

Uxbridge, Massachusetts
Evaluation Report
Project Number: 7533
June 2021

BRIDGE / CULVERT MANAGEMENT PLAN



701 George Washington Hwy
Lincoln, Rhode Island 02865
401.333.2382
www.BETA-Inc.com

THIS PAGE INTENTIONALLY LEFT BLANK

Evaluation Report
Uxbridge, Massachusetts
Project Number: 7533

BRIDGE / CULVERT MANAGEMENT PLAN

Prepared by: BETA GROUP, INC.
Prepared for: Town of Uxbridge

June 2021

THIS PAGE INTENTIONALLY LEFT BLANK

Hartford Avenue East over the Mumford River
(Bridge No. U-02-020)

Priority 10

AVAILABLE INFORMATION

The current NBI Structure Inventory and Appraisal shows an AASHTO Sufficiency Rating of 50.4.

A rating report dated July 27, 1993 was noted by MassDOT. The report notes that a posting is required for a rating of 20, 25, and 36 tons for a Type H, Type 3, and Type 3S2 trucks, respectively. The report indicates the reason for the bridge not meeting statutory requirements is the placement of an additional 2" of bituminous concrete on the wearing surface. It is also indicated that the removal of this additional layer would approximately bring the structure back to its statutory capacity.

The most recent MassDOT routine bridge inspection report on record is dated December 9, 2018.

MassDOT also made available a routine underwater inspection report dated February 9, 2021. The purpose of this report is to quantify and monitor scour at the east abutment.

Hartford Avenue is classified as an Urban Minor Arterial according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of six W33x130 non-composite beams with an 8" reinforced concrete slab on concrete abutments which are numbered from south to north. Bridge construction can be dated circa 1955. The bridge has an out-to-out width of 38'-6" with a clear span of approximately 43'-0". The hydraulic opening of structure is approximately 14'-3" high, measured at mid-span, by 43'-0" wide. The depth of flow at the time of inspection varied greatly between abutments. A large deposit of sediment at the west abutment has narrowed the channel and directed flow to the east abutment face. The river was flowing southward.

The roadway width over the structure is 25'-9" with 5'-4" sidewalks on either side. The roadway consists of an asphaltic wearing surface with driveways at both approaches. There is an intersection with Whittin Street approximately 200' east of the bridge.

There are overhead wires along the south side of the bridge and a water line attached on the south fascia.

The bridge railing consists of a metal bridge rail. The approach guardrail consists of standard highway guardrail that terminates at the bridge. There is currently no transition from the concrete endpost to either the approach guardrail or metal bridge railing.

There are “6 Ton Limit Ahead”, “Road Narrows”, and “Speed Limit 30” at both approaches. All signs are for the Hartford Avenue East over Canal crossing located approximately 100' east.

FINDINGS

The overall condition of the structure is fair with several deficiencies noted.

The underside of the concrete deck slab was found to be in fair condition. There are longitudinal and transverse cracks typical throughout (Photo 3 and 5). The steel beams were in fair-to-poor condition with areas of deterioration noted. Heavy paint failure is typical on all steel beam flanges. Moderate to heavy corrosion of beams, diaphragms, and plates are typical throughout (Photos 3 and 5). Beam 4 was noted to exhibit heavier corrosion. The bearings are in fair condition but do exhibit some deterioration. Bearing plates and anchor bolts at both abutments typically show moderate paint failure and surface rusting. However, bearing plates at beams #1 and #2 at the west abutment show more advanced signs of deterioration.

The abutment concrete is in good condition with only minor problems noted. An area of water staining was present at bay 1 on the west abutment, which continues over the beam seat onto the abutment face (Photo 12). Full height water stains are also present under bay #5. Moderate amounts of debris were typically found on the beam seats. The east abutment has minor honeycombing throughout as well as minor scaling at the waterline. The channel has shifted and flows swiftly in front of the east abutment, leaving most of the abutment susceptible to scour.

The northeast and northwest training walls show loss of pointing and chinking stones at the waterline. Approximately 60' upstream, the northeast wall has a 6'x3'x2' deep void at the base that is causing the wall above it to crumble (Photo 6). The southeast and southwest walls exhibit heavy loss of mortar and chinking stones along with heavy vegetation growth. The southeast wingwall corner has a spall and vegetation growth at the joint (Photo 13). The southeast training wall is also crumbling at the end (Photo 14).

The roadway appears to be newly paved and is in good condition. The guardrail is in poor condition with heavy surface rusting and paint failure. Additionally, the railing post plates and bolts show heavy corrosion up to 100% (Photo 19). Also, the approach guard rail ends at a terminal section rather than a standard transition.

RECOMMENDATIONS

The overall condition of the substructure is fair, while the superstructure condition is fair-to-poor with more advanced deterioration. Due to the age, current posted load rating, and heavy corrosion, it is not cost effective to repair the superstructure. BETA recommends a long-term replacement of the superstructure and substructure repairs to prolong the service life of the structure:

- Remove sediment in front of the west abutment and fill scour hole at east abutment. This should be considered priority because of the high risk to undermining of the east abutment.
- Repair void at base of northeast training wall to prevent crumbling of wall above.

With the eventual superstructure replacement, it is recommended that the guardrail be fully replaced with a MassDOT approved rail.

BUDGETARY COST ESTIMATE

Substructure Repairs

Construction:	\$100,000
Engineering:	<u>\$25,000</u>
Total:	\$125,000

Superstructure Replacement

Construction:	\$1,005,000
Engineering:	<u>\$255,000</u>
Total:	\$1,260,000

THIS PAGE INTENTIONALLY LEFT BLANK

Attachments

Locus Map

Inspection Photos

MassDOT Routine Inspection Report Dated December 20, 2018

National Bridge Inventory Sheet Dated April 15, 2021

MassDOT Routine Underwater Inspection Report Dated February 9, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

HARTFORD AVENUE EAST
OVER
THE MUMFORD RIVER

BRIDGE NO.
U-02-020

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking North: South Bridge Elevation



Photo 2 Looking West: West Abutment



Photo 3 Looking West: Underside of Beams



Photo 4 Looking East: East Abutment



Photo 5 Looking East: Underside of Beams



Photo 6 Looking Northwest: Northwest Training Wall



Photo 7 Looking East: Northeast Wingwall

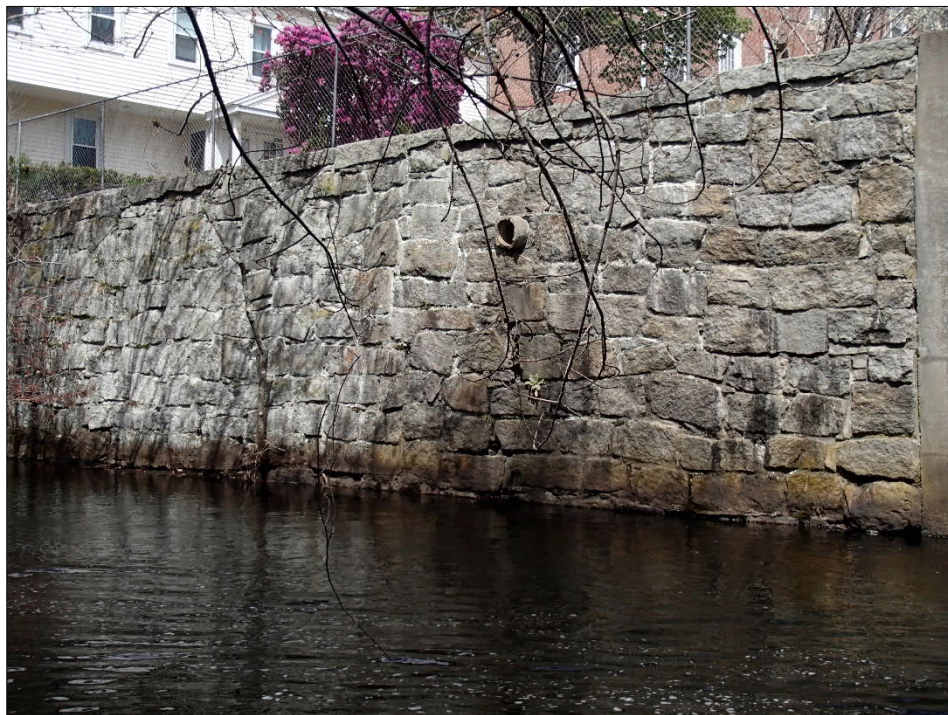


Photo 8 Looking Northeast: Northeast Training Wall



Photo 9 Looking Southwest: Southwest Training Wall



Photo 10 Looking East: Southeast Wingwall



Photo 11 Looking Northwest: Beam End 1 Corrosion



Photo 12 Looking West: West Abutment Water Staining in Bay 1



Photo 13 Looking Southeast: Southeast Wingwall Spall



Photo 14 Looking South: South Training Walls



Photo 15 Looking East: West Approach



Photo 16 Looking West: East Approach



Photo 17 Looking North: North Rail



Photo 18 Looking South Rail



Photo 19 Looking South: Deterioration of Rail Base



Photo 20 Looking West: Water Line Support

STRUCTURES INSPECTION FIELD REPORT

BR. DEPT. NO.

U-02-020

2-DIST
03B.I.N.
1DM

ROUTINE INSPECTION

CITY/TOWN UXBRIDGE		8-STRUCTURE NO. U02020-1DM-MUN-NBI		11-Kilo. POINT 000.612	41-STATUS P:POSTED	90-ROUTINE INSP. DATE DEC 20, 2018
07-FACILITY CARRIED HWY HARTFORD AVE		MEMORIAL NAME/LOCAL NAME		27-YR BUILT 1955	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER MUMFORD RIVER		26-FUNCTIONAL CLASS Urban Minor Arterial		DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 302 : Steel Stringer/Girder		22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER Z. Gikas		
107-DECK TYPE 1 : Concrete Cast-in-Place		WEATHER Clear	TEMP. (air) 6°C	TEAM MEMBERS R. ROGERS		

ITEM 58		5	
DECK		DEF	
1. Wearing Surface	7	-	
2. Deck Condition	5	S-P	
3. Stay in Place Forms	N	-	
4. Curbs	7	-	
5. Median	N	-	
6. Sidewalks	7	M-P	
7. Parapets	N	-	
8. Railing	4	S-A	
9. Anti Missile Fence	N	-	
10. Drainage System	N	-	
11. Lighting Standards	N	-	
12. Utilities	6	M-P	
13. Deck Joints	N	-	
14.	N	-	
15.	N	-	
16.	N	-	
CURB REVEAL (In millimeters)		N 175	S 200

APPROACHES		DEF	
a. Appr. Pavement Condition	6	M-P	
b. Appr. Roadway Settlement	7	-	
c. Appr. Sidewalk Settlement	5	M-A	
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		5	
SUPERSTRUCTURE		DEF	
1. Stringers	N	-	
2. Floorbeams	N	-	
3. Floor System Bracing	N	-	
4. Girders or Beams	5	S-P	
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	6	M-P	
8. Cover Plates	N	-	
9. Bearing Devices	6	M-P	
10. Diaphragms/Cross Frames	5	M-P	
11. Rivets & Bolts	7	-	
12. Welds	7	-	
13. Member Alignment	7	-	
14. Paint/Coating	4	S-P	
15.	N	-	

Year Painted 1955

COLLISION DAMAGE: Please explain
None (X) Minor () Moderate () Severe ()LOAD DEFLECTION: Please explain
None (X) Minor () Moderate () Severe ()LOAD VIBRATION: Please explain
None (X) Minor () Moderate () Severe ()Any Fracture Critical Member: (Y/N) **N**Any Cracks: (Y/N) **N**

ITEM 60		6	
SUBSTRUCTURE		DEF	
1. Abutments	Dive	Cur	6
a. Pedestals	N	N	-
b. Bridge Seats	N	7	-
c. Backwalls	N	7	M-P
d. Breastwalls	7	7	-
e. Wingwalls	7	7	-
f. Slope Paving/Rip-Rap	N	N	-
g. Pointing	N	N	-
h. Footings	7	7	M-P
i. Piles	N	N	-
j. Scour	6	6	M-P
k. Settlement	7	7	-
l.	N	N	-
m.	N	N	-
2. Piers or Bents			N
a. Pedestals	N	N	-
b. Caps	N	N	-
c. Columns	N	N	-
d. Stems/Webs/Pierwalls	N	N	-
e. Pointing	N	N	-
f. Footing	N	N	-
g. Piles	N	N	-
h. Scour	N	N	-
i. Settlement	N	N	-
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 () Minor () Moderate (X) Severe ()I-60 (Dive Report): **6** I-60 (This Report): **6**93B-U/W (DIVE) Insp **01/26/2018**

X=UNKNOWN

N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
------------------------------	----------------------	----------------------------------	---	--

ITEM 61 CHANNEL & CHANNEL PROTECTION <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>Dive</th> <th>Cur</th> <th>DEF</th> </tr> <tr><td>1.Channel Scour</td><td>6</td><td>6</td><td>M-P</td></tr> <tr><td>2.Embankment Erosion</td><td>7</td><td>5</td><td>S-P</td></tr> <tr><td>3.Debris</td><td>7</td><td>7</td><td>-</td></tr> <tr><td>4.Vegetation</td><td>7</td><td>7</td><td>-</td></tr> <tr><td>5.Utilities</td><td>N</td><td>N</td><td>-</td></tr> <tr><td>6.Rip-Rap/Slope Protection</td><td>N</td><td>N</td><td>-</td></tr> <tr><td>7.Aggradation</td><td>7</td><td>7</td><td>-</td></tr> <tr><td>8.Fender System</td><td>N</td><td>N</td><td>-</td></tr> <tr><td>9. Channel Wall</td><td>N</td><td>5</td><td>S-P</td></tr> </table> STREAM FLOW VELOCITY: Tidal () High () Moderate (X) Low () None () ITEM 61 (Dive Report): 6 ITEM 61 (This Report): 6 93b-U/W INSP. DATE: 01/26/2018		Dive	Cur	DEF	1.Channel Scour	6	6	M-P	2.Embankment Erosion	7	5	S-P	3.Debris	7	7	-	4.Vegetation	7	7	-	5.Utilities	N	N	-	6.Rip-Rap/Slope Protection	N	N	-	7.Aggradation	7	7	-	8.Fender System	N	N	-	9. Channel Wall	N	5	S-P	ITEM 36 TRAFFIC SAFETY <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>36</th> <th>COND</th> <th>DEF</th> </tr> <tr><td>A. Bridge Railing</td><td>0</td><td>4</td><td>S-A</td></tr> <tr><td>B. Transitions</td><td>0</td><td>7</td><td>-</td></tr> <tr><td>C. Approach Guardrail</td><td>0</td><td>7</td><td>M-P</td></tr> <tr><td>D. Approach Guardrail Ends</td><td>0</td><td>7</td><td>M-P</td></tr> </table> WEIGHT POSTING <i>Not Applicable</i> ☐ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>H</th> <th>3</th> <th>3S2</th> <th>Single</th> </tr> <tr><td>Actual Posting</td><td>20</td><td>25</td><td>36</td><td>N</td></tr> <tr><td>Recommended Posting</td><td>20</td><td>25</td><td>36</td><td>N</td></tr> </table> Waived Date: 00/00/0000 EJDMT Date: 00/00/0000 At bridge <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td>Y</td><td>Y</td></tr> <tr><td>8</td><td>8</td></tr> </table> Other Advance <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td>Y</td><td>Y</td></tr> <tr><td>8</td><td>8</td></tr> </table> Signs In Place (Y=Yes, N=No, NR=Not Required) Legibility/Visibility		36	COND	DEF	A. Bridge Railing	0	4	S-A	B. Transitions	0	7	-	C. Approach Guardrail	0	7	M-P	D. Approach Guardrail Ends	0	7	M-P		H	3	3S2	Single	Actual Posting	20	25	36	N	Recommended Posting	20	25	36	N	E	W	Y	Y	8	8	E	W	Y	Y	8	8	ACCESSIBILITY (Y/N/P) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>Needed</th> <th>Used</th> </tr> <tr><td>Lift Bucket</td><td>N</td><td>N</td></tr> <tr><td>Ladder</td><td>Y</td><td>Y</td></tr> <tr><td>Boat</td><td>N</td><td>N</td></tr> <tr><td>Waders</td><td>Y</td><td>Y</td></tr> <tr><td>Inspector 50</td><td>P</td><td>N</td></tr> <tr><td>Rigging</td><td>N</td><td>N</td></tr> <tr><td>Staging</td><td>N</td><td>N</td></tr> <tr><td>Traffic Control</td><td>N</td><td>N</td></tr> <tr><td>RR Flagger</td><td>N</td><td>N</td></tr> <tr><td>Police</td><td>N</td><td>N</td></tr> <tr><td>Other:</td><td></td><td></td></tr> </table> TOTAL HOURS 8 PLANS (Y/N): Y (V.C.R.) (Y/N): N TAPE#: _____ List of field tests performed:		Needed	Used	Lift Bucket	N	N	Ladder	Y	Y	Boat	N	N	Waders	Y	Y	Inspector 50	P	N	Rigging	N	N	Staging	N	N	Traffic Control	N	N	RR Flagger	N	N	Police	N	N	Other:		
	Dive	Cur	DEF																																																																																																																										
1.Channel Scour	6	6	M-P																																																																																																																										
2.Embankment Erosion	7	5	S-P																																																																																																																										
3.Debris	7	7	-																																																																																																																										
4.Vegetation	7	7	-																																																																																																																										
5.Utilities	N	N	-																																																																																																																										
6.Rip-Rap/Slope Protection	N	N	-																																																																																																																										
7.Aggradation	7	7	-																																																																																																																										
8.Fender System	N	N	-																																																																																																																										
9. Channel Wall	N	5	S-P																																																																																																																										
	36	COND	DEF																																																																																																																										
A. Bridge Railing	0	4	S-A																																																																																																																										
B. Transitions	0	7	-																																																																																																																										
C. Approach Guardrail	0	7	M-P																																																																																																																										
D. Approach Guardrail Ends	0	7	M-P																																																																																																																										
	H	3	3S2	Single																																																																																																																									
Actual Posting	20	25	36	N																																																																																																																									
Recommended Posting	20	25	36	N																																																																																																																									
E	W																																																																																																																												
Y	Y																																																																																																																												
8	8																																																																																																																												
E	W																																																																																																																												
Y	Y																																																																																																																												
8	8																																																																																																																												
	Needed	Used																																																																																																																											
Lift Bucket	N	N																																																																																																																											
Ladder	Y	Y																																																																																																																											
Boat	N	N																																																																																																																											
Waders	Y	Y																																																																																																																											
Inspector 50	P	N																																																																																																																											
Rigging	N	N																																																																																																																											
Staging	N	N																																																																																																																											
Traffic Control	N	N																																																																																																																											
RR Flagger	N	N																																																																																																																											
Police	N	N																																																																																																																											
Other:																																																																																																																													

RATING Rating Report (Y/N): Y Date: 07/27/1993 Inspection data at time of existing rating I 58: 6 I 59: 6 I 60: 8 Date: 12/01/1992	Recommend for Rating or Rerating (Y/N): Y REASON: <u>Over 10 year old rating.</u>
---	---

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
------------------------------	----------------------	----------------------------------	---	--

REMARKS

BRIDGE ORIENTATION

According to the plans, the approaches are West and East and the elevations are South and North. This is a single span steel beam bridge with 6 beams and 5 bays numbered South to North. The river flows North to South.

ITEM 58 - DECK

Item 58.1 - Wearing Surface

The wearing surface has an 18 inch diameter bit. conc. patch in the center of the Westbound lane at midspan.

Item 58.2 - Deck Condition

The underside of the concrete deck has several areas of minor to moderate scaling, hairline transverse and map cracking, with efflorescence and heavy moisture staining throughout, heaviest in bays #2- #4. **See photo 1.** There are three core holes behind the West end diaphragm in bay #1.

Item 58.4 - Curbs

See Item 58.6.

Item 58.6 - Sidewalks

Both sidewalks have moderate scaling and several minor full width transverse hairline cracks throughout. There are minor chipouts at both ends of both sidewalks in the curb area.

Item 58.8 - Railing

Both bridge rails have moderate paint peeling, surface rusting, and pitting throughout. There is severe corrosion with up to 100% section loss to the anchor bolt nuts on both rails. **See photo 2.**

Item 58.12 - Utilities

The utility in bay #5 is missing 2 feet of metal sheathing at the East end, and the insulation is sagging. **See photo 3.** The metal sheathing is slightly displaced in several areas.

APPROACHES

Approaches a - Appr. Pavement Condition

The East approach to deck transition has full width transverse cracking. **See photo 4.** The West approach has heavy cracking, breakup, bit. conc. patches and settlement throughout. This area of deterioration begins 12 feet out from the approach to deck transition. **See photo 5.**

Approaches c - Appr. Sidewalk Settlement

There is up to 2 inches of settlement to the Northwest and Northeast approach sidewalks. **See photo 6.** The Southwest approach sidewalk has a leveling bit. conc. patch since the previous inspection

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Girders or Beams

All of the beams have minor to moderate surface rusting to the flanges. **See photo 7.**

All beams are W33 x 130

Original flange thickness: 0.855 inch

Original web thickness: 0.58 inch

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
------------------------------	----------------------	----------------------------------	---	--

REMARKS

Item 59.4 - Girders or Beams (Cont'd)

There is heavy surface rusting and minor rust flaking to the West end of beam #1, North face. **See photo 8.**

The South face of beam #2 at the West end has an up to 5 foot long x full height area of heavy rust flaking and section loss. There is a 14 inch high area at the end of the web that has 0.40 inches remaining and tapers back to original thickness 5 feet out from the end. The South side of the bottom flange has 0.60 inches remaining at the face of the bearing and tapers back to original thickness 4 feet out from the end. **See photos 9 & 10.**

The South face of beam #6 has a 6 foot long area of heavy surface rust near midspan, below the utility access manhole in the sidewalk.

Item 59.7 - Conn Plt's, Gussets & Angles

All connection plates have several areas of minor to moderate spot rusting.

Item 59.9 - Bearing Devices

All bearing devices have minor to moderate surface rusting. A few of the anchor bolts for the East bearings are slightly bent.

Item 59.10 - Diaphragms/Cross Frames

All the diaphragms have moderate surface rusting in many areas throughout. There is heavy rust flaking and heavy section loss to the West end diaphragm in bay #2. There is 0.10 inches remaining to the bottom flange at the North end of the diaphragm. **See photo 9.**

Item 59.14 - Paint/Coating

All beams have heavy paint fading throughout. The majority of the paint is gone on the flanges due to surface rust. **See photo 7.** See Item 59.4.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.c - Backwalls

The West backwall has a 1 foot high x 6 inch wide area of delamination in bay #1, and a 6 inch high x 3 inch wide x 1/2 inch deep spall with one exposed rusted rebar in bay #2.

The East backwall has a 6 inch high x 3 inch wide area of delamination in bay #2.

Item 60.1.d - Breastwalls

The West breastwall has a 1 foot high area of intermittent moderate scaling at the top under bay #1, and full height moderate water stains under bay #5. The East breastwall has minor honeycombing at the top under beam #5. Both breastwalls have minor to moderate abrasion from the high waterline down.

Item 60.1.h - Footings

See the Underwater Inspection Report dated 1/26/2018.

Item 60.1.j - Scour

See the Underwater Inspection Report dated 1/26/2018.

SubStructure Scour Notes

See Item 60.1.j.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
------------------------------	----------------------	----------------------------------	---	--

REMARKS

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

See the Underwater Inspection Report dated 1/26/2018.

Item 61.2 - Embankment Erosion

See Item 61.9.

Item 61.9 - Channel Wall

The Southeast and Northwest channel walls both have an approximately 25 foot long area of collapse. **See photos 11 & 12.**

TRAFFIC SAFETY

Item 36a - Bridge Railing

The bridge rails consist of 3 steel channel rails, steel posts, and concrete end posts. See Item 58.8.

Item 36b - Transitions

The Southwest, Southeast and Northwest transitions consist of single panel W-beam guardrail with a boxing glove end that is not attached to the bridge rail. There are no traffic safety features at the Northeast corner of the bridge, where there is a business parking lot.

Item 36c - Approach Guardrail

The Southwest approach guardrail has minor collision damage.

Item 36d - Approach Guardrail Ends

The Southwest, Southeast, and Northwest boxing glove ends are not turned from traffic. Both South ends have minor collision scrapes.

Photo Log

- Photo 1 : Several transverse and longitudinal cracks with efflo. throughout bays #2-#4.
- Photo 2 : Typical 100% section loss to the nuts at the base plates of both railings.
- Photo 3 : Missing metal sheathing and sagging insulation at the East end in bay #5.
- Photo 4 : Full width transverse cracking to the East approach to deck transition.
- Photo 5 : Heavy cracking, breakup, bit. conc. patches and settlement throughout the West approach.
- Photo 6 : Typical settlement of the Northeast (shown) and Northwest approach sidewalks.
- Photo 7 : Typical surface rusting throughout the superstructure.
- Photo 8 : Heavy surface rusting and minor rust flaking to the West end of beam #1, North face.
- Photo 9 : Heavy rust flaking and section loss throughout the last 5 feet of beam #2 at the West abutment.
- Photo 10 : Heavy rust flaking and section loss to the West end of beam #2, South face.
- Photo 11 : Collapsed section of channel wall at the Southeast corner of the bridge.
- Photo 12 : Collapsed section of channel wall at the Northwest corner of the bridge.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 1: Several transverse and longitudinal cracks with efflo. throughout bays #2-#4.



Photo 2: Typical 100% section loss to the nuts at the base plates of both railings.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 3: Missing metal sheathing and sagging insulation at the East end in bay #5.

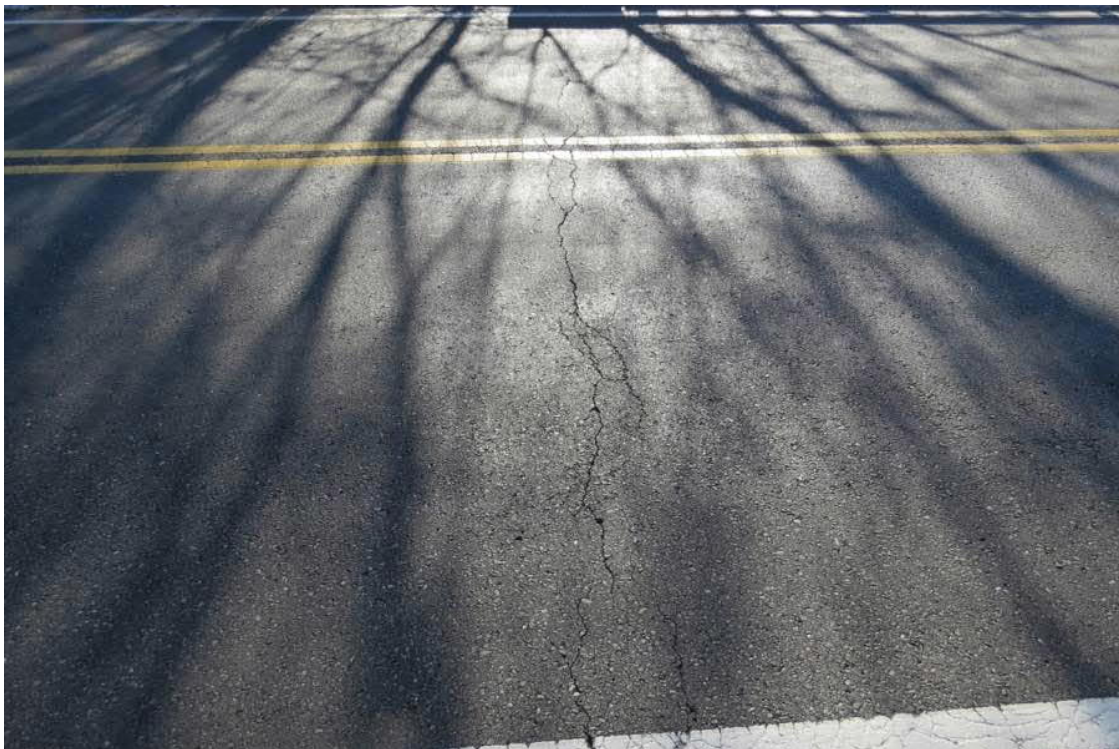


Photo 4: Full width transverse cracking to the East approach to deck transition.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 5: Heavy cracking, breakup, bit. conc. patches and settlement throughout the West approach.



Photo 6: Typical settlement of the Northeast (shown) and Northwest approach sidewalks.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 7: Typical surface rusting throughout the superstructure.



Photo 8: Heavy surface rusting and minor rust flaking to the West end of beam #1, North face.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 9: Heavy rust flaking and section loss throughout the last 5 feet of beam #2 at the West abutment.



Photo 10: Heavy rust flaking and section loss to the West end of beam #2, South face.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE DEC 20, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 11: Collapsed section of channel wall at the Southeast corner of the bridge.



Photo 12: Collapsed section of channel wall at the Northwest corner of the bridge.

THIS PAGE INTENTIONALLY LEFT BLANK

State Information										Classification										Code
BDEPT#= U02020		Agency Br.No.				(112) NBIS Bridge Length														Y
Town= Uxbridge		L.O.				(104) Highway System														N
B.I.N= 1DM		AASHTO= 050.4				(26) Functional Class - Urban Minor Arterial														16
RANK= 792		H.I.= 68.5 %		FHWA Select List= Y (6/21/2017)		(100) Defense Highway														0
(8) Structure Number		U020201DMMUNNBI				(101) Parallel Structure														N
(5) Inventory Route		151000000				(102) Direction of Traffic - 2-way traffic														2
(2) State Highway Department District		03				(103) Temporary Structure														N
(3) County Code 027		(4) Place code		71620		(105) Federal Lands Highways														0
(6) Features Intersected		WATER MUMFORD RIVER				(110) Designated National Network														N
(7) Facility Carried		HWY HARTFORD AVE				(20) Toll - On free road														3
(9) Location		.4 MI E OF RTE 122				(21) Maintain - Town Agency														03
(11) Kilometerpoint		0000.612				(22) Owner - Town Agency														03
(12) Base Highway Network		N				(37) Historical Significance built after 1949 presumed to be not eligi														Z
(13) LRS Inventory Route & Subroute		000000000000				Condition														Code
(16) Latitude		42 DEG 05 MIN 35.26 SEC				(58) Deck														5
(17) Longitude		71 DEG 38 MIN 10.07 SEC				(59) Superstructure														5
(98) Border Bridge State Code		Share %				(60) Substructure														6
(99) Border Bridge Structure No. #						(61) Channel & Channel Protection														5
						(62) Culverts														N
		Structure Type and Material				Load Rating and Posting														Code
(43) Structure Type Main: Steel				Code 302		(31) Design Load - H 20=M 18														4
Stringer/Girder		Jointless bridge type:		Not applicable		(63) Operating Rating Method - Allowable Stress (AS)														2
(44) Structure Type Appr:						(64) Operating Rating														36.6
Other				Code 000		(65) Inventory Rating Method - Allowable Stress (AS)														2
(45) Number of spans in main unit						(66) Inventory Rating														20.6
(46) Number of approach spans		0000				(70) Bridge Posting														5
(107) Deck Structure Type - Concrete Cast-in-Place				Code 1		(41) Structure - Posted for load														P
(108) Wearing Surface / Protective System:						Appraisal														Code
A) Type of wearing surface - Bituminous				Code 6		(67) Structural Evaluation														5
B) Type of membrane - Built-up				Code 1		(68) Deck Geometry														2
C) Type of deck protection - Unknown				Code 8		(69) Underclearances, vert. and horiz.														N
		Age and Service				(71) Waterway adequacy														7
(27) Year Built		1955				(72) Approach Roadway Alignment														7
(106) Year Reconstructed		0000				(36) Traffic Safety Features				0 0 0 0										0
(42) Type of Service: On - Highway-Ped						(113) Scour Critical Bridges														4
Under - Waterway				Code 55		Inspections														
(28) Lanes: On Structure 02		Under structure		00		(90) Inspection Date 12/07/20				(91) Frequency 24 MO										
(29) Average Daily Traffic		008085				(92) Critical Feature Inspection:				(93) CFI DATE										
(30) Year of ADT 2019		(109) Truck ADT		03 %		(A) Fracture Critical Detail N 00 MO A) 00/00/00														
(19) Bypass, detour length		003 KM				(B) Underwater Inspection Y 36 MO B) 02/09/21														
		Geometric Data				(C) Other Special Inspection N 00 MO C) 00/00/00														
(48) Length of maximum span		0014.0 M				(*) Other Inspection (FLOOD) N 00 MO *) 04/05/10														
(49) Structure Length		00014.9 M				(*) Closed Bridge N 00 MO *) 00/00/00														
(50) Curb or sidewalk: Left 01.6 M		Right 01.6 M				(*) UW Special Inspection N 00 MO *) 00/00/00														
(51) Bridge Roadway Width Curb to Curb		007.8 M				(*) Damage Inspection MO *) 00/00/00														
(52) Deck Width Out to Out		011.8 M				Rating Loads														
(32) Approach Roadway Width (w/shoulders)		007.9 M				Report Date 07/27/93				H20					Type 3 Type 3S2 Type HS					
(33) Bridge Median - No median				Code 0		Operating				30.0					37.0 58.0 40.0					
(34) Skew 00 DEG		(35) Structure Flared		N		Inventory				17.0					20.0 32.0 22.0					
						Field Posting														
						Status POSTED				Posting Date 02/02/95										
(10) Inventory Route MIN Vert Clear		99.99 M				2 Axle 3 Axle 5 Axle Single														
(47) Inventory Route Total Horiz Clear		07.8 M				Actual 20 25 36														
(53) Min Vert Clear Over Bridge Rdwy		99.99 M				Recommended 20 25 36														
(54) Min Vert Underclear ref N				00.00 M		Missing Signs N														
(55) Min Lat Underclear RT ref N				00.0 M		Misc.														
(56) Min Lat Underclear LT				00.0 M		Bridge Name														

THIS PAGE INTENTIONALLY LEFT BLANK

2-DIST
03B.I.N.
1DM

UNDERWATER OPERATIONS TEAM

ROUTINE UNDERWATER INSPECTION REPORT

BR. DEPT. NO.
U-02-020

CITY/TOWN UXBRIDGE		8-STRUCTURE NO. U02020-1DM-MUN-NBI		LEVEL OF INSPECTION II	93B-DATE INSPECTED FEB 9, 2021
07-FACILITY CARRIED HWY HARTFORD AVE		ACCESS TO BRIDGE EMBANKMENT		UNDERWATER OPERATIONS ENGINEER RANDI E. BONICA	
06-FEATURES INTERSECTED WATER MUMFORD RIVER		DEPTH 1.3 m	VISIBILITY 1.5 m	TEAM LEADER (DIVE MASTER) JOHN A. MANKOWSKY	Report submitted by:
BOTTOM CONDITION GRAVEL, BOULDERS, SAND		CURRENT MODERATE	TEAM MEMBERS W. J. COLLERAN, Z. GIKAS		

ITEM 60		6	ITEM 61		6	ITEM 62		N
SUBSTRUCTURE		DEF	CHANNEL & CHANNEL PROTECTION		DEF	CULVERTS		DEF
1. Abutments	6		1. Channel Scour	6	-	1. Roof	N	-
a. Pedestals	N	-	2. Embankment Erosion	7	-	2. Floor	N	-
b. Bridge Seats	N	-	3. Debris	7	-	3. Walls	N	-
c. Backwalls	N	-	4. Vegetation	7	-	4. Headwall	N	-
d. Breastwalls	7	-	5. Utilities	N	-	5. Wingwall	N	-
e. Wingwalls	7	-	6. Rip-Rap/Slope Protection	5	M-P	6. Pipe	N	-
f. Slope Paving/Rip-Rap	N	-	7. Aggradation	7	-	7. Protective Coating	N	-
g. Pointing	N	-	8. Fender System	N	-	8. Embankment	N	-
h. Footings	7	-	a. Piles	N	-	9. Wearing Surface	N	-
i. Piles	N	-	b. Diagonal Bracing	N	-	10. Railing	N	-
j. Scour	6	-	c. Horizontal Bracing	N	-	11. Sidewalks	N	-
k. Settlement	8	-	d. Wales	N	-	12. Utilities	N	-
l.	N	-	e. Fasteners	N	-	13. Member Alignment	N	-
2. Piers or Bents	N		f. Ladders	N	-	14. Deformation	N	-
a. Pedestals	N	-	9.	N	-	15. Scour	N	-
b. Caps	N	-	ITEM 59 SUPERSTRUCTURE			16. Settlement	N	-
c. Columns	N	-		N	-	17.	N	-
d. Stems/Webs/Pierwalls	N	-		N	-	18.	N	-
e. Pointing	N	-		N	-	UNDERMINING (Y/N)		
f. Footing	N	-				N		
g. Piles	N	-	DEFICIENCY REPORTING GUIDE					
h. Scour	N	-	DEFICIENCY: A defect in a structure that requires corrective action.					
i. Settlement	N	-	CATEGORIES OF DEFICIENCIES:					
j.	N	-	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 scouring, etc.					
k.	N	-	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 corroding rebars, Deteriorated timber piles, Considerable settlement, Considerable scouring or undermining, etc.					
3. Pile Bents	N		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.					
a. Pile Caps	N	-	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: Any part of piles or fender system which are projecting outward and may become a safety hazard for the navigational traffic, etc.					
b. Piles	N	-	URGENCY OF REPAIR:					
c. Diagonal Bracing	N	-	I=Immediate- [Inspector(s) immediately contact District Bridge Inspection Engineer (DBIE) to report the Deficiency and to receive further instruction from him/her.]					
d. Horizontal Bracing	N	-	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.]					
e. Fasteners	N	-	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.]					
UNDERMINING (Y/N)		N						

X=UNKNOWN

N=NOT APPLICABLE

H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE FEB 9, 2021
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

GENERAL REMARKS

Structure is a single span concrete bridge, dated 1955.

Orientation:

Facing downstream, abutments are labeled as "Left Abutment" and "Right Abutment".

Reference Station 10+00 is at the downstream end. Station 10+40 is at the upstream end.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

Left Abutment:

There is minor concrete abrasion in the vicinity of the waterline.

Right Abutment:

There is minor concrete abrasion in the vicinity of the waterline.

Item 60.1.h - Footings

Left Abutment:

The main force of the current is along the left abutment.

The top of the concrete footing is exposed from STA 10+15 to STA 10+26 and is in good condition.

The toe width is 2.0'.

Item 60.1.j - Scour

Left Abutment:

The main force of the current is along the Left Abutment.

The top of the concrete footing is exposed from Sta 10+15 to STA 10+26 and is in good condition.

The toe width is 2.0'.

Vertical timber sheeting in front of the footing is exposed from STA 9+98 to the upstream end of the upstream wingwall. The maximum exposed height of the sheeting is 1.3'.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

Left Abutment:

The main force of the current is along the Left Abutment.

The top of the concrete footing is exposed from Sta 10+15 to STA 10+26 and is in good condition.

The toe width is 2.0'.

Vertical timber sheeting in front of the footing is exposed from STA 9+98 to the upstream end of the upstream wingwall. The maximum exposed height of the sheeting is 1.3'.

Item 61.6 - Rip-Rap/Slope Protection

There are cut granite block retaining walls both upstream and downstream of the bridge.

Downstream Left Retaining Wall

A void in the retaining wall at the interface of the Left Abutment at and above the waterline measures 0.5' long, 1.5' high, and 4.0' penetration.

Additionally this wall has an area of undermining beginning at the wingwall interface, 6' long, 0.4' high, 4.2' penetration. The wall has a partial collapse at an area downstream of the bridge.

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE FEB 9, 2021
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS**Item 61.6 - Rip-Rap/Slope Protection (Cont'd)****Upstream Left Retaining Wall**

A void in the retaining wall at the interface of the Left Abutment at the waterline measures 0.6' long, 3.5' high, and 2.1' penetration.

Upstream Right Retaining Wall

The wall has a partial collapse along the top of the wall at an area upstream of the bridge.

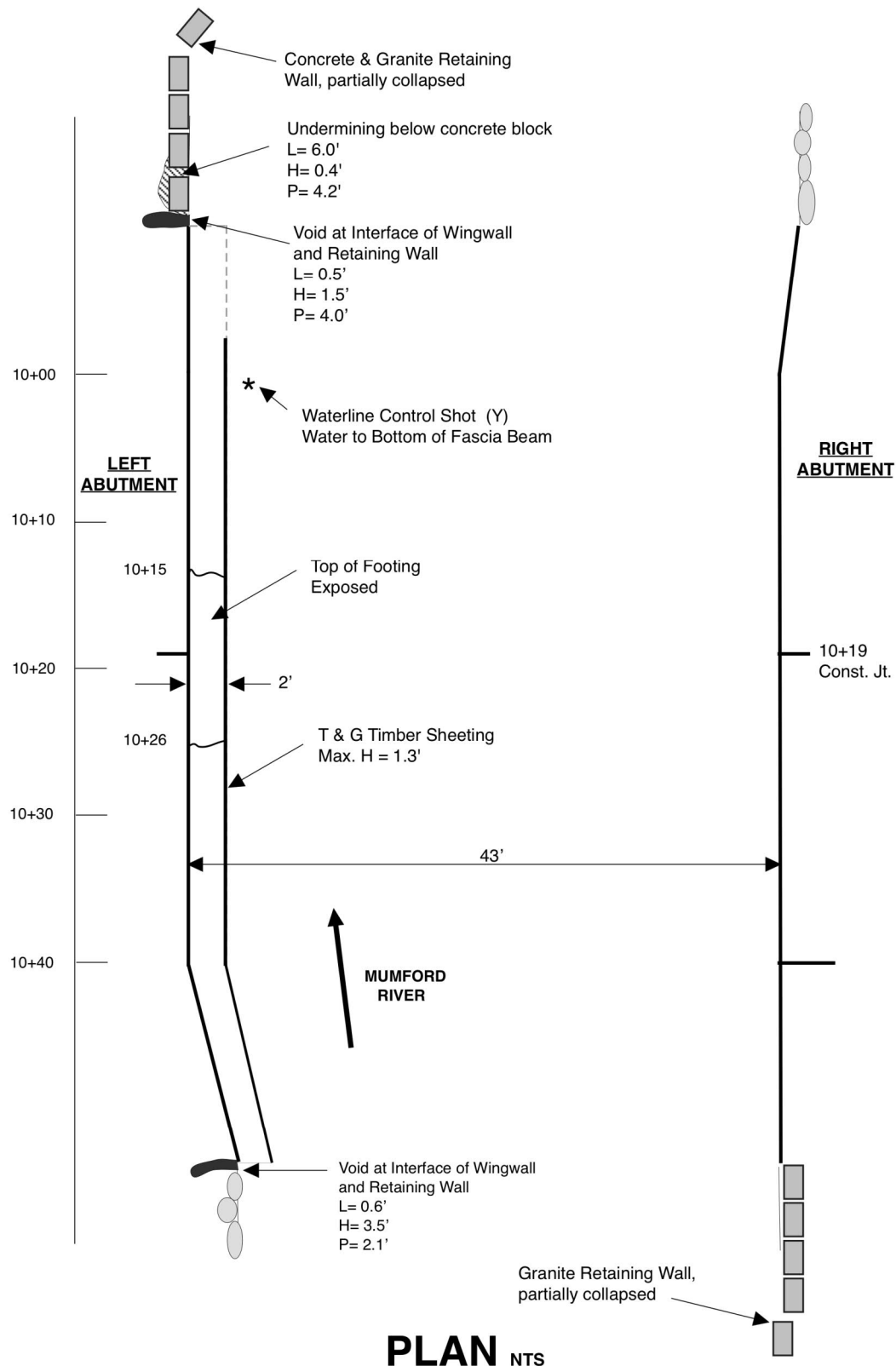
Sketch / Chart Log

Sketch 1 : Plan Sketch

Chart 1 : Scour Monitoring Chart

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE FEB 9, 2021
------------------------------	----------------------	----------------------------------	---	---------------------------------------

SKETCHES



Sketch 1: Plan Sketch

CITY/TOWN UXBRIDGE	B.I.N. 1DM	BR. DEPT. NO. U-02-020	8.-STRUCTURE NO. U02020-1DM-MUN-NBI	INSPECTION DATE FEB 9, 2021
------------------------------	----------------------	----------------------------------	---	---------------------------------------

CHARTS

SCOUR MONITORING CHART @ STA 10+20

OFFSETS	3/24/89	1/18/91	3/11/94	4/4/97	4/14/00	3/5/03	3/9/06
Right Abutment	0.4'	0.4'	0.4'	0.3'	0.2'	0.5'	0.4'
1/4 Span	1.1'	1.4'	1.2'	1.0'	0.8'	1.2'	1.0'
Mid-Span	2.0'	1.6'	1.6'	1.5'	1.2'	2.2'	1.5'
3/4 Span	3.1'	3.0'	3.0'	3.1'	2.8'	3.1'	3.3'
Left Abutment:							
Outside Sheeting	4.0'	3.7'	3.7'	3.6'	3.1'	3.8'	3.8'
On Footing	3.2'	3.3'	3.3'	3.3'	2.8'	3.1'	3.3'
Y	11.9'	11.1'	10.2'	10.3'	11.3'	11.4'	11.8'
Correction	-	-0.8'	-1.7'	-1.6'	-0.6'	-0.5'	0.1'

OFFSETS	1/30/09	1/13/12	1/15/15	1/18/18	2/9/21		
Right Abutment	0.4'	0.1'	0.4'	0.2'	0.4'		
1/4 Span	1.0'	0.9'	0.8'	0.8'	0.9'		
Mid-Span	1.7'	1.4'	1.6'	1.7'	1.6'		
3/4 Span	3.0'	3.1'	3.2'	3.0'	3.1'		
Left Abutment:							
Outside Sheeting	3.5'	3.4'	3.5'	3.3'	3.5'		
On Footing	3.2'	3.2'	3.3'	3.2'	3.3'		
Y	11.3'	10.7'	11.5'	11.0'	11.8'		
Correction	-0.6'	-1.2'	-0.4'	-0.9'	0.1'		

Notes

1. Water control shot (Y) = waterline to bottom of beam @ Sta 10+02, Left Abutment.
2. For comparison, all soundings are adjusted to the 03/24/89 water level.
3. Reference Station 10+00 is located at the downstream end.

Chart 1: Scour Monitoring Chart

THIS PAGE INTENTIONALLY LEFT BLANK

Depot Street over the Mumford River
(Bridge No. U-02-008)

Priority 11

AVAILABLE INFORMATION

The current NBI Structure Inventory and Appraisal shows an AASHTO Sufficiency Rating of 59.6.

A bridge rating report dated February, 1996 was provided by MassDOT. Based on the calculations and the condition of the structure, the report concludes that the bridge capacity is satisfactory and does not require posting.

The most recent MassDOT bridge inspection report on record is dated September 6, 2019.

Depot Street is classified as a Local roadway according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of 9 adjacent precast box beams numbered west to east on concrete abutments. The bridge was constructed in 1994. The structure has an out-to-out width of 36'-0" with a clear span of 75'-0". The hydraulic opening of structure is approximately 15'-2" high by 75'-0" wide. The depth of flow at the time of inspection was approximately 27" and flowing eastward.

The roadway width over the structure is 26'-0" with a 6'-0" sidewalk on the west side of the roadway. There is 3" (minimum) thick asphaltic wearing surface placed directly on top of the box beams. Commercial driveways are located at both approaches. The north approach has a slight horizontal curve with limited visibility.

Overhead wires run along the west fascia of the bridge and a water line is mounted to the east fascia. A USGS gauging station is located at the southwest corner of the bridge. Additionally, there are 2 catch basins at the south approach and one catch basin at the northwest approach.

The bridge railing consists of a concrete bridge rail over the bridge and standard highway guardrail at the approaches. Both are transitioned together by means of a standard concrete highway guardrail transition.

There were no signs noted at the approaches.

FINDINGS

The overall condition of the structure is fair with few problems noted.

The box beams were in fair-to-poor-condition with numerous cracks. Heavy moisture with efflorescence is present at joints 3 and 7 (Photo 7). Beams 1-3, 7, and 8 have several pieces of backer rod hanging (Photo 3). There is heavy efflorescence on beam 1 at the north abutment. There are longitudinal cracks stretching approximately 2' in from each

abutment present on all beams, with the most severe cracking at the fascia beams. Additionally, the northwest fascia has a large piece that has spalled off onto the riprap below (Photos 5 and 6).

The abutments were found to be in good condition. Both abutments have exposed steel sheeting (Photos 8) and minor honeycombing throughout. There is a tree growing out of the riprap on the south side (Photo 9). The south abutment also has a full height vertical hairline crack under beam 7 and a 5' hairline crack under beam 2.

The wingwalls are all in good condition. The only deficiencies noted were on the are areas of minor cracks with efflorescence and honeycombing. There is also heavy vegetation typical at the wingwalls.

The pavement over the bridge is in fair condition. There is a ½" full length longitudinal crack near the east curb and a ¼" longitudinal full-length crack near beam 2, which is sealed. There is also minor alligator cracking throughout. The curb at the southeast endpost is settling, and there is map cracking at the northeast endpost. The northwest approach sidewalk is severely scaled (Photo 16). Both bridge joints are cracked (Photo 12 and 13), and the concrete bridge rail has a 5" diameter area of delamination on the east side at center span. There is also minor hairline cracking along the base of the rail and heavier cracking towards the ends of the guardrail base.

RECOMMENDATIONS

This overall structure is in fair condition, with the superstructure exhibiting more advanced deterioration than the substructure. BETA recommends that the following repairs be completed to extend the structure's anticipated service life:

- Remove the pavement over the structure to repair the shear keys. Repave over the structure with a new superpave wearing surface and membrane waterproofing.
- Repair spall at beam 9 fascia.
- Repair all spalled, cracked, and delaminated areas to concrete bridge railing.

At this time, BETA recommends checking each new MassDOT Routine Inspection Report. The cracking of all beams should be closely monitored. Repair measures may be necessary if cracks are found to widen.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$60,000
Engineering:	<u>\$15,000</u>
Total:	\$75,000

Attachments

Locus Map

Inspection Photos

MassDOT Routine Inspection Report Dated September 6, 2019

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865
P: 401.333.2382
F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

DEPOT STREET
OVER
THE MUMFORD RIVER

BRIDGE NO.
U-02-008

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking Southwest: East Bridge Elevation



Photo 2 Looking North: North Abutment



Photo 3 Looking South: South Abutment



Photo 4 Looking West: Northeast Wingwall



Photo 5 Looking East: Northwest Coping Spall



Photo 6 Looking Down: Spall in Rip Rap on Northwest Side



Photo 7 Looking South: Efflorescence at Joint 7



Photo 8 Looking West: Steel Sheet Piling Visible on South Side



Photo 9 Looking East: Southeast Riprap Vegetation



Photo 10 Looking East: Southwest Endpost Movement



Photo 11 Looking North: South Approach



Photo 12 Looking East: Cracking at South Joint



Photo 13 Looking East: Cracking at North Joint



Photo 14 Looking Southwest: West Barrier and Approach Rail



Photo 15 Looking Southeast: East Barrier and Approach Rail



Photo 16 Looking South: Sidewalk Deterioration at Northwest Side

2-DIST
03B.I.N.
1J2

STRUCTURES INSPECTION FIELD REPORT

BR. DEPT. NO.

U-02-008

ROUTINE INSPECTION

CITY/TOWN UXBRIDGE		8-STRUCTURE NO. U02008-1J2-MUN-NBI		11-Kilo. POINT 000.241	41-STATUS A:OPEN	90-ROUTINE INSP. DATE SEP 6, 2019
07-FACILITY CARRIED HWY DEPOT ST		MEMORIAL NAME/LOCAL NAME		27-YR BUILT 1994	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER MUMFORD RIVER		26-FUNCTIONAL CLASS Urban Local		DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 505 : Prestressed Concrete Box Beam or Girders - Multiple		22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Simkhovich		
107-DECK TYPE 2 : Concrete Precast Panels		WEATHER Sunny	TEMP. (air) 25°C	TEAM MEMBERS J. SNYDER		

ITEM 58		5	
DECK			DEF
1. Wearing Surface	5	S-A	
2. Deck Condition	5	S-A	
3. Stay in Place Forms	N	-	
4. Curbs	7	-	
5. Median	N	-	
6. Sidewalks	7	-	
7. Parapets	N	-	
8. Railing	7	-	
9. Anti Missile Fence	N	-	
10. Drainage System	N	-	
11. Lighting Standards	N	-	
12. Utilities	8	-	
13. Deck Joints	N	-	
14.	N	-	
15.	N	-	
16.	N	-	

	E	W
CURB REVEAL (In millimeters)	200	175

APPROACHES			DEF
a. Appr. Pavement Condition	5	S-A	
b. Appr. Roadway Settlement	6	S-P	
c. Appr. Sidewalk Settlement	6	M-P	
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		5	
SUPERSTRUCTURE			DEF
1. Stringers	N	-	
2. Floorbeams	N	-	
3. Floor System Bracing	N	-	
4. Girders or Beams	5	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	H	-	
10. Diaphragms/Cross Frames	N	-	
11. Rivets & Bolts	N	-	
12. Welds	N	-	
13. Member Alignment	8	-	
14. Paint/Coating	N	-	
15.	N	-	

Year Painted **N**COLLISION DAMAGE: *Please explain*
None (X) Minor () Moderate () Severe ()LOAD DEFLECTION: *Please explain*
None (X) Minor () Moderate () Severe ()LOAD VIBRATION: *Please explain*
None (X) Minor () Moderate () Severe ()Any Fracture Critical Member: (Y/N) **N**Any Cracks: (Y/N) **N**

ITEM 60		7	
SUBSTRUCTURE			DEF
1. Abutments	Dive	Cur	7
a. Pedestals	N	N	-
b. Bridge Seats	N	7	-
c. Backwalls	N	H	-
d. Breastwalls	N	7	-
e. Wingwalls	N	7	M-P
f. Slope Paving/Rip-Rap	N	7	-
g. Pointing	N	N	-
h. Footings	N	H	-
i. Piles	N	N	-
j. Scour	N	7	-
k. Settlement	N	7	-
l.	N	N	-
m.	N	N	-
2. Piers or Bents		N	
a. Pedestals	N	N	-
b. Caps	N	N	-
c. Columns	N	N	-
d. Stems/Webs/Pierwalls	N	N	-
e. Pointing	N	N	-
f. Footing	N	N	-
g. Piles	N	N	-
h. Scour	N	N	-
i. Settlement	N	N	-
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): **7**93B-U/W (DIVE) Insp **00/00/0000**

X=UNKNOWN

N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

ITEM 61
CHANNEL & CHANNEL PROTECTION

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

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

ITEM 61 (Dive Report): N ITEM 61 (This Report): 7

93b-U/W INSP. DATE: 00/00/0000

ITEM 36 TRAFFIC SAFETY

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

WEIGHT POSTING *Not Applicable* X

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: 00/00/0000 EJDMT Date: 00/00/0000

	At bridge	Other Advance								
Signs In Place (Y=Yes,N=No, NR=Not Required)	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">N</td><td style="border: 1px solid black; padding: 2px;">S</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>	N	S			<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">N</td><td style="border: 1px solid black; padding: 2px;">S</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>	N	S		
N	S									
N	S									
Legibility/Visibility	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>					<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>				

CLEARANCE POSTING

	E	W	meter												
Actual Field Measurement	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">ft</td><td style="border: 1px solid black; padding: 2px;">in</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;">0</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;">0</td></tr> </table>	ft	in		0		0	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">ft</td><td style="border: 1px solid black; padding: 2px;">in</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;">0</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;">0</td></tr> </table>	ft	in		0		0	
ft	in														
	0														
	0														
ft	in														
	0														
	0														
Posted Clearance															

	At bridge	Advance								
Signs In Place (Y=Yes,N=No, NR=Not Required)	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">E</td><td style="border: 1px solid black; padding: 2px;">W</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>	E	W			<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">E</td><td style="border: 1px solid black; padding: 2px;">W</td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>	E	W		
E	W									
E	W									
Legibility/Visibility	<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>					<table style="border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> <tr><td style="border: 1px solid black; padding: 2px;"> </td><td style="border: 1px solid black; padding: 2px;"> </td></tr> </table>				

ACCESSIBILITY (Y/N/P)

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

TOTAL HOURS 8

PLANS (Y/N): Y

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

TAPE#: _____

List of field tests performed:

RATING
Rating Report (Y/N): Y
Date: 02/01/1996
Inspection data at time of existing rating
I 58: 8 I 59: 8 I 60: 9 Date : 09/01/1995

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

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

REASON: _____

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

BRIDGE ORIENTATION

The approaches are South and North, and the elevations are West and East (from the plans). This structure is a prestressed concrete box beam bridge with 9 beams and 8 longitudinal beam joints numbered from West to East. The river flows from West to East.

GENERAL REMARKS

A-62 was not available to perform this inspection. An "Other" inspection has been scheduled in 12 months to perform a hands-on inspection with the A-62 to check the condition of the beams on either side of joints #3 and #7.

ITEM 58 - DECK

Item 58.1 - Wearing Surface

There are longitudinal reflective cracks(cracking), up to 1 in. wide, over joints #3 and #7. **See photo 1.** The pavement on the East side of the crack over joint #7 is up to 3/4 in. higher than the opposite side.(No misalignment of the box beams below this area). **See photo 2.** There is heavy moisture staining on the box beams below these cracks, predominantly to the North 2/3 of the span. There is minor to moderate transverse cracking in throughout the rest of the wearing surface.

Item 58.2 - Deck Condition

See Item 59.4 comments.

Item 58.6 - Sidewalks

The West concrete sidewalk has isolated areas of minor scaling along the back of the granite curbs. The West sidewalk fascia overhang has a 6 in. wide x 3-1/2 in. long x 2 in. deep spall near midspan. There is evidence of water infiltration through the construction joint at midspan at the rail base. The Northwest corner of the sidewalk slab, below the endpost, has a 1 ft. high x 1.5 ft. wide x 6 in. deep spall with exposed rebar. **See photo 3.** It appears the rebar was not properly placed in this area reslting in the spall.

Item 58.8 - Railing

The East bridge rail has a 5 in. diameter x 1 in. deep spall to the top of the post on the South face near midspan (possibly as built). The end posts have minor hairline map cracking. Both bridge rails have hairline cracks at the bottom corners of the posts and several at the top throughout.

APPROACHES

Approaches a - Appr. Pavement Condition

There is full width moderate transverse cracking and breakup to both approach to deck transitions. Both approach pavements have heavy isolated longitudinal and transverse cracks throughout. **See photos 4 and 5.**

Approaches b - Appr. Roadway Settlement

There is minor settlement at both approach to deck transitions.

Approaches c - Appr. Sidewalk Settlement

There is up to 1/2 in. of settlement to both approach sidewalks. There is heavy scaling to the Northwest approach sidewalk, and a full width x 1/4 in. settlement crack.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Girders or Beams

There is evidence of water infiltration through joints #3 and #7, which are located below the cracks in the wearing surface described under Item 58.1. **See photos 6 and 7.** Beams #3 and #4 on either side of joint #3 have heavy moisture and efflorescence staining mostly to the North 2/3 of the span. Beam #3 has several longitudinal cracks in this area up to 1/8 in. wide. **See photo 8.** The longitudinal cracks on beam #2 are mostly hairline, with one area where one longitudinal crack is up to 1/16 in. wide and has rust staining due to exposed rebar chair wire. Beams #7 and #8 on either side of joint #7 have moisture and efflorescence staining to the North 2/3 of the span. The underside of the rest of the beams have minor longitudinal cracks. The longitudinal cracks could be seen on the sides of beams #1 and #9. **See photo 9.** The post tensioning rods at midspan and near the North abutment have rust stains due to water infiltration at joints #8 and joint #2. **See photo 10.**

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

The South breastwall has a full height hairline crack under beam #2 and a 5 ft. high hairline crack under beam #7.

Item 60.1.e - Wingwalls

The Northwest wingwall has an area of hairline cracking with efflorescence leaching at the top of the wall above the bridge seat and at the backwall interface.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.4 - Vegetation

There is moderate vegetation growing at all four corners of the bridge, encroaching on the superstructure.

TRAFFIC SAFETY

Item 36a - Bridge Railing

See Item 58.8 comments.

Item 36b - Transitions

All transitions are not sufficiently stiffened.

Item 36d - Approach Guardrail Ends

The Northwest, Southeast, and Northeast guardrail ends have minor collision damage.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

Photo Log

- Photo 1 : View of the wearing surface looking South.
- Photo 2 : Longitudinal crack over joint #7.
- Photo 3 : A spall to the Northwest corner of the sidewalk slab, below the Northwest endpost.
- Photo 4 : The North approach to deck transition.
- Photo 5 : The South approach to deck transition.
- Photo 6 : Beam joint#3 looking North.
- Photo 7 : Beam joint #7, looking North.
- Photo 8 : Joint #3, looking North.
- Photo 9 : Cracks on the side of beam #1 at the South end. Typical on both fascia beams.
- Photo 10 : Rust staining below the post tensioning rods.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 1: View of the wearing surface looking South.



Photo 2: Longitudinal crack over joint #7.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 3: A spall to the Northwest corner of the sidewalk slab, below the Northwest endpost.



Photo 4: The North approach to deck transition.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 5: The South approach to deck transition.



Photo 6: Beam joint#3 looking North.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 7: Beam joint #7, looking North.

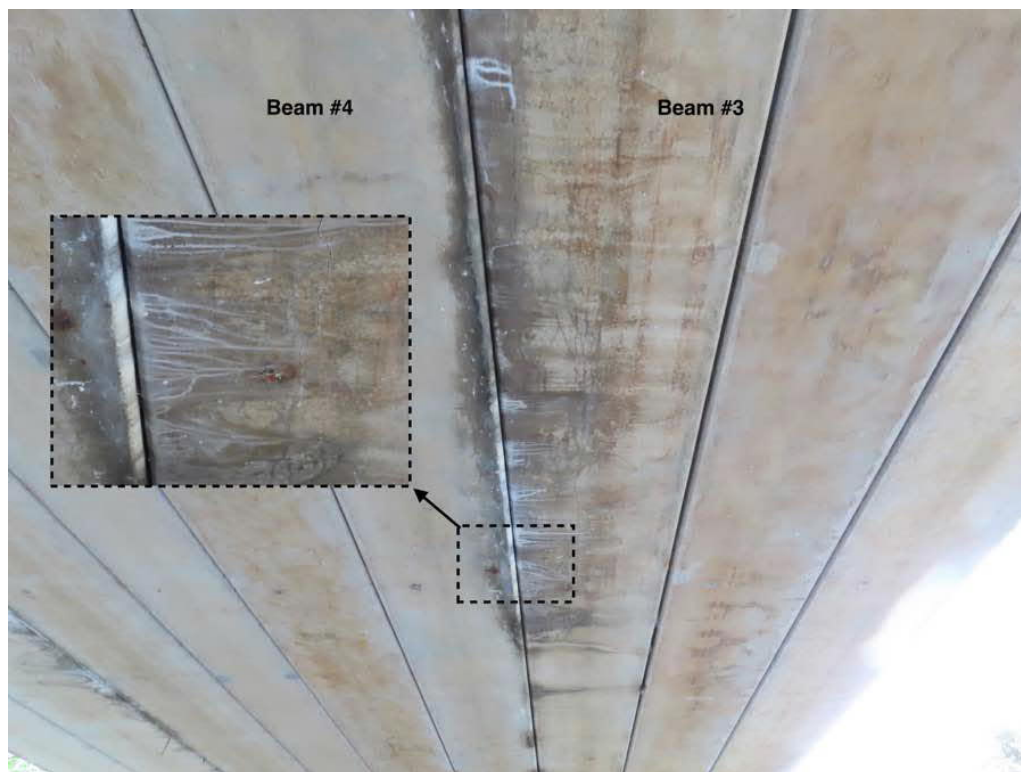


Photo 8: Joint #3, looking North.

CITY/TOWN UXBRIDGE	B.I.N. 1J2	BR. DEPT. NO. U-02-008	8.-STRUCTURE NO. U02008-1J2-MUN-NBI	INSPECTION DATE SEP 6, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 9: Cracks on the side of beam #1 at the South end. Typical on both fascia beams.



Photo 10: Rust staining below the post tensioning rods.

Report Date: April 15, 2021

State Information										Classification										Code	
BDEPT#= U02008		Agency Br.No.								(112) NBIS Bridge Length										Y	
Town= Uxbridge		L.O.								(104) Highway System										N	
B.I.N= 1J2		AASHTO= 059.6								(26) Functional Class - Urban Local										19	
RANK= 3591		H.I.= 99.0 %		FHWA Select List= N (6/21/2017)						(100) Defense Highway										0	
Identification				U020081J2MUNNBI						(101) Parallel Structure										N	
(8) Structure Number				151000000						(102) Direction of Traffic - 2-way traffic										2	
(5) Inventory Route				03						(103) Temporary Structure										N	
(2) State Highway Department District				71620						(105) Federal Lands Highways										0	
(3) County Code 027 (4) Place code				WATER MUMFORD RIVER						(110) Designated National Network										N	
(6) Features Intersected				HWY DEPOT ST						(20) Toll - On free road										3	
(7) Facility Carried				0.1M E JCT RTS 16 & 122						(21) Maintain - Town Agency										03	
(9) Location				0000.241						(22) Owner - Town Agency										03	
(11) Kilometerpoint				N						(37) Historical Significance not eligible										N	
(12) Base Highway Network				000000000000						Condition										Code	
(13) LRS Inventory Route & Subroute				42 DEG 04 MIN 30.77 SEC						(58) Deck										5	
(16) Latitude				71 DEG 37 MIN 31.18 SEC						(59) Superstructure										5	
(17) Longitude				Share %						(60) Substructure										7	
(98) Border Bridge State Code				Code 000						(61) Channel & Channel Protection										7	
(99) Border Bridge Structure No. #				Code 001						(62) Culverts										N	
Structure Type and Material				Code 000						Load Rating and Posting										Code	
(43) Structure Type Main: Prestressed Concrete				Code 505						(31) Design Load - HS 20=MS 18										5	
Box Beam or Girders - Multiple				Jointless bridge type: Not applicable						(63) Operating Rating Method - Allowable Stress (AS)										2	
(44) Structure Type Appr: Other				Code 000						(64) Operating Rating										46.8	
(45) Number of spans in main unit				0000						(65) Inventory Rating Method - Allowable Stress (AS)										2	
(46) Number of approach spans				0000						(66) Inventory Rating										33.3	
(107) Deck Structure Type - Concrete Precast Panels				Code 2						(70) Bridge Posting										5	
(108) Wearing Surface / Protective System:				Code 2						(41) Structure - Open										A	
A) Type of wearing surface - Bituminous				Code 6						Appraisal										Code	
B) Type of membrane - Preformed Fabric				Code 2						(67) Structural Evaluation										5	
C) Type of deck protection - Epoxy Coated Reinforcing				Code 1						(68) Deck Geometry										5	
Age and Service				Code 1						(69) Underclearances, vert. and horiz.										N	
(27) Year Built				1994						(71) Waterway adequacy										8	
(106) Year Reconstructed				0000						(72) Approach Roadway Alignment										6	
(42) Type of Service: On - Highway				Code 15						(36) Traffic Safety Features										1 0 1 0	
Under - Waterway				Code 15						(113) Scour Critical Bridges										8	
(28) Lanes: On Structure 02 Under structure				00						Inspections											
(29) Average Daily Traffic				000780						(90) Inspection Date 09/06/19 (91) Frequency 24 MO											
(30) Year of ADT 2013 (109) Truck ADT				10 %						(92) Critical Feature Inspection: (93) CFI DATE											
(19) Bypass, detour length				199 KM						(A) Fracture Critical Detail N 00 MO A) 00/00/00											
Geometric Data				0022.9 M						(B) Underwater Inspection N 00 MO B) 10/01/88											
(48) Length of maximum span				00024.7 M						(C) Other Special Inspection N 00 MO C) 09/06/19											
(49) Structure Length				000.0 M						(*) Other Inspection () N 00 MO *) 00/00/00											
(50) Curb or sidewalk: Left 00.0 M Right 00.0 M				007.9 M						(*) Closed Bridge N 00 MO *) 00/00/00											
(51) Bridge Roadway Width Curb to Curb				010.7 M						(*) UW Special Inspection N 00 MO *) 00/00/00											
(52) Deck Width Out to Out				007.9 M						(*) Damage Inspection MO *) 00/00/00											
(32) Approach Roadway Width (w/shoulders)				Code 0						Rating Loads											
(33) Bridge Median - No median				Code 0						Report Date 02/01/96 H20 Type 3 Type 3S2 Type HS											
(34) Skew 00 DEG (35) Structure Flared				N						Operating 39.0 52.0 50.0 0.0											
(10) Inventory Route MIN Vert Clear				99.99 M						Inventory 28.0 37.0 35.0 0.0											
(47) Inventory Route Total Horiz Clear				07.9 M						Field Posting											
(53) Min Vert Clear Over Bridge Rdwy				99.99 M						Status LEGAL Posting Date 06/25/96											
(54) Min Vert Underclear ref N				00.00 M						Actual 2 Axle 3 Axle 5 Axle Single											
(55) Min Lat Underclear RT ref N				00.0 M						Recommended											
(56) Min Lat Underclear LT				00.0 M						Missing Signs N											
Navigation Data										Misc.											
(38) Navigation Control - No navigation control on waterway				Code 0						Bridge Name											
(111) Pier Protection				Code						N Anti-missile fence N Acrow Panel N Jointless Bridge											
(39) Navigation Vertical Clearance				000.0 M						Freeze/Thaw N : Not Applicable											
(116) Vert-lift Bridge Nav Min Vert Clear				M						Accessibility (Needed/Used)											
(40) Navigation Horizontal Clearance				0000.0 M						N / N Liftbucket N / N Rigging N / N Other											
										N / N Ladder N / N Staging											
										N / N Boat N / N Traffic Control											
										P / N Wader N / N RR Flagperson										Inspection	
										P / N Inspector 50 N / N Police										Hours: 008	

THIS PAGE INTENTIONALLY LEFT BLANK

Mill Street over Emerson Brook
(Bridge No. U-02-002)

Priority 12

AVAILABLE INFORMATION

The current NBI Structure Inventory and Appraisal shows an AASHTO Sufficiency Rating of 23.9.

Mill Street is classified as a Local roadway according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a mortared stone masonry arch with a date of construction circa 1850. The structure has an out-to-out width of 21'-6" with a clear span of 10'-0". The hydraulic opening of the arch structure is approximately 9'-10" high by 10'-0" wide. The flow was 1' deep at the time of inspection on the west side, but was deeper on the east side, measuring 3' deep. The brook was flowing eastward. The depth of fill over the structure is approximately 4'-9".

The roadway width over the structure is 18'-0" and consists of an asphaltic wearing surface. The width of roadway narrows from the north and south approaches, which have approximate widths of 22'-0" and 21'-0", respectively. There are no sidewalks on either side. A sharp horizontal curve is present at the north approach and an intersection with Pond Street is located approximately 120' north of the structure.

Overhead wires run along the east side of the roadway. There is also a riprap drainage waterway at the Southwest corner of the structure.

The bridge railing consists of timber bridge rail behind standard guardrail. The embankments are very steep, and the only approach guardrail is a single segment of Jersey barrier at the south side of the south approach.

No signs were noted at the approaches.

FINDINGS

The overall condition of the structure is fair with several deficiencies noted.

Inspection of the masonry arch revealed that there is a concrete facing on the underside that has random cracking with efflorescence throughout (Photos 9 and 10). There is also a larger longitudinal crack on the east side of the arch with two 12" diameter x 3" deep spalls. This crack extends across the entire arch and down the north abutment wall. The face of either side of the arch typically shows voids and missing mortar (Photo 13).

Abutment walls are stone masonry with concrete footings completely exposed and are in fair condition with several deficiencies. The north abutment footing shows heavy deterioration and water staining on the face (Photo 3). Random mortar patches and

moisture spots throughout both walls were found to be typical. There is a 30" deep void at the southwest abutment corner (Photo 12)

The northwest and southwest spandrel walls are in good condition with only few missing cobbles. The northwest training wall has a full height 1" crack where it meets the north abutment (Photo 11). The northwest wall is also partially collapsing at the end (Photo 5). The northeast training wall has large voids at the waterline up to 30" deep (Photo 6).

The floor of the culvert is 75% deteriorated concrete and 25% stones. There is minor scour at the north abutment footing, and heavy scour at the downstream end of the floor where the depth of the water drops from 12" to about 3'-0". There is a makeshift dam located at the upstream end which affects water flow through the culvert (Photo 14).

The pavement over the arch and at the approaches is in good condition. There is a sharp horizontal and vertical curve with poor visibility. The guardrail is in poor condition and is leaning away from the roadway on the west side (Photo 17). The guardrail also has areas where it is not fully connected to the posts. There is slight collision damage at the northeast approach. The roadway geometry, poor condition of the guardrails, and lack of any approach rail make this a safety hazard.

RECOMMENDATIONS

The overall condition of this structure is fair. BETA recommends the following to extend the life of the structure and improve public safety:

- Encase north abutment footing with concrete. This will help prevent further scour deterioration to the structure.
- Fill all voids and replace all missing and/or loose stones in the stone arch, abutments, spandrel walls, wingwalls.
- Repoint all masonry joints to the stone arch, abutments, spandrel walls, and wingwalls as required.
- Repair cracks and spalls to stone abutment walls and arch.
- Stabilize all wingwalls as required.
- Repair all scour holes.
- Remove the makeshift upstream dam in order to provide better water flow through the arch.
- Install MassDOT approved guardrail on all approaches and over the culvert.
- Roadway width over the culvert is not adequate to carry two lanes of traffic. Add additional "BE PREPARED TO STOP" approach signs stripe roadway centerlines accordingly. All signage and striping should be in accordance with current MUTCD standards.

- Signage in accordance current MUTCD standards is also recommended indicating a sharp curve and/or reduced speed.

Routine inspections should be conducted at intervals not exceeding two years.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$180,000
Engineering:	<u>\$45,000</u>
Total:	\$225,000

THIS PAGE INTENTIONALLY LEFT BLANK

Attachments

Locus Map

Inspection Photos

MassDOT Routine Arch Inspection Report Dated March 1, 2019

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865
P: 401.333.2382
F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

MILL STREET
OVER
EMERSON BROOK

BRIDGE NO.
U-02-002

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking Northeast: West Culvert Elevation



Photo 2 Looking Northwest: East Culvert Elevation



Photo 3 Looking West: North Abutment



Photo 4 Looking Southwest: South Abutment



Photo 5 Looking North: Northwest Wingwall



Photo 6 Looking North: Northeast Wingwall



Photo 7 Looking South: Southwest Wingwall



Photo 8 Looking South: Southeast Wingwall



Photo 9 Looking South: Culvert Roof at Southwest Corner



Photo 10 Looking West: Culvert Roof at East Entrance



Photo 11 Looking North: Separation at Northwest Wingwall



Photo 12 Looking Southeast: Southwest Abutment Corner



Photo 13 Looking West: East Arch Face



Photo 14 Looking West: Dam in Brook



Photo 15 Looking South: North Approach



Photo 16 Looking North: South Approach



Photo 17 Looking Northwest: West Barrier



Photo 18 Looking East: East Barrier

THIS PAGE INTENTIONALLY LEFT BLANK

2-DIST
03B.I.N.
6X5**STRUCTURES INSPECTION FIELD REPORT**BR. DEPT. NO.
U-02-002**ROUTINE ARCH INSPECTION**

CITY/TOWN UXBRIDGE		8-STRUCTURE NO. U02002-6X5-MUN-BRI		11-Kilo. POINT 000.402	41-STATUS A:OPEN	90-ROUTINE INSP. DATE MAR 1, 2019
07-FACILITY CARRIED HWY MILL ST		MEMORIAL NAME/LOCAL NAME		27-YR BUILT 1850	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER EMERSON BROOK		26-FUNCTIONAL CLASS Rural Local		DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 811 : Masonry Arch - Deck		22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Smith		
107-DECK TYPE N : Not applicable		WEATHER Sunny	TEMP. (air) -1°C	TEAM MEMBERS D. TRAINEE		

ITEM 58 DECK N <table border="1"> <thead> <tr> <th></th> <th></th> <th>DEF</th> </tr> </thead> <tbody> <tr><td>1. Wearing surface</td><td>5</td><td>S-P</td></tr> <tr><td>2. Deck Condition</td><td>N</td><td>-</td></tr> <tr><td>3. Spandrel Fill</td><td>6</td><td>M-P</td></tr> <tr><td>4. Curbs</td><td>N</td><td>-</td></tr> <tr><td>5. Median</td><td>N</td><td>-</td></tr> <tr><td>6. Sidewalks</td><td>N</td><td>-</td></tr> <tr><td>7. Parapets</td><td>N</td><td>-</td></tr> <tr><td>8. Railing</td><td>4</td><td>S-A</td></tr> <tr><td>9. Anti Missile Fence</td><td>N</td><td>-</td></tr> <tr><td>10. Drainage System</td><td>N</td><td>-</td></tr> <tr><td>11. Lighting Standards</td><td>N</td><td>-</td></tr> <tr><td>12. Utilities</td><td>N</td><td>-</td></tr> <tr><td>13. Deck Joints</td><td>N</td><td>-</td></tr> <tr><td>14.</td><td>N</td><td>-</td></tr> <tr><td>15.</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </tbody> </table> CURB REVEAL (In millimeters) N N S N					DEF	1. Wearing surface	5	S-P	2. Deck Condition	N	-	3. Spandrel Fill	6	M-P	4. Curbs	N	-	5. Median	N	-	6. Sidewalks	N	-	7. Parapets	N	-	8. Railing	4	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	-	ITEM 59 SUPERSTRUCTURE 5 <table border="1"> <thead> <tr> <th></th> <th></th> <th>DEF</th> </tr> </thead> <tbody> <tr><td>1. Arch/Arch Ring</td><td>5</td><td>S-P</td></tr> <tr><td>2. Keystone Area</td><td>5</td><td>S-P</td></tr> <tr><td>3. Stringers</td><td>N</td><td>-</td></tr> <tr><td>4. Floorbeams</td><td>N</td><td>-</td></tr> <tr><td>5. Spandrel Walls</td><td>5</td><td>S-A</td></tr> <tr><td>6. Spring Lines</td><td>7</td><td>-</td></tr> <tr><td>7. Diaphragms/Cross Frames</td><td>N</td><td>-</td></tr> <tr><td>8. Conn Plt's, Gussets & Angles</td><td>N</td><td>-</td></tr> <tr><td>9. Pin & Hangers</td><td>N</td><td>-</td></tr> <tr><td>10. Masonry Joints</td><td>6</td><td>M-P</td></tr> <tr><td>11. Rivets & Bolts</td><td>N</td><td>-</td></tr> <tr><td>12. Welds</td><td>N</td><td>-</td></tr> <tr><td>13. Deformation/Flattening</td><td>7</td><td>-</td></tr> <tr><td>14. Member Alignment</td><td>7</td><td>-</td></tr> <tr><td>15. Paint/Coating</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </tbody> </table> Year Painted N COLLISION DAMAGE: <i>Please explain</i> None (X) Minor () Moderate () Severe () LOAD DEFLECTION: <i>Please explain</i> None (X) Minor () Moderate () Severe () LOAD VIBRATION: <i>Please explain</i> None (X) Minor () Moderate () Severe ()					DEF	1. Arch/Arch Ring	5	S-P	2. Keystone Area	5	S-P	3. Stringers	N	-	4. Floorbeams	N	-	5. Spandrel Walls	5	S-A	6. Spring Lines	7	-	7. Diaphragms/Cross Frames	N	-	8. Conn Plt's, Gussets & Angles	N	-	9. Pin & Hangers	N	-	10. Masonry Joints	6	M-P	11. Rivets & Bolts	N	-	12. Welds	N	-	13. Deformation/Flattening	7	-	14. Member Alignment	7	-	15. Paint/Coating	N	-	16.	N	-	ITEM 60 SUBSTRUCTURE 5 <table border="1"> <thead> <tr> <th></th> <th>Dive</th> <th>Cur</th> <th></th> <th>DEF</th> </tr> </thead> <tbody> <tr> <td colspan="4">1. Abutments</td> <td>5</td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>b. Bridge Seats</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>c. Backwalls</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>d. Breastwalls</td><td>N</td><td>6</td><td></td><td>M-P</td></tr> <tr><td>e. Wingwalls</td><td>N</td><td>5</td><td></td><td>S-P</td></tr> <tr><td>f. Slope Paving/Rip-Rap</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>g. Pointing</td><td>N</td><td>6</td><td></td><td>M-P</td></tr> <tr><td>h. Footings</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>i. Piles</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>j. Scour</td><td>N</td><td>5</td><td></td><td>S-A</td></tr> <tr><td>k. Settlement</td><td>N</td><td>5</td><td></td><td>S-P</td></tr> <tr><td>l. Curtain Walls</td><td>N</td><td>5</td><td></td><td>S-P</td></tr> <tr><td>m.</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr> <td colspan="4">2. Piers or Bents</td> <td>N</td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>b. Caps</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>c. Columns</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>d. Stems/Webs/Pierwalls</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>e. Pointing</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>f. Footing</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>g. Piles</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>h. Scour</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>i. Settlement</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>j.</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>k.</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr> <td colspan="4">3. Pile Bents</td> <td>N</td> </tr> <tr><td>a. Pile Caps</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>b. Piles</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>c. Diagonal Bracing</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>d. Horizontal Bracing</td><td>N</td><td>N</td><td></td><td>-</td></tr> <tr><td>e. Fasteners</td><td>N</td><td>N</td><td></td><td>-</td></tr> </tbody> </table> UNDERMINING (Y/N) If YES please explain N COLLISION DAMAGE: None (X) Minor () Moderate () Severe () I-60 (Dive Report): N I-60 (This Report): 5 93B-U/W (DIVE) Insp 00/00/0000				Dive	Cur		DEF	1. Abutments				5	a. Pedestals	N	N		-	b. Bridge Seats	N	N		-	c. Backwalls	N	N		-	d. Breastwalls	N	6		M-P	e. Wingwalls	N	5		S-P	f. Slope Paving/Rip-Rap	N	N		-	g. Pointing	N	6		M-P	h. Footings	N	N		-	i. Piles	N	N		-	j. Scour	N	5		S-A	k. Settlement	N	5		S-P	l. Curtain Walls	N	5		S-P	m.	N	N		-	2. Piers or Bents				N	a. Pedestals	N	N		-	b. Caps	N	N		-	c. Columns	N	N		-	d. Stems/Webs/Pierwalls	N	N		-	e. Pointing	N	N		-	f. Footing	N	N		-	g. Piles	N	N		-	h. Scour	N	N		-	i. Settlement	N	N		-	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		-
		DEF																																																																																																																																																																																																																																																																																	
1. Wearing surface	5	S-P																																																																																																																																																																																																																																																																																	
2. Deck Condition	N	-																																																																																																																																																																																																																																																																																	
3. Spandrel Fill	6	M-P																																																																																																																																																																																																																																																																																	
4. Curbs	N	-																																																																																																																																																																																																																																																																																	
5. Median	N	-																																																																																																																																																																																																																																																																																	
6. Sidewalks	N	-																																																																																																																																																																																																																																																																																	
7. Parapets	N	-																																																																																																																																																																																																																																																																																	
8. Railing	4	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	-																																																																																																																																																																																																																																																																																	
		DEF																																																																																																																																																																																																																																																																																	
1. Arch/Arch Ring	5	S-P																																																																																																																																																																																																																																																																																	
2. Keystone Area	5	S-P																																																																																																																																																																																																																																																																																	
3. Stringers	N	-																																																																																																																																																																																																																																																																																	
4. Floorbeams	N	-																																																																																																																																																																																																																																																																																	
5. Spandrel Walls	5	S-A																																																																																																																																																																																																																																																																																	
6. Spring Lines	7	-																																																																																																																																																																																																																																																																																	
7. Diaphragms/Cross Frames	N	-																																																																																																																																																																																																																																																																																	
8. Conn Plt's, Gussets & Angles	N	-																																																																																																																																																																																																																																																																																	
9. Pin & Hangers	N	-																																																																																																																																																																																																																																																																																	
10. Masonry Joints	6	M-P																																																																																																																																																																																																																																																																																	
11. Rivets & Bolts	N	-																																																																																																																																																																																																																																																																																	
12. Welds	N	-																																																																																																																																																																																																																																																																																	
13. Deformation/Flattening	7	-																																																																																																																																																																																																																																																																																	
14. Member Alignment	7	-																																																																																																																																																																																																																																																																																	
15. Paint/Coating	N	-																																																																																																																																																																																																																																																																																	
16.	N	-																																																																																																																																																																																																																																																																																	
	Dive	Cur		DEF																																																																																																																																																																																																																																																																															
1. Abutments				5																																																																																																																																																																																																																																																																															
a. Pedestals	N	N		-																																																																																																																																																																																																																																																																															
b. Bridge Seats	N	N		-																																																																																																																																																																																																																																																																															
c. Backwalls	N	N		-																																																																																																																																																																																																																																																																															
d. Breastwalls	N	6		M-P																																																																																																																																																																																																																																																																															
e. Wingwalls	N	5		S-P																																																																																																																																																																																																																																																																															
f. Slope Paving/Rip-Rap	N	N		-																																																																																																																																																																																																																																																																															
g. Pointing	N	6		M-P																																																																																																																																																																																																																																																																															
h. Footings	N	N		-																																																																																																																																																																																																																																																																															
i. Piles	N	N		-																																																																																																																																																																																																																																																																															
j. Scour	N	5		S-A																																																																																																																																																																																																																																																																															
k. Settlement	N	5		S-P																																																																																																																																																																																																																																																																															
l. Curtain Walls	N	5		S-P																																																																																																																																																																																																																																																																															
m.	N	N		-																																																																																																																																																																																																																																																																															
2. Piers or Bents				N																																																																																																																																																																																																																																																																															
a. Pedestals	N	N		-																																																																																																																																																																																																																																																																															
b. Caps	N	N		-																																																																																																																																																																																																																																																																															
c. Columns	N	N		-																																																																																																																																																																																																																																																																															
d. Stems/Webs/Pierwalls	N	N		-																																																																																																																																																																																																																																																																															
e. Pointing	N	N		-																																																																																																																																																																																																																																																																															
f. Footing	N	N		-																																																																																																																																																																																																																																																																															
g. Piles	N	N		-																																																																																																																																																																																																																																																																															
h. Scour	N	N		-																																																																																																																																																																																																																																																																															
i. Settlement	N	N		-																																																																																																																																																																																																																																																																															
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		-																																																																																																																																																																																																																																																																															

X=UNKNOWN

N=NOT APPLICABLE

H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

ITEM 61
CHANNEL & CHANNEL PROTECTION

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

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

ITEM 61 (Dive Report): ☐ N ITEM 61 (This Report): ☐ 5

93b-U/W INSP. DATE:

ITEM 36 TRAFFIC SAFETY

	36	COND	DEF
A. Bridge Railing	0	4	S-A
B. Transitions	N	N	-
C. Approach Guardrail	0	4	S-A
D. Approach Guardrail Ends	0	4	S-A

WEIGHT POSTING *Not Applicable* ☒ X

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: EJDMT Date:

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

CLEARANCE POSTING

	N		S		
	ft	in	ft	in	meter
Actual Field Measurement					
Posted Clearance					

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

ACCESSIBILITY (Y/N/P)

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

TOTAL HOURS

PLANS (Y/N): ☐ N

(V.C.R.) (Y/N): ☐ N

TAPE#: _____

List of field tests performed:
None

RATING
Rating Report (Y/N): ☐ N
Date:
Inspection data at time of existing rating
I 58: - I 59: - I 60: - Date: 00/00/0000

Recommend for Rating or Rerating (Y/N): ☐ N If YES please give priority:
HIGH () MEDIUM () LOW ()

REASON: _____

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

BRIDGE ORIENTATION

According to the compass the approaches are North and South and the elevations are East and West. This is a single span stone masonry arch. The brook flows West to East.

ITEM 58 - DECK

Item 58.1 - Wearing surface

The bituminous concrete wearing surface has heavy longitudinal cracking and minor settlement to the Southbound lane. **See Photo 1.**

Item 58.3 - Spandrel Fill

See Item 58.1.

Item 58.8 - Railing

Both bridge rails consist of steel W beam guardrail with 2 in. diameter concrete filled steel pipe rails and 2x6 timber top rails. Both bridge rails have random post spacing and are leaning outward due to the movement of the spandrel wall capstones (rail bases).

West bridge rail: The South end has 15 ft. of missing top timber rail. **See Photo 2.** The spandrel wall capstones are pushed 6 in. out from the top of the spandrel wall. **See Photo 3.**

East bridge rail: One capstone is pushed 6 in. out from the top of the spandrel wall. **See Photo 4.**

APPROACHES

Approaches a - Appr. pavement condition

Both approach pavements have moderate to heavy longitudinal and transverse cracking, with moderate map cracking and minor settlement in the Southbound lane. The North approach has areas of minor to moderate breakup. **See Photos 1 and 5.**

Approaches b - Appr. Roadway Settlement

See Approaches a.

ITEM 59 - SUPERSTRUCTURE

Item 59.1 - Arch/Arch Ring

The arch ring has been coated with concrete and has hairline map cracking with moderate to heavy efflorescence throughout.

Keystone area: At 4 ft. from the West side there is a 6 in. x 6 in. x 2 in. deep spall and an isolated area of minor active leakage (icicle). **See Photo 6.** At 5 ft. from the East side there is a full length x 1/8 in. wide crack with a 3 ft. long x 18 in. wide x 3 in. deep spall. **See Photo 7.**

Item 59.2 - Keystone Area

See Item 59.1.

Item 59.5 - Spandrel Walls

Both spandrel walls have some areas of missing pointing and missing chinking stones throughout. **See Photos 3 and 4.**

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

Item 59.10 - Masonry Joints

There are areas of minor missing pointing at both arch sides where the concrete coating is missing.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

The center of the North breastwall has an 8 ft. long x full height area of minor missing pointing with one cracked stone 6 ft. in from the West. **See Photo 8.**

Item 60.1.e - Wingwalls

Northwest wingwall: There is a full height x up to 1 in. wide vertical settlement crack, with up to 2 ft. penetration, at the interface with the breastwall and spandrel wall. **See Photo 9.**

Northeast wingwall: The base has voids up to 30 in. long x 18 in. wide with up to 4 ft. deep penetration. The East end stones are leaning away from the wall. **See Photo 10.**

Item 60.1.g - Pointing

See Item 60.1.d.

Item 60.1.j - Scour

See Item 60.1.e.

Item 60.1.k - Settlement

See Item 60.1.e.

Item 60.1.l - Curtain Walls

The North curtain wall consists of large stones and concrete and has a 13 ft. long x up to full height x full width area that is missing or deteriorated. **See Photo 11.**

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

See Item 60.1.e.

Item 61.3 - Debris

Approximately 80 ft. downstream there are downed trees and several large rocks directing the flow to the North side of the channel. **See Photo 12.**

Item 61.6 - Rip-Rap/Slope Protection

The rip-rap is hidden by snow cover.

TRAFFIC SAFETY

Item 36a - Bridge Railing

See Item 58.8.

Item 36c - Approach Guardrail

The approach guardrails are continuous with the bridge rails. See Item 58.8.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

Item 36d - Approach Guardrail Ends

See Item 36c.

Photo Log

Photo 1 : Wearing surface and South approach pavement.
 Photo 2 : West bridge rail.
 Photo 3 : West spandrel wall.
 Photo 4 : East spandrel wall.
 Photo 5 : North approach pavement.
 Photo 6 : West side of arch.
 Photo 7 : East side of arch.
 Photo 8 : North breastwall.
 Photo 9 : Northwest wingwall.
 Photo 10 : Northeast wingwall.
 Photo 11 : North curtain wall.
 Photo 12 : Downstream channel.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	---------------------------------------	--------------------------------

PHOTOS

Photo 1: Wearing surface and South approach pavement.



Photo 2: West bridge rail.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 3: West spandrel wall.



Photo 4: East spandrel wall.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 5: North approach pavement.



Photo 6: West side of arch.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 7: East side of arch.



Photo 8: North breastwall.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	---------------------------------------	--------------------------------

PHOTOS

Photo 9: Northwest wingwall.

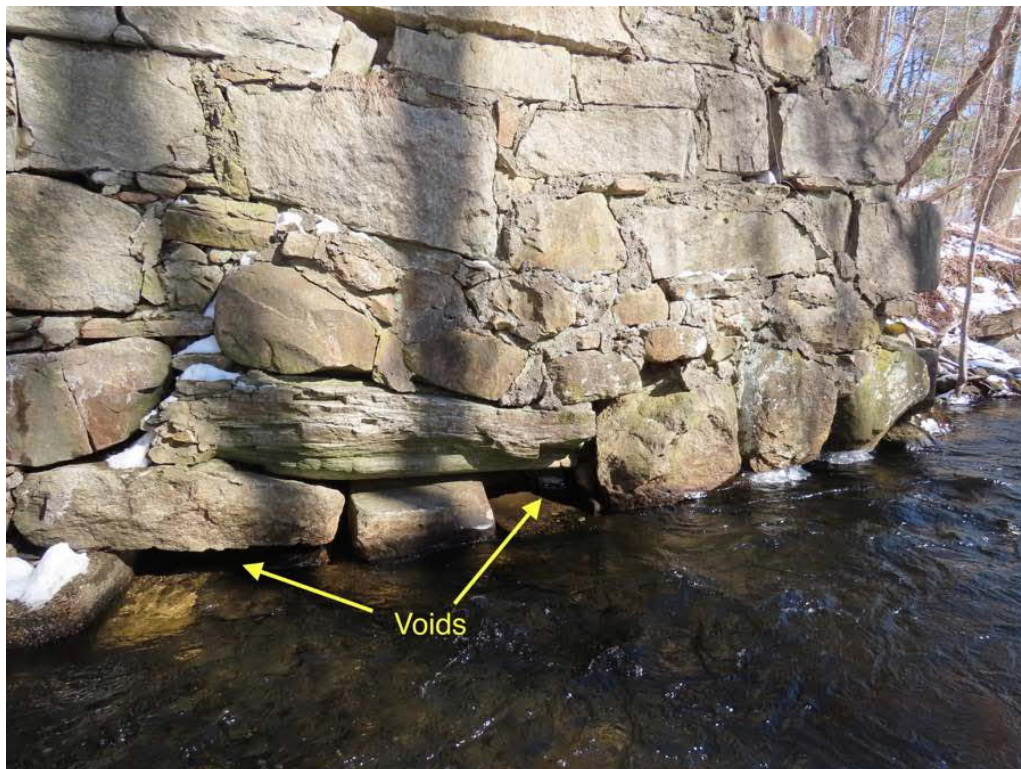


Photo 10: Northeast wingwall.

CITY/TOWN UXBRIDGE	B.I.N. 6X5	BR. DEPT. NO. U-02-002	8.-STRUCTURE NO. U02002-6X5-MUN-BRI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 11: North curtain wall.

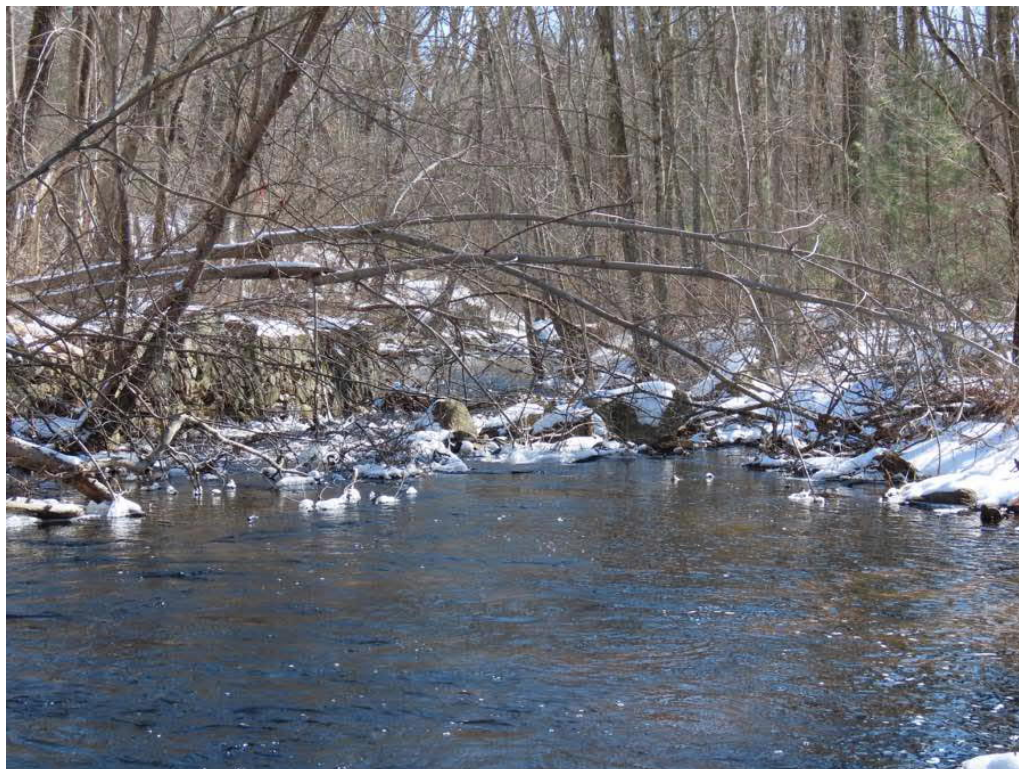


Photo 12: Downstream channel.

THIS PAGE INTENTIONALLY LEFT BLANK

Report Date: April 15, 2021

State Information										Classification										Code																			
BDEPT#= U02002										Agency Br.No.										(112) NBIS Bridge Length										N									
Town= Uxbridge										L.O.										(104) Highway System										N									
B.I.N= 6X5										AASHTO= 023.9										(26) Functional Class - Rural Local										09									
RANK= 0 H.I.= 100.0 %										FHWA Select List= N (6/21/2017)										(100) Defense Highway										0									
(8) Structure Number										U020026X5MUNBRI										(101) Parallel Structure										N									
(5) Inventory Route										151000000										(102) Direction of Traffic - 2-way traffic										2									
(2) State Highway Department District										03										(103) Temporary Structure										N									
(3) County Code 027 (4) Place code										71620										(105) Federal Lands Highways										0									
(6) Features Intersected										WATER EMERSON BROOK										(110) Designated National Network										N									
(7) Facility Carried										HWY MILL ST										(20) Toll - On free road										3									
(9) Location																				(21) Maintain - Town Agency										03									
(11) Kilometerpoint										0000.402										(22) Owner - Town Agency										03									
(12) Base Highway Network										N										(37) Historical Significance undetermined																			
(13) LRS Inventory Route & Subroute										000000000000										Condition										Code									
(16) Latitude										42 DEG 02 MIN 46.15 SEC										(58) Deck										N									
(17) Longitude										71 DEG 38 MIN 16.27 SEC										(59) Superstructure										5									
(98) Border Bridge State Code										Share %										(60) Substructure										5									
(99) Border Bridge Structure No. #																				(61) Channel & Channel Protection										5									
																				(62) Culverts										N									
Structure Type and Material																				Load Rating and Posting										Code									
(43) Structure Type Main: Masonry										Code 811										(31) Design Load - Unknown										0									
Arch - Deck										Jointless bridge type: Not applicable										(63) Operating Rating Method - Allowable Stress (AS)										2									
(44) Structure Type Appr: Other										Code 000										(64) Operating Rating										00.0									
(45) Number of spans in main unit										001										(65) Inventory Rating Method - Allowable Stress (AS)										2									
(46) Number of approach spans										0000										(66) Inventory Rating										00.0									
(107) Deck Structure Type - Not applicable										Code N										(70) Bridge Posting										0									
(108) Wearing Surface / Protective System:																				(41) Structure - Open										A									
A) Type of wearing surface - Bituminous										Code 6										Appraisal										Code									
B) Type of membrane - None										Code 0										(67) Structural Evaluation										3									
C) Type of deck protection - None										Code 0										(68) Deck Geometry										4									
																				(69) Underclearances, vert. and horiz.										N									
																				(71) Waterway adequacy										7									
																				(72) Approach Roadway Alignment										7									
																				(36) Traffic Safety Features										0 N 0 0									
																				(113) Scour Critical Bridges										6									
Age and Service																				Inspections																			
(27) Year Built										1850										(90) Inspection Date 03/04/21										(91) Frequency 24 MO									
(106) Year Reconstructed										0000										(92) Critical Feature Inspection:										(93) CFI DATE									
(42) Type of Service: On - Highway																				(A) Fracture Critical Detail N 00 MO A)										00/00/00									
Under - Waterway										Code 15										(B) Underwater Inspection N 00 MO B)										00/00/00									
(28) Lanes: On Structure 02 Under structure										00										(C) Other Special Inspection N 00 MO C)										00/00/00									
(29) Average Daily Traffic										000293										(*) Other Inspection () N 00 MO *)										00/00/00									
(30) Year of ADT 2015 (109) Truck ADT										00 %										(*) Closed Bridge N 00 MO *)										00/00/00									
(19) Bypass, detour length										001 KM										(*) UW Special Inspection N 00 MO *)										00/00/00									
																				(*) Damage Inspection										MO *) 00/00/00									
Geometric Data																				Rating Loads																			
(48) Length of maximum span										0003.1 M										Report Date 00/00/00										H20 Type 3 Type 3S2 Type HS									
(49) Structure Length										00003.1 M										Operating										0.0 0.0 0.0 0.0									
(50) Curb or sidewalk: Left 00.0 M Right										00.0 M										Inventory										0.0 0.0 0.0 0.0									
(51) Bridge Roadway Width Curb to Curb										006.1 M										Field Posting																			
(52) Deck Width Out to Out										006.4 M										Status										Posting Date 00/00/00									
(32) Approach Roadway Width (w/shoulders)										006.1 M										2 Axle 3 Axle 5 Axle										Single									
(33) Bridge Median - No median										Code 0										Actual																			
(34) Skew 00 DEG (35) Structure Flared										N										Recommended																			
(10) Inventory Route MIN Vert Clear										99.99 M										Missing Signs N																			
(47) Inventory Route Total Horiz Clear										06.1 M										Misc.																			
(53) Min Vert Clear Over Bridge Rdwy										99.99 M										Bridge Name										N Anti-missile fence N Acrow Panel N Jointless Bridge									
(54) Min Vert Underclear ref N										00.00 M										Freeze/Thaw N : Not Applicable																			
(55) Min Lat Underclear RT ref N										00.0 M										Accessibility (Needed/Used)																			
(56) Min Lat Underclear LT										00.0 M										N / N Liftbucket N / N Rigging N / N Other																			
																				N / N Ladder N / N Staging																			
																				N / N Boat N / N Traffic Control																			
																				Y / Y Wader N / N RR Flagperson										Inspection									
																				N / N Inspector 50 N / N Police										Hours: 008									
Navigation Data																																							
(38) Navigation Control - No navigation control on waterway										Code 0																													
(111) Pier Protection										Code																													
(39) Navigation Vertical Clearance										000.0 M																													
(116) Vert-lift Bridge Nav Min Vert Clear										M																													
(40) Navigation Horizontal Clearance										0000.0 M																													

THIS PAGE INTENTIONALLY LEFT BLANK

Elmwood Avenue over Aldrich Brook
(Bridge No. N/A)

Priority 13

AVAILABLE INFORMATION

Elmwood Avenue is classified as a Local roadway according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of an 18" cast-in-place concrete slab on mortared stone masonry abutments. The structure has an out-to-out width of 21'-4" with a clear span of 9'-5". The hydraulic opening of the structure is approximately 8'-9" high by 9'-5" wide. Flow was 18" deep at the time of inspection and flowing southward. Depth of fill over the structure is approximately 20".

The roadway width over the structure is 14'-7" and consists of an asphaltic wearing surface. There are no sidewalks on either side of the roadway. A residential driveway is located directly adjacent to the bridge at the southwest approach. The bridge railing consists of a chain link fence on both sides with no approach guardrail.

Overhead wires run along the south fascia of the bridge.

There are currently no posted signs in the vicinity of the bridge.

FINDINGS

The overall condition of this structure is fair with some deficiencies noted.

The concrete slab is in fair condition with a few minor problems. Transverse cracking on the underside of the slab is present and appears to be sealed and/or repaired. There are also several concrete blocks recessed into the underside of slab (Photo 3). These blocks are likely construction related, used as form supports or steel reinforcing spacers. The blocks are not considered a deficiency but do allow water/moisture to penetrate the slab.

The abutments are also in fair condition with a few minor problems. Both abutments exhibit missing pointing and chinking stones at the waterline. There are areas of missing mortar and voids typically throughout. A full height vertical crack was recorded at the east abutment face (Photo 10). Additionally, there is cracking and slight displacement at the west abutment around the north corner (Photo 9). There is also a large void at the north end of the east abutment, which extends 33" into the wall. Similarly, a void at the south end of the west abutment was recorded and measured 41" deep (Photo 11).

Two stone masonry wingwalls on the south side, although heavily covered in vegetation, are in fair condition with some missing pointing and chinking stones. There is a void at the coping above the southwest wingwall measuring approximately 45" long x 16" high x 12" deep (Photo 13). Two stone masonry wingwalls on the north side are also covered with heavy vegetation. The northeast wall is in fair condition with several large voids and

a tree growing out of it (Photo 6). The northwest wall is in poor condition as it is partially collapsing and displacing the northwest abutment corner (Photos 4 and 5). There is a lack of mortar here with several large voids.

The roadway is in fair condition with some minor notes. There is some washout near the southwest corner, near the coping void. There is also some settlement at the northwest corner near the collapsing wall. The chain-link fence bridge rail is wobbly and not crash tested. Additionally, there is collision damage to the fence post at the southeast corner (Photo 15). There is a steep embankment and the lack of approach guardrail makes this a safety hazard.

RECOMMENDATIONS

This structure is in fair condition with several deficiencies noted. BETA recommends that the following repairs are completed to extend the structures anticipated service life:

- Rebuild the northwest masonry wingwall to prevent further erosion of the embankment and deterioration of the roadway surface. Remove all vegetation from the rest of existing wingwalls. Additionally, fill any remaining voids and repoint as required.
- Repair all spalls and cracks to the concrete slab. Also, finish and smooth all recessed block locations at the slab underside.
- Fill all voids, repair all cracks, and repoint the existing stone masonry abutments.
- Place proper signage such as "BE PREPARED TO STOP," as the roadway width over the structure is not adequate to carry two lanes of traffic. The roadway centerlines should be striped accordingly. All signage and striping should be fabricated and placed in accordance with current MUTCD standards.
- BETA also recommends the addition of crash tested guardrail at all approaches and over the structure.

Conduct bi-annual inspections to monitor overall bridge conditions.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$85,000
Engineering:	<u>\$25,000</u>
Total:	\$110,000

Attachments

Locus Map

Inspection Photos

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

ELMWOOD AVENUE
OVER
ALDRICH BROOK

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking South: North Bridge Elevation



Photo 2 Looking North: South Bridge Elevation



Photo 3 Looking North: Roof



Photo 4 Looking Southwest: Northwest Wingwall



Photo 5 Looking Southeast: Northwest Wingwall



Photo 6 Looking South: Northeast Wingwall



Photo 7 Looking North: Southwest Wingwall



Photo 8 Looking North: Southeast Wingwall



Photo 9 Looking South: Cracking at Northwest Abutment Corner

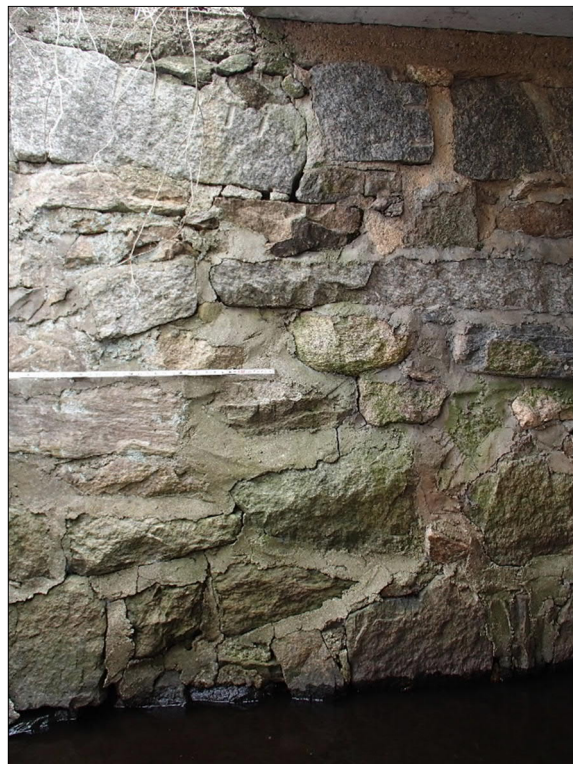


Photo 10 Looking East: East Abutment Cracking on Face

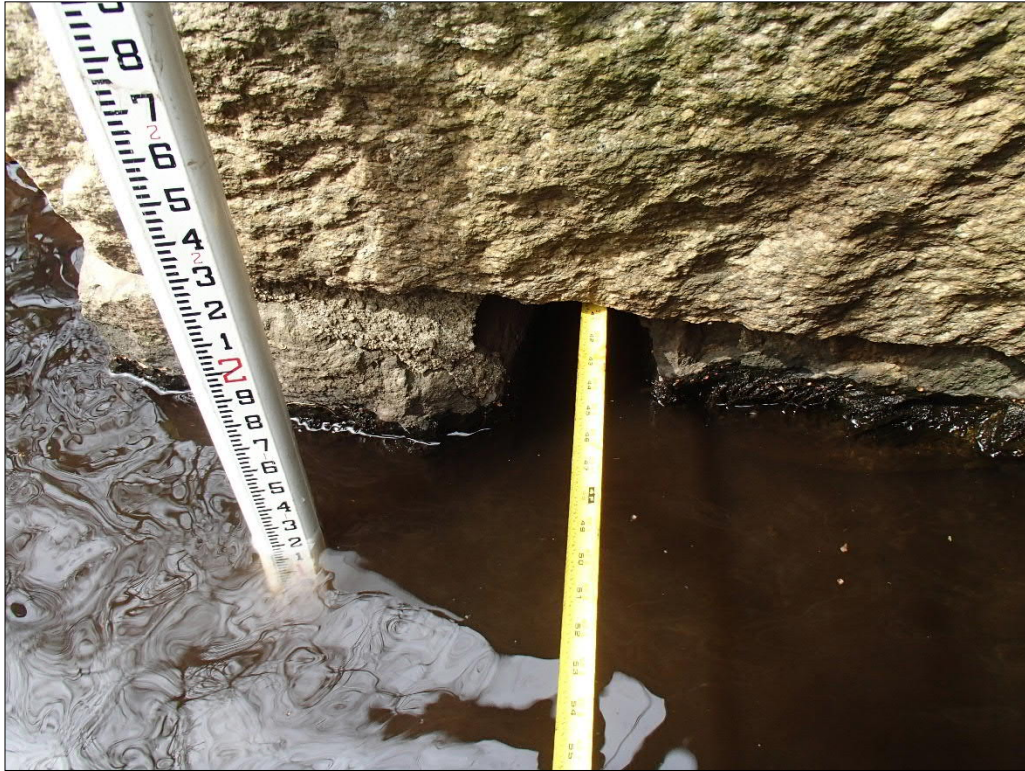


Photo 11 Looking West: Void at West Abutment



Photo 12 Looking West: Debris in Brook



Photo 13 Looking North: Large Void on Parapet near Southwest Wingwall



Photo 14 Looking East: West Approach



Photo 15 Looking South: Collision Damage at Southeast Fence

Hazel Street over Cold Spring Brook
(Bridge No. N/A)

Priority 14

AVAILABLE INFORMATION

Hazel Street is classified as a Local roadway according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a mortared stone masonry arch with dry-laid stone abutments and wingwalls. The date of construction for this structure is unknown. The structure has an out-to-out width of 25'-0" and a clear span of 10'-0". The hydraulic opening of the arch structure is approximately 4'-10" high by 10'-0" wide. The flow was 18" deep at the time of inspection and flowing northward. The depth of fill over the structure is 29".

The roadway width over the structure is approximately 19'-0" and consists of an asphaltic wearing surface. There are no sidewalks on either side. A sharp horizontal curve and blind intersection with Cross Road is located at the east approach. The west approach roadway consists of a wider horizontal curve with residential driveways.

Overhead wires run along the north side of the roadway. There is also a drainage outfall in the waterway embankment northeast of the structure (Photo 10).

The bridge railing consists of timber rails mounted to metal posts. There is no approach guardrail.

There is a "Speed Limit 30" sign posted at the east approach.

FINDINGS

The overall condition of the structure is fair with several deficiencies noted.

The stone arch underside was found to exhibit moderately size voids missing chinking stones. Approximately 50% of the arch's underside is covered with a mortar patching repair (Photos 5 and 6). The patching shows several random spalls, cracking, and efflorescence throughout. A few large spalled areas were also observed.

The abutments are also in fair condition but do show some minor problems. The abutment walls typically exhibit random voids between stones, especially at the water line (Photo 7). Missing chinking stones are also typical and both abutments show minor crumbling at the north opening. The culvert floor has random large boulders at both entrances.

The north spandrel wall shows heavy mortar deterioration with small voids and loss of chinking stones. There is also heavy vegetation growth at this location. The south spandrel wall also shows small voids and missing chinking stones with a few cracked stones. This wall is also crumbling at the wall base on the east end.

The stone training walls are generally in fair condition with the exception of the southwest wall. The northeast, northwest, and southeast walls are mortared stone and support the adjacent roadway. There is cracking at the northeast stone wall (Photo 9). These three walls all typically exhibit deterioration of existing mortar joints, random voids, missing chinking stones, and heavy vegetation growth. The southwest dry-laid stone training wall, which follows Cold Spring Brook, has several large voids. Lateral displacement of this wall was also found and indicates lack of stability.

The roadway condition is in good condition with very minor cracking. Although the roadway is fairly narrow, very high speeds were observed despite a lack of visibility at both approaches. Although the wooden bridge rail is in fair condition, it not a crash tested system. The railings' makeup and lack of approach guardrail makes this a safety hazard.

RECOMMENDATIONS

Due to the structure's apparent age and condition, BETA recommends a complete replacement of this structure as a long-term solution. Alternatively, it may be feasible to rehabilitate the structure by slip-lining with a corrugated metal pipe/arch. If slip-lining is found to be technically feasible, this alternative could provide significant cost savings while minimizing construction impacts to traffic and neighboring residents. In either the case of replacement and/or rehabilitation, a new MassDOT approved bridge railing will be required. In addition, approach guardrail is recommended with the appropriate transitions.

The following recommendations should be implemented in the interim until a culvert replacement/rehabilitation can be scheduled:

- Fill all voids at the outside face, abutments, and wingwalls with chinking stones.
- Repoint all masonry joints as required to the arch, abutments, outside face, and wingwalls.
- Repair the east and west abutment walls at the north opening where partial collapse is present.
- Repoint the northeast, northwest, and southeast training walls. All voids noted in the walls should be filled to prevent further erosion of the embankment and loss of roadway fines. The southwest training also should be stabilized.
- Signage in accordance current MUTCD standards is also recommended at the west approach indicating a sharp curve, narrow roadway, blind intersection, and/or reduced speed.

Annual inspections should be conducted to monitor overall bridge conditions including abutment walls and movement of the southwest stone masonry training wall. Inspections should also be conducted during and following extreme flood events to ensure that the training walls and abutments are performing adequately and that there are no flow obstructions in the channel.

BUDGETARY COST ESTIMATE

Full Replacement:

Construction:	\$505,000
Engineering:	<u>\$130,000</u>
Total:	\$290,000

Rehabilitation via Slip-Lining:

Construction:	\$125,000
Engineering:	<u>\$35,000</u>
Total:	\$160,000

Interim Repairs

Construction:	\$19,000
Engineering:	<u>\$5,000</u>
Total:	\$24,000

THIS PAGE INTENTIONALLY LEFT BLANK

Attachments

Locus Map

Inspection Photos

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

HAZEL STREET
OVER
COLD SPRING BROOK

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking North: South Culvert Elevation



Photo 2 Looking South: North Culvert Elevation



Photo 3 Looking Southeast: Northeast Wingwall



Photo 4 Looking Southwest: Northwest Wingwall



Photo 5 Looking Northeast: Culvert Roof



Photo 6 Looking Northwest: Culvert Roof



Photo 7 Looking East: Voids at the Water Line



Photo 8 Looking South: Cracks and Voids on North Face



Photo 9 Looking East: Cracking at Northeast Wingwall Connection



Photo 10 Looking East: Drainage Pipe



Photo 11 Looking West: East Approach



Photo 12 Looking East: West Approach



Photo 13 Looking South: South Rail



Photo 14 Looking North: North Rail

THIS PAGE INTENTIONALLY LEFT BLANK

Laurel Street over Laurel Brook
(Bridge No. N/A)

Priority 15

AVAILABLE INFORMATION

Laurel Street is classified as a Local roadway according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a mortared stone masonry arch with stone masonry abutments. The structure has an out-to-out width of 20'-6" and a clear span of 12'-0". The hydraulic opening of the arch is approximately 6'-5" high by 12'-0" wide. The flow was 1.3' deep at the west side and 1.7' at the east side while flowing eastward.

The roadway width over the structure, measured from safety barrier to safety barrier, is approximately 16'-6" with no sidewalks and consists of an asphaltic wearing surface. There is a sharp horizontal and vertical curve at the south approach. The bridge railing varies. The east railing consists of approximately a 12' length of timber bridge rail mounted to metal posts. Placed in front of the timber rail is a standard highway guardrail that runs the length of the bridge. This guardrail is mounted to timber posts at each end with a single Jersey barrier at the south approach acting as a transition. The west bridge rail consists of a standard highway guardrail mounted to timber posts. There is also a Jersey barrier that runs the length of the bridge in front of the metal guardrail. The only approach guard rail on the west side is a timber railing at the north approach.

Overhead wires run along the east side of the roadway. Also, there is a paved waterway at the southwest edge of pavement.

The only sign posted reads "Narrow Bridge" and is located at the south approach.

FINDINGS

The overall condition of the bridge is fair with a few problems noted.

The stone arch itself is in good shape. There are a number of areas of concrete repair on the underside of the arch. The arch underside typically shows cracking, failure of the patching, efflorescence, and some water leakage which is worse on the east side (Photo 3 and 4). The capstones above the arch show cracking and rust stains typically throughout.

The stone abutments were found to be in fair condition. Several areas of missing mortar and chinking stones were noted to be concentrated at the waterline. There are also typically voids present along the water line which is 2' deep at the southwest corner (Photo 14).

Stone training walls line the waterway while stone wingwalls support the roadway. These walls are in fair condition but typically exhibit several areas of missing mortar and small voids. The southeast wingwall also has heavy vegetation growing over it. The most

notable wall deficiency is bulging and/or lateral displacement of the northeast wingwall; this wall is experiencing stability failure (Photos 6-8). The wall movement at this location appears to be affecting the northeast face of arch.

Minor amounts of debris and wheel line rutting were typically found in the roadway. There is an area of washout of the wearing surface over the arch at the northeast corner near the northeast wingwall. The south approach alignment consists of a sharp horizontal and vertical curve resulting in minimal sight distance approaching the structure. The guardrail on the east side of the roadway is in fair condition with slight damage and displacement. However, the guardrail on the west side of the roadway is in poor condition with extensive damage. A Jersey barrier has been placed along the length of the roadway to protect this damaged guardrail and has resulted in a significant reduction in roadway width. The reduction in width coupled with poor sight distance at the south approach has created a safety hazard.

RECOMMENDATIONS

This structure is in fair condition with several deficiencies noted. BETA recommends that the following repairs be completed to extend the structure's anticipated service life:

- Replace northeast wingwall with a new masonry wall or a concrete wall to prevent further damage to the roadway above.
- Replace all missing and/or loose chinking stones in the stone arch, abutments, training walls, and wingwalls.
- Repoint all joints to the stone arch, abutments, training walls, and wingwalls.
- Fill all voids noted at the stone wingwalls to prevent erosion of the embankment and loss of roadway fines.

Roadway width over the culvert is not adequate to carry two lanes of traffic. Additional "BE PREPARED TO STOP" approach signs should be added. The roadway centerlines should be striped accordingly. All signage and striping should be fabricated and placed in accordance with current MUTCD standards. Signage in accordance current MUTCD standards is also recommended at the south approach indicating a sharp curve and/or reduced speed. BETA also recommends the installation of new guardrail at all approaches and over the structure.

The clear span of this structure is greater than 10'-0". The Town should contact MassDOT to have a bridge number assigned to this structure and begin a bi-annual inspection program.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$70,000
Engineering:	<u>\$20,000</u>
Total:	\$90,000

THIS PAGE INTENTIONALLY LEFT BLANK

Attachments

Locus Map

Inspection Photos

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

LAUREL STREET
OVER
LAUREL BROOK

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking West: East Culvert Elevation



Photo 2 Looking East: West Culvert Elevation



Photo 3 Looking Northwest: North Abutment



Photo 4 Looking Southwest: South Abutment



Photo 5 Looking West: Culvert Roof



Photo 6 Looking Southwest: Northeast Wingwall



Photo 7 Looking South: Northeast Wingwall



Photo 8 Looking North: Northeast Wingwall



Photo 9 Looking West: Southeast Wingwall



Photo 10 Looking North: Northwest Wingwall



Photo 11 Looking East: Southwest Wingwall



Photo 12 Looking South: Southwest Wingwall



Photo 13 Looking East: Cracked Mortar at Southwest Arch Corner



Photo 14 Looking East: Southwest Corner Void



Photo 15 Looking South: North Approach



Photo 16 Looking North: South Approach



Photo 17 Looking Northwest: West Barrier



Photo 18 Looking East: East Barrier

THIS PAGE INTENTIONALLY LEFT BLANK

Hartford Avenue East over Mumford Tail Race
(Bridge No. N/A)

Priority 16

AVAILABLE INFORMATION

Hartford Avenue East is classified as an Urban Minor Arterial according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a concrete box culvert with dry laid stone masonry training walls. The structure has an out-to-out width of 52'-0" with a clear span of 8'-0". The rectangular hydraulic opening is 4'-0" high by 8'-0" wide. The flow was moving in a southward direction, and the depth was not measured.

The roadway width over the structure is 30'-6" with 5'-0" sidewalks on both sides. The pavement consists of an asphaltic wearing surface. Residential and commercial driveways are located directly adjacent to the structure on both sides of the roadway in the east approach.

Directly adjacent to the structure, the Hartford Avenue East over the Mumford River Bridge carries several utilities. No utilities were found to cross this culvert, but the adjacent structure indicates the presence of a sewer and water line. Overhead wires also run along the south side of the roadway. Additionally, there is a drain line that runs along the roadway. Catch basins are present in the gutter line near the structure and a drainage outfall is located in the northwest training wall.

The guardrail over the culvert consists of a standard highway guardrail with a chain link fence attached. On the north side of the roadway, the guardrail is mounted to the culvert's concrete headwall. Alternatively, the guardrail posts are driven into the ground on the south side of the roadway. Approach guardrail is present at the east approach. At the west approach, there is approach guardrail on the north side only.

There are "6 Ton Limit Ahead", "Road Narrows", and "Speed Limit 30" at both approaches. All signs are for the Hartford Avenue East over Canal crossing located approximately 400' east.

FINDINGS

The overall condition of the structure is good with few minor deficiencies noted.

The concrete box culvert is in good condition but does exhibit minor scaling of the sidewalls, minor efflorescence at the culvert joints, and minor scaling on the north face of the headwall. There are also areas of rust staining on the culvert roof.

The training walls are in fair-to-poor condition. The walls are made up of dry-laid stone masonry. Loose chinking stones and medium-sized voids are random but typical on all wall location. The northwest wall is un-mortared and experiences some shifting (Photo 6). The southwest training wall is experiencing stability failure (Photo 10). Approximately 15'

of the wall shows horizontal displacement into the channel. There is also a large amount of debris at the upstream opening of the culvert (Photo 13).

The roadway over the culvert and at the approaches are newly paved and are good condition. The north sidewalk is completely undermined in an area near the northwest wingwall (Photos 19 and 20). The SS guardrail is in good condition other than minor collision damage at the northeast corner. The alignment of the roadway is straight with clear visibility.

RECOMMENDATIONS

The overall condition of the structure is fair-to-good. BETA recommends that the following items be addressed:

- Fill in void under the northwest corner of the sidewalk with control density fill in order to prevent deterioration of sidewalk.
- Fill all voids to the adjacent training walls to prevent loss of roadway fines.
- Remove debris from the upstream culvert opening.
- Investigate possible stability and repair measures for the southwest training wall. It is possible the wall is on private property.

Conduct bi-annual inspections to monitor overall bridge conditions.

BUDGETARY COST ESTIMATE

Repairs

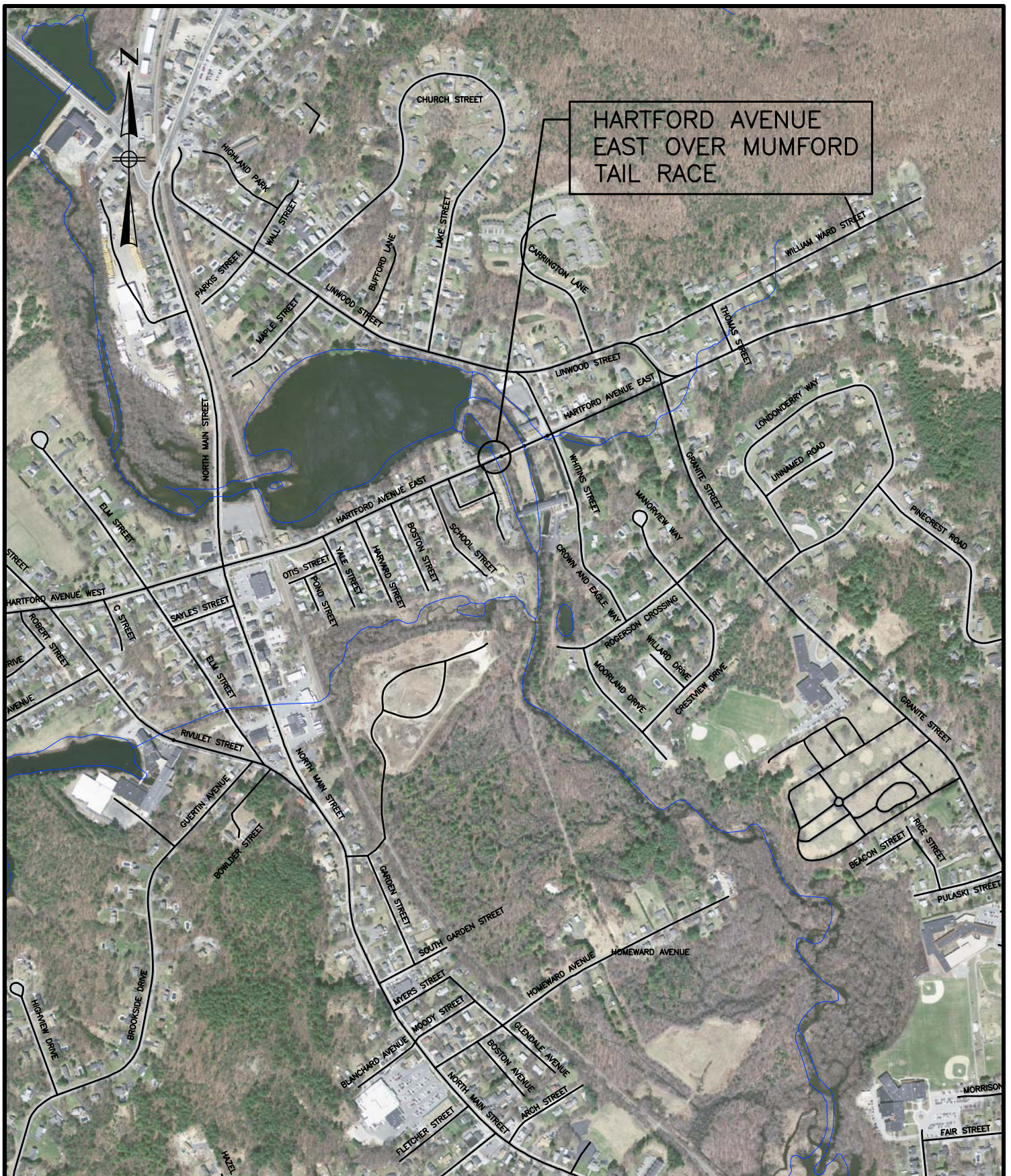
Construction:	\$25,000
Engineering:	<u>\$10,000</u>
Total:	\$35,000

Attachments

Locus Map

Inspection Photos

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

HARTFORD AVENUE EAST
OVER
MUMFORD TAIL RACE

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking North: South Culvert Elevation



Photo 2 Looking South: North Culvert Elevation



Photo 3 Looking North: Through Culvert



Photo 4 Looking South: Through Culvert



Photo 5 Looking South: Culvert Roof



Photo 6 Looking West: Northwest Wingwall



Photo 7 Looking West: Northwest Training Wall



Photo 8 Looking East: Northeast Wingwall



Photo 9 Looking North: Northeast Training Wall



Photo 10 Looking Southwest: Southwest Training Wall



Photo 11 Looking Northeast: Southeast Wingwall



Photo 12 Looking Southeast: Southeast Training Wall



Photo 13 Looking South: Debris in River



Photo 14 Looking East: West Approach



Photo 15 Looking West: East Approach



Photo 16 Looking North: North Barrier



Photo 17 Looking South: South Barrier



Photo 18 Looking West: North Sidewalk



Photo 19 Looking South: Undermining of North Sidewalk



Photo 20 Looking North: Undermining of North Sidewalk

Rivulet Street over Rivulet Brook
(Bridge No. N/A)

Priority 17

AVAILABLE INFORMATION

Rivulet Street is classified as an Urban Collector according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This culvert consists of several separate structures, each of different construction types, adjacent to one another. The culvert's inlet is located at Taft Pond west of Rivulet Street and extends under Foam Concepts at 44 Rivulet Street. Two structures are located within the public right-of-way. For the purpose of this inspection, only the two structures within the right-of-way were inspected. Here, the east structure will be referred to as structure 1, and the west structure will be called structure 2.

Structure 1 consists of a 3-sided concrete box culvert. It has a width of 23'-0" with a clear span of 15'-0". The hydraulic opening of the structure is 7'-2" high by 15'-0" wide. The depth of flow in structure 1 was recorded at 10" at the time of inspection.

Structure 2 consists of a mortared stone masonry arch. It has a width of 41'-0" before reaching the third structure within the property of Foam Concepts. The arch has a clear span of 15'-6". The hydraulic opening of the structure is 6'-6" high by 15'-6" wide. The depth of flow at the time of inspection was approximately 12" and flowing east.

The roadway width over both structures is 42'-1" with a 5'-6" sidewalk on the east side of the roadway. The roadway consists of a bituminous surface course.

Overhead wires run along the east side of the roadway. Also, there are 2- 12" diameter pipes spanning the abutment walls that appear to be damming the flow of the stream.

The guardrail consists of only concrete posts spaced approximately 5' apart with nothing connecting them.

There were no signs noted at the approaches.

FINDINGS

Both structures are overall in fair condition with a few problems noted.

The concrete roof of structure 1 shows random spots of efflorescence and moisture, but otherwise is in good condition (Photo 2). The concrete abutment walls both show moderate scaling up to the high waterline and minor honeycombing throughout. There is also deterioration at the utility pipe penetrations measuring about 9" deep (Photo 12). Both concrete wingwalls are in good condition with random cracking and heavy vegetation leading to the training walls. Both stone training walls around the brook have collapsed (Photos 5 and 7).

The stone arch underside of structure 2 shows random voids and some loss of pointing but is otherwise in fair condition (Photo 9). There are voids up to 2' deep present at the entrance from structure 1. The stone abutment walls show some loss of mortar and chinking stones with several voids along the water line up to 3' deep (Photo 14). The arch ring at the west end of structure 2 has areas of missing stones (Photos 16).

There is a large amount of debris on the channel floor, and the existing utility pipes appear to be damming stream flow. No scour was detected.

The roadway over the structure is in good condition with minor cracking. The bridge rail only consists of concrete posts on the east side. This poses a safety hazard due to the presence of a 15' vertical drop that cannot be seen from the roadway. Structure 2 is visible from the parking lot to the west side (Photo 20).

RECOMMENDATIONS

This structure is in fair-to-good condition with few problems noted. BETA recommends that the following repairs be completed to extend the structures anticipated service life:

- Replace all missing and/or loose chinking stones in the stone arch and abutments of structure 2.
- Repoint all masonry joints to the stone arch and abutments of structure 2.
- Repair concrete at pipe penetrations of structure 1 side walls.
- Remove all debris from waterway and protect utilities from future channel debris.
- Install MassDOT approved guardrail over structure on the east side of the roadway.

The clear span of this structure is greater than 10'-0". The Town should contact MassDOT to have a bridge number assigned to this structure and begin a bi-annual inspection program.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$110,000
Engineering:	<u>\$30,000</u>
Total:	\$140,000

Attachments

Locus Map

Inspection Photos

THIS PAGE INTENTIONALLY LEFT BLANK



RIVULET STREET
OVER RIVULET BROOK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

RIVULET STREET
OVER
RIVULET BROOK

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking West: East Elevation of Structure 1



Photo 2 Looking Northwest: North Abutment of Structure 1



Photo 3 Southwest: South Abutment of Structure 1



Photo 4 Looking North: Northeast Wingwall



Photo 5 Looking Northeast: Northeast Training Wall



Photo 6 Looking Southwest: Southeast Wingwall



Photo 7 Looking South: Southeast Training Wall



Photo 8 Looking West: Elevation of Structure 2



Photo 9 Looking West: Structure 2 Roof



Photo 10 Looking Northwest: North Abutment Wall of Structure 2



Photo 11 Looking Southeast: South Abutment Wall of Structure 2



Photo 12 Looking North: Pipe Running Across Structure 1



Photo 13 Looking Up: Catch Basin Present in Structure 2



Photo 14 Looking South: Voids at Water Line on Structure 2



Photo 15 Looking South: Effloresce at Southwest End of Structure 2



Photo 16 Looking West: Voids at West Arch Ring of Structure 2



Photo 17 Looking South: North Approach



Photo 18 Looking North: South Approach



Photo 19 Looking South: Concrete Posts on East Side



Photo 20 Looking North: Structure 2 Visible in Parking Lot on the West

Hartford Avenue East over the Blackstone River (Bridge No. U-02-018)

Priority 18

AVAILABLE INFORMATION

The current NBI Structure Inventory and Appraisal shows an AASHTO Sufficiency Rating of 77.1.

A bridge rating report dated September 1, 2012 was provided by MassDOT. The report notes that no posting is required because the bridge capacity is satisfactory.

MassDOT has most recently completed a routine arch inspection dated October 9, 2020.

Hartford Avenue is classified as an Urban Minor Arterial according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a mortared stone masonry arch. Original bridge construction is dated circa 1900. The structure was then rebuilt in 1960. There is a 7' high dam located directly upstream of the structure and a concrete spillway through the arch. The structure has an out-to-out width of 24'-0" with a clear span of 39'-0". The hydraulic opening of structure is approximately 11'-0" high by 39'-0" wide. The river was flowing southward rapidly and no depth was recorded. The depth of fill over the bridge is approximately 9'-0".

The bridge carries a roadway 20'-0" wide with no sidewalks on either side and consists of an asphaltic wearing surface. Both approaches are straight with a posted 30 mph speed limit.

Overhead wires run along the north fascia of the bridge. Hydraulic and drainage structures include the dam noted above and rip-rap drainage swales at the southeast and southwest approaches.

The bridge railing consists of concrete posts and railings. The bridge rail across the structure is transitioned to standard SS highway guardrail at both approaches.

The only posted sign noted reads "Watch for Pedestrians" and is located approximately 250' west of the bridge.

FINDINGS

The overall condition of the structure is good with minor deficiencies noted.

The underside of the arch was found to be in fair condition with a few areas of missing mortar with minor to moderate efflorescence (Photo 3). The arch ring has some abrasion and water staining at the water line (Photo 11).

The abutments were also found to be in good condition with some minor problems. All wingwall and abutment faces exhibit random areas of missing mortar and chinking

stones. A full height vertical crack approximately ½" wide was found at the southwest wingwall (Photo 12). Also, the southeast wingwall has a large void with some missing stones (Photo 13). The north wingwalls typically have voids along the water line. The concrete parapets typically exhibit areas of minor scaling. A spall with exposed reinforcement was also recorded at the southeast corner of the south parapet (Photo 10). The southwest embankment is partially eroded (Photo 7).

The approach roadway is in fair condition with longitudinal cracking, while the roadway over the culvert is in slightly worse condition with cracking and patches. The concrete bridge rail randomly exhibits areas of minor scaling and spalling with exposed reinforcement, primarily at the post bases (Photo 18). There is also hairline cracking with rust in the post bases and minor collision damage at the northwest transition.

RECOMMENDATIONS

The overall condition of the structure is good. BETA recommends that the following items be addressed:

- Replace all missing and/or loose chinking stones in the stone arch, wingwalls, and abutments.
- Repoint all masonry joints as required to the stone arch, wingwalls, and abutments.
- Repair any cracked stones in the stone arch, wingwalls, and abutments.
- Repair all concrete deficiencies to concrete bridge railing and parapet.
- Address erosion of the southwest embankment.

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$85,000
Engineering:	<u>\$25,000</u>
Total:	\$110,000

Attachments

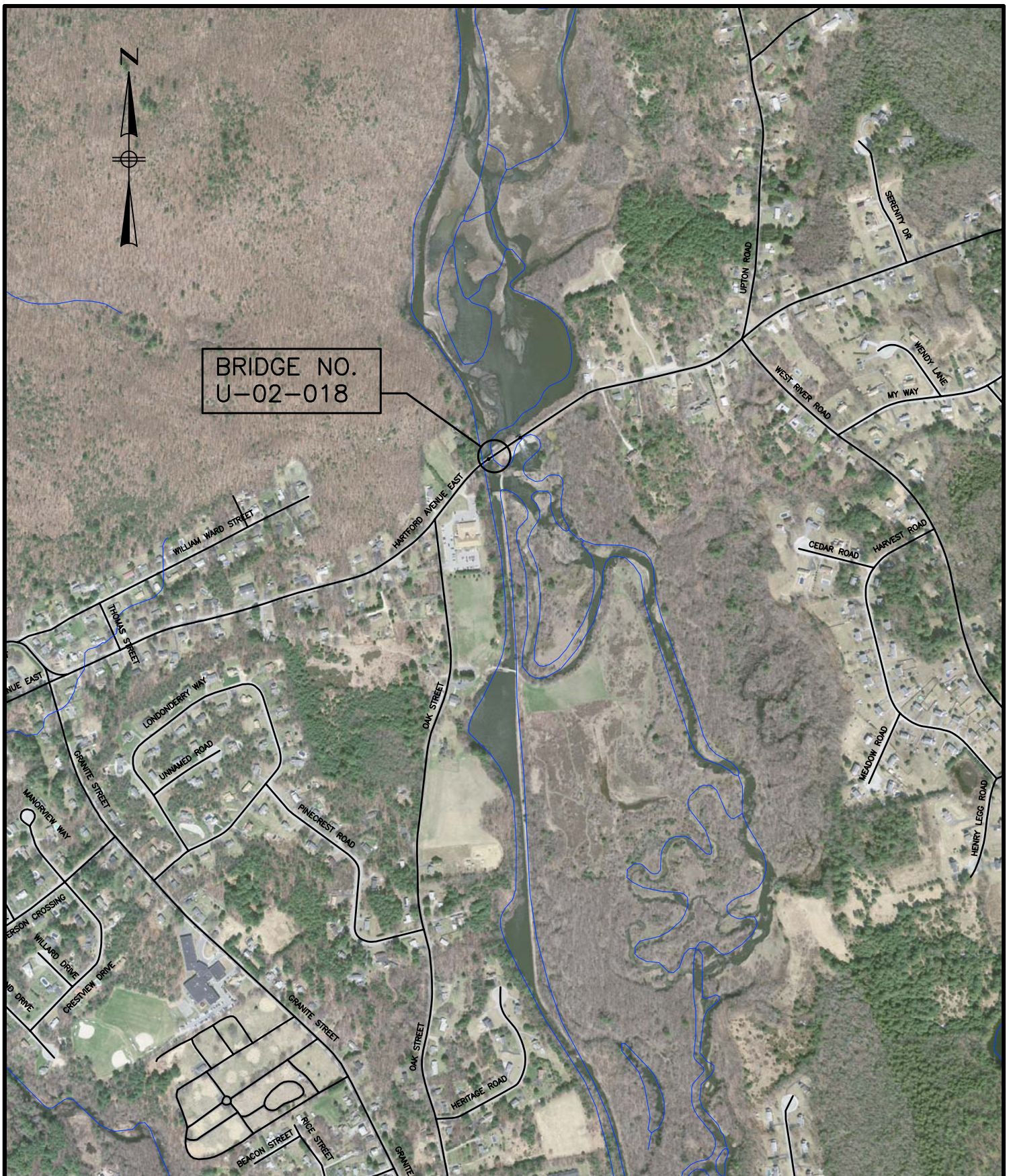
Locus Map

Inspection Photos

MassDOT Routine Arch Inspection Report Dated October 9, 2020

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865
P: 401.333.2382
F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

HARTFORD AVENUE EAST
OVER
THE BLACKSTONE RIVER

BRIDGE NO.
U-02-018

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking Northeast: South Bridge Elevation



Photo 2 Looking Southwest: North Bridge Elevation



Photo 3 Looking Northeast: Underside of Arch



Photo 4 Looking West: Northwest Wingwall



Photo 5 Looking East: Northeast Wingwall



Photo 6 Looking North: Southwest Wingwall



Photo 7 Looking South: Northwest: Southwest Embankment



Photo 8 Looking East: Southeast Wingwall



Photo 9 Looking Southeast: Southeast Riprap



Photo 10 Looking North: South Parapet Spall



Photo 11 Looking Northeast: Southwest Arch Corner



Photo 12 Looking Northwest: Southwest Wingwall Crack



Photo 13 Looking North: Southeast Wingwall Voids



Photo 14 Looking East: West Approach



Photo 15 Looking West: East Approach



Photo 16 Looking South: South Barrier



Photo 17 Looking North: North Barrier



Photo 18 Looking North: North Barrier Deterioration

THIS PAGE INTENTIONALLY LEFT BLANK

STRUCTURES INSPECTION FIELD REPORT

2-DIST
03B.I.N.
1DL

ROUTINE ARCH INSPECTION

BR. DEPT. NO.
U-02-018

CITY/TOWN UXBRIDGE	8-STRUCTURE NO. U02018-1DL-MUN-NBI	11-Kilo. POINT 001.996	41-STATUS A:OPEN	90-ROUTINE INSP. DATE OCT 9, 2020
07-FACILITY CARRIED HWY HARTFORD AVE	MEMORIAL NAME/LOCAL NAME	27-YR BUILT 1900	106-YR REBUILT 1960	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER BLACKSTONE RIVER	26-FUNCTIONAL CLASS Urban Minor Arterial	DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 811 : Masonry Arch - Deck	22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Simkhovich	
107-DECK TYPE N : Not applicable	WEATHER Clear	TEMP. (air) 16°C	TEAM MEMBERS T. TOLOCZKO	

ITEM 58 DECK <table border="1"> <tr> <td></td> <td>N</td> <td>DEF</td> </tr> <tr><td>1. Wearing Surface</td><td>5</td><td>S-P</td></tr> <tr><td>2. Deck Condition</td><td>N</td><td>-</td></tr> <tr><td>3. Spandrel Fill</td><td>6</td><td>M-P</td></tr> <tr><td>4. Curbs</td><td>6</td><td>M-P</td></tr> <tr><td>5. Median</td><td>N</td><td>-</td></tr> <tr><td>6. Sidewalks</td><td>N</td><td>-</td></tr> <tr><td>7. Parapets</td><td>N</td><td>-</td></tr> <tr><td>8. Railing</td><td>6</td><td>M-P</td></tr> <tr><td>9. Anti Missile Fence</td><td>N</td><td>-</td></tr> <tr><td>10. Drainage System</td><td>N</td><td>-</td></tr> <tr><td>11. Lighting Standards</td><td>N</td><td>-</td></tr> <tr><td>12. Utilities</td><td>N</td><td>-</td></tr> <tr><td>13. Deck Joints</td><td>N</td><td>-</td></tr> <tr><td>14.</td><td>N</td><td>-</td></tr> <tr><td>15.</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </table> CURB REVEAL (In millimeters) <table border="1"> <tr> <td>N</td> <td>S</td> </tr> <tr> <td>210</td> <td>260</td> </tr> </table> APPROACHES <table border="1"> <tr> <td></td> <td>DEF</td> </tr> <tr><td>a. Appr. Pavement Condition</td><td>6 M-P</td></tr> <tr><td>b. Appr. Roadway Settlement</td><td>7 -</td></tr> <tr><td>c. Appr. Sidewalk Settlement</td><td>N -</td></tr> <tr><td>d.</td><td>N -</td></tr> </table> OVERHEAD SIGNS (Attached to bridge) (Y/N) N <table border="1"> <tr> <td></td> <td>DEF</td> </tr> <tr><td>a. Condition of Welds</td><td>N -</td></tr> <tr><td>b. Condition of Bolts</td><td>N -</td></tr> <tr><td>c. Condition of Signs</td><td>N -</td></tr> </table>		N	DEF	1. Wearing Surface	5	S-P	2. Deck Condition	N	-	3. Spandrel Fill	6	M-P	4. Curbs	6	M-P	5. Median	N	-	6. Sidewalks	N	-	7. Parapets	N	-	8. Railing	6	M-P	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	-	N	S	210	260		DEF	a. Appr. Pavement Condition	6 M-P	b. Appr. Roadway Settlement	7 -	c. Appr. Sidewalk Settlement	N -	d.	N -		DEF	a. Condition of Welds	N -	b. Condition of Bolts	N -	c. Condition of Signs	N -	ITEM 59 SUPERSTRUCTURE <table border="1"> <tr> <td></td> <td>7</td> <td>DEF</td> </tr> <tr><td>1. Arch/Arch Ring</td><td>7</td><td>M-P</td></tr> <tr><td>2. Keystone Area</td><td>7</td><td>-</td></tr> <tr><td>3. Stringers</td><td>N</td><td>-</td></tr> <tr><td>4. Floorbeams</td><td>N</td><td>-</td></tr> <tr><td>5. Spandrel Walls</td><td>7</td><td>M-P</td></tr> <tr><td>6. Spring Lines</td><td>7</td><td>M-P</td></tr> <tr><td>7. Diaphragms/Cross Frames</td><td>N</td><td>-</td></tr> <tr><td>8. Conn Plt's, Gussets & Angles</td><td>N</td><td>-</td></tr> <tr><td>9. Pin & Hangers</td><td>N</td><td>-</td></tr> <tr><td>10. Masonry Joints</td><td>7</td><td>M-P</td></tr> <tr><td>11. Rivets & Bolts</td><td>N</td><td>-</td></tr> <tr><td>12. Welds</td><td>N</td><td>-</td></tr> <tr><td>13. Deformation/Flattening</td><td>7</td><td>-</td></tr> <tr><td>14. Member Alignment</td><td>7</td><td>-</td></tr> <tr><td>15. Paint/Coating</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </table> Year Painted N COLLISION DAMAGE: Please explain None (X) Minor () Moderate () Severe () LOAD DEFLECTION: Please explain None (X) Minor () Moderate () Severe () LOAD VIBRATION: Please explain None (X) Minor () Moderate () Severe () Any Fracture Critical Member: (Y/N) N Any Cracks: (Y/N) N		7	DEF	1. Arch/Arch Ring	7	M-P	2. Keystone Area	7	-	3. Stringers	N	-	4. Floorbeams	N	-	5. Spandrel Walls	7	M-P	6. Spring Lines	7	M-P	7. Diaphragms/Cross Frames	N	-	8. Conn Plt's, Gussets & Angles	N	-	9. Pin & Hangers	N	-	10. Masonry Joints	7	M-P	11. Rivets & Bolts	N	-	12. Welds	N	-	13. Deformation/Flattening	7	-	14. Member Alignment	7	-	15. Paint/Coating	N	-	16.	N	-	ITEM 60 SUBSTRUCTURE <table border="1"> <tr> <td></td> <td>7</td> <td>DEF</td> </tr> <tr> <td>1. Abutments</td> <td>Dive</td> <td>Cur</td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td></tr> <tr><td>b. Bridge Seats</td><td>N</td><td>N</td></tr> <tr><td>c. Backwalls</td><td>N</td><td>N</td></tr> <tr><td>d. Breastwalls</td><td>N</td><td>7</td></tr> <tr><td>e. Wingwalls</td><td>N</td><td>7</td></tr> <tr><td>f. Slope Paving/Rip-Rap</td><td>N</td><td>N</td></tr> <tr><td>g. Pointing</td><td>N</td><td>6</td></tr> <tr><td>h. Footings</td><td>N</td><td>H</td></tr> <tr><td>i. Piles</td><td>N</td><td>N</td></tr> <tr><td>j. Scour</td><td>N</td><td>H</td></tr> <tr><td>k. Settlement</td><td>N</td><td>7</td></tr> <tr><td>l. Erosion</td><td>N</td><td>7</td></tr> <tr><td>m.</td><td>N</td><td>N</td></tr> <tr> <td>2. Piers or Bents</td> <td>N</td> <td></td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td></tr> <tr><td>b. Caps</td><td>N</td><td>N</td></tr> <tr><td>c. Columns</td><td>N</td><td>N</td></tr> <tr><td>d. Stems/Webs/Pierwalls</td><td>N</td><td>N</td></tr> <tr><td>e. Pointing</td><td>N</td><td>N</td></tr> <tr><td>f. Footing</td><td>N</td><td>N</td></tr> <tr><td>g. Piles</td><td>N</td><td>N</td></tr> <tr><td>h. Scour</td><td>N</td><td>N</td></tr> <tr><td>i. Settlement</td><td>N</td><td>N</td></tr> <tr><td>j.</td><td>N</td><td>N</td></tr> <tr><td>k.</td><td>N</td><td>N</td></tr> <tr> <td>3. Pile Bents</td> <td>N</td> <td></td> </tr> <tr><td>a. Pile Caps</td><td>N</td><td>N</td></tr> <tr><td>b. Piles</td><td>N</td><td>N</td></tr> <tr><td>c. Diagonal Bracing</td><td>N</td><td>N</td></tr> <tr><td>d. Horizontal Bracing</td><td>N</td><td>N</td></tr> <tr><td>e. Fasteners</td><td>N</td><td>N</td></tr> <tr> <td>UNDERMINING (Y/N) If YES please explain</td> <td>N</td> <td></td> </tr> <tr> <td>COLLISION DAMAGE:</td> <td></td> <td></td> </tr> <tr> <td>None (X) Minor () Moderate () Severe ()</td> <td></td> <td></td> </tr> <tr> <td>I-60 (Dive Report):</td> <td>N</td> <td>I-60 (This Report): 7</td> </tr> <tr> <td>93B-U/W (DIVE) Insp</td> <td></td> <td>00/00/0000</td> </tr> </table>		7	DEF	1. Abutments	Dive	Cur	a. Pedestals	N	N	b. Bridge Seats	N	N	c. Backwalls	N	N	d. Breastwalls	N	7	e. Wingwalls	N	7	f. Slope Paving/Rip-Rap	N	N	g. Pointing	N	6	h. Footings	N	H	i. Piles	N	N	j. Scour	N	H	k. Settlement	N	7	l. Erosion	N	7	m.	N	N	2. Piers or Bents	N		a. Pedestals	N	N	b. Caps	N	N	c. Columns	N	N	d. Stems/Webs/Pierwalls	N	N	e. Pointing	N	N	f. Footing	N	N	g. Piles	N	N	h. Scour	N	N	i. Settlement	N	N	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 ()			I-60 (Dive Report):	N	I-60 (This Report): 7	93B-U/W (DIVE) Insp		00/00/0000
	N	DEF																																																																																																																																																																																																																																														
1. Wearing Surface	5	S-P																																																																																																																																																																																																																																														
2. Deck Condition	N	-																																																																																																																																																																																																																																														
3. Spandrel Fill	6	M-P																																																																																																																																																																																																																																														
4. Curbs	6	M-P																																																																																																																																																																																																																																														
5. Median	N	-																																																																																																																																																																																																																																														
6. Sidewalks	N	-																																																																																																																																																																																																																																														
7. Parapets	N	-																																																																																																																																																																																																																																														
8. Railing	6	M-P																																																																																																																																																																																																																																														
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	-																																																																																																																																																																																																																																														
N	S																																																																																																																																																																																																																																															
210	260																																																																																																																																																																																																																																															
	DEF																																																																																																																																																																																																																																															
a. Appr. Pavement Condition	6 M-P																																																																																																																																																																																																																																															
b. Appr. Roadway Settlement	7 -																																																																																																																																																																																																																																															
c. Appr. Sidewalk Settlement	N -																																																																																																																																																																																																																																															
d.	N -																																																																																																																																																																																																																																															
	DEF																																																																																																																																																																																																																																															
a. Condition of Welds	N -																																																																																																																																																																																																																																															
b. Condition of Bolts	N -																																																																																																																																																																																																																																															
c. Condition of Signs	N -																																																																																																																																																																																																																																															
	7	DEF																																																																																																																																																																																																																																														
1. Arch/Arch Ring	7	M-P																																																																																																																																																																																																																																														
2. Keystone Area	7	-																																																																																																																																																																																																																																														
3. Stringers	N	-																																																																																																																																																																																																																																														
4. Floorbeams	N	-																																																																																																																																																																																																																																														
5. Spandrel Walls	7	M-P																																																																																																																																																																																																																																														
6. Spring Lines	7	M-P																																																																																																																																																																																																																																														
7. Diaphragms/Cross Frames	N	-																																																																																																																																																																																																																																														
8. Conn Plt's, Gussets & Angles	N	-																																																																																																																																																																																																																																														
9. Pin & Hangers	N	-																																																																																																																																																																																																																																														
10. Masonry Joints	7	M-P																																																																																																																																																																																																																																														
11. Rivets & Bolts	N	-																																																																																																																																																																																																																																														
12. Welds	N	-																																																																																																																																																																																																																																														
13. Deformation/Flattening	7	-																																																																																																																																																																																																																																														
14. Member Alignment	7	-																																																																																																																																																																																																																																														
15. Paint/Coating	N	-																																																																																																																																																																																																																																														
16.	N	-																																																																																																																																																																																																																																														
	7	DEF																																																																																																																																																																																																																																														
1. Abutments	Dive	Cur																																																																																																																																																																																																																																														
a. Pedestals	N	N																																																																																																																																																																																																																																														
b. Bridge Seats	N	N																																																																																																																																																																																																																																														
c. Backwalls	N	N																																																																																																																																																																																																																																														
d. Breastwalls	N	7																																																																																																																																																																																																																																														
e. Wingwalls	N	7																																																																																																																																																																																																																																														
f. Slope Paving/Rip-Rap	N	N																																																																																																																																																																																																																																														
g. Pointing	N	6																																																																																																																																																																																																																																														
h. Footings	N	H																																																																																																																																																																																																																																														
i. Piles	N	N																																																																																																																																																																																																																																														
j. Scour	N	H																																																																																																																																																																																																																																														
k. Settlement	N	7																																																																																																																																																																																																																																														
l. Erosion	N	7																																																																																																																																																																																																																																														
m.	N	N																																																																																																																																																																																																																																														
2. Piers or Bents	N																																																																																																																																																																																																																																															
a. Pedestals	N	N																																																																																																																																																																																																																																														
b. Caps	N	N																																																																																																																																																																																																																																														
c. Columns	N	N																																																																																																																																																																																																																																														
d. Stems/Webs/Pierwalls	N	N																																																																																																																																																																																																																																														
e. Pointing	N	N																																																																																																																																																																																																																																														
f. Footing	N	N																																																																																																																																																																																																																																														
g. Piles	N	N																																																																																																																																																																																																																																														
h. Scour	N	N																																																																																																																																																																																																																																														
i. Settlement	N	N																																																																																																																																																																																																																																														
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 ()																																																																																																																																																																																																																																																
I-60 (Dive Report):	N	I-60 (This Report): 7																																																																																																																																																																																																																																														
93B-U/W (DIVE) Insp		00/00/0000																																																																																																																																																																																																																																														

X=UNKNOWN

N=NOT APPLICABLE

H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

ITEM 61
CHANNEL & CHANNEL PROTECTION

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

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

ITEM 61 (Dive Report): N ITEM 61 (This Report): 7

93b-U/W INSP. DATE: 00/00/0000

ITEM 36 TRAFFIC SAFETY

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

WEIGHT POSTING *Not Applicable* X

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: 00/00/0000 EJDMT Date: 00/00/0000

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

CLEARANCE POSTING

	N		S		
	ft	in	ft	in	meter
Actual Field Measurement		0		0	
Posted Clearance		0		0	

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

ACCESSIBILITY (Y/N/P)

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

TOTAL HOURS 8

PLANS (Y/N): Y

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

TAPE#: _____

List of field tests performed:

RATING
 Rating Report (Y/N): Y
 Date: 09/01/2012
 Inspection data at time of existing rating
 I 58: - I 59: 7 I 60: 7 Date: 10/20/2010

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

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

REASON: _____

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

BRIDGE ORIENTATION

According to the plans, the approaches are east and west and the elevations are north and south. This is a single span rough cut stone masonry arch structure. There is a concrete dam upstream with a spillway floor that extends under the bridge. The Blackstone River flows north to south.

ITEM 58 - DECK

Item 58.1 - Wearing Surface

There is moderate transverse, longitudinal, and map cracking in several areas, heaviest in the westbound lane, which also has minor breakup and several bituminous concrete patches, up to 6' diameter. There is minor unevenness indicating possible minor loss of spandrel fill. **See Photos 1 & 2.**

Item 58.4 - Curbs

See Item 58.8.

Item 58.8 - Railing

Both bridge rails: The bases/curbs have minor cracking, delamination, and spalling with rust staining throughout, heaviest at the north side. The rails have minor scaling and shallow spalling throughout with a few areas of exposed rebar due to insufficient cover. Most of the tops of the posts have small chipouts due to collision damage.

South rail: The rail base outside face bottom east corner has a 2' high x up to 1' wide x 5" deep spall with exposed rusted rebar. The rail base has several full height hairline cracks, some with efflorescence, and some reflecting through the curb.

North rail: The 2nd bottom rail from the west inside face has moderate delamination cracking. **See Photo 3.**

APPROACHES

Approaches a - Appr. Pavement Condition

The west approach pavement has isolated minor longitudinal and transverse cracking. The east approach has moderate to heavy transverse and longitudinal cracking.

ITEM 59 - SUPERSTRUCTURE

Item 59.1 - Arch/Arch Ring

There is minor missing pointing at intermittent locations throughout and minor to moderate efflorescence staining with efflorescence icicles throughout, heaviest at the bottom 10' at each end. **See Photos 4 & 5.** The south extrados bottom west end has minor missing pointing.

Item 59.5 - Spandrel Walls

The south spandrel wall top west end stone has a full height x 1/8" wide crack (below the joint in the concrete joint in the rail base). **See Photo 6.** Both extrados have several areas of missing pointing along the top. **See Photo 7.** The north spandrel wall has isolated areas of minor missing pointing, up to 3" deep.

Item 59.6 - Spring Lines

Both spring lines have missing pointing in many areas throughout.

Item 59.10 - Masonry Joints

See Items 59.1, 59.5, and 59.6.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

Both breastwalls have several areas of missing pointing and chinking stones above the waterline. **See Photos 4 & 5.**

Item 60.1.e - Wingwalls

The southwest wingwall has a full height x 1/2" wide crack. The northwest wingwall and northeast wingwall bottom have missing pointing and chinking stones in several areas throughout. **See Photos 8 & 9.**

Item 60.1.g - Pointing

See Items 60.1.d and 60.1.e.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

The spillway under midspan just beyond the slope has an approximately 4' deep hole. **See Photo 10.**

TRAFFIC SAFETY

Item 36a - Bridge Railing

Both bridge rails are reinforced concrete rails and posts. See Item 58.8.

Item 36b - Transitions

All transitions are single panel W-beam steel guardrail with posts improperly spaced.

The northwest transition attachment has minor collision damage with a 1' long tear.

The east transition attachments each have one missing anchor bolt.

The northeast transition has a minor collision dent.

Item 36c - Approach Guardrail

Several of the Southwest approach guardrail posts are slightly out of plumb with minor collision damage to the tops.

Photo Log

Photo 1 : Wearing surface overview, looking northeast.

Photo 2 : Westbound lane overview, looking east.

Photo 3 : North rail, 2nd bottom rail from west end.

Photo 4 : West half of arch.

Photo 5 : East half of arch.

Photo 6 : South spandrel wall top west end, cracked stone.

Photo 7 : South spandrel wall, typical missing pointing.

Photo 8 : Northwest wingwall.

Photo 9 : Northeast wingwall.

Photo 10 : Approximately 4' deep hole in spillway center just below slope.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 1: Wearing surface overview, looking northeast.



Photo 2: Westbound lane overview, looking east.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 3: North rail, 2nd bottom rail from west end.



Photo 4: West half of arch.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 5: East half of arch.



Photo 6: South spandrel wall top west end, cracked stone.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 7: South spandrel wall, typical missing pointing.



Photo 8: Northwest wingwall.

CITY/TOWN UXBRIDGE	B.I.N. 1DL	BR. DEPT. NO. U-02-018	8.-STRUCTURE NO. U02018-1DL-MUN-NBI	INSPECTION DATE OCT 9, 2020
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 9: Northeast wingwall.



Photo 10: Approximately 4' deep hole in spillway center just below slope.

THIS PAGE INTENTIONALLY LEFT BLANK

Report Date: April 15, 2021

State Information										Classification										Code																			
BDEPT#= U02018										Agency Br.No.										(112) NBIS Bridge Length										Y									
Town= Uxbridge										L.O.										(104) Highway System										N									
B.I.N= 1DL										AASHTO= 077.1										(26) Functional Class - Urban Minor Arterial										16									
RANK= 1986 H.I.= 92.9 %										FHWA Select List= Y (6/21/2017)										(100) Defense Highway										0									
Identification										U020181DLMUNNBI										(101) Parallel Structure										N									
(8) Structure Number										151000000										(102) Direction of Traffic - 2-way traffic										2									
(5) Inventory Route										03										(103) Temporary Structure										N									
(2) State Highway Department District										71620										(105) Federal Lands Highways										0									
(3) County Code 027 (4) Place code										WATER BLACKSTONE RIVER										(110) Designated National Network										N									
(6) Features Intersected										HWY HARTFORD AVE										(20) Toll - On free road										3									
(7) Facility Carried										400 FT. EAST OF OAK ST										(21) Maintain - Town Agency										03									
(9) Location										0001.996										(22) Owner - Town Agency										03									
(11) Kilometerpoint										N										(37) Historical Significance undetermined																			
(12) Base Highway Network										000000000000										Condition										Code									
(13) LRS Inventory Route & Subroute										42 DEG 05 MIN 54.15 SEC										(58) Deck										N									
(16) Latitude										71 DEG 37 MIN 20.30 SEC										(59) Superstructure										7									
(17) Longitude										Share %										(60) Substructure										7									
(98) Border Bridge State Code																				(61) Channel & Channel Protection										7									
(99) Border Bridge Structure No. #																				(62) Culverts										N									
Structure Type and Material																				Load Rating and Posting										Code									
(43) Structure Type Main: Masonry										Code 811										(31) Design Load - Unknown										0									
Arch - Deck										Jointless bridge type: Not applicable										(63) Operating Rating Method - Allowable Stress (AS)										2									
(44) Structure Type Appr:																				(64) Operating Rating										99.9									
Other										Code 000										(65) Inventory Rating Method - Allowable Stress (AS)										2									
(45) Number of spans in main unit										001										(66) Inventory Rating										99.9									
(46) Number of approach spans										0000										(70) Bridge Posting										5									
(107) Deck Structure Type - Not applicable										Code N										(41) Structure - Open										A									
(108) Wearing Surface / Protective System:																				Appraisal										Code									
A) Type of wearing surface - Not applicable=no deck										Code N										(67) Structural Evaluation										7									
B) Type of membrane - Not applicable=no deck										Code N										(68) Deck Geometry										2									
C) Type of deck protection - Not applicable=no deck										Code N										(69) Underclearances, vert. and horiz.										N									
(71) Waterway adequacy																														6									
(72) Approach Roadway Alignment																														8									
(36) Traffic Safety Features																				0 0 1 1																			
(113) Scour Critical Bridges																														8									
Age and Service																				Inspections																			
(27) Year Built										1900										(90) Inspection Date 10/09/20										(91) Frequency 24 MO									
(106) Year Reconstructed										1960										(92) Critical Feature Inspection:										(93) CFI DATE									
(42) Type of Service: On - Highway																				(A) Fracture Critical Detail N 00 MO A)										00/00/00									
Under - Waterway										Code 15										(B) Underwater Inspection N 00 MO B)										11/29/02									
(28) Lanes: On Structure 02 Under structure										00										(C) Other Special Inspection N 00 MO C)										00/00/00									
(29) Average Daily Traffic										008085										(*) Other Inspection () N 00 MO *)										00/00/00									
(30) Year of ADT 2019 (109) Truck ADT										04 %										(*) Closed Bridge N 00 MO *)										00/00/00									
(19) Bypass, detour length										006 KM										(*) UW Special Inspection N 00 MO *)										00/00/00									
(*) Damage Inspection																				MO *)										00/00/00									
Geometric Data																				Rating Loads																			
(48) Length of maximum span										0011.9 M										Report Date 09/01/12										H20									
(49) Structure Length										00011.9 M										Type 3										Type 3S2									
(50) Curb or sidewalk: Left 00.2 M Right 00.2 M																				Type HS																			
(51) Bridge Roadway Width Curb to Curb										006.1 M										Operating										0.0									
(52) Deck Width Out to Out										007.3 M										Inventory										99.0									
(32) Approach Roadway Width (w/shoulders)										006.4 M																				99.0									
(33) Bridge Median - No median										Code 0										Field Posting																			
(34) Skew 00 DEG (35) Structure Flared										N										Status LEGAL										Posting Date 10/01/12									
(10) Inventory Route MIN Vert Clear										99.99 M										2 Axle										3 Axle									
(47) Inventory Route Total Horiz Clear										06.1 M										5 Axle										Single									
(53) Min Vert Clear Over Bridge Rdwy										99.99 M										Actual																			
(54) Min Vert Underclear ref N										00.00 M										Recommended																			
(55) Min Lat Underclear RT ref N										00.0 M										Missing Signs N																			
(56) Min Lat Underclear LT										00.0 M										Misc.																			
Navigation Data																				Bridge Name																			
(38) Navigation Control - No navigation control on waterway										Code 0										N Anti-missile fence N Acrow Panel N Jointless Bridge																			
(111) Pier Protection										Code										Freeze/Thaw N : Not Applicable																			
(39) Navigation Vertical Clearance										000.0 M										Accessibility (Needed/Used)																			
(116) Vert-lift Bridge Nav Min Vert Clear										M										N / N Liftbucket N / N Rigging N / N Other																			
(40) Navigation Horizontal Clearance										0000.0 M										N / N Ladder N / N Staging																			
																				N / N Boat N / N Traffic Control																			
																				P / Y Wader N / N RR Flagperson										Inspection									
																				P / N Inspector 50 P / N Police										Hours: 008									

THIS PAGE INTENTIONALLY LEFT BLANK

Blackstone Street over Meadow Brook
(Bridge No. U-02-037)

Priority 19

AVAILABLE INFORMATION

Blackstone Street is classified as an Urban Collector according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a mortared stone masonry arch with corrugated iron lining. The date of construction as noted by existing bridge plans is August 1938. The structure has an out-to-out width of 50'-6" with a clear span of 9'-0". The hydraulic opening of the arch structure is approximately 12'-0" high by 10'-0" wide. The depth of flow at the time of inspection was 36" on the west side, and was deeper on the East side. The brook was flowing Westward. The depth of fill over the structure is approximately 6'-6"

The roadway width over the structure is 25'-0" with no sidewalks on either side and consists of an asphaltic wearing surface. There are sharp horizontal curves with poor visibility at both approaches. Also, there are driveways directly adjacent to the structure at the north approach.

Overhead wires run along the west side of the roadway. There are also paved waterways at the east side of the north approach and the west side of the south approach.

The bridge guardrail consists of standard highway guardrail that runs continuously from approach to approach on both sides of the roadway.

The structure is posted at both approaches for a weight limit of 20T, 36T, 52T for Type H, Type 3, and Type 3S2 trucks, respectively. However, no rating report is on file with the Massachusetts Department of Transportation.

FINDINGS

The overall condition of the structure is good with few minor deficiencies noted.

The corrugated lining at the underside of the arch shows no signs of corrosion or missing connection bolts (Photos 2 and 4).

The concrete abutment caps are also in good condition. However, both typically exhibit light-to-moderate scaling and abrasion at the waterline. There is a spall on the south abutment at approximately midspan (Photo 11). Also noted on the masonry portion of the abutments are large voids, up to 7" deep, specifically at the northwest corner (Photo 10).

All wingwalls and headwalls are in good condition with minor loss of pointing at the waterline. No scour was detected. There is a full height crack at the midspan of the east parapet.

The approach roadway shows moderate cracking throughout. The roadway over the culvert is slightly worse with cracking and areas of patching (Photo 13). Both approaches have limited visibility as a result of the horizontal curves. The SS guardrail is also in good condition. It is also noted that the roadway is narrower than the bridge. As a result of the roadway width and depth of fill over the bridge, steep embankments extend down the structures headwalls at both openings.

RECOMMENDATIONS

The overall condition of this structure is good and requires little maintenance at the present time. However, it is recommended that the existing posting be enforced. BETA recommends the following:

- Fill all voids and re-point masonry wingwalls.
- Repair cracks and spalls on concrete footings
- The Town should follow up and clarify the origins and validity of current posting and/or loading restrictions.
- Replace existing wearing surface to minimize possible water infiltration through the structure.

Conduct routine inspections at intervals not exceeding two years

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$40,000
Engineering:	<u>\$10,000</u>
Total:	\$50,000

Attachments

Locus Map

Inspection Photos

MassDOT Routine Arch Inspection Report Dated April 11, 2018

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865

P: 401.333.2382

F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

BLACKSTONE STREET
OVER
MEADOW BROOK

BRIDGE NO.
U-02-037

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking East: West Culvert Elevation



Photo 2 Looking East: Culvert Pipe



Photo 3 Looking West: East Culvert Elevation



Photo 4 Looking West: Culvert Pipe



Photo 5 Looking Northeast: Northwest Wingwall



Photo 6 Looking Southeast: Southwest Wingwall



Photo 7 Looking South: Path to Northeast Wingwall



Photo 8 Looking Northwest: Northeast Wingwall



Photo 9 Looking West: Southeast Wingwall



Photo 10 Looking East: Void at Northwest Water Line



Photo 11 Looking South: Spall at Midspan



Photo 12 Looking South: North Approach



Photo 13 Looking South: Roadway Over Culvert



Photo 14 Looking North: South Approach



Photo 15 Looking North: East Guardrail

STRUCTURES INSPECTION FIELD REPORT

2-DIST
03B.I.N.
6X8

ROUTINE ARCH INSPECTION

BR. DEPT. NO.
U-02-037

CITY/TOWN UXBRIDGE	8-STRUCTURE NO. U02037-6X8-MUN-BRI	11-Kilo. POINT 001.915	41-STATUS P:POSTED	90-ROUTINE INSP. DATE APR 11, 2018
07-FACILITY CARRIED HWY BLACKSTONE ST	MEMORIAL NAME/LOCAL NAME	27-YR BUILT 1938	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER MEADOW BROOK	26-FUNCTIONAL CLASS Urban Collector	DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 311 : Steel Arch - Deck	22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Smith	
107-DECK TYPE N : Not applicable	WEATHER Clear	TEMP. (air) 6°C	TEAM MEMBERS T. TOLOCZKO	

ITEM 58 DECK <table border="1"> <tr> <td></td> <td>N</td> <td>DEF</td> </tr> <tr><td>1. Wearing surface</td><td>5</td><td>S-A</td></tr> <tr><td>2. Deck Condition</td><td>N</td><td>-</td></tr> <tr><td>3. Spandrel Fill</td><td>7</td><td>-</td></tr> <tr><td>4. Curbs</td><td>N</td><td>-</td></tr> <tr><td>5. Median</td><td>N</td><td>-</td></tr> <tr><td>6. Sidewalks</td><td>N</td><td>-</td></tr> <tr><td>7. Parapets</td><td>N</td><td>-</td></tr> <tr><td>8. Railing</td><td>7</td><td>-</td></tr> <tr><td>9. Anti Missile Fence</td><td>N</td><td>-</td></tr> <tr><td>10. Drainage System</td><td>N</td><td>-</td></tr> <tr><td>11. Lighting Standards</td><td>N</td><td>-</td></tr> <tr><td>12. Utilities</td><td>H</td><td>-</td></tr> <tr><td>13. Deck Joints</td><td>N</td><td>-</td></tr> <tr><td>14.</td><td>N</td><td>-</td></tr> <tr><td>15.</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </table> CURB REVEAL (In millimeters) <table border="1"> <tr> <td>E</td> <td>W</td> </tr> <tr> <td>0</td> <td>0</td> </tr> </table> APPROACHES <table border="1"> <tr> <td></td> <td>DEF</td> </tr> <tr><td>a. Appr. pavement condition</td><td>5 S-P</td></tr> <tr><td>b. Appr. Roadway Settlement</td><td>7 -</td></tr> <tr><td>c. Appr. Sidewalk Settlement</td><td>N -</td></tr> <tr><td>d.</td><td>N -</td></tr> </table> OVERHEAD SIGNS (Attached to bridge) (Y/N) N <table border="1"> <tr> <td></td> <td>DEF</td> </tr> <tr><td>a. Condition of Welds</td><td>N -</td></tr> <tr><td>b. Condition of Bolts</td><td>N -</td></tr> <tr><td>c. Condition of Signs</td><td>N -</td></tr> </table>		N	DEF	1. Wearing surface	5	S-A	2. Deck Condition	N	-	3. Spandrel Fill	7	-	4. Curbs	N	-	5. Median	N	-	6. Sidewalks	N	-	7. Parapets	N	-	8. Railing	7	-	9. Anti Missile Fence	N	-	10. Drainage System	N	-	11. Lighting Standards	N	-	12. Utilities	H	-	13. Deck Joints	N	-	14.	N	-	15.	N	-	16.	N	-	E	W	0	0		DEF	a. Appr. pavement condition	5 S-P	b. Appr. Roadway Settlement	7 -	c. Appr. Sidewalk Settlement	N -	d.	N -		DEF	a. Condition of Welds	N -	b. Condition of Bolts	N -	c. Condition of Signs	N -	ITEM 59 SUPERSTRUCTURE <table border="1"> <tr> <td></td> <td>7</td> <td>DEF</td> </tr> <tr><td>1. Arch/Arch Ring</td><td>7</td><td>-</td></tr> <tr><td>2. Keystone Area</td><td>N</td><td>-</td></tr> <tr><td>3. Stringers</td><td>N</td><td>-</td></tr> <tr><td>4. Floorbeams</td><td>N</td><td>-</td></tr> <tr><td>5. Spandrel Walls</td><td>7</td><td>M-P</td></tr> <tr><td>6. Spring Lines</td><td>7</td><td>-</td></tr> <tr><td>7. Diaphragms/Cross Frames</td><td>N</td><td>-</td></tr> <tr><td>8. Conn Plt's, Gussets & Angles</td><td>N</td><td>-</td></tr> <tr><td>9. Pin & Hangers</td><td>N</td><td>-</td></tr> <tr><td>10. Masonry Joints</td><td>6</td><td>M-P</td></tr> <tr><td>11. Rivets & Bolts</td><td>7</td><td>-</td></tr> <tr><td>12. Welds</td><td>N</td><td>-</td></tr> <tr><td>13. Deformation/Flattening</td><td>7</td><td>-</td></tr> <tr><td>14. Member Alignment</td><td>7</td><td>-</td></tr> <tr><td>15. Paint/Coating</td><td>N</td><td>-</td></tr> <tr><td>16.</td><td>N</td><td>-</td></tr> </table> Year Painted N COLLISION DAMAGE: Please explain None (X) Minor () Moderate () Severe () LOAD DEFLECTION: Please explain None (X) Minor () Moderate () Severe () LOAD VIBRATION: Please explain None (X) Minor () Moderate () Severe () Any Fracture Critical Member: (Y/N) N Any Cracks: (Y/N) N		7	DEF	1. Arch/Arch Ring	7	-	2. Keystone Area	N	-	3. Stringers	N	-	4. Floorbeams	N	-	5. Spandrel Walls	7	M-P	6. Spring Lines	7	-	7. Diaphragms/Cross Frames	N	-	8. Conn Plt's, Gussets & Angles	N	-	9. Pin & Hangers	N	-	10. Masonry Joints	6	M-P	11. Rivets & Bolts	7	-	12. Welds	N	-	13. Deformation/Flattening	7	-	14. Member Alignment	7	-	15. Paint/Coating	N	-	16.	N	-	ITEM 60 SUBSTRUCTURE <table border="1"> <tr> <td></td> <td>6</td> <td>DEF</td> </tr> <tr> <td>1. Abutments</td> <td>Dive</td> <td>Cur</td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td></tr> <tr><td>b. Bridge Seats</td><td>N</td><td>N</td></tr> <tr><td>c. Backwalls</td><td>N</td><td>N</td></tr> <tr><td>d. Breastwalls</td><td>N</td><td>6</td></tr> <tr><td>e. Wingwalls</td><td>N</td><td>N</td></tr> <tr><td>f. Slope Paving/Rip-Rap</td><td>N</td><td>N</td></tr> <tr><td>g. Pointing</td><td>N</td><td>H</td></tr> <tr><td>h. Footings</td><td>N</td><td>H</td></tr> <tr><td>i. Piles</td><td>N</td><td>N</td></tr> <tr><td>j. Scour</td><td>N</td><td>7</td></tr> <tr><td>k. Settlement</td><td>N</td><td>7</td></tr> <tr><td>l.</td><td>N</td><td>N</td></tr> <tr><td>m.</td><td>N</td><td>N</td></tr> <tr> <td>2. Piers or Bents</td> <td>N</td> <td></td> </tr> <tr><td>a. Pedestals</td><td>N</td><td>N</td></tr> <tr><td>b. Caps</td><td>N</td><td>N</td></tr> <tr><td>c. Columns</td><td>N</td><td>N</td></tr> <tr><td>d. Stems/Webs/Pierwalls</td><td>N</td><td>N</td></tr> <tr><td>e. Pointing</td><td>N</td><td>N</td></tr> <tr><td>f. Footing</td><td>N</td><td>N</td></tr> <tr><td>g. Piles</td><td>N</td><td>N</td></tr> <tr><td>h. Scour</td><td>N</td><td>N</td></tr> <tr><td>i. Settlement</td><td>N</td><td>N</td></tr> <tr><td>j.</td><td>N</td><td>N</td></tr> <tr><td>k.</td><td>N</td><td>N</td></tr> <tr> <td>3. Pile Bents</td> <td>N</td> <td></td> </tr> <tr><td>a. Pile Caps</td><td>N</td><td>N</td></tr> <tr><td>b. Piles</td><td>N</td><td>N</td></tr> <tr><td>c. Diagonal Bracing</td><td>N</td><td>N</td></tr> <tr><td>d. Horizontal Bracing</td><td>N</td><td>N</td></tr> <tr><td>e. Fasteners</td><td>N</td><td>N</td></tr> <tr> <td>UNDERMINING (Y/N) If YES please explain</td> <td>N</td> <td></td> </tr> <tr> <td>COLLISION DAMAGE:</td> <td></td> <td></td> </tr> <tr> <td>None (X) Minor () Moderate () Severe ()</td> <td></td> <td></td> </tr> <tr> <td>I-60 (Dive Report):</td> <td>N</td> <td>I-60 (This Report): 6</td> </tr> <tr> <td>93B-U/W (DIVE) Insp</td> <td colspan="2">00/00/0000</td> </tr> </table>		6	DEF	1. Abutments	Dive	Cur	a. Pedestals	N	N	b. Bridge Seats	N	N	c. Backwalls	N	N	d. Breastwalls	N	6	e. Wingwalls	N	N	f. Slope Paving/Rip-Rap	N	N	g. Pointing	N	H	h. Footings	N	H	i. Piles	N	N	j. Scour	N	7	k. Settlement	N	7	l.	N	N	m.	N	N	2. Piers or Bents	N		a. Pedestals	N	N	b. Caps	N	N	c. Columns	N	N	d. Stems/Webs/Pierwalls	N	N	e. Pointing	N	N	f. Footing	N	N	g. Piles	N	N	h. Scour	N	N	i. Settlement	N	N	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 ()			I-60 (Dive Report):	N	I-60 (This Report): 6	93B-U/W (DIVE) Insp	00/00/0000	
	N	DEF																																																																																																																																																																																																																																														
1. Wearing surface	5	S-A																																																																																																																																																																																																																																														
2. Deck Condition	N	-																																																																																																																																																																																																																																														
3. Spandrel Fill	7	-																																																																																																																																																																																																																																														
4. Curbs	N	-																																																																																																																																																																																																																																														
5. Median	N	-																																																																																																																																																																																																																																														
6. Sidewalks	N	-																																																																																																																																																																																																																																														
7. Parapets	N	-																																																																																																																																																																																																																																														
8. Railing	7	-																																																																																																																																																																																																																																														
9. Anti Missile Fence	N	-																																																																																																																																																																																																																																														
10. Drainage System	N	-																																																																																																																																																																																																																																														
11. Lighting Standards	N	-																																																																																																																																																																																																																																														
12. Utilities	H	-																																																																																																																																																																																																																																														
13. Deck Joints	N	-																																																																																																																																																																																																																																														
14.	N	-																																																																																																																																																																																																																																														
15.	N	-																																																																																																																																																																																																																																														
16.	N	-																																																																																																																																																																																																																																														
E	W																																																																																																																																																																																																																																															
0	0																																																																																																																																																																																																																																															
	DEF																																																																																																																																																																																																																																															
a. Appr. pavement condition	5 S-P																																																																																																																																																																																																																																															
b. Appr. Roadway Settlement	7 -																																																																																																																																																																																																																																															
c. Appr. Sidewalk Settlement	N -																																																																																																																																																																																																																																															
d.	N -																																																																																																																																																																																																																																															
	DEF																																																																																																																																																																																																																																															
a. Condition of Welds	N -																																																																																																																																																																																																																																															
b. Condition of Bolts	N -																																																																																																																																																																																																																																															
c. Condition of Signs	N -																																																																																																																																																																																																																																															
	7	DEF																																																																																																																																																																																																																																														
1. Arch/Arch Ring	7	-																																																																																																																																																																																																																																														
2. Keystone Area	N	-																																																																																																																																																																																																																																														
3. Stringers	N	-																																																																																																																																																																																																																																														
4. Floorbeams	N	-																																																																																																																																																																																																																																														
5. Spandrel Walls	7	M-P																																																																																																																																																																																																																																														
6. Spring Lines	7	-																																																																																																																																																																																																																																														
7. Diaphragms/Cross Frames	N	-																																																																																																																																																																																																																																														
8. Conn Plt's, Gussets & Angles	N	-																																																																																																																																																																																																																																														
9. Pin & Hangers	N	-																																																																																																																																																																																																																																														
10. Masonry Joints	6	M-P																																																																																																																																																																																																																																														
11. Rivets & Bolts	7	-																																																																																																																																																																																																																																														
12. Welds	N	-																																																																																																																																																																																																																																														
13. Deformation/Flattening	7	-																																																																																																																																																																																																																																														
14. Member Alignment	7	-																																																																																																																																																																																																																																														
15. Paint/Coating	N	-																																																																																																																																																																																																																																														
16.	N	-																																																																																																																																																																																																																																														
	6	DEF																																																																																																																																																																																																																																														
1. Abutments	Dive	Cur																																																																																																																																																																																																																																														
a. Pedestals	N	N																																																																																																																																																																																																																																														
b. Bridge Seats	N	N																																																																																																																																																																																																																																														
c. Backwalls	N	N																																																																																																																																																																																																																																														
d. Breastwalls	N	6																																																																																																																																																																																																																																														
e. Wingwalls	N	N																																																																																																																																																																																																																																														
f. Slope Paving/Rip-Rap	N	N																																																																																																																																																																																																																																														
g. Pointing	N	H																																																																																																																																																																																																																																														
h. Footings	N	H																																																																																																																																																																																																																																														
i. Piles	N	N																																																																																																																																																																																																																																														
j. Scour	N	7																																																																																																																																																																																																																																														
k. Settlement	N	7																																																																																																																																																																																																																																														
l.	N	N																																																																																																																																																																																																																																														
m.	N	N																																																																																																																																																																																																																																														
2. Piers or Bents	N																																																																																																																																																																																																																																															
a. Pedestals	N	N																																																																																																																																																																																																																																														
b. Caps	N	N																																																																																																																																																																																																																																														
c. Columns	N	N																																																																																																																																																																																																																																														
d. Stems/Webs/Pierwalls	N	N																																																																																																																																																																																																																																														
e. Pointing	N	N																																																																																																																																																																																																																																														
f. Footing	N	N																																																																																																																																																																																																																																														
g. Piles	N	N																																																																																																																																																																																																																																														
h. Scour	N	N																																																																																																																																																																																																																																														
i. Settlement	N	N																																																																																																																																																																																																																																														
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 ()																																																																																																																																																																																																																																																
I-60 (Dive Report):	N	I-60 (This Report): 6																																																																																																																																																																																																																																														
93B-U/W (DIVE) Insp	00/00/0000																																																																																																																																																																																																																																															

X=UNKNOWN

N=NOT APPLICABLE

H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. 6X8	BR. DEPT. NO. U-02-037	8.-STRUCTURE NO. U02037-6X8-MUN-BRI	INSPECTION DATE APR 11, 2018
------------------------------	----------------------	----------------------------------	---	--

ITEM 61 CHANNEL & CHANNEL PROTECTION <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>Dive</th> <th>Cur</th> <th>DEF</th> </tr> <tr><td>1.Channel Scour</td><td>N</td><td>6</td><td>M-P</td></tr> <tr><td>2.Embankment Erosion</td><td>N</td><td>7</td><td>-</td></tr> <tr><td>3.Debris</td><td>N</td><td>5</td><td>S-A</td></tr> <tr><td>4.Vegetation</td><td>N</td><td>7</td><td>-</td></tr> <tr><td>5.Utilities</td><td>N</td><td>N</td><td>-</td></tr> <tr><td>6.Rip-Rap/Slope Protection</td><td>N</td><td>7</td><td>-</td></tr> <tr><td>7.Aggradation</td><td>N</td><td>7</td><td>-</td></tr> <tr><td>8.Fender System</td><td>N</td><td>N</td><td>-</td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table> STREAM FLOW VELOCITY: Tidal () High () Moderate () Low (X) None () ITEM 61 (Dive Report): ☐ N ITEM 61 (This Report): ☐ 6 93b-U/W INSP. DATE: 00/00/0000		Dive	Cur	DEF	1.Channel Scour	N	6	M-P	2.Embankment Erosion	N	7	-	3.Debris	N	5	S-A	4.Vegetation	N	7	-	5.Utilities	N	N	-	6.Rip-Rap/Slope Protection	N	7	-	7.Aggradation	N	7	-	8.Fender System	N	N	-													6	ITEM 36 TRAFFIC SAFETY <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>36</th> <th>COND</th> <th>DEF</th> </tr> <tr><td>A. Bridge Railing</td><td>1</td><td>7</td><td>-</td></tr> <tr><td>B. Transitions</td><td>N</td><td>N</td><td>-</td></tr> <tr><td>C. Approach Guardrail</td><td>1</td><td>7</td><td>-</td></tr> <tr><td>D. Approach Guardrail Ends</td><td>1</td><td>7</td><td>-</td></tr> </table> WEIGHT POSTING <i>Not Applicable</i> ☐ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>H</th> <th>3</th> <th>3S2</th> <th>Single</th> </tr> <tr> <td>Actual Posting</td> <td>20</td> <td>36</td> <td>52</td> <td>N</td> </tr> <tr> <td>Recommended Posting</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> </tr> </table> Waived Date: 00/00/0000 EJDMT Date: 00/00/0000 At bridge <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>N</td><td>S</td></tr> <tr><td>Y</td><td>Y</td></tr> <tr><td>7</td><td>7</td></tr> </table> Other Advance <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>N</td><td>S</td></tr> <tr><td>N</td><td>N</td></tr> <tr><td></td><td></td></tr> </table> Signs In Place (Y=Yes, N=No, NR=Not Required) Legibility/Visibility <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>E</th> <th>W</th> </tr> <tr> <td>Actual Field Measurement</td> <td>0</td> <td>0</td> </tr> <tr> <td>Posted Clearance</td> <td>0</td> <td>0</td> </tr> </table> Signs In Place (Y=Yes, N=No, NR=Not Required) Legibility/Visibility <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>At bridge</th> <th>Advance</th> </tr> <tr> <td></td> <td> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> </td> <td> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> </td> </tr> </table>		36	COND	DEF	A. Bridge Railing	1	7	-	B. Transitions	N	N	-	C. Approach Guardrail	1	7	-	D. Approach Guardrail Ends	1	7	-		H	3	3S2	Single	Actual Posting	20	36	52	N	Recommended Posting	N	N	N	N	N	S	Y	Y	7	7	N	S	N	N				E	W	Actual Field Measurement	0	0	Posted Clearance	0	0		At bridge	Advance		<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	E	W					<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	E	W					ACCESSIBILITY (Y/N/P) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th></th> <th>Needed</th> <th>Used</th> </tr> <tr><td>Lift Bucket</td><td>N</td><td>N</td></tr> <tr><td>Ladder</td><td>N</td><td>N</td></tr> <tr><td>Boat</td><td>N</td><td>N</td></tr> <tr><td>Waders</td><td>Y</td><td>Y</td></tr> <tr><td>Inspector 50</td><td>N</td><td>N</td></tr> <tr><td>Rigging</td><td>N</td><td>N</td></tr> <tr><td>Staging</td><td>N</td><td>N</td></tr> <tr><td>Traffic Control</td><td>N</td><td>N</td></tr> <tr><td>RR Flagger</td><td>N</td><td>N</td></tr> <tr><td>Police</td><td>N</td><td>N</td></tr> <tr><td>Other:</td><td></td><td></td></tr> <tr><td> </td><td>N</td><td>N</td></tr> </table> TOTAL HOURS 8 PLANS (Y/N): Y (V.C.R.) (Y/N): N TAPE#: _____ List of field tests performed: 		Needed	Used	Lift Bucket	N	N	Ladder	N	N	Boat	N	N	Waders	Y	Y	Inspector 50	N	N	Rigging	N	N	Staging	N	N	Traffic Control	N	N	RR Flagger	N	N	Police	N	N	Other:				N	N
	Dive	Cur	DEF																																																																																																																																																																	
1.Channel Scour	N	6	M-P																																																																																																																																																																	
2.Embankment Erosion	N	7	-																																																																																																																																																																	
3.Debris	N	5	S-A																																																																																																																																																																	
4.Vegetation	N	7	-																																																																																																																																																																	
5.Utilities	N	N	-																																																																																																																																																																	
6.Rip-Rap/Slope Protection	N	7	-																																																																																																																																																																	
7.Aggradation	N	7	-																																																																																																																																																																	
8.Fender System	N	N	-																																																																																																																																																																	
	36	COND	DEF																																																																																																																																																																	
A. Bridge Railing	1	7	-																																																																																																																																																																	
B. Transitions	N	N	-																																																																																																																																																																	
C. Approach Guardrail	1	7	-																																																																																																																																																																	
D. Approach Guardrail Ends	1	7	-																																																																																																																																																																	
	H	3	3S2	Single																																																																																																																																																																
Actual Posting	20	36	52	N																																																																																																																																																																
Recommended Posting	N	N	N	N																																																																																																																																																																
N	S																																																																																																																																																																			
Y	Y																																																																																																																																																																			
7	7																																																																																																																																																																			
N	S																																																																																																																																																																			
N	N																																																																																																																																																																			
	E	W																																																																																																																																																																		
Actual Field Measurement	0	0																																																																																																																																																																		
Posted Clearance	0	0																																																																																																																																																																		
	At bridge	Advance																																																																																																																																																																		
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	E	W					<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>E</td><td>W</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>	E	W																																																																																																																																																										
E	W																																																																																																																																																																			
E	W																																																																																																																																																																			
	Needed	Used																																																																																																																																																																		
Lift Bucket	N	N																																																																																																																																																																		
Ladder	N	N																																																																																																																																																																		
Boat	N	N																																																																																																																																																																		
Waders	Y	Y																																																																																																																																																																		
Inspector 50	N	N																																																																																																																																																																		
Rigging	N	N																																																																																																																																																																		
Staging	N	N																																																																																																																																																																		
Traffic Control	N	N																																																																																																																																																																		
RR Flagger	N	N																																																																																																																																																																		
Police	N	N																																																																																																																																																																		
Other:																																																																																																																																																																				
	N	N																																																																																																																																																																		

RATING Rating Report (Y/N): ☐ N Date: 00/00/0000 Inspection data at time of existing rating I 58: - I 59: - I 60: - Date: 00/00/0000	Recommend for Rating or Rerating (Y/N): ☐ N If YES please give priority: HIGH () MEDIUM () LOW () REASON: _____
---	--

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. 6X8	BR. DEPT. NO. U-02-037	8.-STRUCTURE NO. U02037-6X8-MUN-BRI	INSPECTION DATE APR 11, 2018
------------------------------	----------------------	----------------------------------	---	--

REMARKS

BRIDGE ORIENTATION

According to the plans, the approaches are South and North and the elevations are West and East. This is a single span galvanized corrugated structural steel arch. The brook flows from East to West.

GENERAL REMARKS

Weight posting note: There are At-bridge signs for 20T - 36T - 52T limits with no rating report on file.

ITEM 58 - DECK

Item 58.1 - Wearing surface

See Approaches, section a - Appr. pavement condition.

APPROACHES

Approaches a - Appr. pavement condition

Both approaches and the wearing surface have a thin asphalt overlay that has raveled away in many areas throughout. There is minor to moderate transverse, longitudinal, and map cracking throughout with several bituminous concrete patches in the Northbound lane, up to 12 foot long x 3 foot wide. **See photo 1.**

ITEM 59 - SUPERSTRUCTURE

Item 59.5 - Spandrel Walls

There is minor missing pointing throughout both spandrel walls. The bottom of the Southwest spandrel wall at the springline interface has a loose stone. **See photo 2.**

Item 59.10 - Masonry Joints

See Item 59.5.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

The breastwalls consist of cement (pointed) stone masonry with concrete caps from springline to waterline. Both concrete caps have intermittent vertical hairline cracks and moderate waterline abrasion throughout. The South concrete cap has a 4 inch diameter x 1 inch deep spall above the waterline at midspan. **See photo 3.**

At the time of inspection the masonry portion of both breastwalls was hidden by high water. There is a 2.5 inch high x 1 foot long x up to 9 inch deep gap in the South breastwall masonry adjacent to the loose stone in the West spandrel wall. **See photo 2.**

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.1 - Channel Scour

The upstream (East) half of the channel is at least 1 foot deeper than the West half, suggesting minor scour action at the upstream side.

Item 61.3 - Debris

There is a downed tree blocking the downstream channel. **See photo 4.**

CITY/TOWN UXBRIDGE	B.I.N. 6X8	BR. DEPT. NO. U-02-037	8.-STRUCTURE NO. U02037-6X8-MUN-BRI	INSPECTION DATE APR 11, 2018
------------------------------	----------------------	----------------------------------	---	--

REMARKS**TRAFFIC SAFETY****Item 36d - Approach Guardrail Ends**

All four approach guardrail ends are turned from traffic but the Northeast (trailing) end is only partially turned.

Photo Log

- Photo 1 : Wearing surface, looking Northwest.
Photo 2 : West spandrel wall at South breastwall.
Photo 3 : Spall at South breastwall cap.
Photo 4 : Felled tree in downstream channel.

CITY/TOWN UXBRIDGE	B.I.N. 6X8	BR. DEPT. NO. U-02-037	8.-STRUCTURE NO. U02037-6X8-MUN-BRI	INSPECTION DATE APR 11, 2018
-----------------------	---------------	---------------------------	--	---------------------------------

PHOTOS

Photo 1: Wearing surface, looking Northwest.



Photo 2: West spandrel wall at South breastwall.

CITY/TOWN UXBRIDGE	B.I.N. 6X8	BR. DEPT. NO. U-02-037	8.-STRUCTURE NO. U02037-6X8-MUN-BRI	INSPECTION DATE APR 11, 2018
------------------------------	----------------------	----------------------------------	---	--

PHOTOS

Photo 3: Spall at South breastwall cap.



Photo 4: Felled tree in downstream channel.

State Information										Classification										Code																			
BDEPT#= U02037										Agency Br.No.										(112) NBIS Bridge Length										N									
Town= Uxbridge										L.O.										(104) Highway System										N									
B.I.N= 6X8										AASHTO= 033.4										(26) Functional Class - Urban Collector										17									
RANK= 0 H.I.= NA										FHWA Select List= N (6/21/2017)										(100) Defense Highway										0									
										Identification																													
(8) Structure Number										U020376X8MUNBRI										(101) Parallel Structure										N									
(5) Inventory Route										151000000										(102) Direction of Traffic - 2-way traffic										2									
(2) State Highway Department District										03										(103) Temporary Structure										N									
(3) County Code 027										(4) Place code 71620										(105) Federal Lands Highways										0									
(6) Features Intersected										WATER MEADOW BROOK										(110) Designated National Network										N									
(7) Facility Carried										HWY BLACKSTNE ST										(20) Toll - On free road										3									
(9) Location										2000 FT S. OF RT. 16										(21) Maintain - Town Agency										03									
(11) Kilometerpoint										0001.915										(22) Owner - Town Agency										03									
(12) Base Highway Network										N										(37) Historical Significance undetermined																			
(13) LRS Inventory Route & Subroute										000000000000										Condition										Code									
(16) Latitude										42 DEG 04 MIN 39.67 SEC										(58) Deck										N									
(17) Longitude										71 DEG 36 MIN 19.67 SEC										(59) Superstructure										7									
(98) Border Bridge State Code										Share %										(60) Substructure										6									
(99) Border Bridge Structure No. #																				(61) Channel & Channel Protection										6									
										Structure Type and Material																													
(43) Structure Type Main: Steel										Code 311										Load Rating and Posting										Code									
Arch - Deck										Jointless bridge type: Not applicable										(31) Design Load - H 20=M 18										4									
(44) Structure Type Appr:																				(63) Operating Rating Method - Allowable Stress (AS)										2									
Other										Code 000										(64) Operating Rating										00.0									
(45) Number of spans in main unit										001										(65) Inventory Rating Method - Allowable Stress (AS)										2									
(46) Number of approach spans										0000										(66) Inventory Rating										00.0									
(107) Deck Structure Type - Not applicable										Code N										(70) Bridge Posting										0									
(108) Wearing Surface / Protective System:																				(41) Structure - Posted for load										P									
A) Type of wearing surface - Bituminous										Code 6										Appraisal										Code									
B) Type of membrane - None										Code 0										(67) Structural Evaluation										3									
C) Type of deck protection - None										Code 0										(68) Deck Geometry										5									
																				(69) Underclearances, vert. and horiz.										N									
																				(71) Waterway adequacy										8									
																				(72) Approach Roadway Alignment										8									
																				(36) Traffic Safety Features										1 N 1 1									
																				(113) Scour Critical Bridges										6									
																				Inspections																			
(27) Year Built										1938										(90) Inspection Date 03/10/21										(91) Frequency 24 MO									
(106) Year Reconstructed										0000										(92) Critical Feature Inspection:										(93) CFI DATE									
(42) Type of Service: On - Highway																				(A) Fracture Critical Detail N 00 MO A)										00/00/00									
Under - Waterway										Code 15										(B) Underwater Inspection N 00 MO B)										00/00/00									
(28) Lanes: On Structure 02										Under structure 00										(C) Other Special Inspection N 00 MO C)										00/00/00									
(29) Average Daily Traffic										001500										(*) Other Inspection () N 00 MO *)										00/00/00									
(30) Year of ADT 2005										(109) Truck ADT 05 %										(*) Closed Bridge N 00 MO *)										00/00/00									
(19) Bypass, detour length										001 KM										(*) UW Special Inspection N 00 MO *)										00/00/00									
																				(*) Damage Inspection MO *)										00/00/00									

THIS PAGE INTENTIONALLY LEFT BLANK

Hartford Avenue East over the West River
(Bridge No. U-02-017)

Priority 20

AVAILABLE INFORMATION

Hartford Avenue is classified as an Urban Minor Arterial according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a double-barrel concrete box culvert, numbered west to east. The boxes and joints are numbered south to north. The structure length is 105'-0", while both boxes have equal spans of 9'-0" each. The hydraulic opening of each box culvert is 6'-0" high by 9'-0" wide. The flow was traveling southward, and depth was not recorded. The structure is considerably lower than the roadway and as a result the depth of fill over the structure is approximately 16'.

The roadway width over the structure is approximately 35'-6" with no sidewalks on either side and consists of an asphaltic wearing surface. There are moderate horizontal and vertical curves with low visibility at both approaches. Residential driveways are also located at both approaches.

Overhead wires run along the north side of the roadway. At the culvert approaches, there are catch basins that connect to a drainage line running down the center of the roadway.

The safety barrier consists of standard SS highway guardrail that is continuous on both sides.

There were no signs noted at the approaches.

FINDINGS

The overall condition of the structure is good with few minor deficiencies noted.

The concrete box culverts are in good condition. Both boxes typically exhibit minor spalling at the culvert joints. Joint 8 in the West Box has spalling and heavy rust stains with moisture (Photos 8 and 9). There is also random spalling on the roof of the west box (See Photo 10). There is an area of exposed rebar near joint 3 in the east box (Photo 11). Both the inside of the culverts and all wingwalls have minor scaling up to 12" above the waterline.

There is a large accumulation of debris at the upstream entrance of the culvert. The west box also has random debris throughout the concrete culvert floor. There is heavy vegetation around the culvert, typical at both sides.

The roadway over the culvert and at both approaches is in good condition. The SS guardrails are continuous across the culvert and are in good condition. Minor collision

damage at the southwest corner of the approach rail was noted. A larger area of collision damage at the southeast corner was also noted (Photo 15).

RECOMMENDATIONS

The overall condition of this structure is good and requires little maintenance at the present time. BETA recommends the following:

- Repair all spalled areas in the concrete box joint and roof.
- Remove all debris from the upstream opening and inside the western box.

Conduct routine inspections at intervals not exceeding two years

BUDGETARY COST ESTIMATE

Repairs

Construction:	\$10,000
Engineering:	<u>\$5,000</u>
Total:	\$15,000

Attachments

Locus Map

Inspection Photos

MassDOT Culvert Inspection Report Dated June 16, 2020

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865
P: 401.333.2382
F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

HARTFORD AVENUE EAST
OVER
THE WEST RIVER

BRIDGE NO.
U-02-017

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking Southeast: North Culvert Elevation



Photo 2 Looking South: West Box 1



Photo 3 Looking Southwest: Northwest Wingwall



Photo 4 Looking South: East Box 2



Photo 5 Looking Southeast: Northeast Wingwall



Photo 6 Looking North: West Box 1



Photo 7 Looking North: East Box 2



Photo 8 Looking East: Box 1 Joint #8 Rust Staining with Efflorescence



Photo 9 Looking East: Box 1 Joint #8 Rust Staining with Efflorescence



Photo 10 Looking East: Box 1 Joint #3 Spaling at Midspan



Photo 11 Looking West: Box 2 Spalls near Joint #3



Photo 12 Looking East: West Approach



Photo 13 Looking West: East Approach



Photo 14 Looking North: North Guardrail



Photo 15 Looking Southwest: Southeast Guardrail Collision Damage

2-DIST
03B.I.N.
BWHSTRUCTURES INSPECTION FIELD REPORT
CULVERT INSPECTIONBR. DEPT. NO.
U-02-017

CITY/TOWN UXBRIDGE		8.-STRUCTURE NO. U02017-BWH-MUN-NBI		11-Kilo. POINT 003.653	41-STATUS A:OPEN	90-ROUTINE INSP. DATE JUN 16, 2020
07-FACILITY CARRIED HWY HWY E HARTFO		MEMORIAL NAME/LOCAL NAME		27-YR BUILT 1990	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER WATER W RIVER		26-FUNCTIONAL CLASS Urban Minor Arterial		DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 119 : Concrete Culvert		22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Simkhovich		
107-DECK TYPE 2 : Concrete Precast Panels		WEATHER Clear	TEMP. (air) 18°C	TEAM MEMBERS T. TOLOCZKO		

TYPE OF CULVERT:

SHAPE:	RECTANGULAR
MATERIAL:	CONCRETE
COATING:	NONE

BARRELS: (In Meters)

SIZE:	2.74Wx1.83H	NUMBER:	2
-------	-------------	---------	---

DEPTH OF COVER (To the nearest tenth of a meter)

N	S
7.6	7.6

CURB REVEAL

(In millimeters)	N	N
------------------	---	---

ITEM 62 CULVERT & RETAINING WALLS

6

I62 (Dive Report):

N

I62 (This Report):

6

	Dive This Rpt.	DEF		Dive This Rpt.	DEF		Dive This Rpt.	DEF			
1. Roof	N	6	M-P	7. Protective Coating	N	N	-	13. Member Alignment	N	8	-
2. Floor	N	7	-	8. Embankment	N	7	-	14. Deformation	N	8	-
3. Walls	N	7	M-P	9. Wearing Surface	N	7	M-P	15. Scour	N	7	-
4. Headwall	N	7	-	10. Railing	N	6	M-P	16. Settlement	N	8	-
5. Wingwall	N	7	-	11. Sidewalks	N	N	-	17.	N	N	-
6. Pipe	N	N	-	12. Utilities	N	X	-	18.	N	N	-

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

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

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

ITEM 61 CHANNEL & CHANNEL PROTECTION

7

STREAM FLOW VELOCITY:

Tidal () High () Moderate () Low (X)

ITEM 61 (Dive Report):

N

ITEM 61 (This Report):

7

93b-

U/W INSP DATE: 00/00/0000

APPROACH CONDITION

	Dive This Rpt.	DEF		Dive This Rpt.	DEF		
1. Channel Scour	N	7	-	5. Utilities	N	X	-
2. Embankment Erosion	N	7	-	6. Rip-Rap/Slope Protection	N	7	-
3. Debris	N	7	-	7. Aggradation	N	7	-
4. Vegetation	N	7	M-P				

a. Appr. Pavement Condition **7** **M-P**

b. Appr. Roadway Settlement **8** **-**

c. Appr. Sidewalk Settlement **N** **-**

d. **N** **-**

WEIGHT POSTING

Not Applicable ☒ X

Actual Posting

H	3	3S2	Single
N	N	N	N

Recommended Posting

N	N	N	N
---	---	---	---

Waived Date: 00/00/0000 EJDMT Date: 00/00/0000

Signs In Place
(Y=Yes, N=No, NR=Not Required)

Legibility/
Visibility

At bridge		Advance	
E	W	E	W

ITEM 36 TRAFFIC SAFETY

ACCESSIBILITY (Y/N/P):

TOTAL HOURS 8

	36	COND	DEF		Needed Used	Needed Used
A. Bridge Railing	1	6	M-P	Ladder	N	N
B. Transitions	N	N	-	Boat	N	N
C. Approach Guardrail	1	5	S-A	Waders	Y	Y
D. Approach Guardrail Ends	0	7	-			

Other: **Tube** **P** **Y**

PLANS (Y/N): **N**

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

TAPE#: _____

RATING

Rating Report (Y/N): **Y**

Date: 02/01/2018

Inspection data at time of existing rating

I 62: - Date: 00/00/0000

Recommend for Rating or Rerating (Y/N): **N**

REASON: _____

If YES please give priority:

HIGH () MEDIUM () LOW ()

X=UNKNOWN

N=NOT APPLICABLE

H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. BWH	BR. DEPT. NO. U-02-017	8.-STRUCTURE NO. U02017-BWH-MUN-NBI	INSPECTION DATE JUN 16, 2020
------------------------------	----------------------	----------------------------------	---	--

REMARKS, PHOTOS & SKETCHES

BRIDGE ORIENTATION

According to the compass the approaches are East and West and the elevations are South and North. This is a 2 barrel precast concrete culvert with the barrels numbered from West to East. There are 14 precast boxes with 13 joints numbered from South to North. The river flows North to South.

ITEM 62 - CULVERT

Item 62.1 - Roof

Barrel #1:

At joint #2, there is a 6 inch long x 2 inch wide x 3 inch deep chipout near the East end. Joints #7 - #10 have up to full length minor longitudinal hairline cracking with water staining, rust and efflorescence, up to 1 foot from the joint. All segments have minor transverse hairline cracking in isolated areas. **See photo 1.**

Barrel #2:

Joint #2 has a 1 foot long x 3 inch wide x 3 inch deep chipout near the West end. Joint #4 has minor water staining throughout. Joints #7, #9, and #10 have minor longitudinal hairline cracking with water staining, efflorescence and rust staining. Joint #13 has an 8 inch long x 5 inch wide x 1 inch deep chipout near midspan. All segments have minor transverse hairline cracking in isolated areas.

CONDITION RATING GUIDE

	CODE	CONDITION	DEFECTS
	N	NOT APPLICABLE	Use if structure is not a culvert.
G	9	EXCELLENT	No deficiencies.
G	8	VERY GOOD	No noticeable or noteworthy differences which affect the condition of the culvert. Insignificant scrape marks caused by drift.
G	7	GOOD	Shrinkage cracks, light scaling, and insignificant spalling, which does not expose reinforcing steel. Insignificant damage caused by drift with not misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting.
F	6	SATISFACTORY	Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting.
F	5	FAIR	Moderate to major deterioration, or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection in one section, significant corrosion or deep pitting.
P	4	POOR	Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joints permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection throughout, extensive corrosion or deep pitting.
P	3	SERIOUS	Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slabs. Integral wingwalls, nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls, or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.
C	2	CRITICAL	Advanced 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	Bridge closed. Corrective action may put back in light service.
	0	FAILED	Bridge closed. Replacement necessary.

DEFICIENCY REPORTING GUIDE

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

CATEGORIES OF DEFICIENCIES:

M= Minor Deficiency - (Examples include but are not limited to: Spalled concrete, minor to moderate corrosion to steel culverts, minor settlement or misalignment, minor scouring, minor damage to guardrail, etc.)

S= Severe/Major Deficiency - (Examples include but are not limited to: Large spalls, wide cracks, moderate to major deterioration in concrete, considerable settlement, considerable scouring or undermining, extensive corrosion and deflection in steel culverts, etc.)

C-S= Critical Deficiency - A deficiency in a structural component or element of a bridge that poses an extreme hazard or unsafe condition to the public. (Follow-up Critical Deficiency Report must be submitted separately)

URGENCY OF REPAIR:

I = Immediate- [Inspector(s) stay at the bridge until the District Maintenance crew or the responsible Agency crew(if not a State bridge) show up and corrective action is taken.]

A = ASAP- [Action will be taken by the District Maintenance Engineer or the Responsible Agency (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].

CITY/TOWN UXBRIDGE	B.I.N. BWH	BR. DEPT. NO. U-02-017	8.-STRUCTURE NO. U02017-BWH-MUN-NBI	INSPECTION DATE JUN 16, 2020
------------------------------	----------------------	----------------------------------	---	--

REMARKS

Item 62.3 - Walls

Barrel #1:

The East wall has a 2 foot high x 7 inch wide area of delamination near the top of joint #8.

Barrel #2:

The East wall has two sections of exposed rusted shallow rebar (1 foot high and 4 inches high) at the top North end of section #3. **See photo 2.**

Item 62.9 - Wearing Surface

The bituminous concrete wearing surface and both approaches have wheel wear with minor transverse and longitudinal cracking.

Item 62.10 - Railing

There are minor collision dents throughout.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.4 - Vegetation

The upstream channel has minor vegetation growth throughout.

APPROACHES

Approaches a - Appr. Pavement Condition

See Item 62.9.

TRAFFIC SAFETY

Item 36c - Approach Guardrail

The Southeast approach guardrail has a 30 foot long area of heavy collision damage. **See photo 3.** The Northwest approach guardrail has minor collision damage.

Item 36d - Approach Guardrail Ends

The West guardrail ends are buried in level ground and not turned from traffic.

Photo Log

Photo 1 : Joint #8 in barrel #1.

Photo 2 : Shallow rebar spalls at the North end of section #3, barrel #2.

Photo 3 : Southeast approach guardrail.

CITY/TOWN UXBRIDGE	B.I.N. BWH	BR. DEPT. NO. U-02-017	8.-STRUCTURE NO. U02017-BWH-MUN-NBI	INSPECTION DATE JUN 16, 2020
------------------------------	----------------------	----------------------------------	---	--

PHOTOS

Photo 1: Joint #8 in barrel #1.



Photo 2: Shallow rebar spalls at the North end of section #3, barrel #2.

CITY/TOWN UXBRIDGE	B.I.N. BWH	BR. DEPT. NO. U-02-017	8.-STRUCTURE NO. U02017-BWH-MUN-NBI	INSPECTION DATE JUN 16, 2020
------------------------------	----------------------	----------------------------------	---	--

PHOTOS

Photo 3: Southeast approach guardrail.

THIS PAGE INTENTIONALLY LEFT BLANK

State Information										Classification										Code		
BDEPT#= U02017										Agency Br.No.										(112) NBIS Bridge Length		Y
Town= Uxbridge										L.O.										(104) Highway System		N
B.I.N= BWH										AASHTO= 096.8										(26) Functional Class - Urban Minor Arterial		16
RANK= 2351 H.I.= 94.0 %										FHWA Select List= N (6/21/2017)										(100) Defense Highway		0
(8) Structure Number										U02017BWHMUNNBI										(101) Parallel Structure		N
(5) Inventory Route										151000000										(102) Direction of Traffic - 2-way traffic		2
(2) State Highway Department District										03										(103) Temporary Structure		N
(3) County Code 027 (4) Place code										71620										(105) Federal Lands Highways		0
(6) Features Intersected										WATER WATER W RIVER										(110) Designated National Network		N
(7) Facility Carried										HWY HWY E HARTFO										(20) Toll - On free road		3
(9) Location										600' E OF CONNOR PASS										(21) Maintain - Town Agency		03
(11) Kilometerpoint										0003.653										(22) Owner - Town Agency		03
(12) Base Highway Network										N										(37) Historical Significance		
(13) LRS Inventory Route & Subroute																				Condition		Code
(16) Latitude										42 DEG 06 MIN 01.46 SEC										(58) Deck		N
(17) Longitude										71 DEG 36 MIN 04.37 SEC										(59) Superstructure		N
(98) Border Bridge State Code										Share %										(60) Substructure		N
(99) Border Bridge Structure No. #																				(61) Channel & Channel Protection		7
																				(62) Culverts		6
																				Load Rating and Posting		Code
(43) Structure Type Main: Concrete										Code 119										(31) Design Load - Unknown		0
Culvert										Jointless bridge type: Not applicable										(63) Operating Rating Method - Load Factor (LF)		1
(44) Structure Type Appr:																				(64) Operating Rating		88.2
Other										Code 000										(65) Inventory Rating Method - Load Factor (LF)		1
(45) Number of spans in main unit										002										(66) Inventory Rating		52.8
(46) Number of approach spans										0000										(70) Bridge Posting		5
(107) Deck Structure Type - Concrete Precast Panels										Code 2										(41) Structure - Open		A
(108) Wearing Surface / Protective System:																				Appraisal		Code
A) Type of wearing surface - None										Code 0										(67) Structural Evaluation		6
B) Type of membrane - None										Code 0										(68) Deck Geometry		N
C) Type of deck protection - None										Code 0										(69) Underclearances, vert. and horiz.		N
																				(71) Waterway adequacy		9
																				(72) Approach Roadway Alignment		5
																				(36) Traffic Safety Features		1 N 1 0
																				(113) Scour Critical Bridges		5
																				Inspections		
(27) Year Built										1990										(90) Inspection Date 06/16/20		(91) Frequency 24 MO
(106) Year Reconstructed										0000										(92) Critical Feature Inspection:		(93) CFI DATE
(42) Type of Service: On - Highway																				(A) Fracture Critical Detail N 00 MO A)		00/00/00
Under - Waterway										Code 15										(B) Underwater Inspection N 00 MO B)		00/00/00
(28) Lanes: On Structure 02 Under structure										00										(C) Other Special Inspection N 00 MO C)		00/00/00
(29) Average Daily Traffic										005773										(*) Other Inspection () N 00 MO *)		00/00/00
(30) Year of ADT 2015 (109) Truck ADT										03 %										(*) Closed Bridge N 00 MO *)		00/00/00
(19) Bypass, detour length										008 KM										(*) UW Special Inspection N 00 MO *)		00/00/00
																				(*) Damage Inspection MO *)		00/00/00

THIS PAGE INTENTIONALLY LEFT BLANK

River Road over Ironstone Brook
(Bridge No. U-02-030)

Priority 21

AVAILABLE INFORMATION

The current NBI Structure Inventory and Appraisal shows an AASHTO Sufficiency Rating of 92.6.

A bridge rating report dated October 1, 2017 was provided by MassDOT. Based on the calculations and the condition of the structure, the report concludes that the bridge capacity is satisfactory and does not require posting.

The most recent MassDOT bridge inspection report on record is dated March 1, 2019.

River Road is classified as a Rural Minor Collector according to the MassDOT Office of Transportation Planning.

BRIDGE DESCRIPTION

This structure consists of a single span, galvanized folded plate girder bridge on concrete abutments with mechanically stabilized earth walls at each corner. There are 4 girders and 3 bays which are numbered south to north. The structure length is 50'-0" with a span length of 46'-0". The flow was traveling southward, and depth was not recorded. There is no fill over the structure.

The roadway width over the structure is approximately 32'-0" with an out-to-out of 35'-0". The roadway is an asphalt wearing surface at the approach and concrete grooved pavement over the culvert. There are no sidewalks present at either side. The north approach forks in two directions and the south approach has a moderate horizontal curve with a slight change in elevation.

Overhead wires run along the south side of the roadway. At the culvert approaches, there are catch basins on both sides.

There is new bridge rail on the north and south sides, with SS highway guardrail on each approach leading up to it.

There was a speed limit sign of "35mph" on the west approach.

FINDINGS

The structure was completed in 2011 and is in good condition with a few minor notes.

The entirety of the superstructure and substructure is set up with bridge monitoring equipment (Photo 8). The beams are in good condition with some minor rusting and efflorescence at the fascia beams. The deck is in good condition with some hairline cracks and efflorescence at the fascia overhangs.

The abutments are also in good condition. The east abutment has graffiti over the entire face and the west abutment has only minor graffiti. There are a few hairline cracks with efflorescence extending down at the beam ends for beams 2-4.

The MSE walls are in good condition. The southwest MSE wall has a 2.5" gap from the superstructure (Photo 6). The joint at the northwest MSE wall has exposed filter fabric (Photo 7). Additionally, all MSE Walls have cap displacement and some fabric exposure in the joints.

The roadway over the culvert and at both approaches is in good condition. There is some slight ponding on the grooved pavement over the culvert and tire marks in the road (Photo 10). The bridge rail is fairly new and is in good condition and the SS guardrail at the approaches are in good condition.

RECOMMENDATIONS

BETA has no recommendations for this bridge at this time as it was recently completed.

BUDGETARY COST ESTIMATE

NA

Attachments

Locus Map

Inspection Photos

MassDOT Routine Inspection Report Dated March 1, 2019

National Bridge Inventory Sheet Dated April 15, 2021

THIS PAGE INTENTIONALLY LEFT BLANK



www.BETA-Inc.com

701 GEORGE WASHINGTON
HIGHWAY, LINCOLN, RI 02865
P: 401.333.2382
F: 401.333.9225

BRIDGE AND CULVERT EVALUATION UXBRIDGE, MASSACHUSETTS

SCALE: 1" = 500'

RIVER ROAD
OVER
IRONSTONE BROOK

BRIDGE NO.
U-02-030

THIS PAGE INTENTIONALLY LEFT BLANK



Photo 1 Looking South: North Bridge Elevation



Photo 2 Looking West: West Abutment



Photo 3 Looking East: East Abutment



Photo 4 Looking East: Northeast MSE Wall



Photo 5 Looking East: Southwest MSE Wall



Photo 6 Looking North: Southwest MSE Wall Gap

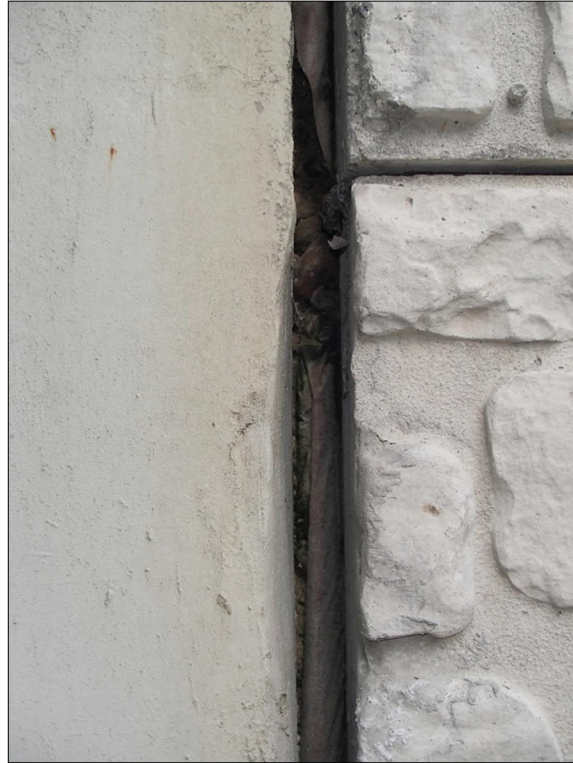


Photo 7 Looking West: Northwest Joint



Photo 8 Typical Bridge Equipment



Photo 9 Looking East: West Approach



Photo 10 Looking North: Roadway Condition

THIS PAGE INTENTIONALLY LEFT BLANK

STRUCTURES INSPECTION FIELD REPORT

2-DIST
03B.I.N.
BAM

ROUTINE INSPECTION

BR. DEPT. NO.
U-02-030

CITY/TOWN UXBRIDGE	8-STRUCTURE NO. U02030-BAM-MUN-NBI	11-Kilo. POINT 001.835	41-STATUS A:OPEN	90-ROUTINE INSP. DATE MAR 1, 2019
07-FACILITY CARRIED HWY RIVER RD	MEMORIAL NAME/LOCAL NAME	27-YR BUILT 2011	106-YR REBUILT 0000	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER IRONSTONE BROOK	26-FUNCTIONAL CLASS Urban Local	DIST. BRIDGE INSPECTION ENGINEER M. Azizi		
43-STRUCTURE TYPE 302 : Steel Stringer/Girder	22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER D. Smith	
107-DECK TYPE 2 : Concrete Precast Panels	WEATHER Sunny	TEMP. (air) -4°C	TEAM MEMBERS D. TRAINEE	

ITEM 58 DECK <table border="1"> <tr> <td>1. Wearing Surface</td> <td>7</td> <td>DEF</td> <td>M-P</td> </tr> <tr> <td>2. Deck Condition</td> <td>7</td> <td>-</td> <td></td> </tr> <tr> <td>3. Stay in Place Forms</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>4. Curbs</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>5. Median</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>6. Sidewalks</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>7. Parapets</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>8. Railing</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>9. Anti Missile Fence</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>10. Drainage System</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>11. Lighting Standards</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>12. Utilities</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>13. Deck Joints</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>14.</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>15.</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>16.</td> <td>N</td> <td>-</td> <td></td> </tr> </table> CURB REVEAL (In millimeters) <table border="1"> <tr> <td>N</td> <td>S</td> </tr> <tr> <td>215</td> <td>215</td> </tr> </table> APPROACHES <table border="1"> <tr> <td>a. Appr. Pavement Condition</td> <td>7</td> <td>DEF</td> <td>-</td> </tr> <tr> <td>b. Appr. Roadway Settlement</td> <td>7</td> <td>-</td> <td></td> </tr> <tr> <td>c. Appr. Sidewalk Settlement</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>d.</td> <td>N</td> <td>-</td> <td></td> </tr> </table> OVERHEAD SIGNS (Attached to bridge) (Y/N) N <table border="1"> <tr> <td>a. Condition of Welds</td> <td>N</td> <td>DEF</td> <td>-</td> </tr> <tr> <td>b. Condition of Bolts</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>c. Condition of Signs</td> <td>N</td> <td>-</td> <td></td> </tr> </table>	1. Wearing Surface	7	DEF	M-P	2. Deck Condition	7	-		3. Stay in Place Forms	N	-		4. Curbs	8	-		5. Median	N	-		6. Sidewalks	N	-		7. Parapets	N	-		8. Railing	8	-		9. Anti Missile Fence	N	-		10. Drainage System	N	-		11. Lighting Standards	N	-		12. Utilities	N	-		13. Deck Joints	8	-		14.	N	-		15.	N	-		16.	N	-		N	S	215	215	a. Appr. Pavement Condition	7	DEF	-	b. Appr. Roadway Settlement	7	-		c. Appr. Sidewalk Settlement	N	-		d.	N	-		a. Condition of Welds	N	DEF	-	b. Condition of Bolts	N	-		c. Condition of Signs	N	-		ITEM 59 SUPERSTRUCTURE <table border="1"> <tr> <td>1. Stringers</td> <td>N</td> <td>DEF</td> <td>-</td> </tr> <tr> <td>2. Floorbeams</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>3. Floor System Bracing</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>4. Girders or Beams</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>5. Trusses - General</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>a. Upper Chords</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>b. Lower Chords</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>c. Web Members</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>d. Lateral Bracing</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>e. Sway Bracings</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>f. Portals</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>g. End Posts</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>6. Pin & Hangers</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>7. Conn Plt's, Gussets & Angles</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>8. Cover Plates</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>9. Bearing Devices</td> <td>N</td> <td>-</td> <td></td> </tr> <tr> <td>10. Diaphragms/Cross Frames</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>11. Rivets & Bolts</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>12. Welds</td> <td>H</td> <td>-</td> <td></td> </tr> <tr> <td>13. Member Alignment</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>14. Paint/Coating</td> <td>8</td> <td>-</td> <td></td> </tr> <tr> <td>15.</td> <td>N</td> <td>-</td> <td></td> </tr> </table> Year Painted N COLLISION DAMAGE: Please explain None (X) Minor () Moderate () Severe () LOAD DEFLECTION: Please explain None () Minor (X) Moderate () Severe () LOAD VIBRATION: Please explain None () Minor (X) Moderate () Severe () Any Fracture Critical Member: (Y/N) N Any Cracks: (Y/N) N	1. Stringers	N	DEF	-	2. Floorbeams	N	-		3. Floor System Bracing	N	-		4. Girders or Beams	8	-		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	8	-		8. Cover Plates	N	-		9. Bearing Devices	N	-		10. Diaphragms/Cross Frames	8	-		11. Rivets & Bolts	8	-		12. Welds	H	-		13. Member Alignment	8	-		14. Paint/Coating	8	-		15.	N	-		ITEM 60 SUBSTRUCTURE <table border="1"> <tr> <td>1. Abutments</td> <td>Dive</td> <td>Cur</td> <td>8</td> <td>DEF</td> </tr> <tr> <td>a. Pedestals</td> <td>N</td> <td>H</td> <td></td> <td>-</td> </tr> <tr> <td>b. Bridge Seats</td> <td>N</td> <td>H</td> <td></td> <td>-</td> </tr> <tr> <td>c. Backwalls</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>d. Breastwalls</td> <td>N</td> <td>8</td> <td></td> <td>-</td> </tr> <tr> <td>e. Wingwalls</td> <td>N</td> <td>8</td> <td></td> <td>-</td> </tr> <tr> <td>f. Slope Paving/Rip-Rap</td> <td>N</td> <td>8</td> <td></td> <td>-</td> </tr> <tr> <td>g. Pointing</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>h. Footings</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>i. Piles</td> <td>N</td> <td>H</td> <td></td> <td>-</td> </tr> <tr> <td>j. Scour</td> <td>N</td> <td>8</td> <td></td> <td>-</td> </tr> <tr> <td>k. Settlement</td> <td>N</td> <td>8</td> <td></td> <td>-</td> </tr> <tr> <td>l.</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>m.</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>2. Piers or Bents</td> <td></td> <td></td> <td>N</td> <td>DEF</td> </tr> <tr> <td>a. Pedestals</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>b. Caps</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>c. Columns</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>d. Stems/Webs/Pierwalls</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>e. Pointing</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>f. Footing</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>g. Piles</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>h. Scour</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>i. Settlement</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>j.</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>k.</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>3. Pile Bents</td> <td></td> <td></td> <td>N</td> <td>DEF</td> </tr> <tr> <td>a. Pile Caps</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>b. Piles</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>c. Diagonal Bracing</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>d. Horizontal Bracing</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> <tr> <td>e. Fasteners</td> <td>N</td> <td>N</td> <td></td> <td>-</td> </tr> </table> 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): 8 93B-U/W (DIVE) Insp 00/00/0000	1. Abutments	Dive	Cur	8	DEF	a. Pedestals	N	H		-	b. Bridge Seats	N	H		-	c. Backwalls	N	N		-	d. Breastwalls	N	8		-	e. Wingwalls	N	8		-	f. Slope Paving/Rip-Rap	N	8		-	g. Pointing	N	N		-	h. Footings	N	N		-	i. Piles	N	H		-	j. Scour	N	8		-	k. Settlement	N	8		-	l.	N	N		-	m.	N	N		-	2. Piers or Bents			N	DEF	a. Pedestals	N	N		-	b. Caps	N	N		-	c. Columns	N	N		-	d. Stems/Webs/Pierwalls	N	N		-	e. Pointing	N	N		-	f. Footing	N	N		-	g. Piles	N	N		-	h. Scour	N	N		-	i. Settlement	N	N		-	j.	N	N		-	k.	N	N		-	3. Pile Bents			N	DEF	a. Pile Caps	N	N		-	b. Piles	N	N		-	c. Diagonal Bracing	N	N		-	d. Horizontal Bracing	N	N		-	e. Fasteners	N	N		-
1. Wearing Surface	7	DEF	M-P																																																																																																																																																																																																																																																																																																																																																							
2. Deck Condition	7	-																																																																																																																																																																																																																																																																																																																																																								
3. Stay in Place Forms	N	-																																																																																																																																																																																																																																																																																																																																																								
4. Curbs	8	-																																																																																																																																																																																																																																																																																																																																																								
5. Median	N	-																																																																																																																																																																																																																																																																																																																																																								
6. Sidewalks	N	-																																																																																																																																																																																																																																																																																																																																																								
7. Parapets	N	-																																																																																																																																																																																																																																																																																																																																																								
8. Railing	8	-																																																																																																																																																																																																																																																																																																																																																								
9. Anti Missile Fence	N	-																																																																																																																																																																																																																																																																																																																																																								
10. Drainage System	N	-																																																																																																																																																																																																																																																																																																																																																								
11. Lighting Standards	N	-																																																																																																																																																																																																																																																																																																																																																								
12. Utilities	N	-																																																																																																																																																																																																																																																																																																																																																								
13. Deck Joints	8	-																																																																																																																																																																																																																																																																																																																																																								
14.	N	-																																																																																																																																																																																																																																																																																																																																																								
15.	N	-																																																																																																																																																																																																																																																																																																																																																								
16.	N	-																																																																																																																																																																																																																																																																																																																																																								
N	S																																																																																																																																																																																																																																																																																																																																																									
215	215																																																																																																																																																																																																																																																																																																																																																									
a. Appr. Pavement Condition	7	DEF	-																																																																																																																																																																																																																																																																																																																																																							
b. Appr. Roadway Settlement	7	-																																																																																																																																																																																																																																																																																																																																																								
c. Appr. Sidewalk Settlement	N	-																																																																																																																																																																																																																																																																																																																																																								
d.	N	-																																																																																																																																																																																																																																																																																																																																																								
a. Condition of Welds	N	DEF	-																																																																																																																																																																																																																																																																																																																																																							
b. Condition of Bolts	N	-																																																																																																																																																																																																																																																																																																																																																								
c. Condition of Signs	N	-																																																																																																																																																																																																																																																																																																																																																								
1. Stringers	N	DEF	-																																																																																																																																																																																																																																																																																																																																																							
2. Floorbeams	N	-																																																																																																																																																																																																																																																																																																																																																								
3. Floor System Bracing	N	-																																																																																																																																																																																																																																																																																																																																																								
4. Girders or Beams	8	-																																																																																																																																																																																																																																																																																																																																																								
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	8	-																																																																																																																																																																																																																																																																																																																																																								
8. Cover Plates	N	-																																																																																																																																																																																																																																																																																																																																																								
9. Bearing Devices	N	-																																																																																																																																																																																																																																																																																																																																																								
10. Diaphragms/Cross Frames	8	-																																																																																																																																																																																																																																																																																																																																																								
11. Rivets & Bolts	8	-																																																																																																																																																																																																																																																																																																																																																								
12. Welds	H	-																																																																																																																																																																																																																																																																																																																																																								
13. Member Alignment	8	-																																																																																																																																																																																																																																																																																																																																																								
14. Paint/Coating	8	-																																																																																																																																																																																																																																																																																																																																																								
15.	N	-																																																																																																																																																																																																																																																																																																																																																								
1. Abutments	Dive	Cur	8	DEF																																																																																																																																																																																																																																																																																																																																																						
a. Pedestals	N	H		-																																																																																																																																																																																																																																																																																																																																																						
b. Bridge Seats	N	H		-																																																																																																																																																																																																																																																																																																																																																						
c. Backwalls	N	N		-																																																																																																																																																																																																																																																																																																																																																						
d. Breastwalls	N	8		-																																																																																																																																																																																																																																																																																																																																																						
e. Wingwalls	N	8		-																																																																																																																																																																																																																																																																																																																																																						
f. Slope Paving/Rip-Rap	N	8		-																																																																																																																																																																																																																																																																																																																																																						
g. Pointing	N	N		-																																																																																																																																																																																																																																																																																																																																																						
h. Footings	N	N		-																																																																																																																																																																																																																																																																																																																																																						
i. Piles	N	H		-																																																																																																																																																																																																																																																																																																																																																						
j. Scour	N	8		-																																																																																																																																																																																																																																																																																																																																																						
k. Settlement	N	8		-																																																																																																																																																																																																																																																																																																																																																						
l.	N	N		-																																																																																																																																																																																																																																																																																																																																																						
m.	N	N		-																																																																																																																																																																																																																																																																																																																																																						
2. Piers or Bents			N	DEF																																																																																																																																																																																																																																																																																																																																																						
a. Pedestals	N	N		-																																																																																																																																																																																																																																																																																																																																																						
b. Caps	N	N		-																																																																																																																																																																																																																																																																																																																																																						
c. Columns	N	N		-																																																																																																																																																																																																																																																																																																																																																						
d. Stems/Webs/Pierwalls	N	N		-																																																																																																																																																																																																																																																																																																																																																						
e. Pointing	N	N		-																																																																																																																																																																																																																																																																																																																																																						
f. Footing	N	N		-																																																																																																																																																																																																																																																																																																																																																						
g. Piles	N	N		-																																																																																																																																																																																																																																																																																																																																																						
h. Scour	N	N		-																																																																																																																																																																																																																																																																																																																																																						
i. Settlement	N	N		-																																																																																																																																																																																																																																																																																																																																																						
j.	N	N		-																																																																																																																																																																																																																																																																																																																																																						
k.	N	N		-																																																																																																																																																																																																																																																																																																																																																						
3. Pile Bents			N	DEF																																																																																																																																																																																																																																																																																																																																																						
a. Pile Caps	N	N		-																																																																																																																																																																																																																																																																																																																																																						
b. Piles	N	N		-																																																																																																																																																																																																																																																																																																																																																						
c. Diagonal Bracing	N	N		-																																																																																																																																																																																																																																																																																																																																																						
d. Horizontal Bracing	N	N		-																																																																																																																																																																																																																																																																																																																																																						
e. Fasteners	N	N		-																																																																																																																																																																																																																																																																																																																																																						

X=UNKNOWN

N=NOT APPLICABLE H=HIDDEN/INACCESSIBLE

R=REMOVED

CITY/TOWN UXBRIDGE	B.I.N. BAM	BR. DEPT. NO. U-02-030	8.-STRUCTURE NO. U02030-BAM-MUN-NBI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

ITEM 61
CHANNEL & CHANNEL PROTECTION

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

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

ITEM 61 (Dive Report): N ITEM 61 (This Report): 7

93b-U/W INSP. DATE: 00/00/0000

ITEM 36 TRAFFIC SAFETY

	36	COND	DEF
A. Bridge Railing	1	8	-
B. Transitions	1	8	-
C. Approach Guardrail	1	8	-
D. Approach Guardrail Ends	1	5	S-A

WEIGHT POSTING *Not Applicable* X

	H	3	3S2	Single
Actual Posting	N	N	N	N
Recommended Posting	N	N	N	N

Waived Date: 00/00/0000 EJDMT Date: 00/00/0000

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

CLEARANCE POSTING

	N		S		
	ft	in	ft	in	meter
Actual Field Measurement	 	0	 	0	
Posted Clearance	 	0	 	0	

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

ACCESSIBILITY (Y/N/P)

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

TOTAL HOURS 8

PLANS (Y/N): Y

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

TAPE#: _____

List of field tests performed:
 None

RATING
 Rating Report (Y/N): N
 Date: 00/00/0000
 Inspection data at time of existing rating
 I 58: - I 59: - I 60: - Date: 00/00/0000

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

REASON: Rating pending

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

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	Advanced 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	Advanced 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 stability. 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].

CITY/TOWN UXBRIDGE	B.I.N. BAM	BR. DEPT. NO. U-02-030	8.-STRUCTURE NO. U02030-BAM-MUN-NBI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

REMARKS

BRIDGE ORIENTATION

According to the plans the approaches are East and West and the elevations are North and South. This is a single span galvanized steel folded plate girder bridge with 4 girders and 3 bays numbered South to North. The brook flows South to North.

ITEM 58 - DECK

Item 58.1 - Wearing Surface

The concrete wearing surface has several up to 6 ft. long x 0.02 in. wide longitudinal cracks at both ends. **See Photo 1.**

Item 58.2 - Deck Condition

Both ends of bay #1 and the West end of bay #3 each have a 2 ft. diagonal hairline crack. **See Photo 2.** There are isolated full width transverse hairline cracks with efflorescence to both deck fascia overhangs.

APPROACHES

Approaches a - Appr. Pavement Condition

There is minor heaving at the Southeast corner of the approach to deck transition. **See Photo 3.**

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Girders or Beams

There are isolated areas of minor rusting on girder #1.

SuperStructure Load Deflection Notes

Minor under heavy live loads.

SuperStructure Load Vibration Notes

Minor under heavy live loads.

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

There is minor graffiti on the East breastwall. There are 8 in. high vertical hairline cracks with efflorescence extending down from the edges of both ends of girders #2 and #3. **See Photo 4.**

TRAFFIC SAFETY

Item 36d - Approach Guardrail Ends

There is minor collision damage to the Northwest approach guardrail. **See Photo 5.**

Photo Log

- Photo 1 : Typical Wearing Surface crack.
- Photo 2 : West end of bay #1 at girder #2.
- Photo 3 : Minor heaving at the Southeast approach to deck transition.
- Photo 4 : Typical cracks under girders.
- Photo 5 : Minor collision damage at the Northwest approach guardrail.

CITY/TOWN UXBRIDGE	B.I.N. BAM	BR. DEPT. NO. U-02-030	8.-STRUCTURE NO. U02030-BAM-MUN-NBI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 1: Typical Wearing Surface crack.



Photo 2: West end of bay #1 at girder #2.

CITY/TOWN UXBRIDGE	B.I.N. BAM	BR. DEPT. NO. U-02-030	8.-STRUCTURE NO. U02030-BAM-MUN-NBI	INSPECTION DATE MAR 1, 2019
-----------------------	---------------	---------------------------	--	--------------------------------

PHOTOS

Photo 3: Minor heaving at the Southeast approach to deck transition.



Photo 4: Typical cracks under girders.

CITY/TOWN UXBRIDGE	B.I.N. BAM	BR. DEPT. NO. U-02-030	8.-STRUCTURE NO. U02030-BAM-MUN-NBI	INSPECTION DATE MAR 1, 2019
------------------------------	----------------------	----------------------------------	---	---------------------------------------

PHOTOS

Photo 5: Minor collision damage at the Northwest approach guardrail.

State Information						Classification							Code			
BDEPT#	U02030		Agency Br.No.			(112) NBIS Bridge Length							Y			
Town=	Uxbridge		L.O.			(104) Highway System							N			
B.I.N=	BAM		AASHTO= 092.6			(26) Functional Class - Urban Local							19			
RANK=	5158	H.I.=	100.0 %	FHWA Select List= N (6/21/2017)		(100) Defense Highway							0			
(8) Structure Number						U02030BAMMUNNBI							N			
(5) Inventory Route						151000000							2			
(2) State Highway Department District						03							N			
(3) County Code 027 (4) Place code						71620							0			
(6) Features Intersected						WATER IRONSTONE BROOK							N			
(7) Facility Carried						HWY RIVER RD							3			
(9) Location						BTWN 146A&122 NR MILLVILL							03			
(11) Kilometerpoint						0001.835							03			
(12) Base Highway Network						N							(37) Historical Significance			
(13) LRS Inventory Route & Subroute						000000000000							Condition	Code		
(16) Latitude						42 DEG 01 MIN 47.49 SEC							(58) Deck	7		
(17) Longitude						71 DEG 36 MIN 11.67 SEC							(59) Superstructure	8		
(98) Border Bridge State Code						Share %							(60) Substructure	8		
(99) Border Bridge Structure No. #													(61) Channel & Channel Protection	7		
Structure Type and Material													(62) Culverts	N		
(43) Structure Type Main: Steel						Code 302							Load Rating and Posting		Code	
Stringer/Girder						Jointless bridge type: Not applicable							(31) Design Load - HL 93		A	
(44) Structure Type Appr:													(63) Operating Rating Method - LRFR rating by RF method using HL-93		8	
Other						Code 000							(64) Operating Rating		2.80	
(45) Number of spans in main unit						001							(65) Inventory Rating Method - LRFR rating by RF method using HL-93		8	
(46) Number of approach spans						0000							(66) Inventory Rating		2.20	
(107) Deck Structure Type - Concrete Precast Panels						Code 2							(70) Bridge Posting		5	
(108) Wearing Surface / Protective System:													(41) Structure - Open		A	
A) Type of wearing surface - Concrete						Code 1							Appraisal		Code	
B) Type of membrane - Epoxy						Code 3							(67) Structural Evaluation		8	
C) Type of deck protection - Epoxy Coated Reinforcing						Code 1							(68) Deck Geometry		4	
Age and Service													(69) Underclearances, vert. and horiz.		N	
(27) Year Built						2011							(71) Waterway adequacy		9	
(106) Year Reconstructed						0000							(72) Approach Roadway Alignment		7	
(42) Type of Service: On - Highway													(36) Traffic Safety Features		1 1 1 1	
Under - Waterway						Code 15							(113) Scour Critical Bridges		8	
(28) Lanes: On Structure 02						Under structure 00							Inspections			
(29) Average Daily Traffic						002700							(90) Inspection Date 03/04/21		(91) Frequency 24 MO	
(30) Year of ADT 2013 (109) Truck ADT						01 %							(92) Critical Feature Inspection:		(93) CFI DATE	
(19) Bypass, detour length						003 KM							(A) Fracture Critical Detail N 00 MO A)		00/00/00	
Geometric Data													(B) Underwater Inspection N 00 MO B)		00/00/00	
(48) Length of maximum span						0014.0 M							(C) Other Special Inspection N 00 MO C)		00/00/00	
(49) Structure Length						00015.2 M							(*) Other Inspection () N 00 MO *)		00/00/00	
(50) Curb or sidewalk: Left 00.0 M Right 00.0 M													(*) Closed Bridge N 00 MO *)		00/00/00	
(51) Bridge Roadway Width Curb to Curb						009.7 M							(*) UW Special Inspection N 00 MO *)		00/00/00	
(52) Deck Width Out to Out						010.7 M							(*) Damage Inspection MO *)		00/00/00	
(32) Approach Roadway Width (w/shoulders)						010.7 M							Rating Loads			
(33) Bridge Median - No median						Code 0							Report Date 10/01/17 H20	Type 3	Type 3S2	Type HS
(34) Skew 00 DEG (35) Structure Flared						N							Operating 76.0	90.0	99.0	0.0
(10) Inventory Route MIN Vert Clear						99.99 M							Inventory 58.0	70.0	99.0	0.0
(47) Inventory Route Total Horiz Clear						09.7 M							Field Posting			
(53) Min Vert Clear Over Bridge Rdwy						99.99 M							Status LEGAL	Posting Date 06/04/19		
(54) Min Vert Underclear ref N						00.00 M							2 Axle 3 Axle 5 Axle	Single		
(55) Min Lat Underclear RT ref N						00.0 M							Actual			
(56) Min Lat Underclear LT						00.0 M							Recommended			
Navigation Data													Missing Signs N			
(38) Navigation Control - No navigation control on waterway						Code 0							Bridge Name			
(111) Pier Protection						Code							N Anti-missile fence N Acrow Panel N Jointless Bridge			
(39) Navigation Vertical Clearance						000.0 M							Freeze/Thaw			
(116) Vert-lift Bridge Nav Min Vert Clear						M							Accessibility (Needed/Used)			
(40) Navigation Horizontal Clearance						0000.0 M							N / N Liftbucket N / N Rigging Other			
													P / N Ladder N / N Staging			
													N / N Boat N / N Traffic Control			
													P / N Wader N / N RR Flagperson			
													N / N Inspector 50 N / N Police			
													Hours: 008			

THIS PAGE INTENTIONALLY LEFT BLANK