

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 57521

CR 27 OVER THE

RED LAKE RIVER

DISTRICT 2 – PENNINGTON COUNTY



PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 34)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 57521, Piers 1 and 2, were found to be in good condition with no defects of structural significance at this time. The channel bottom around the substructure units was well established and in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

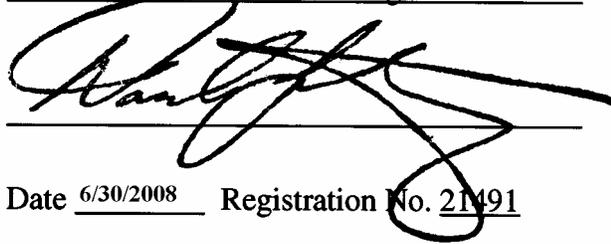
- (A) The 16 inch diameter steel pipe pile encasements over the H-piles of both piers were coated from top of pile down 5 feet. The piles exhibited random minor areas of coating loss on less of 1% of total surface area. In the locations of coating loss, the encasement exhibited minor corrosion with no section loss. From 5 feet below the top of encasement to channel bottom, the encasements were coated with only a primer coat. In the areas where the encasements were not top coated, the encasements exhibited corrosion on up to 75% of total surface area. The corrosion consisted of rust nodules up to ¼ inch in diameter and minor pitting (less than 1/32 inch deep).
- (B) A minor accumulation of timber debris consisting of logs and branches up to 6 inches in diameter and a steel I-beam were observed extending from south shoreline to easternmost pile of Pier 1. The debris accumulation extended from the channel bottom to the waterline and was approximately 10 feet long (N/S) by 5 feet wide (E/W).
- (C) The channel bottom at Piers 1 and 2 consisted of sand, gravel, cobbles up to 6 inches in diameter, and riprap up to 2 feet in diameter with up to 3 inches of probe rod penetration possible.

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.

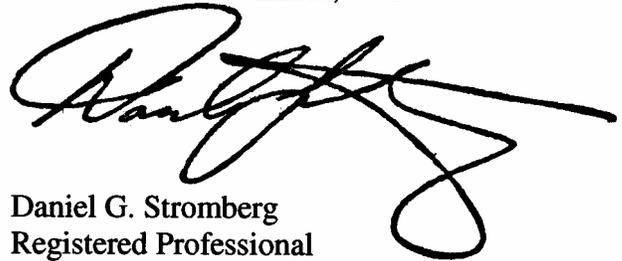
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 57521

Feature Crossed: Red Lake River

Feature Carried: TWP Road – CR 27

Location: District 2 – Pennington County

Bridge Description: The bridge superstructure consists of three spans of cast-in-place reinforced concrete structure. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are supported on steel H-piles and they are numbered 1 and 2 starting from south to north.

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: Partly Cloudy, 69° F

Underwater Visibility: 4 feet

Waterway Velocity: 1.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The pier caps are concrete with an oblong rectangular shape having rounded noses, and are founded on H-piles with steel shell pile (concrete filled) encasements.

Maximum Water Depth at Substructure Inspected: Approximately 5.6 feet.

4. WATERLINE DATUM

Water Level Reference: Top of pier cap on east end of Pier 1.

Water Surface: The waterline was approximately 12.2 feet below the reference.
Waterline Elevation 1154.8.

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 B/08/07

Item 113: Scour Critical Bridges: Code F/07

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

Yes No



Photograph 1. View of Pier 1, Looking Northwest.



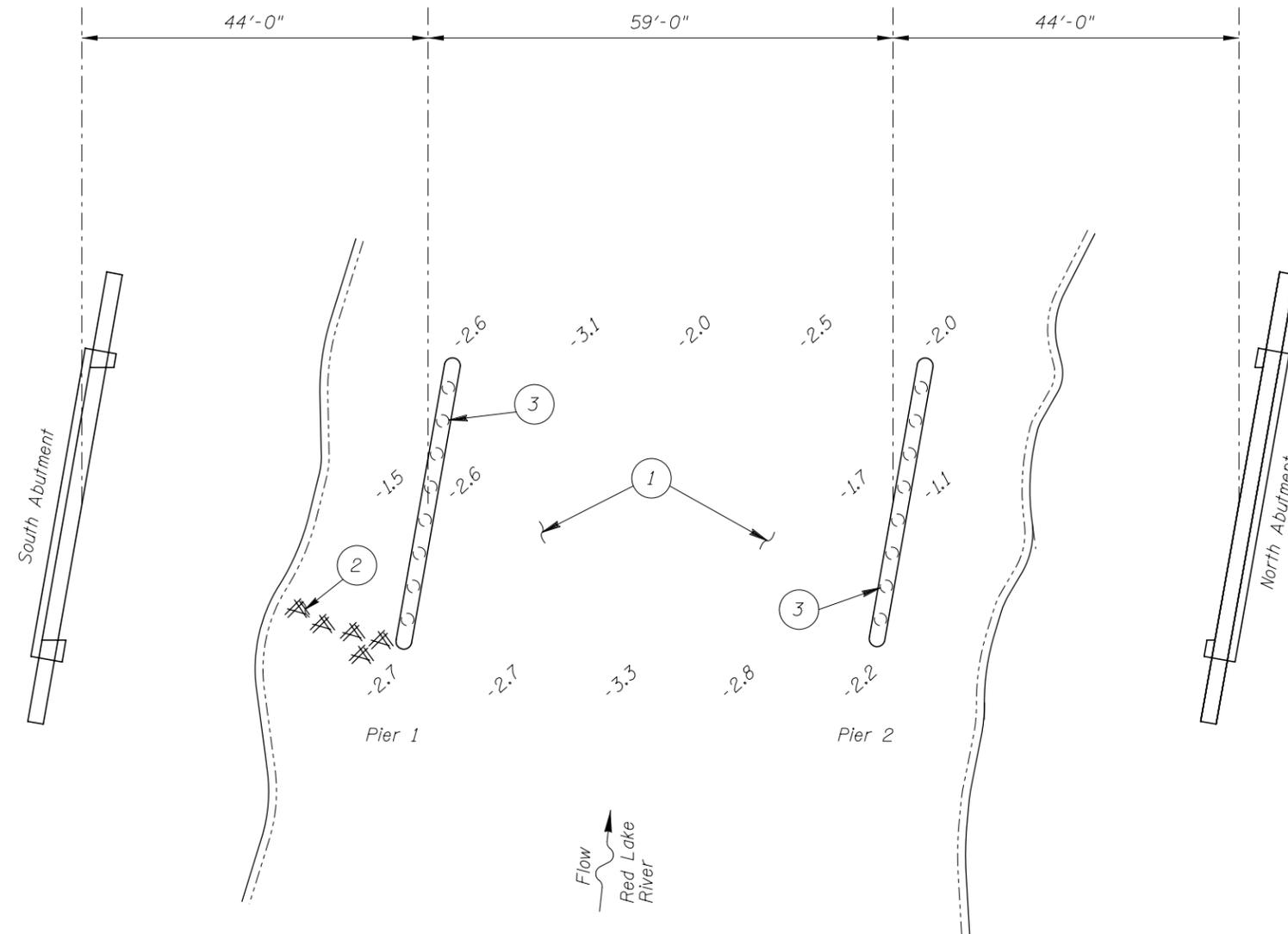
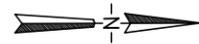
Photograph 2. View of Pier 1 and South Abutment, Looking Southeast.



Photograph 3. View of Pier 2, Looking Northwest.



Photograph 4. View of Pier 2, Looking South.



INSPECTION NOTES:

- ① The channel bottom consisted of sand, gravel, cobbles up to 6 inches in size, and riprap up to 2 feet in diameter with up to 3 inches probe rod penetration.
- ② A minor accumulation of timber debris consisting of 6-inch-diameter and smaller logs and branches and a steel I-beam were observed extending from the shoreline to the upstream pile of Pier 1 and from the channel bottom to the waterline.
- ③ The steel pipe pile encasements exhibited random minor areas of coating failure from the top of the piles down 5 feet. The piles were uncoated (primer only) from 5 feet below the top of the pile to the channel bottom, with minor surface corrosion observed on over 75 % of the surface area with up to 1/4-inch-diameter rust nodules and minor pitting up to 1/32 inch deep.

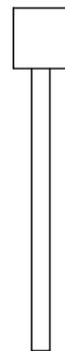
SOUNDING PLAN

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 12.2 feet below the pier cap of Pier 1 on the east end. This corresponds to a waterline elevation of 1154.8 feet.
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.

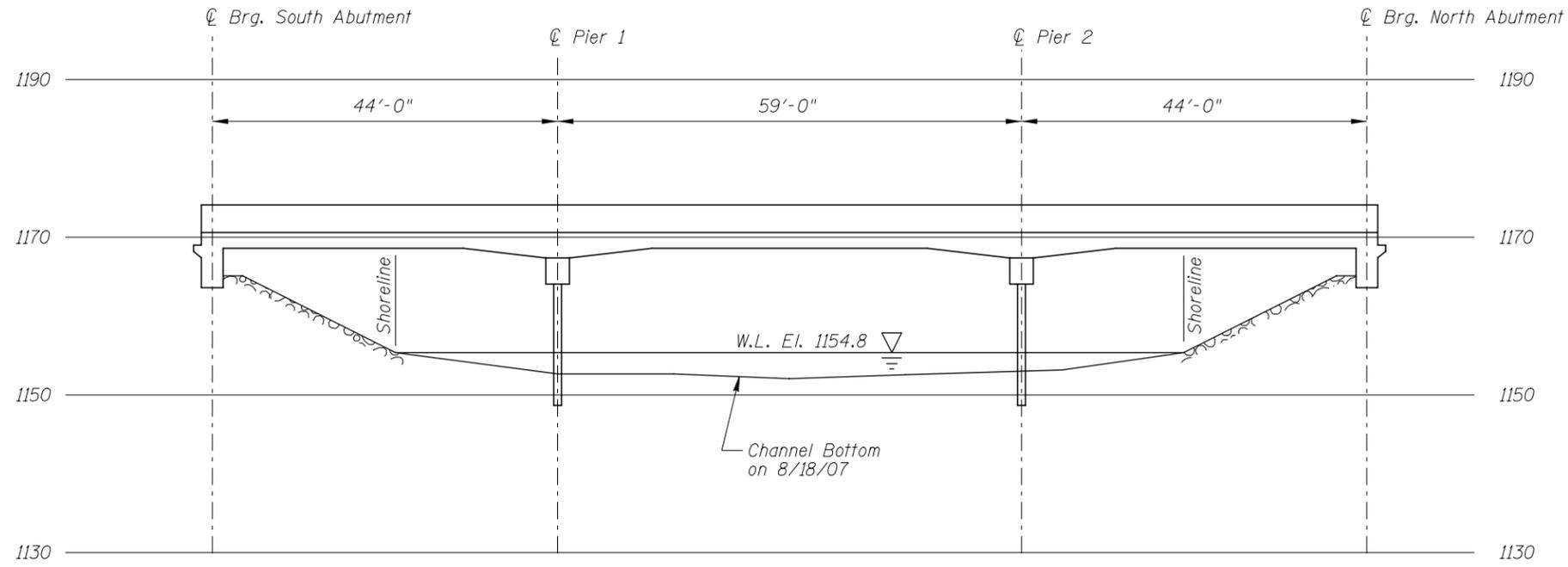
Legend

- 0.4 Sounding Depth (8/18/07)
- Timber Debris

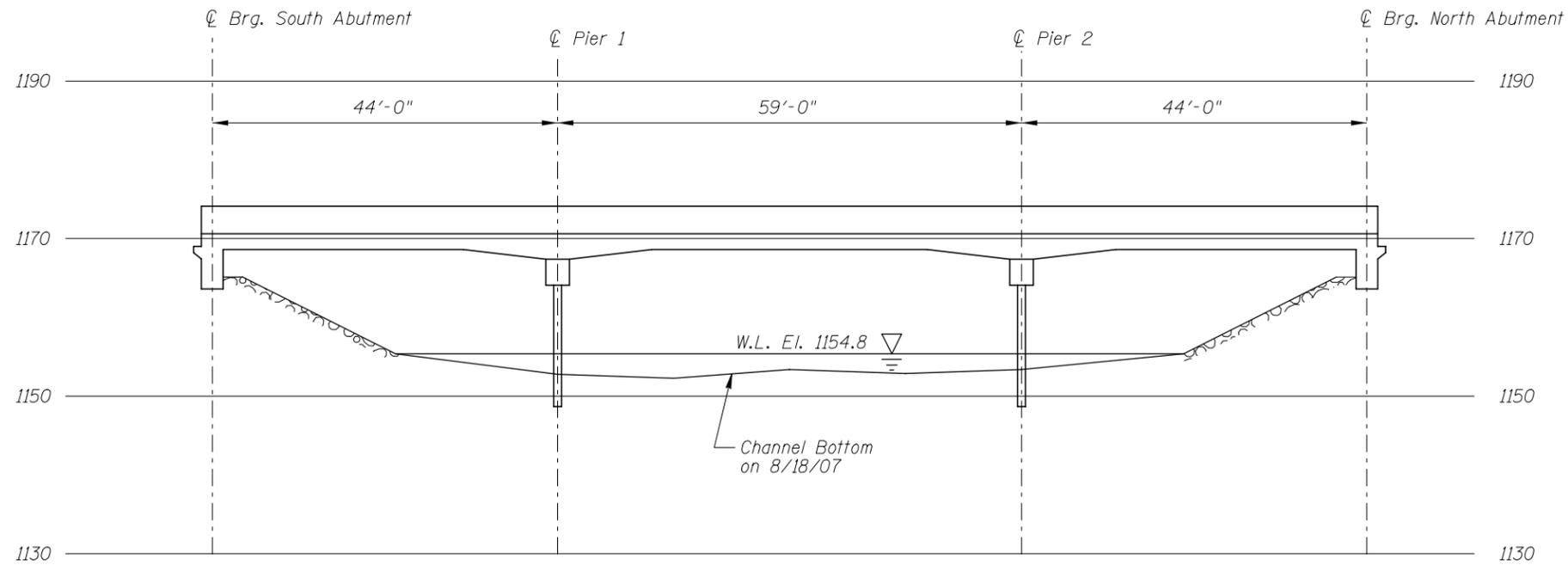


TYPICAL END VIEW OF EACH PIER SECTION

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 57521 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: RR Checked By: DGS Code: 52210034		133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com
		Date: Nov., 2007 Scale: NTS Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 57521 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: RR Checked By: DGS Code: 52210034	COLLINS ENGINEERS	133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com
		Date: Nov., 2007 Scale: 1"=20' 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: 57521 WEATHER: Partly Cloudy, 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, Lead Line, Probe Rod, Camera
TIME IN WATER: 8:45 a.m.
TIME OUT OF WATER: 9:10 a.m.
WATERWAY DATA: VELOCITY 1.5 f.p.s
VISIBILITY 4.0 feet
DEPTH 5.6 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the 16 inch diameter steel pipe pile encasements over the H-piles of both piers were coated from top of pile down 5 feet. The coating exhibited random minor areas of coating loss on less of 1% of total surface area. In the location of coating loss, the encasement steel exhibited minor corrosion with no section loss. From 5 feet below the top of encasement to channel bottom, the encasements were not top coated and there was only a primer coating on the encasements. In the areas where the encasements were not top coated, the encasements exhibited corrosion on up to 75% of total surface area. The corrosion consisted of rust nodules up to 1/4 inch in diameter and minor pitting (less than 1/32 inch deep). A minor accumulation of debris consisting of logs and branches up to 6 inches in diameter and a steel I-beam was observed extending from south shoreline to easternmost pile of Pier 1. The debris extended from the channel bottom to the waterline and was approximately 10 feet long (N/S) by 5 feet wide (E/W).

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. 57521
 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	2.7'	7	N	N	9	N	7	8	8	8	7	7	N	8	N	8	N	N
	Pier 2	2.2'	7	N	N	9	N	7	8	8	8	N	8	N	8	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the 16 inch diameter steel pipe pile encasements over the H-piles of both piers were coated from top of pile down 5 feet. The coating exhibited random minor areas of coating loss on less of 1% of total surface area. In the location of coating loss, the encasement steel exhibited minor corrosion with no section loss. From 5 feet below the top of encasement to channel bottom, the encasements were not top coated and there was only a primer coating on the encasements. In the areas where the encasements were not top coated, the encasements exhibited corrosion on up to 75% of total surface area. The corrosion consisted of rust nodules up to 1/4 inch in diameter and minor pitting (less than 1/32 inch deep). A minor accumulation of debris consisting of logs and branches up to 6 inches in diameter and a steel I-beam was observed extending from south shoreline to easternmost pile of Pier 1. The debris extended from the channel bottom to the waterline and was approximately 10 feet long (N/S) by 5 feet wide (E/W).

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.