

STRUCTURES INSPECTION FIELD REPORT

BR. DEPT. NO.

P-13-011

2-DIST

05

B.I.N.

9KM

ROUTINE INSPECTION

CITY/TOWN PLYMOUTH		8-STRUCTURE NO. P13011-9KM-MUN-BRI		11-Kilo. POINT 000.000	41-STATUS P:POSTED	90-ROUTINE INSP. DATE AUG 10, 2020
07-FACILITY CARRIED HWY BROOK RD		MEMORIAL NAME/LOCAL NAME		27-YR BUILT 1850	106-YR REBUILT 1900	YR REHAB'D (NON 106) 0000
06-FEATURES INTERSECTED WATER BEAVER DAM BROOK		26-FUNCTIONAL CLASS Urban Local		DIST. BRIDGE INSPECTION ENGINEER G. Simpson		
43-STRUCTURE TYPE 302 : Steel Stringer/Girder		22-OWNER Town Agency	21-MAINTAINER Town Agency	TEAM LEADER M. Marshall		
107-DECK TYPE 1 : Concrete Cast-in-Place		WEATHER Clear	TEMP. (air) 32°C	TEAM MEMBERS A. DEPALMA		

ITEM 58 <div>6</div> DECK <div>DEF</div> <table border="1"> <tr><td>1. Wearing surface</td><td>6</td><td>M-P</td></tr> <tr><td>2. Deck Condition</td><td>6</td><td>M-P</td></tr> <tr><td>3. Stay in Place Forms</td><td>N</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>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>5</td><td>S-A</td></tr> <tr><td>13. 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Rivets & Bolts	N	-	12. Welds	N	-	13. Member Alignment	7	-	14. Paint/Coating	N	-	15.	N	-	ITEM 60 <div>6</div> SUBSTRUCTURE <div>DEF</div> <table border="1"> <tr><td>1. Abutments</td><td>Dive</td><td>Cur</td><td>6</td><td>-</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>H</td><td></td><td>-</td></tr> <tr><td> c. Backwalls</td><td>N</td><td>H</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>6</td><td></td><td>M-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>5</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>7</td><td></td><td>-</td></tr> <tr><td> k. 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ITEM 61 CHANNEL & CHANNEL PROTECTION <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th></th> <th>Dive</th> <th>Cur</th> <th>DEF</th> </tr> </thead> <tbody> <tr><td>1.Channel Scour</td><td>N</td><td>7</td><td>-</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>7</td><td>-</td></tr> <tr><td>4.Vegetation</td><td>N</td><td>8</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>N</td><td>8</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> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> STREAM FLOW VELOCITY: Tidal () High () Moderate () Low (X) None () </div> <div style="margin-top: 10px;"> ITEM 61 (Dive Report): N ITEM 61 (This Report): 7 </div> <div style="margin-top: 10px;"> 93b-U/W INSP. 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(Y/N): N </div> <div style="margin-top: 10px;"> TAPE#: _____ </div> <div style="margin-top: 10px;"> List of field tests performed: Hands on and visual inspection. </div>		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
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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: _____ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> If YES please give priority: HIGH () MEDIUM () LOW () </div>
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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].

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REMARKS

BRIDGE ORIENTATION

Brook Road is a one lane road oriented east and west over Beaver Dam Brook which flows south to north in Plymouth, Massachusetts.

GENERAL REMARKS

The structure is constructed of 8 concrete encased steel I-beams with a cast-in-place reinforced concrete deck on field stone masonry abutments with a concrete cap. The beams and bays are numbered from south to north. The previous inspection numbered the beams and bays from north to south. **Refer to Inventory Photos, Sketches 1-3 .**

ITEM 58 - DECK

Item 58.1 - Wearing surface

The bituminous wearing surface has transverse hairline cracks. **Photo 1.**

Item 58.2 - Deck Condition

The reinforced concrete deck has areas of honeycomb up to 1/4" deep. **Photo 2.**

- The fascias of the concrete deck have areas of scale up to 1/4" deep.
- Beam 1 concrete encasement, north elevation, near the west abutment has a spall 4' long x 3" high x 1/2" deep. **Photo 3.**
- Beam 5 concrete encasement, south elevation, near east abutment was not observed this inspection.
- Beam 7 concrete encasement, south elevation, near east abutment has a spall 3' long x 2" high x 2 1/2" deep. **Photo 4.**
- Beam 7 concrete encasement, south elevation, near west abtment has a spall 1' long x 2" high x 2 1/2" deep. **Photo 5.**
- Bay 6 near the east abutment has a spall 4" long x 4" high x 1" deep with exposed rebar. **photo 6.**

Item 58.8 - Railing

The railing consists of steel W-beams guardrails with steel posts running continuously over the bridge and into the approaches. The railing is secured to the bridge with anchor rods that run vertically through the bridge.

- Both rails have minor collisions scrapes throughout. **Photo 7 for typical condtions.**

Item 58.12 - Utilities

The steel water pipe along the south side of the bridge is resting on concrete. The water pipe has no insulation. **The water pipe has a moisture stain. Photo 8.**

APPROACHES

Approaches a - Appr. pavement condition

- The bituminous wearing surface has wheel ruts.
- The southwest has moderate vegetation growth that is starting to encroach toward the roadway. **Photo 9.**
- The east approach has sealed and unsealed cracking. **Photos 10 & 11.**

Approaches b - Appr. Roadway Settlement

The northeast approach roadway and the west approach roadway has settlement up to 1" deep.

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REMARKS

ITEM 59 - SUPERSTRUCTURE

Item 59.4 - Girders or Beams

The structure consists of 8 concrete encased I-beams with exposed bottom flanges. The beams are labeled 1-8 from south to north. The steel beams have light rust. Beams 1 through 7 are within the travel way. Refer to Item 58.2 - Deck for all concrete deficiencies.

- **Beam 1 bottom flange has heavy rust and areas of 100% section loss up to 1' long x full width.**

Photos 12 & 13.

- Beam 8 bottom flange has areas of pitting up to full length. **Photo 14.**

ITEM 60 - SUBSTRUCTURE

Item 60.1 - Abutments

Item 60.1.d - Breastwalls

The breastwalls consists of stone masonry abutments with mortar and reinforced concrete caps. The reinforced concrete caps have areas of honeycomb up to 1/4" deep and up to full height vertical hairline cracks. The stone masonry has voids up to 10" deep, areas of crack mortar (+/-20% of total area) and areas of missing mortar (+/-20% of total area).

West Abutment:

- Below Beam 3, at west abutment: The reinforced concrete cap has honeysombing.

- Below Beam 4, at west abutment: The reinforced concrete cap has full height diagonal crack up to 1/8" wide. **Photo 15.**

- Below Beam 3, at east abutment: The reinforced concrete cap has a full height vertical crack up to 1/8" wide. **Photo 16.**

- Below Beam 5: The reinforced concrete cap has areas of honeycomb up to 1/4" deep.

- The North End: The stone masonry and mortar has areas of missing stones up to 10" deep and areas of missing mortar. This portion has pulled away and the mortar has fallen out leaving a 2" vertical gap. **Photos 17 & 18.**

- The Northwest corner has multiple voids upto 22" deep. **Photo 19.**

Item 60.1.e - Wingwalls

The wingwalls consists of stone masonry and reinforced concrete caps. The northwest wingwall is leaning outward up to 3" over 2' high. **Photo 19.**

The wingwalls have moderate vegetation growth. **Photo 20.**

Item 60.1.g - Pointing

Along the waterline there is cracked and missing mortar.

Item 60.1.k - Settlement

Refer to Item 60.1.d - Breastwalls.

ITEM 61 - CHANNEL AND CHANNEL PROTECTION

Item 61.2 - Embankment Erosion

The embankments have minor areas of undercutting. The southeast embankment has a paved drainage swale with minor erosion to the soil around it.

Item 61.3 - Debris

The downstream and upstream channel have an accumulation of timber debris.

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REMARKS

TRAFFIC SAFETY

Item 36a - Bridge Railing

Refer to Item 58.8- Railing. This is non-standard item.

Item 36c - Approach Guardrail

Refer to Item 58.8 - Railing. The approach W-beam guardrails have light rust. This is non-standard item.

Item 36d - Approach Guardrail Ends

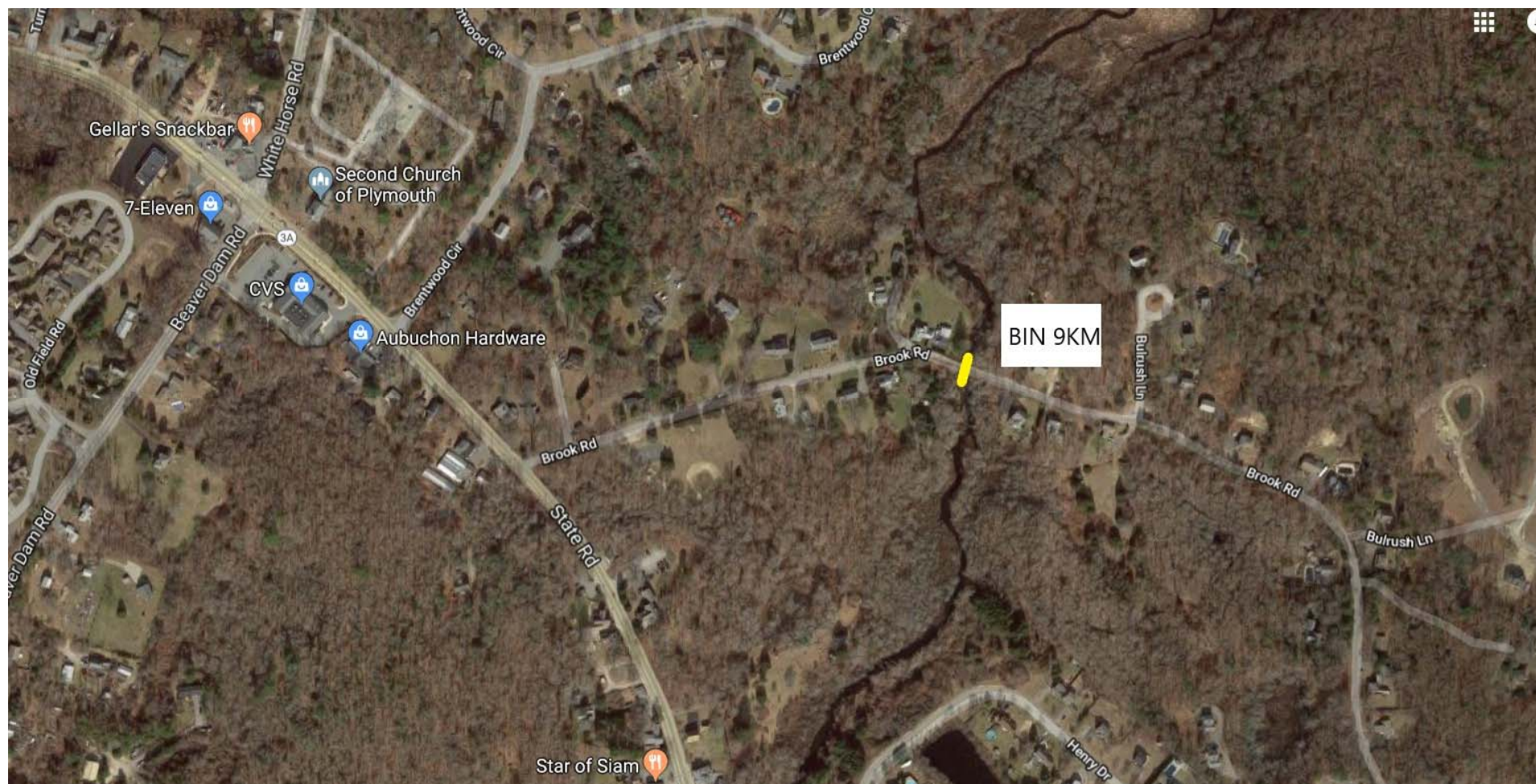
Approach guardrail ends are boxing glove ends with light rust. This is non-standard item.

Sketch / Photo Log

- Sketch 1 : Location Map.
- Sketch 2 : Plan View.
- Sketch 3 : Elevation Views.
- Photo 1 : General wearing surface looking west
- Photo 2 : General underside looking west.
- Photo 3 : Beam 1 south elevation spall.
- Photo 4 : Beam 7 south elevation near east abutment spall.
- Photo 5 : Beam 7 near west abutment spall.
- Photo 6 : Bay 6 at east abutment minor spall.
- Photo 7 : South rail minor collision damage scrapes.
- Photo 8 : South utility looking east.
- Photo 9 : West approach, moderate vegetation growth.
- Photo 10 : East approach sealed and unsealed cracking.
- Photo 11 : East approach looking east sealed and unsealed longitudinal cracking.
- Photo 12 : Beam 1 looking west from midspan, section loss.
- Photo 13 : Beam 1 looking east from midspan, section loss.
- Photo 14 : Beam 8 looking east pitting.
- Photo 15 : West abutment below beam 3 & 4, honeycombing and cracking.
- Photo 16 : East abutment below beam 3 hairline vertical crack.
- Photo 17 : East breastwall overview looking south.
- Photo 18 : West breastwall overview voids.
- Photo 19 : Northwest wingwall leaning and voids in breastwall.
- Photo 20 : North elevation, vegetation growth.

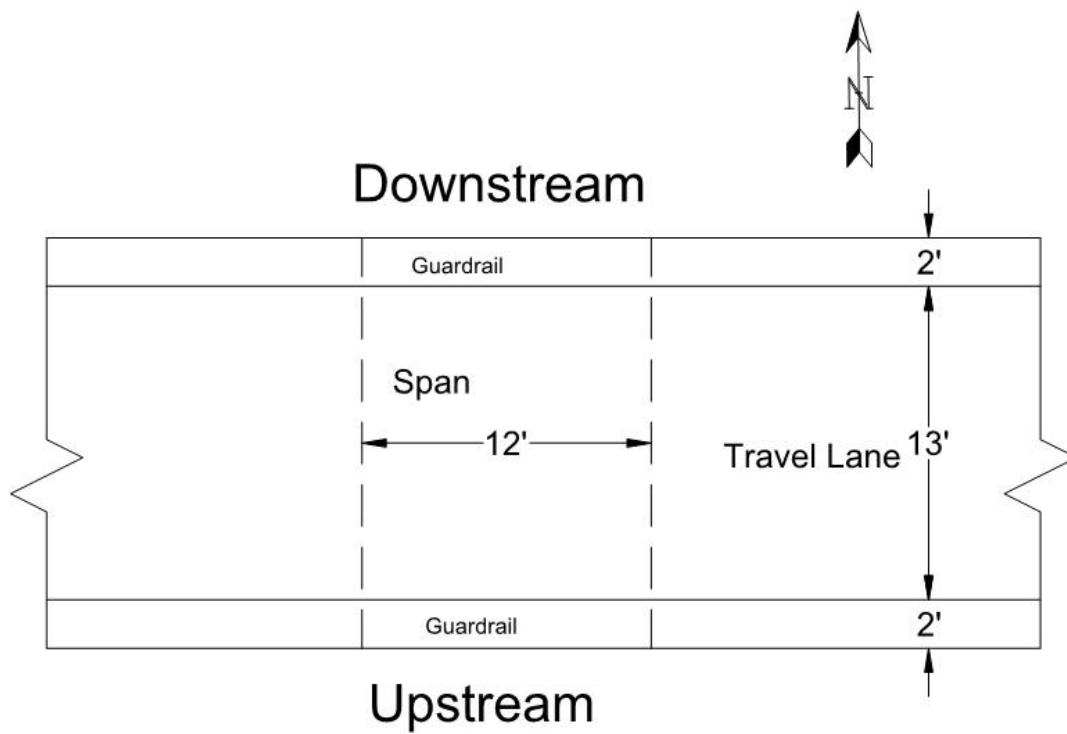
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SKETCHES

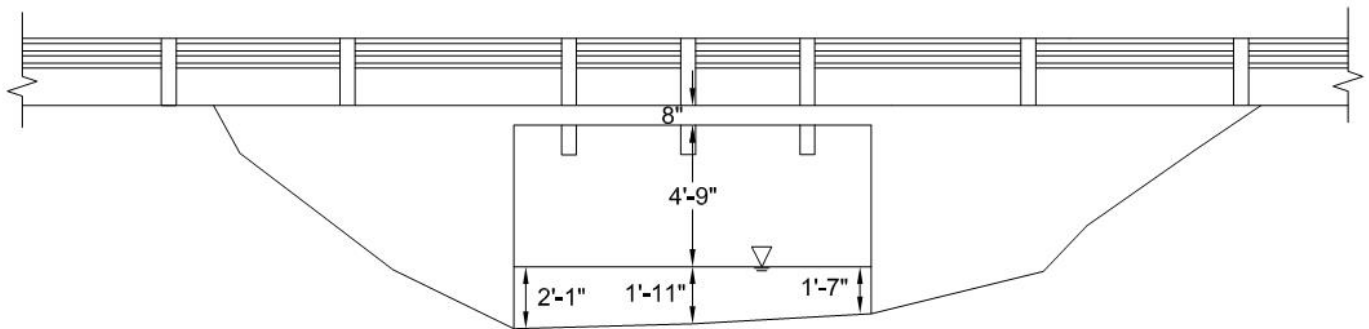


Sketch 1: Location Map.

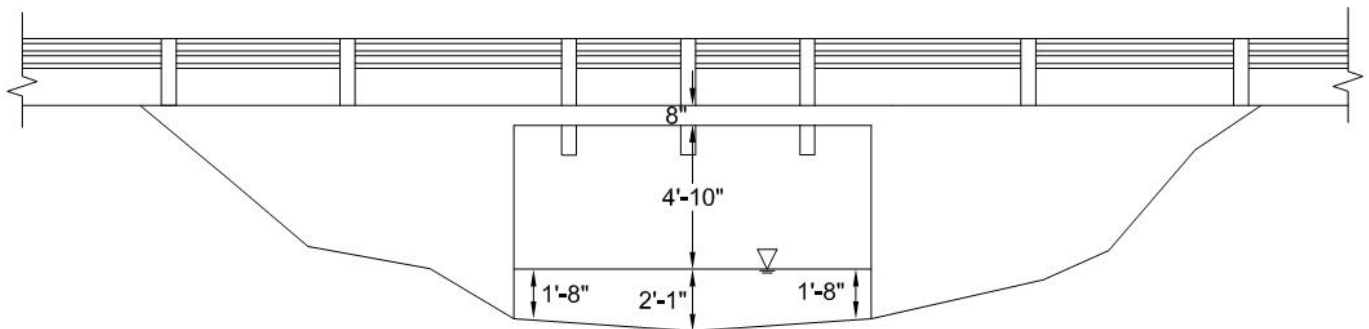
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SKETCHES**Sketch 2: Plan View.**

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SKETCHES

South Elevation
(Upstream)



North Elevation
(Downstream)

Sketch 3: Elevation Views.

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PHOTOS

Photo 1: General wearing surface looking west



Photo 2: General underside looking west.

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PHOTOS

Photo 3: Beam 1 south elevation spall.



Photo 4: Beam 7 south elevation near east abutment spall.

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PHOTOS

Photo 5: Beam 7 near west abutment spall.



Photo 6: Bay 6 at east abutment minor spall.

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PHOTOS

Photo 7: South rail minor collision damage scrapes.



Photo 8: South utility looking east.

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PHOTOS

Photo 9: West approach, moderate vegetation growth.



Photo 10: East approach sealed and unsealed cracking.

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PHOTOS

Photo 11: East approach looking east sealed and unsealed longitudinal cracking.



Photo 12: Beam 1 looking west from midspan, section loss.

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PHOTOS

Photo 13: Beam 1 looking east from midspan, section loss.



Photo 14: Beam 8 looking east pitting.

CITY/TOWN PLYMOUTH	B.I.N. 9KM	BR. DEPT. NO. P-13-011	8.-STRUCTURE NO. P13011-9KM-MUN-BRI	INSPECTION DATE AUG 10, 2020
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PHOTOS

Photo 15: West abutment below beam 3 & 4, honeycombing and cracking.



Photo 16: East abutment below beam 3 hairline vertical crack.

CITY/TOWN PLYMOUTH	B.I.N. 9KM	BR. DEPT. NO. P-13-011	8.-STRUCTURE NO. P13011-9KM-MUN-BRI	INSPECTION DATE AUG 10, 2020
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PHOTOS

Photo 17: East breastwall overview looking south.



Photo 18: West breastwall overview voids.

CITY/TOWN PLYMOUTH	B.I.N. 9KM	BR. DEPT. NO. P-13-011	8-STRUCTURE NO. P13011-9KM-MUN-BRI	INSPECTION DATE AUG 10, 2020
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PHOTOS

Photo 19: Northwest wingwall leaning and voids in breastwall.



Photo 20: North elevation, vegetation growth.

Report Date: August 26, 2020

State Information				Classification				Code			
BDEPT#= P13011				Agency Br.No.				(112) NBIS Bridge Length N			
Town= Plymouth				L.O.				(104) Highway System N			
B.I.N= 9KM				AASHTO= 023.9				(26) Functional Class - Urban Local 19			
RANK= 0 H.I.= NA				FHWA Select List= N (6/21/2017)				(100) Defense Highway 0			
(8) Structure Number				P130119KMMUNBRI				(101) Parallel Structure N			
(5) Inventory Route				151000000				(102) Direction of Traffic - One lane for 2-way traffic 3			
(2) State Highway Department District				05				(103) Temporary Structure N			
(3) County Code 023 (4) Place code				54310				(105) Federal Lands Highways 0			
(6) Features Intersected				WATER BEAVER DAM BROOK				(110) Designated National Network N			
(7) Facility Carried				HWY BROOK RD				(20) Toll - On free road 3			
(9) Location				0.2 MI. EAST OF ST 3A				(21) Maintain - Town Agency 03			
(11) Kilometerpoint				0000.000				(22) Owner - Town Agency 03			
(12) Base Highway Network				N				(37) Historical Significance undetermined			
(13) LRS Inventory Route & Subroute				000000000000				Condition Code			
(16) Latitude				41 DEG 55 MIN 22.55 SEC				(58) Deck 6			
(17) Longitude				70 DEG 33 MIN 46.17 SEC				(59) Superstructure 5			
(98) Border Bridge State Code				Share %				(60) Substructure 6			
(99) Border Bridge Structure No. #								(61) Channel & Channel Protection 7			
								(62) Culverts N			
Structure Type and Material								Load Rating and Posting Code			
(43) Structure Type Main: Steel				Code 302				(31) Design Load - Unknown 0			
Stringer/Girder				Jointless bridge type: Not applicable				(63) Operating Rating Method - Allowable Stress (AS) 2			
(44) Structure Type Appr:								(64) Operating Rating 00.0			
Other				Code 000				(65) Inventory Rating Method - Allowable Stress (AS) 2			
(45) Number of spans in main unit				001				(66) Inventory Rating 00.0			
(46) Number of approach spans				0000				(70) Bridge Posting 0			
(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 2			
B) Type of membrane - Unknown				Code 8				(68) Deck Geometry N			
C) Type of deck protection - Unknown				Code 8				(69) Underclearances, vert. and horiz. N			
								(71) Waterway adequacy 4			
								(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 08/10/20 (91) Frequency 24 MO			
(106) Year Reconstructed				1900				(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				000129				(*) Other Inspection () N 00 MO *) 00/00/00			
(30) Year of ADT 2020 (109) Truck ADT				00 %				(*) Closed Bridge N 00 MO *) 00/00/00			
(19) Bypass, detour length				002 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				0003.7 M				Report Date 00/00/00 H20 Type 3 Type 3S2 Type HS			
(49) Structure Length				00004.7 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				004.0 M				Field Posting			
(52) Deck Width Out to Out				005.2 M				Status Posting Date 00/00/00			
(32) Approach Roadway Width (w/shoulders)				004.0 M				Actual 2 Axle 3 Axle 5 Axle Single			
(33) Bridge Median - No median				Code 0				Recommended 03 05 08			
(34) Skew 00 DEG (35) Structure Flared				N				Missing Signs N			
(10) Inventory Route MIN Vert Clear				99.99 M				Misc.			
(47) Inventory Route Total Horiz Clear				04.0 M				Bridge Name			
(53) Min Vert Clear Over Bridge Rdwy				99.99 M				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: 016			
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							