Biennial Report on Bridge Inspection Quality Assurance

February 1, 2011

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Contents

INTRODUCTION

This biennial report on bridge inspection quality assurance is submitted by the Commissioner of the Minnesota Department of Transportation in response to the requirements specified in Minnesota Statute, Section 165.03, Subdivision 8.

The estimated costs associated with the preparation of this report include the following:

Staff time	$8,000

Minnesota Statute 165.03 Subdivision 8 – Biennial Report on Bridge Inspection Quality Assurance

By February 1 of each odd-numbered year, the commissioner shall submit a report electronically to the members of the Senate and House of Representatives committees with jurisdiction over transportation policy and finance concerning quality assurance for bridge inspections.

At a minimum, the report must:

(1) summarize the bridge inspection quality assurance and quality control procedures used in Minnesota;

(2) identify any substantive changes to quality assurance and quality control procedures made in the previous two years;

(3) summarize and provide a briefing on findings from bridge inspection quality reviews performed in the previous two years;

(4) identify actions taken and planned in response to findings from bridge inspection quality reviews performed in the previous two years;

(5) summarize the results of any bridge inspection compliance review by the Federal Highway Administration; and

(6) identify actions in response to the Federal Highway Administration compliance review taken by the department in order to reach full compliance.

EXECUTIVE SUMMARY

Mn/DOT's Bridge Inspection Program strives to conform to state and federal laws and regulations. The National Bridge Inspection Standards, which was most recently revised in December 2009, is the most comprehensive document with regard to bridge inspections and is the basis for the Federal Highway Administration's annual evaluation of Mn/DOT's Bridge Inspection Program.

Mn/DOT wrote an extensive quality control/quality assurance plan for its bridge inspection program in 2008. It was primarily a compilation of current practice assembled into a formal document, but it also added new processes to comply with changes to the NBIS and more directly address quality assurance. The plan defines and delegates responsibilities for the statewide inspection programs to 194 districts, counties, municipalities and other agencies throughout the state. It also describes the certification and training program for qualified bridge inspectors and sets up a process for quality assurance reviews of state and local agency inspection programs. One significant change is the addition of a process for the review of fracture critical and in-depth inspection reports by a structural engineer from the Mn/DOT's Bridge Office prior to sending the report to the district bridge engineer or local program administrator. The review includes a written assessment that states if the bridge is functioning as designed, if a new load rating is warranted or if any important structural repairs should be made.

Mn/DOT's Bridge Office also has made changes to its bridge inspection manual, which standardizes how inspections are done by each inspecting agency. New elements have been added for the assessment of gusset plate condition and new sections have been added to help inspection staff better identify conditions that could lower the load carrying capacity of a bridge. Additional changes to the manual were made in response to recommendations from the FHWA during their annual review of Mn/DOT's Bridge Inspection Program.

Three technical memoranda have been issued to establish policy with regard to frequency of routine and special inspections, and for reporting and addressing critical bridge inspection findings. Mn/DOT requires an annual inspection of bridges with fracture critical elements and bridges that are in poor condition. Other bridges must be inspected every two years in accordance with NBIS requirements.

Currently, 419 of Mn/DOT's bridges are inspected annually and 4142 bridges are inspected on 24-month frequency. Mn/DOT also provides fracture critical and in depth inspections for 67 Mn/DOT and 88 locally owned bridges, and administers contracts to perform underwater inspections for 189 Mn/DOT and 198 locally owned bridges.

In 2009, one critical deficiency was reported on a Mn/DOT owned structure; in 2010, there were three. Critical deficiencies are conditions that threaten public safety and, if not promptly corrected, could result in the collapse or partial collapse of a bridge. All critical deficiencies have been resolved.

There are currently 86 Mn/DOT employees and 207 local agency employees and consultants who are certified to perform bridge inspections. Certification requires either an engineering degree or five years experience performing bridge inspections, along with two weeks of training in an FHWA approved course and a field proficiency exam. Certified inspectors are also required to attend a one-day bridge

inspection refresher seminar every two years. Inspection seminars were presented by Mn/DOT's Bridge Office at six locations across the state in 2009 and at five locations in 2010. In addition to these seminars, three inspection classes were presented in 2009 and two in 2010. These classes are one to two weeks in length and are required for certification as inspection team leader or to perform fracture critical inspections.

Within Mn/DOT, responsibility for each district's inspection program is delegated to the district bridge engineer. In 2008, Metro District, which owns more than half of Mn/DOT's bridge inventory, placed a structures engineer into a new management position to direct its bridge inspection and maintenance program. In 2009, Metro District added a fourth engineering position to its inspection staff. The Duluth and Rochester districts, which each account for about 15 percent of Minnesota's bridge inventory, added engineering and supervisory positions to support its inspection and maintenance efforts. In addition, five new engineering positions were added to the Central Office Bridge Inspections Unit due to recent changes in NBIS rules that nearly doubled the number of fracture critical inspections done by Mn/DOT each year, as well as expanded and clearly defined Mn/DOT's responsibilities for managing both state and local bridge inspection programs. Prior to 2008, Mn/DOT operated a fleet of four under bridge inspection vehicles. Since then, two new vehicles have been added to the fleet and another is due to be replaced with a new vehicle in 2011.

In response to findings by the Legislative Auditor in 2008, new performance measures were created to document the timeliness of bridge inspections and follow-up maintenance actions. In 2008, 89 percent of all routine bridge inspections and 100 percent of fracture critical inspections were completed on time. In 2009, 94 percent of routine bridge inspections and 99 percent of fracture critical inspections were completed on time. High-priority reactive bridge maintenance items are scheduled to be completed within one year of being identified. In 2009, 66 percent of high-priority maintenance items were completed on time. This measure was significantly impacted by a Metro District effort to check for loose concrete on the underside of all its bridge decks. This required maintenance crews to perform physical inspections and, in some cases, concrete removal on more than 1,100 bridges during 2009 and 2010. If these under-deck bridge assessments in Metro District are excluded from the count, 88 percent of high-priority reactive maintenance items were completed on time.

The bridge inspection programs of 20 percent of Minnesota's local agencies are evaluated each year. In 2008, one municipality was determined to be out of compliance with the NBIS. In 2009, two counties were determined to be out of compliance. Mn/DOT's Bridge Office worked with each agency to bring them back into NBIS compliance and followed up with agencies that were late in submitting requested information. Important findings from these local agency reviews also are reviewed with state and local bridge inspection personnel who attend the annual bridge inspections seminars. Additionally, each agency has electronic access to a Mn/DOT website listing custom reports the agency can use to review the current status of its bridges. In addition to those agencies that received a formal program evaluation, many other agencies were asked to provide additional information with respect to out-of-date bridge ratings, plans to monitor scour, late inspections and inspections performed during winter months.

FHWA annually assesses the management of the statewide bridge inspection program. They occasionally accompany bridge office staff on compliance reviews of local agencies and lead compliance reviews of Mn/DOT districts. During the past two years, none of the Mn/DOT districts evaluated were found to be out of compliance with NBIS requirements. They also found Mn/DOT's management of the overall statewide bridge inspection program to be in substantial compliance. Recommendations were made, however, to improve state and local bridge load ratings and postings, data quality, manuals and other items. Mn/DOT has responded in writing to each recommendation. Changes that address recommendations have been made to inspection manuals. Mn/DOT's ratings staff has resolved most bridge rating issues by consultant contract. Seminar training has been used to promptly address statewide issues.

1. BRIDGE INSPECTION QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

State and Federal Statutes and Regulations

Minnesota Laws and Regulations Governing Bridge Inspections

All bridges that are located on or over public roads must be inspected in accordance with applicable Minnesota statutes and regulations. Minnesota Statute, Chapter 165.03 primarily addresses bridge inspections and assigns responsibility for inspection to bridge owners. Minnesota Rules Chapter 8810.9000 to 8810.9800 provides the regulations necessary to implement the statute. Minnesota rules governing inspector qualifications and inspection frequency, bridge inventory and ratings closely agree with federal regulations that establish National Bridge Inspection Standards.

National Bridge Inspection Standards

Minnesota's Bridge Inspection Program and its quality control and quality assurance processes are required by federal statute to meet the National Bridge Inspection Standards as set forth under Federal Code of Regulations Title 23 Part 650 Subpart C. The regulation was first developed by the Federal Highway Administration in cooperation with the American Association of State Highway and Transportation Officials December 15, 1967, and was enacted as part of the Federal-Aid Highway Act of 1970. It was most recently revised in 2009. The NBIS establishes the minimum requirements for all state transportation departments' bridge inspection organization and holds each state department of transportation responsible for the inspection of all state and locally owned highway bridges located on public roads. It also establishes the minimum qualifications for bridge inspectors and their managers, the frequency of routine and special inspections, and specifies procedures for the inspection and load rating of bridges as well as minimum quality control and quality assurance procedures.

> *§650.313 (g) Quality control and quality assurance. Assure systematic quality control (QC) and quality assurance (QA) procedures are used to maintain a high degree of accuracy and consistency in the inspection program. Include periodic field review of inspection teams, periodic bridge inspection refresher training for program managers and team leaders, and independent review of inspection reports and computations .*

The NBIS also incorporates by reference the AASHTO Manual for Bridge Evaluation. AASHTO developed the manual to establish more specific inspection procedures and evaluation processes that meet the NBIS. Separate sections of the manual provide guidance on maintaining bridge records, bridge management systems, inspection requirements and procedures, destructive and nondestructive inspection and testing methods, and load rating and fatigue evaluation of steel bridges.

A copy of the National Bridge Inspection Standards (CFR 23 Part 650 Subpart C) can be found at the following website: frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2004_register&docid=FHWA–2001–8954.pdf.

The quality control and quality assurance processes and policies described below have been developed by Mn/DOT to assure compliance with the NBIS and conformance with the AASHTO Manual for Bridge Evaluation in order to maintain a high-quality statewide bridge inspection program.

Bridge Inspections Quality Assurance and Quality Control Program

Mn/DOT's quality assurance and quality control procedures governing its statewide inspection program are described comprehensively on the Mn/DOT website in the document titled: Mn/DOT Quality Assurance and Quality Control Procedures for Bridge Inspections, which is available at www.dot.state.mn.us/bridge/documentsformslinks/inspection/Quality%20Assuranc-Quality%20Control%20Procedures.pdf. Below is a summary of the major components of the program.

Quality Control Responsibilities

Specific responsibilities of Mn/DOT's Bridge Inspection Program Manager are described along with those responsibilities delegated to district and local agency program administrators and inspection team leaders.

Qualifications

Mn/DOT maintains a program to certify bridge inspectors as team leaders and approve the appointment of program administrators who meet NBIS minimum experience and training requirements. Program administrators are required to be registered professional engineers. Inspection team leaders are required to be engineers or have five years of bridge inspection experience, and to have completed an FHWA approved inspector training course. In addition, Mn/DOT certification requires inspection team leaders to pass a field proficiency test. All program administrators and team leaders are required to attend two days of refresher training every four years and must submit documentation that they have competently performed their duties and responsibilities. Failure to maintain qualifications can result in decertification or denial of appointment, making the person ineligible to perform bridge safety inspection or program administrative activities.

As of September 2010, Minnesota's state and local bridge inspections are conducted by 194 different entities (Mn/DOT districts, counties, cities and other distinct agencies). Within these agencies, there are 161 appointed program administrators and 303 certified bridge inspection team leaders. Of the 303 inspection team leaders, 86 are Mn/DOT employees.

Training

Mn/DOT offers several Inspector training classes and seminars each year. An introductory, one-week-long "Engineering Concepts for Bridge Inspectors" class is required for new inspectors who do not meet the experience or education requirements for team leader. Prior to certification as team leader, inspectors must take the two-week-long course titled "Safety Inspections of In-Service Bridges." The course is taught by instructors from the National Highway Institute and is an FHWA approved comprehensive bridge inspection training course. Other National Highway Institute courses on advanced topics are scheduled periodically.

Attendance for classes taught in 2009 and 2010 is shown below:

Course	2009 Attendees	2010 Attendees
Engineering Concepts for Bridge Inspectors	27	24
Safety Inspections of In-Service Bridges	30	12
Fracture Critical Inspection Techniques	14	NA

In addition to these courses, Mn/DOT staff annually conducts refresher training seminars for program administrators and inspection team leaders. The seminars are held at various locations throughout the state to facilitate attendance. Topics typically include: review of deficiencies and best practices found during inspection program quality reviews, FHWA compliance review findings, load rating issues and inspection manual updates. Five seminars were conducted around the state in 2009 and 2010. Due to a high level of interest, a sixth seminar will be added to the 2011 schedule.

Compliance and Quality Reviews

FHWA performs an annual review of Mn/DOT's Bridge Inspection Program. The purpose of the review is to evaluate whether the policies, procedures and operating practices meet requirements of the NBIS. It typically consists of a review of functions performed by Mn/DOT's Bridge Office and one or more district offices. The focus of the reviews varies from year to year, but typically will include a review of inspector qualifications, timeliness of bridge inspections and load ratings, and fracture critical and bridge scour documents. Formal findings from the review are reported in the form of recommendations that are summarized in a letter from FHWA to the Commissioner of Highways.

Similarly, Mn/DOT reviews the bridge inspection programs of several local agencies each year. A quality assurance questionnaire is sent to approximately 20 percent of local county and municipal bridge offices each year. Responses are reviewed along with the agency's bridge inspection reports and inventory data for compliance with NBIS requirements. Agencies that fail to respond to the questionnaire or whose reports or data do not clearly indicate compliance are scheduled for a more in-depth on-site review of the agency's program. Findings from both office and on-site reviews are submitted in letter form to the local agency.

Bridge Manuals and Technical Memoranda

Mn/DOT Bridge Manuals

The Mn/DOT Bridge Inspection Manual was last revised October 2009. In order to standardize how inspectors rate the condition of Minnesota bridges, the manual provides detailed descriptions of how

each of the NBIS required bridge inventory data records are to be coded. It also provides descriptions of bridge elements that must be inspected, as well as standard condition codes for those elements. A copy of the Mn/DOT Bridge Inspection Manual is available on Mn/DOT's Bridge Office website at www.dot.state.mn.us/bridge/manuals/inspection/BridgeInspectionManual_Version1.8.pdf.

In addition to the inspection manual, a section has been added to the LRFD Bridge Design Manual that describes requirements to calculate load ratings for bridges.

Mn/DOT Technical Memoranda

Three technical memoranda have been issued that establish standard statewide policies governing bridge inspections. These are available on Mn/DOT's Bridge Office website at www.dot.state.mn.us/bridge/.

Mn/DOT Technical Memorandum No. 04-08-B-01

Technical Memorandum No. 04-08-B-01 provides guidelines for bridge inspection frequency that state and local program administers use to determine if a bridge's routine inspection cycle may be extended from one year, as required by Minnesota Rule 8810, to a two-year interval specified by the NBIS. Bridges rated in poor condition and fracture critical bridges must remain on a one-year schedule. The memorandum was last updated in May 2004.

The number of 24-month and 12-month inspections scheduled statewide for the last two years is as follows (based on 2010 data):

Inspection Frequency	Mn/DOT Bridges	Local Bridges
12-Month	419 (9%)	4,142 (28%)
24-Month	4,161	10,734

Minnesota statutes were changed in 2009 to allow box culvert structures that are in fair or better condition to be inspected every four years. Mn/DOT's Bridge Office has worked with FHWA to develop criteria for 48-month inspections. An agreement was recently reached and the inspection frequency technical memorandum will be modified and reissued in 2011.

Mn/DOT Technical Memorandum No. 08-01-B-01

Technical Memorandum No. 08-01-B-01 provides guidelines for in-depth inspection of fracture critical bridges, underwater inspections and special inspections for other bridges. It describes bridges that require special in-depth or underwater inspection procedures, inspector/diver qualifications and inspection frequency. The memorandum also describes quality assurance procedures Mn/DOT uses to monitor these special inspections. Special in-depth inspections of fracture critical bridges are made on a

24-month or less schedule. Bridges that require a diver to inspect underwater are scheduled for underwater inspections at least every four years. The memorandum was last updated in February 2008.

Based on 2010 data, the following special inspections were scheduled:

Inspection Type	Mn/DOT Bridges	Local Bridges
Fracture Critical / Special Inspection	67	88
Underwater	189	198

Mn/DOT Technical Memorandum No 08-02-B-02

Critical deficiencies found during bridge inspections define the process agencies must use to report conditions found during an inspection that, if not promptly repaired, may lead to collapse, partial collapse or conditions that may otherwise be hazardous to public safety. Progress correcting critical deficiencies are monitored by Mn/DOT's Bridge Office and reported to FHWA each calendar year. The memorandum was first issued in February 2008.

The number of critical deficiencies reported between 2008 and 2010 is shown below:

Year	Mn/DOT	Other Agencies
2008	2	11
2009	1	10
2010	3	9

2. RECENT CHANGES TO QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Several of the quality control and quality assurance processes used by Mn/DOT were developed or modified in the past two years. Substantive changes are described in this section.

Written Quality Control and Quality Assurance Procedures and Processes

As noted in the previous section, a quality control/quality assurance policy was developed and placed on Mn/DOT's website in 2009 (see "Mn/DOT Quality Assurance and Quality Control Procedures for Bridge Inspections" in the appendix of this report).

This document is primarily a compilation of quality control and quality assurance processes from various technical memorandums and other process documentation developed over the history of Mn/DOT's Bridge Inspection Program. Significant additions to the policy made specifically in the past two years include:

- Listing the Mn/DOT Inspection Program Manager's specific quality control roles and responsibilities and specified which of those responsibilities are delegated to Mn/DOT district and local agency program administers and inspection team leaders (Section B1).

- Documenting the process to appoint a Mn/DOT Bridge Inspection Program Administrator. Significant changes to the NBIS that became effective in 2006 established Mn/DOT's overall responsibility for the inspection of all state and local bridges. Implementation of the new requirements called for Mn/DOT to define the tiered relationship between the department's central program management and district and local program administration. While a certification process has existed for inspection team leaders for more than 10 years, addition of an appointment approval process for managers of district and local agency inspection programs formalized the tiered relationship and delegation of authority. The process also documents that failure to maintain qualifications can result in appointment denial or decertification (Section B3).

- Describing a streamlined process for early reporting of significant fracture critical inspection findings and changes to NBIS bridge condition codes, as well as a separate process for review and approval of in-depth inspection reports. Review of the in-depth report includes a separate engineering evaluation of significant findings described below (Section B7a3).

This quality management plan is available at www.dot.state.mn.us/bridge/documentsformslinks/inspection/Quality%20Assuranc-Quality%20Control%20Procedures.pdf.

Structural Assessment of In-Depth Inspection Findings

A separate unit was created in Mn/DOT's Bridge Design Section to review in-depth fracture critical inspection reports and identify if significant structural deficiencies exist. A written assessment is forwarded to the bridge owner who is responsible to follow up if new load ratings or structural repairs are recommended. For Mn/DOT owned bridges, the in-depth report and assessment also are forwarded to the ratings engineer if a new load rating is recommended. If serious structural repairs are needed to a trunk highway bridge, a Mn/DOT Bridge Design Unit will be assigned to consult with the district office and prepare plans to promptly repair the condition. Prior to formation of this unit, Bridge Office engineers typically gave input when fatigue cracks were found during the inspection. Responsibility to determine if the bridge was functioning as designed or if a new load rating was needed fell directly on the district or local agency's bridge engineer.

Updates to the Bridge Inspection Manual

Several changes to the Mn/DOT Bridge Inspection Manual have been made over the last two years. Those changes along with background information have been discussed with program administers and inspection team leaders during annual inspection seminars. Significant changes made include:

Section 2.2

Adding specific language regarding evaluating, coding and monitoring bridges susceptible to scour, and defining which waterway channels must be periodically cross-sectioned to monitor scour and channel migration issues.

Section 2.1 and Appendix A 2.1

Adding condition rating procedures for Gusset Plate truss elements. Paint condition and structural condition are rated using separate elements. Prior to this change, gusset plate condition had not been specifically addressed in Minnesota or nationally. Adding instructions to help standardize how inspectors should measure and report section loss on steel bridge members.

Appendix B

Adding Appendix B to discuss load rating responsibilities of the inspection team leader and program administrator and describe changes to the bridge condition or loading that indicate the load capacity of the bridge should be checked. Sections of Appendix B also discuss how to identify and report additional dead loads that may change the bridge rating, requirements for posting bridges to restrict truck loads, and how to make sure load posting signs are in place and correct.

Appendix C

Adding Appendix C to help inspectors identify if safety features on the bridge (i.e. approach guardrail and bridge railings) meet current national standards. FHWA required Mn/DOT improve on the accuracy of data being reported due to the great variety of guardrail and railings used on state and local bridges.

This addition contains a comprehensive tabulation of railing cross sections and descriptions to allow inspectors to accurately identify the safety feature used on each bridge and determine if it meets current standards.

Performance Targets Added for Bridge Inspections and Maintenance

Mn/DOT regularly measures and reports the numbers of trunk highway bridges in good and poor condition. In response to a finding by the Legislative Auditor in 2008, Mn/DOT also has begun to measure and report the timeliness of its bridge inspections. Mn/DOT's goal is to complete all inspections on time. FHWA has typically counted an inspection on time if it was completed no more than 30 days after it was scheduled.

Based on existing NBIS data, the following percentages of trunk highway bridge inspections were completed on time:

Year	Routine	Fracture Critical
2007	86 %	100 %
2008	89 %	100 %
2009	94 %	99 %
2010	Data Not Available	99 %

Although some routine inspections were late, all inspections were completed within the year scheduled. In 2009, one fracture critical inspection on a bridge owned and inspected by another state agency was completed five months late. In 2010, Mn/DOT completed the fracture critical inspection for one bridge four months late to accommodate a bridge repair contract that restricted access to the bridge. Complete data for routine inspections done in 2010 was not available at the time this report was written.

Beginning in 2009, a standardized procedure for reporting and prioritizing maintenance items as part of the bridge inspection process was adopted statewide. A new department measure was developed to report timely completion of maintenance items classified as high priority in conjunction with that process. High-priority maintenance items are defined as conditions that may impair the safe use of function of a bridge or which may deteriorate into a critical condition if not repaired. The goal is to complete all high-priority items within one year after being identified.

Because high-priority maintenance items have not been separately tracked in the past, only 2009 data was available as this report was prepared. In 2009, a total of 1,337 high-priority reactive maintenance items were identified and 871 of those items were addressed. This equates to a completion rate of 66 percent within the 12-month requirement.

Metro District identified the physical inspection and removal of loose concrete as a high-priority item on all bridges in its district due to recent concerns about loose concrete on the undersides of some bridge decks. This resulted in 1,127 high-priority reactive maintenance items coming due in 2009 in Metro District. The number of bridges needing under-deck repair is significantly less than the total number of bridges identified to date. When this work is removed from the list of high-priority reactive maintenance items, the statewide completion rate rises to 88 percent.

These performance measures are reviewed annually with bridge maintenance supervisors, district bridge engineers, district engineers, and commissioner's staff. Continued monitoring of these bridge inspection and maintenance measures can help determine if districts are adequately staffed.

Added Staff and Equipment

Routine bridge inspections are performed in each Mn/DOT district. Most districts use some of their more experienced bridge maintenance staff to inspect a bridge. Metro District and some other districts have full-time inspection staffs. Some districts also supplement inspection staffing using bridge construction inspectors. All districts assign responsibility to administer their program to a PE, typically at the principal engineer level. During the last two years, a few significant changes have been made to help Mn/DOT better manage its inspection program, including:

- Metro District: Added an administrative engineer with structural engineering experience to its staff in 2008 to oversee bridge inspection and maintenance activities. In 2009, Metro District also added a new engineering position to its inspections unit, which raised the number of engineers in the unit from three to four. Metro District maintains about half of Mn/DOT's bridge inventory.

- District 1-Duluth: Added a new bridge inspections supervisor to assist with program administration and condition evaluation.

- District 6-Rochester: Added a new bridge inspections engineer to assist with administration, inspection and condition evaluation of its trunk highway bridges and local bridges the district contracts to inspect.

Mn/DOT districts in Bemidji, Detroit Lakes, Brainerd, Mankato and Willmar did not add inspection staff. Together they only account for about 20 percent of Mn/DOT's bridge inventory.

Additional staff has been dedicated to perform fracture critical inspections and manage the statewide inspection program due to changes in the NBIS rules that more clearly defined state inspection program requirements and nearly doubled the number of in-depth inspections Mn/DOT performed each year. Prior to 2008, bridge office inspections staff consisted of three engineering positions and three technical positions. Today, staffing consists of seven engineering and four technical positions. Additional assistance for fracture critical bridge inspections is provided by dedicated fracture critical bridge inspectors in the Metro and Rochester districts.

The increased number of inspections also required the purchase of additional inspection equipment. Prior to 2007, Mn/DOT operated four under-bridge inspection vehicles. Since then, two new UBIVs were purchased to accommodate the more frequent inspection mandate. A smaller under-bridge inspection platform was purchased in 2009. It weighs only three tons and allows access to load posted bridges that have insufficient structural capacity for the larger UBIVs. In 2010, another UBIV was ordered to replace one of the older vehicles. The inspection fleet currently consists of:

Vehicle	Reach	Purchased	Comments
UB50	50 feet	1988	Rebuilt in 2003
UB50	50 feet	1991	Will be Replaced with UB62 in 2011
UB75	75 feet	2000	Scheduled for Rebuild in 2012
UB30	30 feet	2000	Scheduled for Rebuild in 2012
UB62	62 feet	2007	-
UB62	62 feet	2008	-
Moog	15 feet	2009	Lighter Weight Platform for Posted Bridges

Since the inspection equipment requires storage, a new 5000-square-foot storage building was completed in 2010 at Mn/DOT's Oakdale facility. The building will house some of the new and existing bridge inspection equipment.

3. SUMMARY OF FINDINGS FROM BRIDGE INSPECTION QUALITY REVIEWS

NBIS Compliance Reviews of local agency inspection programs are conducted by Mn/DOT's Bridge Office Inspections Unit each year. The review starts out with a quality assurance questionnaire that is sent to about 20 percent of local agencies. Agencies that fail to respond to the questionnaire or whose inspection reports or data on file do not clearly indicate compliance are scheduled for a more in-depth on-site review of the agency's program. The inspections unit also teams up with FHWA to visit and review one or two Mn/DOT District Bridge Inspection Programs each year. During 2008 and 2009, reviews were made of the following agencies. Those agencies with in-depth, on-site reviews are shown with an asterisk (*).

2008 (24)
City of Bemidji
City of East Grand Forks*
City of Fergus Falls
City of Moorhead
Becker County
Beltrami County
Clay County
Clearwater County
Douglas County
Grant County*
Hubbard County
Kittson County
Lake of the Woods County
Mahnomen County*
Marshal County*
Norman County*
Ottertail County
Pennington County*
Polk County*
Red Lake County*
Roseau County*
Traverse County*
Wilkin County*
Mn/DOT District 2*

2009 (26)
City of Brainerd
City of Duluth*
City of Grand Rapids
City of Hermantown
City of Hibbing*
City of St. Cloud*
City of Virginia
Aitkin County
Benton County
Carlton County*
Cass County
Cook County*
Crow Wing County
Itasca County*
Kanabec County
Koochiching County
Lake County*
Mille Lacs County*
Pine County
Sherburne County
Sterns County*
St. Louis County*
Todd County
Wadena County
Mn/DOT District 1*
Mn/DOT District 3*

The following is a summary of significant findings from the 2008 and 2009 reviews.

- 23 out of 24 agencies were found in 2008 to be in substantial compliance with the NBIS; one local agency was found not in compliance. The non compliance was based on failure to meet qualifications as a team leader, significantly overdue inspections and insufficient and incomplete inspection reports.

- 23 of 26 agencies in 2009 were found to be in substantial compliance; three were not. One non-compliance was due to incomplete inspections and insufficient or inaccurate reporting and coding of bridge condition. Another non-compliance was based on the agency not having a qualified team leader or program administrator. The last agency was out of compliance due to having 28 inspections that were more than 180 days late.

- Six of 24 agencies in 2008 had a total of 14 inspections that were overdue by 12 or more months.

- Two of 26 agencies in 2009 had a total of four inspections that were overdue by 12 or more months.
- 17 of 24 agencies' files were found in 2008 to be missing a total of 226 bridge rating forms.
- 16 of 26 agencies' files were found in 2008 to be missing a total of 105 bridge rating forms.
- 19 of 24 agencies in 2008 had a total of 111 bridges rated in poor or serious condition that may need new load ratings or posting based on changed conditions.
- 19 of 26 agencies in 2009 had a total of 148 bridges rated in poor or serious condition that may need new load ratings or posting based on changed conditions.
- 11 of 24 agencies in 2008 failed to submit their plans to monitor a total of 46 scour susceptible bridges or failed to classify them correctly.
- 11 of 26 agencies in 2009 failed to submit their plans to monitor a total of 25 scour susceptible bridges or failed to classify them correctly.
- Five of 24 agencies in 2008 had a total of 211 bridges that were inspected during winter months when the presence of snow and ice may inhibit complete inspection. Two other agencies were questioned about quality of inspections based on the high number completed each day.
- No agencies were notified of excessive winter inspections in 2009.
- One agency in 2008 failed to submit documentation for a critical finding discovered during the bridge inspection.

4. ACTIONS TAKEN IN RESPONSE TO FINDINGS FROM BRIDGE INSPECTION QUALITY REVIEWS

Quality Assurance Review Findings and Follow-up

Mn/DOT's Bridge Inspections Unit follows up on quality review findings by sending a letter to the reviewed agency to notify them of significant findings and recommend changes to improve the quality of its programs. When agencies have been found to be out of compliance with the NBIS, the bridge inspections unit works closely with the agency and FHWA to assure the agency attains compliance before its next inspection cycle begins. FHWA may withhold funding from agencies that are repeatedly found to be out of compliance with NBIS rules or with the AASHTO Manual for Bridge Evaluation. The four agencies found out of compliance during 2008 and 2009 have made the necessary modifications to their programs and practice and are now substantially in compliance.

In addition to notifying agencies regarding findings of compliance or non-compliance with NBIS, letters list significant findings that the agency is required to address in order to remain in compliance. Where inspections, load ratings or required data is missing, the letter specifies a date the missing information must be submitted to Mn/DOT. The Mn/DOT Bridge Office Inspections Unit follows up with agencies that do not submit on time. To date, all agencies have made a good effort to respond to findings. Failure to do so could result in the agency being found in non-compliance.

Findings Discussed at Bridge Inspection Seminars

Since each agency receives a quality review only once every five years, it's important that Mn/DOT develop other methods to more frequently communicate some of the more common problems found during agency reviews. Mn/DOT uses the annual bridge inspection seminars for that purpose. Agendas for the seminars are designed to address the deficiencies found during agency reviews, in addition to best practices that can improve an agency's inspection program.

Topics discussed in 2009 and 2010 that specifically address agency review findings include:

- NBIS agency review process
- Typical and special inspection equipment
- Documents to be retained in a bridge file
- Updates to bridge inventory data
- Improving condition description notes on inspection reports
- Concern about incomplete inspections during winter months
- Reporting and reacting to critical findings
- Scheduling inspection to comply with required frequency

- Scour susceptibility categories and stream bed cross section requirements

An in-depth presentation was made in 2009 describing conditions that may require new load ratings, as well as the responsibilities of the team leader and the program administrator to evaluate load rating needs and post bridges to restrict truck loads. Another in-depth presentation in 2010 described the process agencies should use to screen their bridges for scour and assign bridge inventory codes that describe scour susceptibility. The presentation also discussed the requirements for written action plans to respond to flood conditions that analysis indicates may damage the bridge.

Reports Available Electronically to All Agencies

Each year, Mn/DOT is required by the NBIS to submit statewide bridge inventory and inspection data to FHWA. Mn/DOT uses an AASHTO developed bridge management system called Pontis to collect current inspection data from inspection agencies. Using Pontis, Mn/DOT has developed several standard reports that access recent data to help agencies better understand the overall condition of their bridge inventory and identify bridges needing inspection, missing data or that may need new load ratings. Many of these reports are used during the Mn/DOT agency reviews to help Mn/DOT identify deficiencies in an agency's inspection program or data. These and other reports are continuously available to agencies that log on to the Pontis Reports Tab located on Mn/DOT's Bridges and Structures website. A few of those reports used during local reviews include:

- Bridge Inspections Due – Lists inspections that are due and overdue.
- Bridge Inspection Frequency – Lists the bridges on a one or two-year inspection frequency and those eligible to be changed.
- Bridge Scour FGJ – Lists bridges that have not been evaluated for scour, have unknown foundations or require further evaluation.
- Bridge Scour Plan of Action – Lists if bridges that are susceptible to scour have written plans of action guiding agency response during flood events.
- Bridge Rating and Posting List – Lists bridges with capacity ratings, posting signs and those that are missing rating sheets or are in poor or serious conditions, which may require a new rating.
- FC-UW-PA List – Lists bridges that are coded to require fracture critical, underwater or special pinned assembly type inspections.

5. SUMMARY OF FINDINGS FROM FHWA BRIDGE INSPECTION COMPLIANCE REVIEWS

FHWA is responsible for evaluating the overall quality and conformance to the NBIS of each state's bridge inspection program. Mn/DOT is evaluated on the management and inspection of its trunk highway bridges as well as its management and oversight of local agency bridge owners. Typically, the annual review is conducted near the beginning or end of the calendar year and begins with a written response to a set of questions and data requests previously submitted to Mn/DOT's Bridge Office by the FHWA Division Bridge Engineer. After Mn/DOT's response has been reviewed, the FHWA meets with the Minnesota's State Bridge Engineer and staff to discuss responses and provide additional information and access to inspection files as requested. Following the review, the FHWA Division Bridge Engineer submits a letter to the Commissioner of Highways stating whether Mn/DOT was found in compliance with the NBIS and lists findings in the form of recommendations to improve the program based on its review.

In 2009, the FHWA conducted a "Bridge Load Rating and Posting Focused Review" of Mn/DOT and a few local agencies. This was a special in-depth review that examined Mn/DOT's procedures for ensuring accurate and up-to-date load ratings on state and local agency bridges. The results of the focused review concluded that Mn/DOT's load rating and posting practices "appear to be sufficiently appropriate to provide safety to the traveling public." However, the letter also noted that "due to the large number of bridges in Minnesota and the vast number of bridge owners, it was not readily determined whether individual bridge load ratings and needed postings or closings were up-to-date or reflect the current conditions of the bridges. Further review acknowledgement and verification by Mn/DOT districts and local agencies should be pursued to assure that all bridges are load rated and posted properly." A separate report made several recommendations for improvement to statewide bridge rating processes.

Also, as mentioned in a previous section of this report, FHWA along with Mn/DOT staff include a review of Mn/DOT District Bridge Inspection Programs as part of the regional quality reviews scheduled with local agencies each year. Those reviews are very similar to the local agency reviews, except that the FHWA Division Bridge Engineer takes the lead to determine NBIS compliance and makes recommendations for improvement. Mn/DOT District 2-Bemidji was reviewed in 2008, while District 1-Duluth and District 3-Brainerd were reviewed in 2009. All three district inspection programs were found in substantial compliance.

Copies of all compliance letters received from FHWA for the 2008 and 2009 inspection reviews are attached in the **APPENDIX**. A summary of substantial findings from each letter are summarized below.

2008 Annual National Bridge Inspection Standards Review

Mn/DOT was found in substantial compliance with National Bridge Inspection Standards. The following is a summary of recommendations made to improve Mn/DOT's Bridge Inspection Program:

1. Mn/DOT should place more emphasis on good note taking. Inspection notes need to be specific enough such that the difference in condition of bridge members between inspections can be clearly determined.

2. In 2008, there were 938 winter-time inspections, the vast majority by local agencies. There is a concern that some winter-time inspections may be incomplete.

3. Mn/DOT should investigate why some bridges are coded to indicate that no rating analysis has been performed.

4. Mn/DOT should work with local agencies to develop an action plan and measurable goals for either performing a load rating or confirming that a load rating has been performed on bridges that are missing a rating date in their inventory data.

5. Mn/DOT should investigate the reasons that inventory codes for 86 bridges, predominately located on the local system, seem to indicate the bridges should be posted.

6. Mn/DOT should investigate the reasons why 12 local system bridges open to traffic have an operating rating less than three tons.

2009 Minnesota Load Rating and Posting Focused Review

Mn/DOT's statewide bridge load rating and posting practices were found to be sufficiently appropriate to provide safety to the traveling public. The following is a summary of recommendations for improvement made in the focused review:

1. Mn/DOT should consider expanding guidance concerning load rating of bridge decks and substructures.

2. Mn/DOT should correct inconsistencies in the rating guidance given in the design and the inspection manuals.

3. Distribute eight FHWA run load rating and posting data reports to the local agencies and request them to reconcile any changes where needed.

4. Bridge files need to be updated to include load rating summary sheets.

5. Mn/DOT should ensure that its newly developed quality control/quality assurance procedures are followed for all future load ratings.

6. Although Mn/DOT is currently making arrangements to add one more person to the load ratings unit to assist in the rating of bridges for both state owned and locally owned bridges, Mn/DOT may still want to consider adding additional resources.

7. Place greater emphasis on load rating and posting during NBIS local agency compliance reviews.

8. Mn/DOT should develop a policy on how shear forces should be used in the new AASHO Load Rating Program for both rating and posting of bridges.

9. Letters to local agencies should be sent out to inform them of recent changes and additions to load rating guidance that have been made to both the bridge design manual and bridge inspections manual.

10. When consultants are used to do load ratings, the name of the company should be included on the rating form in addition to the engineer's certification.

11. The quality control/quality assurance process for load rating and posting currently in draft form should be added by reference to both the bridge design and the bridge inspections manual.

12. A review process needs to be developed to assure that load rating and posting guidance recently added to the bridge design and bridge inspections manuals is being followed.

13. Local agencies that currently accept load ratings done by consultants at face value should at least verify the ratings were prepared by an engineer, checked by a second engineer and signed by a registered professional engineer.

14. Mn/DOT should continue to discuss with local agencies its need to install warning signs well in advance of bridges that are posted at less than legal truck weights.

15. The load rating form for culverts should have a signature block for the engineer performing the rating.

16. Local agencies need to evaluate all bridges to take into account the short, heavy, seven- and eight-axle trucks that are legal in Minnesota.

2009 Annual National Bridge Inspection Standards Review

Mn/DOT was found in substantial compliance with National Bridge Inspection Standards. The following is a summary of findings and recommendations made to improve Mn/DOT's inspection program:

1. FHWA is satisfied with Mn/DOT's letter of response to the bridge rating and posting focused review.

2. Many scour action plans developed by local agencies are incomplete or insufficient to adequately implement or take appropriate action in the event of flooding. Letters should be sent to local agencies that inform them of documentation required to be included in scour action plans and provide guidance to assist agencies in preparing the plans. Additional emphasis on scour action plans and other applicable documents that are part of the bridge owners file should be made during annual agency reviews.

6. ACTIONS TAKEN IN RESPONSE TO FHWA COMPLIANCE REVIEW FINDINGS

Copies of Mn/DOT's response to each of the FHWA compliance reviews can be found in the appendix. The following is a summarized response corresponding to each of the numbered findings listed in Section 5:

2008 Annual National Bridge Inspection Standards Review

1. During its annual agency quality reviews with local agencies, Mn/DOT will emphasize the importance that team leaders write more descriptive inspection notes. Better note taking is also emphasized in several presentations made during the annual bridge inspections seminars held across the state.

2. Mn/DOT will continue to discourage winter inspection and stress the need for complete inspections during its quality reviews and inspection seminars. When winter inspections are unavoidable, we stress that follow-up inspections are required to inspect elements that could not be inspected due to snow and ice cover.

Items 3, 4, 5 and 6 were all related to a series of eight data searches the FHWA made in anticipation of the load rating and posting focused review that was scheduled to begin in late April 2009. Mn/DOT deferred addressing those three issues until they could be discussed more fully in the focused review.

2009 Minnesota Load Rating and Posting Focused Review

1. Mn/DOT plans to add additional guidance to the bridge design manual relating to the rating of bridge decks and substructures as questions are raised by ratings engineers.

2. Some inconsistencies noted have been corrected. There is some overlap between the bridge design manual, which is primarily used by the engineer who prepares the rating, and the bridge inspections manual, which is used primarily by inspection staff.

3. Mn/DOT reviewed the eight data reports and found several errors. After correcting the errors, some reports contained no bridges. After further discussion with the FHWA additional work is being done by Mn/DOT to reconcile the data before the lists will be forwarded to local agencies.

4. Most trunk highway bridge files now include a rating summary sheet. A process has been written to develop rating sheets for the remaining bridges and culverts constructed using standard design templates. Mn/DOT recently re-rated more than 550 local bridges that had low operating ratings. Load rating summary sheets for those bridges will be placed in the bridge file. Inspection seminars are used to remind owners their files are required to contain the bridge ratings sheet.

5. Mn/DOT is following its new requirement that load ratings be calculated and checked by separate engineers and signed by a registered engineer. The requirement has been added to the ratings section of the bridge design manual, which is used by consulting engineers and others to rate local bridges.

6. Mn/DOT added a third registered engineer to the ratings unit in 2009 to work on state trunk highway bridge ratings and local bridge rating issues and initiatives. Mn/DOT also uses consultants to rate bridges when needed.

7. Mn/DOT reviews several ratings documents with local agencies during annual quality reviews. Additional emphasis on ratings issues is now made at these reviews and inspection seminars.

8. Mn/DOT is working with the University of Minnesota to develop the criteria needed to more accurately evaluate shear load capacity in prestressed bridges. A new inspection item has been added to bridge inspection forms to alert the ratings engineer when conditions found during the inspection indicate a new shear rating is needed.

9. The January 2010 edition of the Mn/DOT State Aid Division's newsletter contained an article about the newly developed load rating guidance that is available in the bridge design and bridge inspection manual. Electronic links to those manuals were provided in the newsletter.

10. To more easily identify a consultant firm responsible for a specific bridge rating, Mn/DOT has added a line to enter the name of the consultant company on the rating form. Previously, only the certifying engineer was identified on the load rating summary form.

11. A draft version of quality control/quality assurance procedures for load rating has been consolidated from the bridge design and bridge inspections manuals into a single document. The draft policy is currently in use by Mn/DOT's rating unit while it's being reviewed by the local FHWA office.

12. The new quality control/quality assurance procedures for load ratings include procedures that will allow local agency load rating procedures and processes to be reviewed at some future date. We use inspection seminars and the local agency quality reviews to emphasize the importance for program administrators to follow currently published Mn/DOT guidance.

13. Our local agencies have been notified of requirements that load ratings be calculated and checked by separate engineers and that they are signed by a registered engineer. The bridge design manual, which is used by consultant engineers who do most local agency ratings, also specifies requirements for calculating, checking and certifying ratings.

14. Mn/DOT's Bridge Inspection Manual discusses the need to post advance warning signs. When advance warning signs are missing from bridges inspected during quality reviews of local agencies, the requirements of the Minnesota's Manual on Uniform Traffic Control Devices to provide advanced signage are discussed with the program administrator.

15. Since most culverts are constructed based on pre-engineered Mn/DOT standard plans, they also have standard load ratings that are specified in Mn/DOT's Bridge Design Manual. Persons using the standard culvert design tables have been instructed to sign the culvert rating form. Another rating process is used for culverts in poor condition.

16. Mn/DOT has done preliminary screening to identify those local bridges that are most susceptible to being overloaded by the short, multi-axle, single truck. Four consultant contracts are underway to re-rate those bridges identified by the screening.

2009 Annual National Bridge Inspection Standards Review

1. Mn/DOT responded to the load rating and posting focused review July 25, 2010.

2. Detailed technical information regarding bridge scour is available to all bridge owners on Mn/DOT's external website at www.dot.state.mn.us/bridge/hydraulics/hydraulics/scour. The site provides scour action plan templates, scour evaluation procedures, contact information for technical assistance and training material. For the last four years, the unit has provided an hour-long session on scour action plan implementation. In March 2010, Mn/DOT offered full-day training sessions at four locations across the state which re-emphasized the importance of complete scour action plans.

APPENDIX

2008 NBIS Review Letter

U.S. Department
of Transportation
Federal Highway Administration
Minnesota Division

380 Jackson Street
Galtier Plaza, Suite 500
St. Paul, MN 55101-2904

(651) 291-6100
(651) 291-6000 Fax

February 9, 2009

Mr. Thomas K. Sorel
Commissioner of Transportation
Department of Transportation
MS 100, Transportation Building
St. Paul, Minnesota 55155

Re: 2008 Annual National Bridge Inspection Standards (NBIS) Review

Dear Mr. Sorel

Enclosed for your review and further action is a report addressing the 2008 statewide safety inspection of bridges in Minnesota. The purpose of the review was to determine statewide compliance with the National Bridge Inspection Standards (NBIS).

Overall, the Minnesota Department of Transportation is considered to be in substantial compliance with the NBIS requirements. Particularly, we wish to express our appreciation for the excellence responses provided by Mn/DOT to findings and recommendations resulting from the 2007 NBIS review and also for the development of the following items:

- Preparation of guidance for the coding of NBI Item 36, traffic safety features.
- Preparation of guidance and policy for load rating of bridges.
- Preparation of guidance for taking channel profiles.

Notwithstanding the acknowledgement noted above in addition to substantial compliance with the NBIS regulations, the following recommendations for improvements to the program are being provided for your consideration:

1. Once again, as in prior years, based on field reviews performed, additional emphasis on "note taking" for pontis ratings 3 and above should be made. Notes need to be specific enough such that the difference in condition of bridge members between inspections can be clearly determined. For example, notes should be specific concerning the location, depth, length, and width of cracks and statements noting the change in condition from the previous inspection. It is acknowledged that Mn/DOT has been encouraging better note taking and is urged to do so more and more in the interest of continuous quality improvement.

2. Concerning winter time inspections, we continue to see an overabundant number of winter time inspections. In 2008, there were 938 winter time inspections, the vast majority being performed by local agencies. While we recognize that some winter time inspections can result in complete and through inspections, it is difficult to determine if a particular winter will provide for satisfactory inspection conditions, such as has been the case this current winter season. It is acknowledged that Mn/DOT has been discouraging such inspections and yet it is urged to do so more and more in the interest of continuous quality improvement, as the importance of bridge inspections during clement weather can not be overemphasized.

3. The following recommendations pertain to load rating and load posting of bridges:

A. According to a recent FHWA query of the Minnesota bridge inventory, 5392 bridges (both State owned and non-State owned) show an entry code of 5 (no rating analysis performed) for item 63 (Method Used to Determine Operating Rating). It is acknowledged, however, that many of these bridges may include structures where engineering judgment was used to determine the rating when no plans are available or identified. Nevertheless, it is recommended that Mn/DOT investigate the reason why these bridges have not had a load rating analysis performed.

B. The Mn/DOT response to the 2007 NBIS review provided much information as well as an action plan for load rating bridges with missing load rating dates. However, the action plan is not specific on the timeline for completion of load ratings for HS-25 designed bridges where ratings are not on file but operating ratings are shown on the plans. It is recommended that Mn/DOT revise the action plan to

provide for a specific timeline for completion of a load rating (or separate rating check) including a "date of rating" date for inclusion in the inventory for these bridges.

C. The Mn/DOT response to the 2007 NBIS review provided much information as well as an action plan for load rating bridges with missing load rating dates. However, the action plan did not provide much information on non-State owned bridges. It is recommended that Mn/DOT work closely with the local agencies to develop an action with defined and measurable goals including a timeline for either confirmation that a load rating has indeed been performed or completion of a load rating (or separate load rating check) including a "date of load rating" date for inclusion in the inventory.

D. A recent FHWA query of Mn/DOT bridge inventory showing Item 70 (Bridge Posting) coded as 4 or less (Relationship of Operating rating to max. legal load - % below) and Item 41 coded as A (open, no restriction) shows that 86 bridges would require posting because the legal load limit exceeds the operating rating of the bridge. It is acknowledged that this could be the result of errors in data entry. Nevertheless, it is recommended that Mn/DOT investigate the reasons for the 86 bridges showing as needing posting and yet are not posted.

E. A recent FHWA query of the Mn/DOT inventory showing Item 64 (Operating Rating) less than 3 tons and Item 41 = A,B,P,R (Structure Open , Posted, or Closed to Traffic) shows that 12 bridges in Minnesota have an operating of less than 3 tons and are open to traffic. Bridges having an operating rating less than 3 tons are required to be closed per the NBIS. It is recommended that Mn/DOT investigate the reasons for the 12 bridges showing as having an operating rating of less than 3 tons and yet are not closed as required by the NBIS.

Your formal response to the all recommendations noted in this letter and the enclosed report, including your actions planned along with anticipated timelines to address each of the recommendations, would be greatly appreciated. We recognize that it may not be feasible to completely accomplish these recommendations within a short timeline, as such, we are willing to work with your office to establish reasonable time frames and progress points in the spirit of continuous quality improvement.

Special appreciation is extended to Mr. Dan Dorgan and members of this staff for their cooperation in the performance of this review.

Sincerely yours,

Derrell Turner
Division Administrator

Enclosure

RRG/jk

cc: 2 MnDOT
1 Garcia
1 File
1 ERF

2008 NBIS Review Letter Response

Minnesota Department of Transportation
Office of Bridges and Structures

Mail Stop 610
3485Hadley Avenue North
Oakdale MN 55128-3307

Office Tel :651/366-4501
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April 2, 2009

Mr. Derrell Turner
Division Administrator
Federal Highway Administration
Galtier Plaza
380 Jackson Street Suite 500
Saint Paul, Minnesota 55101-4802

Dear Mr. Turner:

This letter is in response to the 2008 Annual National Bridge Inspection Standards Review, the results of which were sent to Mn/DOT February 24, 2009. We appreciate the time and the effort of your staff to complete the thorough review reflected in the recommendations. We also appreciate your willingness to work with us to establish reasonable time frames and progress points in the spirit of continuous improvement.

Please consider the following as an initial response to your recommendations, numbered to correspond with your letter.

1. As noted, Mn/DOT continues to stress that inspection notes be specific and descriptive in a way that assists the inspector to identify changes in condition during subsequent inspections. Specific descriptions are important for load path elements in condition states 3, and especially condition states 4 and 5. Mn/DOT will continue to discuss the need for more descriptive notes during its recertification seminars and during our agency quality reviews.

2. While it should be acknowledged that wintertime inspection will always be done to some extent, Mn/DOT continues to encourage these be minimized. Local agencies in particular have limited staff that have multiple responsibilities. The traditional fairer weather months of April through October may be insufficient to complete all bridge inspections due to demands of their construction and maintenance programs. Winter inspections may require a follow-up visit during warmer weather to inspect elements that could not be inspected due to snow and ice cover. We will continue to discourage winter inspections and stress the need for complete inspections during our recertification seminars and during our agency quality reviews.

3. The items noted under Recommendation # 3 relate to posting and load rating data issues that will be discussed in more detail during a Focus Review on Load Rating and Posting of Minnesota bridges that will be conducted by the FHWA beginning April 28. The review stems from a recent OIG mandate that

a focused review of rating and postings practices be conducted in all states across the country. We anticipate that we will address the questions and comments in Recommendation 3 in more detail during that review and in response to recommendations or comments which the review generates.

Please contact me should there be any questions regarding this response. We appreciate the assistance Romeo Garcia and Chris Cromwell of your staff provided in completing our Quality Assurance Audits of the local and Mn/DOT program in the northwest region of Minnesota in late 2008.

Sincerely,

Daniel L. Dorgan
State Bridge Engineer

cc: Thomas Sorel
Michael Barnes
Khani Sahebjam
Julie Skallman
Gary Peterson

2009 Minnesota Load Rating and Posting Focused Review Letter

U.S. Department of Transportation
Federal Highway Administration
Minnesota Division

380 Jackson Street
Galtier Plaza, Suite 500
St. Paul, MN 55101-4802

651.291.6100
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www.fhwa.dot.gov/mndiv

November 27, 2009

Mr. Thomas K. Sorel
Commissioner of Transportation
Department of Transportation
MS 100, Transportation Building
St. Paul, Minnesota 55155

Re: Minnesota Load Rating and Posting Focus Review

Dear Mr. Sorel:

Attached is a report resulting from a focus review on Load Rating and Posting that was recently conducted in Minnesota. The purpose of this focus review was to evaluate Mn/DOT's and selected local agencies policies, procedures and standard operating practices in the area of load ratings and postings for highway bridges to fulfill the requirements of the National Bridge Inspection Standards (NBIS). The report documents observations, discussions, commendable practices and opportunities for improvement in this area of the bridge safety inspection program.

The review was conducted by Chris Cromwell and Romeo Garcia of my office in partnership with Shay Burrows of our FHWA Resource Center and in cooperation with Mn/DOT, Hennepin Co. and the City of St. Paul, during the week of April 28 thru 30 of 2009. A close out meeting was held at the Mn/DOT Bridge Office in Oakdale on April 30th to present the preliminary findings.

The overall conclusion of this review is that the policies and practices for load rating and posting of bridges in Minnesota appear to be sufficiently appropriate to provide safety to the traveling public. On the other hand, due to the large number of bridges in Minnesota and the vast number of bridge owners it was not readily determined whether individual bridge load ratings and needed postings or closings were up to date or reflect the current condition of the bridges. Further review and acknowledgement and verification by Mn/DOT Districts and local agencies should be pursued to assure that all bridges are load rated and posted properly.

Your formal response to each of the opportunities for improvement noted in the enclosed report including your actions planned along with anticipated timelines to address each of these opportunities, would be greatly appreciated. We recognize that it may not be feasible to completely address all opportunities for improvement within a short timeline, as such, we are willing to work with your office to establish reasonable time frames and progress points in the spirit of continuous quality improvement. An initial response by January 15th would be greatly appreciated.

MOVING THE AMERICAN ECONOMY

Minnesota
Federal Highway Administration

Special appreciation is extended to Mr. Dan Dorgan and members of his staff as well as Hennepin Co., and the City of St. Paul for their cooperation in the performance of this review.

Sincerely yours,

Derrell Turner
Division Administrator

RRG/trb

cc: 2 Mn/DOT
1 Dan Dorgan
1 Tom Styrbicki
1 Hennepin County
1 City of St. Paul
1 Shay Burrows
1 Romeo R. Garcia
1 Chris Cromwell
1 File
1 RF
DMS – "Load Rating and Posting Focus Review"

2009 Minnesota Load Rating and Posting Focused Review Report - Abbreviated

Minnesota Department of Transportation & Local Agencies
Bridge Load Rating and Posting Focused Review
April 28-30, 2009
Final Report

Purpose/Objectives:

The purpose of this review was to evaluate the Minnesota Department of Transportation's (Mn/DOT) and selected local agencies policies, procedures and standard operating practices in the area of load ratings and postings for highway bridges to fulfill the requirements of the National Bridge Inspection Standards (NBIS). The review was conducted with a special focus on the following items:

- Identification and documentation of commendable practices in the load rating and posting of bridges for sharing with other agencies.
- Identification of opportunities for improvement to policies, procedures and standard operating practices that can enhance the quality and improve the effectiveness in performing and managing highway bridge load ratings and postings.

Scope:

Mn/DOT's and selected local agencies applicable policies, procedures and bridge data pertaining to load rating and posting were reviewed. This included the performance of interviews with Mn/DOT and selected local agency personnel that are responsible for managing or performing inspections, preparing reports and determining load ratings and postings for highway bridges. Additionally, several load posted bridges were field-evaluated including respective inspection reports, load ratings and applicable postings. For convenience, the City of St. Paul and Hennepin County were selected as part of this review to represent local agencies, due to their close proximity to the Mn/DOT central office. It is noted here that Minnesota has 8 Mn/DOT Highway Districts, 87 counties, and a multitude of other local agencies including Cities and Townships most of which are directly responsible for the inspection of bridges (including load ratings and postings) in their respective jurisdictions totally over 150 bridge owners. As such, it is anticipated that many similar reviews will be conducted throughout the state in future years in the interest of continuous quality improvement in the area of load rating and posting.

Background:

The Office of Inspector General started an audit of the Federal Highway Administration's (FHWA) oversight of structurally deficient bridges on the

NOTE: This abbreviated copy now skips 18 pages to the Opportunities for Improvement section located at the end of this report.

Summary of Findings & Recommendations:

Commendable Practices:

The commendable practices noted below apply to the Minnesota practice and as such includes the local agencies as well as Mn/DOT.

1. Mn/DOT has prepared guidance on load rating and posting for bridge inspectors and is found in Appendix B of the Mn/DOT Bridge Inspection Manual.
2. Mn/DOT has prepared guidance on load rating and posting and is found in Chapter 15 in the Mn/DOT LRFD Bridge Design Manual.
3. Mn/DOT conducted a day long Bridge Load Rating Class 101 for local agencies in 2008.
4. Mn/DOT recently hosted a workshop on Load and Resistance Factor Rating (March 10, 2009).
5. Mn/DOT held a session on Load Rating and Posting at the annual NBIS workshop to introduce Appendix B of the Mn/DOT Bridge Inspection Manual.
6. Annual QC/QA compliance reviews of Districts and local agencies are performed by Mn/DOT to address load rating and posting concerns.
7. Mn/DOT is currently making arrangements to add one more person to the Load Rating unit to assist in the rating of bridges for both State owned and locally owned bridges.
8. Mn/DOT has made available the Mn/DOT version of load rating and posting reports to all bridge owners, via the internet, to assist in verifying bridge posting and rating information and to help identify improvements where needed.

Opportunities for Improvement:

The opportunities for improvement noted below apply to the Minnesota practice and as such includes the local agencies as well as Mn/DOT.

1. Mn/DOT should consider expanding guidance concerning load rating of bridge decks and substructures.
2. The guidance provided in Chapter 15 of the Mn/DOT LRFD Bridge Design Manual and the Mn/DOT Bridge Inspection Manual needs to be consistent. (Some inconsistencies were pointed out during the review).
3. The information noted in the 8 reports on load rating and posting provided by FHWA, needs to be delivered to all bridge owners and a request made to reconcile any changes where needed.
4. Bridge files need to be updated to include load rating summary sheets.
5. About 40% of the load ratings appear to be inconsistent as far as QC/QA is concerned. Some ratings indicated that a check of the rating was made by a second person whereas some ratings do not appear to have been checked by a second person. Although these ratings were performed prior to Mn/DOT's policy that loat ratings be checked by a separate Engineer, Mn/DOT should ensure that the new policy is followed for all future load ratings.

6. Although Mn/DOT is currently making arrangements to add one more person to the Load Rating unit to assist in the rating of bridges for both State owned and locally owned bridges, Mn/DOT may want to consider adding still additional resources.
7. Greater emphasis needs to be placed by Mn/DOT on load rating and posting during annual NBIS compliance reviews of local agencies including specific review of files.
8. A policy to address how shear rating will be used in the load rating program and when they will be used to enforce load posting should be developed by Mn/DOT.
9. Letters should be sent out to all owners to assure that all are aware of new guidance provided in Chapter 15 of the LRFD Bridge Design Manual as well as Appendix B of the Bridge Inspection Manual.
10. The name of Consultant Company performing the load rating should be included in the load rating documents for possible future reference. As such the load ratings forms may need to be adjusted to assure that this is so noted.
11. The process for performing QC/QA for load rating and posting which is currently in draft form should be finalized and formally referenced within Chapter 15 of the LRFD manual and Appendix B of the Bridge Inspection manual..
12. A review of the process for load rating and posting needs to be made to assure that the guidance shown on Chapter 15 of the Mn/DOT LRFD manual as Appendix B of the Mn/DOT Bridge Inspection Manual is being followed.
13. Locals are currently accepting load ratings performed by consultants at face value and while it is not specially required for the local agencies to validate the ratings performed by consultants, the local agencies may want to provide some validation of some kind. At the minimum, the local agencies should verify that the ratings were performed by an engineer, checked by a second engineer, and signed by a registered professional engineer.
14. Mn/DOT should continue to have dialogue on advance warning signs for load posting signs with local agencies during annual NBIS reviews and in other venues.
15. The load rating forms for rating of culverts should have a signature block for the Engineer performing the load rating as all load ratings are required to be performed by a Registered Professional Engineer.
16. Local agencies need to evaluate all bridges to take into account the specialized hauling vehicles (SHVs) and re-rate those bridges where such vehicles are in operation.

2009 Minnesota Load Rating and Posting Focused Review Report Response

Minnesota Department of Transportation
395 John Ireland Boulevard
Saint Paul, MN 55155

January 25, 2010

Derrell Turner
Division Administrator
Federal Highway Administration
Galtier Plaza
St. Paul, MN 55101-2904

RE: 2009 Minnesota Load Rating and Posting Focus Review

Dear Mr. Turner:

Please reference your December 21, 2009 letter and transmittal of the FHWA Bridge Load Rating and Posting Focus Review Report.

Enclosed please find our formal responses to each of the opportunities for improvement identified in the report. If you need further clarification on any of these items, please contact Tom Styrbicki of the Mn/DOT Bridge Office at (651) 366-4507.

Thank you for your continued partnership with Mn/DOT in implementing the National Bridge Inspection Standards.

Sincerely,

Daniel L. Dorgan
State Bridge Engineer

Enclosures

cc: Thomas K. Sorel – Commissioner of Transportation
Michael Barnes – Engineering Services Division Director
Tom Styrbicki – State Bridge Construction and Maintenance Engineer
Bernard Jahn – Hennepin County Bridge Engineer
Glen Pagel – City of St. Paul Bridge Engineer
Shay Burrows – FHWA
Romeo Garcia – FHWA
Chris Cromwell – FHWA

FHWA Opportuity for Improvement in Bold Text
Mn/DOT response in Italics

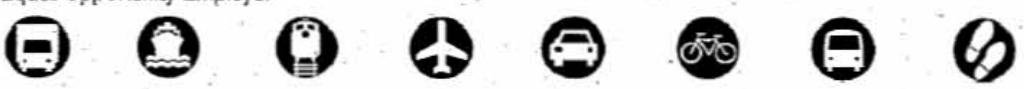
1. **Mn/DOT should consider expanding guidance concerning load rating of bridge decks and substructures.**
   Mn/DOT's LRFD Bridge Design Manual (Section 15.1 – General and Section 15.7 – Substructures) offers guidance on when to perform deck and substructure ratings. As future updates are made to Chapter 15, we will consider adding additional guidance on deck and substructure rating methods.

2. **The guidance provided in Chapter 15 of the Mn/DOT LRFD Bridge Design Manual and the Mn/DOT Bridge Inspection Manual needs to be consistent. (Some inconsistencies were pointed out during the review).**
   Appendix B of the Mn/DOT Bridge Inspection Manual clarifies the roles and responsibilities for bridge rating per the NBIS requirements. It also gives general guidance to inspectors and Program Administrators with regard to bridge rating processes and procedures. Chapter 15 of the LRFD Manual is intended to be a technical reference for bridge rating engineers. We're aware that there is some overlap of subject matter between the two documents and we will ensure that consistent guidance is given when updates to these documents are made in the upcoming year.

3. **The information noted in the 8 reports on load rating and posting provided by FHWA, needs to be delivered to all bridge owners and a request made to reconcile any changes where needed.**
   Given that the reports provided have some inconsistencies and data errors, we will first re-run the reports and evaluate each report and correct the data errors. Following this, some of the reports will not include any bridges. Mn/DOT will screen the remaining data and send to the bridge owners a list of bridges needing further consideration by March 15, 2010.

4. **Bridge files need to be updated to include load rating summary sheets.**
   All trunk highway bridge files include load rating summary sheets. We are currently working on updating the culvert files to include load rating summary sheets. We will continue to encourage local bridge owners during NBIS audits and inspection seminars to keep their bridge files complete. We are currently re-rating over 550 local bridges which presently have low operating ratings. Load rating summary sheets will be produced for these bridges and included in the bridge files.

5. **1/3 to ½ of the load ratings appear to be inconsistent as far as QC/QA is concerned. Some ratings indicated that a check of the rating was made by a second person whereas some ratings do not appear to have been checked by a second person. Although these ratings were performed prior to Mn/DOT's policy that load ratings be checked by a separate Engineer, Mn/DOT should ensure that the new policy is followed for all future load ratings.**
   We agree that ratings should be consistent with the QC/QA policy. All new bridge load ratings follow this policy. As bridges are re-rated, we will also follow the QC/QA policy.



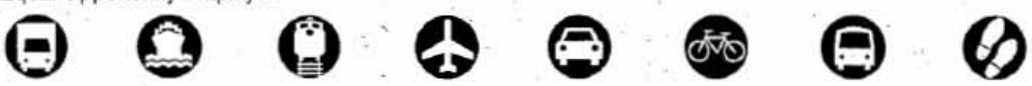
6. **Although Mn/DOT is currently making arrangements to add one more person to the Load Rating unit to assist in the rating of bridges for both State owned and locally owned bridges, Mn/DOT may want to consider adding still additional resources.**
   The Mn/DOT Bridge Office has added a third ratings engineer who is working on both State and Local bridge ratings. We also continue to use consultants to complement our in-house staff when needed.

7. **Greater emphasis needs to be placed by Mn/DOT on load rating and posting during annual NBIS compliance reviews of local agencies including specific review of files.**
   We provide a list of bridges that may need re-rating during NBIS Compliance Reviews and we review local agency bridge files during our visits. We also require local agencies to submit load ratings that are missing from the Mn/DOT Bridge Inventory and ask them to consider re-rating bridges in poor condition or bridges with load ratings that are over 35 years old. We also recommend during NBIS reviews and inspection seminars to re-rate bridges that have a change in condition. Not withstanding these current efforts, greater emphasis on NBIS load rating and posting requirements will be placed on future reviews.

8. **A policy to address how shear rating will be used in the load rating program and when they will be used to enforce load posting should be developed by Mn/DOT.**
   Mn/DOT is currently involved in a research project regarding shear in prestressed concrete beams. Upon the completion of this study, we will use the recommendations to re-evaluate our load rating procedures for shear. It is expected that this guidance will be written into Chapter 15 of the LRFD Bridge Design Manual.

9. **Letters should be sent out to all owners to assure that all are aware of new guidance provided in Chapter 15 of the LRFD Bridge Design Manual as well as Appendix B of the Bridge Inspection Manual.**
   We have used many forums to educate all District and Local bridge owners about the available load rating guidance in the Mn/DOT LRFD Bridge Design Manual and the Bridge Inspection Manual. This includes the State-Aid newsletter, annual certification training, NBIS compliance review visits, State Aid district meetings and County Engineer conferences. The January 2010 State-Aid newsletter will include an article on this very topic and links to both the LRFD manual and Appendix B of the Bridge Inspection Manual will be provided in the article.

10. **The name of Consultant Company performing the load rating should be included in the load rating documents for possible future reference. As such the load ratings forms may need to be adjusted to assure that this is so noted.**
    The load rating summary forms have been revised to include a field for the name of the Consultant Company. The new forms are posted on the Bridge Office website and are available to all Districts and Local agencies.



11. **The process for performing QC/QA for load rating and posting which is currently in draft form should be finalized and formally referenced within Chapter 15 of the LRFD manual and Appendix B of the Bridge Inspection manual.**
The Quality procedures for load rating are currently described in two locations. General guidance is given in Chapter 15 of the LRFD Bridge Design Manual and more detailed procedural guidance is established in the Bridge Inspection QA and QC Manual. The Bridge Office will consolidate our Load Rating QC/QA procedures into a single manual, which will formally document the load rating QC/QA program. A draft of this manual will be completed by March 15, 2010 and the final version completed by July 15, 2010.

12. **A review of the process for load rating and posting needs to be made to assure that the guidance shown in Chapter 15 of the Mn/DOT LRFD manual and Appendix B of the Mn/DOT Bridge Inspection Manual is being followed.**
When our QC/QA process is fully developed and documented, we will consider a periodic review of the load rating and posting processes. In the meantime, we will continue to emphasize to Program Administrators the importance of following Mn/DOT guidance with regard to load ratings and postings.

13. **Locals are currently accepting load ratings performed by consultants at face value and while it is not specially required for the local agencies to validate the ratings performed by consultants, the local agencies may want to provide some validation of some kind. At the minimum, the local agencies should verify that the ratings were performed by an engineer, checked by a second engineer, and signed by a registered professional engineer.**
We can encourage local agencies to validate that their consultant ratings have been performed and checked according to our QC/QA requirements.

14. **Mn/DOT should continue to have dialogue on advance warning signs for load posting signs with local agencies during annual NBIS reviews and in other venues.**
We will continue to discuss this topic with local agencies and make them aware of the available guidance in the MUTCD and other resources.

15. **The load rating forms for rating of culverts should have a signature block for the Engineer performing the load rating as all load ratings are required to be performed by a Registered Professional Engineer.**
Culverts that are in "good" condition are rated based on their type, per the guidance given in the LRFD Manual. The name and title of the person performing the rating is included on the rating form. Culverts with an NBI condition rating of 4 or less are rated by a Physical Inspection Rating which is signed by a registered professional engineer.

16. **Local agencies need to evaluate all bridges to take into account the specialized hauling vehicles (SHVs) and re-rate those bridges where such vehicles are in operation.**
We have done a preliminary screening to identify those local bridges that are susceptible to the SHV. We are currently administering four consultant contracts to re-rate those bridges that were identified in the screening.

2009 NBIS Review Letter

U.S. Department of Transportation
Federal Highway Administration

Minnesota Division

380 Jackson Street
Galtier Plaza, Suite 500
St. Paul, MN 55101-4802

February 23, 2010

FEB 25 2010

BRIDGE ENGINEER	✓		
DESIGN ENGINEER			
PLANNING ENGINEER			
CONSTR/MAINT ENG.	✓		
STANDARDS/RES. ENG			
ADMIN. ASST.			
LOSS			
LIBRARY			

Thomas K. Sorel
Commissioner of Transportation
Department of Transportation
MS 100, Transportation Building
St. Paul, Minnesota 55155

Re: 2009 Annual National Bridge Inspection Standards (NBIS) Review

Dear Mr Sorel:

Enclosed for your review and further action, is a report addressing the 2009 statewide safety inspection of bridges in Minnesota. The purpose of the review was to determine statewide compliance with the National Bridge Inspection Standards (NBIS).

Overall, the Minnesota Department of Transportation (Mn/DOT) is considered to be in substantial compliance with the NBIS requirements.

Notwithstanding substantial compliance with the NBIS regulations, the following selected recommendations for improvements to the program are being highlighted for your general interest and/or consideration:

1. ***As part of the overall annual NBIS review, a "Bridge Load Rating and Posting Focused Review" for Mn/DOT and Local Agencies, was performed in April of 2009. The purpose of this focused review was to evaluate Mn/DOT's and selected local agencies' policies, procedures and standard operating practices in the area of load ratings and postings for highway bridges to fulfill the requirements of the National Bridge Inspection Standards (NBIS). A letter and final report were sent to Mn/DOT on December 21, 2009, requesting a formal response to each of the opportunities for improvement noted in the report including actions planned along with anticipated timelines to address each of these opportunities. We received a letter from Dan Dorgan, Mn/DOT State Bridge Engineer, dated January 25, 2010, with a formal response to each of the opportunities for improvement listed in the report. We are satisfied with the responses provided by Mr. Dorgan.***

2. ***Based on a preliminary cursory type "Scour Plan of Action (POA) Implementation Review" along with some of the NBIS reviews of local agencies, it appears that***

many of the Scour POAs prepared by some of the local agencies are incomplete or insufficient to adequately implement or take appropriate action in the event of flooding. It is recognized that the Mn/DOT Hydraulics Unit is planning to provide training during the 2010 Bridge Safety Workshops to inform Bridge Inspection Team Leaders about the current recommended "Scour POA templates" and other guidance to assist bridge inspection staff update their Scour POAs. It is nevertheless recommended that the Mn/DOT Hydraulics Unit work more closely with the local agencies in efforts to develop complete Scour POAs. It is further recommended, that the Mn/DOT Hydraulics Unit transmit correspondence to all of the bridge owners informing them of the required documentation that should be provided in their Scour POAs, along with guidance to assist them in this effort. Additionally, it is also recommended that the Mn/DOT Bridge Inspection Unit place additional emphasis in the review of the Scour POAs and other applicable documents that are part of the bridge owners file during future Mn/DOT QC/QA reviews.

Your formal response to the all recommendations noted in this letter and the enclosed report, including your actions planned along with anticipated timelines to address each of the recommendations, would be greatly appreciated.

Special appreciation is extended to Mr. Dan Dorgan and members of this staff for their cooperation in the performance of this review.

Sincerely,

Chris Cromwell

Chris Cromwell
Assistant Bridge Engineer

Enclosure

2009 NBIS Review Letter Response

Minnesota Department of Transportation
395 John Ireland Boulevard
Saint Paul, MN 55155

June 14, 2010

Derrell Turner
Division Administrator
Federal Highway Administration
Galtier Plaza
St. Paul, MN 55101-2904

RE: 2009 Minnesota National Bridge Inspection Standards (NBIS) Program Review

Dear Mr. Turner:

Please reference your February 23, 2010 letter to Commissioner Sorel and transmittal of the FHWA 2009 NBIS Program Review Summary Report.

The FHWA recommended that Mn/DOT's Hydraulics Unit work more closely with the local agencies in efforts to develop complete Scour Action Plans, inform them of the required documentation that should be provided in their Scour Action Plans, and provide guidance to assist them in this effort. It was also recommended that the Mn/DOT Bridge Inspection Unit place additional emphasis on the review of Scour Action Plans during their quality assurance reviews of local agency bridge owners.

Enclosed please find our formal response to these recommended program improvements. If you need further clarification on any of these items, please contact Tom Styrbicki of the Mn/DOT Bridge Office at (651) 366-4507.

Thank you for your continued partnership with Mn/DOT in implementing the National Bridge Inspection Standards.

Sincerely,

Duane R. Hill

Duane R. Hill
State Bridge Engineer

Enclosures

cc: Thomas K. Sorel – Commissioner of Transportation
Michael Barnes – Engineering Services Division Director
Tom Styrbicki – State Bridge Construction and Maintenance Engineer
Romeo Garcia – FHWA

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Mn/DOT has worked closely with local agencies to assist them in developing complete scour plans of action (POA). We will continue to provide technical resources, expert assistance and formal training on this topic through the combined efforts of our Bridge Hydraulics Unit, Bridge State Aid Unit, and Bridge Inspections Unit. A summary if these ongoing efforts is listed below;

Bridge Hydraulics Unit

Detailed technical information regarding bridge scour is made available to all bridge owners on Mn/DOT's public website at www.dot.state.mn.us/bridge/hydraulics/hydraulics/scour. The Bridge Hydraulics Unit maintains this data source, providing scour POA templates, scour evaluation procedures, contact information for technical assistance, and training materials.

The Unit offers direct assistance to local agencies, working with bridge owners to review their POAs and provide guidance on the appropriate content and required documentation. Many counties and cities have taken advantage of this service in recent years.

The Unit also conducts formal training sessions. Each of the four Bridge Safety Workshops (Spring 2010) included an hour-long session on scour POA implementation led by the Hydraulics Unit. Additionally, the Unit offered four full-day training sessions on Bridge Scour Monitoring at various locations around the state (March 2010). Each of these training sessions provided an opportunity to re-emphasize the importance of complete scour POAs.

State Aid Bridge Unit

The State Aid Bridge Unit provides a variety of forums to educate local agency bridge owners about their responsibilities as NBIS Program Administrators. They maintain a bridge resource webpage, publish a biannual news letter, conduct county bridge engineer meetings twice a year, and participate in annual conferences with local agency engineers. The Hydraulics Unit frequently uses these communication avenues to transmit information about scour POA preparation to the local agencies and to inform them about the resources that are available.

Bridge Inspections Unit

During the annual NBIS quality assurance reviews conducted by the Bridge Office Inspections Unit, local agency bridge owners are required to complete a questionnaire regarding, among other items, whether scour POAs are in place for susceptible bridges. This topic is also discussed during the face-to-face meetings between the Unit and the local Program Administrator. This year, a newly-developed QA/QC check sheet for scour POAs will be used by the Inspections Unit during their Quality Assurance reviews of the cities and counties.

The Mn/DOT Bridge office, with assistance from our FHWA Division partners, has made a significant effort to educate local agency bridge owners about their responsibilities as NBIS Program Administrators. We will continue work closely with local agencies to ensure compliance with all the requirements of the NBIS, including the preparation of complete scour action plans.