

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 07514

CSAH NO. 34

OVER THE

BLUE EARTH RIVER

DISTRICT 7 - BLUE EARTH COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 136)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 7514, Piers 1 and 2, were found to be in good condition with no structurally significant defects observed. Minor scour depressions were observed at the upstream nose of both piers, as well as moderate to heavy accumulations of timber debris. The channel bottom around the substructure units appeared stable with no evidence of significant scour and no significant changes since the previous inspection.

INSPECTION FINDINGS:

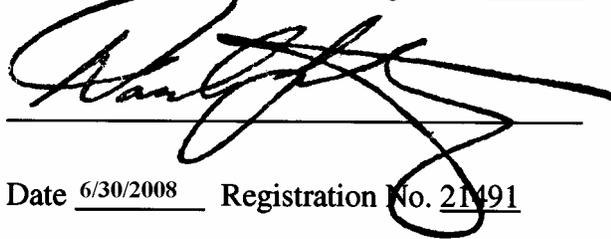
- (A) Minor areas of poor consolidation were observed in the concrete of Pier 1 at the upstream nose.
- (B) A 1/16-inch-wide vertical crack was observed on the upstream nose of Pier 1 and extended from the waterline to 3 feet above the waterline.
- (C) A scour depression, 10 feet in radius and 3 feet deep, was observed at the upstream nose of Pier 1, and a scour depression, 4 feet in radius and 1.5 feet deep, was observed at the upstream nose of Pier 2.
- (D) A Heavy accumulation of timber debris, with pieces up to 2.5 feet in diameter, was observed at the upstream nose and along both sides of Pier 1 extending from the channel bottom to above water.
- (E) A light to moderate accumulation of timber debris, with pieces up to 6 inches in diameter, was observed at the upstream nose and east side of Pier 2.
- (F) Steep vertical banks due to erosion were observed under the bridge on the east side and upstream and downstream of the structure on both sides of the river.

RECOMMENDATIONS:

- (A) Remove the timber debris at the piers before accumulations can further increase and adversely affect the piers and/or surrounding channel bottom.
- (B) 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.

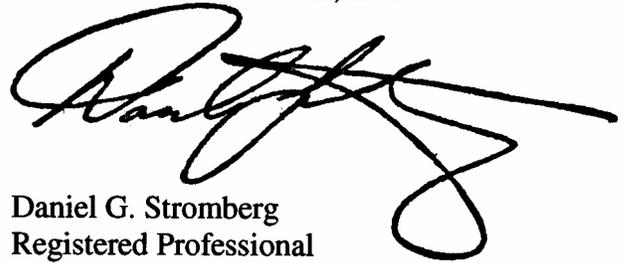
Daniel G. Stromberg



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: 7514

Feature Crossed: Blue Earth River

Feature Carried: CSAH No. 34

Location: District 7 - Blue Earth County

Bridge Description: The bridge superstructure consists of three spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The abutments are founded on steel piles, while the piers are supported by concrete spread footings. The piers are numbered 1 and 2 starting from the west 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: November 20, 2007

Weather Conditions: Cloudy, 48°F

Underwater Visibility: 3.0 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of a reinforced concrete rectangular shaft with hammerhead cap and rounded ends. The piers are founded on rectangular spread footings.

Maximum Water Depth at Substructure Inspected: Approximately 6.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of Pier 2 on the south end.

Water Surface: The waterline was approximately 18.5 feet below reference.
Waterline Elevation = 1016.9

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 5

Item 92B: Underwater Inspection: Code B/11/07

Item 113: Scour Critical Bridges: Code J/91

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

 Yes X No



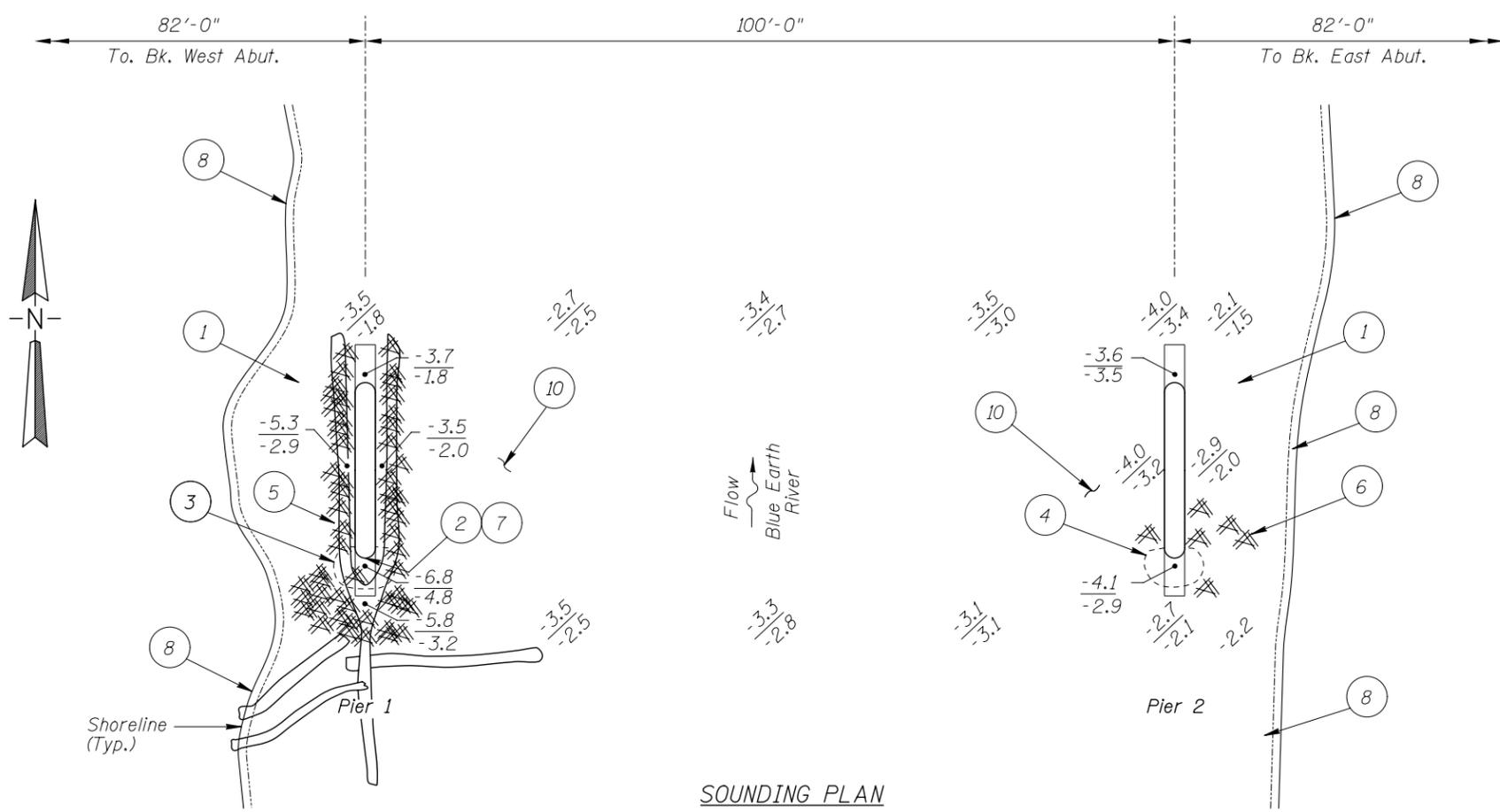
Photograph 1. Overall View of Bridge, Looking Southwest.



Photograph 2. View of Pier 1, Looking Northeast.

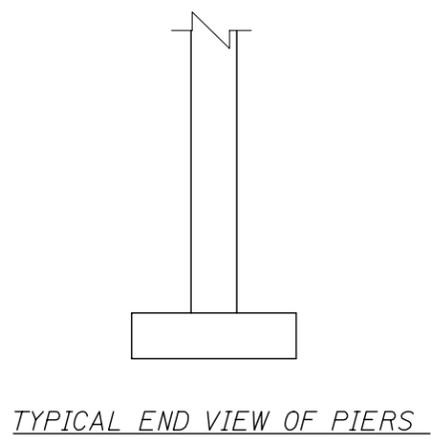


Photograph 3. View of Pier 2, Looking Northwest.



INSPECTION NOTES:

- ① The channel bottom consisted of soft silty sand with up to 8 inches of probe rod penetration.
- ② Minor areas of poor consolidation were observed in the concrete of Pier 1 at the upstream end.
- ③ A scour depression, 10 feet in radius and 3 feet deep, was observed at the upstream nose of Pier 1 due to timber debris.
- ④ A scour depression, 4 feet in radius and 1.5 feet deep, was observed at the upstream nose of Pier 2.
- ⑤ A heavy accumulation of timber debris, with pieces up to 2.5 feet in diameter, was observed at the upstream nose and along both faces of Pier 1. A tree 2.5 feet in diameter and 60 feet long was forked at the upstream end of the pier.
- ⑥ A light to moderate accumulation of timber debris, with pieces up to 6 inches in diameter, was observed at the upstream nose of Pier 2 and extended to the east embankment.
- ⑦ A 1/16-inch-wide vertical crack was observed on the upstream nose of Pier 1 and extended from the waterline to 3 feet above the waterline.
- ⑧ Minor vertical bank erosion was observed at the east embankment and upstream and downstream of the structure along both shorelines.
- ⑨ The concrete of the piers was smooth and sound.
- ⑩ The channel bottom consisted of gravel with 2 inches of probe rod penetration.



- GENERAL NOTES:**
1. Piers 1 and 2 were inspected underwater.
 2. At the time of inspection on November 20, 2007, the waterline was located approximately 18.5 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds to a waterline elevation of 1016.9 based on the previous report dated November 2, 2002.
 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.

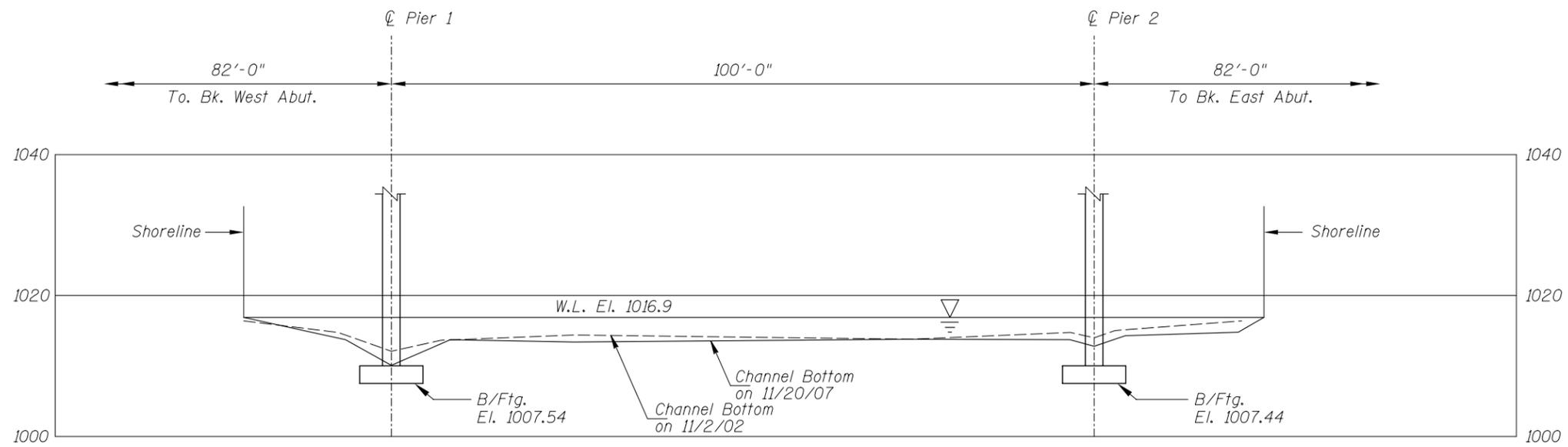
Legend

-2.0 Sounding Depth (11/20/07)
-5.2 Sounding Depth (11/2/02)

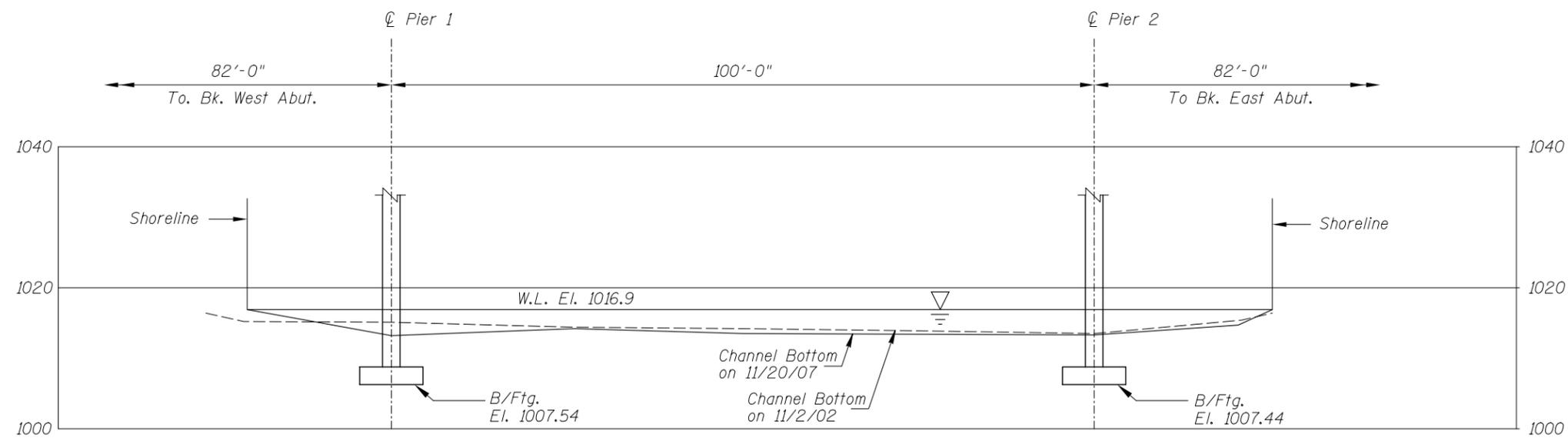
Timber Debris
 Scour Depression

Note:
All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 07514 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: NOV., 2007
Checked By: VR	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52210136		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 07514 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: NOV., 2007
Checked By: VR		Scale: NTS
Code: 52210136		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: November 20, 2007

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

BRIDGE NO: 7514 WEATHER: Cloudy, 48°F

WATERWAY CROSSED: Blue Earth River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

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

TIME IN WATER: 8:00 A.M.

TIME OUT OF WATER: 8:30 A.M.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 3.0 feet

DEPTH 6.8 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were in good condition with no structurally significant material defects observed. Scour depressions, 10 feet in radius and 3 feet deep (Pier 1) and 4 feet in radius and 1.5 feet deep (Pier 2), were observed at the upstream ends of both piers. Light (Pier 2) to heavy (Pier 1) accumulations of timber debris, with pieces up to 2.5 feet in diameter (Pier 1), were also observed at both piers. The west embankment was armored with riprap up to 2 feet in diameter; however, the east embankment and the banks upstream and downstream of the structure (both banks) exhibited minor vertical erosion. Around both piers the channel bottom consisted of silty sand and gravel with 2 to 8 inches of probe rod penetration.

FURTHER ACTION NEEDED: YES NO

Remove the timber debris at the piers before accumulations can further increase and adversely affect the piers and/or surrounding channel bottom.

Reinspect the submerged substructure units at the normal maximum recommended interval (NBIS) of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7514
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Blue Earth River

INSPECTION DATE November 20, 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	6.8'	N	7	N	9	N	7	6	7	8	5	5	7	N	N	N	N	N
	Pier 2	4.1'	N	7	N	9	N	7	7	6	6	8	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were in good condition with no structurally significant material defects observed. Scour depressions, 10 feet in radius and 3 feet deep (Pier 1) and 4 feet in radius and 1.5 feet deep (Pier 2), were observed at the upstream ends of both piers. Light (Pier 2) to heavy (Pier 1) accumulations of timber debris, with pieces up to 2.5 feet in diameter (Pier 1), were also observed at both piers. The west embankment was armored with riprap up to 2 feet in diameter; however, the east embankment and the banks upstream and downstream of the structure (both banks) exhibited minor vertical erosion. Around both piers the channel bottom consisted of silty sand and gravel with 2 to 8 inches of probe rod penetration.

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.