

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6611

CSAH NO. 14

OVER THE

MINNESOTA RIVER

DISTRICT 8 - CHIPPEWA COUNTY



OCTOBER 20, 2012

PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

AYRES ASSOCIATES & COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 6611, Piers 1 and 2, were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the west face of the pier, but no undermining was detected. The steel sheeting which encased the upstream concrete column at Pier 2 and the steel pipe piles exhibited only light surface corrosion with no section loss observed. There was a moderate accumulation of timber debris observed along Pier 1. The channel bottom appeared stable with no evidence of scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The footings at Pier 2 were exposed along the west side of the upstream concrete column with 2.2 feet of vertical face exposure and along west side of the downstream concrete column with 1.7 feet of vertical face exposure.
- (B) The upstream concrete column at Pier 2 was encased in steel sheeting that extended from the top of the footing to 6.5 feet above the waterline, and the steel exhibited light corrosion over 100 percent of the surface area. A gap in the steel sheeting, up to 1/4 inch wide, was observed at the north end of the column and extended from the top of the sheeting to 3 feet above the waterline.
- (C) A light accumulation of timber debris, with pieces up to 1 foot in diameter, was observed at the upstream end of Pier 2.
- (D) A moderate accumulation of timber debris was observed along Pier 1, mainly at the west side of the pier.

RECOMMENDATIONS:

- (A) Monitor the footing exposure at Pier 2 during future underwater inspections for further vertical face exposure and possible undermining of the footing.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

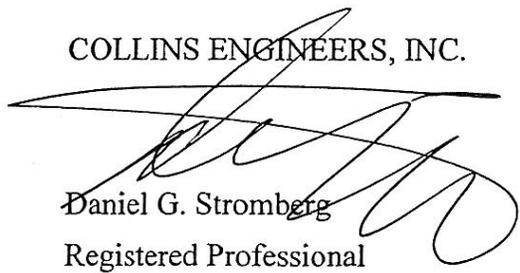
PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 6611

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 14

Location: District 8 - Chippewa County

Bridge Description: Bridge No. 6611 is a three span, multiple steel beam structure supported by two reinforced concrete abutments and two reinforced concrete piers founded on piles. The piers are numbered 1 and 2 starting from the west.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.

Dive Team: Ricardo S. Narvaez, Adam J. Enderby

Date: October 20, 2012

Weather Conditions: Sunny, 65°F

Underwater Visibility: 1.0 foot

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of two hexagon columns under a common pier cap, and two round steel shell piles outside of the columns supporting pier cap extensions. The two columns are supported by separate rectangular footings founded on H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 4.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the south side of Pier 2.

Water Surface: The waterline was approximately 16.7 feet below reference.

Waterline Elevation = 918.9.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/12

Item 113: Scour Critical Bridges: Code U/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

X Yes _____ No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	4	EA		4			
361	Scour	1	EA	1				
386	Cast-In-Place Piling	4	EA		4			
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. Overall View of the Structure, Looking North.



Photograph 2. View of Pier 1, Looking West.



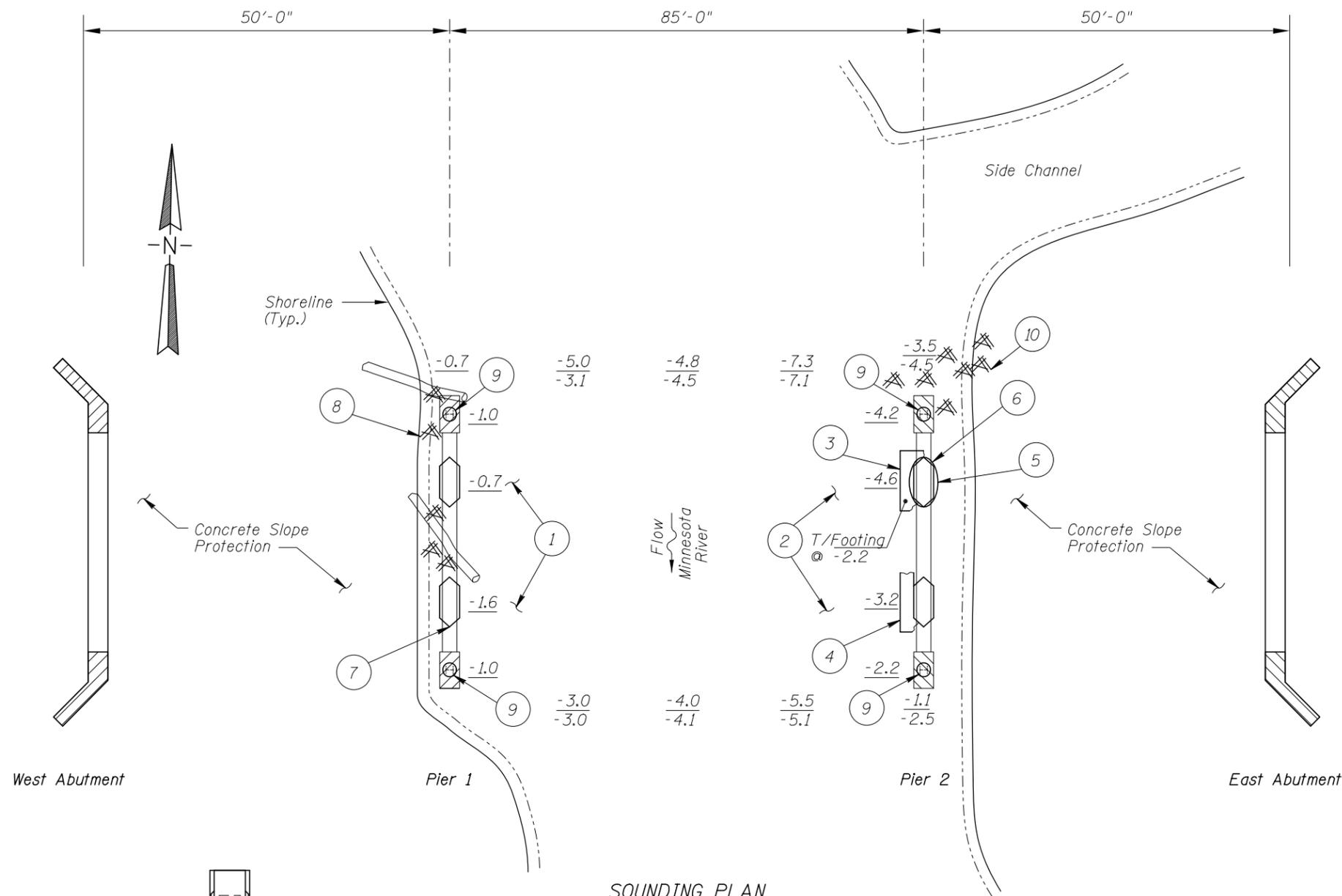
Photograph 3. View of Pier 2, Looking West.

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 20, 2012, the waterline was located approximately 16.7 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds to a waterline elevation of 918.9.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- 1 The channel bottom consisted silty organic material with 6 inches of probe rod penetration.
- 2 The channel bottom consisted of sand and riprap up to 1 foot in diameter, with minimal probe rod penetration.
- 3 The footing was exposed along the upstream concrete column on the west side of Pier 2 with 2.2 feet of vertical face exposure.
- 4 The footing was exposed along the downstream concrete column on the west side of Pier 2 with 1.7 feet of vertical face exposure.
- 5 The upstream concrete column was encased in steel sheeting that extended from the top of the footing to 6.5 feet above the waterline. Light corrosion was observed on 100 percent of the surface area of the steel sheeting.
- 6 A gap in the steel sheeting, up to 1/4 inch wide, extended from the top of the sheeting to 3 feet above the waterline at the north end of the column.
- 7 Minor areas of section loss were observed along the downstream side of the concrete column at Pier 1.
- 8 A moderate accumulation of timber debris was observed along Pier 1, mainly at the west side of the pier.
- 9 The steel pipe piles exhibited minor surface corrosion.
- 10 A light accumulation of timber debris consisting of branches up to 1 foot in diameter was observed at the upstream end of Pier 2.



SOUNDING PLAN

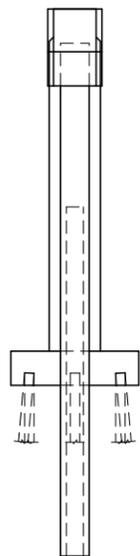
Legend

- 2.0 Sounding Depth (10/20/12)
- 5.2 Sounding Depth (10/20/07)
- Steel Pile Shell
- ⊕ Steel H-Pile
- ▨ Indicates Bridge Widening (c. 1990)
- ⌘ Timber Debris

Note:

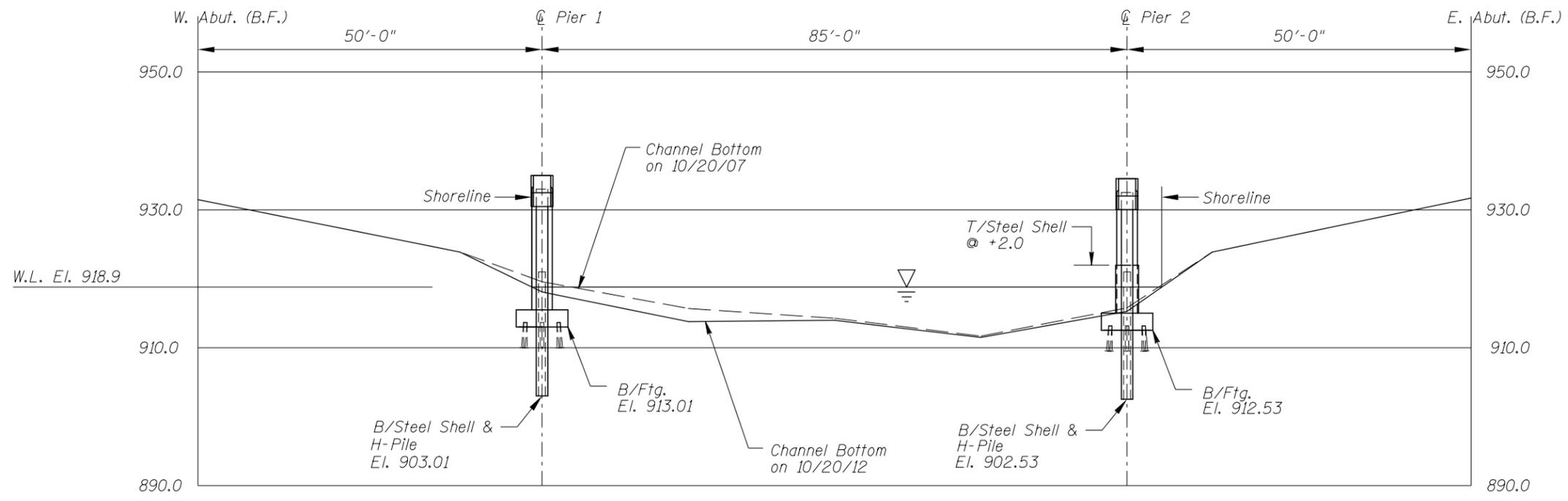
All soundings based on 2012 waterline location.

TYPICAL END VIEW OF PIERS

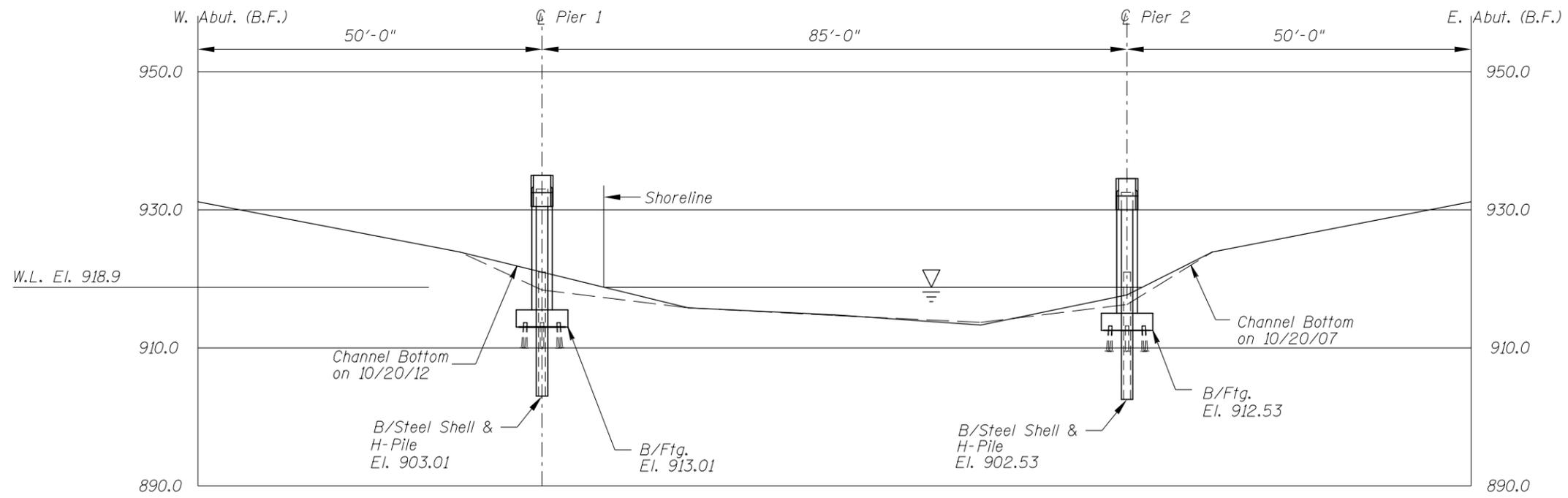


MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6611 OVER THE MINNESOTA RIVER DISTRICT 8, CHIPPEWA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JAC	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: OCT, 2012
Checked By: BKS		Scale: NTS
Code: 52210093		Figure No.: 1

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION					
STRUCTURE NO. 6611 OVER THE MINNESOTA RIVER DISTRICT 8, CHIPPEWA COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES					
Drawn By: JAC Checked By: BKS Code: 52210093	<table border="1"> <tr> <td> COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> </td> <td> AVRES ASSOCIATES <small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small> </td> </tr> <tr> <td> Date: OCT, 2012 Scale: 1"=20' Figure No.: 2 </td> <td></td> </tr> </table>	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	AVRES ASSOCIATES <small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small>	Date: OCT, 2012 Scale: 1"=20' Figure No.: 2	
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Date: OCT, 2012 Scale: 1"=20' Figure No.: 2					

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Ayres Associates DATE: October 20, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 6611 WEATHER: Sunny, 65°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Ricardo S. Narvaez, Adam J. Enderby

EQUIPMENT: Commercial Scuba, Sounding Pole, Lead Line, Probe Rod, Hammer, Camera

TIME IN WATER: 2:10 p.m.

TIME OUT OF WATER: 2:30 p.m.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 1.0 feet

DEPTH 4.6 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: The concrete columns and steel pipe piles were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the west face of the pier with 2.2 feet of vertical exposure at the upstream column and 1.7 feet of vertical exposure at the downstream column. The steel sheeting that encased the upstream concrete column at Pier 2 and the steel pipe piles at both piers exhibited only light surface corrosion with no section loss observed. There was a light accumulation of timber debris observed at the upstream end of Pier 2. A moderate accumulation of timber debris was observed along Pier 1, mainly at the west side of the pier. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: YES NO

Monitor the footing exposure at Pier 2 during future underwater inspections for further vertical face exposure and possible undermining of the footing.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6611
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Minnesota River

INSPECTION DATE October 20, 2012

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	1.6'	7	7	N	9	N	7	8	8	8	7	7	7	7	N	7	N	N
	Pier 2	4.6'	7	7	7	9	N	7	6	8	8	7	6	7	7	N	7	7	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete columns and steel pipe piles were in good condition with no structurally significant defects observed. Both of the column footings at Pier 2 were exposed along the west face of the pier with 2.2 feet of vertical exposure at the upstream column and 1.7 feet of vertical exposure at the downstream column. The steel sheeting that encased the upstream concrete column at Pier 2 and the steel pipe piles at both piers exhibited only light surface corrosion with no section loss observed. There was a light accumulation of timber debris observed at the upstream end of Pier 2. A moderate accumulation of timber debris was observed along Pier 1, mainly at the west side of the pier. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection..

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.