

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7150

CSAH NO. 10

OVER THE

BLUE EARTH RIVER

DISTRICT 7 - BLUE EARTH COUNTY



SEPTEMBER 11, 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. 7150, Piers 1 and 2, were found to be in good condition with no structurally significant defects observed. Both piers exhibited partial footing exposure with up to 8 inches of vertical face exposure. A heavy accumulation of timber debris was observed at Pier 2. The channel bottom appeared stable with no appreciable changes observed since the previous inspection.

INSPECTION FINDINGS:

- (A) The top of the footing was exposed from the upstream nose to the upstream quarter point along the south face of Pier 1 with up to 8 inches of vertical face exposure detected.
- (B) The footing was exposed along the upstream half of the north face of Pier 2 with up to 3 inches of vertical face exposure detected.
- (C) An area of surface concrete section loss, 1.5 feet wide by 6 inches high with a penetration of 1/4 inch, was observed 1.5 feet above the waterline on the south face of the downstream end of Pier 1.
- (D) A band of light to moderate scaling from 3 feet to 1 foot above the waterline was observed 5 feet across the downstream end of Pier 2, with penetrations up to 1/2 inch deep.
- (E) Moderate to heavy accumulation of timber debris was observed along both faces and the upstream nose of Pier 2 extending from the channel bottom to 8 feet above the waterline. The debris extended up to 25 feet off the pier nose and up to 8 feet off the pier faces.

RECOMMENDATIONS:

- (A) Monitor the timber debris at Pier 2 during future inspections.
- (B) Monitor pier footing exposure during future inspections.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:
WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

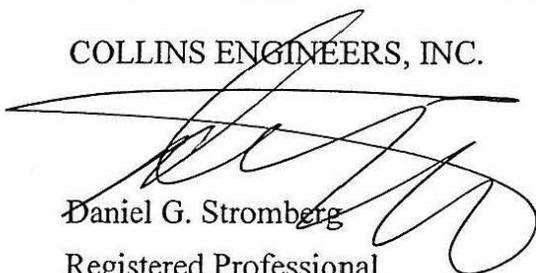
PROFESSIONAL ENGINEER

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: 7150

Feature Crossed: Blue Earth River

Feature Carried: CSAH No. 10

Location: District 7 - Blue Earth County

Bridge Description: The bridge superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The pier footings are founded on steel H-piles, while the abutments are founded on treated timber piles. The piers are numbered 1 and 2 starting from the north end of the bridge.

2. INSPECTION DATA

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

Dive Team: Kasey Yoder (WSB), Lukas Janulis (Collins)

Date: September 11, 2012

Weather Conditions: Sunny, 85°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.5 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of two elongated hexagonal columns supporting a rectangular pier cap. The pier columns are connected by an 8 foot tall concrete diaphragm that extends up from the top of the footing. The columns are supported by a rectangular footing founded on steel H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 3.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the diaphragm wall at Pier 1.

Water Surface: The waterline was approximately 6.0 feet below reference.

Waterline Elevation = 977.9

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/09/12

Item 113: Scour Critical Bridges: Code R/03

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

X Yes No

6. STRUCTURAL ELEMENT CONDITION RATING

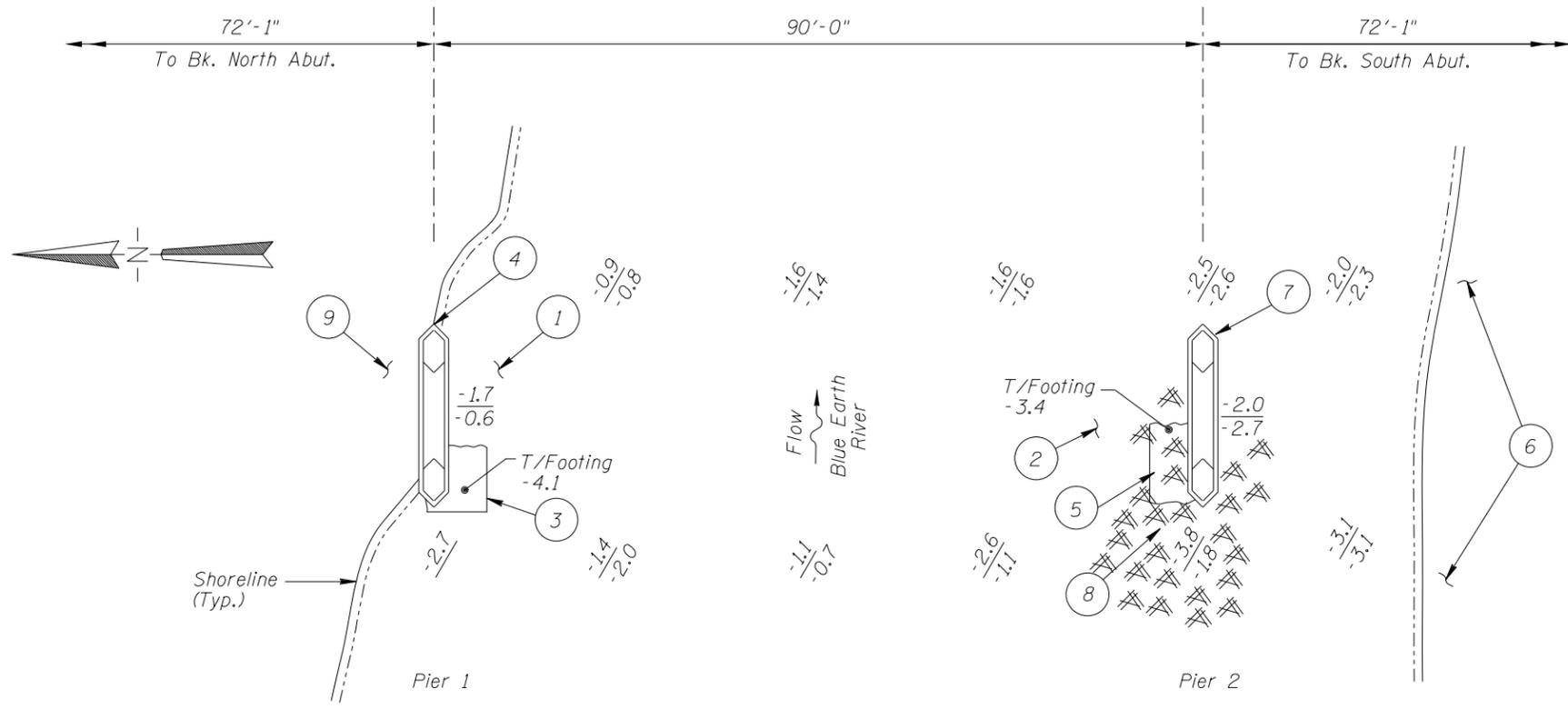
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Concrete Column	4	EA	4				
361	Scour	1	EA		1			
985	Slopes & Slope Protection	1	EA		1			



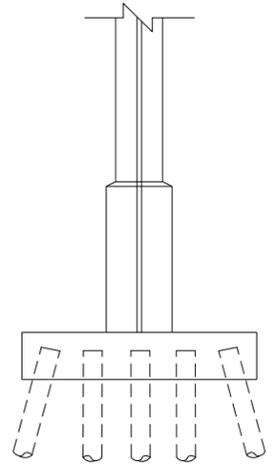
Photograph 1. View of Pier 1, Looking South.



Photograph 2. View of Pier 2, Looking South.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

Legend

-2.0	Sounding Depth (9/11/12)
-5.2	Sounding Depth (11/19/07)
	Timber Debris

Note:
All soundings based on 2012 waterline location.

GENERAL NOTES:

- Piers 1 and 2 were inspected underwater.
- At the time of inspection on September 11, 2012, the waterline was located approximately 6.0 feet below the top of the diaphragm wall at Pier 1. This corresponds to a waterline elevation of 977.9.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom consisted of gravel overlaid with fine silty sand with 2 inches of probe rod penetration.
- The channel bottom consisted of fine silty sand with 3 inches of probe rod penetration.
- The top of the footing was exposed from the upstream nose to the upstream quarter point along the south face of Pier 1 with 8 inches of maximum vertical face exposure detected.
- An area of section loss, 6 inches wide by 1.5 feet high with a penetration of up to 1/4 inch, was observed at 1.5 feet above the waterline on the downstream nose of Pier 1.
- The footing was exposed along the upstream half of the north face of Pier 2 with 3 inches of maximum vertical face exposure detected.
- The South Abutment was well protected with heavy riprap and large pieces of concrete.
- A band of light to moderate scaling was observed 5 feet across the downstream end from 3 feet to 1 foot above the waterline with penetrations up to 1/2 inch deep.
- A moderate to heavy accumulation of timber debris was observed along both faces and the upstream nose of Pier 2 extending from the channel bottom to 8 feet above the waterline. The debris extended up to 25 feet off the pier nose and up to 8 feet off the pier faces.
- Up to 1.5 foot diameter riprap was protecting the north embankment along the north face of Pier 1.

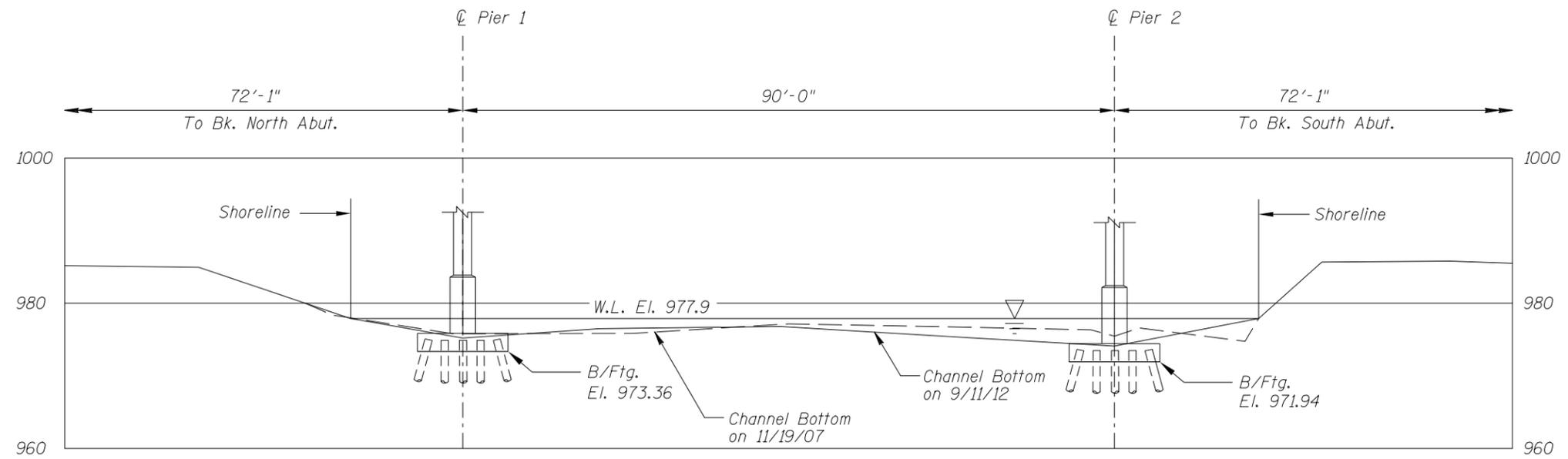
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**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

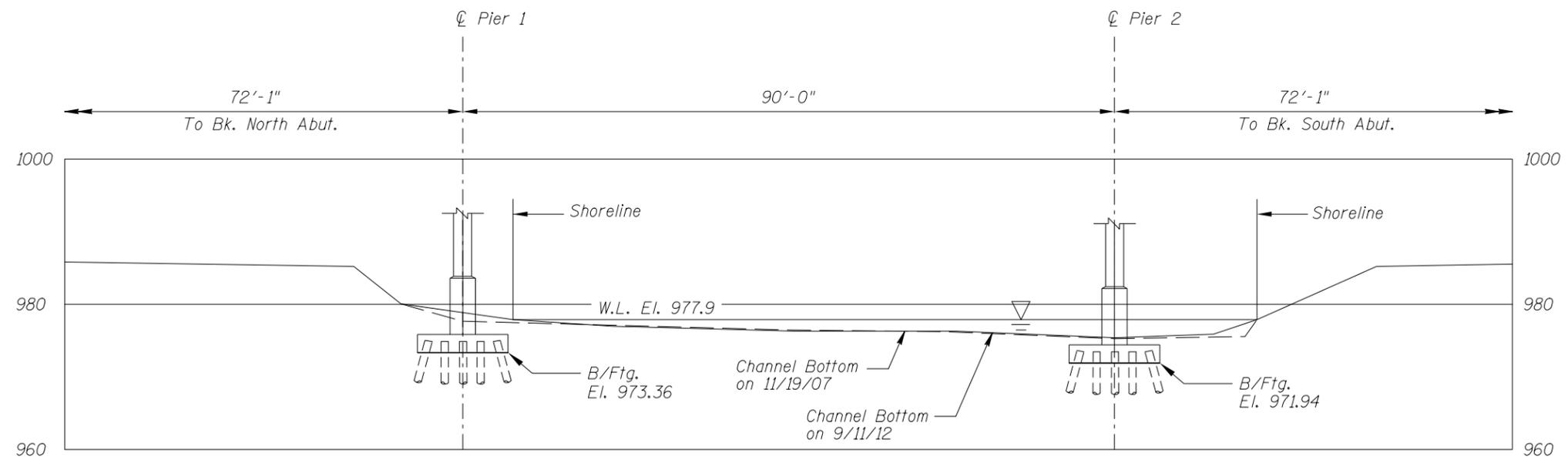
STRUCTURE NO. 7150
OVER THE BLUE EARTH RIVER
DISTRICT 7, BLUE EARTH COUNTY

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: SEP, 2012
Checked By: BRL		Scale: NTS
Code: 52210138		Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

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MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 7150 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: SEP. 2012
Checked By: BRL		Scale: 1"=20'
Code: 52210138		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins Engineers DATE: September 11, 2012

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

BRIDGE NO: 7150 WEATHER: Sunny, 85°F

WATERWAY CROSSED: Blue Earth River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Kasey Yoder (WSB), Lukas Janulis (Collins)

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

TIME IN WATER: 11:30 A.M.

TIME OUT OF WATER: 12:00 P.M.

WATERWAY DATA: VELOCITY 1.5 fps

VISIBILITY 2 foot

DEPTH 3.8 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were found to be in good condition with no structurally significant defects observed. Partial footing exposure was detected at both piers with up to 8 inches of vertical face exposure at the upstream nose of Pier 1 and up to 3 inches of vertical face exposure along the north face of Pier 2. A heavy accumulation of timber debris was observed at Pier 2.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris at Pier 2 to prevent any adverse affects on the bridge.

Monitor pier footing exposure during future inspections.

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. 7150
 INSPECTORS WSB & Associates and Collins Engineers, Inc
 ON-SITE TEAM LEADER WSB & Associates and Collins Engineers, Inc
 WATERWAY CROSSED Blue Earth River

INSPECTION DATE September 11, 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	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'	N	7	7	8	N	7	6	7	7	7	6	7	N	N	N	N	N
	Pier 2	3.8'	N	7	7	8	N	7	6	8	8	6	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were found to be in good condition with no structurally significant defects observed. Partial footing exposure was detected at both piers with up to 8 inches of vertical face exposure at the upstream nose of Pier 1 and up to 8 inches of vertical face exposure along the north face of Pier 2. A heavy accumulation of timber debris was observed at Pier 2.

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.