

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 57518  
CSAH NO. 3  
OVER THE  
RED LAKE RIVER  
DISTRICT 2 - PENNINGTON COUNTY

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AUGUST 27, 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. 57518, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. The steel pipe piles at times exhibited loss of coating with random areas of minor surface corrosion, but no appreciable section loss. The channel bottom consisted of sand which was well established and appeared stable with no evidence of scour.

INSPECTION FINDINGS:

- (A) The 16 inch diameter pile encasements of Piers 1 and 2 were coated from top of pile to the channel bottom. The piles typically had no loss of coating from top of piles down 5 feet. From 5 feet below the top of the pile to the channel bottom, the piles had loss of coating over up to 50% of total surface area. In the areas of coating loss, the piles had random areas of minor surface corrosion with no appreciable section loss.
- (B) Pier 1, Pile B (second pile from the south) has hollow sounds at west face, 3 feet high, starting 6 feet below cap. Pier 1, Pile E (second pile from the north) has hollow sounds at west face, 4 feet high, starting 5 feet below cap. Pier 1, Pile F (northern most pile) has hollow sounds at west face, from 6 feet below cap to ground line.
- (C) Light to moderate accumulations of timber debris and organic material were observed around Piles B through D of Pier 1.

RECOMMENDATIONS:

- (A) 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,

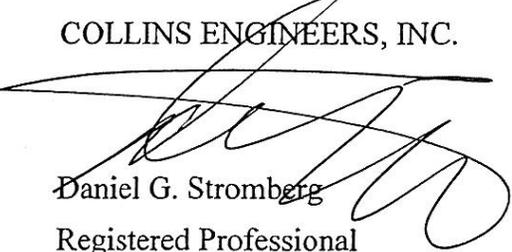
PROFESSIONAL ENGINEER

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: 57518

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 3

Location: District 2 - Pennington County

Bridge Description: The superstructure consists of three spans of multiple precast concrete beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two concrete filled steel pipe pile piers. The piers are numbered 1 and 2 starting from the west end of the bridge. No design drawings were available.

2. INSPECTION DATA

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

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

Date: August 27, 2012

Weather Conditions: Sunny, 69 F

Underwater Visibility: 4.0 feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of a single row of six concrete filled steel pipe piles. The piles at each end are battered in the direction parallel to the pier. The piles support a rectangular reinforced concrete pile cap with rounded ends.

Maximum Water Depth at Substructure Inspected: Approximately 3.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap on the south side of Pier 1.

Water Surface: The waterline was approximately 15.2 feet below reference.  
Assumed Waterline Elevation = 84.8.

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 A/08/12

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
419	Painted Steel Piles	12	EA	9	3			
985	Slopes and Slope Protection	1	EA	1				



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



Photograph 2. View of Pier 1 and West Abutment, Looking West.



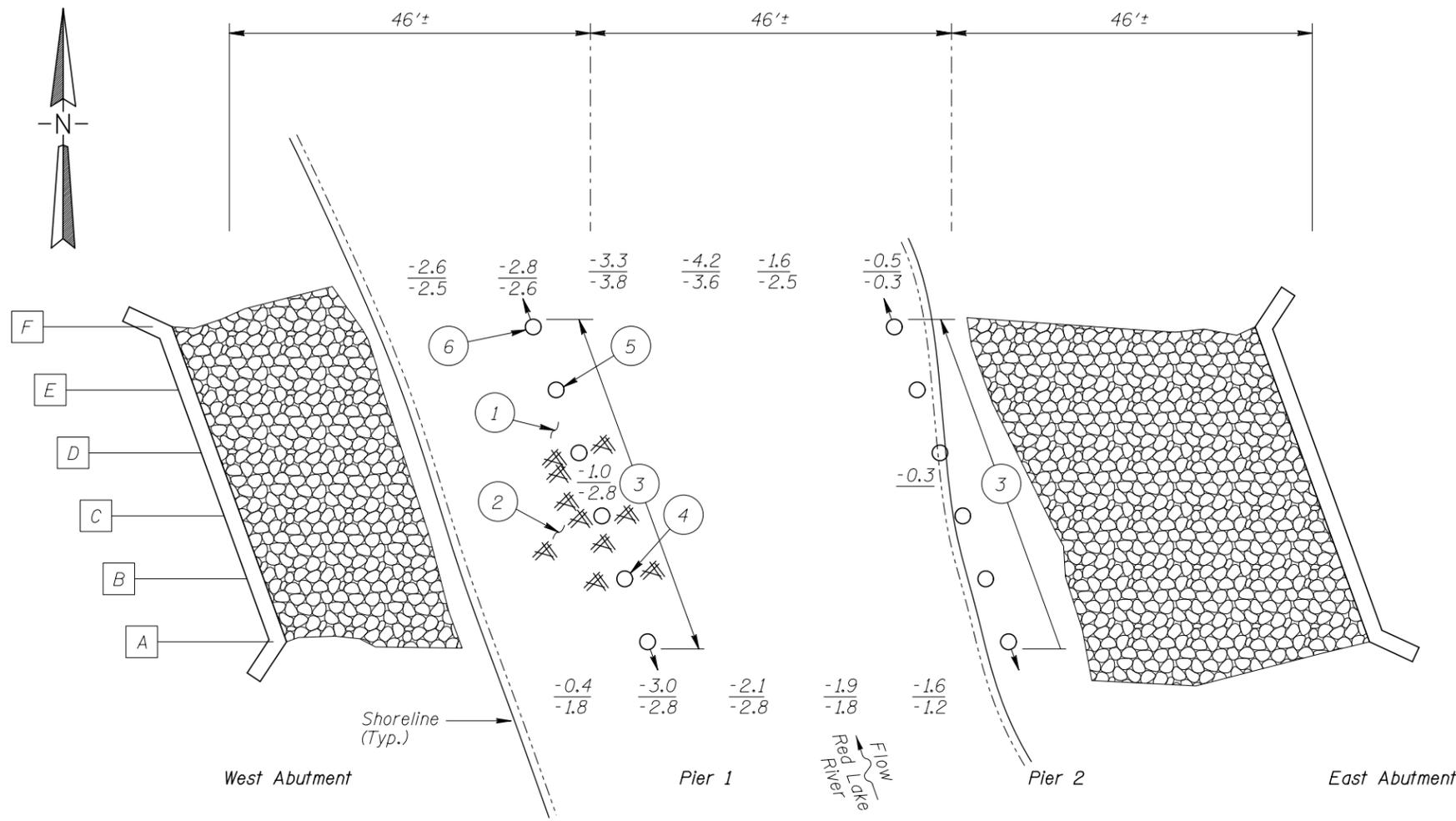
Photograph 3. View of Pier 2 and North Abutment, Looking Northeast.



Photograph 4. View of Debris near the Middle Piles of Pier 1, Looking East.



Photograph 5. View of Pier 2, Looking West.



**GENERAL NOTES:**

1. Piers 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 27, 2012, the waterline was located approximately 15.2 feet below the top of the pile cap on the upstream end of Pier 1. Design plans were not available, therefore a reference of 100.0 was assumed. Based on the assumed reference the waterline elevation was 84.8.
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 material around Piers 1 and 2 consisted of sand with 12 inches of probe rod penetration.
- 2 A light to moderate accumulation of 1-foot-diameter and smaller timber debris and organic material was observed around Piles B through D at Pier 1.
- 3 The steel pipe piles had coating failure and random areas of minor surface corrosion with no appreciable loss of section over approximately 50 percent of the surface area from 5 feet below the top of the piles to the channel bottom.
- 4 Pier 1, Bile B sounded hollow at west face, 3 feet high, starting at 6 feet below the cap.
- 5 Pier 1, Bile E sounded hollow at west face, 4 feet high, starting at 5 feet below the cap.
- 6 Pier 1, Bile F sounded hollow at west face, from 6 feet below cap to ground line.

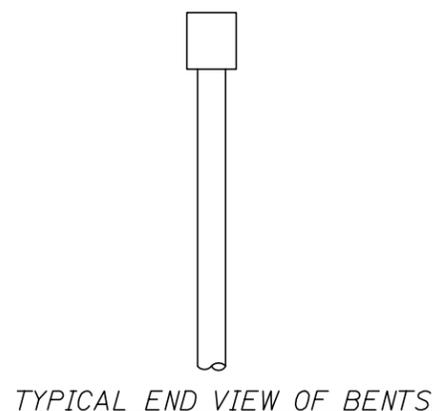
**SOUNDING PLAN**

**Legend**

- 8.0 Sounding Depth (8/27/12)
- 6.8 Sounding Depth (8/18/07)
- Steel Pile
- Battered Steel Pile
- A Pile Designation Identification
- ▣ Riprap
- ▨ Timber Debris

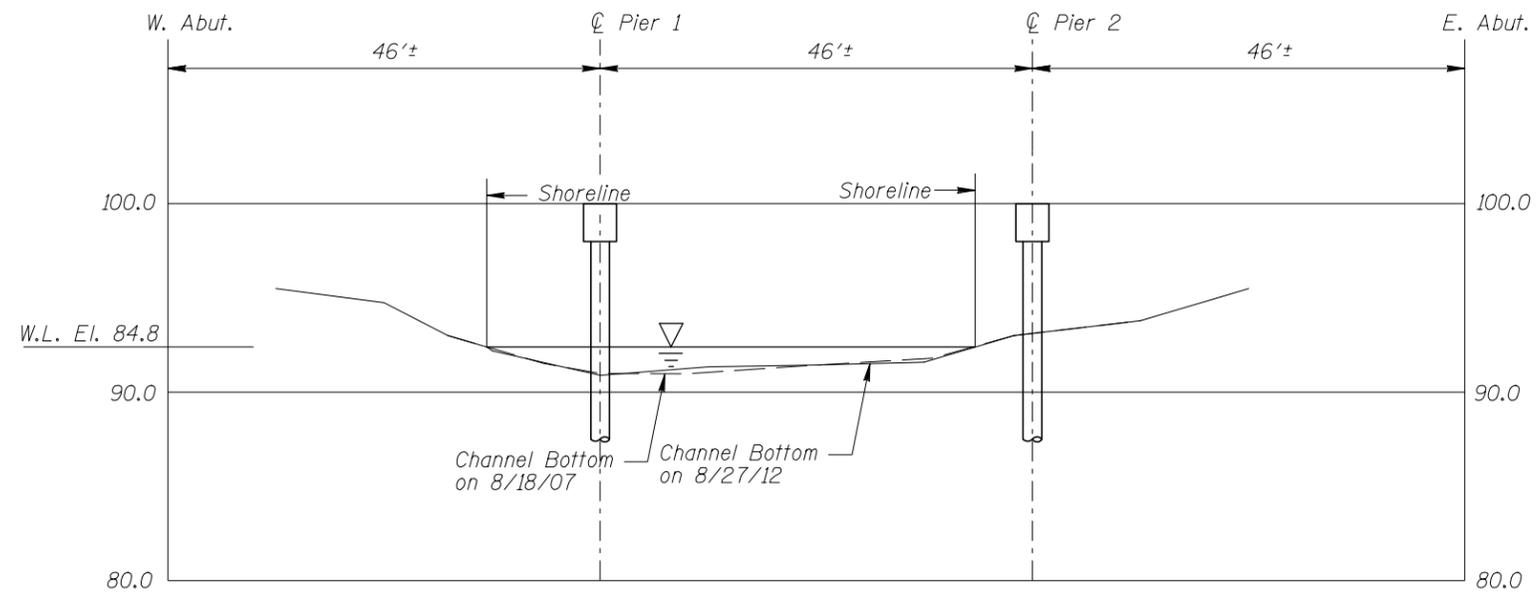
**Note:**

All soundings based on 2012 waterline location.

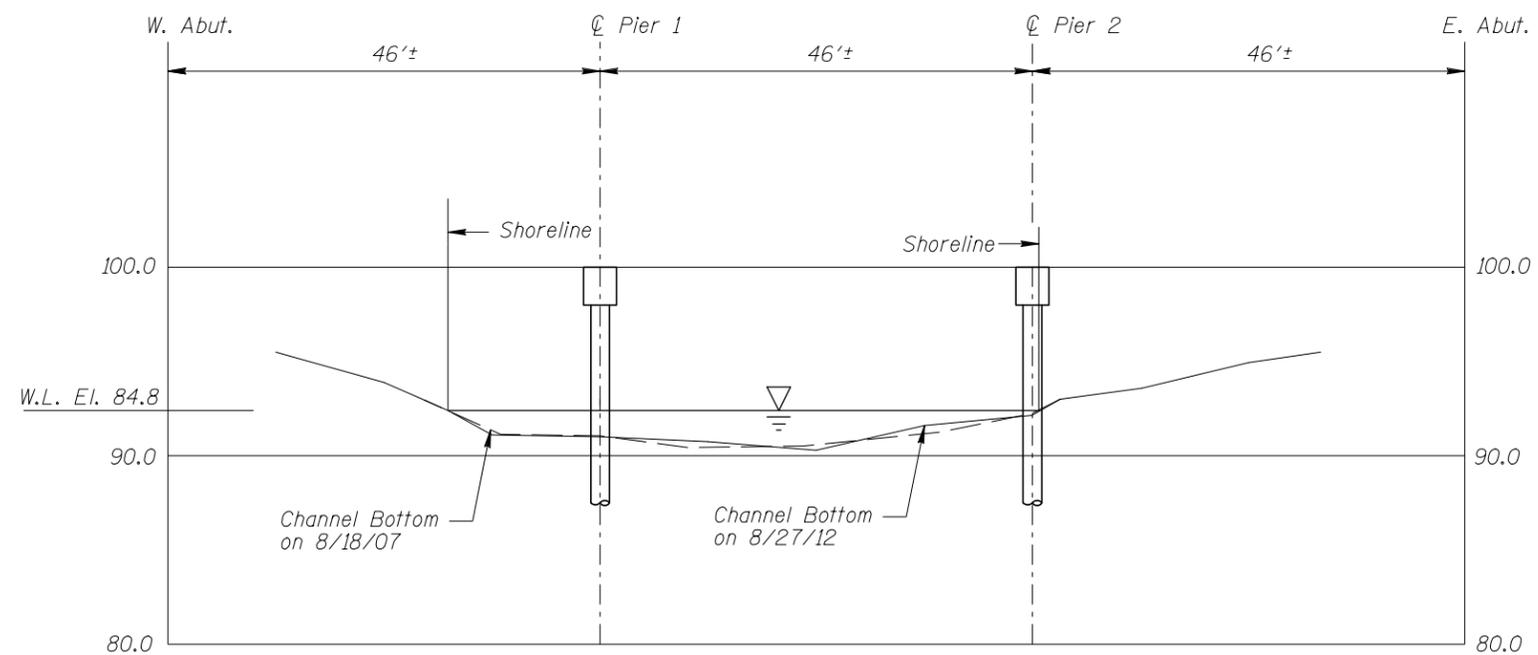


<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 57518 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: JAC	 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: SEPT, 2012
Checked By: BKS		Scale: NTS
Code: 5221009A		Figure No.: 1

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



**UPSTREAM FASCIA PROFILE**  
Vertical Scale: 1"=20'-0"



**DOWNSTREAM FASCIA PROFILE**  
Vertical Scale: 1"=20'-0"

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 57518 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: JAC	<b>AYRES ASSOCIATES</b> <small>3433 Oakwood Hills Parkway Evanston, IL 60201 www.AyresAssociates.com</small>	Date: SEPT, 2012
Checked By: BKS		Scale: 1"=20'
Code: 5221009A		Figure No.: 2

**COLLINS ENGINEERS**  
123 North Wacker Drive  
Suite 300  
Chicago, IL 60606  
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MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: Ayres Associates DATE: August 27, 2012

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

BRIDGE NO: 57518 WEATHER: Sunny, 69° F

WATERWAY CROSSED: The Red Lake River

DIVING OPERATION: \_\_\_\_\_ SCUBA \_\_\_\_\_ SURFACE SUPPLIED AIR

X OTHER Wade

PERSONNEL: Jason A. Cook, Anthony J. Coffaro

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

TIME IN WATER: 10:30 A.M.

TIME OUT OF WATER: 10:45 A.M.

WATERWAY DATA: VELOCITY 1.0 ft/sec

VISIBILITY 4.0 feet

DEPTH 3.0 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the 16 inch diameter pile encasements of Piers 1 and 2 were coated from top of pile to the channel bottom. The piles typically had no loss of coating from top of piles down 5 feet. From 5 feet below the top of the pile to the channel bottom, the piles had loss of coating over up to 50% of total surface area. In the areas of coating loss, the piles had random areas of minor surface corrosion with no appreciable section loss. Light to moderate accumulations of timber debris and organic material were observed around Piles B thru D of Pier 1.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES \_\_\_\_\_ X \_\_\_\_\_ 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. 57518  
 INSPECTORS Ayres Associates  
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.  
 WATERWAY CROSSED The Red Lake River

INSPECTION DATE August 27, 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	3.0'	7	N	N	9	N	7	8	8	8	6	7	N	7	N	7	N	N
	Pier 2	0.5'	7	N	N	9	N	7	8	8	8	8	8	N	7	N	8	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the 16 inch diameter pile encasements of Piers 1 and 2 were coated from top of pile to the channel bottom. The piles typically had no loss of coating from top of piles down 5 feet. From 5 feet below the top of the pile to the channel bottom, the piles had loss of coating over up to 50% of total surface area. In the areas of coating loss, the piles had random areas of minor surface corrosion with no appreciable section loss. Light to moderate accumulations of timber debris and organic material were observed around Piles B thru D of Pier 1.

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.