TOWN OF WILMINGTON

DEPARTMENT OF PUBLIC WORKS

Highway	Water & Sewer	Engineering
Tree	Parks & Grounds	Cemetery

Interoffice Memorandum

TO: Jeffrey M. Hull, Town Manager

CC:

FROM: Paul M. Alunni, PE, Town Engineer
Jamie M. Magaldi, PE, Operations Manager
Michael J. Woods, Director of Public Works

SUBJECT: Butters Row Bridge Review
MassDOT Bridge No. W-38-003

DATE: May 4, 2017

Per your request, the Department of Public Works (DPW) has performed a review of known record information for the Butters Row Bridge (MassDOT Bridge No. W-38-003). This bridge is owned by the Massachusetts Department of Transportation (MassDOT); thus is inspected, operated, and maintained by MassDOT.

Bridge Background and History

The Butters Row Bridge is a single lane bridge constructed c.1920 that carries Butters Row traffic over the Massachusetts Bay Transportation Authority (MBTA) Railroad. The bridge deck is approximately 15.5 FT wide with an overall traveled road width of 13.5 FT. There are no sidewalks located along the bridge however there is a chain link fence mounted to a timber curb along either side of the bridge. Two (2) convex mirrors exist on both sides of the bridge for visibility and safety, as approach grades limit sight distance and the bridge width only allows one vehicle to pass at a time.

The bridge structure consists of wood plank deck on timber stringers, supported by timber peirs. The bridge abutments are constructed of concrete. An asphalt wearing surface exists over the wood plank decking. **The bridge is currently posted for five (5) tons (or 10,000 lbs).**

The bridge underwent reconstruction in 1987 which included replacement of the wood plank deck and a third span added to the eastern edge of the bridge. A more recent log of work performed by MassDOT includes:

December 2011 - Timber decking replaced.
June 2012 – Asphalt wearing course replaced over wood deck
September 2013 – Repair of asphalt wearing course

MassDOT Bridge Inspection Overview

MassDOT performs bridge inspections using a statewide unified system as dictated by the "MassDOT Bridge Inspection Handbook" (referred herein as the Handbook), which meets the requirements of National Bridge Inspection Standards (NBIS) and supplements the requirements of the Federal Highway Administration (FHWA).

Inspection of bridge structure components fall into three (3) main categories:

1. Deck – this includes wearing surface, decking, curbs, and railing.
2. Superstructure – this includes the timber stringers, and timber beams
3. Substructure – this includes the concrete bridge abutments, and timber piers.

As part of a bridge inspection, a condition rating is given to each main component. The following is the MassDOT condition rating guide:

Code	Condition	Defects
9	Excellent	
8	Very Good	No problem noted.
7	Good	Some minor problems.
6	Satisfactory	Structural elements show some minor deterioration.
5*	**Fair**	**All primary structural elements are sound, but may have minor section loss, cracking, spalling or scour.**
4**	**Poor**	**Advance section loss, deterioration, spalling or scour.**
3	Serious	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks may be present.
2	Critical	Advance deterioration of primary structural elements….unless closely monitored it may be necessary to close the bridge until corrective action is taken
1	Imminent Failure	….Bridge is closed to traffic but corrective action may put it back in light service.
0	Failed	Out of Service – beyond corrective action.

*** According to most recent bridge inspection performed December 20, 2016, the Butters Row Bridge Deck, and Substructure, were each given an overall condition rating of "Fair".**

**** According to most recent bridge inspection performed December 20, 2016, the Butters Row Superstructure was given an overall condition rating of "Poor".**

MassDOT bridges are inspected according to an inspection cycle. The frequency of inspection is dependent upon the condition rating given for the bridge:

- Routine Inspections: These types of inspections are considered "hands on" and as such are defined as inspections within an arm's length of viewing. These types of inspections are due in intervals not to exceed 24 months.

- Special Member Inspections: These types of inspections are required when any part of the inspection covering the deck, superstructure, or substructure are rated 4 (Poor) or less. **Where the part is rated a 4, inspection frequency is 1 year** (***Note: Butters Row Bridge currently falls into this category)***. When any part is rated below 4, inspection frequency is every 6 months.

Status of Butters Row Bridge – W-38-003 (Based on MassDOT Inspection Reports)

The bridge was given a special member inspection in June of 2016 (enclosed herewith). Review of the inspection report indicates the bridge deck and substructure received an overall "fair" condition rating, while the bridge superstructure received an overall "poor" rating. The report also indicates that the wearing surface and timber curbing received a "poor" rating.

This June 2016 inspection report also includes the following remarks:

- Wearing Surface – Large areas of missing bituminous overlay throughout.
- Deck Condition – In all three spans, all bays have areas of checking, splitting, and rotting….all bays have random steel tie rods/nails popping out of the underside face.
- Timber Beams – All beams have moderate longitudinal splitting, up to ¼" wide, with areas of moderate checking, dampness, and efflorescence…all beams have steel tie rods/nails popping out of both faces.

In December of 2016, a Special Damage Inspection was performed as the result of a minor train strike. According to MassDOT, cargo tied atop a freight car likely contacted the timber stringers and beams on the superstructure. **The December 2016 inspection report was the last inspection performed on the bridge, and states that the overall component ratings remained unchanged from the June 2016 inspection (previous and present conditions are rated as a 4 and 5).**

Per a recent discussion with the MassDOT District 4 Bridge Engineer, MassDOT intends to perform the following work in the 2017 construction season:

- **Remove and replace sections of timber decking;**
- **Resurface wearing course.**

The bridge is currently not in any replacement program.

MassDOT Bridge Posting – W-38-003

In April 1995, MassDOT completed a rating report for the Butters Row Bridge. **Based upon the condition of the bridge, the bridge is posted for five (5) tons (or 10,000 lbs).** As a reference, this would include, two axle, Class 1, light duty vehicles such as passenger vehicles, light pickup trucks, motorcycle (with no side car), and vans.

Enclosures (1)

STRUCTURES INSPECTION FIELD REPORT

ROUTINE & SPECIAL MEMBER INSPECTION

2-DIST	B.I.N.	BR. DEPT. NO.
04	2NV	W-38-003

CITY/TOWN	8.-STRUCTURE NO.	11-Kilo. POINT	41-STATUS	90-ROUTINE INSP. DATE
WILMINGTON	W38003-2NV-DOT-634	000.000	P:POSTED	JUN 19, 2016

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	YR REHAB'D (NON 106)
HWY BUTTERS ROW		1920	1987	0000

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	DIST. BRIDGE INSPECTION ENGINEER
RR MBTA/BMRR	Urban Collector	T. G. Weil

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER
702 : Timber Stringer/Girder	State Highway Agency	State Highway Agency	A. Labib

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
8 : Timber	Clear	28°C	J. ROY, J. DIDEO

ITEM 58 — DECK: 5

		DEF
1. Wearing surface	4	S-A
2. Deck Condition	5	S-A
3. Stay in place forms	N	-
4. Curbs	4	S-A
5. Median	N	-
6. Sidewalks	N	-
7. Parapets	N	-
8. Railing	5	S-A
9. Anti Missile Fence	N	-
10. Drainage System	N	-
11. Lighting Standards	N	-
12. Utilities	N	-
13. Deck Joints	N	-
14.	N	-
15.	N	-
16.	N	-

CURB REVEAL (In millimeters)	N	S
	480	480

APPROACHES

		DEF
a. Appr. pavement condition	6	M-P
b. Appr. Roadway Settlement	5	S-A
c. Appr. Sidewalk Settlement	N	-
d.	N	-

OVERHEAD SIGNS (Attached to bridge) (Y/N): N

		DEF
a. Condition of Welds	N	-
b. Condition of Bolts	N	-
c. Condition of Signs	N	-

ITEM 59 — SUPERSTRUCTURE: 4

		DEF
1. Stringers	N	-
2. Floorbeams	N	-
3. Floor System Bracing	N	-
4. Timber Beams	4	S-A
5. Trusses - General	N	-
a. Upper Chords	N	-
b. Lower Chords	N	-
c. Web Members	N	-
d. Lateral Bracing	N	-
e. Sway Bracings	N	-
f. Portals	N	-
g. End Posts	N	-
6. Pin & Hangers	N	-
7. Conn Plt's, Gussets & Angles	N	-
8. Cover Plates	N	-
9. Bearing Devices	N	-
10. Diaphragms/Cross Frames	N	-
11. Rivets & Bolts	N	-
12. Welds	N	-
13. Member Alignment	7	-
14. Paint/Coating	N	-
15.	N	-

Year Painted	N

COLLISION DAMAGE: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

LOAD DEFLECTION: *Please explain*
None ( ) Minor ( ) Moderate (X) Severe ( )

LOAD VIBRATION: *Please explain*
None ( ) Minor ( ) Moderate ( ) Severe (X)

Any Fracture Critical Member: **(Y/N)** N

Any Cracks: **(Y/N)** N

ITEM 60 — SUBSTRUCTURE: 5

	Dive	Cur		DEF
1. Abutments			5	
a. Pedestals	N	N		-
b. Bridge Seats	N	6		S-A
c. Backwalls	N	6		M-P
d. Breastwalls	N	5		M-P
e. Wingwalls	N	5		M-P
f. Slope Paving/Rip-Rap	N	N		-
g. Pointing	N	N		-
h. Footings	N	H		-
i. Piles	N	N		-
j. Scour	N	N		-
k. Settlement	N	7		-
l.	N	N		-
m.	N	N		-
2. Piers or Bents			5	
a. Pedestals	N	N		-
b. Caps	N	6		M-P
c. Columns	N	5		S-A
d. Stems/Webs/Pierwalls	N	N		-
e. Pointing	N	N		-
f. Footing	N	6		M-P
g. Piles	N	N		-
h. Scour	N	N		-
i. Settlement	N	7		-
j.	N	N		-
k.	N	N		-
3. Pile Bents			N	
a. Pile Caps	N	N		-
b. Piles	N	N		-
c. Diagonal Bracing	N	N		-
d. Horizontal Bracing	N	N		-
e. Fasteners	N	N		-

UNDERMINING (Y/N) If YES please explain: N

COLLISION DAMAGE:
None (X) Minor ( ) Moderate ( ) Severe ( )

SCOUR: *Please explain*
None (X) Minor ( ) Moderate ( ) Severe ( )

I-60 (Dive Report): N *I-60 (This Report):* 5

93B-U/W (DIVE) Insp 00/00/00

X=UNKNOWN N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE R=REMOVED

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

ITEM 61 — CHANNEL & CHANNEL PROTECTION: N

	Dive	Cur	DEF
1.Channel Scour	N	N	-
2.Embankment Erosion	N	N	-
3.Debris	N	N	-
4.Vegetation	N	N	-
5.Utilities	N	N	-
6.Rip-Rap/Slope Protection	N	N	-
7.Aggradation	N	N	-
8.Fender System	N	N	-

STREAM FLOW VELOCITY:
Tidal ( ) High ( ) Moderate ( ) Low ( ) None (X)

ITEM 61 (Dive Report): N ***ITEM 61 (This Report):*** N

93b-U/W INSP. DATE: 00/00/00

ITEM 36 — *TRAFFIC SAFETY*

	36	COND	DEF
A. Bridge Railing	0	5	S-A
B. Transitions	0	7	-
C. Approach Guardrail	1	4	S-A
D. Approach Guardrail Ends	0	6	M-P

WEIGHT POSTING — *Not Applicable* ☐

	H	3	3S2	Single
Actual Posting	05	05	05	05
Recommended Posting	05	05	05	05

Waived Date: 00/00/00 **EJDMT Date:** 00/00/00

	At bridge E	At bridge W	Other Advance E	Other Advance W
Signs In Place (Y=Yes,N=No, NR=NotRequired)	Y	Y	Y	Y
Legibility/ Visibility	7/7	7/1	7/7	7/7

CLEARANCE POSTING

	N ft	N in	S ft	S in	meter
Not Applicable X					
Actual Field Measurement		0		0	
Posted Clearance		0		0	

	At bridge N	At bridge S	Advance N	Advance S
Signs In Place (Y=Yes,N=No, NR=Not Required)				
Legibility/ Visibility				

ACCESSIBILITY (Y/N/P)

	Needed	Used
Lift Bucket	N	N
Ladder	Y	Y
Boat	N	N
Waders	N	N
Inspector 50	N	N
Rigging	N	N
Staging	N	N
Traffic Control	N	Y
RR Flagger	Y	N
Police	N	N
Other:		
	N	N

TOTAL HOURS 24

PLANS (Y/N): Y

(V.C.R.) (Y/N): N

TAPE#: _____

List of field tests performed:

RATING

Rating Report (Y/N): Y

Date: 01/01/1995

Inspection data at time of existing rating
I 58: **6** I 59: **6** I 60: **5** Date : 06/01/1994

(To be filled out by DBIE)
Request for Rating or Rerating (Y/N): Y

If YES please give priority: HIGH (X) MEDIUM ( ) LOW ( )

REASON: Advanced deterioration throughout primary superstructure element.

CONDITION RATING GUIDE (For Items 58, 59, 60 and 61)

	CODE	CONDITION	DEFECTS
	N	NOT APPLICABLE	
G	9	EXCELLENT	Excellent condition.
G	8	VERY GOOD	No problem noted.
G	7	GOOD	Some minor problems.
F	6	SATISFACTORY	Structural elements show some minor deterioration.
F	5	FAIR	All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
P	4	POOR	Advance section loss, deterioration, spalling or scour.
P	3	SERIOUS	Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
C	2	CRITICAL	Advance deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
C	1	"IMMINENT" FAILURE	Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stablility. Bridge is closed to traffic but corrective action may put it back in light service.
	0	FAILED	Out of service - beyond corrective action.

DEFICIENCY REPORTING GUIDE

DEFICIENCY: A defect in a structure that requires corrective action.

CATEGORIES OF DEFICIENCIES:

M= Minor Deficiency - Deficiencies which are minor in nature, generally do not impact the structural integrity of the bridge and could easily be repaired. Examples include but are not limited to: Spalled concrete, Minor pot holes, Minor corrosion of steel, Minor scouring, Clogged drainage, etc.

S= Severe/Major Deficiency - 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 corroded rebars, Considerable settlement, Considerable scouring or undermining, Moderate to extensive corrosion to structural steel with measurable loss of section, etc.

C-S= Critical Structural Deficiency - A deficiency in a structural element of a bridge that poses an extreme unsafe condition due to the failure or imminent failure of the element which will affect the structural integrity of the bridge.

C-H= Critical Hazard Deficiency - 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 a sidewalk that may cause injuries to pedestrians, Missing section of bridge railing, etc.

URGENCY OF REPAIR:

I = Immediate- [Inspector(s) immediately contact District Bridge Inspection Engineer (DBIE) to report the Deficiency and to receive further instruction from him/her].

A = ASAP- [Action/Repair should be initiated by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) upon receipt of the Inspection Report].

P = Prioritize- [Shall be prioritized by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

STRUCTURES INSPECTION FIELD REPORT

ROUTINE & SPECIAL MEMBER INSPECTION

2-DIST	B.I.N.	BR. DEPT. NO.
04	2NV	W-38-003

CITY/TOWN	8.-STRUCTURE NO.	11-Kilo. POINT	90-ROUTINE INSP. DATE	93*-SPEC. MEMB. INSP. DATE
WILMINGTON	W38003-2NV-DOT-634	000.000	Jun 19, 2016	Jun 19, 2016

07-FACILITY CARRIED	MEMORIAL NAME/LOCAL NAME	27-YR BUILT	106-YR REBUILT	*YR REHAB'D (NON 106)
HWY BUTTERS ROW		1920	1987	0000

06-FEATURES INTERSECTED	26-FUNCTIONAL CLASS	DIST. BRIDGE INSPECTION ENGINEER
RR MBTA/BMRR	Urban Collector	T. G. Weil

43-STRUCTURE TYPE	22-OWNER	21-MAINTAINER	TEAM LEADER
702 : Timber Stringer/Girder	State Highway Agency	State Highway Agency	A. Labib

107-DECK TYPE	WEATHER	TEMP. (air)	TEAM MEMBERS
8 : Timber	Clear	28°C	J. ROY, J. DIDEO

WEIGHT POSTING — *Not Applicable* ☐

	H	3	3S2	Single
Actual Posting	05	05	05	05
Recommended Posting	05	05	05	05

Waived Date: 00/00/00 EJDMT Date: 00/00/00

Signs In Place (Y=Yes,N=No, NR=Not Required) / **Legibility/ Visibility**

	At bridge E	At bridge W	Advance E	Advance W
Signs In Place	Y	Y	Y	Y
Legibility/ Visibility	7/7	7/1	7/7	7/7

PLANS (Y/N): Y

(V.C.R.) (Y/N): N

TAPE#: _____

RATING

Rating Report (Y/N): Y Date: 01/01/1995

Inspection data at time of existing rating

I 58: 6 I 59: 6 I 60: 5 I 62: - Date : 06/01/1994

Request for Rating or Rerating (Y/N): Y

If YES please give priority: HIGH (X) MEDIUM ( ) LOW ( )

REASON: Advanced deterioration throughout primary superstructure element.

SPECIAL MEMBER(S):

	MEMBER	CRACK (Y/N):	WELD'S CONDITION (0-9)	LOCATION OF CORROSION, SECTION LOSS (%), CRACKS, COLLISION DAMAGE, STRESS CONCENTRATION, ETC.	CONDITION PREVIOUS (0-9)	CONDITION PRESENT (0-9)	INV. RATING OF MEMBER FROM RATING ANALYSIS H-20	3	3S2	Deficiencies
A	Item 59.4 - Timber Beams	N	N	See remarks in comments section.	5	4	5	10	8	S-A
B										
C										
D										
E										

List of field tests performed:

	I-58	I-59	I-60	I-62
(Overall Previous Condition)	5	5	6	-
(Overall Current Condition)	5	4	5	-

DEFICIENCY: A defect in a structure that requires corrective action.

CATEGORIES OF DEFICIENCIES:

M= Minor Deficiency - Deficiencies which are minor in nature, generally do not impact the structural integrity of the bridge and could easily be repaired. Examples include but are not limited to: Spalled concrete, Minor pot holes, Minor corrosion of steel, Minor scouring, Clogged drainage, etc.

S= Severe/Major Deficiency - 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 corroded rebars, Considerable settlement, Considerable scouring or undermining, Moderate to extensive corrosion to structural steel with measurable loss of section, etc.

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URGENCY OF REPAIR:

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A = ASAP- [Action/Repair should be initiated by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) upon receipt of the Inspection Report].

P = Prioritize- [Shall be prioritized by District Maintenance Engineer or the Responsible Party (if not a State owned bridge) and repairs made when funds and/or manpower is available].

X=UNKNOWN **N=NOT APPLICABLE** **H=HIDDEN/INACCESSIBLE** **R=REMOVED**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

REMARKS

BRIDGE ORIENTATION

The three span structure carries Butter Row over the MBTA/BMRR. According to the bridge plans, the abutments are labeled West and East. The spans and trestles are numbered from west to east. The timber beams are numbered 1-23 simultaneously from north to south in each span. **See Sketch 1.**

GENERAL REMARKS

All bridge orientation information was found in the 1995 rating report. The bridge was originally a two span structure. The East span was added in 1987, and the deck was replaced. Bridge Inspection currently does not have plans for the 1987 reconstruction.

The west elevation "At Bridge" Weight Posting Sign is hidden by vegetation. **See photo 1.**

For the purposes of this report, the two trestles are labeld as Piers 1 and 2.

ITEM 58 - DECK

Item 58.1 - Wearing surface

There are large areas of missing bituminous overlay throughout. **See photo 2.**

Item 58.2 - Deck Condition

In all three spans, all bays have areas of checking, splitting, and rotting, with moderate efflorescence. **See photo 3.**

There are sings of active leakage throughout all bays.

All bays have random steel tie rods/nails popping out of the underside face.

In span 1, bays 5 & 7 have charred areas from previously noted fire damage.

Item 58.4 - Curbs

Both curbs have numerous areas of collision damage with loose planks and connections. **See photos 4 & 5.**

There are several planks leaning into the roadway along the full length of both curbs. **See photo 6.**

Item 58.8 - Railing

Both fences have areas of broken and loose connections. There are random areas of rust throughout. **See photo 7.**

APPROACHES

Approaches a - Appr. pavement condition

Both approach roadways have ares of moderate mapcracking.

Approaches b - Appr. Roadway Settlement

The east approach has washout/settled areas at both corners of the abutmetns. **See photo 8.**

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WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

REMARKS

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Timber Beams
In all three spans, all beams have moderate longitudinal splitting, up to 1/4" wide, with areas of moderate checking, dampness, and efflorescence. **See photo 9.**

Span 1:
All beams have steel tie rods/nails popping out of both faces. **See photo 10.**

Beams 3 and 4 show signs of crushing and crippling at the west end, up to 3/4 of the beam length. Both beams have moderate deflection and vibrating during heavy live loads.

Beam 6 has large aras of moderate checking, splitting, and rotting throughout all faces.

Beam 8 has planks popping out along the bottom face at the west end, 3' long x 6" high.

Span 2:
All beams have areas of checking. **See photo 11.**

All beams have random steel tie rods/nails popping out and bulging throughout both faces.

Span 3:
All beams have random steel tie rods popping out of both faces. **See photo 12.**

Beams 17, 18, 20, and 21 have moderate longitudinal checking, up to 1/4" wide, starting at the west end to mid-length.

Beams 20 and 21 show signs of crippling and splitting at the west end (At Trestle 2). **See photo 13.**

SuperStructure Load Deflection Notes
There is moderate load deflection during heavy live loads.

SuperStructure Load Vibration Notes
There is moderate to severe vibration during heavy live loads. See Item 59.4 - Beams.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments
Item 60.1.b - Bridge Seats
Both bridge seats are mostly covered with debris.

Item 60.1.c - Backwalls
Both breastwalls have large areas inaccessible due to debris along the bridge seats.

All visible areas have moderate scaling and efflorescence throughout.

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

REMARKS

Item 60.1.d - Breastwalls
Both breastwalls have areas of scaling and delamination throughout. **See photo 14.**

The west breastwall has areas of moderate spalling and scaling throughout, up to 4" deep. **See photo 15.**

The east breastwall has a full height vertical crack at both ends, up to 1/4" wide. **See photo 16.**

Item 60.1.e - Wingwalls
There is a washout area behind the northeast wingwall. See Item b.Approach Roadway Settlement.

Item 60.2 - Piers or Bents
Item 60.2.b - Caps
Both piers have areas of moderate checking and splitting throughout both faces of the cap.

At Pier 1, there area areas of fired damage noted in previous reports.

Item 60.2.c - Columns
All columns have areas of checking and rotting.

Pier 1:
Columns 1 & 3 have full height splits throughout both faces, up to 1/2" wide.

Column 1 has moderate rotting and checking along the edges, up to full height. **See photo 17.**

Pier 2:
Columns 1 & 4 have numerous full height splits throughout both faces, up to 1/2" wide. **See photo 18.**

Item 60.2.f - Footing
The exposed footing has areas of minor scaling.

TRAFFIC SAFETY

Item 36a - Bridge Railing
Both bridge rails consist of chainlink fences mounted onto the deck panels. See Item 58.8 - Railing.

Item 36b - Transitions
All four corners consist of w-beam panels mounted on steel posts and spacers, with boxing glove type ends at the bridge rail corners; not tied.

Item 36c - Approach Guardrail
All four corners consist of w-beam panels mounted on steel posts and spacers.

There is moderate damage at both east corners and the southwest corner. **See photos 19 & 20.**

Item 36d - Approach Guardrail Ends
All four corners have boxing glove type ends.

All four corners have minor damage and scrapes. **See photo 21.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

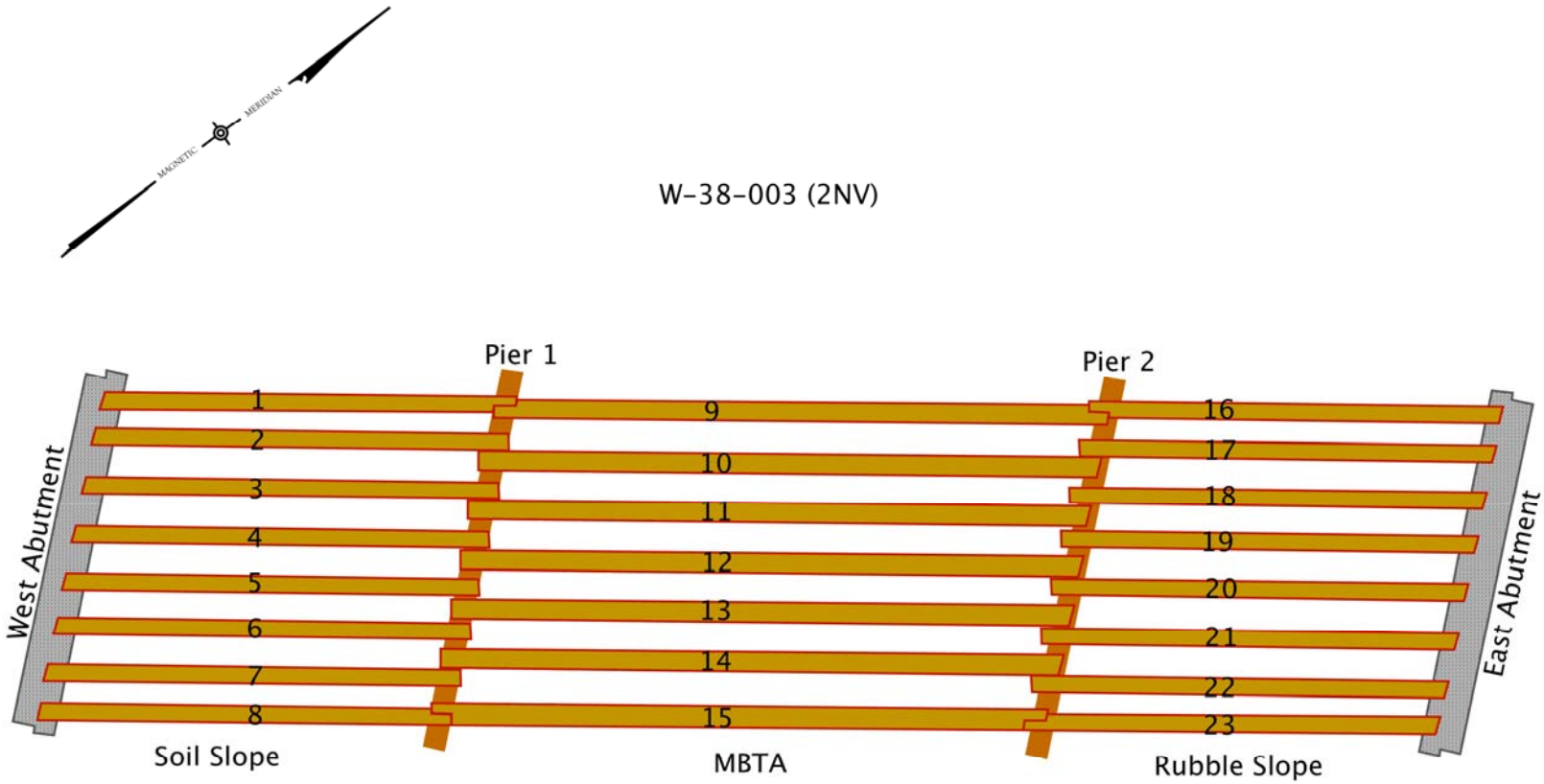
REMARKS

Sketch / Photo Log

Sketch 1 : Framing Plan.
Photo 1 : West elevation, hidden "At Bridge" Weight Posting Sign.
Photo 2 : Typical wearing surface, exposed deck planks.
Photo 3 : Typical rotting, checking, and efflorescence throughout the deck.
Photo 4 : Typical timber curb deterioration and loose connection.
Photo 5 : Typical broken connection throughout both curbs.
Photo 6 : Curb area leaning into roadway; typical throughout both curbs.
Photo 7 : Typical broken fence connection; view of south fence near the west end.
Photo 8 : East approach, washout/settlement area at the north corner of the east abutment.
Photo 9 : Typical areas of checking and splitting throughout all beams.
Photo 10 : Span 1, typical areas of steel tie rods/nails popping out of both faces of all beams; typical splitting.
Photo 11 : Span 2, typical underside.
Photo 12 : Span 3, typical view of random steel tie rod popping out of beam face.
Photo 13 : Span 3, west face of Beams 20 & 21, evidence of crippling and moderate splitting.
Photo 14 : Typical scaling throughout both breastwalls; view of west breastwall.
Photo 15 : West breastwall, north end spalling.
Photo 16 : East breastwall, south end vertical crack.
Photo 17 : Pier 1, Column 1, typical rotting along the full height of the edges.
Photo 18 : Pier 2, column 1, typical vertical splitting.
Photo 19 : Southeast approach guardrail damage.
Photo 20 : Southwest approach guardrail damage.
Photo 21 : Southwest approach rail end damage.

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

SKETCHES



Not to Scale
No Beam numbering on plans

Sketch 1: Framing Plan.

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
WILMINGTON	**2NV**	**W-38-003**	**W38003-2NV-DOT-634**	**JUN 19, 2016**

PHOTOS

Photo 1: **West elevation, hidden "At Bridge" Weight Posting Sign.**

Photo 2: **Typical wearing surface, exposed deck planks.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 3: **Typical rotting, checking, and efflorescence throughout the deck.**

Photo 4: **Typical timber curb deterioration and loose connection.**

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PHOTOS

Photo 5: **Typical broken connection throughout both curbs.**

Photo 6: **Curb area leaning into roadway; typical throughout both curbs.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 7: **Typical broken fence connection; view of south fence near the west end.**

Photo 8: **East approach, washout/settlement area at the north corner of the east abutment.**

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PHOTOS

Photo 9: **Typical areas of checking and splitting throughout all beams.**

Photo 10: **Span 1, typical areas of steel tie rods/nails popping out of both faces of all beams; typical splitting.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 11: **Span 2, typical underside.**

Photo 12: **Span 3, typical view of random steel tie rod popping out of beam face.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 13: **Span 3, west face of Beams 20 & 21, evidence of crippling and moderate splitting.**

Photo 14: **Typical scaling throughout both breastwalls; view of west breastwall.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 15: **West breastwall, north end spalling.**

Photo 16: **East breastwall, south end vertical crack.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 17: **Pier 1, Column 1, typical rotting along the full height of the edges.**

Photo 18: **Pier 2, column 1, typical vertical splitting.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 19: **Southeast approach guardrail damage.**

Photo 20: **Southwest approach guardrail damage.**

CITY/TOWN	B.I.N.	BR. DEPT. NO.	8.-STRUCTURE NO.	INSPECTION DATE
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PHOTOS

Photo 21: Southwest approach rail end damage.

National Bridge Element Inspection

BDEPT#	**W-38-003**	Date	**06/19/2016**
B.I.N.	**2NV**	District Bridge Inspection Eng'r	**Thomas G. Weil**
Item 8	**W38003-2NV-DOT-634**	Inspecting Agency	**Mass. Highway Dept.**
Span Group	**1**	Team Leader	**Andrew Labib**
Town	**Wilmington**	Team Member(s)	**James Roy, Joseph Dideo**
District	**4**		

El #	Element Name	Units	Env.	Total Q.	% or Q	State 1	State 2	State 3	State 4
31	**Timber Deck**	sq feet	2	1,098.000	☐ %			1,098.000	
Notes :									
> 1150	*Check/Shake*	sq feet	2	550.000	☐ %			550.000	
Notes :									
> 1170	*Split/Delamination (Timber)*	sq feet	2	548.000	☐ %			548.000	
Notes :									
> 510	Wearing Surfaces	sq feet	2	903.000	☐ %			503.000	400.000
Notes :									
> > 3230	*Effectiveness (Wearing Surface)*	sq feet	2	903.000	☐ %			503.000	400.000
Notes :									
111	**Timber Open Girder**	feet	2	533.000	☐ %				533.000
Notes :									
> 1170	*Split/Delamination (Timber)*	feet	2	533.000	☐ %				533.000
Notes :									
206	**Tim Col or Pile Ext**	each	2	8	☐ %			4	4
Notes :									
> 1140	*Decay/Section Loss*	each	2	1	☐ %				1
Notes :									
> 1170	*Split/Delamination (Timber)*	each	2	7	☐ %			4	3
Notes :									
215	**Re Conc Abutment**	feet	2	36.000	☐ %			36.000	
Notes :									
> 1080	*Delamination/Spall/Patched Area*	feet	2	34.000	☐ %			34.000	
Notes :									

National Bridge Element Inspection

BDEPT#	**W-38-003**	Date	**06/19/2016**
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Item 8	**W38003-2NV-DOT-634**	Inspecting Agency	**Mass. Highway Dept.**
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Town	**Wilmington**	Team Member(s)	**James Roy, Joseph Dideo**
District	**4**		

El #	Element Name	Units	Env.	Total Q.	% or Q	State 1	State 2	State 3	State 4
> 1130	*Cracking (RC and Other)*	feet	2	2.000	☐ %			2.000	
Notes :									
235	**Timber Pier Cap**	feet	2	36.000	☐ %			36.000	
Notes :									
> 1170	*Split/Delamination (Timber)*	feet	2	36.000	☐ %			36.000	
Notes :									
330	**Metal Bridge Railing**	feet	2	134.000	☐ %		119.000		15.000
Notes :									
> 1000	*Corrosion*	feet	2	119.000	☐ %		119.000		
Notes :									
> 1020	*Connection*	feet	2	15.000	☐ %				15.000
Notes :									