

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7097

CR NO. 7

OVER THE

RED RIVER OF THE NORTH

DISTRICT 2 - POLK COUNTY, CITY OF CLIMAX



AUGUST 30, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

AYRES ASSOCIATES & COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 7097, Pier 2, was in good condition with no defects of structural significance observed. Channel bottom aggradation has occurred at the bridge site since the last underwater inspection as the water depth soundings indicated the streambed elevation was an average of 2 feet higher and the top of footing at Pier 2 was no longer exposed.

INSPECTION FINDINGS:

- (A) Moderate to heavy timber debris consisting of logs and branches 2 feet diameter and smaller was observed at the south (upstream) end and along the entire east face of Pier 2. The debris extended from the channel bottom up 3 feet above the waterline, 6 feet off the east face and 10 feet off the upstream nose towards the west.
- (B) Vertical crack up to 1/8 inch wide was located on east and west faces of Pier 2 extending from the strut to the channel bottom at midpoint of the pier.
- (C) The previously reported footing exposure at Pier 2 was not observed.

RECOMMENDATIONS:

- (A) Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.

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

Inspection Team Leader:

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

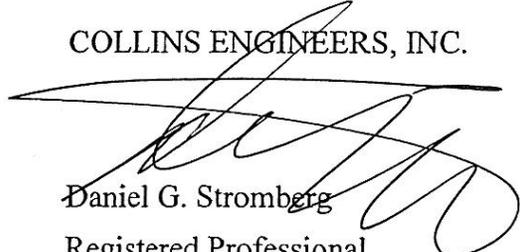
PROFESSIONAL ENGINEER

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: 7097

Feature Crossed: Red River of the North

Feature Carried: CR No. 7

Location: District 2 - Polk County, City of Climax

Bridge Description: The superstructure consists of two steel through truss spans and five steel beam approach span. The superstructure is supported by two reinforced concrete abutments, three steel pile framed bents, and three reinforced concrete piers. The abutments are supported by treated timber piles. The piers are supported by untreated timber piles. The substructure units are designated West Abutment, Piers 1, 2 and 3, Bents 1, 2, and 3, and East Abutment. The piers support the two truss spans over the river and are numbered from west to east.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, Anthony J. Coffaro

Date: August 30, 2012

Weather Conditions: Cloudy, 77°F

Underwater Visibility: None/Negligible

Waterway Velocity: 2.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2.

General Shape: The pier consists of a reinforced concrete cap supported by two multi-sided columns connected by a slender diaphragm wall braced with an integral horizontal strut. The pier is founded on a rectangular footing supported by timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.4 Feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 54.0 feet below reference.

Waterline Elevation = 799.7.

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/08/12

Item 113: Scour Critical Bridges: Code I

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

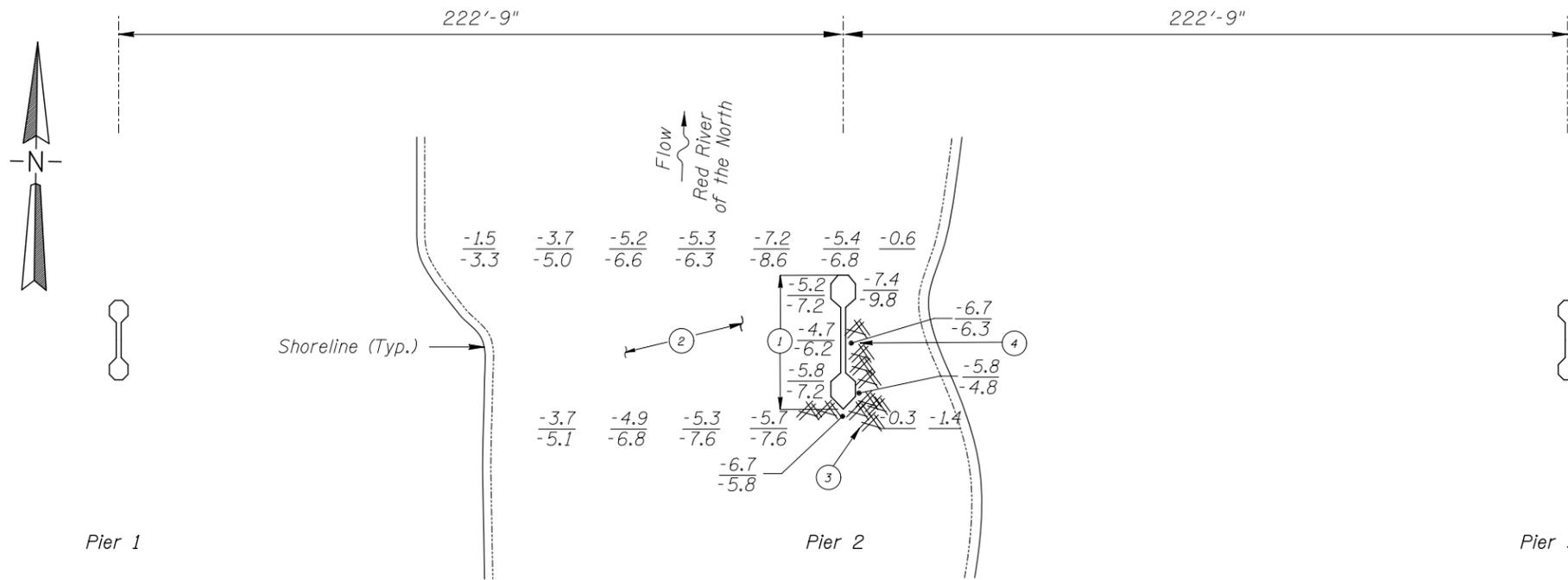
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	26	LF		26			
985	Slopes and Slope Protection	1	EA		1			



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



Photograph 2. View of Pier 2, Looking East.



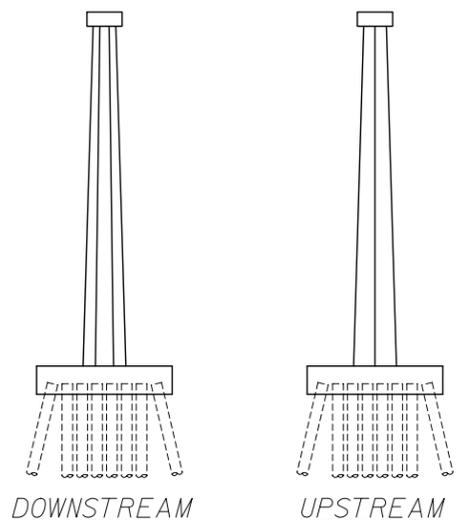
SOUNDING PLAN

GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on August 30, 2012, the waterline was located approximately 54.0 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds to a waterline elevation of 799.7 based on design drawings.
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 truss panel points between the substructure units.

INSPECTION NOTES:

- ① Overall, concrete was smooth and sound with no significant defects.
- ② The channel bottom consisted of soft silt with 2 feet of maximum probe rod penetration.
- ③ Moderate to heavy timber debris accumulation consisting of logs and branches 2 feet in diameter and smaller was observed at south end and east face of Pier 2. The debris extended from channel bottom to 3 feet above the waterline, 6 feet off the east face and 10 feet off the upstream nose.
- ④ Vertical crack 1/8 inch wide extending from strut to channel bottom was located at midpoint of pier on east and west faces of Pier 1.



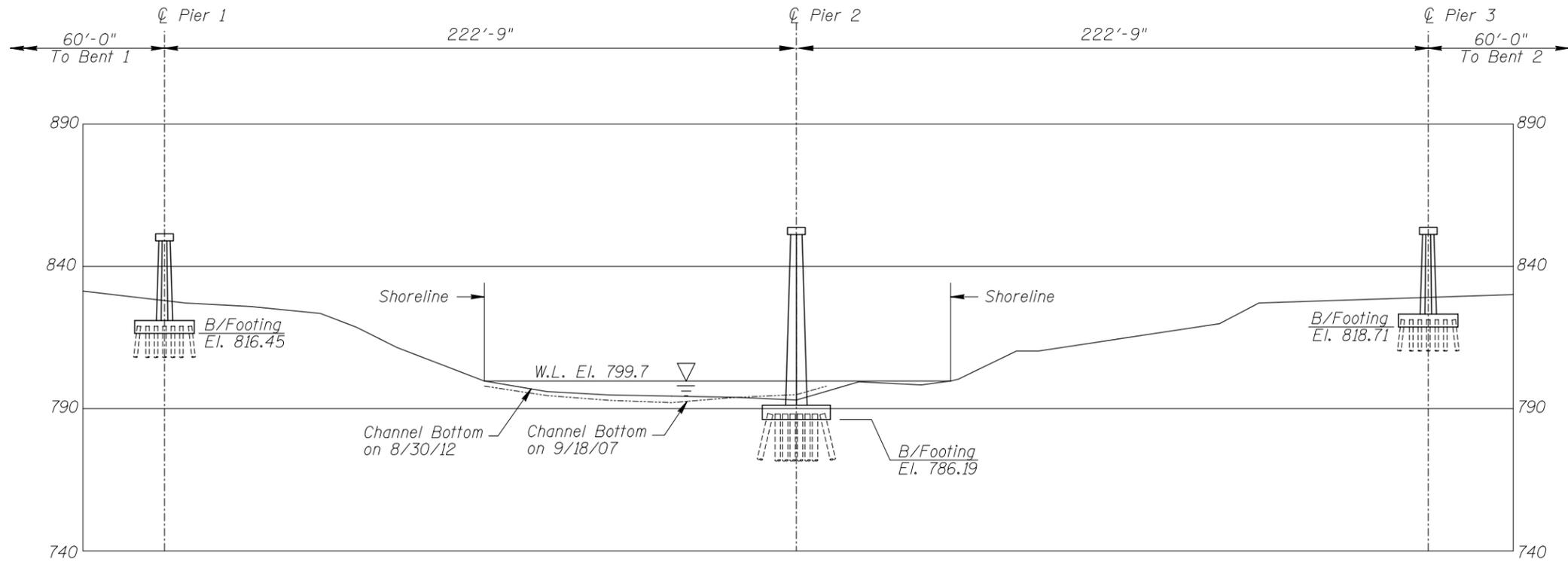
TYPICAL END VIEWS OF PIER 2

Legend

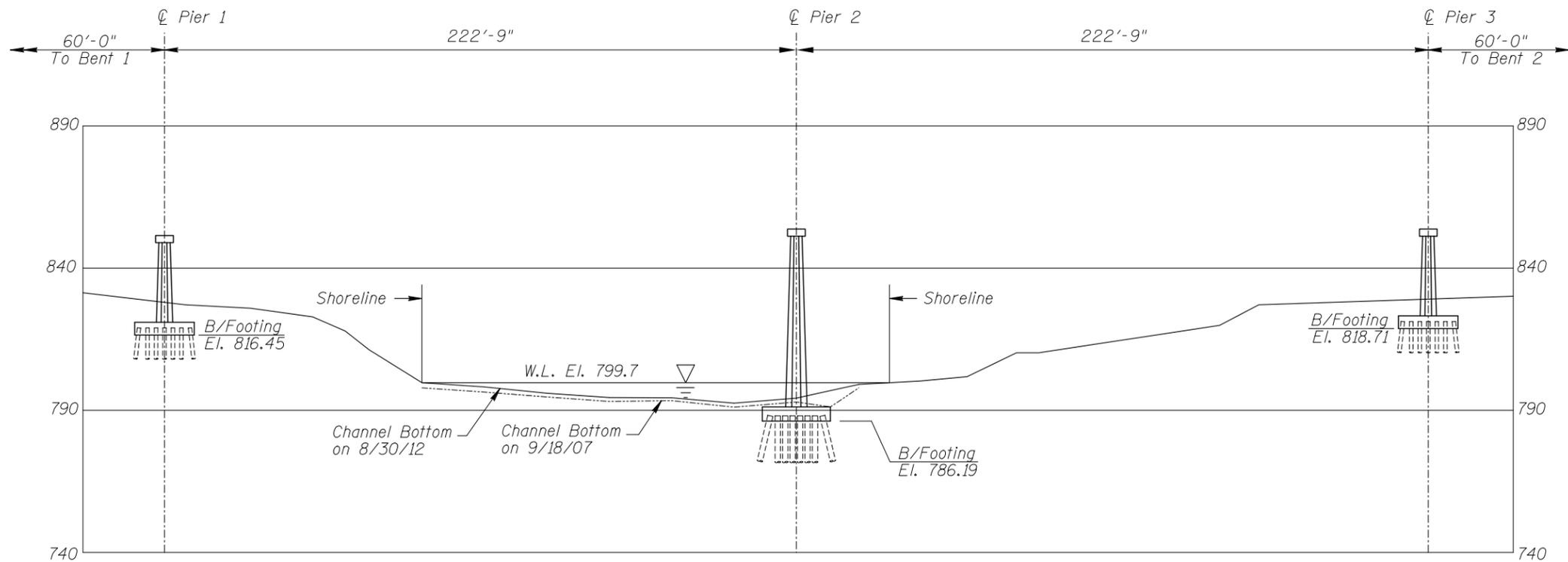
- 2.0 Sounding Depth (8/30/12)
- 5.0 Sounding Depth (9/18/07)
- Timber Debris

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 7097 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF CLIMAX		
INSPECTION AND SOUNDING PLAN		
Drawn By: JAC		Date: SEPT, 2012
Checked By: BKS	<small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small>	Scale: NTS
Code: 52217097		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. 7097 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF CLIMAX		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: JAC	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: SEPT, 2012
Checked By: BKS		Scale: 1"=50'
Code: 52217097		Figure No.: 2

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

INSPECTORS: Ayres Associates DATE: August 30, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 7097 WEATHER: Cloudy, 77°F

WATERWAY CROSSED: Red River of the North

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Jason A. Cook, Anthony J. Coffaro

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

TIME IN WATER: 2:50 PM

TIME OUT OF WATER: 3:20 PM

WATERWAY DATA: VELOCITY 2 ft/sec

VISIBILITY None/Negligible

DEPTH 7.4 feet maximum at Pier 2.

ELEMENTS INSPECTED: Pier 2

REMARKS: Overall, the concrete was smooth and sound. Moderate to heavy timber debris consisting of logs and branches 2 feet diameter and smaller was observed at the south end and around the entire east face of Pier 2. The debris extended from the channel bottom up to 3 feet above the waterline, 6 feet off the east face and 10 feet off the upstream nose towards the west. A vertical crack 1/8 inch wide was located on east and west faces of Pier 2 from the strut to the channel bottom at midpoint of pier wall. Previously reported footing exposure was not observed at the east side of the north column.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris, and if found to be increasing in the future, removal operations 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. 7097
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Red River of the North

INSPECTION DATE August 30, 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 2	7.4'	N	7	N	9	N	7	7	8	N	6	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound. Moderate to heavy timber debris consisting of logs and branches 2 feet diameter and smaller was observed at the south end and around the entire east face of Pier 2. The debris extended from the channel bottom up to 3 feet above the waterline, 6 feet off the east face and 10 feet off the upstream nose towards the west. A vertical crack 1/8 inch wide was located on east and west faces of Pier 2 from the strut to the channel bottom at midpoint of pier wall. Previously reported footing exposure was not observed at the east side of the north column.

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.