

UNDERWATER BRIDGE INSPECTION REPORT



REPORT IDENTIFICATION


Bridge No.: 0023-046.203	Inspection Start Date: 7/20/2023	Inspection Firm: Engineering Operations
County: McKenzie	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River
Inspection Team: Sam Williams (Team Leader) Taylor White Jonathan Ivey Karl Davis Tyler Liebman		
Confirming Engineer: Benjamin Kenney, PE Title: Senior Structural Engineer North Dakota P.E. No.: PE-29238		

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Executive Summary

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Executive Summary

Bridge 0023-046.203 carries North Dakota Highway 23 over Missouri River in McKenzie County. The substructure consists of two reinforced concrete abutments and fourteen reinforced concrete piers (columns), all founded on steel pipe pile supported footings. Piers 2 through 15 were inspected under this contract. The bridge substructures are numbered from **west to east** in accordance with NDDOT's procedures. A Level 3 underwater inspection was performed from the high-water line to the channel bottom and found the substructure units to be in overall **good** condition.

SNBI/NBI Condition and Appraisal Ratings

The following table provides a comparison of the SNBI and NBI ratings found during the 2023 underwater inspection and the latest routine inspection. The recommended rating identifies the controlling rating for each Item listed.

CONDITION RATINGS				
Item	SNBI ID (NBI ID)	2023 UW Inspection	2021 Routine Inspection	Recommended Rating
Substructure	B.C.03 (60)	N/A	7	7 (7)
Substructure UW	B.C.15 (60)	7	N/A	7 (7)
Channel	B.C.09 (61)	8	8	8
Channel Protection	B.C.10 (N/A)	8	N/A	8
Scour	B.C.11 (N/A)	8	N/A	8

NBI APPRAISAL RATINGS				
Item	NBI ID	2023 UW Inspection	2021 Routine Inspection	Recommended Rating
Waterway Adequacy	71	9	9	9
Scour Critical	113	8	8	8

SNBI APPRAISAL RATINGS				
Item	SNBI ID	2023 UW Inspection	2021 Routine Inspection	Recommended Rating
Overtopping Likelihood	B.AP.02	1	N/A	1
Scour Vulnerability	B.AP.03	A	N/A	A
Scour POA	B.AP.04	0	N/A	0

Scour Evaluation

The structure does not have a scour history. There was no notable scour observed during the inspection.

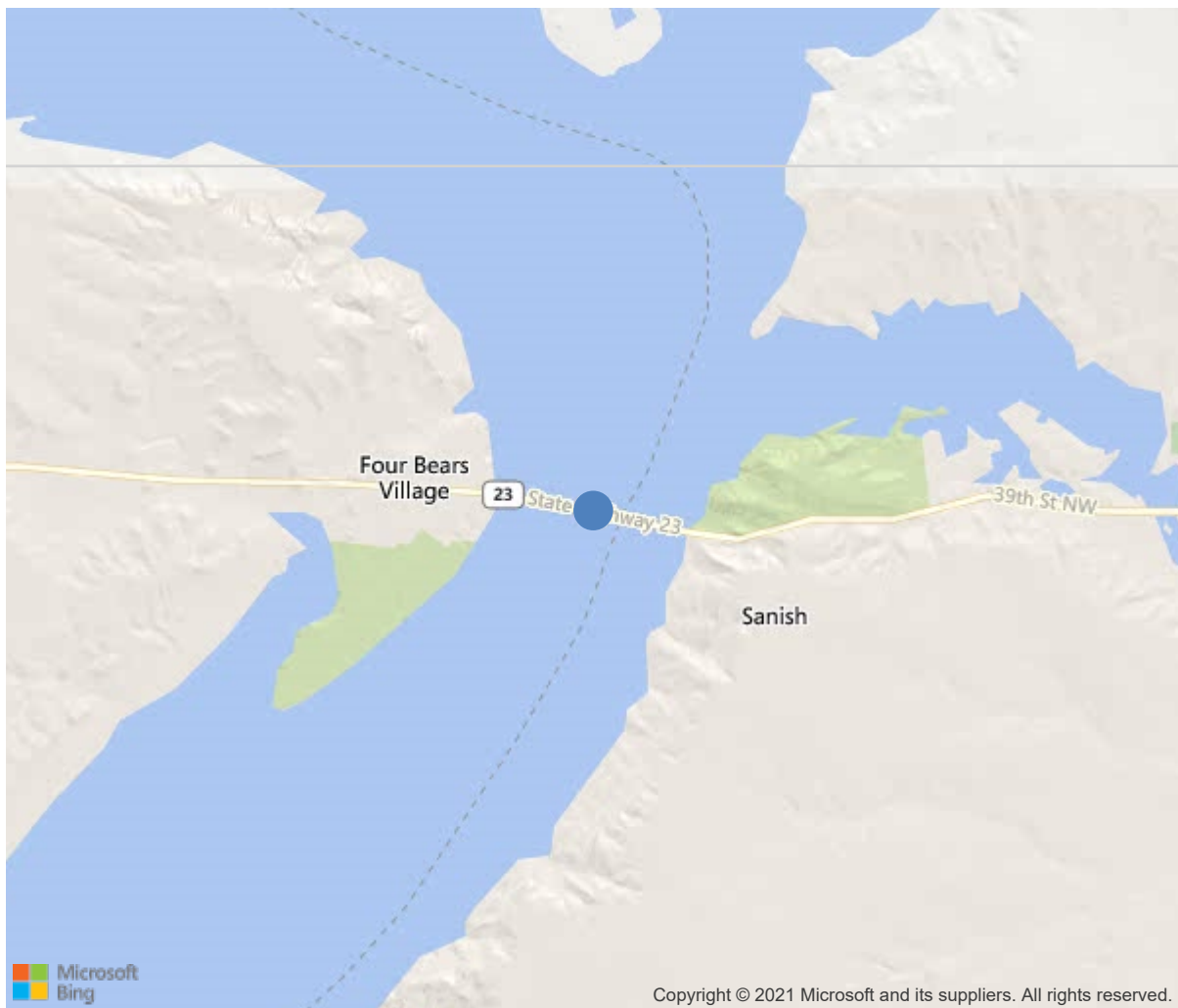
Significant Findings

None.

Recommendations

None.

3 WEST OF ND 1804



47.97979, -102.56160

Inspection Findings

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Superstructure Type Prestressed Spread Box Beams	Substructure Type Reinforced Concrete Abutments and Columns		
Foundation Type Steel Pipe Piles	Total Substructure Units 16	Substructures Inspected Underwater Piers 2 through 15	

SUBSTRUCTURE:

Element /Defect No.	Element / Defect Description	Total Qty.	Units	Condition State Quantity			
				CS1	CS2	CS3	CS4
205	Reinforced Concrete Column	14	EA	14	0	0	0
1080	Delamination/Spall	1	EA	0	0	1	0
220	Reinforced Concrete Footing	448	FT	448	0	0	0
225	Steel Pile	163	EA	0	163	0	0
1000	Corrosion	163	EA	0	163	0	0

Piers 2 through 15

Note: The piers are composed of (1) 9 foot diameter reinforced concrete column founded on a tapered circular footing, 24 foot to 32 foot diameter. All pier footings are supported by (13) 3 feet diameter x 1 inch thick concrete filled steel pipe piles, battered radially outward. Piers 6 through 12 have a test pile beneath the center of the footing. All pier footings have a 5 feet high x up to 39 feet diameter (tapered) seal. The water depth at time of inspection at Piers 2 through 15 was as follows: Pier 2 – 16.0 Feet, Pier 3 – 58.8 Feet, Pier 4 – 60.1 Feet, Pier 5 – 66.2 Feet, Pier 6 – 67.9 Feet, Pier 7 – 67.6 Feet, Pier 8 – 78.4 Feet, Pier 9 – 75.2 Feet, Pier 10 – 77.0 Feet, Pier 11 – 72.0 Feet, Pier 12 – 67.8 Feet, Pier 13 – 64.7 Feet, Pier 14 – 65.7 Feet, Pier 15 – 12.9 Feet.

Element 205 – CS3: (1080) Pier 9 column has a spall, 4 feet high x 2 feet wide x 3 inch deep spall, in the southeast quadrant, 13 feet above the top of the footing (1 Each). Refer to Photo 1.

Element 225 – CS2: (1000) All pipe piles have rust nodules, 1/8 inch to 3/4 inch in diameter, covering approximately 50% of the total surface area, with less than 5% section loss (163 Each). Refer to Photos 2 and 3.

CHANNEL:

The channel is well aligned with the substructure units. The channel bottom is comprised of sandy gravel and soft silt with 3 to 12 inches of probe rod penetration. Random construction debris is scattered about the channel bottom. The banks are armored with riprap and are stable. There are no signs of significant scour or bank erosion. Refer to Figure A-1 for contours.

Inventory Photos

County:	Bridge No.:	Facility Carried:	Feature Intersected:	Inspection Date:
Mckenzie	0023-046.203	IRRFB ND Highway 23	Missouri River	7/20/2023



North Elevation (Upstream)



South Elevation (Downstream)

Inventory Photos

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Channel Condition North (Upstream) of the Bridge



Channel Condition South (Downstream) of the Bridge

Inventory Photos

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Pier 2, East Face



Pier 3, West Face

Inventory Photos

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Pier 4, West Face



Pier 5, West Face

Inventory Photos

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Pier 6, East Face



Pier 7, West Face

Inventory Photos

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Pier 8, West Face



Pier 9, East Face

Inventory Photos

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Pier 10, West Face



Pier 11, West Face

Inventory Photos

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Pier 12, West Face



Pier 13, West Face

Inventory Photos

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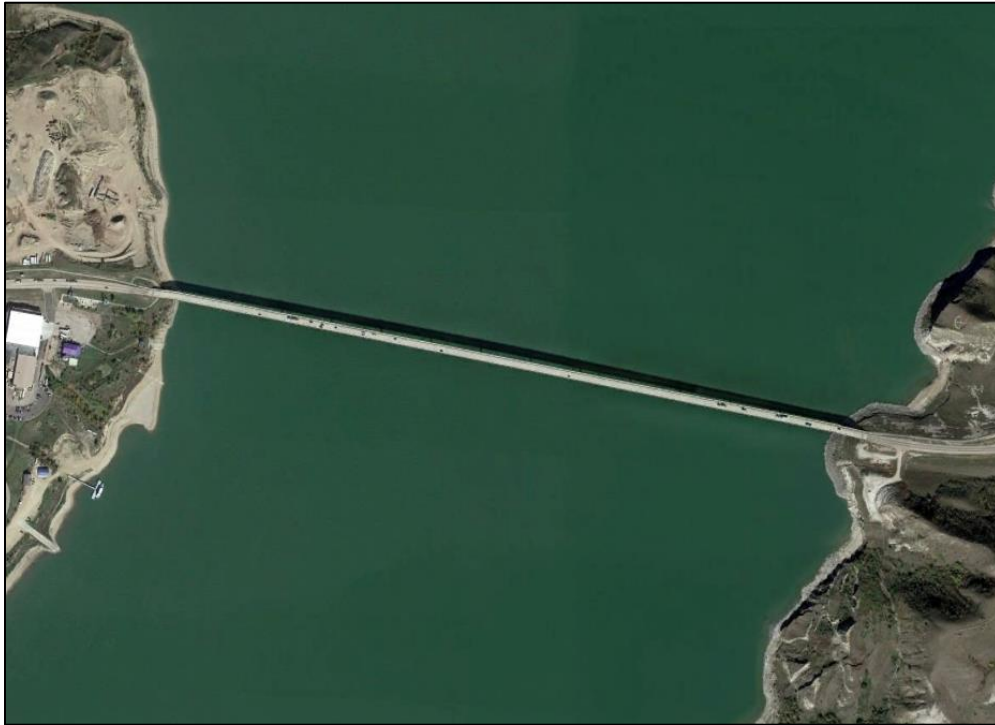
Pier 14, West Face



Pier 15, West Face

Inventory Photos

County:	Bridge No.:	Facility Carried:	Feature Intersected:	Inspection Date:
Mckenzie	0023-046.203	IRRFB ND Highway 23	Missouri River	7/20/2023



Channel Overview

CHANNEL PROFILE

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

Structure Number	Date	Inspector's Name
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STREAM CROSS SECTION

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

Profile 1 taken on <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W side of bridge, from <input type="checkbox"/> N to S <input type="checkbox"/> W to E
Measurements taken from top of <input type="checkbox"/> Curb <input type="checkbox"/> Rail <input type="checkbox"/> Deck
Measurements taken at _____ intervals. (ft.)
Measurements are as follows:
Profile 2 taken on <input type="checkbox"/> N <input type="checkbox"/> S <input type="checkbox"/> E <input type="checkbox"/> W side of bridge, from <input type="checkbox"/> N to S <input type="checkbox"/> W to E
Measurements taken from top of <input type="checkbox"/> Curb <input type="checkbox"/> Rail <input type="checkbox"/> Deck
Measurements taken at _____ intervals. (ft.)
Measurements are as follows:

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

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

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

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

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

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

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

Sounding Data

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Sounding Data (Fascia) - Elevations

Soundings are referenced to the water surface elevation at the time of inspection. (ELEV. 1843.0)

	North Fascia (Upstream)			South Fascia (Downstream)		
Location		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
Abutment1		1889.2			1890.6	
1/4		1880.5			1881.2	
1/2		1865.7			1866.4	
3/4		1846.5	1848.6		1847.8	1852.0
Pier 2		1827.0	1831.6		1831.9	1838.2
1/4		1799.4	1818.5		1789.6	1800.9
1/2		1787.9	1788.6		1785.8	1787.8
3/4		1786.8	1787.6		1785.2	1787.3
Pier 3		1785.9	1792.7		1784.2	1786.5
1/4		1785.9	1786.7		1784.3	1786.8
1/2		1786.2	1786.6		1784.0	1786.7
3/4		1786.1	1786.5		1783.8	1786.8
Pier 4		1785.8	1776.9		1782.9	1786.2
1/4		1785.3	1786.0		1783.9	1785.7
1/2		1782.7	1785.0		1781.7	1783.6
3/4		1780.7	1781.6		1778.4	1782.3
Pier 5		1779.2	1776.8		1776.8	1779.8
1/4		1778.6	1780.1		1778.0	1780.2
1/2		1777.6	1780.0		1777.7	1781.3
3/4		1776.1	1779.1		1777.0	1781.4
Pier 6		1775.6	1777.8		1775.1	1778.5
1/4		1775.2	1778.5		1776.2	1778.8
1/2		1776.0	1778.3		1775.7	1778.4
3/4		1775.9	1778.3		1776.0	1781.4
Pier 7		1775.7	1777.7		1775.4	1778.5
1/4		1776.9	1779.5		1776.9	1778.9
1/2		1772.6	1778.4		1775.6	1778.6
3/4		1767.5	1770.3		1764.8	1774.7
Pier 8		1770.2	1771.1		1764.6	1767.1
1/4		1770.4	1770.0		1767.5	1769.6

Sounding Data

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Sounding Data (Fascia) - Elevations

Soundings are referenced to the water surface elevation at the time of inspection. (ELEV. 1843.0)

Location	North Fascia (Upstream)			South Fascia (Downstream)		
		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
1/2		1770.0	1771.4		1768.7	1771.3
3/4		1769.2	1771.6		1768.8	1771.3
Pier 9		1767.9	1772.2		1767.8	1769.5
1/4		1767.6	1771.1		1767.5	1768.9
1/2		1768.3	1772.2		1769.6	1771.4
3/4		1768.5	1771.4		1767.7	1771.4
Pier 10		1766.0	1775.5		1766.5	1769.0
1/4		1766.6	1768.8		1772.6	1768.6
1/2		1767.4	1769.9		1768.2	1768.3
3/4		1769.3	1770.6		1768.9	1773.4
Pier 11		1771.3	1777.6		1771.0	1774.8
1/4		1774.2	1775.6		1774.5	1777.7
1/2		1776.1	1778.3		1775.9	1778.2
3/4		1776.3	1778.4		1776.1	1778.2
Pier 12		1775.8	1778.0		1775.2	1778.2
1/4		1777.4	1778.5		1776.7	1779.9
1/2		1777.8	1780.1		1777.2	1780.1
3/4		1778.1	1780.2		1777.9	1780.3
Pier 13		1778.5	1779.6		1778.3	1780.7
1/4		1780.5	1781.7		1779.7	1783.5
1/2		1778.9	1777.6		1774.9	1776.3
3/4		1778.7	1775.9		1774.7	1776.4
Pier 14		1782.0	1778.9		1780.6	1780.0
1/4		1790.9	1787.7		1793.9	1790.8
1/2		1808.4	1804.3		1808.7	1806.9
3/4		1815.9	1812.3		1817.3	1820.4
Pier 15		1830.1	1832.9		1839.7	1835.1
1/4		1847.3	1840.1		1848.6	1844.1
1/2		1852.5	1853.0		1860.3	1852.9
3/4		1871.9			1873.0	

Sounding Data

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Sounding Data (Fascia) - Elevations

Soundings are referenced to the water surface elevation at the time of inspection. (ELEV. 1843.0)

	North Fascia (Upstream)			South Fascia (Downstream)		
Location		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
Abutment 16		1887.5			1888.8	
WL (FT)		1843.0	1853.0		1843.0	1853.0

Sounding Data (Fascia) - Water Depths

Soundings are referenced to the water surface elevation at the time of inspection. The water line was referenced to the top of footing at Pier 10 (Elev. = 1827.0 Feet)

	North Fascia (Upstream)			South Fascia (Downstream)		
Location		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
Abutment1		Dry	Dry		Dry	Dry
1/4		Dry	Dry		Dry	Dry
1/2		Dry	Dry		Dry	Dry
3/4		2.1	4.4		Dry	1.0
Pier 2		16.0	21.4		11.1	14.8
1/4		43.6	34.5		53.4	52.1
1/2		55.1	64.4		57.2	65.2
3/4		56.2	65.4		57.8	65.7
Pier 3		57.1	60.3		58.8	66.5
1/4		57.1	66.3		58.7	66.2
1/2		56.8	66.4		59.0	66.3
3/4		56.9	66.5		59.2	66.2
Pier 4		57.2	76.1		60.1	66.8
1/4		57.7	67.0		59.1	67.3
1/2		60.3	68.0		61.3	69.4
3/4		62.3	71.4		64.6	70.7
Pier 5		63.8	76.2		66.2	73.2
1/4		64.4	72.9		65.0	72.8
1/2		65.4	73.0		65.3	71.7

Sounding Data

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Sounding Data (Fascia) - Water Depths						
Soundings are referenced to the water surface elevation at the time of inspection. The water line was referenced to the top of footing at Pier 10 (Elev. = 1827.0 Feet)						
	North Fascia (Upstream)			South Fascia (Downstream)		
Location		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
3/4		66.9	73.9		66.0	71.6
Pier 6		67.4	75.2		67.9	74.5
1/4		67.8	74.5		66.8	74.2
1/2		67.0	74.7		67.3	74.6
3/4		67.1	74.7		67.0	71.6
Pier 7		67.3	75.3		67.6	74.5
1/4		66.1	73.5		66.1	74.1
1/2		70.4	74.6		67.4	74.4
3/4		75.5	82.7		78.2	78.3
Pier 8		72.8	81.9		78.4	85.9
1/4		72.6	83.0		75.5	83.4
1/2		73.0	81.6		74.3	81.7
3/4		73.8	81.4		74.2	81.7
Pier 9		75.1	80.8		75.2	83.5
1/4		75.4	81.9		75.6	84.1
1/2		74.7	80.8		73.4	81.6
3/4		74.5	81.6		75.3	81.6
Pier 10		77.0	77.5		76.5	84.0
1/4		76.4	84.2		70.5	84.4
1/2		75.6	83.1		74.8	84.7
3/4		73.7	82.4		74.1	79.6
Pier 11		71.7	75.4		72.0	78.2
1/4		68.8	77.4		68.5	75.3
1/2		66.9	74.7		67.1	74.8
3/4		66.7	74.6		66.9	74.8
Pier 12		67.2	75.0		67.8	74.8
1/4		65.6	74.5		66.3	73.1
1/2		65.2	72.9		65.8	72.9
3/4		64.9	72.8		65.1	72.7
Pier 13		64.5	73.4		64.7	72.3

Sounding Data

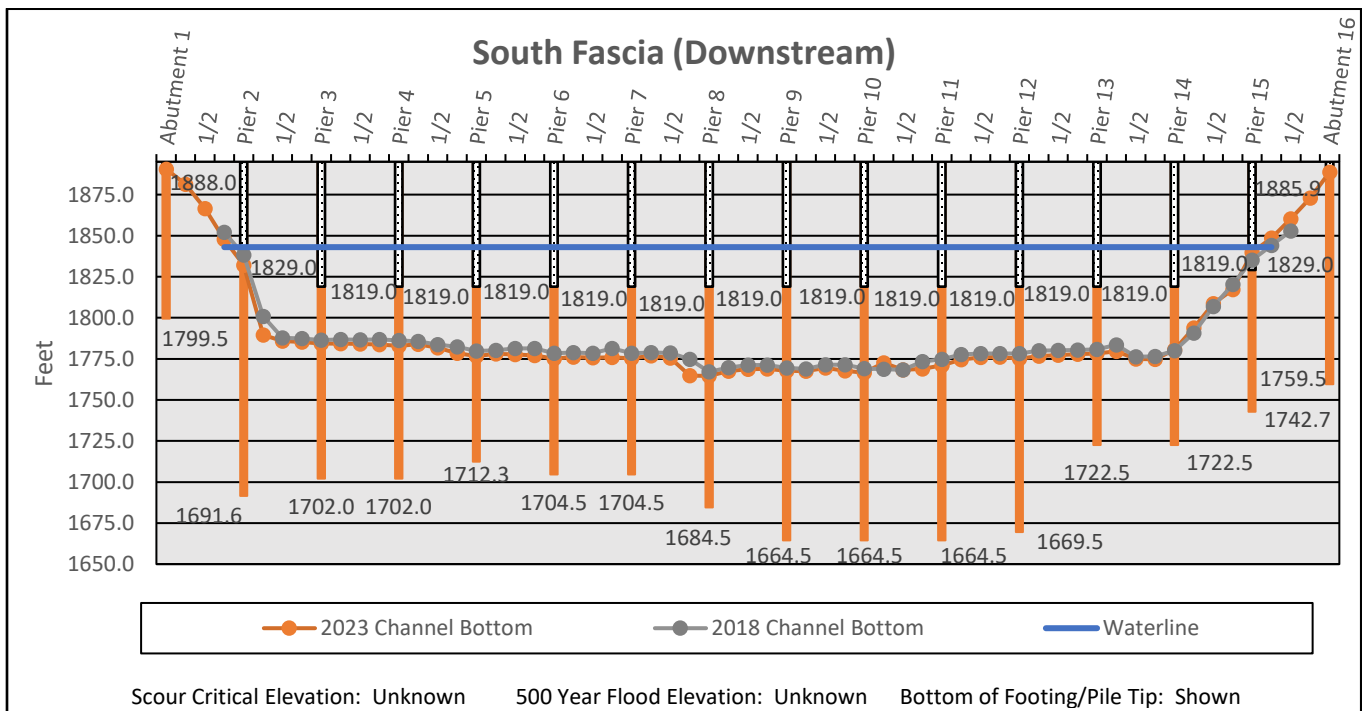
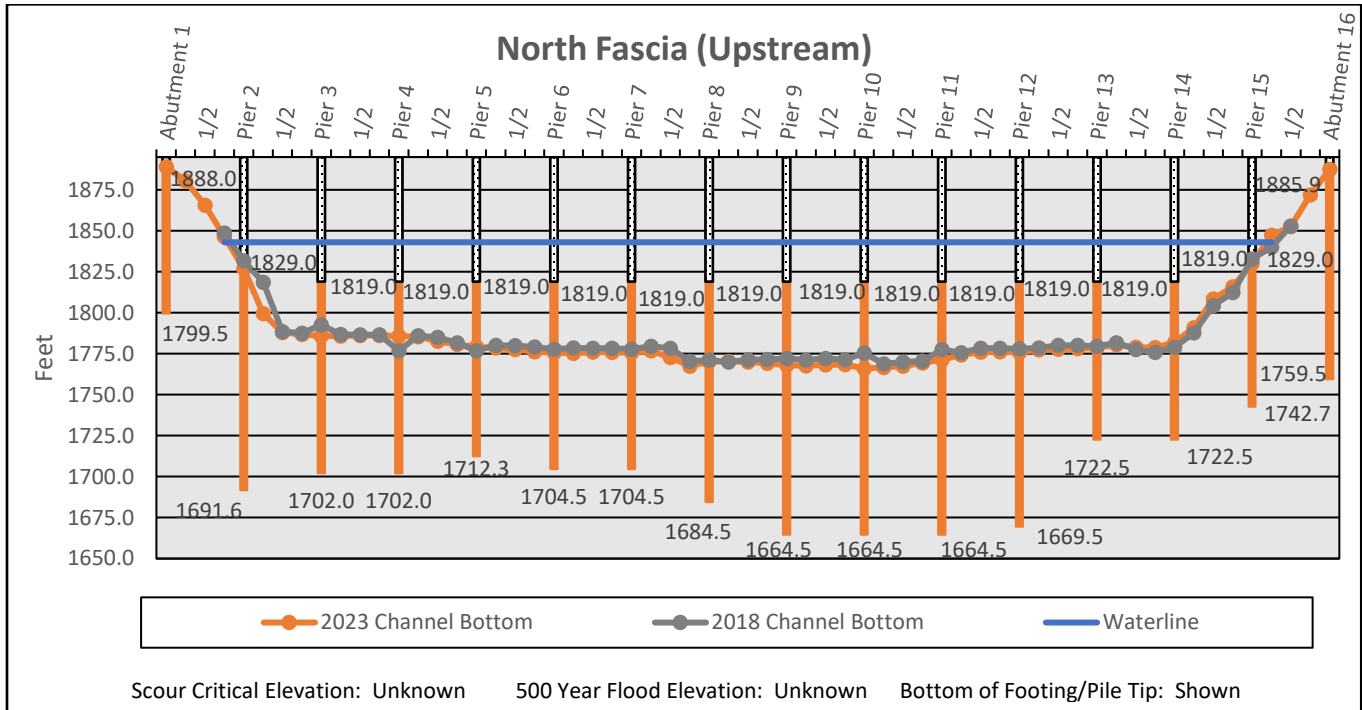
County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Sounding Data (Fascia) - Water Depths						
Soundings are referenced to the water surface elevation at the time of inspection. The water line was referenced to the top of footing at Pier 10 (Elev. = 1827.0 Feet)						
	North Fascia (Upstream)			South Fascia (Downstream)		
Location		2023 Channel Bottom	2018 Channel Bottom		2023 Channel Bottom	2018 Channel Bottom
1/4		62.5	71.3		63.3	69.5
1/2		64.1	75.4		68.1	76.7
3/4		64.3	77.1		68.3	76.6
Pier 15		61.0	74.1		62.4	73.0
1/4		52.1	65.3		49.1	62.2
1/2		34.6	48.7		34.3	46.1
3/4		27.1	40.7		25.7	32.6
Pier 15		12.9	20.1		3.3	17.9
1/4		Dry	12.9		Dry	8.9
1/2		Dry	EOC		Dry	0.1
3/4		Dry	Dry		Dry	Dry
Abutment 16		Dry	Dry		Dry	Dry
WL (FT)		0.0	0.0		0.0	0.0

Note: Fascia sounding measurements are referenced from the top of waterline. Bottom of Footing/Pile Tip elevations are reflected on the following graphs in accordance with 2002 Plans. Waterline was referenced to Pier 10 Top of Footing.

Sounding Data

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Defect Photos

County:	Bridge No.:	Facility Carried:	Feature Intersected:	Inspection Date:
Mckenzie	0023-046.203	IRRFB ND Highway 23	Missouri River	7/20/2023

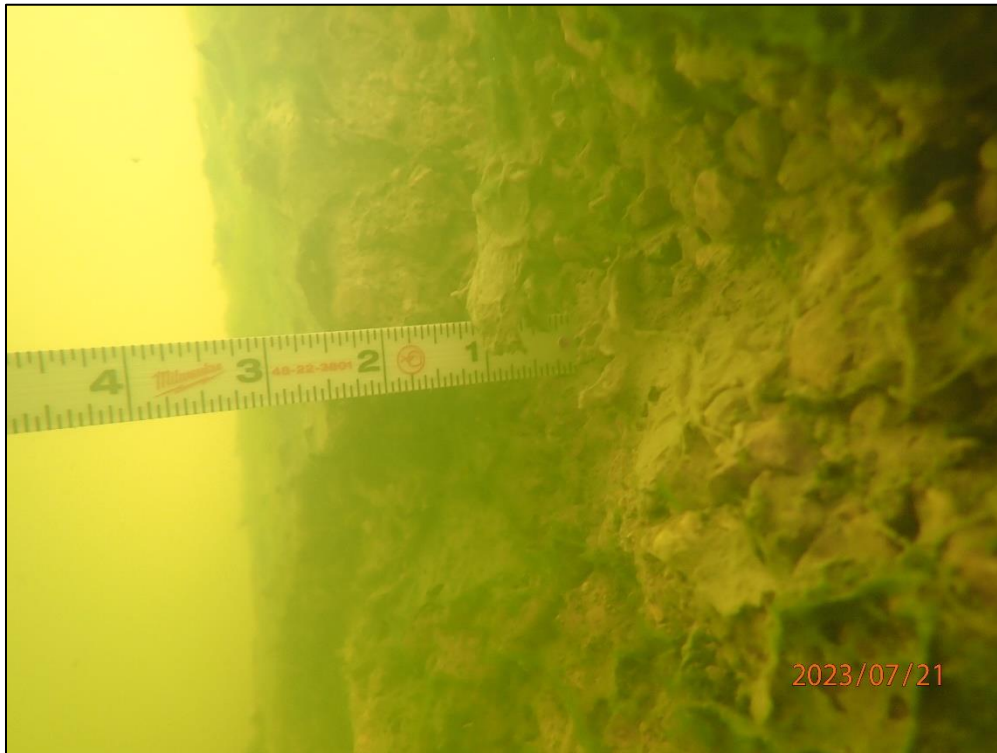


Photo 1 – Pier 9 Spall in Southeast Quadrant

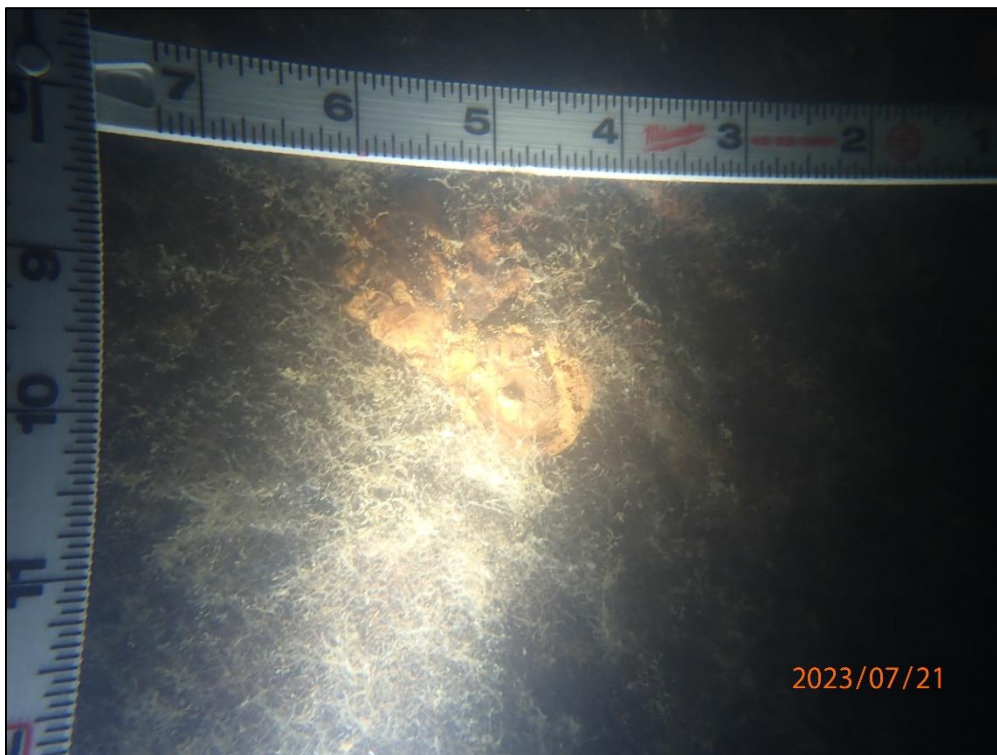


Photo 2 – Typical Steel Pile Rust Nodule

Defect Photos

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Photo 3 – Typical Remaining Thickness of Steel Pipe Piles

Inspection Procedures

County: Mckenzie	Bridge No.: 0023-046.203	Facility Carried: IRRFB ND Highway 23	Feature Intersected: Missouri River	Inspection Date: 7/20/2023
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Inspection Procedures:

23 CFR 650.313 (e) & (e1)

Type of Inspection: Underwater

Diving Mode: ☐ Commercial Scuba ☒ Surface Supplied Air

Water Surface Condition: ☐ Calm ☒ Choppy ☐ Rough

Current: ☒ Slow ☐ Moderate ☐ Fast

Visibility: ☐ < 1ft ☒ 1 - 3 ☐ > 3

Channel: ☐ Straight ☒ Meandering ☐ Braided

Bottom Material: ☐ River Rock ☐ Rip-Rap ☐ Sand ☐ Gravel ☒ Mud / Silt

Debris: ☒ None ☐ Minor ☐ Moderate ☐ Heavy

Channel Restriction: ☒ None ☐ Minor ☐ Moderate ☐ Heavy

Weather: ☒ Sunny ☐ Cloudy ☒ Pt Cloudy ☐ Rain/Snow

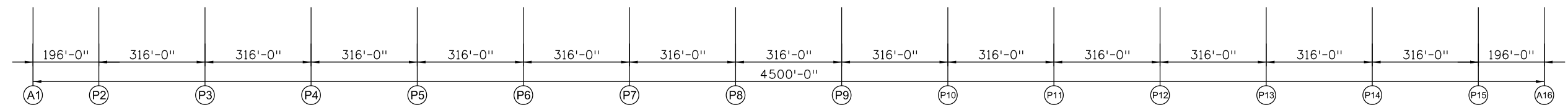
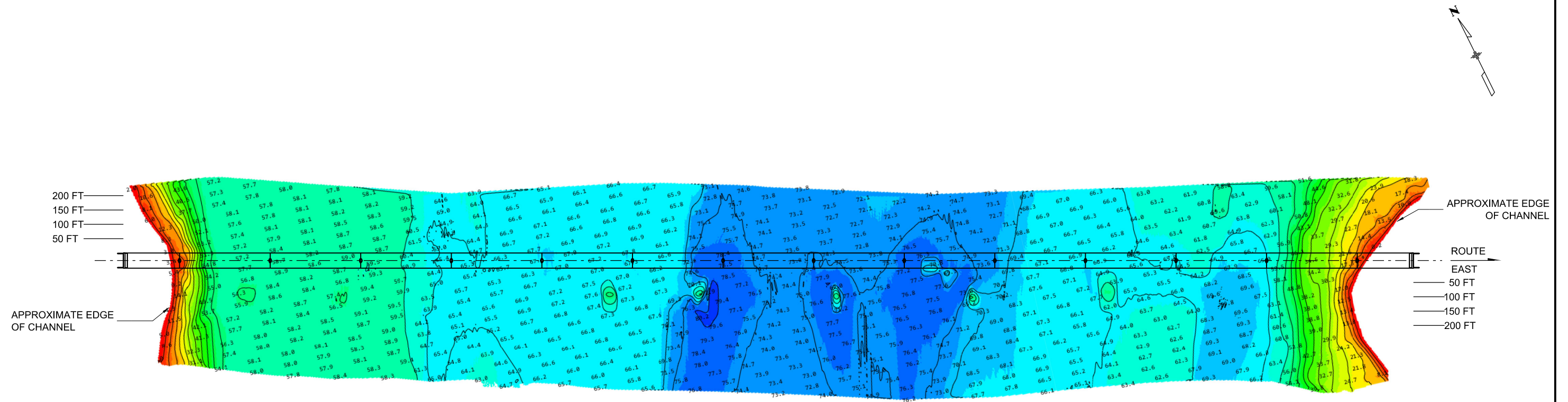
Equipment: ☒ Probe rod ☒ U/W camera ☐ Clear water box ☒ Scale ☐ U/W UT
☐ Cleaning tool ☒ Dive flag ☐ Sea life camera ☐ Fast water rigging equipment
☒ Boat – Type: Scully

Commercial SCUBA Equipment: ☒ OTS wireless comms ☒ Standard set up ☐ High flow pack

Surface Supplied Equipment: ☒ 27 ☐ 17B ☒ 97 ☐ LT WT package ☒ Standard package
☒ HP ☐ LP Compressor

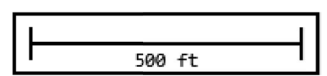
Special Conditions:

- Underwater Inspection included inspection of all bridge elements in the water at the time of inspection. Dive Inspectors performed visual and tactile inspection on all bridge elements from the waterline to the channel bottom. Maximum depth of water was recorded around each substructure unit.
- Scour was assessed in comparison with conditions noted in previous inspection reports. Divers recorded sounding measurements both upstream and downstream of the bridge and noted any significant deficiency to the channel within the recorded area.
- Channel meandering or any significant embankment deficiency within line of sight upstream and downstream of the bridge was also noted.



MISSOURI RIVER
FLOW

d	
0.00	4.00
4.00	8.00
8.00	12.00
12.00	16.00
16.00	20.00
20.00	24.00
24.00	28.00
28.00	32.00
32.00	36.00
36.00	40.00
40.00	44.00
44.00	48.00
48.00	52.00
52.00	56.00
56.00	60.00
60.00	64.00
64.00	68.00
68.00	72.00
72.00	76.00
76.00	80.00
80.00	84.00
84.00	88.00



PLAN

CONTOUR NOTES:

- ALL CHANNEL PROFILE DATA COLLECTED IN THE FIELD IS ACCURATE $\pm 1/2$ FT.
- AT THE TIME OF INSPECTION, THE WATERLINE WAS 16.0 FT ABOVE THE TOP OF THE FOOTING AT PIER 10, CORRESPONDING TO A WATERLINE ELEVATION OF 1843.0 FT.

Print Date: 8/11/2023

Horizontal and Vertical Scale: 1"=300'

0'

150'

300'

600'

e0

Engineering Operations
Phone: 303 835 1029

5575 S. Sycamore St.,
Ste 235 Littleton, CO 80120

NORTH

Dakota

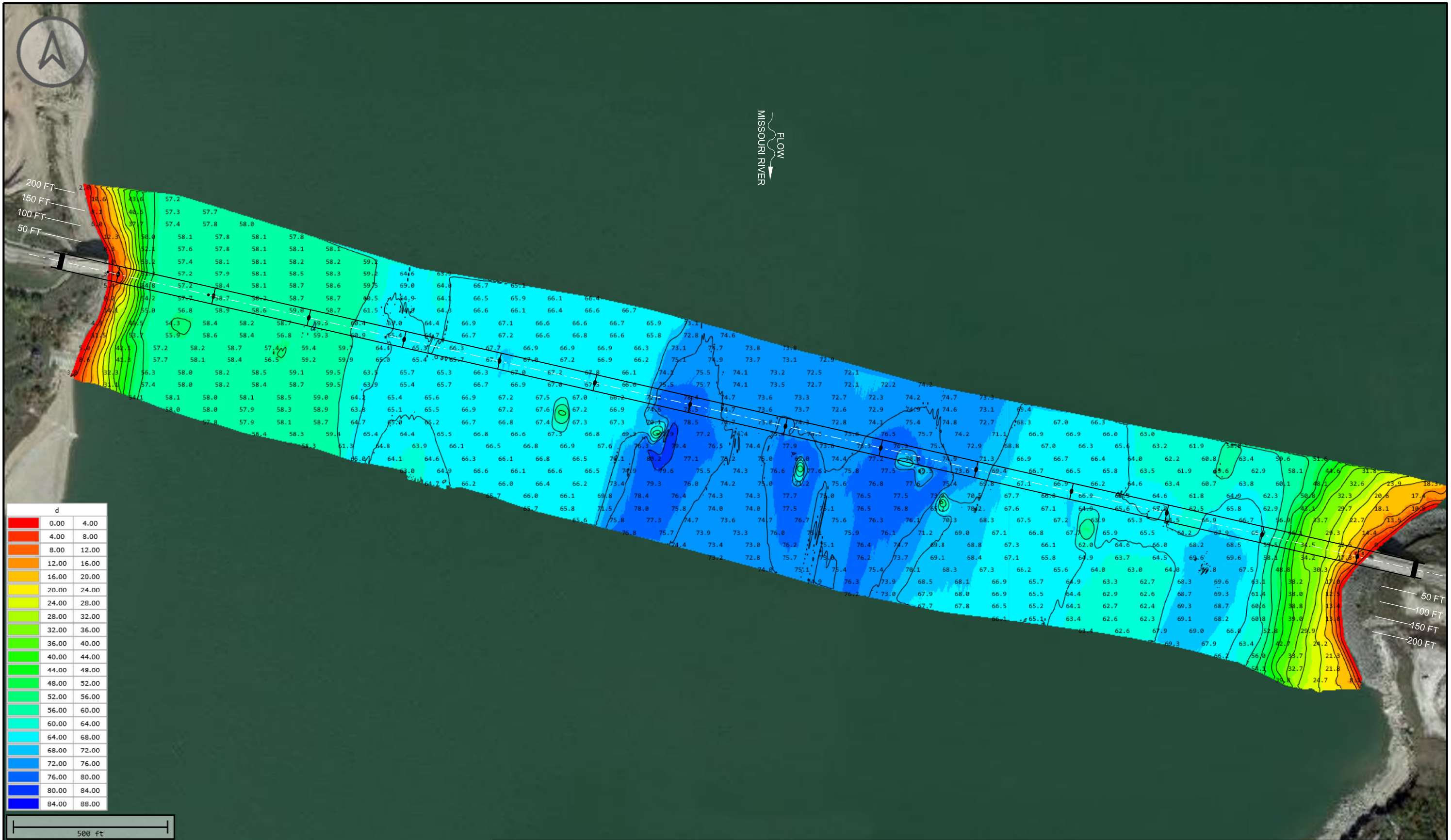
Be Legendary.

Transportation

ND HIGHWAY 23 OVER
MISSOURI RIVER
STRUCTURE NUMBER: 23-046.203

Drawn By: Z.SALAKHADINOV
Checked By: A. RICHARDSON
On/Off System: ON

Date of
Inspection: 07/21/2023
Figure No.: A-1.1



Print Date: 8/11/2023

Horizontal and Vertical Scale: 1"=250'

0'

125'

250'

500'

e0

Engineering Operations
Phone: 303 835 1029

5575 S. Sycamore St.,
Ste 235 Littleton, CO 80120

NORTH

Dakota

Be Legendary.

Transportation

ND HIGHWAY 23 OVER
MISSOURI RIVER
STRUCTURE NUMBER: 23-046.203

Drawn By: Z.SALAKHADINOV

Checked By: A. RICHARDSON

On/Off System: DN

Date of
Inspection: 07/21/2023

Figure No.: A-1.2



PIER 2



PIER 3



PIER 4



PIER 5



PIER 6



PIER 7



PIER 8



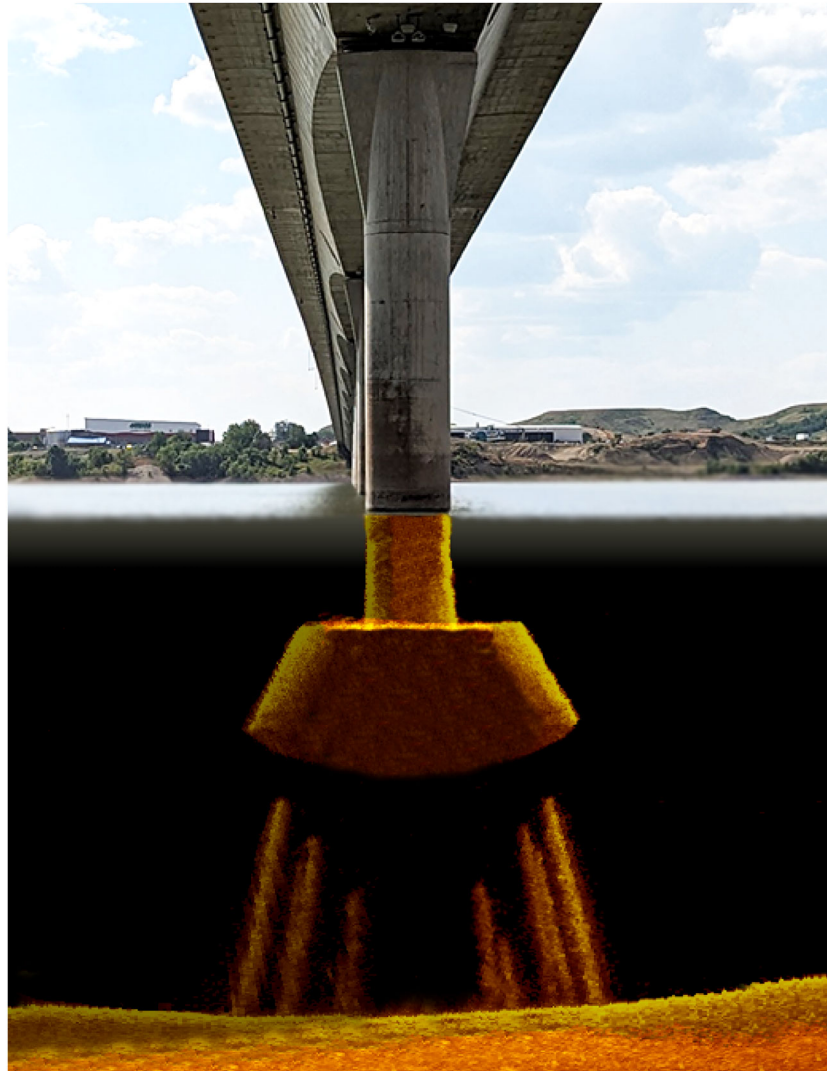
PIER 9



PIER 10



PIER 11



PIER 12



PIER 13

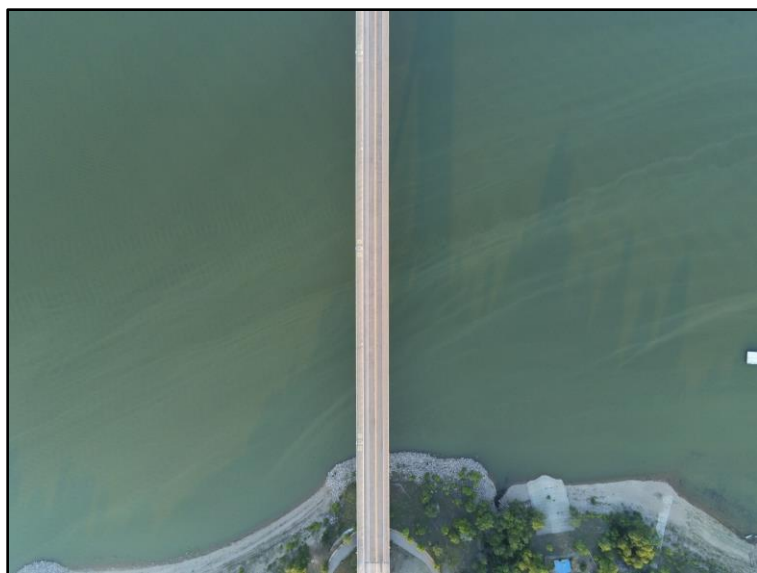


PIER 14

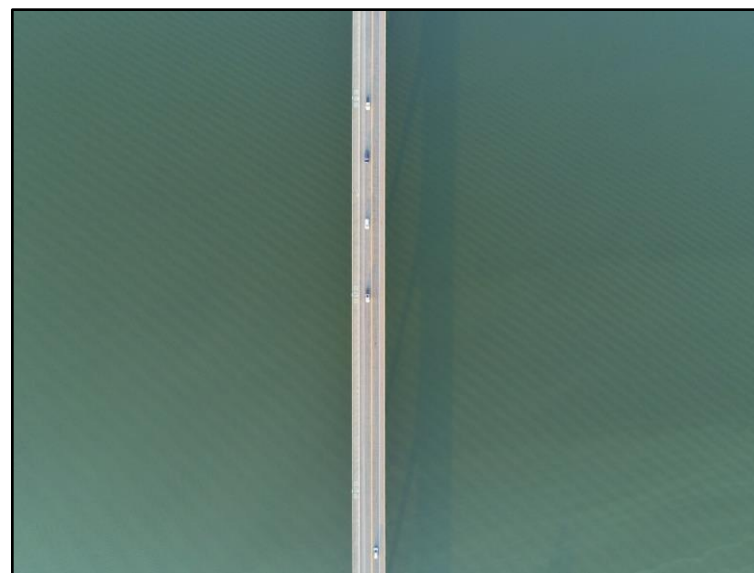


PIER 15

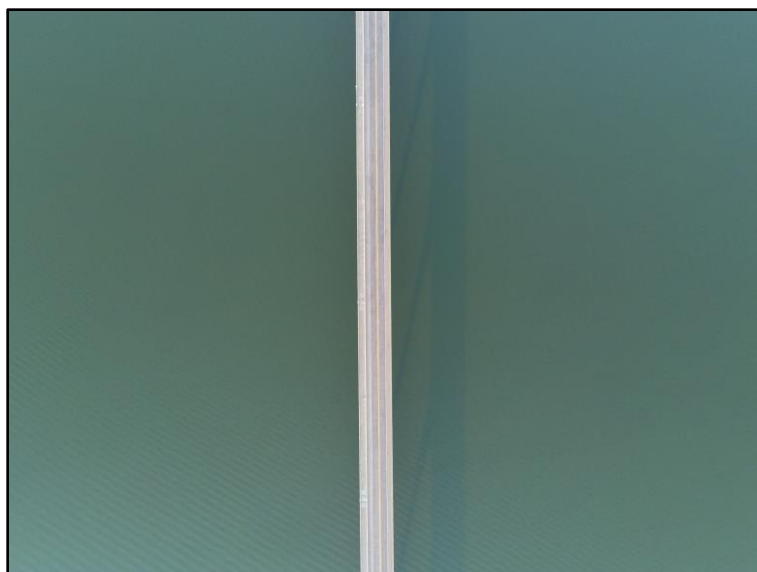
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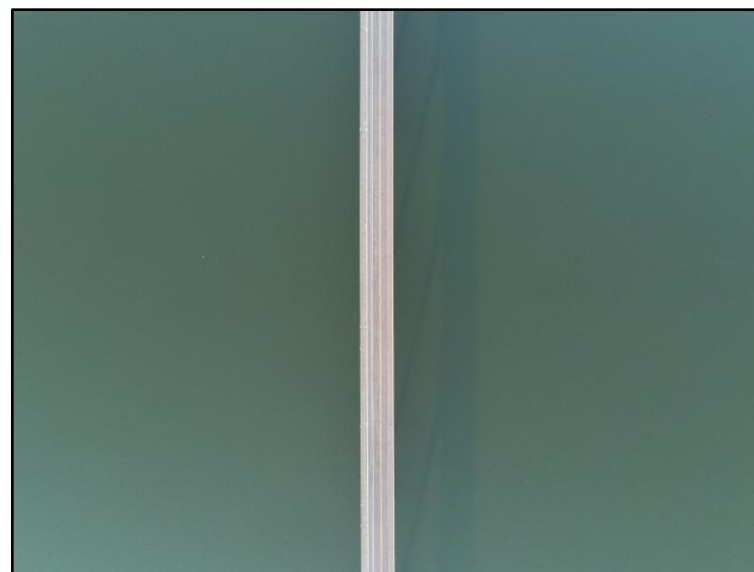
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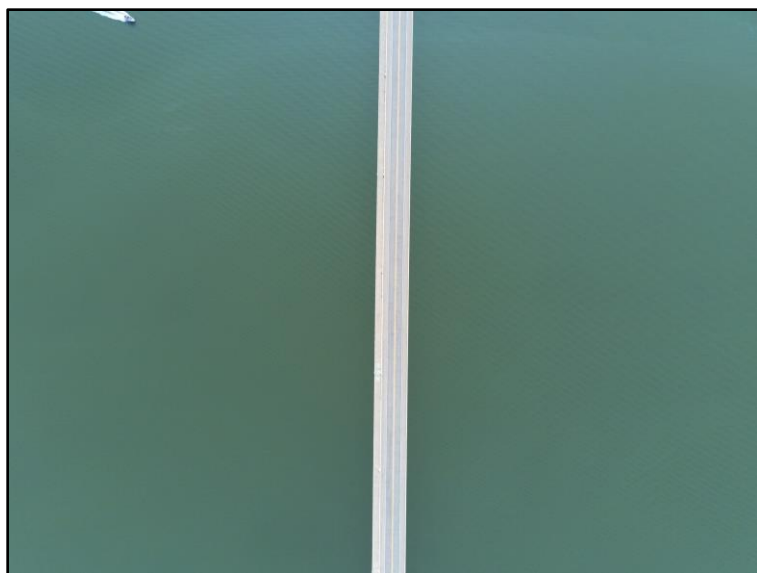


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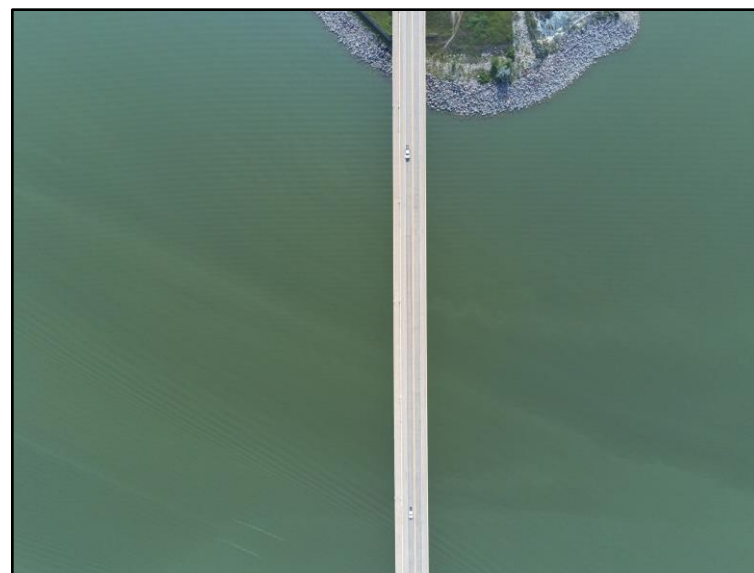


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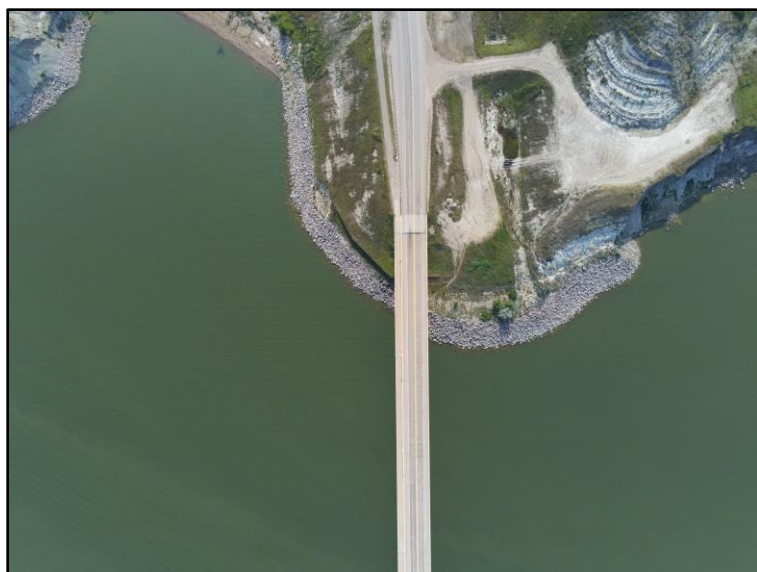
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P5480548.JPG



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P5520552.JPG



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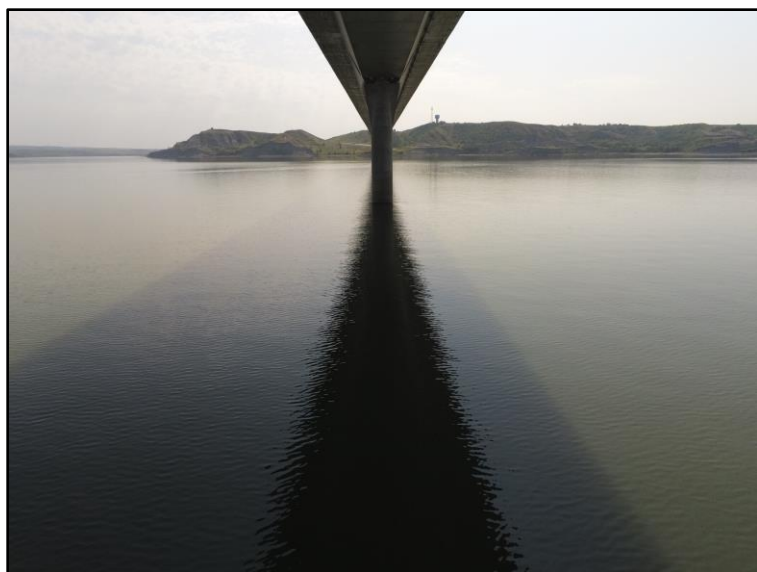
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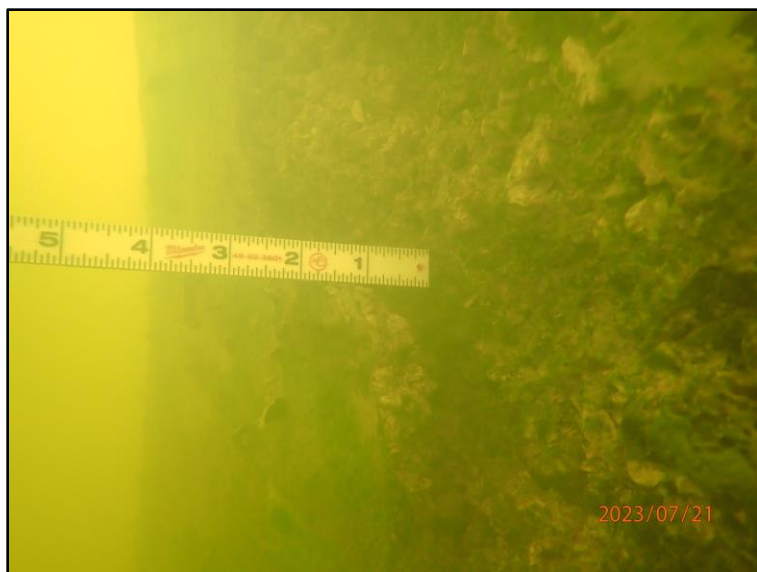
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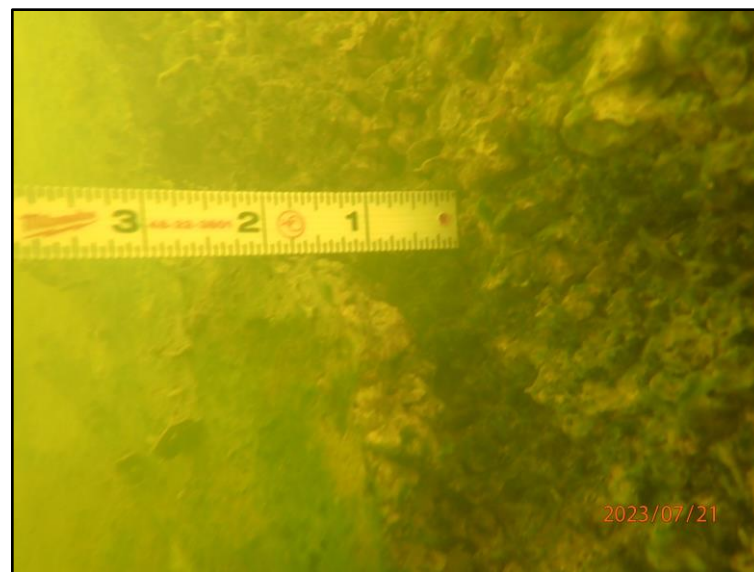
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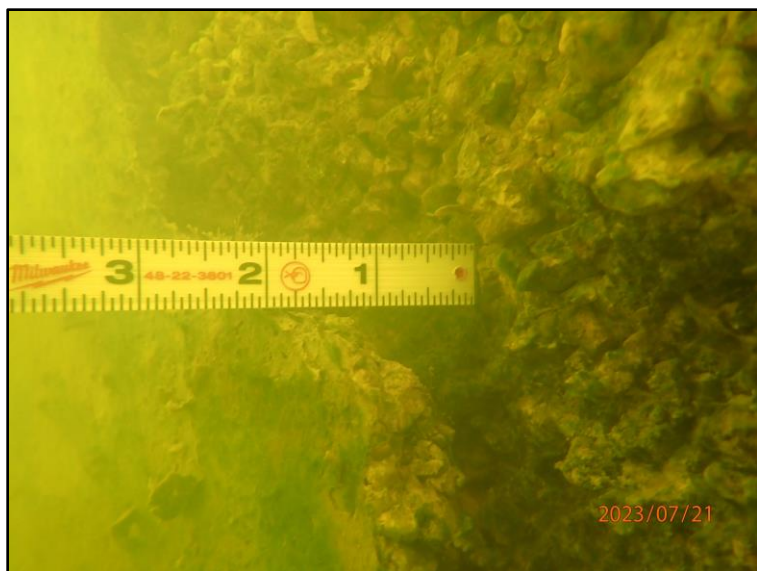


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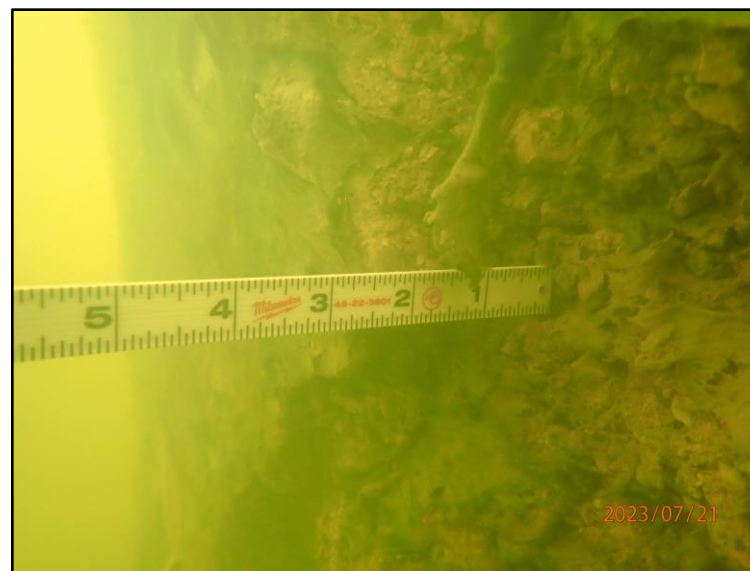


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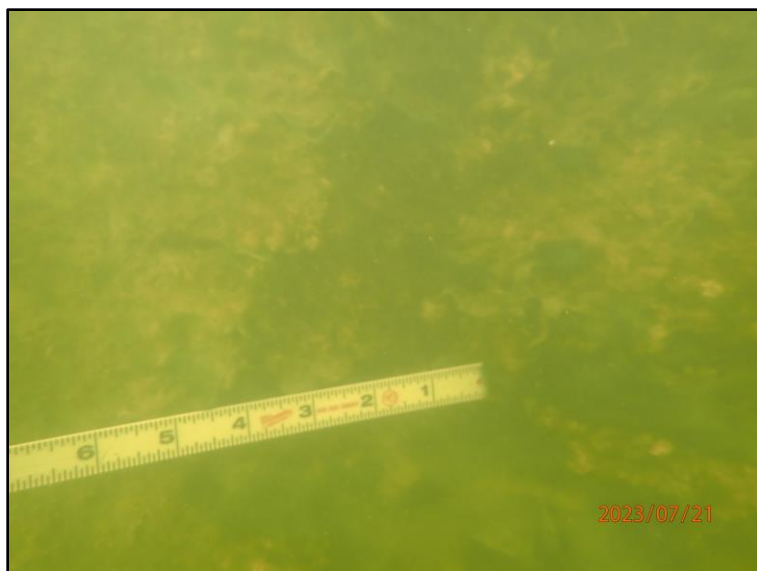
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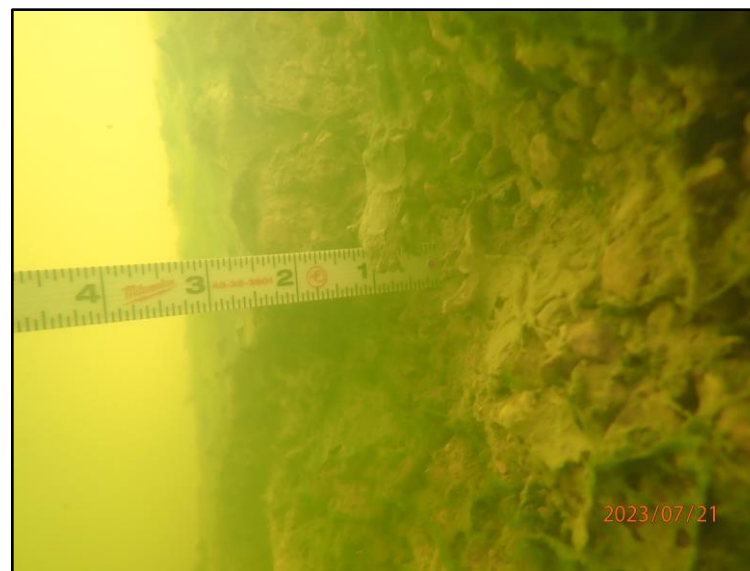
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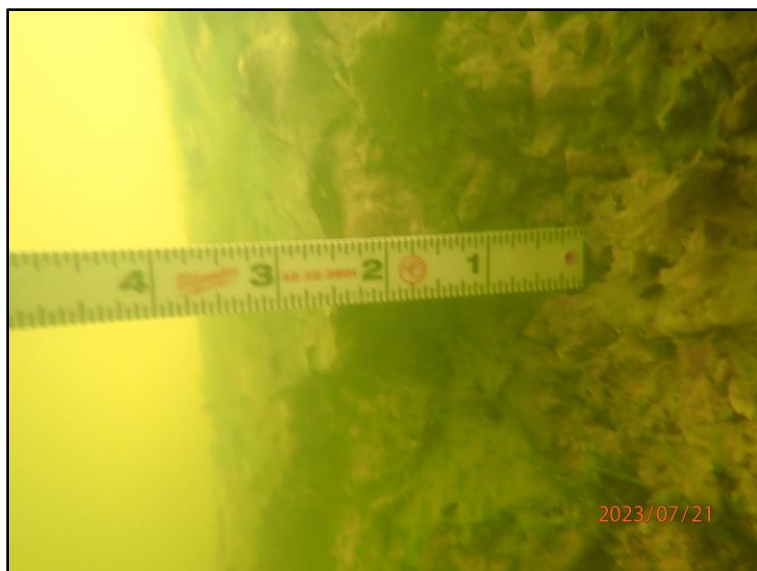


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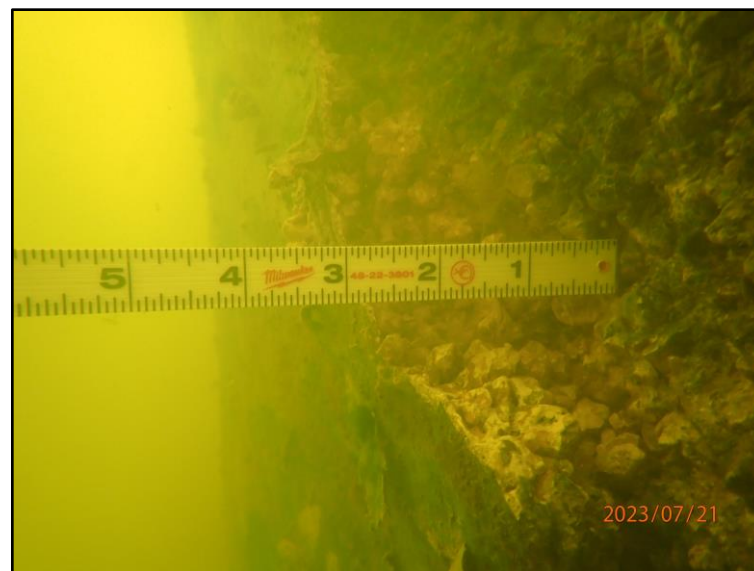


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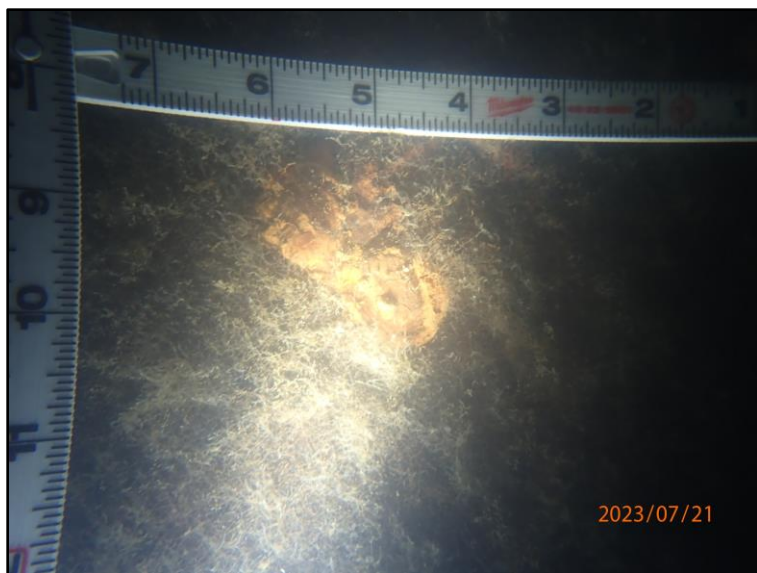


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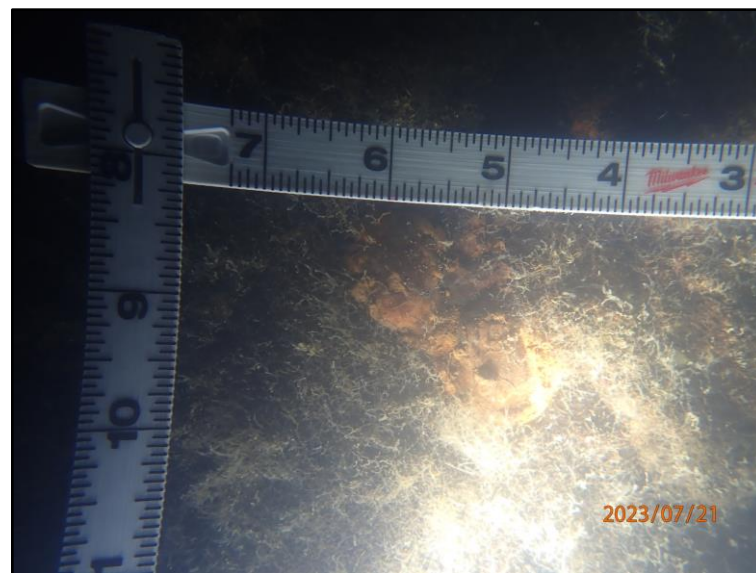


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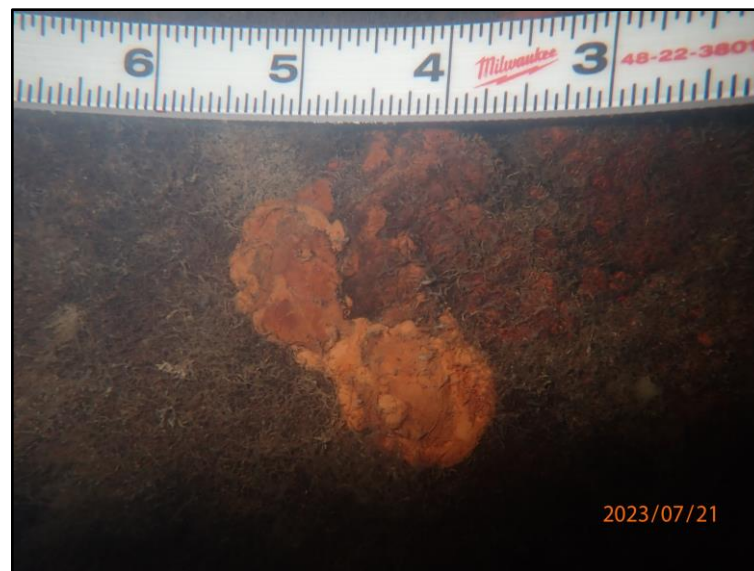


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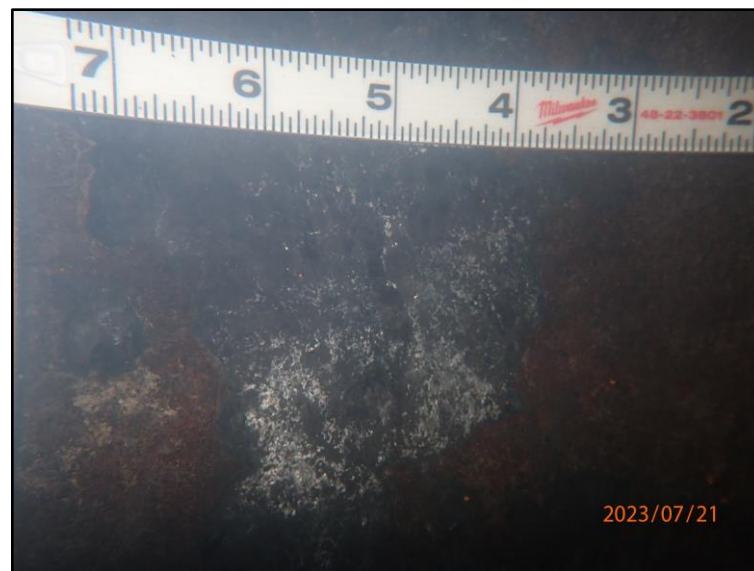


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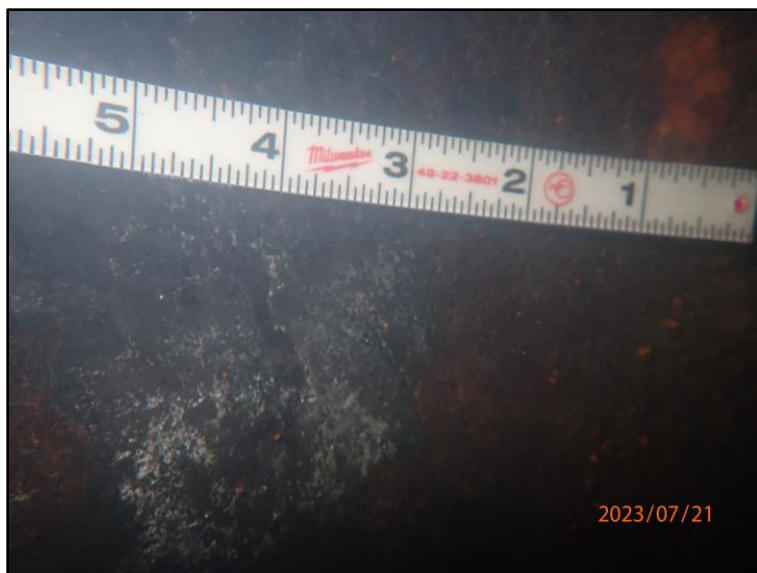


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