# CHAPTER 8
# NON-NBI INSPECTIONS

## 8.1 INTRODUCTION

This chapter addresses inspections performed by MassDOT that are not included in the National Bridge Inspection program.

There are several types of structures across the Commonwealth that are not included in the National Bridge Inspection program, but are included in the state bridge database. Since inspection of Non-NBI bridges are not mandated by the FHWA, they may not be inspected on an established frequency. Examples of these bridges (with Item 8 Category code) include:

- Bridges that are shorter than the minimum NBI length (BRI) or (CUL)
- Railroad bridges over highways (RRO)
- Privately owned bridges (PRI)
- Bridges that are intended for pedestrian (PED) or bikeway (BKY) use

Special circumstances that would warrant inspecting structures beyond their normal frequency schedules would include "Acts of Nature" such as Floods and Earthquakes.

MassDOT inspects portions of bridges every spring in an attempt to remove concrete deterioration resulting from freeze/thaw cycles before it could fall from structures onto the traveled ways below.

Lastly, this chapter will discuss procedures relating to bridges that are considered to be classified as Major and Critical infrastructure.

## 8.2 BRI & CUL STRUCTURES

As detailed previously in this Handbook, the Federal Highway Administration mandates that all bridges over twenty feet be inspected in accordance with the National Bridge Inspection Standards. Massachusetts General Laws Chapter 85 Section 35 however, considers any structure on a public highway that has a span in excess of ten feet to be a bridge. Structures that meet the Massachusetts definition of a bridge but not the FHWA definition (i.e. greater than 10 feet up to and including 20 feet) have a designation of BRI for Item 8 Bridge Category Code in the bridge inventory.

MassDOT does keep an inventory of structures that are ten feet or less in span length. These are considered as culverts, regardless of their actual structure type and construction, and have a designation of CUL for the Item 8 Bridge Category Code. In order to be inventoried as a CUL, the structure must be 10 feet or less but greater than 4 feet in span, provided that no opening or pipe diameter comprising the culvert structure, either as a single opening or a multi opening, is less than 4 feet measured square to the side walls.

Massachusetts General Laws do not specify how the span should be measured. For this, MassDOT defers to the NBIS. Span measurements should be taken along the centerline of the roadway to be consistent with NBIS. For superstructures that have bearings the measurement should be from centerline of bearing to centerline of bearing to be consistent with MGL. For bridges such as arches and frames that do not have definite centerlines of bearings the measurement should be from face to face of breastwall (clear opening) as specified by the NBIS.

### 8.2.1 Inspection of BRI & CUL Structures

It is obviously in the DOT's best interest to monitor conditions of BRI structures as closely as possible given staffing constraints. Scheduling priority within Districts will always be for NBI structures. BRI's should be scheduled for inspection as staffing levels and workloads permit. Scheduling prioritization should consider ADT, age and condition of the structure. MassDOT owned structures should be given priority over municipally owned structures.

Requests by any parties for inspections of BRI structures should be addressed as soon as possible. The DBIE or his/her designee should determine the reason for the inspection request. If there is a concern about structural conditions then an inspection should be scheduled as soon as possible within the constraints of staffing.

MassDOT is in the process of implementing an inspection program for BRI structures, both DOT and Municipally owned. The inspection frequency and reporting process is expected to mirror the requirements of the NBIS.

### 8.2.2 Documentation of BRI & CUL Structures

All documentation for BRI inspections is to be the same as for NBI bridges. Reports are to be created within 4D. It is possible that an inspection is the first inspection for certain BRI structures. In such cases the inspection Team should gather all inventory information that is missing from the SI&A sheet. Particular attention should be given for determining accurate coordinates for the structure. It would also be helpful to provide a brief location description (Item 9). If a Bridge Number and BIN have not been created for the structure, the DBIE should submit a request through the ABIE.

### 8.2.3 Distribution of BRI Inspection Reports

One copy of completed and approved inspection reports should be transmitted to the bridge owner with a cover letter signed by the District Highway Director. Until such time as MassDOT implements a BRI inspection program, the letter should clearly indicate that the inspection was provided as a **courtesy** and that **a re-inspection is not anticipated** at this time. It is very important not to use a letter that is intended for NBI bridges, which indicates that follow up inspections will be occurring at regular intervals. It would be clearly wrong to give bridge owners any impression other than that the enclosed report is a one-time occurrence. An example of a transmittal letter to a municipality for a BRI bridge is included as Attachment 8-1.

A copy of the inspection report and letter is to be provided to the Bridge Inspection Engineer for inclusion into the bridge files.

## 8.3 RAILROAD BRIDGES OVER HIGHWAYS (RRO STRUCTURES)

Bridges carrying railroads by definition are not NBIS structures, because they do not support highway traffic. Many of the railroad bridges do, however, span over roadways. Most of those bridges are owned by railroads or other agencies. However, a small population of these bridges are owned by MassDOT Highway Division.

It is MassDOT Highway Division's policy to periodically inspect DOT owned RRO's for the purpose of protecting the traveling public below. There is no set frequency for inspections of these structures. Scheduling priority within Districts will always be for NBI structures, and then for BRI's. Inspections of RRO's should be

scheduled for inspection as staffing levels and workloads permit. Scheduling prioritization should consider ADT under, structure age and condition. These inspections are not intended to comply with or replace the railroad bridge inspection program that is specified in the Code of Federal Regulations (CFR) 49 Part 237, Bridge Safety Standards, and MGL Chapter 159 Section 83, which put the responsibility for conducting railroad bridge inspections on the operating and bridge owning railroad company respectively.

### 8.3.1 Inspection of RRO Structures

All documentation for RRO inspections is to be the same as for NBI bridges. Reports are to be created within 4D as "Other" Inspections. It is possible that an inspection is the first inspection for certain RRO structures. In such cases the inspection Team should gather all inventory information that is missing from the Railroad SI&A sheet, see Attachment 8-2. Particular attention should be given for determining accurate coordinates for the structure. If a Bridge Number and BIN have not been created for the structure the DBIE should submit a request through the ABIE.

When inspecting a RRO, the focus of the inspection is on the structural elements in close proximity to the traveled way. It is not necessary to inspect the railroad roadbed, ballast, ties, track, and communication systems. Typical superstructure elements to inspect include exterior faces of through girders, floor beams, underside of ballast plates, and girder bearings. A low vertical clearance measurement should be obtained and recorded. Typical substructure elements to inspect include abutment seats, breastwalls and wingwalls, and pier caps and columns.

## 8.4 PRIVATELY OWNED BRIDGE (PRI STRUCTURES)

Privately owned bridges are those that are owned by a private entity, such as an individual, corporation, association, society or partnership. Some of these may be on public highways and may be open to use by the travelling public. MassDOT does not inspect privately owned bridges, even if they are on public highways, based on an opinion of the MassHighway (predecessor to MassDOT) Chief Counsel's office that public funds may not be expended to the benefit of private entities.

In addition, MassDOT considers some bridges owned by public entities to be "private" bridges if they are not on public highways or if access to the bridge by the travelling public is restricted by a gate or guardhouse, which allows only authorized users to go over the bridge.

## 8.5 PEDESTRIAN BRIDGES (PED), BIKEWAY (BKY) AND UTILITY (UTL) STRUCTURES

MassDOT does not typically inspect pedestrian, bikeway, or utility bridges. MassDOT will inspect these bridges if the owner of the structure requests an inspection under special circumstances. The same procedure will be followed as other Non-NBI structures.

## 8.6 EMERGENCY INSPECTIONS DUE TO ACTS OF NATURE

Following certain acts of nature, it is necessary to perform a visual assessment of effected bridges to assure public safety. This section provides a brief guideline on the implementation of an emergency inspection program that may be required in response to typical acts of nature.

### 8.6.1 Flood/Tidal Surge

Coastal and/or riverine flooding has become practically a yearly event at some areas of Massachusetts. This Subsection will provide an overview of the Bridge Inspection Unit's response to check for bridge damage during and after flooding events.

#### 8.6.1.1 Available Information

Flood warnings are issued by the National Weather Service at http://www.erh.noaa.gov/er/box/.

Stream flow data is vitally important to forecast flood magnitude and timing and to manage emergency response. The United States Geological Survey (USGS) has a web interface called Water Data for the Nations that provides current and historical steam flow information collected as part of the National Water Information Systems (NWIS). It can be referenced on line at: water.usgs.gov/floods/current.

The FHWA mandates that MassDOT identify which bridges in its inventory are considered to be susceptible to Scour and code them as Scour Critical Bridges on the SI&A sheet under Item 113 (I-113 = 3 or less). For each of the Scour Critical Bridges a Scour Plan of Action (POA) has been developed. The POA contains much information, including recommendations for monitoring the structure during floods and post-flood evaluations. The POA's can be referenced in 4D at the Bridge Input screen under the Scour POA tab.

#### 8.6.1.2 Structures Requiring Condition Assessment

During a flood event determine which areas of the state are expected to be affected. This information is typically available through the National Weather Service, the National Oceanographic and Atmospheric Administration (NOAA), and/or the Massachusetts Emergency Management Agency (MEMA). Affected areas could be identified by Counties, by selected rivers, or by particular coastlines.

Once the affected areas are determined the list of structures that require assessments can be developed by District Bridge Inspection Engineers and the Underwater Operations Engineer as follows in order of priority:

1. Scour critical bridges
2. Other NBI bridges
3. Non-NBI bridges
4. Other requests

The Bridge Inspection Engineer and the Area Bridge Inspection Engineers are available for assistance in developing lists of affected structures.

#### 8.6.1.3 Condition Assessment Procedure

The DBIE is responsible for coordinating all flood/storm surge assessment activity in their Districts. The assessments should be coordinated with the Underwater Operations Team as appropriate.

Prioritized lists of bridges requiring condition assessments should be prepared by the DBIE. The first list should be created to manage and record site assessment information during the flood. It should have columns to record date and time of the assessment visit, a brief description of flow characteristics, and a column to record the high water elevation estimate. The second list should be created that will aid in management of post

flood inspections. It should indicate date of inspection and other comments (such as any follow up inspections needed).

During widespread flood and/or storm surge events it may be necessary to cease all other inspection activities. The Chief Engineer may also direct that all Part Time U/W inspectors be called to Full Time status to assist with the response to the event.

DURING FLOODING:

During high water flows all structures are at risk, but scour critical bridges are determined to have the highest risk. DBIE's should therefore ensure that all MassDOT owned scour critical bridges are monitored during flooding as possible. Municipally owned scour critical bridges are to be monitored by municipal representatives. Suggested flood monitoring plans are offered on the scour POA's in 4D. Visits should be scheduled for periods when flows are expected to be as close to crest level as much as is possible. Other bridges in vicinity of the scour critical bridges should also be monitored as is geographically prudent.

**Do not**, under any circumstances **enter elevated waters** in order to make an assessment. Assessments during flooding shall be completed from the roadway or embankment by checking for symptoms of stream bed scour such as misalignment of parapets or structural elements and approach roadway settlement. In recent floods much of the damage occurred at approach embankments to bridges. The inspector should also check for accumulation of debris against substructure units that may alter stream flow and exacerbate stream bed scouring.

Since the assessment is not conducted in the water during flooding all assessments can be completed by District inspection staff or municipal representatives. It is not necessary to have Underwater Operations Team members make assessments during flooding on "Dive Bridges".

8.6.1.4 Documentation and Reporting During Flood Assessments

On a list provided by the DBIE's the inspector should note the date and time of the during flood assessment visit. He/she should make a note as to the relative estimated water elevation, perhaps in relation to the low chord of the bridge or to critical water elevation plaquards if installed on scour critical bridges, and provide a description of the intensity of the flow.

The list should be completed by each inspector and provided to the DBIE daily. A compilation of all assessment visit information should be made by the DBIE daily and forwarded to the Bridge Inspection Engineer for use as a status update.

For Scour Critical bridges, also follow the during flood evaluation procedure contained in the POA. This involves documenting each visit to the bridge during flooding on a flood monitoring form. At the conclusion of the flood the completed forms shall be retained in the bridge file.

POST-FLOODING:

As soon as conditions permit, a post flood evaluation should be completed. Suggested post flood inspection tasks are offered on the scour POA's in 4D. Bridges that were closed due to high water during flooding should be evaluated first as conditions permit. It shall be a hands-on inspection assessing damage or structural weakening. The inspectors should note any damage from water flow or debris, undermining of substructure

units, stream bed scour, approach roadway settlement and loss of scour countermeasures such as rip rap or gabions.

Dive bridges should all be inspected by the Underwater Operations Team. Those structures typically inspected by above water teams should be re-inspected by District personnel. In instances where a widespread re-inspection is required, Consultant inspection teams may be contracted to assist the District staff. Such requests for additional consultant assistance must be made to the Bridge Inspection Engineer. Consultant team assignments will also be managed by the DBIE as an extension to their staff.

If the above water inspection team suspects either damage to the substructure units below water or foundation undermining then a follow-up Underwater Inspection by the Dive Unit should be requested.

Coordinate above water and U/W inspections as much as is possible. Dive bridges should be inspected by the Underwater Operations Unit and the above water teams should focus on Non-Dive bridges until such time that all affected structures have been assessed post flood.

8.6.1.5 Documentation and Reporting of Post Flood Assessments

Post flood inspection lists should be completed by each inspection team and provided to the DBIE weekly. A compilation of all lists should be made by the DBIE weekly and forwarded to the Bridge Inspection Engineer for use as a status update.

If no damage has been found then there is no need to create an inspection in 4D. The DBIE shall keep track of the findings based on the flood lists submitted by the teams. If damage is found, then the post flood inspection reports should be completed on the following:

- "Other" inspection report should be used for above water reports
- "Divers Activity Report" should be used by the Underwater Operations Team

Scour Critical bridges have a detailed Post Flood Evaluation process and form. It is contained in the Scour Plan of Action in 4D. Forms shall be completed as suggested in the POA and provided to the DBIE and BIE for inclusion into bridge files.

All inspection reports must be forwarded to the Area Bridge Inspection Engineers for processing and archiving.

8.6.1.6 Flood Assessment Time Frame

Post-flood condition assessment programs should be completed as quickly as possible. All other inspection activities in the affected areas obviously should be ceased until the program is completed.

Should the scope and duration of the post flood assessment program jeopardize the completion of mandated NBI inspections it is acceptable to bring in assistance from Consultants. DBIE's should make requests for consultant assistance as soon as it becomes evident that NBIS inspection frequencies are at risk of being exceeded.

### 8.6.2 Earthquake

The likelihood of earthquakes in Massachusetts of the magnitude that could damage bridges is not great, but it is a possibility. This Subsection will provide an overview of the Bridge Inspection Unit's response to check for bridge damage after a local seismic event.

8.6.2.1 Structures Requiring Condition Assessment

The areas of the state where seismic activity has been noted should be determined and this area should be the focus of the condition assessment. The first priority is interstate and limited access highway bridges, since these are the primary emergency and evacuation routes. The bridges to be checked include those carrying the road in question as well as those over the road in question, since a problem with a bridge over can close a highway. Next priority is large scale bridges over large rivers such as the Merrimack, Charles, Connecticut and Taunton, regardless of the roadway system, which are major arteries. Multi-span bridges with piers, especially if the bridge consists of simple spans, would be more susceptible to damage. Single span bridges should be less susceptible to damage, based upon past experiences, but they should also be checked.

8.6.2.2 Condition Assessment Procedure

Post-earthquake inspections are intended to screen bridges for any damage, so they need not be a full, in-depth inspection, unless in the opinion of the DBIE that a closer inspection is needed. The bridges can be checked from the ground and from side slopes, etc. For very large structures binoculars should be used. If issues are discovered from the ground then an inspection team should be called out to the bridge for a closer, hand on inspection.

What to look for: Structures should be checked for visual signs of movement of the superstructure – spans mis-aligned or bearings shifted. In the case of bearings, rocker bearings are particularly vulnerable, but sliding plates can also suffer displacement. Concrete piers can exhibit new cracking and spalling, particularly to the columns.

8.6.2.3 Documentation and Reporting

Inspectors should keep a log of the bridges checked, the date of the assessment, and whether or not any potential damage was noted. Also indicate if a closer inspection is warranted. Do not enter the initial check visits into 4D. If a bridge was referred for a closer inspection this follow up inspection would be entered into 4D as an "Other" inspection. Districts should provide a daily summary of inspections completed to the Bridge Inspection Engineer and State Bridge Engineer.

8.6.2.4 Earthquake Assessment Time Frame

Post-earthquake condition assessment programs should be completed as quickly as possible. All other inspection activities obviously should be ceased until the program is completed.

## 8.7 FREEZE/THAW INSPECTIONS

MassDOT performs annual freeze/thaw inspection on all bridges over public highways per the policy directive P-07-001 dated 3/19/2007, see Attachment 8-3, Annual Freeze/Thaw Bridge Inspection. The policy outlines the purpose, scope and procedure to be used.

These inspections performed identify and address areas where concrete has been weakened by winter freeze/thaw cycles. A hands-on inspection is conducted by a bridge inspector who looks for obvious signs of loose concrete and delaminated concrete, by means of sounding with a hammer. The areas to be examined are the parapet, deck and substructure elements which would have the potential of having concrete fall onto a travel way or pedestrian pathway. District maintenance crews are present at the time of the inspection for the removal of the concrete that may present a safety issue for vehicular and/or pedestrian traffic below the structure.

As the policy states, the Freeze/Thaw Inspections are conducted jointly with the District Bridge Inspection Units and District Maintenance Units. Each District is responsible for set-up and implementation the annual Freeze/Thaw Inspections required within the District Boundary. The Bridge Inspection Unit identifies and maintains the lists of structures with potential problems in the Bridge Management System (4D). Structures are placed into three different categories. The categories are as follows:

- Category 1 - Bridges with known problematic histories of concrete deterioration
- Category 2 - Bridges that have deteriorated concrete but no known prior problematic histories
- Category 3 - Bridges that have neither deteriorated concrete nor a known prior problematic history

If the District Bridge Inspection Unit does not have the manpower available to undertake the Freeze/Thaw Inspections, the DBIE may request of the Bridge Inspection Engineer assistance thru the consultant contracts that he/she oversees for additional manpower. The BIE will then assign the consultants to perform the Freeze Thaw Inspections only if funds are available in the consultant contract. The requests for consultant assistance are to be submitted to the Bridge Inspection Engineer no later than the first workday in March. This will allow time for the coordination that may need to be done with these consultants.

Reports are created and stored for these inspections in the Bridge Inspection Management System (4D) (see Attachment 8-4, Freeze/Thaw Inspection Report).

## 8.8 BRIDGE SECURITY

The events of the September 11, 2001 attacks on the United States prompted bridge owners to face a new concern: protecting transportation infrastructure from terrorist attack. One of the strategies of prevention is to perform visual inspections of certain critical structures at random intervals during various levels of national alerts. This section provides instructions to the Bridge Inspection Unit personnel on how to conduct inspections of the Major and Critical Structures in the Commonwealth of Massachusetts in the event of National Security situations.

### 8.8.1 Major and Critical Infrastructure Designation

A Major and Critical Structure is determined by considering many factors including inventory route, average daily traffic, general prominence, and potential for major traffic impacts in case of an emergency closure. MassDOT (MassHighway) performed a vulnerability assessment in 2006 which resulted in a list of bridges that were considered to be Major and Critical Infrastructure.

### 8.8.2 Alert Levels

The office of Homeland Security has developed five federal alert levels (and associated color codes) for various risks of terrorism as follows.

- Low Alert (Condition Green) – Low risk of terrorist attacks
- Guarded Alert (Condition Blue) – General risk of terrorist attacks
- Elevated Alert (Condition Yellow) – Significant risk of terrorist attacks
- High Alert (Condition Orange) – High risk of terrorist attacks
- Severe Alert (Condition Red) – Severe risk of terrorist attacks

### 8.8.3 Bridge Security Inspection Objective

The objective of emergency inspections will be to check for suspicious objects or activities on, under or in the vicinity of the subject structures. Inspections should involve driving over and under the structures viewing all accessible areas (with binoculars as necessary). In some cases it may be necessary to park the inspection vehicle in order to view areas of the structures on foot. Inspectors should utilize their knowledge of the structures and land use in their vicinity to determine what may be considered suspicious objects or activities.

**It cannot be stressed enough that MassDOT personnel should not investigate or approach objects or activities that are deemed to be of a suspicious nature.**

Suspicious Objects and Activities (the following are examples, but not limited to):

- Unattended / Parked vehicles
- Unmarked trucks or vans
- Fuel, chemical, hazardous cargo and such trucks and vans
- Abandoned or unmarked packages, boxes, barrels, luggage or such containers
- Unusual or suspicious activity or persons
- Non permitted or unscheduled work, work crews, traffic control or detours
- Unusual variations on or around a bridge structure, such as freshly dug and refilled holes, burned paint, cut or broken steel, missing catch basin covers, etc.
- Explosives, prima cord (looks like cloth line), or detonating wires connected to bridge members

### 8.8.4 Inspection Process for Alert Levels

#### 8.8.4.1 Low Alert Situations (Condition Green)

Normal inspection activities with the available staff to transition quickly into a higher level of alert should the need arise.

#### 8.8.4.2 Guarded Alert Situations (Condition Blue)

Normal inspection activities continue, but are supplemented with a visual inspection of all Major and Critical Structures on a random frequency basis. A list of Major and Critical Structures in each District shall be provided by the BIE to each DBIE when this alert is activated.

Inspectors should report any suspicious object or activities to the Massachusetts State Police or MassDOT Radio Room immediately, and then notify the DBIE. The DBIE shall immediately notify concurrently the District Bridge Engineer, who in turn shall immediately notify the District Highway Director and the Area Bridge Inspection Engineer, who in return will immediately notify the Bridge Inspection Engineer and the State Bridge Engineer. The State Bridge Engineer will notify the Chief Engineer.

Since the expedited reporting of any findings up the MassDOT chain of command is critical, if the person you are to report to is unavailable, it is your responsibility to contact the next level(s) of individuals on the command chain up to and including the Chief Engineer.

A record of each inspection shall be written on the log established for these inspections. The DBIE shall maintain a record of inspections performed that shall record the time and date of inspection, the names of the inspector(s), the findings of the inspection and the names of persons notified if anything suspicious found and the time of this notification.

DBIE's should ensure that all Major and Critical Structures are visited at least once **bi-weekly**.

8.8.4.3 Elevated Alert Situations (Condition Yellow)

Normal inspection activities should continue, but be supplemented with a frequent visual inspection of all Major and Critical Structures.

The reporting process should be as stated in Article 8.8.4.2 above.

DBIE's should ensure that all Major and Critical Structures are visited at least **once weekly** during an Elevated Alert. Elevated Alert Inspections should continue until notified by the State Bridge Engineer to resume normal operations.

8.8.4.4 High Alert Situations (Condition Orange)

Normal inspection activities should continue, but be supplemented with a more frequent visual inspection of all Major and Critical Structures.

When the Bridge Inspection Engineer is notified of a High Alert situation, he/she shall immediately notify the Area Bridge Inspection Engineers, who in turn will immediately notify the District Bridge Engineers and District Bridge Inspection Engineers (DBIE).

Emergency Inspection Plan – DBIE's shall develop an inspection plan that will best utilize MHD inspection forces to complete a visual inspection of all Major and Critical Structures at least **twice weekly**. The plan should be reviewed and completely understood by all inspection unit personnel in advance of such events.

The reporting process should be as stated in Article 8.8.4.2 above. A record of each inspection should be maintained as described in Article 8.8.4.2 above.

Additional Structures – It may be necessary to include the inspection of other structures as directed by the Bridge Inspection Engineer to respond to special specific areas of concern and/or vulnerability. In such cases the emergency inspection plan should be amended such that these structures are also included.

8.8.4.5 Severe Alert Situations (Condition Red)

When the Bridge Inspection Engineer is notified of a Severe Alert situation, he/she shall immediately notify the Area Bridge Inspection Engineers, who in turn will immediately notify the District Bridge Engineers and District Bridge Inspection Engineers (DBIE).

Bridge Inspection personnel should suspend regular inspection activities and be prepared to perform visual inspection or damage assessment inspections upon notification.

## 8.9 DISSEMINATION OF SECURITY SENSITIVE INFORMATION

Documents related to transportation infrastructure are public documents. Documents typically made available include design plans, shop drawings, inspection reports and load rating reports. MassDOT's policy is to provide access to such documents, provided that the access does not jeopardize public safety. Transportation infrastructure has been identified by the United States Department of Homeland Security as a potential target for a terrorist attack. Information relative to the vulnerability of critical transportation infrastructure is considered to be sensitive security information and is not to be made available to the public.

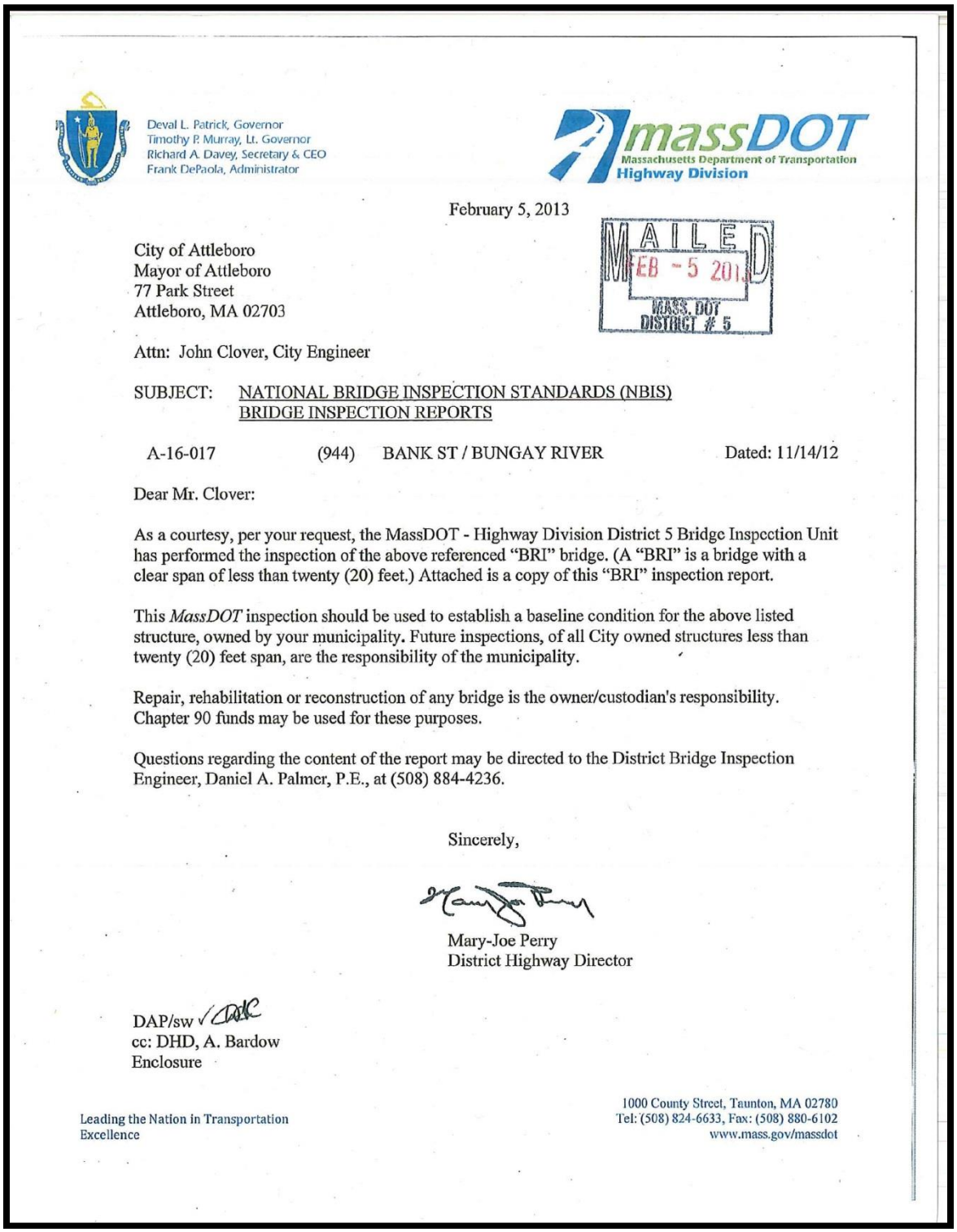
Bridges that appear on MassDOT's Major and Critical Structure list are considered to be security sensitive. A policy has been prepared for the dissemination of information relating to Critical Transportation Infrastructure. Generally requests for information on Major and Critical structures are handled by MassDOT's Chief Counsel's office. They in turn request copies of plans and shop drawings from the Plans and Records department and bridge inspection and/or load rating information from the bridge inspection unit. All requests for any bridge inspection reports received by District Personnel shall be forwarded to the Bridge Inspection Engineer for consideration and action. If districts should receive requests for information on Major and Critical bridges the requests must be referred to the Bridge Inspection Engineer for consideration and action.

### 8.9.1 Redaction of Inspection Reports

Inspection reports for Major and Critical bridges cannot be released to the general public without removal of information relating to structural vulnerabilities. Prior to release all security sensitive information must be redacted from the report. This is done by electronically blacking out the sensitive information. An obvious example of information that should be redacted from reports would be any fracture critical member designations. Also, since the purpose of inspection reports is to describe deficiencies, any deficiencies that may compromise the structural integrity of members should also be redacted. This includes defect documentation and member location information in text, sketches and photographs. Be aware also to redact photos that have background features that may provide specific location references.

Redaction is typically performed by the Area Bridge Inspection Engineer under guidance from the Bridge Inspection Engineer.

## 8.10 CHAPTER 8 ATTACHMENTS



Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Richard A. Davey, Secretary & CEO
Frank DePaola, Administrator

MassDOT Massachusetts Department of Transportation Highway Division

February 5, 2013

MAILED FEB - 5 2013 MASS. DOT DISTRICT # 5

City of Attleboro
Mayor of Attleboro
77 Park Street
Attleboro, MA 02703

Attn: John Clover, City Engineer

SUBJECT: NATIONAL BRIDGE INSPECTION STANDARDS (NBIS)
BRIDGE INSPECTION REPORTS

A-16-017 (944) BANK ST / BUNGAY RIVER Dated: 11/14/12

Dear Mr. Clover:

As a courtesy, per your request, the MassDOT - Highway Division District 5 Bridge Inspection Unit has performed the inspection of the above referenced "BRI" bridge. (A "BRI" is a bridge with a clear span of less than twenty (20) feet.) Attached is a copy of this "BRI" inspection report.

This *MassDOT* inspection should be used to establish a baseline condition for the above listed structure, owned by your municipality. Future inspections, of all City owned structures less than twenty (20) feet span, are the responsibility of the municipality.

Repair, rehabilitation or reconstruction of any bridge is the owner/custodian's responsibility. Chapter 90 funds may be used for these purposes.

Questions regarding the content of the report may be directed to the District Bridge Inspection Engineer, Daniel A. Palmer, P.E., at (508) 884-4236.

Sincerely,

Mary-Joe Perry
District Highway Director

DAP/sw
cc: DHD, A. Bardow
Enclosure

Leading the Nation in Transportation Excellence

1000 County Street, Taunton, MA 02780
Tel: (508) 824-6633, Fax: (508) 880-6102
www.mass.gov/massdot

Attachment 8-1: Sample City/Town Letter for BRI's

## *RAILROAD STRUCTURE INVENTORY AND APPRAISAL SHEET*

Report Date: March 27, 2014

**State Information**

BDEPT#= G01033 Agency Br.No.
Town= Gardner L.O. MHD
B.I.N= 7KL AASHTO= 039.0

**Identification**

(8) Structure Number G010337KLDOTRRO
RAILROAD BRIDGE NO 0
RAILROAD BRANCH NAME
(2) State Highway Department District 03
(6) Features Intersected HWY PEARSON BLVD
(7) Facility Carried RR BMRR
(9) Location JUST NORTH OF ST 2 ROTARY
(16) Latitude 42 DEG 33 MIN 53.96 SEC
(17) Longitude 71 DEG 58 MIN 43.32 SEC
(98) Border Bridge State Code Share %
(99) Border Bridge Structure No. #

**Structure Type and Material**

(43) Structure Type Main: Steel Code 302
Stringer/Girder Jointless bridge type: Not applicable
(44) Structure Type Appr:
Other Code 000
(45) Number of spans in main unit 001
(46) Number of approach spans 0000
(107) Deck Structure Type - Steel plate Code 5
(108) Wearing Surface / Protective System:
( omit (a) and (b) )
C) Type of deck protection - None Code 0
Ballast:
Type of Ties:

**Age and Service**

(27) Year Built 1961
(106) Year Reconstructed 0000
(42) Type of Service: On - Railroad
Under - Highway Code 21
(28) Tracks : On Structure 00 Under structure 02

**Geometric Data**

(48) Length of maximum span 62.992 FT
(49) Structure Length 67.913 FT
(50) Curb or sidewalk: Left FT Right FT
(51) Bridge Roadway Width Curb to Curb FT
(52) Deck Width Out to Out 48.884 FT
(34) Skew 00 DEG (35) Structure Flared
(10) Inventory Route MIN Vert Clear 99 FT 99.00 IN
(47) Inventory Route Total Horiz Clear FT
(53) Min Vert Clear Over Bridge Rdwy 99 FT 099.00 IN N
(54) Min Vert Underclear ref H 13 FT 11.71 IN
(55) Min Lat Underclear RT ref H 6.233 FT
(56) Min Lat Underclear LT FT

**Navigation Data**

(38) Navigation Control - Not applicable, no waterway Code N
(111) Pier Protection Code
(39) Navigation Vertical Clearance
(116) Vert-lift Bridge Nav Min Vert Clear FT
(40) Navigation Horizontal Clearance FT

**Classification** — **Code**

(112) NBIS Bridge Length Y
(21) Maintain - State Highway Agency 01
(22) Owner - State Highway Agency 01
(37) Historical Significance built after 1949 presumed to be not eligil Z

**Condition** — **Code**

(58) Deck 7
(59) Superstructure 7
(60) Substructure 7
(61) Channel & Channel Protection N
(62) Culverts N

**Load Rating and Posting** — **Code**

(41) Structure - Open A

**Appraisal** — **Code**

(71) Waterway adequacy N
(72) Approach Roadway Alignment N
(36) Traffic Safety Features N N N N
(113) Scour Critical Bridges N

**Proposed Improvements**

(75) Type of Work Code 35 1
(76) Length of Structure Improvement 68.897 FT
(94) Bridge Improvement Cost (K) $559
(95) Road Improvement Cost (K) $56
(96) Total Project Cost (K) $839
(97) Year of Improvement Cost Estimate 2008
(114)Future ADT 0
(115)Year of Future ADT 2020

**Inspections**

(90) Inspection Date 07/03/13 (91) Frequency 24 MO
(92) Critical Feature Inspection: (93) CFI DATE

| | | | | |
|---|---|---|---|---|
| (A) Fracture Critical Detail | N | 00 | MO A) | 00/00/00 |
| (B) Underwater Inspection | N | 00 | MO B) | 00/00/00 |
| (C) Other Special Inspection | N | 00 | MO C) | 00/00/00 |
| (*) Other Inspection () | N | 00 | MO *) | 00/00/00 |
| (*) Closed Bridge | N | 00 | MO *) | 00/00/00 |
| (*) UW Special Inspection | N | 00 | MO *) | 00/00/00 |
| (*) Damage Inspection | | | MO *) | 00/00/00 |

**Rating Loads**

Report Date 00/00/00

| | E80 | F40PH | 284K | 263K |
|---|---|---|---|---|
| NORMAL | | | | |
| MAXIMUM | | | | |
| FATIGUE | | | | |

**Accessibility (Needed/Used)**

| | | | | | |
|---|---|---|---|---|---|
| N / N | Liftbucket | N / N | Rigging | N / N | Rigging |
| Y / Y | Ladder | N / N | Staging | | |
| N / N | Boat | N / N | Traffic Control | | |
| N / N | Wader | P / N | RR Flagperson | | |
| N / N | Inspector 50 | N / N | Police | | |

Inspection Hours: 008

Attachment 8-2: Sample SI&A for a RRO Structure

Moving Massachusetts Forward. massDOT Highway

Number: P-07-001
Date: 03-19-07

# POLICY DIRECTIVE

Luisa Paiewonsky (signature on original)

COMMISSIONER, HIGHWAY DIVISION

## ANNUAL FREEZE/THAW BRIDGE INSPECTION

**PURPOSE:** The purpose of this Policy Directive is to establish the procedures and protocol by which MassHighway personnel will conduct a yearly inspection for freeze/thaw damage to bridges during the month of April. This Policy Directive replaces and supersedes Policy Directive P-99-008, dated 9/30/99, and any other previously issued directives relative to freeze/thaw bridge inspections.

**SCOPE:** Annual freeze/thaw bridge inspections will be conducted jointly by the District Bridge Inspection Units and District Maintenance Sections, and will include all bridges over public highways. The purpose of the inspection will be to find areas of concrete that have been weakened by winter freeze/thaw cycles, and to remove any pieces that may present a safety issue for vehicular and/or pedestrian traffic below the structure.

**PROCEDURES:** All freeze/thaw inspections will be conducted in accordance with the protocols contained in the Yearly Freeze/Thaw Bridge Inspection – Inspection Training Reference Guide. All inspections will be conducted by members of the District Bridge Inspection Unit, with direct assistance from District Maintenance crews. All bridges to be inspected will be prioritized within one (1) of the following categories:

- **1 - Bridges with known problematic histories of concrete deterioration**. Bridges in this category will be inspected first. The District Maintenance section will be responsible for providing all required equipment and Traffic Management Plans (TMPs) in order to perform a thorough close-up inspection and immediately remove all areas of weakened concrete.

- **2 - Bridges that have deteriorated concrete but no known prior problematic histories**. Bridges in this category will initially be inspected via a visual inspection from the ground. Any areas of weakened concrete not determined to pose an immediate safety risk will be clearly identified for removal by a Maintenance crew at a later date during the freeze/thaw inspection period. In the event a close-up inspection is deemed necessary by the District Bridge Inspection Unit, the District Maintenance section will be responsible for providing all required equipment and TMPs in order to perform a thorough close-up inspection and immediately remove all areas of weakened concrete.

- **3 – Bridges that have neither deteriorated concrete nor a known prior problematic history**. Bridges in this category shall only require a visual inspection from the ground. Any potential areas of weakened concrete will be identified for a follow-up close-up inspection and/or removal at a later date if necessary.

**REPORTING REQUIREMENTS:** Members of the District Bridge Inspection Unit conducting freeze/thaw inspections shall be responsible for completing a STRUCTURES INPSECTION FIELD REPORT – Annual Freeze/Thaw Inspection Report for each bridge inspected, including before and after (remedial action taken) photographs of all problem areas. A copy of this report shall be placed in the individual inspection file for each bridge. Upon completion of the annual freeze/thaw inspection cycle, the District Bridge Inspection Unit shall prepare a report indicating the total number of bridges inspected, the total number of bridges falling into each of the three (3) categories listed above, and the number of bridges that had weakened concrete removed. This report shall be forwarded through the applicable chain of command for review by the Chief Engineer and the Commissioner.

**PRE-INSPECTION TRAINING REQUIREMENTS:** Prior to the start of the April freeze/thaw bridge inspection cycle, all District Maintenance personnel who will be involved with inspections and/or removal of problematic concrete will undergo inspection training designed to assist them in identifying and distinguishing between concrete that is deteriorated but posing no imminent safety risk and that which has been weakened by freeze/thaw action and may be in danger of falling. This training will be conducted by members of the District Bridge Inspection Unit.

Attachment 8-3: Annual Freeze/Thaw Bridge Inspection Policy, page 2 of 2

*MASSACHUSETTS DEPARTMENT OF TRANSPORTATION* PAGE 1 OF ____

**STRUCTURES INSPECTION FIELD REPORT**

**ANNUAL FREEZE/THAW INSPECTION**

| 2-DIST | B.I.N. | BR. DEPT. NO. |
|---|---|---|
| | | |

| CITY/TOWN | 8.-STRUCTURE NO. | 11-Kilo. POINT | INSPECTION DATE |
|---|---|---|---|
| | | | |

| 07-FACILITY CARRIED | 06-FEATURES INTERSECTED | DIST. BRG. INSP. ENGINEER **M. Azizi** |
|---|---|---|
| | | |

| 22-OWNER | 21-MAINTAINER | TEAM MEMBERS |
|---|---|---|
| | | |

ORIENTATION

Note 1: With each problem area, include a photo (with clear description) after action is taken.
Note 2: Describe each problem area with action taken at each area, or any further action required.

**Deck (Underside) / Arch Ring :**

☐ Not Applicable ☐ No Problem Detected ☐ All Necessary Action taken ☐ Further Action Required

**Beams Diaphragms:**

☐ Not Applicable ☐ No Problem Detected ☐ All Necessary Action taken ☐ Further Action Required

**Concrete Piers / Pier caps /Columns:**

☐ Not Applicable ☐ No Problem Detected ☐ All Necessary Action taken ☐ Further Action Required

**Others (i.e. Parapets, Haunches, Spandrel Walls, etc.):**

☐ Not Applicable ☐ No Problem Detected ☐ All Necessary Action taken ☐ Further Action Required

**Freeze/Thaw Priority List :**

Attachment 8-4: Annual Freeze/Thaw Inspection Report