



# INDIANA DEPARTMENT OF TRANSPORTATION

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**Michael R. Pence, Governor**  
**Karl B. Browning, Commissioner**

## Bridge Inspection Memorandum

14-01

FROM: /s/Merril Dougherty  
Merril Dougherty  
Bridge Inspection Manager  
Bridge Division

TO: All Inspection Personnel, and Consultants

Date: 23 APRIL 2014

Re: Revisions to INDOT Bridge Inspection Manual

REVISES: *Indiana Bridge Inspection Manual* Part 1 Sections 2.1, 2.4.3, 2.4.4, 2.5, 3.2, 3.7, 5.1, 7.2, Part 2 Sections 2.4, 2.5, 3.1, 3.2, and 3.3

EFFECTIVE: Immediately

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The revisions to the *Indiana Bridge Inspection Manual* were necessary due to the changes in FHWA oversight practices and changes in National Bridge Inspection Standards. The changes to the FHWA oversight practices were introduced in 2011. The new criterion defines 23 key metrics, each of which can be linked directly to requirements in the NBIS. These key metrics include inspection file records; determination of bridge load limits; qualifications of inspection personnel; procedures for underwater, fracture-critical, and complex bridge inspections; quality bridge data; and inspection frequency. Other areas that require increased attention are identifying scour critical bridges, implementing plans of actions for these structures, and establishing documented load ratings for all bridges.

The following links provide additional information on the legislated changes and FHWA oversight practices.

<http://flh.fhwa.dot.gov/programs/fabs/documents/2013-metrics.pdf>

<http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

<http://www.fhwa.dot.gov/map21/>

The following outline provides clarification of the changes made in each of the manual sections.

### **SECTION 2.1 PROGRAM SUMMARY**

- Clarification to assure delegation of authority to the counties
- Assurance of authority of the state to close bridges
- Risk of funding for lack of performance

### **Subsection 2.4.3 Bridge Inspection Consultant**

Forward a list of qualified Inspection Team Leaders, Inspection Team Members, and Load Rating Team Members in the firm to the State Program Manager yearly before December 31<sup>st</sup>. The list shall include the following:

- Proof of Professional Engineering Registration in the State of Indiana for all professional engineers for team leaders, state assigned inspection numbers for all team leaders and team members. This requirement applies to inspector and load rating teams.
- Certificates of training for the Safety Inspection of In-Service Bridges for team leaders.
- Certificates of training for the Fracture Critical Inspection Techniques for steel bridges for team leaders performing fracture critical and complex bridge inspections.
- Certificates of training for the underwater bridge inspection class and diver training listed in section 2.4.10

### **Subsection 2.4.4 Inspection Team Leader**

- Be responsible for field work and be on site during the inspection

## **SECTION 2.5 BRIDGE INSPECTION DATABASE**

- All materials considered to make up the bridge file are to be uploaded into the state's Central Database. These materials will include but not limited to the bridge plans, inspection sketches, pictures, and load rating calculations.
- Consultants for the toll road, counties, and local agencies must submit all approved data to the state within 60 days of an inspection.

## **SECTION 3.2 INSPECTION TYPES**

- Special inspections have been extended to 60 months
- In-depth inspections – a new type of up close inspection – 96 months
- Initial inspection – 90 days – new bridges

## **SECTION 3.7 SPECIAL INSPECTIONS**

Complex Bridges that require a Special Inspection include the following:

- Bridges designated by the State Program Manager
- Cable-stayed bridges
- Movable bridges
- Suspension bridges

## **SECTION 5.1 BRIDGE FILE**

The Central Database is the only official bridge file for all inventoried bridges in Indiana. This file shall include all National Bridge Inventory (NBI) data and supplemental data including the following as a minimum:

- Inspection History – The bridge file shall contain as a minimum two complete bridge inspection files for an existing bridge. Each file will include the items as outlined in chapter three for the type of inspection required.
- Construction Plans and Repair History – All available bridge plans are to be uploaded into BIAS. This will include as-built drawings and working drawings.
- Rating Records – The bridge file will include a complete record of the determination of the bridge’s load-carrying capacity. If posting is necessary, a summary of all posting actions taken for the bridge, including load capacity calculations, date of posting , and description of signing used.

**SECTION 7.2 CRITICAL FINDINGS**

**Subsection 7.2.1 Procedures for Inspectors**

Upon identifying a potential critical finding, immediately report the deficiency to the appropriate agency officials. For non-state owned bridges, the finding is to be first reported to the employee of responsible charge. The finding for state owned bridges and the second reporting for non-state owned bridges is to be the State Bridge Inspection Program Manager.

The State Bridge Inspection Program Manager will record the critical finding for tracking and will notify the FHWA in a timely manner. The inspector must submit electronically a written explanation of the actions taken to close the critical finding file with the State Bridge Inspection Program Manager. This written explanation may include calculations which demonstrate the structural capacity of the structure, pictures which show the structure has been properly closed, or pictures showing the structure has been structurally fortified.

**The following information is to be included in the critical finding notification:**

Name of Bridge Inspection Team Leader and Team Leader Number:

Bridge Structure Number:

Bridge NBI Number:

County:

Route:

Location of structure measured from the nearest intersection:

Date of finding:

Date of notification: Reason for Critical Finding Report: This portion of the report shall include pictures and sketches to support the report. The date of the finding shall be included.

Inspector’s Immediate Recommendations: If these recommendations include actions that must be taken by others, a time necessary to take these actions will be given.

Follow-up Actions: Give a complete description of the actions taken and when these items were complete.

Close out document: Describe how the critical finding was resolved and when. This item may include picture, sketches, plans, or calculations to fully explain how the critical finding was resolved. The close out document will be sent to the Program Manager to officially close the critical finding.

**Part 2: QA/QC**

**SECTION 2.4 QUALITY CONTROL OFFICE REVIEW**

**Subsection 2.4.1 Purpose and Scope**

The primary goal of the Quality Control Office Review is to ensure the accuracy and consistency within an Inspecting Agency, and completeness of the inspection data and all required reports.

For the purposes of quality control, each team leader will ensure that two bridge files are reviewed per year. On or before June 1<sup>st</sup> and November 1<sup>st</sup> of each year a report will be submitted to the INDOT Bridge Inspection Data Manager which will include the quality control office review forms filled out for that portion of the year.

## **SECTION 2.5      QUALITY CONTROL FIELD REVIEW**

### **Subsection 2.5.1      Purpose and Scope**

The primary goal of the Quality Control Field Review is to ensure consistency within an Inspecting Agency of the field inspection and data collection. The review will evaluate the consistency and accuracy of component ratings, inventory items, and adequacy of photographic documentation, notes, and recommended maintenance actions.

A Quality Control Field Review involves a field inspection of a bridge, including verification of data incorporated in the inspection report. The field inspection should take place within twelve months of the original inspection to ensure that conditions have not changed significantly.

The Quality Control Field Review Forms are to be completed by the reviewer and submitted to the INDOT Bridge Inspection Data Manager with the November 1<sup>st</sup> quality control submission. The Quality Control Field Review Form is shown in appendix B.

For the purposes of quality control, each team leader will ensure that one bridge is field reviewed per year. On or before November 1<sup>st</sup> of each year a report will be submitted to the INDOT Bridge Inspection Data Manager which will include the quality control field review forms.

## **CHAPTER 3 QUALITY ASSURANCE**

### **SECTION 3.1      QUALITY ASSURANCE**

The INDOT Bridge Inspection Unit has revised the procedures for quality assurance. The new procedures will incorporate two new quality assurance methods. The first method will incorporate a procedure for inspecting a control bridge or bridges. The control bridge will be evaluated by a designated team of highly qualified bridge inspectors which will establish the target values for the control bridge. The team leaders will then be assigned a time to inspect the control bridge or bridges. The second new quality procedure will be independent oversight. In this method, a third party is enlisted to re-inspect a bridge previously inspected by a team leader. The independent reviewer will then compare the inspections.

These two new procedures will be further developed in the next two section of the manual.

### **SECTION 3.2      CONTROL BRIDGE**

As a minimum, one bridge will be selected every 24 months as a control bridge. The control bridge will be evaluated by a designated team of inspectors. The team members will be highly qualified and will independently determine the rating values for the bridge. The team members will also identify any deficiencies and critical findings. Any required notes or explanation of findings will be noted in the inspection. The inspection team will then meet and determine the values and findings to assign to the structure.

All team leaders will be required to inspect the control bridge. The directions and expectations will be clearly defined well in advance of the date selected for the control bridge inspection. The exact testing procedures and review of results may vary for testing sessions but all expectations will be outlined in the testing instructions.

### **SECTION 3.3 INDEPENDENT OVERSIGHT**

As a minimum, 24 bridge files will be selected annually for independent oversight. These structures in part will be selected from the list of team leaders that failed to participate in the inspection of the control bridge. A portion of the files will be selected from team members that performed poorly on the control bridge inspection. The final portion of the selected files will be selected at random.

For the selected bridge files, a third party will re-inspect the bridge. This inspection will be a complete inspection which will generate a comparison of the original inspection. This will give a very accurate comparison for consistency and accuracy.

### **SECTION 3.4 BRIDGE FILE AND LOAD RATING REVIEW**

#### **Subsection 3.4.1 Purpose and Scope**

The primary goal of the Quality Assurance Bridge File Review is to ensure the completeness of the individual bridge files. The Quality Assurance Bridge File Review ensures that the QC efforts are effective across Inspecting Agencies, resulting in overall quality in the State Bridge Inspection Program. Bridge files should be reviewed to ensure that the bridges are properly load-rated and documented and that they contain any other required/available bridge documentation.

#### **Subsection 3.4.2 Bridge File Review**

The INDOT Data Base Manager will select a minimum of 10 bridge files per quarter for quality control review. One half of those files will be selected by searching files for known or suspected inaccuracies. The remaining files will be selected at random.

The bridge files will be reviewed for accuracy and completeness. The items checked for the bridge file will be as outlined in the AASHTO Manual for Bridge Evaluation, Section 2.

The findings of the quarterly review will be submitted to the INDOT Bridge Inspection Program Manager.

#### **Subsection 3.4.3 Load Rating Verification Review**

The INDOT Bridge Load Rating Engineer will select a minimum of 10 bridge files per quarter for quality control review. These files may have been selected for a bridge file review where the load rating section of the file was in question or the files may be selected at random.

The file will be reviewed for accuracy and completeness. The file must contain the summary sheet from the load rating and all supporting computations which must include a clear statement of all assumptions used in calculating the load rating. For computer modeling, an input data file will be included in the file.

The findings of the quarterly review will be submitted to the INDOT Bridge Inspection Program Manger.