

MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 4532

BRIDGE SAFETY INSPECTION REPORT

Facility MILL STREET	Latitude / Longitude 42.11 / -84.2457	MDOT Structure ID 384093200038B01	Structure Condition Fair Condition(5)
Feature SO BRANCH RAISIN RIVER	Length / Width / Spans 34.8 / 25.6 / 3	Owner City: BROOKLYN(0932)	
Location 0.10 MI E OF M-50	Built / Recon. / Paint / Ovly. 1925 / 1984 / /	TSC Jackson(15)	Operational Status P Posted for load(17NNNN)
Region / County University(6) / Jackson(38)	Material / Design 8 Masonry / 11 Arch- Deck, Filled Sp	Last NBI Inspection 11/21/2017 / VMC8	Scour Evaluation 5 Stable w/in footing



NBI INSPECTION

VMC8

Inspector Name	Agency / Company Name	Insp. Freq.	Insp. Date
Frank Brechting	Brechting Bridge & Engineering, Inc.	24	11/21/2017

GENERAL NOTES

Factory in SE quad being converted to restaurant, bar, & retail - traffic and pedestrian traffic projected to increase. Posted at 17 tons. Downstream end of arch repairs completed 2014.

Posting Signs in Place YES

Frequency Justification Comments (required when Poor Condition and frequency is equal to 24 months)

All members continue to function as designed.

DECK

	03/14	12/15	11/17	
1. Surface (SIA-58A)	5	5	5	Large block 1/16" to 1/4" cracking entire surface with shallow spalls along centerline. (11/17) Numerous open random 1/16" to 1/4" cracks. (12/15) Numerous open random 1/16" to 1/8" cracks. (03/14)
2. Expansion Joints	N	N	N	(11/17) (12/15) (03/14)
3. Other Joints	7	6	N	Paved over with several 1/16" transv cracks full width near ref lines. (11/17) Open 1/16" transv cracks full width near ref lines. (12/15) Paved over and cracksealed. (03/14)
4. Railings	7	7	7	A few scattered short 1/16" cracks in mortar. A couple shallow spalls on top of rail. NE & SW approach rail moderate corrosion and not attached to bridge. (11/17) Mortar repaired south rail. NE approach rail moderate corrosion. NE & SW approach rail not attached. (12/15) North rail repaired. South rail losing mortar. SW approach rail not attached. NE approach rail under construction. (03/14)
5. Sidewalks or Curbs	N	N	N	(11/17) (12/15) (03/14)
6. Deck Bottom Surface (SIA-58B)	N	N	N	(11/17) (12/15) (03/14)
7. Deck (SIA-58)	N	N	N	HMA over earth fill. (11/17) HMA over earth fill. (12/15) HMA over earth fill. (03/14)
8. Drainage				Good. (11/17) Minor sand in gutters. (12/15) Clean gutter debris build-up along south bridge rail. (03/14)

SUPERSTRUCTURE

03/14 12/15 11/17

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9. Stringer (SIA-59)	6	6	5	Interior arch lining repair areas OK but many hairline to 1/16" cracks with rust staining. Numerous hairline to 1/8" cracks beyond repaired areas. (11/17) Repairs holding up well that were made to interior arches lining at downstream end of arches. Numerous hairline to 1/8" cracks beyond repaired areas. (12/15) Repairs to interior arches lining made at downstream end of arches. Numerous hairline to 1/8" cracks beyond repaired areas. (03/14)
10. Paint (SIA-59A)	N	N	N	(11/17) (12/15) (03/14)
11. Section Loss	N	N	N	(11/17) (12/15) (03/14)
12. Bearings	N	N	N	(11/17) (12/15) (03/14)

SUBSTRUCTURE

03/14 12/15 11/17

13. Abutments (SIA-60)	6	6	6	NW wingwall mortar repaired. Footings exhibit hairline to 1/16" vertical cracks with efflorescence at approx. 4' spacing. (11/17) NW wingwall mortar repaired. Footings exhibit hairline to 1/16" vertical cracks with efflorescence at approx. 4' spacing. (12/15) NW wingwall losing mortar and 3 large stones have fallen out. Footings exhibit hairline to 1/16" vertical cracks with efflorescence at approx. 4' spacing. (03/14)
14. Piers (SIA-60)	5	5	5	Footings exhibit small vertical cracks at approx. 4' spacing. Moderate to heavy conc delamination and spalling at east downstream footing face. (11/17) Footings exhibit small vertical cracks at approx. 4' spacing. Moderate to heavy conc delamination and spalling at east downstream footing face. (12/15) Footings exhibit small vertical cracks at approx. 4' spacing. Moderate to heavy conc delamination and spalling at east downstream footing face. (03/14)
15. Slope Protection	7	7	N	(11/17) Moderate loss of grout and large stones in NW slope in front of wingwall. (12/15) Moderate loss of grout and large stones in NW slope in front of wingwall. (03/14)
16. Channel (SIA-61)	6	6	6	Stone lined channel upstream, concrete spillway adjacent downstream. Steep banks downstream. Old Mill dam located upstream of bridge. Closed sluice gate with outlet downstream in tributary channel. Moderate loss of grout and large stones in NW slope in front of wingwall. (11/17) Stone lined channel upstream. Steep banks downstream. Old Mill located upstream of bridge. (12/15) Stone lined channel upstream. Steep banks downstream. (03/14)
17. Scour Inspection		7	7	Insignificant scour at upstream entrance. (11/17) Very minor scour at upstream entrance. (12/15) (03/14)

APPROACH

03/14 12/15 11/17

18. Approach Pavement	N	N	6	Many random 1/8" cracks both approaches. Shallow spalling occurring CL of EB lane both approaches. HMA over earth fill. (11/17) HMA over earth fill. (12/15) HMA over earth fill. (03/14)
19. Approach Shoulders Sidewalks	6	6	6	Gravel/vegetated shoulder - narrow, slightly raised. (11/17) Gravel/vegetated shoulder - narrow. (12/15) Gravel/vegetated shoulder - narrow. (03/14)

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- 20. Approach Slopes: Good (11/17), Good (12/15), Good (03/14)
- 21. Utilities: Overhead electric+phone+others approx 27' N of CL. Manhole approx 60' E of bridge in CL of WB lane (11/17), (12/15), (03/14)
- 22. Drainage Culverts: Good. SW drainage culvert repaired in 2009. (11/17), (12/15), (03/14)

MISCELLANEOUS

Guard Rail		Other Items	
Item	Rating	Item	Rating
36A. Bridge Railings	0	71. Water Adequacy	7
36B. Transitions	0	72. Approach Alignment	6
36C. Approach Guardrail	0	Temporary Support	0 No Temporary Supports
36D. Approach Guardrail Ends	0	High Load Hit (M)	No
		Special Insp. Equipment	
		Underwater Insp. Method	1
False Decking (Timber) Removed to Complete Inspection		N/A - No False Decking	

Critical Feature Inspections (SIA-92)

	Freq	Date
92A. Fracture Critical		
92B. Underwater		
92C. Other Special		
92D. Fatigue Sensitive		

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SUPPORTING IMAGES

VMC8 11/21/2017



Document Name: 013.JPG
 Category: Elevation
 Span Number:
 Comments:

Document Name: 015.JPG
 Category: Elevation
 Span Number:
 Comments:



Document Name: 006.JPG
 Category: Posting
 Span Number:
 Comments:

Document Name: 009.JPG
 Category: Approach
 Span Number:
 Comments:

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Document Name: 051.JPG
 Category: Deck
 Span Number:
 Comments: Typical surface cracking & spalling.



Document Name: 052.JPG
 Category: Deck
 Span Number:
 Comments: Cracking & spalling in bridge surface.

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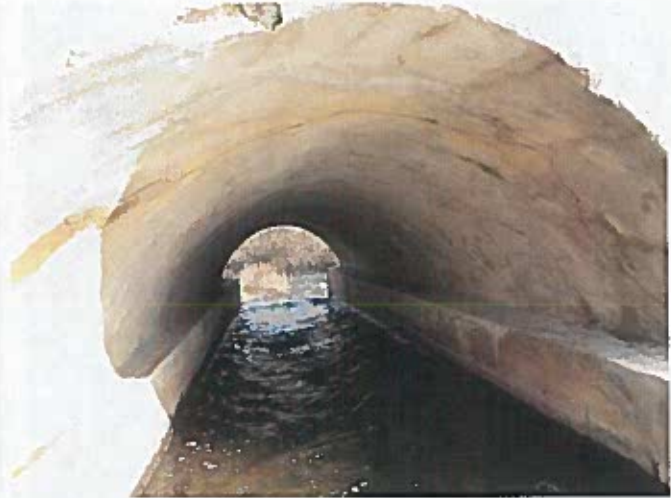
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Document Name: 031.JPG
 Category: Other
 Span Number:
 Comments: Typical arch interior.



Document Name: 050.JPG
 Category: Other
 Span Number:
 Comments: Typical arch interior.



Document Name: 053.JPG
 Category: Other
 Span Number:
 Comments: Typical cracking and rust staining at arch repairs.



Document Name: 054.JPG
 Category: Other
 Span Number:
 Comments:

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STRUCTURE INVENTORY AND APPRAISAL

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Bridge History, Type, Materials

27 - Year Built	1925
106 - Year Reconstructed	1984
202 - Year Painted	
203 - Year Overlay	
43 - Main Span Bridge Type	8 11
44 - Appr Span Bridge Type	
77 - Steel Type	0
78 - Paint Type	0
79 - Rail Type	9
80 - Post Type	
107 - Deck Type	N
108A - Wearing Surface	6
108B - Membrane	N
108C - Deck Protection	N

Structure Dimensions

34 - Skew	25
35 - Struct Flared	0
45 - Num Main Spans	3
46 - Num Apprs Spans	0
48 - Max Span Length	7.9
49 - Structure Length	34.8
50A - Width Left Curb/SW	0
50B - Width Right Curb/SW	0
33 - Median	0
51 - Width Curb to Curb	22
52 - Width Out to Out	25.6
112 - NBIS Length	Y

Inspection Data

90 - Inspection Date	11/21/2017
91 - Inspection Freq	24
92A - Frac Crit Req/Freq	N
93A - Frac Crit Insp Date	
92B - Und Water Req/Freq	N
93B - Und Water Insp Date	
92C - Oth Spec Insp Req/Freq	N
93C - Oth Spec Insp Date	
92D - Fatigue Req/Freq	N
93D - Fatigue Insp Date	
176A - Und Water Insp Method	1
58 - Deck Rating	N
58A/B - Deck Surface/Bottom	5 N
59 - Superstructure Rating	5
59A - Paint Rating	N
60 - Substructure Rating	5
61 - Channel Rating	6
62 - Culvert Rating	N

Navigation Data

38 - Navigation Control	0
39 - Vertical Clearance	0
40 - Horizontal Clearance	0
111 - Pier Protection	
116 - Lift Brdg Vert Clear	

Route Carried By Structure(ON Record)

5A - Record Type	1
5B - Route Signing	5
5C - Level of Service	0
5D - Route Number	01404
5E - Direction Suffix	0
10L - Best 3m Uncr-Lt	0 0
10R - Best 3m Uncr-Rt	99 99
PR Number	
Control Section	
11 - Mile Point	0
12 - Base Highway Network	0
13 - LRS Route-Subroute	000009013 05
19 - Detour Length	9
20 - Toll Facility	3
26 - Functional Class	08
28A - Lanes On	2
29 - ADT	600
30 - Year of ADT	1986
32 - Appr Roadway Width	27.9
32A/B - Ap Pvt Type/Width	4 27.99
42A - Service Type On	1
47L - Left Horizontal Clear	0.0
47R - Right Horizontal Clear	22.3
53 - Min Vert Clr Ov Deck	99 99
100 - STRAHNET	0
102 - Traffic Direct	2
109 - Truck %	10
110 - Truck Network	0
114 - Future ADT	1100
115 - Year Future ADT Freeway	2010
	0

Structure Appraisal

36A - Bridge Railing	0
36B - Rail Transition	0
36C - Approach Rail	0
36D - Rail Termination	0
67 - Structure Evaluation	4
68 - Deck Geometry	4
69 - Underclearance	N
71 - Waterway Adequacy	7
72 - Approach Alignment	6
103 - Temporary Structure	
113 - Scour Criticality	5

Miscellaneous

37 - Historical Significance	1
98A - Border Bridge State	
98B - Border Bridge %	
101 - Parallel Structure EPA ID	N
Stay in Place Forms	
143 - Pin & Hanger Code	1
148 - No. of Pin & Hangers	

Route Under Structure (UNDER Record)

5A - Record Type	
5B - Route Signing	
5C - Level of Service	
5D - Route Number	
5E - Direction Suffix	
10L - Best 3m Uncr-Lt	
10R - Best 3m Uncr-Rt	
PR Number	
Control Section	
11 - Mile Point	
12 - Base Highway Network	
13 - LRS Route-Subroute	
19 - Detour Length	
20 - Toll Facility	
26 - Functional Class	
28B - Lanes Under	
29 - ADT	
30 - Year of ADT	
42B - Service Type Under	5
47L - Left Horizontal Clear	
47R - Right Horizontal Clear	
54A - Left Feature	
54B - Left Underclearance	99 99
54C - Right Feature	
54D - Right Clearance Under Clearance Year	99 99
55A - Reference Feature	N
55B - Right Horiz Clearance	99.9
56 - Left Horiz Clearance	0
100 - STRAHNET	
102 - Traffic Direct	
109 - Truck %	
110 - Truck Network	
114 - Future ADT	
115 - Year Future ADT Freeway	



Proposed Improvements

75 - Type of Work	
76 - Length of Improvement	
94 - Bridge Cost	
95 - Roadway Cost	
96 - Total Cost	
97 - Year of Cost Estimate	

Load Rating and Posting

31 - Design Load	2
41 - Open, Posted, Closed	P
63 - Fed Oper Rtg Method	0
64F - Fed Oper Rtg Load	85
64MA - Mich Oper Rtg Method	0
64MB - Mich Oper Rtg	17
64MC - Mich Oper Truck	2
65 - Inv Rtg Method	0
66 - Inventory Load	.51
70 - Posting	0
141 - Posted Loading	17NNNN
193 - Overload Class	

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STR 4532		WORK RECOMMENDATIONS		
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WORK RECOMMENDATIONS **VMC8**

Inspector Name	Agency / Company Name	Insp. Freq.	Insp. Date
Frank Brechting	Brechting Bridge & Engineering, Inc.	24	11/21/2017

RECOMMENDATIONS & ACTION ITEMS

Recommendation Type	Priority	Description
Deck Patching	H	Hot patch and crackseal HMA surface on bridge and approaches. Monitor seal at shoulder/bridge rail interface for leakage into fill.

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STR 4532 **LOAD RATING SUMMARY**

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Compliance Issue: None
 Compliance Verified: No
 The above structure was analyzed using: Other
 Version or Other: Engineering Judgment.
 Rating Considers Field Condition of Members: Yes Inspection Date: 12/08/2014

Controlling component and failure mode:

Compression in stone arches.

NEW INVENTORY CODING

NBI Item 63- Operating Rating Method	0 Judgment in Rtg Factor
NBI Item 64F- Federal Operating Rating	0.85
MDOT Item 64MA- Michigan Operating Method	0 Judgment in Rtg Factor
MDOT Item 64MB- Michigan Operating Rating	17.0
MDOT Item 64MC- Michigan Operating Truck	2
NBI Item 65- Inventory Rating Method	0 Judgment in Rtg Factor
NBI Item 66- Federal Inventory Rating	0.51
NBI Item 41- Structure Open Posted Closed	P P Posted for load
NBI Item 70- Bridge Posting	0 0 - 59% or less
NBI Item 141- Posted Loading	17NNNN
MDOT Item 193A- Michigan Overload Class	
MDOT Item 193C- Overload Status	N-No Restriction

Analyzed By: Frank J. Brechting III, P.E. Date: 12/08/2014
 Checked By: Frank J. Brechting, Jr., P.E. Date: 12/08/2014

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LOAD RATING ASSUMPTIONS

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Rating Considers Field Condition of Members: Yes Inspection Date: 12/08/2014

Deterioration:

Downstream ends of stone arches losing mortar, some large stones fallen, and stucco lining failing due to moisture intrusion. Failure area not directly under live loads. UPDATE: Repaired 03/14.

Most Recent Year Construct / Reconstruct / Overlay: 1984

History of work that impacts Load rating:

North (downstream) end of arches repaired. Maintain 17 ton posting to limit axle loads on structure.

Superstructure Component: 8 Masonry Beam fy: ksi Beam fc / fb: ksi

Composite: No Number of Beams: Shop Drawings Verified: No

Size of Beams/Beam #'s and spans: 3 stone arches - 8' clear.

Deck: Thickness (in.): Fy / fc: / ksi Deck Design Load > H15: No

Wearing Surface: Mat'l: HMA Thickness (in.): 4.0 Unit Weight (pcf.): 150.0

LEFT CENTER RIGHT

Barrier: Type / Weight (plf.): Masonry / 400.0 / Masonry / 400.0

Sidewalk: Width / Thick (in.): / / /

Clear Roadway (ft.): 22.0

Additional Loads:

Earth fill - approx 3' above top of arches.

Unique Factors That Affect Capacity:

Arches in compression.

Analyzed By: Frank J. Brechting III, P.E.

Date: 12/08/2014