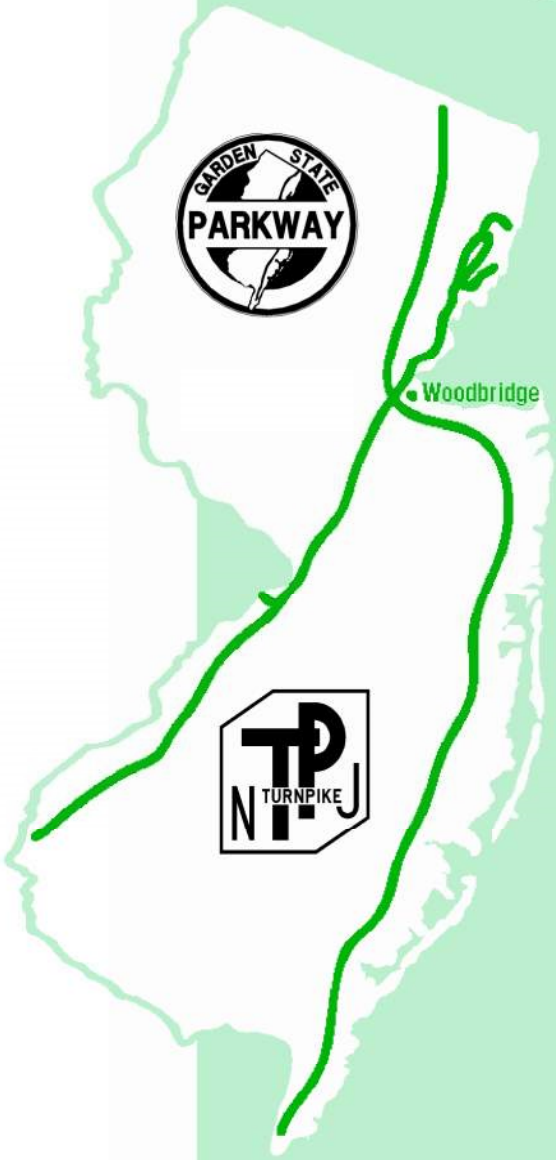
NEW JERSEY TURNPIKE AUTHORITY

GARDEN STATE PARKWAY

NEW JERSEY TURNPIKE



STRUCTURE INSPECTION QUALITY MANAGEMENT PLAN

VERSION 1.0
MAY 2018

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1. PURPOSE

This Quality Management Plan provides overall guidance on the Quality Assurance and Quality Control (QA/QC) procedures implemented as part of the Authority's Structure Inspection Program to meet State and Federal requirements. The Authority's Structure Inspection Program includes regularly scheduled inspections of their structural assets, including but not limited to bridges, culverts, sign structures, retaining walls and noise barriers, high mast light poles and antenna towers. The largest component of the Authority's inspection program is undoubtedly the structural inspection of both routine and major/complex bridges.

Quality Assurance and Quality Control (QA/QC) procedures shall be integrated into all aspects of structure inspection. These procedures contain the requirements needed to confirm that care, skill and diligence has been used to maintain a high degree of accuracy and consistency throughout the inspection program.

The Authority's Structure Inspection Program relies heavily upon the accuracy of the structure inventory and condition assessment information contained in their inspection database. Infrastructure repairs and improvements involving multi-million dollar decisions are made annually based in part on the findings from the structure inspection process. Information obtained during the inspection is used for determining needed maintenance repairs, prioritizing rehabilitations and replacements, allocating resources, and evaluating and improving designs for new structures. The accuracy and consistency of the field inspection and subsequent documentation is vital because it not only impacts programming and funding appropriations, it also affects public safety. Therefore, it is paramount that the data is accurate and consistent.

In order to be successful with the implementation of an overall structure inspection program, the following have been identified as key objectives:

- Clearly definite roles and responsibilities of the Structure Inspection Consultants, the Authority's Structure Inspection Program Technical Manager, and the Authority;
- Open and efficient communication amongst the Structure Inspection Consultants, the Authority's Structure Inspection Program Technical Manager, and the Authority;
- Understanding and prioritization of critical inspection findings;
- Generation of an accurate and complete inventory of Structure Inspection Data, which the Authority can use to maintain their infrastructure in a state of good repair.

The Authority has further established numerous Quality Assurance and Quality Control (QA/QC) procedures to be used to maintain a high degree of accuracy and consistency within the Structure Inspection Program. The procedures that have been identified throughout this document have been established to achieve the following goals:

- Maintain minimum qualifications for inspection and QA\QC personnel;
- Efficiently gather, maintain and share structure information;
- Maintain accurate bridge load ratings which incorporate the latest inspection findings and member deterioration (if applicable);

- Ensure office review and field verification of information and conditions as detailed in structure inspection reports;
- Ensure compliance with the State and Federal requirements;
- Ensure that all Authority-specific defect identification procedures are being correctly followed and implemented;
- Ensure accurate and consistent inspections and reporting of findings for all structures;
- Provide Authority-specific interpretation, evaluation and updating of policy, procedures, and standards;
- Utilize annual Structure Inspection Program workshops and supplemental coaching / training to effectively communicate the needs of the Authority with regards to any ongoing inspection assignments.

This Quality Management Plan is a living document to ensure changes will be issued as warranted because of changes to State or Federal requirements, changes to Authority policy, or changes associated with the inspection of the Authority's structures.

2. BEST PRACTICES

It is important to consider additional practices throughout the course of the project that can help to improve the quality of the work. It is also important to allow for a mechanism for new quality methods and management strategies to be tested for effectiveness prior to widespread use and requirement.

Best Practices may include but are not limited to additional management techniques, inspection means and methods, or independent verification of consultant work that are not directly required by the Authority for structure inspection but have been recognized as having the potential to significantly improve quality. Best Practices afford the Authority the ability to test new quality management and improvement concepts and techniques prior to formal inclusion in the scope of work document. As specific Best Practices are proven to add significant value to the Authority’s Structure Inspection Program through test implementation, they can then be formally added as a requirement within the scope of work document.

The Authority’s Best Practices have been divided into three groups. The first group involves Best Practices that are within the control of the Authority. These practices cannot be implemented directly by the inspection consultant, and must be facilitated by the Authority’s Liaison Engineer (LE). The second group involves Best Practices that can be directly implemented by the Authority's Structure Inspection Program Technical Manager (SIPTM) [formerly known as Bridge Inspection Program Technical Manager]. The third group involves Best Practices that can be directly implemented by inspection consultants throughout the duration of their assignment.

At the discretion of the Authority’s LE, the below practices that are deemed to be applicable to a given inspection assignment shall be discussed with the inspection consultant(s) during the project kick-off meeting for implementation during the project. At

this time, the inspection consultant can be asked to present any additional Best Practices to the LE for consideration.

a. Authority Best Practices

- Annual training workshops – Conduct regular training workshops to educate the inspection consultants currently under contract with the Authority. Workshops allow for an opportunity to review and discuss the Authority's specific policies and procedures in a classroom setting, amongst peers and subject matter experts. The workshops shall ideally occur at the onset of a given contract, such that all information learned or reiterated can be applied to each inspection project. Workshops can include but are not limited to topics such as structure inspection, inspection coding and data entry, or bridge load ratings. Workshops may also include field trips to perform Authority structure inspections in a group environment, or may involve performance of sample bridge load ratings under the supervision of the Load Rating Representative.
- Independent Authority structure inspection field audits (not to be confused with an Inspection Findings Field Review, refer to Section 6.b.) – Perform random and occasional field verifications of inspection findings for structures coded to be in fair or less condition. If deemed necessary by the Authority, a representative from the Authority's SIPTM can also participate in the field audit. This audit would allow for periodic verification of inspection findings for structures that are nearing the end of their service life. The audit will also help to confirm that future for repairs or replacement of a given structure, which would typically be based upon inspection findings, are warranted. Share the structure inspection questions and answers that were brought up during a specific QA Review with the rest of the bridge inspection community by disseminating a FAQ Sheet, in order to help keep all inspectors current.
- Results of QA reviews – Make issues identified during QA Reviews which may require corrective action available to inspection consultants. By sharing those findings that require some level of corrective action, it alerts the inspection community to these issues and shall greatly reduce the likelihood of re-occurrence. It is expected that the subject of the QA Review would take action to prevent any future repeat errors or issues, and would learn from the results of the audit. By sharing these findings, similar benefits and increased focus on the work product can be realized across many consultants. The means of sharing these findings shall be generic in presentation (consultants at fault shall not be identified), and can utilize a wide range of media venues. Information can be shared with only those consultants actively working on Authority projects, or, can be shared with the entire engineering community.
- Follow-up - Provide each structure inspection team leader feedback as to the results of the QA Reviews of their work, so they can better understand the specific areas that might need improvement. Areas of strength for a given Team Leader (TL) shall also be identified during this follow-up, so the TL can better understand how he or she compares with others in terms of their inspection capabilities. Feedback can be provided and shall be formally documented. Formal documentation allows for future comparison of QA Review findings, in order to verify that past issues requiring corrective action do not continue. If deemed necessary by the Authority, a formal meeting between the Authority and the reviewed Team Leader can be requested. For any repeated corrective action (2nd offense following initial finding), the

Authority may enact inspection consultant Disciplinary Action (See Section 8).

b. Structure Inspection Program Technical Manager Best Practices

- Stay current – As a major contributor to the management of quality for the Authority, it is incumbent for this consulting firm to utilize their expertise to keep the Authority's Structure Inspection Program current with regards to technology and practice. This could include presentations or discussions with the Authority Program Manager regarding new methods for structure inspection, data recording, or preparation of structure inspection reports. Such recent advances in structure inspection technology include the potential use of drones for inspection, as well as recording inspection data using laptops or tablets directly from the field (elimination of paper field notes). The SIPTM shall always be in search of ways to improve the Authority's Structure Inspection Program.
- Perform field reviews in teams of two - As discussed later in this Quality Management Plan, field reviews are a part of the SIPTM's roles and responsibilities. While it may be possible for these field reviews to be performed by an individual engineer or inspector, there are added benefits that can be realized if they utilize the services of an assistant. While the primary field review individual will be in charge and responsible for the audit, the presence of a second individual can have the following beneficial results:
  - Additional findings or revelations, perhaps through visual observations or through conversations with the primary reviewer;
  - An opportunity to train and educate additional staff, which could prove useful if field reviews are needed and the primary reviewer is not available;
  - The training and education of additional staff also helps to maintain a seamless transition if staff retire or are promoted to a new position.
- Educate and diversify office QA/QC staff – Similar to the performance of field reviews in teams of two, many benefits can be realized by educating multiple engineers or inspectors to assist with the quality assurance and quality control aspects of the Authority's Structure Inspection Program. In the case of more technical or detailed reviews needed for bridge load rating reports or structure inspection reports, it is critical for multiple staff to be trained in the consistent and proper performance of these reviews. This approach benefits the Authority since it makes more staff capable and available to assist with the review work. Additionally, this benefits the SIPTM consultant, since they are able to diversify their staff and train multiple engineers to perform multiple duties.

c. Structure Inspection Consultant Best Practices

- Independent consultant inspection by a peer inspection team – For projects where an inspection consultant plans to use multiple inspection teams to perform structure inspection, the inspection consultant can propose to have a structure initially inspected by one inspection team, then verified via a second peer inspection team (possibly a sub-consultant inspection team). The peer inspection team shall be another inspection team scheduled to work on that same inspection project. This would allow for all teams involved in a given project to assure that they are consistently assessing, documenting and reporting conditions throughout all structures inspected.
- Promote diversity in structure inspections by using different Team Leaders (TL) or Assistant Team Leaders (ATL) – To minimize or eliminate complacency, utilize different inspection personnel for each cyclical structure inspection. For

bridges, this would require a different inspection team every two years. Ensuring that a given structure is inspected by a different team each cycle provides a “fresh look”, and may help to identify new issues or conditions not previously identified. Based on budget, project size and selected consultant, this may not always be practical.

- Maintain inspection teams of two or more – It is general practice for structure inspections to be performed by a two-person team comprised of a TL and an ATL. However, once arriving on site, the two-person team often works separately, each focusing on specific areas in need of inspection. This can be done for many reasons, such as access limitations, limited time to perform the inspection due to partial or complete roadway closings, efficiency, budget, or consultant workload and available staff. When practical, the inspection consultant can ensure higher quality work by working side-by-side as a team. Working together allows for open discussion of inspection findings, member condition, and structure behavior and may lead to additional findings or realizations by either party. Working together also focuses two individuals on the same area, resulting in a more detailed review of the structure in the field. This type of more thorough inspection is recommended for structures with significant defects, signs of distress, or bridges with low load ratings. This Best Practice will require more time on a per-structure basis, and may be better suited for structures with previously noted deficiencies or other unique features. It shall not typically be expected that all structures in a given inspection contract utilize this means of staffing.
- Maintain consistency from field to office – Utilize the same field inspection staff (TL or ATL) to input field findings and structure coding data into the Authority’s structure database (InspectTech). To ensure consistency between the field and office activities, someone present during the field inspection, and knowledgeable regarding the major findings, shall be used to input the findings.
- Bridge inspection of specific superstructures - For consultants that are utilizing multiple inspection teams to complete a bridge inspection assignment, use of one inspection team to inspect all bridges exhibiting a given superstructure type can be beneficial. Similar bridge types often exhibit similar deficiencies. By assigning one inspection team to all bridges of a given type, that team is given the ability to become an expert in the condition of these bridges. They can more accurately assign coding values to the required elements, and can more easily identify the onset of problems. They may even identify new problems that had previously been overlooked. Since bridge inspections are sometimes grouped in terms of bridge location, this Best Practice may not always be possible.
- Imitation First Cycle Structure Inspection – Inspection teams are expected to review the previous cycle inspection report prior to conducting the field inspection. In nearly all cases, structure inspection is performed in the field by reviewing and verifying the previous notes. This can sometimes lead to complacency, with a tendency to agree with the previous consultant's findings. During a small number of structure inspections for a given assignment, the inspection shall be performed without directly reviewing and verifying the previous field notes. After the independent inspection, the inspection team shall review the current inspection file notes and the previous inspection report while still in the field to ensure all previous noted conditions have been verified. This best practice would eliminate the chance of inspectors quickly and perhaps mindlessly verifying the previous noted conditions, and shall result in

an improved work product.

- Quality Control during field inspection is often more difficult to perform and document. Typically, two individuals perform inspection of a structure, and no one from that inspection team or inspection consultant returns to the structure to verify findings. It is reasonable to assume that field verification by the QC Engineer for every structure inspected as part of a given assignment would be extremely excessive and not supported by the available budget. However, some minimal level of field quality control is advisable for several reasons. First, reviews by another individual can help to ensure consistency in coding across all structure types and physical conditions. Secondly, independent reviews of all inspection teams working on a given assignment can help to ensure consistency in coding and assessment of physical condition between individual inspection teams. The data gathered during a structure inspection is valuable, since it serves as the foundation of program planning and allocation of financial resources.

3. DEFINITIONS

Assistant Team Leader (ATL) – An individual supporting the Team Leader with planning, preparing, and performing field inspection of a given structure. (Refer to Authority Main Bridge Inspection Program Qualifications of Key Personnel)

Audit Statement – A formal statement issued by the Authority's Program Manager or Liaison Engineer indicating repeated errors associated with a structure inspection contract, and resulting in possible Disciplinary Action.

Corrective Action Plan – A plan prepared by an inspection consultant representative, in response to an Audit Statement, which includes a recommended step-by-step process to correct the previously noted error(s) in the Audit Statement.

InspectTech - A comprehensive web-based program utilized by the Authority for storing data related to structure inspection, maintenance, and management of infrastructure assets. This product is maintained by Bentley Systems, Incorporated, and is currently used to record inspection findings, generate inspection reports, and transmit bridge inventory and condition data to NJDOT and FHWA.

Liaison Engineer (LE) - The Authority's employee responsible for assisting the Program Manager to establish and implement all aspects of the Authority's Structure Inspection Program to ensure adherence to Federal and State inspection criteria, laws, codes, standards and regulatory requirements. The LE coordinates with the Structure Inspection Program Technical Manager and Structure Inspection Consultants to evaluate and resolve any inspection and/or reporting issues. Each structure inspection contract has an assigned LE who helps to manage the project, including the scope of work and budget.

Load Rating - The determination of the live load carrying capacity of a bridge's primary members using As-Built plans and supplemented with information gathered from a field inspection.

Load Rating Engineer (LRE) - An engineer from SIC satisfying the requirements of Section 2.2 of the Authority's Load Rating Manual, and who is responsible for performing bridge load ratings.

Load Rating Representative (LR Rep) - An individual supporting the Authority's Structure Inspection Program from the SIPTM by providing expert technical support to the Authority and bridge inspection consultants regarding all aspects of bridge load ratings.

Load Rating Reviewer (LRR) - A professional engineer in the State of New Jersey from SIC satisfying the requirements listed in the Authority's Load Rating Manual and tasked with supervising bridge load ratings, including detailed reviews of all work, and signing and sealing of the load rating summary sheets.

MPT - Vehicular traffic control in order to maintain a safe work site which may include arrow boards, message signs, traffic attenuator vehicles, etc. in accordance with MUTCD and NJTA regulations.

NJTA Load Rating Manual - A supplement to the AASHTO Manual for Bridge Evaluation which contains agency-specific guidance regarding the performance of Load and Resistance Factor Ratings (LRFR) for Authority bridges.

Personal Protective Equipment (PPE) - The minimum personal equipment required to perform structure inspections for the Authority. Required equipment includes a reflective vest, hard hat, safety glasses and hard-soled work boots. Additional equipment, including but not limited to a full-body harness, safety gloves, or flotation device, may be required based on the type of inspection being performed.

Program Manager (PM) - The individual responsible for establishing and implementing all aspects of the Authority's Structure Inspection Program to ensure adherence to Federal and State inspection criteria, laws, codes, standards and regulatory requirements. The Program Manager provides overall leadership to the Structure Inspection Program Technical Manager and Structure Inspection Consultants.

Project Manager (PRM) – The individual responsible for all aspects of the project including planning, procurement and execution. Also serves as a representative to the Authority and implementation of the Authority's Structure Inspection Program to ensure adherence to Federal and State inspection criteria, laws, codes, standards and regulatory requirements. (Refer to Authority Main Bridge Inspection Program Qualifications of Key Personnel)

Quality Assurance (QA) - The use of sampling and other measures to assure the adequacy of quality control procedures and to verify or measure the quality level of the entire bridge

inspection and load rating program. QA involves select reviews of a portion of the work product to ensure that QC was adequately performed.

Quality Assurance Engineer (QAE) - A qualified employee of the Structure Inspection Consultant who is responsible for verifying and maintaining qualification and training records of all project staff, and who also ensures that all required quality control reviews have been conducted on consultant work products. (Refer to Authority Main Bridge Inspection Program Qualifications of Key Personnel)

Quality Assurance Review Team (QA Review Team) - A review team which consists of the Authority Liaison Engineer and the Structure Inspection Program Technical Manager Quality Manager and who together are responsible for performing an inspection findings field review.

Quality Control (QC) - Procedures that are intended to maintain the integrity of a bridge inspection and load rating at or above a specified level. QC involves the detailed review of all work performed in order to verify accuracy prior to formal submission.

Quality Control Engineer - A qualified employee of the Structure Inspection Consultant who is responsible for performing detailed reviews of all work products, such as field work, submitted reports, and additional duties. (Refer to Authority Main Bridge Inspection Program Qualifications of Key Personnel)

Quality Control / Quality Assurance Plan (QAQCP) - A project-specific plan prepared by a Structure Inspection Consultant that identifies the roles and responsibilities of project staff, defines specific processes to be followed, and serves as an overall guidance to ensure quality work.

Quality Management Program - A general structure for quality management implemented by a consulting firm to aid in the adequate and efficient completion of any number of project types. This plan is generally understood to be an in-house guide to the performance of work to ensure the highest levels of quality.

Quality Manager (QM) - A qualified employee of the consulting firm acting as the Structure Inspection Program Technical Manager who is responsible for either performing multiple types of reviews of a given Structure Inspection Consultant's work, or supervising those reviews performed by other SIPTM staff.

Structure Inspection Consultant (SIC) - A consulting firm under contract to provide structure inspection, reporting, bridge load ratings, or other inspection related services to the Authority.

Structure Inspection Program – The Authority's comprehensive structure inspection program that includes regularly scheduled inspections of their numerous structural assets in accordance with Federal and State regulations. Assets inspected as part of this program

include but not limited to bridges (Routine and Major), culverts, sign structures, retaining walls and noise barriers, high mast light poles and antenna towers.

Structure Inspection Program Technical Manager (SIPTM) - The consulting firm contracted to assist the Authority by providing additional oversight of the Authority's Structure Inspection Program, and who has been assigned or delegated the duties and responsibilities for some level of quality assurance regarding structure inspection, reporting, load rating and structure report submissions. The SIPTM provides overall guidance to the inspection consultants.

Team Leader (TL) - Individual in charge of an inspection team who is responsible for planning, preparing, and performing field inspection of a given structure (Refer to Authority Main Bridge Inspection Program Qualifications of Key Personnel). The TL is accompanied by at least one Assistant Team Leader.

4. ROLES AND RESPONSIBILITIES

The overall responsibility for Quality Assurance and Quality Control (QA/QC) activities rests with the Structure Inspection Consultants (SIC). Involvement by the Authority's Program Manager (PM) and the Structure Inspection Program Technical Manager (SIPTM) allows for additional oversight to minimize errors or poor-quality work. See below for a detailed description of roles and responsibilities:

a. New Jersey Turnpike Authority

Program Manager (PM): The PM shall be an Authority employee who has the overall responsibility for establishing and implementing the QA/QC activities applicable to the Structure Inspection Program. The PM oversees the work done by the SIC, and primarily relies upon the services of the SIPTM to verify that all aspects of the structure inspection program adhere to Federal and State inspection criteria, laws, codes, standards, and regulatory requirements.

The PM is responsible for receiving findings from the Quality Manager and Load Rating Representative and acting on those findings. Action could include enforcement of corrective measures, completion of omitted tasks, consultant Disciplinary Action, or any other identified remedy. If corrective measures are needed by the SIC, the PM shall be responsible for mandating the use of those corrective measures.

Liaison Engineer (LE): The Liaison Engineer is an Authority employee who performs management and coordination duties for a given structure inspection assignment. The LE coordinates with the inspection consultant prior to the start of work, arranges for kick-off meetings or future meetings, supervises progress, monitors schedule and budget, and makes determinations regarding the need for potential out-of-scope work. Many of the tasks of the LE require support from the SIPTM.

The LE coordinates with the SIPTM support staff throughout the course of the assignment to ensure all work is being done in accordance with Authority, Federal, and State requirements. In some cases, the SIC may intend to coordinate and contact only the LE. The LE shall clearly state the methods of communication and entities to be included at the onset of the project. If the LE choses to allow the SIC to contact only the LE throughout the assignment, the LE then assumes the responsibility of coordinating directly with the SIPTM support staff on all necessary topics. A key role of the LE is to ensure that all required parties are kept apprised throughout the course of their assignment. Involvement of the Authority's SIPTM will result in a more efficient work flow and higher quality work product.

b. Structure Inspection Program Technical Manager

Quality Manager (QM): The QM shall be an employee of the Authority's consulting firm serving as the SIPTM. The QM shall be responsible for verifying that inspection procedures, gathered data, and prepared reports are in accordance with Authority, State, and Federal requirements. Verification is done through cursory reviews of a given work product. The scope of work for the SIPTM shall specifically define the types and number of reviews to be performed. Findings of the QA Reviews, including non-compliance, shall then be summarized and presented to the Authority LE for assessment and determination of next steps. Unless otherwise noted, those reviews shall include structure inspection findings, data entry into NBI and Element Inspection Forms, proper use of InspectTech, structure inspection report reviews, and bridge load rating report reviews. The QM is also responsible for maintaining the master inspection and report submission schedule, and working with inspection consultants to assist with adherence to that schedule. The QM performs annual structure inspection field audits, responds to questions, and requests for assistance from the inspection consultants, and may be asked to assist with any number of additional tasks by the Authority PM / LE.

The majority of the above noted reviews are typically performed by specialized staff such as the Team Leader or Load Rating Representative. While the QM may also perform some or all of the above noted duties, it is more likely that the QM will serve as the overall manager of all SIPTM staff supporting the Authority's Structure Inspection Program.

Load Rating Representative (LR Rep): The Load Rating Representative shall be an employee of the Authority's consulting firm serving as the SIPTM, and is designated in Appendix A2 of the Authority's Load Rating Manual. The LR Rep serves as the technical expert in the field of bridge load ratings, and provides many technical services to the Authority and their Structure Inspection Program. Services include detailed reviews of select bridge load ratings or bridge load rating updates, guidance regarding proper use of load rating software, performance of technical training seminars, maintenance, and update of the Authority's master listing of bridge load ratings, annual updates to the Authority's Load Rating Manual,

and any other bridge load rating related service. The LR Rep also provides additional technical support and As-Designed bridge load rating reviews done by design consultants. The scope of work for the SIPTM shall specifically define the types and number of reviews to be performed. While the LR Rep assists in the maintenance and upkeep of the Authority's bridge load rating program, LR Rep's effectiveness is heavily reliant on effective coordination by both the Authority's PM and LE. It is critical for the PM and LE to engage the LR Rep on load rating related items to ensure accuracy, consistency, and completeness of work performed.

c. Structure Inspection Consultant

Quality Control Engineer / Project Manager: The Quality Control Engineer / Project Manager shall be an employee of the Authority's Structure Inspection Consultant (SIC) and is responsible for the review of field work, submitted reports, and additional duties as detailed below:

Field Work: The QCE is required to perform field evaluations of all inspection teams as detailed in Section 7.b of this Quality Management Plan. The QCE is responsible for documenting the field evaluations through the use of a QCF 2 – Consultant Field Checklist, as shown in Appendix A.

Structure Inspection Reports: The QCE shall perform a detailed review of all structure inspection reports. The reviews shall include but not be limited to the report content, critical findings, NBI coding, Element Level Inspection data, photographs, bridge load rating data (if applicable), report format, and conformance to all applicable requirements and standards. Increased scrutiny shall be applied to the review of all inspection reports that have an assigned and / or downgraded numerical coding of 5 or below for NBI Items 59 (Deck), 59 (Superstructure), 60 (Substructure) or 62 (Culvert).

The QCE’s review of the structure inspection reports will at a minimum, consist of the following:

- Overall review of the Inspection report for accuracy (ensure that the correct format has been used, all required information has been entered and all required documents have been uploaded);
- Review that all information has been correctly entered in accordance with the FHWA Coding Guide, The Recording and Coding Guide for the Structural Inventory and Appraisal of New Jersey Bridges, and the Authority’s format and requirements. This review will include but not be limited to a check that proper coding conventions, format, significant digits, or correct units have been used;
- Check that all NBI and Element Level Inspection coding directives as posted on the Authority’s website have been addressed: (http://www.njta.com/doing-business/ps-reference-material);
- Check that the Condition Ratings for Items 58 through 62 are consistent with the condition states of each element;

- Check that there is adequate documentation for element level condition states of 3 or higher;
- Check that proper documentation was incorporated into the inspection report for any changes that may have occurred since the previous NBI data was coded (previous inspection);
- Check that all photographs and/or sketches have been properly descripted and cross referenced to the inspection report;
- Check that there is consistency of information between the current inspection report and previous inspection reports, as well as the Diving Report, FCM report, and/or Load Rating Report, if applicable;
- For first cycle Inspections, cross reference the NBI inventory data and Element Inspection data including, elements and quantities, with the As-Built plans to ensure that the data is consistent;
- For every inspection report, verify that a set of inventory photos have been taken and included in the report and saved in the database;
- For every routine inspection, the element level inspection data shall be reviewed for accuracy, including all elements, defect codes and condition states;
- Upon completion of data entry for each structure, verify that the required documents have been correctly uploaded or input in InspectTech.

Load Rating Reviewer (LRR): An employee of the Authority's Structure Inspection Consultant who satisfies the requirements specified in the Authority's Load Rating Manual. The LRR is responsible for performing a thorough review of all bridge load rating deliverables, including load rating calculations, bridge load rating models, and any revisions to existing load rating files. The LRR shall be a Professional Engineer in the State of New Jersey and is responsible for signing and sealing the load rating summary sheet for new or updated bridge load ratings.

Quality Assurance Engineer (QAE): The Quality Assurance Engineer shall be an employee of the Authority's Structure Inspection Consultant and shall have the responsibility to assure that all aspects of the structure inspection contract adhere to Authority, Federal and State requirements. QAE responsibilities include but are not limited to assurance that the inspection staff is qualified and properly trained, their performance meets acceptable standards, and their inspections, inspection reports, load rating reports and data entry are completed accurately and within the permitted time frame. It is preferred that the QAE and QCE consist of different personnel, QAE and QCE can be the same person under extreme circumstances and with approval of the Authority.

The QAE will verify that the required quality control reviews have been properly performed throughout the duration of the project. Following this verification, the QAE will complete QCF 13 - Consultant's Quality Assurance Checklist in Appendix A verifying that the specified report(s) have been thoroughly reviewed and accurately represent the current condition of the structure(s). This individual shall be responsible for the overall quality of a given inspection assignment.

The Inspection Consultant's QAE will also be required to assure that all inspection personnel satisfy the specific requirements for their position.

The QAE shall maintain a current list of all qualified structure inspection personnel with their current personal data regarding professional titles, education, experience, certifications, and additional training. The QAE shall provide this current list to the Authority's SIPTM prior to the start a given assignment, with additional information as required on the form titled "QAF 7 – Tech. Manager Qualifications Review Checklist". This form can be found in Appendix A.

Team Leader (TL): The Team Leader is the individual in charge of an inspection team and is responsible for all aspects of structure inspection, including inspection planning, performance, and documentation of findings. The TL is responsible for a visual verification of the ATL findings at the time of the inspection including accuracy and integrity of all documentation. The TL also generates inspection reports, makes repair recommendations and is responsible for communicating with SIC project manager regarding critical findings and such findings shall be reported to the Authority by SIC project manager. The TL is required to submit daily email documentation to the Authority's LE and a representative of the SIPTM. The email shall detail the inspection plan for the inspection team for that day, and include the OPS number, structure(s) being inspected, the presence of MPT or equipment, and details regarding the type of inspection and planned location of the inspection team while inspecting the structure(s). Each structure inspection TL is responsible for certifying that all work was performed in accordance with the QC procedures contained in their project specific scope of work. The TL shall not serve as QAE or QCE under the same project.

Assistant Team Leader (ATL): The Assistant Team Leader is under the direct supervision of the TL, and works together with the TL to complete the structure inspection. All aspects of the duties assigned to the ATL shall be checked by the responsible TL. Typical duties include assisting the TL with inspection planning, performance, and documentation of findings.

5. NJ TURNPIKE AUTHORITY QUALITY ASSURANCE

Representatives of the Authority will perform quality assurance reviews on work performed by both the Structure Inspection Program Technical Manager (SIPTM) and the Structure Inspection Consultant (SIC).

Critical Findings: Any condition deemed a critical finding shall be reported directly and immediately to the Authority. Once the deficiency is confirmed as a critical finding (Currently Category A, Priority 1, or Vertical Underclearance Posting), a report shall be issued through InspectTech by the SIC. The critical finding moves through a predetermined workflow in InspectTech involving the Authority's Engineering and Maintenance Departments.

Once a year, a Quality Assurance Review will be conducted on the SIPTM. This review will be performed at the SIPTM's office, and will be immediately followed by a discussion of findings.

Office Review: During this review, the Authority's Program Manager (PM) or their elected representative will conduct a comprehensive office review of the Quality Assurance process used by the SIPTM. The Quality Assurance office review will focus on the overall completeness and accuracy of the Quality Assurance review and associated documentation generated by the SIPTM. The Authority will review the SIPTM's identification, resolution, and follow-up of any discrepancies or corrective actions identified during their field reviews of the SIC. Verification of complete, accurate, efficient, and professional work by the SIPTM will also be performed. The completed QAF 11 – Office Review Checklist in Appendix A generated by the SIPTM may be reviewed to ensure consistency among all correspondence. If questions are raised by the Authority for any structure that cannot be resolved in an office setting, a supplemental site visit and structure field review may be needed. The Authority will specify the need for this additional field review of the SIPTM at the conclusion of the office review. If needed, this additional structure site visit will include presence by the Authority PM or representative, the SIPTM, and possibly the Team Leader of record for that structure. Any questions or discrepancies identified by the Authority during either the office review or supplemental field review will be conveyed to the SIPTM for review and potential corrective action (See QAF 6 Authority Review Form in Appendix A).

Field Review: In addition to the SIPTM quality assurance review, the Authority's Liaison Engineer, together with the SIPTM and the SIC Team Leader of record will conduct a re-inspection of one structure in a given inspection contract. See the Inspection Findings Field Review discussion (Section 6.b.) for additional details pertaining to this review.

Report Review: Upon submittal of the final reports, the LE shall verify that all comments made by the SIPTM during draft report reviews were incorporated into the final report and or justification made as to why the comment weren't addressed. The report itself shall serve as the comment resolution document.

Once all the reviews are complete, the LE will schedule a close-out meeting with the PM to cover the findings and any recommendations for improvement. The QM is encouraged to join. Issues to be covered include how the inspection results on selected structures compare with QA findings. The comparison will focus on appropriate assignment of elements, reasonable consistency with element conditions, states, and the NBI condition ratings. Specific limits for the expected consistency between the two inspections shall be discussed. Every effort will be made to define the results quantitatively. For example, document the number of errors per structure inspection when compared to the Quality Assurance review; document the number of coding errors per submission; document the

number of errors or omissions per review by the Quality Control review process; document the number of folders missing data for load rating or load posting calculations. An important item for discussion is to identify the sources of discrepancies and solutions. Another item for discussion is whether the recommended follow-up actions have been addressed which repairs can be done by in-house maintenance crews, which will need a maintenance contract for greater rehabilitation, and which will require structure replacement.

6. STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER QUALITY ASSURANCE

a. Qualification Review

All individuals intending to perform work under the Authority's Structure Inspection Program shall complete QAF 7 – Tech. Manager Qualifications Review Checklist (See Appendix A). This form lists the requirements for common roles on structure inspection assignments, and is required to be completed prior to start of work and submitted at the scheduled kick off meeting.

Qualification requirements and Authority-approved training courses for key personnel performing structure inspection can be found via the following link: http://www.njta.com/media/3561/njta-bridge-inspection-program_rev-oct2011.pdf

Qualification forms will be reviewed and only properly qualified individuals will be permitted to perform work for the Authority. The Structure Inspection Consultant's Quality Assurance Engineer will collect and maintain supplemental certification training records for all assigned staff and will provide this information, along with completed QAF 3 Forms, to the Authority's Structure Inspection Program Technical Manager for review and approval. It is the responsibility of the SIPTM to review the completed forms and supplemental information including years and type of experience, training completed, and certifications / registrations and determine whether the proposed individual is qualified for the proposed role. Following review, the SIPTM will notify both the Authority and the Structure Inspection Consultant regarding approvals or disapprovals for each individual reviewed.

Individuals who do not satisfy the Authority's requirements will be disapproved by the SIPTM and will be restricted from performing any work in the specified role for the Authority. Disapproved individuals can become reapproved by ensuring that all the necessary requirements for their intended role are satisfied, as specified on Form QAF 3. Once the deficient requirements are satisfied, the individual shall update and resubmit the QAF 3 Form to the SIPTM. In some cases, attendance in required training courses may be lacking, and enrollment and completion could result in approval. Disapproved Structure Inspection Consultant individuals shall coordinate with the SIPTM to ensure that actions taken to correct the disapproval will be sufficient prior to engaging in those actions (training, certifications, etc.).

The SIPTM will review qualifications for all proposed staff on all structure inspection assignments. Consultants found to have performed any work for the Authority with individuals not currently qualified by the SIPTM will be subject to Structure Inspection Consultant Disciplinary Action, explained later in this document.

b. Field QA Review

Field QA reviews are an important part of any structure inspection quality management plan and will be conducted by the Structure Inspection Program Technical Manager. These reviews evaluate all aspects of a structure inspection, including but not limited to the consistency and accuracy of component ratings, element data, adequacy of photographic documentation and notes, recommended maintenance actions, and critical findings. The field review also includes a performance review which evaluates the processes used to conduct the inspection. A SIC's performance is assessed through review of their inspection equipment, methods of access, maintenance and protection of traffic and safety of the inspection team throughout the inspection process.

Consultant Practice Field Review: A Consultant Practice Quality Assurance Field Review is conducted by the Structure Inspection Program Technical Manager (using a team of two) and may be scheduled or unscheduled. In most cases, members of the inspection team shall not be given any prior knowledge of the review. Therefore, Team Leaders are required to keep the SIPTM informed of the team's current location and proposed schedule by means of daily email notifications. The time needed to perform field review depends on several factors, such as the experience of the team, organization of the team, the type of structure being inspected, whether or not the inspection team is in a lane / shoulder closing, or is utilizing a short duration closing to perform the inspection. The results of the field review, including supplemental notes or comments on the inspection team, shall be documented on the QAF 1 – Consultant Practice Field Review Checklist (See Appendix A).

This review shall document the structure, specific location, names of inspectors, arrival time, proper use of equipment, safety practices, on site availability of resources to conduct the inspection, access methods, MPT and the quality and thoroughness of each inspection team's activities.

Safety is a vital element in the Authority's structure inspection program. The structure inspections ensure safety of the traveling public, and must be performed in a way that ensures the safety of the entire bridge inspection team. With this in mind, field reviews shall include a review of the team's compliance with the Authority safety requirements as well as all applicable state and federal safety regulations. This is also a suitable time to discuss current safety issues and overall safety awareness with the team.

After each Consultant Practice Field Review, the SIPTM shall complete a QAF 9 - Field Review Findings and Recommendations Form (See Appendix A) and submit it to the Authority for review. If it's determined that review of an inspection team is unsatisfactory to the Authority, SIPTM will conduct another unannounced field review on that particular inspection team within 30 days of receiving notification from the Authority. If an inspection team receives two consecutive unsatisfactory reviews, it may become grounds for Disciplinary Action (Refer to Section 8 for details).

Inspection Findings Field Review: An Inspection Findings Quality Assurance Field Review shall be an independent inspection conducted by a Quality Assurance review team composed of the Authority's Liaison Engineer and a representative of the SIPTM. The Inspection Findings Field Reviews will be conducted on an annual basis, and is intended to allow for both the Authority and the SIPTM staff to stay informed with the current condition of the Authority's structures. These reviews will be on a select number of bridges based upon the following considerations:

- The suggested number of reviews shall be one each annually for routine bridges, sign structures, retaining walls, high mast light poles and antenna towers, and one annually per major bridge inspection contract. Due to the size and number of spans for the major bridges, a representative span, ideally including fracture critical members, shall be selected for field review.
- Structures selected for inspection findings field review shall typically satisfy one or more of the following criteria:
    1. Structures on the critical follow-up list or having a status requiring follow-up action;
    2. Structures with urgent or critical maintenance recommendations;
    3. Bridges with load restrictions or implemented load posting;
    4. Structures that have temporary repairs in-place;
    5. Structures that are in need of rehab / replacement actions;
    6. Structures where inspections are beyond the due date;
    7. Structures that contain complex or unusual structural details.

Inspection Findings Field Review Preparations: In preparation for the field review, and in order to assure that the review is as thorough as possible, the team shall have the following items on hand:

- A copy of all relevant structure plans (including rehabilitations and modifications, if present);
- A copy of all appropriate supplemental reports to assure that all supplemental information has been integrated into the routine inspection report;
- Inspection Findings Field Review Checklist – QAF 8 – Inspection Findings Field Review Checklist (See Appendix A);
- The previous cycle structure inspection report;
- Proper inspection and safety equipment.

Performing the Inspection Findings Field Review

- Step one: The QA review team will perform an independent inspection, with a focus on the following specific areas:
    - The NBI data used to calculate the Sufficiency Rating;
    - The NBI element condition ratings;
    - The element list for the bridge and their quantities;
    - Remarks to help clarify the condition rating information;
    - Maintenance recommendations.

  The structure inspection information is documented, then discussed upon completion of the independent inspection and recorded on the QA form according to the consensus of the two-person QA review team.

- Step two: Information contained in the previous cycle bridge inspection report is then added to the QAF 9 - Field Review Findings and Recommendations Form (Appendix A), side-by-side with the information generated by the QA Review Team so the two can be easily be compared.
    - The NBI data used to calculate the Sufficiency Rating must be exact;
    - The NBI element condition rating information must be exact;
    - The element list for the bridge and their quantities must be exact;
    - Remarks to help clarify the condition rating must meet expectations;
    - Posting Maintenance Recommendations must meet expectations.

- Step three: Specific areas that exhibit differences between review team findings and the last recorded structure inspection that are beyond the prescribed acceptable thresholds are then identified and openly discussed so that the QA review team can better determine which is correct and why.

- Step four: Upon completion of review, the results are recorded on the QAF 9 - Field Review Findings and Recommendations Form. Copies of each QA review are given to the person that generated the last bridge inspection report of record, so they can determine whether the last bridge inspection report needs to be amended. The results of the QA Review will be compiled, shared and discussed during the annual training in the following year.

QA Review Results: The results of each QA Review are tabulated so the information can be used as follows:

- Assess whether a bridge inspector is operating within acceptable limits;
- Assess the effectiveness the Authority's Inspection Program;
- Assess areas where additional training or discussion is needed.

c. Inspection Report Review

The inspection reports prepared by the Inspection Consultant teams shall be reviewed by the Authority's Structure Inspection Program Technical Manager (SIPTM). The review, along with Field Reviews, are conducted to ensure a uniform quality of the individual bridge inspection report. Also, the review is to monitor the inspection for completeness, thoroughness, consistency, and accuracy.

The SIPTM will review 100% of all Major bridge inspection reports and 25% of the Routine bridge and other structural asset inspection reports. Upon receiving the notice of report completion, the QM then starts the QA process. This includes the following:

- Verify that the structure inspection report checklist is properly completed and submitted as part of the draft report submittal;
- Verify that structures are inspected in a timely fashion in accordance with the submitted schedule;
- Verify that the report uses correct photo and file references;
- Verify that the appropriate documents are included in the reports;
- Verify if a structural asset inspection requires soundings. If required per the OPS Scope of Work, verify that soundings are conducted and documented;
- Verify that the appropriate resources needed for safety, access, and adequate inspection are being used;
- Verify that the NBI codes are supported by bridge inspection report content.
- Verify that the NBI elements are complete and accurate;
- Verify that the element condition states are supported by the inspection report content;
- Verify that appropriate repairs and repair priorities are recommended based on inspection report content;
- Verify that Inspection Reports have updated information added such as completed repairs;
- Review Inspection findings for completeness and clarity;
- Review Photographs and sketches for agreement with the inspection findings;
- Verify changes made to all asset and report values for reasonableness and consistency;
- Verify NBI codes (Items 1 through 116) and required/select NJDOT codes;
- Check to make sure that if a Deck (58), Superstructure (59), Substructure (60), Channel (61), or Culvert (62) rating is coded a 5 or less that an appropriate remark and recommendation has been recorded.

d. Data Validation Check by State/FHWA

The Authority submits bridge inspection data to the NJ Department of Transportation (NJDOT) utilizing the following process:

- Data is sent to the NJDOT electronically on a monthly basis or as needed to update NJDOT's CombIS system when errors are found by NJDOT during annual NBI audits. The submission is performed through the Authority's Software Consultant and the Authority's Structure Inspection Program Technical Manager provides the list of structures and data to be sent to the Authority;

- The NJDOT runs the data checks on the Authority's NBI/Element Level data intermittently throughout the year. These data checks are performed to reduce the amount of FHWA errors that might occur in the State's annual submission;
- The NJDOT submits errors from their data checks to the Authority. If the errors are due to miscoding of the NBI or element level inspection, the SIPTM shall correct the errors and resubmit to the State/FHWA;
- The SIPTM currently runs data queries for verification of performance of inspections by the next anniversary date. Other data checks are performed as needed when a typical coding issue is found during the review process;
- The Authority may require a formal period of time to cease all bridge NBI and Element Level Inspection data entry by the SIC while corrections are being made to the data prior to submittal to FHWA. The Authority will provide dates when this will occur to all SIC staff if necessary.

e. Office Review

The SIPTM may conduct an office audit to review the Inspection Consultant's office QA/QC procedures when the quality of the SIC's inspection report or load ratings are deemed unsatisfactory. This may include load rating procedures, filing procedures and bridge file content, consultant's in-house quality control plan, procedures and results, consultant's procedures for notification and follow-up with the Authority.

The Office Review will consist of the following, at a minimum:

- Review working copies of inspection reports;
- Verify correct and appropriate level of follow-up on identified critical deficiencies;
- Verify the presence of complete and organized bridge files;
- Verify the use and correctness of accurate and current master lists;
- Verify accurate documentation of bridge load ratings;
- Verify the presence of thorough and accurate documentation of inspections performed;
- Verify the presence of thorough documentation confirming the SIC's Quality Assurance and Quality Control processes;
- Verify the follow up procedure used by the SIC for reviewed documents;

f. Load Rating Reviews

Load Rating Quality Assurance and Quality Control Reviews:

The Structure Inspection Program Technical Manager's Load Rating Representative is responsible for all quality control activities associated with Structure Inspection Consultant bridge load ratings. Other qualified SIPTM staff, including qualified Load Rating Engineers, Load Rating Reviewers, or other staff familiar with Load and Resistance Factor Ratings and the Authority's specific load rating requirements, may assist with the technical reviews of the load rating submission.

Quality assurance reviews are important because initial load ratings by past

consultants did not receive any type of additional QA review by the Authority or SIPTM. To date, detailed quality control reviews have been performed on a small percentage of the Authority's bridge inventory. Those reviews have shown that multiple bridge load ratings contain inaccuracies and errors that require correction. For this reason, it is important to perform both detailed quality control reviews, as well as brief quality assurance reviews to ensure accuracy of the reported bridge load rating data.

Each bridge inspection contract which includes the initial performance of bridge load ratings or updates to existing bridge load rating files shall receive quality control reviews by the SIPTM. The number of bridge load rating reviews performed varies based on the size of the inspection contract, the total number of bridge load ratings performed by the SIC, and the results of the initial quality control reviews. In general, 5 to 10 percent of the bridges load rated by a given SIC will be reviewed. If the typical quality control reviews reveal significant errors or inaccuracies, the SIPTM will identify additional bridges for review. In these cases, the total number of reviews will exceed 10 percent of the bridges load rated.

Bridge load ratings will be selected for review based on structure and member type, load rating software used, and the timing of the completed bridge load ratings. Reviews will ideally include a range of structure types, since different modeling techniques or load rating calculations may be needed. If multiple load rating software programs are utilized for a given assignment, one structure load rating using each type of software is routinely reviewed. As further noted below, the initial load ratings completed by a consultant are typically selected for review. This approach intends to identify potential errors early in a given project, and seeks to reduce the number of repetitive revisions that could be required for multiple bridge load files.

The quality control review by the SIPTM represents a detailed review of a select number of bridge load ratings to ensure accuracy and confirm adherence to the Authority's Load Rating Manual. Reviews typically begin with a detailed review of the submitted load rating summary sheet, and confirmation of all data presented on that sheet. Important information such as the bridge surface roughness rating coding, legal load impact, condition factors, system factors, and ADTT are all reviewed and confirmed by referencing the appropriate documents (current bridge inspection report, or the Authority's Load Rating Manual). For new bridge load ratings, the SIPTM will also thoroughly review the assumptions or written description of the load rating process. For updated bridge load ratings, the SIPTM will thoroughly review the summary of updates to understand the reason for the updates, and to confirm accuracy. The bridge load rating model (AASHTOWare's Bridge Rating file, or other) will be reviewed in detail to ensure accuracy as well as consistency with the data reported on the load rating summary sheet. The supporting load rating calculations will be cross referenced with the bridge load rating model, and may be reviewed in detail if deemed necessary. The SIPTM will also perform an analysis of select members summarized on the submitted load

rating summary sheet using the submitted files and applicable load rating software, to ensure that the load rating factors reported accurately represent the noted member and have used the load rating software correctly. At the conclusion of the quality control review for a given structure, the SIPTM reviewer will send an email to the SIC summarizing the results of the review including a completed QAF 10 – Load Rating Review Checklist (see Appendix A). See below for a detailed step-by-step listing of the typical quality control process:

- SIC's are advised to contact the SIPTM Load Rating Representative when their first load rating or load rating update is completed;
- The SIPTM will make every effort to review the initial load ratings in a timely fashion so any findings can be applied to ongoing and future load ratings by the same consultant, thereby minimizing the need for future revisions;
- The SIC is asked to submit all load rating files to the SIPTM by use of InspectTech. Specifically, files shall be uploaded to the bridge asset, and located within the load rating section of the specified cycle inspection report. This allows for tracking of submission dates, an easy way to transfer files, and for file access to multiple individuals (Authority and SIPTM staff);
- Once all load rating files are placed in InspectTech for SIPTM review, the SIC shall email the SIPTM LR Representative to notify them that the bridge load rating files are ready and accessible for review;
- The SIPTM will perform a quality control review of the submitted files;
- When review is complete, the SIPTM will summarize the findings of the QC review and email this summary to the SIC, Authority Program Manager, and Authority Liaison Engineer;
- The SIC then shall review the comments (if any), and respond to each with their assessment. If a load rating resubmission is required, the SIC shall remove the previous load rating files from InspectTech, and resubmit in accordance with the above noted process. Responses to comments shall typically consist of some variation of the following:
    - Agree and will revise accordingly;
    - Disagree (give reason and plans for revisions).
- If needed, this process will be repeated until the SIPTM reviewer deems the load rating sufficient, accurate, and free from all significant errors;
- Once deemed sufficient, the SIPTM reviewer will respond to the latest email and will conclude the review, stating that they have no further comments;
- The SIC shall finalize all load rating files, have the Load Rating Reviewer sign and seal the load rating summary sheet, and submit all final load rating files using InspectTech. Revised load rating files shall be removed from InspectTech such that there are no duplicate load rating files or possible sources for confusion;
- In addition to quality control reviews, the SIPTM is responsible for performing quality assurance reviews on all bridge load ratings performed. These reviews are less detailed, and typically include only a brief review of the submitted load rating summary sheet and Summary of Updates / load rating assumptions.

g. Training

As part of the quality control/quality assurance process, the Authority conducts annual training seminars for all inspectors and the QA/QC engineers. The seminars typically include sharing best practices, a review of deficiencies found during inspection program quality reviews, FHWA compliance review findings, load rating issues, inspection manual updates and report format changes. Comprehensive training provides an opportunity to thoroughly familiarize participants with bridge inspection terminology and techniques along with data collection practices and procedures to ensure consistency and reliability of the structure inspection program. Each Team Leader and Quality Control Engineer / Project Manager, at a minimum, will be required to attend the training session annually. Training records will be maintained by the SIPTM and failure to attend will be grounds for Disciplinary Action of the team leader or firm as described later in this document.

The following courses are provided by the National Highway Institute (NHI). Some courses are required in order to meet NJTA qualifications.

The following courses are required for TL and PM:

- "Safety Inspection of In-Service Bridges" - FHWA-NHI-130055
- "Bridge Inspection Refresher Training" - FHWA-NHI-130053 (If applicable)
- "Fracture Critical Inspection Techniques for Steel Bridges" - FHWA-NHI-130078
- "Inspection and Maintenance of Ancillary Highway Structures" - FHWA-NHI-130087
- "Underwater Bridge Inspection" - FHWA-NHI-130091

The following courses are required for LRE and LR Rep:

- "Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures" - FHWA-NHI-130092

The following courses are recommended but not required:

- "Underwater Bridge Repair Rehabilitation and Countermeasures" - FHWA-NHI-130091A
- "Bridge Inspection Non-Destructive Evaluation Showcase (BINS)" - FHWA-NHI-130099
- "Stream Stability and Scour at Highway Bridges" - FHWA-NHI-135046
- "Stream Stability and Scour at Highway Bridges for Bridge Inspectors" - FHWA-NHI-135047
- "Inspection of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes" - FHWA-NHI-132080

7. STRUCTURE INSPECTION CONSULTANT QA/QC REQUIREMENTS

a. Development of Project Quality Control / Quality Assurance Plan

Immediately following Notice to Proceed, the Structure Inspection Consultant (SIC) shall submit a project-specific Quality Control/Quality Assurance (QA/QC) Plan for

the Authority's review and approval. This plan shall clearly explain how the consultant's firmwide Quality Management Program will be utilized to satisfy the requirements of the Authority's Quality Management Plan for this assignment. The QA/QC Plan shall identify all certified QA/QC personnel and their roles, and explicitly outline measures to be followed throughout the duration of the assignment, including the quality management of subconsultants and their work. The SIC is solely responsible for the quality of submittals for their inspection assignment, including the submittals of subconsultants, and will be monitored by the Authority on a continuous basis for adherence to the approved QA/QC Plan.

At a minimum, the QA/QC Plan shall:

- Provide an organizational chart which identifies all staff involved with the project, including the Quality Assurance and Quality Control Engineers;
- Restrict the QA or QC Engineers from serving in multiple roles (such as Team Leader and QC Engineer) which would place them in a position to review their own work product;
- List the Quality Assurance and Quality Control Engineers' experience and qualifications. These persons shall have at least 10 years of bridge inspection experience and shall be familiar with Authority's inspection procedures and requirements;
- Identify a filing structure to be used for all project related documents (both electronic and hard copy);
- Identify specific and possibly unique ways that the consultant intends to ensure quality;
- Outline the methods for performing detailed reviews which ensure Quality Control, and further detail how quality control documents (electronic or hard copy) are to be generated, saved, and retained;
- Detail the methods for performing high-level Quality Assurance, including the number of reviews, level of detail for each review, and creation and management of quality assurance documents (electronic or hard copy);
- Include a schedule with estimated dates of inspection, preliminary report submission, QC review, QA review, and final report submission.

b. Field Quality Control

Inspection Team

Given the complex and varied nature of structure inspection work, it is imperative that inspectors use multiple Quality Assurance and Quality Control methods to minimize the risk of errors or omissions while also employing important safety measures for the structure inspection staff. It is the ultimate responsibility of the inspection Team Leader to ensure that the field inspection is performed in a complete, correct, and safe manner. The following information identifies ways in which typical field inspection activities can be conducted to maintain the highest level of quality, and highlights specific areas that have proven to be problematic for Authority Structure Inspection Consultants in the recent past. This section does not represent a complete listing of field quality control measures to be employed during inspection.

Prior to the commencement of inspection activities, the inspection Team Leader shall prepare and complete an equipment checklist to ensure that all equipment and materials required to execute the structure inspection are available for use. In the event of a field audit, the list can be presented to the Structure Inspection Program Technical Manager representative to expedite the audit.

A QCF 2 – Consultant Field Checklist can be developed to highlight the specific dangers associated with the type of inspection being performed. In lieu of a checklist, the inspection team may choose to conduct daily safety briefings to verbally discuss the week's upcoming possible safety hazards, current events with regards to safety, or a summary of past safety hazards or potentially dangerous experiences. The safe use of inspection equipment, as well as the use of Personal Protective Equipment, shall also be discussed. These types of hazard assessments and associated recommended safety equipment shall be discussed well before being exposed to these conditions so that the inspection team can adequately prepare.

Careful attention shall be paid to the methods for recording the condition of the structure during inspection. The inspection team shall be thorough in all situations. All items shall be clearly marked or confirmed on the field note sheets or previous reports which can be utilized as field notes. A few minutes of additional time spent in the field to ensure notes are legible, clear, and complete will be beneficial when report writing in the office begins.

All photographs will be taken with a digital camera during structure inspection. The inspection team shall also have the ability to transmit electronic photos from the field to their office, should critical findings be discovered that require immediate action. This could be accomplished by using a laptop or smartphone while on-site. Clear records of all photographs taken during a structure inspection shall be kept for future reference during report preparation.

No less than one-week prior to arriving on site to perform the inspection, the inspection team shall review the previous inspection report and findings to ensure that there are no conditions which could potentially require the use of unique inspection equipment, access, or tools. The team shall also check InspectTech for any critical findings or maintenance notes that may have been performed by others for that structure. Upon completion of the inspection for each structure, the original field notes and photo logs shall be promptly scanned and saved electronically.

It is standard inspection practice to hand-clean selected areas to allow close, hands-on inspection for corrosion, deterioration, or other otherwise hidden defects. Debris, vegetation, fungus, marine growth, vines, litter, and many other obscuring coverings can accumulate and hide problem areas. This cleaning may require

simple brushing away by hand, scraping or wire brushing with unpowered hand tools, or in some cases, use of a shovel to clear accumulated detritus. Exposure to certain types of debris or litter may be hazardous to the inspection team's health. Various forms of safety equipment (gloves, safety glasses, respirators, etc.) may be needed to conduct the inspection safely.

On metal structures, particularly on fracture critical members, it may be necessary to remove cracked or peeling paint for proper inspection. Laminar or pack rust often requires chipping with a hammer or using other means to remove the corrosion down to base metal. If the overall paint system on an element is damaged during inspection cleaning, field inspection practices shall include recoating the damaged areas to minimize the chance for future corrosion. A coat of rust retardant spray primer is often sufficient.

On concrete structures, leaching, lime encrustation, and debris may cover heavily-corroded steel reinforcing. Debris on precast concrete piles can obscure heavy spalling or cracking.

Timber structures are particularly susceptible to insect damage and decay in areas where debris causes a wet/dry condition. Inspectors shall give particular attention to cleaning and carefully inspecting such areas, especially when a wet/dry condition is present near the end grain.

For all structures, vegetation, as well as dirt and debris accumulation, can also obscure large defects such as cracks or spalls. All obscuring materials shall be moved aside or removed by the inspection team so that the inspectors can see the previously obscured elements. Where vegetation is too dense or widespread to be moved or removed by the inspection team, the Structure Inspection Program Technical Manager shall be contacted so that they can coordinate with the Authority and their Maintenance Department to allow for clearing of the vegetation. It is the responsibility of the inspection Team Leader to identify and report areas requiring vegetation, dirt and debris removal in a timely manner so that the inspection schedule is not delayed. Obscured or hidden areas shall not be omitted from the inspection simply due to difficult access.

Quality Control Engineer / Project Manager

For every structure inspection contract, the Structure Inspection Consultant’s Quality Control Engineer / Project Manager shall select five (5) structures (not more than 5% of the total number of structures being inspected) to review in the field for each team leader (the Quality Control Engineer / Project Manager must be someone other than the team leader). Recommended criteria for selection of the structures to receive additional field review by the QC Engineer are as follows:

- Bridges shall be selected using the following criteria, when possible:
    - Multiple superstructure types shall be selected, to allow for a

diverse sampling during review;
    - At least one bridge in Fair or Poor overall condition shall be selected;
    - Other bridges selected shall cover a range of overall conditions;
    - If present, bridges with low load ratings shall also be selected for review.
- Sign structures, high mast light poles, retaining walls, or other structures shall be selected as follows:
    - Include the structure which exhibits the worst overall condition;
    - Remaining structures selected shall cover a range of overall conditions.

This field review shall consist of the Quality Control Engineer / Project Manager assessing the correctness and completeness of the inspection, including safety protocols, State and Federal coding, elements and quantities, photos required by the contract as well as those needed to depict critical conditions, etc. This review and independent verification of inspection procedures shall be done concurrent with the Team Leader inspection activities so that any questions raised during the review can be discussed and immediately corrected.

Field reviews performed by the QC Engineer shall be recorded and documented using a QCF 2 – Consultant Field Checklist as shown in Appendix A. This form shall include all the details of the field review and findings, including but not limited to the structure number, arrival and departure times, inspection access methods, safety of the inspection team, independent coding of reviewed items, notes summarizing the on-site discussions with the Team Leader and Assistant Team Leader, and final conclusions. The Structure Inspection Consultant shall retain the completed QC Engineer Field Evaluation Forms, and the forms shall be made available to either the Authority or the Structure Inspection Program Technical Manager, if requested.

c. Report Preparation Quality Control

The inspection report is the only documented, permanent record of the inspection. The inspection report is considered a legal document, and all rehabilitation and replacement work decisions are based on the information it contains. Therefore, it is imperative that the inspection report has accurate, thorough, and defensible information. Reports shall include notes, photos, sketches, or other information necessary to document the condition of the structure adequately and thoroughly.

The use of photographs to convey condition assessment and supplement report narrative text is encouraged. An efficient system is recommended for recording the photos taken in the field, such that pertinent photos can be easily selected and inserted into the inspection report. The use of photograph logs in the field, identification of important photos while in the field and which are likely to be included in the report, and organized filing and storing of electronic images are a few effective techniques to ensure photograph organization.

Inspection reports shall be as concise as possible while still conveying important and meaningful information. Refrain from inclusion of a narrative or graphics which fail to describe the structure condition.

The Quality Control Engineer / Project Manager shall perform detailed reviews of all inspection reports and ensure that the condition of the structure was properly assessed and documented. Responsibilities for review include but are not limited to detailed verification of the overall structure assessment (comparison of photos, field notes, and condition assessments), review of photos and photo captions, verification of all structure coding data, general format review, and review of all other components of the inspection report. The QC Engineer shall be made aware of the structure inspection and report submission schedule, and shall perform the detailed reviews to allow ample time for review of comments, corrections (if needed), and formal submission to the Authority. Reviews are expected to utilize InspectTech, the database that contains all of the structure specific inspection data for the Authority. QCE shall complete a QCF 1 – Consultant InspectTech Report Checklist (see Appendix A) and included with the report for submission. All reviews performed by the QC Engineer shall be fully documented, and shall be made available to either the Authority or Structure Inspection Program Technical Manager, if requested. The Quality Control Engineer / Project Manager shall discuss any apparent problems regarding report accuracy with the team leader.

d. Data Preparation Quality Control

Structure Inspection Consultant Team Leaders shall follow all NBI and Element Level Inspection coding directives as well as report preparation notifications as posted on the Authority's website: http://www.njta.com/doing-business/ps-reference-material.

Upon notification from a Structure Inspection Consultant Team Leader of recommendation to increase or lower a bridge's numerical condition coding to a 4 or less for Items 58, 59, 60, or 62, the Authority's Structure Inspection Program Technical Manager shall verify the condition and concur with the decision. The SIC's TL shall be made explicitly aware that the Authority desires accurate and impartial condition assessments of bridge elements. It is the responsibility of the SIC's TL to identify potential structurally deficient conditions and report them for final concurrence. Intentionally and inaccurately reporting a higher than actual coding for a given structure item is a potentially dangerous practice that may result in Disciplinary Action.

It is preferred that the Team Leader immediately notify the Authority and the Authority's Structure Inspection Program Technical Manager of the low coding when it is first identified in the field (same day) so that the SIPTM may utilize any required inspection equipment (lift truck, under-bridge inspection unit, etc.) or MPT that the Team Leader is currently using for prompt and economical field

verification. If there is concurrence with the decision to reduce the numerical condition coding of the element, member, or structure, the SIPTM will ensure the data entry into InspectTech is revised to reflect the date of the inspection report or special member inspection report and the inspection frequency reflects the new condition.

The SIPTM shall notify the Authority's Liaison Engineer when a bridge's numerical condition coding recommended to be lowered to a numerical value of a 4 or less, for Item 58, 59, 60, or 62 which would classify it as Structurally Deficient. This notification shall be via an email specifying the Structure Number as well as the component that resulted in this status.

e. Load Rating Quality Control

All load rating quality control reviews shall be performed in accordance with Section 4.3 of the current NJTA Load Rating Manual. Load rating calculations shall be performed by the Load Rating Engineer, and thoroughly reviewed in accordance with Section 4.3 by the Load Rating Reviewer. Upon completion of the load rating review, the LRR shall complete a QCF 3 – Consultant Load Rating Checklist (see Appendix A) to include with load rating submission.

f. Quality Assurance

The Structure Inspection Consultant's Quality Assurance Engineer shall ensure that all aspects of the structure inspection contract adhere to Authority, Federal and State requirements. The QAE's responsibilities include but are not limited to assurance that the consultant staff is qualified and properly trained, their performance meets acceptable standards, and their inspections, inspection reports, data entry, and other associated tasks are completed accurately and within the permitted time frame. The QA's review shall also include confirmation that quality control reviews have been properly performed and documented in accordance with established time frames indicated in the report submittal schedule. Confirmation shall involve reviews of hard copy or electronic records of all reports to confirm that all deliverables have received a detailed quality control review. Reviews shall also be performed where comments or revisions were recommended to ensure that they were addressed to the satisfaction of both the originator and reviewer. The QAE shall be ultimately responsible for all aspects of quality as they pertain to a given project. Upon completion of the QA review for a given structure, they shall complete and sign the form titled QAF 5 - Consultant Quality Assurance Checklist (See Appendix A), verifying that the report has been thoroughly reviewed and accurately represents the current condition of the structure.

The Structure Inspection Consultant's QAE shall confirm that all consultant personnel satisfy the specific requirements for their position.

Qualification requirements for key personnel performing bridge inspection for the Authority are listed on their website:
http://www.njta.com/media/3561/njta-bridge-inspection-program_rev-oct2011.pdf

The QAE shall maintain a current list of all qualified personnel with their current information regarding professional titles, education, experience, certifications, and additional training. Electronic copies of all required certifications shall be maintained in a personnel file for each employee. The QAE shall provide this current list to the Authority's Structure Inspection Program Technical Manager prior to the start of a given assignment, with additional information as required on the form titled "QAF 3 – Quality Assurance Audit: Tech. Manager Qualifications Review Checklist" (See Appendix A). This form shall be completed prior to the start of work. The list shall also be updated if new employees are approved by the applicable Authority Liaison Engineer and subsequently added to the Structure Inspection Consultant's organization chart.

8. STRUCTURE INSPECTION CONSULTANT DISCIPLINARY ACTION

Where quality assurance and quality reviews by the Structure Inspection Program Technical Manager or the Authority reveals repetitive errors by the Team Leader or any representative of the Structure Inspection Consultant, the Authority reserves the right to conduct disciplinary action against the SIC in fault.

Repetitive errors that could potentially result in disciplinary actions are hereby defined as:

- Three or more instances of the same or similar error in one inspection contract where the consultant had previously been alerted to the presence of the error by the Structure Inspection Program Technical Manager or the Authority for all prior instances

When three or more repetitive errors are identified, the Authority Program Manager or Liaison Engineer will issue an Audit Statement to the consultant. The Audit Statement will be made in writing, and will alert the consultant to the ongoing nature of the noted errors, and will serve as the initial step in the following detailed disciplinary action process:

- Upon receiving Audit Statement from the Authority, the SIC shall:
  - Review the findings of the Audit Statement
  - Prepare and submit a Corrective Action Plan to the Authority which will correct the noted errors and assure the Authority that they will not be repeated
- The Upon receipt of the Corrective Action Plan the overall quality of work by the SIC for that assignment shall be reviewed by the Authority or the SIPTM for similar errors and overall quality.
- If the same or similar errors are identified, the SIC and the responsible individual will be notified that an office audit will be conducted by the Authority and/or the SIPTM.
- If the errors persist after conduct of the office audit, a QAF-4 - Disciplinary Action form (see Appendix A) will be filed by the Authority to notify the SIC and the responsible individuals to attend an in-person meeting with the Authority's

leadership personnel at NJTA Headquarters.

Types of Errors

Typical errors resulting in possible Disciplinary Action can be, but are not limited to, the following:

- Lack of notification provided to the Authority with regards to critical structure findings, such as damaged load carrying primary members, critical scour at foundations, vehicular impact damage which could adversely affect the capacity of load carrying primary members, bridges requiring closure, etc.
- Lack of notification for structures with low legal loads requiring further analysis to potentially increase the values.
- Failure to adequately document and address findings from Quality Control or Quality Assurance reviews.
- Errors identified during reviews of submitted bridge load ratings or load rating updates that, when corrected, result in a 10% or more change in previously reported controlling rating factors, or, a 5% or more decrease in previously reported controlling rating factors. Submissions include both Preliminary and Final load rating reports.
- Recurring miscoded critical inventory items such as NBI Items 36, 43, 51, 53, 54, 92, 93B, 93C, and 113.
- Recurring miscoded critical elemental items such as structural elements and Category A deficiencies. This can include improper or omitted element numbers, quantities and/or condition states.
- Failure to submit completed inspection data and/or corrections in accordance with the approved schedule.

The Structure Inspection Consultant shall agree to abide by the disciplinary action procedures as part of any structure inspection agreement before they will be allowed to begin work.

APPENDIX A – FORMS

New Jersey Turnpike Authority:

- QAF 4 – Disciplinary Action Form (TBD)
- QAF 6 – Authority Review Form (TBD)

Structure Inspection Program Technical Manager:

- QAF 1– Consultant Practice Field Review Checklist
- QAF 2 – Report Review Checklist
- QAF 7 – Tech. Manager Qualification Checklist (TBD)
- QAF 8 – Inspection Findings Field Review Checklist (TBD)
- QAF 9 – Field Review Findings and Recommendation Form (TBD)
- QAF 10 – Load Rating Review Checklist (TBD)
- QAF 11 – Office Review Checklist

Structure Inspection Consultants:

- QAF 3 – Consultant Qualification Form
- QAF 5 - Consultant Quality Assurance Checklist (TBD)
- QCF 1 – Consultant InspectTech Report Checklist
- QCF 2 – Consultant Field Checklist (TBD)
- QCF 3 – Consultant Load Rating Checklist (TBD)

NEW JERSEY TURNPIKE AUTHORITY

QAF 4 – Disciplinary Action Form

TO BE PUBLISHED AT A LATER DATE

NEW JERSEY TURNPIKE AUTHORITY

QAF 6 – Authority Review Form

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 1 – Consultant Practice Field Review Checklist

1.1 - Field Review Checklist - Bridges

1.3- Field Review Checklist - Minor Culverts

1.4 - Field Review Checklist - Signs

1.5 - Field Review Checklist - Retaining Walls and Noise Barriers

1.6 - Field Review Checklist - Microwave Towers

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.1 – FIELD REVIEW CHECKLIST - BRIDGES

Structure No: _____ Structure Name: _____

Field Review Date: _____ Field Arrival & Departure Time: _____ / _____

Project: OPS: _____ Garden State Parkway or NJ Turnpike: GSP / TPK

Group: _____

Carries: _____ Crosses: _____

No. of Spans / Bridge Type: _____

Consultant: _____

Team Leader: _____ Assistant Team Leader: _____

Other Team Members: _____

Did Consultant send e-mail notification to the Bridge Inspection Technical Manager today? Yes / No

Did Consultant obtain approval for Lane/Shoulder closing? Yes / No

The following items were reviewed with the inspection team during this field visit:

- ☐ Previous inspection report / Fracture Critical Member (FCM) Report onsite to determine problem areas.
- ☐ Understanding and implementation of Category A reporting procedures.
- ☐ Proper determination and use of Direction of Orientation.
- ☐ Understanding of structural behavior and primary load paths of bridge.
- ☐ Identification of Category D, E & E' welds. FCMs identified and proper documentation.
- ☐ 100% hands-on inspection of FCMs.
- ☐ Section loss measurements (D-meter, caliper, estimated, other) and proper documentation.
- ☐ Clearance Sketches (Lidar) and Section Loss sheets.
- ☐ Vertical clearance postings.
- ☐ Channel cross-section, soundings & substructure profile measurement / documentation for scour & undermining.
- ☐ Underwater Inspection requirements for underwater portion of bridge.
- ☐ Proper coding of SI&A condition ratings and Bridge Element inspection ratings.
- ☐ Appropriate use of sketches and tables when preparing documentation.
- ☐ Proper photo documentation and referencing.
- ☐ Presence and use of basic inspection manuals / forms (*checklist on page 2*) and equipment (*checklist on page 3*).
- ☐ Use / Availability of proper access equipment.
- ☐ Proper use of safety equipment & procedures.
- ☐ Confined Space Requirements (including Training Course)?

GENERAL REMARKS: _____

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Bridge Inspection Technical Manager's Auditor Signature Date

_____

Consultant Task Lead Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.1 – FIELD REVIEW CHECKLIST - BRIDGES

Auditor's General Review at a distance

What are inspectors doing (top side / underside)?
Is proper MPT on site? If short duration closing is "Shoulder Closed" sign and arrow board mounted on back of TMA?
Are proper signs installed? Is it NJTA Maintenance Force closing or Contractor closing?
Hands on inspection techniques for FCM members?

Auditor's General Review of Field Inspection Team ("No" requires a comment)

Condition	Yes or No	Comment
Do all Team Members have Photo ID present?		
Team Leader in field matches the Team Leader proposed?		
Assessment of Team Leaders Bridge Inspection Methods		
Is company vehicle properly identified?		

Required Forms and Manuals Available (Check all that apply)

- ☐ Bridge List
- ☐ Previous Cycle Inspection Report(s)
- ☐ Previous Category A and Priority 1 Notifications
- ☐ Emergency and Priority 1 Repair Definitions
- ☐ Authority Deficiency Category Definitions
- ☐ Construction History Updates
- ☐ SI&A Forms
- ☐ Element Inspection Forms
- ☐ Photo Logs
- ☐ Field Note Forms
- ☐ Bridge Sketches
- ☐ Schematic or method for collecting NBE data (top of deck)
- ☐ Framing Plan or method for collecting NBE data (underside of deck)
- ☐ 2011 NJTA Manual for Traffic Control in Work Zones
- ☐ Bridge Inspector's Reference Manual (BIRM)
- ☐ Inspection of Fracture Critical Bridge Members (FHWA-IP-86-26)
- ☐ Recording and Coding Guide for SI&A of the Nation's Bridges (FHWA-PD-96-001)
- ☐ Recording and Coding Guide for SI&A of New Jersey Bridges (NJDOT)
- ☐ Bridge Element Inspection Manual

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.1 – FIELD REVIEW CHECKLIST - BRIDGES

Equipment ("No" requires a comment)

Condition	Yes or No	Comment
Is the required PPE available? See Checklist Below		
Is the appropriate PPE being used?		
Is a First Aid kit available?		
Does the team have a list of emergency phone numbers and locations available?		

Personal Protective Equipment in Use (Check all that apply)

- ☐ Hard Hat
- ☐ Work Boots
- ☐ Reflectorized Safety -ANSI Class 3 (with sleeves)
- ☐ Respirator/Dust Mask
- ☐ Flashing Yellow Light on Vehicle
- ☐ Protective Eyewear
- ☐ Safety harness and lanyard
- ☐ Gloves
- ☐ Life Jacket
- ☐ Chest or Hip Waders

General Equipment for Inspection (Check all that apply)

- ☐ Binoculars
- ☐ Boat
- ☐ BoreScope
- ☐ Calipers
- ☐ Cell phone
- ☐ Chalk, keel, paint sticks, markers
- ☐ Chipping hammer
- ☐ Digital camera
- ☐ D-Meter
- ☐ Dye Penetrant kit
- ☐ Feeler Gauge
- ☐ Flashlight
- ☐ Inspection Mirror
- ☐ Ladders
- ☐ Laptop Computer
- ☐ Line level and string line
- ☐ Magnifying glass
- ☐ Optical Crack Gauge
- ☐ Pliers
- ☐ Pocket knife
- ☐ Plumb bob
- ☐ Probing rod
- ☐ Scrapers
- ☐ Screwdriver / Ice Pick
- ☐ Shovel
- ☐ Sounding hammer
- ☐ Sounding rod
- ☐ Straight edge
- ☐ Thermometer / temperature gauge
- ☐ Underclearance rod
- ☐ Wire brush
- ☐ Wisk broom
- ☐ Wrenches
- ☐ 4 foot carpenter's level
- ☐ 6 foot ruler
- ☐ 25 foot tape
- ☐ 100 foot tape

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.1 – FIELD REVIEW CHECKLIST - BRIDGES

Work Zone Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment	
Is work zone traffic control being used?	Yes	☐ By contractor	☐ By Authority
	No / N/A		
Reason for use:			
Are cones & signs being utilized?			
Is the set-up in conformance with Authority Standards and MUTCD Standards?			
Does the Inspection Team have the NJTA Traffic Permit on hand?			

Check Type of Traffic Control Equipment Being Used:			
Arrow Board	☐	☐	Shadow Vehicle (Van)
Shadow Vehicle (Truck)	☐	☐	Impact Attenuator (TMA)
Flaggers (highway or railroad)	☐	☐	Other:

Fall Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment
Are the inspection crew members trained in fall protection and scaffolding safety?		
If an Underbridge Inspection Equipment is being used, are the operators certified?		
If an aerial lift (manlift or bucket truck) is being used, have the operators been instructed regarding its use?		
If the bridge requires an Underwater Inspection, is a qualified diver on site performing a Type-2 Underwater Inspection?		

Indicate Access Equipment Type Being Used	
Circle One or Fill In: 30, 40, 50, 60, 75, or _____Ft. – UBIU	☐
Circle One or Fill In: 30, 35, 40, 50, 60, or _____Ft. – Bucket Truck	☐
Fill In:_____Ft. or Model_____– ManLift	☐
Other:	☐

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.1 – FIELD REVIEW CHECKLIST - BRIDGES

Team Leader Technical Knowledge

	Excellent	Good	Fair	Poor
Bridge Inspection Methods	☐	☐	☐	☐
Terminology of Defects	☐	☐	☐	☐
Clearance Measurements	☐	☐	☐	☐
SI&A Condition Ratings	☐	☐	☐	☐

Comparison of Field Work Completed to Actual Field Conditions

	Excellent	Good	Fair	Poor
Consistency	☐	☐	☐	☐
Accuracy	☐	☐	☐	☐
Completeness	☐	☐	☐	☐
Engineering Judgment	☐	☐	☐	☐

Inspection Conduct

	Excellent	Good	Fair	Poor
Use of Field Equipment	☐	☐	☐	☐
Safety Conduct	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐
General Inspection Conduct	☐	☐	☐	☐

Explanation of any Rating Fair or Poor:

_____

_____

Questionnaire (Note: "Yes" requires comment)

Condition	Yes or No	Comment
Does the inspection team feel additional safety equipment is needed?		
Does the inspection team feel additional safety training is needed?		
Does the reviewer feel additional equipment and/or safety training is needed?		

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.3 – FIELD REVIEW CHECKLIST - MINOR CULVERTS

Structure No: _____ Structure Name: _____

Field Review Date: _____ Field Arrival & Departure Time: _____ / _____

Project: OPS: _____ Garden State Parkway or NJ Turnpike: GSP / TPK

Group: _____

Carries: _____ Crosses: _____

Culvert Type: _____

Consultant: _____

Team Leader: _____ Assistant Team Leader: _____

Other Team Members: _____

Did Consultant send e-mail notification to the Bridge Inspection Technical Manager today? Yes / No

Did Consultant obtain approval for Lane/Shoulder closing? Yes / No

The following items were reviewed with the inspection team during this field visit:

- ☐ Previous inspection report onsite to determine problem areas.
- ☐ Understanding and implementation of Category A reporting procedures.
- ☐ Proper determination and use of Direction of Orientation.
- ☐ Understanding of structural behavior and primary load paths of culverts.
- ☐ Section loss measurements (caliper, estimated, other) and proper documentation.
- ☐ Sounding measurements, channel cross section and scour / undermining sketches.
- ☐ Appropriate use of sketches (soundings) and tables when preparing documentation.
- ☐ Proper photo documentation and referencing.
- ☐ Presence and use of basic inspection manuals / forms (*checklist on page 2*) and equipment (*checklist on page 3*).
- ☐ Use / Availability of proper access equipment.
- ☐ Proper use of safety equipment & procedures.
- ☐ Confined space procedures.
- ☐ Underwater Inspection requirements for underwater portion of culvert.
- ☐ Any additional culverts require underwater inspection?
- ☐ Any culverts obstructed and therefore un-inspectable? (Establish Culvert Cleaning List)
- ☐ Latitude and Longitude coordinates obtained for culverts.
- ☐ Any additional Non-NBIS culverts discovered not currently included with NJTA inventory?

GENERAL REMARKS: _____

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Bridge Inspection Technical Manager's Auditor Signature Date

_____

Consultant Task Lead Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.3 – FIELD REVIEW CHECKLIST - MINOR CULVERTS

Auditor's General Review at a distance

What are inspectors doing?
Is proper MPT on site? If short duration closing is "Shoulder Closed" sign and arrow board mounted on back of TMA?
Are proper signs installed? Is it NJTA Maintenance Force closing or Contractor closing?
Proper techniques for culverts deemed as Confined Spaces?

Auditor's General Review of Field Inspection Team ("No" requires a comment)

Condition	Yes or No	Comment
Do all Team Members have Photo ID present?		
Team Leader in field matches the Team Leader proposed?		
Assessment of Team Leaders Culvert Inspection Methods		
Is company vehicle properly identified?		

Required Forms and Manuals Available (Check all that apply)

- ☐ Culvert List
- ☐ Previous Cycle Inspection Report(s)
- ☐ Previous Category A and Priority 1 Notifications
- ☐ Emergency and Priority 1 Repair Definitions
- ☐ Authority Deficiency Category Definitions (Culverts)
- ☐ Construction History Updates
- ☐ Photo Logs
- ☐ Culvert Field Note Forms
- ☐ Sounding Diagrams
- ☐ 2011 NJTA Manual for Traffic Control in Work Zones
- ☐ Bridge Inspector's Reference Manual (BIRM)
- ☐ FHWA - Culvert Inspection Manual, 1986, FHWA-IP-86-2
- ☐ NJDOT - Underwater Inspection and Evaluation of NJ Bridges Guidelines Manual, June 1994 Edition with August 2008 Revisions

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.3 – FIELD REVIEW CHECKLIST - MINOR CULVERTS

Equipment ("No" requires a comment)

Condition	Yes or No	Comment
Is the required PPE available? See Checklist Below		
Is the appropriate PPE being used?		
Is a First Aid kit available?		
Does the team have a list of emergency phone numbers and locations available?		

Personal Protective Equipment in Use (Check all that apply)

- ☐ Hard Hat
- ☐ Work Boots
- ☐ Reflectorized Safety -ANSI Class 3 (with sleeves)
- ☐ Respirator/Dust Mask
- ☐ Flashing Yellow Light on Vehicle
- ☐ Protective Eyewear
- ☐ Safety harness and lanyard
- ☐ Gloves
- ☐ Life Jacket
- ☐ Chest or Hip Waders

General Equipment for Inspection (Check all that apply)

- ☐ Binoculars
- ☐ Boat
- ☐ BoreScope
- ☐ Calipers
- ☐ Cell phone
- ☐ Chalk, keel, paint sticks, markers
- ☐ Chipping hammer
- ☐ Digital camera
- ☐ Flashlight
- ☐ Inspection Mirror
- ☐ Laptop Computer
- ☐ Line level and string line
- ☐ Magnifying glass
- ☐ Optical Crack Gauge
- ☐ Plumb Bob
- ☐ Probing Rod
- ☐ Scrapers
- ☐ Screwdriver / Ice Pick
- ☐ Shovel
- ☐ Sounding hammer
- ☐ Sounding Rod
- ☐ Straight edge
- ☐ Thermometer / temperature gauge
- ☐ Wire brush
- ☐ 4 foot carpenter's level
- ☐ 6 foot ruler
- ☐ 25 foot tape
- ☐ 100 foot tape

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.3 – FIELD REVIEW CHECKLIST - MINOR CULVERTS

Work Zone Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment	
Is work zone traffic control being used?	Yes	☐ By contractor	☐ By Authority
	No / N/A		
Reason for use:			
Are cones & signs being utilized?			
Is the set-up in conformance with Authority Standards and MUTCD Standards?			
Does the Inspection Team have the NJTA Traffic Permit on hand?			

Check Type of Traffic Control Equipment Being Used:			
Arrow Board	☐	☐	Shadow Vehicle (Van)
Shadow Vehicle (Truck)	☐	☐	Impact Attenuator (TMA)
Flaggers	☐	☐	Other:

Confined Space / Underwater Inspection ("No" requires a comment)

Condition	Yes, No or N/A	Comment
Is the culvert deemed a Confined Space?		
If so, are proper Confined Space Procedures / Techniques being used?		
Does the culvert require an Underwater Inspection?		
If so, is a qualified diver on-site performing a Type-2 Underwater Inspection?		
Is the culvert noted as previously requiring an Underwater Inspection?		

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.3 – FIELD REVIEW CHECKLIST - MINOR CULVERTS

Team Leader Technical Knowledge

	Excellent	Good	Fair	Poor
Culvert Inspection Methods	☐	☐	☐	☐
Terminology of Defects	☐	☐	☐	☐
Sounding Measurements	☐	☐	☐	☐
Scour / Undermining Measurements	☐	☐	☐	☐

Comparison of Field Work Completed to Actual Field Conditions

	Excellent	Good	Fair	Poor
Consistency	☐	☐	☐	☐
Accuracy	☐	☐	☐	☐
Completeness	☐	☐	☐	☐
Engineering Judgment	☐	☐	☐	☐

Inspection Conduct

	Excellent	Good	Fair	Poor
Use of Field Equipment	☐	☐	☐	☐
Safety Conduct	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐
General Inspection Conduct	☐	☐	☐	☐

Explanation of any Rating Fair or Poor:

_____

_____

Questionnaire (Note: "Yes" requires comment)

Condition	Yes or No	Comment
Does the inspection team feel additional safety equipment is needed?		
Does the inspection team feel additional safety training is needed?		
Does the reviewer feel additional equipment and/or safety training is needed?		

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.4 – FIELD REVIEW CHECKLIST - SIGNS

Structure No: _____

Field Review Date: _____ Field Arrival & Departure Time: _____ / _____

Project: OPS: _____ Garden State Parkway or NJ Turnpike: GSP / TPK

Group: _____

Location: _____ Purpose: _____

Sign Structure Type: _____

Consultant: _____

Team Leader: _____ Assistant Team Leader: _____

Other Team Members: _____

Did Consultant send e-mail notification to the Bridge Inspection Technical Manager today? Yes / No

Did Consultant obtain approval for Lane/Shoulder closing? Yes / No

The following items were reviewed with the inspection team during this field visit:

- ☐ Previous inspection report onsite to determine problem areas.
- ☐ Understanding and implementation of Category A reporting procedures.
- ☐ Proper determination and use of Direction of Orientation.
- ☐ Understanding of structural behavior and primary load paths of sign structures.
- ☐ Close-up visual inspection of all welds, hardware conn's & appurtenances for truss style sign structures (Tpk only).
- ☐ Eight point binocular scan of Vierendeel sign bridges.
- ☐ Use of Articulating bucket truck for Cantilever / Butterfly signs over travel lane (arm to remain within sign profile).
- ☐ Section loss measurements (D-meter, caliper, estimated, feeler gauge, other) and proper documentation.
- ☐ Clearance measurements and section loss sketches.
- ☐ Appropriate use of sketches (flange diagram) and tables when preparing documentation.
- ☐ Proper photo documentation and referencing.
- ☐ Supplemental form - Hybrid VMS (3rd page of field notes).
- ☐ Presence and use of basic inspection manuals / forms (*checklist on page 2*) and equipment (*checklist on page 3*).
- ☐ Use / Availability of proper access equipment.
- ☐ Proper use of safety equipment & procedures.
- ☐ Understanding of Flange Categories.
- ☐ Documentation / measurement of the mast plumbness and arm levelness.
- ☐ Equipment properly secured to inspector.

GENERAL REMARKS: _____

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Bridge Inspection Technical Manager's Auditor Signature Date

_____

Consultant Task Lead Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.4 – FIELD REVIEW CHECKLIST - SIGNS

Auditor's General Review at a distance

What are inspectors doing?
Is proper MPT on site? If short duration closing is "Shoulder Closed" sign and arrow board mounted on back of TMA?
Are proper signs installed? Is it NJTA Maintenance Force closing or Contractor closing?
-Close-up visual inspection (by climbing) of all welds, hardware connections & appurtenances for truss style sign structures (Tpk only)? -Eight point binocular scan of Vierendeel sign bridges? -Use of Articulating bucket truck for Cantilever / Butterfly signs over travel lane (arm to remain within sign profile)?

Auditor's General Review of Field Inspection Team ("No" requires a comment)

Condition	Yes or No	Comment
Do all Team Members have Photo ID present?		
Team Leader in field matches the Team Leader proposed?		
Assessment of Team Leaders Sign Structure Inspection Methods		
Is company vehicle properly identified?		

Required Forms and Manuals Available (Check all that apply)

- ☐ Sign Structure List
- ☐ Previous Cycle Inspection Report(s)
- ☐ Previous Category A and Priority 1 Notifications
- ☐ Emergency and Priority 1 Repair Definitions
- ☐ Authority Deficiency Category Definitions
- ☐ Construction History Updates
- ☐ Photo Logs
- ☐ Field Note Forms
- ☐ Flange Diagrams
- ☐ 2011 NJTA Manual for Traffic Control in Work Zones
- ☐ Bridge Inspector's Reference Manual (BIRM)
- ☐ NJTA - Sign Structure Inspection Procedure, Version 2.0, Feb. 2016
- ☐ FHWA - Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaries and Traffic Signals, March, 2005

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.4 – FIELD REVIEW CHECKLIST - SIGNS

Equipment ("No" requires a comment)

Condition	Yes or No	Comment
Is the required PPE available? See Checklist Below		
Is the appropriate PPE being used?		
Is a First Aid kit available?		
Does the team have a list of emergency phone numbers and locations available?		

Personal Protective Equipment in Use (Check all that apply)

- ☐ Hard Hat
- ☐ Work Boots
- ☐ Reflectorized Safety -ANSI Class 3 (with sleeves)
- ☐ Respirator/Dust Mask
- ☐ Flashing Yellow Light on Vehicle
- ☐ Protective Eyewear
- ☐ Safety harness and ≤6' long dual lanyard
- ☐ Gloves

General Equipment for Inspection (Check all that apply)

- ☐ Binoculars
- ☐ BoreScope
- ☐ Calipers
- ☐ Cell phone
- ☐ Chalk, keel, paint sticks, markers
- ☐ Chipping hammer
- ☐ Digital camera
- ☐ D-Meter
- ☐ Dye Penetrant kit
- ☐ Feeler Gauge
- ☐ Flashlight
- ☐ Inspection Mirror
- ☐ Ladders
- ☐ Laptop Computer
- ☐ Line level and string line
- ☐ Magnifying glass
- ☐ Optical Crack Gauge
- ☐ Pliers
- ☐ Pocket knife
- ☐ Plumb bob
- ☐ Scrapers
- ☐ Screwdriver / Ice Pick
- ☐ Shovel
- ☐ Sounding hammer
- ☐ Straight edge
- ☐ Underclearance Rod
- ☐ Wire brush
- ☐ Wisk broom
- ☐ Wrenches
- ☐ 6 foot carpenter's level
- ☐ 6 foot ruler
- ☐ 25 foot tape
- ☐ 100 foot tape

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.4 – FIELD REVIEW CHECKLIST - SIGNS

Work Zone Protection ("No" requires a comment)

Condition	Yes, No or N/A	Comment	
Is work zone traffic control being used?	Yes	☐ By contractor	☐ By Authority
	No / N/A		
Reason for use:			
Are cones & signs being utilized?			
Is the set-up in conformance with Authority Standards and MUTCD Standards?			
Does the Inspection Team have the NJTA Traffic Permit on hand?			

Check Type of Traffic Control Equipment Being Used:			
Arrow Board	☐	☐	Shadow Vehicle (Van)
Shadow Vehicle (Truck)	☐	☐	Impact Attenuator (TMA)
Flaggers	☐	☐	Other:

Access & Fall Protection ("No" requires a comment)

Condition	Yes, No or N/A	Comment
Are the inspection crew members trained in fall protection and scaffolding safety?		
Is a bucket truck being used?		
If a bucket truck is being used, have the operators been instructed regarding its use?		
Is all equipment secured to the inspector while over a travel lane?		

Indicate Access Equipment Type Being Used	
Circle One or Fill In: 30, 35, 40 or _____Ft. – Articulating Bucket Truck	☐
Other:	☐

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.4 – FIELD REVIEW CHECKLIST - SIGNS

Team Leader Technical Knowledge

	Excellent	Good	Fair	Poor
Sign Structure Inspection Methods (and GSP Limitations)	☐	☐	☐	☐
Terminology of Defects	☐	☐	☐	☐
Clearance Measurements	☐	☐	☐	☐
Flange Diagrams	☐	☐	☐	☐

Comparison of Field Work Completed to Actual Field Conditions

	Excellent	Good	Fair	Poor
Consistency	☐	☐	☐	☐
Accuracy	☐	☐	☐	☐
Completeness	☐	☐	☐	☐
Engineering Judgment	☐	☐	☐	☐

Inspection Conduct

	Excellent	Good	Fair	Poor
Use of Field Equipment	☐	☐	☐	☐
Safety Conduct	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐
General Inspection Conduct	☐	☐	☐	☐

Explanation of any Rating Fair or Poor:

_____

_____

Questionnaire (Note: "Yes" requires comment)

Condition	Yes or No	Comment
Does the inspection team feel additional safety equipment is needed?		
Does the inspection team feel additional safety training is needed?		
Does the reviewer feel additional equipment and/or safety training is needed?		

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.5 – FIELD REVIEW CHECKLIST RETAINING WALLS AND NOISE BARRIERS

Structure No: _____ Structure Name: _____

Field Review Date: _____ Field Arrival & Departure Time: _____ / _____

Project: OPS: _____ Garden State Parkway or NJ Turnpike: GSP / TPK

Group: _____

Extension of Structure No.: _____ Freestanding / Independent of Bridge: Yes / No

Structure Type: Retaining Wall / Noise Barrier Construction / Material Type: _____

Consultant: _____

Team Leader: _____ Assistant Team Leader: _____

Other Team Members: _____

Did Consultant send e-mail notification to the Bridge Inspection Technical Manager today? Yes / No

Did Consultant obtain approval for Lane/Shoulder closing? Yes / No

The following items were reviewed with the inspection team during this field visit:

N/A Previous inspection report onsite to determine problem areas.

☐ Understanding and implementation of Category A reporting procedures.

☐ Proper determination and use of Direction of Orientation and Naming Convention.

☐ Understanding of structural behavior of retaining walls and noise barriers.

☐ Wall / barrier definitions (Wall $\geq$ 4' high & Barrier $\geq$ 8' high at any point along the wall or barrier)

☐ Classification of type and structure limits.

☐ Close visual inspection from the ground supplemented where necessary with hands-on inspection.

☐ Section loss measurements (ruler, estimated, other) and proper documentation.

☐ Sounding measurements & streambed profile for documentation of scour and undermining.

☐ Appropriate use of sketches when preparing documentation.

☐ Underwater Inspection requirements (Type 2) for portions of any walls below water.

☐ Proper photo documentation and referencing.

☐ Verification of existing inventory information and input of new inventory information.

☐ Presence and use of basic inspection manuals / forms (*checklist on page 2*) and equipment (*checklist on page 3*).

☐ Use / Availability of proper access equipment.

☐ Proper use of safety equipment & procedures.

GENERAL REMARKS: _____

_____

_____

_____

_____

Bridge Inspection Technical Manager's Auditor Signature Date

_____

Consultant Task Lead Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.5 – FIELD REVIEW CHECKLIST RETAINING WALLS AND NOISE BARRIERS

Auditor's General Review at a distance

What are inspectors doing?
Is proper MPT on site? If short duration closing is "Shoulder Closed" sign and arrow board mounted on back of TMA?
Are proper signs installed? Is it NJTA Maintenance Force closing or Contractor closing?
Close visual inspection from ground or supplemental hands-on inspection with ladders or special equipment?

Auditor's General Review of Field Inspection Team ("No" requires a comment)

Condition	Yes or No	Comment
Do all Team Members have Photo ID present?		
Team Leader in field matches the Team Leader proposed?		
Assessment of Team Leaders Retaining Wall / Noise Barrier Inspection Methods		
Is company vehicle properly identified?		

Required Forms and Manuals Available (Check all that apply)

- ☐ Retaining Wall / Noise Barrier List
- N/A Previous Cycle Inspection Report(s)
- ☐ Previous Category A and Priority 1 Notifications
- ☐ Emergency and Priority 1 Repair Definitions
- ☐ Authority Deficiency Category Definitions
- ☐ Construction History Updates
- ☐ Inventory Data Forms
- ☐ Photo Logs
- ☐ Field Note Forms
- ☐ Field Note Sketches
- ☐ 2011 NJTA Manual for Traffic Control in Work Zones
- ☐ Bridge Inspector's Reference Manual (BIRM)
- ☐ NJTA - Manual for Retaining Wall and Noise Barrier Inspection, Version 1.0, March 2017.
- ☐ NJDOT - Underwater Inspection and Evaluation of NJ Bridges Guidelines Manual, June 1994 Edition with August 2008 Revisions

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.5 – FIELD REVIEW CHECKLIST RETAINING WALLS AND NOISE BARRIERS

Equipment ("No" requires a comment)

Condition	Yes or No	Comment
Is the required PPE available? See Checklist Below		
Is the appropriate PPE being used?		
Is a First Aid kit available?		
Does the team have a list of emergency phone numbers and locations available?		

Personal Protective Equipment in Use (Check all that apply)

- ☐ Hard Hat
- ☐ Work Boots
- ☐ Reflectorized Safety -ANSI Class 3 (with sleeves)
- ☐ Respirator/Dust Mask
- ☐ Flashing Yellow Light on Vehicle
- ☐ Protective Eyewear
- ☐ Safety harness and lanyard
- ☐ Gloves
- ☐ Life Jacket
- ☐ Chest or Hip Waders

General Equipment for Inspection (Check all that apply)

- ☐ Binoculars
- ☐ Boat
- ☐ BoreScope
- ☐ Cell phone
- ☐ Chalk, keel, paint sticks, markers
- ☐ Chipping hammer
- ☐ Digital camera
- ☐ Flashlight
- ☐ Inspection Mirror
- ☐ Ladders
- ☐ Laptop Computer
- ☐ Line level and string line
- ☐ Magnifying glass
- ☐ Optical Crack Gauge
- ☐ Pliers
- ☐ Pocket knife
- ☐ Plumb bob
- ☐ Probing Rod
- ☐ Scrapers
- ☐ Screwdriver / Ice Pick
- ☐ Shovel
- ☐ Sounding hammer
- ☐ Straight edge
- ☐ Wire brush
- ☐ Wisk broom
- ☐ Wrenches
- ☐ 4 foot carpenter's level
- ☐ 6 foot ruler
- ☐ 25 foot tape
- ☐ 100 foot tape

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.5 – FIELD REVIEW CHECKLIST RETAINING WALLS AND NOISE BARRIERS

Work Zone Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment	
Is work zone traffic control being used?	Yes	☐ By contractor	☐ By Authority
	No / N/A		
Reason for use:			
Are cones & signs being utilized?			
Is the set-up in conformance with Authority Standards and MUTCD Standards?			
Does the Inspection Team have the NJTA Traffic Permit on hand?			

Check Type of Traffic Control Equipment Being Used:			
Arrow Board	☐	☐	Shadow Vehicle (Van)
Shadow Vehicle (Truck)	☐	☐	Impact Attenuator (TMA)
Flaggers	☐	☐	Other:

Fall Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment
Are the inspection crew members trained in fall protection and scaffolding safety?		
Is a bucket truck being used?		
If a bucket truck is being used, have the operators been instructed regarding its use?		
Does the retaining wall require an Underwater Inspection?		
If so, is a qualified diver on-site performing a Type-2 Underwater Inspection?		

Indicate Access Equipment Type Being Used	
Circle One or Fill In: 30, 35, 40 or _____Ft. – Bucket Truck	☐
Other:	☐

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.5 – FIELD REVIEW CHECKLIST RETAINING WALLS AND NOISE BARRIERS

Team Leader Technical Knowledge

	Excellent	Good	Fair	Poor
Retaining Wall / Noise Barrier Inspection Methods	☐	☐	☐	☐
Terminology of Defects	☐	☐	☐	☐
Inventory Information	☐	☐	☐	☐
Sounding Measurements	☐	☐	☐	☐

Comparison of Field Work Completed to Actual Field Conditions

	Excellent	Good	Fair	Poor
Consistency	☐	☐	☐	☐
Accuracy	☐	☐	☐	☐
Completeness	☐	☐	☐	☐
Engineering Judgment	☐	☐	☐	☐

Inspection Conduct

	Excellent	Good	Fair	Poor
Use of Field Equipment	☐	☐	☐	☐
Safety Conduct	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐
General Inspection Conduct	☐	☐	☐	☐

Explanation of any Rating Fair or Poor:

_____

_____

Questionnaire (Note: "Yes" requires comment)

Condition	Yes or No	Comment
Does the inspection team feel additional safety equipment is needed?		
Does the inspection team feel additional safety training is needed?		
Does the reviewer feel additional equipment and/or safety training is needed?		

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.6 – FIELD REVIEW CHECKLIST - MICROWAVE TOWERS

Structure No: _____ Structure Name: _____

Field Review Date: _____ Field Arrival & Departure Time: _____ / _____

Project: OPS: _____ Garden State Parkway or NJ Turnpike: GSP / TPK

Group: _____

Location: _____

Tower Type: _____

Consultant: _____

Team Leader: _____ Assistant Team Leader: _____

Other Team Members: _____

Did Consultant send e-mail notification to the Bridge Inspection Technical Manager today? Yes / No

The following items were reviewed with the inspection team during this field visit:

- ☐ Previous inspection report onsite to determine problem areas.
- ☐ Understanding and implementation of Category A reporting procedures.
- ☐ Proper determination and use of Direction of Orientation.
- ☐ Section loss measurements (D-meter, caliper, estimated, other) and proper documentation.
- ☐ Appropriate use of sketches and tables when preparing documentation.
- ☐ Proper photo documentation and referencing.
- ☐ Presence and use of basic inspection manuals / forms (*checklist on page 2*) and equipment (*checklist on page 3*).
- ☐ Use / Availability of proper access equipment.
- ☐ Proper use of safety equipment & procedures.
- ☐ Verify as-built plans or field measure member sizes, connections and structure geometry?
- ☐ Inspection of: Foundation, Tower Structure, Equipment Shelter, Lighting System, Grounding Apparatus, Electrical System, Security Fence, Antennas.
- ☐ Climbing Apparatus & Hardware inspected for functionality and OSHA/PEOSHA conformance?
- ☐ Photo of Antenna Nameplate & recording: type, model name, number, height, diameter & its location on tower.
- ☐ If the information on the nameplate is worn, field measurements should be taken for the size of Antenna.
- ☐ Wind speed / tension in guy wire checked?

GENERAL REMARKS: _____

_____

_____

_____

_____ _____

Bridge Inspection Technical Manager's Auditor Signature Date

_____ _____

Consultant Task Lead Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.6 – FIELD REVIEW CHECKLIST - MICROWAVE TOWERS

Auditor's General Review at a distance

What are inspectors doing?
Close visual / climbing inspection techniques for FCM members?

Auditor's General Review of Field Inspection Team ("No" requires a comment)

Condition	Yes or No	Comment
Do all Team Members have Photo ID present?		
Team Leader in field matches the Team Leader proposed?		
Assessment of Team Leaders Bridge Inspection Methods		
Is company vehicle properly identified?		

Required Forms and Manuals Available (Check all that apply)

- ☐ Tower List
- ☐ Previous Cycle Inspection Report(s)
- ☐ Previous Category A and Priority 1 Notifications
- ☐ Emergency and Priority 1 Repair Definitions
- ☐ Authority Deficiency Category Definitions
- ☐ Construction History Updates
- ☐ Photo Logs
- ☐ Field Note Forms
- ☐ Bridge Inspector's Reference Manual (BIRM)
- ☐ Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaires and Traffic Signals, March 2005
- ☐ TIA/EIA-222-G Standard

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.6 – FIELD REVIEW CHECKLIST - MICROWAVE TOWERS

Equipment ("No" requires a comment)

Condition	Yes or No	Comment
Is the required PPE available? See Checklist Below		
Is the appropriate PPE being used?		
Is a First Aid kit available?		
Does the team have a list of emergency phone numbers and locations available?		

Personal Protective Equipment in Use (Check all that apply)

- ☐ Hard Hat
- ☐ Work Boots
- ☐ Reflectorized Safety -ANSI Class 3 (with sleeves)
- ☐ Respirator/Dust Mask
- ☐ Flashing Yellow Light on Vehicle
- ☐ Protective Eyewear
- ☐ Safety harness and lanyard
- ☐ Gloves

General Equipment for Inspection (Check all that apply)

- ☐ Binoculars
- ☐ Calipers
- ☐ Cell phone
- ☐ Chalk, keel, paint sticks, markers
- ☐ Chipping hammer
- ☐ Digital camera
- ☐ D-Meter
- ☐ Dye Penetrant kit
- ☐ Feeler Gauge
- ☐ Flashlight
- ☐ Inspection Mirror
- ☐ Laptop Computer
- ☐ Magnifying glass
- ☐ Optical Crack Gauge
- ☐ Pliers
- ☐ Pocket knife
- ☐ Plumb bob
- ☐ Scrapers
- ☐ Screwdriver / Ice Pick
- ☐ Straight edge
- ☐ Thermometer / temperature gauge
- ☐ Wire brush
- ☐ Wrenches
- ☐ 4 foot carpenter's level
- ☐ 6 foot ruler
- ☐ 25 foot tape
- ☐ 100 foot tape

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.6 – FIELD REVIEW CHECKLIST - MICROWAVE TOWERS

Work Zone Protection / Access ("No" requires a comment)

Fall Protection / Access ("No" requires a comment)

Condition	Yes, No or N/A	Comment
Does the Inspection Team have the NJTA Traffic Permit on hand?		
Contacted Gerry Minneci of ITS for access to tower (towers are enclosed by locked security fence)?		
Are the inspection crew members trained in fall protection?		

Additional Comments:

NEW JERSEY TURNPIKE AUTHORITY
QAF 1.6 – FIELD REVIEW CHECKLIST - MICROWAVE TOWERS

Team Leader Technical Knowledge

	Excellent	Good	Fair	Poor
Tower Inspection Methods	☐	☐	☐	☐
Terminology of Defects	☐	☐	☐	☐
Clearance Measurements	☐	☐	☐	☐

Comparison of Field Work Completed to Actual Field Conditions

	Excellent	Good	Fair	Poor
Consistency	☐	☐	☐	☐
Accuracy	☐	☐	☐	☐
Completeness	☐	☐	☐	☐
Engineering Judgment	☐	☐	☐	☐

Inspection Conduct

	Excellent	Good	Fair	Poor
Use of Field Equipment	☐	☐	☐	☐
Safety Conduct	☐	☐	☐	☐
Technical Ability	☐	☐	☐	☐
General Inspection Conduct	☐	☐	☐	☐

Explanation of any Rating Fair or Poor:

_____

_____

Questionnaire (Note: "Yes" requires comment)

Condition	Yes or No	Comment
Does the inspection team feel additional safety equipment is needed?		
Does the inspection team feel additional safety training is needed?		
Does the reviewer feel additional equipment and/or safety training is needed?		

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 2 – Report Review Checklist

NEW JERSEY TURNPIKE AUTHORITY
QAF 2 – REPORT REVIEW CHECKLIST

Structure Name:		Structure No:	
Project Name:		Garden State Parkway or NJ Turnpike (circle one):	GSP / TPK
Carried:		Crossed:	
No. of Spans / Bridge Type:			
Consultant:			
Team Leader:		Assistant Team Leader:	
Other Team Members:		QC Engineer:	

GUIDELINES

The Bridge Technical Manager shall ensure the inspection report is complete, thorough and accurate to the limit of available resources. The Bridge Technical Manager is encouraged to use the following rules and checks for reviewing bridge inspection reports.

GENERAL REMARKS: _____

_____

_____

_____

Bridge Inspection Technical Manager's Auditor Signature Date

NEW JERSEY TURNPIKE AUTHORITY
QAF 2 – REPORT REVIEW CHECKLIST

The Bridge Technical Manager performs the technical QA review. This may include:

GENERAL

YES	NO	N/A	
☐	☐	☐	Does the report format match the Authority's required format?
☐	☐	☐	Forms – Were all applicable and necessary forms completed?
☐	☐	☐	Names – Do all documentation forms have the Team Leader and/or the Assistant Team Leader names and other identifying information such as date and features?
☐	☐	☐	Was the inventory verified by the preparer and reviewer?
☐	☐	☐	Does the report have a sticker on the cover, denoting the bridge as containing Fracture Critical Members?
☐	☐	☐	
☐	☐	☐	All rated elements, comments, photos, sketches, flag reports, etc. are carefully checked for technical accuracy and compliance with this manual. This review may be as detailed as the quality control review.
☐	☐	☐	Who inspected the bridge? Are they approved for bridge inspection work?
☐	☐	☐	Date in the Report – Is it the same as the first day in the field?
☐	☐	☐	Date in the Report – For new bridges, reconstructed bridges or major rehabs, is the inspection started within 180 days of reopening to traffic of the newly constructed bridge or any portion thereof?
☐	☐	☐	Is the actual access used to inspect the bridge noted on the form? Are they applicable or in need of update?
☐	☐	☐	Is the load posting coded correctly?
☐	☐	☐	Ensure photos, ratings and comments are consistent with each other and NBI rating guidance.
☐	☐	☐	Does the report include a section on fatigue-prone details, if applicable?
☐	☐	☐	Was a 100% Hands-On Inspection completed for fracture-critical members?
☐	☐	☐	Is the 100% hands-on inspection completed/waived for weld categories D, E, and/or E' welds? If so, is the correct cycle being maintained for 100% hands on inspection of the details?
☐	☐	☐	Were Category welds D, E, and E' located on sketches in the Report?
☐	☐	☐	Were all D, E, and E' Category welds properly identified?
☐	☐	☐	Field Notes – Is the recorded date consistent with that recorded elsewhere?
☐	☐	☐	Field Notes - Are the date, arrival, departure, temperature and weather lines completed?
☐	☐	☐	MP Marker – Are they in place? The Bridge Technical Manager shall notify Maintenance of missing or defaced MP Markers for eventual replacement.
☐	☐	☐	Are all cross references correct?
☐	☐	☐	Are the proper bridge components included and rated?
☐	☐	☐	

Notes:

NEW JERSEY TURNPIKE AUTHORITY
QAF 2 – REPORT REVIEW CHECKLIST

CLEARANCES

YES	NO	N/A	
☐	☐	☐	Were vertical clearances measured if the bridge crosses a highway? Is the minimum clearance and its location noted? Are vertical clearances on and/or under the bridge coded correctly?
☐	☐	☐	Were the vertical clearances measured, if the bridge crosses a railroad? Is the minimum clearance and its location noted? ? Are vertical clearances on and/or under the bridge coded correctly?
☐	☐	☐	
☐	☐	☐	
☐	☐	☐	

Notes:

CATEGORY A DEFICIENCIES

YES	NO	N/A	
☐	☐	☐	Category A Deficiencies – Check to see if documentation and actions are consistent with the previous and current Category A status.
☐	☐	☐	Are substandard vertical clearances on and/or under the bridge posted correctly?
☐	☐	☐	

Notes:

PHOTOS

YES	NO	N/A	
☐	☐	☐	Check proper orientation: roadway direction, north arrow, waterway, etc.
☐	☐	☐	Check that photos differentiate between above and below deck photos
☐	☐	☐	Are 2 Overall Elevation Photos included, showing the feature under the bridge?
☐	☐	☐	Are 2 Overall Top of Bridge Roadway Photos included?
☐	☐	☐	Are 2 top and underside of deck included(unless formwork different)?
☐	☐	☐	Is 1 Photo included for each repair type (unless typical for structure, then 1 typical)?
☐	☐	☐	Is there 1 photo for each typical utility bay and support system?
☐	☐	☐	Do captions describe what photo shows?
☐	☐	☐	Do photos of deterioration show an estimated quantity?
☐	☐	☐	Are standard Photos provided for new bridges, after major rehabilitation or applicable change conditions noted?
☐	☐	☐	Are comments and photos included for all defects that are recommended for repair?
☐	☐	☐	Are comments and photos included any element that has had Work Done since the previous inspection?
☐	☐	☐	Did the inspector adhere to the established direction of orientation when referencing in photos?

Notes:

NEW JERSEY TURNPIKE AUTHORITY
QAF 2 – REPORT REVIEW CHECKLIST

CONCLUSIONS AND RECOMMENDATIONS

YES	NO	N/A	
☐	☐	☐	Overall Condition - matches condition on SI&A?
☐	☐	☐	Is the structural integrity affected?
☐	☐	☐	Any changes in bridge condition and bridge elements since previous inspection & work done?
☐	☐	☐	Safety features meet current standards?
☐	☐	☐	Do shoulder widths meet current standards?
☐	☐	☐	Ratings adequate? (List Controlling Member, %Overstress)
☐	☐	☐	Load Posting required?
☐	☐	☐	Interim inspection required and why if it is needed?
☐	☐	☐	Waterway opening adequate, if applicable?
☐	☐	☐	Fatigue details and condition noted?
☐	☐	☐	Vertical underclearance matches SI&A?
☐	☐	☐	Posting of vertical underclearance required?
☐	☐	☐	Does one repair make another useless?
☐	☐	☐	Do the defects match field notes?
☐	☐	☐	List safety feature/upgrades last?
☐	☐	☐	Repair Priority and Defect codes match SI&A?

Notes:

PLATES/DRAWINGS

YES	NO	N/A	
☐	☐	☐	GP&E - Direction of view
☐	☐	☐	GP&E - Point of min. vertical underclearance indicated (54, DJ)match SI&A Sheet
☐	☐	☐	GP&E - All horizontal underclearances match SI&A Sheet (55, 56)
☐	☐	☐	GP&E - All horizontal underclearances match SI&A Sheet
☐	☐	☐	GP&E - Do number of lanes under match SI&A Sheet (28)?
☐	☐	☐	GP&E - Clearances shown at shoulder lines and skip lines at both fascias not requiring traffic control?
☐	☐	☐	GP&E - Does min. vertical underclearance match Elevation?
☐	☐	☐	GP&E - All underclearances clearly shown and located?
☐	☐	☐	Cross Section - Shoulder, lane & sidewalk widths shown?
☐	☐	☐	Cross Section - Stringer spacing shown?
☐	☐	☐	Cross Section - Do dimensions match SI&A (28, AH, 47, 48, 49, 50, 51, 52, 53, AQ) & field notes?
☐	☐	☐	Cross Section - Are utilities shown?
☐	☐	☐	Fatigue Details- Types of fatigue details & locations (Categories D, E, E', F) shown?
☐	☐	☐	Fatigue Details- Cracks & defects with sizes & locations shown?
☐	☐	☐	Fatigue Details- If defects noted, do they match conclusions & recommendations and field notes?

Notes:

NEW JERSEY TURNPIKE AUTHORITY
QAF 2 – REPORT REVIEW CHECKLIST

SI&A RATINGS

YES	NO	N/A	
☐	☐	☐	Year of ADT changed to current cycle year (30)?
☐	☐	☐	Item 115 updated to current cycle year + 20?
☐	☐	☐	Latest inspection date updated (90)?
☐	☐	☐	Cycle number updated (CI)?
☐	☐	☐	Consultant updated (CM)?
☐	☐	☐	Condition Ratings match field notes?
☐	☐	☐	Items 64 & 66 match Rating Summary Sheet?

Notes:

LOAD RATINGS

YES	NO	N/A	
☐	☐	☐	Does the report contain a statement regarding the current bridge ratings?
☐	☐	☐	Did the inspector adhere to the established direction of orientation when providing ratings and comments?
☐	☐	☐	Does the Inspection Consultants' letter or transmittal provide a statement justification to perform an update of the bridge load ratings calculations?

Notes:

ADDITIONAL REPORTS

YES	NO	N/A	
☐	☐	☐	Diving – Does scour documentation indicate water depths of 4 feet or more at any substructure indicating the need for a diving inspection?
☐	☐	☐	Diving – Did inspector properly reference previous diving report in the bridge inspection report, where applicable?
☐	☐	☐	Diving - Are channel profiles near substructures taken if water depth and/or turbidity prohibit a visual inspection?
☐	☐	☐	Diving - Is the extent of scour documented by sketches?
☐	☐	☐	Diving - If there are any stream channel alignment problems, is there a stream alignment sketch?
☐	☐	☐	Diving - Is water depth measured and documented to determine if diving is required?
☐	☐	☐	Diving - Are substructure deficiency (underwater) sketches done, if necessary?
☐	☐	☐	Sounding Survey- Soundings shown at 10' intervals along both fascias and along longitudinal centerline of bridge?
☐	☐	☐	Sounding Survey - Sufficient soundings along abutment/pier & relationship to footing?
☐	☐	☐	Sounding Survey - Exposed/undermined footings shown on sketch?
☐	☐	☐	Sounding Survey - Benchmark & waterline references shown on sketch(s)?
☐	☐	☐	Sounding survey - Does the Sounding documentation include flow direction?
☐	☐	☐	FCM - Does the report include Fracture Critical Member Report, if applicable?
☐	☐	☐	Pin and Hangers - Does the report include a section on pins and hangers, if applicable?

Notes:

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 7 – Tech. Manager Qualification Checklist

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 8 – Inspection Findings Field Review Checklist

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 9 – Field Review Findings and Recommendation Form

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 10 – Load Rating Review Checklist

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION PROGRAM TECHNICAL MANAGER

QAF 11 – Office Review Checklist

Part 1: Office Review

Firm Name:		**Firm Location:**	
Principle-In-Charge:		**Quality Assurance Manager:**	
Auditor:		**Date of Quality Audit:**	

Office Quality Audit	Response	Comments
Organization:		
1. Is a Quality Assurance Manager (QAM) in place?	☐ Yes ☐ No ☐ N/A	
Management:		
1. Do Project Specific Quality Plans (PSQP) exist for active projects?	☐ Yes ☐ No ☐ N/A	
2. Are approved Quality and Administration procedures in place for all active projects?	☐ Yes ☐ No ☐ N/A	
3. Are quality check and review activities accounted for within PSQP?	☐ Yes ☐ No ☐ N/A	
4. Is each employee familiar with the PSQP?	☐ Yes ☐ No ☐ N/A	
5. Are Corrective Action Reviews conducted on projects in the office? a. Who facilitates? b. What records are maintained? Are they shared with the client?	☐ Yes ☐ No ☐ N/A _____ ☐ Yes ☐ No ☐ N/A	
6. Are internal audits conducted on PSQP in the office? a. Who facilitates? b. What records are maintained? Are they shared with the client?	☐ Yes ☐ No ☐ N/A _____ ☐ Yes ☐ No ☐ N/A	
Training:		
1. Has the staff received training on the PSQP? a. Do training records exist?	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	
2. Do new hires receive training on the PSQP? a. Does any documented evidence exist?	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	
3. Are there opportunities when quality performance or quality related information is routinely shared with office staff?	☐ Yes ☐ No ☐ N/A	

Project Name:	Project No.:

Part 2: Project Quality Audit

Project % Complete:			
Project Manager:		**Quality Assurance Manager:**	
Auditor:		**Date of Quality Audit:**	

Project Quality Audit:	Response	Comments
Project Team Organization:		
1. Has a Quality Assurance Manager (QAM) been assigned?	☐ Yes ☐ No ☐ N/A	
Project Quality Plan:		
1. Has a Project Specific Quality Plan (PSQP) Approval Form been completed and shows evidence of approval?	☐ Yes ☐ No ☐ N/A	
2. Has a Project Delivery Schedule been completed, including the assignment of check and review dates?	☐ Yes ☐ No ☐ N/A	
4. Was NJTA approval of the PSQP necessary? a. If so, is there record of that approval?	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	
5. Are subconsultants utilized on this project? Are subconsultants following the PSQP or a Quality Plan (QP) of their own? a. If PSQP, was it provided to subs? b. If their own, is it available and is there evidence of QAM review and approval?	☐ Yes ☐ No ☐ N/A ☐ PSQP ☐ Sub QP ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	
6. Has the project team been trained on the PSQP? a. Do training records exist?	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	
7. What method is used for review?	☐ Electronic Copy ☐ Hardcopy ☐ Comment Resolution Forms	
Project Quality Records:		
8. Has a project quality record repository been established and included in the PSQP? a. Does it include folders/meta data for storing of Project Quality Records? b. Is a copy of the approved PSQP Approval Form posted in that repository? c. Are subconsultant QPs (if applicable) posted in that repository? d. Does the project team (including subconsultants if applicable) have access to that repository?	☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐ N/A	

Record Keeping:		
9. Are folders available for each individual structure?	☐ Yes ☐ No ☐ N/A	
a. Are filed notes available?	☐ Yes ☐ No ☐ N/A	
b. Are records available **in the repository** to demonstrate the Quality Control (QC) checks and Quality Assurance (QA) reviews have occurred?	☐ Yes ☐ No ☐ N/A	
c. Have QC checks and QA reviews been conducted in accordance with the PSQP? (e.g. proper reviewer color used, Project Manager and reviewer signatures and date, etc.)	☐ Yes ☐ No ☐ N/A	
d. Do records indicate that reviewer(s)' comments been resolved and verified?	☐ Yes ☐ No ☐ N/A	
e. Is there an office copy of the submitted reports?	☐ Yes ☐ No ☐ N/A	
f. Have Client Review Comments been addressed?	☐ Yes ☐ No ☐ N/A	
g. Are there records of comment resolution?	☐ Yes ☐ No ☐ N/A	
h. Are records available **in the repository** to demonstrate QC checks and QA reviews have occurred prior to final report submission?	☐ Yes ☐ No ☐ N/A	
Continual Improvement Feedback:		
10. Have any quality issues been encountered on the project, since the development of the PSQP?		
11. What challenges if any, have you encountered in executing the PSQP?		
12. What has went well or was benefited in executing the PSQP?		
13. Have you made any changes to the PSQP, which has resulted in higher quality deliverables or greater efficiency?		
Additional Space for Reviewers Notes:		

STRUCTURE INSPECTION CONSULTANTS

QAF 3 – Consultant Qualification Form

NEW JERSEY TURNPIKE AUTHORITY
QAF 3 – QUALITY ASSURANCE AUDIT: TECHNICAL MANAGERS QUALIFICATIONS REVIEW CHECKLIST

Applicant Name	Area Code - Telephone Number - Home	
Address	Area Code – Telephone Number - Work	
City	State	ZIP Code
E-Mail Address	Employer	

Refer to the Authorities website http://www.state.nj.us/turnpike/documents/NJTA-Bridge-Inspection-Program_rev-OCT2011.pdf for required qualifications. Forward two completed copies of this form to XXXXX. One copy will be returned to you, if deemed qualified.

The Applicant is applying for the Project Title: _____

PART I - REGISTRATION/TRAINING - Complete All Information

Graduate Civil Engineer (BSCE)	Yes or No
New Jersey Registered Professional Engineer Reg. No.:	Yes or No Emphasis: Structural
Circle the minimum number of years of NBIS Bridge Inspection Experience	3 5 10
NICET Level III or IV Reg. No.:	Yes or No If Yes, Attach Copy of Certificate
NHI Course No. 130053 - Bridge Inspection Refresher Training	Yes or No Date: If Yes, Attach Copy of Certificate
NHI Course No. 130055 – Safety Inspection of In-Service Bridges	Yes or No Date: If Yes, Attach Copy of Certificate
NHI Course No. 130078 - FCM Inspection Course	Yes or No Date: If Yes, Attach Copy of Certificate
Course for Confined Space Inspections (Firms such as Applegate Associates, (732) 292-9956, offer a 3 to 4 hour training course).	Yes or No Date: If Yes, Attach Copy of Certificate
NHI Course No. 130091 – Underwater Bridge Inspection	Yes or No Date: If Yes, Attach Copy of Certificate
Association of Commercial Diving Educators (ACDE) accredited school complying with the requirements of ANSI/ACDE-01-1993, "Commercial Diver Training –Minimum Standard" (or a military diving school meeting the same standards)	Yes or No Date: If Yes, Attach Copy of Certificate
NHI Course No. 130087 – Sign and Ancillary Structure Inspections	Yes or No Date: If Yes, Attach Copy of Certificate
Minimum of 5 years of bridge design and/or load rating experience	Yes or No
Demonstrates a working knowledge of LRFD Specifications and the NJTA Load Rating Manual	Yes or No
NHI Course No. 130092 Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (4 days)	Yes or No Date: If Yes, Attach Copy of Certificate
NHI Course No. 130092B Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (2 days)	Yes or No Date: If Yes, Attach Copy of Certificate
Additional Specialized Certifications	

NEW JERSEY TURNPIKE AUTHORITY
QAF 3 – QUALITY ASSURANCE AUDIT: TECHNICAL MANAGERS QUALIFICATIONS REVIEW CHECKLIST

APPROVAL: FOR NJTA BRIDGE TECHNICAL MANAGER USE ONLY! DO NOT WRITE BELOW THIS LINE.

Qualified As:

Project Manager (Meets Criteria 1 OR 2)

1. ☐ Registered Professional Engineer in the State of New Jersey
   AND
   _____Years of NBIS Bridge inspection Experience > 5 Years
   AND either of the following:
   ☐ NHI Course No. 130053 - Bridge Inspection Refresher Training within past_____years (every 5 years)
   OR
   ☐ NHI Course No. 130055 – Safety Inspection of In-Service Bridges within past_____years (every 5 years)

2. ☐ Graduate Engineer (BSCE)
   AND
   ☐ _____Years of NBIS Bridge inspection Experience > 10 Years
   AND either of the following:
   ☐ NHI Course No. 130053 - Bridge Inspection Refresher Training within past_____years (every 5 years)
   OR
   ☐ NHI Course No. 130055 – Safety Inspection of In-Service Bridges within past_____years(every 5 years)

Team Leader (Meets Criteria 1 OR 2)

1. ☐ Registered Professional Engineer in USA (NJ preferred)
   AND
   _____Years of NBIS Bridge inspection Experience > 3 Years
   AND
   ☐ NHI Course No. 130055 – Safety Inspection of In-Service Bridges within past_____years
   AND
   ☐ NHI Course No. 130053 - Bridge Inspection Refresher Training within past_____years (every 5 years)

2. ☐ Graduate Engineer (BSCE)
   AND
   ☐ _____Years of NBIS Bridge inspection Experience > 5 Years
   AND
   ☐ NHI Course No. 130055 – Safety Inspection of In-Service Bridges within past_____years
   AND
   ☐ NHI Course No. 130053 - Bridge Inspection Refresher Training within past_____years (every 5 years)

Team Leader for Special Inspections : FCM

☐ NHI Course No. 130078 - FCM Inspection Course within past_____years (within the past 5 years)

Bridge Inspection Diver

☐ NHI Course No. 130091 – Underwater Bridge Inspection within past_____years (within the past 5 years)
☐ Association of Commercial Diving Educators (ACDE) within past_____years

Confined Space Inspection

☐ Course for Confined Space Inspections within past_____years

Team Leader for Sign and Ancillary Structures

☐ NHI Course No. 130087 – Sign and Ancillary Structure Inspections within past_____years (within the past 5 years)

NEW JERSEY TURNPIKE AUTHORITY
QAF 3 – QUALITY ASSURANCE AUDIT: TECHNICAL MANAGERS QUALIFICATIONS REVIEW CHECKLIST

Load Rating Engineer

- ☐ _____Years of bridge design and/or load rating experience > 5 years

AND

- ☐ Demonstrates a working knowledge of LRFD Specifications and the NJTA Load Rating Manual

AND

- ☐ NHI Course No. 130092 Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (4 days);

AND

- ☐ NHI Course No. 130092 or 130092B Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (4 days or 2 days) every five years following the initial 4 day course

Load Rating Reviewer

- ☐ _____Years of bridge design and/or load rating experience > 5 years

AND

- ☐ Demonstrates a working knowledge of LRFD Specifications and the NJTA Load Rating Manual

AND

- ☐ NHI Course No. 130092 Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (4 days);

AND

- ☐ NHI Course No. 130092 or 130092B Fundamentals of LRFR and Applications of LRFR for Bridge Superstructures (4 days or 2 days) every five years following the initial 4 day course

AND

- ☐ Registered Professional Engineer in the State of New Jersey

NOTES

Reviewed By	Date
Bridge Technical Manager's Auditor Signature	

NEW JERSEY TURNPIKE AUTHORITY
QAF 3 – QUALITY ASSURANCE AUDIT: TECHNICAL MANAGERS QUALIFICATIONS REVIEW CHECKLIST

PART II - EXPERIENCE - Attach Additional Sheets If Needed

Persons other than a P.E. are required to complete Part II in its entirety. A minimum of 5 years of responsible bridge inspection experience for Team Leaders and 10 years for Project Managers must be shown. P.E.'s. List all relevant experience.

Bridge Safety Inspection Field Experience

Please state your inspection experience in various types of bridges (i.e., steel girders, concrete girders, trusses, slabs, prestressed girders, culverts, movable bridges, other complex structures, etc.).

Date From	Date To	Describe Bridge Type(s) and Inspection Type(s)	Name & Telephone No. for References	*Approx. %**

*** Percent of year devoted to bridge safety inspection field work.**

I, the undersigned, affirm that all statements and data in Parts I and II are true and correct. I understand that any misrepresentation may constitute fraud, and may be punishable to the full extent of the law. Furthermore, I understand that it is my responsibility to stay current on bridge inspection issues, and that I will notify the Authority and the Authority's Bridge Technical Manager of any name or mailing address changes in writing within 30 days.

_____ _____

(APPLICANT SIGNATURE) (DATE)

STRUCTURE INSPECTION CONSULTANTS

QAF 5 - Consultant Quality Assurance Checklist

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION CONSULTANTS

QCF 1 – Consultant InspectTech Report Checklist

1 - Bridge Report Checklist

2 - Culvert Report Checklist

3 - Retaining Wall/Noise Barrier Report Checklist

NEW JERSEY TURNPIKE AUTHORITY

Str.: Date: Cycle:

REPORT CHECKLIST QC-1

CONSULTANT INSPECTECH REPORT QUALITY CONTROL REVIEW

QA/QC:

Date:

Number of most recent notification:

General

NBI Calcs	☐	Open the NBI Calcs Form to recalculate values for NBI 67, BSR and SD/FONBI when NBI data is changed.
Work Done	☐	Check for work done on the bridge between inspection cycles. Go to the Maintenance tab for Category A's, the Asset Info Tab for History/Notes, and the Quick View for Contract Information.
FCM Location Plan	☐	Include FCM Location plan in the FCM Report.

Photographs

Order of Photographs	☐	General Photos: Elevation (2), Approach (2), Top of Deck, Under Deck, Waterway (2) Critical Findings Photos: Category A, Priority 1, Inadequate Clearance Defect Photos (In order of field notes): Approach, Deck, Superstructure, Bearings, Substructure, Miscellaneous (Category D, Utilities). Work done photos are incorporated with defect photos by element. Equipment Photos (If they have not already been included)
Utility Photos	☐	Include photos of all utilities. Specify type and description.
Repairable Defect Photos	☐	Upload photos of all repairable defects. Only typical defect photos need to be included in the report.

Report Sections

Load Rating Summary Sheet	☐	Add Load Rating Summary Sheet as a PDF attachment to the Report Sections. Check the values against the NBI data and alert NJTA if they do not match. Load rating data cannot be edited by inspectors.
Section Loss Documentation	☐	Add Section Loss Sheets and Documentation as a PDF attachment to the Report Sections.
Clearance and/or Soundings	☐	Add Clearance and/or Soundings as a PDF attachment to the Report Sections.
Underwater Inspection Report	☐	Add Underwater Inspection Report as a PDF attachment to the Report Sections.
FCM Inspection Report	☐	Add FCM report as a PDF attachment to the Report Sections.

File Uploads

Element Baseline	☐	Upload backup calculations for element baseline quantities to "Element Calculations". Do not include in Report Sections. Applicable only when initial element inspection form is coded or if the structure has had work done which changes the elements or the quantities.
Deck Framing Plan	☐	Upload framing plan or deck schematic, used to collect field data, to "Element Calculations". (Particularly for bare decks for use during the next inspection.) Do not include in Report Sections.
Bearing Matrix FIle	☐	Upload Bearing Matrix working file to "File". Bearing Matrix from 2015 or 2016 inspection (where defects were included in matrix) should be saved, converted to excel and used in the field to collect data. Do not include in Report Sections.
Working Files	☐	Upload all working files to their own File Type. This includes load rating, clearance, soundings, underwater inspection, FCM inspection, etc.
Final Report	☐	Upload the Final Report PDF to "NBIS Report".

NEW JERSEY TURNPIKE AUTHORITY

Str. Date: Cycle:

CULVERT REPORT CHECKLIST

Notifications	Remember to read all email notifications and apply changes to the report.	Enter most recent notification number as of date.

Report Prep in IT

Category A & Bridge Notes	Remember to check for any work on the bridge between inspection cycles. Go to the Maintenance tab for Category A's and the Asset Info tab for Info/Notes

Report Prep in IT - Photographs

Order of Photographs	Elevation (2: Inlet, Outlet), Approach to Culvert (All), General view culvert interior, View of roadway above, Waterway (2: Upstream, Downstream), Defects (In order of field notes: Roadway, Culvert, Headwalls / Wingwalls, Waterway, Misc.) **Include Work Done in Defect Photo order not at end.
Utility Photos	Identify all utilities on bridge with photos. If not captured within existing general or defect photos, include at the end.
Repairable Defect Photos	All repairable defects must have a photo file uploaded for each location, however, only typical defect photos need to be included in the report.

Report Prep in IT - Report Sections

Section Loss Documentation	Insert Section Loss Sheets and Documentation as a PDF report section.
Soundings	Insert Soundings as a PDF report section.
Underwater Inspection Report	Remember to upload underwater inspection report, if required.
Scour Report	Include information from the scour report in the document (NBI codes and 61, 71 & 113 write up).

Report Prep - File Uploads

Element Baseline	Element baseline quantities backup shall be uploaded into IT. This is not part of the report. Place under " Element Calculations"
Working Files (i.e. C&R, FCM, UW, Load Ratings)	All working files shall be uploaded. Place Conclusions and Recommendations under "NBI Report" file type. Place remaining working files accordingly.

NEW JERSEY TURNPIKE AUTHORITY

Str. Date: Cycle:

RETAINING WALL/NOISE BARRIER REPORT CHECKLIST

Notifications	Remember to read all email notifications and apply changes to the report.	Enter most recent notification number as of date.

Work Done

Category A & Bridge Notes	Remember to check for any work on the Retaining Wall/Noise Barrier between inspection cycles. Go to the Maintenance tab for Category A's and the Asset Info tab for Info/Notes

Report Prep in IT - Photographs

Order of Photographs	Elevation (2: Front Face and Rear Face), Top of Roadway/Ramp for Retaining Wall (1: Along the Asset), Defects (In order of field notes: wall/panel, vertical support, joint, etc.) **Include Work Done in Defect Photo order not at end.
Defect Photos	All defects must have a photo file uploaded for each location, however, only typical defect photos need to be included in the report.

Report Prep in IT - Report Sections

Soundings	Insert Soundings as a PDF report section.
Underwater Inspection Report	Insert underwater inspection report, if required.

Report Prep - File Uploads

Field Sketches	If the template for the field sketch is used to collect data during the inspection, upload it as a PDF to the File folder.
Working Files (i.e. UW, Sounding)	All working files shall be uploaded. Place remaining working files accordingly.

STRUCTURE INSPECTION CONSULTANTS

QCF 2 – Consultant Field Checklist

TO BE PUBLISHED AT A LATER DATE

STRUCTURE INSPECTION CONSULTANTS

QCF 3 – Consultant Load Rating Checklist

TO BE PUBLISHED AT A LATER DATE