

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 57503
CSAH NO. 7
OVER THE
RED LAKE RIVER
DISTRICT 2 - PENNINGTON COUNTY



AUGUST 28, 2012
PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
AYRES ASSOCIATES & COLLINS ENGINEERS, INC.
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 57503, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. A moderate accumulation of timber debris extending from the channel bottom to the waterline was observed around the entire perimeter of Pier 1, extending up to 10 feet off the pier faces and noses. As noted in the previous inspection, a minor scour depression was observed at the upstream end of Pier 2. Overall, the channel bottom at the bridge was stable with no significant changes since the last inspection.

INSPECTION FINDINGS:

- (A) An 8-inch length of exposed reinforcing steel was observed at the waterline at the upstream end of Pier 1.
- (B) A minor scour depression 3 feet in diameter and 1 foot deep, was observed at the upstream end of Pier 2.
- (C) A moderate accumulation of timber debris, which included drift up to 1 foot in diameter, was observed around the upstream nose from the channel bottom to the waterline and extending 10 feet off the faces and noses of Pier 1.
- (D) A minor accumulation of timber debris build-up was observed at the upstream nose of Pier 2.

RECOMMENDATIONS:

- (A) The timber debris accumulation at Pier 1 did not significantly affect the channel flow, and as a result, does not require removal at this time. If the debris accumulation increases in size or density, it may be necessary to remove the debris to reduce excessive lateral loads on the pier, limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.

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

Inspection Team Leader

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

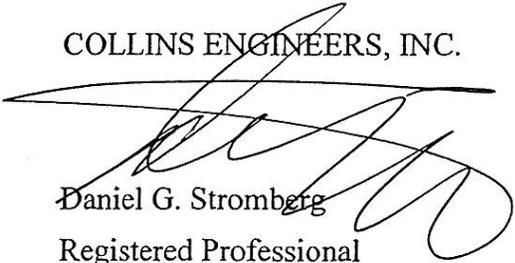
PROFESSIONAL ENGINEER

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: 57503

Feature Crossed: Red Lake River

Feature Carried: CSAH No. 7

Location: District 2 - Pennington County

Bridge Description: The bridge superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered starting from the west end of the bridge. No design drawings were provided.

2. INSPECTION DATA

Professional Engineer Diver: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, Anthony J. Coffaro

Date: August 28, 2012

Weather Conditions: Sunny, 60°F

Underwater Visibility: 4.0 feet

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of a rectangular reinforced concrete shaft with rounded ends. They support a rectangular reinforced concrete hammerhead pier cap with tapered ends.

Maximum Water Depth at Substructure Inspected: Approximately 4.3 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the north end of Pier 2.

Water Surface: The waterline was approximately 12.2 feet below reference.
Assumed Waterline Elevation = 87.8.

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 6

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code I/94

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

Yes No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	2	EA		2			
985	Slopes and Slope Protection	1	EA	1				



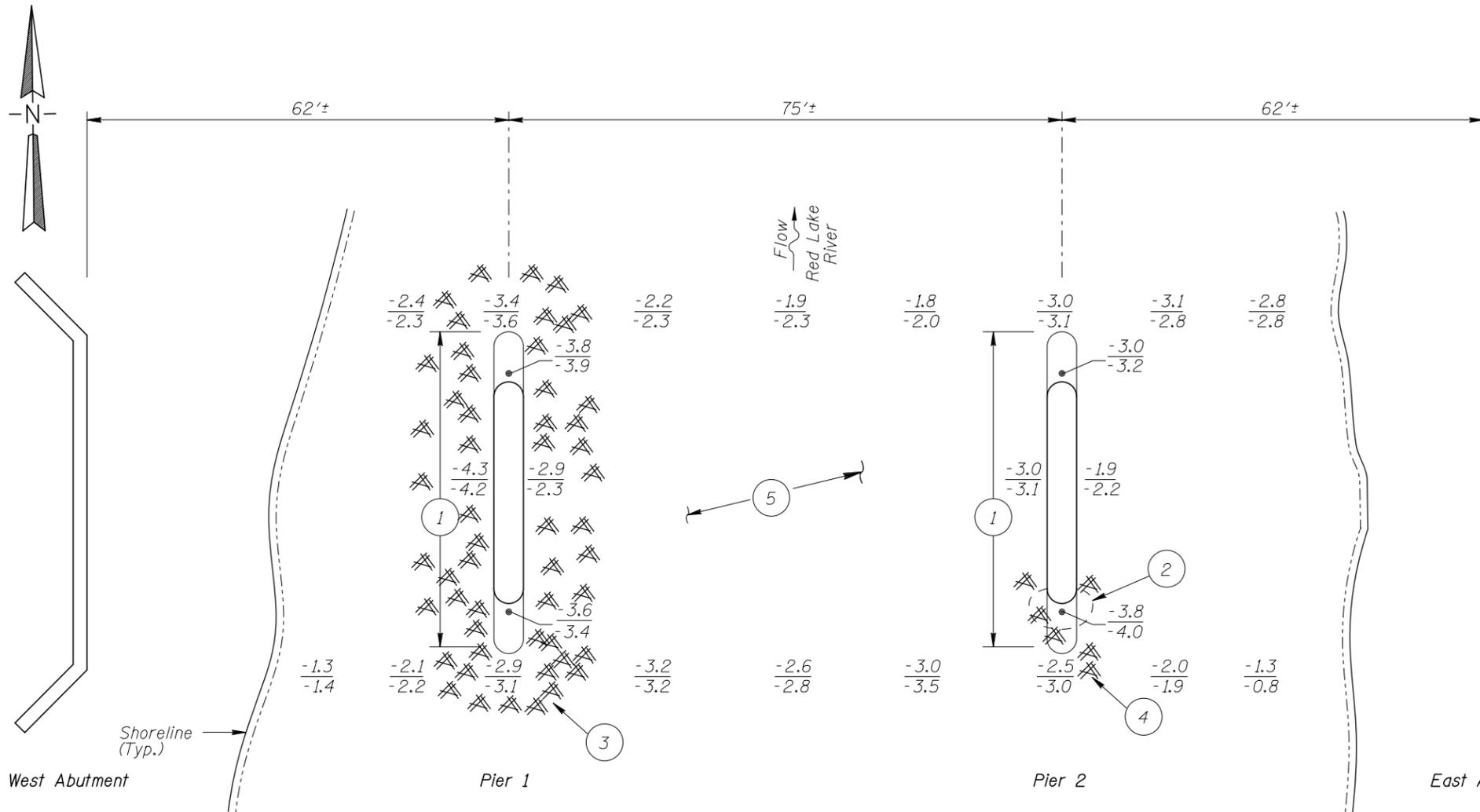
Photograph 1. Overall View of the Structure, Looking North.



Photograph 2. View of Pier 1, Looking East.



Photograph 3. View of Pier 2, Looking West.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 28, 2012, the waterline was located approximately 12.2 feet below the top of the pier cap on the north end of Pier 2. Design plans were not available, therefore a reference of 100.0 was assumed. Based on the assumed reference the waterline elevation was 87.8.
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 as well as around the pier structures.

INSPECTION NOTES:

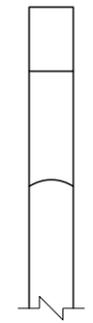
- ① Overall, the concrete piers were smooth and sound with an 8-inch length of exposed reinforcing steel located at the waterline at the upstream end of Pier 1. In addition, minor scaling was observed at the upstream nose of Piers 1 and 2 from channel bottom to 4 feet above the waterline.
- ② A minor scour depression, 1 foot deep with a radius of 3 feet, was observed at the upstream end of Pier 2.
- ③ A moderate accumulation of timber debris, which included drift up to 1 foot in diameter, was observed around the entire perimeter of Pier 1 from the channel bottom to the waterline and up to 10 feet off the pier faces and noses.
- ④ A minor accumulation of timber debris build-up was observed at the upstream nose of Pier 2.
- ⑤ The channel bottom around the entire perimeters of Piers 1 and 2 consisted of sand and gravel and random rip rap up to 1 foot in diameter with up to 6 inches of probe rod penetration.

West Abutment

Pier 1

Pier 2

East Abutment



TYPICAL END VIEW OF PIERS

Legend

- 6.0 Sounding Depth (8/28/12)
- 6.5 Sounding Depth (8/18/07)
- X Timber Debris
- Scour Depression

Note:

All soundings based on 2012 waterline location.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 57503
OVER THE RED LAKE RIVER
DISTRICT 2, PENNINGTON COUNTY

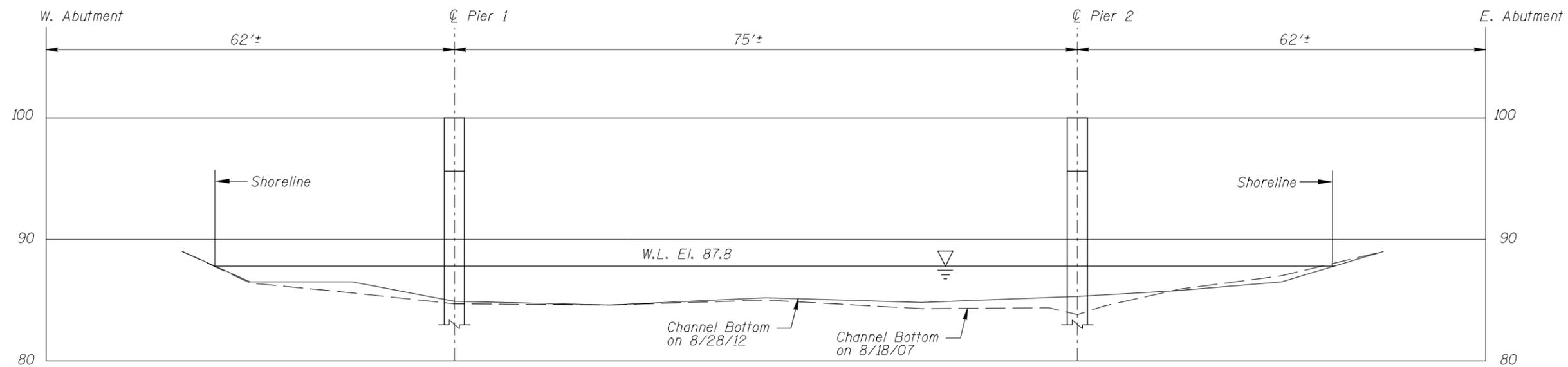
INSPECTION AND SOUNDING PLAN

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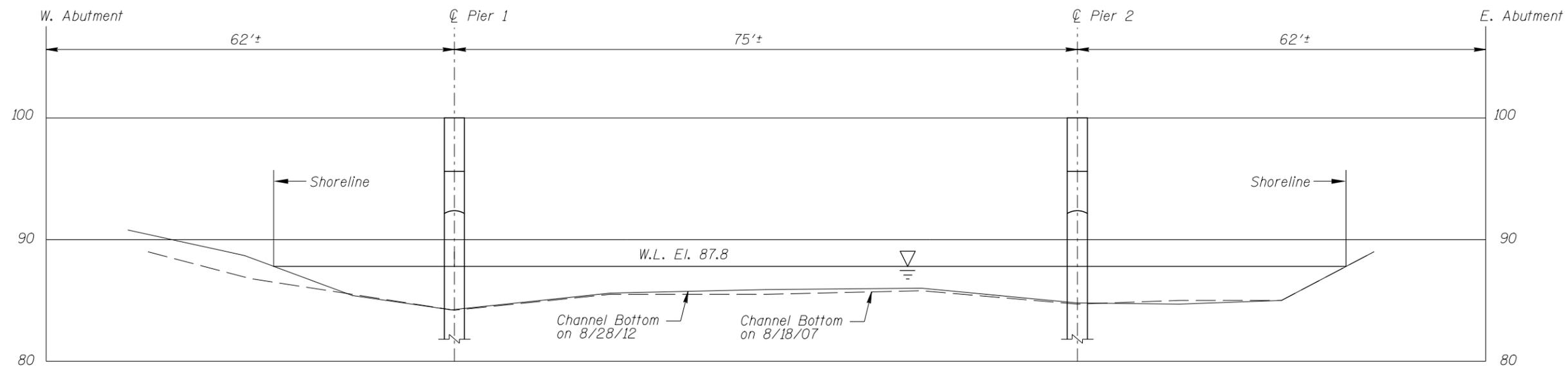
Drawn By: JAC
Checked By: BKS
Code: 52210164

AVRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

Date: SEPT, 2012
Scale: NTS
Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION	
STRUCTURE NO. 57503 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY	
UPSTREAM AND DOWNSTREAM FASCIA PROFILES	
Drawn By: JAC Checked By: BKS Code: 52210164	<div style="text-align: center;">  </div> Date: SEPT, 2012 Scale: NTS (U.O.N.) Figure No.: 2

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

INSPECTORS: Ayres Associates DATE: August 28, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 57503 WEATHER: Partly Cloudy, 60°F

WATERWAY CROSSED: Red Lake River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
X OTHER Wade

PERSONNEL: Jason A. Cook, Anthony J. Coffaro

EQUIPMENT: Waders, Probe Rod, Sounding Pole, U/W Light, Hammer, Camera

TIME IN WATER: 7:30 A.M.

TIME OUT OF WATER: 7:50 A.M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 4.0 feet

DEPTH 4.3 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were generally smooth and sound with only an 8 inch length of exposed reinforcing steel located at the waterline at the upstream end of Pier 1. In addition, minor scaling was observed at the upstream nose of Piers 1 and 2 from the channel bottom to 4 feet above the waterline. A minor scour depression was observed at the upstream end of Pier 2. A moderate accumulation of timber debris, which included drift up to 1 foot in diameter, was observed around the entire perimeter of Pier 1 from the channel bottom to the waterline extending up to 10 feet off the pier faces and noses. A minor accumulation of timber debris build-up was observed at the upstream nose of Pier 2.

FURTHER ACTION NEEDED: _____ YES X NO

The timber debris accumulation at Pier 1 did not significantly affect the channel flow, and as a result, does not require removal at this time. If the debris accumulation increases in size or density, it may be necessary to remove the debris to reduce excessive lateral loads on the pier, limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.

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. 57503
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Red Lake River

INSPECTION DATE August 28, 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	4.3'	N	7	N	9	N	7	7	7	7	6	6	7	N	N	N	N	N
	Pier 2	3.8'	N	7	N	9	N	7	7	7	7	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were generally smooth and sound with only an 8 inch length of exposed reinforcing steel located at the waterline at the upstream end of Pier 1. In addition, minor scaling was observed at the upstream nose of Piers 1 and 2 from the channel bottom to 4 feet above the waterline. A minor scour depression was observed at the upstream end of Pier 2. A moderate accumulation of timber debris, which included drift up to 1 foot in diameter, was observed around the entire perimeter of Pier 1 from the channel bottom to the waterline extending up to 10 feet off the pier faces and noses. A minor accumulation of timber debris build-up was observed at the upstream nose 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.