Bridge Safety Inspection
Quality Assurance for
MDOT and Local Agencies

Presented by: Great Lakes Engineering Group
Organization of the Project Team

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Overview

Purpose of QA/QC Project

- Increase consistency and accuracy of inspections
- Heighten awareness of National Bridge Inspection Standards (NBIS) requirements
- Provide a system of checks and balances on bridge inspections
- Ensure that written documentation exists in an acceptable structure
Timeline

- 2004: Changes to NBIS, new requirements for QA/QC
- 2007: QA/QC reviews begin for all agencies in Michigan
- 2015: Reviews ongoing, most bridge owners have participated in a QA or QC review
- 2016: Heads up Superior Region
Overview

QA vs. QC

**Quality Control (QC)**\(^1\) – Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level.

**Quality Assurance (QA)**\(^1\) – The use of sampling and other measures to ensure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program.

\(^1\)CFR Vol. 69, No. 239, Part 650, Subpart C – National Bridge Inspection Standards
Review Process

Each review consists of:
- Initial meeting with bridge owner and inspector
- Discussion of current quality control measures
- File review of a sample of bridges
- Field review of a sample of bridges
- Close out meeting, recommendations

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<thead>
<tr>
<th>Total Number of Bridges in Inventory</th>
<th>Quality Assurance Review</th>
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<tr>
<td>All Inventory Sizes</td>
<td>File Review</td>
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<td>10% of Inventory</td>
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<td>Field Review</td>
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<td>5%, maximum of 5</td>
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<th>Total Number of Bridges in Inventory</th>
<th>Quality Control Review</th>
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<td>Field Review</td>
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<td>5% of Inventory</td>
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**QA Review performed when:**
- Quality Control is already being performed
- All required components of the program included
- Major components of the program included

**QC Review performed when:**
- Agency is not performing adequate QC
- Some key program components needed
- Major program components missing
Findings

2015 – North Region
- 50 agencies reviewed (25 local, 24 county, 1 region)
- 50% of agencies received a QA review in 2015
Findings

Quality Control and Personnel Qualifications
Findings

Bridge File Components

[Bar chart showing data for various bridge file components from 2000 to 2015]

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Findings

Inspection Consistency with Established Criteria

- Comments consistent with the ratings?
- Is the level of comments sufficient?
- Ratings, comments align with help guides?
- Inspection frequency modified appropriately?
Trends, 2007-2015

- **Upward Trends**
  - Inspection timeliness
  - Underwater inspections
  - Load analysis on file with assumption and summary forms
  - Bridge file components
  - Inspection report quality

- **Not-So-Upward Trends**
  - Effective QC
  - File/field review of inspection reports
  - Separate files for each structure
Upward Trends

- Timeliness, underwater inspection, load analysis
Upward Trends

Bridge file components

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Upward Trends

Inspection report quality

![Bar chart showing upward trends in inspection report quality metrics from 2007 to 2015. The metrics include: comments consistent with the ratings, level of comments being sufficient, ratings and comments aligning with help guides, and inspection frequency modified appropriately. The data indicates an overall improvement in these metrics over the years.]

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Not-So-Upward Trends

Effective QC, file/field review, separate files
The Perfect Review

File Review (Owner)
- Quality control plan
- Inspector credentials
- Documentation of file and field QC (see next slide)
- Separate file for each structure
- Current inspection report
- Load analysis with assumption and summary forms
- Scour assessment
- Plans, correspondence, maintenance records, photos

Field Review (Inspector)
- Ratings in alignment with MDOT NBI Rating Guidelines
- Comments consistent with ratings
- Level of comments increase as ratings decrease
- Inspection frequency modified appropriately
- Report Critical Findings with RFA’s
- Request Detailed Inspection, Load Ratings, Underwater Inspections as needed

*Refer to Michigan Structure Inspection Manual (MiSIM) Chapter 2 “Quality Assurance and Quality Control”
# Tracking QC

- Create method to track quality control activities
- Ensure revisions are made based on QC checks
- Provide to bridge owner for files

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<thead>
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<th>Bridge Number</th>
<th>Inspection Report</th>
<th>Plot No.</th>
<th>Work Taken</th>
<th>QC Review</th>
<th>Revisions</th>
<th>Certification</th>
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Recommendations

Refer to Michigan Structure Inspection Manual (MiSIM) Chapter 2 “Quality Assurance and Quality Control”

**Owner**
- Have inspector’s quality control plan and credentials on file. Need credentials for everyone associated with inspection. Document all QC activity!
- Maintain separate file for each bridge that contains all relevant data
- Perform random QA checks to ensure files are accurate and complete

**Inspector**
- Create method to track quality control activities and provide documentation for owner
- Perform 5% file and 2.5% field reviews annually for each inspector
- Complete continuing education to maintain QTL status (24 hours every 5 years)
Questions and Discussion