

Inspection Report with SI&A Data

Structure Description: 766.08 Foot - 5 Span Prestressed concrete continuous Stringer/Multi-beam or Girder

2 District: 09 **3 County:** Mason **16 Latitude:** 38°40'18.00" **7 Longitude:** 83°47'56.00"

7 Facility Carried: US-62

Milepoint: 16.960

6A Feature Intersected: LAWRENCE CREEK

9 Location: 2.6 MI. N. JCT KY 9

NBI	X
Element	X
Fracture Critical	
Underwater	
Special	X

NBI CONDITION RATINGS

58 Deck:	6	61 Channel:	8
59 Superstructure:	5	62 Culvert:	N
60 Substructure:	4	Sufficiency Rating:	87

GEOMETRIC DATA

48 Max Length Span:	154.856 ft
49 Structure Length:	766.076 ft
32 Approach Roadway:	60.039 ft
33 Median:	(0) No Median
34 Skew:	20°
35 Flare:	No Flare
50A Curb/Sidewalk Width L:	0.000 ft
50B Curb/Sidewalk Width R:	0.000 ft
47 Horiz. Clearance:	59.711 ft
51 Width Curb to Curb:	60.039 ft
52 Width Out to Out:	63.320 ft

DESIGN

Substandard:	Not Sub-Standard
43A Main Span Material:	(6) P/S Concrete Continuous
43B Main Span Design:	(02) Stringer / Girder
45 Number of Spans Main:	5
44A Approach Span Material:	Not Applicable (0)
44B Approach Span Design:	Not Applicable (00)
46 Number of Approach Spans:	0
107 Deck Type:	(1) Concrete-Cast-in-Place
108A Wearing Surface:	(1) Monolithic Concrete
108B Membrane:	(0) None
108C Deck Protection:	(0) None
Overlay Y/N:	No
Overlay Type:	None
Overlay Thickness:	in
Overlay Date:	

ADMINISTRATIVE

27 Year Built:	1996
106 Year Reconstructed:	0
42A Type of Service On:	(1) Highway
42B Type of Service Under:	(5) Waterway
37 Historical Significance:	(5) Not Eligible
21 Maintenance Responsibility:	(01) State Hwy Agency
22 Owner:	(01) State Hwy Agency
101 Parallel Structure:	(N) No II Structure Exists

APPRAISAL

36A Bridge Railings:	(1) Meets Standards
36B Transitions	(1) Meets Standards
36C Approach Guardrail:	(1) Meets Standards
36D Approach Guardrail Ends:	(1) Meets Standards
71 Waterway Adequacy:	(8) Equal Desirable
72 Approach Alignment:	(8) Equal Desirable Crit
92A Fracture Critical Inspection:	No
92B Under Water Inspection:	No
113 Scour Critical:	(8) Stable above footing
Recommended Scour Critical:	(8) Stable Above Footing

CLEARANCES

10 Vert. Clearance:	99.999 ft
53 Min. Vert. Clearance Over:	99.999 ft
54A Vert. Under Reference:	(N) Feature not hwy or RR
54B Min. Vert. Underclearance:	0.000 ft
55A Lateral Under Reference:	(N) Feature not hwy or RR
55B Min. Lat. Underclearance R:	0.000 ft
56 Min. Lat. Underclearance L:	0.000 ft

POSTINGS

41 Posting Status:	(A) Open, No Restriction
Signs Posted Cardinal:	No
Signs Posted Non-Cardinal:	No
Field Postings Gross:	tons
Field Postings Type I:	tons
Field Postings Type II:	tons
Field Postings Type III:	tons
Field Postings Type IV:	tons

LOAD RATINGS

63 Operating Type:	(1) Load Factor (LF)
64 Operating Rating:	63.1 tons
65 Inventory Type:	(1) Load Factor (LF)
66 Inventory Rating:	37.9 tons
Truck Capacity Type I:	108 tons
Truck Capacity Type II:	110 tons
Truck Capacity Type III:	113 tons
Truck Capacity Type IV:	123 tons

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12: Re Concrete Deck

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
SQ.FT	48,508	45,597	94%	2,911	6%	0	0%	0	0%

CS2 - The wearing surface of the deck has some minor transverse cracking (typically near the piers) and some areas of longitudinal cracking. Small pop-out spalls are present throughout the wearing surface. Some moderate spalling is present along the transverse joint in the north bound lane at abutment 6. A 1 foot section of the armored edge is broke and missing in the south bound lane at abutment 6. There is a waviness in the deck and the superstructure, that is causing traffic to bounce as it crosses the bridge.

1130: Cracking (RC and Other)

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
SQ.FT	1,800	0	0%	1,800	100%	0	0%	0	0%

See parent element 12 for notes.

109: Pre Opn Conc Girder/Beam

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	4,596	4,488	98%	12	0%	96	2%	0	0%

CS3- At both abutments the beam ends are pressed tightly against the abutment/pile cap back walls; placing an undesirable axial load on the beams in spans 1 and 5 (particularly span 5). All 6 elastomeric bearings at abutment 6 are sheared and bulged to the point in which they are no longer functioning as intended, while the elastomeric bearings at abutment 1 are moderately sheared, moderately bulged, and have moved up to 2 inches from the their original location on the abutment seat.

From the Special-Other Inspection dated 12/2/2014: Most all of the beams have light to minor sized shear cracks in their webs near the piers. Many of the beams have only 1 noticeable shear crack while other beams have several. The greatest intensity of shear cracking was noted in beams 4 - 6 (beams numbered from upstream to downstream) near piers 4 and 5. Beam 5 in span 3 near pier 4 has up to 6 minor sized shear cracks in both faces. Some of these cracks extend up through the web to the top flange. Several of the beams have light to minor sized longitudinal cracks in the undersides of their bottom flanges. Some of these cracks are intermittent while others extend for 1/3 to 2/3 of the beams length. A few patched areas were noted in a couple of the beams' bottom flanges. These areas were patched during construction and minor cracking is present within these patches. The pier caps have some minor vertical cracks adjacent to the pedestals, this cracking is typical.

CS2- All of the beams at both abutments have very fine hairline cracking that begins in the lower web just above the bottom flange. This cracking trends upward diagonally. The length of the cracks range from 5 inches to 15 inches from the front face of the diaphragms. Some shallow exposed steel is present in some of the beam undersides at the abutments.

CS1- All of the beams in span 1 appear to be swept towards the downstream with the exception of beam 1 which appears to be swept towards the upstream.

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1110: Cracking (PSC)									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	108	0	0%	12	11%	96	89%	0	0%
See parent element 109 for notes.									

205: Re Conc Column									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
EACH	8	7	88%	1	13%	0	0%	0	0%
CS2- There is minor cracking and minor spalling present on the upstream column of pier 4.									

1130: Cracking (RC and Other)									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
EACH	1	0	0%	1	100%	0	0%	0	0%
See parent element 205 for notes.									

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220: Re Conc Pile Cap/Ftg

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	288	1	0%	0	0%	0	0%	287	100%

CS4- The end bents/abutments/reinforced concrete pile caps were constructed on 2 rows of HP14x73 steel piles (1 straight pile each wingwall end, 8 straight piles along the back row, and 9 battered piles along the front row); per the design plans pile lengths at both abutments were anticipated to exceed lengths of over 100 linear feet per pile (from pile cut-off elevation to bottom of pile). The piles were to be driven through fill/earth core material. The beams at both abutments (particularly at abutment 6) are pressed tightly against the back-wall due to rotation/settlement of the abutments/pile caps. At all 4 abutment corners/wingwalls there are shear cracks present indicating movement and overstressing due to rotation/settlement. Settlement is obvious along both abutment faces, based on the increase in the vertical height between the bottom of the masonry coating and top of the embankment fill; the fill appears to have lowered/settled up to 2'-5" along abutment 6 and 1'-10" along abutment 1. At some point in the past there was a fairly large erosion/void exposing many of the piles at abutment 6; this was repaired by placing flow-able-fill in the void. This repair is beginning to crack and bulge, most likely due to the continuation of settlement. Multiple asphalt overlay/repairs have been made over the years to the approach roadway and approach slabs to correct advanced settlement at both ends of the bridge. Along the face of abutment 1, there is evidence of the continuation of settlement due to the formation of small voids; there is the potential of drag-down forces being applied to the piles of both abutments. At abutment 1 it appears that the superstructure has moved upstream in relation to the approach slab and pile cap. At abutment 6 it appears that the superstructure has moved downstream in relation to the approach slab and pile cap.

Limited Characters - See defect 896 for additional/continuation of notes.

896: Additional Notes 1

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	1	1	100%	0	0%	0	0%	0	0%

Notes Continued from Element 220:

CS4- Heavy cracking is present on the abutment seat of both abutments particularly downstream of beam 6 and upstream of beam 1. At the base of the upstream and downstream corners of both abutments/pile caps there is heavy cracking with some cracking up to 2 inches in width. The beams and end diaphragms at both abutments are pressed tight against the back-walls with multiple areas of spalling present. It is possible that the rotation/settlement has ceased/slowed due the beams locking the abutments in place; however this is less than desirable due to the increase in internal stresses created to both the substructure and superstructure.

CS2- Cracking is present along the faces and back-wall between interior beams with widths 0.012 inches to 0.05 inches or spacing of 1 foot to 3 foot.

Smart level readings were taken at the 4 marked location on abutment 6; the readings are within reasonable tolerance to the previously recorded readings.

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4000: Settlement									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	287	0	0%	0	0%	0	0%	287	100%
See parent element 220 and Defect 896 under element 220 for notes.									

234: Re Conc Pier Cap									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	240	180	75%	0	0%	60	25%	0	0%
CS3- The underside of the pier cap of pier 5 is stained lightly with rust staining most likely from inadequate cover over the stirrup/ shear reinforcing bars.									
CS1- Otherwise the pier caps appear to be in good condition.									

1120: Efflorescence/Rust Staining									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	60	0	0%	0	0%	60	100%	0	0%
See parent element 234 for notes.									

302: Compressn Joint Seal									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	116	0	0%	0	0%	89	77%	27	23%
CS4- The joint at abutment 6 is completely closed at both the upstream and downstream shoulders/ends. Impact damage present in the northbound lane at abutment 6.									
CS3- Evidence of leakage is present at both locations captured in this condition state. The remaining portions of the joints not captured in CS4 has seal damage captured in this condition state.									
CS2- Portions of both joints are partially filled debris captured in this condition state.									

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2320: Seal Adhesion									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	109	0	0%	0	0%	89	82%	20	18%
See parent element 302 for notes.									

310: Elastomeric Bearing									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
EACH	60	48	80%	6	10%	0	0%	6	10%
CS4- All 6 elastomeric bearing pads at abutment 6 are either excessively bulging, sheared beyond repair, or alignment is beyond the tolerable limits.									
CS2- All of the elastomeric bearing pads at abutment 1 have moved (up to 2 inches) from their original positions but remain within the tolerable limits of vertical and/or lateral movement.									

2220: Alignment									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
EACH	12	0	0%	6	50%	0	0%	6	50%
See parent element 310 for notes.									

331: Re Conc Bridge Railing									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	1,532	1,503	98%	25	2%	4	0%	0	0%
CS3- There is an area of moderate spalling located on the exterior face of the downstream barrier wall near abutment 6.									
CS2- There are minor areas of spalling, minor vertical cracks, and areas of minor impact damage throughout both barrier walls.									
The barrier walls exhibit lateral/horizontal offsets at all four corners of the bridge between the bridge railing and approach slab railing are less than desirable; most likely from settlement/rotation of the abutments/pile caps.									

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1080: Delamination/Spall/Patched Area									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
FT	14	0	0%	10	71%	4	29%	0	0%
See parent element for notes.									

850: 2nd Elem									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
(EA)	1	0	0%	0	0%	1	100%	0	0%
CS3- The diaphragms at abutments 1 and 6 are pressed tight against the abutment back-walls. Areas of spalling are present particularly at the upstream and downstream ends, and at the shear key locations; some areas have exposed reinforcing steel without section loss. The diaphragm at pier 2 appears to have moved towards the downstream; see inspection dated 12/2/2014 for additional information.									

1080: Delamination/Spall/Patched Area									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
(EA)	1	0	0%	0	0%	1	100%	0	0%
See parent element 850 for notes.									

851: Transitions									
Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
(EA)	1	0	0%	1	100%	0	0%	0	0%
CS2- Up to 1/4 inch transition is present in at least one lane at both ends of the bridge.									

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852: Drains

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
(EA)	1	0	0%	0	0%	1	100%	0	0%

CS3 - Some of the drains are 100% open, however a decent number are completely blocked with debris (particularly along the downstream barrier wall).

857: Embankment Erosion

Units	Total Qty	Qty. St. 1	% in 1	Qty. St. 2	% in 2	Qty. St. 3	% in 3	Qty. St. 4	% in 4
(EA)	1	0	0%	1	100%	0	0%	0	0%

CS2- In the past erosion and/or settlement was severe around/at abutment 6; exposing many of the piles. Repairs were made by placing flow-able-fill around abutment 6. While it appears that settlement is continuing at both abutments the only current erosion issue/defect present is at the downstream end of abutment 1; the pile cap is undermined with no piles exposed/detected. It should be noted while the erosion issue rating is fair under this element, the settlement issue/defect is attached to element 220.

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STRUCTURE NOTES

-12.4

The load rating is controlled by an interior beam: at midspan for Trucks 1-4, and at outer piers for Inventory & Operating - 10/6/10 ALI.

The settlement and/or rotation of abutment 6 needs to be corrected and stabilized. According to the design plans HP14 X 73 steel piles were driven to the rock line at an elevation of approximately 590'. The piles were cut off at an elevation of 713.85'. A vertical test pile was drove approximately 120' at this abutment (11/2/2011).

Continued from the inspection notes for the 12-2-14 special inspection: Several of the beams have light to minor sized longitudinal cracks in the undersides of their bottom flanges. Some of these cracks are intermittent while others extend for 1/3 to 2/3 of the beams length. A few patched areas were noted in a couple of the beam's bottom flanges. These areas were patched during construction and minor cracking is present within these patches. The pier caps have some minor vertical cracks adjacent to the pedestals, this cracking is typical. See photos for further details.

INSPECTION NOTES

-In this inspection report the spans/abutments/piers are numbered from south to north (abutments and piers numbered in sequence), and the beams are numbered from upstream downstream (east to west).

-Due to the severity of the rotation/settlement and signs of potential overstressing of the piles and pile caps at both abutments/end bent pile caps this bridge is being placed on a 6 month special inspection frequency.

-The NBI Condition Rating Superstructure (059) was lowered based on the findings during this inspection and a Special-Other Inspection dated 12/2/2014 (PVRS); the inspection on that date utilized a work platform, thus an arm length inspection of the superstructure elements not normally accessible from ground level was possible. Item (059) lowered from 7 (Good) to 5 (Fair). Typically the bearings are not included in the rating of Item (059), however per the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (dated December 1995, page 39) under extreme situations they may be included; due to the severity of the bearing (particularly at Abutment 6) the bearings are be considered/included in the rating of Item (059) for this structure.

-The NBI Condition Rating of Substructure (060) was lowered based on the severity of the rotation/settlement and signs of potential overstressing of the piles and pile caps at both abutments/end bent pile caps. Item (060) lowered from 5 (Fair) to 4 (poor).

-Special-Other, NBI, and Element Inspection by B.Jones.

WORK

Action: 1038 - Drainage-Clean/Clear Deck Drains/Downspouts

Generated by user "BJONES" on 8/11/2016 Clean Deck Drains.

Action: 1041 - Drainage-Repair Washouts / Erosion

Generated by user "BJONES" on 8/11/2016 Repair erosion around abutment 1.



End view looking from the south approach to abutment 1.

In this inspection report the spans/abutments/piers are numbered from south to north (abutments and piers numbered in sequence), and the beams are numbered from upstream to downstream (east to west).



Elevation view looking from the upstream south embankment.



End view looking from the north approach to abutment 6.



Elevation view looking from the downstream north embankment.



View of the south approach/transition.
Note this approach has settled severely in the past; it was recently repaired during a roadway asphalt overlay project.



View looking down and along the deck joint of abutment 1.
Note the joint is full of debris and compressed/closed past the anticipated/tolerable limits.



Close up view of the joint gap in the northbound lane at abutment 1.



View of the downstream approach slab curb constructed in the recent asphalt roadway project (downstream similar).



View of the horizontal offset between the upstream barrier wall at abutment 1. Note the entire superstructure appears to have moved towards the upstream at this location.



View of lateral offset between the upstream barrier wall at abutment 1. Note the barrier wall sliding plates have torn off due to the horizontal movement.



View of the horizontal offset between the downstream barrier wall at abutment 1. Note the entire superstructure appears to have moved towards the upstream.



View of lateral offset between the downstream barrier wall at abutment 1. Note the barrier wall sliding plates have torn off due to the horizontal movement.



View along the downstream barrier wall (typical).
Note the minor vertical cracking throughout, minor spalling (with no exposed reinforcing steel) at isolated locations throughout, and minor impact damage at random/isolated locations.



Typical view of the deck.
Note minor there are minor to moderate transverse and longitudinal cracks throughout.



View looking downstream from the bridge deck.



View looking upstream from the bridge deck.



View sighted along the upstream barrier wall looking from abutment 1. Note the top of the wall appears to be wavy throughout, this is consistent with the driving surface; traffic appears to bounce while crossing the structure in both directions.



Slightly different perspective then the top photo on this page.



View of transverse cracking in the deck over at one line of the beam ends over pier 2.



If you look closely, you can see the deck transverse cracking present at all of the interior beam ends over pier 2; note the cracking is aligned with the bridge skew.



Close-up of transverse cracking noted in the bottom photo of page 10. Note this location is located at the beam ends over pier 2 of beamline 3.



View of minor spall on the top of the upstream barrier wall located at the first drain from abutment 1 in span 1.



Typical view of the deck.



View along the southern cold joint in the deck.



View along the northern cold joint in the deck.



Some of the deck-drains are open, however a large number are 100% blocked with debris as shown above.



View of the north approach/transition.

Note the asphalt cracking present in the northbound lane and shoulder; an indication of continuing settlement.



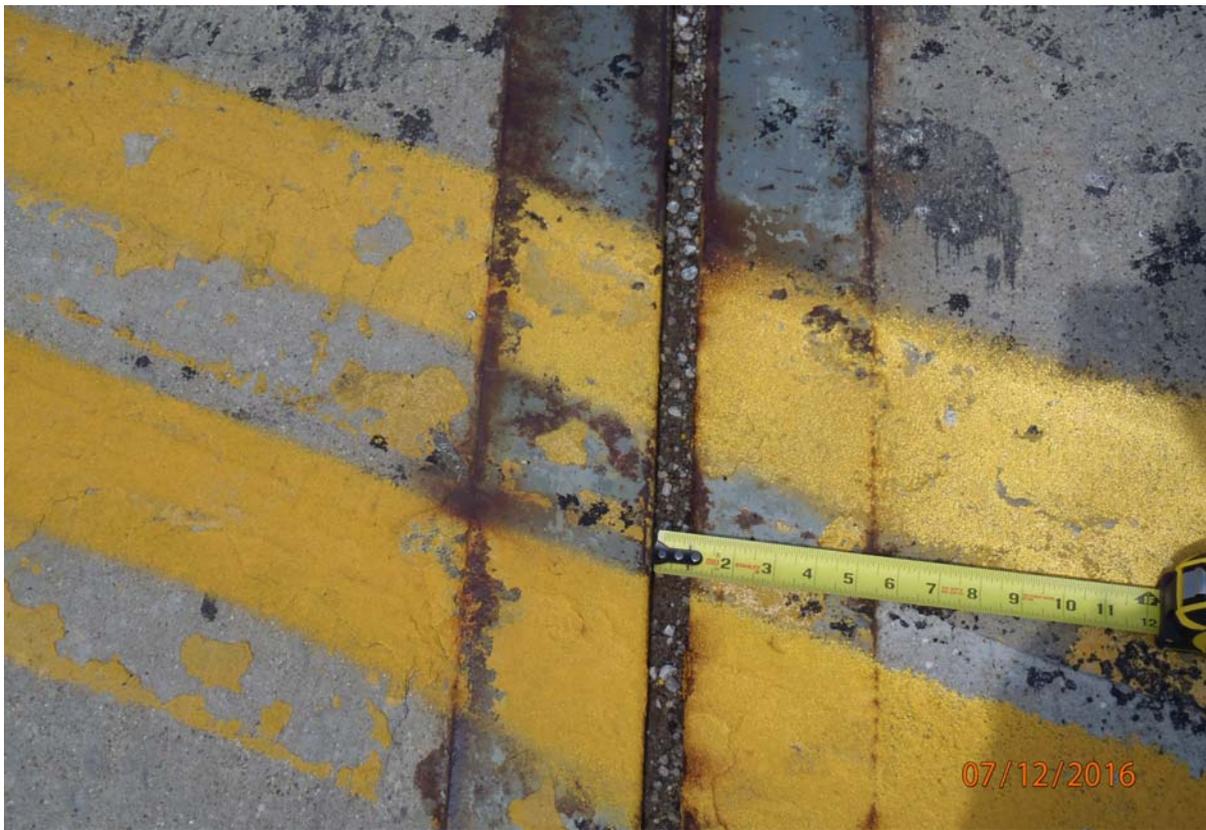
View looking down and along the joint over abutment 6.



View looking down at the joint over abutment 6 near the upstream barrier wall.
Note the joint is completely closed at this location.



View of snowplow damage to joint at abutment 6, in the northbound lane.



Close up view of the joint gap at the centerline of abutment 6.



View of the horizontal offset between the upstream barrier wall at abutment 6. Note the entire superstructure appears to have moved towards the downstream at this location. **16/75**



View of lateral offset between the upstream barrier wall at abutment 6.
Note the barrier wall sliding plate has mostly torn off due to the horizontal and lateral movement.



View of lateral offset between the downstream barrier wall at abutment 6.
Note the deck joint is completely closed at this location.



View of the horizontal offset between the downstream barrier wall at abutment 6. Note the entire superstructure appears to have moved towards the downstream at this location.



View of the downstream approach roadway drain at the end of the north approach slab (typical of the upstream at this location).



View of erosion under the approach roadway slab located at on upstream side near abutment 6.



View along the upstream face of the upstream beam (beam 1) looking from abutment 6. Note the shear cracking in the wingwall (Wingwall D per plans). The shear cracks are up to **19/75** 0.023" wide with efflorescence staining.



View of the upstream face of beam 1 at abutment 6.
Note the heavy cracking and staining of/on the abutment back-wall, spalling of the diaphragm,
and the cracking/spalling of the wingwall.



Close-up view of the above photo.



Elevation view looking from the upstream north embankment.



Elevation view looking from the upstream north embankment.



View of abutment 6.



View along the face of abutment 6. Note at some point in the past heavy erosion was present exposing many of the piles at this abutment thus flow-able-fill was placed in the voided areas; the cracking and settlement of the flow-able-fill finished surface indicates that settlement is continuing.



View of the back-wall downstream of beam 6.

Note the heavy cracking up to 0.02" wide with efflorescence and rust staining. Note the green circles and PK nails - the below level reading was recorded at this location.



View of the level reading taken at the above location.

Note when the smart level was flipped the reading did not change; this smart level is assigned to B. Jones and the calibration might vary slightly.



View of cracking present on the abutment seat downstream of beam 6.
Note the cracking widths are up to 0.06" wide.



View of 2'-5" of vertical difference between the constructed height of the fill along abutment 6.
Note photos dated back to 1997 indicate that the fill was approximately to/near the masonry coating line.



View of a spall and void under the downstream side of the pile cap of abutment 6. Note no piles are exposed but reinforcing steel is without any measureable section loss.



View of heavy cracking present at the downstream corning of the pile cap of abutment 6. Note the cracking is up to 1/2" wide.



View of the face of the pile cap under and downstream of beam 6.
Note the heavy cracking with rust staining; the cracks are up to 0.02" wide at this location.



View of the downstream wingwall of abutment 6 (Wingwall C per plans).
Note the spalling of the barrier wall, spalling of the wingwall, and shear cracking with efflorescence and rust staining up to 0.023" wide.



View of the date, design loading, plan number, and contractor stamp located on the upstream face of the downstream barrier wall at abutment 6.



View along the exterior face of beam 6 looking from abutment 6.



View of the location of the smart level reading taken between beams 5 and 6 at abutment 6 (similar to the reading taken between beams 1 and 2).



Close-up the above noted smart level reading taken between beams 5 and 6 at abutment 6.



Close-up the smart level reading taken between beams 1 and 2 at abutment 6.



View of the back-wall upstream of beam 1.

Note the heavy cracking up to 0.03" wide with efflorescence and rust staining.
Note the green circles and PK nails - the below level reading was recorded at this location.



View of the level reading taken at the above location (bottom photo page 29). Note when the smart level was flipped the reading did change by 0.01 degrees (89.7 degrees); this smart level is assigned to B. Jones and the calibration might vary slightly.



View of diaphragm and back wall spalling located upstream of beam 1. Note the diaphragm spall is approximately 20" tall with no exposed reinforcing steel.



View sighted along the upstream face of beam 1.



View of very minor longitudinal/diagonal cracks in the exterior face of beam 1 (3 cracks in total) extending from the diaphragm into span 5 approximately 15" from the face of the diaphragm; the cracks are up to 0.002" wide.



View of cracking present at the upstream corning of the pile cap of abutment 6.
Note the cracking is up to 2" wide near the base of the pile cap with exposed reinforcing steel
without section loss.



View of cracking present on the abutment seat upstream of beam 1.
Note the cracking widths are up to 1/4" wide.



View of small void under the pile cap upstream of beam 1; no piles where exposed/detected.



View of the upstream wingwall of abutment 6 (Wingwall D per plans). Note the spalling of the wingwall/back-wall, cracking of the back-wall, and shear cracking with efflorescence up to 0.023" wide.



View of the bearing pad under beam 6 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 5 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 5 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 4 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 4 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 3 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 3 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 2 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 2 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 1 at abutment 6.
Note the deformation and cracking.



View of the bearing pad under beam 1 at abutment 6.
Note the deformation and cracking.



View of vertical and diagonal cracking in the back-wall and abutment face between beams 5 and 6 at abutment 6. Note the cracks in the abutment face are up to 0.023" wide, and some with rust staining.



View of vertical cracking in the face of abutment 6 under and between beams 4 and 5; up to 0.05" wide under beam 5 and up to 0.03" wide between beams 4 and 5.



View of vertical cracking in the face of abutment 6 up to 0.026" wide under beam 4.



View of cracking in the face of abutment 6 between beams 3 and 4.



View of cracking in the face of abutment 6 under beam 3.



View of cracking in the face of abutment between beams 2 and 3.



View of cracking in the face of abutment 6 between beams 1 and 2.



View of cracking and heavy staining in the back-wall of abutment 6 between beams 1 and 2.



View of cracking under beam 1, upstream of beam 1, and downstream of beam 1 in the face of abutment 6.



View of the shear key and diaphragm between beams 4 and 5 at abutment 6.
Note the spalling of the back-wall.



View of the shear key and diaphragm between beams 4 and 5 at abutment 6.
Note the gap/movement of the superstructure towards the downstream.



View of the shear block between beams 2 and 3.
Note the previous patched areas and gap/noticeable movement of the superstructure towards the upstream.



View between beams 1 and 2 (beam 6 on left) in span 5 (typical of other bays at this location).



View of the underside of span 5.



View of the north face of pier 5.



View of the underside of the pier cap of pier 5.
Note the transverse rust staining most likely from inadequate cover over the stirrup/shear reinforcing on cap underside.



View of the underside of the pier cap of pier 5.
Note the transverse rust staining most likely from inadequate cover over the stirrup/shear reinforcing on cap underside.



View of the underside of the pier cap of pier 5.
Note the transverse rust staining most likely from inadequate cover over the stirrup/shear reinforcing on cap underside.



View of the strut of pier 5. Note the evidence of diaphragm spalling located on the top of the strut.



View of minor cracking on the north face of the upstream column of pier 5.



View of abutment 6.



View of the north face of pier 4.



View of the underside of span 4.



View of piers 2 - 4, and abutment 1.



View of the gabion baskets at the base of the south slope (pier 3).



View of the underside of span 3.



View of the north face of 5. Note the gabion baskets downstream of the bridge along the south fill/embankment.



Close-up of bottom photo on page 52.



View the upstream wingwall of abutment 1 (Wingwall B per plans).
Note the shear cracking with effloresce staining.



View along the upstream face of beam 6 looking from abutment 1.
Note the waviness of the superstructure.



View of the north fill/embankment downstream of the bridge.



View of the south face of pier 2.



Typical view between interior beams in span 1.



View of the underside of span 1.



View sighted along the underside of beam 6 in span 1.
Note it appears the beam is sweep towards the upstream.



View sighted along the underside of beam 5 in span 1.
Note it appears the beam is sweep towards the downstream.



View sighted along the underside of beam 4 in span 1.
Note it appears the beam is sweep towards the downstream.



View sighted along the underside of beam 3 in span 1.
Note it appears the beam is sweep towards the downstream.



View sighted along the underside of beam 2 in span 1.
Note it appears the beam is sweep towards the downstream.



View sighted along the underside of beam 1 in span 1.
Note it appears the beam is sweep towards the downstream.



View of shear cracking with efflorescence and rust staining extending from the downstream wingwall (Wingwall A per plans) into the back-wall of the upstream face of abutment 1.



View of erosion and voided area/undermining of the downstream side of the pile cap of abutment 1 at/near beam 1. No piles are exposed or could be detected.



View along the face of abutment 1.
Note the evidence of settlement and potential drag-down.



View along abutment 1.

Note the approximate 1'-10" difference between the soil and original masonry coating line from construction along the abutment face; from previous records (1997) the fill was actually to/near the masonry coating line.



View of the bearing under beam 6 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 5 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 5 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 5 at abutment 1.
Note the bearing pad has moved from its original position.



View of the diaphragm and shear block between beams 4 and 5 (beam 5 on right). Note the diaphragm is spalled with exposed reinforcing steel without section loss. In addition note the superstructure is pressed tight against the abutment back-wall the entire length of the abutment.



View of the horizontal gap between the diaphragm and shear block between beams 4 and 5 at abutment 1; indicating the superstructure has moved towards the upstream at this location.



View of the bearing under beam 4 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 3 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 2 at abutment 1.
Note the bearing pad has moved from its original position.



View of the bearing under beam 1 at abutment 1.
Note the bearing pad has moved from its original position.



View of the diaphragm and shear block between beams 2 and 3 (beam 3 on right).
Note the diaphragm is spalled.



View of the horizontal gap between the diaphragm and shear block between beams 2 and 3 at abutment 1; indicating the superstructure has moved towards the downstream at this location.



View of the back-wall downstream of beam 6.
Note the cracking in the back.



View of the back-wall upstream of beam 1.
Note the cracking in the back.



View of typical minor vertical cracking under the beam seats
and spaced throughout between the beam seats of abutment 1.



View of the south face of the diaphragm and superstructure of span 1 at pier 2. Note the gap between the diaphragm and beam seats indicating the superstructure has moved towards the downstream.



View of the south face of pier 3.



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View of the underside of span 2.



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Elevation view looking from downstream.



View of the fill/embankment on the downstream side of abutment 6.



View of the fill/embankment on the downstream side of abutment 1.



View of the fill/embankment on the downstream side of abutment 6. Note the gabion baskets at the base of the fill.



Close-up of above photo.



Close-up of gabion baskets at the base of the fill (around pier 4) of the north fill/embankment.



View of the north face of pier 3.



View of gabion baskets at the base of the south fill/embankment (pier 3).



View of the underside of span 3.



View looking up at the south face of pier 4.