

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 18501
CSAH NO. 16
OVER THE
PINE RIVER (CROSS LAKE / RUSH LAKE)
DISTRICT 3 – CROW WING COUNTY



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

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 18501, Piers 1, 2, and 3, were found to be in good condition with coating failure and minor related corrosion below the waterline covering 15% to 20% of the surface area. The channel bottom around the substructure units appeared stable with no significant scour or debris accumulations and no notable changes from the last inspection.

INSPECTION FINDINGS:

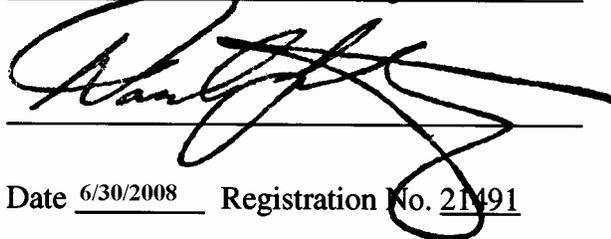
- (A) All of the piles at each of the piers exhibited coating failure covering 15% to 20% of the surface area below the waterline. Associated with the coating loss was minor surface corrosion and rust nodules, and overall minimum corrosion with section losses of up to 1/32 inch. Aquatic growth was observed on all piles from the waterline to the channel bottom.

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.

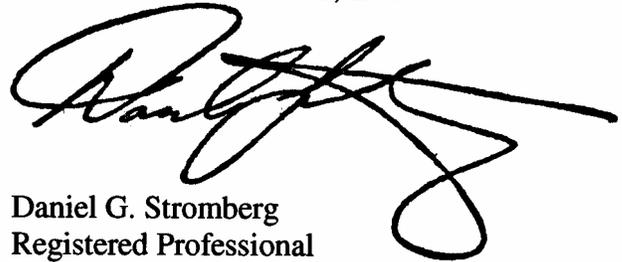
Daniel G. Stromberg



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: 18501

Feature Crossed: Pine River (Cross Lake / Rush Lake)

Feature Carried: CSAH No. 16

Location: District 3 – Crow Wing County

Bridge Description: The superstructure consists of four spans of multiple concrete beams. The superstructure is supported by two reinforced concrete abutments and three steel pipe pile bent piers. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 15, 2007

Weather Conditions: Partly Cloudy, 48°F

Underwater Visibility: 5.0 feet

Waterway Velocity: Negligible / None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: Piers 1, 2, and 3 consist of a single line of eight steel pipe piles supporting a reinforced concrete cap. Each abutment is an open abutment with a concrete slope wall.

Maximum Water Depth at Substructure Inspected: Approximately 7.4 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 9.7 feet below reference.
Assumed Waterline Elevation = 90.3

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/10/07

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



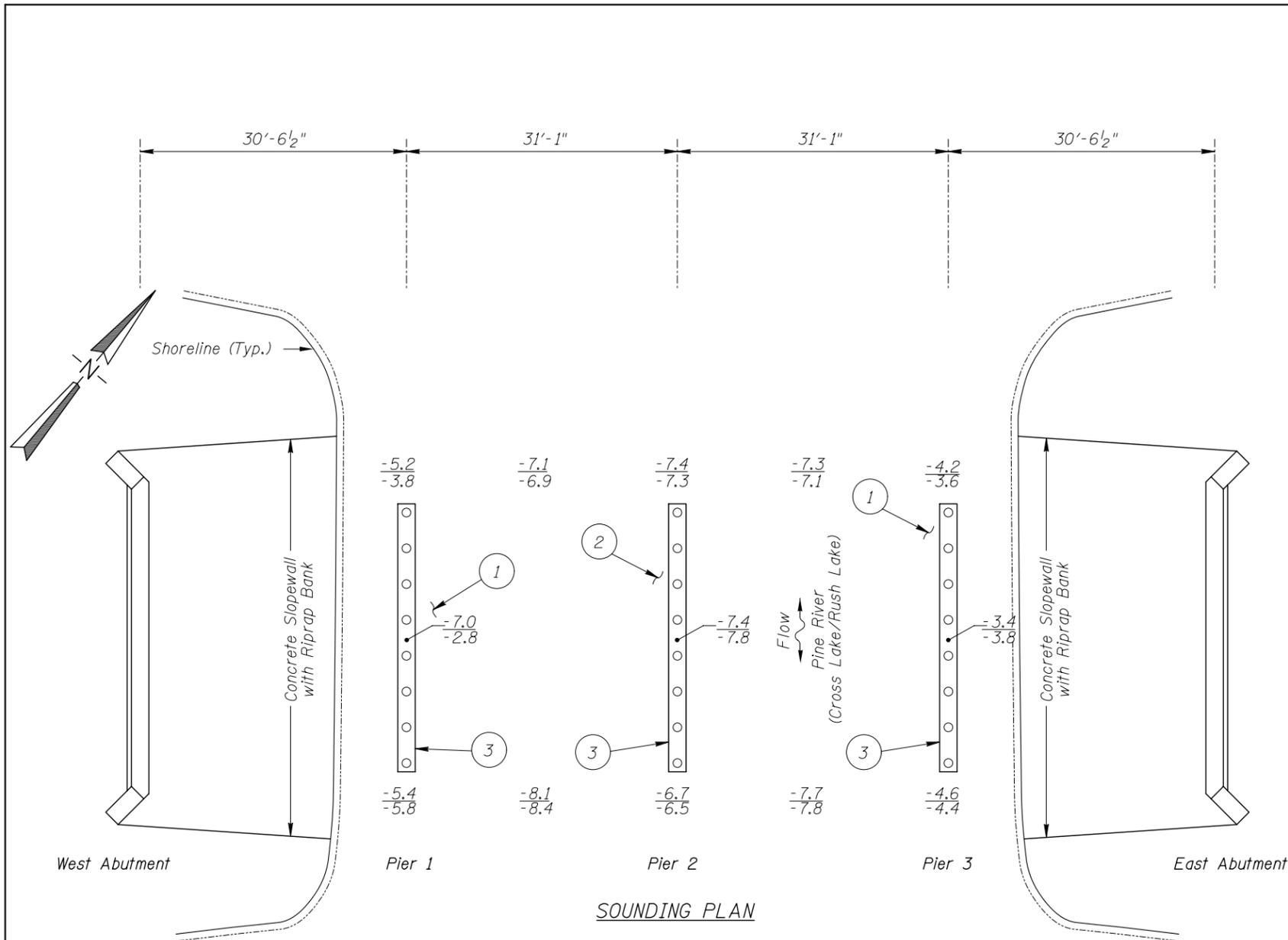
Photograph 1. View of Pier 1, Looking Northwest.



Photograph 2. View of Pier 2, Looking Northwest.



Photograph 3. View of Pier 3, Looking Southwest.



GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on October 16, 2007, the waterline was located approximately 9.7 feet below the top of the pile cap at the north 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 90.3.
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 mid point intervals between the substructure units.

INSPECTION NOTES:

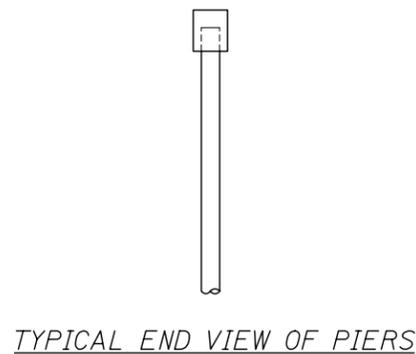
- 1 The channel bottom around Piers 1 and 3 consisted of 1- to 2-foot-diameter riprap.
- 2 The channel bottom around Pier 2 consisted of gravel and sand and 4- to 6-inch-diameter cobbles with up to 2 inches of probe rod penetration.
- 3 The piles exhibited coating failure and minimal surface corrosion on 15% to 20% of the surface area below the waterline. All piles exhibited a layer aquatic growth from the waterline to the mudline.

Notes:

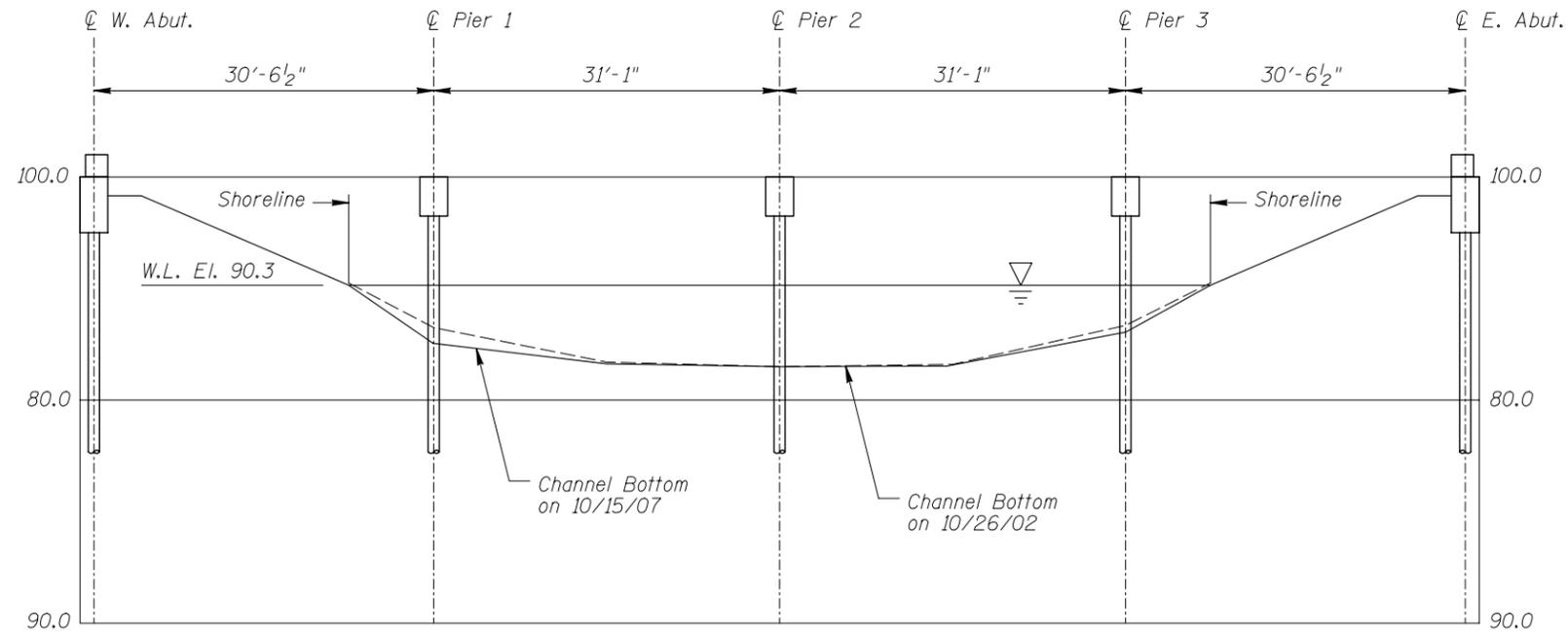
All soundings based on 2007 waterline location.

Legend

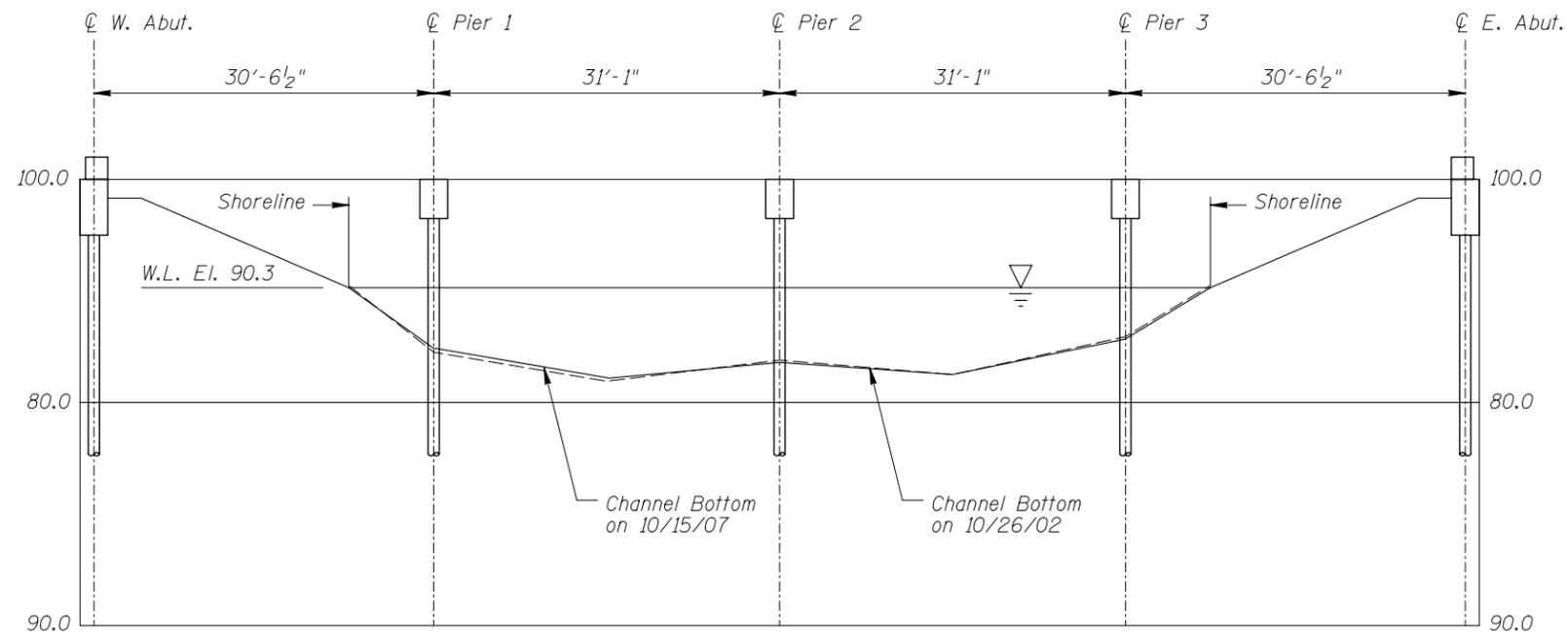
- 5.2 Sounding Depth (10/15/07)
- 5.2 Sounding Depth (9/26/02)
- Steel Pipe, Cast-in-place Concrete Pile



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 18501 OVER THE PINE RIVER (CROSS LAKE/RUSH LAKE) DISTRICT 3, CROW WING COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MDK	COLLINS ENGINEERS	Date: OCT. 2007
Checked By: DGS	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 522118501		Figure No.: 1



NORTH FASCIA PROFILE



SOUTH FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 18501 OVER THE PINE RIVER (CROSS LAKE/RUSH LAKE) DISTRICT 3, CROW WING COUNTY		
NORTH AND SOUTH FASCIA PROFILES		
Drawn By: MDK	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT. 2007
Checked By: DGS		Scale: 1/16" = 1'
Code: 522118501		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 15, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 18501 WEATHER: Partly Cloudy, 48°F

WATERWAY CROSSED: Pine River (Cross Lake / Rush Lake)

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

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

TIME IN WATER: 9:10 a.m.

TIME OUT OF WATER: 3:25 a.m.

WATERWAY DATA: VELOCITY Negligible / None

VISIBILITY 5.0 feet

DEPTH 7.4 feet at Pier 2

ELEMENTS INSPECTED: Piers 1, 2, and 3.

REMARKS: Overall, the submerged steel of the piles was in good condition with coating failure and related minor corrosion covering 15 to 20% of the surface area below the waterline. There was minor rust nodules and overall minimum corrosion with section losses up to 1/32 inch deep. All piles exhibited aquatic growth from the waterline to the channel bottom. There was no significant scour or other channel bottom deficiencies.

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. 18501
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Pine River (Cross Lake / Rush Lake)

INSPECTION DATE October 15, 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	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	5.4'	7	N	N	9	N	7	8	8	8	N	8	N	7	N	7	N	N
	Pier 2	7.4'	7	N	N	9	N	7	8	N	N	N	8	N	7	N	7	N	N
	Pier 3	4.6'	7	N	N	9	N	7	8	8	8	N	8	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged steel of the piles was in good condition with coating failure and related minor corrosion covering 15 to 20% of the surface area below the waterline. There was minor rust nodules and overall minimum corrosion with section losses up to 1/32 inch deep. All piles exhibited aquatic growth from the waterline to the channel bottom. There was no significant scour or other channel bottom deficiencies.

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.