

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6676

CSAH NO. 25

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 (CEI 42)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 6676, Pier 2, was in good condition with no structurally significant defects observed. At the time of the inspection, the channel was partially restricted by a moderate accumulation of timber debris in and around numerous abandoned timber piles cut-off just above the waterline in the eastern portion of the channel. The channel bottom around Pier 2 appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

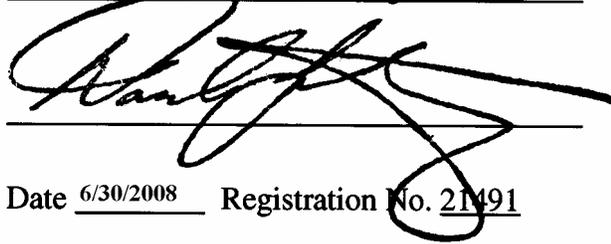
- (A) A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed around the entire perimeter of Pier 2 extending from the channel bottom up 2 feet and off the faces and noses up to 3 feet.
- (B) Numerous abandoned timber piles were present along the eastern shoreline. Most of these piles were cut-off at up to 3 feet above the waterline and were catching timber drift up to 1.5 feet in diameter and causing it to accumulate in the channel at the bridge.
- (C) Heavy bank erosion was located along the entire eastern shoreline in the vicinity of the bridge, exhibiting 10 foot vertical banks, loss of soil, and exposed tree roots.
- (D) The concrete surfaces of Pier 2 were smooth and sound with random areas of poor consolidation and section loss with up to ½ inch maximum penetration and no exposed reinforcing steel.

RECOMMENDATIONS:

- (A) Ideally, the moderate accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to removing or cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.
- (B) Design plans with footing information for Pier 2 should be obtained, if possible, for the next underwater inspection.
- (C) 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



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: 6676

Feature Crossed: Red River of the North

Feature Carried: CSAH No. 25

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 three reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the structure. Both abutments and Piers 1 and 3 are supported on footings founded on steel H-piles. The drawings furnished did not indicate the foundation type for Pier 2.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 20, 2007

Weather Conditions: Cloudy, 60° F

Underwater Visibility: None/Negligible

Waterway Velocity: 3.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2

General Shape: The pier consists of two multi-sided columns connected with a full height, solid shaft web wall. As previously indicated, no foundation information for Pier 2 was furnished.

Maximum Water Depth at Substructure Inspected: Approximately 6.2 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 33.0 feet below reference.
Waterline Elevation = 836.8.

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/08/07

Item 113: Scour Critical Bridges: Code I/94

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

 Yes X No



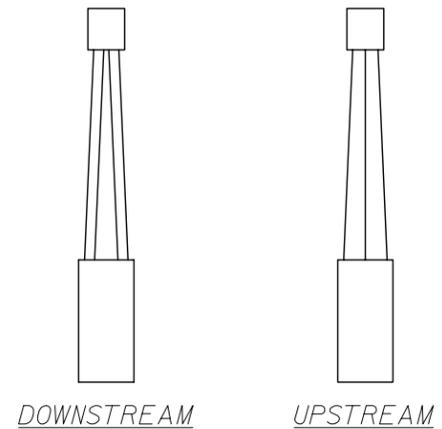
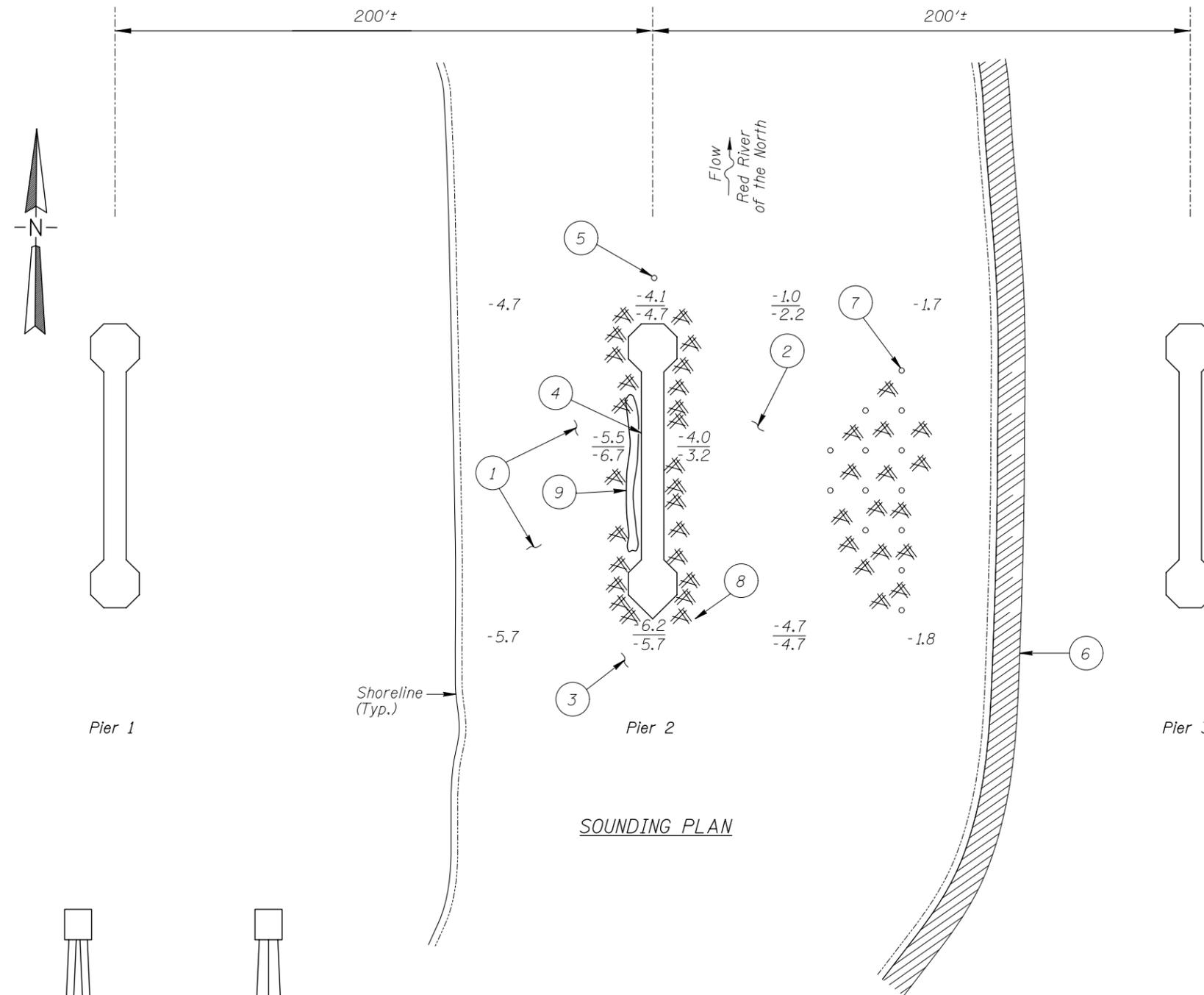
Photograph 1. Overall View of the Structure, Looking Southwest.



Photograph 2. View of Pier 2 and Abandoned Timber Piles along East Shore, Looking West.



Photograph 3. View of Pier 2, Looking East.



TYPICAL END VIEWS OF PIER 2

GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on August 20, 2007, the waterline was located approximately 33.0 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 836.8.
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.

INSPECTION NOTES:

- 1 The channel bottom material along the west side of Pier 2 consisted of silt and gravel with up to 6 inches of maximum probe rod penetration.
- 2 The channel bottom material along the east side of Pier 2 consisted of clayey silt with up to 12 inches of maximum probe rod penetration.
- 3 The channel bottom material at the upstream nose of Pier 2 consisted of hard clay with 2 to 4 inches of maximum probe rod penetration.
- 4 The concrete surfaces of Pier 2 were smooth and sound. Random minor areas of poor consolidation and section loss with up to 1/2 inch maximum penetration and no exposed reinforcing steel were present.
- 5 An abandoned timber pile was observed 2 feet north of the downstream nose of Pier 2, extending from 2 feet below the waterline into the channel bottom.
- 6 Heavy bank erosion was located along the entire eastern shoreline in the vicinity of the bridge, exhibiting 10 foot vertical banks, loss of soil, and exposed tree roots.
- 7 Abandoned timber piles cut off at up to 3 feet above the waterline with scattered accumulated timber drift, with pieces up to 1.5 foot in diameter, hung up on and throughout piles.
- 8 A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed around the entire perimeter of Pier 2 extending from channel bottom up 2 feet and off faces and noses by up to 3 feet.
- 9 A log, 1.5 feet in diameter, extended along the west face of the pier shaft on the channel bottom.

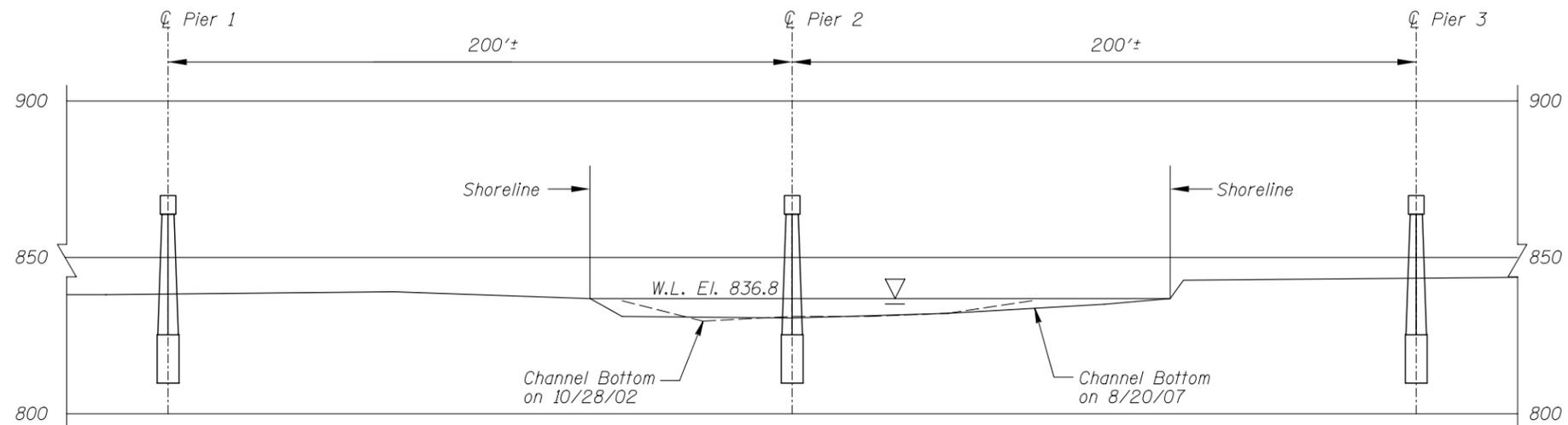
Legend

- 2.0 Sounding Depth (8/20/07)
- 5.2 Sounding Depth (10/28/02)
- o Cut Off Pile
- Bank Erosion
- Timber Debris

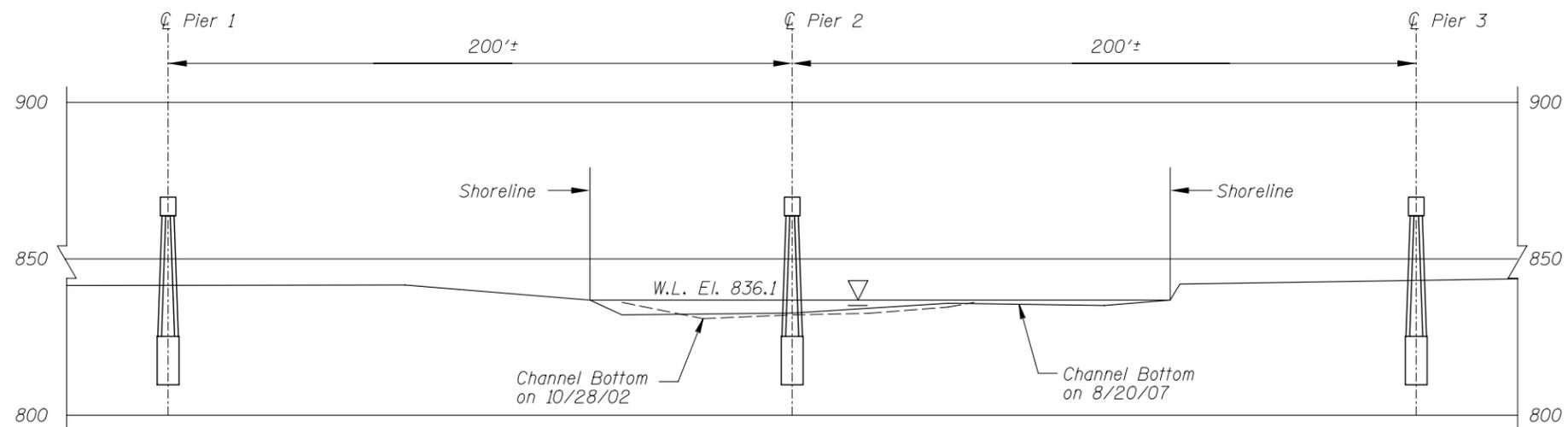
Note:

All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6676 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52210042		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6676 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN 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: AUGUST, 2007
Checked By: MDK		Scale: NTS (U.O.N.)
Code: 52210042		Figure No.: 2

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

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

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 6676 WEATHER: Cloudy, 60° F

WATERWAY CROSSED: Red River over the North

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

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

TIME IN WATER: 9:50 a.m.

TIME OUT OF WATER: 10:30 a.m.

WATERWAY DATA: VELOCITY 3.0 f.p.s.

VISIBILITY None/ Negligible

DEPTH 6.2 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: The concrete surfaces of Pier 2 were smooth and sound with random minor areas of poor consolidation and section loss. A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed around the entire perimeter of Pier 2 extending from the channel bottom up 2 feet and off the faces and noses by up to 3 feet. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. A 1.5-foot-diameter log was also observed along the west face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks on the east side were heavily eroded as noted in the previous inspection.

FURTHER ACTION NEEDED: YES NO

Ideally, both the moderate accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to removing or cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.

FURTHER ACTION NEEDED CONTINUED:

Design plans with footing information for Pier 2 should be obtained, if possible, for the next underwater inspection.

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. 6676
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
 WATERWAY CROSSED Red River of the North

INSPECTION DATE August 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 2	6.2'	N	7	N	9	N	7	7	5	N	5	5	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete surfaces of Pier 2 were smooth and sound with random minor areas of poor consolidation and section loss. A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed around the entire perimeter of Pier 2 extending from the channel bottom up 2 feet and off the faces and noses by up to 3 feet. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. A 1.5-foot-diameter log was also observed along the west face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks on the east side were heavily eroded as noted in the previous inspection.

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.