



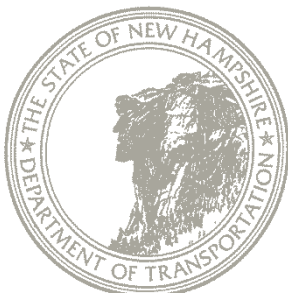
Bridge Design Manual

Chapter 12

Overview of Existing Bridge Section, Bridge Inspection, and Load Ratings

January 2015 – v 2.0

(Revised June 2019)



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Chapter 12

**Overview of Existing Bridge Section,
Bridge Inspection, and Load Ratings**

This chapter provides a brief overview of the NHDOT Existing Bridge Section, bridge inspection program, and bridge load rating requirements. For a more thorough description of these efforts, please refer to the *NHDOT Bridge Inspection Manual*, which can be found on the NHDOT Bridge Design - Document Library web page at:

<https://www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents/NHDOTBridgeInspectionManual.pdf>

12.1 Existing Bridge Section Overview

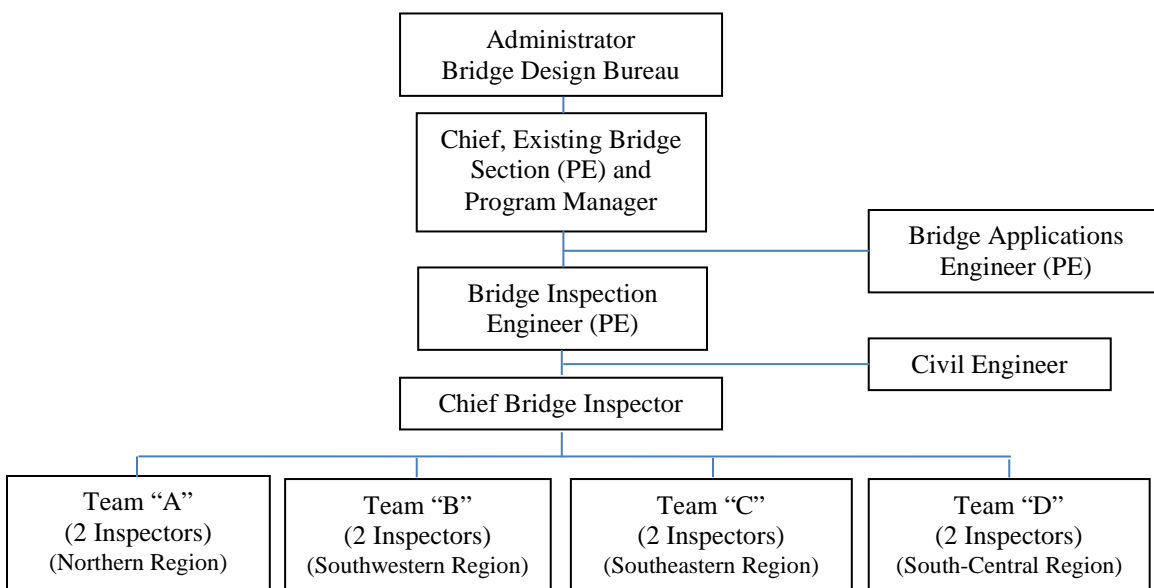
12.1.1 Organization, Roles, and Responsibilities

The Existing Bridge Section of the Bridge Design Bureau is comprised of engineers and inspectors, each with defined roles and responsibilities, including:

- Administering the Bridge Inspection Program and performing inspections for all publically-owned bridges in the State in accordance with state and federal requirements
- Maintaining, updating, and reporting bridge inventory data using the Department's Bridge Management System
- Assuring the accuracy and appropriateness of load ratings and that appropriate weight limit postings are implemented as necessary
- Responding to emergency situations involving bridges to ensure public safety

Bridge Inspection Teams, each with two Bridge Inspectors, are assigned specific regions of the state in which they perform bridge inspections. The inspection data is first recorded on laptop computers and is then transferred to supervisory personnel for review and QC/QA, prior to updating the Bridge Management System database.

An organizational chart for the Existing Bridge Section is shown below:



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12.2 Bridge Inspection Program Overview

12.2.1 Background

Inspection of existing bridges is one of the most important activities performed by Bridge Design personnel as it directly affects the safety of the traveling public. These actions determine and evaluate the condition of all state and municipal bridges to ensure that they are able to safely carry all legal loads in accordance with any load postings and/or weight restrictions in effect. Primarily, the Program ensures prompt discovery of any deterioration, defect, or structural deficiency of bridge elements that could be hazardous to the traveling public.

In general, each State is required to conduct biennial (every two years) inspections of bridges carrying traffic on public highways, and to record structure inventory and appraisal data in a specified format. Requirements for the inspection, evaluation, and load rating of the nation's bridges are defined by the National Bridge Inspection Standards (NBIS) in the Code of Federal Regulations, 23 CFR § 650C.

The NBIS stipulates that each state highway department perform inspections, prepare reports, and determine load ratings in accordance with the *AASHTO Manual for Bridge Evaluation (MBE)* and the *FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (Coding Guide)*. The Existing Bridge Section of the Bridge Design Bureau has established a Bridge Inspection Program to satisfy the NBIS requirements.

The primary responsibilities of a bridge inspector are to ensure public safety and to protect the public's investment in these structures. Any defects identified that present an immediate hazard to the public or that threaten the integrity of the bridge are immediately reported and repair actions are initiated to address the issue until a long term solution is developed and implemented.

12.2.2 Purpose

The Bridge Inspection Program, administered by the Existing Bridge Section of the Bridge Design Bureau, follows established procedures for bridge inspection, evaluation, load rating, and reporting. The outcome of this effort, which assesses the condition and safety of each bridge, also determines the available load capacity (i.e., weight limit postings) and maintenance needs of structures in the NHDOT Bridge Inventory. This inventory also includes various other non-highway bridges owned and maintained by the State (e.g., various bypassed historic structures, pedestrian bridges, and railroad bridges).

When referencing bridges in New Hampshire it is important to note that a "bridge", as defined in *RSA 234.2 Bridge Defined*, is any span 10-ft. (3-m) or greater, and that according to FHWA regulations a "bridge" is defined as any span greater than 20-ft. (6-m). The NHDOT Bridge Inventory includes data and inspection records of all publically owned structures carrying highway traffic and having a span of 10-ft. (3-m) or greater, thus meeting both bridge definitions.

The objectives of NHDOT's bridge inspection, evaluation, and load rating program are to:

- Fulfill the requirements of the National Bridge Inspection Standards (NBIS);
- Ensure prompt discovery of any deterioration, defect, or structural deficiency that could be hazardous to the traveling public;
- Maintain an up-to-date inventory that records the condition of all qualifying state-owned bridges carrying traffic on Class I, II, and III public highways as defined in RSA 229:5 by conducting periodic inspections as required by RSA 234:22;

- Maintain an up-to-date inventory that records the condition of all qualifying municipality-owned bridges carrying traffic on Class IV and V public highways as defined in RSA 229:5 by conducting periodic inspections as required by RSA 234:23;
- Maintain an up-to-date inventory that records the condition of other bridges for which the State feels it has a vested interest. These are determined on a case-by-case basis and may include state-owned pedestrian and railroad bridges, bridges constructed using Department funds that are not owned by the State, portions of bridges not owned by the State that cross Class I, II, and III highways maintained by NHDOT, and other miscellaneous structures considered important by NHDOT to the transportation network;
- Establish and maintain the information required by the AASHTO Bridge Management Software (BrM);
- Determine the extent of minor deterioration to assist with planning routine maintenance and repair work;
- Determine the extent of major deterioration for guiding decisions relative to bridge rehabilitation and replacement; and;
- Provide information for re-evaluation of live load capacity to guide posting and closure decisions.

Bridges on Class VI highways are specifically *excluded* from inspection efforts and from the bridge inventory. New Hampshire State law (RSA 234:22 and 234:23) requires inspection of bridges on Class I, II, III, IV, and V Highways only, specifically omitting Class VI Highways. Additionally, Federal regulations apply only to bridges on “public roads” which are:

1. Under the jurisdiction of a public authority, and
2. Maintained by a public authority, and
3. Open to public travel.

Therefore, the Bridge Design Bureau does *not* inspect bridges on Class VI Highways.

12.2.3 Evaluation of Bridge Condition

The condition evaluation efforts for each bridge establish the physical and functional condition of the bridge components, including the extent of deterioration and any other defects that are identified. The results of this evaluation are the basis for load rating, maintenance actions, and preservation, repair, and rehabilitation programs. In addition, as bridge inspections are repeated, a continuous history of bridge condition over time can be established for each bridge and for the bridge population as a whole, thereby providing bridge condition trends that are the basis for establishing goals and developing system-wide bridge programs and projects.

The condition rating for each major bridge element (e.g. deck, superstructure, substructure, or culvert) is evaluated in accordance with the 0-9 numeric coding system per FHWA requirements. For bridges crossing over waterways, additional assessment data of waterway adequacy, channel condition, and scour are also collected and are based on a similar numeric coding system.

Quality Control (QC) and Quality Assurance (QA) procedures for all bridge inspection efforts, as well as routine and specialized training of inspection personnel, are also important aspects of the NHDOT Bridge Inspection Program. These actions ensure that bridge inspections are consistent, accurate, thorough, and are completed in accordance with all applicable state and federal laws and regulations by an inspection staff that is well trained in the most up-to-date methods and requirements.

The condition of each bridge directly affects the safe load capacity of the bridge. It is often the case that severely deteriorated bridges have significantly reduced safe load capacities. Load ratings are determined by an engineer by evaluating available plans, calculations, shop drawings, records, and bridge inspection data as needed. The effects of all deterioration, damage, or other defects are taken into consideration to ensure that the load rating is based on the current condition of the bridge.

12.2.4 Coordination for Bridge Inspections and Providing Bridge Data

During various aspects of bridge inspection efforts it is necessary to coordinate with both internal and external organizations, agencies, and partners to meet responsibilities and achieve program goals.

A. Internal Coordination

Generally involves other NHDOT Bureaus regarding the use of equipment and staff in support of inspection activities. The Bureaus and Inspection Tasks are listed below:

- **Bridge Maintenance:** Scheduling the use of “spider” staging and support personnel; Design and develop emergency repairs to state bridges by Bridge Maintenance staff;
- **Mechanical Services:** Scheduling the use of “Snooper” under-bridge inspection equipment and support personnel; Scheduling maintenance/repair work for bridge inspection vehicles;
- **Traffic Bureau:** Coordinate the repair, replacement, or removal of bridge posting signs for weight limits, vertical clearance restrictions, and other bridge-related signage;
- **Highway and Turnpike Maintenance Bureaus:** Respond to reports of damage to bridges;
- **Commissioners’ Office:** Provide reports of bridge inspection data and respond to requests for bridge condition data and projections for development of budgetary needs, transportation improvement programs, and specific projects to address deficiencies;
- **Transportation Systems, Management, & Operations (TSMO):** Report bridge conditions and emergencies that could affect overall vehicular travel on the statewide transportation network;
- **Planning & Community Assistance Bureau:** Provide bridge condition data for development of the 10-Year Plan; Assist with issues involving municipal bridges;
- **Other NHDOT Bureaus:** As needed.

B. External Coordination

Generally involves federal agencies, other state departments, and transportation partners, such as:

- **FHWA:** Reporting NH bridge inspection data for National Bridge Inventory; Ensure compliance with applicable federal laws, regulations, and requirements;
- **NH Department of Natural and Cultural Resources, Division of Parks & Recreation:** Scheduling inspection of NHDCR-owned bridges and provide inspection data;
- **NH Department of Safety:** Schedule officers and cruisers for traffic control during specific bridge inspections;
- **NH Department of Justice, Attorney General’s Office, Transportation & Construction Bureau:** Provide bridge data and testimony as needed in support of Department objectives;
- **NH Municipalities:** Provide inspection results and required load postings for municipally-owned bridges; Respond to requests involving bridge issues of local concern;

- Neighboring states: Coordinate with the transportation departments of adjoining states (MA, ME, & VT) to ensure consistent reporting of the inspection data from shared border bridges to the National Bridge Inventory (NBI);
- Railroads: Schedule inspections of bridges involving railroads for right-of-way access and to ensure that proper railroad flagging is provided;
- Engineering Consultants: Schedule and complete structural and underwater bridge inspection actions not performed by NHDOT Bridge Inspection personnel; Provide prior bridge inspection data as needed;

12.2.5 Bridge Inspection Reports

In accordance with federal regulations, specific data is collected during bridge inspection efforts and submitted to FHWA by March 15 of each calendar year to update the National Bridge Inventory (NBI). The NBI contains current and historical inspection data on the more than 600,000 bridges (federal definition) in the United States. States usually collect additional bridge data not specifically required by FHWA but nonetheless considered necessary for their individual Bridge Inspection Programs. There is no federal requirement for states to prepare or submit individual Bridge Inspection Reports and each state independently develops Reports containing pertinent inspection data suitable for their needs.

NHDOT Bridge Inspection Reports compile and condense specific data recorded during bridge inspection efforts, and present it in a consistent format for reference by all users. Although an Inspection Report does not contain *all* data collected during bridge inspections, it does include bridge data that is generally needed to understand the bridge configuration, current condition, and required postings. All data collected, both current and historical, is retained in the NHDOT Bridge Management System database. It is important to note that this includes data for all federal definition (spans 20-ft. [6-m] or greater) and state definition (spans 10-ft. [3-m] or greater) bridges in New Hampshire, both state and municipally owned.

During inspection activities, photos are taken of any areas of concern to record their specific conditions at the time of inspection. This usually includes areas where deterioration or other concerns are present, such as impact damage or scour action. When current photos and data are compared with historical photos and data of the same concern or area of the bridge, estimates can be made of its rate of progression so that corrective actions can be scheduled. Photos are also taken of the roadway approaches and elevation views. These supplemental photos are not taken during every inspection and are generally only updated when changes have occurred at these locations.

The Bridge Inspection Report documents the observations made during the field inspection, the condition state of the bridge elements, and the physical description of the bridge. See [Appendix 12.2-A1](#) for a sample Bridge Inspection Report.

The following lists the data noted on a NHDOT Bridge Inspection Report:

- Bridge identification numbers (State and Federal)
- Location and crossing
- Date of inspection
- Name of inspection Team members
- Bridge Owner
- Recommended postings
- Vertical and horizontal clearances
- Condition of major bridge elements

- Structure type and materials
- Bridge dimensions
- Plan file location
- Year built/rebuilt
- Detour length
- Bridge service (classification)
- Element details
- Element states and notes
 - Element notes are limited to 4,000-characters dedicated to describing the condition states of each element based on observations and measurements in the field. Each element also can be documented for several potential defects and protection of sub-elements, each with its own note section of 4,000-characters. Inspectors describe each specific element and concisely record the necessary information leading to a proper consideration of the condition states of each element
- Bridge notes
 - Bridge notes are limited to a 4,000-character length, which includes specific items not covered by the Element or Inspection Notes.
- Inspection notes
 - Inspection Notes are limited to a 4,000-character length, which includes specific items not covered by the Element or Bridge Notes.
- Previous inspection notes
- Approach and roadway notes
- Inspection history
- Inspection frequency

12.2.6 Bridge Records (Files)

This Section provides an overview of the NHDOT Bureau of Bridge Design policy for maintaining bridge records (files) to meet Federal Highway Administration (FHWA) requirements and to effectively manage physical assets. The Existing Bridge Section prepares and maintains the bridge records as noted in Section 12.2.2.

This policy applies to the following bridge inventory:

- All publicly owned and maintained bridges carrying highway traffic. Federal definition bridges are structures having spans 20-ft. (6-m.) or greater, while State-definition bridges are structures having spans 10-ft. (3-m.) or greater. (Refer to Section 1.4 for more specifics);
- Various other non-highway bridges owned and maintained by the State (e.g. various bypassed historic structures, pedestrian, and railroad bridges);
- Bridges or portions thereof serving other uses and crossing highways that are open to public travel; and
- Various other bridges for which the State has established a vested interest.

All bridge records shall meet the requirements of Section 2 of the *AASHTO Manual for Bridge Evaluation (MBE)*. The MBE emphasizes three main points for maintaining a bridge file:

- Bridge owners should maintain a complete, accurate, and current file of each bridge under their jurisdiction.

- A bridge record always contains the current and sometimes the cumulative information about an individual bridge.
- A bridge file may be stored electronically, on paper, or a combination of both.

A. Components and Location of Bridge Files

Bridge files contain bridge information, inspection reports, and notations of any actions taken to address findings of deficiencies. Bridge files maintain relevant maintenance and inspection data to allow the assessment of current bridge conditions. The general components of a bridge file are as follows:

- Bridge inspection report
- Bridge capacity summary sheet (Form 4) bearing the NH P.E. seal and signature of the engineer responsible for the load rating.
- Bridge capacity calculations and diagrams
- Inspection photos
- Hydraulic report (if applicable)
- Bridge contract plans
- Shop drawings
- Scour Plans of Action (POA) (if applicable)
- Fracture critical member identification and inspection report (if applicable)
- Underwater (diving) inspection report (if applicable)
- Complex bridge inspection report (if applicable)
- Scour critical inspections (if applicable)
- Bridge maintenance records

The Bureau of Bridge Design maintains both a hard copy and an electronic copy of inspection records to comply with the minimum NBIS requirements.

1) Paper Files

The hard copies (paper files) contain the bridge capacity summary sheet, inspection reports, sketches, and inspection photos, and are located in filing cabinets in the Bureau of Bridge Design. The inspection reports are cumulative, meaning that all historic as well as current data must be kept in the bridge file. The paper files are organized according to ownership, town, and bridge number.

2) Electronic Files

As noted above, a bridge file can contain a vast amount of additional data and documents that cannot all be stored as paper files. Therefore, the bridge files are also stored electronically as a supplement to the paper files. The electronic bridge files have a backup system intended to protect the electronic data for the life of the structures. The electronic bridge file is also cumulative and includes all the components listed above, except for the inspection photos. The electronic files are located on the Department's V:\drive and are organized according to town, Bridge Inspection Maintenance Folder, and bridge number (e.g., V:\Towns\Albany\BridgeInspMaint\030_150). The subfolders shall be listed as follows:

- Plans
 - Plan year subfolder
- Shop Drawings
 - Plan year subfolder
- Bridge Inspection Files
 - Year subfolder

- ◆ Bridge Capacity Form, calculations, diagrams
- ◆ Scour POA and Scour Critical inspections
- ◆ Fracture Critical, Underwater, Complex Bridge, Scour Critical Inspection Report
- Bridge Maintenance Files
 - Year subfolder

The electronic bridge file maintains cumulative contract bridge plans and selected shop drawings, including: structural steel, expansion joints, bearings, prestressed/precast elements, and fabricator designs. It also maintains cumulative bridge maintenance records.

The Bureau of Bridge Maintenance maintains a cumulative electronic file of all in-house repairs completed. In-house drawings and specifications supplementing each repair are also retained in the electronic folder “Bridge Maintenance files”.

3) Inspection Photos

The electronic inspection photos are stored separately in the Bridge Inspection Photo Reviewer (BIPR) database located at: N:\Databases\B18-BridgeDesign\BIPR.mdb.

4) Bridge Inventory Database

The Bureau of Bridge Design maintains a database that records contract plans completed on state managed structures. This database correlates contract number and bridge number for structures maintained by the NHDOT. This database is located at: N:\Databases\B18-BridgeDesign\BridgeFileNumber.mdb.

B. Access to Bridge File

The paper bridge files are publically available during working hours at the NHDOT Concord office, Bureau of Bridge Design. Upon completion of the review and QC/QA processes of the inspection reports, copies of municipal bridge inspection reports are sent to the municipality.

The electronic bridge inspection reports are available on the “NH Bridges” map located on the Bridge Design website located at:

<https://www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents.htm>

The map has “bubble” markers for each bridge in the state. Select the appropriate bubble marker to obtain bridge information, then select “Bridge Inspection Report” to obtain the latest inspection report. The inspection photos are currently not available for on-line viewing but will be available at a future time.

All other documents in the electronic file for each bridge can be provided upon receipt of a request submitted to the Bureau of Bridge Design, Existing Bridge Section.

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12.3 Load Ratings Overview

12.3.1 Introduction and Background

Load rating of new and existing bridges is a critical activity as it directly corresponds to the safety of the traveling public. The ability of each bridge to safely carry all anticipated loads must be determined and evaluated so that any required load restrictions can be posted and imposed.

The National Bridge Inspection Standards (NBIS) require that a load rating be calculated and kept on file for each bridge in the National Bridge Inventory. The load rating calculations are a required component of the bridge file and are updated when the condition of the bridge changes to reflect the safe load capacity of the “As-Inspected” structure in its current condition. Therefore, load ratings are updated for those structures where available live load capacity has been reduced because of deterioration, damage, an increase in dead load, or structural modifications. Updating the load rating of a structure that experiences an *increase* in capacity is optional, subject to approval by the Chief, Existing Bridge Section.

Load rating of bridges is completed in accordance with the *AASHTO Manual for Bridge Evaluation (MBE)*. Appendices in the MBE provide examples of load rating different types of structures with accepted load rating methods per AASHTO specifications, e.g., Allowable Stress Rating (ASR), Load Factor Rating (LFR), and Load and Resistance Factor Rating (LRFR), or other appropriate rational and professionally accepted criteria. All bridge load ratings submitted to the NHDOT shall bear the stamp of a Professional Engineer (PE) licensed in the state of New Hampshire. Rating calculations shall be performed by engineers familiar with the principles of structural analysis and load rating methods relative to the structure type under evaluation. The engineering knowledge and skill necessary to properly evaluate the load capacity of bridges varies with the complexity of the bridge.

Interpretation of load posting requirements and load rating results requires experience and judgment, and thus, each analysis is reviewed by a qualified engineer. Good judgment on the part of the rating engineer is prudent for recognizing special situations where routine, simplified analysis procedures are inadequate, and more sophisticated analysis methods are required. In addition, the reviewing engineer also evaluates the load rating decisions regarding material strengths, effects of deterioration and defects, stability, etc. The reviewing engineer may also recommend additional inspection and/or testing as part of the load rating process.

Please refer to the *NHDOT Bridge Inspection Manual* for information on the following additional topics:

- General Load Rating / Re-Rating Guidelines and Load Rating Revision Criteria
- Selection of Members for Analysis
- Load Rating Methods and Computer Software
- Bridges with Unknown Structural Components
- Load Posting Requirements
- Format of Load Rating Package (including Form 4)
- Oversize/Overweight (OS/OW) Permits
- Documentation of Losses
- Field Investigation Forms for Rating Evaluations

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References

1. New Hampshire Department of Transportation Bureau of Bridge Design, *Bridge Inspection Manual, March 2017*, Concord, NH. Retrieved from <https://www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents.htm>
2. Washington State Department of Transportation, *Bridge Inspection Manual M 36-64*. Retrieved from <https://www.wsdot.wa.gov/Publications/Manuals/M36-64.htm>

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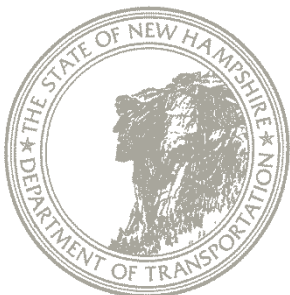


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January 2015 – v 2.0

(Revised June 2019)



SAMPLE INSPECTION REPORT

The electronic bridge inspection reports are available on the “NH Bridges” map located on the Bridge Design website located at:

<https://www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents.htm>

The map has bubble markers for each bridge in the state. Hit on the bubble marker to obtain bridge information and hit on the “Bridge Inspection Report” to obtain the latest inspection report. The inspection photos are currently not available for on-line viewing but will be available at a future time.

New Hampshire Department of Transportation

Existing Bridge Section
Bureau of Bridge Design

Bridge Inspection Report

NBI Structure Number: 005201520010900

Concord 152/108

Date of Inspection: 11/29/2018

I-393,US 4,US202

Date Report Sent: 12/11/2018

over

Owner: NHDOT

I-93

Bridge Inspection Group: D-Team

Bridge Maintenance Crew: 05

Interstate Bridge Number: 045

Recommended Postings:

Weight: **No Posting Required**

Weight Sign OK

Width: **Not Required**

Width Sign OK

Primary Height Sign Recommendation: *None*

Clearances: Over: 99.99

Height Sign OK

Optional Centerline Height Sign Rec: *None*

(Feet) Under: 16.08

Route: 99.99

Condition:

Red List Status: State Redlist

Deck: 4 Poor

Superstructure: 6 Satisfactory

Substructure: 4 Poor

Culvert: N/A (NBI)

Sufficiency Rating: 29 %

NBI Status: Structurally Deficient

Bridge Rail: Substandard

Rail Transition: Substandard

Bridge Approach Rail: Meets Standards

Approach Rail Ends: Substandard

Structure Type and Materials:

Number of Main Spans: 2

Number of Approach Spans: 0

Main Span Material and Design Type:

Steel Multiple Beam

NH Bridge Type: IB-C (1 Beams w/ Concrete Deck)

Deck Type: Concrete, Cast in Place

Wearing Surface: Bituminous

Membrane: Other

Deck Protection: None

Curb Reveal: 7 in

Plan Location: 6-2-3,88-3-2

Total Bridge Length: 167.0 ft

Right Curb/Sidewalk Width: 0.7 ft

Total Bridge Width: 93.8 ft

Median: Closed Med w/Barriers

Bridge Skew: 23.00 °

Year Built/Rebuilt: 1958/1981

Detour Length: 3.0 mi

Bridge Dimensions:

Length Maximum Span: 80.0 ft

Left Curb/Sidewalk Width: 0.7 ft

Width Curb to Curb: 80.0 ft

Approach Roadway Width: 80.0 ft

(W/Shoulders)

NHDOT 008 Inspection

Concord 152/108

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New Hampshire Department of Transportation

Bridge Inspection Report

NBI Structure Number: 005201520010800

Existing Bridge Section
Bureau of Bridge Design

Concord 152/108

Bridge Service:

Type of Service on Bridge: Highway

Type of Service Under: Highway

Lanes on Bridge: 4

Lanes Under: 4

AADT: 41,300

Percent Trucks: 8 %

Year of AADT: 2013

Future AADT: 61,124

Year of Future AADT: 2038

Federal or State Definition Bridge: Fed-Definition Bridge

National Highway System: NHS Roadway on Bridge

Roadway Functional Class: Urban Interstate

New Hampshire Bridge Tier: 1

Eligibility for the National Register of Historic Places: Not Eligible

Traffic Direction: Two-way traffic

National Bridge Inventory (NBI) Appraisal Ratings:

Deck Geometry: 9 - Above Desirable Criteria

Underclearances: 5 - Above Min. Tolerable

Approach Alignment: 8 - Equal Desirable Criteria

Structural Evaluation: 2 - Intolerable, Replacement

Channel/Channel Protection: N - Not Applicable (NBI)

Waterway Adequacy: N - Not Applicable (NBI)

Bridge Scour Critical Status: N - Not Over Waterway

Riprap Condition: N - Not Applicable

Debris Present: unknown

Channel Notes:

New Hampshire Department of Transportation

Existing Bridge Section
Bureau of Bridge Design**Bridge Inspection Report**

NBI Structure Number: 005201520010800

Concord 152/108

Element Details (see disclaimer below)

No.	Description	Material Notes and Condition Notes:
12	Reinforced Concrete Deck	CURBS- CRACKED, SPALLED. UNDERSIDE OF DECK- FINE CRACKS, LEAKING, SPALLING AND REBAR EXPOSED.
L 510	Wearing Surfaces	ASPHALT- NO DAMAGE.
L1090	Exposed Rebar	SPAN #1 MEDIUM SPALLS IN BAYS #11 AND #12. SPAN #2 LARGE SPALLS IN BAYS #10 AND #11.
L1120	Efflorescence/Rust Staining	EFFLORESCENCE AND RUST STAINING UNDER CURBS AND JOINT.
107	Steel Open Girder/Beam	BEAMS- PAINT PEELING; RUST FORMATION ON BOTTOM FLANGES. LIGHT CORROSION WITH MINOR SECTION LOSS TO BEAM ENDS UNDER JOINT.
L 515	Steel Protective Coating	
L1000	Corrosion	RUST HAS INITIATED ON ALL BEAMS, BEAM ENDS UNDER JOINT MINOR SECTION LOSS DUE TO LEAKAGE.
205	Reinforced Concrete Column	MEDIUM SPALLS AND REBAR EXPOSED ON #4.
L1090	Exposed Rebar	SPAN #1, COLUMN #4 MEDIUM SPALL AT CENTER IN A 1 X 2 AREA, WEST.
215	Reinforced Concrete Abutment	ABUTMENTS- CRACKS, MODERATE SPALLS AND REBAR EXPOSED. BACKWALLS AND BRIDGE SEATS- CRACKS AND LIGHT SPALLS. WINGS- ALL LOOSE GRANITE FACING HAS BEEN REMOVED.
L1090	Exposed Rebar	SPAN #1 TWO MEDIUM SPALLS AT CENTER, WEST. SPAN #2 MEDIUM SPALL AT CENTER, EAST.
234	Reinforced Concrete Pier Cap	REPAIRED BY BRIDGE MAINTENANCE.
301	Pourable Joint Seal	FULLY ADHERED.
302	Compression Joint Seal	JOINT- GLAND TORN, RIPPED, AND FAILED. HEAVY LEAKING ON PIER CAP.
L2330	Seal Damage	SEVERAL AREAS HOLED.
311	Movable Bearing	ANCHOR BOLTS BENT AND LIFTED UP AT PIER. RUSTED UNDER LEAKAGE.
L 515	Steel Protective Coating	
313	Fixed Bearing	RUSTED UNDER LEAKAGE.
L 515	Steel Protective Coating	
330	Metal Bridge Railing	DAMAGED ON NORTH AND POST BROKEN ON SOUTHEAST.
331	Reinforced Concrete Bridge Railing	SCALING AND MINOR SPALLS.

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New Hampshire Department of Transportation

Bridge Inspection Report

NBI Structure Number: 005201520010800

Existing Bridge Section
Bureau of Bridge Design

Concord 152/108

Element States (see disclaimer below)

No.	Description	Quantity	Units	State 1	State 2	State 3	State 4
12	Reinforced Concrete Deck	13,358	sq.ft	98%	2%	0%	0%
L 510	Wearing Surfaces	---	---	100%	0%	0%	0%
L 1090	Exposed Rebar	95	sq.ft	0%	100%	0%	0%
L 1120	Efflorescence/Rust Staining	133	sq.ft	0%	100%	0%	0%
107	Steel Open Girder/Beam	2,339	ft	82%	17%	1%	0%
L 515	Steel Protective Coating	---	---	100%	0%	0%	0%
L 1000	Corrosion	414	each	0%	97%	3%	0%
205	Reinforced Concrete Column	8	each	88%	13%	0%	0%
L 1090	Exposed Rebar	1	each	0%	100%	0%	0%
215	Reinforced Concrete Abutment	240	ft	96%	4%	0%	0%
L 1090	Exposed Rebar	9	ft	0%	100%	0%	0%
234	Reinforced Concrete Pier Cap	95	ft	100%	0%	0%	0%
301	Pouable Joint Seal	168	ft	100%	0%	0%	0%
302	Compression Joint Seal	98	ft	25%	25%	50%	0%
L 2330	Seal Damage	49	ft	0%	0%	100%	0%
311	Movable Bearing	42	each	100%	0%	0%	0%
L 515	Steel Protective Coating	---	---	100%	0%	0%	0%
313	Fixed Bearing	14	each	71%	29%	0%	0%
L 515	Steel Protective Coating	---	---	100%	0%	0%	0%
330	Metal Bridge Railing	591	ft	97%	2%	0%	1%
331	Reinforced Concrete Bridge Railing	591	ft	0%	100%	0%	0%

Element Disclaimer: NHDOT is transitioning from CoRe elements to AASHTO elements. The AASHTO element data shown above is the product of the automated element migration routine from the AASHTOWare B-M software. This migrated data has undergone limited field verification. Adequate quality control of this element data is not expected to be achieved until the conclusion of the 2020 inspection season. Please utilize element data with caution.

Bridge Notes:

Several beam webs out of plumb 1/2 to 1 inch at pier, noted 1991.

ADDED TO STATE RED LIST ON 5/18/2011 DUE TO SOFFIT AND SUBSTRUCTURE. SOME LOOSE GRANITE FACING ON WINGS HAD TO BE REMOVED. GRANITE FACING APPEARS STABLE ON SOUTHWEST, NORTHWEST AND SOUTHEAST; DEBRIS BEHIND NORTHEAST WING PUSHING GRANITE FACING OUTWARDS WITH VOID BETWEEN CORNER OF NORTHEAST ABUTMENT AND GRANITE FACING.

11/17/2016, 3/28/2017

3/12/18- PIER CWIP, 11/29/18- PIER CAP AND COLUMN #1 REPAIRED, ALL LOOSE GRANITE FACING HAS BEEN REMOVED BY BRIDGE MAINTENANCE.

Inspection Notes: 11/29/2018

NJL inspection comments -

DECK: ASPHALT- NO DAMAGE. CURBS- CRACKED, SPALLED. UNDERSIDE OF DECK- FINE CRACKS, LEAKING, SPALLING AND REBAR EXPOSED. RAIL- DAMAGED ON NORTH AND ON SOUTH. POST BROKEN ON SOUTHEAST. JOINT SEAL- HOLES AREAS CAUSING LEAKAGE OVER PIER.

SUPERSTRUCTURE: BEAMS- PAINT PEELING, RUST FORMATION ON BOTTOM FLANGES. LIGHT CORROSION WITH MINOR SECTION LOSS ON BEAM ENDS UNDER JOINT.

SUBSTRUCTURE: ABUTMENTS- CRACKS, MODERATE SPALLS AND REBAR EXPOSED. BACKWALLS AND BRIDGE SEATS- CRACKS, LIGHT SPALLS. WINGS- LOOSE GRANITE FACING HAS BEEN REMOVED ON ALL FOUR CORNERS. COLUMNS- CRACKS, MEDIUM SPALL WITH REBAR EXPOSED #4. CAP- SEVERAL REPAIRED AREAS.

PICTURES: D223-

40. WEST SIDE OF PIER, REPAIRED.

41. COLUMN #1, REPAIRED.

42. EAST SIDE OF PIER, REPAIRED.

NHDOT 008 Inspection

Concord 152/108

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New Hampshire Department of Transportation

Existing Bridge Section
Bureau of Bridge Design

Bridge Inspection Report

Concord 152/108

NBI Structure Number: 005201520010800

Previous Inspection Notes: 03/12/2018

BTB inspection comments -
DECK: ASPHALT- NEW PAVEMENT. CURBS- CRACKED, SPALLED. UNDERSIDE OF DECK- FINE CRACKS, LEAKING, SPALLING AND REBAR EXPOSED. RAIL- DAMAGED ON NORTH AND ON SOUTH. POST BROKEN ON SOUTHEAST. JOINT SEAL- HOLED AREAS CAUSING LEAKAGE OVER PIER. .
SUPERSTRUCTURE: BEAMS- PAINT PEELING; RUST FORMATION ON BOTTOM FLANGES. LIGHT CORROSION WITH MINOR SECTION LOSS TO BEAM ENDS UNDER JOINT.
SUBSTRUCTURE: ABUTMENTS- CRACKS, MODERATE SPALLS AND REBAR EXPOSED. BACKWALLS AND BRIDGE SEATS- CRACKS, LIGHT SPALLS. WINGS- LOOSE GRANITE FACING HAS BEEN REMOVED ON ALL FOUR CORNERS. COLUMNS- CRACKS; MEDIUM TO LARGE SPALLS, REBAR EXPOSED ON #1 AND #4. CAP- CRACKS, MEDIUM TO LARGE DELAMINATIONS, SPALLS AND REBAR EXPOSED. SPALLED UNDER BEARING #14, SPAN #1.

PICTURE: D212-17. SUBSTRUCTURE, CWIP.

Approach and Roadway Notes:

APPROACH ASPHALT- NO DAMAGE. APPROACH W-BEAM- MINOR DAMAGE.

Inspection History

Inspection Date	Inspector Initials	Inspection Type(s) Performed				Major Element Ratings				Red list	Posting
		NBI	Elem	FCM	U/W	Deck	Super	Sub	Culvert		
11/29/2018	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/12/2018	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/17/2017	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/28/2017	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/17/2016	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/09/2016	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/03/2015	KLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/19/2015	KLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/14/2014	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/24/2014	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
12/05/2013	KLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
04/08/2013	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/09/2012	KLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
03/08/2012	MHC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
11/15/2011	MHC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
05/18/2011	NJL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	6	4	N	<input checked="" type="checkbox"/>	No Posting Req'd
04/29/2009	KLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	5	N	<input type="checkbox"/>	No Posting Req'd
06/20/2007	RLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	6	N	<input type="checkbox"/>	No Posting Req'd
06/02/2005	RLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	6	N	<input type="checkbox"/>	No Posting Req'd
05/06/2003	RLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	6	N	<input type="checkbox"/>	No Posting Req'd
06/15/2001	RLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	6	N	<input type="checkbox"/>	No Posting Req'd
07/13/1999	RLM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	7	6	N	<input type="checkbox"/>	No Posting Req'd
04/01/1997		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	7	6	N	<input type="checkbox"/>	No Posting Req'd
08/01/1995		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	7	7	N	<input type="checkbox"/>	No Posting Req'd
07/01/1993		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	6	7	N	<input type="checkbox"/>	No Posting Req'd
06/01/1991		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	5	5	N	<input type="checkbox"/>	No Posting Req'd

NBI	Elem	FCM	U/W
8	8	N/A	N/A