

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69539
CR NO. 156
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 unit inspected at Bridge No. 69539, Pier 3, was found to be in good condition with light concrete scaling present near the waterline. The channel bottom appeared to be stable with no evidence of significant scour. The substructure condition and channel bottom profile were comparable to the finding of the pervious underwater inspection.

INSPECTION FINDINGS:

- (A) Light scaling was observed from 1 foot below to 2 feet above the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.

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,

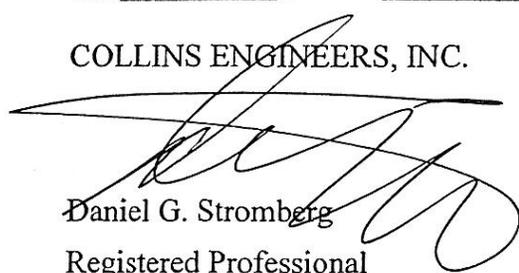
PROFESSIONAL ENGINEER

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: 69539

Feature Crossed: St. Louis River

Feature Carried: CR 156

Location: District 1 - St. Louis County

Bridge Description: The superstructure is a four span, multiple prestressed concrete girder bridge supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments, a steel pipe pile pier, and two reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the bridge.

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: Cloudy, 75° F

Underwater Visibility: 2 feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 3.

General Shape: The pier consists of an oblong rectangular shaft with rounded noses, which rests upon a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 8.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 3.

Water Surface: The waterline was approximately 27.2 feet below reference.
Assumed Waterline Elevation = 72.8.

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/07/12

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	Concrete Pier Wall	33	LF	33				
985	Slopes and Slope Protection	1	EA	1				



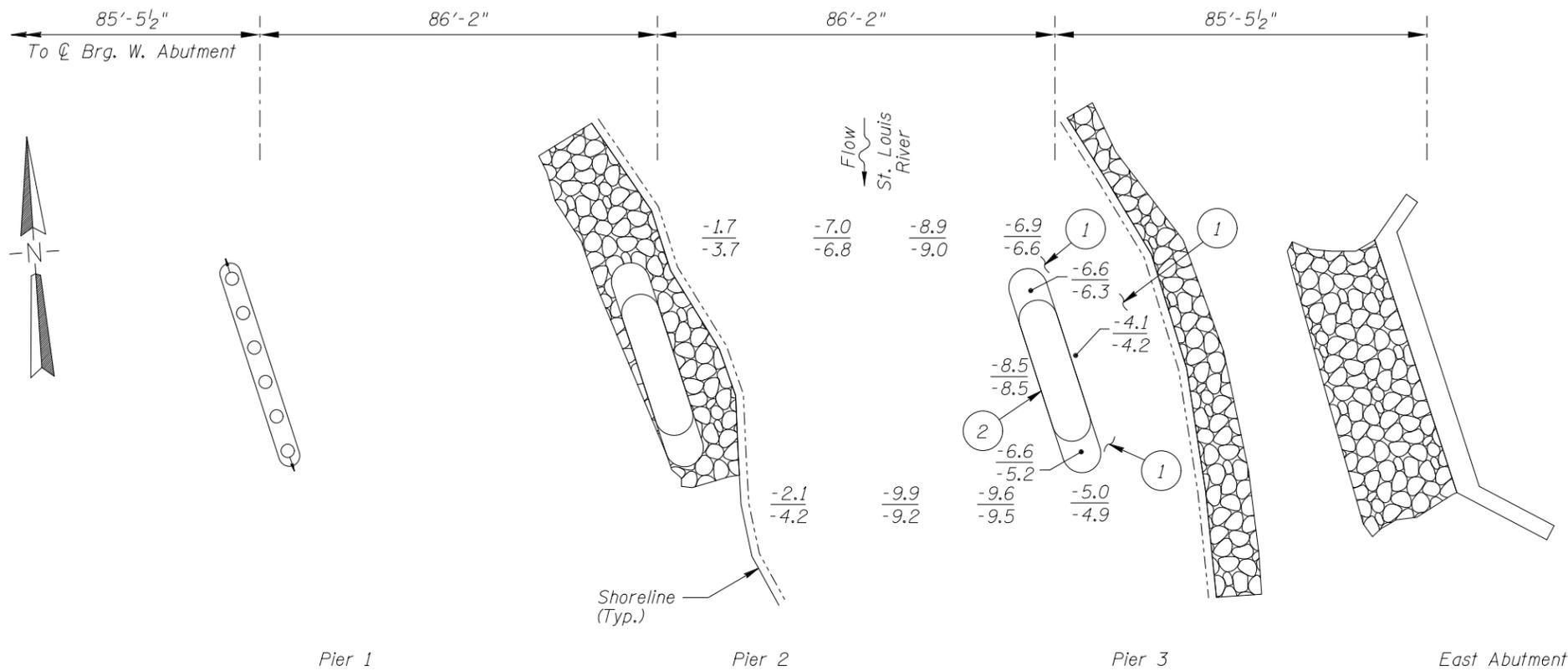
Photograph 1. View of Pier 1, Looking East.



Photograph 2. View of Pier 2, Looking East.



Photograph 3. View of Pier 3, Looking East.



SOUNDING PLAN

GENERAL NOTES:

1. Pier 3 was inspected underwater.
2. At the time of inspection on July 25, 2012, the waterline was located approximately 27.2 feet below the top of the cap at the upstream end of Pier 3. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 72.8.
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:

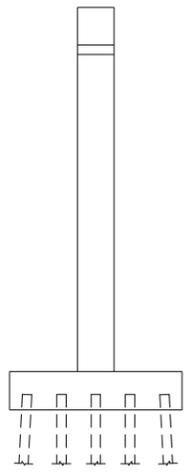
- 1 The channel bottom consisted of 1-foot-diameter riprap with no probe rod penetration around Pier 3.
- 2 Light scaling was observed from 1 foot below the waterline to 2 feet above the waterline with typical penetrations of 1/8 inch and up to 1/4 inch maximum penetrations.

Legend

- 8.0 Sounding Depth (7/25/12)
- 8.0 Sounding Depth (8/29/07)
- Steel Encased Concrete Pile
- Battered Steel Encased Concrete Pile
- ▣ Riprap
- ▨ Timber Debris

Note:

All soundings based on 2012 waterline location.



TYPICAL END VIEW OF PIER 3

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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DISTRICT 1, ST. LOUIS COUNTY

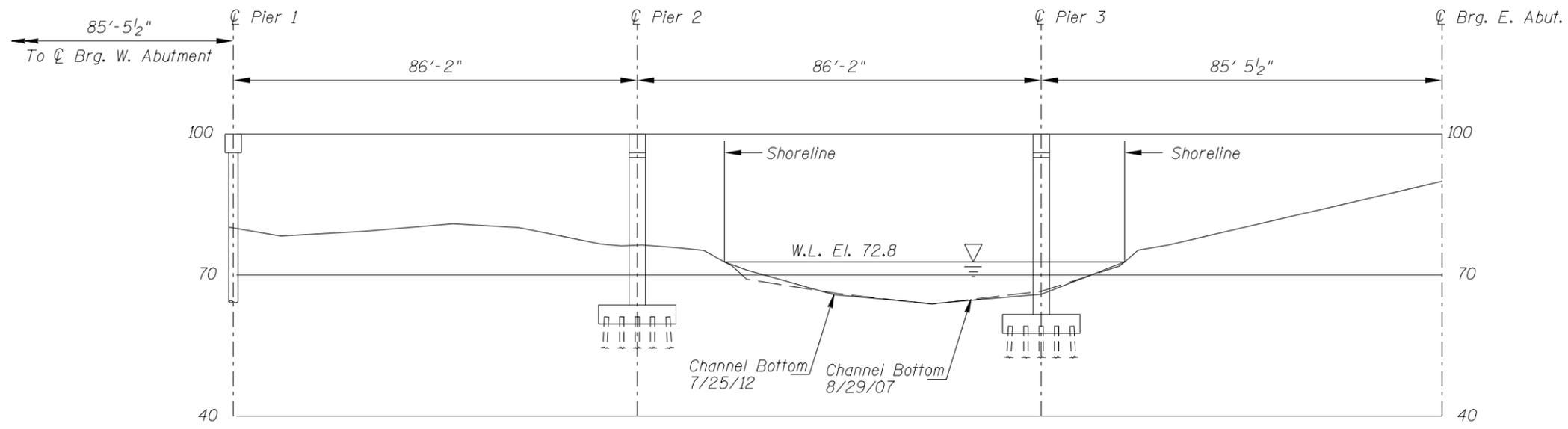
INSPECTION AND SOUNDING PLAN

Drawn By: BJR		Date: JULY 2012
Checked By: BRL		Scale: NTS
Code: 52210003		Figure No.: 1

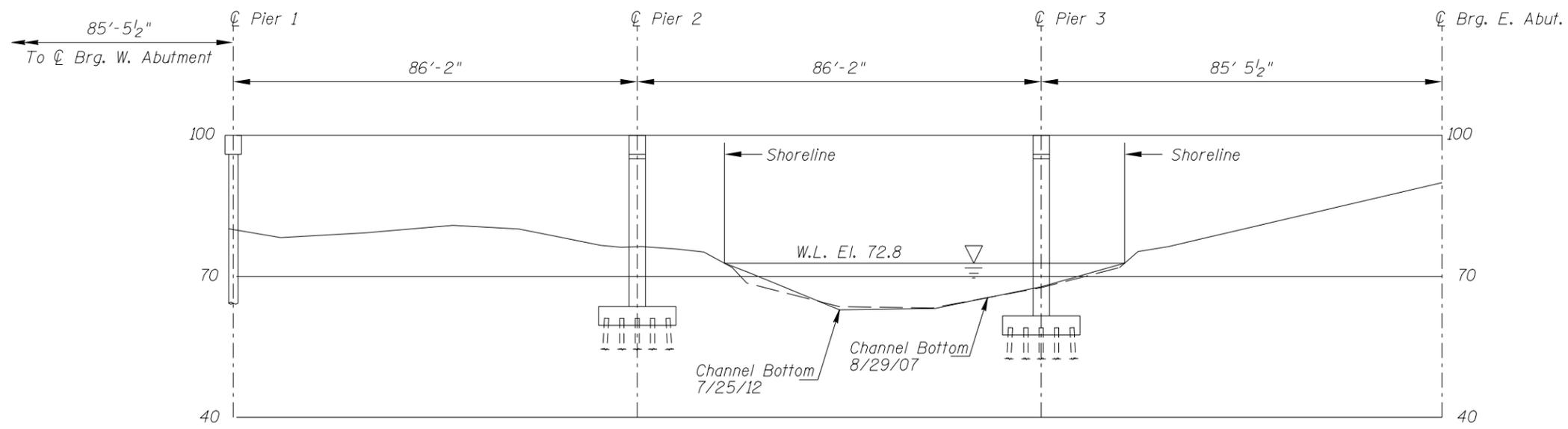
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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 69539
 OVER THE ST. LOUIS RIVER
 DISTRICT 1, ST. LOUIS COUNTY

UPSTREAM AND DOWNSTREAM
 FASCIA PROFILES

Drawn By: BJR	COLLINS ENGINEERS <small>123 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: 52210003		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins DATE: July 24, 2012

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

BRIDGE NO: 69539 WEATHER: Cloudy, 75°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, Lead Line, Sounding Pole, Probe Rod,
Camera

TIME IN WATER: 12:30 A.M.

TIME OUT OF WATER: 12:50 A.M.

WATERWAY DATA: VELOCITY 1.0 ft/s

VISIBILITY 2.0 feet

DEPTH 8.5 feet maximum at Pier 3

ELEMENTS INSPECTED: Pier 3

REMARKS: Overall, the concrete was in good and sound condition with light scaling from 1 foot below to 2 feet above the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.

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. 69539
 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 (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 3	8.5'	N	7	N	8	N	7	7	7	7	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good and sound condition with light scaling from 1 foot to 2 feet above the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.

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.