



Latitude:46.91642, Longitude:-103.53171

Route:00094 Log:900.807

District 65, Billings County

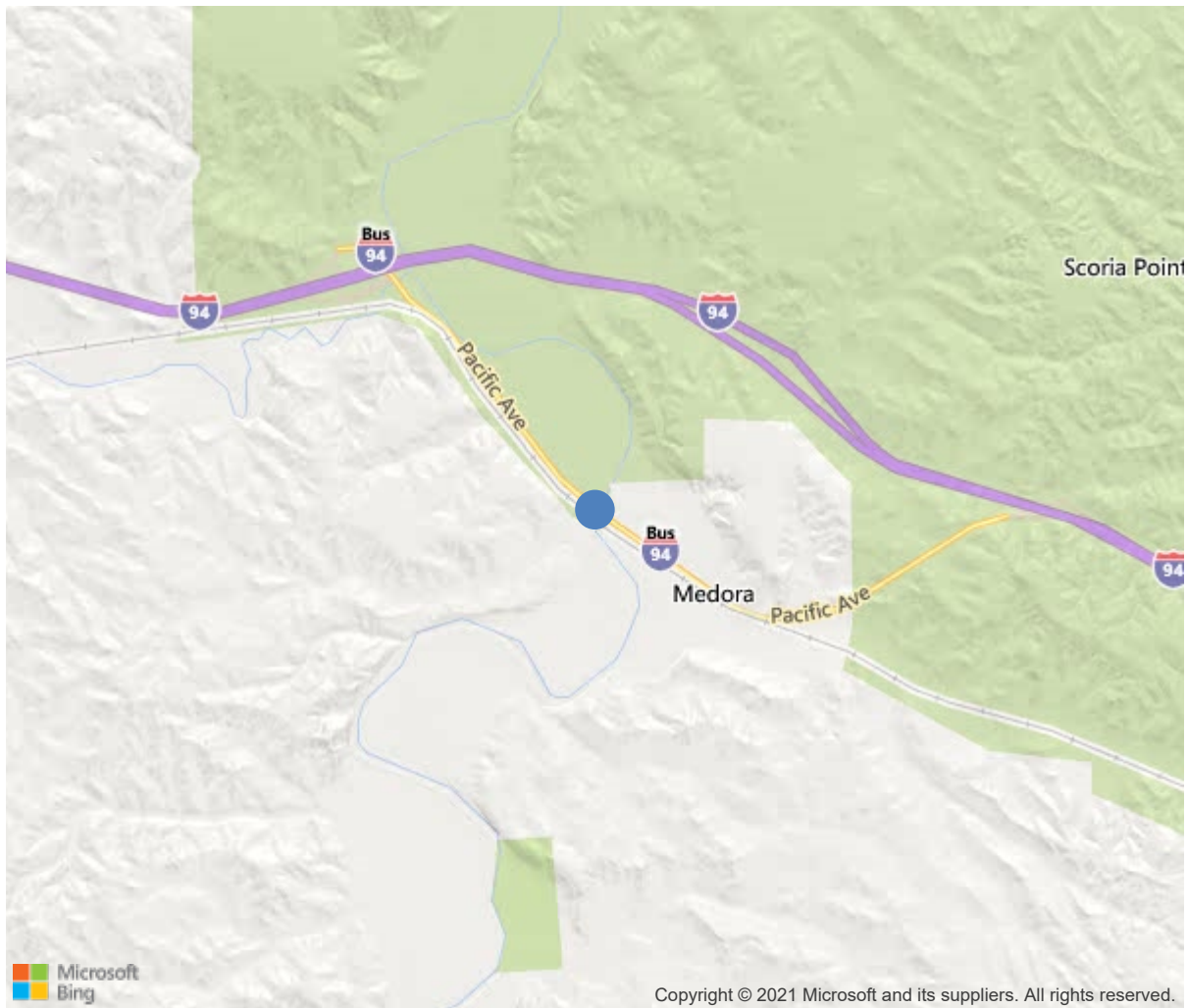
Owner: 1-State Highway Agency

Place Code: MEDORA CITY

Team Leader: Jake Mertz

Approved By: Travis McCloud

2 SOUTHEAST OF I-94



46.91642, -103.53171

IDENTIFICATION	
(1) State Names	North Dakota
(8) Structure Number	0094-901.376
(5) Inventory Route	00094
(2) Highway Agency District	65
(3) County Code	Billings, North Dakota
(4) Place Code	51900
(6) Features Intersected	LITTLE MISSOURI RIVER
(7) Facility Carried	I-94 BUSINESS LOOP
(9) Location	2 SOUTHEAST OF I-94
(11) Mile Point	900.807 mi
(12) Base Highway Network	Yes
(13) LRS Inventory Rte	0000000000
(16) Latitude	46.91642
(17) Longitude	-103.53171
GPS X	154960.9
GPS Y	5205852
(98) Border Bridge State Code	-1
(99) Border Bridge Struct. No.	-
STRUCTURE TYPE AND MATERIAL	
(43) Main Structure Type	32
Material	3-Steel
Type	2-Stringer/Multi-beam or girder
(44) Approach Structure Type	00
Material	0-Other
Type	0-Other
(45) No. of Spans in Main Unit	4
(46) No. of Approach Spans	0
Culvert	
(107) Deck Structure Type	1-Concrete Cast-in-Place
(108) Wearing Surface/Protective System	
Type of Wearing Surface	4-Low slump Concrete
Type of Membrane	0-None
Type of Deck Protection	0-None
Deck overburden	1
AGE AND SERVICE	
(27) Year Built	1942
(106) Year Reconstructed	
(42) Type of Service	55
On	5-Highway-pedestrian
Under	5-Waterway
(28) Lane	
On	2
Under	0
(29) Average Daily Traffic	730
(30) Year of ADT	2019
(109) Truck ADT	11 %
(19) Bypass, Detour Length	6 mi
(114) Future ADT	1100
(115) Year of Future ADT	2039
GEOMETRIC DATA	
(48) Length of Maximum Span	115.2 ft
(49) Structure Length	412.1 ft
(50) Curb or Sidewalk Width	
Left	10.8 ft
Right	0 ft
(51) Bridge Roadway Width Curb to Curb	30.8 ft
(52) Deck Width Out to Out	44.9 ft
(32) Approach Roadway Width (W/Shoulders)	26.9 ft
(33) Bridge Median	0-No median
(34) Skew	0 Deg
(35) Structure Flared	No flare
(10) Inventory Route Min Vert Clear	99.99 ft
(47) Inventory Route Total Horiz Clear	30.8 ft
(53) Min Vert Clear Over Bridge Rdwy	99.99 ft
(54) Min Vert Underclear	0 ft
Ref:	
(55) Min Lat Underclear RT	99.9 ft
Ref:	
(56) Min Lat Underclear LT	0 ft

CLASSIFICATION	
(A-7) Agency Admin Area	1
(112) NBIS Bridge Length	Y
(104) Highway System	Non-NHS
(26) Functional Class	6-Rural Minor Arterial
(100) Defense Highway	0-The inventory route is not a S
(A16) TE Route	
(101) Parallel Structure	N-No parallel structure exists.
(102) Direction of Traffic	2 - way traffic
(103) Temporary Structure	
(105) Federal Lands Highways	0-N/A
(110) Designated National Network	0-The inventory route is not part of
(20) Toll	3-On free road. The structure is toll-
(21) Maintain	1-State Highway Agency
(22) Owner	1-State Highway Agency
(37) Historical Significance	2-Bridge is eligible for the NRHP.
CONDITION	
(58) Deck	7
(59) Superstructure	7
(60) Substructure	6
(61) Channel & Channel Protection	7
(62) Culverts	N
LOAD RATING AND POSTING	
(31) Design Load	5-MS 18 / HS 20
(63) Operating Rating Method	1
(64) Operating Rating	55.5
(65) Inventory Rating Method	1-Load Factor(LF)
(66) Inventory Rating	33.2
(70) Bridge Posting	5-Equal to or above legal loads
(41) Structure Open/Posted/Closed	A-Open, no restriction
APPRAISAL	
(67) Structural Evaluation	6
(68) Deck Geometry	6
(69) Clearances, Vertical/Horizontal	N
(71) Waterway Adequacy	8
(72) Approach Roadway Alignment	6
(36) Traffic Safety Features	1111
A) Bridge Railings	1-Inspected feature meets currently a
B) Transitions	1-Inspected feature meets currently a
C) Approach Guardrail	1-Inspected feature meets currently a
D) Approach Guardrail Ends	1-Inspected feature meets currently a
(113) Scour Critical Bridges	3-Bridge is scour critical; bridge fo
APPROVED INSPECTIONS	
(90) Inspection Date	04/2021
(91) Frequency	24 Months
(92) Critical Feature Inspection	Req Freq. (Mon) Date
A: Fracture Critical Detail	No
B: Underwater Inspection	No
C: Other Special Inspection	No
NAVIGATION DATA	
(38) Navigation Control	0-No navigation control on water
(111) Pier Protection	-
(39) Navigation Vertical Clearance	0 ft
(116) Vert-Lift Bridge Nav Min Vert Clr	ft
(40) Navigation Horizontal Clearance	0 ft
AGENCY ITEMS	
(A-21) Fedaid Project no.	TES-5-088(001)000
(A-14) Chaining Date	6/14/2017
(A-15) Delamination Pct	0.0
(A-2) Rating Date	5/12/2017 12:00:00 AM
Bridge Health Index	86.11

Inspection Team Lead: Jake Mertz

ELEM	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
12	Reinforced Concrete Deck	SF	13186	12652	532	2	0
1080	Delamination/Spall/Patched Area	SF	2	0	0	2	0
1090	Exposed Rebar	SF	2	0	2	0	0
1120	Efflorescence/Rust Staining	SF	250	0	250	0	0
1130	Cracking (RC and Other)	SF	280	0	280	0	0
(12)	new deck overlay 2013 - 11/19/2019						
(12-1080)	spall sw corner under curb - 11/19/2019						
(12-1090)	sw corner under side curb - 11/19/2019						
(12-1120)	staining underside of deck and sidewalk. - 11/19/2019						
(12-1130)	No change to this defect. 19April2021						
(12-1130)	cracking on underside of deck - 11/19/2019						
(12-1130)	There is cracking on the underside and some cracks on the top of the deck that measured approximately 0.008 in width. 19April2021						
107	Steel Open Girder/Beam	LF	2051	2000	51	0	0
1000	Corrosion	LF	51	0	51	0	0
515	Steel Protective Coating	SF	25851	0	100	25751	0
3440	Effectiveness (Steel Protective Coatings)	SF	100	0	100	0	0
3410	Chalking (Steel Protective Coatings)	SF	25751	0	0	25751	0
(107-1000)	Freckled rust has initiated on the steel beams. 19April2021						
(107-515-3440)	system beginning to fail in some areas - 11/19/2019						
(107-515-3410)	No change to this defect. 19April2021						
(107-515-3410)	All the steel beams have chalked with loss of pigment. 19April2021						
205	Reinforced Concrete Column	EA	6	6	0	0	0



ELEM	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
210	Reinforced Concrete Pier Wall	LF	75	68	7	0	0
1130	Cracking (RC and Other)	LF	7	0	7	0	0
(210-1130)							
piers have some vertical cracks and scaling. - 11/19/2019							
Pier 2 has 2 cracks that measured approximately 0.020 in width. Pier 3 has 3 cracks that measured approximately 0.020 in width. Pier 4 has 2 cracks that measured approximately 0.020 in width. 19April2021							
215	Reinforced Concrete Abutment	LF	112	106	6	0	0
1130	Cracking (RC and Other)	LF	6	0	6	0	0
(215-1130)							
portion of abutment have vertical cracks and spalls - 11/19/2019							
Abutment 5 has 1 crack in the approximate center of the abutment that measured 0.008 in width. Abutment 1 has approximately 5 cracks that ranged from 0.006 to 0.008 in width. 19April2021							
234	Reinforced Concrete Pier Cap	LF	105	96	9	0	0
1130	Cracking (RC and Other)	LF	9	0	9	0	0
(234-1130)							
north side of pier cap pier 4 cracking - 11/19/2019							
Pier 2 and pier 3 pier caps have approximately 2 feet of cracking on the South end s of each cap. These cracks average approximately 0.006 in width. 19April2021							
303	Assembly Joint with Seal	LF	95	0	0	92	3
2330	Seal Damage	LF	3	0	0	0	3
2350	Debris Impaction	LF	92	0	0	92	0
(303-2330)							
Both joints are filled with debris and the East joint has a hole approximately 3 feet in length next to centerline in the east bound lane. 19April2021							
(303-2350)							
impaction debris starting to cause joint to fail - 11/19/2019							
Both joints are filled with debris and the East joint has a hole approximately 3 feet in length next to centerline in the east bound lane. 19April2021							
311	Movable Bearing	EA	16	0	16	0	0
1000	Corrosion	EA	16	0	16	0	0
515	Steel Protective Coating	SF	80	0	80	0	0
3440	Effectiveness (Steel Protective Coatings)	SF	80	0	80	0	0
(311-1000)							
All the movable bearings have freckled rust initiated. 19April2021							

ELEM	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(311-515-3440)							
All the movable bearings have freckled rust initiated. 19April2021							
313	Fixed Bearing	EA	4	0	4	0	0
1000	Corrosion	EA	4	0	4	0	0
515	Steel Protective Coating	SF	20	0	20	0	0
3440	Effectiveness (Steel Protective Coatings)	SF	20	0	20	0	0
(313-1000)							
All the fixed bearings have freckled rust initiated. 19April2021							
(313-515-3440)							
Freckled rust has initiated on the fixed bearings. 19April2021							
330	Metal Bridge Railing	LF	1217	1212	5	0	0
1020	Connection	LF	5	0	5	0	0
515	Steel Protective Coating	SF	100	100	0	0	0
(330-1020)							
One portion of railing pulling apart and not connected. - 11/19/2019							
331	Reinforced Concrete Bridge Railing	LF	892	892	0	0	0
(331)							
There is hairline cracking on both barriers. 19April2021							
815	Re Conc Backwall	LF	112	112	0	0	0
8398	Slope Protection	EA	2	2	0	0	0
8401	Wings	EA	4	1	2	1	0
1080	Delamination/Spall/Patched Area	EA	1	0	0	1	0
1130	Cracking (RC and Other)	EA	2	0	2	0	0
(8401-1080)							
The Southeast wing has a 6 inch by 6 inch spall with approximately 6 inches of exposed rebar. 19April2021							
(8401-1130)							
The Southwest wing and the Southeast wing have cracks. The Southeast wing crack measured approximately 0.006 in width. The Southwest wing crack measured approximately 0.008. In width. 19April2021							

### **Inspection Comments**

NBI Remarks: Efflorescent staining through cracks on the underside of the deck and sidewalk.

Piers have vertical cracks and some scaling.

Portion of abutment have vertical cracks and some minor spalls.

10/31/2013 - New deck overlay, new expansion joints, new curb and gutter at ends and sealant at walkway. With new drain extensions north side. New guardrail also. In 2013 construction season.

10/31/2013 - North side of pier cap pier # 4 cracking. - 11/19/2019

Exposed rebar SW corner 15' East underside of curb. - 11/19/2019

## Channel Profile

The flow of waterway is considered: S to N

All soundings taken from: Top rail Steel

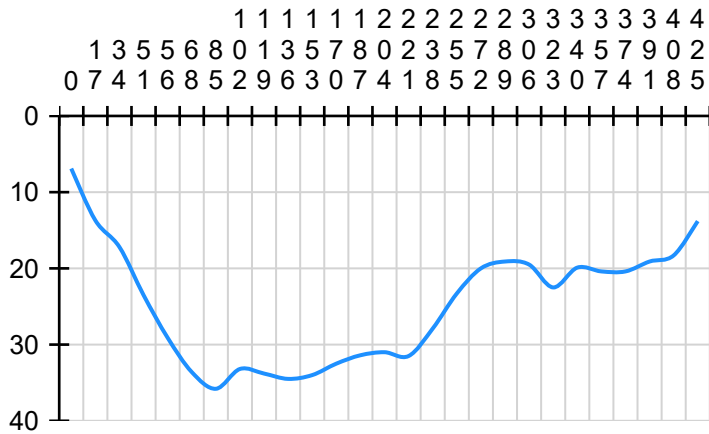
Top of water: 32.6

Bottom of Beam:

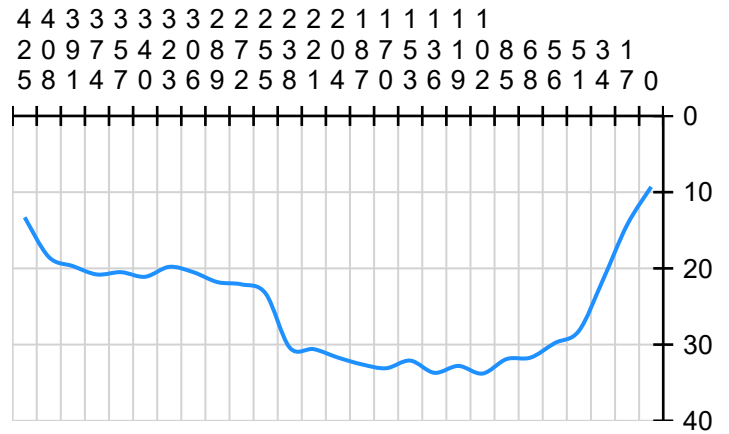
Station	Distance (ft)	DS Measurement (ft)	US Measurement (ft)
1	0	9.3	6.9
2	17	14.3	13.7
3	34	21.5	17.2
4	51	28.2	23.5
5	56	29.8	29.1
6	68	31.7	33.6
7	85	31.9	35.8
8	102	33.8	33.2
9	119	32.8	33.8
10	136	33.7	34.5
11	153	32.1	34
12	170	33.1	32.5
13	187	32.6	31.4
14	204	31.7	31
15	221	30.6	31.5
16	238	30.4	27.9
17	255	23.3	23.3
18	272	22.1	20
19	289	21.8	19.1
20	306	20.5	19.5
21	323	19.8	22.5
22	340	21.1	19.9
23	357	20.5	20.4
24	374	20.8	20.4
25	391	19.7	19.1
26	408	18.5	18.3
27	425	13.3	13.8



UpStream Measurements



DownStream Measurements



**CHANNEL PROFILE**  
North Dakota Department of Transportation, Bridge  
SFN 17336 (7-2016)

Structure Number: 0094-901.376 Date: 4/19/21 Inspector's Name: Michael Mente

**STREAM CROSS SECTION**  
NOTE: Stream profile is to be taken on both sides of the bridge. Check appropriate directions.

Profile 1 taken on ☒ N ☐ S ☐ E ☐ W side of bridge, from ☐ N to S ☐ W to E  
Measurements taken from top of ☐ Curb ☒ Rail ☐ Deck  
Measurements taken at Top Steel Intervals (ft.) 9.3  
Measurements are as follows: 65C 31.7 85C 31.9 105C 33.7 125C 34.5 145C 35.2 165C 35.8 185C 36.5 205C 37.2

Profile 2 taken on ☐ N ☐ S ☐ E ☐ W side of bridge, from ☐ N to S ☐ W to E  
Measurements taken from top of ☐ Curb ☐ Rail ☐ Deck  
Measurements taken at Intervals (ft.)  
Measurements are as follows: 25C 21.8 30C 20.5 35C 19.3 40C 18.1 45C 17.3 50C 16.5 55C 15.8 60C 15.1

Evidence of Scour at Bridge	Yes	No	NA
Channel slopes washing or sloughing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scour holes near abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Scour holes near piers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bed deposits downstream	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Exposure of footings	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Debris collection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Riprap (if any) displaced	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Existing Channel Condition	Yes	No	NA
Are channel banks up and downstream of bridge stable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the channel degrading/aggrading up or downstream?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the Structure on a channel change?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are there lakes, reservoirs, dams, etc., near the crossing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Does the channel appear to be moving laterally in the area of the bridge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Substructure Condition (Below Waterline)	Yes	No	NA
Is pier/abutment scaling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is pier/abutment spalling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there exposed rebar?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Substructure Condition (Below Waterline)	Yes	No	NA
Is there exposed piling below footing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there cracks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there section loss on members?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If yes is answered to any of the questions, measurements should be taken. Also, include sketches along with dimensions when possible. These deficiencies shall be reflected in the rating of item 60. If these questions can not be answered, notify Bridge Division.

**NOTE:** Take pictures or draw sketches of any and all factors contributing to scour or movement of the channel or streambed. Some factors are, but are not limited to, inadequate waterway area, ice jams/floes, debris, and channel/structures alignment. Give scour hole dimensions.

Enter any remarks or explanations for the above items below. Use an additional page if necessary.

*Some Scour around Pier 2  
Bank too straight due to past floods*

Channel profile

**CHANNEL PROFILE**  
North Dakota Department of Transportation, Bridge  
SFN 17336 (7-2016)

Structure Number: 0094-901.376 Date: 4/19/21 Inspector's Name: Michael Mente

**STREAM CROSS SECTION**  
NOTE: Stream profile is to be taken on both sides of the bridge. Check appropriate directions.

Profile 1 taken on ☐ N ☒ S ☐ E ☐ W side of bridge, from ☐ N to S ☐ W to E  
Measurements taken from top of ☐ Curb ☒ Rail ☐ Deck  
Measurements taken at Top Steel Intervals (ft.) 9.3  
Measurements are as follows: 65C 33.6 85C 35.8 105C 37.2 125C 38.5 145C 39.8 165C 41.1 185C 42.4 205C 43.7

Profile 2 taken on ☐ N ☐ S ☐ E ☐ W side of bridge, from ☐ N to S ☐ W to E  
Measurements taken from top of ☐ Curb ☐ Rail ☐ Deck  
Measurements taken at Intervals (ft.)  
Measurements are as follows: 25C 19.1 30C 18.3 35C 17.5 40C 16.7 45C 15.9 50C 15.1 55C 14.3 60C 13.5

Evidence of Scour at Bridge	Yes	No	NA
Channel slopes washing or sloughing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scour holes near abutments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Scour holes near piers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bed deposits downstream	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Exposure of footings	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Debris collection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Riprap (if any) displaced	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Existing Channel Condition	Yes	No	NA
Are channel banks up and downstream of bridge stable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the channel degrading/aggrading up or downstream?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the Structure on a channel change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there lakes, reservoirs, dams, etc., near the crossing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the channel appear to be moving laterally in the area of the bridge?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Substructure Condition (Below Waterline)	Yes	No	NA
Is pier/abutment scaling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is pier/abutment spalling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there exposed rebar?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Substructure Condition (Below Waterline)	Yes	No	NA
Is there exposed piling below footing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there cracks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there section loss on members?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If yes is answered to any of the questions, measurements should be taken. Also, include sketches along with dimensions when possible. These deficiencies shall be reflected in the rating of item 60. If these questions can not be answered, notify Bridge Division.

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Enter any remarks or explanations for the above items below. Use an additional page if necessary.

*Minor Scour visible @ pier 2  
Bank straightened due to past floods*

Channel profile





SW wing cracks



South barrier crack





SE wing



N1 beam





N1 beam



Abutment 5 cracks .008





S1 beam chalking looking west



SE wing spall and exposed rebar 6"x6"





SE wing crack .006



East strip seal damage





East strip seal joint damage



East strip seal joint damage



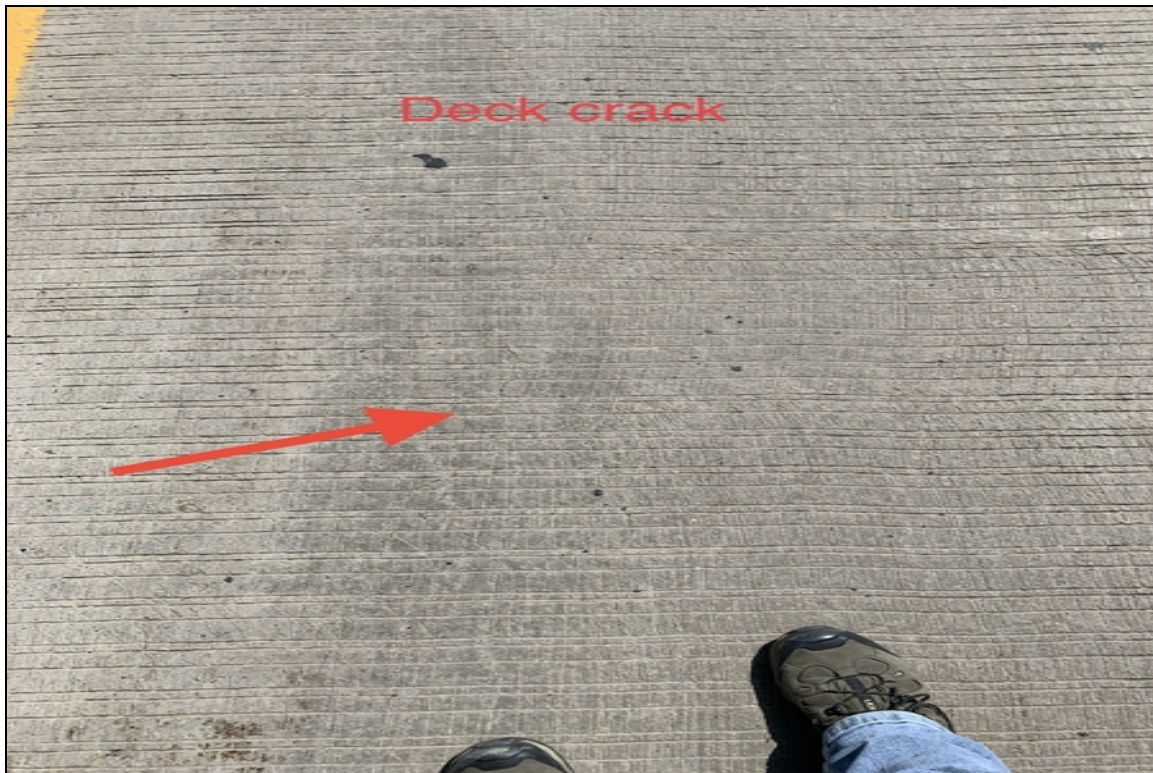


Deck looking west



Deck crack .006





Deck crack



West strip seal





Looking east



Looking west



Looking north



Looking south





Span 1 deck crack and efflorescence



Pier 2 west face





West abutment



Deck cracking above pier 2 with small pop out





Deck cracking above pier 2 with small pop out



.020 pier 2 crack



Pier 2 crack west face



.006 pier 2 south end cap





South side soffit spalling exposed rebar



Span 1 west side pier 2 s1 beam paint failure



Span 1 west side pier 2 s1 beam paint failure



Pier 2 south end cap cracks





Pier 2 location south over hang spalls



S1 looking east

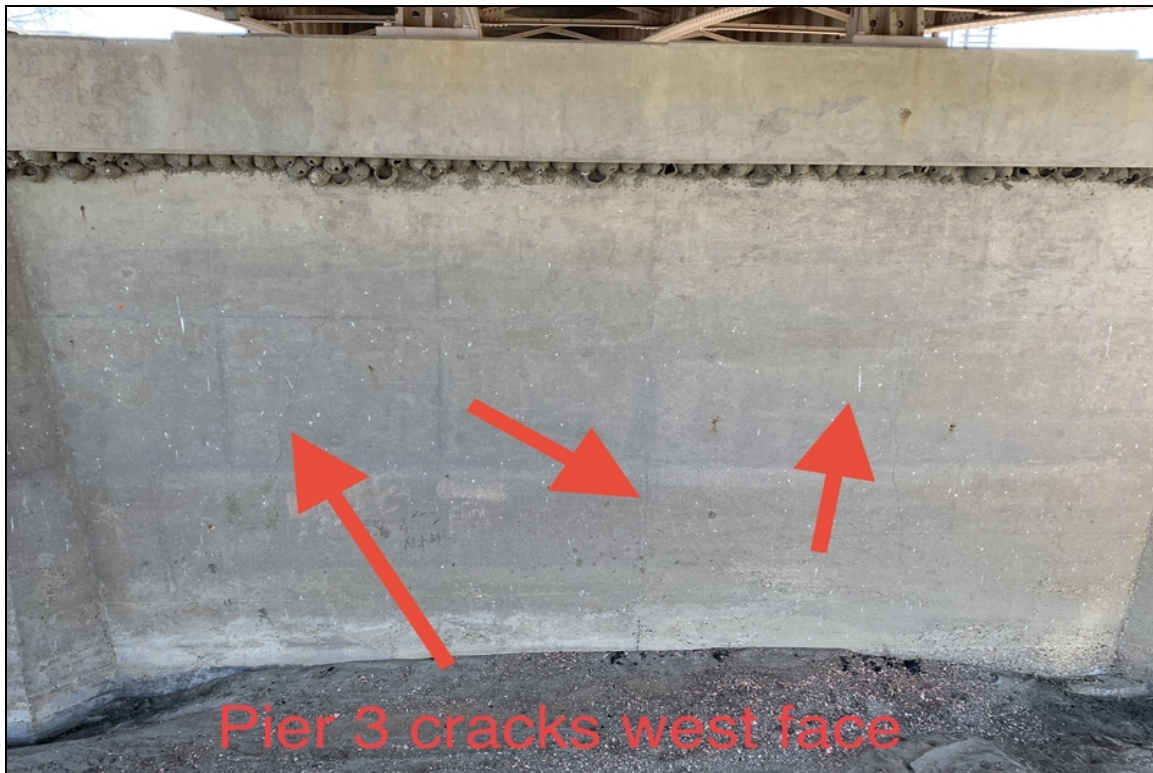


Pier 3 bearings



Pier 3 bearings





Pier 3 cracks west face



Looking east north side sidewalk





Pier 3 scaling



.020 pier 3 cracks





Pier 3 cap minor pop out 2"x2" west face

Pier 3 cap minor pop out 2"x2"



Span 3 erosion

Span 3 erosion



.010 pier 3 cap crack

.010 pier 3 cap crack



Span2 s1

Span 2 s1 paint failure





Span 2 s1 paint failure



West abutment s1 bearing



West abutment s1 bearing



Pier 4 west face





Channel debris



West abutment crack .006





West slope protection



West abutment





West abutment crack



West backwall and deck lips repairs



West sidewalk abutment cracks .006



## Maintenance Needs

**Date Reported:** 04/19/2021  
**Priority:** High  
**Type of Work:** Replace Joint Seal (P)  
**Status:** Unknown  
**Component:** Deck

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## Deficiency Description

Both joints are filled with debris and the East joint has a hole approximately 3 feet in length next to centerline in the east bound lane.

## Remarks

Recommend to replace the East joint seal and remove debris from the West joint seal. 19April2021

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**Date Reported:** 04/19/2021  
**Priority:** Normal  
**Type of Work:** Repair Erosion  
**Status:** Unknown  
**Component:** 8401 - Wings

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#### Deficiency Description

There is some erosion occurring around the bottom of the Northeast wing.

#### Remarks

Recommend replacing lost material due to erosion. 19April2021

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Erosion NE wing