

# **RAILROAD OPERATIONS**

COMMUTER RAIL DESIGN STANDARDS MANUAL

> VOLUME I SECTION III

BRIDGES

March, 2009

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# 1. Introduction/Purpose

The Massachusetts Bay Transportation Authority (MBTA) owns and maintains bridges that carry railroads and roadways throughout the commuter rail system. The Authority is responsible for ensuring each railroad bridge can safely carry the revenue (passenger) and freight loading that may be operated over the structures, and ensuring that each roadway bridge can safely carry commercial and civilian traffic over the structures. The purpose of this Section is to clearly define the inspection and rating guidelines established by the Authority to ensure compliance with the Federal Railway Administration's (FRA's) "Statement of Agency Policy on the Safety of Railroad Bridges".

The MBTA defines a bridge as any structure with total bridge length (sum of all spans) greater than 20 feet. Culverts are those structures that do not meet the classification requirements of a bridge.

The American Railway Engineering and Maintenance-of-Way Association (AREMA) Bridge Inspection Handbook outlines the criteria for inspection of railroad bridges, and shall be used in conjunction with the United States Department of Transportation Federal Highway Administration (FHWA) Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, FHWA National Bridge Inspections Standards Regulation (NBIS), and this Section.

The AREMA Manual for Railway Engineering, Volume 2 Structures, Chapter 15 Part 7; Existing Bridges gives the general requirements for inspection and rating of existing steel bridges. The Massachusetts Highway Department (MHD) Bridge Manual, Chapter 7; Bridge Load Rating Guidelines is intended to establish a uniform policy for determining live load capacity of highway bridges in the Commonwealth. Engineers performing inspections and load ratings of MBTA bridges shall use these two references and sound engineering judgment when interpreting the requirements of these codes/guidelines.

A flow chart for inspection and load rating of railroad bridges, which depicts the process graphically, is shown in Figure A1 in Appendix A.

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# 2. Bridge Inspection

# 2.1. General

All bridges within the MBTA Inventory shall be inspected to evaluate the condition of the structure due to the effects of corrosion, collision, or alterations due to improvement programs that are not reflected on previous inspection reports. All changes need to be thoroughly documented and reported in the inspections so that their effect can be analyzed in subsequent load ratings.

According to the FRA "Regular comprehensive inspections are vital to maintaining valid bridge ratings and to performing timely bridge rating and repair"<sup>1</sup>. Accordingly, standard practice has been to inspect bridges carrying railroad traffic at a frequency not less than once per year.<sup>2</sup>

Many steel commuter rail bridges are fracture critical. Fracture critical bridges are bridges that contain fracture critical members (FCMs), which are tension or bending members whose failure would be expected to result in collapse of all or a portion of the bridge. Fracture critical bridges must be identified as such and particular care must be taken in their inspection and evaluation.

# 2.2. Existing Plans and Other Documentation

Plans must be verified during inspection for any changes that may have occurred during construction or may have been made during the life of the bridge.

## 2.3. Inspection Personnel

There are three categories of personnel associated with bridge inspection:

- 1. Program Manager: in responsible charge of all inspection teams and procedures
- 2. Team Leader: an Inspector, who is in charge of planning, performing, and reporting the inspection
- 3. Inspectors: assist the Team Leader in the inspection

According to the FRA, "The inspector is a technician who should be able to reach all parts of the bridge to be inspected, detect indications of deterioration or other problems on the bridge, and accurately record and report them"<sup>3</sup> Specific qualifications for each of the three categories of inspection personnel follow:

<sup>&</sup>lt;sup>2</sup> ibid <sup>3</sup> ibid

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<sup>&</sup>lt;sup>1</sup> Federal Register / Vol. 72, No. 175 / Tuesday, September 11, 2007 / Notices, p 51900

# 2.3.1. Program Manager

The Program Manager shall possess <u>all</u> of the following minimum qualifications:

- 1. Be registered as a Professional Structural Engineer in the Commonwealth of Massachusetts.
- 2. Have a minimum of ten years experience in the inspection and rating of railroad or highway bridges, depending on the function of the bridge.
- 3. Have completed a formal bridge inspection training course, covering all facets of bridge inspection.

# 2.3.2. Team Leader

The Team Leader shall possess <u>one</u> of following minimum qualifications:

- 1. Be registered as a Professional Structural Engineer in the Commonwealth of Massachusetts (Required for Special Inspections and Emergency Inspections).
- 2. Have a minimum of five years experience in bridge/structure inspection and completed a formal bridge inspection training course.

The Team Leader for the inspection of a fracture critical bridge must have completed a formal training course to recognize fracture critical members and fatigue sensitive details. FHWA Report No. FHWA-IP-86-26 *Inspection of Fracture Critical Bridge Members*, although more geared to highway bridges, this is a valuable resource that provides guidelines for identification, inspection and evaluation of fracture critical members and should be utilized in any training program for bridge inspectors.

# 2.3.3. Inspector

Inspectors shall possess <u>one</u> of following minimum qualifications:

- 1. A minimum of two years experience in the design and/or construction of bridges or similar structures and have completed a formal inspection training course
- 2. A bachelor or associate degree in civil engineering/construction, or
- 3. Meet the qualifications of a Team Leader.

# 2.4. Inspection Safety Requirements

2.4.1. General

All bridge inspection efforts shall be coordinated with the MBTA, the owner of the structures and right-of-way, and the Massachusetts Bay Commuter Railroad Company (MBCR), the current operator of the commuter rail system, to ensure the safety of personnel working on or around active railroad tracks, and to ensure the safe and timely movement of trains.

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#### 2.4.2. MBTA Right-of-Way Training

Prior to any inspection crew entering MBTA right-of-way, or otherwise accessing MBTA bridges or other structures, all individuals must have completed MBTA Right-of-Way Safety Training, and shall carry on their person identification indicating that they are in compliance with the requirements. Additionally, all work performed within the MBTA Right-of-Way, or in the vicinity of any MBTA bridge shall be performed in accordance with the requirements of the MBTA Right-of-Way Safety Rulebook.

#### 2.4.3. MBCR Roadway Worker Protection

Prior to any inspection crew accessing MBTA bridges or other structures, all individuals must have completed MBCR Roadway Worker Protection Training, and shall carry on their person identification indicating that they are in compliance with the requirements. Additionally, all work performed on MBTA property, or in the vicinity of any MBTA bridge shall be performed in accordance with the requirements of the MBCR Roadway Worker Protection Program.

2.4.4. Work within Electrified Corridor

Any work performed for the inspection of bridges or structures within the vicinity of electrified corridor(s) may require electrified catenary to be deenergized. The requirements for de-energizing sections of corridor shall be coordinated with Amtrak. Amtrak safety training will be required when working on electrified corridors operated by Amtrak.

#### 2.4.5. Flagman Protection

Flagman protection shall be used when required by the MBTA, MBCR, Amtrak, and/or freight railroad. No inspection team shall access MBTA property without flagman protection, or written notification from the MBTA indicating that flagman protection is not required.

## 2.4.6. Detail Police Protection

Detail police protection is provided by MBTA police for any work on MBTA property, including inspection of MBTA owned bridges over local roads. MBTA Transit Police: (617)222-1212

#### 2.5. Inspection Categories for Railroad Bridges

2.5.1. General

AREMA Chapter 15, Section 7.4 categorizes inspections as Periodic, Special and Emergency as summarized in the following paragraphs.

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# 2.5.2. Periodic Inspection

Periodic Inspections are regular scheduled inspections that shall be performed annually, excluding years when Special Inspections are performed, and shall be performed in accordance with the requirements of AREMA Chapter 15, Section 7.4.3. Periodic Inspections include observations of all components of the bridge. The primary objective of the Periodic Inspection is to identify changes in the condition of the bridge compared with previous inspections.

# 2.5.3. Special Inspections

Special Inspections are hands-on inspections that shall be performed in accordance with the requirements of AREMA Chapter 15, Section 7.4.4. Special Inspections are carried out to obtain detailed information that includes photographs, verification of bridge dimensions and member sizes, and accurate and member-specific data of any deterioration that may be discovered, including evidence of fatigue related defects. Additional tasks performed during Special Inspections may include, but are not limited to the following:

- Underwater inspection of substructures, including inspection for effects of scour<sup>4</sup>
- Extraction of concrete cores for laboratory testing and evaluation of strength, chloride content, alkali-silica reaction, etc.
- Removal of steel coupons for laboratory testing to determine steel properties.
- Removal of samples from wood elements possibly including piles, for laboratory testing to determine wood properties and ascertain cause of deterioration (fungus, insect, chemical)

The frequency of Special Inspections for MBTA Commuter Rail Bridges shall be <u>five years</u>, or less, and will be determined based on the following:

- The age of the bridge
- The general condition based on previous inspections
- The load rating of the bridge

# 2.5.4. Fracture Critical Inspections

The MBTA will specify the frequency that fracture critical components of bridges are inspected based on the age of the bridge, findings of past inspections, fatigue rating of fracture critical components, and annual tonnage

<sup>&</sup>lt;sup>4</sup> Scour, or the erosion of stream bed in the area of piers and abutments, is related to stream flow velocity, resulting turbulence around piers and abutments and the composition streambed material.

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carried over the bridge. At a minimum, Fracture Critical Inspections shall be conducted at a two-year interval, following the criteria outlined below:

Condition Rating	Determining Factor	Inspection Frequency
5 and above	Fracture Critical Members or Fatigue Sensitive Details	Two-year Interval
4 and below	Fracture Critical Members or Fatigue Sensitive Details	Determined by MBTA
4 and below (Overall Condition*)	Fracture Critical Bridge	Determined by MBTA

\* Overall condition rating irrespective of condition rating of fracture critical members and fatigue sensitive details

2.5.5. Emergency Inspections

Emergency Inspections are performed to evaluate damage to a bridge caused by flood, fires, earthquake, derailment, collision or other unusual occurrences, and shall be performed in accordance with the requirements of AREMA Chapter 15, Section 7.4.5.

2.5.6. Underwater Inspections

Underwater inspections of substructures, including inspection for effects of scour should be performed to a degree of inspection intensity of the underwater structural elements so that the extent of damage and loss in crosssectional area can be detected and recorded (i.e. detailed measurements, video, testing, etc.).

# 2.5.7. Summary

# The MBTA Railroad Operations Directorate requires the following:

- Periodic Inspections (1-year intervals)
- Special Inspections (5-year intervals)
- Underwater Inspections (5-year intervals)
- Emergency Inspections (as needed)
- Fracture Critical Inspections (minimum 2-year intervals)

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# 2.6. Inspection of MBTA Owned Highway Bridges

The frequency of inspection of MBTA owned highway bridges that are judged to be in good condition shall be <u>two years</u>, to be consistent with MHD and NBIS policy. Bridges in marginal condition and bridges that have fracture critical members shall be inspected at a frequency determined by the MBTA.

# 2.7. Procedure for Notification of Critical Inspection Findings

In the event that the inspector identifies a deficiency that in their judgment is critical to the safety of the public, warranting immediate action on the part of the MBTA, the Inspection Team Leader shall immediately contact the Program Manager and Contract Project Manager for the inspection contract if working as a consultant to the MBTA. Additionally, the Inspection Team Leader or Program Manager shall <u>immediately</u> <sup>5</sup>contact the Railroad Operations Directorate, Chief Engineer. All parties shall meet at the bridge in question including the Bridge Inspection Team Leader, Bridge Inspection Program Manager, and at a minimum at least one of the prime MBTA contact persons to discuss the appropriate course of action for continuing safe passage of train traffic.

# **2.8. Inspection Reports**

2.8.1. General

All bridge inspections shall be documented in standardized reports, the formats of which will be provided by the Authority. Inspection reports shall include at a minimum, standardized inspection forms with numerical condition ratings and photographic documentation.

## 2.8.2. Railroad Bridge Inspection Forms

Standardized forms for Periodic Inspections, designed to include all types of bridges owned by the MBTA are included in Appendix A. The forms are intended to provide a uniform means of data collection for the Periodic Inspection, and to be a minimum checklist of bridge elements to be evaluated. The inspection forms included in Appendix A are consistent with MHD Bridge Inspection forms, and forms previously used by MBTA Design and Construction Directorate. Sample forms included in Appendix A are:

- 1. Railroad/Transit Bridge Inspection
- 2. Railroad/Transit Routine Arch Inspection
- 3. Routine Culvert Inspection
- 4. Pedestrian Bridge Routine Inspection
- 5. Highway Bridge; Routine Inspection

<sup>&</sup>lt;sup>5</sup> For the purpose of this criteria/policy, immediately is defined as within four (4) hours from the time the inspector identifies a critical deficiency.

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- 6. Divers Activity Report
- 7. Fracture Critical Inspection
- 8. Standard Remarks/Photo Page
- 9. Standard Fatigue Sensitive Details Notes Page

The standard bridge inspection forms are to be completed using numerical condition ratings ranging from 0 (Failed) to 9 (Excellent) based on the procedures described in the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges for all bridge inspections.

- 2.8.3. Highway Inspection Forms It is recommended that MBTA owned highway bridges follow the inspection standards, including inspection forms, used by MHD, which are outlined in the Massachusetts Highway Department Bridge Inspection Handbook.
- 2.8.4. Structure Inventory and Appraisal (SI&A) Forms Structure Inventory and Appraisal forms for each bridge shall be edited with neat markings in red and forwarded to the MBTA for updating in the MBTA's Bridge Management System.
- 2.8.5. Inspection Reports

Periodic Inspections and Emergency Inspections need only be documented using the standard forms included in Appendix A, and shall include full photo documentation and detailed written descriptions, photographs, and appropriate sketches for all elements where deficiencies warrant a condition rating value less than 6 out of 9.

Full reports are to be submitted for all Special Inspections. Special Inspection Reports shall include the appropriate inspection form, a written narrative, locus plan, detailed sketches, and photographs as required using the format provided by the Authority.

2.8.5.1. Written Narrative

The written narrative shall at a minimum, include a description of the bridge, and a detailed description of all noted deficiencies.

2.8.5.2. Locus Plan

A single  $8\frac{1}{2}$  in. x 11 in. page of the inspection report shall contain a locus map with minimum dimensions of 6 in. x 8 in. with the bridge location clearly identified, and of adequate scale to easily locate the

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bridge. The locus plan shall include a north arrow and bridge identification.

2.8.5.3. Detailed Sketches

All inspection reports shall include the following standard sketches as a minimum, followed by sketches of noted deficiencies:

- 1. Plan
- 2. Elevation
- 3. Cross Section
- 4. Pier Elevation

## 2.8.5.4. Standard Photos for Inspections

All inspection reports shall include the following standard photos as a minimum, followed by photo documentation of any/all deficiencies:

- 1. Bridge Elevation (N-S, E-W)
- 2. Bridge Elevation (N-S, E-W)
- 3. Bridge Approach (N-S, E-W)
- 4. Bridge Approach (N-S, E-W)
- 5. View Upstream
- 6. View Downstream
- 7. Typical Bridge Top Surface
- 8. Bridge Rail and Sidewalk if present (N-S, E-W)
- 9. Bridge Rail and Sidewalk if present (N-S, E-W)
- 10. Typical Bridge Underside
- 11. Bridge Abutment Elevation
- 12. Bridge Abutment Elevation
- 13. Bridge Wingwall Elevation
- 14. Bridge Wingwall Elevation
- 15. Bridge Wingwall Elevation
- 16. Bridge Wingwall Elevation
- 17. Bridge Pier(s) Elevation(s)

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## 3. Load Rating of Bridges

#### 3.1. General

Load ratings shall be completed in accordance with the requirements of the latest edition of the AREMA Manual for Railway Engineering and this chapter and shall bear the stamp and signature of a Professional Structural Engineer registered in the Commonwealth of Massachusetts. The rating Engineer shall use sound judgment when interpreting the requirements of rating guidelines. All ratings shall be performed using measured section properties. No load rating shall be performed using estimated losses.

Appendix B provides a sample rating summary chart, which shall have the controlling load ratings shaded to highlight governing elements, and shall bear the stamp and signature of a Professional Structural Engineer registered in the Commonwealth of Massachusetts.

#### 3.2. Railroad Loadings used in Rating Calculations

The primary load cases that are of concern to MBTA Railroad Operations are the F40PH – Modified Engine loading and 263 kip rail car, which typically travel over Authority-owned bridges. MBTA Railroad Operations shall be notified of all bridge load rating capacities for these load conditions. The evaluation of other load cases may be required by the MBTA Design and Construction Directorate.

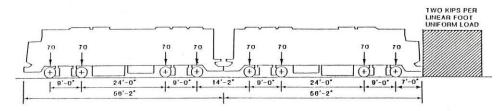
- 3.2.1. Railroad Load Cases
  - 3.2.1.1. F40PH Modified Loading

The F40PH-Modified Loading is the standard MBTA commuter rail loading applied daily to MBTA commuter rail bridges. Normal and Maximum Ratings shall be calculated for the F40PH-Modified loading shown below.

Rating values shall be expressed relative to four axle loads equal to **280 kips.** Bridges with normal rating values of less than 280 kips shall be considered deficient and will require specific recommendations to improve the normal rating to a minimum of 280 Kips.

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#### TOTAL WEIGHT EACH LOCOMOTIVE 280,000 lbs. AXLE LOAD IN KIPS ONE TRACK OF TWO RAILS



F40PH-MODIFIED LOADING

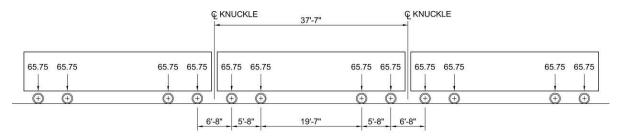
LOADS ARE REPRESENTATIVE OF THE F40-PH-2 ENGINE AND DIMENSIONS OF THE F40PH ENGINE.

RATING IS EXPRESSED IN KIPS PROPORTIONAL TO THE 280 KIP LOCOMOTIVE SHOWN.

3.2.1.2. 263,000 Lbs. Freight Car Loading (263-Kip Rail Car)

This loading is the standard commercial freight loading applied to MBTA commuter rail bridges. Normal and Maximum Ratings shall be calculated for the 263-Kip Rail Car loading shown below, and shall be expressed relative to four axle loads equal to 263 kips. The proportionate rating values for the 286-kip Rail Car loading shall also be presented in the summary of load ratings for the structure.

Rating values shall be expressed relative to four axle loads equal to **263 kips.** Bridges with normal rating values of less than 263 kips shall be considered deficient and will require specific recommendations to improve the normal rating to a minimum of 263 Kips.



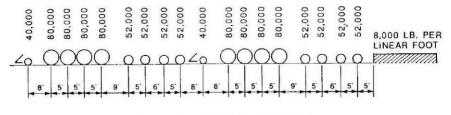
#### 263 K LOADING RATINGS ARE EXPRESSED IN KIPS PROPORTIONAL TO THE 263 KIP RAIL CAR SHOWN (THE RATINGS FOR THE 286 KIP RAIL CAR AND THE 263 KIP RAIL CAR ARE PROPORTIONATE)

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#### 3.2.1.3. AREMA Cooper E-80 Loading

This loading is the standard AREMA load condition for which all railroad bridges nationwide are judged. Normal and Maximum Ratings shall be calculated for the Cooper E-80 loading shown below.

Rating values shall be expressed as the equivalent E value compared to a single axle load of **80 kips (E-80).** 



AREMA COOPER E80 LOADING LIVE LOAD IN LBS. PER AXLE RATING IS EXPRESSED IN AXLE LOAD (KIPS) PROPORTIONAL TO COOPER E80

3.2.2. Normal Rating

Normal Rating is the load level that can be carried by the structure for its expected service life. Normal ratings shall be calculated and reported in accordance with the requirements of AREMA for each live load case with and without fatigue considerations. For bridges which have load ratings below normal limits listed in Sections 3.2.1, additional rating computations shall be performed using reduced operating speeds at 10-mile-per-hour increments between 60 mph and 10 mph. The rating engineer is not required to continue the reduced speed progression once the normal rating limit is achieved. The results of the reduced speed ratings shall be reported in the breakdown of bridge rating summary table. The procedures for incorporating speed reductions shall follow the latest edition of the AREMA Manual for Railway Engineering bridge rating guidelines.

If fatigue governs the bridge load rating, and the rating is below the normal limit, the engineer may be required by the Authority to calculate the remaining fatigue life of the structure.

3.2.3. Maximum Rating

Maximum Rating is the load level that the structure can support at infrequent intervals, with any applicable speed restrictions. Maximum Ratings shall be calculated and reported in accordance with the requirements of AREMA for each live load case. For bridges which have been evaluated for Normal load ratings at reduced speeds, additional Maximum rating computations shall be

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performed for the corresponding speeds. The results of the reduced speed ratings shall be reported in the breakdown of bridge rating summary table.

#### 3.3. Load Rating for MBTA Owned Highway Bridges

Ratings for MBTA owned highway bridges shall be performed following the load rating standards used by the MHD, which are outlined in Chapter 7 of the MHD Bridge Manual and the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Condition Evaluation of Bridges. Highway bridges shall include load ratings for MBTA bus loading as directed by the MBTA.

#### 3.4. Rating Reports

Each Rating shall be presented in a report book which summarizes the rating values for the components of the bridge, with the overall rating value corresponding the controlling member element rating. Highway bridges shall be rated in accordance with the requirements of the MassHighway Bridge Manual, Chapter 7. Railroad bridges shall be rated for both Normal and Maximum Rating values, as well as reduced speed ratings if necessary (see sections 3.2.2 and 3.2.3 for criteria). Each Rating Report shall be prepared under the direction of, and bear the stamp and signature of a Professional Structural Engineer Registered in the Commonwealth of Massachusetts.

Each rating report shall contain the following:

- 1. Cover page indicating Structure information including Bridge Number, Structure Number, etc.
- 2. Rating Report Table of Contents
- 3. Breakdown of Bridge Rating Summary Tables
- 4. Location Plan
- 5. Description of bridge
- 6. Rating Analysis Assumptions and Criteria
- 7. Evaluation of Rating and Recommendations
- 8. List of available plans
- 9. Graphical representation of train loadings
- 10. Most Recent Inspection Report
- 11. Photographs of bridge
- 12. Rating Calculations (Indexed)
- 13. Previous Rating Report

Rating Reports shall be presented in a format as provided by the Authority.

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#### 3.4.1. Rating Recommendations

Recommendations included in the rating report may be general addressing the global condition and future maintenance or inspection of the bridge, or they may address specific deficiencies of the bridge. All recommendations shall be based on sound engineering judgment, and shall be clearly based upon the findings of the rating calculations. If normal or inventory ratings are less than stated statutory limits, then specific recommendations shall be made to increase the load carrying capacity of the bridge.

The engineer shall ensure that all recommendations are practical, prudent, and will not adversely affect the structure, long-term performance, maintenance, or revenue service without justification.

All deficiencies reported in the most recent inspection report shall be addressed within the rating report identifying the effect of the deficiency, if any on the bridge rating.

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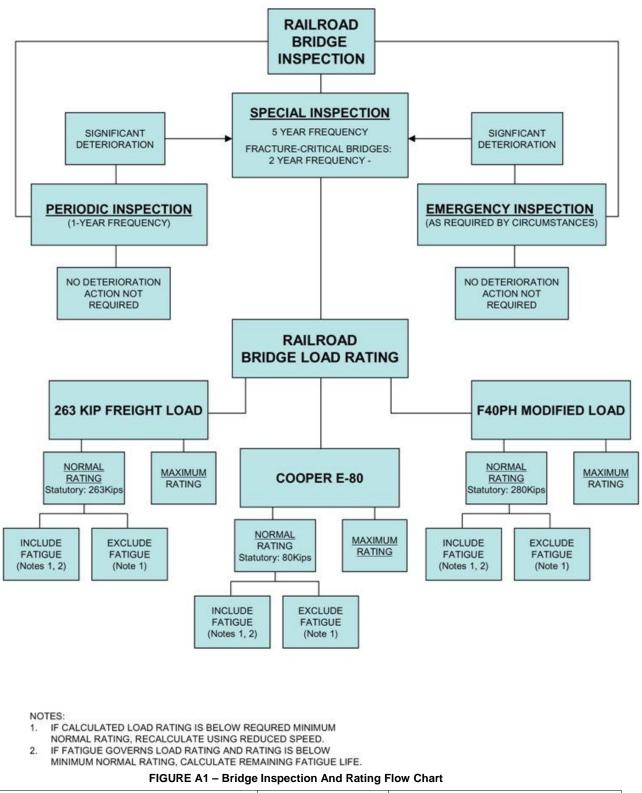
The MBTA Railroad Operations Directorate requires following:

- All Bridges shall have Periodic Inspections at 1-year intervals, and shall be documented using one of the standard forms included in Appendix A.
- All Bridges that are Fracture Critical shall be inspected at 2-year intervals unless condition or rating capacity of Fracture Critical Members warrants more frequent inspection interval. Inspection interval shall be determined by the Authority. All Fracture Critical inspections shall be documented using one of the standard forms included in Appendix A.
- Underwater Inspections of bridges over water shall occur at 5-year intervals, and shall be documented using the standard form included in Appendix A.
- Special Inspections of bridges shall occur at 5-year intervals, unless condition or rating capacity of bridge elements warrants more frequent inspection interval. Inspection interval shall be determined by the Authority. Special Inspections shall be documented in a full report including the standard forms included in Appendix A.

Massachuset Bay Transportatio		Commuter Rail	Bridges	Section III
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# **APPENDIX** A

	Massachusetts Bay Transportation		Commuter Rail	Bridges	Section III
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Authority		Design Standards		Appendix A
RAILROAD	OPERATIONS	Manual		
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4-ACILITY CARRIED LINE       MEMORIAL ALMEL OCAL NAME       27-YER BUILT       106-YER REBUILT       VERT UNDERCLEARANCE         5-FEATURES INTERSECTED BRIDGE OVER       26-FUNCTIONAL CLASS.       QUALITY CONTROL ENGINEER       NO.TRACKS         5-FEATURES INTERSECTED BRIDGE OVER       22-OWNER       21-MAINTAINER       TEAM LEADER       NO.TRACKS         5-FEATURES INTERSECTED BRIDGE OVER       22-OWNER       21-MAINTAINER       TEAM LEADER       NO.TRACKS         60-OECK TYPE       WEATHER       TEAM SEGUE       NO.SPANS       NO.SPANS         TISIS	PACILITY CARRIED LINE       MEMORIAL NAME       27-YR BUILT       Tok-YR REBUILT       YRT, UNDERCLEARANCE         S-FEATURES INTERSECTED BRIDGE OVER       26-FUNCTIONAL CLASS.       QUALITY CONTROL ENGINEER       NO.TRACKS         S-FEATURES INTERSECTED BRIDGE OVER       22-OWNER       21-MAINTAINER       TEAM LEADER       NO.TRACKS         PD-DECK TYPE       22-OWNER       1E-MAINTAINER       TEAM MEMBERS       NO.SPANS         TINISS		AD/TRANS				15. 1 × × × × × × ×		
	G-FEATURES INTERSECTED BRIDGE OVER     26-FUNCTIONAL CLASS.     QUALITY CONTROL ENGINEER     3-STRUCTURE TYPE     22-OWNER     21-OWNER     21-	-CITY/TOWN 8-STR	UUTURE No./MDPW	V BRIDGE No. MIL	E POST/T ID	No. 41-STATUS	INSPECTIO	NDATE	
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DS-STRUCTURE TYPE       22-OWNER       21-MAINTAINE TEAM LEADER       NO.TRACKS         OT-DECK TYPE       WEATHER       TEAM MEMBERS       NO.SPANS         TIENSS	DS-STRUCTURE TYPE       22-OWNER       21-MAINTAINER       TEAM LEADER       NO.TRACKS         07-DECK TYPE       WEATHER       TEMP. dirit       TEAM MEMBERS       NO.SPANS         TIENSS	Z EE ATUBES INTERSECTED/DDIDGE OVER	26 EUNCTIONAL	CLASS		CONTROL ENGL	NEER		
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1. Structural Condition <ul> <li>a. Top Flange or Chord</li> <li>b. Bottom Flanges or Chord</li> <li>c. Web or Diagonals</li> <li>c. Stems</li> <li>b. Bottom Flanges</li> <li>d. Top States Backwalls</li> <li>c. Stems</li> <li>c. Stems</li> <li>c. Stems</li> <li>c. Backwalls</li> <li>d. Protection</li> <li>c. Net or Diagonal Straining</li> <li>c. Stems</li> <li>d. Protection</li> <li>d. Stems</li> <li>d. Stems</li> <li>d. Stems</li> <li>d. Stems</li> <li>d. Pointing</li> <li>d. Pointing</li> <li>d. Protection</li> <li>d. Stems</li> <lid. li="" stems<=""> <li>d. Stems</li> <lid. ste<="" td=""><td>1. Structural Condition       a. Top Flange or Chord         2. Ballast       b. Bottom Flange or Chord         3. Ties       d. Trans Joints         4. Deck Joints       g. Seams         5. Walkways       g. Knew Braces         6. Drainage       g. Knew Braces         1. Structural Condition       g. Seams         1. Rivets or Bolts       g. Boaring Stiftners         1. Notation Enges       g. Foo Status         1. Top Lateral Bracing       g. Seams         1. Top Lateral Bracing       g. Seams         1. Top Lateral Bracing       g. Seamings         1. Approach Settlement       g. Barings         1. Approach Settlement       g. Barings         1. Approach Settlement       g. Stringes         1. Appr. rail condition       g. Stringes         a. Appr. rail condition       g. Stringes         b. Bottom Flanges       g. Stringes         c. Appr. rail condition</td><td></td><td></td><td></td><td>DEF</td><td>SUBSTR</td><td>UCTURE</td><td></td><td>DEF</td></lid.></lid.></ul>	1. Structural Condition       a. Top Flange or Chord         2. Ballast       b. Bottom Flange or Chord         3. Ties       d. Trans Joints         4. Deck Joints       g. Seams         5. Walkways       g. Knew Braces         6. Drainage       g. Knew Braces         1. Structural Condition       g. Seams         1. Rivets or Bolts       g. Boaring Stiftners         1. Notation Enges       g. Foo Status         1. Top Lateral Bracing       g. Seams         1. Top Lateral Bracing       g. Seams         1. Top Lateral Bracing       g. Seamings         1. Approach Settlement       g. Barings         1. Approach Settlement       g. Barings         1. Approach Settlement       g. Stringes         1. Appr. rail condition       g. Stringes         a. Appr. rail condition       g. Stringes         b. Bottom Flanges       g. Stringes         c. Appr. rail condition				DEF	SUBSTR	UCTURE		DEF
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4. Deck Joints	4. Deck Joints	6, D		hragms				-+-1	$\vdash$
5. Walkways       i. Rivets or Bolts       j. Welds         6. Drainage       i. Rivets or Bolts       i. Settlement         7. Fire Protection       m. Bottom Lateral Bracing       i. Settlement         8. Handrails       p. Hangers       c. Portals         9. Utilities       i. Approach Settlement       i. Settlement         10. Approach Settlement       i. Suffeners       i. Settlement         11.       i. Source Source       j. Settlement         12. Phore Source       i. Settlement       i. Settlement         13. Approach Settlement       i. Stiffeners       j. Settlement         14. Suffeners       i. Stiffeners       j. Settlement         15. Appr rail condition       i. Needs       j. Settlement         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Needs       j. Settlement         17. Welds       j. Settlement       j. Settlement         18. Appr satisment       i. Stiffeners       i. Stiffeners         2. Appr satisment       i. Stiffeners       i. Stiffeners         3. Appr satisment       i. Staffeners       i. Stiffeners         a. Appr satisment       i. Staffeners <td>5. Walkways       i. Rivets or Bolts       j. Welds         6. Drainage       i. Rivets or Bolts       i. Settlement         7. Fire Protection       m. Bottom Lateral Bracing       i. Settlement         8. Handrails       p. Hangers       c. Portals         9. Utilities       i. Approach Settlement       i. Settlement         10. Approach Settlement       i. Suffeners       i. Settlement         11.       i. Source Source       j. Settlement         12. Phore Source       i. Settlement       i. Settlement         13. Approach Settlement       i. Stiffeners       j. Settlement         14. Suffeners       i. Stiffeners       j. Settlement         15. Appr rail condition       i. Needs       j. Settlement         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Needs       j. Settlement         17. Welds       j. Settlement       j. Settlement         18. Appr satisment       i. Stiffeners       i. Stiffeners         2. Appr satisment       i. Stiffeners       i. Stiffeners         3. Appr satisment       i. Staffeners       i. Stiffeners         a. Appr satisment       i. Staffeners<td>4. Deck Joints g. K</td><td>nee Braces</td><td>lingino</td><td></td><td></td><td></td><td></td><td></td></td>	5. Walkways       i. Rivets or Bolts       j. Welds         6. Drainage       i. Rivets or Bolts       i. Settlement         7. Fire Protection       m. Bottom Lateral Bracing       i. Settlement         8. Handrails       p. Hangers       c. Portals         9. Utilities       i. Approach Settlement       i. Settlement         10. Approach Settlement       i. Suffeners       i. Settlement         11.       i. Source Source       j. Settlement         12. Phore Source       i. Settlement       i. Settlement         13. Approach Settlement       i. Stiffeners       j. Settlement         14. Suffeners       i. Stiffeners       j. Settlement         15. Appr rail condition       i. Needs       j. Settlement         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Stiffeners       i. Stiffeners         16. Appr satisment       i. Needs       j. Settlement         17. Welds       j. Settlement       j. Settlement         18. Appr satisment       i. Stiffeners       i. Stiffeners         2. Appr satisment       i. Stiffeners       i. Stiffeners         3. Appr satisment       i. Staffeners       i. Stiffeners         a. Appr satisment       i. Staffeners <td>4. Deck Joints g. K</td> <td>nee Braces</td> <td>lingino</td> <td></td> <td></td> <td></td> <td></td> <td></td>	4. Deck Joints g. K	nee Braces	lingino					
6. Drainage	6. Drainage								
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10. Approach Settlement	10. Approach Settlement		or Beams			e. Top of	Stem or Cap		
11.       b. Bottom Flanges       b. Bottom Flanges         11.       c. Webs       c. Webs         a. Stiffneers       c. Webs       c. Webs         a. Appr. rail condition       c. Webs       c. Webs         b. Appr. rail condition       b. Sottim Flanges       c. Webs         a. Appr. rail condition       c. Webs       c. Webs         b. Appr. Railway Settlement       c. Webs       c. Webs         c. Appr. Sidewaik Settlement       c. Webs       c. Webs         d.       c. Webs       c. Webs         a. Condition of Welds       c. Condition of Signs       f. Welds       c. Condition Damage         b. Condition of Signs       c. Condition of Signs       c. Condition of Signs       c. Condition of Signs	11.       b. Bottom Flanges         11.       b. Bottom Flanges         c. Webs       i. Erosion or Scour         i. Erosion or Scour       j. Settlement         i. Stiffeners       i. Erosion or Scour         i. Bottom Flanges       i. Erosion or Scour         i. Brivets or Bolts       i. Erosion or Scour         i. Bottom Flanges       i. Erosion or Scour         j. Settlement       i. Stiffeners         a. Appr. rail condition       i.         b. Appr. Railway Settlement       i.         c. Appr. Sidewalk Settlement       i.         d.       Stiffeners         e. Rivets or Bolts       i.         j. Sottom Flanges       i.         i. Appr. Railway Settlement       i.         d.       Stiffeners         i. Appr. Sidewalk Settlement       i.         d.       Stiffeners         g. Connections       i.         h. Diaphragms       i.         i. Biotraffanges       i.         i. Appr. Sidewalk Settlement       i.         d.       Stiffeners         g. Connections       i.         h. Diaphragms       i.         i. Deff       i.         a. Condition of Signs </td <td>10 Annuagh Settlement</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><math>\vdash</math></td>	10 Annuagh Settlement							$\vdash$
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Image: series of the series	APPROACHES       DEF         a. Appr. rail condition       .         b. Appr. rail condition       .         b. Appr. Railway Settlement       .         c. Appr. Sidewalk Settlement       .         d.       .         OVERHEAD SIGNS       (Y/N)         DEF       .         a. Condition of Welds       .         b. Condition of Signs       .	d. S	tiffeners						
g. Connections	g. Connections         h.         3. Stringers         a. Appr. rail condition         b. Appr. Railway Settlement         c. Appr. Sidewalk Settlement         d.         d.         DVERHEAD SIGNS (YIN)         DEF         a. Condition of Welds         b. Condition of Signs						ng		
APPROACHES       DEF       3. Stringers         a. Appr. rail condition	APPROACHES       DEF         a. Appr. rail condition		onnections						느니
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b. Appr. Railway Settlement b. Appr. Railway Settlement c. Appr. Sidewalk Settlement d. c. Appr. Sidewalk Settlement d. c. Webs c. Appr. Sidewalk Settlement d. c. Condition of Welds b. Condition of Signs c. Condition of	b. Appr. Railway Settlement							oderate ( ) Seve	re ()
c. Appr. Sidewalk Settlement	c. Appr. Sidewalk Settlement	c. W	ebs			I-60 (Dive Re	port):	I-60 (This Re	port):
d.       f. Welds       Any Fracture Critical Member : (Y/N)         g. Connections       Any Fracture Critical Member : (Y/N)         Attached to bridge)       (Y/N)         DEF       A. Superstructure (General)         a. Condition of Welds	d.       f. Welds       Any Fracture Critical Member : (Y/N)         g. Connections       Any Gracks in Tension Plates : (Y/N)         b. Diaphragms       I         i.       Juphragms         a. Condition of Welds       I         b. Condition of Bolts       I         c. Condition of Signs       I					936-11/W (D			
h. Diaphragms       Any Cracks in Tension Plates : (Y/N)         J.       i.         Attached to bridge)       DEF         a. Condition of Welds       i.         b. Condition of Bolts       i.         c. Condition of Signs       i.	h. Diaphragms       i.         Attached to bridge)       DEF         a. Condition of Welds       i.         b. Condition of Bolts       i.         c. Condition of Signs       d. Member Alignment         e.       i.								
Attached to bridge)       DEF         Attached to bridge)       DEF         a. Condition of Welds	Attached to bridge)       DEF         Attached to bridge)       DEF         a. Condition of Welds	h. D	the second s			Any Crac	ks in Tension	Plates : (Y/	N)
a. Condition of Welds <ul> <li>a. Condition of Welds</li> <li>b. Action Under Trains</li> <li>c. Condition of Bolts</li> <li>c. Condition of Signs</li> </ul> <ul> <li>a. Paint</li> <li>b. Action Under Trains</li> <li>c. Collision Damage</li> <li>d. Member Alignment</li> <li>e.</li> </ul> <ul> <li>None () Minor () Moderate () Severe ()</li> <li>LOAD DEFLECTION:</li> <li>None () Minor () Moderate () Severe ()</li> </ul> Mone () Minor () Moderate () Severe ()	a. Condition of Welds <ul> <li>a. Paint</li> <li>b. Action Under Trains</li> <li>c. Condition of Bolts</li> <li>c. Condition of Signs</li> </ul> <ul> <li>Mone () Minor () Moderate () Severe ()</li> <li>LOAD DEFLECTION:</li> <li>None () Minor () Moderate () Severe ()</li> <li>LOAD VIBRATION:</li> <li>None () Minor () Moderate () Severe ()</li> </ul>	Attached to bridge)	perstructure (G	eneral)			1112-21-22 CS		
b. Condition of Bolts c. Condition of Signs b. Action Under Irains c. Collision Damage c. Condition of Signs c	b. Condition of Bolts c. Condition of Signs b. Action Under Irains c. Collision Damage d. Member Alignment e. b. Condition of Signs c. Condition of Signs	Candilian of Wolds	aint			None (	) Minor ( ) M	Noderate ( ) Sev	vere ()
e. None ( ) Minor ( ) Moderate ( ) Severe ( )	e. None ( ) Minor ( ) Moderate ( ) Severe ( )	<i>D. A</i>		s		Contraction and a second second by a		loderate ( ) Se	vere ()
		c. Condition of Signs	ember Alignment					ladarata ( ) Car	
		X=ONKNOWN N=NOT APPLI	JADLE	N=HIDL	/=IN/IIN/AU	JUESSIDLE	K=RE	MOVED	

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		1. B 2. H 3. W 4. C	CVI 62 CUI arrel eadwall /ingwalls utoff Wall		5. Settl 6. Foot	
CHANNEL & CHANNEL PROTECTION 1. Channel Scour 2. Embankment Erosion 3. Drift 4. Channel Alignment 5. Vegetation 5. Rip-Rap 7. Silt 3. Debris in Channel		1. B 2. H 3. W 4. C	arrel eadwall /ingwalls utoff Wall		5. Settl 6. Foot 7. Ade	ement
1. Channel Scour         2. Embankment Erosion         3. Drift         4. Channel Alignment         5. Vegetation         5. Rip-Rap         7. Silt         3. Debris in Channel		2. H 3. W 4. C	eadwall /ingwalls utoff Wall		6. Foot 7. Ade	lings
2. Embankment Erosion 3. Drift 4. Channel Alignment 5. Vegetation 3. Rip-Rap 7. Silt 3. Debris in Channel		3. w 4. c Ratir	/ingwalls utoff Wall		7. Ade	
2. Embankment Erosion 3. Drift 4. Channel Alignment 5. Vegetation 6. Rip-Rap 7. Silt 3. Debris in Channel		4. C Ratir	utoff Wall			
3. Drift 4. Channel Alignment 5. Vegetation 3. Rip-Rap 7. Silt 3. Debris in Channel			ng Report (Y			
4. Channel Alignment 5. Vegetation 6. Rip-Rap 7. Silt 3. Debris in Channel			ng Report ()			
5. Vegetation 5. Rip-Rap 7. Silt 3. Debris in Channel		- Real		(/N):		ACCESSIBILITY: (Y/N/P) Needed Used
5. Rip-Rap 7. Silt 3. Debris in Channel			lest for Rat	ing or Rerating (Y/	ND	Ladder
7. Silt 3. Debris in Channel	-			ing of iterating (1/	N).	Boat Wader
3. Debris in Channel		HIG	H() ME	DIUM ( ) LOW (	)	Inspector 50
		11_	10. 141		54.00	Rigging Staging
		- Rea	son:			Traffic Control
		-	<u>a an sura ana</u>			RR Flagger Police
						Other
		CLE4	ARANCE POS	TING: N/E	s/w	
TREAM FLOW VELOCITY: idal () High () Medium () Low	()	Not A	oplicable ( )	ft in ft	in meter	TOTAL HOURS:
	, ,		Actual Field Measure Posted Clearance		┥┝═╣└═┙┣	PLANS: (Y/N)
		1 I -			ner Advance	
51 (Dive Report): I-61 (This Repo	(rt):	Signs	in Place	N/E S/W N/E	s/w	(V.C.R.): (Y/N)
3b-U/W INSP DATE		(Y=Yes Legib				TAPE #:
		Visibili				and of Field Festa Fe
GENERAL DEF			COND	ITION RATING GUID	E (for Items 58	, 59, 60)
I. Clearance Signs	col	G16101 - 2508	ONDITION			DEFECTS
2. Rail on Bridge	N G 9		PPLICABLE	Excellent condition.		
	G 8			No problem noted.		
3. Track Guard Rail	G 7	GOOD		Some minor problems.		
4. Rail Fasteners	F 6		ACTORY	Structural elements show sor		and a second
5.	F 5	()202000				e minor section loss, cracking, spalling or scour.
	P 4 P 3			Advanced section loss, deter Loss of section, deterioration		r. eriously affected primary structural components. Local cracks in concrete may be present.
5.	r 3 C 2					cracks in concrete may be present. Fatigue cracks in steel or shear cracks in concrete
7.		CRITIC	AL	may be present or scour may necessary to close the bridge	have removed substructu until corrective action is	rre support. Unless closely monitored it may be taken.
3.	C 1	"IMMI	IENT" FAILURE	Major deterioration or section movement affecting structure service.	loss present in critical st stability. Bridge is close	ructural components or obvious vertical or horizontal d to traffic but corrective action may put it back in light
<u>,                                     </u>	0	FAILE	)	Out of service - beyond correct	ctive action.	
				DEFICIENCY REP	ORTING GUIDE	
10.	DEF	ICIENCY:	A defect in a	structure that requires correction	ve action.	
11.			DEFICIENCIES			
12.	M= N	Ainor Deficien	cy - Deficiencies repaired. Ex Clogged dra	kamples include but are not limiter	ally do not impact the str d to: Spalled concrete, Mi	uctural integrity of the bridge and could easily be inor pot holes, Minor corrosion to steel, Minor scouring,
	S= Se	evere/Major D	eficiency - Defi are	ciencies which are more extensive not limited to: Moderate to major of	deterioration in concrete,	e planning and effort to repair. Examples include but Exposed and corroding rebars, Considerable o extensive corrosion to structural steel with measurable
	C-S=	Critical-Strue	loss	of section, etc.		an extreme unsafe condition due to the failure or
				imminent failure of the element w	hich will affect the struct	ural integrity of the bridge. oses an extreme hazard or unsafe condition to the
				public, but does not impair the st concrete hanging down over traff	ructural integrity of the br fic or pedestrians, A hole	inge. Examples include but are not limited to: Loose in a sidewalk that may cause injuries to pedestrians,
				Missing section of bridge railing,		
		ENCY OF RI		mmediately contact District Bridge	Inspection Engineer (DF	BIE) to report the Deficiency and to receive further
			instruction from	m him/her].		e Responsible Party (if not a State owned bridge) upon
		rioritize -	receipt of the	Inspection Report].		e Party (if not a State owned bridge) and repairs made
			when funds ar	nd/or manpower is available].		,

# FIGURE A2 – Railroad/Transit Inspection Form

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2-DIST B.I.N.	RUCTURES IN LROAD/TRANS				BRI	IDGE NO.
CITY/TOWN 8-	STRUCTURE No./MDPW BF	RIDGE No. Mile Post/	f ID No. 41-S	TATUS INSPEC	CTION DATE	
07-FACILITY CARRIED/LINE	MEMORIAL NAME	LOCAL NAME	27-YR BUILT	106-YR REBUILT	VERT. UNDI	ERCLEARAN
06-FEATURES INTERSECTED/BRIDGE OVER	26-FUNCTIONAL C	LASS	QUALITY CON	TROL ENGINEER		
43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER			NO. TRACKS
107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBEI	ks		NO. SPANS
ITEM 58	ITEM 59			ITEM 60	1	
DECK DEF	SUPERSTR			SUBSTRUCTUR		DEF
1. Wearing Surface	1. Arch/Arch F	Ring		1. Abutments	Dive Thi Rpt. Rpt	is it.
2. Deck Condition	2. Keystone A	rea		a. Pedestals		
3. Spandrel Fill	3. Stringer/Tee	22.22.23		b. Bridge Seats		
4. Curbs	4. Floor Beam			c. Backwalls d. Breastwalls		-
				e. Wingwalls		
5. Median	5. Spandrel W	alls		f. Slope Paving/Rip-Rap g. Pointing	,	
6. Sidewalks	6. Spring Line	5		h. Footings		
7. Parapets/Coping	7. Diaphragms	3		i. Piles		-   -
8. Railing	8. Conn Plt's,	Gussets & Angles		j. Scour k. Settlement		
9. Anti Missile Fence	9. Hangers			1. Erosion		
10. Drainage System	10. Masonry J	oints		m. 2. Piers or Bent		
11. Lighting Standards	11. Rivets & B			2. Fiers of Bent	.5	
12. Utilities		0113		a. Pedestals		
	12. Welds	0.02202020 59	-	b. Caps c. Columns		
13. Deck Joints	13. Deformation			d. Stems/Webs/Pierwalls	s	
14.	14. Member A	lignment		e. Pointing f. Footing		
15.	15. Paint/Coat	ing		g. Piles		
16.	16.			h. Scour		$\neg \vdash$
CURB REVEAL N/E S/W	Year Painted:			i. Settlement j. Erosion		
(In millimeters)	COLLISION DA	MAGE: Please expla	in	k.		
				3. Pile Bents		
APPROACHES DEF	LOAD DEFLEC	nor ( ) Moderate ( ) TION: <u>Please expl</u>		a. Pile Caps		
a. Appr. Pavement Condition	None ( ) Min	or () Moderate () :		b. Piles c. Diagonal Bracing	++	
b. Appr. Roadway Settlement	LOAD VIBRATIO			d. Horizontal Bracing		
c. Appr. Sidewalk Settlement	None ( ) Mi	nor ( ) Moderate ( )	Severe ( )	e. Fasteners		
OVERHEAD SIGNS (Y/N)	/:			UNDERMINING (Y/N)	If YES pleas	e explain
(attached to bridge)		Critical Member? (Y	N)	COLLISION DAMAGE None ( ) Minor ( )		) Severe ( )
a. Condition of Welds				I-60 (Dive Report):	I-60 (This I	Report):
b. Condition of Bolts			S Please			
c. Condition of Signs	Any Cracks?	· · · · ·		93b-U/W (DIVE) INSP D		
X=UNKNOWN N=NO	T APPLICABLE	H=HIDD	EN/INACCE	ESSIBLE	R=REI	MOVED

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	OWN			B.I.N.	BR.	DEPT. NO.	8 - STRUCTURE NO.		PAGE NO. 2 C
CH. 1. CH 2. En 3. De 4. Ve 5. Ut 6. Rip 7. Ag 8. Fe	nannel Si nbankme abris agetation ilities p-Rap/Sk ggradatio ander Sys REAM FL	PROTECTION cour ent Erosion oppe Protection on stem cow VELOCITY: n( ) Moderate ( ) Low(	Rpt.	This Report):		1. Bridge 2. Transiti 3. Approa 4. Approa	ons ch Guardrail ch Guardrail Ends CE POSTING: N/E ft in d Measurement arrance	S/W	ACCESSIBILITY: (Y/N/P) Needed Use Lift Bucket Use Boat Definition Definition Definition Traffic Control RR Flagger Definition Dother: Use PLANS: (Y/N) Use CV.C.R.): (Y/N)
		NSP. DATE:			]	Signs in Place (Y=Yes N=No Legibility/ Visibility			TAPE #: List of Field Tests Performed:
KAI	ING:		(10	be filled out	Dy QUE)			e give priority.	7
Rat Dat	ing Repo	ort (Y/N):		equest for R	ating or	Rerating (Y/N):	HIGH ( )	MEDIUM ( ) LOW (	<u></u>
		ort (Y/N):			1711		HIGH ( )		<u></u>
		CONDITION	Re		1711				یا 
Dat	e:	CONDITION	Re	eason:	CON		IG GUIDE (for Items 58, 59		┘ ───
Dat	code	CONDITION		eason:	CON		IG GUIDE (for Items 58, 59		<u></u>
Dat G G G	e:	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD		eason:	CON		IG GUIDE (for Items 58, 59		<u></u>
Dat G G F	e:	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY	Re E> No Sc St	cellent conditio porblem noted ome minor probl ructural elemen	CON	IDITION RATIN	IG GUIDE (for Items 58, 59 DEFECTS	9, 60)	
Dat G G F F	e: CODE N 9 8 7 6 5	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR	Re E> No So St All	ccellent conditio o problem noted me minor probl ructural elemen I primary structu	CON n. ems. ts show so ral elemen	DITION RATIN	IG GUIDE (for Items 58, 58 DEFECTS tion. ay have minor section loss, cracking,	9, 60)	
Dat G G F	e:	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY	E EXAMPLE A	cellent conditio porblem noted ome minor probl ructural elemen l primary structu dvance section, d	CON n. ems. ts show so rral elemen oss, deterioration	IDITION RATIN	IG GUIDE (for Items 58, 59 DEFECTS Iton. ay have minor section loss, cracking, scour.	e), 60)	I failures are possible. Fatigue
Dat G G F F P P	e: CODE N 9 8 7 6 5 4	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS	E E E E E E E E E E E E E E E E E E E	cellent conditio o problem noted me minor problem ructural elemen l primary structu tvance section n acks in steel or tvance deteriora	CON n. ems. ts show so ral elemen oss, deteri eterioration sheer crac	DITION RATIN	IG GUIDE (for Items 58, 58 DEFECTS iton. ay have minor section loss, cracking, scour. have seriously affected primary struc be present. ents. Fatigue cracks in steel or shee	spalling or scour. tural components. Loca ar cracks in concrete ma	ay be present or scour may have
Dat G G G F F P P C	e: CODE N 9 8 7 6 5 4 3 3 2	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL	Re E> No So All Ac Corr re	cellent conditio problem noted ome minor probl ructural elemen primary structu dvance section 1 ses of section, d toxis in steel or tivance deteriors	CON ems. Is show so ral elemen oss, deteri elerioration sheer craca ation of prin ture suppo	IDITION RATIN orme minor deteriorat ts are sound but m ioration, spalling or sourt sk in concrete may many structural elem r. Unless closely r	IG GUIDE (for Items 58, 59 DEFECTS iton. ay have minor section loss, cracking, scour. nave seriously affected primary struc be present. rents. Fatigue cracks in steel or she.	spalling or scour. Lural components. Loca ar cracks in concrete at the bridge until corre	ay be present or scour may have active action is taken.
Dat G G F F P P	e: CODE N 9 8 7 6 5 4 3 2 1	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR	E Ex Ex Sc Sc Sc Sc Con Con Con Con Con Con Con Con	cellent conditio o problem noted me minor problem ructural elemen primary structural vance section, d acks in steel o ryvance deterior noved substruc- ajor deterioratio ajor deterioratio ajor deterioratio	CON n. ems. ts show so ral elemen- cass, deteri teterioration sheer crace tion of print ture support n or section	IDITION RATIN ome minor deterioral ts are sound but m ioration, spalling or souri n, spalling or souri ks in concrete may mary structural elem mary structural elem t, Unless closely r n loss present in crit raffic but corrective	IG GUIDE (for Items 58, 58 DEFECTS iton. ay have minor section loss, cracking, scour. have seriously affected primary struc be present. ents. Fatigue cracks in steel or shee	spalling or scour. tural components. Loca ar cracks in concrete ma se the bridge until corre	ay be present or scour may have active action is taken.
Dat G G G F F P P C	e: CODE N 9 8 7 6 5 4 3 3 2	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL	E Ex Ex Sc Sc Sc Sc Con Con Con Con Con Con Con Con	ceellent conditio o problem notes me minor problem primary struct twance section in sis of section, d acks in steel or vance deterior wance dustrus agior deterioratio	CON n. ems. Is show so ral elemen oss, deteri eterioration sheer crace sheer crace ture support ture support o closed to syond corre-	IDITION RATIN ome minor deterioral ts are sound but m ioration, spalling or souri n, spalling or souri mary structural elem mary structural elem traffic but corrective ective action.	IG GUIDE (for Items 58, 59 DEFECTS iton. ay have minor section loss, cracking, scour. nave seriously affected primary struct be present. itemis. Fatigue cracks in steel or she be present. itemis structural components or obviou a action may put it back in light service	spalling or scour. tural components. Loca ar cracks in concrete ma se the bridge until corre	ay be present or scour may have active action is taken.
Dat G G G F F P P C C	e: CODE N 9 8 7 6 5 4 3 2 1 0	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR FAILED	E Ex St St All Ac Crr E M. St St Crr St St Ot	cellent conditio o problem noted me minor problem noted me minor problem noted tructural elemen primary struct. Vance section 1, as of section, 4, as of sec	CON n. ems. Its show so ral elemen oss, deteri sheer crace ture suppo n or section of print ure suppo a closed to syond correl	IDITION RATIN ome minor deterioral ts are sound but m ioration, spalling or n, spalling or sourt sk in concrete may mary structural elem sk in concrete may mary structural elem source that no to spresent in or n loss present in or n loss pr	IG GUIDE (for Items 58, 59 DEFECTS Ion. ay have minor section loss, cracking, scour. nave seriously affected primary struc be present. hents. Fatigue cracks in steel or shee nonitored, it may be necessary to cit licel structural components or obviou	spalling or scour. tural components. Loca ar cracks in concrete ma se the bridge until corre	ay be present or scour may have active action is taken.
Dat G G G F F P P C C C	e: CODE N 9 8 7 6 5 4 3 2 1 0 FICIENC	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR FAILED Y: A defect in a stru	Re E> No So So So So So So So So So So So So So	cellent conditio o problem noted me minor problem noted me minor problem noted tructural elemen primary struct. Vance section 1, as of section, 4, as of sec	CON n. ems. Its show so ral elemen oss, deteri sheer crace ture suppo n or section of print ure suppo a closed to syond correl	IDITION RATIN ome minor deterioral ts are sound but m ioration, spalling or n, spalling or sourt sk in concrete may mary structural elem sk in concrete may mary structural elem source that no to spresent in or n loss present in or n loss pr	IG GUIDE (for Items 58, 59 DEFECTS iton. ay have minor section loss, cracking, scour. nave seriously affected primary struct be present. itemis. Fatigue cracks in steel or she be present. itemis structural components or obviou a action may put it back in light service	spalling or scour. tural components. Loca ar cracks in concrete ma se the bridge until corre	ay be present or scour may have active action is taken.
Dat	e: CODE N 9 8 7 6 5 4 3 2 1 0 FICIENCC TEGORI	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR FAILED Y: A defect in a struct ES OF DEFICIENCI	Re E No St At Ac C C C C C C C C C C C C C C C C C C	cellent conditio o problem noted o problem noted primary struct. Vrance section 1 acks in ateel or vhance deteriory wance deteriory and deterioration ability. Bridge ie at of service - but hat requires	CON ems. ts show so ral elemer oss, deteri terforation sheer crace titon of prin ture support closed to syond corre- correcti	IDITION RATIN	IG GUIDE (for Items 58, 59 DEFECTS DEFECTS ion. ay have minor section loss, cracking, scour. have seriously affected primary struc be present. honitored, it may be necessary to do ical structural components or obviou action may put it back in light servic REPORTING GUIDE	spalling or scour. tural components. Loca ar cracks in concrete ma se the bridge until corre- s vertical or horizontal m e.	ay be present or scour may have citive action is taken. novement affecting structure
Dat	e: N 9 8 7 6 5 4 3 2 1 0 FICIENCE TEGORI Minor I Severe/I	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR FAILED Y: A defect in a struct ES OF DEFICIENCI	Ref	cellent conditio problem noted problem noted problem noted primary structur vance section 1 acks in steel or vance deteriors acks in steel or vance deteriors and returned to hat requires are mon por hona, encies which ar oration in concer- citural steel with A deficiency will affect the	CON n. ems. ts show so constant there support there support	DITION RATIN ome minor deteriorat ts are sound but ma ioration, spalling or io- no spalling or soour ks in concrete may may structural eler rt. Unless closely re- many structural eler trutific but corrective ective action. DETECIENCY P ive action DETECIENCY P ive action DETECIENCY P ive action ratily do no timpact ti and and corroding re ble loss of section, e aral element of a brit integrity of the bridg	IG GUIDE (for Items 58, 55 DEFECTS DEFECTS item. ay have minor section loss, cracking, scour. have seriously affected primary struc be present. rents. Fatigue cracks in steel or she monitored, it may be necessary to do a action may put it back in light servic a action may put it back in light servic REPORTING GUIDE the structural integrity of the bridge ar recouring. Clogged drainage, etc. drage drained and effort to re bars, Considerable settlement, Cons ite. ge that poses an extreme unsafe co ge.	spalling or scour, spalling or scour, tural components. Loca ar cracks in concrete ma se the bridge until correr s vertical or horizontal m e. d could easily be repair pair. Examples include iderable scouring or und ndition due to the failure	ay be present or scour may have citive action is taken. novement affecting structure red. Examples include but are not limited to: but are not limited to: Moderate to major dermining, Moderate to extensive corrosion e or imminent failure of the element which
Dat	e: N 9 8 7 6 5 4 3 7 6 5 4 3 7 6 5 4 3 7 6 5 7 6 5 7 6 5 7 6 5 7 6 5 7 6 5 7 7 6 5 7 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7	CONDITION NOT APPLICABLE EXCELLENT VERY GOOD GOOD SATISFACTORY FAIR POOR SERIOUS CRITICAL "IMMINENT" FAILUR FAILED XY: A defect in a stru ES OF DEFICIENCII Deficiency - Deficiency -	Ref	cellent conditio problem noted problem noted problem noted primary structur vance section 1 acks in steel or vance deteriory acks in steel or vance deteriory and the section 1 hat requires are mon on has encies which ar oration in concru- citural steel with A deficiency will integrity of the A deficiency will affectionery in integrity of the	CON n. ams. ts show so constant there support there support	DITION RATIN prome minor deterioration ta are sound but main ta are sound but main ta are sound but main traffic but corrective are sound but main and many structural elem any structural elem tructural elemany structural elemany tructural elemany t	Ide GUIDE (for Items 58, 58 DEFECTS DEFECTS Ition. ay have minor section loss, cracking, scour. nave seriously affected primary struc be present. ments. Fatgue cracks in steel or she- icol structural components or obviou a action may put it back in light servic REPORTING GUIDE the structural integrity of the bridge ar r scouring, Clogged drainage, etc. Reporting of the bridge ar scouring, Clogged drainage, etc. deed more planning and effort to re bars, Considerable settlement, Cons tc.	spalling or scour. spalling or scour. tural components. Loca ar cracks in concrete mail s the bridge until corre s vertical or horizontal m e. d could easily be repair pair. Examples include iderable scouring or und ndition due to the failure or unsafe condition to t	ay be present or scour may have citive action is taken. novement affecting structure red. Examples include but are not limited to: but are not limited to: Moderate to major fermining, Moderate to extensive corrosion

# FIGURE A3 – Railroad/Transit Routine Arch Inspection Form

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RO	ES INSPECTION FIEL	ION
	CTURE NO./MDPW BRIDGE NO MILEPOST/T ID MEMORIAL NAME/LOCAL NAME	NO 41-STATUS INSPECTION DATE 27-YR BUILT 106-YR REBUILT VERT. UNDERCLEARANCE
06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS. QUALITY (	CONTROL ENGINEER
	22-OWNER 21-MAINTAINER TEAM LEA WEATHER TEMP. (air) TEAM MEN	
TYPE OF CULVERT: SHAPE: MATERIAL: COATING:	BARRELS: (In feet) Size: DEPTH OF COVE (To t CURB REVEAL	NUMBER:
Dive This Rpt. Rpt.         DEF         Dive Rpt.           1. Roof         1. Roof         7. Protective Coating           2. Floor         8. Embankment         9. Wearing Surface           3. Walls         10. Railing         11. Sidewalks           5. Wingwall         11. Sidewalks         12. Utilities	This ppt.         DEF         Dive Thin Rpt.           13. Member Alignment         1           14. Deformation         1           15. Scour         1           16. Settlement         1           17. Fill         1           18. Protective Fence         1	I-62 (Dive Report): I-62 (This Report): UNDERMINING (Y/N) // YES please explain COLLISION DAMAGE: Please explain LOAD VIBRATION: Please explain
CHANNEL & CHANNEL PROTECTION         Dive This Rept.         1. Channel Scour         2. Embankment Erosion         3. Debris         4. Vegetation         4. Vegetation         Met Applicable             Actual Posting         Recommended Posting	Dive This DEF ITEM 61 (Dive Rep	b. Appr. Roadway Settlement c. Appr. Sidewalk Settlement
Waived Date:       EJE         GENERAL       COND       DEF         1. Clearance Signs	DMT Date:     Legibility/ Visibility       ACCESSIBILITY:(Y/N/P) Needed Used     Other       Ladder     Other       Boat     Other       Waders     Other       or Rerating (Y/N):     If YES please g	(V.C.R.): (Y/N)
X=UNKNOWN N=NOT APPLIC	CABLE H=HIDDEN/IN/	ACCESSIBLE R=REMOVED

#### FIGURE A4 – Routine Culvert Inspection Form

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CITYTOPIN     STRECTURE DO     II-MILE PART     O-RECTURE DISPECTION DATE       TRATRERS CARRED     MOMMAL NAMPLOCAL NAME     II-MILE PART     O-RECTURE DISPECTION DATE       TRATRERS CARRED     MOMMAL NAMPLOCAL NAME     II-MILE PART     VERTURE     II-MANTARKE S-STRECTURE DARTH       STRECTURE TYPE     II-MILE TYPE     II-MILE TYPE     II-MILE TYPE     II-MILE TYPE       INFORCENTRY     TRANSFERRE     II-MANTARKE S-STRECTURE     DEF       STRECTURE TYPE     II-MILE TYPE     II-MILE TYPE     II-MILE TYPE       INFORCENTRY     TRANSFERRE     II-MANTARKE S-STRECTURE     DEF       STRECTURE TYPE     II-MILE TYPE     II-MILE TYPE     II-MILE TYPE       INFORCENTRY     TRANSFERRE     II-MILE TYPE     II-MILE TYPE       INFORCENTRY     II-MILE T		CHUSETTS BAY TRANSP PEDESTRIA				PAGE NO. 1 OF
P. P. ATTRES CARRIED       MEXORAL NAME (LOCAL NAME       21- YE BUILT		<b>ROUTINE IN</b>	SPECTI	ON		B.I.N.
ACILITIES INTERSECTED     VEATURE     TEM     2: ORNE     2     J-MAINTAINER     4: STRUCTURE TYPE     4: STRUCTURE     TEAM LEADER     TEAM MEMBERS     TEME     5     STRUCTURE     TEAM LEADER     TEAM MEMBERS     TEME     TEAM MEMBERS     TEME     TEAM MEMBERS     TEME     TEAM MEMBERS     TEME     TEAM MEMBERS     TEM     SUBSTRUCTURE     DEF     1. Wearing Surface     1. Stringers     1. Stringers     2. Floctobeams     3. StringerSection     4. Gurdes or Beams     4. Gurdes or Beams     4. Gurdes or System Bracing     4. Gurdes or Beams     4. Gurdes or System Bracing     4. Gurdes or Beams     4. Gurdes     4. Structure     4. Drokes     4. Drokes     4. Drokes     4. Structure     4. Drokes     4. Drokes     4. Drokes     4. Drokes     4. Drokes     4. Dro	CITY/TOWN	8-STRUCTURE NO.	11- MILE POIN	T	90 - ROUTINE INSPEC	TION DATE
LS_STRUCTURE TYPE       44-STRUCTURE TYPE APPROACH       45-MINIBER OF SMANS. MAN       45-MINIBER OF SMANS. MAN         MONDECK TYPE       TLAM LEADER       TEAM SO         TIEM SS       TIEM SS       SUPERSTRUCTURE       DEF         1. Wearing Surface       2. Floorbeams       1       DECK/WALKWAY       DEF         1. Wearing Surface       2. Floorbeams       1       DEF       1. Abutments         2. Deck Conditions       3. Sizy in-place Forms       4. Girders or Beams       1       DEF       1. Abutments         3. Sizy in-place Forms       4. Girders or Beams       1       DEF       1. Abutments       DEF         1. Automation of the Contrast       1       1. Floorbeams       1       DEF       1. Abutments       DEF         1. Curbs       6. Farapets       1       1. Curbs       DE       DE       DE       DE         1. Lighting Standards       1       D. Lateral Bracing       1. Floos       I. Floos       I. Floos       I. Floorbeams       I. Statement       I. Statement       I. Statement       I. Statesthement       I. Statement       I.	7- FEATURES CARRIED	MEMORIAL NAME/ LOCAL NAME	27- YR BUILT	106-YR REBUILT	YR REBUILT	
INP. DECK TYPE       TEAM MEANERS         ITEM IS       ITEM SP       ITEM MODEL         DECK / WALKWAY       DEF       ITEM SP       ITEM SP         J. Wearing Surface       I.       SUPERSTRUCTURE       DEF         1. Wearing Surface       2. Floorbeams       3. Floor System Bracing       4. Girders or Beams       5. Back Conditions       9. Floorbeams	6- FACILITIES INTERSECTED	WEATHER TEMP	22- OWNER	21- MAINTAINER	49- STRUCTURE LENG	TTH (OVERALL)
Item Iss       Item Iss       Item Iss       Item Iss         DECK/ WALKWAY       DEF       DEF       DEF       DEF         1. Wearing Surface       Courbos       Stringers       DEF       DEF       DEF         1. Wearing Surface       Courbos       Stringers       DEF       DEF       DEF       DEF         1. Wearing Surface       Courbos       Stringers       DEF       DEF       DEF       DEF         1. Wearing Surface       General       Detroited Structure       DEF       DEF       DEF       DEF         1. Curbos       General       Detroited Structure       DEF       DEF       DEF       DEF         2. Carbos       General       Detroited Structure       DEF       DEF       DEF       DEF         3. Stay in place Forms       Detroited Structure       DEF       DEF       DEF       DEF       DEF         10. Lighting Standards       E. Sway Bracing       I. Footings       I. Piles       I. Pil	3- STRUCTURE TYPE	44- STRUCTURE TYPE APPROACH	45- NUMBER 0	OF SPANS- MAIN	46- NUMBER OF SPAN	IS APPROACH
DECK/WALKWAY       SUPERSTRUCTURE       SUBSTRUCTURE         1. Wearing Surface        DEF       1. Abutments       DEF         1. Wearing Surface         DEF       1. Abutments       DEF         2. Deck Conditions         DEF       1. Abutments       DEF         3. Stay in-place Forms         DEF       1. Abutments       DEF         4. Curbs         Der Chords        D	107- DECK TYPE	TEAM LEADER	TEAM MEMBE	RS	•	
DEF       DEF         1. Wearing Surface       DEF         2. Deck Conditions       3. Stay in-place Forms       1. Stringers         3. Stay in-place Forms       3. Floor System Bracing       1. Bridge Seats         4. Curbs       6. Parapets       1. Stringers       1. Bridge Seats         5. Clazing       1. Tursses - General       1. Bridge Seats       1. Bridge Seats         6. Parapets       1. Upper Chords       1. Stringers       1. Stringers         7. Raling       1. Lower Chords       1. Stringers       1. Stringers         9. Drainage System       1. Lateral Bracing       1. Piles       1. Piles         11. Utilities       1. Portals       1. Piles       1. Piles         12. Deck Joints       1. Portals       1. Piles       1. Int West & Bolts         13. Appr. Pavement contition       11. Weids & Bolts       2. Piers or Bonts         13. Appr. Pavement settlement       12. Weids       1. Rowert & Bonts       2. Piers or Bonts         14. Appr. Pavement settlement       12. Weids       1. Starter Paint/Coating       1. Footings         15. Condition of Signs       Uptowerts       Moderat() Seewe()       1. Storgers         15. Condition of Signs       Weid       Mow() Mower() Seewe()       1. Footings	ITEM 58					
1. Wearing Surface       1. Stringers       1. AbutmentS         2. Deck Conditions       2. Floor System Bracing       1. AbutmentS         2. Outob       3. Stay in-place Forms       3. Floor System Bracing       1. AbutmentS         4. Curbs       4. Girders or Beams       1. Bridge Seats       1. Burdley Seats         5. Glazing       6. Parapets       1. Upper Chords       1. Blow Seats         6. Parapets       2. Upper Chords       1. Store Parage         8. Anti Missile Fence       2. Web Members       9. Pointing         9. Drainage System       1. Lateral Bracing       1. Floes         10. Lighting Standards       1. Potals       1. Piles         11. Utilities       1. Potals       1. Piles         11. Nivets & Bolts       1. Rivets & Bolts       1. Rivets & Bolts         12. Deck Joints       9. Bearing Devices       1. Rivets & Bolts         13. App: Pavement condition       11. Rivets & Bolts       1. C. Columns         14. 1       7. Conn Pfs. Gussets & Angles       1. Settlement         15       12. Welds       1. C. Columns       2. Plers or Bents         a. App: Pavement settlement       13. Member Alignment       c. Columns       1. Floes         14. Paint/ Coating       1. Floes       1. Floes <t< td=""><td>DECK/ WALKWAY</td><td>SUPERSTRUCTURE</td><td></td><td>SUBSTR</td><td>UCTURE</td><td></td></t<>	DECK/ WALKWAY	SUPERSTRUCTURE		SUBSTR	UCTURE	
2. Deck Conditions <ul> <li>J. Floor System Bracing</li> <li>J. Floor System Bracing</li> <li>J. Floor System Bracing</li> <li>J. Floor System Bracing</li> <li>J. Backwalls</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Redestals</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Redestals</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Readestals</li> <li>J. Com Pfs, Gussets &amp; Angles</li> <li>J. Readestals</li> <li>J. Conting</li> <li>J. Weat B</li></ul>			DEF			DEF
3. Stay in-place Forms       3. Floor System Bracing       b. Bridge Seats         4. Curbs       6. Parapets       c. Backwalls         5. Glazing       5. Trusses - General       c. Backwalls         6. Parapets       b. Lower Chords       f. Stope Paving/Rip-Rap         9. Drainage System       c. Web Members       g. Pointing         9. Drainage System       d. Lateral Bracing       i. Pootals         10. Lighting Standards       g. Pootings       i. Pootals         11. Utilities       f. Portals       j. Settlement         12. Deck Joints       g. End Posts       m.         13       B. Ower Plates       m.         14       7. Com Pfs, Gussets & Angles       m.         15.       10. Diaphragms/ Cross Frames       a. Podestals         16. Appr. Pavement condition       11. Rivets & Bolts       b. Capus         15.       12. Welds       c. Columns         13. Member Alignment       c. Columns       d. Stems or Ramps         15.       Columns       g. Piles or Bents         16. Ondition of Bolts       Columns       d. Stemer()         17. Nover 1. Moderit() Moderit() Stewer()       k.       b. Columns         18. Cover Plates       g. Piles       c. Columns						
4. Curbs       4. Girders or Beams <ul> <li>Glazing</li> <li>Glazing</li></ul>			┼──╢──			+
S. Glazing       5. Trusses - General       d. Breastwalls         6. Parapets       a. Upper Chords       e. Wingwalls         7. Railing       b. Lower Chords       e. Wingwalls         8. Anti Missile Fence       c. Web Members       g. Pointing         9. Drainage System       d. Lateral Bracing       h. Footings         10. Lighting Standards       e. Sway Bracing       h. Footings         11. Utilities       g. End Posts       k.         12. Deck Joints       g. End Posts       k.         13       G. Pin & Hanger       l.         14       7. Com Pts, Gussets & Angles       m.         15       B. Bearing Devices       m.         10. Diphting Top Pavement condition       11. Rivets & Bolts       e. Columns         12. WedtS       11. Rivets & Bolts       e. Columns         13. Member Alignment       12. WedtS       f. Footings         14. Paint Coating       f. Footings       g. Piles or Bents         a. Condition of Welds       CoLLISION DAMAGE:       Please Explain         Access tro DISABLED       More() Modente() Serve()       j.         ADA ACCESSIBLE: Y/N       Any Fracture Critical Member: Any Cracks:       a. Pile Caps         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS       <			+ -			+
6. Parapets       a. Upper Chords       a. Wergwalls         7. Railing       b. Lower Chords       f. Slope Paving/Rip-Rap         8. Ant Missile Fence       c. Web Members       f. Slope Paving/Rip-Rap         9. Drainage System       d. Lateral Bracing       f. Footings         10. Lighting Standards       f. Portals       f. Portals         11. Utilities       f. Portals       f. Portals         12. Deck Joints       g. End Posts       f. Row Parapets         13       G. Pin & Hanger       f. I.         14       7. Com Pts, Gussets & Angles       f. m.         15       B. Cover Plates       f. D. Diaphragms/ Cross Frames       f. Portals         10. Lighting Standards       f. Parapetics       f. Columns       f. Pedestals         a. Appr. Pavement condition       f1. Rivet's & Bolts       f. Columns       f. Columns         14. Paint Coating       f5.       Columns       f. Columns       f. Footings         0. Stering Webs       f. More()       Mowe()       Sewee()       j. Kettlement       j. J.         0. Condition of Bolts       f. Condition of Signs       f. Columns       f. Settlement       j. J.         a. Condition of Signs       Mow()       Mowe()       Sewee()       j. J.       j. Lobapt				_		+
7. Railing       b. Lower Chords       f. Slope Paving/Rip-Rap         8. Anti Missile Fence       c. Web Members       g. Pointing         9. Drainage System       d. Lateral Bracing       h. Footings         10. Lighting Standards       e. Sway Bracing       h. Footings         11. Utilities       f. Portalis       j. Settlement         12. Deck Joints       g. End Posts       j. Settlement         13       6. Pin & Hanger       l.         14       7. Conn Pf's, Gussets & Angles       m.         15       8. Cover Plates       m.         9. Bearing Devices       m.         12. Welds       12. Welds         13. Member Alignment       c. Columns         14. Paint/ Coating       f. Footings         15.       I. Bering Coating         16.       Stems or Ramps         17. Newles       Bef         18. Member Alignment       c. Columns         19. Paint/ Coating       f. Footings         19. Condition of Bolts       Paint/ Coating         11. Rivets & Bolts       g. Pointing         12. Welds       f. Footings         13. Member Alignment       c. Columns         14. Paint/ Coating       f. Footings         g. Pointin			$\left  - \right  \right $			+
8. Anti Missile Fence			$\left  - \right  \right $		0470-4774	+
9. Drainage System			┼──┤┝──			+
10. Lighting Standards			┼──┤┝──		<u> </u>	+
11. Utilities       i       f. Portals       i         12. Deck Joints       i       g. End Posts       i         13       i       i.       i.         13       i.       i.       i.         14       i.       i.       i.         15       i.       i.       i.         16. Pin & Hanger       i.       i.       i.         15       i.       i.       i.       i.         16. Diaphragms/ Cross Frames       i.       i.       i.       i.         a. Appr. Pavement condition       i1. Rivelts & Bolts       i.       i.       i.       i.         13. Member Alignment       i1.       i.					ys	+
12. Deck Joints       g. End Posts       k.         13						
13       13       6. Pin & Hanger       1         14       14       14       15       16         15       16       8. Cover Plates       16         9. Bearing Devices       17       10. Diaphragms/ Cross Frames       17         14. Appr. Pavement condition       11. Rivets & Bolts       11. Rivets & Bolts       11. Rivets & Bolts         15					nent	
14						
15						
APPROACHES       Def         10. Diaphragms/ Cross Frames       a. Appr. Pavement condition         11. Rivets & Bolts       a. Pedestals         b. Appr. Pavement condition       11. Rivets & Bolts         c. Stairs or Ramps       13. Member Alignment         14. Paint/ Coating       c. Columns         15.       15.         OVERHEAD SIGNS       (Y/N)         Year Painted:       f. Footings         Itatemet to image.       DEF         C. CullISION DAMAGE:       Please Explain         Nore()       More()       Moret()         Nore()       Moret()       Severe()         AAA ACCESSIBLE:       YN       Any Fracture Critical Member:         ANY Fracture Critical Member:       Any Gracks:       a. Piles         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS       Diagonal Bracing       c. Diagonal Bracing         NOTES:       UNDERMINING YN       If YES please explain				<i>m.</i>		+
APPROACHES       Def       10. Diaphragms/ Cross Frames       2. Piers or Bents         a. Appr. Pavement condition       11. Rivets & Bolts       1         b. Appr. Pavement settlement       12. Welds       1         c. Stairs or Ramps       13. Member Alignment       1         15.       14. Paint/ Coating       1         15.       15.       1         OVERHEAD SIGNS       (Y/N       Year Painted:       1         ittamete to brage.       DEF       COLLISION DAMAGE: Please Explain       6. Settlement         None()       Moor()       Moderate()       Severe()       1.         LOAD DEFLECTION:       Please Explain       1.       1.         None()       Moor()       Moderate()       Severe()       1.         AAA ACCESSIBLE:       Y/N       Any Fracture Critical Member:       a.       Pile Caps       1.         AND ACCESSIBLE:       Y/N       Any Gracks:       Image:       Image: </td <td>15</td> <td></td> <td></td> <td></td> <td></td> <td></td>	15					
a. Appr. Pavement condition       11. Rivets & Bolts       1         b. Appr. Pavement settlement       12. Welds       1         c. Stairs or Ramps       13. Member Alignment       1         d. Determine       13. Member Alignment       1         14. Paint/ Coating       1       1         15.       1       1         OVERHEAD SIGNS       (Y/N)       Year Painted:       1         (attached to bridge.       DEF       COLLISION DAMAGE:       Please Explain         Nore()       More()       Moderate()       Severe()         LOAD DEFLECTION:       Please Explain       1       1.         Nore()       More()       Moderate()       Severe()       1.         AAA ACCESS TO DISABLED       Any Fracture Critical Member:       1.       1.       1.       1.         ADA ACCESS IBLE: Y/N       Any Fracture Critical Member:       1.       1.       1.       1.       1.         ADM ACCESS IBLE: Y/N       Any Fracture Critical Member:       1.       1.       1.       1.       1.       1.         AD ACCESS IBLE: Y/N       Any Fracture Critical Member:       1.       1.       1.       1.       1.       1.       1.         AD ACCESS IBLE: Y/N <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
b. Appr. Pavement settlement       12. Welds       b. Caps         c. Stairs or Ramps       13. Member Alignment       c. Columns         14. Paint/ Coating       c. Columns       c. Columns         15.       15.       c. Stems/ Webs. Pier Walls       c. Columns         0VERHEAD SIGNS       (Y/N)       Year Painted:       c. Columns       c. Columns         16.       Year Painted:       c. Footings       c. Pointing       c. Columns         a. Condition of Welds       DEF       COLLISION DAMAGE: Please Explain       h. Settlement       c.         b. Condition of Bolts       DEF       LOAD VIBRATION: Please Explain       h. Settlement       c.         ACCESS TO DISABLED       Any Fracture Critical Member:       Any Gracks:       a. Pile Caps       c.         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS       b. Piles       c.       c. Diagonal Bracing       c.         NOTES:       WOTES:       UNDERMINING Y/N If YES please explain       COLLISION DAMAGE       wore()       Minor() Moderate() Severe()       UNDERMINING Y/N If YES please explain						
C. Stairs or Ramps       13. Member Alignment       1         14. Paint/ Coating       1         15.       1         OVERHEAD SIGNS       (Y/N)         Year Painted:       1         15.       1         16.       1         17.       Year Painted:         18.       Year Painted:         19.       Year Painted:         10.       Year Painted:         10.       Year Painted:         10.       Year Painted:         10.       Year Painted: <t< td=""><td></td><td></td><td></td><td></td><td>tals</td><td>+</td></t<>					tals	+
Image: Severe ()       Image: Severe ()         Image: Severe ()	the statement of the stat				de Antoi A	+
Image: Seven ()       Image: Seven ()         OVERHEAD SIGNS (Y/N ()       Year Painted: ()         DEF       COLLISION DAMAGE: Please Explain         a. Condition of Welds ()       None()         b. Condition of Signs ()       DEF         Condition of Signs ()       DEF         ACCESS TO DISABLED       None()         ADA ACCESSIBLE: Y/N ()       Any Fracture Critical Member:         Any Cracks:       Any Cracks:         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS       Diagonal Bracing         NOTES:       UNDERMINING Y/N (fryes please explain)         MOTES:       UNDERMINING Y/N (fryes please explain)	C. Stairs or Ramps					+
OVERHEAD SIGNS (Y/N)       Year Painted: <ul> <li>(attached to bridge;</li> <li>(b) Condition of Welds</li> <li>(c) Collision DAMAGE:</li> <li>(c) Diagonal Bracing</li> <li>(c) Collision DAMAGE:</li> <li>(c) Diagonal Bracing</li> <li>(c) Collision DAMAGE:</li> <li>(c) Miner() Moderate() Severe()</li> <li>(c) Collision DAMAGE:</li> <li>(c) Collision DAMAGE:</li> <li>(c) Miner() Moderate() Severe()</li> <li>(c) Diagonal Bracing</li> <li>(c) Collision DAMAGE:</li> <li>(c) Moderate() Severe()</li> <li>(</li></ul>						+
(attached to bridge)       DEF         a. Condition of Welds       DEF         b. Condition of Welds       DEF         c. Condition of Bolts       DEFLECTION:         c. Condition of Signs       None() Minor() Moderate() Severe()         LOAD VIBRATION:       Please Explain         None() Minor() Moderate() Severe()       J.         LOAD VIBRATION:       Please Explain         None() Minor() Moderate() Severe()       J.         ADA ACCESSIBLE:       Y/N         Any Fracture Critical Member:       Any Fracture Critical Member:         Any Cracks:       Any Cracks:         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS       D. Diles         FORM IS INCLUDED ON THE REVERSE SIDE.       UNDERMINING Y/N If YES please explain         NOTES:       UNDERMINING Y/N If YES please explain					and the second se	
a. Condition of Welds	OVERHEAD SIGNS (Y/N	Year Painted:		f. Footing	IS	
a. Condition of Welds		COLLISION DAMAGE: Pleas	se Explain	g. Piles		
b. Condition of Bolts	Annual of the contract of the second se		2.2		ment	
c. Condition of Signs						
ACCESS TO DISABLED       LOAD VIBRATION:       Please Explain         ACCESS TO DISABLED       Nome()       Moderate()       Severe()         ADA ACCESSIBLE: Y/N       Any Fracture Critical Member:       a. Pile Caps       a. Piles         Any Cracks:       Any Cracks:       b. Piles       c. Diagonal Bracing         FORM IS INCLUDED ON THE REVERSE SIDE.       e. Fasteners       UNDERMINING Y/N If YES please explain         NOTES:       UNDERMINING Y/N If YES please explain       COLLISION DAMAGE	c. Condition of Signs			j.		
ADA ACCESSIBLE: Y/N       Any Fracture Critical Member: Any Cracks:       a. Pile Caps         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS FORM IS INCLUDED ON THE REVERSE SIDE.       b. Piles         NOTES:       c. Diagonal Bracing         UNDERMINING Y/N       If YES please explain         COLLISION DAMAGE None()       Minor()						
ADA ACCESSIBLE: Y/N       Any Fracture Critical Member: Any Cracks:       a. Pile Caps         A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS FORM IS INCLUDED ON THE REVERSE SIDE.       b. Piles         NOTES:       c. Diagonal Bracing         UNDERMINING Y/N       If YES please explain         COLLISION DAMAGE None()       Minor()	ACCESS TO DISABLED	None ( ) Minor ( ) Moderate ( ) S	evere ( )	3. Pile Ber	nts	
A BREAKDOWN OF THE CRITERIA REQUIRED TO COMPLETE THIS FORM IS INCLUDED ON THE REVERSE SIDE. NOTES: C. Diagonal Bracing d. Horizontal Bracing e. Fasteners UNDERMINING Y/N If YES please explain COLLISION DAMAGE None() Minor() Moderate() Severe()	ADA ACCESSIBLE: Y/N	Any Fracture Critical Member:				
FORM IS INCLUDED ON THE REVERSE SIDE.       d. Horizontal Bracing         NOTES:       e. Fasteners         UNDERMINING Y/N       If YES please explain         COLLISION DAMAGE       None()         None()       Minor()		Any Cracks:		b. Piles		
NOTES:     e. Fasteners     Indexnining Y/N     If YES please explain       COLLISION DAMAGE       None()     Minor()     Moderate()						$\square$
UNDERMINING Y/N If YES please explain COLLISION DAMAGE None() Minor() Moderate() Severe()		ASE SIDE.				+
COLLISION DAMAGE None ( ) Minor ( ) Moderate ( ) Severe ( )	NOTES:			e. Fasten	ners	
None() Minor() Moderate() Severe()				UNDERMINI	NG Y/N If YES plea	ase explain
				COLLISION	DAMAGE	
				C. LANSING, M. D. DOLLARS,		Severe ( )
X = UNKNOWN N = NOT APPLICABLE H = HIDDEN R = REMOVED	X = UNKNOWN	N = NOT APPLICABLE				

# FIGURE A5 – Pedestrian Bridge Routine Inspection Form

Massach Bay Transpor		Commuter Rail	Bridges	Section III
Authority		Design Standards Manual		Appendix A
	Date March, 2009			Page A-7

Lift Buc Ladder Boat Wader Inspect	ket	BILITY (Y/N/P) Needed	Used Neede Staging	d Used						
Boat Wader Inspect		Needed	Staging	d Used						
Ladder Boat Wader Inspect										
Wader Inspect	1		Traffic Control							
Wader Inspect Rigging	2		RR Flagger							
	0 × E	0	Police							
			Other:							
	_									
		]	CONDITION RATING GUID	E (for Items 58, 59, 60)						
_	DE			DEFECTS						
	N 9	NOT APPLICABLE EXCELLENT	Excellent condition							
G	8	VERY GOOD	No Problems Noted.							
	7	GOOD	Some Minor Problems							
	6 5	SATISFACTORY	Structural elements show some minor deterioration. All primary structural elements are sound but may ha	we wind a setting to a set line of						
	5 4	FAIR POOR	All primary structural elements are sound but may have Advance section loss, deterioration, spalling, or scou		alling or scour.					
201	3	SERIOUS	Loss of Section, deterioration, spalling or scour have possible. Fatigue cracks in steel or sheet cracks in c	seriously affected primary structur	al components. Local failures are					
c :	2	CRITICAL	Advance deterioration of primary structural elements scour may have removed structural support. Unless	Fatigue cracks in steel or shear of						
c ·	1	"IMMINENT" FAILURE	corrective action is taken. Major deterioration or section loss present in critical : involving structural stability. Bridge is closed to traffi							
	0	FAILED	Out of Service. Beyond Corrective Repair.	but conective action may put it be	ack in light service.					
			DEFICIENCY REPORTING	GOIDE						
DEFICI			ucture that required corrective action							
		RIES OF DEFICIENCI leficiency -	ES. Deficiencies which are minor in nature, generally be repaired. Examples include but are not limite Minor scouring, Clogged drains, etc.							
<u>S= Severe/Major Deficiency</u> -			Deficiencies which are more extensive in nature and need more planning and effort to repair. Examples include but are not limited to: Moderate to major deterioration in concrete, Exposed and corroding rebars, Considerable settlement, Considerable scouring or undermining, Moderate to excessive corrosion to structural steel with measurable loss of section. etc							
<u>C-S= Cr</u>	ritica		A deficiency in a structural element of a bridge that poses an extreme unusual condition due to the failure or imminent failure of the element which will affect the structural integrity of the bridge.							
<u>C-H= C</u>	ritic		A deficiency in a component or element of a bridge that poses an extreme hazard or unsafe condition to the public, but does not impair the structural integrity of the bridge. Examples include but are not limited to : Loose concrete hanging down over traffic or pedestrians, A hole in the deck that may cause injuries to pedestrians, Missing section of bridge railing, etc							
	-	OF REPAIR:								
URGEN	VCY			21 22 29 20 11 20202 22202						
URGEN I = Imm		ate -	Inspector(s) immediately contact MBTA Bridge B	Engineer to report the Deficiency	and to receive further instruction					
<u>  = Imm</u>	nedia	ate -	Inspector(s) immediately contact MBTA Bridge B from him/ her. (Action/ Repair should be initiated by MBTA Mai							

FIGURE A5 – Pedestrian Bridge Routine Inspection Form									
	Massachusetts Bay Transportation		Commuter Rail	Bridges	Section III				
	Authority	OPERATIONS	Design Standards Manual		Appendix A				
		Date March, 2009			Page A-8				

		ROUTIN	E INSPI	ECTIC	<b>N</b>			
CITY/TOWN	8-ST	RUCTURE NO.		MILE PO	DINT	41-STATUS	INSPECTION DATE	
FACILITY CARRIED		MEMORIAL NAM	/IE/LOCAL N/	AME .	12	27-YR BUILT 106-Y	R REBUILT VERT. UN	DERCLEARANCE
-FEATURES INTERSECTED		26-FUNCTIONAL	CLASS.	QL	JALITY C	ONTROL ENGINEEI	R	
-STRUCTURE TYPE		22-OWNER	21-MAINTA	INER TE	AM LEA	DER		
7-DECK TYPE		WEATHER	TEMP. (air)	TE	AM MEM	IBERS		
ГЕМ 58	I U DI	VI 59				ITEM 60		
	SUP	ERSTRUCTURE	<u> </u>	╡ᆮ	DEF	SUBSTRUC	TURE	DEF
. Wearing Surface	1. S	tringers		⊣⊢		1. Abutmer	nts Dive This Rpt. Rpt.	
. Deck Condition	2. F	oorbeams		⊣⊢		a. Pedestals		
. Stay-in-place Forms		oor System Bra		⊣⊢		b. Bridge Sea c. Backwalls		
. Curbs	4. G	irders or Beams	50 E	┥┝		d. Breastwal	ls	
. Medians	5. T	russes-General				e. Wingwalls f. Slope Pavi		
. Sidewalks		. Upper Chords			_	g. Pointing		
. Parapets	t	. Lower Chords				h. Footings		
. Railings		. Web Members	_			i. Piles j. Scour		
. Anti-Missile Fence	c	. Lateral Bracings				k. Settlement		
0. Drainage System	6	. Sway Bracings			_	<u>I.</u> m.		
1. Lighting Standards		Portais				2. Piers or	Bents	
2. Utilities		. End Posts		_  -	_	a. Pedestals		
3. Deck Joints	6. P	ins/Hangers			_	b. Caps		
4.		onn Pit's, Gussets A	Ingles	⊣⊢		c. Columns d. Stems/Wei	halBiamualla	
5.		over Plates				e. Pointing	DSIFIErwalls	
6.	9. B	earing Devices		⊣⊢		f. Footing		
N/E S/W		Diaphragms/Cross I	Frames			g. Piles h. Scour		
	11.1	Rivets & Bolts		⊣⊢		i. Settlement		
n inches)		Velds		⊣⊢		j. k.		
PPROACHES	EF	Member Alignm	ent			3. Pile Ben	its	
Appr. pavement condition	14.1	Paint/Coating		⊣⊢		a. Pile Caps		
Appr. Roadway Settlement	15.			ᅴᄂ		b. Piles		
Appr. Sidewalk Settlement	Yea	r Painted:				c. Diagonal l d. Horizonta		
	and the second se	ISION DAMAGE: O Minor C	) Moderate (	) Savara	0	e. Fasteners	I Bracing	
26	None LOAI	DEFLECTION:	woderate C	J Severe		UNDERMINING	(Y/N) If YES please exp	plain
VERHEAD SIGNS (Y/N)	None		) Moderate (	) Severe	0	COLLISION DAM		
	EF LOAE None	O VIBRATION:	) Moderate (	) Severe	0	None O Mir	nor O Moderate C	) Severe
Condition of Welds						I-60 (Dive Report)	: 1-60 (T	his Report):
Condition of Bolts		Fracture Critica	I Member	(Y/N)		93b-U/W (DIVE)		
Condition of Signs	Any	Cracks : (Y/N)				930-01W (DIVE)		
X=UNKNOWN	N=NOT	APPLICABLE		H=HID	DEN/I	NACCESSIBLE	E R=RI	EMOVED

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ΓΥ/ΤΟ	OWN		B.I.N.	BR. DEPT. NO.	8-STRUCTURE NO.	PAGE 2 OF X INSPECTION DATE
HAN	<b>1 61</b> VEL &			ITEM 36 TRA 1. Bridge Railing	  FFIC SAFETY 36 COND DEF	Needed Used
HAN	VEL PF	ROTECTION Dive Rpt	This DEF	2. Transitions		Lift Bucket
. Cha	nnel S			3. Approach Guar		Boat
. Em	bankm	ent Erosion		4. Approach Guar	drail Ends	Wader
. Drif	t			WEIGHT POSTIN	G: Not Applicable	Inspector 50
. Veg	etatio	n		Actual Posting	H 3 3S2 SINGLE	Rigging Staging
. Util						Traffic Control
		ope Protection		Recommended Posting		RR Flagger
	radati		<u> </u>	Waived Date:	EJDMT Date:	Police
. ren	der Sy	rstem			At bridge Other Advanc	e
			<b>—</b>	Signs in Place (Y=Yes N=No)		
				Legibility/		11
				Visibility CLEARANCE POS	TING: N/E S/W	TOTAL HOURS:
TREAN dal	O Hig	VELOCITY: gh O Medium O Lo	w 0	Not Applicable		PLANS: (Y/N)
				Posted Clearance	At bridge Other Advanc	e (V.C.R.): (Y/N)
I (Dive	Report):	I-61 (This Re	port):	Signs in Place	N/E S/W N/E S/W	TAPE #:
ь <i>Ш</i>	VINCO	DATE		(Y=Yes N=No)		List of Field Tests Performed:
0 0/1	, mor			Legibility/ Visibility		
ATIN ating F ate:	a. Report (		uest for Ratin son:	g or Rerating (Y/N)	High O Medium C Lo	w O
			CON	DITION RATING GU	IDE (for Items 58, 59, 60)	
	CODE	CONDITION		DE	FECTS	
-	N	NOT APPLICABLE	Excellent condition.			
G	9 8	EXCELLENT VERY GOOD	No problem noted.			
G	7	GOOD	Some minor problem	ns.		
F	6	SATISFACTORY	Structural elements	show some minor deterioration		
F	5	FAIR	All primary structura	l elements are sound but may	have minor section loss, cracking, spalling or si	cour.
Ρ	4	POOR	Advanced section lo	oss, deterioration, spalling or se	cour.	
Ρ	3	SERIOUS				
С	2	CRITICAL				
С	1	"IMMINENT" FAILURE				
	0	FAILED				
				DEFICIENCY REP	ORTING GUIDE	
	ENCY:					
ATEG	URIES	OF DEFICIENCIES:				
RGE	ICY OF	REPAIR:				
Imme	ediate -	FREPAIR: [Inspector(s) immediat	ely contact District Br be initiated by District	ridge Inspection Engineer (DBI Maintenance Engineer or the	<li>E) to report the Deficiency and to receive further Responsible Party (if not a State owned bridge)</li>	er instruction from him/her]. upon receipt of the Inspection Report].

# FIGURE A6 – Highway Bridge Routine Inspection Form

Massachusetts Bay Transportation		Commuter Rail	Bridges	Section III
Authority	OPERATIONS	Design Standards Manual		Appendix A
	Date March, 2009			Page A-10

		IVERS ACTIV					
CITY/TOWN	8-STRUCT	URE NO.	LEVEL OF IN	SP.	93b-INSPECTION	N DATE	
ACILITY CARRIED	ACCESS T	O BRIDGE	UNDERWAT	ER OPERATIONS E	NGINEER		
FEATURES INTERSECTED	DEPTH	VISIBILITY	TEAM LEADER (	DIVE MASTER)	Report submi	itted by:	
TTOM CONDITION	CURRENT	TEAM MEMBERS					
TEM 60 (Underwater)	TIEM	[ 61		ITEN	1 62		
SUBSTRUCTURE		NEL & NEL PROTECTION		CULV	ERTS	DEF	
. Abutments	1.000	annel Scour		DEF 1. Ro		+	-11
a. Pedestals		bankment Erosio	on .	2. Flo			-11
b. Bridge Seats	3. Dri			3. W	alis eadwall	+	-11
c. Backwalls		getation			ingwall	┼─┨┝──	11
d. Breastwalls	5. Uti			6. Pi			
e. Wingwalls	6. Rip	-Rap/Slope Prote	ction		otective Coating		
f. Slope Paving/Rip-Rap		7. Aggradation			nbankment		
g. Pointing		8. Fender System			earing Surface		
h. Footings		a. Piles			Railing		
i. Piles		b. Diagonal Bracing c. Horizontal Bracing			Bidewalks	┿┥┝━	-11
j. Scour		Vales	9		Itilities /lember Alignment	+	-11
k. Settlement		asteners			Deformation	+ + + -	
I. Piers or Bents		adders			Cour	+ + + + + + + + + + + + + + + + + + +	
					Settlement		
a. Pedestals	TIBM	59 SUPERSTRU	CTURE				
b. Caps		to any part done by					
c. Columns d. Stems/Webs/Pierwalls							-1
e. Pointing					ERMINING (Y=Yes	/ N=No)	
f. Footing	—  <b> </b> —		DEFICIENC	Y REPORTING	GUIDE		
g. Piles	DEE	ICIENCY: A defec	tin a structure that re	quires corrective ac	ction.		٦I
h. Scour	CAT	EGORIES OF DEF					
i. Settlement	M= 1		and could easily be repaired	or in nature, generally do I. Examples include but	o not impact the structural integ are not limited to: Spalled conci	rity of the bridge rete, Minor	
j.	S= S		scouring, etc. hcy - Deficiencies which a	re more extensive in natu	ure and need more planning an	d effort to repair.	
k.			Examples include bu and corroding reban	t are not limited to: Mode , Deteriorated timber pile	erate to major deterioration in c es, Considerable settlement, C	oncrete, Exposed	
. Pile Bents	C-S=	Critical-Structural I	scouring or underm Deficiency - A deficienc	y in a structural element of	of a bridge that poses an extren	ne unsafe	
a. Pile Caps			condition d structural i	ue to the failure or immin- ntearity of the bridge.	ent failure of the element which	will affect the	
b. Piles	C-H=	= Critical-Hazard De	ficiency - A deficiency i unsafe condi	n a component or elemen ion to the public, but doe	nt of a bridge that poses an extr is not impair the structural integ	reme hazard or grity of the bridge.	
c. Diagonal Bracing			Examples inc	lude but are not limited to	<ul> <li>Any part of piles or fender systems</li> <li>safety hazard for the navigation</li> </ul>	stem which are	
d. Horizontal Bracing	URG	SENCY OF REPAIL	<b>?</b> :		gineer (DBIE) to report the Def		
e. Fasteners		receive fur	ther instruction from him/he	].	enance Engineer or the Respo		
		•	not a State owned bridge	upon receipt of the Inspe	ection Report].		
UNDERMINING (Y=Yes / N=No)	P= P	rioritize - [Shall be pr and repairs	ioritized by District Mainten made when funds and/or m	ance Engineer or the Re anpower is available].	sponsible Party (if not a State of	owned bridge)	
X=UNKNOWN	N=NOT APP		H=HIDDE	N/INACCESSI	BLE R=	REMOVED	
E-P1(V3)-4/98							

#### FIGURE A7 – Divers Activity Report (Underwater Inspection) Form

Massachusetts Bay Transportation		Commuter Rail	Bridges	Section III
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CITY	Y/TOWN		8-STF	UCTURE NO.		1-MILE POST/	T ID. 9	90-ROUT	INE INS	P. DATE	93a-F.C. IN:	SP. DATE
-FACILITY CARRIED MEMORIAL NAME/LOCAL NAME 27-YR BUILT   106-YR REBUILT   YR REHAB'D (NON 106)							B'D (NON 106)					
06-FEATURES INTERSECTED 26-FUNCTIONAL CLASS. QUALITY CONTROL ENGINEER												
-STI	RUCTURE TYPE			22-OWNER	21-MAINTAR	VER TEAM LE	ADER					
107-DECK TYPE WEATHER TEMP. (air) TEAM MEMBERS												
//-D	lokiiite			WEATHER	TEMT. (all)	TEAM ME	MDER	3				
	Applicable	Actual Po Recomment Waived D	nded Posting	E80 F40PH	SINGLE	C	Signs ir Y=Yes N _egibil /isibility	ity/		At bridge		NIE SW
	TING: ng Report (Y/N):		led out by DBIE, est for Ratir	ig or Rerating	(Y/N):	If YES please	give pri	ority:		PLA	NS:	(Y/N)
Date		Reaso	on:							(V.C	C.R.): = #:	(Y/N)
FRA	ICTURE CRITICAL ME	EMBER(										
	MEMBER	CRACK (Y/N)	WELD'S CONDITION (0-9)	LOCATION OF COL COLLISION DAM	RROSION, SECTIO AGE, STRESS CON			COND PREVIOUS 9			OF MEMBER	Deficiencies
4												
3												
;												
5												
E												
List	of field tests performed:						h) Here			Condition (ondition)	8	
	<b>ICIENCY:</b> A defect in a structure Minor Deficiency-	Deficier	icies which are mir	or in nature, generally d ot holes, Minor corrosio				nd could ea	sily be rep	aired. Examp	eles include but a	are not limited to:
S= Se	evere/Major Deficiency-	Deficien	cies which are mo	re extensive in nature an rroding rebars, Consider	d need more planning	and effort to repair.	Example					
	Critical-Structural Deficiency	A defici	ency in a structura of the bridge.	element of a bridge tha								
Н=	<ul> <li>Critical-Hazard Deficiency-</li> </ul>	Example		nt or element of a bridge ot limited to: Loose co								
I = In A = A	As soon as possible- (Action	Repair should	be initiated by Dis	et Bridge Inspector Eng trict Maintenance Engin nce Engineer or the Res	eer or the Responsible	Party (If not a State	owned l	bridge) upo	n receipt o	f the Inspect	ion Report).	le).
P = P			No. C	PPLICABLE		I=HIDDEN/						MOVED

# FIGURE A8 – Fracture Critical Inspection Form

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CITY/TOWN	B.I.N.	BR. DEPT. NO.	8 - STRUCTURE NO.	INSPECTION DATE	NO. X OF
		REMARK	S & PHOTOS	1	
Ļ					

# FIGURE A9 – Standard Remarks & Photos Page

Bay	chusetts		Commuter Rail	Bridges	Section III
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ITY/TOWN	B.I.N.	BR. DEPT. NO.	8 - STRUCTURE NO.	INSPECTION DATE
	F	TIGUE SE	NSITIVE DETAILS	
FATIGUE SENSI	TIVE DETAILS (	FSD):		
DESCRIPTION:				
QUANTITY OF F	SD TYPES:			
Notes: 1. See attach	ed sheets for descrip	tion of Fatigue S	ensitive Details	
2. Refer to	sketches and photos	tor locations of I	racture Critical Members a	nd Fatigue Sensitive Details

# FIGURE A10 – Standard Fatigue Sensitive Details Page

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# **APPENDIX B**

Bridge Rating Example Summary Table

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# Bridges

# SUMMARY OF BRIDGE RATING

# TOWN/CITY:

# BRIDGE NO.: MILE POINT:

CARRIES:

STRUCTURE NO.:

OVER: BIN NO.:

# **RATINGS**

	NORMAL	MAXIMUM
F40PH (280K) Modified		
263K Rail Car		
AREMA Cooper E-80		



Bridge Engineer

Date

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# Bridges

# **BREAKDOWN OF BRIDGE RATING**

# TOWN/CITY:

BRIDGE NO .:

MILE POINT:

CARRIES:

OVER:

STRUCTURE NO.:

BIN NO.:

BRIDGE COMPONENT		NORMAL		MAXIMUM		
	F40PH (280K) Modified	263K Rail Car	AREMA Cooper E-80	F40PH (280K) Modified	263K Rail Car	AREMA Cooper E-80
		0	200			200

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# **BREAKDOWN OF BRIDGE RATING - FATIGUE**

TOWN/CITY:

BRIDGE NO.:

MILE POINT:

CARRIES:

OVER:

STRUCTURE NO.:

BIN NO.:

BRIDGE COMPONENT		NORMAL		MAXIMUM		
	F40PH (280K) Modified	263K Rail Car	AREMA Cooper E-80	F40PH (280K) Modified	263K Rail Car	AREMA Cooper E-80
		0	200			200

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