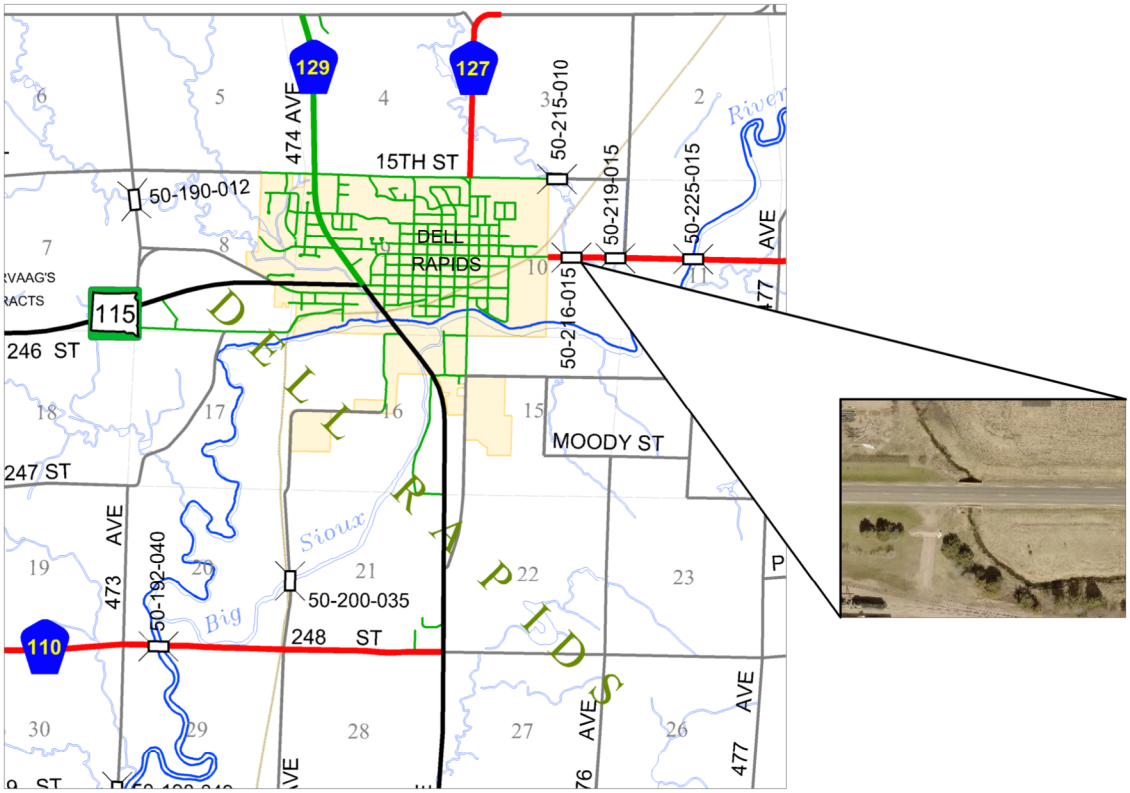
Bridge Inspection Report
for
Minnehaha County
South Dakota
2022
Structure No. 50-216-015
Jasper Street / Co. Hwy 104



Dell Rapids Township

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12059
CHRIS J. BROZIK
SOUTH DAKOTA

10/28/22

CIVIL DESIGN INC

MINNEHAHA COUNTY
18 62
SOUTH DAKOTA

Repair and Posting Recommendations
Bridges Maintained by Local Governments

Structure No. 50-216-015 **Hwy or Street** Jasper St. / Co. Hwy. 104

FA Route No. 6250 **Agency Responsible for Maintenance** Minnehaha Co.

Location 1.2 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 34.0 ft Three Span Continuous Concrete Bridge with Concrete Abutments.

0 Degree Skew - 30.2 ft Roadway Width.

Date Inspected 6/16/2022 **Year Built** 1922 - Reconstructed 1966

Posting Recommendations

Single Unit - N.A. tons Current Posting: Not Posted

Combination - N.A. tons Legal Loads: No Load Posting Required

Legal Loads Based on Article 6.1.4 of AASHTO "The Manual for Bridge Evaluation", Third Edition

Repair, Rehabilitation, and/or Replacement Recommendations

1. Install bridge railing rubrails and approach guardrails as required.
2. Install NE object marker that is damaged and lying on ground.
3. Straighten the 1st delineator along the NW approach.
4. Clean and repair/patch areas of scaling, spalling, and exposed rebar on the underside of the concrete slab.
5. Clean and repair/patch areas of deterioration and honeycombing at the center columns in the east & west bents.
6. Patch hole in slab along south side of original slab in west span.
7. Monitor underside of concrete slab for continued deterioration.
8. **Structure is currently in the 5-year capital improvement plan & scheduled for future replacement.**

The South Dakota Department of Transportation is required by Federal Statute to maintain an inventory of all bridges on all public traveled routes. Therefore, it is important that County and City Officials report any changes on bridges on their system. Examples of changes which should be reported are: Replacement of an existing bridge with pipe or new bridge, safety updated, rehabilitation or repair of an existing bridge etc. Changes should be reported to: South Dakota Department of Transportation, Local Government Assistance, Pierre, South Dakota, 57501.

RECOMMENDATIONS MADE BY: _____ DATE: 6/16/2022

Chris Brozik, P.E.

Bridge Inspection Report

Structure No. 50-216-015 **Maint. Proj. No.**

Feature Carried Jasper St. / Co. Hwy. 104 **County** Minnehaha Co.

Feature Crossed Unnamed Tributary to Big Sioux River

Location 1.2 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 34.0 ft Three Span Continuous Concrete Bridge with Concrete Abutments.
0 Degree Skew - 30.2 ft Roadway Width.

Date Inspected	Inspectors	Temperature
06/16/22	Chris Brozik, P.E. & Anthony Peters	63 Deg F

Approach - Items 65.00 - 65.09

1. ALIGNMENT - The vertical and horizontal alignments are good.

2. CONDITION - Bituminous - Smooth.

3. JOINTS - None

4. GUARD RAILS - None

5. EMBANKMENT - Good - No sign of erosion behind the wingwalls. There is a CMP culvert underneath the roadway approach off the SW corner of the structure which discharges into the channel just off the end of the SW wingwall. There is some erosion evident off the end of the culvert, but it does not appear to be endangering the structure.

6. DRAINAGE - The drainage of the roadway is good.

7. SIGNAGE - Type 2 Object Markers - At all four (4) corners of the structure. The NE object marker is damaged and lying on the ground.

   Delineators - There are four (4) delineators located off the NW, NE, and SE corners and three (3) delineators located off the SW corner of the structure. The first delineator along the SW approach was not installed due to a residential entrance. The 1st delineator along the NW approach is slightly bent forward. Otherwise, the delineators appear to be in relatively good condition.

8. GPS COORDINATES - Latitude: 43.82602 North Longitude: -96.69411 West

Structure Number 50-216-015 **Date** 06/16/22

Deck - Items 58.00 - 58.17

1. DECK CONDITION - CRACKING, SCALING, SPALLING, AND DELAMINATIONS -

   Cast-in-place concrete - The top surface of the concrete slab is not visible due to the bituminous overlay.

2. OVERLAY - TYPE, THICKNESS, AND CONDITION -

   Bituminous - Approximate 6-inch average depth, smooth. Light vegetation growth is evident along edges of overlay.

3. JOINTS - OPENINGS - None

4. DRAINS - None

5. CURBS AND MEDIAN - Cast-in-place concrete - Some vertical hairline cracks and areas of light scaling and rust staining are evident throughout. Overall, the concrete curbs appear to be in relatively good condition.

6. SIDEWALKS - None

7. RAILING OR BARRIER - The railings consist of a painted steel channel mounted on painted double steel angle posts. The paint on the railing members appears to be in fair to good condition with some areas of surface rust evident.

8. LIGHTING - None

9. UTILITIES - None

10. DECK DELAMINATION SURVEY - Unable to perform a deck delamination survey due to the bituminous overlay.

Structure Number 50-216-015 **Date** 06/16/22

Superstructure - Items 59.00 - 59.20

1. UNDERSIDE OF DECK - Cast-in-place concrete - The original structure appears to have been widened approximately 7 ft along both sides. A significant amount of spalling is evident along the south side of the original slab in all spans and along north side of original slab in east span which have exposed reinforcing steel. The exposed portions of the reinforcing steel are heavily rusted with plating evident and moderate section loss, but does not appear to be affecting structure capacity at the time of inspection. Stalactites are evident along south side of original slab at the west and center spans. There are longitudinal hairline cracks and areas of light scaling evident throughout the original portion of the slab with a couple areas of efflorescence evident. Areas of light scaling are also evident on the underside of the widening portions of the concrete slab. There is an approximate 3"x5"x10" deep hole in the south side of the original slab in the west span which appears to extend to the bottom of the bituminous overlay.
2. BEARING DEVICES - None
3. GIRDERS OR BEAMS - STIFFENERS, WELDS, SPLICES, AND ETC. -

   None
4. DIAPHRAGMS - None
5. TRUSSES - MAIN MEMBERS, PORTALS, BRACING, GUSSET PLATES, AND ETC. -

   None
7. RIVETS OR BOLTS - None
8. WELDS - None
9. PAINT - None
10. DRAINAGE SYSTEM - None
11. UTILITIES - None
12. REACTION UNDER LOAD - No excessive deflection under heavy vehicle load.
13. COLLISION DAMAGE - None evident.

Structure Number 50-216-015 **Date** 06/16/22

Substructure - Items 60.00 - 60.05

1. ABUTMENTS -

   A. WINGWALLS - The wingwalls consist of cast-in-place concrete and are direct extensions of the backwalls. Some chips are evident along the tops of the wingwalls. It appears these chips occurred during the placement of the riprap. Overall, the wingwalls appear to be in relatively good condition.

   B. BACKWALLS - The backwalls consist of cast-in-place concrete. Both ends of the original backwalls were extended when the structure was widened. There are some areas of honeycombing evident in the original portions of the backwalls. A spall is evident at the north end of the original portion of the east backwall. The widening portions of the backwalls appear to be in relatively good condition.

   C. FOOTINGS - None

   D. PILE CAPS - None

2. PIERS OR BENTS -

   A. CAPS - Cast-in-place concrete - The original concrete caps were extended when the structure was widened. Some areas of light to moderate scaling are evident throughout and some vertical hairline cracks are evident over the columns. Overall, the concrete bent caps appear to be in satisfactory condition.

   B. COLUMNS - Cast-in-place concrete - There are five (5) concrete columns per bent (10 total columns). The original bents consisted of three (3) columns. The original end columns were added onto and an additional column was added at the ends of the bents when the structure was widened. A significant amount of deterioration and a lack of consolidation is evident towards the bottom of the center column in both bents.

   C. FOOTINGS - The portion of the concrete footings at columns #2 - #5 in both bents have been exposed, but do not appear to be undermined.

3. GROUT PADS - None

4. ANCHOR BOLTS - None

5. PILES - None visible.

6. BRACING - None

7. PAINT - None

Structure Number 50-216-015 **Date** 06/16/22

Substructure - Items 60.00 - 60.05 (Continued)

8. MOVEMENT -

   A. PLUMBNESS - Everything appears vertical.

   B. SETTLEMENT - None evident.

   C. HORIZONTAL - None evident.

Structure Number 50-216-015 **Date** 06/16/22

Channel and Channel Protection - Items 61.00 - 61.09

1. CHANNEL -

   A. ALIGNMENT - The channel alignment is fair. It appears a RHF skew would better fit the channel.

   B. VEGETATION - Good

   C. SCOUR - None

   D. DEBRIS - None

   E. FLOW LINE - Well defined.

2. EMBANKMENT EROSION - Minor amount of embankment erosion is evident in both the upstream and downstream channels.

3. WATERWAY ADEQUACY - Appears adequate.

4. SPUR DIKES & JETTIES - None

5. WING DAMS - None

6. RIP RAP - A significant amount of riprap has been placed along NW channel bank, in front of the wingwalls, and at the ends of the backwalls at the corners of the structure.

7. OBSERVED HIGH WATER ELEVATION - Appears to be approximately 2 to 3 feet below the bottom of the concrete slab.

8. STREAM BED - Appears relatively stable.

ELEMENT LEVEL INSPECTION
(Main Span)

Str. No.: 50-216-015		**Maint. Proj. No.:**	
Feature Carried: Jasper St. / Co. Hwy. 104		**MRM:**	**County:** Minnehaha Co.
Feature Crossed: Unnamed Tributary to Big Sioux River			
Location: 1.2 miles east and 0.2 miles north of Dell Rapids, SD.			
Bridge Description: 34.0 ft Three Span Continuous Concrete Bridge with Concrete Abutments.			
0 Degree Skew - 30.2 ft Roadway Width.			
Length: 34.0 ft	**Roadway width:** 30.2 ft		**Deck width:** 34.2 ft
Deck Area : Length x Deck Width = 1,163 Sq. ft			**Skew:** 0 degrees
Inspector(s): Chris Brozik, P.E. & Anthony Peters		**Date:** 06/16/22	

Element Condition States

Elem Num	Element Description	Env	Quantity	Units	Quantity in Condition State 1	2	3	4	
38	Reinforced Concrete Slab	2	1,163	SF	425	630	108		
1090	Exposed Rebar	2		SF			68		
1080	Delamination/Spall/Patched Area	2		SF		430			
1130	Cracking	2		SF		200			
1120	Efflorescence/Rust Staining	2		SF			40		
1190	Abrasion/Wear	2		SF					
1900	Distortion	2		SF					
4000	Settlement	2		SF					
6000	Scour	2		SF					
7000	Damage	2		SF					
814	AC w/o Membrane Overlay	2	1,027	SF	1,027				
3230	Effectiveness	2		SF					
3210	Delam./Spall/Patched Area/Pothole	2		SF					
3220	Crack	2		SF					
7000	Damage	2		SF					
205	Columns, Reinforced Concrete	2	10	EA		8	2		
1090	Exposed Rebar	2		EA					
1080	Delamination/Spall/Patched Area	2		EA		8	2		
1130	Cracking	2		EA					
1120	Efflorescence/Rust Staining	2		EA					
1190	Abrasion/Wear	2		EA					
1900	Distortion	2		EA					
4000	Settlement	2		EA					
6000	Scour	2		EA					
7000	Damage	2		EA					
215	Abutment, Reinforced Concrete	2	68	LF	28	40			
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF		40			
1130	Cracking	2		LF					

1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
234	Pier Cap, Reinforced Concrete	2	68	LF	68				
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF					
1130	Cracking	2		LF					
1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
330	Metal Bridge Railing	2	68	LF	68				
1010	Cracking	2		LF					
1020	Connection	2		LF					
1900	Distortion	2		LF					
1000	Corrosion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
816	Lead Based Paint	2	196	SF	196				
3420	Peeling/Bubbling/Cracking	2		SF					
3440	Effectiveness	2		SF					
3410	Chalking	2		SF					
7000	Damage	2		SF					
817	Non-Lead Based Paint	2		SF					
3420	Peeling/Bubbling/Cracking	2		SF					
3440	Effectiveness	2		SF					
3410	Chalking	2		SF					
7000	Damage	2		SF					
818	Metallized/Galvanized Coating	2		SF					
3420	Peeling/Bubbling/Cracking	2		SF					
3440	Effectiveness	2		SF					
3410	Chalking	2		SF					
7000	Damage	2		SF					

Bridge Inspection Digital Photo Log

Structure No. **50-216-015**

Photo Number:	Date:	Description:
1	6/16/2022	Approach looking East
2	6/16/2022	Approach looking West
3	6/16/2022	Profile looking North
4	6/16/2022	Profile looking South
5	6/16/2022	CMP Culvert Outlet at SW Corner of Structure
6	6/16/2022	NE Object Marker Damaged and on Ground
7	6/16/2022	1st NW Approach Delineator Slightly Bent
8	6/16/2022	Top of Bituminous Overlay looking West
9	6/16/2022	South Bridge Rail
10	6/16/2022	North Bridge Rail
11	6/16/2022	Typical Rail Post Condition
12	6/16/2022	Underside of Existing Slab, South side of East Span
13	6/16/2022	Underside of Existing Slab, North side of East Span
14	6/16/2022	Underside of Existing Slab, South side of Center Span
15	6/16/2022	Underside of Existing Slab, North side of Center Span
16	6/16/2022	Underside of Existing Slab, South side of West Span
17	6/16/2022	Underside of Existing Slab, North side of West Span
18	6/16/2022	Hole in underside of Slab, South side of West Span
19	6/16/2022	West Backwall
20	6/16/2022	East Backwall
21	6/16/2022	NE Backwall Spall
22	6/16/2022	Typical Configuration of Bent
23	6/16/2022	West Bent Center Column Honeycombing
24	6/16/2022	East Bent Center Column Honeycombing
25	6/16/2022	Typical Exposed Concrete Footing (West Bent Column #3 shown)
26	6/16/2022	Upstream Channel looking NW
27	6/16/2022	Downstream Channel looking South
28	6/16/2022	Riprap along NW Channel Bank
29	6/16/2022	Riprap in front of SE Wingwall
30	6/16/2022	Riprap in front of NE Wingwall

50-216-015_2022_1_CDI_Approach looking East

50-216-015_2022_2_CDI_Approach looking West

50-216-015_2022_3_CDI_Profile looking North

50-216-015_2022_4_CDI_Profile looking South

50-216-015_2022_5_CDI_CMP Culvert Outlet at SW Corner of Structure

50-216-015_2022_6_CDI_NE Object Marker Damaged and on Ground

50-216-015_2022_7_CDI_1st NW Approach Delineator Slightly Bent

50-216-015_2022_8_CDI_Top of Bituminous Overlay looking West

50-216-015_2022_9_CDI_South Bridge Rail

50-216-015_2022_10_CDI_North Bridge Rail

50-216-015_2022_11_CDI_Typical Rail Post Condition

50-216-015_2022_12_CDI_Underside of Existing Slab, South side of East Span

50-216-015_2022_13_CDI_Underside of Existing Slab, North side of East Span

50-216-015_2022_14_CDI_Underside of Existing Slab, South side of Center Span

50-216-015_2022_15_CDI_Underside of Existing Slab, North side of Center Span

50-216-015_2022_16_CDI_Underside of Existing Slab, South side of West Span

50-216-015_2022_17_CDI_Underside of Existing Slab, North side of West Span

50-216-015_2022_18_CDI_Hole in underside of Slab, South side of West Span

50-216-015_2022_19_CDI_West Backwall

50-216-015_2022_20_CDI_East Backwall

50-216-015_2022_21_CDI_NE Backwall Spall

50-216-015_2022_22_CDI_Typical Configuration of Bent

50-216-015_2022_23_CDI_West Bent Center Column Honeycombing

50-216-015_2022_24_CDI_East Bent Center Column Honeycombing

50-216-015_2022_25_CDI_Typical Exposed Concrete Footing (West Bent Column #3 shown)

50-216-015_2022_26_CDI_Upstream Channel looking NW

50-216-015_2022_27_CDI_Downstream Channel looking South

50-216-015_2022_28_CDI_Riprap along NW Channel Bank

50-216-015_2022_29_CDI_Riprap in front of SE Wingwall

50-216-015_2022_30_CDI_Riprap in front of NE Wingwall

CHANNEL PROFILE

MINNEHAHA COUNTY

STR. NO. 50-216-015

MEASUREMENTS TAKEN FROM THE TOP OF: **RAIL**

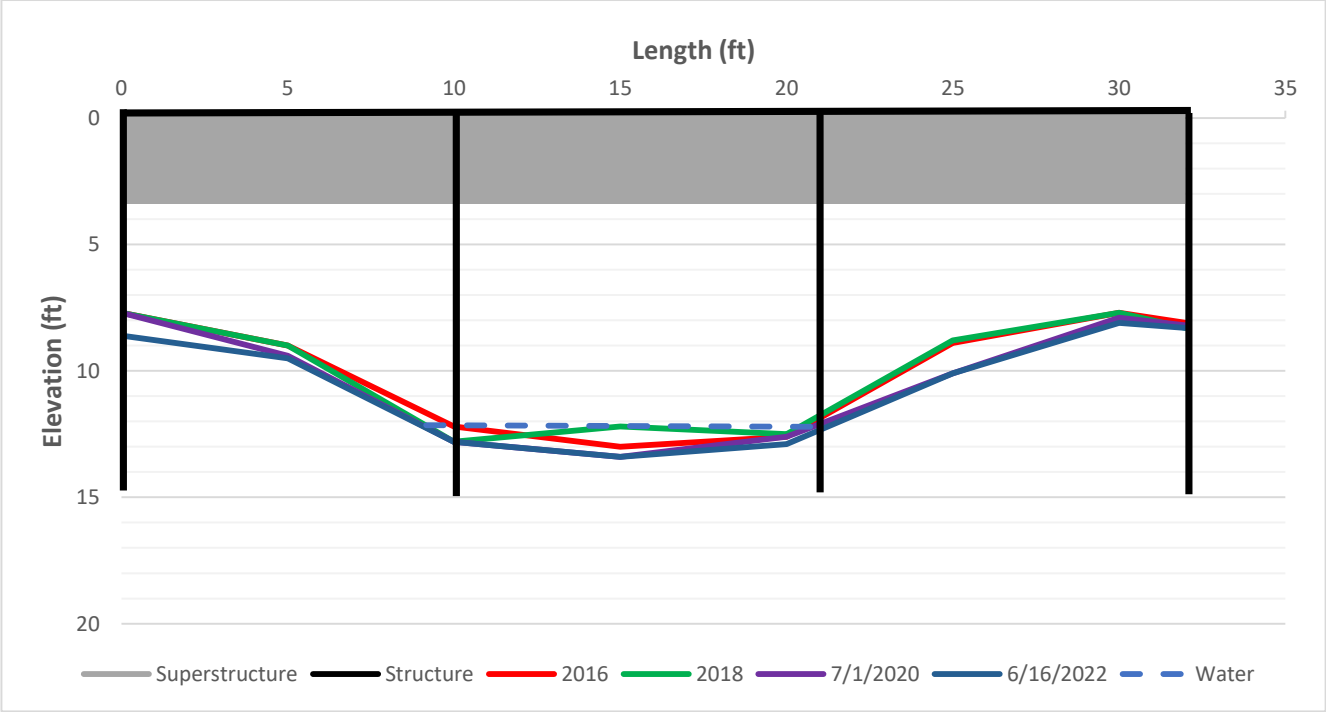
MEASUREMENTS TAKEN ON THE INLET SIDE OF THE STRUCTURE: **NORTH**

WATER ELEV: **12.6**

		2016	2018	7/1/2020	6/16/2022
West End	0	7.7	7.7	7.7	8.6
	5	9.0	9.0	9.4	9.5
	10	12.2	12.8	12.8	12.8
	15	13.0	12.2	13.4	13.4
	20	12.6	12.5	12.6	12.9
	25	8.9	8.8	10.1	10.1
	30	7.7	7.7	7.9	8.1
East End	32	8.1	8.3	8.2	8.3

ABUT./BENT	
1	0
2	10
3	21
4	32

Top of RAIL to bottom of Superstructure 3.5 ft.



Note: Only Partial Set of Construction Plans are enclosed in SDDOT bridge inspection file.

CIVIL DESIGN INC

General Bridge Data

(8) STR NO : 50-216-015

(7) FACILITY : JASPER ST, HWY 104

(6) FEAT INTER : TRIB TO BIG SIOUX RV

(9) LOCATION : 1.2E & 0.2N DELL RAPIDS

INTERCHANGE : N

SECTION(S) : 10 -1 -1 -1

TOWNSHIP(S) : 104N -1

RANGE(S) : 49W -1

(2) REGION : Mitchell

(3) COUNTY : 50 MINNEHAHA

(21) CUSTODIAN : 2 County Hwy Agency

(22) OWNER : 2 County Hwy Agency

MAINT PROJ :

(42A) SERV TYPE ON : 1 Highway

(42B) SERV TYPE UND : 5 Waterway

(103) TEMP STRUCTURE : Unknown (NBI)

(99) BORDER BRIDGE STR NO : -1

(98A) NEIGHBOR STATE : Unknown (P)

(98B) PERCENT SHARE : -2.00

Highway Carried (NBI 5)

(5B) ROUTE PREFIX : 4 County Hwy

(5C) LEVEL OF SERVICE : 1 Mainline

(5D) ROUTE NUMBER : 00000

(5E) DIRECT SUFFIX : 0 N/A (NBI)

MRM ENGLISH : 0.00

POSTED SPEED : 55 MPH

SCHOOL BUS RT : Y

MAIL RT : Y

(104) NHS SYSTEM : 0 Not on NHS

FA ROUTE : 6250

(26) FUNC CLASS : 07 Rural Mjr Collector

(28A) LANES : 2

(102) DIRECTION TRAFFIC : 2 2-way traffic

(105) FED LANDS HWY : 0 N/A (NBI)

(19) DETOUR : 9.00 mi

(29) ADT TOTAL : 1120.00

(30) YEAR OF ADT : 2021

(109) % TRUCK : 3.00 %

(53) MIN V CLR RT : 99.99 ft

(53) MIN V CLR LT : 0.00 ft

(10) MAX V CLR RT : 99.99 ft

(10) MAX V CLR LT : 0.00 ft

(47) HORIZ V CLR RT : 30.20 ft

(47) HORIZ V CLR LT : 0.00 ft

GIS Data

LATITUDE : 43.82602

LONGITUDE : -96.69411

DATE : 03/28/2016

COMMENT : Calculated GIS INFO

Main Span

(27) YEAR BUILT : 1922

(106) RECONSTR : 1966

(49) STR LENGTH : 34.00 ft

NBIS BRIDGE LENGTH : 32.00 ft

(48) MAX SPAN LENGTH : 11.00 ft

(43A) MATERIAL : 2 Concrete Continuous

(43B) DESIGN : 01 Slab

SD STR TYPE : X020

(107) DECK STR TYPE : 1 Concrete-Cast-in-Place

(52) DECK WIDTH : 34.20 ft

(51) BRIDGE RDWY WIDTH : 30.20 ft

(32) APPR RDWY WIDTH : 24.00 ft

(50A) LT SIDEWALK WIDTH : 0.00 ft

(50B) RT SIDEWALK WIDTH : 0.00 ft

(34) SKEW : 0.00°

SKEW DIR :

(45) NO MAIN SPANS : 3

(46) NO APPR SPANS : 0

(31) DESIGN LOAD : 0 Unknown

(33) BRIDGE MEDIAN : 0 No median

(35) STR FLARED : 0 No flare

Box Culvert Data

BOX CULVERT SIZE : 0 X 0 X 0

FILL HT OVER BOX : 0.00 ft

LENGTH OF LONGEST CELL : 0.00 ft

Rail Data

(36) SAFETY FEAT : 0000

BRIDGE RAIL 1 : 06 - STL DISCONT CHANNEL RAIL

RAIL TRANS 1 : 00 - NO TRANSITION PROVIDED

APPR RAIL 1 : 00 - NO APPROACH RAIL

APPR RAIL TERM 1 : 00 - NO TERMINALS PROVIDED

NBI Prop Work

(75A) WORK TYPE : 31 Repl-Load Capacity

(75B) WORK BY : 1 Contract

(76) IMPROV LENGTH : 184.06 ft

(94) BRIDGE IMPROV COST : $263,756.00

(95) RDWAY IMPROV COST : $26,376.00

(96) TOTAL PROJECT COST : $449,960.00

(97) YEAR OF IMPROV COST : $2,018.00

(114) ADT FUTURE : 1400.00

(115) YEAR OF ADT FUTURE : 2036

Steel Paint

UNDERCOAT :

TOPCOAT :

YEAR :

COLOR :

Status

SUFF RATE : 48.50

FED SUFF RATE : 63.40

FED SR DATE : 03/14/2022

DEFICIENCY : S

CANDIDATE : H

Deck Data

(108A) WEARING SURFACE : 6 Bituminous

DECK PROTECTION : None

OVERLAY THICKNESS : 6.00 in

DECK DELAM AREA : 0.00 sq ft

DECK DELAM DATE :

DECK SURVEY :

CHLORIDE : N

RESTEEL DEPTH : N

ELECTRO POTENT : N

Load Rating Data

(41) OPER STATUS : A Open, no restriction

(66) INV HS20 : 21.60 tons

(65) METHOD : 0 Field eval and docs

(64) OP HS20 : 36.00 tons

(63) METHOD : 0 Field eval and docs

TRUCK TYPE 3 : 24.00 tons

TRUCK TYPE 3S2 : 40.00 tons

TRUCK TYPE 3-2 : 46.00 tons

NRL : 40.00 tons

SHV-4 : 27.00 tons

SHV-5 : 31.00 tons

SHV-6 : 34.80 tons

SHV-7 : 38.80 tons

EV2 : tons

EV3 : tons

BARS NO : JDG

Hydraulics

DRAINAGE AREA : 3.35 sq mi

OBSERV HW ELEV : 0.00 ft

YEAR : 01/01/1901

DESIGN FREQ : 0.00

DESIGN FLOW : 0.00 cfs

DESIGN VELOCITY : 0.00 fps

DESIGN AREA : 0.00 sq ft

DESIGN YEAR :

DESIGN HW ELEV : ft

100 YEAR FLOW : 0.00 cfts

100 YEAR HW ELEV : ft

V MAX : fps

SCOUR SCREENING : 2

SCOUR RATING : U

TOPEKA SHINER : N

Rail Paint

UNDERCOAT : LEAD-BASED PAINT

TOP COAT : LEAD-BASED PAINT

YEAR :

COLOR : ORANGE

Highway Carried (Under Record)

(5A) RECORD TYPE :
(5B) ROUTE PREFIX :
(5C) LEVEL OF SERVICE :
(5D) ROUTE NUMBER :
(5E) DIRECT SUFFIX :
MRM :
ADM JUR :
(104) NHS SYSTEM :
FA ROUTE :
(26) FUNC CLASS :
(28B) LANES :
(101) DIRECTION OF TRAFFIC :
(19) DETOUR LENGTH : mi
(29) ADT :
(30) ADT YEAR :

(54) MIN V CLR RT :
(54) MIN V CLR LT :
(10) MAX V CLR RT :
(10) MAX V CLR LT :
(47) HORIZ CLR RT :
(47) HORIZ CLR LT :
(55) OUT UNDCLR RT :
(55) OUT UNDCLR LT :
(56) MED UNDCLR RT :
(56) MED UNDCLR LT :

Project Number	PCN	Date Done
NA	none	01/01/1922

Inspection

GENERAL COMMENT : -1
REGION COMMENT : -1
FREE COMMENT : -1

INSPECTION TYPE	LAST INSPECTION DATE	REQUIRED	INSPECTION FREQUENCY	NEXT INSP DATE
NBI	06/16/2022		24 month(s)	06/16/2024
FRACTURE CRITICAL	NA	N	NA	NA
UNDERWATER	NA	N	NA	NA
SPECIAL	NA	N	NA	NA
ELEMENT INSPECTION	06/16/2022		24 month(s)	06/16/2024

INSPKEY : BHSS
APPRAIS BY : CLB
APPRAIS DATE : 10/03/2022
QA INSPECTOR :
QA INSP DATE :
LAST INSPECTION BY :
CONSULTANT CODE : CIVIL DESIGN

Condition Ratings

(58) DECK : 4
(59) SUPER : 4
(60) SUB : 5
(62) CULVERT : N
(113) SCOUR : U
(61) CHANNEL : 6
APPROACH : 7 -1

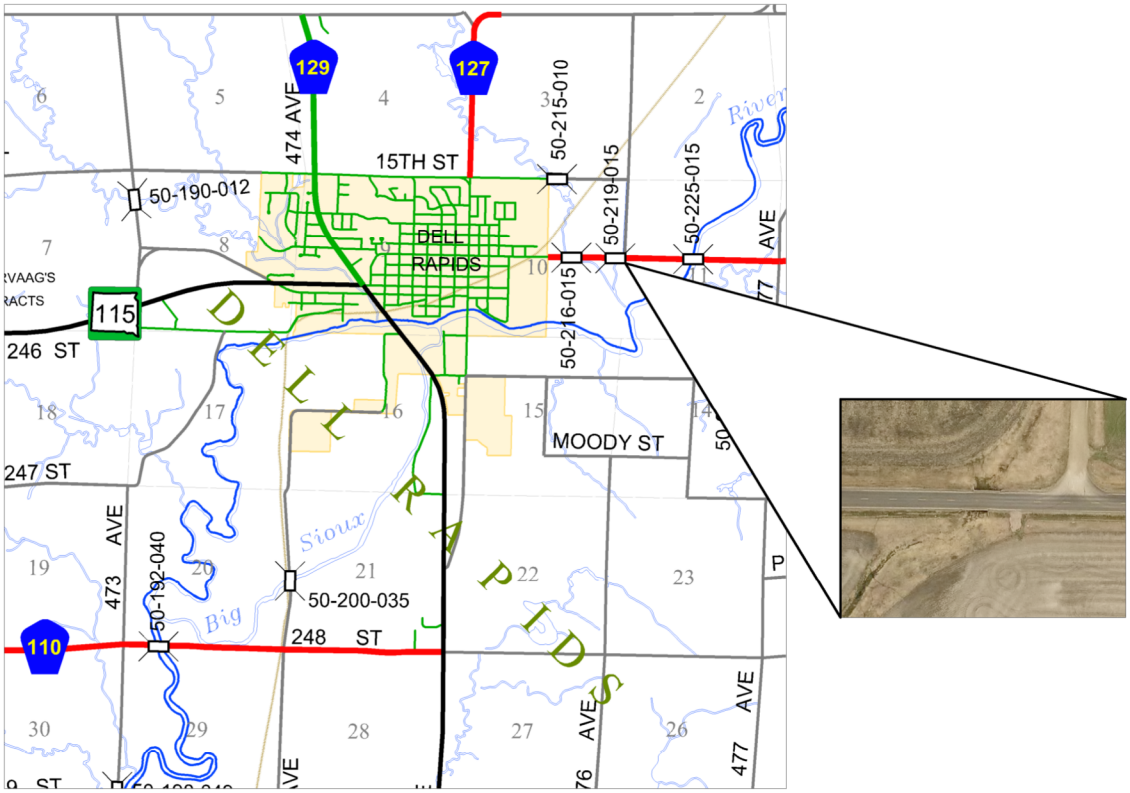
Appraisal Ratings

STR APPR : 4 -1
DECK GEOM : 5 -1
UNDERCLR : N -1
WATERWAY : 8 -1
APPR ALIGN : 8 -1
BR POST : 5 LEGAL LOADS
SCOUR SCREENING : 2
SCOUR RATING : U

Elements	Unit	ID	Env	Quantity	Units	Q 1	Q 2	Q 3	Q 4
Re Concrete Slab	**MAIN**	**38**	**2**	**1163.00**	**sq.ft**	**425.00**	**630.00**	**108.00**	**0.00**
Cast-in-place concrete - The top surface of the concrete slab is not visible due to the bituminous overlay. Cast-in-place concrete - The original structure appears to have been widened approximately 7 ft along both sides. A significant amount of spalling is evident along the south side of the original slab in all spans and along north side of original slab in east span which have exposed reinforcing steel. The exposed portions of the reinforcing steel are heavily rusted with plating evident and moderate section loss, but does not appear to be affecting structure capacity at the time of inspection. Stalactites are evident along south side of original slab at the west and center spans. There are longitudinal hairline cracks and areas of light scaling evident throughout the original portion of the slab with a couple areas of efflorescence evident. Areas of light scaling are also evident on the underside of the widening portions of the concrete slab. There is an approximate 3"x5"x10" deep hole in the south side of the original slab in the west span which appears to extend to the bottom of the bituminous overlay.								
— Delamination/Spall/Patched Area	MAIN	1080	2	430.00	sq.ft	0.00	430.00	0.00	0.00
–									
— Exposed Rebar	MAIN	1090	2	68.00	sq.ft	0.00	0.00	68.00	0.00
–									
— Efflorescence/Rust Staining	MAIN	1120	2	40.00	sq.ft	0.00	0.00	40.00	0.00
— Cracking (RC and Other)	MAIN	1130	2	200.00	sq.ft	0.00	200.00	0.00	0.00
–									
— AC w/o Membrane Overlay	MAIN	814	2	1,027.00	sq.ft	1,027.00	0.00	0.00	0.00
Bituminous - Approximate 6-inch average depth, smooth. Light vegetation growth is evident along edges of overlay.									
Re Conc Column	**MAIN**	**205**	**2**	**10.00**	**each**	**0.00**	**8.00**	**2.00**	**0.00**
Cast-in-place concrete - There are five (5) concrete columns per bent (10 total columns). The original bents consisted of three (3) columns. The original end columns were added onto and an additional column was added at the ends of the bents when the structure was widened. A significant amount of deterioration and a lack of consolidation is evident towards the bottom of the center column in both bents.									
— Delamination/Spall/Patched Area	MAIN	1080	2	10.00	each	0.00	8.00	2.00	0.00
–									
Re Conc Abutment	**MAIN**	**215**	**2**	**68.00**	**ft**	**28.00**	**40.00**	**0.00**	**0.00**
The backwalls consist of cast-in-place concrete. Both ends of the original backwalls were extended when the structure was widened. There are some areas of honeycombing evident in the original portions of the backwalls. A spall is evident at the north end of the original portion of the east backwall. The widening portions of the backwalls appear to be in relatively good condition. The wingwalls consist of cast-in-place concrete and are direct extensions of the backwalls. Some chips are evident along the tops of the wingwalls. It appears these chips occurred during the placement of the riprap. Overall, the wingwalls appear to be in relatively good condition.									
— Delamination/Spall/Patched Area	MAIN	1080	2	40.00	ft	0.00	40.00	0.00	0.00
–									
Re Conc Pier Cap	**MAIN**	**234**	**2**	**68.00**	**ft**	**68.00**	**0.00**	**0.00**	**0.00**
Cast-in-place concrete - The original concrete caps were extended when the structure was widened. Some areas of light to moderate scaling are evident throughout and some vertical hairline cracks are evident over the columns. Overall, the concrete bent caps appear to be in satisfactory condition.									
Metal Bridge Railing	**MAIN**	**330**	**2**	**68.00**	**ft**	**68.00**	**0.00**	**0.00**	**0.00**
The railings consist of a painted steel channel mounted on painted double steel angle posts. The paint on the railing members appears to be in fair to good condition with some areas of surface rust evident.									
— Lead Based Paint	MAIN	816	2	196.00	sq.ft	196.00	0.00	0.00	0.00
–									

Action	Agency Status	Agency Priority	Assigned to	Rec. Date	Str No	Assigned To	Notes	Target Year
			No					

Bridge Inspection Report
for
Minnehaha County
South Dakota
2022
Structure No. 50-219-015
Jasper Street / Co. Hwy 104



Dell Rapids Township

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12059
CHRIS J. BROZIK
SOUTH DAKOTA

10/28/22

CIVIL DESIGN INC

MINNEHAHA COUNTY
18 62
SOUTH DAKOTA

Repair and Posting Recommendations
Bridges Maintained by Local Governments

Structure No. 50-219-015 **Hwy or Street** Jasper St. / Co. Hwy. 104

FA Route No. 6250 **Agency Responsible for Maintenance** Minnehaha Co.

Location 1.5 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 36.3 ft Two Span Continuous Concrete Bridge with Concrete Abutments.
30 Degree LHF Skew - 24.3 ft Roadway Width.

Date Inspected 6/16/2022 **Year Built** 1938

Posting Recommendations

Single Unit - N.A. tons Current Posting: Not Posted

Combination - N.A. tons Legal Loads: No Load Posting Required

Legal Loads Based on Article 6.1.4 of AASHTO "The Manual for Bridge Evaluation", Third Edition

Repair, Rehabilitation, and/or Replacement Recommendations

1. Install bridge railing rubrails and approach guardrails as required.
2. Install 1st NE and 2nd SE approach delineators that are damaged or missing.
3. Clear the deck drains as required.
4. Completely remove and replace the damaged section of the north concrete bridge railing as required.
5. Repair the scaling on the north column at the center bent.
6. Monitor cracking, efflorescence, and stalactites along edges of concrete slab.
7. **Structure is currently in the 5-year capital improvement plan & scheduled for future replacement.**

The South Dakota Department of Transportation is required by Federal Statute to maintain an inventory of all bridges on all public traveled routes. Therefore, it is important that County and City Officials report any changes on bridges on their system. Examples of changes which should be reported are: Replacement of an existing bridge with pipe or new bridge, safety updated, rehabilitation or repair of an existing bridge etc. Changes should be reported to: South Dakota Department of Transportation, Local Government Assistance, Pierre, South Dakota, 57501.

RECOMMENDATIONS MADE BY: _____ DATE: 6/16/2022

Chris Brozik, P.E.

Bridge Inspection Report

Structure No. 50-219-015 **Maint. Proj. No.**

Feature Carried Jasper St. / Co. Hwy. 104 **County** Minnehaha Co.

Feature Crossed Unnamed Tributary to Big Sioux River

Location 1.5 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 36.3 ft Two Span Continuous Concrete Bridge with Concrete Abutments.

30 Degree LHF Skew - 24.3 ft Roadway Width.

Date Inspected	Inspectors	Temperature
06/16/22	Chris Brozik, P.E. & Anthony Peters	66 Deg F

Approach - Items 65.00 - 65.09

1. ALIGNMENT - The vertical and horizontal alignments are good. There is a T-intersection approximately 100 ft east of the structure.

2. CONDITION - Bituminous - Smooth. There is a bituminous patch along north half of east bridge end.

3. JOINTS - None

4. GUARD RAILS - A portable concrete barrier curb section has been placed off of the west end of the north railing. It appears a vehicle impact occurred at the end of the bridge railing.

5. EMBANKMENT - Good - No sign of erosion behind the wingwalls.

6. DRAINAGE - The drainage of the roadway is good.

7. SIGNAGE - Type 3 Object Markers - An object marker has been installed at the west end of the concrete barrier curb extending off of the west end of the north bridge railing. The object marker appears to be in satisfactory condition.

   Type 2 Object Markers - There are object markers located at the NE, SW, and SE corners of the structure. The SW marker is leaning backward and facing inward, but is still visible.

   Delineators - There are four (4) delineators located off the NW, SW, and SE corners and two (2) delineators located off the NE corner of the structure. The 2nd delineator along the NE approach was not installed due to a roadway intersection. The1st NE delineator is missing. The 2nd SE delineator is bent downward.

8. GPS COORDINATES - Latitude: 43.82597 North Longitude: -96.68737 West

Structure Number 50-219-015 **Date** 06/16/22

Deck - Items 58.00 - 58.17

1. DECK CONDITION - CRACKING, SCALING, SPALLING, AND DELAMINATIONS -

   Cast-in-place concrete - The top surface of the concrete slab is not visible due to the gravel and bituminous overlay.

2. OVERLAY - TYPE, THICKNESS, AND CONDITION -

   Gravel and bituminous overlay - Approximate 12-inch average total depth. The bituminous surfacing is relatively smooth.

3. JOINTS - OPENINGS - None

4. DRAINS - Deck drains (6-inch dia.) 2 per side, 4 total - All of the deck drains have been covered with gravel and the bituminous overlay surfacing.

5. CURBS AND MEDIAN - Cast-in-place concrete - The inside faces of the curbs are not visible due to the gravel and bituminous overlay. A moderate amount of scaling is evident along the exterior faces of the curbs and a significant amount of scaling is evident at the ends of the curbs with some areas of exposed rebar.

6. SIDEWALKS - None

7. RAILING OR BARRIER - The railings consist of reinforced concrete pigeon hole railings. A moderate to significant amount of scaling is evident throughout with areas of exposed reinforcing steel. It appears a significant vehicle impact occurred at the west end of the north railing. The top concrete railing member, some of the spindles, and the concrete curb have been significantly damaged. A portable concrete barrier curb section has been placed off the west end of the north railing. Steel channels have been installed along the outside face of the railing and are anchored into the concrete barrier curb section. A steel plate has been installed along the inside face of the railing. The steel channels and steel plate are bolted together with bolts running through the pigeon holes. The concrete barrier curb section and steel channels do not provide a railing with the same amount of strength as the original concrete bridge railing before the vehicle impact, but they are providing additional strength to what is provided by the damaged concrete bridge railing. The damaged section of the north concrete bridge railing needs to be completely replaced.

8. LIGHTING - None

9. UTILITIES - None

10. DECK DELAMINATION SURVEY - Unable to perform a deck delamination survey due to the bituminous overlay.

Structure Number 50-219-015 **Date** 06/16/22

Superstructure - Items 59.00 - 59.20

1. UNDERSIDE OF DECK - Cast-in-place concrete - Transverse cracks, longitudinal cracks, and areas of map cracking are evident throughout. A significant amount of efflorescence is evident along both the north and south side (outside 1 ft edge) of the concrete slab in the both spans. The efflorescence along edges of slab has advanced to active stalactites dripping along both edges of the east and west spans. The south edge has minor stalactites and the north edge has moderate to substantial stalactites evident. Scaling and some spalls are evident along the bottom exterior edges of the slab at the corners of the structure.

2. BEARING DEVICES - None

3. GIRDERS OR BEAMS - STIFFENERS, WELDS, SPLICES, AND ETC. -

   None

4. DIAPHRAGMS - None

5. TRUSSES - MAIN MEMBERS, PORTALS, BRACING, GUSSET PLATES, AND ETC. -

   None

7. RIVETS OR BOLTS - None

8. WELDS - None

9. PAINT - None

10. DRAINAGE SYSTEM - Deck drains (6-inch dia.) 2 per side, 4 total - All of the deck drains have been covered with gravel and the bituminous overlay surfacing.

11. UTILITIES - None

12. REACTION UNDER LOAD - No excessive deflection under heavy vehicle load.

13. COLLISION DAMAGE - None evident, except as noted to the north railing.

Structure Number 50-219-015 **Date** 06/16/22

Substructure - Items 60.00 - 60.05

1. ABUTMENTS -
   - A. WINGWALLS - Cast-in-place concrete - A moderate to heavy amount of scaling and areas of horizontal hairline cracking are evident on the tops of the wingwalls. Overall, the wingwalls appear to be in satisfactory condition.
   - B. BACKWALLS - Cast-in-place concrete - Some vertical hairline cracks and some scaling along the bottom of the backwalls are evident. Some efflorescence is evident along the top of the backwalls at the ends of the backwalls.
   - C. FOOTINGS - The footing along the bottom of the backwalls can be felt. Previously undermining along the NE backwall footing has been mitigated with riprap.
   - D. PILE CAPS - None
2. PIERS OR BENTS -
   - A. CAPS - Cast-in-place concrete - The bent cap consists of a concrete beam. There are vertical hairline cracks evident between and over the columns. Significant scaling is observed along the north and south ends of the cap.
   - B. COLUMNS - Cast-in-place concrete - There are four (4) concrete columns at the bent. A significant amount of scaling is evident on the north column at the bent. There does not appear to be a significant amount of section loss or exposed reinforcing steel at this time. Vertical hairline cracking is evident in the columns. The south column has efflorescence buildup along the south face which appears to be coming from the underside of slab and from the scaling bent cap.
   - C. FOOTINGS - The north three (3) columns have footings exposed, but do not appear to be undermined. The north column footing appears to be significantly scaling by feeling and probing.
3. GROUT PADS - None
4. ANCHOR BOLTS - None
5. PILES - None visible.
6. BRACING - None
7. PAINT - None
8. MOVEMENT -
   - A. PLUMBNESS - Everything appears vertical.
   - B. SETTLEMENT - None evident.
   - C. HORIZONTAL - None evident.

Structure Number 50-219-015 **Date** 06/16/22

Channel and Channel Protection - Items 61.00 - 61.09

1. CHANNEL -

   A. ALIGNMENT - The channel alignment is good.

   B. VEGETATION - Good

   C. SCOUR - Previously, a minor to moderate amount of scour appeared to be occurring in front of the backwalls as the footings could be felt. The north half of the east backwall footings were beginning to undermine, due to approximately 3 feet of scour. Approximately 2-3 feet of scour at inlet and under north half of structure were evident. This scour and undermining has been mitigated with riprap along the east and west abutments.

   D. DEBRIS - None

   E. FLOW LINE - Well defined.

2. EMBANKMENT EROSION - None evident.

3. WATERWAY ADEQUACY - Appears adequate.

4. SPUR DIKES & JETTIES - None

5. WING DAMS - None

6. RIP RAP - Riprap has been placed along the front of the east and west abutments and behind the NW wingwall.

7. OBSERVED HIGH WATER ELEVATION - Appears to be approximately 1 to 2 feet below the bottom of the concrete slab.

8. STREAM BED - Appears to be somewhat scouring on the inlet side of the structure.

ELEMENT LEVEL INSPECTION
(Main Span)

Str. No.: 50-219-015		**Maint. Proj. No.:**	
Feature Carried: Jasper St. / Co. Hwy. 104		**MRM:**	**County:** Minnehaha Co.
Feature Crossed: Unnamed Tributary to Big Sioux River			
Location: 1.5 miles east and 0.2 miles north of Dell Rapids, SD.			
Bridge Description: 36.3 ft Two Span Continuous Concrete Bridge with Concrete Abutments.			
30 Degree LHF Skew - 24.3 ft Roadway Width.			
Length: 36.3 ft	**Roadway width:** 24.3 ft		**Deck width:** 27.3 ft
Deck Area : Length x Deck Width = 991 Sq. ft			**Skew:** 30 degrees LHF
Inspector(s): Chris Brozik, P.E. & Anthony Peters		**Date:** 06/16/22	

Element Condition States

Elem Num	Element Description	Env	Quantity	Units	Quantity in Condition State 1	2	3	4	
38	Reinforced Concrete Slab	2	991	SF		921	70		
1090	Exposed Rebar	2		SF					
1080	Delamination/Spall/Patched Area	2		SF		328	32		
1130	Cracking	2		SF		343			
1120	Efflorescence/Rust Staining	2		SF		250	38		
1190	Abrasion/Wear	2		SF					
1900	Distortion	2		SF					
4000	Settlement	2		SF					
6000	Scour	2		SF					
7000	Damage	2		SF					
814	AC w/o Membrane Overlay	2	882	SF	882				
3230	Effectiveness	2		SF					
3210	Delam./Spall/Patched Area/Pothole	2		SF					
3220	Crack	2		SF					
7000	Damage	2		SF					
205	Columns, Reinforced Concrete	2	4	EA	3	1			
1090	Exposed Rebar	2		EA					
1080	Delamination/Spall/Patched Area	2		EA		1			
1130	Cracking	2		EA					
1120	Efflorescence/Rust Staining	2		EA					
1190	Abrasion/Wear	2		EA					
1900	Distortion	2		EA					
4000	Settlement	2		EA					
6000	Scour	2		EA					
7000	Damage	2		EA					
215	Abutment, Reinforced Concrete	2	54	LF	44	10			
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF					
1130	Cracking	2		LF		10			

1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
234	Pier Cap, Reinforced Concrete	2	27	LF	19	8			
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF		2			
1130	Cracking	2		LF		6			
1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
331	Reinforced Concrete Bridge Railing	2	72	LF		57	6	9	
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF		57			
1130	Cracking	2		LF					
1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF			6	9	

Bridge Inspection Digital Photo Log

Structure No. **50-219-015**

Photo Number:	Date:	Description:
1	6/16/2022	Approach looking West
2	6/16/2022	Approach looking East
3	6/16/2022	Profile looking South
4	6/16/2022	Profile looking North
5	6/16/2022	1st NE Approach Delineator Missing
6	6/16/2022	2nd SE Approach Delineator Bent
7	6/16/2022	Top of Bituminous Overlay looking West
8	6/16/2022	Bituminous Patch at NE Bridge End
9	6/16/2022	NW Slab and Curb Edge Deterioration and Damage
10	6/16/2022	NE Slab and Curb Edge Deterioration
11	6/16/2022	SE Slab and Curb Edge Deterioration
12	6/16/2022	South Rail
13	6/16/2022	North Rail
14	6/16/2022	NW Portable Concrete Jersey Barrier
15	6/16/2022	SW Rail end Spall with Exposed Rebar
16	6/16/2022	Steel Channel Attached to Backside of NW Railing
17	6/16/2022	Underside of South Edge of Slab in West Span with Stalactites
18	6/16/2022	Underside of South Edge of Slab in East Span with Stalactites
19	6/16/2022	Underside of North Edge of Slab in West Span with Stalactites
20	6/16/2022	Underside of North Edge of Slab in East Span with Stalactites
21	6/16/2022	South Edge of Slab with Efflorescence and Minor Stalactites
22	6/16/2022	North Edge of Slab with Active Stalactite Dripping
23	6/16/2022	Center Bent
24	6/16/2022	North Bent Column Scaling
25	6/16/2022	Center Bent South Column Efflorescence Buildup
26	6/16/2022	Upstream Channel looking North
27	6/16/2022	Downstream Channel looking South
28	6/16/2022	Riprap in front of West Abutment
29	6/16/2022	Riprap in front of East Abutment

50-219-015_2022_1_CDI_Approach looking West

50-219-015_2022_2_CDI_Approach looking East

50-219-015_2022_3_CDI_Profile looking South

50-219-015_2022_4_CDI_Profile looking North

50-219-015_2022_5_CDI_1st NE Approach Delineator Missing

50-219-015_2022_6_CDI_2nd SE Approach Delineator Bent

50-219-015_2022_7_CDI_Top of Bituminous Overlay looking West

50-219-015_2022_8_CDI_Bituminous Patch at NE Bridge end

50-219-015_2022_9_CDI_NW Slab and Curb Edge Deterioration and Damage

50-219-015_2022_10_CDI_NE Slab and Curb Edge Deterioration

50-219-015_2022_11_CDI_SE Slab and Curb Edge Deterioration

50-219-015_2022_12_CDI_South Rail

50-219-015_2022_13_CDI_North Rail

50-219-015_2022_14_CDI_NW Portable Concrete Jersey Barrier

50-219-015_2022_15_CDI_SW Rail end Spall with Exposed Rebar

50-219-015_2022_16_CDI_Steel Channel Attached to Backside of NW Railing

50-219-015_2022_17_CDI_Underside of South Edge of Slab in West Span with Stalactites

50-219-015_2022_18_CDI_Underside of South Edge of Slab in East Span with Stalactites

50-219-015_2022_19_CDI_Underside of North Edge of Slab in West Span with Stalactites

50-219-015_2022_20_CDI_Underside of North Edge of Slab in East Span with Stalactites

50-219-015_2022_21_CDI_South Edge of Slab with Efflorescence and Minor Stalactites

50-219-015_2022_22_CDI_North Edge of Slab with Active Stalactite Dripping

50-219-015_2022_23_CDI_Center Bent

50-219-015_2022_24_CDI_North Bent Column Scaling

50-219-015_2022_25_CDI_Center Bent South Column Efflorescence Buildup

50-219-015_2022_26_CDI_Upstream Channel looking North

50-219-015_2022_27_CDI_Downstream Channel looking South

50-219-015_2022_28_CDI_Riprap in front of West Abutment

50-219-015_2022_29_CDI_Riprap in front of East Abutment

CHANNEL PROFILE

MINNEHAHA COUNTY

STR. NO. 50-219-015

MEASUREMENTS TAKEN FROM THE TOP OF: **RAIL**

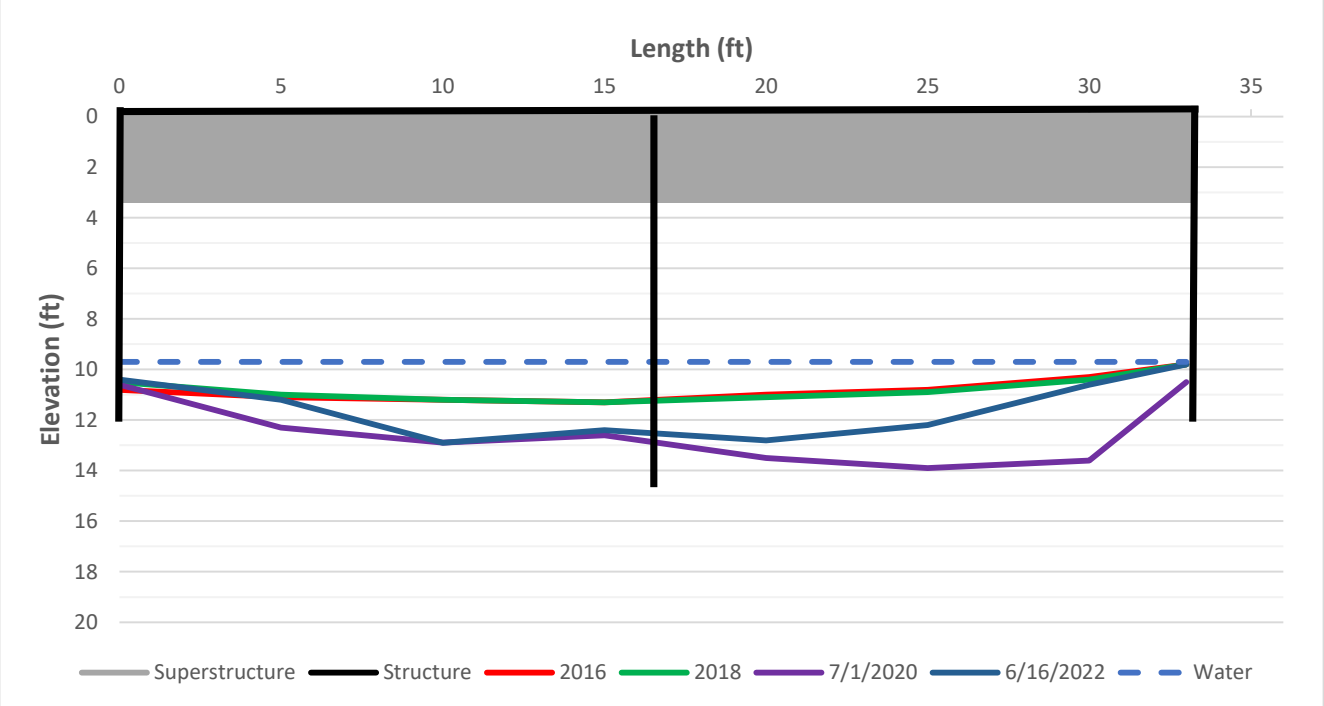
MEASUREMENTS TAKEN ON THE INLET SIDE OF THE STRUCTURE: **NORTH**

WATER ELEV: **9.7**

		2016	2018	7/1/2020	6/16/2022
West End	0	10.8	10.5	10.6	10.4
	5	11.1	11.0	12.3	11.2
	10	11.2	11.2	12.9	12.9
	15	11.3	11.3	12.6	12.4
	20	11.0	11.1	13.5	12.8
	25	10.8	10.9	13.9	12.2
	30	10.3	10.4	13.6	10.6
East End	33	9.8	9.8	10.5	9.8

ABUT./BENT	
1	0
2	16.5
3	33

Top of RAIL to bottom of Superstructure 3.6 ft.



Note: No Construction Plans are enclosed in SDDOT bridge inspection file.

CIVIL DESIGN INC

General Bridge Data

(8) STR NO : 50-219-015

(7) FACILITY : JASPER ST, HWY 104

(6) FEAT INTER : TRIB TO BIG SIOUX RV

(9) LOCATION : 1.5E & 0.2N DELL RAPIDS

INTERCHANGE : N

SECTION(S) : 10 -1 -1 -1

TOWNSHIP(S) : 104N -1

RANGE(S) : 49W -1

(2) REGION : Mitchell

(3) COUNTY : 50 MINNEHAHA

(21) CUSTODIAN : 2 County Hwy Agency

(22) OWNER : 2 County Hwy Agency

MAINT PROJ :

(42A) SERV TYPE ON : 1 Highway

(42B) SERV TYPE UND : 5 Waterway

(103) TEMP STRUCTURE : Unknown (NBI)

(99) BORDER BRIDGE STR NO : -1

(98A) NEIGHBOR STATE : Unknown (P)

(98B) PERCENT SHARE : -2.00

Highway Carried (NBI 5)

(5B) ROUTE PREFIX : 4 County Hwy

(5C) LEVEL OF SERVICE : 1 Mainline

(5D) ROUTE NUMBER : 00000

(5E) DIRECT SUFFIX : 0 N/A (NBI)

MRM ENGLISH : 0.00

POSTED SPEED : 55 MPH

SCHOOL BUS RT : Y

MAIL RT : Y

(104) NHS SYSTEM : 0 Not on NHS

FA ROUTE : 6250

(26) FUNC CLASS : 07 Rural Mjr Collector

(28A) LANES : 2

(102) DIRECTION TRAFFIC : 2 2-way traffic

(105) FED LANDS HWY : 0 N/A (NBI)

(19) DETOUR : 9.00 mi

(29) ADT TOTAL : 1111.00

(30) YEAR OF ADT : 2021

(109) % TRUCK : 3.00 %

(53) MIN V CLR RT : 99.99 ft

(53) MIN V CLR LT : 0.00 ft

(10) MAX V CLR RT : 99.99 ft

(10) MAX V CLR LT : 0.00 ft

(47) HORIZ V CLR RT : 24.00 ft

(47) HORIZ V CLR LT : 0.00 ft

GIS Data

LATITUDE : 43.82597

LONGITUDE : -96.68737

DATE : 03/28/2016

COMMENT : Calculated GIS INFO

(27) YEAR BUILT : 1938

(106) RECONSTR : (1)

(49) STR LENGTH : 36.30 ft

NBIS BRIDGE LENGTH : 32.30 ft

(48) MAX SPAN LENGTH : 18.10 ft

Main Span

(43A) MATERIAL : 2 Concrete Continuous

(43B) DESIGN : 01 Slab

SD STR TYPE : X020

(107) DECK STR TYPE : 1 Concrete-Cast-in-Place

(52) DECK WIDTH : 27.30 ft

(51) BRIDGE RDWY WIDTH : 24.30 ft

(32) APPR RDWY WIDTH : 24.00 ft

(50A) LT SIDEWALK WIDTH : 0.00 ft

(50B) RT SIDEWALK WIDTH : 0.00 ft

(34) SKEW : 30.00°

SKEW DIR : L

(45) NO MAIN SPANS : 2

(46) NO APPR SPANS : 0

(31) DESIGN LOAD : 0 Unknown

(33) BRIDGE MEDIAN : 0 No median

(35) STR FLARED : 0 No flare

Box Culvert Data

BOX CULVERT SIZE : 0 X 0 X 0

FILL HT OVER BOX : 0.00 ft

LENGTH OF LONGEST CELL : 0.00 ft

Rail Data

(36) SAFETY FEAT : 0000

BRIDGE RAIL 1 : 11 - CONC PIGEON HOLE RAIL

RAIL TRANS 1 : 00 - NO TRANSITION PROVIDED

APPR RAIL 1 : 00 - NO APPROACH RAIL

APPR RAIL TERM 1 : 00 - NO TERMINALS PROVIDED

NBI Prop Work

(75A) WORK TYPE : 31 Repl-Load Capacity

(75B) WORK BY : 1 Contract

(76) IMPROV LENGTH : 191.60 ft

(94) BRIDGE IMPROV COST : $274,684.00

(95) RDWAY IMPROV COST : $27,468.00

(96) TOTAL PROJECT COST : $462,092.00

(97) YEAR OF IMPROV COST : $2,018.00

(114) ADT FUTURE : 1400.00

(115) YEAR OF ADT FUTURE : 2036

Steel Paint

UNDERCOAT :

TOPCOAT :

YEAR :

COLOR :

Status

SUFF RATE : 35.30

FED SUFF RATE : 49.90

FED SR DATE : 03/14/2022

DEFICIENCY : S

CANDIDATE : P

Deck Data

(108A) WEARING SURFACE : 6 Bituminous

DECK PROTECTION : None

OVERLAY THICKNESS : 12.00 in

DECK DELAM AREA : 0.00 sq ft

DECK DELAM DATE :

DECK SURVEY :

CHLORIDE : N

RESTEEL DEPTH : N

ELECTRO POTENT : N

Load Rating Data

(41) OPER STATUS : A Open, no restriction

(66) INV HS20 : 21.60 tons

(65) METHOD : 0 Field eval and docs

(64) OP HS20 : 36.00 tons

(63) METHOD : 0 Field eval and docs

TRUCK TYPE 3 : 24.00 tons

TRUCK TYPE 3S2 : 40.00 tons

TRUCK TYPE 3-2 : 46.00 tons

NRL : 40.00 tons

SHV-4 : 27.00 tons

SHV-5 : 31.00 tons

SHV-6 : 34.80 tons

SHV-7 : 38.80 tons

EV2 : tons

EV3 : tons

BARS NO : JDG

Hydraulics

DRAINAGE AREA : 1.99 sq mi

OBSERV HW ELEV : 0.00 ft

YEAR : 01/01/1901

DESIGN FREQ : 0.00

DESIGN FLOW : 0.00 cfs

DESIGN VELOCITY : 0.00 fps

DESIGN AREA : 0.00 sq ft

DESIGN YEAR :

DESIGN HW ELEV : ft

100 YEAR FLOW : 0.00 cfts

100 YEAR HW ELEV : ft

V MAX : fps

SCOUR SCREENING : 2

SCOUR RATING : U

TOPEKA SHINER : N

Rail Paint

UNDERCOAT :

TOP COAT :

YEAR :

COLOR :

Highway Carried (Under Record)

(5A) RECORD TYPE :
(5B) ROUTE PREFIX :
(5C) LEVEL OF SERVICE :
(5D) ROUTE NUMBER :
(5E) DIRECT SUFFIX :
MRM :
ADM JUR :
(104) NHS SYSTEM :
FA ROUTE :
(26) FUNC CLASS :
(28B) LANES :
(101) DIRECTION OF TRAFFIC :
(19) DETOUR LENGTH : mi
(29) ADT :
(30) ADT YEAR :

(54) MIN V CLR RT :
(54) MIN V CLR LT :
(10) MAX V CLR RT :
(10) MAX V CLR LT :
(47) HORIZ CLR RT :
(47) HORIZ CLR LT :
(55) OUT UNDCLR RT :
(55) OUT UNDCLR LT :
(56) MED UNDCLR RT :
(56) MED UNDCLR LT :

Project Number	PCN	Date Done
NA	none	01/01/1938

Inspection

GENERAL COMMENT : -1
REGION COMMENT : -1
FREE COMMENT : -1

INSPECTION TYPE	LAST INSPECTION DATE	REQUIRED	INSPECTION FREQUENCY	NEXT INSP DATE
NBI	06/16/2022		24 month(s)	06/16/2024
FRACTURE CRITICAL	NA	N	NA	NA
UNDERWATER	NA	N	NA	NA
SPECIAL	NA	N	NA	NA
ELEMENT INSPECTION	06/16/2022		24 month(s)	06/16/2024

INSPKEY : NJQN
APPRAIS BY : CLB
APPRAIS DATE : 10/03/2022
QA INSPECTOR :
QA INSP DATE :
LAST INSPECTION BY :
CONSULTANT CODE : CIVIL DESIGN

Condition Ratings

(58) DECK : 4
(59) SUPER : 4
(60) SUB : 5
(62) CULVERT : N
(113) SCOUR : U
(61) CHANNEL : 7
APPROACH : 7 -1

Appraisal Ratings

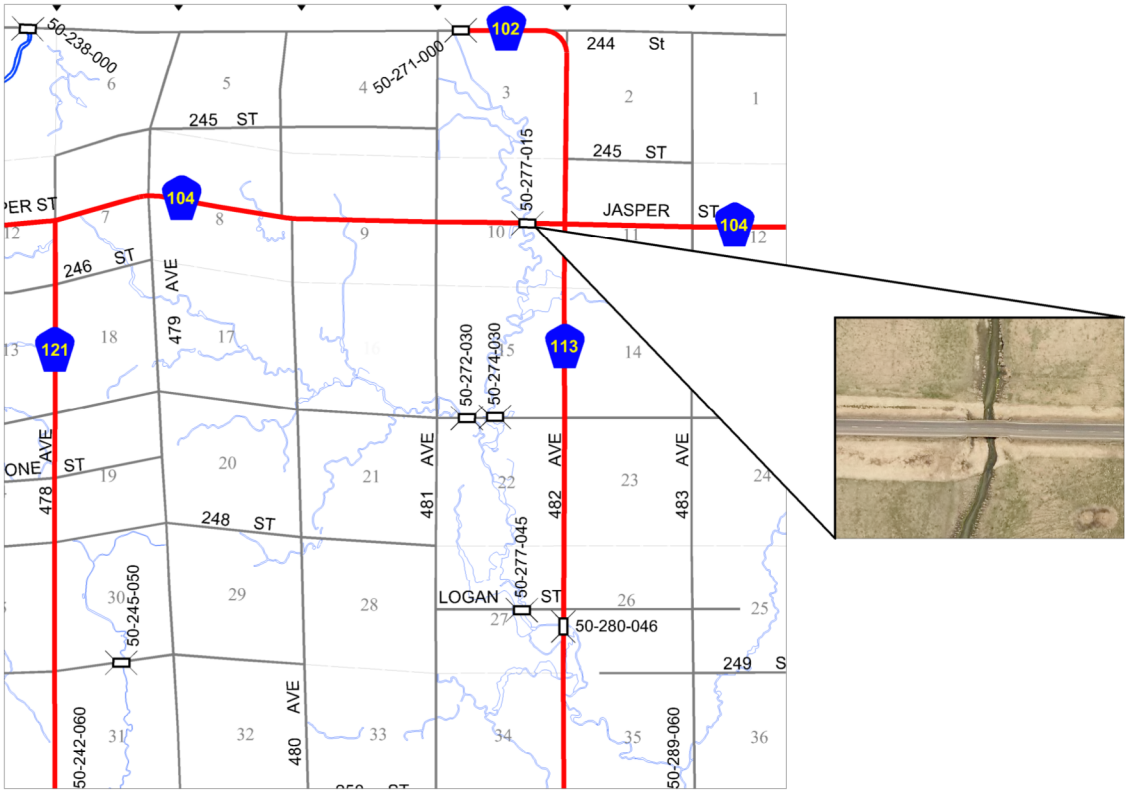
STR APPR : 4 -1
DECK GEOM : 4 -1
UNDERCLR : N -1
WATERWAY : 7 -1
APPR ALIGN : 8 -1
BR POST : 5 LEGAL LOADS
SCOUR SCREENING : 2
SCOUR RATING : U

Elements	Unit	ID	Env	Quantity	Units	Q 1	Q 2	Q 3	Q 4
Re Concrete Slab	**MAIN**	**38**	**2**	**991.00**	**sq.ft**	**0.00**	**921.00**	**70.00**	**0.00**
Cast-in-place concrete - The top surface of the concrete slab is not visible due to the gravel and bituminous overlay. Cast-in-place concrete - Transverse cracks, longitudinal cracks, and areas of map cracking are evident throughout. A significant amount of efflorescence is evident along both the north and south side (outside 1 ft edge) of the concrete slab in the both spans. The efflorescence along edges of slab has advanced to active stalactites dripping along both edges of the east and west spans. The south edge has minor stalactites and the north edge has moderate to substantial stalactites evident. Scaling and some spalls are evident along the bottom exterior edges of the slab at the corners of the structure.								
— Delamination/Spall/Patched Area	MAIN	1080	2	360.00	sq.ft	0.00	328.00	32.00	0.00
–									
— Efflorescence/Rust Staining	MAIN	1120	2	288.00	sq.ft	0.00	250.00	38.00	0.00
— Cracking (RC and Other)	MAIN	1130	2	343.00	sq.ft	0.00	343.00	0.00	0.00
–									
— AC w/o Membrane Overlay	MAIN	814	2	882.00	sq.ft	882.00	0.00	0.00	0.00
Gravel base with bituminous surfacing - Approximate 12-inch average total depth. The bituminous surfacing is relatively smooth.									
Re Conc Column	**MAIN**	**205**	**2**	**4.00**	**each**	**3.00**	**1.00**	**0.00**	**0.00**
Cast-in-place concrete - There are four (4) concrete columns at the bent. A significant amount of scaling is evident on the north column at the bent. There does not appear to be a significant amount of section loss or exposed reinforcing steel at this time. Vertical hairline cracking is evident in the columns. The south column has efflorescence buildup along the south face which appears to be coming from the underside of slab and from the scaling bent cap.									
— Delamination/Spall/Patched Area	MAIN	1080	2	1.00	each	0.00	1.00	0.00	0.00
–									
Re Conc Abutment	**MAIN**	**215**	**2**	**54.00**	**ft**	**44.00**	**10.00**	**0.00**	**0.00**
Cast-in-place concrete - Some vertical hairline cracks and some scaling along the bottom of the backwalls are evident. Some efflorescence is evident along the top of the backwalls at the ends of the backwalls. Cast-in-place concrete - A moderate to heavy amount of scaling and areas of horizontal hairline cracking are evident on the tops of the wingwalls. Overall, the wingwalls appear to be in satisfactory condition.									
— Cracking (RC and Other)	MAIN	1130	2	10.00	ft	0.00	10.00	0.00	0.00
–									
Re Conc Pier Cap	**MAIN**	**234**	**2**	**27.00**	**ft**	**19.00**	**8.00**	**0.00**	**0.00**
Cast-in-place concrete - The bent cap consists of a concrete beam. There are vertical hairline cracks evident between and over the columns. Significant scaling is observed along the north and south ends of the cap.									
— Delamination/Spall/Patched Area	MAIN	1080	2	2.00	ft	0.00	2.00	0.00	0.00
— Cracking (RC and Other)	MAIN	1130	2	6.00	ft	0.00	6.00	0.00	0.00
Re Conc Bridge Railing	**MAIN**	**331**	**2**	**72.00**	**ft**	**0.00**	**57.00**	**6.00**	**9.00**
The railings consist of reinforced concrete pigeon hole railings. A moderate to significant amount of scaling is evident throughout with areas of exposed reinforcing steel. It appears a significant vehicle impact occurred at the west end of the north railing. The top concrete railing member, some of the spindles, and the concrete curb have been significantly damaged. A portable concrete barrier curb section has been placed off the west end of the north railing. Steel channels have been installed along the outside face of the railing and are anchored into the concrete barrier curb section. A steel plate has been installed along the inside face of the railing. The steel channels and steel plate are bolted together with bolts running through the pigeon holes. The concrete barrier curb section and steel channels do not provide a railing with the same amount of strength as the original concrete bridge railing before the vehicle impact, but they are providing additional strength to what is provided by the damaged concrete bridge railing. The damaged section of the north concrete bridge railing needs to be completely replaced.									

Elements	Unit	ID	Env	Quantity	Units	Q 1	Q 2	Q 3	Q 4
Delamination/Spall/Patched Area	MAIN	1080	2	57.00	ft	0.00	57.00	0.00	0.00
–									
Damage	MAIN	7000	2	15.00	ft	0.00	0.00	6.00	9.00
–									

Action	Agency Status	Agency Priority	Assigned to	Rec. Date	Str No	Assigned To	Notes	Target Year
			No					

Bridge Inspection Report
for
Minnehaha County
South Dakota
2022
Structure No. 50-277-015
Jasper Street / Co. Hwy 104



Logan Township

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12059
CHRIS J.
BROZIK
SOUTH DAKOTA

10/28/22

CIVIL DESIGN INC

MINNEHAHA COUNTY
18 62
SOUTH DAKOTA

Repair and Posting Recommendations
Bridges Maintained by Local Governments

Structure No. 50-277-015 **Hwy or Street** Jasper St. / Co. Hwy. 104

FA Route No. 6250 **Agency Responsible for Maintenance** Minnehaha Co.

Location 7.3 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 70.8 ft Four Span Continuous Concrete Bridge with Concrete Abutments.

0 Degree Skew - 24.3 ft Roadway Width.

Date Inspected 6/16/2022 **Year Built** 1940

Posting Recommendations

Single Unit - N.A. tons Current Posting: Not Posted

Combination - N.A. tons Legal Loads: No Load Posting Required

Legal Loads Based on Article 6.1.4 of AASHTO "The Manual for Bridge Evaluation", Third Edition

Repair, Rehabilitation, and/or Replacement Recommendations

1. Straighten 1st NE and 4th SW approach delineators that are bent.
2. Install bridge railing rubrails and approach guardrails as required.
3. Clear deck drains as required.
4. Monitor scour at the bents.
5. **Structure is currently in the 5-year capital improvement plan & scheduled for future replacement.**

The South Dakota Department of Transportation is required by Federal Statute to maintain an inventory of all bridges on all public traveled routes. Therefore, it is important that County and City Officials report any changes on bridges on their system. Examples of changes which should be reported are: Replacement of an existing bridge with pipe or new bridge, safety updated, rehabilitation or repair of an existing bridge etc. Changes should be reported to: South Dakota Department of Transportation, Local Government Assistance, Pierre, South Dakota, 57501.

RECOMMENDATIONS MADE BY: _____ DATE: 6/16/2022

Chris Brozik, P.E.

Bridge Inspection Report

Structure No. 50-277-015 **Maint. Proj. No.**

Feature Carried Jasper St. / Co. Hwy. 104 **County** Minnehaha Co.

Feature Crossed West Pipestone Creek

Location 7.3 miles east and 0.2 miles north of Dell Rapids, SD.

Bridge Description 70.8 ft Four Span Continuous Concrete Bridge with Concrete Abutments.

0 Degree Skew - 24.3 ft Roadway Width.

Date Inspected	Inspectors	Temperature
06/16/22	Chris Brozik, P.E. & Anthony Peters	80 Deg F

Approach - Items 65.00 - 65.09

1. ALIGNMENT - The horizontal and vertical alignments are good.

2. CONDITION - Bituminous - Smooth.

3. JOINTS - None

4. GUARD RAILS - None

5. EMBANKMENT - Good - No erosion is evident behind the wingwalls. Riprap has been placed behind the NW and NE wingwalls.

6. DRAINAGE - The drainage of the roadway is good.

7. SIGNAGE - Type 2 Object Markers - At all four (4) corners of the structure. The object markers appear to be in good condition.

   Delineators - There are four (4) delineators located off of all four (4) corners of the structure. The 1st NE approach delineator and 4th SW approach delineator are bent downward.

8. GPS COORDINATES - Latitude: 43.82635 North Longitude: -96.57830 West

Structure Number 50-277-015 **Date** 06/16/22

Deck - Items 58.00 - 58.17

1. DECK CONDITION - CRACKING, SCALING, SPALLING, AND DELAMINATIONS -

   Cast-in-place concrete - The top surface of the concrete slab is not visible due to the bituminous overlay.

2. OVERLAY - TYPE, THICKNESS, AND CONDITION -

   Bituminous - Approximate 5-inch average depth. There are three (3) gouges in overlay toward centerline of eastbound lane due to an apparent piece of dragging equipment.

3. JOINTS - OPENINGS - None

4. DRAINS - Deck drains - The deck drains have been overlaid with the bituminous overlay and are plugged.

5. CURBS AND MEDIAN - Cast-in-place concrete - A significant amount of spalling and scaling is evident along the inside face of the north curb. There is some section loss evident in the face of the north curb over the east bent. The south curb exterior face has a vertical crack over center bent. A moderate amount of scaling is evident along the inside face of the south curb. A significant amount of the spalling and exposed reinforcing steel is evident at the east end of the north and south curbs.

6. SIDEWALKS - None

7. RAILING OR BARRIER - The railings consist of reinforced concrete pigeon hole railings. Several spalls, cracks, and areas of exposed reinforcing steel are evident throughout. The south railing has a moderately to heavily weathered appearance with some moss evident on the surface of the railing. There are some small chips and some scrapes evident at the west end of the south railing. It appears these chips and scrapes are due to a vehicle impact.

8. LIGHTING - None

9. UTILITIES - None

10. DECK DELAMINATION SURVEY - Unable to perform a deck delamination survey due to the bituminous overlay.

Structure Number 50-277-015 **Date** 06/16/22

Superstructure - Items 59.00 - 59.20

1. UNDERSIDE OF DECK - Cast-in-place concrete - There are longitudinal hairline cracks evident towards the center portion of the slab. Some areas of minor honeycombing are evident throughout. There is an approximate 4 ft x 8 ft area of map cracking and efflorescence along the north side of the west span. There are several cementitious patches in span #3 from the west. It appears these patches are filling some honeycombed areas. Large spalls, which have exposed reinforcing steel, are evident at several of the deck drain locations. Some of the exposed reinforcing steel is plating with minor section loss. The exposed portions of the reinforcing steel have a heavily rusted appearance.

2. BEARING DEVICES - None

3. GIRDERS OR BEAMS - STIFFENERS, WELDS, SPLICES, AND ETC. -

   None

4. DIAPHRAGMS - None

5. TRUSSES - MAIN MEMBERS, PORTALS, BRACING, GUSSET PLATES, AND ETC. -

   None

7. RIVETS OR BOLTS - None

8. WELDS - None

9. PAINT - None

10. DRAINAGE SYSTEM - Deck drains - the deck drains have been overlaid with the bituminous overlay and are plugged.

11. UTILITIES - None

12. REACTION UNDER LOAD - No excessive deflection under heavy vehicle load.

13. COLLISION DAMAGE - None evident.

Structure Number 50-277-015 **Date** 06/16/22

Substructure - Items 60.00 - 60.05

1. ABUTMENTS -

    A. WINGWALLS - Cast-in-place concrete - The wingwalls have areas of light to moderate scaling evident, but overall, the wingwalls appear to be in satisfactory condition.

    B. BACKWALLS - Cast-in-place concrete - Some vertical hairline cracks and areas of light to moderate scaling are evident, but overall, the backwalls appear to be in satisfactory condition.

    C. FOOTINGS - None

    D. PILE CAPS - None

2. PIERS OR BENTS -

    A. CAPS - Cast-in-place concrete - The bent caps consist of concrete beams. There are vertical cracks, slightly bigger than hairline, evident between, and over, the columns. Overall, the bent caps appear to be in relatively good condition.

    B. COLUMNS - Cast-in-place concrete - There are four (4) concrete columns per bent (12 total columns). Areas of scaling are evident, but overall, the concrete columns appear to be in relatively good condition.

    C. FOOTINGS - Bent footings are exposed but do not appear to be undermined. It appears they observed scour previously and are actively silting back in.

3. GROUT PADS - None

4. ANCHOR BOLTS - None

5. PILES - None visible.

6. BRACING - None

7. PAINT - None

8. MOVEMENT -

    A. PLUMBNESS - Everything appears vertical.

    B. SETTLEMENT - None evident.

    C. HORIZONTAL - None evident.

Structure Number 50-277-015 **Date** 06/16/22

Channel and Channel Protection - Items 61.00 - 61.09

1. CHANNEL -

   A. ALIGNMENT - The channel alignment is good.

   B. VEGETATION - Good

   C. SCOUR - Moderate scour of approximately 3 feet at column #1 & #2 footings (2020 - 3'-5' scour) in the west and center bent. Previously observed scour at upstream side of structure has silted back in, but downstream side still has approximately 3 feet of scour. Scour does not appear to be endangering structure at the time of inspection.

   D. DEBRIS - None

   E. FLOW LINE - Well defined.

2. EMBANKMENT EROSION - None evident.

3. WATERWAY ADEQUACY - Appears adequate.

4. SPUR DIKES & JETTIES - None

5. WING DAMS - None

6. RIP RAP - None, except as noted behind the NW and NE wingwalls.

7. OBSERVED HIGH WATER ELEVATION - Appears to be approximately 2 to 3 feet below the bottom of the concrete slab.

8. STREAM BED - Appears to have previously scoured at the bent locations and is actively silting back in at the structure location.

ELEMENT LEVEL INSPECTION
(Main Span)

Str. No.: 50-277-015		**Maint. Proj. No.:**	
Feature Carried: Jasper St. / Co. Hwy. 104		**MRM:**	**County:** Minnehaha Co.
Feature Crossed: West Pipestone Creek			
Location: 7.3 miles east and 0.2 miles north of Dell Rapids, SD.			
Bridge Description: 70.8 ft Four Span Continuous Concrete Bridge with Concrete Abutments.			
0 Degree Skew - 24.3 ft Roadway Width.			
Length: 70.8 ft	**Roadway width:** 24.3 ft		**Deck width:** 27.3 ft
Deck Area : Length x Deck Width = 1,933 Sq. ft			**Skew:** 0 degrees
Inspector(s): Chris Brozik, P.E. & Anthony Peters		**Date:** 06/16/22	

Element Condition States

Elem Num	Element Description	Env	Quantity	Units	Quantity in Condition State 1	2	3	4	
38	Reinforced Concrete Slab	2	1,933	SF	936	989	8		
1090	Exposed Rebar	2		SF			8		
1080	Delamination/Spall/Patched Area	2		SF		22			
1130	Cracking	2		SF		967			
1120	Efflorescence/Rust Staining	2		SF					
1190	Abrasion/Wear	2		SF					
1900	Distortion	2		SF					
4000	Settlement	2		SF					
6000	Scour	2		SF					
7000	Damage	2		SF					
814	AC w/o Membrane Overlay	2	1,720	SF	1,712	8			
3230	Effectiveness	2		SF					
3210	Delam./Spall/Patched Area/Pothole	2		SF					
3220	Crack	2		SF					
7000	Damage	2		SF		8			
205	Columns, Reinforced Concrete	2	12	EA		12			
1090	Exposed Rebar	2		EA					
1080	Delamination/Spall/Patched Area	2		EA		12			
1130	Cracking	2		EA					
1120	Efflorescence/Rust Staining	2		EA					
1190	Abrasion/Wear	2		EA					
1900	Distortion	2		EA					
4000	Settlement	2		EA					
6000	Scour	2		EA					
7000	Damage	2		EA					
215	Abutment, Reinforced Concrete	2	55	LF	12	43			
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF		8			
1130	Cracking	2		LF		35			

1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
234	Pier Cap, Reinforced Concrete	2	82	LF	67	15			
1090	Exposed Rebar	2		LF					
1080	Delamination/Spall/Patched Area	2		LF					
1130	Cracking	2		LF		15			
1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					
331	Reinforced Concrete Bridge Railing	2	142	LF		142			
1090	Exposed Rebar	2		LF		30			
1080	Delamination/Spall/Patched Area	2		LF		71			
1130	Cracking	2		LF		41			
1120	Efflorescence/Rust Staining	2		LF					
1190	Abrasion/Wear	2		LF					
1900	Distortion	2		LF					
4000	Settlement	2		LF					
6000	Scour	2		LF					
7000	Damage	2		LF					

Bridge Inspection Digital Photo Log

Structure No. **50-277-015**

Photo Number:	Date:	Description:
1	6/16/2022	Approach looking East
2	6/16/2022	Approach looking West
3	6/16/2022	Profile looking North
4	6/16/2022	Profile looking South
5	6/16/2022	1st NE Approach Delineator Bent
6	6/16/2022	4th SW Approach Delineator Bent
7	6/16/2022	Top of Bituminous Overlay looking East
8	6/16/2022	Bituminous Overlay Gouges in Eastbound Lane
9	6/16/2022	SW Concrete Curb and Railing Spall
10	6/16/2022	SE Concrete Curb Spall with Exposed Rebar
11	6/16/2022	NW Concrete Curb Spall
12	6/16/2022	NE Concrete Curb Spall with Exposed Rebar
13	6/16/2022	South Curb and Slab Vertical Crack over Center Bent
14	6/16/2022	North Bridge Rail
15	6/16/2022	South Bridge Rail
16	6/16/2022	Typical Concrete Railing Spalling with Exposed Rebar
17	6/16/2022	Underside of Slab Span #2
18	6/16/2022	Underside of Slab Span #3
19	6/16/2022	Underside of Slab Span #4 Spall with Exposed Rebar at South Deck Drain
20	6/16/2022	Underside of Slab Span #4 Spall with Exposed Rebar at North Deck Drain
21	6/16/2022	West Abutment
22	6/16/2022	East Abutment
23	6/16/2022	Typical Configuration of Bent
24	6/16/2022	West Bent Column #1 (South) Exposed Footing
25	6/16/2022	Upstream Channel looking North
26	6/16/2022	Downstream Channel looking South
27	6/16/2022	Scour at West Bent between Column #1 and #2
28	6/16/2022	Scour at Center Bent Column #1 (South)
29	6/16/2022	Riprap behind NW Wingwall
30	6/16/2022	Riprap behind NE Wingwall

50-277-015_2022_1_CDI_Approach looking East

50-277-015_2022_2_CDI_Approach looking West

50-277-015_2022_3_CDI_Profile looking North

50-277-015_2022_4_CDI_Profile looking South

50-277-015_2022_5_CDI_1st NE Approach Delineator Bent

50-277-015_2022_6_CDI_4th SW Approach Delineator Bent

50-277-015_2022_7_CDI_Top of Bituminous Overlay looking East

50-277-015_2022_8_CDI_Bituminous Overlay Gouges in Eastbound Lane

50-277-015_2022_9_CDI_SW Concrete Curb and Railing Spall

50-277-015_2022_10_CDI_SE Concrete Curb Spall with Exposed Rebar

50-277-015_2022_11_CDI_NW Concrete Curb Spall

50-277-015_2022_12_CDI_NE Concrete Curb Spall with Exposed Rebar

50-277-015_2022_13_CDI_South Curb and Slab Vertical Crack over Center Bent

50-277-015_2022_14_CDI_North Bridge Rail

50-277-015_2022_15_CDI_South Bridge Rail

50-277-015_2022_16_CDI_Typical Concrete Railing Spalling with Exposed Rebar

50-277-015_2022_17_CDI_Underside of Slab Span #2

50-277-015_2022_18_CDI_Underside of Slab Span #3

50-277-015_2022_19_CDI_Underside of Slab Span #4 Spall with Exposed Rebar at South Deck Drain

50-277-015_2022_20_CDI_Underside of Slab Span #4 Spall with Exposed Rebar at North Deck Drain

50-277-015_2022_21_CDI_West Abutment

50-277-015_2022_22_CDI_East Abutment

50-277-015_2022_23_CDI_Typical Configuration of Bent

50-277-015_2022_24_CDI_West Bent Column #1 (South) Exposed Footing

50-277-015_2022_25_CDI_Upstream Channel looking North

50-277-015_2022_26_CDI_Downstream Channel looking South

50-277-015_2022_27_CDI_Scour at West Bent between Column #1 and #2

50-277-015_2022_28_CDI_Scour at Center Bent Column #1 (South)

50-277-015_2022_29_CDI_Riprap behind NW Wingwall

50-277-015_2022_30_CDI_Riprap behind NE Wingwall

CHANNEL PROFILE

MINNEHAHA COUNTY

STR. NO. 50-277-015

MEASUREMENTS TAKEN FROM THE TOP OF: **RAIL**
MEASUREMENTS TAKEN ON THE INLET SIDE OF THE STRUCTURE: **NORTH**

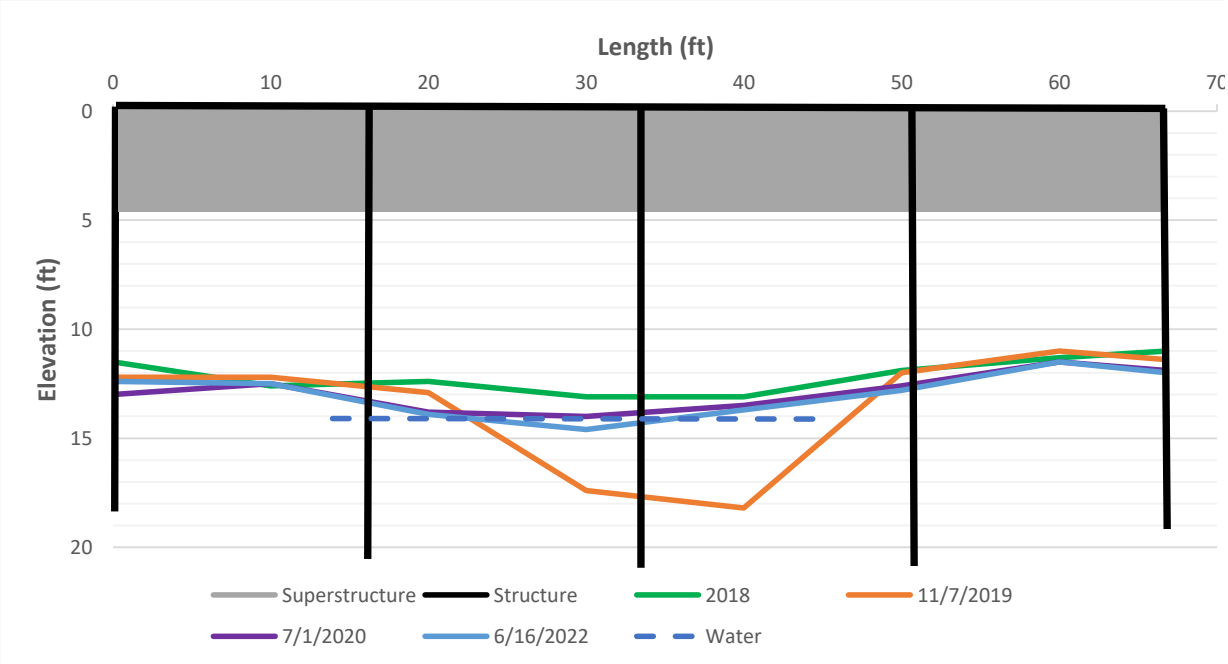
WATER ELEV: **12.2**

		2018	11/7/2019	7/1/2020	6/16/2022
West End	0	11.5	12.2	13.0	12.4
	10	12.6	12.2	12.5	12.5
	20	12.4	12.9	13.8	13.9
	30	13.1	17.4	14.0	14.6
	40	13.1	18.2	13.5	13.7
	50	11.9	12.0	12.6	12.8
	60	11.3	11.0	11.5	11.5
East End	66.8	11.0	11.4	11.9	12.0

ABUT./BENT	
1	0
2	16.1
3	33.4
4	50.7
5	66.8

OUTLET SIDE	7/1/2020	6/16/2022
At Bent 2:	16.0	13.3
At Bent 3:	17.0	13.7
At Bent 4:		12.7

Top of RAIL to bottom of Superstructure: 4.4 ft



Note: No Construction Plans are enclosed in SDDOT bridge inspection file.

CIVIL DESIGN INC

General Bridge Data

(8) STR NO : 50-277-015

(7) FACILITY : JASPER ST, HWY 104

(6) FEAT INTER : WEST PIPESTONE CREEK

(9) LOCATION : 7.3E & 0.2N DELL RAPIDS

INTERCHANGE : N

SECTION(S) : 10 -1 -1 -1

TOWNSHIP(S) : 104N -1

RANGE(S) : 48W -1

(2) REGION : Mitchell

(3) COUNTY : 50 MINNEHAHA

(21) CUSTODIAN : 2 County Hwy Agency

(22) OWNER : 2 County Hwy Agency

MAINT PROJ :

(42A) SERV TYPE ON : 1 Highway

(42B) SERV TYPE UND : 5 Waterway

(103) TEMP STRUCTURE : Unknown (NBI)

(99) BORDER BRIDGE STR NO : -1

(98A) NEIGHBOR STATE : Unknown (P)

(98B) PERCENT SHARE : -2.00

Highway Carried (NBI 5)

(5B) ROUTE PREFIX : 4 County Hwy

(5C) LEVEL OF SERVICE : 1 Mainline

(5D) ROUTE NUMBER : 00000

(5E) DIRECT SUFFIX : 0 N/A (NBI)

MRM ENGLISH : 0.00

POSTED SPEED : 55 MPH

SCHOOL BUS RT : Y

MAIL RT : Y

(104) NHS SYSTEM : 0 Not on NHS

FA ROUTE : 6250

(26) FUNC CLASS : 07 Rural Mjr Collector

(28A) LANES : 2

(102) DIRECTION TRAFFIC : 2 2-way traffic

(105) FED LANDS HWY : 0 N/A (NBI)

(19) DETOUR : 9.00 mi

(29) ADT TOTAL : 506.00

(30) YEAR OF ADT : 2021

(109) % TRUCK : 3.00 %

(53) MIN V CLR RT : 99.99 ft

(53) MIN V CLR LT : 0.00 ft

(10) MAX V CLR RT : 99.99 ft

(10) MAX V CLR LT : 0.00 ft

(47) HORIZ V CLR RT : 24.00 ft

(47) HORIZ V CLR LT : 0.00 ft

GIS Data

LATITUDE : 43.82635

LONGITUDE : -96.57830

DATE : 03/28/2016

COMMENT : Calculated GIS INFO

(27) YEAR BUILT : 1940

(106) RECONSTR : (1)

(49) STR LENGTH : 70.80 ft

NBIS BRIDGE LENGTH : 66.80 ft

(48) MAX SPAN LENGTH : 17.30 ft

Main Span

(43A) MATERIAL : 2 Concrete Continuous

(43B) DESIGN : 01 Slab

SD STR TYPE : X020

(107) DECK STR TYPE : 1 Concrete-Cast-in-Place

(52) DECK WIDTH : 27.30 ft

(51) BRIDGE RDWY WIDTH : 24.30 ft

(32) APPR RDWY WIDTH : 24.00 ft

(50A) LT SIDEWALK WIDTH : 0.00 ft

(50B) RT SIDEWALK WIDTH : 0.00 ft

(34) SKEW : 0.00°

SKEW DIR :

(45) NO MAIN SPANS : 4

(46) NO APPR SPANS : 0

(31) DESIGN LOAD : 0 Unknown

(33) BRIDGE MEDIAN : 0 No median

(35) STR FLARED : 0 No flare

Box Culvert Data

BOX CULVERT SIZE : 0 X 0 X 0

FILL HT OVER BOX : 0.00 ft

LENGTH OF LONGEST CELL : 0.00 ft

Rail Data

(36) SAFETY FEAT : 0000

BRIDGE RAIL 1 : 11 - CONC PIGEON HOLE RAIL

RAIL TRANS 1 : NN - NOT APPLICABLE

APPR RAIL 1 : 00 - NO APPROACH RAIL

APPR RAIL TERM 1 : 00 - NO TERMINALS PROVIDED

NBI Prop Work

(75A) WORK TYPE : 31 Repl-Load Capacity

(75B) WORK BY : 1 Contract

(76) IMPROV LENGTH : 317.26 ft

(94) BRIDGE IMPROV COST : $454,908.00

(95) RDWAY IMPROV COST : $45,491.00

(96) TOTAL PROJECT COST : $712,559.00

(97) YEAR OF IMPROV COST : $2,018.00

(114) ADT FUTURE : 700.00

(115) YEAR OF ADT FUTURE : 2036

Steel Paint

UNDERCOAT :

TOPCOAT :

YEAR :

COLOR :

Status

SUFF RATE : 58.50

FED SUFF RATE : 66.30

FED SR DATE : 03/14/2022

DEFICIENCY :

CANDIDATE :

Deck Data

(108A) WEARING SURFACE : 6 Bituminous

DECK PROTECTION : None

OVERLAY THICKNESS : 5.00 in

DECK DELAM AREA : 0.00 sq ft

DECK DELAM DATE :

DECK SURVEY :

CHLORIDE : N

RESTEEL DEPTH : N

ELECTRO POTENT : N

Load Rating Data

(41) OPER STATUS : A Open, no restriction

(66) INV HS20 : 21.60 tons

(65) METHOD : 0 Field eval and docs

(64) OP HS20 : 36.00 tons

(63) METHOD : 0 Field eval and docs

TRUCK TYPE 3 : 24.00 tons

TRUCK TYPE 3S2 : 40.00 tons

TRUCK TYPE 3-2 : 46.00 tons

NRL : 40.00 tons

SHV-4 : 27.00 tons

SHV-5 : 31.00 tons

SHV-6 : 34.80 tons

SHV-7 : 38.80 tons

EV2 : tons

EV3 : tons

BARS NO : JDG

Hydraulics

DRAINAGE AREA : 10.86 sq mi

OBSERV HW ELEV : 0.00 ft

YEAR : 01/01/1901

DESIGN FREQ : 0.00

DESIGN FLOW : 0.00 cfs

DESIGN VELOCITY : 0.00 fps

DESIGN AREA : 0.00 sq ft

DESIGN YEAR :

DESIGN HW ELEV : ft

100 YEAR FLOW : 0.00 cfts

100 YEAR HW ELEV : ft

V MAX : fps

SCOUR SCREENING : 2

SCOUR RATING : U

TOPEKA SHINER : Y

Rail Paint

UNDERCOAT :

TOP COAT :

YEAR :

COLOR :

Highway Carried (Under Record)

(5A) RECORD TYPE :
(5B) ROUTE PREFIX :
(5C) LEVEL OF SERVICE :
(5D) ROUTE NUMBER :
(5E) DIRECT SUFFIX :
MRM :
ADM JUR :
(104) NHS SYSTEM :
FA ROUTE :
(26) FUNC CLASS :
(28B) LANES :
(101) DIRECTION OF TRAFFIC :
(19) DETOUR LENGTH : mi
(29) ADT :
(30) ADT YEAR :

(54) MIN V CLR RT :
(54) MIN V CLR LT :
(10) MAX V CLR RT :
(10) MAX V CLR LT :
(47) HORIZ CLR RT :
(47) HORIZ CLR LT :
(55) OUT UNDCLR RT :
(55) OUT UNDCLR LT :
(56) MED UNDCLR RT :
(56) MED UNDCLR LT :

Project Number	PCN	Date Done
NA	none	01/01/1940

Inspection

GENERAL COMMENT : -1
REGION COMMENT : -1
FREE COMMENT : -1

INSPECTION TYPE	LAST INSPECTION DATE	REQUIRED	INSPECTION FREQUENCY	NEXT INSP DATE
NBI	06/16/2022		24 month(s)	06/16/2024
FRACTURE CRITICAL	NA	N	NA	NA
UNDERWATER	NA	N	NA	NA
SPECIAL	NA	N	NA	NA
ELEMENT INSPECTION	06/16/2022		24 month(s)	06/16/2024

INSPKEY : QZRW
APPRAIS BY : CLB
APPRAIS DATE : 10/04/2022
QA INSPECTOR :
QA INSP DATE :
LAST INSPECTION BY :
CONSULTANT CODE : CIVIL DESIGN

Condition Ratings

(58) DECK : 5
(59) SUPER : 5
(60) SUB : 6
(62) CULVERT : N
(113) SCOUR : U
(61) CHANNEL : 6
APPROACH : 7 -1

Appraisal Ratings

STR APPR : 5 -1
DECK GEOM : 4 -1
UNDERCLR : N -1
WATERWAY : 7 -1
APPR ALIGN : 8 -1
BR POST : 5 LEGAL LOADS
SCOUR SCREENING : 2
SCOUR RATING : U

Elements	Unit	ID	Env	Quantity	Units	Q 1	Q 2	Q 3	Q 4
Re Concrete Slab	**MAIN**	**38**	**2**	**1933.00**	**sq.ft**	**936.00**	**989.00**	**8.00**	**0.00**
Cast-in-place concrete - The top surface of the concrete slab is not visible due to the bituminous overlay. Cast-in-place concrete - There are longitudinal hairline cracks evident towards the center portion of the slab. Some areas of minor honeycombing are evident throughout. There is an approximate 4 ft x 8 ft area of map cracking and efflorescence along the north side of the west span. There are several cementitious patches in span #3 from the west. It appears these patches are filling some honeycombed areas. Large spalls, which have exposed reinforcing steel, are evident at several of the deck drain locations. Some of the exposed reinforcing steel is plating with minor section loss. The exposed portions of the reinforcing steel have a heavily rusted appearance.									
├ Delamination/Spall/Patched Area	MAIN	1080	2	22.00	sq.ft	0.00	22.00	0.00	0.00
–									
├ Exposed Rebar	MAIN	1090	2	8.00	sq.ft	0.00	0.00	8.00	0.00
–									
├ Cracking (RC and Other)	MAIN	1130	2	967.00	sq.ft	0.00	967.00	0.00	0.00
–									
├ AC w/o Membrane Overlay	MAIN	814	2	1,720.00	sq.ft	1,712.00	8.00	0.00	0.00
Bituminous - Approximate 5-inch average depth. There are three (3) gouges in overlay due to an apparent piece of dragging equipment.									
└ Damage	MAIN	7000	2	8.00	sq.ft	0.00	8.00	0.00	0.00
Re Conc Column	**MAIN**	**205**	**2**	**12.00**	**each**	**0.00**	**12.00**	**0.00**	**0.00**
Cast-in-place concrete - There are four (4) concrete columns per bent (12 total columns). Areas of scaling are evident, but overall, the concrete columns appear to be in relatively good condition.									
├ Delamination/Spall/Patched Area	MAIN	1080	2	12.00	each	0.00	12.00	0.00	0.00
–									
Re Conc Abutment	**MAIN**	**215**	**2**	**55.00**	**ft**	**12.00**	**43.00**	**0.00**	**0.00**
BACKWALLS - Cast-in-place concrete - Some vertical hairline cracks and areas of light to moderate scaling are evident, but overall, the backwalls appear to be in satisfactory condition. WINGWALLS - Cast-in-place concrete - The wingwalls have areas of light to moderate scaling evident, but overall, the wingwalls appear to be in satisfactory condition.									
├ Delamination/Spall/Patched Area	MAIN	1080	2	8.00	ft	0.00	8.00	0.00	0.00
–									
├ Cracking (RC and Other)	MAIN	1130	2	35.00	ft	0.00	35.00	0.00	0.00
–									
Re Conc Pier Cap	**MAIN**	**234**	**2**	**82.00**	**ft**	**67.00**	**15.00**	**0.00**	**0.00**
Cast-in-place concrete - The bent caps consist of concrete beams. There are vertical cracks, slightly bigger than hairline, evident between, and over, the columns. Overall, the bent caps appear to be in relatively good condition.									
├ Cracking (RC and Other)	MAIN	1130	2	15.00	ft	0.00	15.00	0.00	0.00
–									
Re Conc Bridge Railing	**MAIN**	**331**	**2**	**142.00**	**ft**	**0.00**	**142.00**	**0.00**	**0.00**
The railings consist of reinforced concrete pigeon hole railings. Several spalls, cracks, and areas of exposed reinforcing steel are evident throughout. The south railing has a moderately to heavily weathered appearance with some moss evident on the surface of the railing. There are some small chips and some scrapes evident at the west end of the south railing. It appears these chips and scrapes are due to a vehicle impact.									
├ Delamination/Spall/Patched Area	MAIN	1080	2	71.00	ft	0.00	71.00	0.00	0.00
–									

Elements	Unit	ID	Env	Quantity	Units	Q 1	Q 2	Q 3	Q 4
Exposed Rebar	MAIN	1090	2	30.00	ft	0.00	30.00	0.00	0.00
–									
Cracking (RC and Other)	MAIN	1130	2	41.00	ft	0.00	41.00	0.00	0.00
–									
7361 Scour Smart Flag	**MAIN**	**7361**	**2**	**1.00**	**each**	**0.00**	**1.00**	**0.00**	**0.00**

CURRENT 2022 INSPECTION - Moderate scour of approximately 3 feet at column #1 & #2 footings (2020 - 3'-5' scour) in the west and center bent. Previously observed scour at upstream side of structure has silted back in, but downstream side still has approximately 3 feet of scour. Scour does not appear to be endangering structure at the time of inspection.

PREVIOUS 2020 INSPECTION - Moderate scour of approximately 3 - 5 feet at column #1 & #2 footings in the west and center bent. Previously observed scour at upstream side of structure has silted back in, but downstream side still has approximately 3 - 5 feet of scour. Scour does not appear to be endangering structure at the time of inspection.

PREVIOUS - (2019 Special) Channel – No apparent bank cutting/erosion.
No stream flow debris observed.
Moderate scour of ~ 4'-5' observed at Bent 3 (See Channel Profile).
Minor scour of ~ 1' observed under east span.

Action	Agency Status	Agency Priority	Assigned to	Rec. Date	Str No	Assigned To	Notes	Target Year
			No					