

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 31514

MSAS 119

OVER THE

MISSISSIPPI RIVER

ITASCA COUNTY, CITY OF GRAND RAPIDS



OCTOBER 2, 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. 31514, Piers 1 and 2, were generally in good condition with no defects of structural significance observed. The concrete was smooth and sound with no significant deterioration, with some light scaling located near the waterline with maximum penetrations of 1/4 inch. Footing and original formwork was observed to be exposed and/or protruding from the channel bottom on the channel side of both piers. The top of both footings were typically exposed in and around the edges, with sand on top of the footing closer to the pier shafts. The maximum vertical exposure of the footings was comparable to what was found in 2007, with maximums of 3 feet and 1 foot at Piers 1 and 2, respectively.

INSPECTION FINDINGS:

- (A) The concrete of the Piers 1 and 2 was smooth and sound with no significant deterioration.
- (B) Light scaling on the pier shafts was observed from 4 feet above the waterline to the channel bottom with maximum penetrations of 1/4 inch on both piers.
- (C) The footing and original formwork was observed to be exposed and/or protruding from the channel bottom on the channel side of both piers. The top of both footings were typically exposed in and around the edges of the footing, with sand on top of the footing closer to the pier shafts. The maximum vertical exposure was 3 feet and 1 foot at Piers 1 and 2, respectively.

RECOMMENDATIONS:

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

Inspection Team Leader:
Daniel G. Stromberg, P.E.

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: 31514

Feature Crossed: Mississippi River

Feature Carried: MSAS 119 (7th Ave)

Location: City of Grand Rapids

Bridge Description: The superstructure consists of precast concrete beams (3 spans) supporting a reinforced concrete deck. The substructure consists of two reinforced concrete abutments and two reinforced concrete piers designated Piers 1 and 2 from west to east.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E.

Dive Team: Clayton G. Brookins, Marc B. Parker

Date: October 2, 2102

Weather Conditions: Sunny, 60°F

Underwater Visibility: 5.0 foot

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of an oblong rectangular shaft with rounded noses, which is founded on a rectangular footing. The exact foundation configuration is unknown as no plans were available.

Maximum Water Depth at Substructure Inspected: Approximately 7.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the concrete parapet at the downstream end of Pier 2.

Water Surface: The waterline was approximately 33.0 feet below reference.
Assumed Waterline Elevation = 67.0.

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

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	68	LF	68				
361	Scour	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. Overall View of the Structure, Looking Northwest.



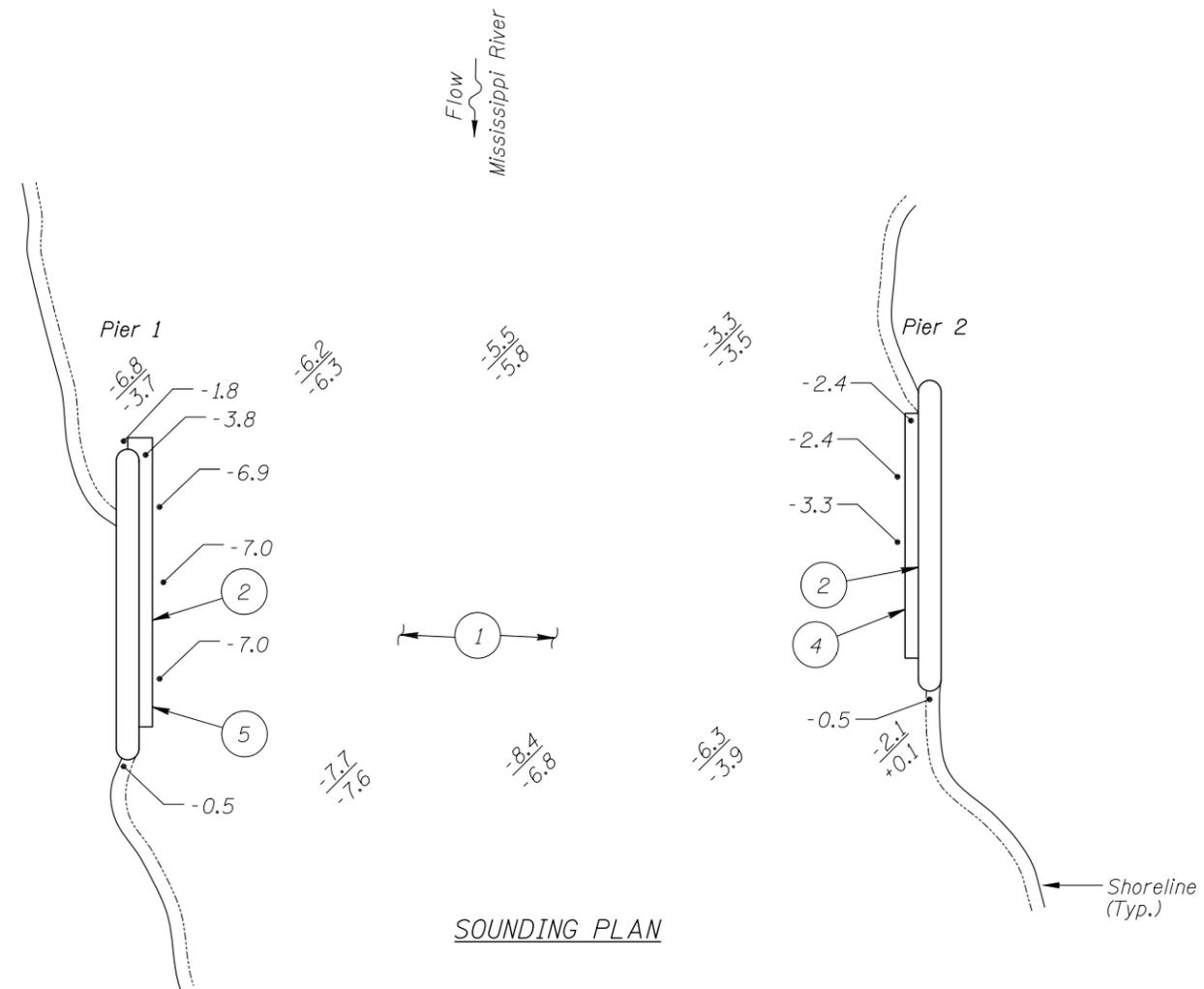
Photograph 2. View of the Pier 1, Looking Northwest.



Photograph 3. View of the Pier 2, Looking Northeast.



Photograph 4. View of the Pier 2 Footing Exposure, Looking Down.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on October 2, 2012, the waterline was located approximately 33.0 feet below the top of the concrete parapet on the downstream end of Pier 2. Due to lack of design plan information, the reference elevation was assumed to be 100.0 feet. This corresponds to a waterline elevation of 67.0 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 as well as around the pier structures.

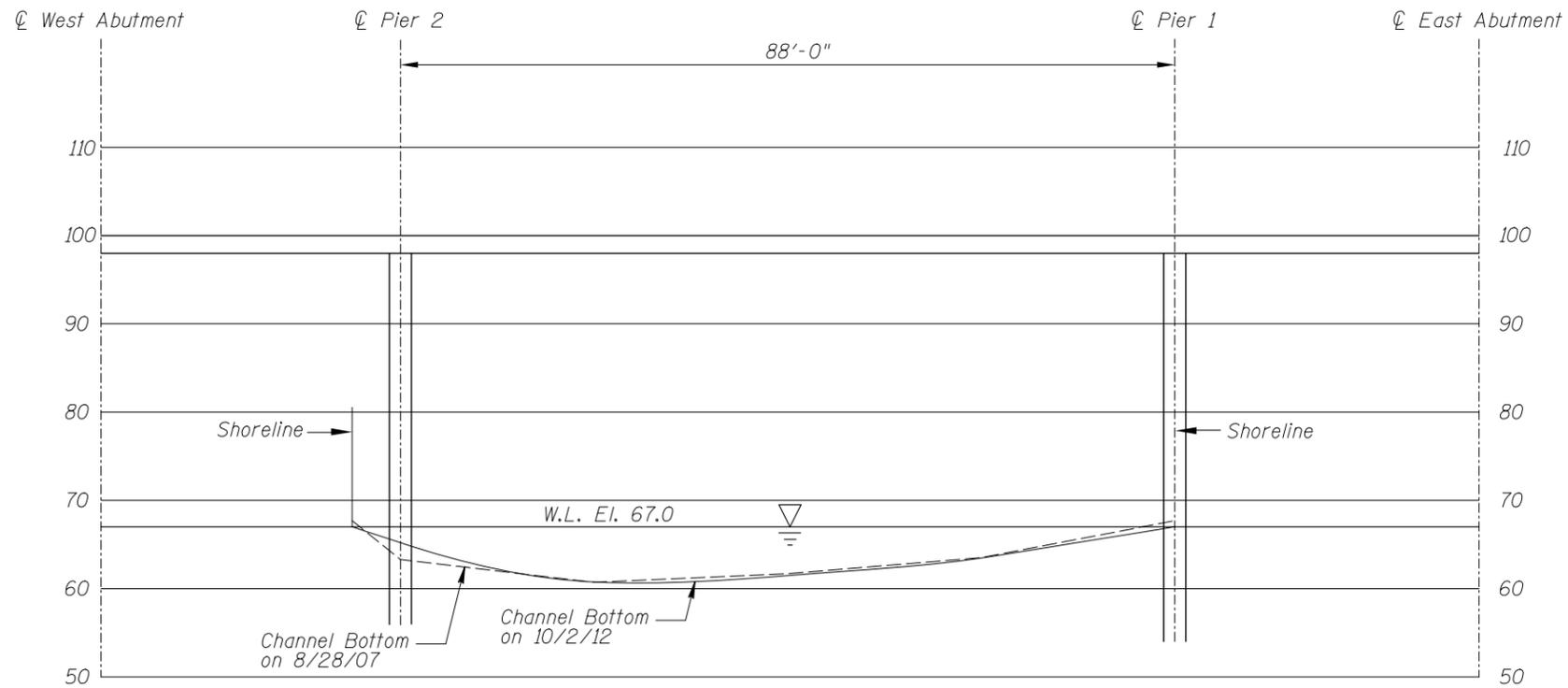
INSPECTION NOTES:

- 1 The channel bottom material consisted of sand with scattered 1 foot diameter and smaller rocks allowing a 2 inch maximum probe rod penetration. 2 foot diameter rocks were observed at the upstream and downstream noses of the piers.
- 2 Overall the concrete was relatively smooth and sound with no significant deterioration.
- 3 Light scaling was observed from 4 feet above the waterline to the channel bottom with a typical penetration of 1/8 inch.
- 4 Footing and formwork was exposed 6 feet out from the west face of Pier 2, with the top at 2.4 feet below waterline. The footing (and formwork) was exposed from 8 feet down of the upstream nose to 6 feet from the downstream end of Pier 2. The maximum vertical exposure was 1 foot.
- 5 Footing and formwork was observed 6 feet out from the entire east face of Pier 1. The maximum vertical exposure was 3 feet and was located at the middle of the pier. The footing (and formwork) was observed for a short distance also at the upstream nose of Pier 1. The top of the footing was at 3.8 feet below the waterline and was covered by a layer of sand, from the upstream nose to the downstream 1/4-point of Pier 1.

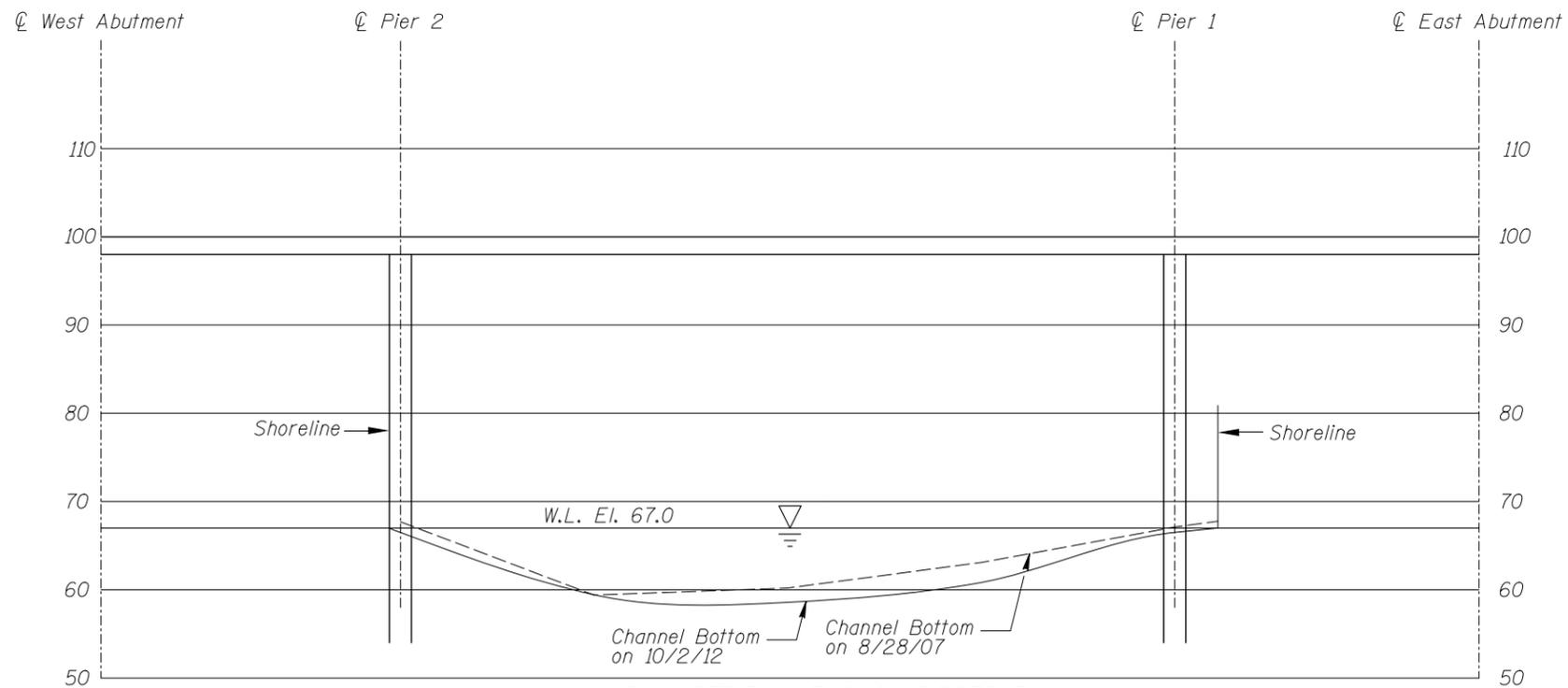
Legend

- 0.4 Sounding Depth (10/2/12)
- 1.2 Sounding Depth (8/28/07)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 31514 MASA 129-I19 OVER THE MISSISSIPPI RIVER ITASCA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MBP	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: 742331514		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. 31514 MASA 129-119 OVER THE MISSISSIPPI RIVER ITASCA COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: MBP	COLLINS ENGINEERS	Date: Oct., 2012
Checked By: LJ		Scale: 1"=20'
Code: 742331514		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 2, 2012

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 31514 WEATHER: Sunny, 60° F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Marc B. Parker

EQUIPMENT: Commercial Scuba, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 11:30 A.M.

TIME OUT OF WATER: 12:00 P.M.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 5.0 feet

DEPTH 7.0 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: The substructure units inspected at Bridge No. 31514, Piers 1 and 2, were generally in good condition with no defects of structural significance observed. The concrete was smooth and sound with no significant deterioration, with some light scaling located near the waterline with maximum penetrations of 1/4 inch. Footing and original formwork was observed to be exposed and/or protruding from the channel bottom on the channel side of both piers. The top of both footings were typically exposed in and around the edges, with sand on top of the footing closer to the pier shafts. The maximum vertical exposure of the footings was comparable to what was found in 2007, with maximums of 3 feet and 1 foot at Piers 1 and 2, respectively.

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. 31514
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER. Daniel G. Stromberg, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 2, 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	7.0'	N	7	7	9	N	7	6	8	8	N	7	8	N	N	N	N	N
	Pier 2	3.3'	N	7	7	9	N	7	6	8	8	N	7	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

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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.