

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 57502  
CSAH NO. 24  
OVER THE  
RED LAKE RIVER  
DISTRICT 2 - PENNINGTON COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO. 5221 (CEI 163)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 57502, Piers 1 and 2, were in good condition with no defects of structural significance observed. The channel bottom appeared to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

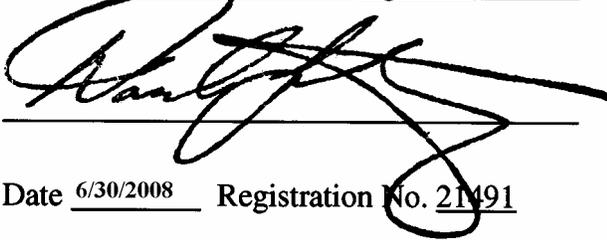
- (A) The concrete was smooth and sound with random minor areas of poor consolidation with up to ¼ inch penetration on the faces of both piers.
- (B) Minor scaling was observed from the channel bottom to 5 feet above the waterline (bottom of hammerhead pier cap) with up to ¼ inch maximum penetration on the upstream noses of Piers 1 and 2.
- (C) The channel bottom material around Pier 1 consisted of sand with 3 inches of maximum probe rod penetration; and around Pier 2, the bottom consisted of silty sand with 12 inches of maximum probe rod penetration.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

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



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 57502

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 24

Location: District 2 - Pennington County

Bridge Description: The superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and two concrete piers, with the piers numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 18, 2007

Weather Conditions: Sunny, 69° F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.5 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers consist of an oblong rectangular concrete shaft with rounded noses supporting a hammerhead pier cap. Design plans with foundation information were not available.

Maximum Water Depth at Substructure Inspected: Approximately 2.9 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the west side of Pier 2.

Water Surface: The waterline was approximately 11.7 feet below reference.  
Assumed Waterline Elevation = 88.3.

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 8

Item 92B: Underwater Inspection: Code B/08/07

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   X   No



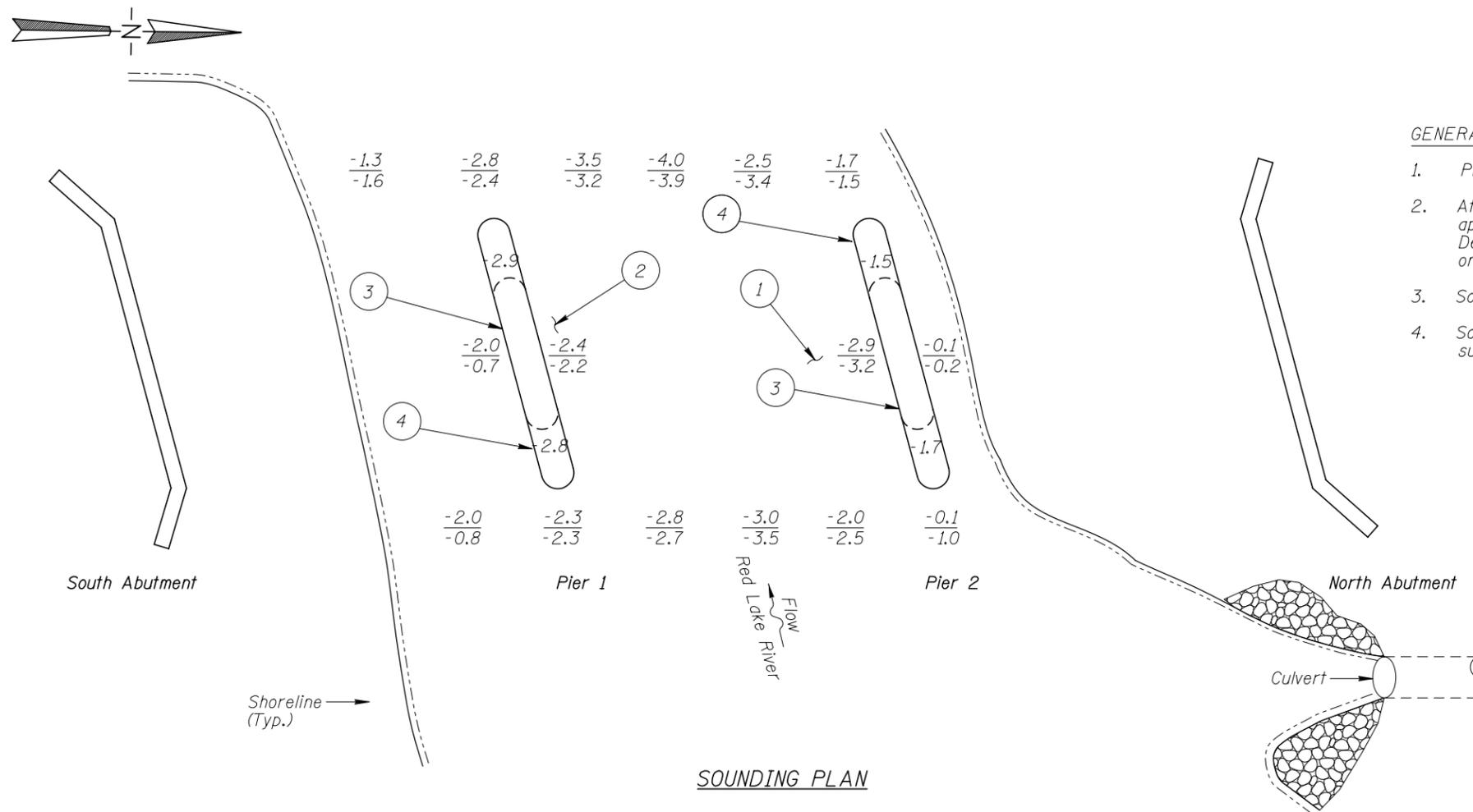
Photograph 1. Overall View of the Structure, Looking East.



Photograph 2. View of Pier 1, Looking Southeast.



Photograph 3. View of Pier 2, Looking South.



**GENERAL NOTES:**

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 18, 2007 the waterline was located approximately 11.7 feet below the top of the pier cap on the downstream 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 88.3.
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.



**TYPICAL END VIEW OF PIERS**

**INSPECTION NOTES:**

- 1 The channel bottom material around Pier 2 consisted of silty sand with up to 12 inches maximum probe rod penetration.
- 2 The channel bottom material around Pier 1 consisted of sand with 3 inches of maximum probe rod penetration.
- 3 The concrete was typically smooth and sound with random minor areas of poor consolidation with up to 1/4 inch penetration on the faces of both piers.
- 4 Minor scaling was observed from the channel bottom to 5 feet above the waterline (bottom of hammerhead pier cap) with up to 1/4 inch maximum penetration on the upstream noses of Piers 1 and 2.

**Legend**

- 2.0 Sounding Depth (8/18/07)
- 5.2 Sounding Depth (8/26/02)

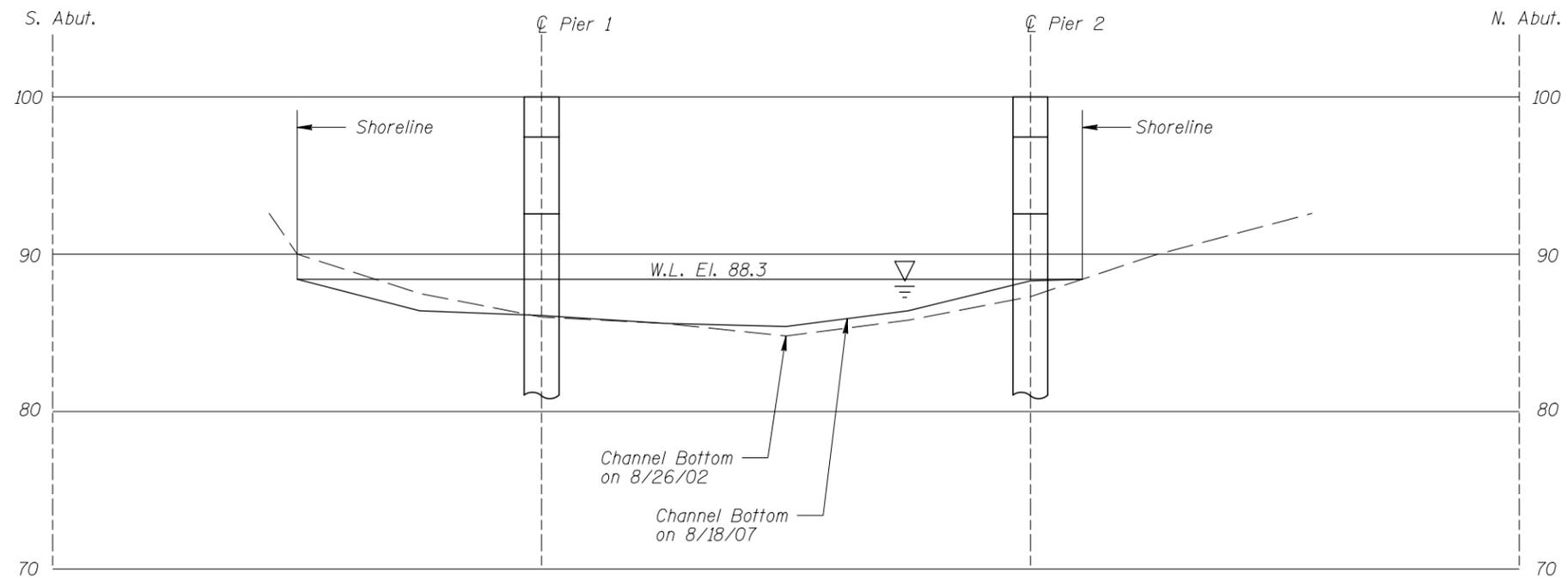
Timber Debris

Riprap

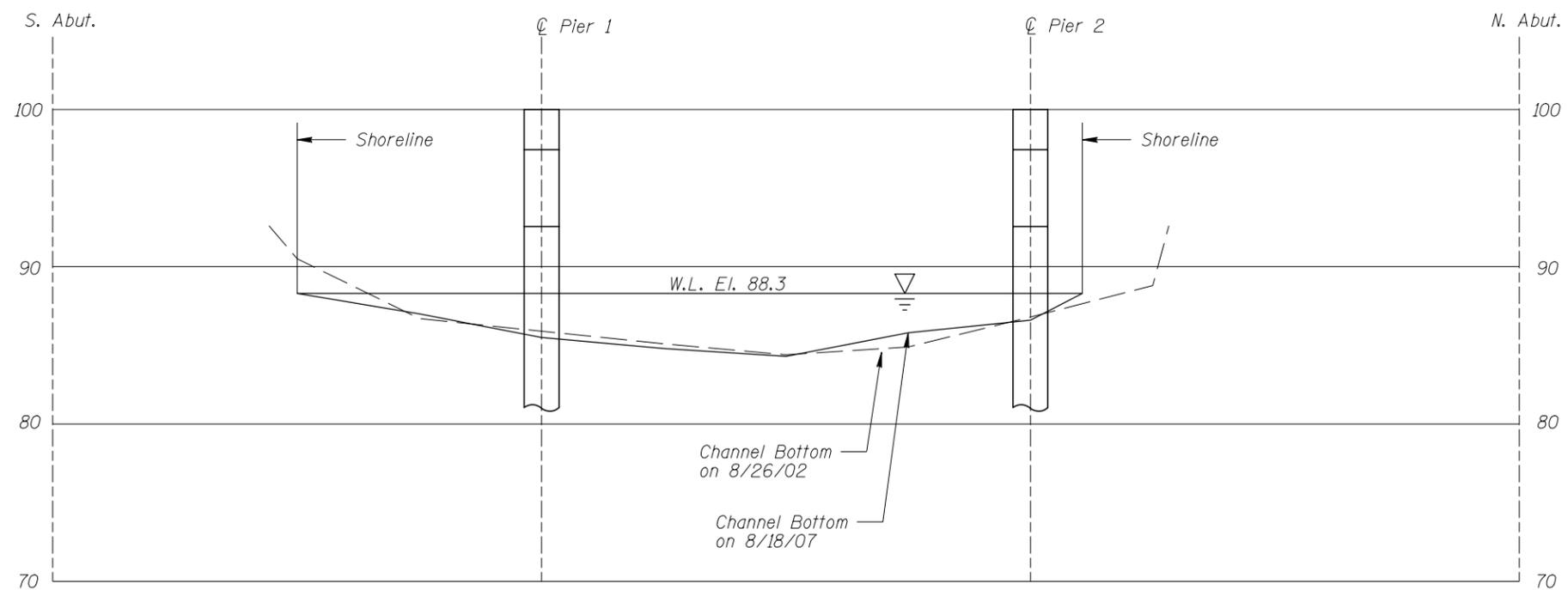
**Note:**

All soundings based on 2007 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 57502 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS</b> <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEP. 2007
Checked By: MDK		Scale: NTS
Code: 52210163		Figure No.: I



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



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

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 57502 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS</b> <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUG. 2007
Checked By: MDK		Scale: NTS (U.O.N.)
Code: 52210163		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 18, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 57502 WEATHER: Sunny, 69 ° F

WATERWAY CROSSED: Red Lake River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod,  
Camera

TIME IN WATER: 10:00 A.M.

TIME OUT OF WATER: 10:31 A.M.

WATERWAY DATA: VELOCITY 1.5 f.p.s

VISIBILITY 2.0 feet

DEPTH 2.9 feet maximum at Piers 1 and 2.

ELEMENTS INSPECTED: Pier 1 and Pier 2

REMARKS: Overall, the concrete was smooth and sound with random minor areas of poor consolidation with up to ¼ inch penetration on the faces of both piers. Minor scaling was observed from the channel bottom to 5 feet above the waterline (bottom of hammerhead pier cap) with up to ¼ inch maximum penetration on the upstream noses of Piers 1 and 2. The channel bottom material around Pier 1 consisted of sand with 3 inches of maximum probe rod penetration; and around Pier 2, it consisted of silty sand with 12 inches of maximum probe rod penetration.

FURTHER ACTION NEEDED:  YES  NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 57502  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.  
 WATERWAY CROSSED Red Lake River

INSPECTION DATE August 18, 2007  
 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	2.9'	N	7	N	9	N	7	8	8	8	N	8	7	N	N	N	N	N
	Pier 2	2.9'	N	7	N	9	N	7	8	8	8	N	8	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound with random minor areas of poor consolidation with up to ¼ inch penetration on the faces of both piers. Minor scaling was observed from the channel bottom to 5 feet above the waterline (bottom of hammerhead pier cap) with up to ¼ inch maximum penetration on the upstream noses of Piers 1 and 2. The channel bottom material around Pier 1 consisted of sand with 3 inches of maximum probe rod penetration; and around Pier 2, it consisted of silty sand with 12 inches of maximum probe rod penetration.

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.