

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 18510
CSAH NO. 6
OVER THE
DAGGETT CHANNEL
DISTRICT 3 – CROW WING COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 18510, Piers 1 and 2, were found to be in good condition with no defects of structural significance at this time. The piles exhibited coating failure from the waterline to the mudline with 10% to 30% of the surface area covered by rust nodules that exhibited 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss related to the corrosion. The channel bottom around the substructure units appeared stable with no significant scour or other channel bottom deficiencies.

INSPECTION FINDINGS:

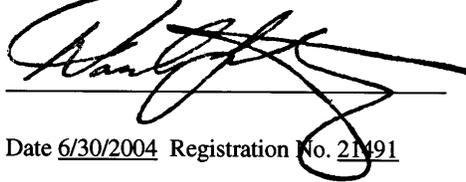
- (A) The piles of Pier 1 exhibited coating loss from the waterline to the mudline with 10% of the surface area covered with rust nodules that exhibited 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss as a result of the present extent of corrosion.
- (B) The piles of Pier 2 exhibited coating loss from the waterline to the mudline with 30% of the surface area covered with rust nodules that exhibited 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss as a result of the present extent of corrosion.

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 6/30/2004 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: 18510

Feature Crossed: The Daggett Channel

Feature Carried: CSAH No. 6

Location: District 3 – Crow Wing County

Bridge Description: The superstructure consists of three spans of multiple concrete beams. The superstructure is supported by two reinforced concrete abutments and two steel pipe pile piers. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 26, 2002

Weather Conditions: Sunny, " 50E F

Underwater Visibility: " 5 Feet

Waterway Velocity: Negligible / None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Piers 1 and 2 consist of a single line of 15 steel pipe piles supporting a reinforced concrete cap. Each abutment is an open abutment with a concrete sloped wall.

Maximum Water Depth at Substructure Inspected: Approximately 10 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the east end of Pier 2.

Water Surface: The waterline was approximately 9.3 feet below reference.
Assumed Waterline Elevation = 90.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

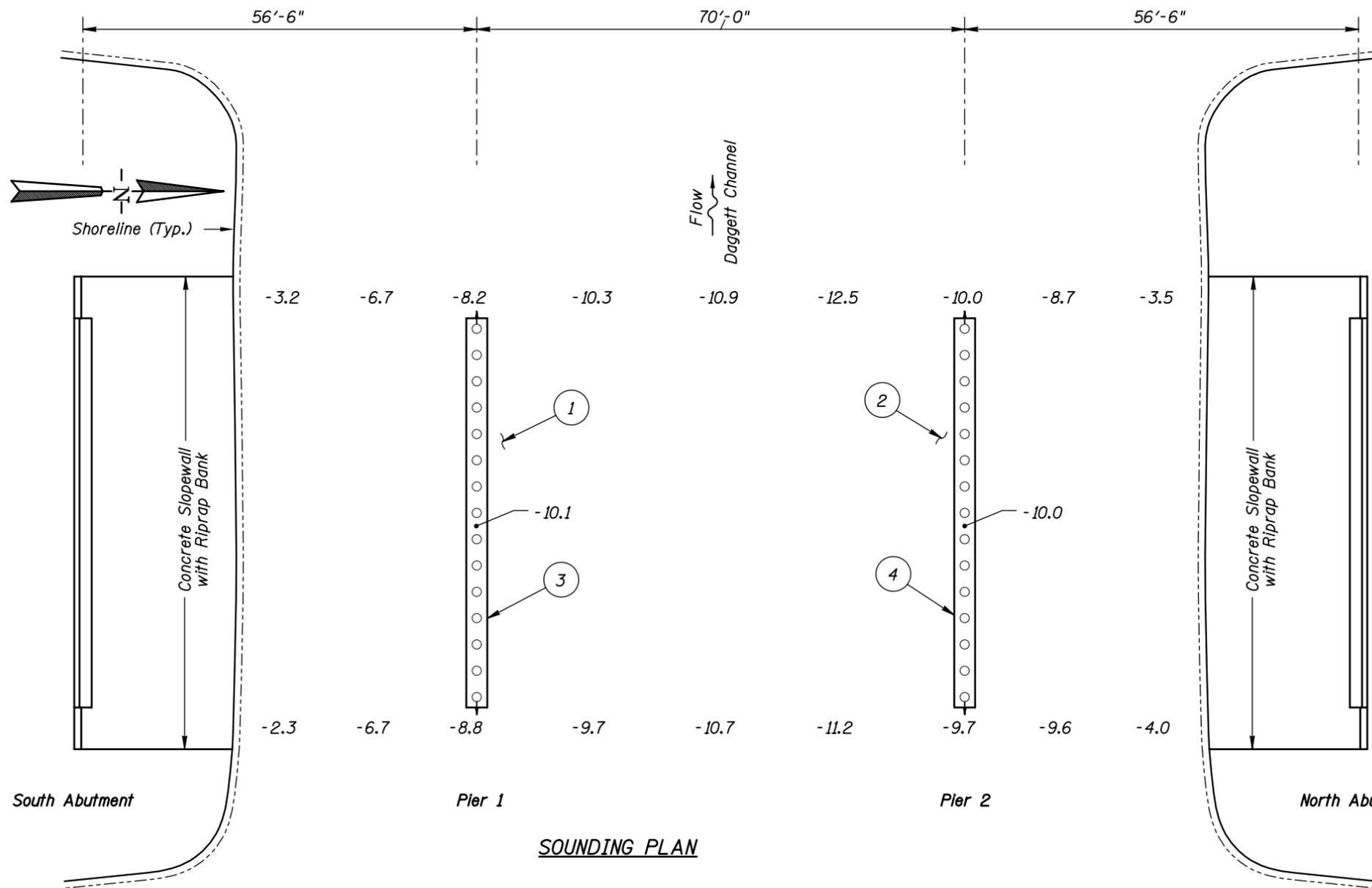
Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code I/02

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

_____ Yes X No



GENERAL NOTES:

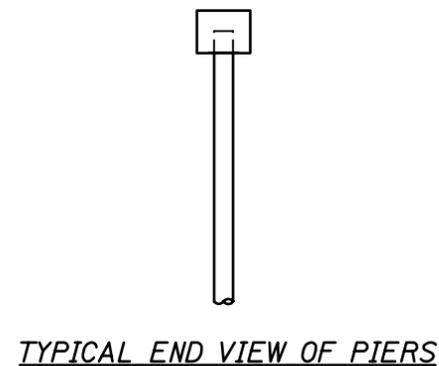
1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 26, 2002, the waterline was located approximately 9.3 feet below the top of the pile cap at the upstream end of Pier 2. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 90.7.
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.

INSPECTION NOTES:

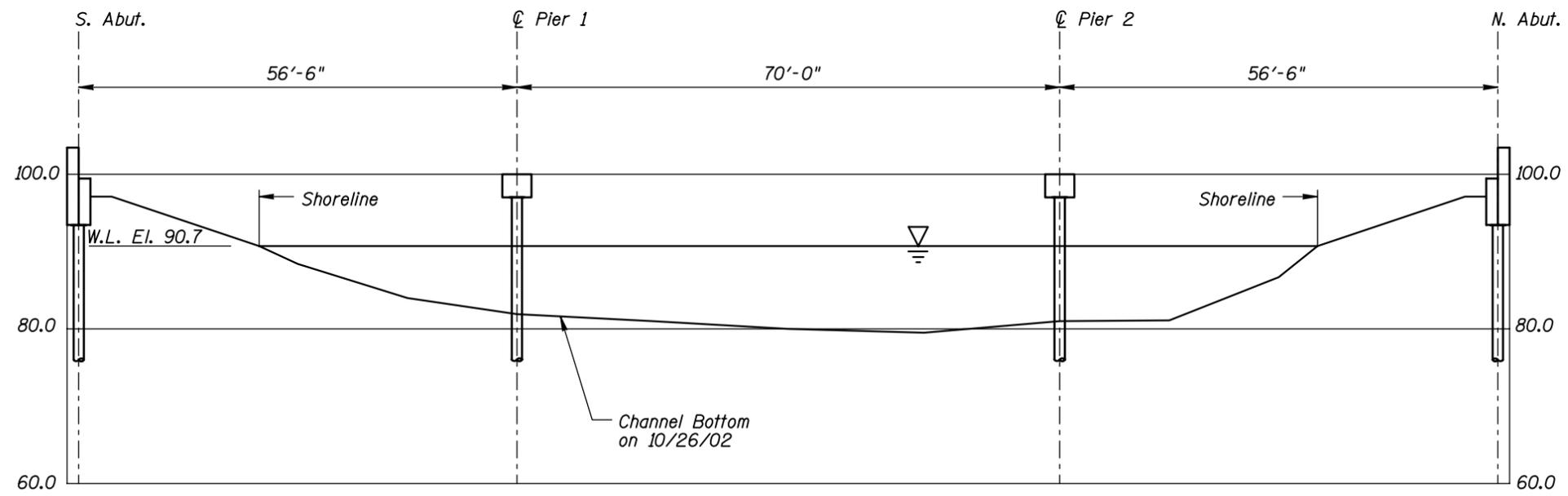
- ① The channel bottom around Pier 1 consisted of sand with with 6 to 8 inches of probe rod penetration.
- ② The channel bottom around Pier 2 consisted of sand and 6 to 8 inch diameter cobbles with 6 to 8 inches of probe rod penetration.
- ③ Pier 1 exhibited coating loss from the waterline to the mudline with 10% of the surface area covered with rust nodules that exhibited 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss up to 1/32 inch deep.
- ④ Pier 2 exhibited coating loss from the waterline to the mudline with 30% of the surface area covered with rust nodules that exhibited 1/2 inch maximum diameter. The piles exhibited only minor pitting and minimal section loss up to 1/32 inch deep.

Legend

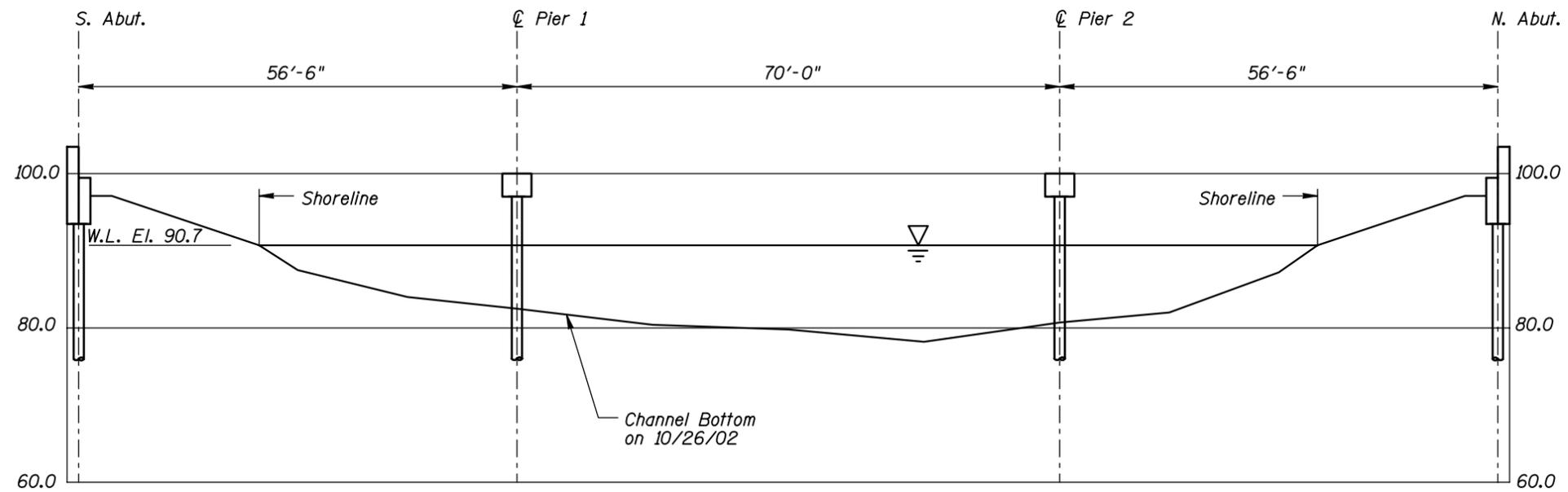
- 5.2 Sounding Depth from Waterline (9/26/02)
- Steel Pipe, Cast-in-place Concrete Pile
- ⊕ Battered Steel Pipe, Cast-in-place Concrete Pile



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 18510 OVER DAGGETT CHANNEL DISTRICT 3, CROW WING COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 351218510		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. 18510 OVER DAGGETT CHANNEL DISTRICT 3, CROW WING COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: OCT. 2002
Checked By: MDK		Scale: 1"=20'
Code: 351218510		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Southeast.

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

INSPECTORS: Collins Engineers, Inc. DATE: September 26, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 18510 WEATHER: Sunny, " 50E F
WATERWAY CROSSED: The Daggett Channel
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 2:20 A.M.
TIME OUT OF WATER: 2:50 A.M.
WATERWAY DATA: VELOCITY Negligible / None
 VISIBILITY " 5 feet
 DEPTH " 10 foot maximum at Piers 1 and 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from the waterline to the mudline with 10% to 30% of the surface area covered by rust nodules that exhibited up to 1/2 inch maximum diameter. The piles had exhibited only minor pitting (up to 1/32 inch deep) and minimal section loss related to the corrosion. No channel bottom deficiencies were encountered.

FURTHER ACTION NEEDED: _____ YES _____ X _____ 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. 18510
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Daggett Channel

INSPECTION DATE September 26, 2002

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	10.0'	8	N	N	9	N	8	N	8	8	N	8	N	8	N	8	N	N
	Pier 2	10.0'	8	N	N	9	N	8	N	8	8	N	8	N	8	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from the waterline to the mudline with 10% to 30% of the surface area covered by rust nodules that exhibited up to 1/2 inch maximum diameter. The piles had exhibited only minor pitting (up to 1/32 inch deep) and minimal section loss related to the corrosion. No channel bottom deficiencies were encountered.

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.