UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69506

CSAH 133

OVER THE

ST. LOUIS RIVER

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 below water at Bridge No. 69506, Pier 1 and Pier 2, were in satisfactory condition with no defects of structural significance. Moderate concrete deterioration was found at Pier 1 as the outer concrete layer from channel bottom up 4 feet was unsound and delaminated. The concrete was found to be soft with the outer 1/4 inch easily degraded. The channel bottom was riprapped and appeared stable.

INSPECTION FINDINGS:

(A) The concrete surfaces of Pier 1 were unsound and the outer layer (approximately 1/4 inch thick) was easily degradable by the use of hand tools. The concrete defects typically were present from the channel bottom up 4 feet.

(B) The channel bottom material consisted of rip rap of 2 feet in diameter and smaller with no penetration.

RECOMMENDATIONS:

(A) Monitor the extent of concrete deterioration during future underwater inspections.

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

Respectfully submitted,

WSB and Associates

Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

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: 69506

Feature Crossed: St Louis River

Feature Carried: CSAH 133

Location: St. Louis County

Bridge Description: The superstructure consists of three spans of precast beams supporting a reinforced concrete deck. The bridge is supported by two reinforced concrete abutments and two reinforced 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, 75° F

Underwater Visibility: 2.0 foot

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1

General Shape: The pier consisted of a hammerhead pier cap supported by concrete columns. At the time of inspection, no plans were available for this structure, therefore the substructure configuration is unknown.

Maximum Water Depth at Substructure Inspected: Approximately 8.8 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 27.7 feet below reference.
Assumed Waterline Elevation = 72.3.

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

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 6

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

Item 113: Scour Critical Bridges: N/94

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

_____ Yes X No

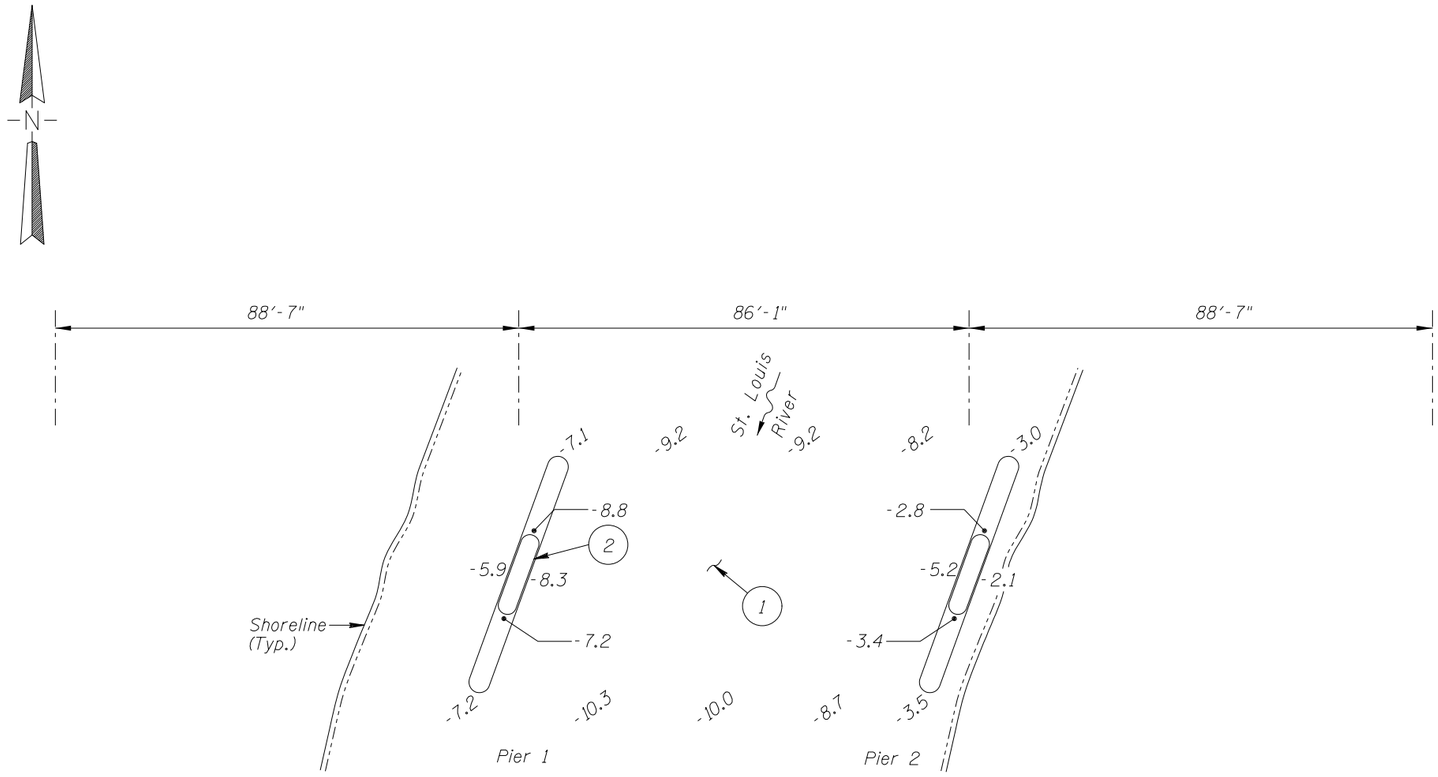
6. STRUCTURAL ELEMENT CONDITION RATING:

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	39	LF	19.5	19.5			
985	Slopes and Slope Protection	1	EA		1			

Photograph 1. View of Downstream Fascia, Looking North.

Photograph 2. View of Pier 1, Looking Northwest.

Photograph 3: View of Pier 2, Looking Northwest.



SOUNDING PLAN

Legend

-1.2 Sounding Depth from Waterline (7/25/12)

Note:

All soundings are based on 2012 waterline location.

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on July 25, 2012, the waterline was located approximately 27.7 feet below the top of the pier cap at the downstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 72.3.
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 riprap 2 feet dia. and smaller allowing no probe rod penetration.

(2) The outer (approximately 1/4 inch thick) layer of concrete from the channel bottom up 4 feet was unsound and easily degradable by the use of hand tools.

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MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 69506
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		Scale: NTS
Code: ---		Figure No.: 1

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Chicago, IL 60606
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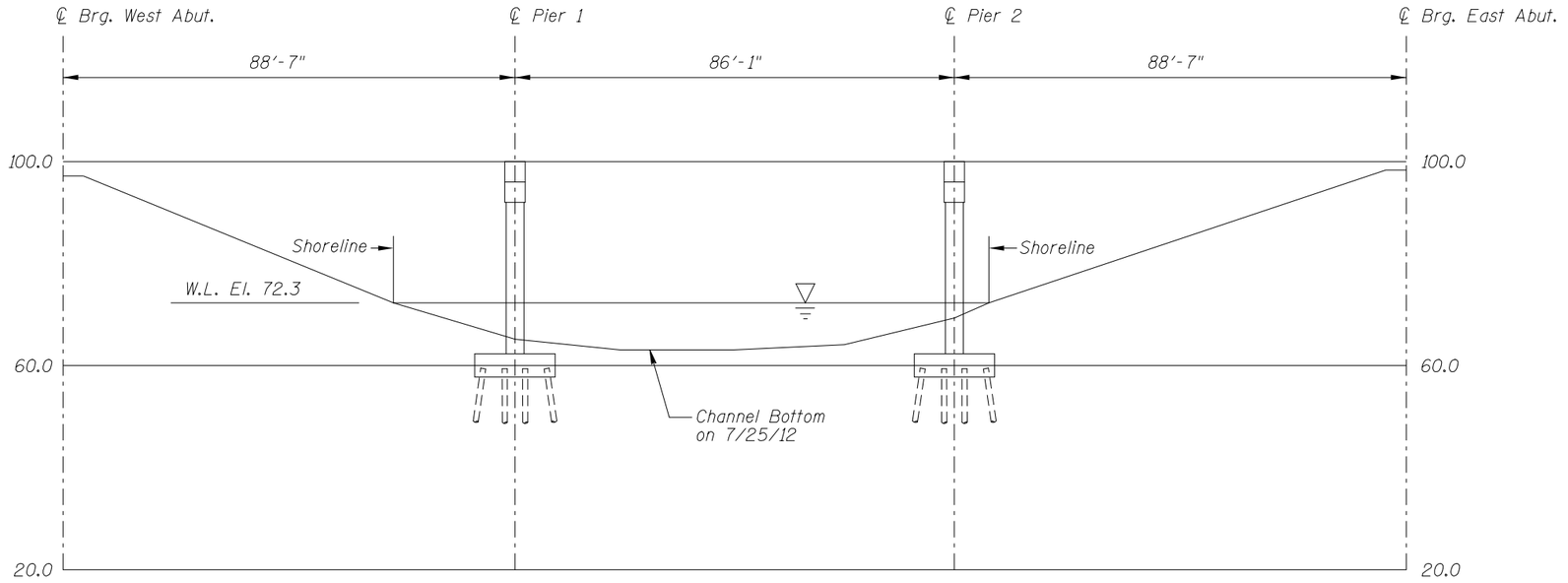
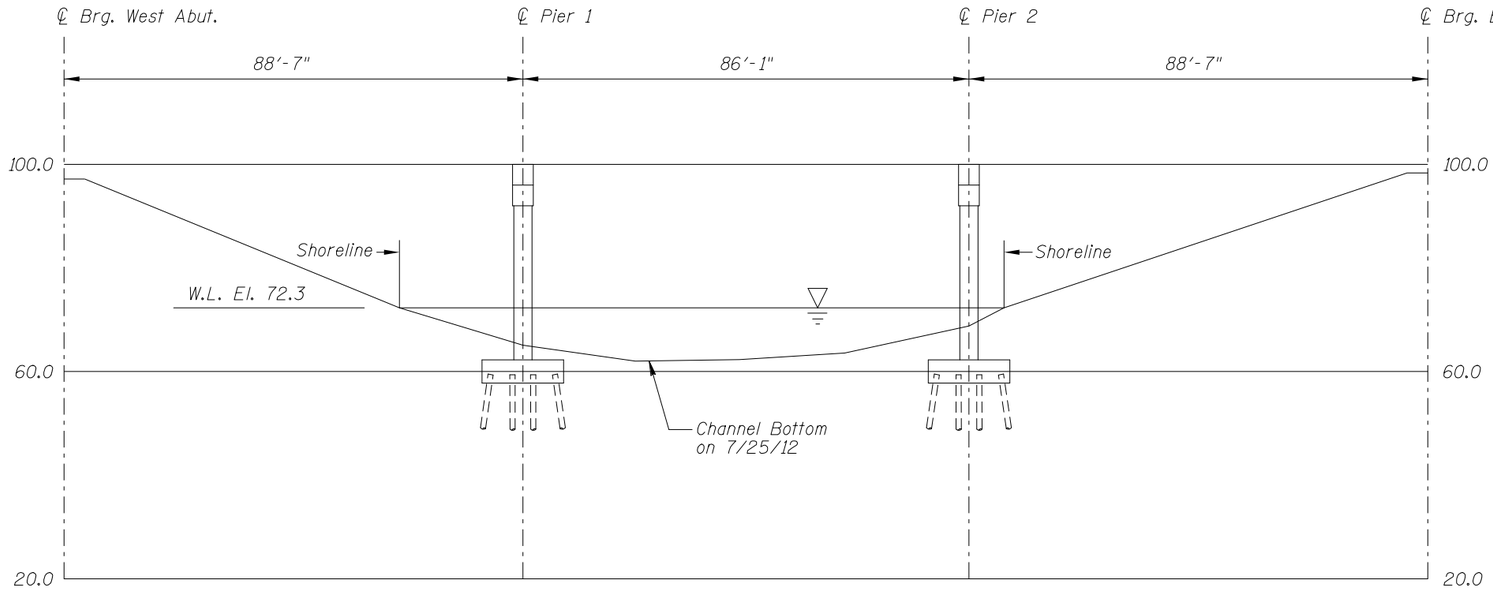


UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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STRUCTURE NO. 69506
OVER THE ST. LOUIS RIVER
DISTRICT 1, ST. LOUIS COUNTY

UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: BJR	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: JULY 2012
Checked By: BRL		Scale: 1"=20'
---		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: 69506 WEATHER: Sunny, 75° F
WATERWAY CROSSED: St Louis River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Kasey Yoder (WSB), John Loftus (Collins)
EQUIPMENT: Commercial Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 13:10
TIME OUT OF WATER: 13:45
WATERWAY DATA: VELOCITY 1.0 ft/sec.
VISIBILITY 2.0 feet
DEPTH 8.8 feet maximum at Pier 1
ELEMENTS INSPECTED: Pier 1 and Pier 2
REMARKS: Overall, Pier 1 and Pier 2 were in satisfactory condition with no defects of structural significance. There was concrete deterioration of Pier 1 with easily degradable and unsound concrete surfaces from the channel bottom up four feet.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the extent of concrete deterioration during future underwater inspections.

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. 69506
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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	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	8.8’	N	6	N	8	N	6	7	6	6	N	6	6	N	N	N	N	N
	Pier 2	5.2’	N	7	N	8	N	7	7	6	6	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, Pier 1 and Pier 2 were in satisfactory condition with no defects of structural significance. There was concrete deterioration of Pier 1 with easily degradable and unsound concrete surfaces from the channel bottom up four feet.

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.