

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 62580
RASPBERRY ISLAND (SERVICE) ROAD
OVER THE
MISSISSIPPI RIVER
CITY OF ST PAUL, RAMSEY COUNTY



OCTOBER 31, 2012
PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 62580, Piers 1, 2, 3, and 4, were found to be generally in good condition with no defects of structural significance observed. Typically, the concrete shafts were in good and sound condition and the submerged steel piles exhibited only light surface corrosion. The bottom of the concrete shaft of Pier 4 exhibited poorly formed concrete with some reinforcing steel protruding from the bottom of the shaft. Minor accumulations of timber debris, with pieces up to 12 inches in diameter, were observed on the channel bottom scattered throughout piles of Pier 3. The channel bottom appeared stable with no evidence of significant scour or significant changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The channel bottom material consisted of 2 inch diameter gravel with random riprap at the upstream ends of Piers 1 and 2 with minimal probe rod penetration, and sand allowing up to 6 inches of probe rod penetration at Pier 3. Along Pier 4, 6 inch diameter cobbles and gravel were observed.
- (B) A minor accumulation of timber debris, with pieces up to 12 inches in diameter, was observed on the channel bottom randomly scattered throughout the piles of Pier 3 extending from channel bottom up 2 to 3 feet.
- (C) Timber formwork and steel angles were observed at the base of the concrete shaft of Pier 4. The bottom of the shaft was poorly formed with rough edges and reinforcing steel protruding from the base.
- (D) The concrete shafts were in good and sound condition and extended approximately 2 feet below the waterline. The submerged steel piles exhibited light surface corrosion with rust nodules up to ¼ inch in diameter.

RECOMMENDATIONS:

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

Inspection Team Leader:
WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

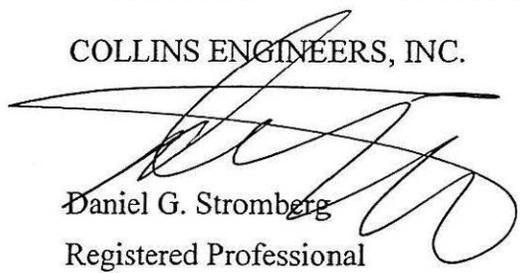
PROFESSIONAL ENGINEER

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: 62580

Feature Crossed: Mississippi River

Feature Carried: Raspberry Island Road

Location: City of St Paul Ramsey County

Bridge Description: The bridge superstructure consists of a five span cast-in-place concrete slab with concrete overlay. The superstructure is supported by four concrete piers and two concrete abutments on steel H-piles. The piers are numbered 1 to 4 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R. Lovelace, P.E. (WSB)

Dive Team: Lukas Janulis, P.E., Brad Robinson (WSB)

Date: October 31, 2012

Weather Conditions: Sunny, 40°F

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, 3, and 4.

General Shape: The piers each consist of an oblong rectangular concrete shaft with rounded or beveled noses, which extends approximately 2 feet below the waterline, encasing multiple steel H-piles which extend down into the channel bottom.

Maximum Water Depth at Substructure Inspected: Approximately 9.0 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the shaft at Pier 2.

Water Surface: The waterline was approximately 8.5 feet below reference.

USGS M.S.L. Waterline Elevation = 685.0 feet

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/10/12

Item 113: Scour Critical Bridges: Code I/02

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
210	Reinforced Concrete Pier Wall	151	LF	151				
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. View of Pier 1, Looking Southeast.



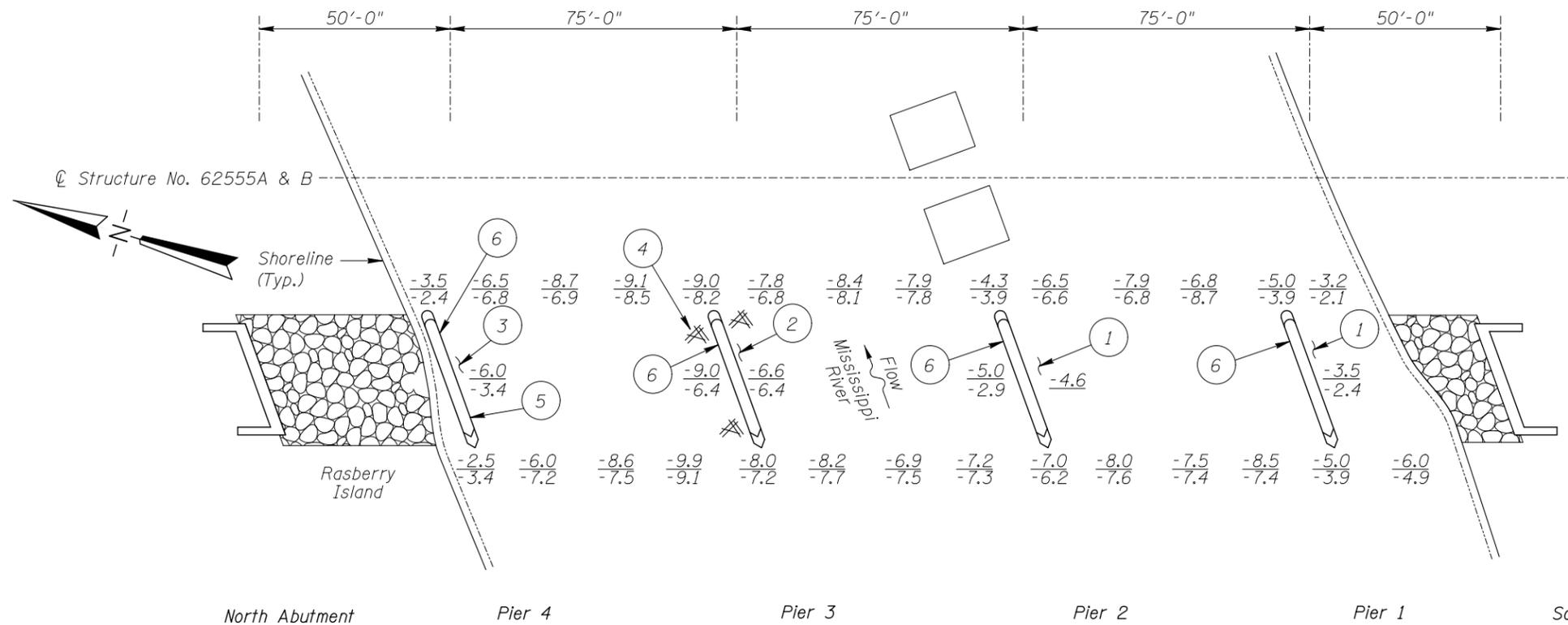
Photograph 2. View of Pier 2, Looking North.



Photograph 3. View of Pier 3, Looking North



Photograph 4. View of Pier 4, Looking North.



GENERAL NOTES:

1. Piers 1 through 4 were inspected underwater.
2. At the time of inspection on October 31, 2012, the waterline was located approximately 8.5 feet below the top of the tapered shaft of Pier 2. This corresponds to waterline elevation referenced to USGS M.S.L. of 685.0 feet.
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.

SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material consisted of 2 inch diameter gravel with random riprap at the upstream end and with minimal probe rod penetration.
- 2 The channel bottom material consisted of sand allowing up to 6 inches of probe rod penetration.
- 3 The channel bottom material consisted of 6 inch diameter cobbles and gravel.
- 4 A minor accumulation of timber debris, with pieces up to 12 inches in diameter, was observed on the channel bottom randomly scattered throughout the piles of Pier 3 extending from channel bottom up 2 to 3 feet.
- 5 Timber formwork and steel angles were observed at the base of the concrete shaft of Pier 4. The bottom of the shaft was poorly formed with rough edges and reinforcing steel protruding from the base.
- 6 The concrete shafts were in good and sound condition and extended 2 feet below the waterline. The submerged steel piles exhibited light surface corrosion with rust nodules up to 1/4 inch in diameter.

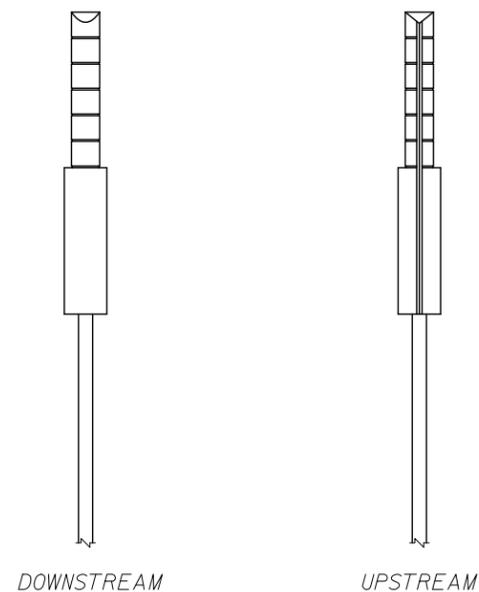
Legend

-5.0 Sounding Depth (10/31/12)
 -4.1 Sounding Depth (10/18/07)

⊗ Timber Debris

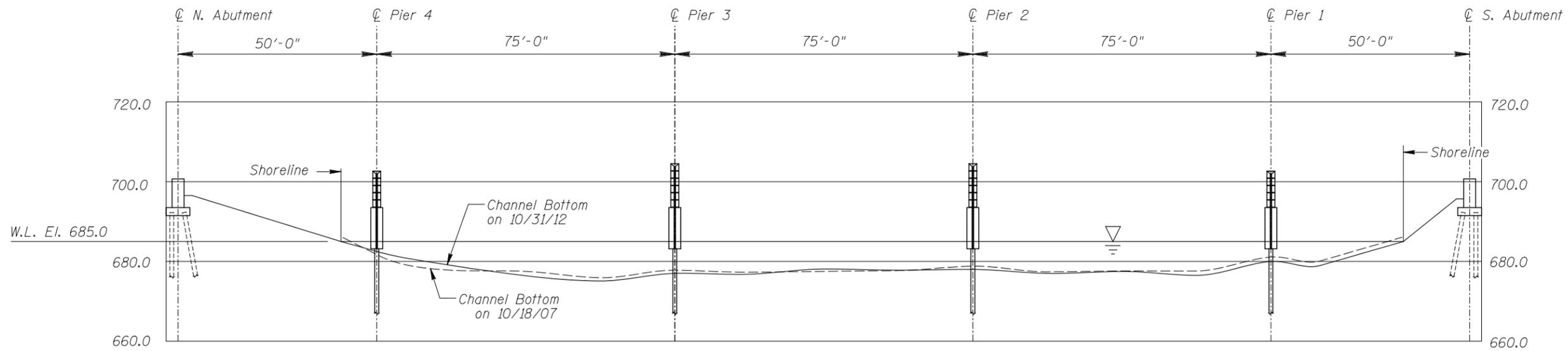
Note:

All soundings based on 2012 waterline location.

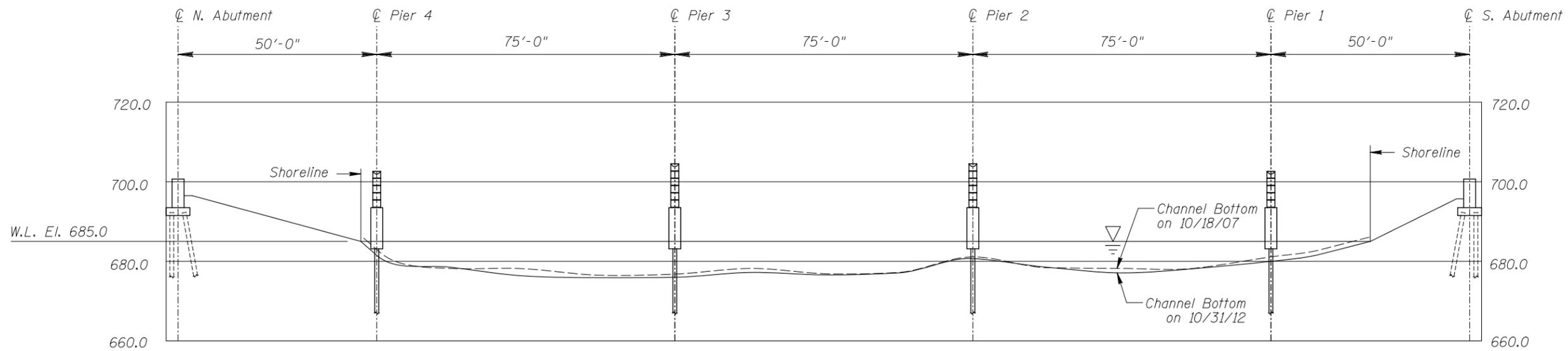


TYPICAL END VIEW OF PIERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 62580 OVER THE MISSISSIPPI RIVER CITY OF ST. PAUL, RAMSEY COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT. 2012
Checked By: LJ		Scale: NTS
Code: 742362580		Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 62580 OVER THE MISSISSIPPI RIVER CITY OF ST. PAUL, RAMSEY COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: CRE Checked By: LJ Code: 742362580	COLLINS ENGINEERS	123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com
		Date: OCT. 2012 Scale: 1"=30' Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 31, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace, P.E. (WSB)

BRIDGE NO: 62580 WEATHER: Sunny, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Lukas Janulis, P.E., Brad Robinson (WSB)

EQUIPMENT: Commercial Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera, 14' Boat with Motor.

TIME IN WATER: 9:30 A.M.

TIME OUT OF WATER: 9:45 A.M.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 1.0 feet

DEPTH 9.0 feet maximum at Pier 3

ELEMENTS INSPECTED: Piers 1, 2, 3, and 4

REMARKS: Overall, Piers 1 through 4 were in good condition with no structurally significant defects observed. Typically, the concrete shafts were in good and sound condition and the submerged steel piles exhibited only light surface corrosion. The bottom of the concrete shaft of Pier 4 exhibited poorly formed concrete with some reinforcing steel protruding from the bottom of the shaft. Minor accumulations of timber debris, with pieces up to 12 inches in diameter, were observed on the channel bottom scattered throughout piles of Pier 3. The channel bottom appeared stable with no evidence of significant scour.

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. 62580
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E. (WSB)
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 31, 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	5.0'	7	7	N	9	N	7	N	N	8	N	8	7	7	N	N	N	N
	Pier 2	7.0'	7	7	N	9	N	7	N	N	N	7	7	7	7	N	N	N	N
	Pier 3	9.0'	7	7	N	9	N	7	N	N	N	7	7	7	7	N	N	N	N
	Pier 4	6.0'	7	7	N	9	N	7	N	N	8	N	8	7	7	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 through 4 were in good condition with no structurally significant defects observed. Typically, the concrete shafts were in good and sound condition and the submerged steel piles exhibited only light surface corrosion. The bottom of the concrete shaft of Pier 4 exhibited poorly formed concrete with some reinforcing steel protruding from the bottom of the shaft. Minor accumulations of timber debris, with pieces up to 12 inches in diameter, were observed on the channel bottom scattered throughout piles of Pier 3. The channel bottom appeared stable with no evidence of significant scour.

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.