

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69505
CSAH NO. 8
OVER THE
ST. LOUIS RIVER
DISTRICT 1 – ST. LOUIS COUNTY



JULY 25, 2012

PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

AND
WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 69505, Piers 1 and 2, were in good condition with no defects of structural significance observed. A heavy accumulation of timber debris was observed around the perimeter of Pier 1. The channel bottom appeared to be in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The concrete exhibited light scaling from 3 feet above the waterline to the channel bottom with exposed aggregated and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch.
- (B) A heavy accumulation of 2-foot-diameter and smaller timber debris was observed around the entire perimeter of Pier 1 extending 50 feet upstream, 25 feet downstream off the noses, off 20 feet off the faces of the pier, from the channel bottom to 8 feet above the waterline. Due to the timber debris, the pier components below water were partially inaccessible to the engineer-diver, and soundings around the pier could not be taken.

RECOMMENDATIONS:

- (A) Remove timber debris around Pier 1.

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

WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

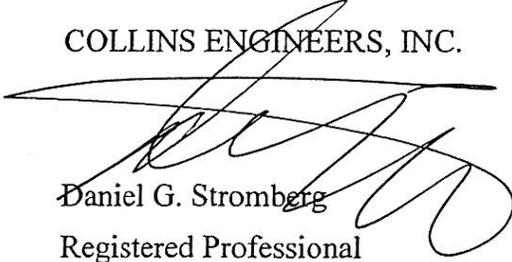
PROFESSIONAL ENGINEER

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: 69505

Feature Crossed: St. Louis River

Feature Carried: CSAH No. 8

Location: District 1 – St. Louis County

Bridge Description: The superstructure consists of three spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and two concrete piers.

2. INSPECTION DATA

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

Dive Team: Kasey Yoder (WSB), John Loftus (Collins)

Date: July 25, 2012

Weather Conditions: Sunny, 73°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Piers

General Shape: The piers consist of an oblong rectangular concrete shaft supporting a hammerhead pier cap on top of a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 3.9 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 2.

Water Surface: The waterline was approximately 16.7 feet below reference.
Assumed Waterline Elevation = 83.3

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 4

Item 92B: Underwater Inspection: Code B/07/12

Item 113: Scour Critical Bridges: Code N/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:

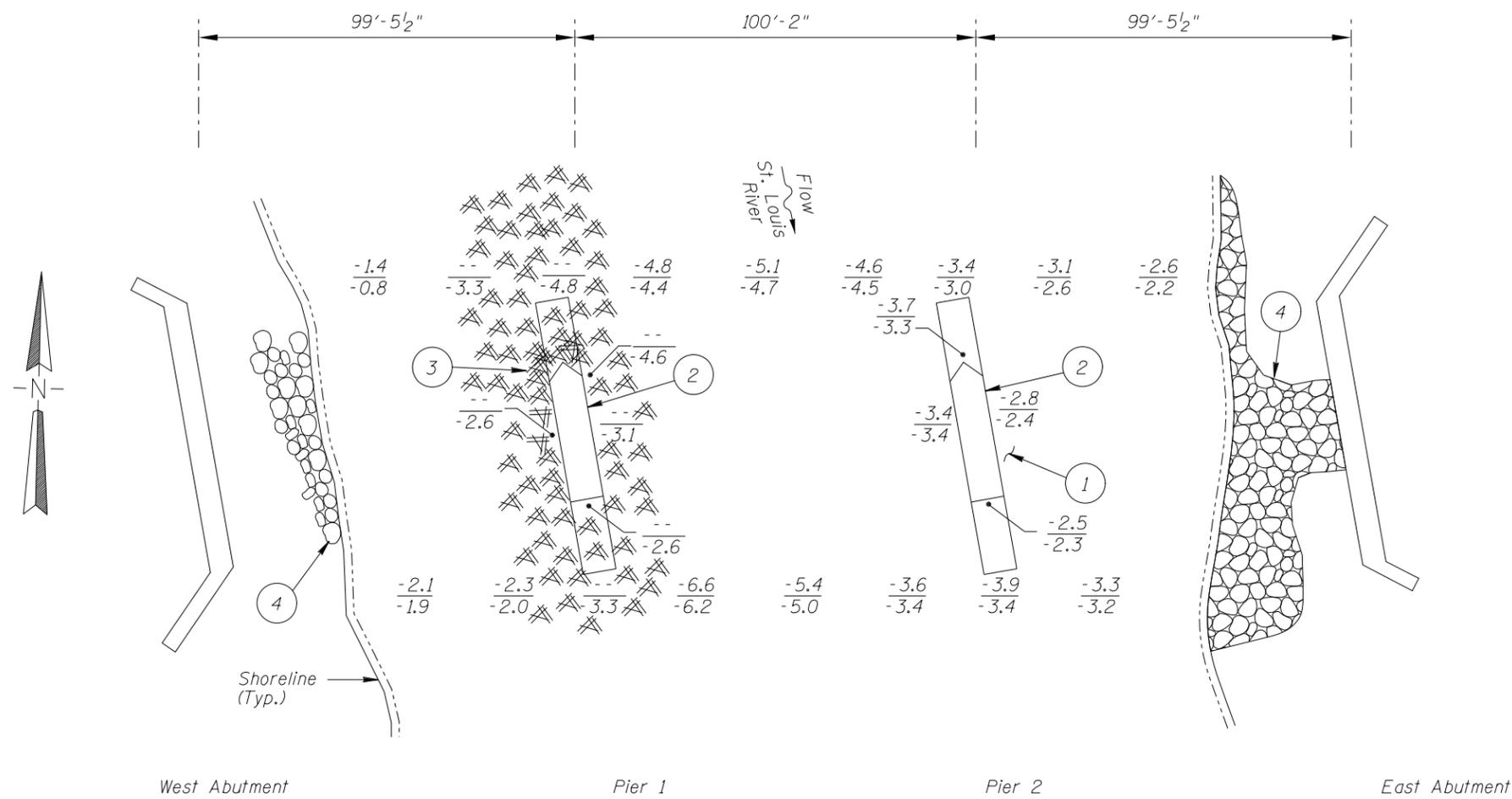
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	2	EA	2				
361	Scour	1	EA	1				
985	Slopes	1	EA		1			



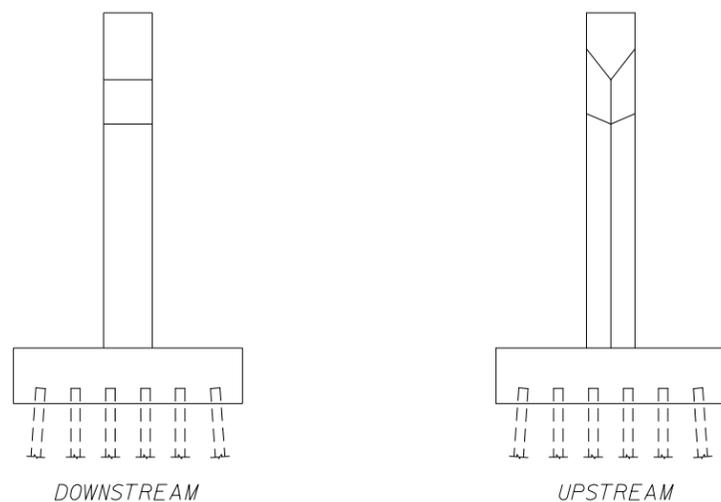
Photograph 1. View of Pier 1 and Timber Debris, Looking West.



Photograph 2. View of Pier 2, Looking West.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

Legend

-8.0 Sounding Depth (7/25/12)
 -8.0 Sounding Depth (8/29/07)

Timber Debris

Riprap

Note:

All soundings based on 2012 waterline location.

GENERAL NOTES:

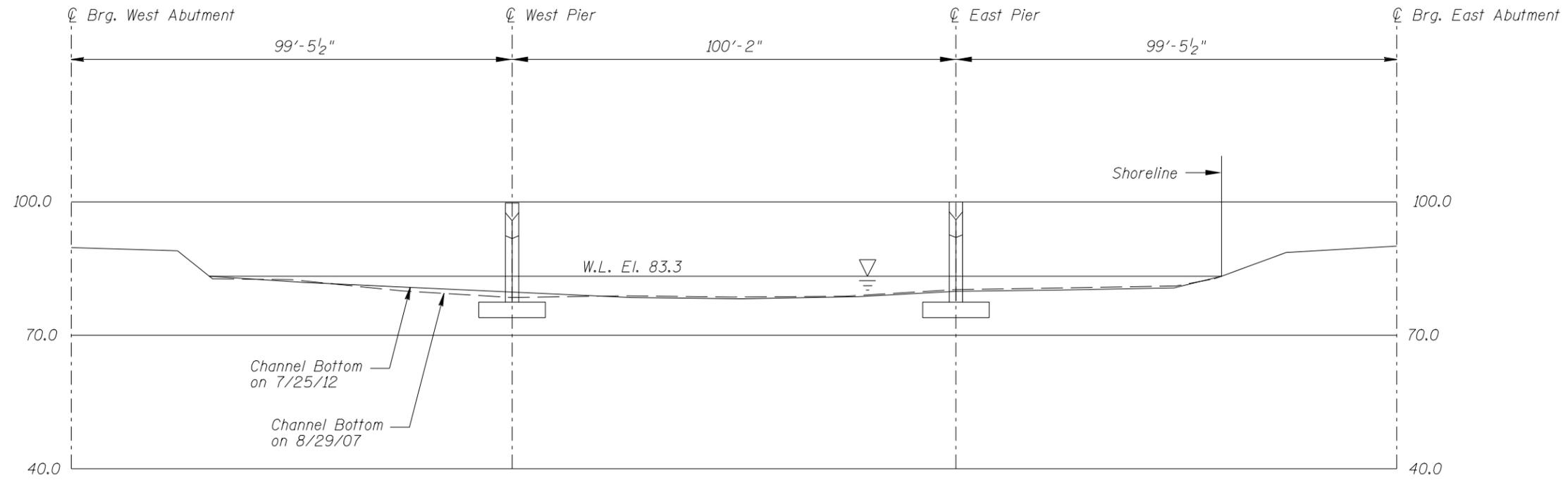
1. Pier 1 and Pier 2 were inspected underwater.
2. At the time of inspection on July 25, 2012, the waterline was located approximately 16.7 feet below the top of the pier cap at the upstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 83.3.
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:

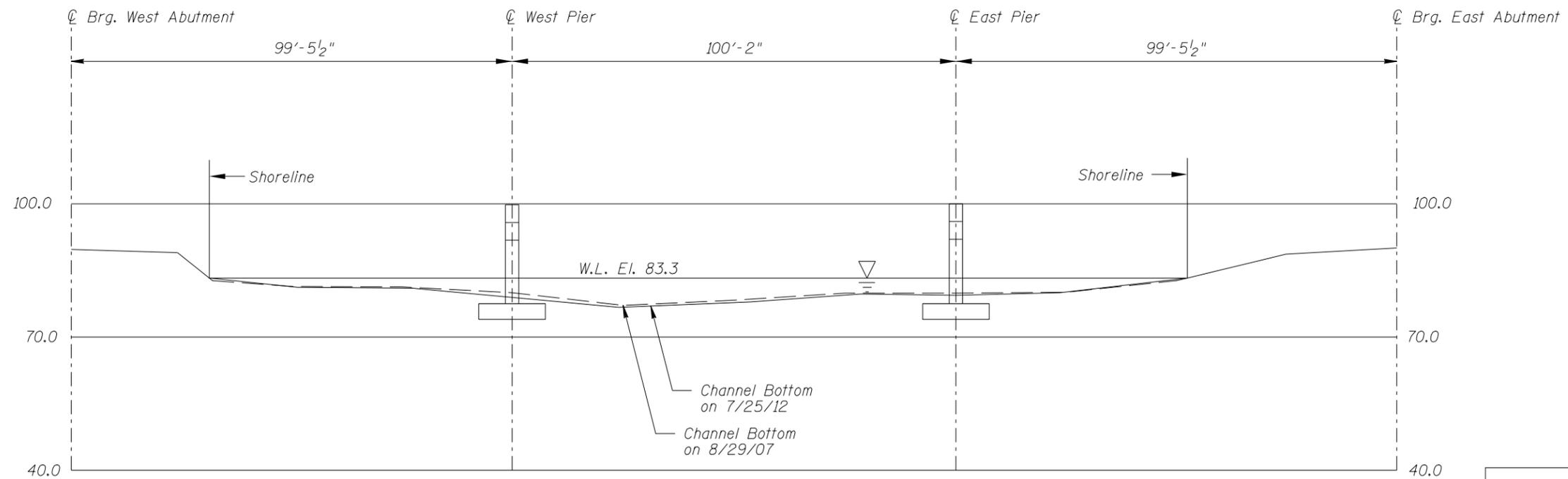
- 1 The channel bottom consisted of 1- to 2-foot-diameter riprap and cobbles.
- 2 The concrete exhibited light scaling from 3 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch.
- 3 A heavy accumulation of 3-foot-diameter and smaller timber debris was observed around the entire pier extending 50 feet upstream and 25 feet downstream off the noses, 20 feet off the faces of Pier 1, from the channel bottom to 8 foot above the waterline.
- 4 1- to 2-foot-diameter riprap and cobbles were observed along the embankments.

WSB
 & Associates, Inc.
 701 Xenia Avenue South, Suite 300
 Minneapolis, MN 55416
 www.wsbeng.com
 763-541-800 • Fax 763-541-1700
 INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 69505 OVER THE ST. LOUIS RIVER DISTRICT 1, ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BJR	COLLINS ENGINEERS	Date: JULY 2012
Checked By: BRL	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: NTS
Code: 522169505		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. 69505 OVER THE ST. LOUIS RIVER DISTRICT I, ST. LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: JULY 2012
Checked By: BRL		Scale: 1"=30'
Code: 522169505		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins DATE: July 25, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 69505 WEATHER: Sunny, 73°F

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Kasey Yoder (WSB), John Loftus (Collins)

EQUIPMENT: Commercial Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod,
Camera

TIME IN WATER: 17:10

TIME OUT OF WATER: 17:50

WATERWAY DATA: VELOCITY 1.0 ft/s

VISIBILITY 2.0 feet

DEPTH 3.9 feet maximum Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was in good, sound condition with light scaling from 3 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch. A heavy accumulation of timber debris was observed around the entire Pier 1 extending 50 feet upstream, 25 feet downstream off the noses, and 20 feet off the faces of Pier 1, from the channel bottom to 8 feet above the waterline. The Pier 1 components below water were inaccessible due to timber debris.

FURTHER ACTION NEEDED: YES NO

Remove timber debris around Pier 1.

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. 69505
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED St. Louis River

INSPECTION DATE July 25, 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	N	N	7	N	8	N	7	6	N	7	4	4	7	N	N	N	N	N
	Pier 2	3.9'	N	7	N	8	N	7	7	N	7	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good, sound condition with light scaling from 3 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch. A heavy accumulation of timber debris was observed around the entire Pier 1 extending 50 feet upstream, 25 feet downstream off the noses, and 20 feet off the faces of Pier 1, from the channel bottom to 8 feet above the waterline. The Pier 1 components below water were inaccessible due to timber debris.

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.