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Chapter 5 – Quality Assurance/Quality Control (QA/QC) for Local Public Agencies

CHAPTER 5
QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FOR LOCAL PUBLIC AGENCIES

5.1 SCOPE OF LOCAL PUBLIC AGENCY QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

Of the more than 25,000 bridges in Iowa that are in the NBI, over 19,000 of the bridges are owned, inspected, and maintained by counties, cities, and other public agencies, known collectively as LPAs. Iowa Code 314.18 requires LPAs to be responsible for the safety inspection and evaluation of all highway bridges under their jurisdiction that are located on public roads, in accordance with the NBIS. Iowa DOT updates and issues I.M. 7.020 to assist LPAs in complying with the NBIS. In addition, this chapter of the Iowa Bridge Inspection Manual provides definitions and processes that are to be followed to ensure proper Quality Control and Quality Assurance for the inspections and reporting for these bridges.

Private bridge owners are subject to the NBIS and do fall under Iowa DOT oversight when there is a public route on both ends of the bridge.

5.2 NBIS DEFINITION OF TERMS

The NBIS definitions of Quality Control and Quality Assurance are provided in the following sections.

5.2.1 Quality Control

Quality Control is defined as procedures intended to maintain the quality of a bridge inspection and load rating at or above a specified level.

5.2.2 Quality Assurance

Quality Assurance is defined as the use of sampling and other measures to assure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program.

5.3 ROLE OF SIIMS

Iowa DOT implemented SIIMS in May 2010. SIIMS is a software package used to update the bridge records of Iowa's portion of the NBI. The user interface is a password-protected website allowing Iowa DOT and LPA bridge inspectors to manage inspections and document findings in a standardized reporting format.

SIIMS is the foundation of the Iowa DOT quality control program. The software presents standard collection screens for data entry, schedules inspections, and performs integrity checks at each stage of the approval process. These quality control measures are in place to obtain consistent inspection data from multiple inspectors, which is necessary if proper resource planning is to occur across the State.

5.4 QUALITY CONTROL

5.4.1 Inspection Scheduling

Inspection dates and inspection frequencies are entered in SIIMS for all NBI structures. Multiple inspection types, such as NSTM or Underwater Inspections, may be entered and scheduled for separate dates, years, and frequencies.

SIIMS can forecast upcoming inspections and provide maps of bridge locations.

When the date of an inspection passes without the creation of an inspection report, SIIMS will automatically notify the bridge owner and Program Manager via e-mail if a report is not created by the time the inspection is 1 month, 3 months, and 6 months past due.

If an inspection report was created but remains unapproved, SIIMS will automatically notify the bridge owner and Program Manager via e-mail when the inspection report is 3 months and 6 months past the inspection date.

If an inspection report is not created or the report remains unapproved 6 months after the inspection date, SIIMS will automatically notify the bridge owner and Program Manager via e-mail and request an aggressive, short-term plan to correct this deficiency.

5.4.2 LPA Compliance

For LPAs with NBIS compliance issues, the LPA will be directed to complete one of the following actions:

1. Complete all the actions necessary to resolve the compliance deficiencies.
2. Submit an aggressive, short-term plan to correct the deficiencies for FHWA approval.

Iowa DOT will issue two notifications to the LPA. First, Iowa DOT will issue a 60-day notification to the LPA that failure to correct the NBIS errors will result in the LPA being assessed as non-compliant with the NBIS. At the end of the 60 days, Iowa DOT will issue a 30-day second advanced notification recommending that FHWA not approve future Federal-aid projects for the noted LPA.

For LPAs that have not corrected the NBIS deficiencies or have not carried out a short-term plan to correct the NBIS deficiencies within 90 days from the date of the first notification, Iowa DOT will notify FHWA of the recommended local governmental entities that should have their Federal-aid project funding suspended.

For those LPAs that submit a short-term plan, Iowa DOT shall review the plan to ensure the LPA necessarily corrected deficiencies in a reasonable time frame and, if it does, Iowa DOT will recommend its approval to FHWA. Additionally, Iowa DOT shall evaluate the progress made by the LPA to complete the short-term corrective plan in accordance with the approved timeline. Iowa DOT shall notify FHWA when the LPA has failed to make sufficient progress or failed to complete its short-term plan by the approved timelines. Additionally, in the case of failure to make sufficient progress or complete its short-term plan by the approved timelines, Iowa DOT shall issue a 30-day advanced notification recommending that FHWA not approve future Federal-aid projects for the noted LPA.

5.4.3 Data Collection

When an inspection report is created in SIIMS, a series of web pages are populated with the NBI information available for the structure. SIIMS promotes consistent NBI data collection by standardizing the data entry based on the following:

1. The inspector reviews each NBI entry and updates the data to reflect their inspection findings.
2. Each report includes a Load Rating Evaluation Form the inspector must complete before SIIMS will allow the inspection report to be approved.

Each report has an Error Check page alerting the inspector to entries that are missing or varying from an expected format.

5.4.4 Inspection Report Approval

Quality Control is performed for the inspection and the load rating by the Program Manager for the LPA. When an inspector submits a report for approval, the error check software in SIIMS will review the report fields. If data entry errors are found, such as Item B.IR.01 (NSTM Inspection Required) is coded "Yes" but no NSTM inspection date is entered, an Error Check page will appear, and the report will not be approved until the errors are resolved.

When the error check software finds entries that do not match the data stored in the SIIMS database, the inspector will be asked if the new data must overwrite the existing data or if the existing data must remain. The inspector must choose whether to use the report values or central database values before SIIMS will allow the report to be approved. Some data may be uneditable because it is data maintained by the Iowa DOT. If the data is uneditable and appears to be incorrect or in question, contact the Research and Analytics Bureau to correct or clarify the data discrepancy.

LPA inspectors perform their own quality control review of the report content. SIIMS is programmed to check for data entry errors, but decisions about maintenance activities or structural repairs are made by the LPA inspector or Program Manager.

When a Program Manager or Team Leader (other than the Team Leader who performed the inspection) reviews the report this is considered an independent QC review, and the date of that review needs to be entered under SNBI Item B.IE.08 (Inspection Quality Control Date).

5.4.5 Training

The NBIS requires periodic bridge inspection refresher training for Program Managers and Team Leaders in Part 650.313(g). Iowa DOT has defined periodic as being every 5 years in accordance with the NBIS. All State and LPA bridge inspection personnel are required to complete the Bridge Inspection Refresher Training Course every 5 years following the completion of the Safety Inspection of In-Service Bridges Training Course.

The SIIMS system contains an individual's qualifications as a team leader. When an individual's refresher training or professional license is within 6 months of expiring, a notice will appear each time the user logs into SIIMS. This notice will show the date(s) of expiration.

5.5 QUALITY ASSURANCE

The terms quality control and quality assurance are not interchangeable. The NBIS defines quality control as a tool and quality assurance as an evaluation of that tool. SIIMS has built-in quality controls that guide inspectors through data collection and standardize data entry in order to obtain consistent inspection data from multiple inspectors. The Iowa DOT Bridges and Structures Bureau Field Engineer Specialist will do the QA review of LPA inspections. When an inspection receives an independent QA review, the Field Engineer Specialist will enter the date under SNBI Item B.IE.09 (Inspection Quality Assurance Date).

Quality assurance is a review of the inspection data to provide the following:

1. An evaluation of how well the quality control tools in SIIMS are delivering consistent inspection data.
2. Identification of where the data are not consistent so the quality control tools can be corrected or modified.

5.5.1 Review of LPA Bridge Records

Iowa DOT I.M. 7.020 states the Iowa DOT shall annually review a random sample of LPA bridge records to determine if they contain the following minimum (as applicable) items:

1. Bridge Plans
2. Repair Plans
3. Photographs
4. Scour Evaluation Data
5. Channel Cross Section
6. Local Agency Field Data Collection Form
7. Structure Inventory and Appraisal (SI&A) Forms
8. Load Rating Calculations
9. Load Rating Evaluation Form
10. Critical Findings
11. Critical Features List
12. Special Inspection Equipment List

5.5.2 LPA Team Leader Reviews

Team Leaders are required to have a Quality Assurance review completed every 4 years by a qualified Program Manager, as per I.M. 7.020. The review includes the following:

1. An independent party review by a Professional Engineer licensed in the State of Iowa and qualified as a Team Leader.
2. A field review of inspection data for 10 bridges inspected during the past 12 months. The bridges selected shall include, but are not limited to, the following:
    a. Predominant bridge types inspected

b. Bridges with lower bridge condition ratings

c. Bridges with Deck (Item B.C.01), Superstructure (Item B.C.02), Substructure (Item B.C.03), or Culvert (Item B.C.04), rated 4 or less (if applicable to the bridges inspected by the Team Leader).

3. The Reviewer accompanies the Team Leader under review during the inspection of 2 of the 10 selected bridges.
4. A Quality Assurance Field Review Worksheet completed for each bridge inspected. The Quality Assurance Field Review Worksheet is available in in the current I.M. 7.020.
5. Verification of the information provided by an individual to obtain access to SIIMS as a Team Leader.
6. Documentation that the Team Leader has completed the Bridge Inspector Refresher Training Course and, if needed, Bridge Inspection Techniques for Nonredundant Steel Tension Members (NSTM)

The findings of the Team Leader reviews are reported to the Iowa DOT. If there are negative findings regarding the Team Leader, the report shall include corrective recommendations, or actions taken, to resolve those findings.

5.5.3 Load Rating Engineer Reviews

Load Rating Engineer reviews will be conducted by the Bridges and Structures Bureau (BSB) utilizing SIIMS in conjunction with on-site field reviews as part of the Iowa DOT's annual oversight of the LPA's program.