

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 09501

CSAH 12

OVER THE

KETTLE RIVER

CARLTON COUNTY

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JULY 26, 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. 09501, Piers 1 and 2, were in good condition with no defects of structural significance. Light concrete scaling was observed from 1 foot above the waterline to the channel bottom of both piers. The channel bottom appeared stable and well established.

INSPECTION FINDINGS:

- (A) Light scaling was observed from 1 foot above the waterline to the channel bottom, with maximum penetration of 1/8 inch.
- (B) The channel bottom material consisted of sand and random rip rap, 2 feet in diameter and smaller, not allowing any probe rod penetration.

RECOMMENDATIONS:

- (A) 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,

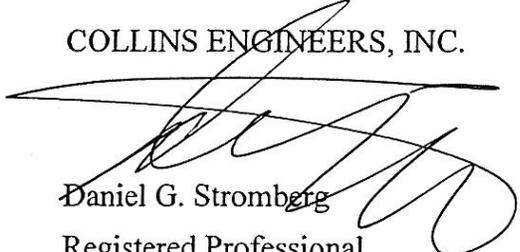
PROFESSIONAL ENGINEER

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: 09501

Feature Crossed: Kettle River

Feature Carried: CSAH 12

Location: Carlton County

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

2. INSPECTION DATA

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

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

Date: July 26, 2012

Weather Conditions: Cloudy, 70° F

Underwater Visibility: 2.0 foot

Waterway Velocity: 2.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers consisted of deep driven steel H-piles encased in a solid concrete pier shaft.

Maximum Water Depth at Substructure Inspected: Approximately 5.6 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 10.5 feet below reference.  
Waterline Elevation = 79.5.

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: P/09

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:

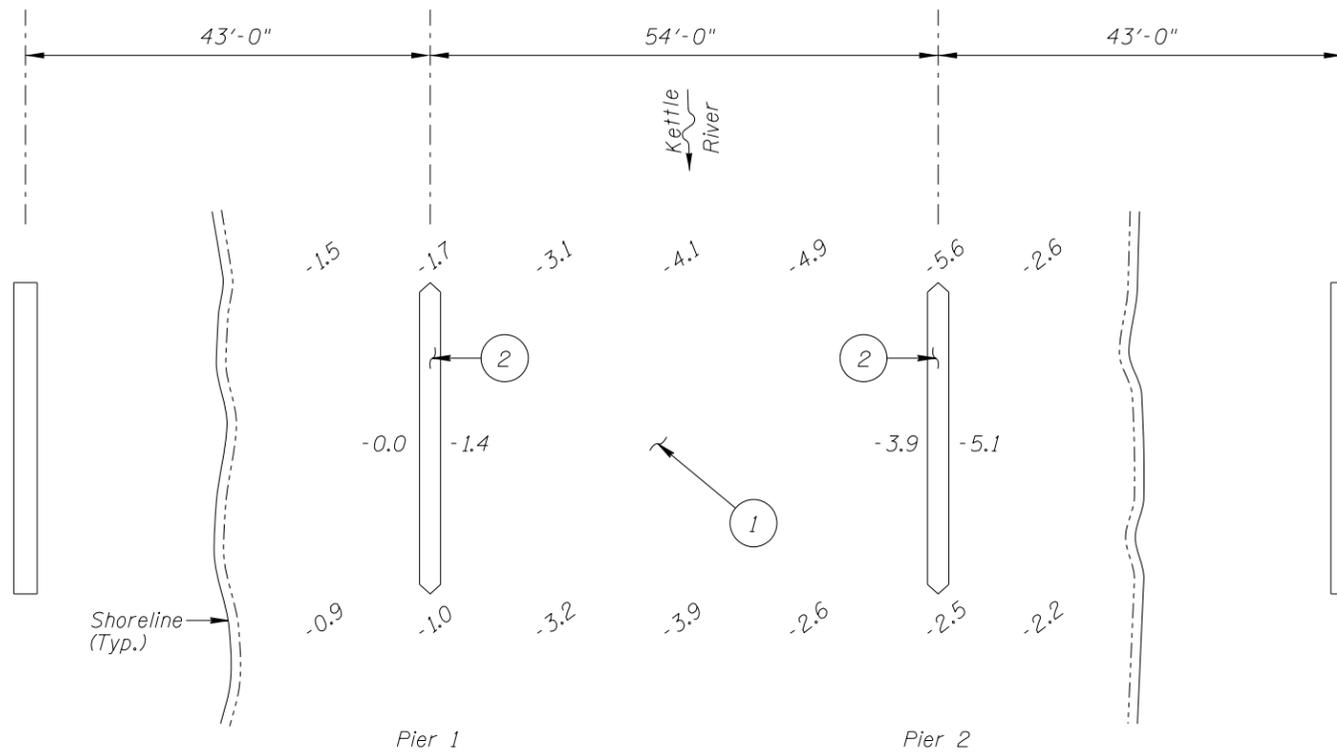
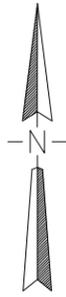
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Concrete Pier Wall	68	LF		68			
361	Scour	1	EA	1				
985	Slopes	1	EA	1				



Photograph 1. View of Pier 1, Looking West.



Photograph 2. View of Pier 2, Looking Southeast.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on July 26, 2012, the waterline was located approximately 10.5 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds with a waterline elevation of 79.48 feet based on bridge design plans dated November 5, 1963.
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 diameter and smaller rocks with no rod penetration possible.
- (2) Light concrete scaling, with up to 1/8 inch penetration was observed from 1 foot above waterline to channel bottom on Pier 1 and 2.

Legend

-1.2 Sounding Depth from Waterline (7/26/12)

Note:

All soundings are based on 2012 waterline location.

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 09501  
OVER THE KETTLE RIVER  
DISTRICT I, CARLTON COUNTY

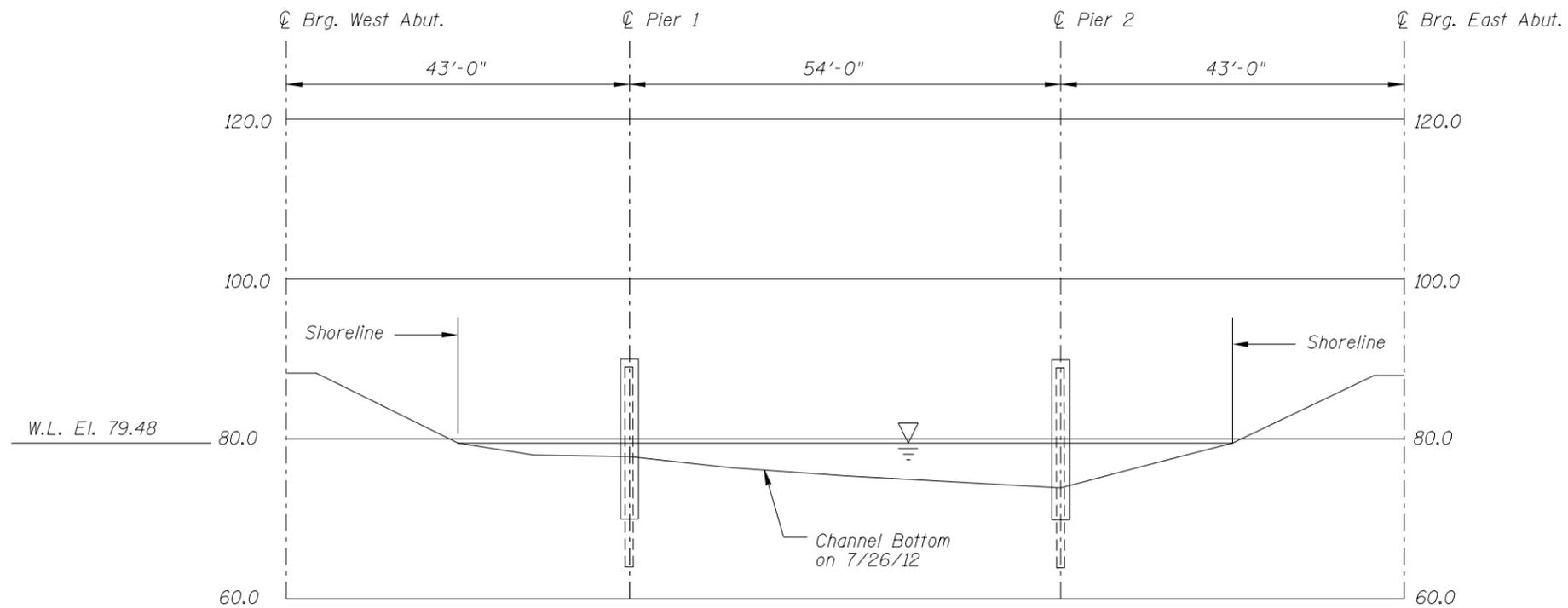
INSPECTION AND SOUNDING PLAN

**WSB**  
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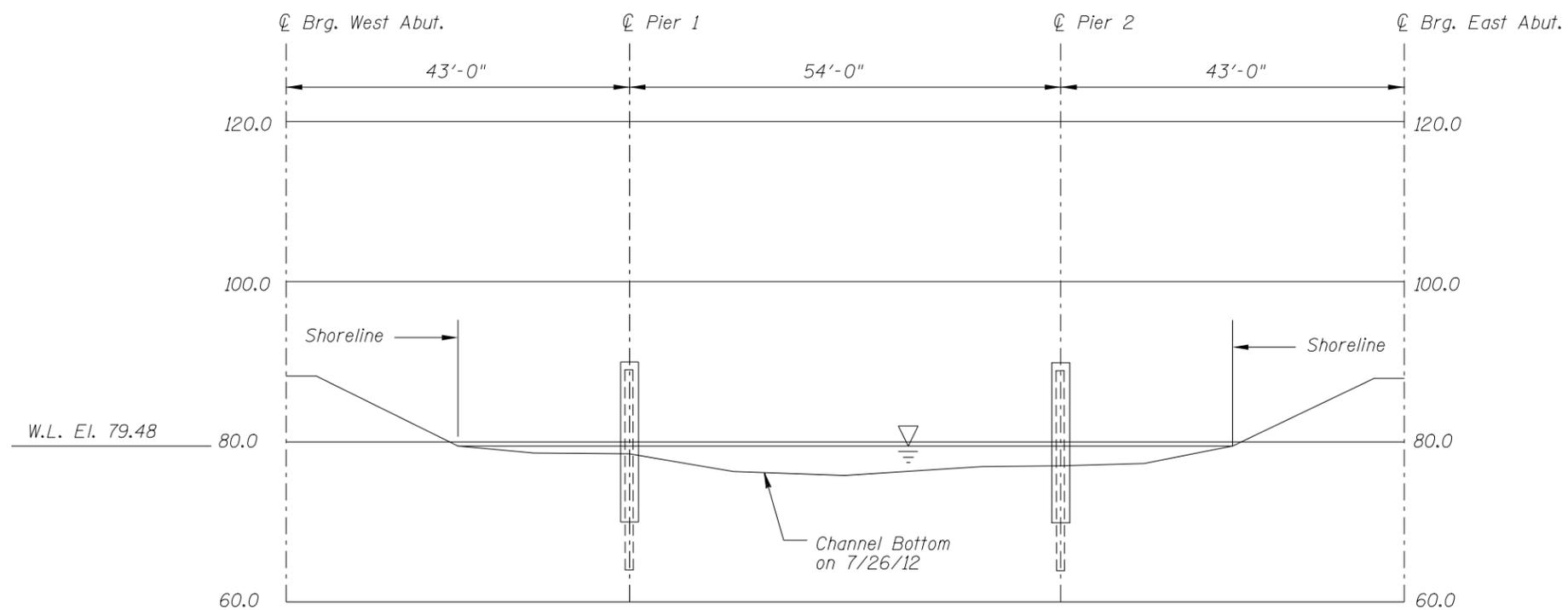
Drawn By: BJR  
Checked By: BRL  
Code: ---

**COLLINS ENGINEERS**  
123 North Wacker Drive  
Suite 300  
Chicago, IL 60606  
(312) 704-9300  
www.collinsengr.com

Date: JULY 2012  
Scale: NTS  
Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 09501 OVER THE KETTLE RIVER DISTRICT I, CARLTON COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: JULY 2012
Checked By: BRL		Scale: 1"=20'
---	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins DATE: July 26, 2012

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

BRIDGE NO: 09501 WEATHER: Cloudy, 70° F

WATERWAY CROSSED: Kettle 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: 16:40

TIME OUT OF WATER: 17:10

WATERWAY DATA: VELOCITY 2 ft/sec.

VISIBILITY 2 feet

DEPTH 5.6 feet maximum

ELEMENTS INSPECTED: Pier 1 and Pier 2

REMARKS: Overall, Piers 1 and 2 were in good condition with no defects of structural significance. Light concrete scaling was found from 1 foot above the water line to the channel bottom with a maximum penetration of 1/8 inch. The channel bottom appeared stable and well established.

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. 09501  
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.  
 WATERWAY CROSSED Kettle River

INSPECTION DATE July, 26, 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 1	1.7'	N	7	N	8	N	7	7	7	7	N	7	7	N	N	N	N	N
	Pier 2	5.6'	N	7	N	8	N	7	7	7	7	N	7	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 and 2 were in good condition with no defects of structural significance. Light scaling was found from 1 foot above the water line to the channel bottom with a maximum penetration of 1/8 inch. The channel bottom appeared stable and well established.

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.