

CHAPTER 7: QUALITY CONTROL/QUALITY ASSURANCE

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SECTION 7.1 INTRODUCTION

Subsection 7.1.1 Purpose

In order to maintain the accuracy and consistency of structure inspections and structure inspection reports, structure owners shall implement the quality control (QC) and quality assurance (QA) measures described herein. An accurate and thorough condition assessment of each structure is vital to maintaining a safe, functional and reliable highway system.

INDOT has developed a Structure Inspection Manual that contains the following procedures for Quality Control and Quality Assurance. These procedures are documented and will be updated and maintained within the manual. However, Federal Regulation 23 CFR 650.313(g) requires each state to assure that systematic QC and QA procedures are used to maintain a high degree of accuracy and consistency in the inspection program. This shall include periodic field review of inspection teams, periodic bridge inspection refresher training for Program Managers and Team Leaders, and independent review of inspection reports, plans of action and load rating calculations.

Due to the inspection cycle frequency and amount of data collected, the Toll Road District shall be treated as a County owned bridge, for the purpose of this chapter.

Subsection 7.1.2 Scope

The scope of the QC and QA procedures is to outline:

- Team Member Roles and Responsibilities
- Documenting Qualifications for Various Inspection Team Members
- Tracking Current Qualified Bridge Inspectors
- Required Bridge Inspection Training
- QC Roles and Review Procedures
- QA Roles and Review Procedures
- Bridge File Maintenance
- Identification and Resolution of Data Errors, Omissions, and/or Changes
- Disqualification and Requalification Processes

Subsection 7.1.3 Definitions

- Comprehensive Bridge Training: Training that covers all aspects of bridge inspection and enables inspectors to relate conditions observed on a bridge to established criteria.
- Critical Finding: A structural or safety related deficiency that requires immediate follow-up inspection or action.
- Inspecting Agency: Organizational unit responsible for conducting or overseeing bridge inspection. For example, the Inspecting Agency for state owned bridges

are the various Districts. The Inspecting Agency for locally owned bridges are the owners or hired consultants for a particular County.

- Load Rating: The determination of the live load carrying capacity of a bridge using bridge plans and supplemented by information gathered from a field inspection.
- Quality Assurance (QA): 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. Typically conducted from outside of the Inspecting Agency for the purpose of evaluating the quality level of the program overall.
- Quality Assurance Officer (QAO): The individual or individuals assigned by the State Program Manager to perform the quality assurance on bridge inventory data, reports, field inspections, and load ratings.
- Quality Control (QC): Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level. Typically conducted from within an Inspecting Agency for the purpose of providing consistency within an Inspecting Agency or from an external source when reviewing data for a specific District or County.
- Quality Control Officer (QCO): The individual within a particular consulting firm assigned to review the bridge inspection reports and perform an internal quality control review for the report developed for an individual County. For INDOT District bridges this individual will be the District Bridge Engineer.
- Quality Control Officer for Data Review (QCODR): The INDOT employee charged with the review of all incoming inventory data performed by INDOT District and County consultant Team Leaders.
- Quality Control Officer for Report Review (QCORR): The INDOT employee charged with the review of all incoming draft reports performed by INDOT District and County consultant Team Leaders.

SECTION 7.2 INSPECTION TEAM AND DOCUMENTATION

Descriptions of the inspection team personnel and documentation are given in Part 1 - Section 2.3.

SECTION 7.3 QUALITY CONTROL

See Pat X – X.X.X for a flow chart of the entire structure inspection process, which includes the Quality Control/Quality Assurance procedures.

Subsection 7.3.1 Quality Control Officer

The Quality Control Officer will be the INDOT District Bridge Engineer for each INDOT District. For Consultants, the Quality Control Officer will be another responsible Team Leader within the Consulting Firm who is either the direct supervisor of the Team Leader or a Program Manager. For firms without an active second Team Leader,

another consulting firm with a qualified Team Leader will be necessary to be the Quality Control Officer.

The Quality Control Officer:

- Shall not be the Team Leader in charge of the inspections or member of the original inspection team
- Shall have knowledge of required procedures and practices as well as federal or state requirements.

As a member of the original inspection team, the Quality Control Officer may have a predisposition towards specific deficiencies of a bridge and may overlook deficiencies that were missed during the original inspection. This can undermine the quality of the review.

It is important that the Quality Control Officer is familiar with the inspection requirements to ensure that the data, results, and conclusions conform to federal and state requirements.

Subsection 7.3.2 Quality Control Office Review

Subsection 7.3.2(01) Purpose and Scope

The primary goal of the Quality Control Office Review is to ensure the accuracy, consistency (within an Inspecting Agency) and completeness of the inspection data and reports. The review should consist of reviewing the data and reports to make certain that it meets both federal and state requirements. Prior to the Quality Control Office Review, the Team Leader should run all checks for the data and make all required corrections. This review shall apply to all report types developed.

Due to the volume of information, it is not practical to thoroughly review all items required for submission as part of the Quality Control Office Review. The items and level of review should be determined by the Quality Control Officer because he/she must ultimately approve the data leaving the Inspecting Agency. Below are suggestions on items to perform a review.

Subsection 7.3.2(02) Quality Control Criteria

This review by the Quality Control Officer shall include (but not limited to) the following:

- Verify that the inspection (Routine, Fracture Critical, Underwater and Special Detail) was performed at the appropriate time with respect to the required date set forth in the routine inspection cycle or other time-based cycles.
- Review noted deficiencies and compare to recommended maintenance and repair items.
- Review to ensure that critical findings were properly handled (i.e. the bridge owner or representative was notified in a timely manner).

- Review load ratings to ensure the selected bridges have been load rated and computations reflect on site conditions.
- Verify that all structural condition ratings of 4 or less for Items 58, 59, 60, 62 or 113A (3 for Item 113A) have been documented properly (photos and notes).
- Verify inspector qualifications.
- Verify compliance with posting policies (including photos)
- Verify that the “Year Remaining Life” values are consistent with the condition ratings.
- Verify that, if required, a scour plan of action has been developed and is on file.
- Verify general Bridge File content (see Part 1 - Section 5.1 of the Indiana Section Inspection Manual). The AASHTO Manual for Condition Evaluation of Bridges states “Bridge Owners should maintain complete, accurate, and current records of each bridge under their jurisdiction.” This should include all available plans, load ratings, bridge specific correspondence, maintenance/repair costs, plan of actions, photographs, field notes and reports, and any other pertinent information.
- Review the priority schedule of bridges that require repairs (not applicable to INDOT owned bridges)

Subsection 7.3.2(03) Sampling

The Quality Control Office Review shall be performed on structures selected from a group that meet any of the following criteria:

- a structural condition rating of a 4 or less for Items 58, 59, 60 & 62
- a structural condition rating that changed by 2 or more for Items 58, 59, 60 & 62
- a scour critical rating (Item 113A) of 3 or less
- posted for 10 tons or less

For County owned bridges, the minimum number of structures to undergo the Quality Control Office Review shall be the greater of:

- 5% of the total number of structures or
- 5 structures

If the number of bridges which meet the sampling criteria is less than the minimum number listed above, the bridges with the lowest sufficiency ratings in the County shall be selected for the remaining structures for the Quality Control Office Review. If a Fracture Critical, Special Detail or Underwater Inspection is required within the County, a Quality Control Office Review shall be performed on one of these bridges (from any of the types of inspections).

If the number of structures that meet the selection criteria exceeds 15 structures, then only 15 structures are required to be reviewed.

For INDOT owned bridges, five bridges per Team Leader, per quarter, shall be reviewed by the Quality Control Officer for the above criteria. In addition, if the Team Leader is responsible for any Fracture Critical or Special Detail Inspections, one of each

shall be sampled for each of these inspection types, per quarter. Consideration will be given for quarters which district personnel are not performing inspections.

The bridges reviewed by the Quality Control Officer shall be noted as being “reviewed” in the Bridge File database. The Quality Control Office Review Form is to be completed by the Quality Control Officer and submitted with the draft data submission to INDOT. See Appendix A for an example of the form.

Subsection 7.3.3 Quality Control Field Review

Subsection 7.3.3(01) 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 sample bridges including a verification of data included in the inspection report. The field inspection should take place within 3 months of the original inspection to ensure that conditions have not changed significantly.

Subsection 7.3.3(02) Quality Control Criteria

This review by the Quality Control Officer should include (but not limited to) the following:

- Perform a field verification of condition ratings
- Verify adequacy of photographs, notes and sketches
- Verify all critical deficiencies have been identified
- Verify recommended maintenance and repair recommendations
- Review documentation of inspection notes for any item with a condition rating of a 4 or less.
- Verify Load Limit and One Lane Bridge postings.
- Verify Scour Documentation and Scour Plans of Action

The above review is only required to be performed on the portion of the bridge that meets the criteria identified under the following “Sampling” section. It is up to the Quality Control Officer’s discretion to expand the review to other components of the bridge.

The Quality Control Log and Quality Control Field Review Form are to be completed by the Quality Control Officer and submitted with the draft data submission to INDOT. See Appendix B and C for examples of the Log and Forms.

Subsection 7.3.3(03) Sampling

The Quality Control Field Review shall be performed on structures selected from a group that meet any of the following criteria:

- a structural condition rating of a 4 or less for Items 58, 59, 60 & 62
- a structural condition rating that changed by 2 or more for Items 58, 59, 60 & 62
- a scour critical rating (Item 113A) of 3 or less
- posted for 10 tons or less

The minimum number of structures to undergo the Quality Control Office Review shall be the greater of:

- 5% of the total number of structures
- 5 structures

If the number of bridges which meet the sampling criteria is less than the minimum number listed above, the bridges with the lowest sufficiency ratings in the County/District shall be selected for the remaining structures for the Quality Control Field Review.

If the number of structures that meet the selection criteria exceeds 15 structures, then only 15 structures are required to be reviewed. Due to accessibility problems, Quality Control Field Reviews are not required on Fracture Critical or Special Detail Inspections. However, the Quality Control Officer may elect to perform Field Reviews on these structures.

For INDOT owned bridges, five bridges per Team Leader, per quarter, shall be reviewed by the Quality Control Officer for the above criteria. Consideration will be given for quarters which district personnel are not performing inspections. Due to accessibility problems, Quality Control Field Reviews are not required on Fracture Critical or Special Detail Inspections. However, the Quality Control Officer may elect to perform Field Reviews on these structures.

All structures that meet the sampling criteria shall be input into the Quality Control Log Form, however, only structures that were reviewed by the QCO should have values in the "Date of Field Review" and "Comments" fields. If additional structures were added to meet the minimum number of reviewed structures criteria, these should also be input into the form. The Quality Control Log Form can be found in Appendix C. Also, the bridges reviewed by the Quality Control Officer shall be noted as being "reviewed" in the Bridge File database.

Subsection 7.3.4 Corrective Actions

Upon the conclusion of the Internal Office and Field Reviews, the Quality Control Officer shall summarize the comments and discuss the comments with the Team Leader responsible for the report. All changes to the inspection report should be made by, or with the consent of, the Team Leader. All corrective actions shall be performed prior to submission of the draft data to INDOT Central Office.

Subsection 7.3.5 Inspection Report Submission Review by INDOT

Upon completion of the internal Quality Control Reviews and any needed corrections, the draft electronic inspection data shall be submitted to the QCODR at for an INDOT via e-mail for the Quality Control Data Review. The Office and Field Review Forms, as well as the Quality Control Log Forms shall be submitted in .pdf format with the data. The QCODR shall have 30 days from the time of receipt to review and comment on the submitted draft data. If required, the QCODR shall contact the Team Leader to address comments on the submitted data. The Team Leader shall address the comments and resubmit the draft electronic data. This shall then reset the 30 day review and comment period.

After all comments are addressed or a resubmission is not required, the Team Leader shall submit the draft inspection report via e-mail for the INDOT Quality Control Report Review (see Section 7-3.07(02)).

The QCORR shall have 30 days from the time of receipt to review and comment on the draft inspection report. If errors are found which the QCORR believes should be corrected and reviewed prior to the final inspection report, the QCORR shall contact the Team Leader to make the changes. The Team Leader shall then make the revisions and resubmit the revised information. This shall then reset the 30 day review and comment period. Upon approval of the draft report or surpassing of the 30 day review period, final inspection reports shall be submitted to INDOT.

Comments received after the review period shall be addressed at the discretion of the submitting Team Leader and may be addressed at the next inspection cycle and report submission. However, all data must meet federal requirements and any comments received regarding these requirements must be addressed promptly and regardless of the review timeline by INDOT.

Subsection 7.3.6 Quality Control Data Review

Subsection 7.3.6(01) Purpose and Scope

The primary goal of the Quality Control Data Review is to ensure consistency of data collection and data submission. This QC data review ensures that the QC efforts are effective for the individual Inspecting Agency, resulting in overall quality of the individual bridge inspection program.

Subsection 7.3.6(02) Quality Control Criteria

This review by the Quality Control Officer for Data Review should include (but not limited to) the following:

- Review accuracy of data entry in accordance FHWA coding and local requirements.
- Review of data for consistency between Inspecting Agencies.

Subsection 7.3.6(03) Sampling

100% of the data shall be reviewed by the Quality Control Officer for Data Review for the above criteria.

Subsection 7.3.7 Quality Control Report Review

Subsection 7.3.7(01) Purpose and Scope

The primary goal of the Quality Control Report Review is to ensure consistency and quality of inspection reports. This QC report review ensures that the QC efforts are effective for the individual Inspecting Agency, resulting in overall quality of the individual bridge inspection program. There should be two levels of review for the Quality Control Report Review:

- Level I – cursory review of document content and consistency.
- Level II – Thorough review of document for NBIS compliance, documentation, content and consistency.

Subsection 7.3.7(02) Submission Requirements

The Team Leader is required to submit the following information to the Quality Control Officer for Report Review for their Quality Control Report Review:

- Routine Inspection Reports – All summary reports, including the table of contents and the Structure Inventory and Appraisal Reports (SI&A) for the five bridges with the lowest sufficiency rating.
- Fracture Critical, Special Detail, and Underwater Inspection Report – The entire report shall be submitted.

Subsection 7.3.7(03) Level I Quality Control Criteria

This review by the Quality Control Officer for Report Review should include (but not limited to) the following:

- Review to ensure that federal and state required reports are included in the document.
- Review to ensure that the individual bridge reports utilize appropriate forms.
- Verify that the Inspector meets state and federal requirements.

Subsection 7.3.7(04) Level II Quality Control Criteria

This review by the Quality Control Officer for Report Review should include (but not limited to) the following:

- All requirements of the Level I Quality Control Review
- Verify that reported deficiencies are well documented with photographs and that appropriate recommended actions are stated in the report.

Subsection 7.3.7(05) Sampling

A Level I Quality Control Review should be performed on 100% of the submitted reports. In addition, 5% of the submitted SI & A reports shall undergo a Level II Quality Control Review.

SECTION 7.4 QUALITY ASSURANCE

Subsection 7.4.1 Quality Assurance Officer

The State Program Manager, or their designee, shall be the Quality Assurance Officer for the State of Indiana. Their role as the officer is to ensure adherence to federal and state inspection criteria, laws, codes, standards, as well as regulatory requirements. His/her review will include the evaluation of the Team Leader's choice of inspection equipment, information gathering methods, time and frequency of inspection services, and the quality control review efforts and log documentation. For Quality Assurance Peer Field Reviews and Post Inspection Reviews, the Quality Assurance Officer shall be a certified Team Leader. If the review is involving a Underwater Inspection, Fracture Critical Inspection or Special Features Inspection, the Quality Assurance Officer shall be certified in the respective area.

Subsection 7.4.2 Quality Assurance Data Review

Subsection 7.4.2(01) Purpose and Scope

The primary goal of the Quality Assurance Data Review is to ensure consistency of data collection and data submission. The QA Data Review ensures that the QC efforts are equally effective across different Inspecting Agencies, resulting in overall quality in the bridge inspection program. Results of the previous Quality Control Data Reviews will be provided to the Quality Assurance Officer on a quarterly basis in order to determine recurring deficiencies in data entry within the industry that could require additional training. This data will be summarized in a quarterly report.

Subsection 7.4.3 Quality Assurance Report Review

Subsection 7.4.3(01) Purpose and Scope

The primary goal of the Quality Assurance Report Review is to ensure consistency and quality of inspection reports. The QA Report Review ensures that the QC efforts are equally effective across different Inspecting Agencies, resulting in overall quality in the bridge inspection program. Results of the previous Quality Control Data Reviews will be provided to the Quality Assurance Officer on a quarterly basis in order to determine recurring deficiencies in the report development within the industry that could require additional training. This data will be summarized in a quarterly report.

Subsection 7.4.4 Quality Assurance Office Review

Subsection 7.4.4(01) Purpose and Scope

The primary goal of the Quality Assurance Office Review is to ensure the completeness of the individual Bridge Files. The QA Office Review ensures that the QC efforts are equally effective across different Inspecting Agencies, resulting in overall quality in the bridge inspection program. The review should consist of reviewing the Bridge Files to ensure that the bridges are properly load rated and documented, as well as any other required/available bridge documentation. There should be two levels of review for the Quality Assurance Report Review:

- Level I – cursory review of file content and consistency.
- Level II – Thorough review of Bridge File for documentation, content, and consistency.

Prior to the Office Review, the Quality Assurance Officer shall submit a form to the Inspecting Agency which contains questions about general office practices with regards to Bridge File maintenance and documentation of inspections and correspondence. Appendix D is a blank copy of such form. An editable version of this form may also be found on the Department's website at <http://www.in.gov/dot/div/contracts/design/dmforms>.

This form should be submitted back to the Quality Assurance Officer a minimum of 7 days prior to the Office Review.

Subsection 7.4.4(02) Level I Quality Assurance Criteria

This review by the Quality Assurance Officer should include (but not limited to) the following:

- Verify that bridge plans, repair plans, rehabilitation plans, as-builts and/or shop drawings are present, when available.
- Verify that Load Rating Calculations are present.
- Verify that Scour Plans of Action are present, when required.
- Verify that any pertinent correspondence regarding a bridge is located in the Bridge File (i.e. copies of letters, e-mails, etc.).
- Verify that the Team Leaders and inspectors meet state and federal requirements.

See Appendix E for example review forms.

Subsection 7.4.4(03) Level II Quality Assurance Criteria

This review by the Quality Assurance Officer should include (but not limited to) the following:

- All requirements of the Level I Quality Assurance Review.
- Verify that Load Rating Calculations are present and verify the Load Ratings are in accordance with the criteria of Section 7-4.04(04).

- Verify that the Bridge File contains current and previous inspection reports which comment on existing deficiencies to provide a baseline for future inspections.
- Verify that if a bridge requires a special inspection (i.e. Fracture Critical, Underwater, Special Detail...) that current and previous inspection reports are present within the Bridge File to provide a baseline for future inspections.

See Appendix F for example review forms.

Subsection 7.4.4(04) Load Rating Verification

For bridges which are selected for a Level II Quality Assurance Review, the load ratings shall be reviewed in the following manner.

- Stage I – Verify that the load rating provided in the Bridge File is consistent with the signage in the field and the data entered in the bridge inventory. Also, verify that a professional engineer was involved in the performing or checking of the load ratings.
- Stage II – Includes all items in Stage I review. Also, review of calculations, assumptions, and documentation in the load rating. This includes review of inclusion of deterioration of the structural members in the load rating or any rehabilitation made to the bridge.
- Stage III – Includes all items in Stage II review. Also, an independent recalculation of the load rating by the Quality Assurance Officer. Due to the assumptions made during the load rating process, there will be variability in what is calculated between the Team Leader and Quality Assurance Officer. An acceptable tolerance between load ratings is 2 tons. However, consideration shall be given to the subjectivity of bridges load rated due to deterioration. If the 2 ton tolerance is exceeded, the Quality Assurance Officer shall review the assumptions made during the original load rating and further coordination may be required with the Team Leader to determine the discrepancy.

Subsection 7.4.4(05) Sampling

For INDOT owned bridges, two Districts will undergo a Quality Assurance Office Review every year. The typical cycle shall be to review each District every three years. For locally owned bridges, two counties in each INDOT District will undergo a Quality Assurance Office Review every year. No Team Leader shall be reviewed twice within a two year cycle unless directed by the State Program Manager. The intent of this review is to not review a County twice within a four year cycle.

For the selected Inspecting Agency to be reviewed:

- 8 of the Bridge Files will undergo a Level I Review.
- 4 of the Bridge Files will undergo a Level II Review. Of these bridges, a minimum of one bridge will be verified by a Stage II Load Rating Review and a minimum of one bridge will be verified by a Stage III Load Rating Review.

Subsection 7.4.5 Quality Assurance Peer Field Review

Subsection 7.4.5(01) Purpose and Scope

The primary goal of the Quality Assurance Peer Field Review is to ensure proper equipment (see Part 1 – Section 4.5 of the Indiana Structure Inspection Manual) and safety measures are utilized during inspections, as well as verifying the thoroughness of the inspection. This QA review ensures that the QC efforts are equally effective across different Inspecting Agencies, resulting in overall quality in the bridge inspection program. The Quality Assurance Officer shall contact the Team Leader to determine the Team Leader's schedule of inspection. The Quality Control Officer shall coordinate with the Team Leader to determine bridges that would be good candidates for the Peer Field Review.

The sampling procedure for the selection of bridges shall include consideration of the bridge posting, the sufficiency rating of the bridge, bridges that are in need of bridge rehabilitation or replacement, new structures, special inspection type, and the location of the bridge. The Peer Field Review shall be performed at the Team Leader's schedule and shall not impede the Team's Leader's Inspection.

Subsection 7.4.5(02) Quality Assurance Criteria

The Quality Assurance Officer shall observe the Team Leader performing the inspection of the subject bridge. This evaluation shall document the arrival time, set-up time, preparations made for equipment, safety conformance, access methods, and the quality and thoroughness of each inspection team member's activities. It should also note whether or not safety equipment was properly used, whether appropriate access methods were used, and an evaluation of whether the inspection served its desired purpose. The Quality Assurance Officer shall not impede the inspection of the Team Leader or Member, but observe their inspection technique and activities. The Field Performance Review Form shall be filled out during the inspection to record notes and comments during the Field Peer Review. Appendix G is a blank copy of the Field Performance Review Form. An editable version of this form may also be found on the Department's website at <http://www.in.gov/dot/div/contracts/design/dmforms>.

Subsection 7.4.5(03) Sample for Routine Inspections

For INDOT owned bridges, five bridges in each District shall undergo a Quality Assurance Peer Review annually. For locally owned bridges, five bridges per County from twelve different counties will undergo a Quality Assurance Peer Review annually. No Team Leader shall be reviewed twice within a two year cycle unless directed by the State Program Manager. The intent of this review is to not review a County twice within a four year cycle.

Subsection 7.4.5(04) Sample for All Other Inspections

For INDOT owned bridges, a minimum of one bridge in each District shall undergo a Quality Assurance Peer Review annually. For locally owned bridges, one bridge per County from twelve counties will undergo a Quality Assurance Peer Review annually. The bridge selected may be an Underwater Inspection, Fracture Critical Inspection or Special Features Inspection. No Team Leader shall be reviewed twice within a two year cycle unless directed by the State Program Manager. The intent of this review is to not review a County twice within a four year cycle.

Subsection 7.4.5(05) Scoring

Upon completion of the Peer Field Review Form, the Quality Assurance Officer shall record the resulting scores for the review. If the reviewed Team Leader repeatedly has unacceptable scores, the Team Leader may be subject to a meeting with the State Program Manager for possible disciplinary action. All reviewed Team Leaders will receive a copy of their Peer Field Review Form for review and have the opportunity to comment on the score received.

Subsection 7.4.6 Quality Assurance Post-Inspection Field Review

Subsection 7.4.6(01) Purpose and Scope

The primary goal of the Quality Assurance Post-Inspection Field Review is to ensure consistency of ratings and deficiency documentation between Inspecting Agencies. This QA review ensures that the QC efforts are equally effective across different Inspecting Agencies, resulting in overall quality in the bridge inspection program. The Quality Assurance Officer shall inspect the selected bridges without any prior knowledge of the bridge's condition. The re-inspection generates a companion inspection result that can be compared to the subject inspection data for analysis of consistency and accuracy. The re-inspection should be performed within six months of the Team Leader's inspection to ensure that conditions have not changed significantly. Therefore, coordination will be required between the Team Leader and Quality Assurance Officer for Data Review to determine a time-table for both inspections.

The re-inspection should be performed by the assigned Quality Assurance Officer. It is very important to use a limited number of independent reviewers to ensure consistency in the Quality Assurance Reviews.

The sampling procedure for the selection of bridges shall include consideration of the bridge posting, the sufficiency rating of the bridge, bridges that are in need of bridge rehabilitation or replacement, new structures, bridges that have a critical finding, bridges that have an unusual change in condition rating (i.e. a change of more than 1 from the previous rating), special inspection type, and the location of the bridge.

Subsection 7.4.6(02) Criteria

This review by the independent reviewer should include (but not limited to) the following:

- Item 36A Traffic Safety Features
- Item 43A Main Superstructure Type
- Item 43C Main Widening Type
- Item 44A Str. Type - Approach
- Item 48 Max Span Length
- Item 50 Structure Length
- Item 51 Bridge Roadway Width
- Item 53 Vertical Clear./Deck
- Item 54 Vertical Underclearance
- Item 55 Lateral Clearance
- Item 58 Deck Condition Rating
- Item 59 Superstructure Condition Rating
- Item 59B Paint Rating
- Item 60 Substructure Condition Rating
- Item 61 Channel Condition Rating
- Item 62 Culverts Condition Rating
- Item 65 Approach Roadway Condition Rating
- Item 71 Waterway Adequacy
- Item 72 Roadway Alignment
- Item 75 Type of Work Needed and Description of Work
- Item 113A Scour Critical Bridge
- Item 113B Foundation Type
- Remarks containing deficiencies
- Verification of required signage

An acceptable tolerance between structural condition ratings is +/- 1. An acceptable tolerance between geometric measurements is 3". See Appendix H for an example form.

Subsection 7.4.6(03) Sampling for Routine Inspections

For INDOT owned bridges, four bridges in each District shall undergo a Quality Assurance Peer Review annually. For locally owned bridges, five bridges per County from twelve different counties will undergo a Quality Assurance Post Inspection Review annually. No Team Leader shall be reviewed twice within a two year cycle unless directed by the State Program Manager. The intent of this review is to not review a County twice within a four year cycle.

Subsection 7.4.6(04) Sample for All Other Inspections

For INDOT owned bridges, one bridge in each District shall undergo a Quality Assurance Peer Review annually. For locally owned bridges, one bridge from twelve counties will undergo a Quality Assurance Post Inspection Review annually. The bridge selected may be an Underwater Inspection, Fracture Critical Inspection or Special Features Inspection. No Team Leader shall be reviewed twice within a two year cycle

unless directed by the State Program Manager. The intent of this review is to not review a County twice within a four year cycle.

Subsection 7.4.6(05) Scoring

Upon completion of the Post Inspection Review Form, the Quality Assurance Officer shall record the resulting scores for the Inventory Review and Condition and Appraisal Review. If the reviewed Team Leader has two unacceptable scores within a 10 year period, the Team Leader may be subject to a meeting with the State Program Manager for possible disciplinary action. All reviewed Team Leaders will receive a copy of their Post Inspection Review Form for review and have the opportunity to comment on the score received.

Subsection 7.4.7 Quality Assurance Closeout and Comments

For Quality Assurance Peer Field Reviews, after the inspection has concluded, the Quality Control Officer will generate a Peer Field Review Quality Assurance Report. The findings shall be discussed with the Program Manager and submitted to the Team Leader involved in the inspection. If the Team Leader would like to schedule a meeting to discuss the findings of the report, the Team Leader should contact the Program Manager to schedule the meeting. An annual report will be generated which summarize the findings of the report.

For Quality Assurance Post-Inspection Reviews, after the inspection has concluded and the results are compared, the Quality Control Officer will generate a Post-Inspection Review Quality Assurance Report. The findings shall be discussed with the Program Manager and submitted to the Team Leader involved in the inspection. If the Team Leader would like to schedule a meeting to discuss the findings of the report, the Team Leader should contact the Program Manager to schedule the meeting. An annual report will be generated which summarizes the findings of the report and will be submitted to the State Program Manager.

Subsection 7.4.8 Corrective Actions

Data error, omissions and/or changes can occur during the inspection and inventory process, as well as during the Quality Assurance process. The identification and resolution of these items shall be done in an expedited manner. Notification of the issue shall occur immediately to the appropriate Program Manager. A discussion will occur to discuss the issue in-depth. A revision to the report shall be documented and submitted to the State Program Manager for their files. Once reviewed and accepted by the State Program Manager the corrected information shall be submitted to the Inspecting Agency for their files or further action.

SECTION 7.5 DISQUALIFICATION AND REQUALIFICATION

Subsection 7-5.01 Disqualification Process

When the quality assurance reviews indicate that a Team Leader and/or an Inspecting Agency continue to make the same or similar mistakes, omissions, etc., INDOT shall implement disqualification procedures as follows:

For INDOT Owned Bridges:

1. Upon receiving INDOT's Quality Assurance Report, the District shall address the findings of the report and take steps to correct the problems to insure they will not be repeated in the future.
2. The Team Leader will be placed on probation and 10 bridges inspected by the Team Leader will be reviewed within the next 6 months. This review will be conducted by a team consisting of the original reviewer, another qualified Team Leader, and a member of the FHWA, if they desire.
3. If the same or similar mistakes are found during this second review, the Team Leader shall be given notification that they will be disqualified if these problems are not corrected and avoided in the future, and placed on a secondary probation which will result in 5 bridges being reviewed in the next 3 months. Implementing a secondary probation period will be at the discretion of the State Program Manager.
4. If the same or similar problems are found, the Team Leader will be notified that they are hereby disqualified for a minimum of two years and will no longer be allowed to perform bridge safety inspections in the State of Indiana until they have been re-qualified.
5. INDOT reserves the right to disqualify immediately and indefinitely if gross negligence, misconduct, and/or major omissions are found. These errors may adversely affect the safety and/or the public or the capacity of the bridge.

For County Owned Bridges:

1. Upon receiving INDOT's Quality Assurance Report, the Inspecting Agency shall address the findings of the report and take steps to correct the problems to insure they will not be repeated in the future.
2. The Team Leader and Inspecting Agency will be placed on probation and 10 inspected bridges will be reviewed within the next two inspections. These inspections do not necessarily have to involve the same counties where the original errors were found. This review will be conducted by a team consisting of the original reviewer, another qualified Team Leader, and a member of the FHWA, if they desire.
3. If the same or similar mistakes are found during this second review, the Inspecting Agency and/or the Team Leader shall be given notification that they will be disqualified if these problems are not corrected and avoided in the future, and placed on a secondary probation which will result in a review of 5 bridges during the next inspection. Implementing a secondary probation period will be at the discretion of the State Program Manager.

4. If the same or similar problems are found, the Inspecting Agency and/or the Team Leader will be notified that they are hereby disqualified for a minimum of two years and will no longer be allowed to perform bridge safety inspections in the State of Indiana until they have been re-qualified.
5. INDOT reserves the right to disqualify immediately and indefinitely if gross negligence, misconduct, and/or major omissions are found. These errors may adversely affect the safety and/or the public or the capacity of the bridge.

Subsection 7.5.2 Reasons for Disqualification

Typical reasons for disqualification can be, but are not limited to, the following:

1. Lack of proper follow-up with the bridge owner for critical findings, such as broken load carrying members, critical scour at foundations, vehicular impacts which could adversely affect load carrying members, bridges requiring closure, etc.
2. Lack of follow-up with the bridge owner for correcting load posting deficiencies.
3. Failure to correct findings from Quality Control or Quality Assurance reviews, including recurring unacceptable scores.
4. Recurring miscoded critical inventory items such as NBI Items 41(Open, Posted or Closed), 43 (Structure Type), 51(Bridge Roadway Width), 54 (Vertical Under clearance), 90 (Inspection Date), 92 (Critical Feature Inspection), 93(Critical Feature Inspection Date), and 113A (Scour Critical Bridge).
5. Recurring miscoded critical rating items such as condition states.
6. Recurring condition rating deviations of more than 1 above or below an independent condition review.
7. Failure to submit completed inspection data and/or corrections in a timely manner.
8. Failure to maintain the Bridge File to meet minimum requirements.
9. Failure to maintain or update Scour Plan of Actions.
10. Failure to inspect the bridges within the required frequency (unless Notice to Proceed was given at a time when this is not possible).
11. Dishonest or unethical behavior that adversely affects the inspection results.

The Indiana Department of Transportation has the final authority to carry out this disqualification process. The Inspecting Agency must agree to these procedures as part of any bridge safety inspection agreement before they will be allowed to perform any bridge safety inspections.

Subsection 7.5.3 Requalification Process

1. A disqualified Team Leader and/or Inspecting Agency may be requalified after the two-year period if they indicate in a written report how they will correct their deficiencies. Upon approval by INDOT, the Team Leader or Inspecting Agency shall be placed back on the qualified list and under probation for twelve (12) months.
2. A disqualified Team Leader may also be requalified following the two year disqualification period and after he/she has retaken the training course "Safety Inspection of In-Service Bridges" and achieved a score of 70 percent or better on the examination given at the end of the course. Attendance in the entire course is mandatory for requalification (i.e., no "testing out").
3. Henceforth, prospective Team Leaders taking the training course "Safety Inspection of In-Service Bridges" must attend the entire course and achieve a score of 70 percent or better on the examination given at the end of the course to be considered requalified.