

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 07514

CSAH NO. 34

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. 07514, Piers 1 and 2, were found to be in good condition with no structurally significant defects observed. A minor scour depression was observed at the upstream nose of Pier 2, as well as light accumulation 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 scour depression, 4 feet in radius and 1.5 feet deep, was observed at the upstream nose of Pier 2.
- (C) A light accumulation of timber debris, with pieces up to 6 inches in diameter, was observed at the upstream nose and east side of Pier 2.
- (D) 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) The inspection of the submerged substructure units of Structure No. 07514 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.
- (B) 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,

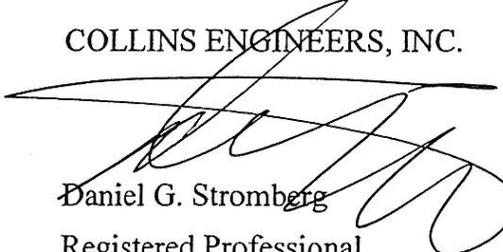
PROFESSIONAL ENGINEER

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: 07514

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: Barritt Lovelace, P.E.

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

Date: September 11, 2012

Weather Conditions: Sunny, 95°F

Underwater Visibility: 3.0 feet

Waterway Velocity: 0.5 ft/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 2.5 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 21.2 feet below reference.
Waterline Elevation = 1014.2

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 A/11/12

Item 113: Scour Critical Bridges: Code O/08

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

 Yes X No

6. PONTIS CODING INFORMATION

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	39	LF	39				
361	Scour	1	EA	1				
985	Slopes & Slope Protection	1	EA		1			



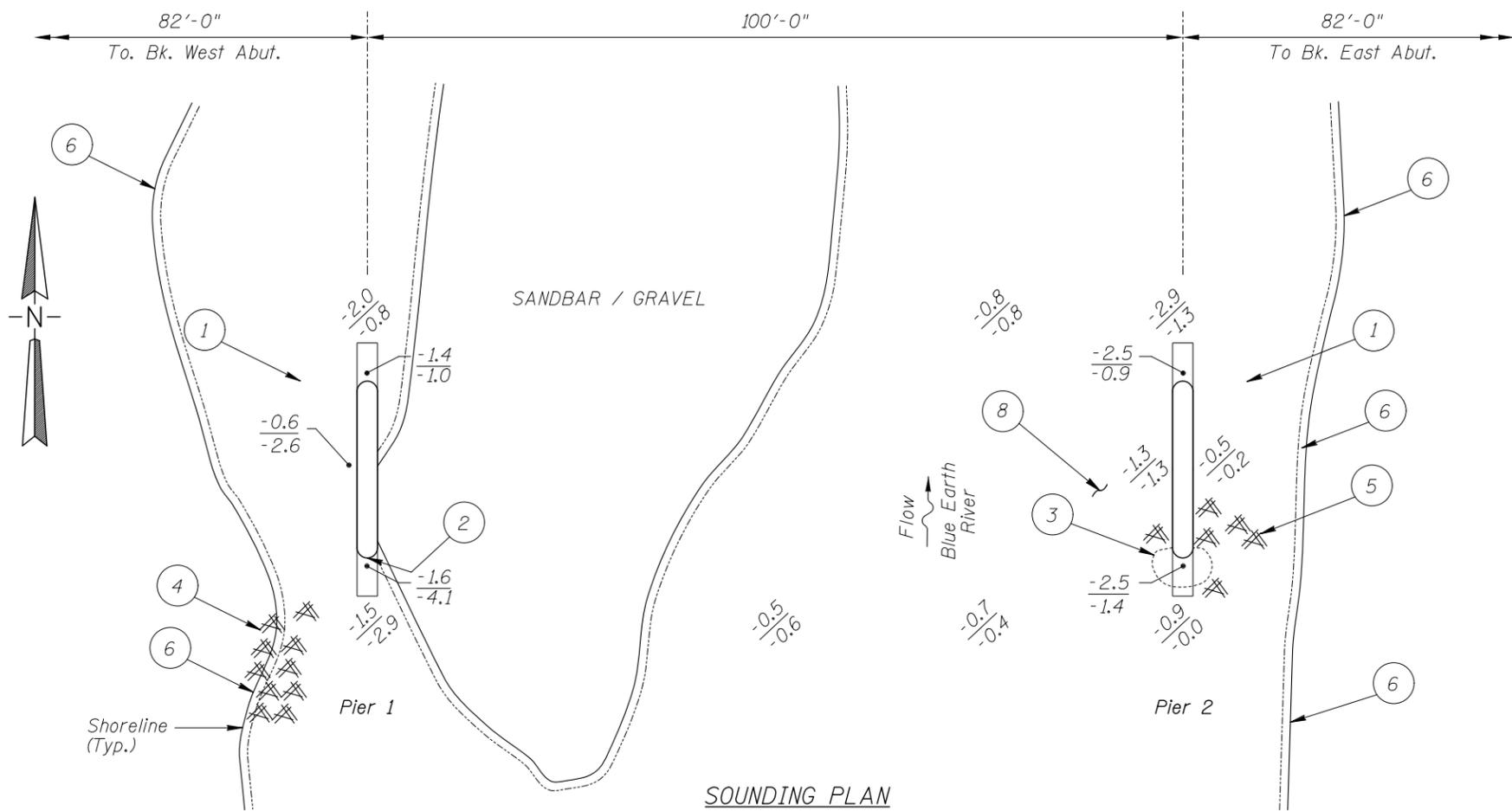
Photograph 1. Overall View of Bridge, Looking South.



Photograph 2. View of Pier 1, Looking East.

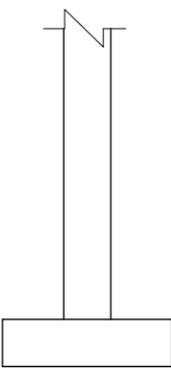


Photograph 3. View of Pier 2, Looking East.



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, 4 feet in radius and 1.5 feet deep, was observed at the upstream nose of Pier 2.
- ④ A moderate to heavy accumulation of timber debris, was observed along the west embankment upstream of the structure.
- ⑤ A light 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.
- ⑥ Minor vertical bank erosion was observed at the east embankment and upstream and downstream of the structure along both shorelines.
- ⑦ The concrete of the piers was smooth and sound.
- ⑧ The channel bottom consisted of gravel with 2 inches of probe rod penetration.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

- 1. Piers 1 and 2 were inspected underwater.
- 2. At the time of inspection on September 11, 2012, the waterline was located approximately 21.2 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds to a waterline elevation of 1014.2 based on the previous report dated November 20, 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 1/4 point intervals between the substructure units.

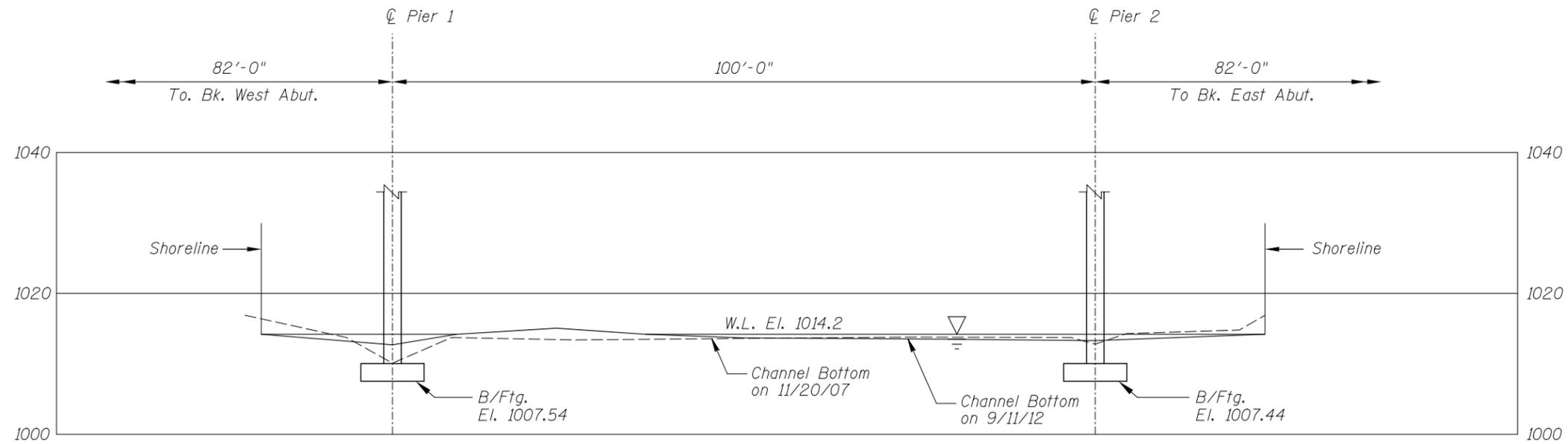
Legend

- 2.0 Sounding Depth (9/11/12)
- 5.2 Sounding Depth (11/20/07)
- Timber Debris
- Scour Depression

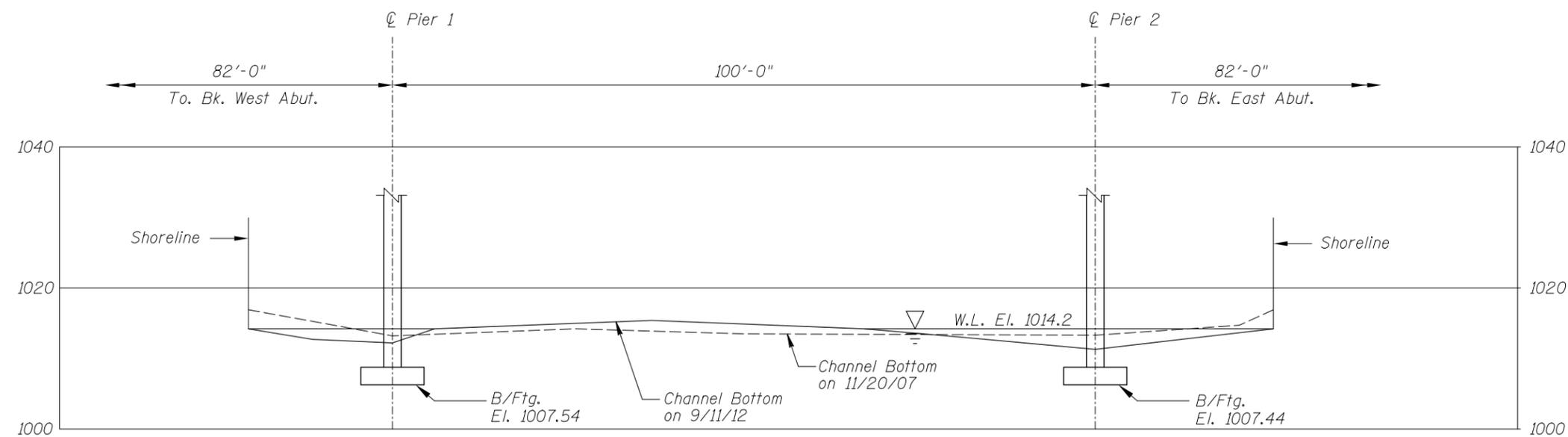
Note:
All soundings based on 2012 waterline location.

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: BJR	COLLINS ENGINEERS	Date: SEP. 2012
Checked By: BRL	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: NTS
Code: 52210136	<small>701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.wsben.com</small>	Figure No.: 1

WSB
& Associates, Inc.
INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION



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: BJR	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEP. 2012
Checked By: BRL		Scale: NTS
Code: 52210136		Figure No.: 2

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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: 07514

WEATHER: Sunny, 95°F

WATERWAY CROSSED: Blue Earth River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR

OTHER Wading

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

EQUIPMENT: Wetsuit, Probe Rod, Lead Line, Sounding Pole, Scraper, Camera

TIME IN WATER: 2:05 P.M.

TIME OUT OF WATER: 2:15 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/s

VISIBILITY 3.0 feet

DEPTH 2.5 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were in good condition with no structurally significant material defects observed. The east embankment and the banks upstream and downstream of the structure 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. Light accumulation of timber debris was observed at Pier 2. A scour depression, 4 feet in radius and 1.5 feet deep was observed at the upstream nose of Pier 2.

FURTHER ACTION NEEDED: _____ YES _____ X _____ NO

The inspection of the submerged substructure units of Structure No. 9124 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 07514
 INSPECTORS WSB & Associates and Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 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	1.6'	N	7	N	8	N	7	7	7	8	7	7	7	N	N	N	N	N
	Pier 2	2.5'	N	7	N	8	N	7	6	6	6	6	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. The east embankment and the banks upstream and downstream of the structure 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. Light accumulation of timber debris was observed at Pier 2. A scour depression, 4 feet in radius and 1.5 feet deep was observed at the upstream nose of 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.