

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 30501

CSAH NO. 7

OVER THE

RUM RIVER

DISTRICT 3 - ISANTI COUNTY



JULY 27, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

AND

WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 30501, Piers 1 and 2, were found to be generally in good condition with no structurally significant defects observed. Light scaling with up to 1/4 inch maximum penetration was observed around both piers. A scour pocket, 3 foot in radius by 2 feet deep, extended around the entire pier shaft at Pier 1 and Pier 2. The channel bottom around the substructure units appeared stable aside from the localized scour at the piers.

INSPECTION FINDINGS:

- (A) A band of light scaling was observed around the entire perimeter of Piers 1 and 2 from the channel bottom to 2 feet below the waterline with up to 1/4 inch of penetration.
- (B) The entire pier shaft at Pier 1 and Pier 2 was located in a 2-foot-deep scour depression which extended approximately 3 feet off the pier faces and noses.

RECOMMENDATIONS:

- (A) Monitor scour around the stem of each pier during future underwater inspections. If scour is found to be increasing and/or foundation undermining develops, scour counter measures may become warranted.

- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

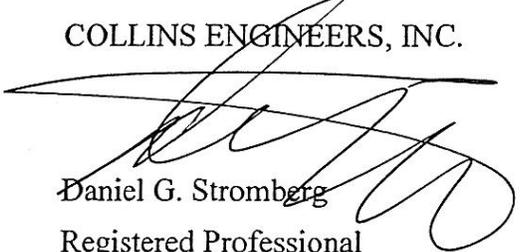
PROFESSIONAL ENGINEER

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: 30501

Feature Crossed: Rum River

Feature Carried: CSAH No. 7

Location: District 3 - Isanti County

Bridge Description: The bridge superstructure consists of three spans of multiple steel girders supported by two concrete hammerhead type piers and two concrete abutments. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E (WSB)

Dive Team: Brad Robinson (WSB), John Loftus (Collins)

Date: July 27, 2012

Weather Conditions: Sunny, 70° F

Underwater Visibility: 1.0 foot

Waterway Velocity: 2.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each pier consists of an oblong rectangular shaft with rounded noses and rests upon a rectangular concrete footing supported on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 9.2 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 8.9 feet below reference.
Assumed Waterline Elevation = 91.1

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 6

Item 92B: Underwater Inspection: Code B/07/12

Item 113: Scour Critical Bridges: Code O/02

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
210	Concrete Pier Wall	33	LF		33			
361	Scour Smart Flag	1	EA		1			
985	Slopes and Slope Protection	1	EA		1			



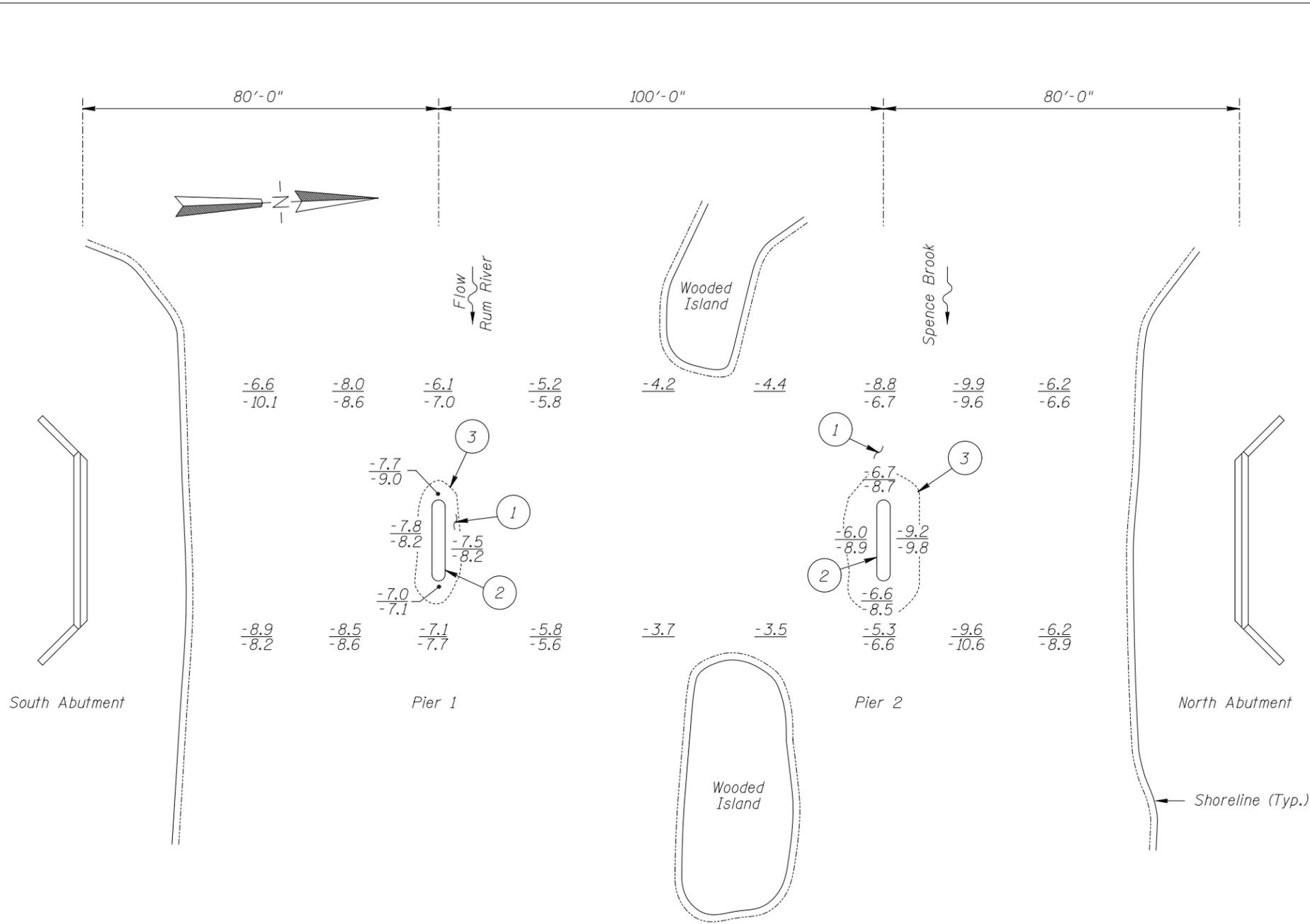
Photograph 1. Overall View of Structure, Looking Southeast.



Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 2, Looking South.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on July 27, 2012, the waterline was located approximately 8.9 feet below the top of the 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 91.1.
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 consisted of silty sand with up to 1 foot of probe rod penetration.
- 2 A band of light scaling was observed around the entire perimeter of both piers and extended from the channel bottom to 2 feet below the waterline with up to 1/4 inch of penetration.
- 3 A scour pocket, 3 feet in radius by 2 feet deep, extended around the entire pier shaft at Pier 1 and 2.

Legend

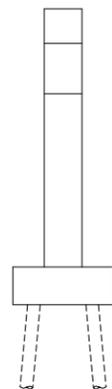
-6.0 Sounding Depth (7/27/12)
 -6.0 Sounding Depth 10/16/07

○ Scour Depression

Note:

All soundings based on 2012 waterline location.

TYPICAL END VIEW OF PIERS



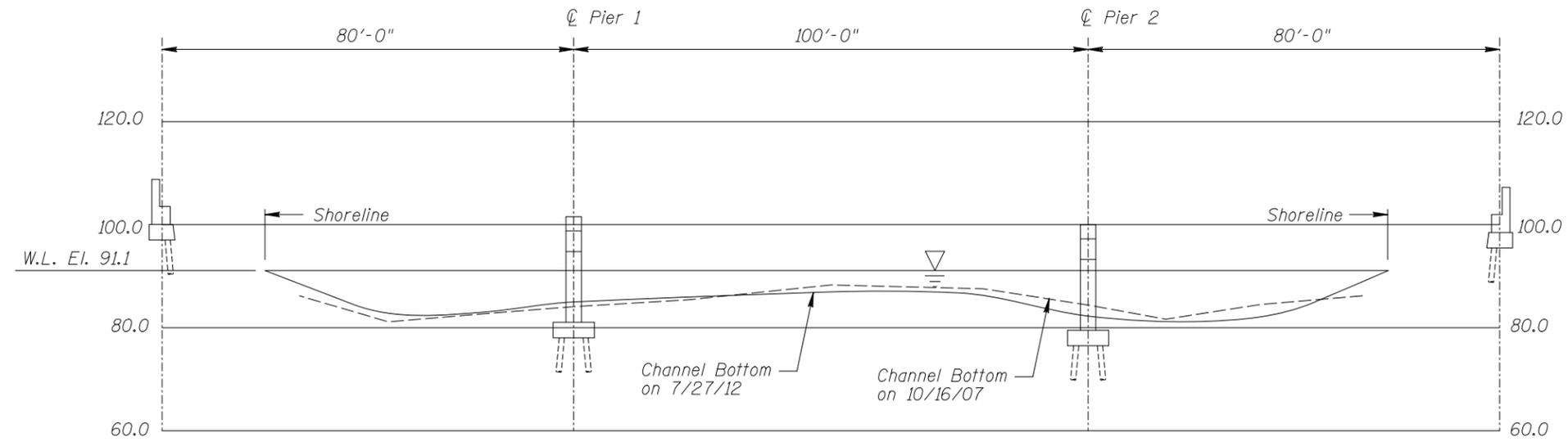
**MINNESOTA
 DEPARTMENT OF TRANSPORTATION
 UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 30501
 OVER THE RUM RIVER
 DISTRICT 3, ISANTI COUNTY

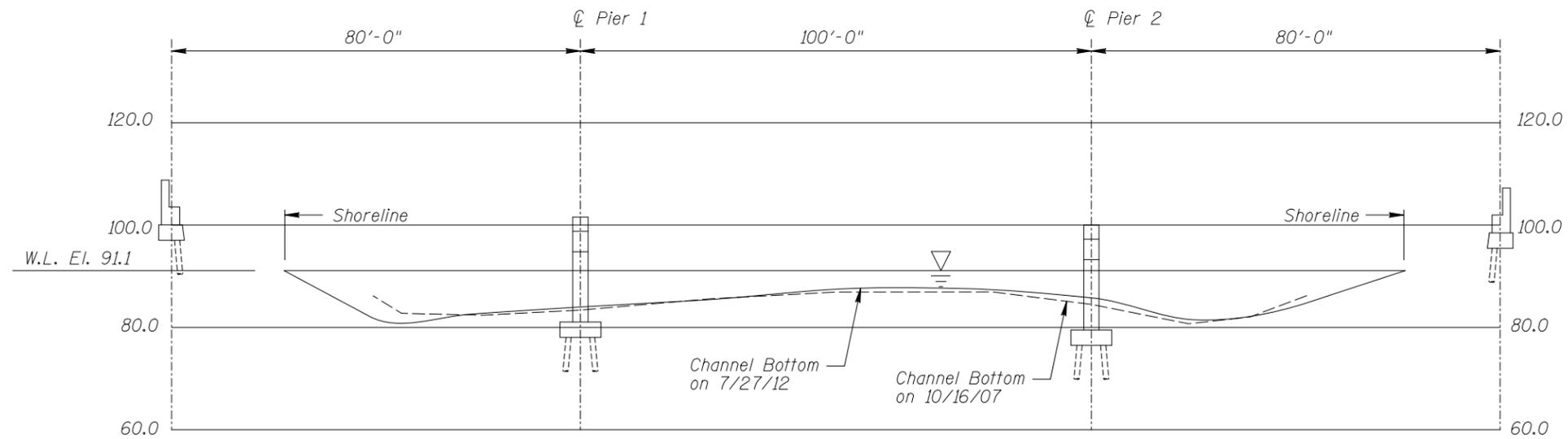
INSPECTION AND SOUNDING PLAN

Drawn By: BJR	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: JULY 2012
Checked By: BRL		Scale: NTS
Code: 522130501		Figure No.: 1

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.



**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 30501
OVER THE RUM RIVER
DISTRICT 3, ISANTI COUNTY
UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: BJR	COLLINS ENGINEERS	Date: JULY 2012
Checked By: BRL		Scale: 1"=30'
Code: 522130501		Figure No.: 2

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(312) 704-9300
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MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: WSB & Associates and Collins DATE: July 27, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 30501 WEATHER: Sunny, 70° F

WATERWAY CROSSED: Rum River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Brad Robinson (WSB), John Loftus (Collins)

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

TIME IN WATER: 9:35 a.m.

TIME OUT OF WATER: 10:15 a.m.

WATERWAY DATA: VELOCITY 2 ft/sec

VISIBILITY 1.0 foot

DEPTH 9.2 feet maximum at Pier 2, 9.6 feet maximum in channel

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete of the piers was in good condition. A band of light scaling was observed along the entire perimeter of both piers from the channel bottom to 2 feet below the waterline with up to ¼ inch of penetration. The entire pier shaft at Pier 1 and Pier 2 was located in a 2-foot-deep scour depression which extended approximately 3 feet off the pier faces and noses.

FURTHER ACTION NEEDED: YES NO

Monitor scour around the stem of each pier during future underwater inspections. If scour is found to be increasing and/or foundation undermining develops, scour counter measures may become warranted.

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. 30501
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED Rum River

INSPECTION DATE July 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	7.8'	N	7	N	8	N	7	6	6	6	N	6	7	N	N	N	N	N
	Pier 2	9.2'	N	7	N	8	N	7	6	6	6	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good condition. A band of light scaling was observed along the entire perimeter of both piers from the channel bottom to 2 feet below the waterline with up to ¼ inch of penetration. The entire pier shaft at Pier 1 and Pier 2 was located in a 2-foot-deep scour depression which extended approximately 3 feet off the pier faces and noses.

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.