over fences;
 - c. Work comfortably at heights;
 - d. Work comfortably in confined spaces;
 - e. Work comfortably close to live traffic;
 - f. Work comfortably in or near water; and
 - g. Perform other similar field tasks.

Underwater Bridge Inspection Diver

All diving operations shall be conducted in accordance with all applicable federal and state regulations. Occupational Safety and Health Administration (OSHA) 29 CFR 1910 Subparts T and Y, as well as USCG 46 CFR 197.200, mandate training qualifications for all members associated with a diving activity. These federal regulations mandate diving and emergency management training (CPR and First Aid) requirements. The National Bridge Inspection Standards states the training requirements for underwater bridge inspection divers.



Qualifications

In addition to diving and emergency management training, structure inspection training and qualifications shall be the same for underwater inspections as for above water inspections. However, the team leader shall be a certified diver and be able to perform the underwater inspection unless an “unmanned” method ensures a sufficient level of certainty. Furthermore, the team leader shall be on-site at all times and partake in at least 50 percent of the diving to ensure proper detection and assessment of defects.

Team members for underwater inspections shall have training and experience necessary to perform assigned tasks in a safe and healthful manner. It is preferable that all team members be certified divers since each may be called upon to act in a variety of roles including standby rescue diver, in an emergency. In accordance with OSHA regulations, the dive team should consist of at least three individuals.

The minimum qualifications for an underwater bridge inspector are defined in 23 CFR Part 650 National Bridge Inspection Standards, Section 650.309 (e):

Underwater bridge inspection divers are qualified by having successfully completed both of the following training courses:

1. FHWA approved comprehensive bridge inspection training course
2. FHWA approved underwater bridge inspection diver training course

Specialists

Non-Destructive Evaluation (NDE)

Non-Destructive Testing (NDT) personnel shall be qualified in accordance with nationally recognized NDE personnel qualifications practice or standards such as ANSI/ANST-CP-198, SNT-TC-1A, MIL STD 410, NAS-410 or a similar document. The practice or standard used and the applicable revision shall be specified in the contractual agreement between the structure owner and the NDE inspector.

Consultant, Contractor, and Subcontractor Personnel

A. NDE Requirements

Consultants, contractors, and their subcontractors performing NDE [magnetic particle testing (MT), liquid (dye) penetrant testing (PT), ultrasonic testing (UT), etc.] on bridges or ancillary structures as defined in the Wisconsin Structure Inspection Manual shall submit their written practice and personnel certifications for review prior to being allowed to solicit or perform these activities.

Consultants, contractors, and their subcontractors performing NDE (visual inspection) on bridges or ancillary structures, as defined in the *Wisconsin Structure Inspection Manual*, shall:

1. have taken and passed the NHI 80-hour course (Safety Inspection of In-service Bridges) or NHI 1 week bridge inspection course for PE's or



2. be certified as an American Welding Society Certified Welding Inspector (AWS/CWI) or
3. Submit their written practice and certifications documenting the equivalent training that qualifies their personnel to perform visual inspection on structures in the State of Wisconsin. This option must be approved by the DOT's Statewide Program Manager for approval prior to performing any work.

State, County, and Local Units of Government

A. NDE Requirements

State, county, and local units of government performing NDE (MT, PT, UT, etc.) shall be certified under the State of Wisconsin DOT's written practice or submit their written practice and personnel certifications for review prior to performing NDE (MT, PT, UT, etc.).

State, county, and local units of government performing NDE (visual inspection) on bridges or ancillary structures as defined in the *Wisconsin Structure Inspection Manual* shall:

1. have taken and passed the NHI 80-hour course (Safety Inspection of In-service Bridges) or NHI 1-week In-Service Bridge Training for PE's or
2. be certified as an American Welding Society Certified Welding Inspector (AWS/CWI) or
3. Submit their written practice and certifications documenting the equivalent training qualifying their personnel to perform visual inspections on structures within their jurisdiction. This option must be approved by the Statewide Program Manager for approval prior to performing any work.

Movable Structures

Movable structures function with large complex pieces of machinery, hydraulic, and electrical equipment. Each part of a movable structure has a relationship to, and must interact with, many other parts. In order for a movable structure to operate efficiently and to provide a long and serviceable life, all parts of the structure must be in alignment and receive proper maintenance. Proper maintenance requires that all functional systems (including electrical, mechanical, hydraulic, and structural elements related to the machinery) should be inspected and evaluated by personnel who are sufficiently experienced in that particular discipline.

The personnel who perform inspection of movable structures are required to have additional experience and training beyond just that for structural inspections. The inspection team may include separate structural, electrical, mechanical, and hydraulic Lead Inspectors. A single individual may serve as Inspection Team Leader and/or Lead Inspector in more than one of these disciplines if the individual possesses the necessary level of expertise. It is necessary that each Lead Inspector have the experience in their specific discipline to meet those qualifications comparable with the Inspection Team Leader for structural inspections. However, an experienced tradesman or engineer with a background in electricity or machinery may qualify as a Lead Inspector so long as their qualifications are adequate for the type of structure and approved by the Inspection Team Leader or Inspection Program Manager. Each



Lead Inspector must supervise and monitor the work performed by anyone assisting in the efforts of their discipline. Likewise, the Inspection Team Leader must supervise and coordinate the Lead Inspectors and all team members. More specifics are documented in Part 3 of this manual.

1.2.4 Official Bridge Files

The Official Bridge File for documentation on highway bridges within Wisconsin is the Highway Structures Information System ([HSIS](#)). HSIS is supplemented with other documents located in the bridge owner's office (WisDOT's central and regional, county highway departments, or municipalities). The official copy of inspection documentation produced on or after April 1, 2016, is stored in HSIS. Inspection documentation in HSIS dated before April 1, 2016 are copies of the official inspection report originating from the bridge owner's office. Other historical documentation may be stored in either HSIS or the bridge owner's office.

The National Bridge Inspection Standards require documents/components of the bridge files must be maintained for as long as the bridge exists. Whenever possible, documents should be stored electronically in HSIS.

Documents stored in bridge owner's office must be saved in a designated accessible Bridge File. The Bridge File can be a folder in a file drawer in the bridge owner's office or an electronic copy stored on a bridge owner's electronic storage system. Electronic files can be scanned copies of paper documents or an original electronic file. The Bridge File must be maintained/saved, either paper or electronic, for as long as the bridge exists.

Section 2 of *AASHTO's Manual for Bridge Evaluation (MBE)* identifies a wide range of components that should make up the bridge file. A list of applicable significant bridge file components, which is a subset of the list in the MBE, is identified in the *NBIS Metrics for the Oversight of the National Bridge Inspection Program*, Metric #15: Inspection procedures – Bridge File:

- a. Inspection reports
- b. Waterway information – channel cross-sections, soundings, stream profiles
- c. Special inspection procedures and requirements for nonredundant steel tension member (NSTM), complex, in-depth, and underwater dive inspections
- d. Load rating documentation
- e. Posting documentation
- f. Critical findings and actions taken
- g. Scour assessment
- h. Scour Plan of Action (POA)
- i. Inventory and evaluation data
- j. Significant correspondence which includes agreements



- k. Maintenance records

Components of the official bridge file located in HSIS include:

- a. Copies of inspection reports from 2004 to April 1, 2016.
- b. Official inspection reports from April 1, 2016 to present stored electronically.
- c. Structure plans, where available (original construction, as-built, repairs, rehabilitation)
- d. Structure and hydraulic design computations from 2004 to present
- e. Nonredundant steel tension member (NSTM) diagram
- f. Critical Findings and responses
- g. Load ratings and bridge posting documentation
- h. Scour plan of action (POA)
- i. Inventory data
- j. Special inspection procedures

Components that generally remain in the local offices include:

- a. Inspection reports prior to 2004
- b. Structure and Hydraulic design computations where available
- c. Historical waterway information where available
- d. Limited significant correspondences (ownership, inspection & maintenance responsibility)
- e. Scour assessment documentation, where not part of the structure design computations

Highway Structure Information System (HSIS) is maintained by the Statewide Structure Management Engineer for all bridges and ancillary structures in Wisconsin. This database system consists of element level data, an electronic directory of supplemental information files (approved format such as .pdf, .doc, etc.), and inventory data utilized to create the National Bridge Inventory (NBI) File sent annually to FHWA. The data and files in this system are maintained by the regional and county (local) inspection Program Managers. Currently FHWA requires that all states maintain an NBI file that contains bridge inventory and inspection data in the format described in the current edition of the FHWA Specifications for the National Bridge Inventory (SNBI) for all bridges in the state. FHWA requires all States to collect and submit element data as provided by the current edition of the *AASHTO Manual for Bridge Element Inspection*.



Each year, the Statewide Structure Management Engineer uses inventory and inspection data in HSIS to create the NBI file. The Statewide Structure Management Engineer is the primary contact for data submittal and coordination with the FHWA, WisDOT regions, and counties.

1.2.5 WisDOT Bridge Inspection Quality Control Program

1.2.5.1 Purpose

The NBIS Metrics for Oversight of the National Bridge Inspection Program, Metric #20: Inspection Procedures – QC/QA states:

1. Systematic quality control (QC) and quality assurance (QA) procedures are used to maintain a high degree of accuracy and consistency in the inspection program.
2. QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.

The accuracy and consistency of inspection data is crucial to the entire bridge management operation as it lays the foundation for any bridge management systems. The data gathered through the Bridge Inspection Program aids in making decisions for needed maintenance, repair, rehabilitation, and replacement as well as improving design for new bridges. Furthermore, quality inspection and documentation practices will help to uphold the WISDOT commitment to the safety of the traveling public.

In order to maintain the accuracy and consistency of structure inspections and structure inspection reports, inspection programs are required to have appropriate quality control and quality assurance (QC/QA) measures. Typical QC procedures will include a centralized qualification list for inspectors, the online data management software for bridge information (HSIS), and Quality Control Best Practices to provide a review or validation process. Furthermore, WisDOT BOS, each region, and each county shall conduct QC practices of their inspection program as outlined in this section.

Private bridge owners are not subject to the NBIS and do not fall under WisDOT oversight. They are encouraged but not required to perform inspections that comply with the NBIS. Railroad structures fall under the oversight of the Federal Railroad Administration.

The purpose of the Quality Control Program is to ensure uniformity and consistency in inspector training and qualification, completeness and accuracy of inspection reports and structure data, and timeliness in adherence to inspection interval requirements.

1.2.5.2 Components

The Quality Control Program within WisDOT's Bridge Inspection Program has numerous components, which cover the requirements WisDOT has established for both region and county programs.

1. Training Courses

WisDOT hosts several training courses for inspectors to learn new information or keep up-to-date with current practices. Inspectors from the state, region, and county level, as



well as consultants, all have access to these trainings that are put on by WisDOT, as needed.

2. Inspector Qualification Records

WisDOT's BOS maintains a system which houses the qualification records for all current and past inspectors that inspect within the State of Wisconsin. This record includes training completion certificates, experience histories, letters of recommendation, and licenses.

3. Data Management System

The Highway Structures Information System (HSIS) is the online database that contains bridge inventory and inspection information along with construction history and pertinent bridge related documents (such as bridge plans). The software is capable of performing data checks as well as running queries of its data to aid in achieving compliance for inspection interval metrics.

4. Inspection Operations

Inspection programs shall have a process in place to ensure that inspectors are sufficiently equipped to properly inspect all necessary structures on time. While this process can vary in form, its function is vital to maintaining an accurate bridge management system.

5. Inspection Interval Compliance Procedure

WisDOT has a procedure in place for actions to be taken by the Regional Program Managers and BOS as it relates to the inspection entry timeline.

6. Inspection Meetings

Inspection meetings on a regular basis can be utilized to discuss emerging issues or concerns with the inspection program or as a refresher of the inspection program.

7. Quality Control Best Practices

Inspection programs shall utilize some form of inspection report review and validation in order to ensure quality and completeness. Methods for accomplishing this component can vary from program to program.

8. Quality Control DT Form

Every Program will be required to have on-file a standardized Quality Control form (WisDOT DT2002). This form will detail the program's staff, regular bridge meetings, review methods, and bridges (listed by inspection type).

Each component highlighted above will be discussed in further detail in the following sections.

1.2.5.3 Training Courses

There are several training courses offered by WisDOT that are required for inspectors as part of the qualification process to perform certain inspections. While WisDOT may offer these courses in order to maintain a sufficient pool of qualified inspectors, it remains the inspector's



responsibility to ascertain the necessary training. A listing of future courses offered by WisDOT can be found on the Maintenance & Inspection Training & Tools webpage (<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrcs/strct/inspection-training.aspx>). The courses typically offered by WisDOT are described below.

Safety Inspection of In-Service Bridges

This is a National Highway Institute (NHI) standard course 130055 lasting 2-weeks that is required for all Inspection Team Leaders and Program Managers. This comprehensive course, based on the 2012 FHWA “Bridge Inspector’s Reference Manual (BIRM)”, covers AASHTO’s element-level inspection approach as well as critical finding procedures. This training course is historically hosted by WisDOT when there is enough interested participants. Individuals looking to take this training should coordinate with WisDOT to learn about options that exist in any given year. A modified version of this course NHI 130056 is also offered for Professional Engineers and only takes 1-week instead of the 2-week option.

WisDOT Inspector Refresher Training

Wisconsin certified bridge inspectors are required to complete a cumulative total of 18 hours of FHWA approved bridge inspection refresher training over each 60-months period. Copies of completion certificates must be emailed to WisDOT by emailing to Structure-Inspection@dot.wi.gov.

Additionally, Wisconsin certified bridge inspectors are required to complete all WisDOT bridge inspection program-based refresher training. The method for an inspector to complete WisDOT refresher training will depend on method of training delivery and the subject of the training – in person, webinar, or review of electronic media.

Bridge Inspection Techniques for Nonredundant Steel Tension Members (NSTM)

Inspectors that wish to complete NSTM Inspections in the state of Wisconsin are required to complete this NHI standard course. Inspectors will be taught the concepts of NSTM Member identification, failure mechanisms, fatigue, Non-Destructive Evaluation (NDE) methods, and documenting inspection procedures. WisDOT offers this course as needed.

Underwater Bridge Inspection

Inspectors that wish to complete Underwater Dive Inspections in the state of Wisconsin are required to complete this NHI standard course. Inspectors will be taught the methods of underwater inspection, underwater material deterioration mechanisms, deterioration inspection techniques, and scour inspection techniques. WisDOT offers this course as needed.

Other Specialized or Field Specific Training

WisDOT may offer additional training in specific fields or for specialized tasks, as needed.

A complete listing of all NHI courses can be found on their website: www.nhi.fhwa.dot.gov



1.2.5.4 Inspector Registry

The National Bridge Inspection Standards (NBIS) requires state DOT's to maintain inspector contact information in a registry of state certified bridge inspectors. WisDOT maintains the list through the Highway Structures Information System (HSIS). All Wisconsin certified inspectors must provide and update the following information within HSIS to remain certified and be able to enter inspection data.

- Email address
- Employer name
- Work address
- Telephone number
- Additional information can be provide
 - Home address
 - Home telephone number

In HSIS, inspector contact information can be entered in HSIS on under **Preferences** and the **Inspector** tab as shown in the picture below.

The screenshot shows the 'Preferences' window with the 'Inspector' tab selected. The form contains the following fields and values:

| Inspector | |
|-------------------|---------------------------------|
| Inspector | |
| Bowers, Ryan (| |
| Inspector id | |
| 9612 | |
| First name | |
| Ryan | |
| Middle initial | |
| | |
| Last name | |
| Bowers | |
| Work | |
| Employer | Email |
| WisDOT | ryan.bowers@dot.wi.gov |
| Address line 1 | Phone (000)000-0000 (extension) |
| 141 NW Barstow St | (608) 267-3577 |
| Address line 2 | Fax (000)000-0000 |
| | optional: () - |
| City | |
| Waukesha | |
| State | Zip 00000 (-0000) |
| WI | 53188 |



1.2.5.5 Inspector Qualification Records

Inspector ID numbers allow an inspector to enter an inspection into the HSIS database and are granted only to qualified individuals. Those seeking to acquire such a number must first submit a Qualifications Record form (WisDOT DT2001). This form requires the applicants to verify their qualifications mainly through training course completion certificates, license numbers, experience histories, and letters of recommendation. See the [Inspector Application and Credentials](#) webpage for submitting this information and other requirements.

BOS will review the documentation provided and make a decision on whether to accept the applicant and assign them an Inspector ID number. Follow-up on the experience history may be performed. Successful applicants will be emailed a cover letter informing them of their acceptance and their unique Inspector ID number. Once an ID number is assigned, HSIS permissions is assigned to the ID number. More specifics on the permissions within HSIS will be discussed in the following section.

All of the documents associated with this process will be stored by BOS in its filing system. This system is to be maintained under the direction of the SPM.

Qualifications required for Team Leaders and Load Raters are summarized in Figure 1.2.3.2-1, which was presented earlier in this chapter.

1.2.5.6 Data Management

WisDOT utilizes its in-house software, the Highway Structures Information System (HSIS), as its tool for data management. HSIS performs many tasks in the Quality Control process, the more important of which will be enumerated below.

Inventory Data

HSIS houses the structure inventory data, construction history, structure plans, and rating files. All of this information is easily navigable through a tab hierarchy, as the software was designed to be used on a mobile platform.

Inspection Data and Checks

HSIS maintains an inspection history for each structure, starting in the late 1990s. Inspections are entered through the interface of the database within a standardized inspection form. Additionally, the system houses fields for inspection intervals associated with each inspection type required for a given structure. Most importantly, for QC, however, are the data checks performed by HSIS during inspection entry.

One check relates back to the assignment of an inspector ID. Once the new inspector ID has been assigned in HSIS, specific permissions will be assigned to the inspector ID. This will only allow the user to access certain fields and change data specific to a particular program. Furthermore, the permissions can be categorized by the training and special inspection qualifications associated with the individual inspector. This is to say that certain IDs will have permissions to enter Routine bridge inspections versus NSTM bridge inspections versus Underwater Dive bridge inspections. This feature ensures that only those individuals that have been deemed qualified by BOS bridge inspection staff are allowed to create a certain type of inspection.

Another check affects the ability of the inspector to complete the inspection being entered. HSIS will check to ensure that all necessary fields are filled with information prior to



allowing inspection report completion. It will also check to make sure appropriate data rules are followed. Element quantity fields will even be checked for accuracy as they relate to the sum of defects associated with the given element. For example, material defect quantities cannot add up to more than the total quantity for that element.

Additionally, HSIS houses a series of over 50 data checks; all of which ensure that NBI, Element, SI&A, and Inspection data all conform to appropriate submission standards.

Automated Reports

Another important feature of HSIS is the ability to run queries of the inventory and inspection data. Over the years, certain queries have become more common and were written into the system as reports. These reports can be set up to automatically query data and email results to particular users on set intervals or upon changing of certain data fields. Three examples will be described below.

Advanced Planning is necessary to avoid inspections being completed past the due date. Bridge Owners and Inspection Program Managers are subscribed to a distribution list for bridge inspection scheduling. This report distributed automatically on the first of each month. This monthly scheduling report that is maintained by BOS staff queries for any bridges due for inspection within the next 4 to 6 months (depending on type of inspection) or any bridges that are overdue for an inspection. The information is displayed chronologically by structure under STRUCTURE_ID column. The user can Filter and sort to display what they want. Under the STATUS column one can find the status of the inspection. A few important ones are listed below with definition:

- Past-Due - When a due date has past and an inspection has not been created in HSIS. HSIS has no current inspection report started. This designation signifies an inspection hasn't been entered or has yet to be performed (and will be late).
- Missing – Structure is flagged requiring this type of inspection, but no inspection of that type exists. As an example, newly constructed bridges that are open to public traffic but have no routine inspection on file will be categorized with a “Missing” status.
- Late – The inspection has been completed in HSI and was performed after the due date.

Inspection Program Managers can also subscribe to a report which will send them an email upon completion of any inspection of a structure within their jurisdiction whose NBI Component value drops to a 4 or less. This tool allows for Program Managers to get an alert when structure condition is classified as poor in order to review inspection data and validate the inspectors concerns regarding condition. This can be setup by the user in HSIS under go-tools-system-subscriptions tab.

Load Rating Engineers within BOS are subscribed to a report for structures that may need to be rerated. This report queries for any structures that have had the rerate flag checked, have significant changes to NBI Component values, or have a material defect in Condition State 4 for certain primary elements. There is a section within the HSIS interface that allows Load Rating Engineers to communicate rerate findings back to the inspector.

1.2.5.7 Inspection Operations

Inspection Operations are the cornerstones for a successful and efficient inspection program. These operations include scheduling, preparation, procedure, and submission.



Scheduling is a programmatic approach to dividing up structure inspections over time and between inspectors. This approach is unique for each inspection program and plays an important role in establishing a good Quality Control Program.

Preparation is a set of efforts put forth prior to an inspection. Pre-inspection preparations should at least include the following:

- Assess equipment needs, traffic control needs, and access requirements
- Coordinate equipment reservations (such as Under Bridge Inspection Vehicles) and any necessary traffic control
- Review prior inspection reports, maintenance history, and bridge plans for background knowledge on the structure
- Delegate inspection duties amongst members of the inspection team, if applicable
- Ensure that inspection vehicle is properly stocked with appropriate equipment and reference manuals
- As a safety precaution, make someone else aware of the inspection plan should you be inspecting alone

Inspection procedure is an established protocol to be followed while on-site. Aspects of this operation include the following:

- Proper safety equipment is utilized by all inspection personnel
- Appropriate inspection tools and measuring devices are used
- Proper selection, documentation, and use of access equipment (including Under Bridge Inspection Vehicles)
- Maintain safe operating limits and work practices
- Ensure that established inspection procedures are being followed, especially for special inspections
- Ensure that all areas with defects/deterioration are appropriately documented, including any pertinent measurements

1.2.5.8 Inspection Submittal

Submission of inspection data must be entered, and the report completed in a timely fashion to ensure the required inspections have been performed. Inspectors shall create the inspection report in HSIS within 28 days after the month in which the field portion of the inspection is completed. The minimum information to create an inspection in HSIS is *Date, Team Leader, Inspection Type and Activity Types*. For example, any inspection performed in the month of July shall be created in HSIS no later than August 28th. The remainder of the inspection data must be entered, and the report completed in HSIS as soon as possible but within 3 months after the month when the field portion of the inspection is completed. WisDOT encourages programs to utilize tablet devices as an aid for a timelier entry of inspection reports.

Bridge Inspection Interval Late Tolerance

The inspection date is the last day of the field portion of the inspection and is expected to be completed during the month the inspection is due. Field inspections completed after the month in which it is due are considered late by WisDOT. The program manager for a late inspection or



anticipated to be late inspection must provide email notification and an expected completion date to the next level inspection program authority as soon as possible. County and Local Inspectors shall notify the County PM who will notify the Region PM. State inspectors are to notify the Region PM who will notify BOS Structures Inspection Unit Supervisor. The Region PM will enter a grace date in HSIS for all inspections utilizing the late tolerance for the anticipated completion date.

An acceptable interval tolerance for late inspections is allowed by the NBIS which WisDOT has adopted. An inspection interval falling outside of the acceptable tolerances is considered noncompliant which results in the inspection program being noncompliant. The acceptable interval tolerances are as follows:

| Acceptable Inspection Interval Tolerances | |
|---|--------------------|
| Existing interval | Interval Tolerance |
| < 24 months | 2 months * |
| ≥ 24 months | 3 months * |

* After the month in which the inspection was due.

Inspections that are expected to exceed the tolerances require FHWA approval 3 months in advance of the inspection due date and must be documented in HSI.

Inspections that exceed the acceptable tolerances are rare and are reserved for unusual circumstances. These include but are not limited to natural disasters.

1.2.5.9 Inspection Interval Compliance Procedure

The Inspection Interval Compliance Procedure was established in an effort to ensure timely inspections and adherence to FHWA Metrics 6 through 10. This procedure occurs on a monthly cycle (around the first of the month) and lays out actions to be taken for past-due inspections. The expectation is that an inspection will be performed on the correct interval and entered in a timely fashion.

Past-due inspections are inspections that have exceeded the date of next required inspection and are not yet created in HSIS. For example, an inspection is two months past-due if it was required to be inspected in July and nothing is entered into HSIS as of September 1st.

The Inspection Interval Compliance Procedure is composed of three steps, with each subsequent step becoming more urgent. The level of urgency at each step is described below. After the step descriptions, there is a flowchart summarizing the contact tree for this procedure.

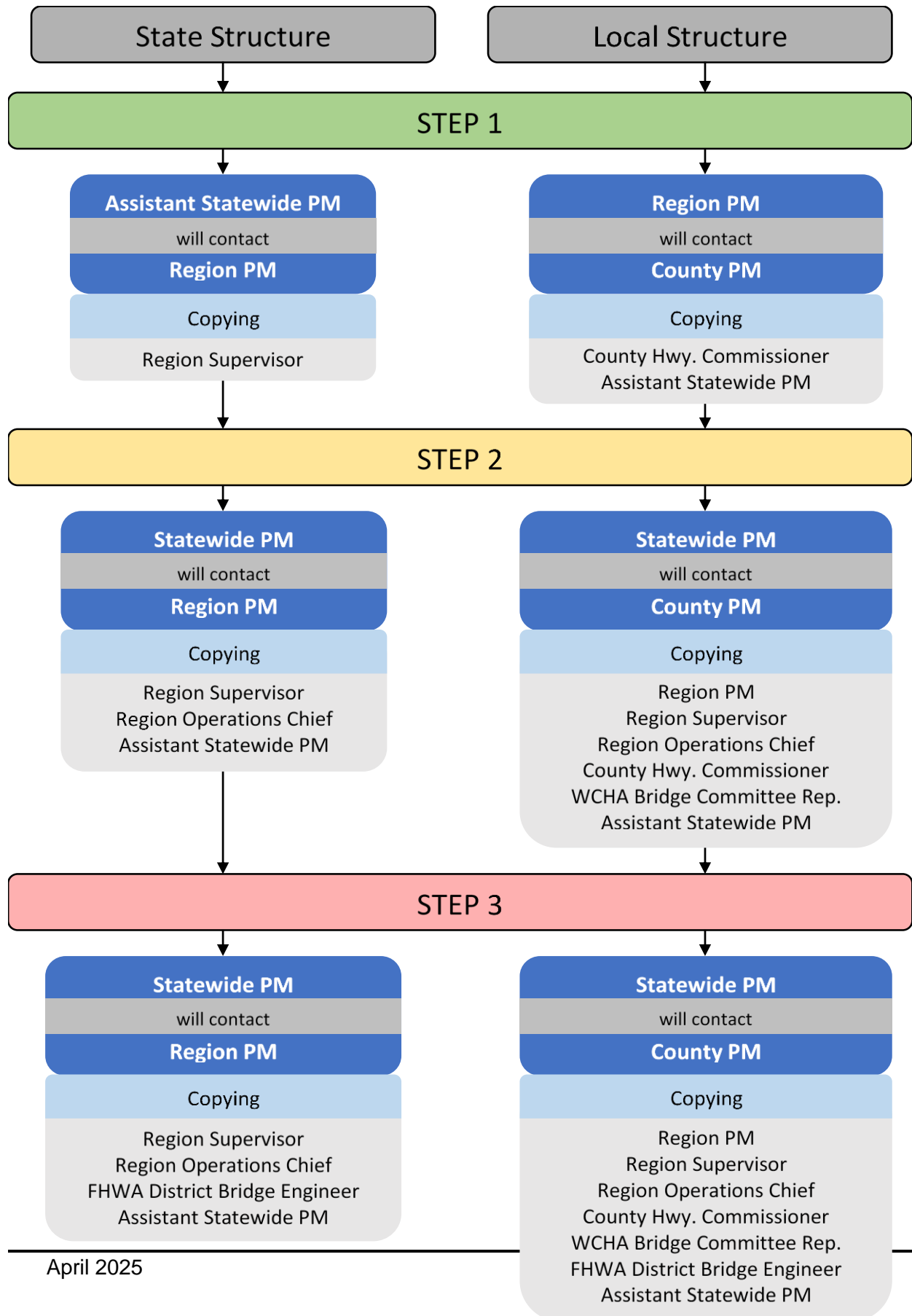
Step 1: Occurs for any inspection showing up as 2 months past-due. This step is an informal check-in in the form of either an email or a call asking about the completeness of the inspections in question. If the inspections are indeed complete, this information shall be passed on to WisDOT BOS staff. If the inspections in question are not yet complete, the need to perform the inspection should be enumerated.

Step 2: Occurs for any inspections showing up as 3 months past-due. This step will be a little more formal in that the contact will be documented with an email to be saved on file with



WisDOT BOS. For State-owned structures, WisDOT will offer alternatives available in order to get the inspection complete should the Region not have the capabilities to do so. For Local-owned structures, WisDOT will remind the County of their responsibility, under WI Statute 84.17, to perform the inspections in question.

Step 3: Occurs for any inspections showing up as 4 months past-due. In order to maintain compliance for Metrics 6 through 10, WisDOT must not let an inspection be inspected over 4 months past its required inspection date. Therefore, this step is the final and most urgent step. For State-owned structures, should the Region not have the capability to do so, WisDOT BOS will cause it to be performed by the end of the 4th month. For Local-owned structures, WisDOT will send a Directive Letter to the County, copying Wisconsin County Highways Association (WCHA), citing WI Admin. Code Trans 212, directing the inspections in question to be performed.





1.2.5.8 Inspection Meetings

WisDOT encourages each program to have inspection meetings, as necessary to keep up-to-date on current issues and practices within the inspection program. These meetings can consist of Bridge Owners, Program Managers, and Inspection Team Leaders gathering to discuss the state of either the Bridge Program or the Inspection Program. Alternatively, or complementary to these meetings, some Regions may host an inspection season refresher in the early spring which serves as a reminder of inspection requirements and practices for Bridge Owners and Program Managers. Lastly, WisDOT may send out an Update Seminar for inspectors to reaffirm some of the Wisconsin-specific practices as well as to disseminate new program policies. These forums offer great opportunities for involved parties to ask questions and maintain uniform approaches for inspection.

1.2.5.9 Quality Control Best Practices

Quality Control Best Practices are defined as activities which satisfy the “independent review of inspection reports” section within the criteria language for FHWA’s Metric #20. The intent of these Best Practices is to have each program internally provide some level of review as to the completeness and accuracy of information being submitted on inspection reports. WisDOT provides several Best Practice options (outlined below), but it is the responsibility of each program to utilize their own form of inspection report review and/or validation.

Collaborative Inspections

A Collaborative Inspection is defined as an inspection performed in a team of 2 or more in which all inspectors are working together in performing the inspection of the structure. This also implies that each inspector will be evaluating the structure in its entirety and not that each inspector only inspects a portion of the structure. While the latter method can lower inspection times, it does not qualify as a Quality Control Best Practice. Collaborative Inspections include a Team Leader working alongside any individual with at least one of the following qualifications: Regional Program Manager, County Program Manager, another Team Leader, Team Member, or Bridge Owner. WisDOT’s Under Bridge Access Inspection Staff can qualify towards this Best Practice.

Quality Control Inspections

A Quality Control Inspection is defined as an inspection performed by a Team Leader under the supervision of any individual with at least one of the following qualifications: Regional Program Manager, County Program Manager, or another Team Leader. This Best Practice differs from Collaborative Inspections in that the additional inspector is present simply to observe the practices and process of the Team Leader. They need not participate directly in the inspection of the structure, but should provide input on the acceptability of the Team Leader’s inspection methods and results. WisDOT’s Under Bridge Access Inspection Staff can qualify towards this Best Practice.

Inspector Rotation

Inspector Rotation is accomplished by alternating Team Leaders each inspection cycle for all or a portion of the program’s inventory. This format allows for several different sets of eyes to view the structure during its lifespan. The additional sets of eyes will provide quality



checks on Inventory Data, Elements, Defects, and Component Ratings. This method is predicated upon the assumption that the same inspector does not inspect the same structure in consecutive cycles.

Independent Entry

Independent Entry is defined as having another individual enter an inspection for the Team Leader that performed the inspection. The individual entering the inspection must have at least passed the NHI “Safety Inspection of In-Service Bridges” course and must not have participated on the same inspection he/she is entering. This Best Practice is targeted at having a fresh set of eyes review the elements and data present on the report. Elements should make sense for the structure type being inspected and low NBI Component Ratings should be supplemented with sufficient documentation.

Inspection Report Review

Inspection Report Review is defined as an independent review of an inspection report by a Bridge Owner or Program Manager. The Program Manager reviewing an inspection report for which he/she was the Team Leader will not qualify under this Best Practice. Data to be reviewed includes but is not limited to: Inventory Data, Elements, Defects and Quantities, NBI Component Ratings, Documentation/Justifications, and Maintenance Actions. Inspection reports should also be reviewed for completeness. This review only signifies that the Bridge Owner or Program Manager has reviewed the inspection report for the above aspects. It does not, under any circumstance, signify that the Bridge Owner or Program Manager assumes responsibility for the accuracy or thoroughness of either the field inspection itself, the assessment of the structure’s condition, or the documentation of the structure’s condition.

Each program must have some form of review and validation of inspection reports, whether it is one of the Best Practices outlined above or another method that has worked in their program. While every inspection report does not need to be reviewed under a Best Practice, the program shall review enough reports during a cycle to ascertain that inspection reports being submitted are of sufficient quality.

1.2.5.10 Quality Control DT Form

The Quality Control DT2002 Form is a standardized form that lays out the scope and responsibilities of County and Region Inspection Programs. WisDOT requires that this form be updated and resubmitted to BOS no later than January 15th on the year the program is due for a Quality Assurance Review. The reviewing agency will inform the program by December 1st of the prior year if they are required to complete this document. Additionally, the form shall be updated and resubmitted when a new County Highway Commissioner or Program Manager is hired. Each program is responsible to keep this document-up-to-date as it should be a living document. Sections of the form are listed and described below.

Inspection Program Staff

Inspection Program Staff includes Bridge Owners, Highway Commissioners, Program Managers, Team Leaders, and Team Members that are directly involved in the inspection program. These individuals are the human resource component available to maintain the inspection program. The minimum amount of information needed in this section includes the individual’s name, their role within the program, and their Inspector ID number, if applicable. If



consultants are hired by the program to fill a Program Manager role, the DT form shall be accompanied by a document detailing the scope of services that the consultant will provide to fulfill that role.

Inspection Meetings

Any bridge related inspection meetings, as detailed in section 1.2.5.8, can be documented under this section. These meetings highlight the programs dedication to maintain current and consistent inspection practices. Documentation should include an approximate interval for each meeting listed.

Inspection Scheduling Method

Each program will document the general method they use to schedule structure inspections, including the following criteria:

- when inspections are typically performed (general months and years)
- how and why inspections are delegated to specific inspectors

Quality Control Best Practices

Each program will document the methods they have historically used over the last inspection cycle for satisfying the “independent review of inspection reports” clause in the Metric #20 language. There are entries available for the program to write in methods not detailed as Best Practices in section 1.2.5.9. Each Best Practice documented on the form shall be accompanied by either a percentage of the inventory reviewed, the number of inspections reviewed, or the number of days spent performing reviews.

Bridges within Program Jurisdiction

Bridge lists will be attached to the DT form to help define the scope of each program. Note that these lists capture the program at a certain point in time and any future references should understand that the lists may not be final or complete. Counties and Regions should still maintain their own separate lists of structures that should be up-to-date at all times. One list shall be provided for each of the following inspection or activity types:

- 24-month Routine
- 12-month Routine
- NSTM
- Underwater Dive
- Underwater Profile
- In-Depth
- Movable
- Scour Critical

The minimum amount of information needed on these lists includes Structure ID and inspection interval. To help better identify bridges WisDOT recommends including columns for Feature On, Feature Under, Owner, and Municipality. Bridges may very likely show up on multiple lists.

This form will serve as an aid not only in the Quality Assurance Process but also in detailing roles and responsibilities to Owners and Program Managers.

**1.2.6 WisDOT Bridge Inspection Quality Assurance Program****1.2.6.1 Purpose**

The NBIS Metrics for Oversight of the National Bridge Inspection Program, Metric #20: Inspection Procedures – QC/QA states:

1. Systematic quality control (QC) and quality assurance (QA) procedures are used to maintain a high degree of accuracy and consistency in the inspection program.
2. QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.

In order to maintain the accuracy and consistency of structure inspections and structure inspection reports, structure owners should implement appropriate quality control and quality assurance (QC/QA) measures. Typical QA procedures will include a field review performed by an independent agent and various performance metrics monitored by the WISDOT.

The purpose of the Quality Assurance Program is to monitor the quality of the inspection program and to evaluate the need for possible adjustments to individual Quality Control Programs.

1.2.6.2 Components

The Quality Assurance Program within WisDOT's Bridge Inspection Program has numerous components, which cover the oversight responsibilities assigned to WisDOT's BOS and its regions. WisDOT's BOS Bridge Inspection Unit Supervisors will lead the Quality Assurance Program.

1. **Quality Assurance Field Reviews**
WisDOT utilizes various types of field reviews to assess the quality of inspection personnel, processes, and reports. These reviews are comprised of a sampling of completed inspections and may vary in scope, scale, interval, and selection criteria. Where prudent, load rating reviews will be performed.
2. **Quality Assurance DT Form**
Every Quality Assurance Field Review will be documented using a standardized quality assurance form (WisDOT DT2003). This form will include the type of field review, the adequacy of quality control documentation, a narrative on subject's performance, and detailed analysis of inspection report data.
3. **Field Review Summary Report**
Quality Assurance Field Reviews within each year will be summarized in a concise report that documents the trends of current inspection practices while highlighting any potential opportunities for improvement.
4. **Disqualification and Requalification Procedures**



Inspectors that exhibit unethical behavior or fail to uphold the requirements of WisDOT's Bridge Inspection Program may be subject to a disqualification/requalification procedure.

5. **WisDOT Quality Assurance Metrics**
The Highway Structures Information System (HSIS) is WisDOT's online bridge information database and it has the capability to run queries of its data to aid in the creation of certain performance metrics. These metrics are aimed at guiding future WisDOT Policy.
6. **Quarterly Inspection Performance Measures on Inspection Compliance**
Specialized query reports within HSIS allow WisDOT to monitor compliance to inspection interval requirements on a quarterly basis.

Each component mentioned above will be discussed in further detail in the following sections.

1.2.6.3 Quality Assurance Field Reviews

Quality Assurance Field Reviews occur separately from the normal inspection process and are carried out by an independent team (as defined below). These field reviews shall be performed on a cycle such that each program is reviewed every fourth year. Further details of field reviews are described below.

Scope

Field reviews are an evaluation of the structure and its condition as it relates to the most recent Routine inspection report. Field reviews are not meant to substitute or constitute an inspection of any type and should not be treated as a full-scale inspection. The main purpose of the Quality Assurance Field Reviews is to assure that correct inventory data was captured, appropriate elements and assessments were documented, and justification via pictures and/or diagrams was provided for NBI component values. While the review does not require defect quantities to be calculated, a check of such values shall be performed to determine applicability to the structure's condition. Another goal for the field reviews, in assessing quality, is to assure that documented NBI component values are within 1 of the review panel's rating and that documented overburden measurements are within 1" of what is measured during the review.

Each field review shall consist of an on-site inspection review of typically between 2 and 6 structures. Further items to review are as follows:

Fixed Bridges:

1. Review QC DT form for completeness and accuracy.
2. Check qualification of inspectors.
3. Review office bridge file documentation for organization, content and location, see form [DT1729](#) Bridge File Documentation.
4. Check bridge overburden values are within 1" of actual measurement during the review.
5. Review recommended bridge maintenance items are appropriate and completed maintenance/repairs are documented.
6. Review UW probe form filled out completely.
7. Review structures requiring UW dive inspections.



8. Review UW profiles are completed per program requirements.
9. Review Scour Plan of Actions (POA's) for completeness and accuracy paying special attention to triggers required for monitoring and closing the bridge during flood events. Review a minimum of 1 structure per review.
10. Review Scour Appraisal documentation (scour calcs, evaluations/assessment forms, summary of scour evaluation, information on plans, etc.).

Movable bridges: On an annual basis perform a minimum of 2 QC office reviews and a minimum of 1 QA field reviews of moveable bridges statewide.

Items to review:

1. Check for accuracy and qualifications of inspectors
2. Review DT forms are completed properly filled out
3. QA review of inspection report similar to a fixed bridge QA review
4. Check files and look for supporting documents for conditions
5. Look for documentation process for severe finding, what triggers process and implementation
6. Safety, inspection and structure procedures defined including Tag Out procedure
7. Review list of contacts for emergency or maintenance issues
8. Review maintenance history, process and scheduling.

Types of Field Reviews

Field reviews are categorized into one of four types: County, Region, Supplemental, or Federal.

County Program Reviews are led by the WisDOT's Bridge Inspection Unit Supervisor. The Regional Program Manager is responsible to establish a 4-year cycle in which each county within their jurisdiction shall be reviewed. The review should be performed by a team of at least two participants, although it may be performed solely by the Unit Supervisor. These participants can be any combination of the following parties: Bridge Inspection Unit Supervisor, Regional Program Manager, Regional Inspection Staff, County Program Manager, other BOS Staff, or FHWA Division Bridge Engineer.

Region Program Reviews are led by WisDOT's Bridge Inspection Unit Supervisor and are scheduled such that each program will be reviewed on a 4-year cycle. The review shall be performed by a team of at least three participants. These participants can be any combination of the following parties : Bridge Inspection Unit Supervisor, other BOS Staff, FHWA Division Bridge Engineer, Regional Program Manager, or Regional Inspection Staff.

Supplemental Reviews are led by WisDOT BOS Staff and will be performed as needed. These reviews provide a more focused approach to assuring quality by targeting areas of concern discovered by WisDOT, regardless of structure ownership. Additionally, these reviews may involve office data reviews and/or field reviews.



Federal Reviews are led by the FHWA Division Bridge Engineer. These reviews are typically performed every year and generally involve the review of any publicly-owned bridges within select regions of the state. These reviews tend to rotate regions on a 4-year cycle, similar to Region Program Reviews. The main difference to highlight is that WisDOT acts as a separate and independent agent from FHWA's Metric Review Program. WisDOT's presence is solely in an auxiliary capacity to aid the FHWA Division Bridge Engineer on his/her review as an extra review panel member. This effort also affords WisDOT the opportunity to collect more quality assurance data to further assure Inspection Program quality.

Selection Criteria

Structures used for Field Reviews will be selected based on one or more of the following factors.

Condition

Structures in poorer condition afford the review team the opportunity to gauge an inspector's thoroughness and diligence during the last inspection. Age can also play a role within this criterion as it may be prudent to review a structure inspection of a new structure in which accelerated deterioration is documented. Similarly, it may be prudent to review a structure inspection of an old structure in which limited deterioration is documented.

Large Drops in NBI Component Values

Bridges generally age gradually over time and it is therefore concerning when a structure's component rating for Deck, Superstructure, Substructure, or Culvert drops rapidly between inspections. This criterion would allow WisDOT the opportunity to become informed of any accelerated deterioration.

Lack of Documentation/Justification

Inspection reports with lower NBI component ratings should have sufficient documentation to justify the ratings. Reports without sufficient documentation (as determined by a Program Manager) may be subject to review.

Inspectors

Inspectors that perform an excessive number of inspections in a single day may not have utilized proper inspection practices or performed their inspection duties to the appropriate extent and may therefore be subject to review. Likewise, any inspectors that perform very few inspections per cycle may not be as proficient with Wisconsin's inspection practices and could be subject to review.

Random

Bridges selected for review may be selected on a completely random or a selectively random basis. Selectively random could limit the randomization to a pool of structures that was filtered to a certain region of the state, certain superstructure types, particular inspectors or firms, or structures along an easily traversable path. Completely random would not be limited by any filters and would pull from any publicly-owned structure in the State of Wisconsin.

Input from Bridge Owner/Program Manager



WisDOT is willing to accommodate recommendations from Bridge Owners or Program Managers if they have concern about how future maintenance should be handled for the structure or if they have questions about how to document specific elements of the structure. Additionally, if Bridge Owners or Program Managers have concern about a specific inspector or program, WisDOT will give consideration to reviewing inspections performed by said inspector.

1.2.6.4 Quality Assurance DT Form

The Quality Assurance DT Form is a standardized form that serves as a location to document findings from both the review of the Quality Control DT Form and the Quality Assurance Field Reviews. It will also act as a To-Do list for any Follow-up Actions required from the field reviews. Sections of the Quality Assurance DT Form are detailed below.

Quality Control DT Form Check

In this short section, the completeness and adequacy of the program's QC DT Form will be documented. Commentary on any deficient areas is required. The reviewer shall then sign their name to confirm that the QC DT Form was reviewed in its entirety. Further details on what goes into a check of the QC DT Form will be given later, in section 1.2.6.5.

Program's Performance

Once the field reviews have been completed, this summary section shall be filled out to enumerate findings within the categories of Commendable Practices, Room for Improvement, and Follow-up Actions. Commendable Practices are those aspects of the reviewed inspection program that yield quality work commensurate with or in excess of WisDOT's expectations. Room for Improvement is any portion of the reviewed inspection program that needs to be enhanced to meet WisDOT's expectation for quality. Follow-up Actions are any items that need to be addressed within the near future regarding findings from the field reviews.

Field Reviews

Several blocks are set aside for a detailed analysis of each inspection report that was field reviewed. Each block contains entries for Bridge ID, miscellaneous notes, required follow-up actions, elements, and NBI component values, among other things.

This completed form provides the layout for any required Follow-up Actions. Typical Follow-up Actions include the submission of miscellaneous inspection documents, diagrams, or pictures, and a load rating check. WisDOT's Load Rating Staff will review the load rating files for all structures that are field reviewed.

Upon completion of all Follow-up Actions, but no later than December 31st of that year, the QA DT Form shall be distributed to WisDOT BOS and the agency that was subject to review.



1.2.6.5 Example Schedules for Various QA Reviews

Quality Assurance Reviews of County or Region Programs shall begin with an assessment of the program's Quality Control DT Form. Because this DT 2002 Form is required to be submitted by February 1st for all programs due for QA Review within the upcoming year, and because the review of this form can take place strictly in an office setting, WisDOT recommends that the QC DT Form be reviewed the last few months of the previous year for planning purposes. This practice would allow a portion of the QA Review to occur outside of the typically busy inspection months. During the review of the QC DT Form, the reviewer should check several pieces of information. First, the reviewer should be ensuring that all documented Team Leaders are indeed qualified through WisDOT to perform inspections. Next, a comprehensive cross-check of the given bridge lists with HSIS will be performed. If the lists provided differ from the lists in HSIS, then the reviewer shall follow up with the program to correct any inconsistencies. Once corrections are agreed upon, the updated lists, if applicable, shall be emailed to WisDOT BOS. Lastly, the form shall be checked for completeness. Once the review of the QC DT Form is finished, the reviewer shall fill out the appropriate section of the Quality Assurance DT Form and sign his/her name.

The examples highlighted below may be used as a template for how WisDOT anticipates Quality Assurance Field Reviews to be scheduled.

County Program Reviews can take place in a single day. The BOS Unit Supervisor and/or the Regional Bridge Program Manager shall coordinate with the County Program Manager, County Highway Commissioner, and BOS Staff (if applicable) in order to find a date that will work for all involved parties to spend the day visiting bridges in the field. Once a date is agreed upon, the Unit Supervisor should then select several structures to field review using the selection criteria laid out in 1.2.6.3.

Region Program Reviews can take place in a single day, but may require BOS Staff to travel the day prior to the review. The BOS Unit Supervisor shall coordinate with the Regional Program Manager and the FHWA Division Bridge Engineer (if applicable) in order to find a date that will work for all involved parties. Once a date is agreed upon, the Unit Supervisor should then select structures to field review using the selection criteria laid out in 1.2.6.3. Further thought should be given to planning progression of field reviews along a path as it relates to each Regional Program in order to limit the amount of travel time for all parties.

Supplemental Reviews are scheduled as necessary. They may involve office/data type reviews or field reviews by BOS Staff. BOS Staff may or may not coordinate with Program Managers dependent on the review content. Program Managers may participate in the review if deemed necessary to clarify review results.

Federal Reviews are scheduled entirely by the FHWA Division Bridge Engineer.

WisDOT's goal is to make time to participate alongside FHWA for the entirety of these reviews. WisDOT participants may include the Statewide Inspection Program Manager, Assistant Inspection Program Manager, Unit Supervisor, Region Program Manager, Local Program Managers, or other Team Leaders of the inspections being reviewed.



1.2.6.6 Field Review Summary Report

Upon completion of the year's Quality Assurance Field Reviews (of all types), BOS Staff will summarize trends and findings in a concise report. This report will be used to highlight current inspection practices and, if applicable, opportunities for improvement to the Bridge Inspection Program. BOS will look provide FHWA with a copy of this report by January 31st of the following year.

1.2.6.7 Disqualification/Requalification Procedures

Inspectors that fail to uphold the requirements for a quality inspector as established by WisDOT may be subject to the disqualification/requalification process. There are three different arms of this process and each one is described below.

Failure to Maintain Qualification

Should an inspector fail to attend required refresher trainings or fail to maintain their registration as a Professional Engineer, as applicable, WisDOT's Statewide Program Manager may disqualify this individual from performing inspections within the State of Wisconsin. These individuals may re-qualify as Wisconsin inspectors by simply completing the necessary training or updating any professional certifications, where required for Team Lead status.

Inspection Quality

Any inspector that shows a significant lack in inspection quality may be subject to disqualification via a review committee. Examples of inadequate inspection quality include but are not limited to: fraud, misconduct, falsification, other unethical behavior, and repeated failure to correct previous mistakes. The review committee shall be comprised of the following 3 individuals, all with voting powers:

- WisDOT Statewide Program Manager
- WisDOT Assistant Statewide Program Manager
- and a Region Program Manager from the same region as the inspector being reviewed or BOS Maintenance Unit Supervisor

In addition to the 3-member review committee, non-voting members may be selected by the committee to participate in the review or may choose to participate voluntarily. This includes any of the following:

- FHWA Division Bridge Engineer
- Region Program Manager(s)
-
- County Program Manager(s)
- WCHA Representative

Determinations within the committee will be decided by majority vote. After WisDOT investigates and compiles concerning evidence, the first action of this process is for the Statewide PM to notify the subject inspector that he/she is currently under review and for what reason. The subject inspector will have the opportunity to provide his/her defense to the review committee. The review committee shall then be assembled to determine



whether or not the offense warrants disqualification or permanent removal. The review committee is permitted to permanently disallow an inspector from inspecting in the State of Wisconsin at any step in this process. If the inspector is disqualified, then the review committee notifies the subject inspector, and the requalification process begins. It will be the disqualified inspector's responsibility to create a plan enumerating corrective steps to be taken to re-establish and prove inspection competency. The review committee will meet for a second time to review this proposal, make any desired changes, and return to the inspector. The last action of the review committee will be one final meeting to determine the outcome of the inspector's plan for improvement. At this point the committee will either grant re-qualification, establish an auxiliary re-qualification procedure, or permanently disallow the inspector from inspecting in the State of Wisconsin. The timeline for the disqualification/requalification procedure involving the review committee will be established on a case-by-case basis, not to exceed one year from the date of notification by the Statewide PM.

Inspection Timeliness

Any inspector or program manager that fails to maintain timely inspection practices may be subject to disqualification via a review committee. Examples include but are not limited to: failure to quickly address critical findings, failure to properly inspect structures within prescribed intervals, and failure to enter inspection reports in a timely manner. The review committee and requalification process are the same for this offense as it is for the prior offense.

1.2.6.8 WisDOT Quality Assurance Metrics

WisDOT utilizes its in-house software, the Highway Structures Information System (HSIS), as its tool for data management. HSIS is capable of running complex queries of the data to aid in producing several performance metrics used by WisDOT. Some of the metrics that WisDOT looks at in regards to inspection quality are described below.

Excessive Inspection Counts

WisDOT becomes concerned with inspection quality levels when an excessive number of inspections are performed in a single day. At the end of an inspection year, BOS Staff creates a metric on the number of inspections performed as part of an excessive inspection count. Also, WisDOT will track which inspectors are performing these excessive inspections. These inspectors may be subject to a Supplemental Field Review.

Average Inspection Time

WisDOT will look at inspection times as a tool to assess inspection quality for a given structure.

Time to Create/Complete

One important, and often overlooked, aspect of quality is timeliness. HSIS has the ability to produce data regarding the amount of time it takes inspectors to perform the final documentation aspects of the inspection process. After performing an inspection, inspectors will start by creating the inspection in HSIS. This lets HSIS know that an inspection was indeed performed and will allow the inspector to then enter the inspection



information into the database. Once an inspector enters all the information and determines that it is complete to his/her best knowledge, he/she will then digitally sign and submit the inspection report. WisDOT is gathering information on how long it takes for inspectors to first create the inspection after performing it then to complete it after creating it. WisDOT may then take this information to evaluate which inspectors, if any, may be subject to disciplinary actions as laid out in 1.2.6.7.

1.2.6.9 Quarterly Performance Measures on Inspection Compliance

In order to monitor adherence to inspection interval requirements as laid out by the National Bridge Inspection Standards (NBIS), WisDOT BOS Staff utilizes reports from HSIS. These reports query inspection data pertaining to inspection date, type, interval, and late reason in order to establish whether or not a structure's inspection is in compliance. These reports are used on a quarterly basis as intermediate measures to gauge inspection interval compliance as it relates to State and Federal bridge inspection requirements. These quarterly reports allow WisDOT to see trends that arise during an inspection season and afford the Bridge Inspection Program the opportunity to preemptively correct deficiencies that will be captured on future FHWA Metric Reviews. This effort is an attempt to strengthen WisDOT's Inspection Program in advance of federal requirements for corrective action or improvement.