

**MICHIGAN DEPARTMENT OF TRANSPORTATION**

**STR 1307**

**BRIDGE SAFETY INSPECTION REPORT**

<b>Facility</b> RAYMOND ROAD	<b>Latitude / Longitude</b> /	<b>MDOT Structure ID</b> 13200027000B020	<b>Structure Condition</b> Poor Condition(4)
<b>Feature</b> KALAMAZOO RIVER	<b>Length / Width</b> 219.82 / 31.17	<b>Owner</b> County: Calhoun(13)	
<b>Location</b> EMMETT TWP SEC 8	<b>Built / Recon. / Paint / Ovly.</b> 1960 / / /	<b>TSC</b> Marshall(5C)	<b>Operational Status</b> P Posted for load(P)
<b>Region / County</b> Southwest(5) / Calhoun(13)	<b>Material / Design</b> 5 Prestressed Concrete / 05 Multiple Box Beam	<b>Last NBI Inspection</b> 09/23/2013 / WKOS	<b>Scour Evaluation</b> 5 Stable w/in footing



**NBI INSPECTION**

**WKOS**

<b>Inspector Name</b> Angie Kline	<b>Agency / Company Name</b> Calhoun County Road Department	<b>Insp. Freq.</b> 24	<b>Insp. Date</b> 09/23/2013
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**GENERAL NOTES**

Joe Michalsky was the lead inspector onsite during the inspection. Posting in place, 23/23/31.

**Posting Signs in Place** YES

**DECK**

09/09 09/11 09/13

<b>1. Surface (SIA-58A)</b>	7	7	6	Knuckling of joints indicates that beam ends may be in contact. Some ravelling at edges of pavement. Hairline longitudinal cracks allowing water to leak between beams. (09/13) Knuckling of joints indicates that beam ends may be in contact. Some ravelling at edges of pavement. Hairline longitudinal cracks allowing water to leak between beams. (09/11) Cracks reflecting through at supports. Hairline skewed cracks over supports typical, with some cracks open to 1/2" producing voids. Vegetation growth at ends of joints and along shoulders. Knuckling of joints indicates that beam ends may be in contact. (09/09)
<b>2. Expansion Joints</b>	N	N	5	Need to be sealed. (09/13) (09/11) (09/09)
<b>3. Other Joints</b>	N	9	6	Reference lines completely sealed by new HMA overlay. 3 piers covered by cold patch and appear in tact. Need to hot rubber seal them. (09/13) Reference lines completely sealed by new HMA overlay. 3 piers covered by cold patch and appear in tact. (09/11) (09/09)
<b>4. Railings</b>	7	7	6	Metal decorative rail with concrete posts and concrete brush block. Brush block has spalls at top surface of W rail to 5% of surface. Transverse steel exposed in brushblock. Conc posts typically have vertical cracks at interior face. Conc truck discharged onto brush block at W rail. Trans cracks typ at brushblock near posts. Long cracks typ at brushblock. East rail has rust stains from high steel at edge and spalls to <5% of surface. Steel exposed in some locations. West approach has upgraded GR, east approach does not. guardrail in NW approach has impact damage. (09/13) Metal decorative rail with concrete posts and concrete brush block. Brush block has spalls at top surface of W rail to 5% of surface. Transverse steel exposed in brushblock. Conc posts typically have vertical cracks at interior face. Conc truck discharged onto brush block at W rail. Trans cracks typ at brushblock near posts. Long cracks typ at brushblock. East rail has rust stains from high steel at edge and spalls to <5% of surface. Steel exposed in some locations. West approach has upgraded GR, east approach does not. guardrail in NW approach has impact damage. (09/11) Metal decorative rail with concrete posts and concrete brush block. Brush block has spalls at top surface of W rail to 5% of surface. Transverse steel exposed in brushblock. Conc posts typically have vertical cracks at interior face. Conc truck discharged onto brush block at W rail. Trans cracks typ at brushblock near posts. Long cracks typ at brushblock. East rail has rust stains from high steel at edge and spalls to <5% of surface. Steel exposed in some locations. West approach has upgraded GR, east approach does not. (09/09)
<b>5. Sidewalks or Curbs</b>	N	N	5	Spalling, narrow, lots of delamination. (09/13) (09/11) (09/09)
<b>6. Deck Bottom Surface (SIA-58B)</b>	N	N	N	Side by side box beams. (09/13) Side by side box beams. (09/11) (09/09)

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**7. Deck (SIA-58)**      6      6      6      Deck bottom obscured by side by side box beams while top of deck obscured by HMA. Cracks with rusting and efflorescence at west fascia near south abutment and at north abutment east fascia. (09/13)  
Deck bottom obscured by side by side box beams while top of deck obscured by HMA. Cracks with rusting and efflorescence at west fascia near south abutment and at north abutment east fascia. (09/11)  
See Superstructure comments. (09/09)

**8. Drainage**      Deck drains opens. New HMA spillways at SE and SW approach. Deack drains causing beams to deteriorate, 1E, 9E and 10E (09/13)  
Deck drains opens. New HMA spillways at SE and SW approach. (09/11)  
Deck drains in fascia beams appear open and functioning. (09/09)

**SUPERSTRUCTURE**

09/09 09/11 09/13

**9. Stringer (SIA-59)**      4      4      4      10 SBS PS Conc Box beams Span 1s: Heavy leaking between fascia beams and first interior beams. Span 2s: Bm 1w: 4x1' spall exposing stirrups and long PS strand. Bm 2w: 2 incipient spalls with 1 broken strand. 5x2' spall exposing 5 strands, 3x1' spall exposing 3 strands, 5x2' spall exposing 7 strands. Bm 9w: 1x1' spall with 2 broken strands. 2x2' spall exposing 3 strands, 1x1' spall exposing 3 strands, 3x1' spall exposing 1 strand. Span 3s: Bm 9w: 1x1' spall exposing 3 strands, 10x2' spall exposing 4 strands. Span 4s: Beam 1: 1'x2' spall near north abutment at fascia. overall: Heavy leaking between fascia beams and first interior beams. (09/13)  
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Span 3s: Bm 9w: 1x1' spall exposing 3 strands, 10x2' spall exposing 4 strands.  
Span 4s: Heavy leaking between fascia beams and first interior beams. (09/09)

**10. Paint (SIA-59A)**      N      N      N      (09/13)  
(09/11)  
(09/09)

**11. Section Loss**                N      (09/13)  
(09/11)  
(09/09)

**12. Bearings**      6      6      6      Minor corrosion in steel plates. (09/13)  
Minor corrosion in steel plates. (09/11)  
Minor corrosion in steel plates. (09/09)

**SUBSTRUCTURE**

09/09 09/11 09/13

**13. Abutments (SIA-60)**      7      8      8      Moisture staining typical. NE wingwall has 3 exposed bars in backwall. Hairline horizontal and vertical cracks typical. Oil staining on slope paving. (09/13)  
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Moisture staining typical. NE wingwall has 3 exposed bars in backwall. Hairline horizontal and vertical cracks typical. (09/09)

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<b>14. Piers (SIA-60)</b>	5	5	5	<p>Pier 1s: Honeycombing/poor finish at US face. Scaled area in span 1s below bm 9w (2sft). Map cracking typical. Vert hairline cracks typical. Rust stains where steel is high. Hairline crack below beam 4w full height of abutment. Vert crack w/eff, rust staining and a scaled section at N face below beam 3w. Short hairline cracks beginning to spall and rust with efflorescence. Pier 2s: Vert hairline cracks typical. Rust spots from high steel typical. Hairline horizontal cracks w/eff at top corners of S face. 4 exposed vertical bars due to 4'x2' spall; 2 exp bars due to 4x1' spall; 2 bars due to 2x1' spall; 2 bars due to 3x2' spall; 3 bars due to 3x3' spall; all on N face of abutment and all vertical bars. Heavy leaking onto pier from joints Hairline vert cracks on N face, some map cracking. at north side, 15 exposed vertical bars = 26 sft of spalls. Pier 3s: 3 vertical bars exposed at S side due to 3x2' spall. Vert hairline cracks typical with efflorescence. Several spalls sum to 7 sft, exposing 1 vertical bar and 7 stirrups at DS face of pier. vert hairline cracks typically with some eff. North face has 3 exposed bars due to 4x2' spall, 5 exp bars due to 3x5' spall. Vert hairline cracks typ with leaking onto pier. (09/13)</p> <p>Pier 1s: Honeycombing/poor finish at US face. Scaled area in span 1s below bm 9w (2sft). Map cracking typical. Vert hairline cracks typical. Rust stains where steel is high. Hairline crack below beam 4w full height of abutment. Vert crack w/eff, rust staining and a scaled section at N face below beam 3w. Short hairline cracks beginning to spall and rust with efflorescence. Pier 2s: Vert hairline cracks typical. Rust spots from high steel typical. Hairline horizontal cracks w/eff at top corners of S face. 4 exposed vertical bars due to 4'x2' spall; 2 exp bars due to 4x1' spall; 2 bars due to 2x1' spall; 2 bars due to 3x2' spall; 3 bars due to 3x3' spall; all on N face of abutment and all vertical bars. Heavy leaking onto pier from joints Hairline vert cracks on N face, some map cracking. at north side, 15 exposed vertical bars = 26 sft of spalls. Pier 3s: 3 vertical bars exposed at S side due to 3x2' spall. Vert hairline cracks typical with efflorescence. Several spalls sum to 7 sft, exposing 1 vertical bar and 7 stirrups at DS face of pier. vert hairline cracks typically with some eff. North face has 3 exposed bars due to 4x2' spall, 5 exp bars due to 3x5' spall. Vert hairline cracks typ with leaking onto pier. (09/11)</p> <p>Pier 1s: Honeycombing/poor finish at US face. Scaled area in span 1s below bm 9w (2sft). Map cracking typical. Vert hairline cracks typical. Rust stains where steel is high. Hairline crack below beam 4w full height of abutment. Vert crack w/eff, rust staining and a scaled section at N face below beam 3w. Short hairline cracks at US face, N side. Pier 2s: Vert hairline cracks typical. Rust spots from high steel typical. Hairline horizontal cracks w/eff at top corners of S face. 4 exposed vertical bars due to 4'x2' spall; 2 exp bars due to 4x1' spall; 2 bars due to 2x1' spall; 2 bars due to 3x2' spall; 3 bars due to 3x3' spall; all on N face of abutment and all vertical bars. Heavy leaking onto pier from joints Hairline vert cracks on N face, some map cracking. Pier 3s: 3 vertical bars exposed at S side due to 3x2' spall. Vert hairline cracks typical with efflorescence. Several spalls sum to 7 sft, exposing 1 vertical bar and 7 stirrups at DS face of pier. vert hairline cracks typically with some eff. North face has 3 exposed bars due to 4x2' spall, 5 exp bars due to 3x5' spall. Vert hairline cracks typ with leaking onto pier. (09/09)</p>
<b>15. Slope Protection</b>	7	7	6	<p>Poured concrete slab slope protection at both abutments. Waterline has begun to spall sections of concrete at toe of south abutment slope, creating voids in slope paving- 4 areas up to 6'x 2 1/2'. (09/13)</p> <p>Poured concrete slab slope protection at both abutments. Waterline has begun to spall sections of concrete at toe of south abutment slope, creating voids in slope paving. (09/11)</p> <p>Poured concrete slab slope protection at both abutments. Waterline has begun to spall sections of concrete at toe of south abutment slope, creating voids in slope paving. (09/09)</p>

APPROACH

09/09 09/11 09/13

<b>16. Approach Pavement</b>	6	9	8	<p>New HMA approach. (09/13) New HMA approach. (09/11) N Approach: Random cracking typical near both shoulders and near CL. A trans crack may have initiated much of these random cracks. App has settled and a bit wedge was installed in NB lane. Trans cracks typ near ref line open to 1" with voids and potholes occurring in SB lane. S. Approach: many bit patches. Random cracking occurring at SB lane. Trans cracks typ at CL. Bit patches appear in tact. Bit patches at S ref line appear to have scaled joint. Trans cracks appearing near ref line. (09/09)</p>
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<b>17. Approach Shoulders Sidewalks</b>	6	9	8	New aggregate shoulder at northwest side. E side has HMA curb. W side has shoulder that is half grass and half gravel. (09/13) New aggregate shoulder at northwest side. E side has HMA curb. W side has shoulder that is half grass and half gravel. (09/11) E side has HMA curb, W side has shoulder that is half grass and half gravel. Shoulders taper and only 2' shoulders carried through bridge deck. (09/09)
<b>18. Approach Slopes</b>				(09/13) (09/11) (09/09)
<b>19. Utilities</b>				(09/13) (09/11) (09/09)
<b>20. Channel (SIA-61)</b>	7	7	7	Channel bottom is largely sand and gravel. Down tree at downstream end of 3s. (09/13) Channel bottom is largely sand and gravel. Down tree at downstream end of 3s. (09/11) Channel bottom is largely sand and gravel. (09/09)
<b>21. Drainage Culverts</b>				(09/13) (09/11) (09/09)

MISCELLANEOUS

Guard Rail

Item	Rating
36A. Bridge Railings	0
36B. Transitions	0
36C. Approach Guardrail	0
36D. Approach Guardrail Ends	0

Other Items

Item	Rating
71. Water Adequacy	8
72. Approach Alignment	8
Temporary Support	0 No Temporary Supports
High Load Hit (M)	No
Special Insp. Equipment	2
Underwater Insp. Method	0

Critical Feature Inspections (SIA-92)

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

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STRUCTURE INVENTORY AND APPRAISAL

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Bridge History, Type, Materials

27 - Year Built	1960
106 - Year Reconstructed	
202 - Year Painted	
203 - Year Overlay	
43 - Main Span Bridge Type	5 05
44 - Appr Span Bridge Type	
77 - Steel Type	0
78 - Paint Type	0
79 - Rail Type	4
80 - Post Type	4
107 - Deck Type	1
108A - Wearing Surface	6
108B - Membrane	0
108C - Deck Protection	0

Structure Dimensions

34 - Skew	40
35 - Struct Flared	0
45 - Num Main Spans	4
46 - Num Apprs Spans	0
48 - Max Span Length	54.8
49 - Structure Length	219.8
50A - Width Left Curb/SW	1.31
50B - Width Right Curb/SW	1.31
33 - Median	0
51 - Width Curb to Curb	26.0
52 - Width Out to Out	31.17
112 - NBIS Length	Y

Inspection Data

90 - Inspection Date	09/23/2013
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	0
58 - Deck Rating	6
58A/B - Deck Surface/Bottom	6 N
59 - Superstructure Rating	4
59A - Paint Rating	N
60 - Substructure Rating	5
61 - Channel Rating	7
62 - Culvert Rating	

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	4
5C - Level of Service	0
5D - Route Number	02011
5E - Direction Suffix	0
10L - Best 3m Unclr-Lt	0 0
10R - Best 3m Unclr-Rt	99 99
PR Number	
Control Section	
11 - Mile Point	0.0
12 - Base Highway Network	0
13 - LRS Route-Subroute	0000012993 09
19 - Detour Length	4
20 - Toll Facility	3
26 - Functional Class	17
28A - Lanes On	2
29 - ADT	2520
30 - Year of ADT	1995
32 - Appr Roadway Width	29.0
32A/B - Ap Pvt Type/Width	4 29.0
42A - Service Type On	1
47L - Left Horizontal Clear	0.0
47R - Right Horizontal Clear	25.6
53 - Min Vert Clr Ov Deck	99 99
100 - STRAHNET	0
102 - Traffic Direct	2
109 - Truck %	11
110 - Truck Network	0
114 - Future ADT	4509
115 - Year Future ADT	2023
Freeway	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	3
69 - Underclearance	N
71 - Waterway Adequacy	8
72 - Approach Alignment	8
103 - Temporary Structure	
113 - Scour Criticality	5

Miscellaneous

37 - Historical Significance	5
98A - Border Bridge State	
98B - Border Bridge %	
101 - Parallel Structure	N
EPA ID	
Stay in Place Forms	
143 - Pin & Hanger Code	
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 Unclr-Lt	
10R - Best 3m Unclr-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	N
54B - Left Underclearance	99 99
54C - Right Feature	N
54D - Right Clearance	99 99
Under Clearance Year	
55A - Reference Feature	N
55B - Right Horiz Clearance	0
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 - Oper Rtg Method	1
64F - Fed Rtg Method	23.4
64M - Mich Oper Rtg	9 34
65 - Inv Rtg Method	1
66 - Inventory Load	14
70 - Posting	0
141 - Posted Loading	232331
195 - Analysis ID	
193 - Overload Class	

