

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 69511

CSAH 15

OVER THE

CLOQUET RIVER

ST. LOUIS COUNTY

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SEPTEMBER 26, 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. 69511, Piers 1 and 2, were found to be in satisfactory condition below water with defects of only minor structural significance. The concrete of the pier shafts and exposed footing was sound with a band of light scaling around the shafts. The top of the footing was exposed at Pier 1 with no vertical exposure observed. A large tree was observed across the upstream nose of Pier 1. A heavy accumulation of timber debris was observed around the perimeter of Pier 2.

INSPECTION FINDINGS:

- (A) The channel bottom material consisted of stones and cobbles up to 1 foot in diameter and sand allowing a maximum probe rod penetration of 2 inches.
- (B) The concrete of the shafts of Piers 1 and 2 exhibited light scaling with up to 1/8 inch of penetration extending from the waterline to 2 feet above the waterline.
- (C) The top of the footing of Pier 1 was exposed from the north face midpoint to the upstream nose and extending up to 2 feet off the face of the pier. No vertical exposure or edge of footing was observed.
- (D) An 8 inch diameter tree was observed along the upstream nose of Pier 1 that extended 10 feet off the north and south faces and from the channel bottom to the waterline.
- (E) A heavy accumulation of timber debris consisting of 1 foot diameter and smaller trees and branches was observed around Pier 2 extending from the channel bottom to 2 feet above the waterline, 10 feet off the north and south faces, and 15 feet upstream of the upstream nose.

RECOMMENDATIONS:

- (A) Ideally the timber debris at the piers should be removed to inhibit further accumulation. Until the timber has been removed, monitor the extent of timber accumulations at the bridge.
  
- (B) 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,

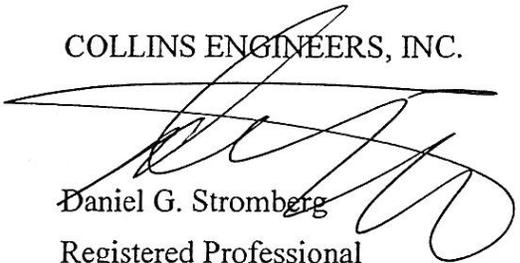
PROFESSIONAL ENGINEER

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: 69511

Feature Crossed: Cloquet River

Feature Carried: CSAH No. 15

Location: St. Louis County

Bridge Description: The superstructure is three spans of multiple concrete girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. There was no available foundation detail plans for this structure at the time of the inspection. The piers are numbered 1 through 2 from the south to north.

2. INSPECTION DATA

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

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

Date: September 26, 2012

Weather Conditions: Sunny, 55°F

Underwater Visibility: 3.0 feet

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Piers 1 and 2 are reinforced concrete hammerhead piers. The pier shaft is supported on a continuous rectangular footing. The footing details were unknown at the time of inspection.

Maximum Water Depth at Substructure Inspected: Approximately 7.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the upstream nose of Pier 2.

Water Surface: The waterline was approximately 11.3 feet below reference.  
Water Elevation = 88.7.

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 5

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code I/12

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	39	LF	39	0	0	0	n/a
220	Reinforced Concrete Footing	1	EA	1	0	0	0	n/a
985	Slopes & Slope Protection	1	EA	1	0	0	n/a	n/a



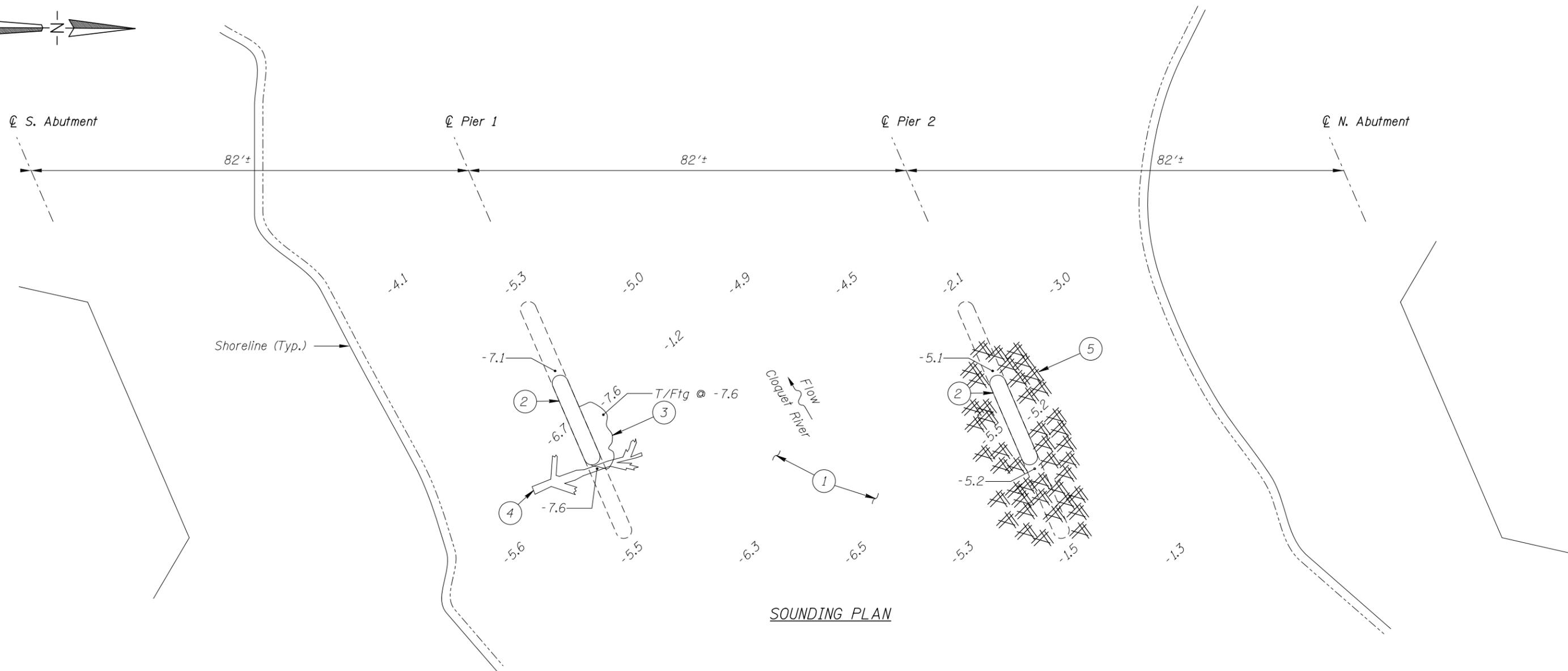
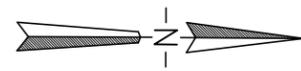
Photograph 1. Overall View of the Structure, Looking Southwest.



Photograph 2. View of Pier 1, Looking Southwest.



Photograph 3. View of Pier 2, Looking Northeast.



**SOUNDING PLAN**

**INSPECTION NOTES:**

- ① The channel bottom material consisted of stones and cobbles up to 1 foot in diameter and sand allowing a maximum probe rod penetration of 2 inches.
- ② The concrete of the shafts of Piers 1 and 2 exhibited light scaling with up to 1/8 inch of penetration extending from the waterline to 2 feet above the waterline.
- ③ The top of the footing of Pier 1 was exposed from the north face midpoint to the upstream nose and extending up to 2 feet off the face of the pier. No vertical exposure or edge of footing was observed.
- ④ A 8 inch diameter tree was observed along the upstream nose of Pier 1 that extended 10 feet off the north and south faces and from the channel bottom to the waterline.
- ⑤ A heavy accumulation of timber debris consisting of 1 foot diameter and smaller trees and branches was observed around Pier 2 extending from the channel bottom to 2 feet above the waterline, 10 feet off the north and south faces, and 15 feet upstream of the upstream nose.

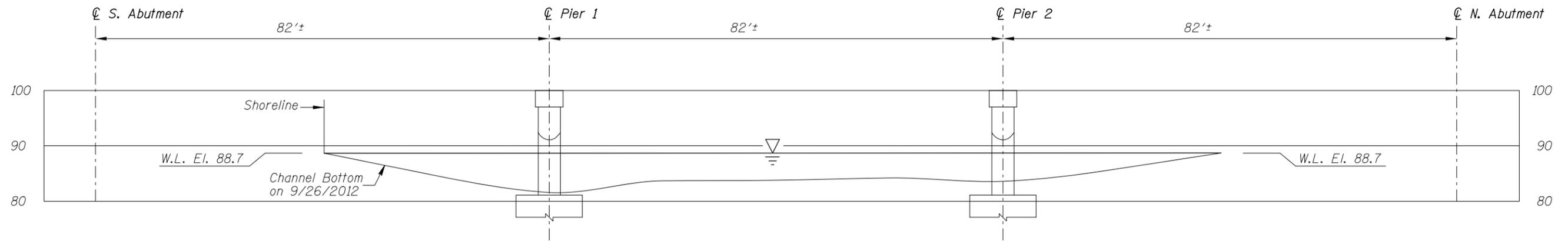
**GENERAL NOTES:**

- 1. Piers 1 and 2 were inspected at this bridge.
- 2. At the time of inspection on September 26, 2012, the waterline was located approximately 11.3 feet below the top of pier cap on the upstream nose of Pier 2. Since elevation information was not available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 88.7
- 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.

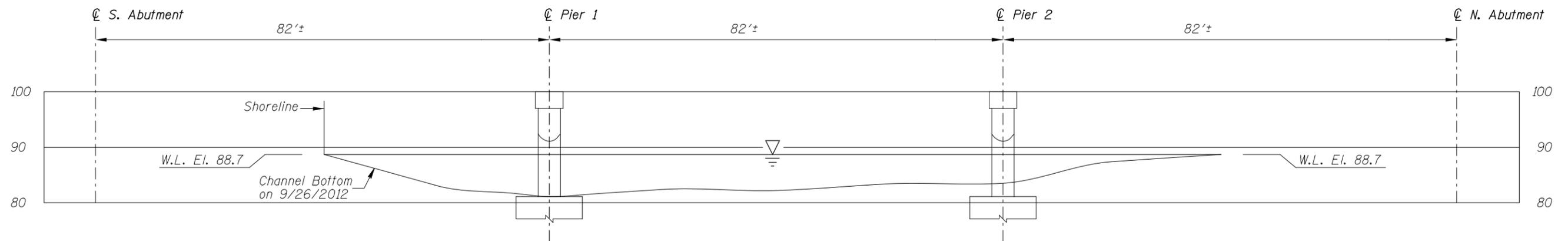
**Legend**

- 1.0 Sounding Depth (9/26/12)
- ⊗ Timber Debris
- ⑤ Inspection Note

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 695II CSAH 15 OVER THE CLOQUET RIVER ST. LOUIS COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: MBP	<b>COLLINS ENGINEERS</b>	Date: NOV. 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 7423695II		Figure No.: I



DOWNSTREAM FASCIA PROFILE



UPSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 69511 CSAH 15 OVER THE CLOQUET RIVER ST. LOUIS COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: MBP	<b>COLLINS ENGINEERS</b>	Date: NOV. 2012
Checked By: LJ		Scale: 1"=20'
Code: 742369511		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: September 26, 2012

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

BRIDGE NO: 69511 WEATHER: Sunny, 55°F

WATERWAY CROSSED: Cloquet River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Marc B. Parker, Clayton G. Brookins

EQUIPMENT: Commercial Scuba, Hand Tools, Probe Rod, Camera

TIME IN WATER: 4:20 P.M.

TIME OUT OF WATER: 4:55 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 3.0 feet

DEPTH 7.6 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the substructure unit inspected underwater were found to be in satisfactory condition below water with defects of only minor structural significance. The concrete of the pier shafts and exposed footing was sound with a band of light scaling around the shafts. The top of the footing was exposed at Pier 1 with no vertical exposure observed. A large tree was observed across the upstream nose of Pier 1. A heavy accumulation of timber debris was observed around the perimeter of Pier 2.

FURTHER ACTION NEEDED:  YES  NO

Ideally the timber debris at the piers should be removed to inhibit further accumulation. Until the timber has been removed, monitor the extent of timber accumulations at the bridge.

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. 69511  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.  
 WATERWAY CROSSED Cloquet River

INSPECTION DATE September 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	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	7.6'	N	7	6	N	N	6	N	N	8	6	6	7	N	N	N	N	N
	Pier 2	5.5'	N	7	N	N	N	7	N	N	8	5	5	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the substructure unit inspected underwater were found to be in satisfactory condition below water with defects of only minor structural significance. The concrete of the pier shafts and exposed footing was sound with a band of light scaling around the shafts. The top of the footing was exposed at Pier 1 with no vertical exposure observed. A large tree was observed across the upstream nose of Pier 1. A heavy accumulation of timber debris was observed around the perimeter of Pier 2.

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.