

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 30506
CR NO. 63
OVER THE
STANCHFIELD CREEK
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. 30506, Piers 1 and 2; and South Abutment were found to be in good condition with no defects of structural significance observed. The timber piles were in good condition and exhibited only minor checking. The channel bottom appeared stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The timber piles at both piers were in good condition with minor checking up to 1/4 inch in width.
- (B) The upper and lower bracing connection to the easternmost pile of Pier 2 exhibited minor splits which did not affect the connection.
- (C) The upstream piles of each pier were protected with a steel ice breaker which exhibited moderate corrosion with rust delamination up to 1/4 inch thick and nodules up to 1/4 inch in diameter with 1/16 inch deep pitting extending from the channel bottom to the waterline.
- (D) Moderate accumulation of timber debris consisting of logs and branches up to 12 inches in diameter along with some vegetation was observed at the upstream fascia from Pier 1 to the North Shore, extending 5 feet upstream of the fascia and extending from the channel bottom to 1 foot above the waterline. The accumulation was 25 feet long by 3 feet wide.

RECOMMENDATIONS:

- (A) Monitor the timber debris accumulation at the piers, during future inspections, and if found to be increasing to a more detrimental extent, removal operations may become warranted at that time.

- (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,

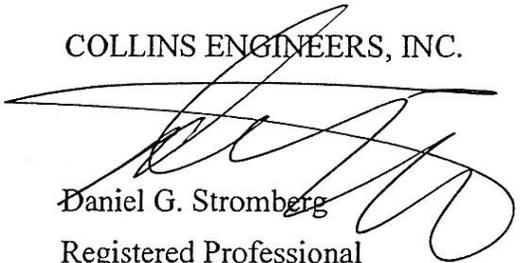
PROFESSIONAL ENGINEER

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: 30506

Feature Crossed: Stanchfield Creek

Feature Carried: CR No. 63

Location: District 3 - Isanti County

Bridge Description: The bridge superstructure consists of three spans of timber deck and stringers that are supported by two timber pile piers and two timber pile abutments. The piers are numbered 1 and 2 starting from the south end of the bridge. Each pier consists of a timber pier cap supported by eight timber piles. The abutments consist of ten timber piles with horizontal wall planking.

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: < .5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2 and South Abutment

General Shape: Each pier consists of a timber pier cap supported by a single row of eight timber piles. Timber cross bracing interconnects the piles. The abutment consists of a timber pile cap supported by ten timber piles with horizontal backwall planking.

Maximum Water Depth at Substructure Inspected: Approximately 6.3 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the pile cap at the west end of Pier 1.

Water Surface: The waterline was approximately 5.2 feet below reference.
Waterline Elevation = 933.3.

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

Item 60: Substructure: Code 6

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
206	Timber Column	36	LF		35	1		
361	Scour Smart Flag	1	EA		1			
985	Slopes and Slope Protection	1	EA			1		



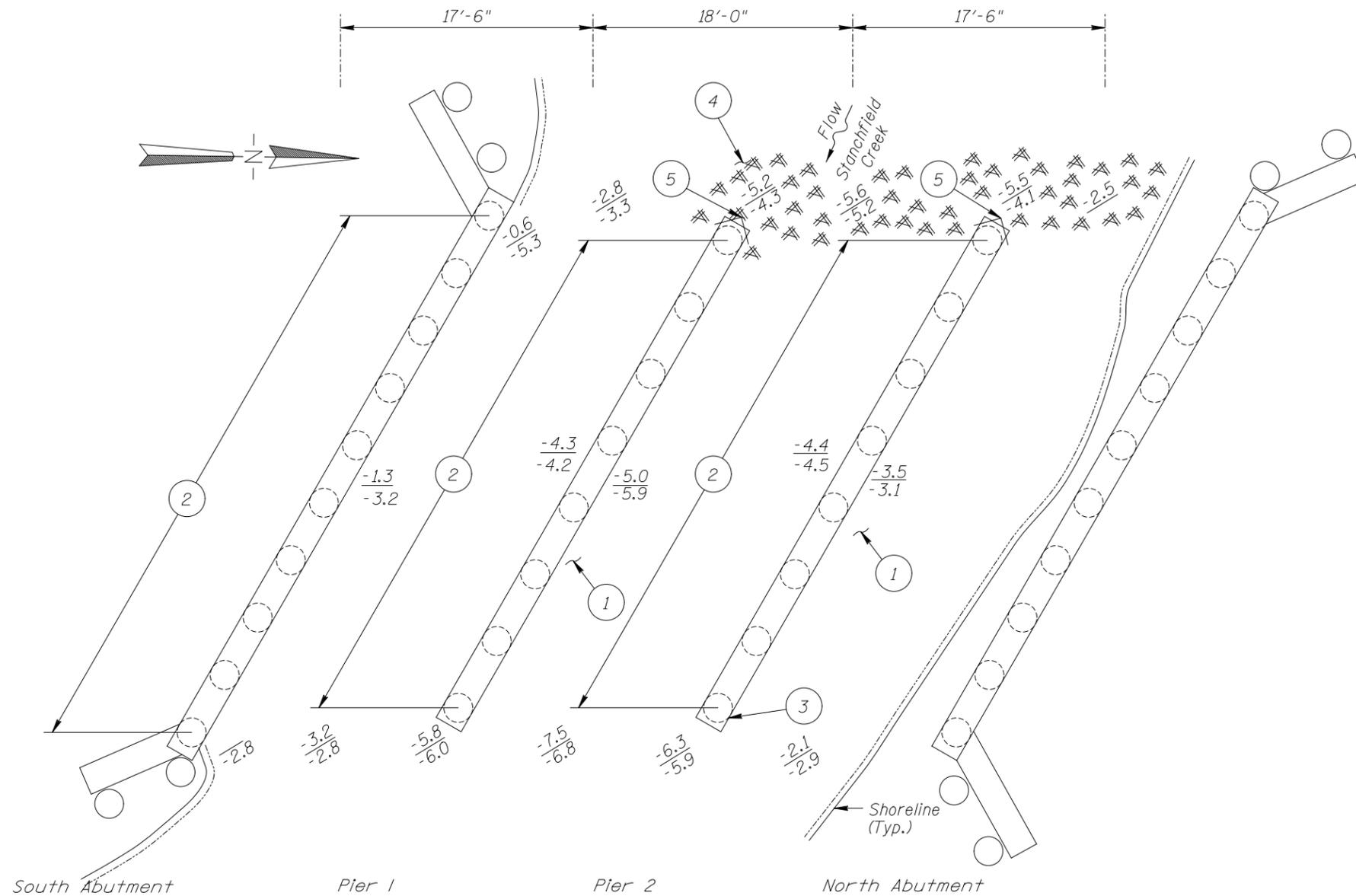
Photograph 1. Overall View of the Structure, Looking East.



Photograph 2. View of Pier 2, Looking Southwest.



Photograph 3. View of Pier 1 and Timber Debris, Looking Northeast.



SOUNDING PLAN

GENERAL NOTES:

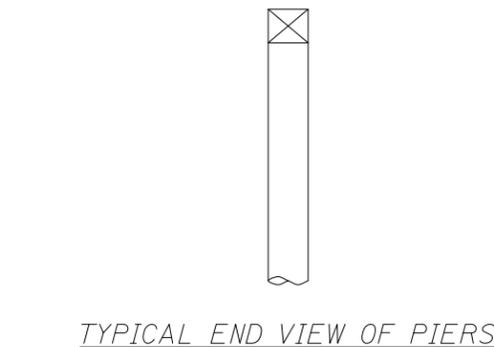
1. Piers 1 and 2 and the South Abutment were inspected underwater.
2. At the time of inspection on July 27, 2012, the waterline was located approximately 5.2 feet below the top of the pile cap at the upstream end of Pier 1. This corresponds with a waterline elevation of 933.3 based on the previous report dated October 16, 2007.
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 the mid points between the substructure units.

INSPECTION NOTES:

- 1 The channel bottom consisted silty sand and of 6- to 8-inch-diameter cobbles with up to 1 inch of probe rod penetration.
- 2 The timber piles exhibited minor checking up to 1/4 inch wide.
- 3 The upper and lower cross bracing connection to the easternmost pile of Pier 2 exhibited minor splits.
- 4 A moderate accumulation of timber debris consisting of 12-inch-diameter and smaller logs along with some vegetation was observed at the upstream fascia from Pier 1 to the north shore, extending 5 feet upstream off the fascia and from the channel bottom to 1 foot above the waterline.
- 5 The upstream piles were protected with a steel ice breaker that exhibited moderate corrosion with rust nodules up to 1/4 inch in diameter with 1/16-inch-deep pitting from the channel bottom to the waterline.

Note:

All soundings based on 2012 waterline location.



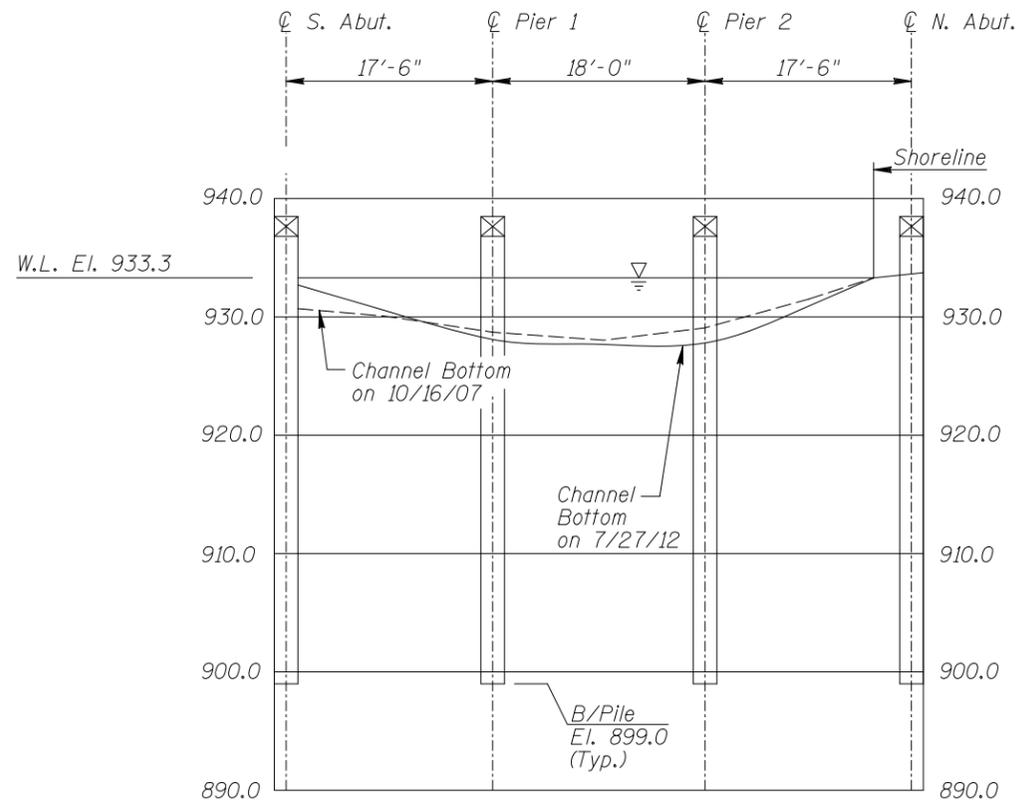
TYPICAL END VIEW OF PIERS

Legend

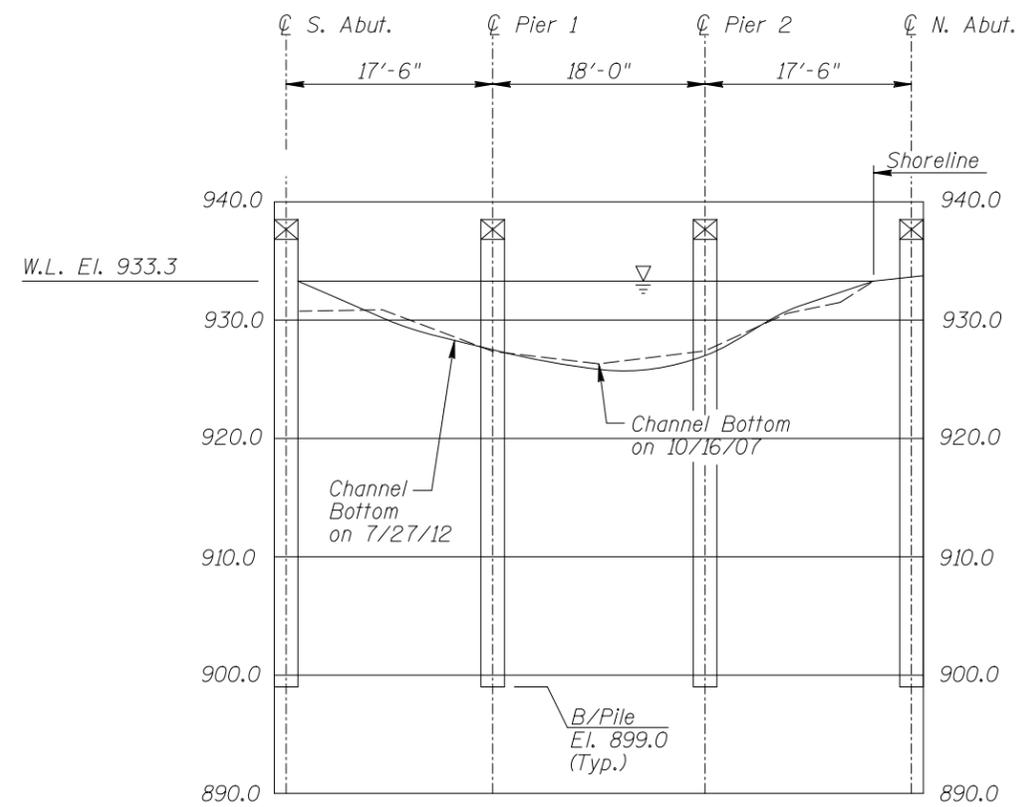
- 4.0 Sounding Depth from Waterline (7/27/12)
- 3.5 Sounding Depth from Waterline (9/16/07)
- Timber Pile (under pile cap)
- Timber Pile
- ▲▲▲ Timber Debris

WSB
 & Associates, Inc.
 701 Xenia Avenue South, Suite 300
 Minneapolis, MN 55416
 www.wsbeng.com
 763-541-4800 • Fax 763-541-1700
 INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 30506 OVER STANCHFIELD CREEK DISTRICT 3, ISANTICOUNTY		
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: 522I0074		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. 30506 OVER STANCHFIELD CREEK DISTRICT 3, ISANTI COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS	Date: JULY 2012
Checked By: BRL		Scale: 1/16"=1'
Code: 52210074		Figure No.: 2

123 North Wacker Drive
Suite 300
Chicago, IL 60606
(312) 704-9300
www.collinsengr.com

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: 30506 WEATHER: Sunny, 70°F

WATERWAY CROSSED: Stanchfield Creek

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

TIME IN WATER: 11:00 a.m.

TIME OUT OF WATER: 11:25 a.m.

WATERWAY DATA: VELOCITY < 0.5 ft/sec

VISIBILITY 1.0 feet

DEPTH 6.3 feet maximum at Pier 2, 7.5 feet in channel

ELEMENTS INSPECTED: Piers 1 and 2, and South Abutment

REMARKS: Overall, the timber piles at the substructure units were in good condition with minor checking up to 1/4 inch in width. The upper and lower bracing connection to the easternmost pile of Pier 2 exhibited minor splits which did not affect the connection. The upstream piles of each pier were protected with a steel ice breaker which exhibited moderate corrosion with rust delamination from the channel bottom to the waterline. The abutment backwall planking at the South Abutment was in good condition. Moderate accumulation of timber debris consisting of logs and branches up to 12 inches in diameter along with some vegetation was observed at the upstream fascia from Pier 1 to the North Shore, extending 5 feet upstream of the fascia and extending from the channel bottom to 1 foot above the waterline.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris accumulation at the piers, during future inspections, and if found to be increasing to a more detrimental extent, removal operations may become warranted at that time.

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. 30506
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED Stanchfield Creek

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	5.8'	7	N	N	8	7	7	7	7	N	6	6	N	N	7	N	N	N
	Pier 2	6.3'	7	N	N	8	6	7	7	N	N	6	6	N	N	7	N	7	N
	South Abutment	1.3'	7	7	N	8	N	7	7	N	N	N	7	N	N	7	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the timber piles at the substructure units were in good condition with minor checking up to 1/4 inch in width. The upper and lower bracing connection to the easternmost pile of Pier 2 exhibited minor splits which did not affect the connection. The upstream piles of each pier were protected with a steel ice breaker which exhibited moderate corrosion with rust delamination from the channel bottom to the waterline. The abutment backwall planking at the South Abutment was in good condition. Moderate accumulation of timber debris consisting of logs and branches up to 12 inches in diameter along with some vegetation was observed at the upstream fascia from Pier 1 to the North Shore, extending 5 feet upstream of the fascia and extending from the channel bottom to 1 foot above the waterline.

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.