

Bridge Safety Inspection Quality Assurance Manual



November 2020

Preface

This edition of the Bridge Safety Inspection Quality Assurance Manual provides the policy and procedures governing the conduct of the Statewide Quality Assurance (QA) program. It represents and is heavily influenced by the current manner in which QA evaluations are currently being conducted. It should be noted that the QA procedures and standards currently in effect have evolved over a number of years since the program's inception and are considered the foundation of the QA program for the foreseeable future.

List of Major Changes included in Publication 240, November 2020

General:

- Restructured all chapters to conventional numbering system.
- Revised content of all chapters to align activities with current practice.
- Updated data fields for BMS2 coding.
- Changed language to properly identify BIS as opposed to BQAD.
- Updated all language to identify proper personnel and up to date information.

Chapters 1-9:

- Added new sections in chapters to provide additional information on how the evaluations are conducted.
- Removed old Section 1.10 – QA Expansion.
- Removed old Chapter 5.0 - Computer Edit of BMS2 Data.
- Added Section 5.4 – Newly Identified.
- Added Section 4.13 – DRPA and DRJTBC Bridges

Appendices:

- Updated all appendices to reflect current evaluation reporting requirements.
- Removed old Appendix G (Instructions for Preparing Adobe Acrobat PDF Files for Document Submissions) because it has become more common knowledge.
- Added new Appendix G (Maximum Time Period Flowchart Guideline)
- Split Appendix B into Appendix B-1 and Appendix B-2 to provide better examples.

TABLE OF CONTENTS

1.0 Introduction	1
1.1 General	1
1.2 Definitions of QC and QA.....	2
1.3 Objectives	2
1.4 QA Flexibility.....	2
1.5 Levels of QA	3
1.6 Bridge Safety Inspection Specifications.....	3
1.7 QA Team Member Qualifications	3
1.8 Resources.....	4
1.9 Bridges to Receive QA.....	4
1.10 QA Tolerance Levels.....	4
2.0 Planning the Evaluation.....	5
2.1 Objective.....	5
2.2 Sequence of Activities.....	5
2.3 QA Evaluation Level Per Cycle	5
2.4 Selecting the Bridges.....	5
2.5 Timing the Evaluation	6
3.0 QA at the Bridge Site	7
3.1 Objective.....	7
3.2 Scheduling.....	7
3.3 District Bridge Unit Contact.....	7
3.4 Sequence of Activities.....	7
3.5 Identify the Bridge.....	8
3.6 Inventory Data	8
3.7 Condition/Appraisal Evaluation	8
3.8 Load Rating Data Collection	9
3.9 Signing Verification	10
3.10 Bridge Maintenance.....	10
4.0 QA at the District Office	11
4.1 Objective.....	11
4.2 Preparation.....	11
4.3 Focus.....	11
4.4 General File Contents	11
4.5 Inventory Items Documentation	12
4.6 Inspection Documentation.....	12
4.7 Load Rating Analysis Documentation.....	13
4.8 Load Posting Documentation	13
4.9 Bridge Maintenance.....	14
4.10 Scour Assessment Documentation	14
4.11 Construction Plans/Shop Drawings/FCM Plan	14
4.12 Inspection Support and Control.....	14
4.13 DRPA and DRJTBC Bridges	15

5.0 Bridge Maintenance Evaluation	16
5.1 Objective.....	16
5.2 Maintenance/Repair Needs.....	16
5.3 Verify Implementation	16
5.4 Newly Identified.....	16
6.0 District Findings	18
6.1 Objective.....	18
6.2 Report Format.....	18
6.3 Summary.....	18
6.4 Narrative	18
6.5 District Bridge Inspection Unit Organization.....	18
6.6 Findings at the Bridge	19
6.7 Findings at the District Office	19
6.8 Exhibits and Appendices	19
6.9 Report Review Process.....	19
6.10 Preliminary Report Distribution	19
6.11 Close-Out Meeting	19
6.12 Final Report.....	20
7.0 Cycle Summary Report	21
7.1 Objective.....	21
7.2 Report Preparation.....	21
7.3 Narrative Description	21
7.4 Special Emphasis Items.....	21
7.5 Statistical Comparison.....	22
7.6 Recommendations to Districts.....	22
7.7 Conclusions/Recommendations	22
8.0 Corrective Actions.....	23
8.1 Task List and Schedule.....	23
8.2 Measures of Effectiveness.....	23
8.3 Reporting.....	23

Appendices

- Appendix A – Bridge Inspection Quality Assurance Evaluation Cover Page Example
- Appendix B-1 – Condition and Appraisal Evaluation Form Example
- Appendix B-2 – Inventory Data Evaluation Form Example
- Appendix C – Bridge File Evaluation Form Example
- Appendix D – Operational Procedures Evaluation
- Appendix E – QA/District Comparison Table Example
- Appendix F – QA/District Comparison Graph Example
- Appendix G – Maximum Time Period Flowchart Guideline

1.0 INTRODUCTION

1.1 General

The National Bridge Inspection Standards (NBIS) require that all structures defined as bridges and located on a public highway system be inspected at intervals not to exceed 24 months (some bridges that meet specific criteria may be extended to 48 months). PennDOT has a decentralized Bridge Safety Inspection Program which meets these NBIS requirements. The PennDOT Bridge Safety Inspection Manual Publication 238 contains a compilation of inspection guidelines.

The Bridge Safety Inspection Program provides information on each bridge that is used to complete and update the database for the Bridge Management System (BMS2). As with its predecessor, this system accepts, stores, updates, and reports physical and operating characteristics for all public bridges in Pennsylvania. It also contains bridge inventory data, which is an expansion of the Federal Structure Inventory and Appraisal (SI&A) format. BMS2 is the resource for District and Statewide management to make decisions such as prioritization and budgeting for current and future needs. It provides management with reports based on scenarios developed from existing conditions.

Much of the BMS2 information related to geometry and physical condition is provided by inspectors assigned to District Bridge Safety Inspection Units. Damage or deterioration found during field observations is reported according to the guidelines provided in Publication 238 and Publication 100A and stored in the BMS2 Database. The Districts program timely remedial actions, and, if necessary, restrict traffic until appropriate repair or replacement is affected.

The accuracy and consistency of the inspection and documentation is vital not only because it impacts programming and funding appropriations, but also because of public safety concerns. Therefore, the Department addresses this need with quality control and quality assurance procedures. Quality control is the responsibility of each District. The District develops and enforces Bridge Inspection Quality Control (QC) Procedures, which they update regularly. They also submit an outline of these procedures to the Bridge Inspection Section (BIS) in the Bureau of Maintenance and Operations (BOMO). The BIS functions as a technical resource to coordinate and standardize the Bridge Inspection Program and disperse appropriate information. The Bridge Inspection QA Program is an independent, Central Office bridge inspection evaluation function performed by a QA evaluation team, designated by the BIS, to ensure that the Districts are operating in accordance with approved QC plans and the NBIS.

The flow of QA evaluation information follows a well-defined path. After the QA evaluation team completes the necessary field and office evaluations for each District, they will provide the BIS QA Project Manager with a summary report. The BIS QA Project Manager will review the summary report and discuss all relevant findings with the BIS Section Chief. The summary reports are then sent to the District for review and will be discussed at a close-out meeting. Major findings and unresolved problems will be brought to the attention of the Bureau Director for appropriate follow-up action. At the completion of the review process in all Districts, a Statewide Summary Report will be issued that summarizes the statewide results on approximately an annual basis.

Quality cannot be taken for granted, which is why the Department's QC/QA procedures shall be properly conceived and clearly defined. This manual provides guidelines so that the QA activities may be measured quantitatively, interpreted uniformly, and recommended improvements assessed and implemented.

1.2 Definitions of QC and QA

The distinction between QC and QA is important since each function has a specific purpose and a different organizational level is responsible for its administration.

QC is the enforcement, by a supervisor, of procedures that are intended to maintain the quality of a product or service at or above a specified level. QC of state bridge inspections is a daily operational function performed within each District, under the supervision of the District Executive (DE), the Assistant District Executive (ADE) for Design, District Bridge Engineer (DBE), and the Assistant District Bridge Engineer - Inspection.

QA is the verification or measurement of the level of quality of a sample product or service. The sample findings must be compared against established standards to determine if the specified procedures, on which those standards are based, have been followed. To maintain an objective and unbiased viewpoint, QA evaluations must be performed by an entity that is external to the organization that performs the QC function. As such, the Statewide Bridge Inspection QA evaluation activities will be performed by the BIS, or its agents (Consultants).

The purpose of bridge inspection QA evaluations is to measure the performance of the District in the execution of the Bridge Safety Inspection Program, and to report the findings in accordance with the uniform guidelines provided in this manual. QA evaluations are also used to identify areas of non-uniformity in the inspection results throughout the state. The objective is to measure the statewide bridge inspection quality and uniformity through statistical analysis of the combined quantitative QA results within and between the Districts. Qualitative or subjective information cannot accomplish this. The requirement is to monitor specific areas of the inspection program and report findings as accurately as possible, not to provide opinions. The challenge, then, is to provide objective QA findings in a quantitative format.

1.3 Objectives

The structure and procedures of the QA program have been developed to accomplish the following objectives:

- Assess and improve the quality of the data contained in the Bridge Management System, starting with the inventory and continuing with the field information recorded from inspections
- Assess and improve the accuracy of the condition ratings
- Assess and improve the accuracy of maintenance item identification and priority level
- Assess and improve the accuracy of load ratings and inspection reporting in support of load rating
- Assess and identify training needs
- Assess and identify gaps in quality and provide recommendations to close them

1.4 QA Flexibility

This manual provides for implementation of the Bridge Safety Inspection QA Program. The process by which it is implemented each new cycle will be evaluated based on the results of previous cycles. Certain activities will be modified or substituted for, if it can be determined that the QA process is not providing the best information. The Department anticipates the QA evaluation process will undergo continuous assessment and refinement to provide the most accurate and useful information possible.

National Bridge Element (NBE) level inspection and documentation are not covered under the QA program at this time. They will be addressed as NBE level inspections increase in frequency.

1.5 Levels of QA

Four levels of QA procedures have been established for the QA evaluation process, so that the activities may be adjusted and planned to match the need and resources. The definitions of the four levels of procedures used in this manual depend on both the location (bridge site or office) of the QA evaluation and the type of the data (inventory, condition rating, load rating, etc.) that is under review. These definitions consist of either a set of data points or descriptive information that is associated with each level and are provided in Sections 3.0 and 4.0 of this Manual.

The QA evaluation process has been typically performed at the highest level (Level IV) for all activities. Lower levels may be used in the future, but only after careful evaluation indicates that this action is appropriate.

A sample size of 10 state-owned and 10 local-owned bridges for each PennDOT District is currently considered appropriate. Additionally, a sample size of 10 bridges for the PA Turnpike Commission (PTC) and 5 bridges for the PA Department of Conservation and Natural Resources (DCNR) is considered appropriate.

1.6 Bridge Safety Inspection Specifications

The following specifications, unless otherwise modified in this Manual, govern the conduct of the safety inspection of bridges for QA purposes in the order of precedence as follows:

- National Bridge Inspection Standards (NBIS)*
- PennDOT Policy and Strike-Off Letters (SOL)*
- PennDOT Bridge Safety Inspection Manual, Publication 238*
- PennDOT Bridge Management System 2 (BMS2) Coding Manual, Publication 100A*
- PennDOT Design Manual, Part 4, Structures
- PennDOT Design Standards for Bridge Construction, BC-700M Series
- PennDOT Design Standards for Bridge Design, BD-600M Series
- PennDOT Design Standards for Roadway Construction, RC 0M to 100M Series
- PennDOT Temporary Traffic Control Guidelines, Publication 213
- AASHTO Manual for Bridge Evaluation (MBE)*
- AASHTO Manual for Bridge Element Inspection (MBEI)*
- AASHTO Standard Specifications for Highway Bridges
- FHWA Bridge Inspector's Reference Manual (BIRM)

**Use the version of each manual that was active at the time of the inspection that is being evaluated.*

1.7 QA Team Member Qualifications

The Inspection Team Leader of the QA evaluation at the bridge must meet or exceed the requirements specified in Publication 238 and the NBIS. The QA Team's qualifications are established by the BIS using the NBIS criteria as the minimum requirements.

The QA evaluation provides a base for statistically measuring and comparing the judgment of the District and Consultant Inspectors and must be consistent to be effective and credible. The Consultant performing the evaluation will minimize switching QA team members in order to accomplish uniformity.

1.8 Resources

The QA Team will have the same standard equipment as each District Inspection Team, and have access to special equipment as necessary to provide a “routine” inspection of the sample bridges. While working in the Districts, the QA team will minimize interference with other District activities such as construction or maintenance projects that are in progress.

1.9 Bridges to Receive QA

The QA procedures described herein apply to state and local bridge safety inspections that are performed by either District personnel or by consultants under District oversight. QA evaluation procedures should be performed on bridges with a 20-foot or greater opening and coded “yes” for NBIS length. They may be expanded to include the following types of inspection:

- Railroads
- Fracture critical members and details
- Underwater structure components

1.10 QA Tolerance Levels

Condition/Appraisal: The original inspection item ratings are considered out-of-tolerance if they vary more than $1 \pm$ from the ratings compiled by the QA team.

Observed Scour: The original inspection item ratings are considered out-of-tolerance if they vary more than $1 \pm$ from the ratings compiled by the QA team.

Load Rating: Bridge capacity ratings (Operating Rating level) are considered out-of-tolerance if they vary by more than 15% from the capacity ratings done by the QA team. For posted bridges, the bridge data is out-of-tolerance if the QA team’s posting evaluation calls for a reduction of more than 2 tons. (Conservatively posted bridges that are more than 2 tons lower than the QA team’s posting evaluation will not be considered out-of-tolerance).

Inventory Items: Most items have an exact coding tolerance, i.e., ± 0 in the coded value. However, there are items such as Bridge Roadway Width for which tolerances are set on a case-by-case basis.

Maintenance Item and Priority Code: Both of these items are an exact coding tolerance, i.e., ± 0 in the priority coding and the maintenance items must match.

2.0 PLANNING THE EVALUATION

2.1 Objective

Planning the QA evaluation involves selecting the District's state and local sample bridges. The BIS selects the state-owned, PTC-owned, and DCNR-owned bridges for each cycle. PTC bridges are selected each cycle while DCNR bridges are only selected in odd cycles. Even cycles will include a file review of the Delaware River Port Authority (DRPA) owned and the Delaware River Joint Toll Bridge Commission (DRJTBC) owned bridges (See Section 4.13). At the same time, the BIS requests input from the District as to which Consultant Inspector, for local-owned bridges, should be selected to QA. The list of local-owned bridges will then be selected by the BIS for evaluation during the cycle. After selections have been made by the BIS, the QA Team shall prepare a schedule with provisions for equipment and support workforce, where necessary, in order to provide the specified QA level. This chapter provides the important policies, procedures, and processes that should be incorporated into planning the evaluation.

2.2 Sequence of Activities

Each cycles' activities begin with the designation by the BIS of the required level of QA that is needed (See Section 2.3). The BIS will announce the evaluations that will be performed after the sample bridges have been selected. The sequence of District QA evaluations may change from cycle to cycle.

All these activities, except for the bridge selection, are performed and/or generated by the QA Team. Based on the activities included in the selected level, the QA evaluation will involve the following activities:

- Selecting the sample bridges
- An office visit including a file evaluation of each bridge
- A field site evaluation of each selected bridge
- An evaluation of the accuracy of selected BMS2 data items in the system
- An evaluation of the accuracy of specific condition and appraisal ratings, and maintenance recommendations
- An independent load rating evaluation, if applicable
- A draft report of the findings
- A close-out meeting held at the District to discuss findings
- A final report of the QA evaluation including resolution of conflicts, final results of the evaluations with findings, and recommendations for program improvement

2.3 QA Evaluation Level Per Cycle

The BIS determines the QA evaluation level for each cycle based on an assessment of needs, prior results, and/or availability of funds. The BIS Chief issues final approval of the QA level based upon BIS staff recommendations and after the required resources are budgeted and approved.

2.4 Selecting the Bridges

The selection process provides a sampling that represents an appropriate spectrum of inspections for all the District bridges with an opening greater than 20-feet and coded "yes" for NBIS length. For all QA evaluation levels, the QA team should place an emphasis on bridges classified as "poor" and bridges with a minimum condition rating of "5".

BIS establishes a profile of the bridges in each District as follows:

- a. The BMS2 profile data consisting of:
 - Items No. 5A01, 6A01-6A03; Identifying the structure
 - Items No. 5A09, 5C01, 5C03, and 5C06; Location description-features/intersected
 - Item No. 6A26-6A29; Structure type
 - Item No. 6A08; Total length (3 groups: 8'-20'(no QA evaluation), 20'-499', $\geq 500'$)
 - Item No. 5A15; Year built
 - Item No. 5C04, 5C05, and 5A17-5A18; Type highway/service
 - Item No. VM02; Maintenance responsibility
 - Item No. 7A03; Type of inspection
 - Item No. 7A05; Inspected by
 - Item No. 7A01; Date of inspection
 - Item No. VII2 and VII8; Access Requirements
 - Additional data as necessary to satisfy current cycle's emphasis items identified by BIS

The size of the sample group consists of 10 state-owned and 10 local-owned bridges for each of PennDOT's Districts. In selecting the sample bridges, the BIS will match the District profile, selecting only from the group that qualify based on date of inspection, as discussed in the following topic. In addition, bridges requiring special access requirements such as railroad permits, bridge cranes, rigging, diving equipment, etc. should only be selected if the QA Team can reasonably acquire the tools and resources. The BIS and the QA Team should scrutinize the bridge lists before the bridge evaluations to identify access issues. In most cases, a bridge requiring special access requirements may be replaced on the QA list with a less restrictive bridge. Beyond that, the selection is mostly random.

Obtain BMS2 data appropriate for level of inspection as follows:

- a. Levels I, II, III, and IV – After selection of the District structures, the BIS will provide the QA Team(s) with BMS2 Business Partner access, for the selected bridges, for use of the data items listed in Topics 3.5-3.10. The information should be used by the QA team in planning and conducting the field evaluation.
- b. Levels I, II, III, and IV – The QA team will collect other pertinent information, including location maps, copies of inspection reports, and bridge plans, during the office file evaluation at the District office or from the Documents screen in BMS2.

2.5 Timing the Evaluation

The QA Team should perform Bridge QA evaluations (includes both the field evaluation and file review) within eight (8) weeks after receipt of the QA bridge list. The BIS selection will take into account the date of the bridge inspections to be evaluated so that the time between the original inspection and the QA inspection does not exceed 6-9 months.

3.0 QA AT THE BRIDGE SITE

3.1 Objective

The QA evaluation at the bridge consists of an independent bridge safety inspection and subsequent verification of BMS2 condition/appraisal rating, Items No. 6B36, 6B38-6B40, 1A01-1A06, 4A02, 4A08-4A11, IN03 and certain inventory data prescribed, based on the level of evaluation. The QA Team will follow the same QA procedures and perform an independent NBIS Regular inspection on all sample bridges. The inspection data collected shall be documented using the Department's iForms bridge inspection software in QA Mode.

3.2 Scheduling

The QA team will group daily bridge inspections based on locations of the structures, to minimize driving time. The District office will resolve any location questions. Bridge inspection scheduling also includes provisions for special equipment and workforce. Whenever possible, the QA teams will use District crane resources.

3.3 District Bridge Unit Contact

The District Bridge Engineer (DBE) or designated representative will coordinate the scheduling and execution of the QA evaluation inspections requiring District crane resources to ensure resource requirements can be met.

3.4 Sequence of Activities

The QA evaluation is a systematic sequence of activities depending on the level of inspection required. The following is a typical sequence of activities performed by the QA Team:

	QA Level			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
• Verify and identify the structure	X	X	X	X
• Verify inventory data based on QA level	X	X	X	X
• Verify inspection method and access equipment need	X	X	X	X
• Verify posting signs	X	X	X	X
• Perform independent condition/appraisal	X	X	X	X
• Compare with District rating and reconcile, if possible	X	X	X	X
• Document findings based upon QA level	X	X	X	X
• Photograph the structure		X	X	X
• Prepare field sketches to locate scour and other details as req'd		X	X	X
• List/prioritize maintenance/repair needs		X	X	X
• Take measurements for load rating check			X	X
• Verify inspection interval				X

Many of the activities vary considerably based on the QA level which is described later in this section.

3.5 Identify Bridge

The QA team can normally locate the bridge using the information contained in the BMS ID number, which consist of the state or local route, segment, and offset, and descriptive information contained in the inspection report (or Lat/Long coordinates in BMS2). For Levels II, III, and IV, the team shall photograph an elevation view of the bridge and place the photograph on the report cover sheet (Appendix A), along with the cycle number, BMS ID number, inspection date, district, county, QA structure number, and list of team members.

3.6 Inventory Data

As part of a QA evaluation at the bridge, the team shall measure and describe certain elements of the bridge or verify the BMS2 data. The number of items and which specific items are to be checked will be based on the QA evaluation level identified in Sections 3.6-3.10. At the direction of the BIS, items may vary; however, the variance may only apply for a single QA cycle.

- a. Level I – Inventory item verification performed by the QA team includes the following:
 - (1) Verification of BMS2 Item No. 5C27, 6A26-6A29, and VP02.
 - (2) Using the BMS2 Business Partner Access provided, the QA team shall verify the BMS2 data by checking against field measurements. If there is a discrepancy, the evaluator shall record the correct information for comparison on a BMS2 inventory printout. If data cannot be verified at the bridge, from the plans, or from other sources, make note of the missing information and do not hold the item out of tolerance.
- b. Level II – Same as Level I; plus verification of BMS2 Item No. 5A17-5A18, 5C08, 5C15, 5C26, and 4A18-4A20.
 - (1) Items 4A19 and 4A20 should only be verified for bridges with a highway or railroad underneath the structure.
- c. Level III – Same as Level II; plus verification of BMS2 Items No. 5A10-5A11, 5C01, 5C03, 5E01, 6C18-6C23, 6C25, 6A38, 5B02-5B04, 5B17, 5B18, 6A44-6A48, VP04, and VP05.
 - (1) Items 6C20-6C23 should only be verified for bridges with a highway or railroad underneath the structure.
- d. Level IV – In lieu of a marked up BMS2 data printout, Inventory data shall be independently collected and recorded by the QA team before looking at the BMS2 Inventory data. Both QA and BMS2 data shall be transferred to the “Inventory Data Evaluation” form found in Appendix B-2 for comparison. This form will take the place of the marked up BMS2 data printouts in the individual bridge inspection evaluation reports.

3.7 Condition/Appraisal Evaluation

BMS2 Items No. 6B36, 6B38-6B40, 1A01-1A06, 4A02, 4A08-4A11, and IN03 shall be checked by the QA team as part of the Condition/Appraisal Evaluation.

- a. Level I – the QA team shall employ the following evaluation sequence and procedures:
 - (1) Perform the QA inspection prior to looking at the previous condition/appraisal ratings. Appendix B-1 shall be used to record the QA Evaluation Ratings. The inspection is “routine” using appropriate access equipment.
 - (2) After the inspection, compare the previous ratings shown in BMS2 with the recorded QA ratings.
 - (3) If tolerance ± 1 is exceeded on a rating, re-evaluate the element to ensure nothing was overlooked and the QA rating is correct.
 - (4) Additional documentation is unnecessary if the difference between the QA and the previous District rating is within the tolerance as indicated in Appendix B-1. If not within the tolerance, provide a brief description to justify the rating.
- b. Level II – Same as Level I except, when tolerance is exceeded, add photographs and/or sketches to illustrate the areas controlling the ratings.
- c. Level III – Same as Level II plus add photographs and/or sketches if the condition ratings are “4” or below regardless of whether tolerance is exceeded.
- d. Level IV – Unlike Levels I-III, perform a “routine” inspection with complete documentation as if there was no previous inspection. Complete a blank Form D-491 (in PUB 100A appendices) or use QA Mode in iForms with appropriate sketches and photographs in addition to using the Appendix B-1 form. The previous inspection documentation will not be available to the QA team at the bridge.

3.8 Load Rating Data Collection

During the field evaluation, the QA team must gather sufficient data to perform the specified level of load rating verification and compare the analysis against items IR04 and IR11. Since the accuracy of the load capacity rating is controlled by the accuracy in sizing members, the QA evaluation at the bridge includes precise measurements to provide the required data for the prescribed level of evaluation. The QA team will neatly document the measurements using sketches, as necessary, and include them in the QA records for each sample bridge. Data collection by the QA team shall also include documenting and compiling the following information:

- a. Level I – Significant deficiencies such as section loss or reduction in strength due to damage or deterioration.
- b. Level II – Same as Level I except:
 - (1) One primary member identified on the longest span and sized to include C-C bearing length.
- c. Level III – Same as Level II except:
 - (1) All deficiencies that potentially decrease capacity.
 - (2) The significant dimensions required to load rate the longest span.
- d. Level IV – Same as Level III except:
 - (1) The significant dimensions required to load rate the entire superstructure of the bridge.

The preceding requirements for obtaining dimensions apply to superstructures that are not complex. On more complicated structures, such as trusses, the QA team will verify only selected member dimensions (i.e., top and bottom chord), and only when detailed plans or sketches are available from the District.

A QA Load Rating analysis may become the new analysis on record for a bridge upon review and confirmation by the District and approval from the BIS Chief.

In the event that the QA Load Rating analysis calls for a reduction in the current posting or from no posting to a posting, this may be reported to and coordinated with the District Load Rating Engineer and Assistant District Bridge Engineer for Inspection in advance of the close-out meeting to allow for timely reduction of the bridge posting.

3.9 Signing Verification

The QA team evaluation includes the verification of signing as follows:

- a. Level I – Identify all signs that restrict the use of the bridge and compare them with BMS2 Item Nos. VP01-VP05.
- b. Level II - The same as Level I plus the addition of a description of the sign legibility, visibility, and condition.
- c. Level III - The same as Level II, plus the addition of a description of the location of all signs.
- d. Level IV - The same as Level III, plus the addition of an evaluation of the adequacy of the signing.

3.10 Bridge Maintenance

For Levels I through IV, the QA team will perform an evaluation of the maintenance items and assigned priority coding in accordance with Section 5.0 of this Publication. This assessment shall be based on the completeness and correctness of the maintenance items identified and the appropriate priority coding. The results of the evaluation shall be recorded in Appendix C, Item No. 6.

4.0 QA AT THE DISTRICT OFFICE

4.1 Objective

QA evaluation at the District office consists of verifying the availability and accuracy of required documentation. This section provides procedures developed to accomplish this. The evaluation will include a comparison of the data obtained by the QA team at the sample bridges with that reported by the District bridge safety inspection team.

4.2 Preparation

The QA team will perform the evaluation at the District office where the active District bridge safety inspection records are stored (or if access is restricted, the District will provide any documents they can via the Documents screen in BMS2). The District Bridge Engineer, or a designated representative, will provide workspace for the QA team during the time required for the office QA evaluation. The Assistant District Bridge Engineer for Inspection or designated representative qualified to answer questions related to the inspection activities must be available to the QA team on a periodic basis during the office QA evaluation.

The office evaluation will be conducted with an emphasis on minimizing the disruption caused to the District routine while the QA evaluation at the District office is in progress.

4.3 Focus

The files studied during the office QA evaluation are for the sample bridges evaluated in the field. Depending on the QA level, the file evaluation may be cursory (C), selected items (S), or in-depth (I). The topics covered are as follows:

Topic	QA Level			
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
• General file contents	C	S	S	I
• Inventory items documentation	C	S	S	I
• Inspection documentation	C	S	S	I
• Load rating analysis documentation	C	C	S	I
• Posting documentation	C	C	S	I
• Bridge maintenance	C	C	S	I
• Scour assessment documentation	C	C	S	I
• Construction plans/Shop drawings	C	C	S	I
• Fracture critical member and fatigue prone detail plan	C	C	S	I

The Bridge File Evaluation Form (Appendix C) shall be used to record the results of each file evaluation.

4.4 General File Contents

The QA team shall verify the general bridge file contents in BMS2 for completeness (file exists and is filled out) and accuracy (file is up to date and accurate) and record the results in Appendix C, Item No. 1. The contents inventoried will vary depending on the level of inspection and verified by the QA team as follows:

- a. Level I – The BMS2 system has been updated with the most recent inspection data.

- b. Level II - The same as Level I, plus whether the file contains D-491 Inspection Reports, load rating, posting recommendations, and proposed improvements, if applicable.
- c. Level III – The same as Level II, plus the presence of either sketches or “as-built” plans.
- d. Level IV – The same as Level III, plus the presence of historical documentation, such as re-occurring problems, repairs, or rehabilitation.

4.5 Inventory Items Documentation

Section 3.6 lists the inventory items evaluated by the QA team on each sample bridge. The evaluation for Levels I through IV consists of verifying the specified items through comparison of file information with data obtained at the bridge site. The results shall be recorded in Appendix C, Item No. 2.

4.6 Inspection Documentation

This part of the QA evaluation involves reviewing the condition/appraisal ratings and documentation from BMS2 Item Nos. 6B36, 6B38-6B40, 1A01-1A06, 4A02, and 4A08-4A11. The QA team will compare the evaluation results with the BMS2 item documentation from the latest District bridge safety inspection iForms report (D-450s). Record the results in Appendix C, Item No. 3. The following process shall be used in the assessment:

- a. Level I – Identify and document out-of-tolerance ratings at each bridge. Correlate and evaluate the findings for the group of items.
- b. Level II – Same as Level I, plus compare the documentation for out-of-tolerance ratings with the inspector’s documentation in the file. Using that data, determine if the difference is due to the inspector’s understanding of the rating scale guidelines or from overlooking a defect. For documentation purposes, it must be determined whether the difference is due to interpretation of instructions or thoroughness of inspection.
- c. Level III – Same as Level II, plus:
 - (1) Evaluate documentation for condition ratings of “4” or less for accuracy and completeness.
 - (2) Perform a general evaluation of the inspection documentation, photographs, and sketches to verify that sufficient details are available for an engineer to determine the extent and severity of problems and to determine changes that may affect the load rating. Verify that section measurements were reported at locations with section loss to primary members.
- d. Level IV – Same as Levels I-III, except:
 - (1) If the reason for out-of-tolerance ratings cannot be determined by comparing the reports, an additional trip to the bridge may be required.
 - (2) Verify the inspection interval as prescribed in PUB 238, Table IP 2.3.2.4-1, Intervals of Routine (NBI) and Other Special (Interim) Inspections for Bridges. A normal interval is 24 or 48 months; however, reduced/extended intervals are occasionally established due to condition or capacity limitations.

4.7 Load Rating Analysis Documentation

Each inspection file should contain the capacity of the bridge and sufficient documentation (general plan & elevation drawings, typical section drawings, section property data, material strength references, sufficient description or sketches of section remaining, calculations for analysis program input, analysis program input and output file, etc.) to determine how it was derived. During the office QA evaluation the team shall verify that the load rating documentation is consistent with the specified QA level and record the findings in Appendix C, Item No. 4. The QA team will perform the rating analysis verification as follows:

- a. Level I – Verify that BMS2 Item No. VP02, VP04, VP05, IR04, IR10, and IR11 are consistent.
- b. Level II – Same as Level I plus:
 - (1) Spot check the method used to determine the load rating; and if calculations exist, verify the member sized in the field (see Section 3.8.b.(1)).
 - (2) Verify that deficiencies were considered in the calculations (see Section 3.8.a).
 - (3) Verify that analysis calculations have been checked and initialed.
 - (4) Verify that analyses performed after July 2010 are sealed by a P.E. and include a load rating summary form.
 - (5) Verify that the controlling member and span are clearly identified for each vehicle rated.
- c. Level III – Same as Level II plus check the calculations for the longest span.
- d. Level IV – Same as Level III, plus perform an independent load rating analysis and verify the Operating Rating level load rating calculations. In addition, using the input parameters from the previous District or consultant analysis that was obtained during the Office File Review, perform an updated run of the file analysis using the latest version of the appropriate Department load rating software. This updated District or consultant analysis should be compared to the QA Team's independent analysis so that differences due to updates in load rating software are ruled out of the comparison.

Note: In Level IV, for posted bridges or bridges which indicate posting is required per the QA analysis, the QA team will make adjustments in the analysis to emulate actual field conditions and other considerations made within the file analysis.

4.8 Posting Documentation

PennDOT posting requirements are contained in Publication 238 Part IP, Chapter 4, sections 4.4 and 4.5 including coverage of restrictions based on weight, one truck at a time, other components, and highway conditions. Records of load posting analysis, decisions and documentation forms are required be kept in the bridge inspection file. The QA team will perform the office QA evaluation to verify that the appropriate load rating documentation is present as called for by the specified QA level, and record the findings in Appendix C, Item No. 5. QA team posting verification is performed as follows:

- a. Level I – Compare the signing at the bridge with the data in BMS2 Items No. VP02, VP04, VP05, IR04, IR10, and IR11.

- b. Level II – Same as Level I plus verify the existence of file documentation.
- c. Level III – Same as Level II plus verify the completeness of file documentation.
- d. Level IV – Same as Level III plus verify the accuracy of file documentation.

4.9 Bridge Maintenance

For Levels I through IV, the QA team will perform an evaluation of the maintenance items and assigned priority coding in accordance with Section 5.0 of this Publication. This assessment shall be based on the completeness and correctness of the maintenance items identified and the appropriate priority coding. The results of the evaluation shall be recorded in Appendix C, Item No. 6.

4.10 Scour Assessment Documentation

For Levels I through IV the QA team will evaluate the completeness of the scour documentation, including the availability of the Hydrology and Hydraulics (H&H) Report, Scour Plan of Actions, and the availability and completeness of required scour sketches. The results of the evaluation shall be recorded in Appendix C, Item No.7.

In addition, the accuracy of the Scour Critical Bridge Indicator (SCBI), BMS2 Item 4A08, is to be evaluated in accordance with the following:

For most bridges built after 1982, a Hydrologic Study and Hydraulic Analysis was performed as part of the design and these bridges were designed to resist failure due to scour based on setting the footing depth below the calculated theoretical scour depth and/or by installing designed scour countermeasures. For these bridges, it should be verified that Item IU03, SCBI Source, is coded as “C” (Computed). Item 4A08 should also be coded as “8”, and the Scour Calculator should not have been run. In some cases, if the scour conditions have changed significantly between inspections, the SCBI Source may be changed to “O” (Observed) and have the Scour Calculator run, regardless of whether an H&H analysis was performed in the design.

- a. For all other bridges, verify that IU03 is coded as “O” (Observed) and:
 - (1) If the scour calculator has not been run in BMS2, and there is not a copy of a USGS Scour Calculator run in the file that was produced by the District prior to the availability of the Scour Calculator in BMS2, then it is to be evaluated whether or not Item 4A08 matches the USGS EF rating recorded in BMS2 Item 2A01 (Structure Notes).
 - (2) If the Scour Calculator has been run in BMS2, then evaluate whether or not Item 4A08 rating agrees with the controlling value for BMS2 Item IU27.

4.11 Construction Plans/Shop Drawings/FCM Plan

For Levels II through IV, the QA team shall note the availability of design plans and shop drawings. For Levels III and IV, the team shall conduct an in-depth evaluation of the Fracture Critical Member and Detail plan to ensure the requirements of Publication 238 have been satisfied. The results for the Construction Plans/Shop Drawings shall be recorded in Appendix C, Item No. 8. The results for the FCM plan shall be recorded in Appendix C, Item No. 9.

4.12 Inspection Support and Control

Inspection and documentation procedures vary between District inspection units. Procedural differences are not important if they produce accurate results, can be interpreted the same statewide, PUB 240 (11-20)

and conform to inspection standards. Certain Districts may have developed inspection procedures that provide unique results either above or below the norm. If the previous QA findings indicate unique results it may be helpful to study the operational procedure that produced the unique results. During each evaluation the QA team is asked to complete or update all or part of Appendix D.

The District procedure information shall be obtained from interview(s) with the bridge safety inspection supervisor or a designated representative during the office evaluation. The written responses in the QA evaluation may be expanded to as many sheets as are necessary. Other unique details related to the District inspection operational procedures that are volunteered during the interview may be documented at the end of the questionnaire. QA team responses to the Appendix D queries are required as follows:

- a. Level I – Answer to question No. 1, Appendix D is the minimum required.
- b. Level II – Same as Level I plus answers to questions No. 2, 3, 4, 5 and 6.
- c. Level III – Same as Level II plus answers to questions No. 7, 8 and 9.
- d. Level IV – Same as Level III plus answers to questions No. 10, 11, 12, and 13.

4.13 DRPA and DRJTBC Bridges

In even cycles, the BIS will select two bridges for the DRJTBC and one bridge for the DRPA for a file evaluation of general file contents, inventory items, and inspection documentation. The QA team shall provide a brief report that includes items as follows:

- a. Perform a file review of the general bridge file contents in accordance with these sections: Section 4.4 – General File Contents, Level IV; Section 4.10 – Scour Assessment Documentation; Section 4.11 – Construction Plans/Shop Drawings/FCM Plan.
- b. Perform a review of the latest inspection report and evaluate whether the inspection notes, sketches and photos support the condition ratings assigned for Deck, Superstructure, Substructure, Channel, and Culvert (if applicable).

The report will consist of a cover page, a description of each QA review element performed, a summary of the findings for each QA review element, and recommendations for improvement.

5.0 BRIDGE MAINTENANCE EVALUATION

5.1 Objective

An important purpose of the Bridge Safety Inspection is to identify maintenance/repair needs and priorities. The QA program includes the evaluation of the accuracy of the maintenance/repair needs identified by the District and the documentation for implementing the work.

5.2 Maintenance/Repair Needs

As part of the evaluation at the bridge, the QA team shall recommend maintenance/repair solutions to the problems identified on the structure during the inspection. The purpose of collecting this information is verification of the inspectors' input to the Proposed Maintenance screen in BMS2, (or Maintenance and Major Improvement Needs, Form D-491M). The QA team shall use the following procedures:

- a. Level I – Based on items listed in the BMS2 Proposed Maintenance screen or Form D-491M, identify structural elements requiring repair within the next six months.
- b. Level II – Same as Level I, except include the recommended repair for the elements identified.
- c. Level III – Same as Level II, except list all maintenance and repairs needed. This list includes repairs necessary to return or preserve the bridge to an original condition.
- d. Level IV – Same as Level III, except include the priority for the maintenance/repair need. The six (6) priorities provided for BMS2 Item No. IM05 shall be used.

5.3 Verify Implementation

Ideally, the inspection documentation lists immediate problems, potential problems, and maintenance necessary to avoid future problems. The QA team shall verify the bridge file includes a Maintenance and Major Improvement Needs Form that indicates the recommended improvements and a priority for each. Also, the team shall verify the dates that the required work was scheduled and completed are included in the file documentation. The QA findings shall be recorded on Appendix C, Item No. 6. The verification sequence used by the QA team shall be as follows:

- a. Level I – Compare inspection documentation to verify that problems requiring immediate repair are identified. (Priority 0 and 1)
- b. Level II – Same as Level I, plus verify that a reasonable and complete Plan of Action has been documented in BMS2 to address Priority 0 and 1 maintenance needs.
- c. Level III – Same as Level II, plus verify the documentation of all maintenance and repair needs.
- d. Level IV – Same as Level III, plus evaluate the priority for each repair.

5.4 Newly Identified

When identifying maintenance/repair items as part of the evaluation at the bridge, the QA team shall notify the BIS Chief when any newly identified Priority 0 or 1 Maintenance Items are found. The QA team shall send an immediate email with defect description and pictures so that the

PUB 240 (11-20)

Maintenance Item can be confirmed as Priority 0 or 1 and remediation actions can take place as soon as possible. Timeliness is very important, especially when dealing with Priority 0 Maintenance Items, and reporting the newly identified Priority 0 or 1 should be done immediately after the bridge site evaluation is completed.

6.0 DISTRICT FINDINGS

6.1 Objective

The previous sections provide guidelines and requirements for recording the QA evaluation findings for each District. The individual District preliminary reports prepared by the QA team shall include correlation of the data collected during the evaluation and a concise statement of the findings. After review by the BIS and the District Bridge Engineer, the QA team shall discuss the findings with the District in a close-out meeting. This section addresses the District report preparation by the QA Team and the close-out meeting.

6.2 Report Format

The Draft Summary Report consists of the individual inspection and analysis QA evaluation reports for each bridge reviewed as well as a summary report which combines the findings from the individual reports and presents these findings in both written and tabular format. A statistical correlation and presentation of the data is an important consideration in preparing the QA Preliminary Summary Report. To that end, the same information shall be requested in the same order for each District evaluation to provide the basis for a comparison. The QA team will correlate and summarize the findings by each District and eventually provide a statewide comparison of all the Districts. Additional comparisons may be required to examine variances in quality by groupings such as bridge type or sufficiency rating if there is sufficient need to determine reasons for those variances. The evaluation report will be organized to provide different levels of detail. The basic sections of the report consist of a summary, narrative, exhibits, and the appendices.

6.3 Summary

The purpose of the QA evaluation is to both highlight strengths and document problems that must be addressed by the District. The QA team shall make every effort to provide an accurate description of the magnitude of discrepancies versus concurrent findings. The summary contains general statements about the quality of the District inspection, documentation and follow-up procedures with emphasis on strong and weak areas. It also contains the highlights of the significant findings and differences between the District of interest and other Districts.

6.4 Narrative

The narrative portion of the report offers a concise description of the findings of the QA evaluation. It includes a description of the level(s) of QA used, including exceptions, and a description of emphasis items. The topic should also be sub-divided in a manner that ensures the significant findings from both the field and office evaluations are covered in separate sections. Only those findings that are significantly above or below average must be included.

6.5 District Bridge Inspection Unit Organization

A brief description of unique organizational procedures of the District bridge inspection unit shall be provided by the QA team to assist in evaluating the QA findings. The description should contain only useful information in accordance with the topic format contained from Appendix D. Typically, the District inspection organization and procedures are standardized throughout the state. However, there may also be unique situations that influence the quality such as a District's QC program. This information can be particularly useful in developing best practices that can be shared among the Districts.

6.6 Findings at the Bridge

The handwritten field reports prepared by the QA team will be included in the report to provide and compare the findings at the bridge, some of which may also be included in the appendices to illustrate findings. It is also necessary to obtain the condition ratings for all the sample QA evaluations which are sorted to provide statistical comparison and analysis. Lists and graphs, such as examples in Appendix E and Appendix F shall be prepared to show any differences between the QA and District ratings. The narrative of the report should also include sufficient backup detail to describe the above and below average aspects of the District inspection unit.

6.7 Findings at the District Office

The QA team will assess the completeness and accuracy of the “paper trail” contained in the inspection file held at the District Office. The QA team will look to see if an item exists and is filled out in the inspection file (completeness) and whether the item is filled out accurately and up to date (accuracy). The findings shall be documented in the format shown in Appendix C. Instances of similar findings on several bridges shall be identified and quantified where possible. Unique findings related to the District’s bridge inspection office tasks, including planning and follow-up, shall also be documented. The numerical ratings from Appendix C will be used by the QA team for a statistical comparison with statewide norms.

6.8 Exhibits and Appendices

Lists, graphs, questionnaires and other documents prepared to support the findings shall be referenced in the narrative and grouped together as exhibits. Backup data for each sample bridge shall be bound separately. Some of the backup documents may also be included in the appendices if they provide useful information.

6.9 Report Review Process

Electronic draft copies of the bridge inspection QA preliminary report for each District shall be submitted to the BIS Chief, Bureau of Maintenance and Operations, for review no later than six (6) weeks after the field inspections have been completed. This can be completed via sharepoint site or other electronic file sharing service.

6.10 Preliminary Report Distribution

Electronic copies of the approved preliminary report shall be submitted to the BIS after the review process is completed and all corrections have been made. The schedule for this submission is one (1) week after the review comments are received and shall include the original reports with photographs for each sample QA bridge together in a separate folder. This can be completed via sharepoint site or other electronic file sharing service. Copies of the reports will be forwarded to the District by the BIS.

6.11 Close-Out Meeting

A close-out meeting shall be scheduled with the District within four (4) weeks of the final submission of the approved preliminary report. The meeting will be scheduled and attended by a BIS Manager. Any consultants involved in the QA evaluation shall be represented.

Prior to the close-out meeting, the QA Consultant Project Manager and a BIS Manager may field view selected bridges, where it is deemed necessary, in order to provide clarity to the discrepancies found in the QA evaluations.

The close-out meeting sequence shall include the following two (2) forums:

- a. The District Bridge Engineer, District Safety Inspection Supervisor, BIS Manager, QA Consultant Project Manager, District Inspectors, and Consultant Representatives will meet initially to discuss the findings and problem areas.
- b. The District Executive (DE) or designated staff will be briefed on the QA findings followed by a discussion of unresolved issues.

A close-out letter (minutes of the meeting) will be prepared by the QA team to document the conclusions or any follow-up activities agreed on during the meeting.

The District Bridge Engineer will be responsible for documenting that follow-up activities have been implemented.

6.12 Final Report

The discussion results (meeting minutes) that occurred during the close-out meeting for the preliminary report shall be incorporated into a draft final report. Electronic copies of the draft meeting minutes shall be submitted to the BIS within two (2) weeks of the close-out meeting for review. The meeting minutes shall be incorporated into the final report after the review comments are received. Electronic copies of the approved final report shall be submitted to the BIS after the review process is completed and all corrections have been made. The schedule for this submission is one (1) week after the review comments are received. This can be done via sharepoint site or other electronic file sharing service. The BIS will forward copies of the final reports to the District.

7.0 CYCLE SUMMARY REPORT

7.1 Objective

The statewide QA report prepared by the QA team shall contain a summary of the District bridge inspection QA evaluations and a comparison of the findings statewide for each cycle. A description of the procedures used during the evaluation shall be included.

The contents of the report are as follows:

- A narrative of QA objectives for that cycle
- A list and description of special emphasis items
- A list of bridges for which the evaluation was performed, including the date of inspection by the District/Consultant and the date of inspection by QA for each bridge
- A quantitative comparison of Districts in tabular form
- Recommendations given to Districts
- Conclusions and recommendations for the next cycle's QA levels, for bridge inspection training, and for procedure, process, or program improvement

7.2 Report Preparation

The QA team(s) that performed the District(s) evaluations will prepare the QA cycle summary report within six (6) weeks after all final reports have been submitted. The submission and review sequence of the report shall be as follows:

- a. An electronic draft of the report shall be submitted to the BIS Chief for review and comment.
- b. Within two (2) weeks of receipt of comments from the BIS, the QA team shall update the report and submit an electronic copy to the BIS for distribution.
- c. A copy of the inspection report for each bridge prepared in PDF format shall be uploaded to the Documents screen in BMS2 by the QA team for permanent retention and to ensure a copy is available for review by follow-on inspection teams.

7.3 Narrative Description

The purpose of the narrative is to provide important details of the QA program for the cycle. The introduction shall include a brief discussion of the purpose of the program and the methodology. The narrative shall also provide sufficient detail to support the conclusions drawn from the statistical data described in Section 7.5. A discussion of statewide findings shall be provided and organized by item with emphasis on the significant issues that were common to more than one District. Unique findings shall be summarized separately for each District. Problems identified in collection or interpreting the QA data may be included.

7.4 Special Emphasis Items

At the beginning of each QA cycle, the BIS may identify special emphasis items that shall either be added to or emphasized during the statewide bridge safety inspection QA program activity. The items may be added because of deficiencies identified during previous cycles' findings. They may also be added due to a change in the NBIS, FHWA emphasis, or emphasis in the state program. The QA cycle summary report shall include special findings resulting from these emphasis items.

Since it is considered important to compare findings from cycle-to-cycle and District-to-District, the special emphasis items shall be shown separately unless they have been identified as a permanent part of future QA evaluation.

7.5 Statistical Comparison

Each District report shall contain graphs showing variances between the District and QA team condition/appraisal ratings for the group of sample inspections. Each page must contain a separate graph for BMS2 Items 6B36, 6B38-6B40, 1A01-1A06, 4A02, 4A08-4A11, and IN03 (Similar to Appendix F). The QA cycle report shall present the graphs grouped by BMS2 Item Number, rather than by District.

The condition/appraisal graphs for all of the Districts shall be displayed side by side. This permits a direct comparison of all the District bridge safety inspection units' performance for each item related to the condition/appraisal ratings. An average variance statewide shall also be shown.

Additional QA emphasis items shall be treated similarly. Aspects of each District inspection program that are providing above or below average results shall be reported in a narrative format, only if statistical/tabulation comparisons are not self-explanatory.

7.6 Recommendations to Districts

The report shall contain a brief statement summarizing the recommendations provided to each of the Districts. The District reports and close-out meetings will provide the major source of this information.

7.7 Conclusions/Recommendations

The QA team assessment of Statewide Quality Assurance shall be based upon various quality sub-elements generated during the evaluation:

- a. The report shall include the evaluation of District findings and conclusions developed regarding the quality of the statewide bridge inspection program.
- b. Problems which occur in three or more Districts shall be listed with the magnitude of occurrence. Problems which could have a significant impact on achieving the primary objectives of the inspection program shall also be reported, even occurring only once.
- c. The QA team shall present any information considered relevant to above and below average levels of quality in the statewide bridge inspection program.
- d. In order to identify trends, correlation shall be made whenever possible of the levels of quality with factors such as District operational procedures, District QC program, resources (both quality and quantity), training, etc.

Implementation and refinement of best practices of the Bridge Inspection QA Program can be expected to result in the determination that certain procedures provide more useful information than others. Recommended modifications to the program to improve procedures may be determined upon completion of each cycles' evaluation and will be documented in the Cycle Summary Report.

8.0 CORRECTIVE ACTIONS

8.1 Task List and Schedule

At the completion of each QA cycle, a BIS Manager will prepare a list of tasks aimed at remedies to issues adversely affecting the inspection program quality for the state. The issues may be confined within a specific District or may be evaluated to be systemic. It is also crucial to the value and success of the QA program that any appropriate remedial action identified is within the realm of the capabilities and resources available for its implementation. The task list is a compilation of the activities identified by the individual Districts during the close-out meetings.

A schedule of milestones and completion dates for remedial actions is essential for planning and resource allocation and is a measure of progress towards QA improvement. Districts must put forth the appropriate level of effort to perform QC improvements that will ultimately result in improved QA measures. To that end, the development of milestones and completion dates for the remedial action tasks generated by a BIS Manager must be coordinated with the District and accepted by the BIS Chief before being added as an attachment to the Cycle Summary Report.

8.2 Measures of Effectiveness

The BIS will monitor the following measures, and depending on the circumstances, may require action and follow-up at the District level:

- a. Condition and Appraisal ratings - 2 levels of action:
 - (1) Rating accuracy < 90% - Notification letter sent to DE
 - (2) Rating accuracy < 85% - Formal corrective action plan must be developed and submitted to the BIS
- b. Load Rating – Corrective action plan shall be submitted to the BIS for the following circumstances:
 - (1) Load rating results in a weight restriction for a bridge that was not previously weight restricted
 - (2) Load rating results in reduction of the bridge weight restriction by 10 or more tons
- c. Maintenance Priority – Corrective action plan may be required in the event a priority “0” maintenance item noted during the QA inspection is not identified as such during the original inspection. At the very least, the District shall investigate the root cause of the discrepancy and report the results to the BIS.

8.3 Reporting

A BIS Manager will present the results of the QA improvement effort during the District Bridge Engineers annual meeting.

APPENDICES

Appendix A	Bridge Inspection Quality Assurance Evaluation Cover Page Example
Appendix B-1	Condition and Appraisal Evaluation Form Example
Appendix B-2	Inventory Data Evaluation Form Example
Appendix C	Bridge File Evaluation Form Example
Appendix D	Operational Procedures Evaluation
Appendix E	QA/District Comparison Table Example
Appendix F	QA/District Comparison Graph Example
Appendix G	Maximum Time Period Flowchart Guideline

APPENDIX A

BUREAU OF MAINTENANCE AND OPERATIONS
STATEWIDE BRIDGE QUALITY ASSURANCE PROGRAM



BRIDGE INSPECTION QUALITY ASSURANCE EVALUATION

CYCLE NO.	3				
STRUCTURE BMS NO.	XX-XXXX-1234-5678				
INSPECTION DATE	September 18, 2019				
DISTRICT	XX-0	COUNTY	Dauphin	QA STRUCTURE NO.	1

[QA Reviewer - Insert Photo of Elevation View for the Subject Bridge]

QA Inspection Team Members

John Johns, P.E. CBSI

Jane Janes, CBSI

SUMMARY OF QA FINDINGS

[PE Seal]

[Signature]

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX B-1

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM CONDITION AND APPRAISAL EVALUATION

QA STRUCTURE NO. 1

STRUCTURE BMS NO. XX-XXXX-XXXX-XXXX QA TEAM 1 DATE XX/XX/XXXX

BMS2 ITEM NO.	QA REVIEW RATING	PREVIOUS BMS2 RATING	TOLERANCE (+/-1)	DETAILS REGARDING VARIANCE FROM TOLERANCE Additional details , sketches, or photographs may be included on attached sheets
6B36 PAINT	6	6	0	
6B38 APPR SLAB	7	7	0	
6B39 APPR RDWY	7	6	-1	
6B40 DECK W.S.	6	6	0	
1A01 DECK	6	8	+2	Deck was considered to be in worse condition than the District rating because of the size and number of spalls.
1A02 SUB STR	6	6	0	
1A03 CULVERT	N	N	0	
1A04 SUP STR	6	7	+1	
1A05 CHANNEL	8	6	-2	Channel was considered to be in worse condition due to the slumping of the banks
1A06 WATERWAY	9	9	0	
4A02 APPR ALIGN	8	8	0	
4A08 SCBI	8	8	0	
4A09 STR COND	6	6	0	
4A10 DK GEO	6	5	-1	
4A11 UND CLR	4	4	0	
IN03 OBS. SCOUR (NAB)	8	8	0	[Note: Reviewer rate each substructure unit]
IN03 OBS. SCOUR (FAB)	8	8	0	

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX B-2

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM INVENTORY DATA EVALUATION

QA STRUCTURE NO. 1

STRUCTURE BMS NO. XX-XXXX-XXXX-XXXX QA TEAM 1 DATE XX/XX/XXXX

BMS2 ITEM NO.	QA REVIEW RATING	PREVIOUS BMS2 RATING	Toler. (OK/NG)	QA Toler. Level	Comments / Tolerance Descriptions
5A17 TYPE SERVICE ON	1	1	OK	Exact	
5A18 TYPE SERVICE UNDER	6	6	OK	Exact	
5C26 APPR ROAD WIDTH	19	21	NG	+/- 1 ft	QA measured approach roadway of 19.0' at the near and far approach 25' from the bridge during the field inspection.
5C27 BRIDGE ROAD WIDTH	21.8	22.5	NG	+/- 0.3 ft	QA measured the most restrictive bridge road width at 21.8' measured face-to-face of the guide rail at the bridge connection during the field inspection.
5C15 DETOUR LENGTH	1	10	NG	+/- 2 mi or 10%	The Detour length was confirmed through Google Earth and Functional Class Maps.
5E01 NBIS LENGTH?	Y	Y	OK	Exact	
6A26 MATERIAL USED	1	1	OK	Exact	
6A27 PHYSICAL MAKEUP	6	6	OK	Exact	
6A28 SPAN INTERACTION	6	6	OK	Exact	
6A29 STRUC CONFIG	15	15	OK	Exact	
6A38 DECK TYPE	10	10	OK	Exact	
5B17 MAX SPAN LENGTH	40	40	OK	+/- 1 ft	
5B18 STRUCTURE LENGTH	120	120	OK	+/- 1 ft	
6A44 FC GROUP NO.	9	9	OK	Exact	
6A45 FC MEMBER TYPE	9	9	OK	Exact	
6A46 FC FATIGUE SUS	9	9	OK	Exact	
6A47 FC MATERIAL	9	9	OK	Exact	

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX B-2

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM INVENTORY DATA EVALUATION

QA STRUCTURE NO. 1

STRUCTURE BMS NO. XX-XXXX-XXXX-XXXX QA TEAM 1 DATE XX/XX/XXXX

BMS2 ITEM NO.	QA REVIEW RATING	PREVIOUS BMS2 RATING	Toler. (OK/NG)	QA Toler. Level	Comments / Tolerance Descriptions
6A48 ADTT	3	3	OK	Exact	
VP02 POSTING STATUS	A	A	OK	Exact	
VP04 POST WEIGHT LIMIT	-1	-1	OK	Exact	
VP05 POST LIMIT COMB	-1	-1	OK	Exact	
5B02 DECK SURF TYPE	6	6	OK	Exact	
5B03 DECK MEMB TYPE	0	0	OK	Exact	
5B04 DECK PROTECT	1	0	NG	Exact	QA found in the plans that epoxy coated rebar was used in the bridge deck.
5A10 LATITUDE	39.816110	39.817375	NG	+/- 50 ft	The coordinates were not lined up with the bridge.
5A11 LONGITUDE	-77.299100	-77.299444	NG	+/- 50 ft	The coordinates were not lined up with the bridge.
5C01 ROAD/ROUTE NAME	BIG RD	BIG RD	OK	Exact	[Note: Reviewer check items for each feature on/under bridge]
	US 25	US 25	OK		
5C03 FEAT ON/UNDER	1	1	OK	Exact	
	2	2	OK		
5C08 LANES ON/UNDER	2	2	OK	Exact	
	2	2	OK		
6C25 MEDIAN TYPE	0	0	OK	Exact	There is no median on the under route US 25.
	0	4	NG		

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX B-2

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM INVENTORY DATA EVALUATION

QA STRUCTURE NO. 1

STRUCTURE BMS NO. XX-XXXX-XXXX-XXXX QA TEAM 1 DATE XX/XX/XXXX

BMS2 ITEM NO.	QA REVIEW RATING	PREVIOUS BMS2 RATING	Toler. (OK/NG)	QA Toler. Level	Comments / Tolerance Descriptions
4A18 REFERENCE FEATURE	H	H	OK	Exact	
4A19 MIN LAT UNDERCLR RT	0.0	0.0	OK	+/- 1 ft	
4A20 MIN LAT UNDERCLR LT	16.1	16.1	OK	+/- 1 ft	
6C18 HOR CLEAR LT	—	—	OK	+/- 1 ft	
	—	—	OK		
6C19 HOR CLEAR RT	28.0	28.0	OK	+/- 1 ft	
	35.9	35.9	OK		
6C20 MIN VERT CLEAR LT	99.90	99.90	OK	+/- 1 ft	
	99.90	99.90	OK		
6C21 MIN VERT CLEAR RT	99.90	99.90	OK	+/- 1 ft	
	16.33	16.33	OK		
6C22 DEF VERT CLEAR LT	99.90	99.90	OK	+/- 1 ft	
	99.90	99.90	OK		
6C23 DEF VERT CLEAR RT	99.90	99.90	OK	+/- 1 ft	
	16.58	16.58	OK		

APPENDIX C

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM
BRIDGE FILE EVALUATIONQA STRUCTURE NO. 1STRUCTURE BMS NO. XX-XXXX-XXXX-XXXXINSPECTION DATE: XX/XX/XXXXFILE REVIEW TEAM: 1INSPECTION TEAM: 1

Rating Scale

The rating scale provides an index relative to standards for the bridge file set forth in the Manual for Bridge Evaluation and PUB 238. Application of the ratings will be according to the following:

COMPLETENESS

- 0 - Needs Improvement** - Less than the required data is collected and presented (missing items). Files are incomplete.
1 - Meets Standards - The data collected and presented satisfies the requirements.

ACCURACY

- 0 - Needs Improvement** - The data present in the files is out of date or are inaccurate.
1 - Meets Standards - The data present in the files is up to date and accurate.

SIGNIFICANT FINDINGS OF THE QA BRIDGE FILE EVALUATION

	FILE REVIEW TOPIC	RATING FOR ACCURACY	RATING FOR COMPLETENESS	COMMENTS
1.	GENERAL FILE CONTENTS	1	0	The latest inspection data has been uploaded to BMS2. The bridge file contains current load rating, BMS2 printouts, and proposed improvements. The bridge file does not contain a location map, basic sketches (plan, section, elevation), plans, or inspection notes.
2.	INVENTORY ITEMS DOCUMENTATION	0	1	Refer to the 'Inventory data Evaluation' in the QA report for accuracy and completeness of Inventory Items from field inspection verification. Items 5C15 and 6A45-6A48 were noted as having discrepancies in accuracy.
3.	INSPECTION DOCUMENTATION	0	1	For the Condition and Appraisal items, there were four items noted as being out of tolerance during the field inspection: Item 4A08 SCBI and Item IN03 (NAB, P01, FAB). The out of tolerance ratings appear to be due to the previous inspection's interpretation of the rating scale and not from overlooking a defect. There were two Condition ratings that were coded ≤ 4. Item 1A02 Sub = 4 and Item 1A05 Channel = 4. Overall, the inspection documentation and photos provide sufficient detail in order to determine the extent and severity of problems at the bridge. Inspections are being performed at the required interval in accordance with Pub 238 Table IP 2.3.2.4-1 (24 months)

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX C

4.	LOAD RATING ANALYSIS DOCUMENTATION	0	0	A current load rating is included in the bridge file. The ratings in the current analysis match the ratings in BMS2; however, there is no rating for the TK527 load. The analysis calculation does not match the date in BMS2. The rating was performed using BAR 7.8 (11/25/97). There are no supporting calculations. There is no existing beam deterioration that should have been considered in the analysis. The current analysis has not been signed, checked, or initialed; a load rating summary sheet has not been provided. Items 4B03 Bridge Posting Appraisal, VP01 Status Date, VP02 Posting Status, IR04 Load Type, IR10 Inv Rating, and IR11 Opr Rating are consistent. Items VP04 Posted Weight Limit and VP05 Posting Limit Combination are not consistent.
5.	POSTING DOCUMENTATION	1	1	Based on the current analysis ratings, the bridge requires posting. The bridge file contains a Bridge Posting Evaluation. The bridge file contains Bridge Posting Recommendation Data Sheets in accordance with Pub 238, 4.6.3 and 8.3.3.
6.	BRIDGE MAINTENANCE	1	1	Form M of iForms is complete with recommended maintenance items and priority codes for each. There were no Priority 0 or 1 maintenance items recommended in the previous inspection.
7.	SCOUR ASSESSMENT DOCUMENTATION	1	0	A Waterway Opening Cross-section and Stream Plan Sketch are not included in the bridge file but are required based on Pub 238, IP 8.3.1. and Pub 238, IE 2.2.18I. There is no H&H report or USGS scour assessment available for the bridge. A scour POA is not included in the bridge file (SCBI = 4). It appears that the scour calculator has been run in BMS2. The SCBI source has been coded as 'O - Observed', and the controlling individual sub unit SCBI code matches the overall SCBI code ('4').
8.	CONSTRUCTION PLANS/SHOP DRAWINGS	0	1	There are unnumbered Design Drawings included in the bridge file but are not referenced in BMS2. There are no shop or repair drawings indicated in BMS2 or included in the bridge file.
9.	FCM PLAN	N/A	N/A	The bridge is not fracture critical - FCM plan not required.

PennDOT Bridge Safety Inspection-QA Manual Publication 240
APPENDIX D



**PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM
OPERATIONAL PROCEDURES EVALUATION**

DISTRICT: _____ INSPECTION SUPERVISOR: _____

DATE: _____ QA REVIEWER: _____

The QA Reviewer must comment on the following topics. After this information is documented, only changes are indicated during subsequent inspections.

1. Bridge Safety Inspection organizational structure. Include status of CBSI certifications.
2. Content of typical bridge file and location/documentation of other pertinent documents such as plans, design computations, etc. (See Pub 238 Chapter 8)
3. Verification and scheduling of maintenance/repair recommendations.
4. Procedure for updating load capacity ratings.
5. Load posting documentation and implementation.
6. Scheduling use of access equipment where necessary.
7. Scheduling routine inspection and review of report.
8. District QC activities – Method of documentation – consistency with QC plan.
9. Fatigue and fracture critical inspection plans.
10. Monitoring channel scour.
11. Involvement in overload permit requests.
12. Procedure for QC of BMS2 data during report acceptance.
13. Involvement in monitoring local bridge inspection activities.

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX E

Example

Table 1: NBIS QA COMPARISON OF CONDITION AND APPRAISAL RATINGS

Cycle 1 District XX-0																																										
QA BRIDGE #	STRUCTURE BMS NO. 5A01	BRKEY 5A03	DIST./CONSULTANT INSP. DATE 7A01	FIELD VIEWED	CATEGORY	STRUCTURE TYPE 6A26-29	PAINT CONDITION		APPROACH SLAB		APPROACH ROADWAY		DECK WEARING SURFACE		DECK CONDITION		SUB STRUCTURE		CULVERT CONDITION		SUPER STRUCTURE		CHANNEL CONDITION		WATERWAY ADEQUACY		APPROACH ALIGNMENT		SCOUR CRITICAL RATING		STRUCTURAL CONDITION		DECK GEOMETRY		UNDERCLEARANCE APPRAISAL		OBSERVED SCOUR RATING (FROM TABLE 2)		TOTAL OUT OF TOLERANCE ITEMS (PER BRIDGE)	TOTAL % IN TOLERANCE & REMARKS		
							Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D			NO. OUT OF TOL. SUB- UNITS	NO. SUB- UNITS PER QA
S T A T E S T R U C T U R E S																																										
1	XX-XXXX-0430-1899	11111	12/06/16		A2	1 6 6 15	6 6	7 7	7 6	6 6	6 8	6 6	N N	6 7	8 6	9 9	8 8	8 8	6 5	6 5	4 4	0	2	2																		
2	XX-XXXX-0020-0000	22222	11/14/16		A1	2 1 1 03	N N	N N	6 7	7 8	6 5	5 6	N N	6 5	6 6	N 6	8 8	3 4	5 5	7 2	N N	0	2	2																		
3	XX-XXXX-0342-1462	33333	11/17/16		A2	4 2 2 04	N N	N N	6 7	7 8	7 8	6 7	N N	7 7	N N	N N	8 8	N N	6 7	6 5	5 6	0	0	0																		
4	XX-XXXX-0041-1320	44444	09/20/16		A1	3 1 9 31	N N	N N	8 8	8 8	N N	N N	7 8	N N	6 7	9 9	8 8	8 8	5 8	5 4	N N	1	2	2																		
5	XX-XXXX-0020-1288	55555	10/11/16		A1	4 2 2 07	N N	N N	6 7	6 8	6 7	6 7	N N	5 6	5 6	9 6	8 8	8 8	5 6	6 5	N N	4	4	6																		
6	XX-XXXX-0070-1702	66666	11/21/16		A2	4 2 2 06	N N	5 6	6 6	5 8	5 7	5 5	N N	4 8	5 5	6 8	6 8	8 8	4 5	4 9	N N	0	4	6																		
7	XX-XXXX-0080-2620	77777	11/16/16		A3	3 1 9 31	N *	N N	6 5	6 7	N N	N N	6 6	N N	6 7	7 6	8 8	8 8	5 5	4 4	N N	0	2	1																		
8	XX-XXXX-0240-0670	88888	09/27/16		A1	2 1 1 03	N N	N N	6 5	6 5	6 6	5 5	N N	4 4	5 4	5 3	6 7	8 8	4 4	3 3	N N	0	2	1																		
9	XX-XXXX-0500-1063	99999	12/07/16	X	B1	2 1 1 03	N N	N N	8 5	8 5	5 4	5 5	N N	4 5	5 5	5 3	8 8	8 8	4 5	3 4	N N	2	2	5																		
10	XX-XXXX-0010-0403	00000	01/11/17		A1	2 1 1 01	6 7	4 6	7 6	7 6	7 5	7 6	N N	7 5	6 6	9 9	8 8	8 8	7 6	6 6	N N	0	2	3																		
OUT-OF-TOLERANCE (> + / - 1)							1	1	1	3	3	0	0	2	1	5	1	0	1	2	0	7	22	28	% IN - TOLERANCE 84%																	
STATE BRIDGES FIELD VIEWED WITH BIS = 1																																										
L O C A L S T R U C T U R E S																																										
11	XX-XXXX-0581-2077	12121	05/20/16		A1	1 6 1 04	N *	N N	6 5	6 4	5 5	6 6	N N	5 5	6 5	6 6	8 8	8 8	5 5	3 3	N N	0	2	2																		
12	XX-XXXX-0346-2078	21212	05/11/16		A2	1 9 1 18	N *	N N	4 5	N N	5 6	6 6	N N	4 4	5 5	7 7	8 6	8 8	3 3	5 5	N N	0	2	2																		
13	XX-XXXX-0641-2084	23232	05/11/16		A1	8 6 1 04	N *	N N	5 5	5 5	6 5	4 5	N N	5 5	4 4	7 7	8 8	3 2	4 5	4 4	N N	0	2	1																		
14	XX-XXXX-0400-2105	32323	05/19/16		A1	1 6 1 04	N *	N N	7 4	5 4	5 6	5 5	N N	5 5	5 5	7 7	6 6	3 6	5 5	3 3	N N	0	2	3																		
15	XX-XXXX-0XX4-2108	34343	05/11/16		A2	1 6 1 04	N *	N N	5 5	5 4	2 3	3 3	N N	5 5	3 4	6 4	6 6	2 6	3 3	5 5	N N	1	2	4																		
16	XX-XXXX-0880-0005	43434	09/21/16		A1	1 6 1 04	6 8	N N	6 7	7 7	7 8	5 5	N N	7 8	5 5	4 4	8 4	3 6	5 5	4 4	N N	0	2	3																		
17	XX-XXXX-0413-0002	45454	06/15/16		A1	2 1 2 03	N N	N N	6 6	6 6	6 6	5 5	N N	5 4	5 5	6 5	8 4	5 5	5 4	7 2	N N	0	2	2																		
18	XX-XXXX-0830-0013	54545	06/28/16		A1	4 2 1 07	N N	N N	5 6	6 6	6 6	6 7	N N	4 6	6 6	8 8	5 7	3 6	4 6	6 6	N N	0	2	4																		
19	XX-XXXX-0770-0006	56565	07/26/16		A1	8 6 2 04	N N	N N	5 6	6 6	6 7	5 5	N N	5 5	5 5	6 5	5 5	4 6	5 5	4 4	N N	0	2	1																		
20	XX-XXXX-0812-0001	65656	07/18/16		A1	2 1 2 03	N N	N N	7 6	6 6	6 6	6 6	N N	5 6	6 5	6 5	8 6	3 6	5 6	5 5	N N	0	2	2																		
OUT-OF-TOLERANCE (> + / - 1)							6	0	1	1	0	0	0	1	0	1	5	6	1	1	0	1	20	24	% IN - TOLERANCE 86%																	
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																																										
D I S T R I C T T O T A L S																																										
TOTAL OUT-OF-TOLERANCE							7	1	2	4	3	0	0	3	1	6	6	6	2	3	0	8	42	52	TOTAL % IN-TOLERANCE 85%																	
RATING </=4 & OUT-OF-TOLERANCE							1	0	0	0	2	0	0	0	0	1	1	0	0	0	6			11																		
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																																										

LEGEND:

- "Q" Quality Assurance Consultant's Rating
- "D" District's Rating
- "X" Indicates Bridge was Field Viewed by QA and BIS
- "*" Indicates an Item Which should Have Been Coded was Left Blank
- Indicates Item is in Tolerance
- Indicates Item is out of Tolerance
- Indicates Item Changed Following Close Out Meeting

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX E

Example

Table 2: NBIS QA COMPARISON OF OBSERVED SCOUR RATINGS (ITEM IN03)

Cycle 1 District XX-0																							
QA BRIDGE #	STUCTURE BMS NO. 5A01	BRKEY 5A03	DIST./CONSULTANT INSP. DATE 7A01	FIELD VIEWED	CATEGORY	STRUCTURE TYPE 6A26-29	ABUTMENT		PIERS					WINGWALLS				CULVERTS		TOTAL NO. OF SUB UNITS	TOTAL NO. OF SUB UNITS OUT OF TOL.	REMARKS	
							NAB (IN03)	FAB (IN03)	P01 (IN03)	P02 (IN03)	P03 (IN03)	P04 (IN03)	P05 (IN03)	WNL (IN03)	WNR (IN03)	WFL (IN03)	WFR (IN03)	CIN (IN03)	COU (IN03)				
							Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D		Q D
S T A T E S T R U C T U R E S																							
1	XX-XXXX-0430-1899	11111	12/06/16		A2	1 6 6 15			8 8	8 8									2 2	0	Bridge is not over waterway		
2	XX-XXXX-0020-0000	22222	11/14/16		A1	2 1 1 03	5 5	5 5										2 2	0				
3	XX-XXXX-0342-1462	33333	11/17/16		A2	4 2 2 04												0 0	0				
4	XX-XXXX-0041-1320	44444	09/20/16		A1	3 1 9 31										5 5	6 4	2 2	1				
5	XX-XXXX-0020-1288	55555	10/11/16		A1	4 2 2 07	4 6	4 6	4 6	4 6								4 4	4				
6	XX-XXXX-0070-1702	66666	11/21/16		A2	4 2 2 06	7 7	7 7	7 6	6 6								4 4	0				
7	XX-XXXX-0080-2620	77777	11/16/16		A3	3 1 9 31										8 8	8 7	2 2	0				
8	XX-XXXX-0240-0670	88888	09/27/16		A1	2 1 1 03	7 7	7 7										2 2	0				
9	XX-XXXX-0500-1063	99999	12/07/16	X	B1	2 1 1 03	6 8	6 8										2 2	2				
10	XX-XXXX-0010-0403	00000	01/11/17		A1	2 1 1 01	7 7	7 7										2 2	0				
OUT-OF-TOLERANCE (> + / - 1)							2	2	1	1	0	0	0	0	0	0	0	1	22	22	7	% IN TOLERANCE 68%	
STATE BRIDGES FIELD VIEWED WITH BIS = 1																							
L O C A L S T R U C T U R E S																							
11	XX-XXXX-0581-2077	12121	05/20/16		A1	1 6 1 04	8 8	8 8											2 2	0			
12	XX-XXXX-0346-2078	21212	05/11/16		A2	1 9 1 18	8 8	7 7											2 2	0			
13	XX-XXXX-0641-2084	23232	05/11/16		A1	8 6 1 04	4 4	4 4											2 2	0			
14	XX-XXXX-0400-2105	32323	05/19/16		A1	1 6 1 04	4 4	4 4											2 2	0			
15	XX-XXXX-0XX4-2108	34343	05/11/16		A2	1 6 1 04	4 4	2 4											2 2	1			
16	XX-XXXX-0880-0005	43434	09/21/16		A1	1 6 1 04	4 4	4 4											2 2	0			
17	XX-XXXX-0413-0002	45454	06/15/16		A1	2 1 2 03	4 4	4 4											2 2	0			
18	XX-XXXX-0830-0013	54545	06/28/16		A1	4 2 1 07	4 4	4 4											2 2	0			
19	XX-XXXX-0770-0006	56565	07/26/16		A1	8 6 2 04	6 6	6 6											2 2	0			
20	XX-XXXX-0812-0001	65656	07/18/16		A1	2 1 2 03	7 6	7 6											2 2	0			
OUT-OF-TOLERANCE (> + / - 1)							0	1	0	0	0	0	0	0	0	0	0	0	20	20	1	% IN TOLERANCE 95%	
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																							
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1							TOTAL % IN TOLERANCE =															81%	

LEGEND:

- "Q" Quality Assurance Consultant's Rating
- "D" District's Rating
- "X" Indicates Bridge was Field Viewed by QA and BIS
- " * " Indicates an Item Which should Have Been Coded was Left Blank
- Indicates Item is in Tolerance
- Indicates Item is out of Tolerance
- Indicates Item Changed Following Close Out Meeting

APPENDIX E
Example


TABLE 3: NBIS QA COMPARISON OF LOAD RATINGS																												
Cycle 1 District XX-0																												
QA BRIDGE #	STRUCTURE BMS NO. 5A01	BRKEY 5A03	DIST./CONSULTANT INSP. DATE 7A01	CATEGORY	STRUCTURE TYPE 6A26-29	ANALYSIS INFORMATION		OPERATING RATINGS (TONS)																POST REQ'D AS PER DISTR. ORIG. ANALY.	POST REQ'D AS PER DISTR. UPDATED ANALY.	POST REVISED PER ORIG. ANALY. & UPDATED ANALY.	POST REQ'D AS PER QA IND. ANALY.	REMARKS
						AVAILABLE DRAWINGS USED BY QA	PROGRAM	ORIGINAL DISTRICT RATINGS				UPDATED FILE ANALYSIS RATINGS				TONNAGE DIFFERENCE (D-U)				QA INDEPENDENT ANALYSIS RATINGS								
								H	HS	ML80	TK527	H	HS	ML80	TK527	H	HS	ML80	TK527	H	HS	ML80	TK527					
D	D	D	D	U	U	U	U	D-U	D-U	D-U	D-U	Q	Q	Q	Q													
S T A T E S T R U C T U R E S																												
1	XX-XXXX-0430-1899	11111	12/06/16	A2	1 6 6 15	S-7924	Bar7	35.8	56.9	39.9	47.9	34.1	53.1	36.7	44.6	1.7	3.8	3.2	3.3	36.9	64.8	44.2	53.7	N	N	N	N	No Analysis Evaluation Performed The bridge is currently not posted The bridge is currently not posted
2	XX-XXXX-0020-0000	22222	11/14/16	A1	2 1 1 03	S-10138	PS3	36.0	49.5	36.8	44.2	36.0	49.5	36.8	44.2	0.0	0.0	0.0	0.0	36.3	49.4	37.0	44.2	N	N	N	N	
3	XX-XXXX-0342-1462	33333	11/17/16	C2	4 2 2 04	S-1234; S-4567	PS3	47.0	55.8	49.0	54.5	47.0	55.8	49.0	54.5	0.0	0.0	0.0	0.0	44.8	53.1	46.6	51.9	N	N	N	N	
4	XX-XXXX-0041-1320	44444	09/20/16	A1	3 1 9 31	S-123	Bar7	34.9	58.0	39.3	49.1	34.9	58.0	39.3	49.1	0.0	0.0	0.0	0.0	27.2	42.6	30.7	38.3	N	N	N	Y	
5	XX-XXXX-0020-1288	55555	10/11/16	A1	4 2 2 07			75.3	96.8	84.2	95.1	75.3	96.8	84.2	95.1	0.0	0.0	0.0	0.0	77.9	100.1	87.2	98.3	N	N	N	N	
6	XX-XXXX-0070-1702	66666	11/21/16	A2	4 2 2 06			25.7	46.2	31.5	38.9	25.7	46.3	31.6	38.9	0.0	-0.1	-0.1	0.0	21.1	33.1	26.6	31.9	Y	Y	N	Y	
7	XX-XXXX-0080-2620	77777	11/16/16	A3	3 1 9 31			40.5	58.1	44.7	52.8	40.5	58.1	44.7	52.8	0.0	0.0	0.0	0.0	35.5	50.6	39.2	46.0	N	N	N	N	
8	XX-XXXX-0240-0670	88888	09/27/16	A1	2 1 1 03			58.2	72.4	64.9	70.8	N/A	N/A	N/A	N/A	0.0	0.0	0.0	0.0	60.5	77.0	69.3	76.2	N	N	N	N	
9	XX-XXXX-0500-1063	99999	12/07/16	B1	2 1 1 03	Bar7	65.1	90.1	70.8	83.0	65.1	90.1	70.8	83.0	0.0	0.0	0.0	0.0	71.9	97.6	78.2	91.7	N	N	N	N		
10	XX-XXXX-0010-0403	00000	01/11/17	A1	2 1 1 01	Bar7																	% IN - TOLERANCE 69%					
L O C A L S T R U C T U R E S																												
11	XX-XXXX-0581-2077	12121	05/20/16	A1	1 6 1 04		Bar7	17.1	25.1	19.0	22.5	17.1	25.1	19.0	22.5	0.0	0.0	0.0	0.0	31.3	36.6	27.8	33.0	Y	Y	N	Y	The bridge is currently posted for 13T/19T Combination Under Construction - no QA eval. The bridge is currently posted for 18T/28T Combination
12	XX-XXXX-0346-2078	21212	05/11/16	A2	1 9 1 18		Bar7																					
13	XX-XXXX-0641-2084	23232	05/11/16	A1	8 6 1 04			20.0	30.5	22.7	27.2	20.0	30.5	22.7	27.2	0.0	0.0	0.0	0.0	25.4	39.0	29.0	34.7	Y	Y	N	Y	
14	XX-XXXX-0400-2105	32323	05/19/16	A1	1 6 1 04			26.7	41.2	39.9	46.0	26.7	41.2	39.9	46.0	0.0	0.0	0.0	0.0	29.0	43.1	41.0	47.8	N	N	N	N	
15	XX-XXXX-0XX4-2108	34343	05/11/16	A2	1 6 1 04			39.9	57.1	43.7	51.8	40.5	58.1	44.7	52.8	-0.6	-1.0	-1.0	-1.0	35.5	50.6	39.2	46.0	N	N	N	N	
16	XX-XXXX-0880-0005	43434	09/21/16	C1	1 6 1 04			47.2	64.4	57.3	63.1	47.2	64.4	57.3	63.1	0	0	0	0	59.2	80.1	71.1	78.4	N	N	N	N	
17	XX-XXXX-0413-0002	45454	06/15/16	A1	2 1 2 03			65.1	90.1	70.8	83	65.1	90.1	70.8	83	0	0	0	0	71.9	97.6	78.2	91.7	N	N	N	N	
18	XX-XXXX-0830-0013	54545	06/28/16	A1	4 2 1 07			36.1	49.7	36.4	44.1	36.1	49.7	36.4	44.1	0.0	0.0	0.0	0.0	36.3	49.4	37.0	44.2	N	N	N	N	
19	XX-XXXX-0770-0006	56565	07/26/16	A1	8 6 2 04			47.0	55.8	49.0	54.5	47.0	55.8	49.0	54.5	0.0	0.0	0.0	0.0	44.8	53.1	46.6	51.9	N	N	N	N	
20	XX-XXXX-0812-0001	65656	07/18/16	A1	2 1 2 03			51.1	67.5	59.3	66	51.1	67.5	59.3	66	0	0	0	0	72.2	95.4	83.8	93.3	N	N	N	N	
LEGEND:																											% IN - TOLERANCE 56%	


LEGEND:


"Q" QA Independent Analysis Ratings

"D" District's Ratings

"U" QA Updated File Analysis Ratings

 Indicates Item is in Tolerance

 Indicates Item is out of Tolerance

 Indicates Item Changed Following Close Out Meeting

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX E
Example

TABLE 4: NBIS QA COMAPRISON OF INVENTORY DATA																																																								
Cycle 1																																																								
District XX-0																																																								
QA BRIDGE #	STRUCTURE BMS NO.	BRKEY	CATEGORY	TYPE OF SERVICE ON		TYPE OF SERVICE UNDER		APPROACH ROADWAY WIDTH		BRIDGE ROADWAY WIDTH		BYPASS DETOUR LENGTH		NBIS BRIDGE LENGTH		STRUCTURE TYPE				BRIDGE DECK TYPE		MAX SPAN LENGTH		STRUCTURE LENGTH		FRACTURE CRITICAL RATING FACTORS								POSTING STATUS		POSTED WEIGHT LIMIT		POSTED LIMIT COMBINATION		DECK SURFACE TYPE		DECK MEMBRANE TYPE		DECK PROTECTION TYPE		LATITUDE		LONGITUDE		REMARKS						
				5A17		5A18		5C26		5C27		5C15		5E01		6A26-29				6A38		5B17		5B18		6A44-48								VP02		VP04		VP05		5B02		5B03		5B04		5A10		5A11								
				[E]		[E]		[+/- 1 FT]		[+/- 0.3 FT]		[+/- 2 MI] or [10%]		[E]		[E]				[E]		[+/- 1 FT]		[+/- 1 FT]		[E]								[E]		[E]		[E]		[E]		[E]		[+/- 50 FT]		[+/- 50 FT]										
				Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	26	27	28	29	26	27	28	29	Q	D	Q	D	Q	D	44	45	46	47	48	44	45	46	47	48	Q	D	Q	D	Q	D	Q	D	Q	D		Q	D	Q	D		
S T A T E S R U C T U R E S																																																								
1	XX-XXXX-0430-1899	11111	A2	1	1	6	6	19	21	21.8	22.5	1	10	Y	Y	1	6	6	15	1	6	6	15	10	10	40	40	120	120	1	0	0	0	1	1	0	0	0	1	A	A	-1	-1	-1	-1	3	3	0	0	0	0	40.716167	40.716167	-76.517853	-76.517853	
2	XX-XXXX-0020-0000	22222	A1	1	1	5	5	30	37	36.1	37.0	1	2	Y	Y	2	1	1	03	2	1	1	03	10	10	50	50	51	51	9	9	9	9	3	9	0	0	0	*	A	A	-1	-1	-1	-1	6	6	0	0	1	0	39.816110	39.817375	-77.299100	-77.299444	
3	XX-XXXX-0342-1462	33333	C2	1	1	1	6	25	28	22.0	22.0	7	11	Y	Y	4	2	2	04	4	2	2	04	10	10	32	32	66	66	9	9	9	9	3	9	0	0	0	*	A	A	-1	-1	-1	-1	3	3	0	0	0	0	39.224942	39.224942	-77.504039	-77.504039	
4	XX-XXXX-0041-1320	44444	A1	5	5	5	5	21	19	0.0	0.0	5	8	N	N	3	1	9	31	3	1	9	31	00	00	18	18	18	18	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	6	N	0	N	0	N	40.528375	40.528375	-78.376019	-78.376019	
5	XX-XXXX-0020-1288	55555	A1	1	1	5	5	20	20	20.0	20.0	2	5	Y	Y	4	2	2	07	4	2	2	07	10	10	64	65	141	141	9	9	9	9	3	9	9	9	9	1	A	A	-1	-1	-1	-1	1	1	0	0	1	1	39.554289	39.554033	-77.386543	-77.387831	
6	XX-XXXX-0070-1702	66666	A2	1	1	6	6	19	16	18.0	18.0	2	14	Y	Y	4	2	2	06	4	2	2	06	10	10	30	30	78	78	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	1	1	0	0	1	1	40.027100	40.027100	-77.886544	-77.886544	
7	XX-XXXX-0080-2620	77777	A3	1	1	5	5	38	42	39.6	42.3	2	20	Y	Y	3	1	9	31	3	1	9	31	01	01	23	25	25	25	4	2	1	3	3	4	2	1	3	3	A	A	-1	-1	-1	-1	3	2	2	2	1	1	40.222345	40.222345	-78.098213	-78.098213	
8	XX-XXXX-0240-0670	88888	A1	1	5	5	5	20	20	24.0	24.0	2	7	Y	Y	2	1	1	03	2	1	1	03	10	99	36	38	39	39	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	1	1	0	0	1	1	39.999876	39.999876	-77.654567	-77.654567	
9	XX-XXXX-0500-1063	99999	B1	1	1	5	5	37	37	23.5	23.2	2	3	Y	Y	2	1	1	03	2	1	1	03	10	10	21	21	21	21	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	1	1	0	0	1	1	39.008798	39.008798	-78.980000	-78.980000	
10	XX-XXXX-0010-0403	00000	A1	5	5	7	7	39	40	39.4	39.3	1	10	Y	Y	2	1	1	01	2	1	1	01	10	10	45	44	45	45	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	6	6	0	0	0	0	41.045678	41.045678	-78.365420	-78.365420	
OUT-OF-TOLERANCE (Varies, see [])				1		1		6		3		8		0		0					1		2		0		5					0		0		0		2		1		2		2		2										
STATE BRIDGES FIELD VIEWED WITH BIS = 1																																																								
L O C A L S T R U C T U R E S																																																								
11	XX-XXXX-0581-2077	12121	A1	1	1	5	5	17	16	14.5	16.1	1	1	Y	Y	1	6	1	04	1	6	1	04	10	10	34	35	37	36	6	3	6	3	3	6	3	6	3	3	P	P	13	13	19	19	6	6	0	0	1	1	40.272345	40.272345	-78.094213	-78.094213	
12	XX-XXXX-0346-2078	21212	A2	1	1	5	5	22	22	23.0	22.0	4	4	Y	Y	1	9	1	18	1	9	1	18	10	10	32	32	32	32	5	3	6	3	3	5	3	6	3	3	A	A	-1	-1	-1	-1	1	1	0	0	0	0	39.899876	39.899876	-77.657567	-77.657567	
13	XX-XXXX-0641-2084	23232	A1	5	5	5	5	21	22	23.5	23.5	99	2	Y	Y	8	6	1	04	8	6	1	04	10	10	40	40	41	41	3	4	8	8	3	3	3	6	3	3	P	P	18	18	28	28	1	1	0	0	0	0	39.098798	39.098798	-78.698000	-78.698000	
14	XX-XXXX-0400-2105	32323	A1	5	1	5	5	20	20	23.9	24.0	2	4	Y	Y	1	6	1	04	1	6	1	04	10	10	30	34	30	34	3	3	6	3	3	3	3	6	3	3	A	A	-1	-1	-1	-1	6	6	0	0	0	0	41.048678	41.048678	-78.368420	-78.368420	
15	XX-XXXX-0XX4-2108	34343	A2	5	5	5	5	20	20	20.1	20.1	1	1	Y	Y	1	6	1	04	1	6	1	04	10	10	56	56	56	56	6	4	8	8	3	6	4	8	8	3	A	A	-1	-1	-1	-1	0	N	0	N	0	N	40.278345	40.278345	-78.094813	-78.094813	
16	XX-XXXX-0880-0005	43434	C1	5	5	5	5	22	23	22.0	22.0	1	5	Y	Y	1	6	1	04	1	6	1	04	10	10	32	31	33	33	6	4	8	8	3	6	4	6	3	3	A	A	-1	-1	-1	-1	6	6	0	0	0	0	39.889876	39.889876	-77.658567	-77.658567	
17	XX-XXXX-0413-0002	45454	A1	1	1	5	5	33	33	33.0	33.0	1	2	Y	Y	2	1	2	03	2	1	2	03	10	10	32	31	33	33	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	6	6	0	0	1	1	39.088798	39.088798	-78.898000	-78.898000	
18	XX-XXXX-0830-0013	54545	A1	1	1	5	5	13	17	15.8	15.8	3	3	Y	Y	4	2	1	07	4	2	1	07	10	10	44	44	44	44	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	6	6	0	0	1	1	41.048878	41.048878	-78.384200	-78.384200	
19	XX-XXXX-0770-0006	56565	A1	1	1	5	5	20	20	20.7	20.5	1	1	Y	Y	8	6	2	04	8	6	2	04	10	10	20	20	21	21	6	4	8	8	3	6	4	8	8	3	A	A	-1	-1	-1	-1	7	7	0	0	0	0	39.788798	39.788798	-78.838000	-78.838000	
20	XX-XXXX-0812-0001	65656	A1	5	5	6	5	32	32	32.0	32.0	2	2	Y	Y	2	1	2	03	2	1	2	03	10	10	22	22	23	23	9	9	9	9	3	9	9	9	9	3	A	A	-1	-1	-1	-1	6	6	0	0	0	0	41.088878	41.088878	-78.684200	-78.684200	
OUT-OF-TOLERANCE (Varies, see [])				1		1		1		2		3		0		0					0		1		1		0					0		0		0		1		1		1		0		0										
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																																																								
D I S T R I C T T O T A L S																																																								
TOTAL OUT-OF-TOLERANCE				2		2		7		5		11		0		0					1		3		1		5					0		0		0		3		2		3		2		2										
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																																																								

- LEGEND:
- "Q" Quality Assurance Consultant's Rating
 - "D" District's Rating
 - "X" Indicates Bridge was Field Viewed by QA and BIS
 - " * " Indicates an Item Which should Have Been Coded was Left Blank
 - Indicates Item is in Tolerance
 - Indicates Item is out of Tolerance
 - [] Indicates Tolerance Level for that Item, [E] = Exact Coding Req'd
 - Indicates Item Changed Following Close Out Meeting

PennDOT Bridge Safety Inspection-QA Manual Publication 240

APPENDIX E

Example

TABLE 4: NBIS QA COMAPRISON OF INVENTORY DATA (continued)																															
Cycle 1 District XX-0																															
QA BRIDGE #	STRUCTURE BMS NO. 5A01	BRKEY 5A03	CATEGORY	ROAD/ROUTE NAME 5C01 [E]	FEATURE ON/UNDER BRIDGE 5C03 [E]		LANES ON/UNDER 5C08 [E]		MEDIAN TYPE 6C25 [E]	REFERENCE FEATURE 4A18 [E]	MIN LAT UNDER CLEARANCE RIGHT 4A19 [+/- 1 FT]		MIN LAT UNDER CLEARANCE LEFT 4A20 [+/- 1 FT]		HOR CLEARANCE LEFT 6C18 [+/- 1 FT]		HOR CLEARANCE RIGHT 6C19 [+/- 1 FT]		MIN VERT CLEARANCE LEFT 6C20 [+/- 1 FT]		MIN VERT CLEARANCE RIGHT 6C21 [+/- 1 FT]		DEF VERT CLEARANCE LEFT 6C22 [+/- 1 FT]		DEF VERT CLEARANCE RIGHT 6C23 [+/- 1 FT]		TOTAL % IN TOLERANCE AND REMARKS				
					Q	D	Q	D			Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	NO. OUT OF TOL.	NO. ITEMS PER Q/A	
S T A T E S U R E S																															
1	XX-XXXX-0430-1899	11111	A2	I-8 LONG BR NB I-8 LONG BR SB N. BACK ST. 26-NSRC BIG RIVER FIELD RD	1 1 12 12 A A B B C C 1 1	6 6 6 6 3 3 0 0 0 0 2 2	3 3 3 3 0 0 0 0 0 0 0 0	H H		99.9 99.9 99.9 99.9	99.9 99.9 99.9 99.9	51.0 51.0 51.0 51.0 60.8 60.8	51.0 51.0 51.0 51.0 0.0 0.0	99.90 99.90 99.90 99.90 14.16 14.16	99.90 99.90 99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90 14.50 14.50	99.90 99.90 99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90 14.91 14.91	99.90 99.90 99.90 99.90 99.90 99.90	3	63										
2	XX-XXXX-0020-0000	22222	A1	MARSH CREEK BOY RD	2 2 1 1	2 2 2 2	0 0 0 0	N N				- -	- -	21.0 23.5											10	35					
3	XX-XXXX-0342-1462	33333	C2	US 25 (NB) US 25 (SB)	A A B B	2 4 2 4	4 4 4 4		H H	99.9 99.9	99.9 99.9	- -	- -	28.0 28.0 55.9 55.9	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	11	59			
4	XX-XXXX-0041-1320	44444	A1	SR-3347, Burg Rd Marshall Run	1 1 2 2	2 2 2 2	0 0 0 0	N N				55.6 55.6	55.6 55.6	- -	16.33 16.33	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	99.90 99.90 99.90 99.90	5	35		
5	XX-XXXX-0020-1288	55555	A1	CHAMBER RD. APRIL CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	42.3 40.9											6	35					
6	XX-XXXX-0070-1702	66666	A2	US 18 NB US 18 SB	1 1 12 12	4 4 4 4	5 5 5 5	N N				40.0 40.0 40.0 40.0	40.0 40.0 40.0 40.0	40.0 40.0 40.0 40.0											4	41					
7	XX-XXXX-0080-2620	77777	A3	LATE CK. FRONT ST	2 2 1 1	2 2 3 3	7 0	N N				- -	- -	36.0 36.0											6	35					
8	XX-XXXX-0240-0670	88888	A1	MILE RUN SR 3012	2 2 1 1	2 2 2 2	0 0 0 0	N N				- -	24.0	24.0 24.0											6	35					
9	XX-XXXX-0500-1063	99999	B1	FREE RUN SR 1111	2 2 1 1	2 2 2 2	0 0 0 0	N N				- -	- -	24.5 24.5											2	35					
10	XX-XXXX-0010-0403	00000	A1	PACKER RD LAMBEAU RUN	2 2 1 1	2 2 2 2	0 0 0 0	N N				- -	- -	28.9 28.9											1	35					
OUT-OF-TOLERANCE (Varies, see [])					6	1	2	1	0	0	0	0	1	2	0	0	1	0	0	1	0	54	408	% IN-TOLERANCE 87%							
STATE BRIDGES FIELD VIEWED WITH BIS = 1					L O C A L S T R U C T U R E S																										
11	XX-XXXX-0581-2077	12121	A1	ONE RD ONE CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	18.5 18.5											1	35					
12	XX-XXXX-0346-2078	21212	A2	TWO RD TWO CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	20.0 20.0											1	35					
13	XX-XXXX-0641-2084	23232	A1	THREE RD THREE CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	21.5 21.5											1	35					
14	XX-XXXX-0400-2105	32323	A1	FOUR ROAD FOUR CK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	27.0 29.1											5	35					
15	XX-XXXX-0XX4-2108	34343	A2	FIVE ROAD FIVE CK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	23.0 23.0											3	35					
16	XX-XXXX-0880-0005	43434	C1	FIRST ST FIRST CREEK	1 1 2 *	2 2 2 *	0 0 0 0	N N				- -	- -	23.0 22.5											3	35					
17	XX-XXXX-0413-0002	45454	A1	SECOND ST SECOND CK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	24.0 24.0											0	35					
18	XX-XXXX-0830-0013	54545	A1	THIRD ST THIRD CK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	20.3 20.3											1	35					
19	XX-XXXX-0770-0006	56565	A1	FOURTH STREET FOURTH CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	19.5 19.6											0	35					
20	XX-XXXX-0812-0001	65656	A1	FIFTH STREET FIFTH CREEK	1 1 2 2	2 2 2 2	0 0 0 0	N N				- -	- -	18.3 18.0											1	35					
OUT-OF-TOLERANCE (Varies, see [])					1	1	0	0	0	0	0	0	1	3	0	0	1	0	0	1	0	16	350	% IN-TOLERANCE 95%							
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0					D I S T R I C T T O T A L S																										
TOTAL OUT-OF-TOLERANCE					7	2	2	1	0	0	0	1	3	0	0	1	0	1	0	1	0	70	758	% IN-TOLERANCE 91%							
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																															

LEGEND:

"Q" Quality Assurance Consultant's Rating

"D" District's Rating

"X" Indicates Bridge was Field Viewed by QA and BIS

"*" Indicates an Item Which should Have Been Coded was Left Blank

Indicates Item is in Tolerance

Indicates Item is out of Tolerance

[] Indicates Tolerance Level for that Item, [E] = Exact Coding Req'd

Indicates Item Changed Following Close Out Meeting

APPENDIX E

Example

Table 5: NBIS QA COMPARISON OF MAINTENANCE ITEMS																																			
Cycle 1 District XX-0																																			
QA BRIDGE #	STRUCTURE BMS NO.	BRKEY	DIST./CONSULTANT INSP. DATE	FIELD VIEWED	CATEGORY	STRUCTURE TYPE	40-RDPAVMT Pavement (Patch/Raise)	41-RDRLFT Pavement Relief Jt. (Rep/Repl)	46-RDSHLDR Shoulders (Repair/Reconstr)	47-RDDRIN Drainage-Off Bridge (Improve)	27-RDGERL Guide Rail (Connect to Bridge)	70-RDLDSGN Load Limit Signs (Replace)	51-RDCLSGN Clearance Signs (Replace)	24-RDBRUSH Cut Brush to Clear Signs	64-A744201 Approach Slab (Replace)	23-A743101 Clean/Flush Deck	1-B743101 Clean/Flush Scupper/Down spouting	8-C743102 Clean/Flush Bearing/Bearing Seat	34-D743102 Clean/Flush Steel-Horizontal Surfaces	92-BRSHCLR Clean/Flush Brush Clearing	10-BITWRGS Bitum. Deck W. Surf (Rep/Repl)	35-B744301 Timber Deck (Rep/Repl)	37-C744302 Open Steel Grid (Rep/Repl)	6-D744303 Concrete Deck (Repair)	39-E744303 Concrete Sidewalk (Repair)	21-F744303 Concrete Curb/Parapet (Rep)	2-A743301 Joints - Reseal	4-A744101 Joints - Repair/Reseal	33-B744102 Joints - Compression Seal (Rep/Rehab)	53-C744102 Joints - Modular Dam (Rep/Rehab)	20-D744102 Joints - Steel Dams (Rep/Rehab)	9-E744102 Joints - Other Types (Rep/Rehab)			
Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D	Q	D		
1	XX-XXXX-0430-1899	11111	12/06/16	X	A2	1 6 6 15	4 4		4 4	2 2	2 2		3 5			5 5		5 5		5 4		2 2				2 2									
2	XX-XXXX-0020-0000	22222	11/14/16		A1	2 1 1 03	4 3					2 2		3 3					5 5		5 4		2 2				2 2								
3	XX-XXXX-0342-1462	33333	11/17/16		C2	4 2 2 04	4 4					2 2		3 3			5 5						2 2		4 2		3 4			2 2					
4	XX-XXXX-0041-1320	44444	09/20/16		A1	3 1 9 31	3 3			4	2 3			3 3				5 5				4 4				3 3				2 2					
5	XX-XXXX-0020-1288	55555	10/11/16		A1	4 2 2 07	4 4					2 2		3								4			3 3		3 3								
6	XX-XXXX-0070-1702	66666	11/21/16		A2	4 2 2 06				4	2 2			3 3								4				2 2		5							
7	XX-XXXX-0080-2620	77777	11/16/16		A3	3 1 9 31	4 4			4 5		3										4													
8	XX-XXXX-0240-0670	88888	09/27/16		A1	2 1 1 03	4 2					2 2		3						5 3		2 2													
9	XX-XXXX-0500-1063	99999	12/07/16		B1	2 1 1 03																													
10	XX-XXXX-0010-0403	00000	01/11/17		A1	2 1 1 01	4 5					5 5																							
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	2	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0		
OUT-OF-TOLERANCE - PRIORITY CODES**							3	0	0	1	1	0	1	0	0	0	0	0	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
STATE BRIDGES FIELD VIEWED WITH BIS = 1																																			
L O C A L S T R U C T U R E S																																			
11	XX-XXXX-0581-2077	12121	05/20/16		A1	1 6 1 04					2							5 5				3 3													
12	XX-XXXX-0346-2078	21212	05/11/16		A2	1 9 1 18																													
13	XX-XXXX-0641-2084	23232	05/11/16		A1	8 6 1 04					2 2			3 3					4		3														
14	XX-XXXX-0400-2105	32323	05/19/16		A1	1 6 1 04	3 3					2 2						5 5				3 3			2 2										
15	XX-XXXX-0XX4-2108	34343	05/11/16		A2	1 6 1 04					3 3	2 2	2 2																						
16	XX-XXXX-0880-0005	43434	09/21/16		C1	1 6 1 04	2					2																							
17	XX-XXXX-0413-0002	45454	06/15/16		A1	2 1 2 03																4 4													
18	XX-XXXX-0830-0013	54545	06/28/16		A1	4 2 1 07	4					3 3					5 5								3 3										
19	XX-XXXX-0770-0006	56565	07/26/16		A1	8 6 2 04						3 2						5 5				2													
20	XX-XXXX-0812-0001	65656	07/18/16		A1	2 1 2 03						2 2																3 2							
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
OUT-OF-TOLERANCE - PRIORITY CODES**							0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																																			
D I S T R I C T T O T A L S																																			
TOTAL OUT-OF-TOLERANCE - MAINTENANCE ITEMS							0	0	0	2	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL OUT-OF-TOLERANCE - PRIORITY CODES							3	0	0	1	2	0	1	0	0	0	0	0	2	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0
PR CODE = 0 or 1 & OUT-OF-TOLERANCE							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																																			

LEGEND:

"Q" Quality Assurance Consultant's Rating

"D" District's Rating

"X" Indicates Bridge was Field Viewed by QA and BIS

Indicates that Coding of Item Differs between QA and District* **

Indicates that Coding of Item Matches between QA and District* **

* Maintenance Items are considered Out-of-Tolerance Only when QA assigned a Maintenance Item that the District did not

** Priority Codes are considered Out-of-Tolerance Only when Both QA and District assigned a Maintenance Item, but their Coding of that Item differed

Indicates Item Changed Following Close Out Meeting

APPENDIX E

Example

Table 5: NBIS QA COMPARISON OF MAINTENANCE ITEMS (continued)																																		
Cycle 1 District XX-0																																		
QA BRIDGE #	STRUCTURE BMS NO.	BRKEY	DIST./CONSULTANT INSP. DATE	FIELD VIEWED	CATEGORY	STRUCTURE TYPE	7-RLGBRPR Bridge/Parapet (Rep/Repl)	17-RLGSTRM Struct Mount (Rep/Repl)	18-RLGPEDN Pedestrian (Rep/Repl)	58-RLGMEDB Median Barrier (Rep/Repl)	52-DRNGRAT Scupper Grate (Replace)	31-B744401 Drain/Scupper (Install)	14-C744402 Down spouting (Rep/Repl)	66-A743501 Bearings - Lubricate	44-A744501 Bearings - Steel (Rep/Rehab)	61-B744501 Bearings - Steel (Replace)	68-C744502 Bearings - Expansion (Reset)	45-D744503 Bearings - Pedestal/Seat (Reconstruct)	62-A744601 Timber - Stringer (Rep/Repl)	60-B744601 Timber - Other Members (Rep/Repl)	25-A744602 Steel - Stringer (Rep/Repl)	50-B744602 Steel - Floorbeam (Rep/Repl)	49-C744602 Steel - Girder (Repair)	54-D744602 Steel - Diaph/Lat. Bracing (Rep/Repl)	42-A744603 RC/PS - Stringer (Rep/Repl)	69-B744603 RC/PS - Diaphragm (Rep/Repl)	26-C744603 RC/PS - Other Members (Rep/Repl)	36-A744701 Truss - Members (Strengthen/Rep/Repl)	82-B744701 Truss - Portal (Modify)	71-C744702 Truss - Members (Tighten/Flame stop)	57-A743201 Painting - Superstructure - Spot	16-B743201 Painting - Substructure - Spot		
	5A01	5A03	7A01			6A26-29	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D	Q D		
S T A T E S T R U C T U R E S																																		
1	XX-XXXX-0430-1899	11111	12/06/16	X	A2	1 6 6 15		2 3					3 3		3				2 2		3 3				4 4							4 3		
2	XX-XXXX-0020-0000	22222	11/14/16		A1	2 1 1 03																												
3	XX-XXXX-0342-1462	33333	11/17/16		C2	4 2 2 04		2 2	5																									
4	XX-XXXX-0041-1320	44444	09/20/16		A1	3 1 9 31			4 4																	2 2								
5	XX-XXXX-0020-1288	55555	10/11/16		A1	4 2 2 07			2 2				4																					
6	XX-XXXX-0070-1702	66666	11/21/16		A2	4 2 2 06			3																									
7	XX-XXXX-0080-2620	77777	11/16/16		A3	3 1 9 31			4																	3 3								
8	XX-XXXX-0240-0670	88888	09/27/16		A1	2 1 1 03			4																									
9	XX-XXXX-0500-1063	99999	12/07/16		B1	2 1 1 03																												
10	XX-XXXX-0010-0403	00000	01/11/17		A1	2 1 1 01																												
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
OUT-OF-TOLERANCE - PRIORITY CODES**							0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
STATE BRIDGES FIELD VIEWED WITH BIS = 1																																		
L O C A L S T R U C T U R E S																																		
11	XX-XXXX-0581-2077	12121	05/20/16		A1	1 6 1 04														2 2												4 2		
12	XX-XXXX-0346-2078	21212	05/11/16		A2	1 9 1 18																												
13	XX-XXXX-0641-2084	23232	05/11/16		A1	8 6 1 04			3 3													2												
14	XX-XXXX-0400-2105	32323	05/19/16		A1	1 6 1 04																					4 2						4 3	
15	XX-XXXX-0XX4-2108	34343	05/11/16		A2	1 6 1 04			3 3																								4 4	
16	XX-XXXX-0880-0005	43434	09/21/16		C1	1 6 1 04																											4 4	
17	XX-XXXX-0413-0002	45454	06/15/16		A1	2 1 2 03																												
18	XX-XXXX-0830-0013	54545	06/28/16		A1	4 2 1 07			3 3																								4	
19	XX-XXXX-0770-0006	56565	07/26/16		A1	8 6 2 04			3							3 3																	4	
20	XX-XXXX-0812-0001	65656	07/18/16		A1	2 1 2 03								4 2	3 2	3 2																	4 2	
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0		
OUT-OF-TOLERANCE - PRIORITY CODES**							0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																																		
D I S T R I C T T O T A L S																																		
TOTAL OUT-OF-TOLERANCE - MAINTENANCE ITEMS							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0		
TOTAL OUT-OF-TOLERANCE - PRIORITY CODES							0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	
PR CODE = 0 or 1 & OUT-OF-TOLERANCE							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																																		

LEGEND:

"Q" Quality Assurance Consultant's Rating

"D" District's Rating

"X" Indicates Bridge was Field Viewed by QA and BIS

Indicates that Coding of Item Differs between QA and District* **

Indicates that Coding of Item Matches between QA and District* **

* Maintenance Items are considered Out-of-Tolerance Only when QA assigned a Maintenance Item that the District did not

** Priority Codes are considered Out-of-Tolerance Only when Both QA and District assigned a Maintenance Item, but their Coding of that Item differed

Indicates Item Changed Following Close Out Meeting

APPENDIX E

Example

Table 5: NBIS QA COMPARISON OF MAINTENANCE ITEMS (continued)																																
Cycle 1																																
District XX-0																																
QA BRIDGE #	STRUCTURE BMS NO.	BRKEY	DIST./CONSULTANT INSP. DATE	FIELD VIEWED	CATEGORY	STRUCTURE TYPE	65-C743201 Painting - Superstructure - Full	79-D743201 Painting - Substructure - Full	38-A744801 Backwall (Rep/Rep)	28-B744802 Abutments (Repair)	15-C744802 Wing (Rep/Rep)	32-D744802 Piers (Repair)	22-E744803 Footings (Underpin)	19-F744804 Masonry (Repoint)	56-A745101 Abut. Slopewall (Rep/Rep)	43-B745102 Abut. Slopewall (Construct New)	67-A745901 Pile Repair	30-A745301 Stream Bed Paving (Rep/Constr)	13-B745301 Rock Protection	11-C745301 Scour Hole (Backfill)	55-D745302 Stream Deflector (Rep/Constr)	3-ECREVMVG Vegetation/Debris (Remove)	12-ECREMDP Deposition (Remove)	29-A745201 Culvert - Headwall/Wings (Rep/Rep)	63-B745202 Culvert - Apron/Cutoff Wall (Rep/Rep)	48-C745203 Culvert - Barrel (Repair)	TOTAL OUT-OF-TOLERANCE MAINT. ITEMS (PER BRIDGE)	TOTAL OUT-OF-TOLERANCE PRIORITY CODES (PER BRIDGE)	TOTAL MAINTENANCE ITEMS (PER QA)	TOTAL MAINTENANCE ITEMS (PER DISTRICT)	TOTAL % IN-TOLERANCE & REMARKS	
S T A T E S T R U C T U R E S																																
1	XX-XXXX-0430-1899	11111	12/06/16		A2	1 6 6 15				3 3	3 3											3 3		2 2		2 2	0	2	14	14		
2	XX-XXXX-0020-0000	22222	11/14/16		A1	2 1 1 03	2 2	4 4		3 3						3 3			3 3	3 3		3 3				0	2	15	16			
3	XX-XXXX-0342-1462	33333	11/17/16		C2	4 2 2 04			3 3	3 3	1			2 2								4 4	2 4			1	3	12	13			
4	XX-XXXX-0041-1320	44444	09/20/16		A1	3 1 9 31							2 2	2 2					2 2				4 4			1	2	14	14			
5	XX-XXXX-0020-1288	55555	10/11/16		A1	4 2 2 07				3 3									2 2			3 3			2	0	9	9				
6	XX-XXXX-0070-1702	66666	11/21/16		A2	4 2 2 06							3 4						3 3	3 3						2	1	8	8			
7	XX-XXXX-0080-2620	77777	11/16/16		A3	3 1 9 31					4 4								2 2							0	1	6	8			
8	XX-XXXX-0240-0670	88888	09/27/16		A1	2 1 1 03													2 3	2		3	1 1			2	3	7	7			
9	XX-XXXX-0500-1063	99999	12/07/16	X	B1	2 1 1 03							3 3											4 4		4	4	0	0	4	4	
10	XX-XXXX-0010-0403	00000	01/11/17		A1	2 1 1 01				4 4									3 3	3						1	1	5	4			
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	9		94	97	91%	
OUT-OF-TOLERANCE - PRIORITY CODES**							0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0		15	88		83%
STATE BRIDGES FIELD VIEWED WITH BIS = 1																																
L O C A L S T R U C T U R E S																																
11	XX-XXXX-0581-2077	12121	05/20/16		A1	1 6 1 04				2			0						2 2	2							4	1	9	5		
12	XX-XXXX-0346-2078	21212	05/11/16		A2	1 9 1 18																				0	0	0	0			
13	XX-XXXX-0641-2084	23232	05/11/16		A1	8 6 1 04	4 3			3									2 3							1	2	6	8			
14	XX-XXXX-0400-2105	32323	05/19/16		A1	1 6 1 04																	4 3	3		0	3	8	9			
15	XX-XXXX-0XX4-2108	34343	05/11/16		A2	1 6 1 04				3 3									2 2							0	0	7	7			
16	XX-XXXX-0880-0005	43434	09/21/16		C1	1 6 1 04				3									4							2	0	3	3			
17	XX-XXXX-0413-0002	45454	06/15/16		A1	2 1 2 03																				0	0	2	2			
18	XX-XXXX-0830-0013	54545	06/28/16		A1	4 2 1 07							4 4						2	2						3	1	8	7			
19	XX-XXXX-0770-0006	56565	07/26/16		A1	8 6 2 04			3 2	3 2									2 3			3 3				1	4	8	8			
20	XX-XXXX-0812-0001	65656	07/18/16		A1	2 1 2 03													3 3							0	5	7	7			
OUT-OF-TOLERANCE - MAINTENANCE ITEMS*							0	0	0	3	0	0	1	0	0	0	0	0	2	2	0	0	0	0	0	0	11		58	56	80%	
OUT-OF-TOLERANCE - PRIORITY CODES**							1	0	1	1	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0		16	45		64%	
LOCAL BRIDGES FIELD VIEWED WITH BIS = 0																																
D I S T R I C T T O T A L S																																
TOTAL OUT-OF-TOLERANCE - MAINTENANCE ITEMS							0	0	0	3	1	0	1	0	0	0	0	0	2	4	0	1	0	0	0	0	20		152	153	TOTAL % IN-TOLERANCE	
TOTAL OUT-OF-TOLERANCE - PRIORITY CODES							1	0	1	1	0	0	0	1	0	0	0	0	3	0	0	1	1	0	0	0		31	133		87%	
PR CODE = 0 or 1 & OUT-OF-TOLERANCE							0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2				77%	
TOTAL BRIDGES FIELD VIEWED WITH BIS = 1																																

LEGEND:

"Q" Quality Assurance Consultant's Rating

"D" District's Rating

"X" Indicates Bridge was Field Viewed by QA and BIS

Indicates that Coding of Item Differs between QA and District* **

Indicates that Coding of Item Matches between QA and District* **

* Maintenance Items are considered Out-of-Tolerance Only when QA assigned a Maintenance Item that the District did not

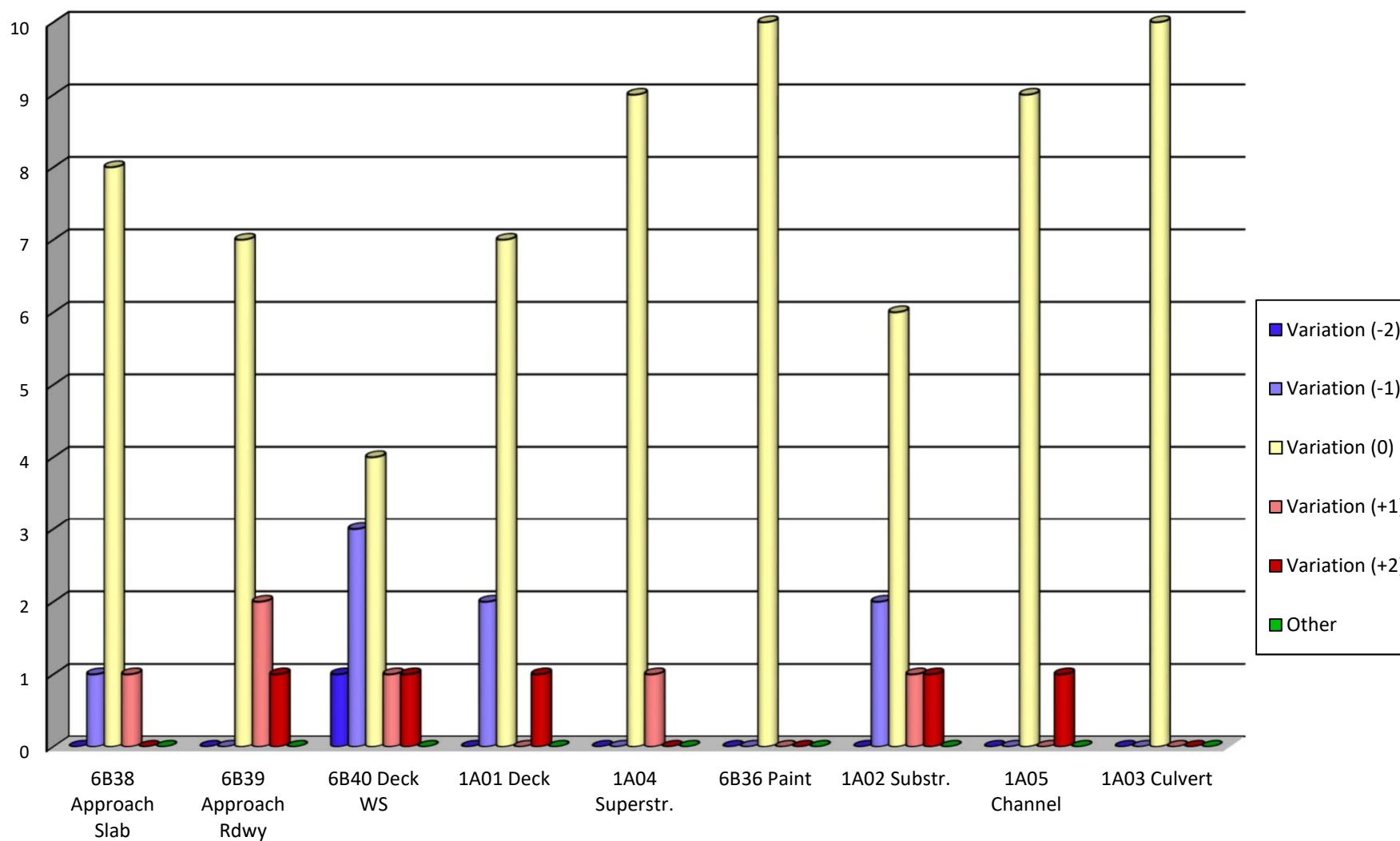
** Priority Codes are considered Out-of-Tolerance Only when Both QA and District assigned a Maintenance Item, but their Coding of that Item differed

Indicates Item Changed Following Close Out Meeting

APPENDIX F

PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM
Frequency In Variation of QA's and District's Condition Ratings
State-Owned Bridges

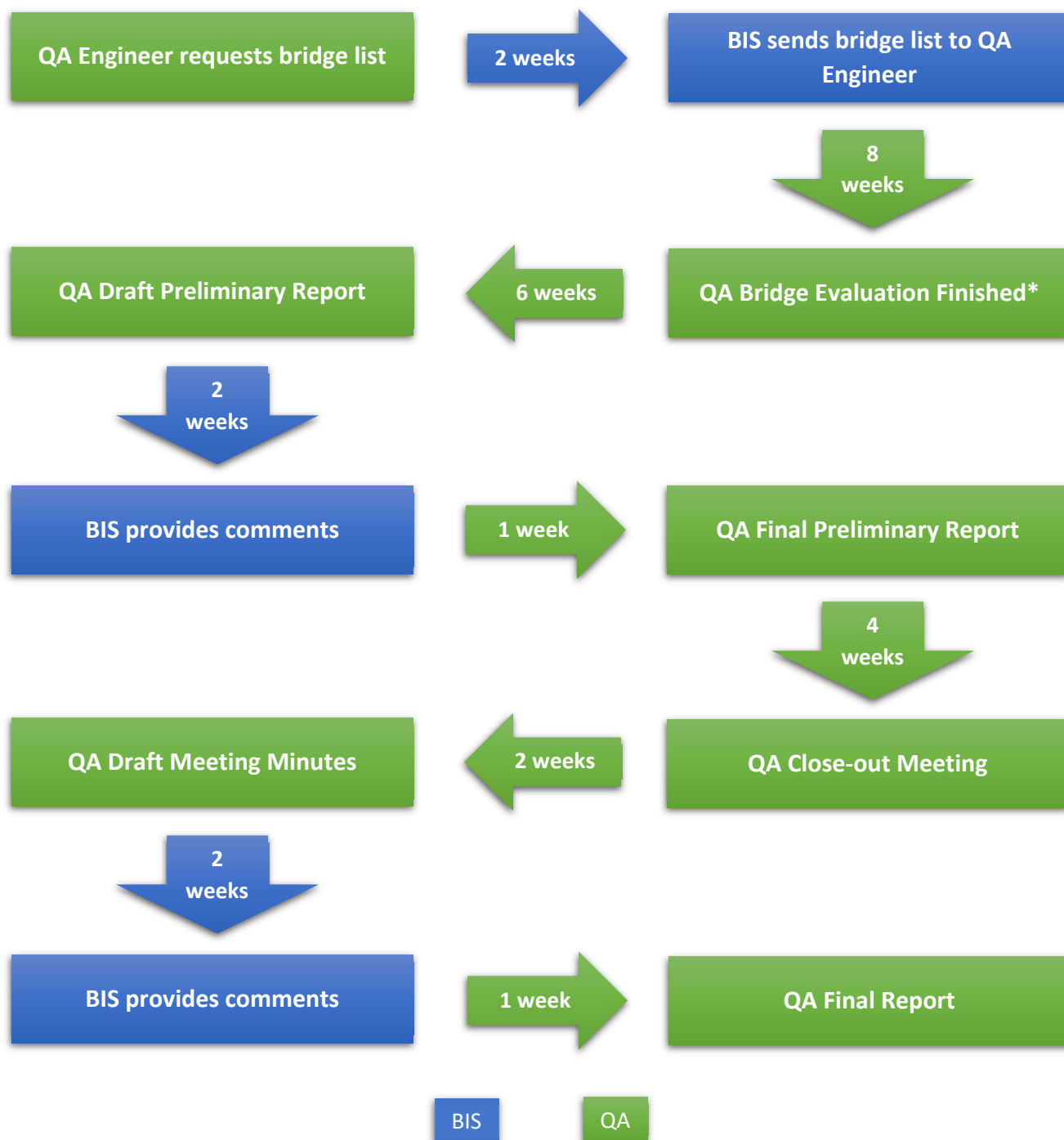
*Note: "+" delta indicates
 District Rating > QA Rating



PennDOT Bridge Safety Inspection-QA Manual Publication 240
APPENDIX G



**PENNDOT BRIDGE SAFETY INSPECTION QA PROGRAM
MAXIMUM TIME PERIOD FLOWCHART GUIDELINE**



*QA Bridge Evaluation includes both the field evaluation and the file review