

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 04511

CSAH No. 12

OVER THE

MISSISSIPPI RIVER

DISTRICT 2 - BELTRAMI COUNTY



AUGUST 13, 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 inspected at Structure No. 04511, Pier 1, was found to be generally in good condition with no defects of structural significance observed. Minor light timber debris was observed at the upstream nose. A minor local scour depression was observed at the downstream nose of the pier. This report represents an initial underwater inspection of this structure.

INSPECTION FINDINGS:

- (A) Minor timber debris consisting of twigs was observed at the upstream nose of Pier 1.
- (B) A minor scour depression, 3 foot radius and 1 foot deep, was observed at the downstream nose of Pier 1.
- (C) The streambed material consisted of cobbles.
- (D) The west and east embankments had sparse riprap, 2 foot to 3 foot in diameter, with signs of erosion observed.
- (E) Overall, the concrete of Pier 1 was smooth and sound.

RECOMMENDATIONS:

- (A) 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,

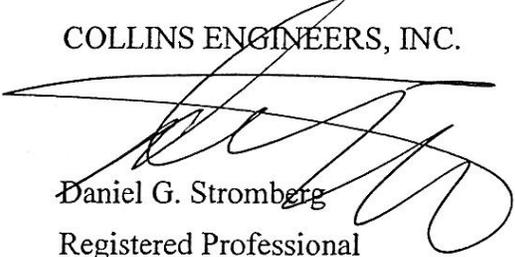
PROFESSIONAL ENGINEER

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: 04511

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 12

Location: District 2 - Beltrami County

Bridge Description: The superstructure consists of reinforced concrete deck over steel girders supported by two reinforced concrete abutments and one reinforced concrete pier. The substructure units are designated as West Abutment, Pier 1, and East Abutment.

2. INSPECTION DATA

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

Dive Team: Jason A. Cook, James A. Hitchman

Date: August 13, 2012

Weather Conditions: Sunny, 70° F

Underwater Visibility: 4.0 feet

Waterway Velocity: 1.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1.

General Shape: Pier 1 is a tapered pier with two openings in the pier face founded on an unknown foundation.

Maximum Water Depth at Substructure Inspected: 4.0 feet at Pier 1.

4. WATERLINE DATUM

Water Level Reference: The top of pier cap at the downstream nose of Pier 1.

Water Surface: The waterline was approximately 11.7 feet below reference.
Assumed Waterline Elevation = 88.3

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 7

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code I/08

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

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	1	EA	1				
985	Slopes	1	EA		1			
361	Scour	1	EA	1				



Photograph 1. Overall View of Downstream Fascia, Looking North.



Photograph 2. Overall View of Pier 1, Looking East.



Photograph 3. View of Pier 1, Looking West.



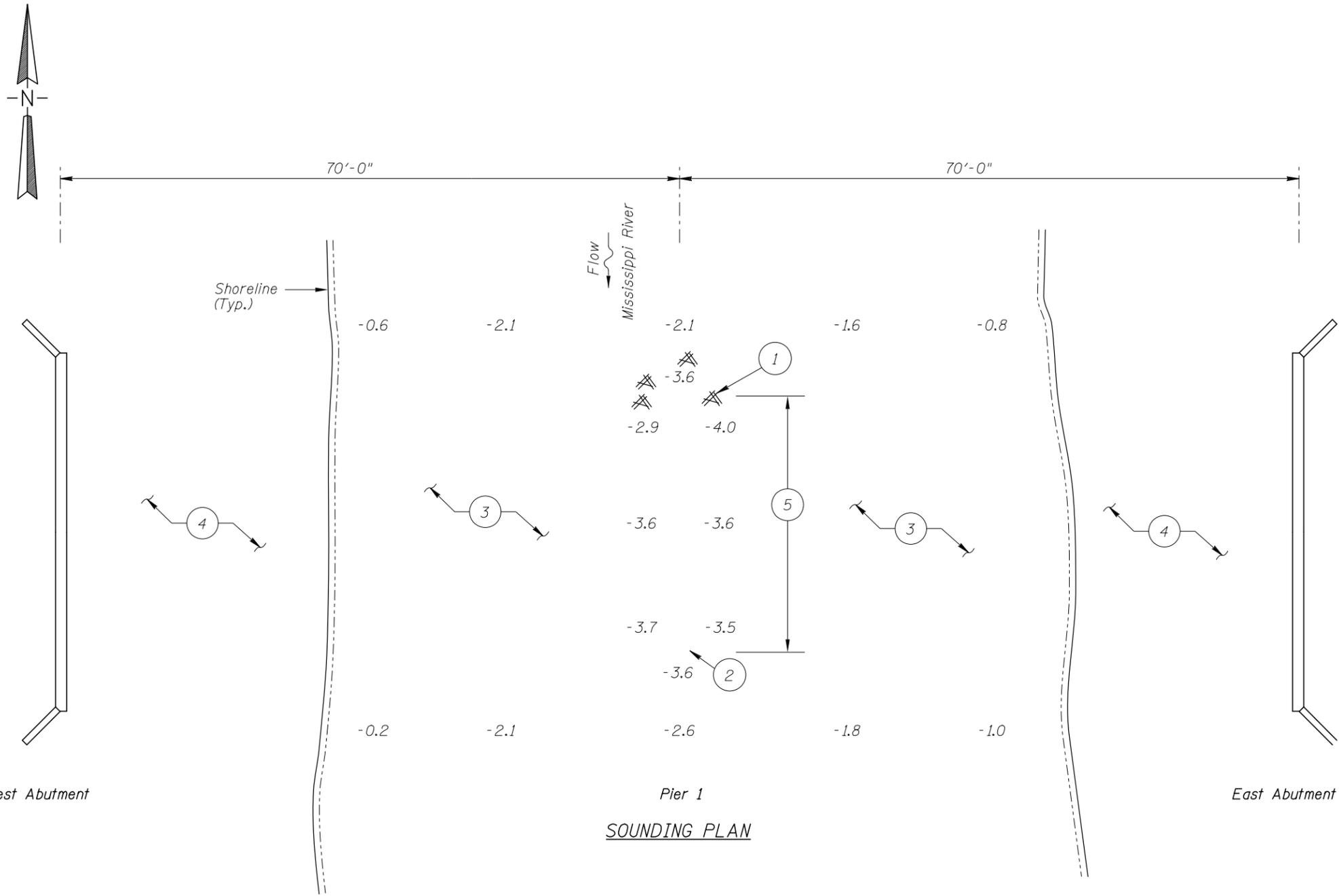
Photograph 4. View of the West Abutment, Looking West



Photograph 5. View of the East Abutment, Looking Northeast.



Photograph 6. View of Typical Embankment Erosion and Missing Riprap.



GENERAL NOTES:

1. Piers 1 was inspected underwater.
2. At the time of inspection on August 13, 2012, the waterline was located approximately 11.7 feet below top of pier cap at the downstream nose of Pier 1. This corresponds to a waterline elevation of 88.3 feet based on an assumed benchmark elevation of 100.0 feet.
3. Soundings indicate the water depth at the time of the inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

GENERAL NOTES:

- ① Minor timber debris consisting of twigs was observed at the upstream nose of Pier 1.
- ② A minor scour depression, 3 foot radius and 1 foot deep, was observed at the downstream nose of Pier 1.
- ③ The streambed material consisted of cobbles.
- ④ The west and east embankments had sparse riprap, 2 foot to 3 foot in diameter, and signs of erosion were observed.
- ⑤ Overall, the concrete of Pier 1 was smooth and sound.

SOUNDING PLAN

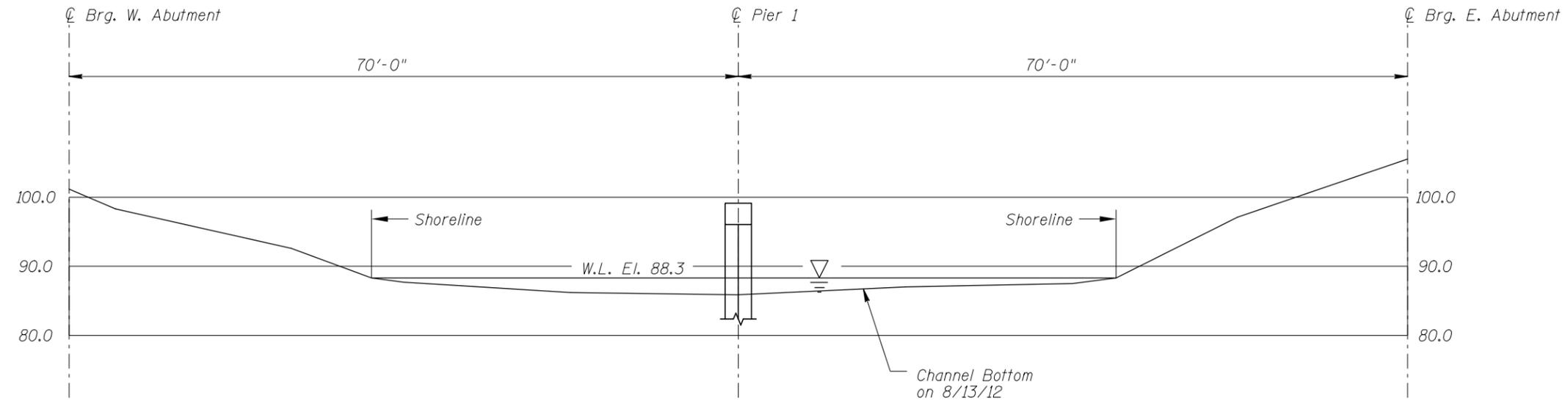
Legend

-7.0 Sounding Depth (8/13/12)

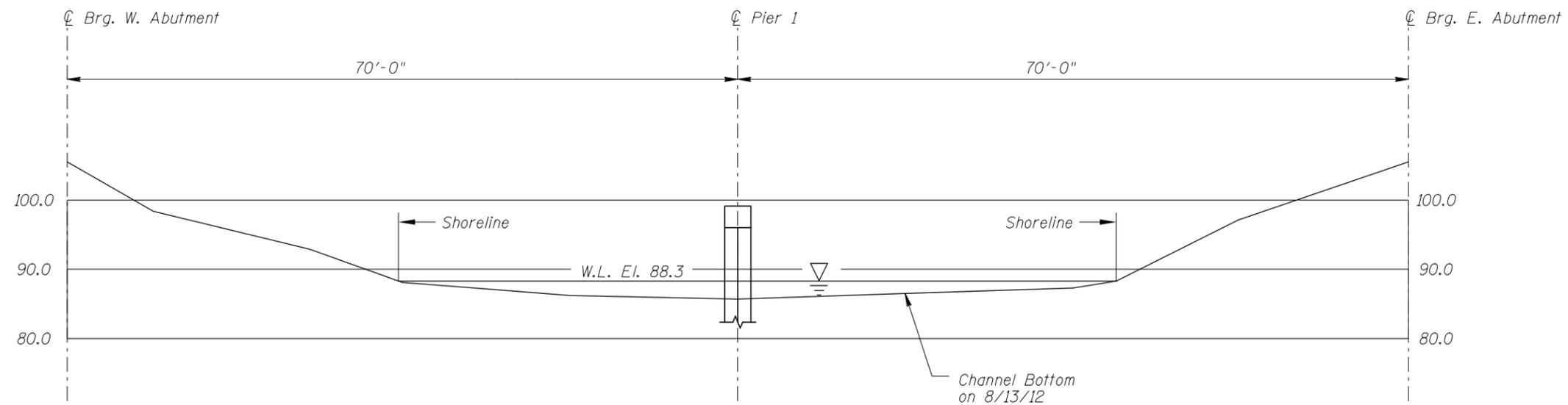
Timber Debris

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 04511 OVER THE MISSISSIPPI RIVER DISTRICT 2, BELTRAMI COUNTY, CITY OF BEMIDJI		
INSPECTION AND SOUNDING PLAN		
Drawn By: JAC		Date: AUGUST, 2012
Checked By: BKS	3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Scale: NTS
Code:		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. 04511 OVER THE MISSISSIPPI RIVER DISTRICT 2, BELTRAMI COUNTY, CITY OF BEMIDJI UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: JAC		Date: AUGUST, 2012
Checked By: BKS	<small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small>	Scale:
Code:		Figure No.: 2

COLLINS ENGINEERS	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com
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MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Ayres Associates DATE: August 13, 2012

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

BRIDGE NO: 04511 WEATHER: Sunny, 70° F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
 OTHER Wade

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: Dry Suit, Camera, Sounding Rod, Hammer

TIME IN WATER: 10:00 A.M.

TIME OUT OF WATER: 10:20 A.M.

WATERWAY DATA: VELOCITY 1.5 ft/sec

VISIBILITY 4.0 feet

DEPTH 4.0 feet maximum at Pier 1

ELEMENTS INSPECTED: Pier 1

REMARKS: The structure inspected at Structure No. 04511, Pier 1, was found to be generally in good condition with no defects of structural significance observed. Minor timber debris was observed at the upstream nose. A minor local scour depression was observed at the downstream nose of the pier. The channel bottom material typically consisted of cobbles.

FURTHER ACTION NEEDED: _____ YES NO

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. 04511
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE August 13, 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 Abutment	4.0'	N	7	N	N	N	7	8	6	6	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The structure inspected at Structure No. 04511, Pier 1, was found to be generally in good condition with no defects of structural significance observed. Minor timber debris was observed at the upstream nose. A minor local scour depression was observed at the downstream nose of the pier. The channel bottom material typically consisted of cobbles.

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.