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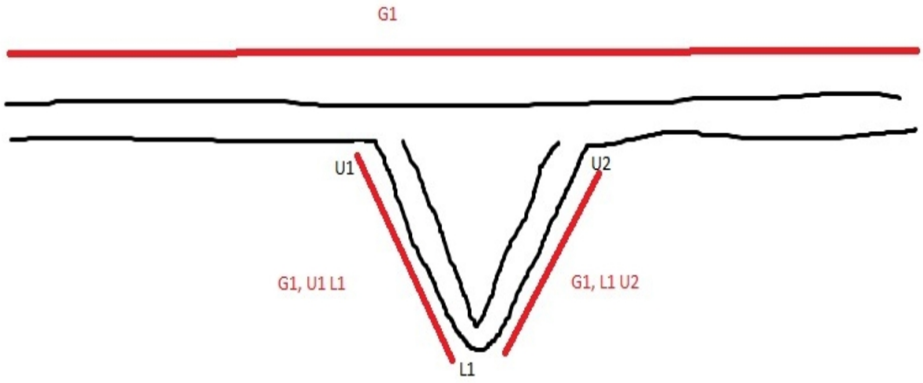
Asset #0002-358.090(Routine)
US HIGHWAY 2 over RED RIVER OF THE NORTH
Location: EAST OF US 81
Inspection Date: 06/06/2022



Latitude:47.93320, Longitude:-97.03733

Route:00002 Log:358.014

District 66, 18 - Gr. Forks

Owner: 1 - State Highway Agency

Place Code: 32060

Team Leader: Mn DOT

Approved By: Matthew Kurle

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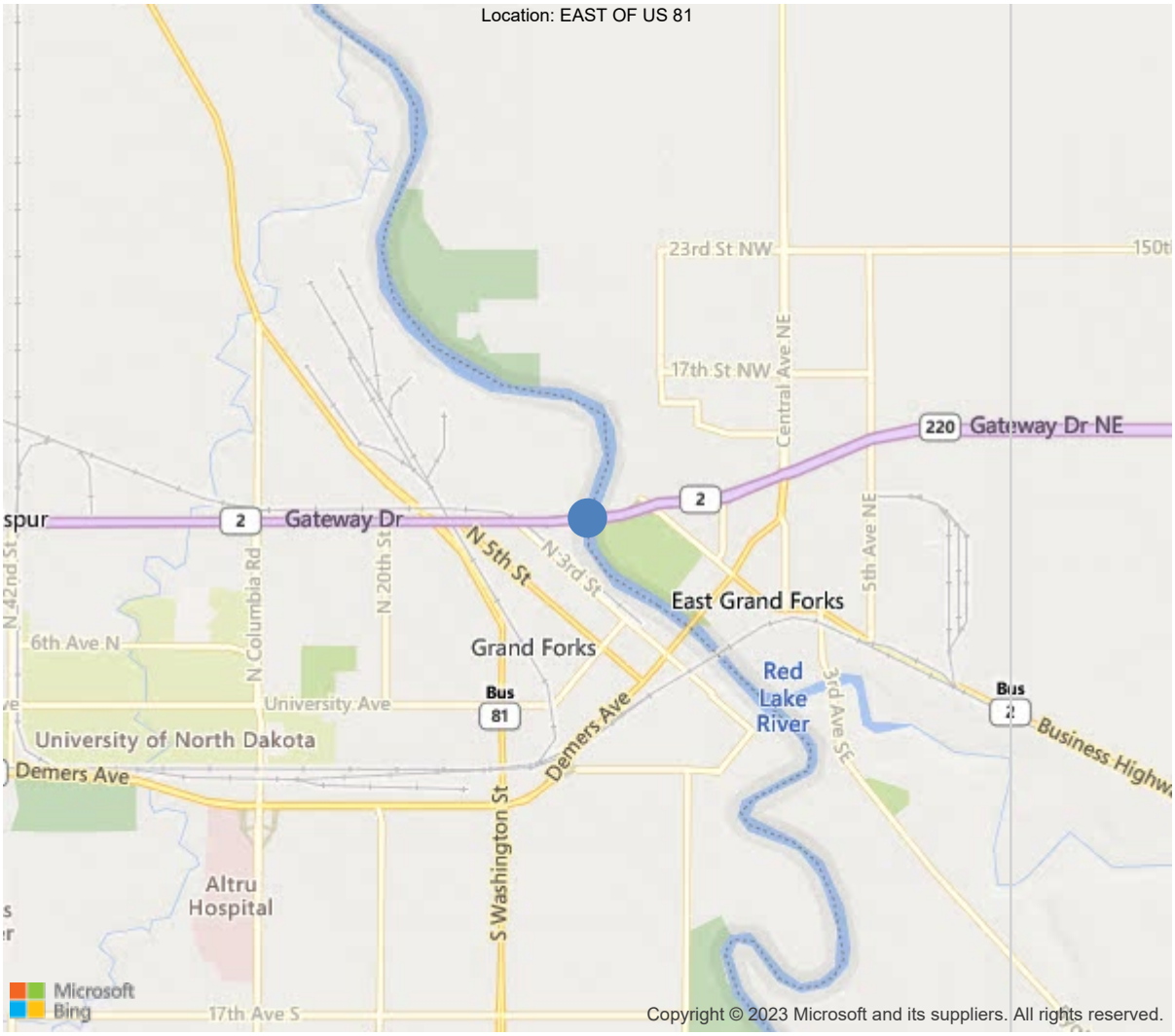
District: 66, **County:** 18 - Gr. Forks
Inspection Date: 06/06/2022



47.93320, -97.03733

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Asset #0002-358.090(Routine)

US HIGHWAY 2 over RED RIVER OF THE NORTH

Location: EAST OF US 81

Inspection Date: 06/06/2022

IDENTIFICATION	
(1) State Names	38 - North Dakota
(8) Structure Number	0002-358.090
(5) Inventory Route	
(2) Highway Agency District	6 - Grand Forks
(3) County Code	18 - Gr. Forks
(4) Place Code	32060
(6) Features Intersected	RED RIVER OF THE NORTH
(7) Facility Carried	US HIGHWAY 2
(9) Location	EAST OF US 81
(11) Mile Point	358.014 mi
(12) Base Highway Network	No
(13) LRS Inventory Rte & Subrte	0000000000
(16) Latitude	47.9332018699639
(17) Longitude	-97.0373264900843
(98) Border Bridge State Code	27
(99) Border Bridge Structure No.	9090
STRUCTURE TYPE AND MATERIAL	
(43) Main Structure Type	310
Material	3 - Steel
Type	10 - Truss - Thru
(44) Approach Structure Type	32
Material	3 - Steel
Type	2 - Stringer/Multi-beam or girder
(45) No. of Spans in Main Unit	2
(46) No. of Approach Spans	11
(107) Deck Structure Type	1 - Concrete Cast-in-Place
(108) Wearing Surface/Protective System	
Type of Wearing Surface	0 - None (no additional concrete thickne
Type of Membrane	0 - None
Type of Deck Protection	1 - Epoxy Coated Reinforcing
AGE AND SERVICE	
(27) Year Built	1963
(106) Year Reconstructed	2018
(42) Type of Service	15
On	1 - Highway
Under	5 - Waterway
(28) Lane	
On	4
Under	0
(29) Average Daily Traffic	21500
(30) Year of ADT	2019
(109) Truck ADT	6 %
(19) Bypass, Detour Length	4 mi
GEOMETRIC DATA	
(48) Length of Maximum Span	274.9 ft
(49) Structure Length	1261.2 ft
(50) Curb or Sidewalk Width	
Left	8.7 ft
Right	1.4 ft
(51) Bridge Roadway Width Curb to Curb	54.5 ft
(52) Deck Width Out to Out	67.3 ft
(32) Approach Roadway Width (W/Shoulders)	63 ft
(33) Bridge Median	2 - Closed median (no
(34) Skew	0 Deg
(35) Structure Flared	0 - No flare
(10) Inventory Route Min Vert Clear	19.5 ft
(47) Inventory Route Total Horiz Clear	54.5 ft
(53) Min Vert Clear Over Bridge Rdwy	19.72 ft
(54) Min Vert Underclear	0 ft
Ref:	
(55) Min Lat Underclear RT	99.9 ft
Ref:	
(56) Min Lat Underclear LT	0 ft
NAVIGATION DATA	
(38) Navigation Control	0 - No navigation control on w
(111) Pier Protection	
(39) Navigation Vertical Clearance	0 ft
(116) Vert-Lift Bridge Nav Min Vert Clear	ft
(40) Navigation Horizontal Clearance	0 ft

CLASSIFICATION	
(112) NBIS Bridge Length	Y
(104) Highway System	1
(26) Functional Class	14 - Urban Other Principal Art
(100) Defense Highway	0 - Not a STRAHNET route
(101) Parallel Structure	N - No parallel structure exis
(102) Direction of Traffic	2 - way traffic
(103) Temporary Structure	
(105) Federal Lands Highways	0 - N/A
(110) Designated National Network	1 - The inventory route is par
(20) Toll	3 - On toll free road
(21) Maintain	1 - State Highway Agency
(22) Owner	1 - State Highway Agency
(37) Historical Significance	5 - Bridge is not eligible for
CONDITION	
(58) Deck	7
(59) Superstructure	4
(60) Substructure	6
(61) Channel & Channel Protection	6
(62) Culverts	N
LOAD RATING AND POSTING	
(31) Design Load	5 - MS 18 / HS 20
(63) Operating Rating Method	8
(64) Operating Rating	
Type	8 - Load and Resistance Factor Rating (LRF
Rating	1.2
(65) Inventory Rating Method	8 - Load and Resistance Factor
(66) Inventory Rating	
Type	
Rating	0.9
(70) Bridge Posting	5 - Equal to or above legal loads
(41) Structure Open/Posted/Closed	A - Open, no restriction
APPRAISAL	
(67) Structural Evaluation	
(68) Deck Geometry	
(69) Clearances, Vertical/Horizontal	N
(71) Waterway Adequacy	6
(72) Approach Roadway Alignment	7
(36A) Bridge Railings	0 - Does not meet currently accepta
(36B) Transitions	N - Not applicable or a safety feat
(36C) Approach Guardrail	N - Not applicable or a safety feat
(36D) Approach Guardrail Ends	N - Not applicable or a safety feat
(113) Scour Critical Bridges	5 - Bridge foundations determined t
PROPOSED IMPROVEMENTS	
(75) Type of Work	38 - Other structural work, in
(76) Length of Structure Improvement	1261.2 ft
(94) Bridge Improvement Cost	$ 1018000
(95) Roadway Improvement Cost	$ 102000
(96) Total Project Cost	$ 1527000
(97) Year of Improvement Cost Estimate	2010
(114) Future ADT	21500
(115) Year of Future ADT	2039

INSPECTIONS *

(90) Inspection Date			06/06/2022
(91) Frequency			12
(92) Critical Feature Inspection	Done	Freq. (Mon)	Date
A: Fracture Critical Detail	Yes	24	06/15/2021
B: Underwater Inspection	Yes	60	08/01/2020
C: Other Special Inspection			

* The inspection date and frequency information in this box contains the current NBI date and frequency information. Please refer to the report header for the date this inspection was conducted.

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Location: EAST OF US 81
Inspection Date: 06/06/2022

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
12	Reinforced Concrete Deck	SF	84865	84431	434	0	0
1130	Cracking (RC and Other)	SF	434	0	434	0	0
510	Wearing Surfaces	SF	70510	32961	37533	16	0
3220	Crack (Wearing Surface)	SF	37899	350	37533	16	0

(12) [2017] Structure is in process of being rehabbed. Both EBL have a new deck. WBL are in the process of being removed. RJA
[2018 FC-2019 FC] Deck replaced. The deck has small cracks with efflorescence especially at the drain scuppers. 200 LF of transverse cracks
with efflorescence (CS2).
[2020 D2] Minor cracks present in various areas. 767 LF x 0.1 = 77 SF. (CS 1). Minor cracks with light leaching (little or no build-up). 554 LF x
0.1 = 56 SF. (CS 2). RJA*
[2021 FC] Minor cracks with light leaching or light water saturation (CS-2).
[2022 D2] Minor cracks with light leaching (little or no build-up). 1662 LF x 0.1 = 166 SF. (CS 2). MAG

(510-12) [2017] Structure is in process of being rehabbed. Both EBL have a new deck and both east bound and west bound traffic is running in these
lanes. WBL is in the process of being removed. RJA
[2018 FC] New wearing surface. The top of the deck is covered in dirt and debris from the ongoing construction project. This element rating
should be reviewed once the construction project is completed.
[2019 FC] Both truss spans have extensive hairline map cracking throughout (CS2) with some small areas of wider cracks, especially in Span
7 near Floorbeam 3 in the east bound lanes (CS3).
[2020 D2] Unsealed minor cracks less than 0.012 inches wide. 250 LF x 0.1 = 25 SF. (CS 1). Sealed cracks less than 1/8 inch wide. 3225 LF x
0.1 = 333 SF. (CS 2). Concrete patches that remain sound located in the EBL near the Minnesota end each measure 1 1/2 x 1 1/2 feet. 7 SF.
(CS 2). Concur with 2019 FC findings and quantities. RJA*
[2021 FC] No significant change.
[2022 D2] Unsealed minor cracks less than 0.012 inches wide. 300 LF x 0.1 = 30 SF. (CS 1). Sealed cracks less than 1/8 inch wide. 3230
LF x 0.1 = 323 SF. (CS 2). MAG

(3220-510-12) Various cracking to wearing surface in the Eastbound Lanes within the Truss Sections. See Photos. - 12/17/2019

107	Steel Open Girder/Beam	LF	5600	4994	400	206	0
1900	Distortion	LF	606	0	400	206	0
515	Steel Protective Coating	SF	68424	68424	0	0	0

(107) Notes: [Previous Notes] There is a bend in the bottom flange of the south fascia girder, span 12, no cracks present. Girders 1 and 2 (from the
south) in span 2 have impact damage due to a high load hit. Magnetic Particle examination of those areas revealed no cracks.
[2017] No significant change found during inspection. RJA
[2018 FC] No significant change found during inspection.
[2019 FC] Fascia girders have holes from previous drain attachments. No other significant changes.
[2020 D2] 8 painted steel girders. No significant changes. Concur with 2019 FC quantities. RJA*
[2021 FC] Spans 2 and 3 have a negative camber on north fascia beam.
[2022 D2] No significant change. MAG

(1900-107) Distortion to Bottom Flange of the South Facia Beam ins Span 12. See Photo. - 12/17/2019, 6/29/2020.

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(515-107) Notes: [Previous Notes] Protective coating quantity includes diaphragms. 9 SF / LF. [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA. [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA* [2021 FC] No significant change. [2022 D2] No significant change. (CS 1). MAG							
113	Steel Stringer	LF	4464	4288	176	0	0
1000	Corrosion	LF	1	0	1	0	0
1010	Cracking	LF	175	0	175	0	0
515	Steel Protective Coating	SF	71276	71275	1	0	0
3440	Effectiveness (Steel Protective Coatings)	LF	1	0	1	0	0
(113) Notes: {Previous Notes} There is a square cope detail at the top of the web on all of the stringers, which is fatigue prone and should be monitored for cracking. [2017] Structure is in the process of being rehabbed. Access limited. RJA [2018 FC-2019 FC] Span 7 Stringer 1 at Floorbeam 3' on the east side has a crack on the top at the cope. It has been drilled out to arrest the crack. [2020 D2] 8 painted steel stringers between each painted steel floorbeam. No significant changes. Concur with 2019 FC quantities. RJA [2021 FC] Span 7 Stringer 3 has fretting rust at floorbeam 3 stiffener (CS-2). [2022 D2] No significant change. MAG							
(1000-113) 6/15/21: Span 7 Stringer 3 has fretting rust at floorbeam 3 stiffener (CS-2).							
(1010-113) 6/29/20: Span 7 Stringer 1 at Floorbeam 3' on the east side has a crack on the top at the cope. It has been drilled out to arrest the crack.							
(515-113) Notes: [Previous Notes] Protective coating quantity includes diaphragms. 7.9 SF / LF per stringer & 3024 SF of diaphragm steel. [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] Span 7 Stringer 3 has fretting rust at floorbeam 3 stiffener (CS-2). [2022 D2] No significant change. MAG							
(3440-515-113) 6/15/21: Span 7 Stringer 3 has fretting rust at floorbeam 3 stiffener (CS-2).							
120	Steel Truss	LF	1115	765	200	149	1
1000	Corrosion	LF	349	0	200	149	0
1010	Cracking	LF	1	0	0	0	1
515	Steel Protective Coating	SF	42205	42177	16	8	4
3440	Effectiveness (Steel Protective Coatings)	LF	28	0	16	8	4

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4

(120) Notes: [FC SMART FLAG NOTES] Do Not Remove. See in-depth report for location of FC members.
[BOTTOM CHORD NOTES] Pack rust is forming at the gusset plates and batten plates on the bottom of both chords. The bolting plate @ the
bottom of the 4th vert chord in the NW corner of the truss is twisted down approx 1 inch where cross brace ties in. The cross brace coming into
this plate is also twisted. 3 cross bracing hanger rods are bent. The X-bracing on the SW corner of truss is also bent. Several interior welds of
the lower chord box members were inspected after blasting & cleaning-no defects were noted. There are some nuts missing on diagonal
bracing hanger rods. Two broken hanger rods 1 at MN (east) Pier, 1 at ND (west) pier.
[TOP CHORD NOTES] Minimal sect loss on top chord verticals & diagonals. There are broken welds on the angle stiffeners on top of the inside
gusset plates (deck height) @ the 1st panel points W of the NE & SE end posts.
PREVIOUS NOTES
[2003 FC] There is some rust and some minor section loss beginning to form, especially along the curb line and at the bottom chord connections on the verticals and diagonals. The total area affected is less than 5%..There are scattered areas of surface pitting on the chords.
There is minor section loss with moderate pitting at the bottom panel point connections on gusset plates and truss members (<5 %) Pack rust is
forming at the gusset plates and batten plates on the bottom of the chords. There is some minor section loss beginning to form, especially along
the curb line and at the bottom chord connections on the verticals and diagonals. The total area affected is less than 5%
[2007 FC] There are scattered areas of surface pitting on the chords. Magnetic particle was performed on the gusset plate to lower chord welds.
A crack approx. 2 inches long was found on the at the L0 south side of the west truss. Consulted w/CO & was instructed to grind out crack and
prime & apply Dow 888 to prevent rusting. Re-inspected in December 07 & again in March of 08. Ground out crack was re-inspected on
11/19/07 by DSH and found to have no further propagation. Inspected again and no propagation on May 13th 2008.
[2009 FC] Pack rust and minor section loss on bottom chords and panel points. Joe F
[2010] Bridge Maintenance added angle iron stiffeners to all (8) Lo locations to the unsupported lengths, also the in-place stiffeners were
repaired / installed where needed on 5/20/2010, (4) bolts that were missing on the East truss -no. side @ Lo location were replaced. Bridge
Maintenance incorporated debris drains @ all (8) Lo locations in order to adequately flush areas that were not able to clean; this was done on
6/10/2010. North side of west truss, vert. members are within 1/4 inch of concrete sidewalk slab, south side shows 1-2 inches of clearance. East
truss, 3rd bay, no. side 1 wind bracing anchor rod snapped off.
[2013] No significant change. Magnetic particle examination of the plug welds and welds on the T1 steel from L0-L1 revealed no new discontinuities.
[2015] Pitting on most vertical and diagonal members, especially in areas facing the rail and deck edge. Pack rust distortion up to 3/8 inch at the
corners of web splice plates U1-U2 and U1'-U2'.
[2016] Pack rust at Floor beam / batten plate connections CS3. Surface corrosion at various locations in the splash zones. Truss beg. and ends
appear worse than mid span. CS2
[2016] No significant change found during FC inspection.
[2017] No changes. RJA
[2018 FC-2019 FC] The old drain scuppers were attached to the lower chord with a welded bracket. The old scuppers have been removed.
The connection points have pitting up to 3/16 inch.
[2020 D2] Painted steel truss. No significant changes. Concur with 2019 FC quantities. RJA
[2021 FC] 2" crack in weld of the bottom plate at Span 6 L0-L1 N bottom chord (CS-4).Through corrosion of 2" at L0'S (CS-3).
[2022 D2] 2 inch crack has propagated to 2 and 9/16 inches. (CS 4). MAG

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(1000-120) No Rusting visible due to the coating system. Rusting of steel areas removed from blasting and painting operations causing steel section loss to various vertical and diagonal members from L0-L0' in both spans 6 and 7. See Photos. - 12/17/2019 (1010-120) 2" crack in weld of the bottom plate at Span 6 L0-L1 N bottom chord (CS 4). Through corrosion at 2" at L0's (CS 3). (515-120) Notes: [Previous Notes] Protective coating quantity includes sway bracing and lateral bracing. [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] Isolated areas of paint failure, minor and moderate deterioration. [2022 D2] No significant change. MAG							
152	Steel Floor Beam	LF	1380	0	888	492	0
1000	Corrosion	LF	1380	0	888	492	0
515	Steel Protective Coating	SF	13760	13760	0	0	0
(152) Notes: [Previous Notes] Rust Some of the floor beams are starting to develop pack rust. Isolated section loss at lower flange connections to panel points. Each Floorbeam has 17 stiffeners. Minor section loss at the bottom of the 2 exterior stiffeners. East truss 4th floorbeam from Pier 7 "center pier" has an area of corrosion with section loss 1/8 + inches on bottom flange 4 foot from south lower truss chord. Scattered areas of pitting on webs and lower flange. Each floorbeam is 69 feet. long. Floor beams tend to have heavy pack rust bottom flange at connection ends. East truss FB0, FB2, FB3, FB4', FB3', FB1' West truss FB2', FB4', FB4 exhibit section loss approx. 10% plus on the bottom flange at the batten plate connection. Each floor beam was individually computed and total CS2 and CS3 are shown. [2017] No changes. RJA [2018 FC-2019 FC] Span 6 Floorbeam 1 has a 1.75-inch diameter area of through corrosion in the web lower corner at the L1S connection. The sand blasting from the painting contract is exposing areas of pitting. This element rating should be reviewed when the painting contract is complete. [2020 D2] 9 painted steel floorbeams per span. No significant changes. Concur with 2019 FC quantities. RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG (1000-152) No Rusting, but Steel Section Loss from rusting on the Floor Beams removed during the blasting and painting operations along the bottom flanges and near the connection plates within Spans 6 and 7. - 12/17/2019 6/9/20: [Span 6 Floorbeam 1 has a 1.75-inch diameter area of through corrosion in the web lower corner at the L1S connection. The sand blasting from the paining contract is exposing areas of pitting. This element rating should be reviewed when the painting should be reviewed when the painting contract is complete.							

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(515-152) Notes: 16.9 SF / LF [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG Routine 06/06/2022 Fracture Critical 06/15/2021 13760 SF 13760 0 0 0 Steel Pin and Pin & Hanger Assembly or both 161 Routine							
161	Steel Pin, Pin and Hanger Assembly	EA	56	56	0	0	0
515	Steel Protective Coating	SF	336	336	0	0	0
(161) Notes: [2017] The steel pin and hanger assemblies on the entire EBL spans have all been replaced this summer due to the rehab that is in process. The WBL pin and hanger assemblies are original and no changes are noted. The pin and hanger assemblies for the entire WBL spans will be replaced next season during the continued rehab process. RJA [2018 FC] The pin and hangers have all been replaced. [2019 FC] Pins were ultrasonic tested as part of the inspection. No defects noted. [2020 D2] Painted steel hangers with stainless steel pins. No significant changes. Concur with 2019 FC quantities. RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG							
(515-161) Notes: 6 SF/ EA [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG							
162	Steel Gusset Plate	EA	80	44	0	36	0
1000	Corrosion	EA	18	0	0	18	0
1900	Distortion	EA	18	0	0	18	0
515	Steel Protective Coating	SF	3861	3845	10	4	2
3440	Effectiveness (Steel Protective Coatings)	EA	16	0	10	4	2

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(162) Notes: [Previous Notes] Top plates have minor distortion due to construction fit-up. Bottom plates have distortion due to pack rust. A three stage spot painting of gussets was completed in the week of 9/14/09. The bottom chord as well as the upper chord gusset plates have old pitting (painted over), Pitting up to 1/4 inch on upper and lower plates with the lower plates having the most corrosion due to the splash zone. [2017] No changes. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] Lower gusset plates have small areas of pitting that have been painted over. [2020 D2] Painted steel gusset plates. No significant changes. Concur with 2019 FC quantities. RJA [2021 FC] Surface corrosion and pack rust starting and active at some gusset plates. [2022 D2] No significant change. MAG							
(1000-162) No Rusting. Existing condition of the Gusset Plate from the coating and splash areas caused rusting. Steel Section Loss to Lower Chord Gusset Plates due to the removal of the coating from the sand blasting and painting operations. - 12/17/2019							
(1900-162) Minor distortion to lower Gusset Plates due to rusting and steel section loss to steel from the removal of the existing coating. - 12/17/2019							
(515-162) Notes: 12 SF/ EA [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. The north upper panel points have unpainted bolts from light replacement. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] Some areas of minor, moderate deterioration and failed paint. [2022 D2] No significant change. MAG							
(3440-515-162) 6/15/21: Some areas of minor, moderate deterioration and failed paint							
202	Steel Column	EA	72	0	72	0	0
1900	Distortion	EA	72	0	72	0	0
515	Steel Protective Coating	SF	11277	11277	0	0	0

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(202) Notes: [2017] Structure is in the process of being rehabbed. Access limited. RJA [2018 FC-2019 FC] No significant issues observed during inspection. [2020 D2] 8 painted steel columns per bent. Measurements taken at 54 degrees. Inches per foot and direction of tilt is as follows - B2 - 1/4 inch East B3 - 1/2 inch East B4 - 1/8 inch East B5 - 1/2 inch West B9 - Plumb B10 - 1/8 inch West B11 - 1/8 inch West B12 - 1/8 inch West B13 - 1/4 inch West Slightly out of position or alignment. 64 EA. (CS 2). RJA* [2021 FC] No significant change. [2022 D2] Measurements taken at 70 degrees. Inches per foot and direction of tilt are as follows - bent 2 - 3/8 inch east bent 3 - 3/8 inch east bent 4 - 1/8 inch east bent 5 - 1/2 inch west bent 9 - 1/8 inch west bent 10 - 1/8 inch west bent 11 - 1/8 inch west bent 12 - 1/4 inch west bent 13 - 1/4 inch west Slightly misaligned. 72 EA. (CS 2). MAG						
(1900-202) Bent Piers 9-13 lean to the West 3 1/2" in 4. Bent Piers 2-4 Lean to the East 2" in 4'. Bent Pier 5 straightened out under 2017-2018 Contract. - 12/17/2019						
(515-202) Notes: [2017] Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC] This Bridge is under construction and is partially painted. This element rating should be reviewed after the painting contract has completed. [2019 FC] New paint. [2020 D2] Little or no paint deterioration. (CS 1). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG						
205 Reinforced Concrete Column		EA	6	6	0	0	0
1130 Cracking (RC and Other)		EA	3	3	0	0	0
(1130-205) Minor vertical cracking to South Columns at Piers 6, 7, 8 with minor discoloration at Piers 7 and 8. See Photo. - 12/17/2019							
210 Reinforced Concrete Pier Wall		LF	210	195	15	0	0
1120 Efflorescence/Rust Staining		LF	4	4	0	0	0
1130 Cracking (RC and Other)		LF	25	20	5	0	0
6000 Scour		LF	10	0	10	0	0

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(210) Notes: [2017] A new P6 was constructed this summer and the old pier was demolished and removed.. This new pier has a system installed for monitoring movement. Some minor shrinkage cracks and honeycomb due to poor consolidation are present. Minor cracks present in various areas. (CS 1). RJA [2018 FC-2019 FC] No significant changes. [2020 D2] Graffiti present on P6 east and P8 west. Minor cracks present in various areas. (CS 1). 3 moderate cracks present on P6 and 1 moderate crack evident on P7. 4 LF. (CS 2). RJA [2020] Underwater Inspection: Concrete Pier Wall element inclusive of footing step at bottom of columns, due to specification of RC Pile Footing element specific to steel columns in element 220. The upstream and downstream footings were exposed with 2in and 16in vertical face exposure respectively (10lf CS2). Pier 7 exhibited (5) minor to moderate vertical cracks in the web-wall (5lf CS2). [2021 FC] No significant change. [2022 D2] Graffiti on all 3 piers in various areas, no other significant change. MAG (1120-210) Minor vertical cracking with seepage and efflorescence to Pier 6 east Wall. See Photo. - 12/17/2019 (1130-210) Minor Vertical Cracking to Piers 6-8 to the Walls. See Photo. - 12/17/2019 6/29/20: 3 moderate cracks present on P6 and 1 moderate crack evident on P7. 4 LF. (CS 2). 08/2020 (UW): Pier 7 exhibited (5) minor to moderate vertical cracks in the web-wall (5 LF in CS 2). (6000-210) 08/2020 (UW):The upstream and downstream footings were exposed with 2in and 16in vertical face exposure respectively (10lf CS2).						
215	Reinforced Concrete Abutment	LF	180	166	14	0	0
1130	Cracking (RC and Other)	LF	33	19	14	0	0
(215) Notes: [2017] Structure is in process of being rehabbed. The south half of both the ND and MN abutments have been rehabbed and have some minor shrinkage cracks present. The north half of both the ND and MN abutments need to be rehabbed yet and will be done once WBL deck is completely removed. RJA [2018 FC] East Abutment was inaccessible due to painting contract. Review this rating after the contract is complete. [2019 FC] Wingwalls replaced. New wingwalls are 6 feet long. [2020 D2] Minor cracks present in various areas. (CS 1). West abutment exhibits 8 moderate cracks - 5 of these with leaching with minor build up. East abutment exhibits 6 moderate cracks. 14 LF. (CS 2). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG (1130-215) 6/29/20: Minor cracks present in various areas. (CS 1). West abutment exhibits 8 moderate cracks - 3 of these with leaching with minor build up. East abutment exhibits 6 moderate cracks. 14 LF. (CS 2).						
220	Reinforced Concrete Pile Cap/Footing	LF	540	470	70	0	0
1120	Efflorescence/Rust Staining	LF	3	0	3	0	0
1130	Cracking (RC and Other)	LF	30	30	0	0	0
6000	Scour	LF	67	0	67	0	0

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(220) Notes: [Previous Notes] This element is used to describe the condition of the concrete footings supporting the steel column bents. This is an each item - there are 9 bents, with a separate footing for each side (eastbound & westbound), so the total quantity should be 18 (each footing support 4 steel columns). Each footing cap is 30 feet long, and is supported by two lower footings (each lower footing is supported by 2 steel Hpiling). The lower footings should be below grade (not visible for inspection) - only the upper portions of the footing caps should be visible for inspection. There is minor cracking on the footings. [2017] Minor cracks present in various areas. (CS 1). RJA [2019 FC] The B5 footing has started to undermine due to the position of the deck drains. Pier 6 has a 4 X 4 X 5 inch area of undermining at the center on the east side by the electrical box. The 2016 UW report recommends a rating of CS-2 for the Pier 7 rating due to exposure increasing from 0 inches to 12 inches since the last UW inspection. [2020 D2] No significant changes. Concur with 2019 FC quantities. RJA [2021 FC] No significant change. [2022 D2] Undermining at pier 6 has been repaired, no other significant change. MAG						
(1120-220) Minor vertical cracking with seepage and efflorescence to West Side of cap lower portion. See Photo. - 12/17/2019						
(1130-220) Minor diagonal and vertical cracking to Bent Piers 4 and 5 Caps. See Photo. - 12/17/2019						
(6000-220) 6/29/20: The B5 footing has started to undermine due to the position of the deck drains. Pier 6 has a 4 X 4 X 5 inch area of undermining at the center on the east side by the electrical box. 12 inches of exposure of footing at Pier 7.						
234	Reinforced Concrete Pier Cap	LF	210	208	2	0	0
1130	Cracking (RC and Other)	LF	2	0	2	0	0
(234) Notes: [2017] A new P6 was constructed this summer and the old pier was demolished and removed.. This new pier has a system installed for monitoring movement. Some minor shrinkage cracks and honeycomb due to poor consolidation are present. Minor cracks present in various areas. (CS 1). RJA [2018 FC-2019 FC] Pier 6 replaced as part of reconstruction. Piers 7 and 8 appear to be unchanged. This element rating should be reviewed after the construction and painting contract has been completed. [2020 D2] Moderate crack located at the south end of P6. 1 LF. (CS 2). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG						
(1130-234) 2020: Moderate crack located at the south end of P6 (CS 2). 6/15/21: No significant change.						
300	Strip Seal Expansion Joint	LF	700	698	2	0	0
2340	Seal Cracking	LF	2	0	2	0	0
(300) Notes: [2017] Structure is in process of being rehabbed. Both EBL have a new deck and both east bound and west bound traffic is running in these lanes. WBL is in the process of being removed. RJA [2018 FC-2019 FC] New strip seals. [2020 D2] Little or no deterioration. Joint is functioning as intended (movement is not restricted). RJA [2021 FC] Span 10 strip seal gland has a separated bead (CS-2). [2022 D2] No significant change. MAG						
(2340-300) 6/15/21: Span 10 strip seal gland has a separated bead (CS-2).						
301	Pourable Joint Seal	LF	1824	1824	0	0	0

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(301) Notes: [2017] Structure is in process of being rehabbed. Both EBL have a new deck and both east bound and west bound traffic is running in these lanes. WBL is in the process of being removed. RJA [2018 FC] This Bridge is under construction. This element rating should be reviewed after the deck has been swept clean. [2019 FC] There are now 29 transverse deck joints and 200 LF of poured joint in the approaches. The poured joints are in good shape. [2020 D2] Little or no deterioration. RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG							
304	Open Expansion Joint	LF	134	67	0	67	0
7000	Damage	LF	67	0	0	67	0
(304) Notes: This element rates the finger joints over Piers 6 & 8 [2018 FC] New finger joints were installed. There are no diapers under the joints. [2019 FC] Finger Joint 9 had a piece of plywood restricting the movement of the joint. [2020 D2] There are 7 drain funnels "diapers" located under each of the assembly joints to aid in deck drainage. Plywood as described in 2019 FC note has been removed. Joint is functioning as intended (movement is not restricted). RJA [2021 FC] Span 5 finger joint is shifted laterally 3/8” (CS-3). [2022 D2] Span 5 finger joint is shifted laterally 1/2 inch. 67 LF. (CS 3). MAG (7000-304) 6/15/21: Span 5 finger joint is shifted laterally 3/8" (CS 3).							
311	Movable Bearing	EA	150	150	0	0	0
515	Steel Protective Coating	SF	100	100	0	0	0
(311) Notes: [2017] These bearings are located as follows - 16 each (64 total) at B2 thru B5, 2 at P6, 2 at P7 (south), 2 at P8 and 16 each (80 total) at B9 thru B13 = 150 EA. P6 rockers are plumb and now sitting on newly reconstructed pier. P7 and P8 rockers - no changes. RJA [2018 FC-2019 FC] The bearings have been repainted. [2020 D2] No restriction of movement - bearing is functioning as intended. Alignment is appropriate for the current temperature. RJA* [2021 FC] No significant change. [2022 D2] No significant change. MAG							
313	Fixed Bearing	EA	18	18	0	0	0
515	Steel Protective Coating	SF	100	100	0	0	0
(313) Notes: [2017] These bearings are located at follows - 8 at the west abutment, 2 at P7 (north) and 8 at the east abutment - 18 EA. Structure is in process of being rehabbed. East approach span (MN side) is contained and sandblasting/priming is occurring. RJA [2018 FC-2019 FC] All bearings repainted. [2020 D2] Bearing is functioning as intended. RJA* [2021 FC] No significant change. [2022 D2] No significant change. MAG							
321	Reinforced Concrete Approach Slab	SF	2287	2287	0	0	0
330	Metal Bridge Railing	LF	2522	2520	2	0	0
1900	Distortion	LF	2	0	2	0	0
515	Steel Protective Coating	SF	7566	0	7566	0	0
3410	Chalking (Steel Protective Coatings)	LF	7566	0	7566	0	0

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
(330) Notes: [2017] Structure is in process of being rehabbed. South metal bridge railing has been removed and replaced under this contract. North rail is being removed now and will be replaced once new concrete railing is in-place. RJA [2018 FC-2019 FC] The old rail was removed and placed on the new concrete rail. Old damaged sections have been replaced with new material. [2020 D2] In-place and functioning. RJA [2021 FC] No significant change. [2022 D2] Top rails separated from vertical uprights in 2 locations - at ND finger joint on the south rail and 15 sections in from the west on the north rail. Slightly misaligned. 2 LF. (CS 2). MAG							
(515-330) Notes: [2020 D2] Galvanized steel surface exhibits minor coating deterioration. Light chalking or fading of galvanized surface. (CS 2). RJA [2021 FC] No significant change. [2022 D2] No significant change. MAG							
(3410-515-330) 6/29/20: Galvanized steel surface exhibits minor coating deterioration. Light chalking or fading of galvanized surface.							
331	Reinforced Concrete Bridge Railing	LF	3783	3270	513	0	0
1120	Efflorescence/Rust Staining	LF	100	0	100	0	0
1130	Cracking (RC and Other)	LF	613	200	413	0	0
(331) Notes: [2017] Structure is in process of being rehabbed. South concrete bridge railing is new and has minor shrinkage cracks. North rail is being removed now. RJA [2018 FC-2019 FC] A concrete rail (barrier code 28 modified without metal railing) was added to protect the sidewalk from traffic. The exterior rails have isolated minor shrinkage cracks. [2020 D2] Superficial scale, abrasion, wear, scrapes, popouts and minor cracks present in various areas. (CS 1). South rail exhibits 229 LF moderate width cracks. Sidewalk/pedestrian rail exhibits 164 LF moderate width cracks. North rail exhibits 219 LF moderate width cracks. 612 LF. (CS 2). RJA [2021 FC] No significant change. [2022 D2] Superficial scale, abrasion, wear, scrapes, pop-outs and minor cracks in various areas. (CS 1). Moderate width cracks with light leaching (little or no build-up) on sidewalk/pedestrian rail. 148 LF. Moderate width dry cracks - south rail 186 LF, north rail 179 LF. 148 LF + 186 LF + 179 LF = 513 LF. (CS 2). MAG							
(1120-331) Various cracking with seepage and efflorescence to Pedestrian Barrier and Roadway Barriers. See Photos. - 12/17/2019							
(1130-331) Various vertical cracking to Pedestrian Barrier and Outer Barriers. See Photos. - 12/17/2019							
8399	Slope Protection, RC	EA	2	0	2	0	0
4000	Settlement	EA	2	0	2	0	0
(8399) Notes: [2017] This structure is in the process of a rehab. RJA [2018 FC] No changes. [2020 D2] Minor to moderate deterioration or loss of protection. Minor to moderate erosion. (CS 2). RJA [2021 FC] No significant change. [2020 D2] Minor to moderate deterioration or loss of protection. Minor to moderate erosion of both slopes. Minor separation/settlement of slope paving near MN abutment. (CS 2). MAG							
8401	Wings	EA	4	4	0	0	0

General Observation

NBI Remarks: Channel bank erosion upstream & downstream. Riprap installed at bents 2 & 3. MnDot has added angle iron gusset plate stiffeners @ L0 & L0' piers 6 & 8 in Feb. 2010. High load damage to south outside beams span #12.
3/2018 - Bridge Division modified Ratings to match MnDOT per FHWA directive added MnDOT inspection from 10-18-2017 during construction.
6/2019 Pins UTed as part of the inspection. No defects noted.
9/2019 - MNDOT Forces sealed all cracks to Concrete Barriers, Concrete Deck, and Bridge Deck Overlay.
12/2019 - Under Contract during 2017 to 2019. Work Completed: Removal and Replacement of Concrete Bridge Deck Spans #1-#13 with configuration of Concrete Bridge Deck Trail on the north side. Bridge Deck Overlay to Spans #6 and #7 in the Eastbound Lanes. Removal and Replacement of Pier 6. Removal of Existing Lead Industrial Coating and Application of Organic Zinc, Macropoxy and Polyurethane Finish Coat. Removal and Replacement of Pin and Hanger Assemblies at Bent Piers 2-4 and 10-13. Removal and Replacement of Finger Expansion Joints at Bent Piers 5 and 9. Removal and Replacement of Strip Seal Joints at Bent Piers 2-4 and 10-13. Straightening of Steel Columns at Bent Pier 5. Spall Repair work to Bearing seats at Abutment 1 and 14. New Back walls at Abutment 1 and 14. Removal and Replacement of Concrete Barriers. New Pedestrian Barrier. New Concrete Approach Panels at both ends. New PCC Pavement at both bridge ends. Geo instrumentation installed in and around Pier 6.
Slight sag in Girders 1-8 in Spans 1-5. See Photo. - 12/17/2019

3/6/2020: Bridge Division modified NBI ratings (058, 059, 060, 061, 062, 071, 072) to match MnDOT NBI ratings from 6-27-2019 inspection KAL.
6/29/2020: Routine inspection by MnDOT. Bridge Layout= West abutment 1, B2 thru B5, P6 thru P8, B9 thru B13, East abutment
08/2020: Underwater inspection by MnDOT.
6/15/2021: Routine and Fracture Critical inspection by MnDOT. See FileNet for full FC report.

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58 - Deck (7 - GOOD CONDITION - some minor problems.)

6/29/20: Minor (or isolated) deterioration. Minor cracking and leaching evident.

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59 - Superstructure (4 - POOR CONDITION - advanced section loss, deterioration, spalling or scour.)

6/29/20: Minor section loss and pitting of members in the splash zone.
6/15/21: NBI 4 du to unarrested crack that may propagate into critical stress area.

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60 - Substructure (6 - SATISFACTORY CONDITION - structural elements show some minor deterioration.)

08/2020 (UW): NBI has been reviewed and is recommended to be lowered to a 6 for footing exposure within tolerable limits.
6/15/21: No significant change.

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61 - Channel/Channel Protection (6 - Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor stream bed movement evident. Debris is restricting the channel slightly.)
08/2020 (UW): No significant changes have occurred to the channel bottom configuration or condition since the 2016 underwater inspection. Footing exposure limits are similar to what was observed in 2016.
6/15/21: No significant change.

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71 - Waterway Adequacy (6 - Equal to present minimum criteria)

6/29/20: Slight chance of overtopping bridge deck and roadway approaches with 2 to 3 feet of freeboard.

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72 - Approach Roadway Alignment (7 - Better than present minimum criteria)

6/29/20: Minor sight distance problems with no speed reduction required.

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113 - Scour Critical Bridges (5 - Bridge foundations determined to be stable for assessed or calculated scour condition. Scour is determined to be within the limits of footing or piles (Example B) by assessment (i.e.,bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures (see HEC 23).)
08/2020 (UW): The upstream and downstream footings were exposed with 2in and 16in vertical face exposure respectively.

Significant Findings

1) There is a 2" crack in the weld of the bottom plate of L0-L1 N bottom chord in span 6 that may propagate into critical stress area.
2) There are areas of section loss in the lower lateral bracing and areas such as Span 6 Floorbeam 1 at L1S that have been arrested by
repainting. There are drilled-out cracks in Span 7 Stringer 1 between Floorbeams 3' & 4' at the Floorbeam 3' connection, and Span 6 Stringer
8 between Floorbeams 3' and 4'.
3) Plug welds between gusset plates L0 and L-1/2 and the lower chord were found to have cracks during the 2009 inspection. No new cracks
were found by UT testing during this inspection.
4) The new sidewalk has ponding at the deck joints. This appears to be caused by a combination of plugged drains, kick-up on both ends of
the sidewalk joint, and improper grading during concrete placement. This has the potential to cause hazards to pedestrians if the ponding
water freezes in place in the winter.
5) The Pier 5 bent footing has started to undermine due to the position of the deck drains (Photos 14, 15). Pier 6 has a 4' X 4'X 5" area of
undermining at the center on the east side by the electrical box.
6) There are two possible plugs weld in the web of FB 0 in Span 7.

Critical Finding

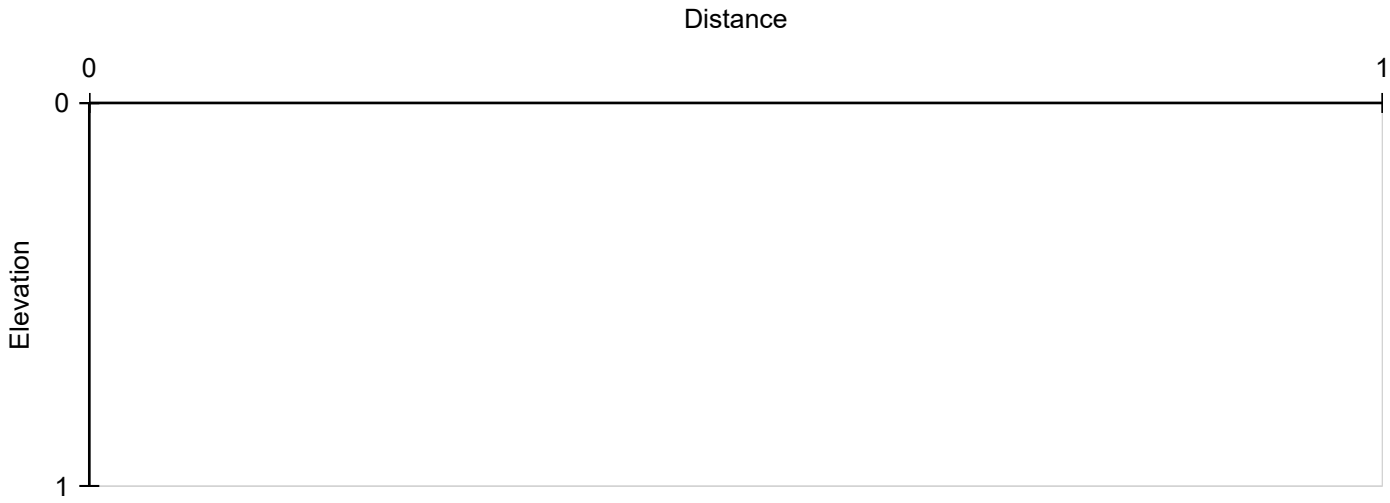
NORTH Dakota | Transportation
Be Legendary.

Asset **#0002-358.090**(Routine)
District: 66, **County:** 18 - Gr. Forks
Inspection Date: 06/06/2022

Channel Profile

Station	Distance	Upstream	Downstream

Upstream Elevation



Downstream Elevation