

# INDOT BRIDGE INSPECTION MANUAL

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## PART 1

### ADMINISTRATION

# BRIDGE INSPECTION MANUAL

## PART 1: ADMINISTRATION

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### **INTRODUCTION**

Part 1 of the Bridge Inspection Manual contains the following chapters:

1. Program Overview
2. Program Summary
3. Inspection Program
4. Organazations
5. Qualifications and Responsibilities

These chapters define the qualifications and procedures that all titled Bridge Inspection employees must follow. The performance expectations and responsibilities are provided in part 1-1.04 of this manual.

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### 1-1.0 PROGRAM OVERVIEW

#### **1-1.01 Program Summary**

It is important for the safety of the driving public that qualified personnel inspect Indiana's bridges and large culverts. The Bridge Inspector is required to render judgment pertaining to the safety and integrity of the structures inspected.

The individuals involved in the State Bridge Inspection Program have critical input on many issues, including the allocation of scarce rehabilitation funds and the decision to close major bridges. It is important that the Inspector is highly trained and proficient; he/she must understand the mechanics, behavior trends, and economics of a wide range of bridge types.

Indiana's State Bridge Inspection Program operates under the directives of the Federal Highway Administration (FHWA) and the Indiana Department of Transportation (INDOT). The mission of the program is as noted below:

1. Ensure public safety.
2. Provide for the efficient use of resources in maintaining the serviceability of Indiana's bridges and large culverts.
3. Comply with all federal and state laws, rules, and policies.
4. The State is given the responsibility to accurately inventory and inspect all highway bridges on public roads. The State shall inspect the bridges on its highways and delegates this responsibility to the counties to accurately inventory and inspect their bridges on public roads.
5. The failure of a county to perform these responsibilities may cause a loss or reduction of funding. The State shall have the authority to take the appropriate action to assure bridge safety. These actions will include that the bridge has been inspected at the proper frequency, that if necessary, the bridge is posted, and that the posting is done in a timely manner. The State has the authority to close unsafe bridges.

#### **1-1.02 Inspection Program**

The State Bridge Inspection Program is federally mandated and has been in effect since 1971. The program policies are based on the National Bridge Inspection Standards (NBIS). Bridge inspection reports are stored in BIAS (Bridge Inspection Application System) and records are kept in ERMS (Electronic Records Management System). The required bridge data is forwarded to the FHWA on an annual basis.

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NBIS define a bridge as a structure, including supports, erected over a depression or an obstruction, such as water, highway, or railway. It has a track or passage way for carrying traffic or other moving loads, and has an opening measured along the center of the roadway of more than twenty feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes. It may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

This manual will address all bridges meeting this definition, as well as large culverts spanning between 4-and 20 feet. Refer to [Figures 1:1-1](#) for the defining bridge measurements.

### **1-1.03 Organization**

The State Program Manager (SPM) is charged with administering the State Bridge Inspection Program. The INDOT Bridge Inspection Engineers (BIE), State/Toll Road/County/Local Bridge Inspection Consultants report to the State Program Manager. Approved Team Leaders report to the appropriate INDOT Bridge Inspection Engineer, the Toll Road Operating Engineer, or Bridge Inspection Consultant. Approved Team Members report to their Approved Team Leaders.

The Assistant State Program Managers (ASPM) are charged with either the overall responsibility for load rating and posting of bridges or assisting the SPM in administering the Inspection Program.

The organization of the State Bridge Inspection Program is shown in [Figure 1:1-2](#) and described in detail later in this section. The review and quality assurance/quality control procedure are discussed in Part 4, Quality Assurance/Quality Control.

### **1-1.04 Qualifications and Responsibilities**

Below are listed the qualifications required for the various bridge inspection positions and categories. To apply for these, one must submit an Inspection Qualifications Form.

The Inspection Qualification Form can be found online at:

<https://www.in.gov/dot/div/contracts/standards/bridge/INDOT-QualForm.docx>

The various Bridge Inspection Positions are summarized in a table in [Figure 1:1-3](#).

#### **1-1.04(01) State Program Manager (SPM)**

The SPM is responsible for setting all bridge inspection policies and procedures, and for all bridge inspections and related reporting in the state.

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### **SPM Minimum Qualifications**

The SPM must meet the following minimum qualifications:

1. Capable of overseeing the INDOT Bridge Inspection Engineers (BIE), all Bridge Inspection Consultants (BIC).
2. Sound background in bridge inspection.
3. Specialized knowledge and skills in bridge design, construction, soils, construction materials, and emergency repair techniques.
4. Successful completion of the Safety Inspection of In-Service Bridges (FHWA-NHI-130055) course or Safety Inspection of In-Service Bridges for Professional Engineers (FHWA-NHI-130056).
5. Successful completion of the Fracture Critical Inspection Techniques for Steel Bridges (FHWA-NHI-130078) course.
6. Registered Professional Engineer (PE) in the state of Indiana.

### **SPM Responsibilities**

As a part of the responsibilities of this position, the SPM shall:

1. Oversee the INDOT BIE, all Inspection Consultants and for setting all bridge inspection policies and procedures
2. Manage the statewide bridge inspection and inventory programs.
3. Ensure all bridges in the state are inspected at a frequency and by a method consistent with the NBIS and state law.
4. Ensure that bridge inspection data is uploaded to BIAS within mandated time frames and that all required files have been uploaded into ERMS.
5. Ensure load ratings are completed in accordance with all federal requirements.
6. Oversee quality assurance and quality control of all bridge inspection programs.
7. Coordinate with federal, state, toll road, county, and local governmental agencies.
8. Formulate and monitor in-depth inspection programs for bridges with fracture critical members, underwater components, or unique or special features requiring additional attention during inspection to assure the safety of such structures.
9. Conduct annual inspections of state border bridges in company with respective states' personnel and district offices to determine required actions and lead the effort to accomplish Indiana's portion of any required actions.
10. Notify FHWA of all critical findings within 24 hours.

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11. Ensure proper signage is in place for bridges that require load posting or other restrictions.
12. Ensure a system is in place that will notify INDOT BIE and BIC of required inspections and their due dates.
13. Ensure a system is in place to upload all approved inspection data.
14. Formulate and administer programs and policies.
15. Develop, implement, and evaluate inspection and preservation policies, standards, procedures, and programs.
16. Analyze federal and state legislation, administrative rules, and national and industry standards for incorporation in programs and policies.
17. Recommend the revision of legislation and participate in new legislation development.
18. Lead prompt, decisive, and effective responses to emergencies such as floods, earthquakes, and major bridge damage.
19. Train bridge inspection personnel.
20. Develop, monitor, and update training programs for state and consultant inspectors.
21. Arrange or conduct inspection training programs and refresher programs throughout the state.
22. Provide training on proper access, equipment operation, and safety procedures.
23. Review and approve Approved Team Leader and Approved Team Member qualifications. The SPM will have the final say on all questions of qualifications.
24. Maintain a list of all qualified Approved Team Leaders and Approved Team Members in Indiana. The list will identify training required to keep the qualifications up to date.
25. Evaluate Approved Team Leaders and Approved Team Members and require additional training, as necessary.
26. Advise on technical issues concerning problems or deficiencies discovered during inspections.
27. Act as an Approved Team Leader as needed.
28. Monitor inspections and develop a good, general knowledge of all bridges in the state and their inspection records.
29. Review all inspection reports for complex bridges performed on Indiana bridges.
30. Manage state bridge inspection personnel and consultants to meet the needs of the State Bridge Inspection Program.



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31. Manage state-owned under-bridge access equipment to assist in the inspection of bridges statewide.

### **1-1.04(02) Assistant State Program Manager ASPM-R&P) – Rating & Posting**

The ASPM-R&P is responsible for setting all bridge load rating and posting policies and procedures for all bridges in the state.

#### **ASPM-R&P Minimum Qualifications**

The ASPM must meet the following minimum qualifications:

1. Capable of overseeing the load rating and posting of all public bridges in the state.
2. Registered Professional Engineer (PE) in the state of Indiana.

#### **ASPM-R&P Responsibilities**

The Assistant State Program Manager (ASPM-R&P) is charged with the overall responsibility for load rating and posting of bridges in the state.

### **1-1.04(03) Assistant State Program Manager (ASPM-BI&I) – Bridge Inspection & Inventory**

The ASPM-BI&I is responsible for assisting the SPM and to help ensure that NBI Data is being collected in a timely manner and stored in the Bridge Files properly, and reported to the FHWA as required.

#### **ASPM- BI&I Minimum Qualifications**

The ASPM must meet the following minimum qualifications:

1. Capable of overseeing the INDOT Bridge Inspection Engineers (BIE), all Bridge Inspection Consultants (BIC)
2. Sound background in bridge inspection
3. Specialized knowledge and skills in bridge design, construction, soils, construction materials, and emergency repair techniques
4. Successful completion of the Safety Inspection of In-Service Bridges (FHWA-NHI-130055) course or Safety Inspection of In-Service Bridges for Professional Engineers (FHWA-NHI-130056)
5. Successful completion of the Fracture Critical Inspection Techniques for Steel Bridges (FHWA-NHI-130078) course
6. Registered Professional Engineer (PE) in the state of Indiana.

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### **ASPM- BI&I Responsibilities**

The responsibilities of this position are:

1. Assist the INDOT BIE, all Inspection Consultants with data and data base issues.
2. Assist the SPM to manage the statewide bridge inspection and inventory programs.
3. Assist BIAE to ensure all bridges in the state are inspected at a frequency and by a method consistent with the NBIS and state law.
4. Assist BIAE to ensure bridge inspection data is uploaded to BIAS within mandated time frames and that all required files have been uploaded into ERMS.
5. Assist BIAE to oversee quality assurance and quality control of all bridge inspection data.
6. Assist with the coordination with federal, state, toll road, county, and local governmental agencies.
7. Participate on the annual inspections of state border bridges in company with respective states' personnel and district offices to determine required actions and lead the effort to accomplish Indiana's portion of any required actions.
8. Continuously review the status of all critical findings and recommend to the SPM those that can be closed out.
9. Review the NBI Data monthly to ensure that all INDOT BIE and BIC have access to the latest information on all required inspections and their due dates.
10. Ensure the database to upload all approved inspection data is functioning properly.
11. Assist the SPM to formulate and administer programs and policies.
12. Assist the SPM to develop, implement, and evaluate inspection and preservation policies, standards, procedures, and programs.
13. Assist the SPM to analyze federal and state legislation, administrative rules, and national and industry standards for incorporation in programs and policies.
14. Assist the SPM to lead prompt, decisive, and effective responses to emergencies such as floods, earthquakes, and major bridge damage.
15. Assist the BIEA and CIE to train bridge inspection personnel, especially on the use of the database.
16. Assist the SPM to develop, monitor, and update training programs for state and consultant inspectors.
17. Assist the SPM to arrange or conduct inspection training programs and refresher programs throughout the state.

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18. Review and approve Approved Team Leader and Approved Team Member qualifications. The SPM will have the final say on all questions of qualifications.
19. Assist to maintain a list of all qualified Approved Team Leaders and Approved Team Members in Indiana. The list will identify training required to keep the qualifications up to date.
20. Assist with the evaluation of Approved Team Leaders and Approved Team Members and require additional training as necessary.
21. Advise on technical issues concerning problems or deficiencies discovered during inspections.
22. Act as an Approved Team Leader as needed.
23. Monitor inspections and develop a good, general knowledge of all bridges in the state and their inspection records.
24. Review all inspection reports for complex bridges performed on Indiana bridges.
25. Other duties as assigned by the SPM

### **1-1.04(04) Bridge Inspection Area Engineer (BIAE)**

The BIAE is responsible for assisting the SPM and ASPM-BI&I as directed, to help develop bridge inspection policies and procedures, and for ensuring all bridge and large culverts inspections in their areas of oversight are conducted on time and to the proper level of quality, by assisting the District Bridge Inspection Supervisors. They shall be responsible for conducting statewide Quality Assurance (QA).

#### **INDOT BIAE Minimum Qualifications**

The BIAE will meet the following minimum qualifications:

1. Capable of overseeing the INDOT BIE
2. Sound background in bridge inspection
3. Specialized knowledge and skills in bridge design, construction, soils, construction materials, and emergency repair techniques
4. Successful completion of FHWA-NHI-130055, Safety Inspection of In-Service Bridges or FHWA-NHI-130056, Safety Inspection of In-Service Bridges for Professional Engineers
5. Successful completion of FHWA-NHI-130078, Fracture Critical Inspection Techniques for Steel Bridges
6. Registered PE in the state of Indiana

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### **BIAE Responsibilities**

As a part of the responsibilities of this position, the BIAE shall:

1. Oversee INDOT BIE.
2. Assist the ASPM-R&P, to ensure that state and county bridge postings and restrictions are in place and done so in a timely manner.
3. Ensure proper signage is in place for bridges that require load posting or other restrictions.
4. Ensure that the District Bridge Inspection Supervisors have properly trained their personnel on how to use the inspection database on their computers and I-pads and are able to upload all approved inspection data.
5. Develop, implement, and evaluate inspection and preservation policies, standards, procedures, and programs.
6. Analyze federal and state legislation, administrative rules, and national and industry standards for incorporation in programs and policies.
7. Recommend the revision of legislation and participate in new legislation development.
8. Lead prompt, decisive, and effective responses to emergencies such as floods, earthquakes, and major bridge damage.
9. Train bridge inspection personnel.
10. Develop, monitor, and update training programs for state and consultant inspectors.
11. Arrange or conduct inspection training programs and refresher programs throughout the state.
12. Provide training on proper access, equipment operation, and safety procedures.
13. Assist in the evaluation of Approved Team Leaders and Approved Team Members as to possible upgrades in their status and recommend additional training to help upgrade inspectors.
14. Advise on technical issues concerning problems or deficiencies discovered during inspections.
15. Act as an Approved Team Leader as needed.
16. Monitor inspections and develop a good, general knowledge of all bridges in the state and their inspection records.

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18. Review all inspection reports for complex bridges performed on Indiana bridges.
19. Conduct Quality Assurance Reviews on both State and Local Bridge Inspections.
20. Work with the SPM to address all issues found by the FHWA during their annual NBIS Program Review.

### **1-1.04(05) I N D O T Bridge Inspection Engineer (BIE)**

The INDOT BIE is responsible for the inspection and reporting for all assigned state-owned bridges.

#### **INDOT BIE Minimum Qualifications**

The INDOT BIE must meet the following qualifications:

1. Successful completion of FHWA-NHI-130055, Safety Inspection of In-Service Bridges or FHWA-NHI-130056 Safety Inspection of In-Service Bridges for Professional Engineers
2. Qualified as a Bridge Approved Team Leader in the state of Indiana
3. Registered PE in the state of Indiana with appropriate training and experience
4. Capable of overseeing Approved Team Leaders and Approved Team Members
5. Successful completion of FHWA-NHI-130078, Fracture Critical Inspection Techniques for Steel Bridges
6. Demonstrate a strong background in such areas as structural engineering, structural behavior trends, and bridge rehabilitation techniques
7. Demonstrate management abilities
8. Demonstrate thorough familiarity with NBIS, this manual, and applicable INDOT guideline
9. Good eyesight and the ability to walk and climb over uneven surfaces and be comfortable working at heights, near water, in confined spaces, and close to live traffic

#### **BIE Responsibilities**

As a part of the responsibilities of this position, the INDOT BIE shall:

1. Coordinate inspections to ensure that all inspections are completed in compliance with this manual.
2. Oversee Approved Team Leaders and Approved Team Members.
3. Ensure that all assigned state-owned bridge inspection results are approved and uploaded to BIAS within 60 days from end of inspection month and within seven days for all closures and emergency inspections.

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4. Notify the SPM of all critical findings in accordance with Section 2-4.0.
5. Act as an Approved Team Leader as needed.

### **1-1.04(06) Bridge Inspection Consultant (BIC)**

The BIC is the individual in a prequalified consulting firm who is responsible for all contracted inspections. This may be the same individual in the Firm that has been designated as the BIAS Administrator. The firm that this person works for may be hired by INDOT and working on INDOT Bridges, and/or hired by a County or the Indiana Toll Road and working on local or Toll Road Bridges. The firms may have multiple Approved Team Leaders or Team Members however the BIC is the Inspector responsible for the contracted work and is usually the contact person for the SPM to discuss issues on inspection work for the firm.

### **BIC Minimum Qualifications**

The BIC must meet the following minimum qualifications:

1. Registered PE in the state of Indiana with appropriate training and experience
2. Qualified as an Approved Team Leader in the state of Indiana.
3. Successful completion of FHWA-NHI-130055, Safety Inspection of In-Service Bridges or FHWA-NHI-130056, Safety Inspection of In-Service Bridges for Professional Engineers
4. Successful completion of FHWA-NHI-130078, Fracture Critical Inspection Techniques for Steel Bridges
5. Capable of overseeing ATL and ATM
6. If this person is the BIAS administrator for the Firm, then this person must have had BIAS Administrative training from INDOT.

### **BIC Responsibilities**

As a part of the responsibilities of this position, the BIC shall:

1. Oversee ATL and ATM at his Firm and provide Access to and Training for BIAS.
2. Accept responsibility for all contracted inspections.
3. Inspect or ensure that inspectors inspect all bridges and large culverts included in their contracts in compliance with this manual.
4. Ensure that all inspection results are approved and uploaded to BIAS within 60 days of the of the inspection date and within seven days for all closures and emergency inspections.
5. Ensure that all quality control and quality assurance procedures are met for all team leaders.
6. Fulfill requests for information from the SPM in an efficient and timely manner.

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7. Recommend load posting, restrictions, or bridge closings and ensure the related signage is in compliance with the applicable requirements.
8. Notify the SPM of all critical findings in accordance with Section 2-4.0.
9. Assist INDOT in maintaining an accurate and up to date inventory of all bridges and large culverts in BIAS.
10. Recommend a bridge repair and construction program to the agency.
11. Ensure all ATL, ATM, LRE, and General User active profiles are maintained in good standing in BIAS. The list shall include the following:
  - a. Name
  - b. Company Name
  - c. Address
  - d. Email Address
  - e. Phone Number
  - f. Training Course Certificates
  - g. Professional Engineering License
  - h. Other Pertinent Certifications; SPRAT, Commercial Diver, Confined Space, etc.

### **1-1.04(07) Approved Team Leader (ATL)**

The ATL is the person responsible for the field inspection work. Preferably, the inspection team should consist of two persons: an ATL and an Approved Team Member (ATM).

#### **ATL Minimum Requirements**

The ATL must meet the following requirements to be considered qualified:

1. Be responsible for field work and be on site during the inspection
2. Demonstrate a strong background in such areas as structural engineering, structural behavior trends, and bridge rehabilitation techniques
3. Demonstrate management abilities
4. Thorough familiarity with all NBIS, this manual, and applicable INDOT guideline
5. Good eyesight, the ability to walk and climb over uneven surfaces, and the ability to work at heights, near water, in confined spaces, and close to live traffic
6. Meet one of the following scenarios:

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- a. Successful completion of FHWA-NHI-130055, Safety Inspection of In-Service Bridges, or FHWA-NHI-130056 Safety Inspection of In-Service Bridges for Professional Engineers **and** Registered PE in the state of Indiana
  - b. Successful completion of FHWA-NHI-130055 and Bachelor degree in Engineering from a college or university accredited by the Accreditation Board for Engineering and Technology or a substantially equivalent organization, **and** successful completion of the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering exam, **and** two years of bridge inspection experience in a responsible capacity under the direction and supervision of a qualified ATL
  - c. Successful completion of FHWA-NHI-130055 **and** five years of Bridge Inspection Experience in a responsible capacity under the direction and supervision of a qualified ATL.
  - d. Successful completion of FHWA-NHI-130055 **and** Certified Level III or IV NICET Bridge Inspector.
  - e. Successful completion of FHWA-NHI-130055 **and** Associate's degree in Engineering or Engineering Technology from a college or university accredited by the Accreditation Board for Engineering and Technology or by a substantially equivalent organization, **and** four years of bridge inspection experience in a responsible capacity, as determined by the SPM, under the direction and supervision of a qualified ATL.
7. Complete the Critical Finding Course through INDOT University
- a. All INDOT Approved Team Leaders are required to take and pass an on-line Critical Finding Course, and to attach their completion form into their account file in BIAS.
  - b. Approved Team Leaders (ATL) are required to complete the Critical Finding Course through INDOT University within 90 days of November 9, 2018 or within 90 days becoming an ATL, whichever is a later date. The certificate acquired upon successful completion shall be uploaded into the ATL's BIAS User Account into a folder titled "INDOT Courses".
  - c. To register for this course, send an email request with your first and last name and email address to INBridgesHelp@indot.in.gov . The class should take approximately 60 minutes to complete. Successful completion of the course provides 1 PHD credit.

**To remain qualified**, all Approved Team Leaders:

1. Must successfully complete Bridge Inspection Refresher Training (FHWA-NHI-130053) or FHWA-NHI-130055/130056 at least once every 10 years.
2. Must have conducted a bridge inspection, where he/she has fully participated in the field inspection work and signed his/her name on the report in the last five years. Approved



Team Leaders who do not meet this requirement must successfully complete FHWA-NHI-130053 - Bridge Inspection Refresher Training to become re-qualified.

3. Maintain a current S-BRITE Bridge Inspection certification. The requirements to acquire and maintain the bridge inspection certification from the Purdue University Steel Bridge Research, Inspection, Training, and Engineering Center will be published in Bridge Inspection Memorandums and may also be found at the S-BRITE link: <https://engineering.purdue.edu/CAI/SBRITE/Training>.

The Approved Team Leader who does not meet the ongoing qualifications outlined may conduct field inspections during an emergency such as a flood, post-earthquake, or after a collision. He/she must be instructed by, and under the supervision of, a qualified Approved Team Leader. The inspections should be limited and should not involve changing any NBI data without having their data reviewed by a qualified Approved Team Leader.

### **1-1.04(08) Complex Bridge Approved Team Leader**

Approved Team Leader for the inspection of a complex bridge is not a separate team leader classification. A complex bridge inspection is not a separate type of bridge inspection. A complex bridge inspection will follow the instructions outlined in the inspection plan, for the individual complex bridge. This complex inspection plan shall be in saved in BIAS, so it is easy to find and review. The inspection plan will outline the experience and skills necessary to perform the complex bridge inspection. The selection of a complex team leader will be based on experience and specific engineering qualifications for the specific complex bridge. A complex bridge may require engineering expertise in areas such as structural, mechanical, and electrical. The specific requirements will be listed in the design level three requirements of contract documents if contracted and the inspection plan. The team leader managing the multidisciplinary engineering specialties must meet the following requirements:

1. Qualified Approved Team Leader
2. Successful completion of FHWA-NHI-130078, Fracture Critical Inspection Techniques for Steel Bridges.
3. Licensed Professional Engineer in the state of Indiana and have specific experience on the type of complex bridge being inspected and have qualified team members to cover all necessary engineering disciplines to inspect all components of the complex structure.
4. Current certification from Purdue University Steel Bridge Research, Inspection, Training and Engineering Center.
5. The credentials must be approved by the SPM.

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### 1-1.04(09) Fracture Critical Approved Team Leader (ATL-F)

#### **ATL-F Minimum Requirements**

Approved Team Leaders for the inspection of a fracture critical bridge must meet the following requirements:

1. Qualified Approved Team Leader
2. Successful completion of FHWA-NHI-130078.
3. Licensed Professional Engineer in the state of Indiana or have 2 additional years of bridge inspection experience as a team leader.
4. Current certification from Purdue University Steel Bridge Research, Inspection, Training and Engineering Center.
5. The credentials must be approved by the SPM.

### 1-1.04(10) Underwater Approved Team Leader (ATL-U)

#### **ATL-U Minimum Requirements**

An Approved Team Leader for an Underwater Inspection will meet the following requirements:

1. Qualified Approved Team Leader
2. Divers must meet the requirements listed in Section 1.04(13)
3. Registered PE licensed in the State of Indiana
4. Experienced in Underwater and In-Water Bridge inspections
5. Experienced in stream bed profiles and cross sections
6. Experienced in underwater nondestructive testing techniques
7. Responsible for the inspection, data integrity, and report preparation for bridge inspection projects in the last five years

#### **ATL-U Responsibilities**

The Approved Team Leader shall:

1. Lead the inspection team in actively planning, preparing, and performing bridge inspections. The ATL-U must be at the bridge at all times during the inspection.

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2. Be on site leading in the inspection of each bridge and participating in all in-water activities.
3. Ensure worksite safety compliance, including traffic control, waterway control where needed, Inspection Team Members' safety procedures, equipment, and the proper use of access equipment.
4. Sign each bridge inspection report and take full responsibility for all data and comments contained in the report.
5. Approve all data in BIAS.
6. Train Inspection Team Members working under his/her supervision and provide opportunities to further his/her knowledge and professionalism in this field.
7. Report any condition which is dangerous to persons or property, or any structural condition that would likely increase the potential for structure or member failure, to the SPM and the INDOT BIE or BIC as soon as possible.
8. Report any Critical findings to the appropriate individuals and agencies identified in 1- 4.02.
9. Recommend load posting calculations be completed as needed.
10. Recommend restrictions or bridge closings and ensure the related signage is following all applicable requirements.
11. Duties and responsibilities of the Approved Team Leader are described in 1 - 1.04(05).
12. Clearly document in the report, all areas that were not able to be inspected fully, due to drift/debris build-up.

### **1-1.04(11) Approved Team Member (ATM)**

#### **ATM Minimum Requirements**

An ATM shall meet, as a minimum, all the qualifications listed below:

1. High School Degree or equivalent
2. Familiarity with NBIS
3. Familiarity with the FHWA Recording and Coding Guide
4. Familiarity with appropriate parts of this manual

The Approved Team Member is encouraged to take FHWA-NHI-130055, Safety Inspection of In-Service Bridges.

#### **ATM Responsibilities**

The Approved Team Member is responsible for the following:

1. Following all Approved Team Leader instructions in a safe manner

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2. Assisting the Approved Team Leader in the field
3. Documenting his/her participation and experience
4. Keeping a personal log of bridge inspection and related bridge experience
5. Acting in a professional manner
6. Studying to take and pass Bridge Inspection Training Class (FHWA-NHI-130055)

### **1-1.04(12) Nondestructive Testing Specialists**

Individuals contracted to perform nondestructive testing (NDT) shall be qualified in accordance with American Society for Nondestructive Testing (ASNT) Level II or III, or as called for in any bridge inspection contract. For all NDT work, other than dye penetrate, the NDT personnel must work hand-in-hand with a professional engineer, licensed in Indiana, who is qualified as a Bridge Approved Team Leader.

### **1-1.04(13) Divers**

Diving operations shall be conducted in accordance with all applicable federal and state regulations. Each member of the team should be trained in accordance with Occupational Safety and Health Administration (OSHA) standards.

All divers shall have completed training accredited by the Association of Commercial Diving Educators to the appropriate level or documented evidence that the divers training meets the requirements specified by the national consensus standard published by the American National Standards Institute (ANSI) and the Association of Commercial Diving Educators (ACDE) (i.e. ANSI / ACDE-01-2015, American National Standard for Divers – Commercial Diver Training – Minimum Standard).

All divers shall have certification proving successful completion of the Underwater Bridge Inspection course (FHWA-NHI-130091). All proof of training and certifications must be on file in the BIAS Account of the individual.

### **1-1.04(14) Load Rating Engineer (LRE)**

Routine load ratings of state-owned bridges are generally performed and maintained by INDOT's Bridge Load Rating Engineer in the Division of Bridges. The load rating of toll road, county, and local bridges is generally done by the BIC of record for owner.

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### **LRE Minimum Qualifications**

The LRE must meet the qualifications listed below:

1. Have experience calculating load ratings and knowledge of load capacity rating computer programs and posting policies in Indiana. A list containing (15-20) bridges load rated along with the rating methods/programs used and the condition of the bridges (new/deteriorated) must be in the person's BIAS Account, in order to be considered as a LRE
2. Registered PE licensed in the state of Indiana, qualified to oversee, review, and certify all load capacity ratings performed under his/her supervision
3. It is preferred, but not required, that the LRE successfully complete FHWA-NHI-130055, Safety Inspection of In-Service Bridges.

### **LRE Responsibilities**

The LRE must:

1. Provide engineering judgment to those performing the load ratings.
2. Be actively involved in reviewing the quality and accuracy of all load ratings.

### **1-1.05 Bridge Inspection Database**

INDOT's Bridge Inspection Database is called BIAS (Bridge Inspection Application System). This application is used to create the annual file submitted to Federal Highway.

All inspection data shall be entered into BIAS and approved by the Approved Team Leader.

These materials include the following:

1. Structure Inventory and Appraisal information
2. Field inspection information including sketches and photographs showing typical and deteriorated conditions. This requirement includes a brief narrative to justify a change in condition rating. An NBI item rated below 5 or condition state 3 requires a picture or sketch in addition to narrative descriptions of the deteriorated condition. A plan of action is to be included if required.
3. Critical Findings in accordance with Section 1-4.02
4. Waterway information in accordance with Section 1-2.10
5. Other Inspection Procedures. These items will include other required reports such as fracture critical and underwater. These reports will be in accordance with Section 1-2.0 of this manual.
6. Load Rating. A dated load rating along with identification of the analysis to determine capacity. Results must be included which clearly identify the loads and methodology used in the analysis. Identify controlling members. Include any updates that reflect changes in the

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condition of structural members. If calculations cannot be provided due to lack of information, provide documentation for justification of determined load rating.

7. Posting Documentation. In accordance with 3-9.02(02)
8. Scour Assessment. Document the assessment conducted to determine the scour vulnerability of the bridge.

For additional information on BIAS and ERMS requirements see section 2-3 Reporting Systems

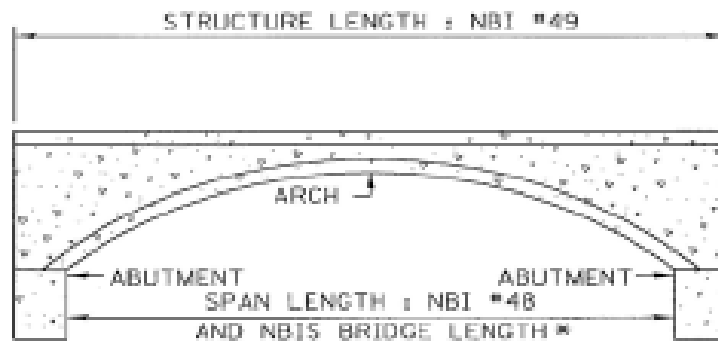
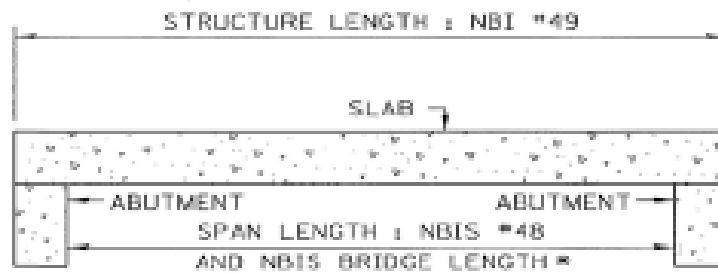
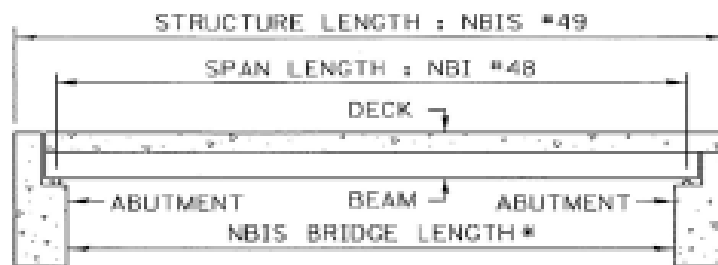
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### FIGURES

#### 1-1.1: Bridge Structure Measurements



\* IF GREATER THAN 20 FEET  
NBIS #112 = Y

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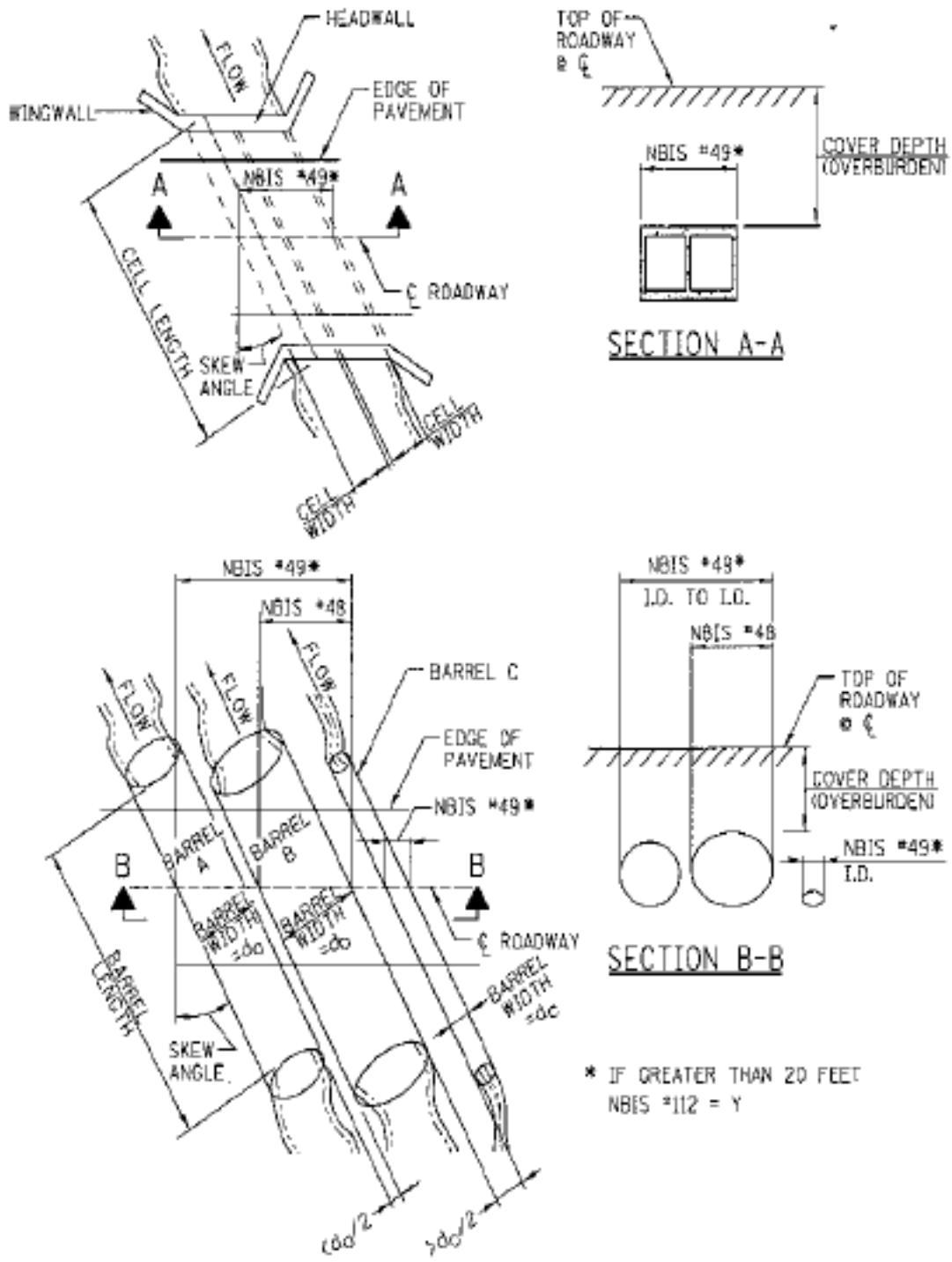
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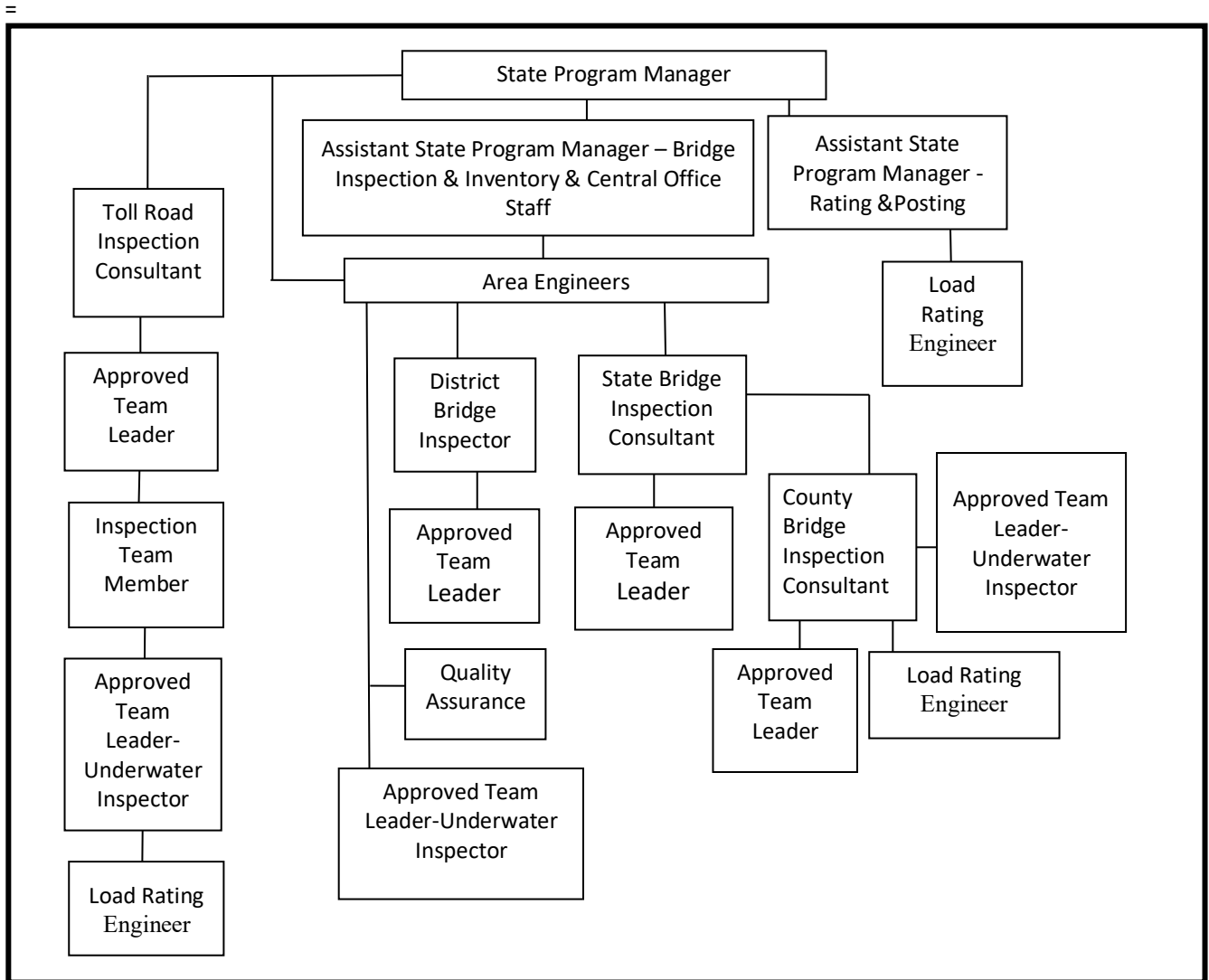
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### 1-1.2: State Bridge Inspection Program Organization

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### [1-1.3: Bridge Inspection Positions](#)

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| <b>Inspection Positions</b>                                     | <b>BIAS<br/>Abbreviation</b> | <b>Manual<br/>Section</b> |
|---|------------------------------|---------------------------|
| State Program Manager   | SPM                          | 1-1.04(01)                |
| Assistant State Program Manager - Load Rating & Posting         | ASPM-R&P                     | 1-1.04(02)                |
| Assistant State Program Manager - Bridge Inspection & Inventory | ASPM-BI & I                  | 1-1.04(03)                |
| Bridge Inspection Area Engineer                                 | BIAE                         | 1-1.04(04)                |
| INDOT Bridge Inspection Engineer                                | BIE                          | 1-1.04(05)                |
| Bridge Inspection Consultant                                    | BIC                          | 1-1.04(06)                |
| Approved Team Leader  | ATL                          | 1-1.04(07)                |
| Complex Bridge Approved Team Leader                             | ~                            | 1-1.04(08)                |
| Fracture Critical Approved Team Leader                          | ATL-F                        | 1-1.04(09)                |
| Underwater Approved Team Leader-                                | ATL-U                        | 1-1.04(10)                |
| Approved Team Member  | ATM                          | 1-1.04(11)                |
| Nondestructive Testing Specialists                              | ~                            | 1-1.04(12)                |
| Divers  | ~                            | 1-1.04(13)                |
| Load Rating Engineer  | LRE                          | 1-1.04(14)                |