



Dave Heineman
Governor

STATE OF NEBRASKA

DEPARTMENT OF ROADS

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May 24, 2010

Dear Nebraska Bridge Owner:

RE: Bridge Inspection Program
Memo No. 100524 – General

This memorandum to all Bridge Owners is the first of future communication on Bridge Inspection Program (BIP) in Nebraska. These memos will be maintained on the NDOR Bridge Division Website. This first memorandum is somewhat long, but this is necessary given the changes that have taken place in the processes to meet the National Bridge Inspection Standards (NBIS).

- **BIP Memorandums:** The Bridge Division will be issuing a Program Memo at least annually at the beginning of a given inspection year communicating revisions to the BIP Manual and other policy matters. As you know, NDOR submits an NBI data set to FHWA no later than April 1 of each year. The data generally represents data collected from inspections and load ratings from the prior calendar year. BIP Memos will be issued throughout the year as needed.
- **Policy for Design, Load-Rating and Inspection of Public Road Bridges:** Attached is the revised policy dated May 24, 2010 regarding design (hydraulic, geometric and structural) and inventory inspections. This does not represent any changes to past practice or requirements of prior policies, but rather clarifies and reemphasizes requirements for design and submittal of documentation to NDOR.
- **NDOR Bridge Conference:** NDOR will be holding a Bridge Conference this summer to provide a more detailed overview of new processes of the Bridge Inspection Program and of the Bridge Inspection Manual. LTAP will be handling the arrangements for this conference. You will receive a notification in the near future regarding the date and agenda.
- **Bridge Inspection Program Manual:** If you have not done so already we recommend that you read the Bridge Inspection Program Manual that was effective on January 25, 2010. The Manual, program forms, reference documents and interim guidance including this and future BIP Memos, will be posted on the NDOR Bridge Division Website. Attached you will find a list of the “Top Ten” items you need to know regarding the Manual and areas of emphasis from the compliance process with FHWA.
- **NDOR/Bridge Owner Agreements:** The Federal Highway Administration (FHWA) has a national initiative to ensure compliance with the NBIS, which was particularly heightened after the collapse of the I35W Bridge in Minneapolis. Much progress has been made in this area in Nebraska and, as a result Nebraska is now conditionally compliant; there are some important tasks at hand to be done to attain full compliance.

An FHWA compliance requirement is that NDOR enter into agreements with each Bridge Owner that define the Owner's inspection responsibilities. The agreement will cover both bridge inspections and load rating responsibilities, described more fully in the BIP Manual. NDOR will retain responsibility for underwater inspections and fracture critical inspections.

The agreement is currently being developed by NDOR. Working drafts will be posted to the Bridge Division website. You will receive a copy of the proposed agreement in the near future. The goal is to have these agreements in place by September 1, 2010.

- Quality Assurance Results: NDOR also completed a Quality Assurance review of program operations of inspection and load rating, and records. Quality Assurance provides not only a check on quality Control being done by those generating data and reports for the Program, it also provides a mechanism to identify best practices or recurring problematic issues to be shared with all participants to improve the Program. A summary of the findings for this inaugural cycle is attached. Your organization's individual reports will be sent separately.
- Pontis Owner Packages Available: We also want to inform you that the Nebraska database refreshed data is ready to go and available on the ftp site for your use. The ftp site addresses is <ftp://164.119.10.37>. Read the "Read Me" file on the ftp site for full instructions. If you do not have inspections due before the summer meeting in Valentine and you are attending the meeting, you can bring your laptop to Valentine and bridge staff will update it for you.

If you have any questions, please call Steve Andersen at 402-479-4705.

Sincerely,

Signed by:

Mark Traynowicz
State Bridge Engineer

Enclosures: Bridge Policy on Design, Load Rating and Inspection, v100524
Top Ten Things to Read in the BIP Manual
BIP QA Evaluation, 2008 Cycle - Summary

Copy: County Attorney
County Clerk
FHWA/NE Division Office
Jeff Schroeder, Asst. Attorney General
Jim Wilkinson, Local Project Engineer
File

STATE OF NEBRASKA, DEPARTMENT OF ROADS (NDOR)
POLICY FOR DESIGN, LOAD-RATING AND INSPECTION OF PUBLIC ROAD BRIDGES
May 24, 2010

Definitions: Bridge – Bridge shall have the definition set out in 23 CFR § 650.305. **Maintenance** - Maintenance means the act, operation, continuous process of repair, reconstruction or preservation of the whole or any part of any highway, including surface, shoulders, roadsides, traffic control devices, structures, waterways, and drainage facilities, for the purpose of keeping it at or near or improving upon its original standard of usefulness and safety (Neb. Rev. Stat. § 39-101(6)). **Public Road** – Public road means any road or street under the jurisdiction of and maintained by a public authority and open to public travel (23 USC § 101(27)).

Any Bridge on a Public Road under the jurisdiction of the state, a municipality, a county, or a village shall be designed, constructed, inspected and maintained in accordance with state and Federal law. The public entity with jurisdiction for any Bridge located on a Public Road in Nebraska shall provide to NDOR copies of all bridge plans, hydraulic design reports, load-rating reports and inspection reports applicable to each Public Road Bridge.

Hydraulic Design: The hydraulic design will satisfy the requirements of Federal-Aid Policy Guide, 23 CFR 650A (Location and Hydraulic Design of Encroachments on Floodplains) and FHWA-IP-90-017 (HEC-18 Scour), which is covered in the NDOR Hydraulic Analysis Guidelines. The Nebraska Natural Resources Commission provides minimum standards governing the hydraulic design of improvements in floodplains (See 455 NAC Section 004 and 005, and Chapter 31 of the Nebraska statutes). A Nebraska licensed professional engineer with training and experience in the hydraulic design of Public Road Bridges shall complete, seal and sign the hydraulic design report. The hydraulic design reports for Bridge projects on Federal-aid projects shall be submitted to the NDOR Local Projects Division in accordance with the LPA Manual. The hydraulic design reports for all other Bridge projects shall be submitted to the NDOR Bridge Division prior to construction.

Geometric and Structural Design: All Public Road Bridges shall be designed and constructed to meet the minimum standards of the Nebraska Board of Public Roads Classifications and Standard for the geometric and structural design of Bridges (See Minimum Standards created pursuant to Neb. Rev. Stat. § 39-2113). These standards apply to the original construction and any reconstruction, rehabilitation or retrofit of the Bridge. A Nebraska licensed professional engineer with training and experience in geometric and structural design of Public Road Bridges shall complete, seal and sign the Bridge design plans. The plans for Bridge projects on Federal-aid projects shall be submitted to the NDOR Local Projects Division in accordance with the LPA Manual. The plans for all other Bridge projects shall be submitted to the NDOR Bridge Division prior to construction.

Load-Rating and Inspection: All Public Road Bridges are subject to the National Bridge Inspection Standards (NBIS). The NBIS requires that all Public Road Bridges be load-rated and inspected. The NDOR Bridge Inspection Program (BIP) Manual sets out the policy covering load-rating and inspection of Public Road Bridges. All Bridges shall be load-rated in accordance with the (BIP) Manual and the load-rating documents shall be sealed and signed by a Nebraska licensed professional engineer with training and experience in Bridge load-rating. The load-rating documents of any Bridge constructed as a part of a Federal-aid project shall be submitted to the NDOR Local Projects Division in accordance with the LPA Manual. The load-ratings documents for all other bridges shall be submitted to the NDOR Bridge Division in accordance with the (BIP) Manual. Bridges must be inspected regularly as designated in the (BIP) Manual, or funding sanctions may be imposed.

Exemption: This policy does not apply to Bridges located on private property or private roads.

Signed by:

Mark Traynowicz
State Bridge Engineer

Signed by:

Monty Fredrickson
Director

The January 25, 2010 Nebraska Bridge Inspection Program Manual includes procedures and policies used in the past, but there are also new policies and procedures. WE encourage you to take the time to read the entire Manual. Today we are pointing you to the top ten items you should review.

1. The Manual is organized in Chapters covering the basic operations of Bridge Inspection Program required by the National Bridge Inspection Standards; each was designed to stand alone, for example Chapter 3 Coding and Chapter 4 Inspection can be taken to the field without the need for the whole Manual. You should, however, read the ***Responsibilities Section from each Chapter***. This will give you the “Reader’s Digest version” of who is doing what to make sure all Nebraska Bridge Owners are compliant with the NBIS. Much of this is not new, but is documented in each chapter for everyone’s benefit.
2. ***The Introduction*** – This not only describes the purpose and recent history of the Manual, it also explains what you, as a program participant, can expect on documents that are basic tools of the Bridge Inspection Program. All documents will be on our websites, including the Manual, reference documents, Supplemental Guidance between Manual revisions, forms, and memos from the Bridge Division Office. There is also a form for providing suggestions and comments and we encourage your input.
3. ***Section 1.6 Quality Control and Assurance, General*** – There can be much confusion between these two very important activities.
 - Basically, you need to remember that Quality Control is the responsibility of the party who is creating a report or doing an inspection and is required on 100% of the reports or data generated. You can think of this in terms of a construction project – the contractor is expected to deliver the specified quality on 100% of whatever they build.
 - Quality Assurance is the activity to make sure the QC is getting done. Continuing the construction project analogy, this is the same activity that the State or you complete in checking that the contractor had delivered the quality required, such as compaction tests.
4. ***Section 1.6.3.4 Operation, Bridge Inspection Program Operations Matrix and the Program reports and Data generated Matrix*** – These two tables are a super-condensation the NBIS requirements and the expected data and reports to be generated by the program participants.
5. ***Section 2.6 Summary of Mandatory Components of Bridge Records*** – The AASHTO Manual for Conditional Evaluation of Bridges (superseded on January 25, 2010 by the Manual for Condition Evaluation of Bridges) had also always outlined expectations for records that Bridge Owner’s should keep as part of their bridge records. This table tells NE Owners what they must have in their files as a minimum. We will be completing QA checks on all Bridge Owners in the state as part of our commitment to compliance with the NBIS. We found in the QA review done in 2008 that generally Owners are keeping good records, but you definitely should have your staff review each of your bridge records to make sure they have all these components.
6. ***Sections 3.12 to 3.19 on the Nebraska Inventory Items*** – There have been some revisions to old items and some new items have been added. If there are new items added between Manual revisions, these will be posted on the Bridge Division Website as Supplemental Manual Guidance.
7. ***Section 4.6 Inspection Frequencies*** – One area that NE has been cited by the FHWA as being non-compliant is timely inspections. All routine inspections are to be done within a 24-month interval of the prior routine inspection. NDOR is requiring that bridges with certain risk factors have a special inspection between the biennial routine inspections as these are given in this section.

8. **Section 4.16 Repair and Maintenance Reporting** – NDOR uses their own forms to identify needed repairs and maintenance. If your county has a system in place, such as a work order system for repairs or maintenance, that's great! Make sure you get copies of these in each bridge record. If you don't have your own system, we encourage you to adopt the use of these forms, so that you can keep good records on each of our bridges.
9. **Section 5.6 Bridge Load Posting** – Probably the most serious finding from the QA review done in 2008 was bridges that should have been closed or load posted but were not. All NE bridge Owners must do everything they can to protect the public's safety. There is no excuse for a tardy action when your load rating engineer, who must be a NE PE, has delivered notice that a bridge should be closed or posted.
10. **Chapter 6.7 Bridge Scour Plan of Action** – As you know, the FHWA takes scour monitoring very seriously, and rightfully so since this is the most likely cause of failure for the vast majority of bridges on the public roadway system. If you have bridges with Plans of Action, you must also maintain a log of action required and maintenance activities that are specified in the POA.

Please don't forget to give us your feedback on the Manual.

NDOR has accomplished a great deal to improve the program and aid program participants generating data for the bridge inventory. Efforts include switching data management to Pontis, developing a file management system, standardizing load rating means and policies, and addressing bridges over waterways that have been previously assigned “unknown foundation”.

Primary activities accomplished by NDOR for BIP operations:

- Formalization of the BIP Organization
- Manual update with revised organization to parallel NBIS
- Development and Initiation of a QA Program
- Quality checks for data in the inventory.

Nebraska Department of Roads (NDOR) contracted with Parsons Brinckerhoff to perform a Quality Assurance Evaluation for the Bridge Inspection Program (BIP). The Quality Assurance Plan for the program involves reviewing specific operations required by the NBIS and the variable in those operations. QA Evaluation was completed on the final 2008 dataset (the data submitted to FHWA in April 2009, covering data generally generated in 2008). A total of 841 structures were random sample subjects for four major program operations. These sample subjects were also used to complete QA for other operations.

For this inaugural cycle, QA evaluations have been performed on the Program Organization, personnel qualifications, inspections, load ratings, owners’ records, scour, follow-up and inventory data. Random sampling for subjects was used for these operations: inspection, load rating, owners’ record and hydraulic assessments. Findings to date and proposed corrective action are summarized; additional recommendations are also proposed.

- QA Evaluation on Program Organization
 - Findings
 - None
 - Recommendations
 - Post Program documents on the Bridge Division website;
 - Communicate Program information and refinements to all Bridge Owners with an annual letter from the State Bridge Engineer which would also include a summary report of QA Evaluation results
 - Complete QA Evaluations after the dataset has been submitted to FHWA.

 - QA Evaluation on Qualifications
 - Findings
 - None
 - Recommendations
 - Investigate best practices used to set qualifications for assistant team leaders;
 - Develop a procedure for tracking and assessing QA findings on the inspection operation and criteria for corrective action or disqualification for performance-base reasons.
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- QA Evaluation on Inspection Frequency
 - Findings
 - Conversion from BISON to Pontis preserved month and year, but not individual day
 - Recommendations
 - Review intervals for the entire inventory after Pontis has been used for two inspection cycles;
 - Follow-up with communication to Bridge Owners who have bridges that considered the deck as lateral bracing (“bracing by deck” policy”) and perform QA on the Owners response in the 2009 cycle.

 - QA Evaluation on Inspection on 318 routine inspections of all structure types.
 - Findings
 - QA Evaluation of inspection revealed major findings that resulted in closure of some bridges. Some findings were related to the Bridge Owner not closing or posting bridges as recommended by the Load Rating Engineer. Some findings were related to the Inspector who had missed critical findings (two timber pile 90% rotten in a 4-pile abutment; failure to clean the structure which revealed critical crack in one case and termite infestation of stringer in another case.)
 - Inconsistency for some condition ratings indicating the need for additional guidance to inspector for these items.
 - Inconsistency in coding stream behavior items.
 - Recommendations
 - Inspectors need to clean all elements to complete a thorough inspection.
 - Nearly all FC findings of the QA Evaluation were in agreement with subject Team Leaders. FC report consistency is much improved from past practice, but additional guidance is needed in some areas.
 - Additional guidance is needed regarding stream behavior for the inspectors;
 - Performance-based criteria should be developed for inspector qualifications.

 - QA Evaluation on Bridge Load Rating on 316 structures
 - Findings
 - Ratings done with the NDOR trucks with different names will preclude running the same LARS model in a future rerating.
 - Submission of only a LARS model file and Load Rating Summary sheet is not sufficient for the QA Evaluations nor an Owner’s records. Submission of a pdf file with input and output used by the LRE is needed to perform a standard evaluation without the QA team running the LARS model. This information will allow both QC and QA review of the rating for the software version and truck used by the LRE for that particular rating. The LRE of record would also have the input/output documented for the load rating that they have sealed.
 - Recommendations
 - A standard LARS truck library needs to be adopted.
 - A standard list of load rating records requirement should assist both Load Rating Engineers and Owners to complete Bridge Records.
 - Electronic records (pdf) are recommended for software input and output for the Records.
 - A standardized file-naming convention should be adopted.
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- QA Evaluation on Bridge Owners Records on 181 Bridge records under 36 Bridge Owners
 - Findings
 - 46% of the records included the components proposed as mandatory in the NDOR BIP Manual.
 - Recommendations
 - Additional guidance is needed on expectations that meeting the AASHTO Manual for Evaluation of Bridges and that are useful for the Owners and others who monitor the Program.
 - A standardized file-naming convention should be adopted for electronic files in these Records.

 - QA Evaluation on Scour on 25 structures for the 2008 cycle
 - Findings
 - Processes in the Hydraulic Assessment Guidelines were generally followed, but some reports were missing data and the engineers should provide this information.
 - Some computational errors found in some reports.
 - Recommendations
 - Reports were amended for the missing data and errors.
 - Review HEC 18 methodologies for calculation scour, its application and more specific implementation in the Guidelines.

 - QA Evaluation on Follow-up
 - Findings
 - Completion of identified maintenance or repair items inconsistent.
 - During QA inspections some bridges found that were not posted or closed as recommended by the Load Rating Engineer.
 - Hydraulic Assessments generated Plans of Action that need Owner follow-up.
 - Recommendations
 - Continue monitoring of Critical Findings and submittal of reports to FHWA;
 - Work with non-state Bridge Owners on possibly using NDOR Bridge Repair Report and Maintenance Checklist, if the Owners programs do not have a maintenance program in place.
 - Follow-up action on Owners who have bridge rated with the “bracing by deck” policy to return these to a 24-month inspection cycle.
 - Implement the proposed procedure to follow-up on Owner posting and closure of bridge as required.
 - Work with non-state Bridge Owners on POA logs for their files.

 - QA Evaluation on Inventory Data
 - Findings
 - Evaluation of the data for subjects of other program operations and examination of the data lists have found some data inconsistencies and apparent miscoding that were addressed
 - Recommendations
 - Miscodings were addressed by the Data Manager.
 - Several new items are recommended for the database as the result of the QA Evaluations and these are noted in each section of the QA Evaluation Report for the 2008 NBI Cycle.
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