

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 5871

CR NO. 9

OVER THE

RED RIVER OF THE NORTH

DISTRICT 2 - NORMAN COUNTY



PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 5871, Pier 1, was in good condition with no structurally significant defects observed. The channel bottom appeared stable with no significant scour, or other deficiencies.

INSPECTION FINDINGS:

- (A) Light scaling was observed extending from 1 foot above the waterline to 1 foot below the waterline, with 1/8 inch maximum penetration.
- (B) Section loss was observed at ledge in shaft along the south end at 1 foot above the waterline, with 6 inches of maximum penetration.
- (C) Moderate accumulation of timber debris, consisting of logs and branches 2 feet in diameter and smaller, was observed around the entire perimeter of Pier 1 extending from the channel bottom to between 4 and 8 feet above the channel bottom and off the pier faces and noses by up to 6 feet.

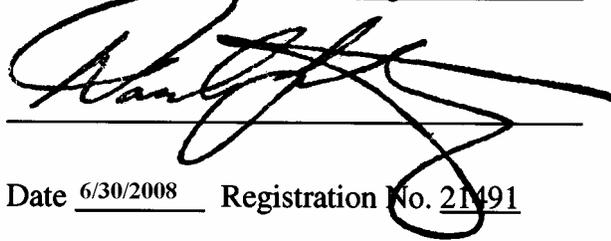
RECOMMENDATIONS:

- (A) Ideally, the moderate accumulation of timber debris located around Pier 2 should be removed. Until that can be accomplished, monitor the extent of timber debris.

- (B) Reinspect the submerged substructure unit 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



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 5871

Feature Crossed: Red River of the North

Feature Carried: CR No. 9

Location: District 2 - Norman County

Bridge Description: The two main spans consist of steel through trusses and the two approach spans consist of multiple steel beams. The substructure includes two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered 1 and 2 starting from the east end of the structure. Both abutments and Piers 1 and 2 are supported on footings founded on steel H-piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Denis Redzic, Valerie Roustan

Date: September 18, 2007

Weather Conditions: Cloudy, 58° F

Underwater Visibility: None/Negligible

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1

General Shape: The pier consists of two multi-sided columns connected with a full height, solid shaft web wall, all of which sits on two rectangular pile supported footings.

Maximum Water Depth at Substructure Inspected: Approximately 17.5 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the north end of Pier 1.

Water Surface: The waterline was approximately 35.5 feet below reference.
Waterline Elevation = 794.4.

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/09/07

Item 113: Scour Critical Bridges: Code F/07

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

 Yes X No



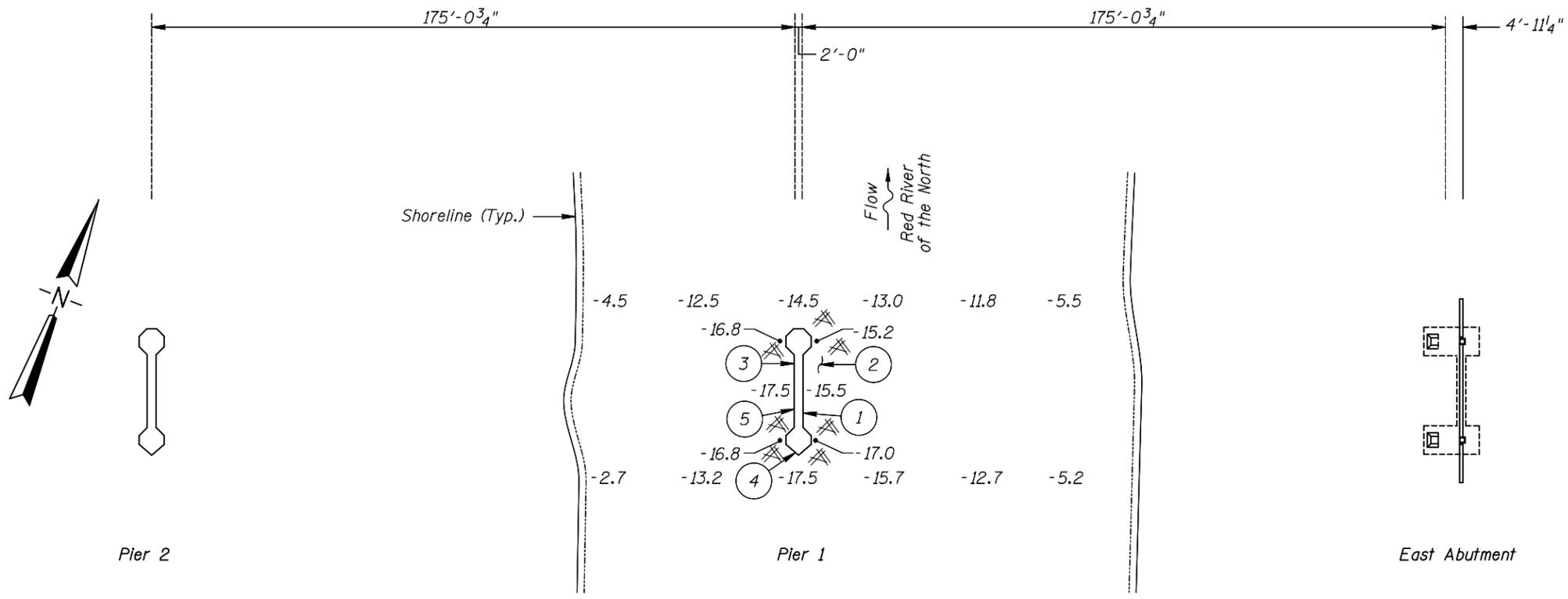
Photograph 1. Overall View of the Structure, Looking Southeast.



Photograph 2. View of Pier 1, Looking East.

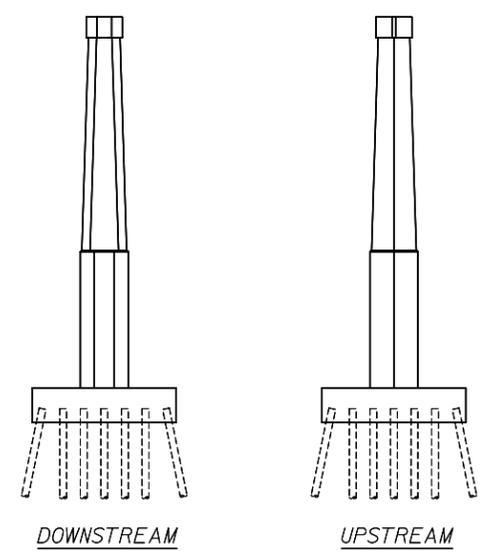


Photograph 3. View of the south end of Pier 1, Looking East.



- INSPECTION NOTES:**
- 1 Overall, concrete was smooth and sound with no significant defects.
 - 2 The channel bottom consisted of soft silt, sand and gravel with 2 feet maximum probe rod penetration.
 - 3 Light scaling around pier shaft extending 1 foot above waterline to 1 foot below waterline, 1/8 inch maximum penetration.
 - 4 Section loss at ledge at south end at 1 foot above waterline with 6 inches maximum penetration.
 - 5 Moderate timber debris consisting of logs and branches 2 feet in diameter and smaller was observed around the entire perimeter of Pier 1. The debris extended 4 to 8 feet above the channel bottom and 5 to 6 feet off the faces and noses of the pier.

SOUNDING PLAN

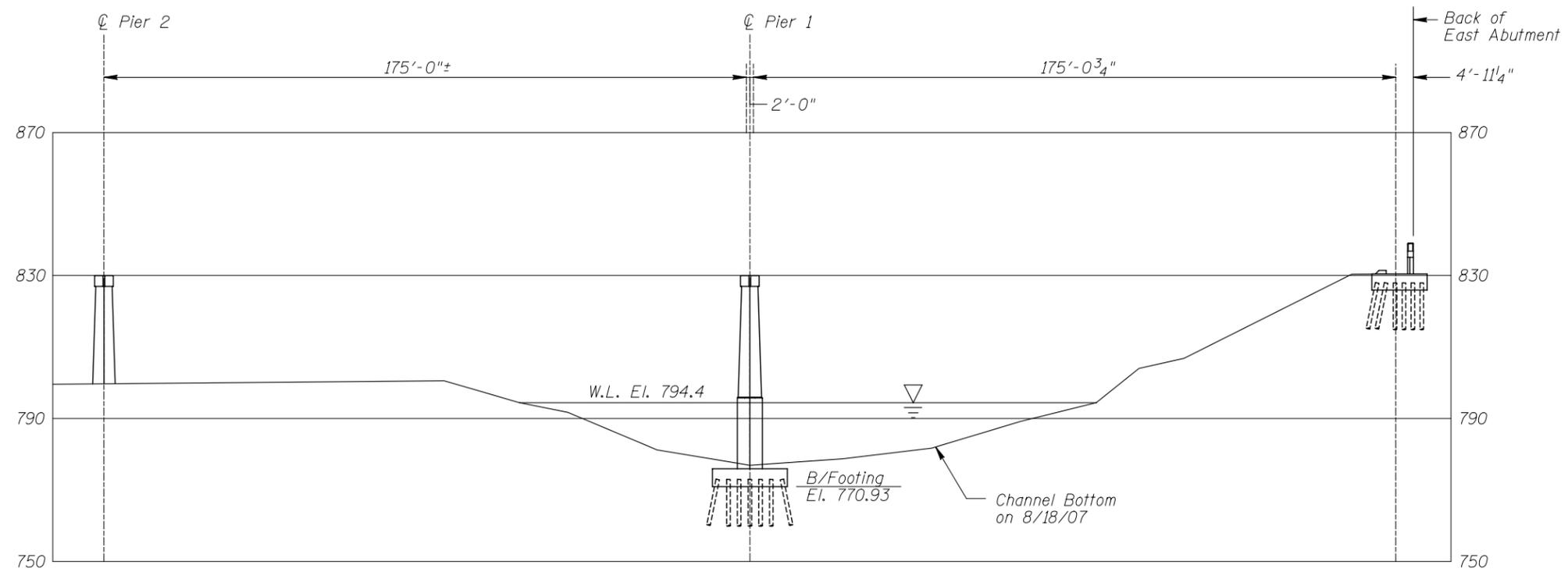


TYPICAL END VIEWS OF PIER 1

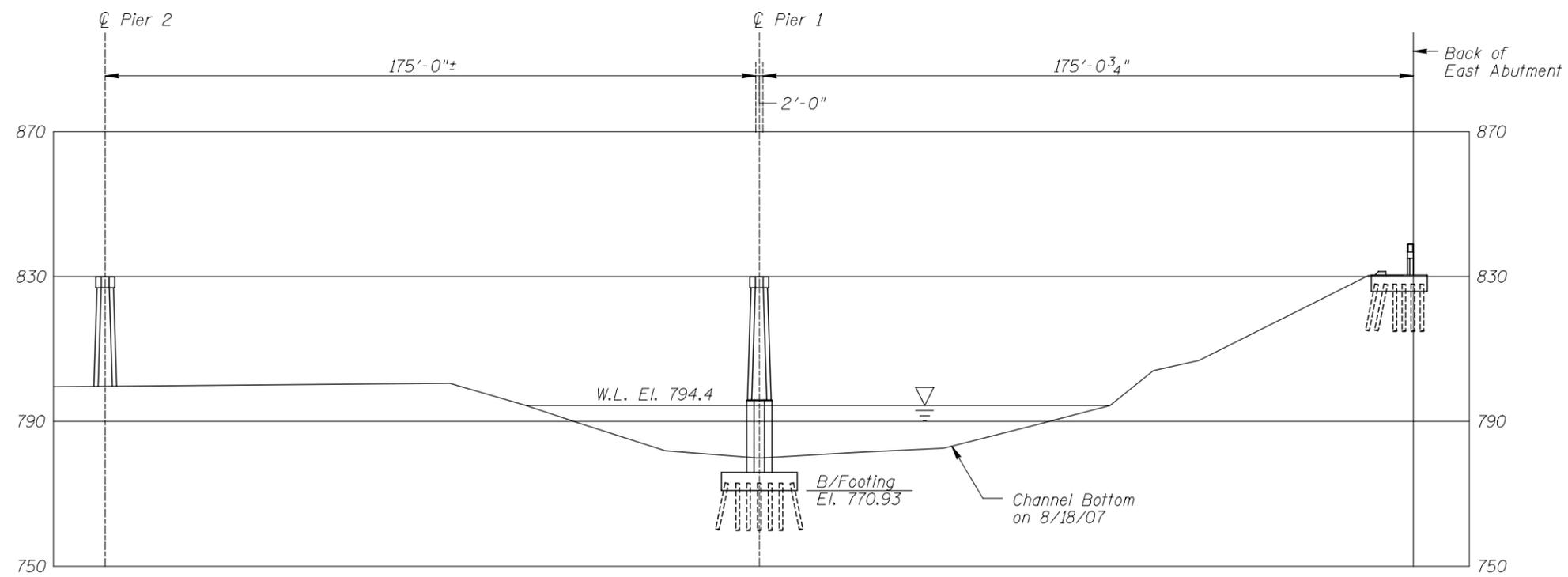
- GENERAL NOTES:**
1. Piers 1 was inspected underwater.
 2. At the time of inspection on August 18, 2007 the waterline was located approximately 35.5 feet below the top of the pier cap at the downstream end of Pier 1. This corresponds to a waterline elevation of 794.4 based on design drawings.
 3. Soundings 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 and the substructure units.

Legend
 -5.2 Sounding Depth (9/18/07)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 5871 OVER RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: SEPT. 2007
Checked By: VR	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52215871		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. 5871 OVER RED RIVER OF THE NORTH DISTRICT 2, CLAY 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: AUG. 2007
Checked By: VR		Scale: 1" = 40'
Code: 52215871		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: September 18, 2007

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

BRIDGE NO: 5871 WEATHER: Cloudy, 58° F

WATERWAY CROSSED: Red River over the North

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Denis Redzic, Valerie Roustan

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

TIME IN WATER: 1:30 p.m.

TIME OUT OF WATER: 2:00 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY None/ Negligible

DEPTH 17.5 feet maximum at Pier 1

ELEMENTS INSPECTED: Pier 1

REMARKS: The concrete surfaces of Pier 1 were smooth and sound with no significant defects. Light scaling was observed extending from 1 foot above the waterline to 1 foot below the waterline with 1/8 inch maximum penetration. Section loss was observed along shaft ledge at the south end at 1 foot above the waterline with 6 inches of maximum penetration. Moderate timber debris, consisting of logs and branches 2 feet in diameter and smaller, was observed around the entire perimeter of Pier 1 from the channel bottom to 4 - 8 feet above the channel bottom and off the faces and noses by up to 6 feet. The channel bottom appeared stable with no appreciable scour.

FURTHER ACTION NEEDED: YES NO

Ideally, the moderate accumulation of timber debris located around Pier 2 should be removed. Until that can be accomplished, monitor the extent of timber debris.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 5871
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Red River of the North

INSPECTION DATE September 18, 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	17.5'	N	7	N	9	N	7	8	8	N	6	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete surfaces of Pier 1 were smooth and sound with no significant defects. Light scaling was observed extending from 1 foot above the waterline to 1 foot below the waterline with 1/8 inch maximum penetration. Section loss was observed along shaft ledge at the south end at 1 foot above the waterline with 6 inches of maximum penetration. Moderate timber debris, consisting of logs and branches 2 feet in diameter and smaller, was observed around the entire perimeter of Pier 1 from the channel bottom to 4 - 8 feet above the channel bottom and off the faces and noses by up to 6 feet. The channel bottom appeared stable with no appreciable scour.

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.