

**STRUCTURAL EVALUATION**  
**EXPLANATION OF NBIS (adjusted for CoMBIS) SCOPE OF WORK**  
**CONSULTANT CONTRACTS**

**This document was partially modified for CoMBIS projects on 20111213**

**This document updated to 20130326**

**This document updated to 20130408**

**NOTE: The revised National Bridge Inspection Standards (NBIS) are Effective on January 13, 2005**

\*Items available on NJDOT website under—Engineering/Operations/Structural Evaluation

**I. MATERIALS FOR CONSULTANT:**

1. Detailed Sample Scope of Work including supplementary and Electrical/Mechanical Scope of Work (Level I, II or III)\*
2. Bridge list-with last inspection date.
3. Copy of new proposal program containing Group data.
4. Monthly progress report form\*
5. Copies of latest SI&A/PONTIS (PDI files to be e-mailed).
6. Bridge plans (if necessary).
7. CD or hard copies of reports from the previous inspection cycle; word processing report disk, CADD disk for soundings and clearances, etc.
8. NBIS qualification forms\*.
9. Sample field inspection and report submission schedule form (standard project schedule-located on our Web Page).
10. SDMS Contractors Specifications, Version 3.1, January, 2006\*
11. Consultant Evaluation System (CES) standards for Structural Evaluation\*
12. How to Review SI&A Data—Review Aid\*
13. How to Review Pontis Data—Review Aid\*
14. MOT/Equipment/RR usage spreadsheet\*
15. Form AD-99 (Report of Loss, Theft and Vandalism)\*

**II. ITEMS FOR REFERENCE:** (Provide any item if consultant needs)

1. A copy of Section 43 and 44 - NJDOT Design Manual (with report format).
2. Bridge Inspection Report Templates (including substructure scour form, updated cover sheet and waterway/channel form)—Updated 2008\*
3. Underwater Inspection Report Template & field notes Forms- Updated 2008\*.
4. Draft copy of State-Consultant Lump Sum/Cost Plus Agreement.
5. Priority Repair Categories memo dated 01/02/2008\*
6. Procedure for Transmitting Traffic Interference Reports.
7. List of suggested underwater inspection vendors.
8. List of currently pre-approved scanning vendors.
9. Pontis E-mail Submission Transmittal Sheet\*
10. Sample completed bridge survey reports\*
11. NBIS Compliance Bridge Inspection Forum and Clarifications\*
12. Engineering Judgment rating guide line memorandum dated 9/8/2008\*
13. National Highway System (NHS) Route List\*

### **III. PUBLICATIONS:** (Partial list of specifications and reference publications)

1. Current (2011) AASHTO The Manual for Bridge Evaluation, 2<sup>nd</sup> edition.
2. Current (2010) AASHTO LRFD Bridge Design Specification, 5<sup>th</sup> Edition with 2010 Interim Revisions.
3. AASHTO LRFD Movable Highway Bridge Design Specifications, 2<sup>nd</sup> Edition with 2011 Interim Revisions.
4. AASHTO Movable Bridge Inspection, Evaluation, & Maintenance Manual, 1<sup>st</sup> Edition.
5. Current FHWA Bridge Inspector Reference Manual.
6. 1994 NJDOT Underwater Inspection and Evaluation Guidelines Manual-Revised 1997 & 2008\*
7. FHWA Recording and Coding Guide for the Structure Inventory & Appraisal (SI&A) of the Nation's Bridges 1995 and revised 2003.
8. AASHTO Guide for CORE Structural Elements, 1st. Edition, with 2002 and 2010 Interim
9. Current (2011) AASHTO Guide Manual for Bridge Element Inspection, 1<sup>st</sup> Edition.
10. 2003 NJDOT Recording and Coding Guide-Revised 2009\*
11. 2003 NJDOT PONTIS/Seismic Manual- Revised 2008\*
12. 2006 Pontis Lite Users Manual\*

### **IV. ITEMS FOR DISCUSSION:**

**Please note that the new “Consultant Project Evaluation” system is in place (10/01/2006). The projects will be evaluated at the completion of the project in October of each year. The Consultant Project Evaluation criteria can be found on our web page.**

1. Qualifications of Key Personnel: Project Manager, Team Leader,
2. Phase A Work: Routine or In-depth inspections (inclusive of **SI&A and Pontis Elemental** Data Collection) and Load Factor/Working Stress and Load and Resistance Factor ratings.
3. Phase B Work: Interim inspections as indicated.
4. 2nd Cycle Inspection: If applicable

#### **1. QUALIFICATIONS OF KEY PERSONNEL**

**NOTE:** Consultant shall use the Project Manager and Team Leader listed in their Expression of Interest. Other personnel will not be permitted to function in either capacity. The Department does not encourage changes in key staff (including proposing alternate key staff). A change will be entertained only when extreme situations, such as resignations, make the change necessary. Any change of Project Manager or Team Leader must be approved in writing, in advance, by the Department. Their qualifications must be equal to or better than the personnel indicated in the **Expression of Interest**.

Informal roles, such as Assistant Project Manager or Assistant

Team Leader, do not exist with regard to any representation of the function of personnel who have worked on this contact (or for that matter any contract with NJDOT Structural Evaluation).

**Project Manager:**

a. Registered Professional Engineer in the United States (preferably in New Jersey) with a minimum of 5 years of NBIS (bridge inspection) experience.

**OR**

b. Graduate Civil Engineer (BSCE) with a minimum of 10 years of NBIS (bridge inspection) experience.

**AND**

c. Completion of NHI Course Nos. 130053 or 130055 during the last 5 years where PONTIS (Bridge Management) was covered in the course agenda.

**Team Leader (all inspection types, including underwater):**

a. Registered Professional Engineer with a minimum of 3 years of NBIS (bridge inspection) experience in a responsible capacity.

**AND**

b. Completion of NHI Course No. 130055 (10 Day) is required (only needs to be taken once). The Basic Course (13 Day) offered by PennDOT can meet this requirement IF Pontis is included in the syllabus. This requirement will be effective for any bridge inspection solicitation dated 2012 and forward.

**AND**

c. Completion of NHI Course No. 130053 (BI Refresher) is required every 5 years\*. NJDOT will only accept NHI training for the BI Refresher course. Training from other vendors will not meet this requirement. Additionally, PONTIS (Bridge Management) must be covered in the course agenda.

**OR**

a. Graduate Engineer with a minimum of 5 years of NBIS bridge inspection experience in a responsible capacity.

**AND**

b. Completion of NHI Course No. 130055 (10 Day) is required (only needs to be taken once). The Basic Course (13 Day) offered by PennDOT can meet this requirement IF Pontis is included in the syllabus. This requirement will be effective for any bridge inspection solicitation dated 2012 and forward.

**AND**

c. Completion of NHI Course No. 130053 (BI Refresher) is required every 5 years\*. NJDOT will only accept NHI training for the BI Refresher course. Training from other vendors will not meet this requirement. Additionally, PONTIS (Bridge

Management) must be covered in the course agenda.

- \* Upon completion of Course No. 130055 (10 Day), you will be required to take Course No. 130053 (BI Refresher) within 5 years to remain an eligible team leader.

### **Underwater Bridge Inspection Diver:**

- a. Divers working on *only* underwater inspections may substitute NHI-130091 (Underwater Bridge Inspection) in place of a comprehensive inspection course (NHI-130055 or PennDOT Basic Course).

**NOTE:** For bridges over active Railroad lines (NJ Transit, Conrail, Amtrak, CSX, Norfolk Southern, Shared Assets, etc.) the consultant must have his Team Leader and other field inspection engineers complete annual training provided by the concerned company. Training of the Project Manager may also be required depending on the number of bridges over a particular railroad. The man-hours for attending mandatory railroad safety training courses may be directly charged against the project.

## **2. PHASE A WORK**

Phase A work shall include **Routine or In-depth** inspections (ground level or hands on) as approved for redundant, non-redundant or fracture critical bridges or members. Also, includes underwater inspections, testing, load analysis, and report preparation in an approved format.

## **3. PHASE B WORK**

Those bridges that qualify for **interim** inspections (usually one year frequency) shall include field verification of the specific member(s) for bridges that have been load posted for operating ratings or the condition rating of superstructure and/or substructure and/or Culvert is coded as 3 or less.

## **V. CONSULTANTS PROPOSAL (ESTIMATE):**

1. The project will be a **Lump Sum/Cost Plus Fixed Fee** agreement.

For **all contracts**, the consultant shall obtain at least three (3) bids for Underwater Inspection, Snooper, Traffic Safety, Testing and Scanning and include these costs in the **Direct Expenses** (reimbursable and out of pocket expenses). As an alternative to this method for Underwater Diving, the diving firm may be hired as a sub-consultant if a Bridge Inspection Team Leader or Engineer/Diver is provided by the diving firm.

2. Consultant must familiarize themselves with all bridges before submitting the cost

- estimate and associated expenses such as Direct Expenses (Reimbursable and out of pocket). Include all third party costs such as scanning, equipment and labor (including Snooper), traffic control, diver for underwater inspection, railroad flagging and insurance, etc. wherever needed. Also, it should be noted that proper **safety** procedures must be maintained during all operations including the use of safety harnesses, shadow vehicles, flagman, etc.
3.
    - a. The Mid-point of **Part I** of the project will not need to be calculated as there is no escalation for Part I. Submission of all deliverables is due within six (6) months of the Agreement/Notice to Proceed.
    - b. The **Mid-point** of **Part II** of the project, based on a twelve (12) month contract, will be six (6) months from the agreed upon starting date listed in the Contract Modification.
    - c. As per the NJDOT directive letter dated October 19, 2009, budget salary cost escalation will be allowed in any agreements and modifications (until further notice) of 3 percent per annum [based on the mid-point of the contract] for titles in the ASCE P1-P4/NICET I-II categories. No salary cost escalation will be allowed for higher level titles for the first 18 months of planned contract duration.  
Certified wage rates are required to be submitted with the preliminary cost proposal (or e-mailed directly to the Project Manager prior to proposal submission).
  4. **Fixed fee** shall be negotiated as a percentage of the final negotiated **salaries**. For computing fees, the latest audited overhead shall be used and the fixed fee factor shall usually be **18%** of the **salaries** for all types of bridges and sign structures.
  5. Prior written approval must be obtained from the State for employing any **outside services** (reimbursable expenses listed in the agreement) within two (2) weeks from Notice to Proceed. The State Project Manager must be included in all correspondence for solicitation notices for outside services. The consultant must assemble all bids received from outside vendors, prepare a recommendation, and send to the State Project Manager for review. The consultant will not be reimbursed otherwise. Please note that none of the bridge inspection functions shall be allowed to be sublet to sub-consultants without prior written approval. Such approval will not be given except in **extreme situations**. Special testing during inspection shall be considered as a vendor item.
  6. The consultant shall only submit one invoice within each 30 day period. Less than 30 days between any two invoices will require that the invoice be returned to the consultant.
  7. All lane closures shall meet NJDOT and/or County standards and any violations will be the consultant's personal responsibility. No mobile lane closures are permitted for bridge inspection projects. All lane or shoulder closures on State bridges shall be coordinated with the appropriate Traffic Operations Office and/or Regional Maintenance Permits Office. Use the 'NJDOT Structural Evaluation Work Zone Set-Up Guide' for State highways.

Traffic Operations North	Phone # (732) 697-7360
	Fax # (732) 324-6217
Traffic Operations South	Phone # (856) 486-6650
	Fax # (856) 486-6802
Regional Maintenance North	Phone # (973) 601-6625
	Fax # (973) 601-6623
Regional Maintenance Central	Phone # (732) 625-4330
	Fax # (732) 625-4344
Regional Maintenance South	Phone # (856) 486-6688

**STATE POLICE ARE NO LONGER TO BE USED FOR ANY TRAFFIC CONTROL OPERATION**

8. The State does not allow the **leasing** of a car for inspection purposes and expects the consultant to have their own inspection vehicle and other essential equipment. However, the consultant shall be reimbursed for the mileage **in accordance with the Federal Highway Administration's current reimbursement rate for travel.**
9. As per the requirements of Department's Policy and Procedure No. 3.115C, (Section IV, Step 26) the consultant may be **monitored** in the field and/or in their office.
10. All proposals shall be submitted in a 3-ring binder and shall include the bridge list, scope of work, a complete certified (latest approved) wage rates (~~approval not more than 3 months old~~) or ~~certified payroll~~, a sheet describing the derivation of the wage rates used in the proposal, the resumes of the personnel anticipated to be used for this project, and a copy of all relevant training certificates. Also, include in the proposal the cost estimate sheets for each bridge and summary sheets for both Phase A and Phase B work separately.
11. Two copies of the preliminary proposal shall be submitted to the State directly to the Manager, Structural Evaluation, and an additional copy of the proposal shall be sent to the county engineer. The copy of the proposal previously sent to the Bureau of Auditing is no longer required.

**Note: The new NJDOT Proposal Program is now required to be used for preparing all Part II proposals (We accept, and can provide, a simple spreadsheet for the Part I proposal).** In addition, please be aware that data generated directly from this program will be the source for the initial Project schedule spreadsheet and the monthly progress report form.

After negotiation of the project, submit **only revised pages** (two copies - properly marked so that there is no confusion as to where they are to be inserted in the proposal) to the State.

12. All correspondence sent to the State, including the proposal, is to be addressed to the Manager, Structural Evaluation & Bridge Management to the attention of the appropriate Project Engineer.
13. The general liability and professional liability insurance certificates for the project

shall be sent directly to the Manager, Bureau of Professional Services ATTN: Agreement Coordinator.

## **VI. QUALITY ASSURANCE:**

In compliance with Quality Assurance/Quality Control (QA/QC), Section 6 of the NJDOT Procedures Manual, the consultant shall submit with its proposal a written narrative that describes their Quality Assurance policy.

As a minimum, all evaluation reports must be reviewed for completeness and accuracy, before being submitted to the Department, by a senior level engineer (namely the Project Manager) who is intimately familiar with the Department's and with NBIS requirements for bridge and other structural evaluation projects. Also, the field observation and data must be spot checked for accuracy by a NBIS qualified Project Manager or QA/QC Engineer. All final reports must be signed and sealed (Certified) by a Professional Engineer registered in the State of New Jersey before submission to the Department. This engineer is to be the Project Manager, unless the Project Manager does not have a PE license in which case a separate engineer (ASCE Grade P5 or above, and not permitted to be a Team Leader assigned to this project) will be allowed to be the Certifying Engineer and will be permitted to sign and seal the report. This will also be done online at the time of electronic report submission, by having the Certifying Engineer enter their PE number.

**NOTE: The ID issued in CoMBIS for Project Managers and for Certifying Engineers SHALL NEVER be shared. As this ID gives you the ability to submit reports as final, allowing anyone else to submit a report for you constitutes fraud.**

## **VII. AREAS OF EMPHASIS:**

1. The field schedule shall indicate any special inspections such as fracture critical, underwater, and ultrasonic or snooper where necessary. The consultant MUST obtain State approval for the field schedule, report submission schedule, and the proposed Project Manager and Team Leader before starting the inspection work. Any change in the staff, especially the Team Leader, and any significant change in the schedule, must be pre-approved. The standard project schedule form (Located on our web page) must be submitted biannually (at end of March and September via E-mail and Hard copy).
2. It is no longer necessary to document areas of minor deterioration resulting in element condition codes of '7' or greater. It is required that the Field Notes document any conditions that result in element condition ratings of '6' or less, Emergency/Priority repair conditions or conditions that will require monitoring during subsequent inspection cycles.
3. The full name, seal, and signature of the Load Rating Reviewer shall appear on the Load Rating Summary Sheet (LRSS) with the Load Rating

Engineer's name and initials (if rating was prepared in current cycle). See NJDOT Bridge Load Rating Manual Appendix A, Section 11.2 for details.

4.
  - a. Check closely (hands-on) areas vulnerable to fatigue and special emphasis shall be given to **Fracture Critical and Non-redundant members during** routine inspection. Hands-on inspection of hangers, rolled and welded **FRACTURE CRITICAL MEMBERS (FCM's)** and close visual inspection of riveted members shall be performed. Perform U.T. of pins and hangers in trusses (as per approved plan), hanger connections and sheave trunnions, wire ropes (Lift Bridge) and other members as necessary.
  - b. Use of Dye Penetrant test is encouraged for areas suspected to develop fatigue cracks or to verify propagation of cracks previously arrested by drilling holes.
  - c. In-depth inspection of fracture critical bridges and bridges with pin/hanger details is carried out every four (4) years - every alternate cycle - consistent with the approved fracture critical scope of work under separate consultant projects. However, the important information contained in such special FCM inspection reports (inspection findings and recommendations) shall also be included in the routine bridge inspection survey reports.
5. Estimated remaining fatigue life and/or fatigue ratings shall be extra work.
6. All **priority repairs** shall be submitted electronically utilizing the CoMBIS system with COMPLETE recommendation and repair scheme. The consultant SHALL verify that the electronically sent priority is actually received by the appropriate bridge owner personnel . As CoBMIS is still a new system, verification outside the system is to be done until are are satisfied that these notifications are happening without fail within CoMBIS.

The Consultant will notify the State Project Manager (or Assigned Engineer) immediately by phone if they encounter any structural or safety problems of an **EMERGENCY** type that need **IMMEDIATE ATTENTION**. The Consultant must issue Priority I repair letters within 1 week (7 days) of the inspection date. Priority II repair letters must be issued within 1 month (30 days) of the inspection date.

If any vandalism is observed during the inspection, contact the County for guidance as to whether additional reporting requirements are required. Graffiti that meets the definition of vandalism for reporting consists of graffiti that is vulgar, racial or anti-religion/anti-semitic.

7. Special attention shall be paid when upgrading the code of SI&A Items 58, 59, 60, 62, etc. that will change the status of a deficient or obsolete bridge. Any proposed revisions shall be specifically discussed with the Project Manager. Also, changes in SI & A items that result in changes in SI&A



items 68 (Deck Geometry) or 69 (Underclearances) that are automatically coded shall be similarly discussed.

8. The Consultant must notify the Project Manager, in writing, as soon as it is evident that **Additional or Extra Work** (as defined in the standard agreement) may be necessary and must negotiate costs associated with it. The Department will only reimburse for work that has been specifically authorized by agreement, Contract Modification, Letter of Intent, or, when appropriate, letter from the Manager, Structural Evaluation. Also, the Consultant shall notify the PM as soon as it is apparent that a cost overrun due to any reason is occurring on the project. Failure to promptly notify the PM will result in lower Consultant Evaluation System (CES) ratings.
9. All electronic records, including CADD sheets and other working files shall be handed over to the County or other bridge owners at the completion of the project. This will typically be accomplished by uploading these files directly into CoMBIS. Working files including underwater inspection reports (MS Word, CAD, Visio, etc.), must be properly named (#####\_YYYYMMDDcy

All newly created CADD files:

The STATE prefers and recommends that Microsoft Visio be utilized where possible. However, contact the County for final guidance of acceptable file types. Microstation **Version 08.05.08.70** 2-dimensionall “.dgn” file format is a less acceptable alternative. AutoCad is only permitted if this is the sole County standard for these types of drawings. Also, please return the bridge plans, if prepared or provided, to the bridge owner at the completion of the project.

Any images are to be according to the standards set for the CoMBIS system. These will eventually be documented, and may end up as a section in the **SDMS Contractor’s Specifications**. Once documented, the current version in effect at the time the work is actually performed is to be used.

10. BLANK
11. Visual inspection of structures, within the approach limits of the bridge, shall also be made and shall typically include any **overhead sign structures**, signs attached to the bridge and **Noise Reduction Walls**.
12. When inspecting prestressed concrete adjacent box beam/voided slab bridges, the inspector needs to be aware of the following defects which may be indicative of a serious problem that shall be brought to the attention of the bridge owner:
  - a. When no reinforced concrete deck is present (asphalt overlay directly on top slab of beams) and where no waterproofing membrane is provided, water may be trapped in the overlay creating an environment

- for corrosion and cracking. Water will infiltrate the boxes through cracks in the top flanges.
- b. Check the bottom of the beams for longitudinal cracks which may be caused by an accumulation of water in the boxes (freeze-thaw action). The cracks will become incipient spalls/spalls along the bottom edges of the beams on voided slabs and spalls in the bottom flange of box beams as the condition progresses.
  - c. Check for rust stains in the bottom flange which indicate corrosion of steel reinforcement.
  - d. The beam drainage weep holes shall be probed to ensure that they are functioning properly.
  - e. Check the underside of adjacent box beams for evidence of water leakage between the boxes. This is an indication of failed shear keys. Failed shear keys on bridges without reinforced concrete deck slabs can cause a situation where the lateral tie rods have insufficient strength to transfer loads between beams making the bridge non-redundant and vulnerable to partial collapse.
13. Check all gusset plates on main load carrying members for signs of cracking, bowing, distortion and section losses. When full access for visual inspection to determine section is lacking, then Non-Destructive Testing (NDT) must be used. A hands-on inspection of gusset plates on non-redundant members is required. Should conditions not permit this or access would be prohibitively expensive, then the Project Manager should be advised and alternatives discussed.

**VIII. BRIDGE INSPECTION SECURITY:**  
**This section has been moved to Appendix B**

**IX. REPORT FORMATS:**

**The consultant is FULLY responsible for the quality of the bridge inspections and reports produced. The State has introduced a reduced report review policy whereby it is unlikely that errors in the reports will be identified. In addition, the reviews by many of the other bridge owners are also minimal. The State's review policy is geared towards establishing a proper Consultant Evaluation Rating system score for the consultant's project. Therefore, the responsibility of the consultant for the quality of the work product cannot be overemphasized.**

1. County/Municipal/NJT/DEP/PIP Bridges—The current policy is that 10% of the reports will be thoroughly reviewed. The remaining 90% will receive a 'focused' review as needed.
2. All bridge survey reports will be submitted to the bridge owner within ten (10) months from the notice to proceed. If revisions are required by

the bridge owner, revised final reports will be submitted within 30 days of receipt of comments from the bridge owner..

From now on, all reports submitted by consultants are to be submitted as Final; all consultants are to sign and certify all reports before submitting them to the bridge owner.

**Note that format reports are still required. These reports will be reviewed and comments returned to the consultant.**

For each report, other than Format Reports, the bridge owner will either accept the report as final, or provide comments. Any comments or corrections offered by the bridge owner will be provided back to the consultant within the CoMBIS system for incorporation into the corrected final report.

- A. All bridge evaluation reports shall be completed in the approved format. **The first report submission of each project shall consist of Format reports.** The remaining bridge survey reports are to be submitted only after the approval of the format reports.

The **report format** to be used for this project shall be the CoMBIS equivalent of format A.

Submit **Format** reports as the first submission for the bridges. Include one in, at least, each of the following categories (the County can request more format reports if appropriate – up to 10% of all reports):

- a. A Structurally Deficient bridge with least sufficiency rating.
- b. A Functionally Obsolete with least sufficiency rating.
- c. A rehabilitated or rebuilt bridge.
- d. Bridge in fair to very good condition or first cycle (if applicable).

**NOTES:** **At least two of the Format reports above shall contain load rating analysis (when applicable to the project). Include one format rating of a steel superstructure and one format rating of a prestressed concrete superstructure (if no prestressed concrete bridges exist in a project, rate any other concrete superstructure).**

B. **GENERAL**

1. Use of a digital camera is mandatory. **Consultants shall ensure their photography and printing process produces a result equal to or better**

**than 35 mm photography. Photographs will be at least 3 megapixels in size, and shall not be excessively JPEGed. Images larger than 8 megapixels are discouraged.** The bridge owner and the STATE both reserve the right to reject any images deemed to be of poor quality.

**Note: Color Xerox copies will never be accepted.**

- a. Make sure photos are not dark and show the intended defects or feature clearly. Any photo not meeting these requirements will be rejected. This is important for scanning or PDF quality. The consultant will be asked to resubmit clear and sharp photos at their cost. Include photos of significant defects and work done.
  - b. Take one photo of each elevation along the bridge centerline (which shall be for the full bridge length) showing clearly all the features of the bridge and also features intersected. Take one photo of each roadway direction (along the center line). Any angular views of elevations or roadways will be rejected. Panoramic photos shall be used when necessary for larger bridges.
  - c. For structures over a waterway, take one photo of the approximate thalweg looking upstream and another looking downstream. Each photo must be taken from beneath the structure (NOT from the deck), and from the approximate centerline of the roadway. If multiple waterways or multiple branches of a single waterway cross under a structure, provide upstream and downstream channel photos for each.
  - d. Include underdeck photo(s) to clearly show each type of superstructure.
  - e. Photos are required for all Emergency or Priority Repairs conditions. In addition, photos are required to document all element condition ratings of '6' or below, and defects that require monitoring during future cycle inspections (settlement, lateral movements, wide cracks, tilted bearings, etc.). Additional photos are needed to show any Work Done since the previous inspection, any posting signs, or any special equipment used for inspection.
  - f. For scanning/viewing convenience, photo sheets are to be prepared for viewing in portrait orientation. Only Panoramic views may be in landscape orientation.
2. Use both Load Factor/Working Stress and Load and Resistance Factor methods for ratings in accordance with the current AASHTO Manual for Condition Evaluation of Bridges. For further details, see Attachment A. For pile bents, only caps shall be rated.

**Evaluation of Gusset Plates/Splice Plates on Fracture Critical Bridges**

Use both Load Factor/Working Stress and Load and Resistance Factor methods for rating of Gusset and/or Splice Plates in accordance with the current AASHTO Manual for Condition Evaluation of Bridges, 1994 (includes 2000 Interim Revisions). The load rating method for the gusset plate is determined by the method used to rate the main load carrying member. For further details, see Attachment A. Revised load capacity ratings are to be performed for the gusset and/or splice plates on FCMs during the next routine inspection of each structure. Only plates which connect sections of the FCM are to be load rated under this provision. It does not apply to plates connecting secondary members to the FCM. Subsequently, the load capacity ratings for the gusset and/or splice plates on FCMs are to be updated when determined that dead load has been added to a structure and the load carrying capacity of the gusset and/or splice plates is a controlling factor in the overall capacity of the bridge.

3. Where ratings are based on engineering judgment the ratings shall ALWAYS be based on the existing condition and other factors as per your engineering judgment with no reference to any previous report.
4. **VERTICAL UNDERCLEARANCES:** All bridges with a minimum underclearance of less than 14'-9" are required to be posted for vertical clearance if the Department is responsible for the posting (bridges above State jurisdiction roadways). This differs from the previously understood cut-off of 14'- 6". Bridges over non-State jurisdiction roadways will still be posted with a vertical clearance cut-off of 14'- 6". The vertical clearance posting of bridges is mandated under NJSA 27:5G-3. A **Priority 1 Action** is required to notify that the vertical clearance posting is required.

**Verify all vertical and lateral underclearances during each cycle of inspection.**

5. **Entering SI&A and Pontis Element data:**  
Within thirty (30) days of the inspection, enter the revised Dates of Inspection (SI&A Items 90 and 93) plus any changes to the SI&A Condition and Appraisal Items (SI&A Items 58 through 62 and 67 through 72). In addition, for all reconstructed or replaced bridges, submit revised coding input for SI&A Item 27 (Year Built), Item 106 (Year Reconstructed) and Items 58, 59, 60 & 62 (Condition Codes) at the same time. For CoMBIS Projects, we also look for all field collected data to have been entered within this time frame.

Within 90 days of the date of inspection, all SI&A/Pontis data must be in the system. This data must have received a thorough review (QA/QC) by the Project Manager or QA/QC Engineer.

Also, for this cycle, determine Items 16 & 17 (Latitude & Longitude) for all bridges to the following accuracy: xx.xxxxx Degrees.

The coding for Item 11 (Milepoint) must be verified using the current version of the Straight Line Diagrams in effect when the bridges are

inspected. Also, the SRI shall be coded for all roadways.

Please make sure that all the coded data for **SI&A/Pontis**, whether existing, new or corrected, is reviewed, verified and complete in all respects.

6. Also, make sure that the guide rails proposed meet the NJDOT Roadway Design Manual criteria listed under Section 8. When a guide rail(s) is required but not provided, specific reasons for recommending the proposed guide rails shall be given. BCT's on all State roads shall be considered as inadequate and Item 36(d) shall be coded zero. However, BCT's can be considered to be adequate on local roads (city/county/municipal, etc) depending on the owner's design standards. In all cases, BCT's located on NHS highways are to be considered inadequate. Refer to the Commentary on Item 36 (Safety Features) included as State Appendix F in the 2003 SI&A Coding Manual.
7. **RATINGS:** Provide a Load Rating Summary Sheet (LRSS) analyzing the summary of current ratings, even if ratings were done in a previous cycle report. Update the rating Calculations when necessary as per the NJDOT Bridge Load Rating Manual. The controlling member(s) must be clearly identified. All members of the structure must be rated. The term "unique member" will be used to classify a member with different section properties (but not variations in spacing, length, skew, etc). The number of unique members will be considered during negotiating of rating hours. Both the "As-Built" and "As-Inspected" ratings must be reported for all members. Always field measure section loss (**Do not estimate**) and make a note in the field note of remaining steel section. Compare this remaining section with "As-Built" section, either field measured or from "As-Built" plans for assessing the need for re-rating. Typically, primary load-bearing members that exhibit section loss of 10% or more from the "As-Built" condition will be considered as a unique member that requires rating. Any section loss below 10% is not to be modeled (except when special condition exist) for rating purposes unless the State Project Manager directs otherwise. For Engineering Judgment Rating, follow the guide lines provided in the memorandum dated 9/8/2008.
8. Provide a breakdown of estimated repair quantities in the field notes for all major recommendations (to eliminate Structurally Deficient or Functionally Obsolete conditions) or Emergency/Priority repair items. These quantities shall be consistent with the repair recommendations.
9. On narrow bridges (2 lanes or less), take soundings along both fascias only. Plot the soundings on the original sounding plot. For bridges with more than 2 lanes, provide additional soundings along the centerline of the bridge and around the substructure units. Make sure the sounding plot is referred to a permanent benchmark (abutment bearing seat etc.) and indicates the elevation of the bottom of substructure footings as they relate to the benchmark.

10. In addition to the current sounding plot, the oldest available sounding plot shall be shown to assess long term changes in the streambed. The Sounding drawings must be prepared in accordance with the format shown in the 1994 'Underwater Inspection and Evaluation of New Jersey Bridges Guidelines Manual' pages 13 thru 22 with the exception of the plan view requirement. **If a Consultant has requested plans for a structure (for load rating or other purposes), they must verify that all substructure elevations provided on the sounding sketch adhere to those shown on the plans.** The sounding plots are to be included in the working drawings CD. If the sounding plots are not in conformance with the requirements, time should be included in the cost proposal to update the drawings to meet standards.
11. All portions of the Underwater Inspection report is to be prepared in such a way as to be fully able to be PDFed.
12. The NJDOT Straight Line Diagrams (SLD) provide data that must be utilized for inspection reports. Data contained in the reports should be verified with the most recent edition of the SLD. When a Ramp is included in the structure name, the structure name should reflect the purpose of the Ramp, rather than an arbitrary name of the Ramp. For example, "Ramp A [Connecting US 1 NB to NJ 171] over US 130" is preferred over "Ramp A over US 130".

**X. Underwater Inspection:** Bridges over waterways shall be inspected in accordance with the 1994 NJDOT Underwater Inspection and Evaluation Guidelines Manual and OSHA Guidelines CFR 1910, Subpart T. Underwater diving inspections must be performed on bridges that have been determined to be **scour critical** (Item 113 coded '3' or less) that have a depth of water not less than 4 feet. Additionally, bridges with low free board must have an underwater diving inspection performed every cycle (24 month frequency). For other bridges requiring underwater diving inspection, the frequency will typically be 48 months. All required underwater inspections should be completed within four months of the Notice to Proceed. The consultant must obtain approval from the State Project Manager for any underwater inspections that will be performed later than four months after the Notice to Proceed.

- a. Diving shall be done for bridges over **DIVEABLE** waterways (depth of water not less than 4 ft.) or bridges with low freeboard to the superstructure (that prevents normal inspections by other means) by a fully qualified diver, experienced in the underwater inspection of concrete, steel and timber structures. The inspection must be conducted under the direct supervision of a fully qualified bridge inspection Team Leader. As per the new NBIS, all underwater divers must have completed comprehensive Federally approved bridge inspection training. Diver's report shall be reviewed, by the consultant, and included in the inspection report as an appendix. The consultant shall include comments and necessary repairs in the conclusions and recommendations section of the main report based on the diver's report.

- b. For bridges over waterways, state in the Conclusions and Recommendations Section if the bridge is **Scour Critical** and if countermeasures are required or have been provided.
- c. If an underwater inspection was performed this cycle (or previous cycle), include the repair recommendations resulting from this inspection or a statement saying no repairable defects were found.
- d. Please make sure that the RFP is sent to the diving vendors based on the overall location of the bridges (North & South Jersey) and at least three responses shall be confirmed. A list of diving vendors will be made available. However, the RFP does not have to be limited to the diving firm names listed with this office.
- e. The depth of water (not less than 4') in the channel near the substructure unit that requires underwater inspection by a diver must be verified by the team leader prior to the underwater inspection. The Consultant's Team Leader shall be present at the site during the operation unless the dive team includes a qualified Team Leader.
- f. It is now acceptable to obtain underwater diver inspection services as a sub-consultant provided that the diving firm provides the Bridge Inspection Team Leader or provides an engineer/diver.

## **XII. PHASE B WORK:**

A list of bridges requiring interim inspections shall be submitted as per the agreement and inspections carried out if required upon approval by the State. The report format for Phase B work (interim) shall include a letter indicating changes in condition of the component(s), if any, supported by photographs. For the new shorter duration inspection projects, it will be necessary for the consultant to request a time extension in order to conduct the interim inspections within the authorized time.

## **XIII. FILE PDFing PROCESS:**

All Consultants will be required to use the SDMS Contractors Specifications for all projects as appropriate.

**Starting January 1<sup>st</sup>, 2008, all PDF files created by you (file date after 1/1/08) must be compliant with the following standard:**

### **PDF/A-1b (sRGB version)**

PDF/A standards (ISO 19005-1:2005) are defined by the International Organization for Standardization (ISO). PDF/A standards apply to long-term archiving of electronic documents. PDF/A-1b is the less strict of the two PDF Archival standards.



All sheet scanning and file PDFing is to be performed using the **CURRENT** version of the “SDMS Contractors Specifications” in effect **at the time** the scanning or PDFing is actually performed. Therefore, if scanning or file PDFing does not occur for some time after the initiation of the project, make sure that all involved have and use a copy of the current specifications

**ATTACHMENT A**  
**LOAD FACTOR RATINGS**

1. As mandated by the FHWA, compute the load ratings using both the Load Factor/Working Stress and Load and Resistance Factor methods of analysis, as per NJDOT Bridge Load Rating Manual.

For the following structure types, Allowable Stress ratings can be computed:

- a. Timber structures
  - b. Masonry structures
  - c. Truss members for spans less than 500ft. long
  - d. Wrought Iron structures
2. Review previous ratings, framing plans, conditions, etc. and identify all members that need to be rated.
  3. New computations shall be made without reference to the previous calculations. Previous calculations may be utilized without any assumption as to their accuracy.
  4. The calculations shall be made by use of the latest version of the following computer programs.

A. LARS Bridge – Bentley Systems, Inc.

<http://www.bentley.com/en-US/Products/LARS+Bridge/Index.htm>

B. Box Culvert (Penn DOT)

C. STAAD III—Arches and Frames

D. DESCUS—Curved Girders

E. NJDOT SPREADSHEET– Bolted, Riveted & Welded Gusset/Splice Plates.

5. Inventory and operating ratings shall be provided for AASHTO HS-20 and three rating vehicles, AASHTO Type 3 & 3-3 and N.J. 3S2. Inventory and operating rating factors shall also be provided for AASHTO HL-93.
  6. Load Factor and Load and Resistance Factor ratings shall be calculated for Maximum Strength or Serviceability Strength and not for Fatigue. If fatigue ratings are required, they will be considered as extra work.
  7. Provide a summary in the Load Rating Summary Sheet (LRSS) that includes assumptions made, posting requirements, specific reasons for rating the bridge, members that have not been considered (**with justification**), etc., as per sample LRSS sheet.
1. All load rating computer input and output files shall be provided electronically to the bridge owner at the end of the project with the working file CD.

**ATTACHMENT B**  
**BRIDGE INSPECTION SECURITY**

**Yellow (or lower) Alert Level**

2. Consultants and their subcontractors shall have the following with them at all times while conducting bridge inspections:
  - a. Photo ID for each team member.
  - b. Letter of authorization from the Department (Notice to Proceed Letter).
  - c. Properly identified inspection vehicle. Magnetized sign with firm name is acceptable.
  - d. Additionally for subcontractors, a letter from the consultant authorizing their presence at the site on dates specified. The letter shall also indicate the type of work being done and equipment being used. In addition, a copy of the vendor approval letter from the Department shall be in possession.
  - e. While performing initial scoping of the bridges in a project, consultants shall have a copy of the Selection Notification Letter with the bridge list from the Department in lieu of the Notice to Proceed Letter.
3. In-House staff shall have the following with them at all times while conducting bridge inspections:
  - a. Department issued Photo ID for each team member.
  - b. Letter of authorization signed by the Unit Manager or designee.
4. Staff shall dress appropriately for bridge inspection activities. This means wearing safety vests, hard hats, and other clothing to help security personnel identify you as a bridge inspector.
5. Copies of previous cycle Bridge Survey Reports and other related materials should be retained to further confirm the reason for your presence at the bridge site.
6. Lane or shoulder closures on State highways are to be processed for permits through the appropriate Traffic Operations Office or Region.
7. Drawbridge Operations must be notified 72 hours or three (3) working days prior to the inspection activity for all movable bridges. This is also a requirement for underwater diving inspections or other subcontractors. Also, if applicable, the Coast Guard shall be contacted prior to the inspection to request approval for your presence in navigable waterways.
8. Bridge Inspection staff should be aware of any unusual or suspicious activity encountered. Any suspicious devices found on or near bridges or the potential reconnaissance of highway infrastructure shall be reported immediately to the Office of Counter Terrorism [1-866-472-3365]. If a situation is deemed to be emergent in nature (suspicious packages, etc.), then the local emergency officials shall be contacted using 911 in addition to notifying the Office of Counter Terrorism. Finally, the Manager, Structural Evaluation shall be notified. The intent is not to confront anybody acting suspiciously, but to report the suspicious activity. To that end, bridge inspectors should attempt to obtain information, such as license plate numbers or photos, that would allow appropriate security staff to investigate the matter but not to expose themselves to risk.
9. While conducting bridge inspections, staff shall consider the potential security vulnerabilities of the structure. Examples of security vulnerability issues are:

- Missing locks on box beam access doors
- Holes cut through chain link fencing
- Lack of access control to Fracture Critical Members (FCM's). Pin-Hanger Connections, Movable Bridge Machinery, etc.
- Industrial sites located close enough to the structure where objects thrown from the bridge could impact the site—tank farms, chemical sites, industrial sites, etc.

Any such situations found shall be brought to the Department's attention by writing a letter or e-mail to the Manager, Structural Evaluation as soon as possible after the situation is identified.

9. The Department will notify the affected County Office of Counter-Terrorism officials when an inspection is scheduled within their jurisdiction. This will be achieved by e-mailing the consultant's field schedule at the start of the project. This measure will not relieve the consultant from notifying the police during Orange Alerts as the original field schedule is subject to changes.

### **Orange Alert Level**

1. Regularly scheduled bridge inspections will continue to be conducted.
2. All of the above security measures remain in effect as modified below.
3. All staff is to be notified that we are at the Orange Alert Level and that we are at a heightened state of security. Any unusual activity at bridges shall be viewed at a heightened awareness context.
4. All staff shall have at least two forms of ID (including at least one photo ID) while conducting bridge inspections.
5. Local police departments must be notified that specific bridges are to be inspected prior to engaging in any inspection activity.

### **Red Alert Level**

1. All regular bridge inspection activities will cease until a lower alert level is specified.
2. In-house staff identified as critical must carry a Departmental Photo ID and a letter of authorization signed by the Commissioner prior to conducting any inspection activities. Specific letters of authorization may also be issued to consultants.
3. The function of in-house bridge inspection staff switches from regularly scheduled work activities to emergency response.