

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 02501
CSAH NO. 24
OVER THE
RUM RIVER
DISTRICT 5 - ANOKA COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 103)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 02501, Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance observed. At Pier 1, there was up to one vertical foot of footing exposure, with numerous cracks and voids observed on top of the downstream portion of the exposed footing. Light (Pier 1) to moderate (Pier 2) scaling was observed near the waterline at both piers. The top of the footing at the upstream end of Pier 2 was also slightly exposed. The channel bottom appeared to be stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The top of the footing of Pier 1 was exposed along the east side of the pier with up to one foot of vertical face exposure. Numerous cracks and voids were observed on the top of the downstream portion of the footing with a maximum penetration of 5 inches. Associated transverse cracks, 1/16 to 1/2 inch wide, were observed extending from the pier shaft to the edge of footing.
- (B) At the upstream nose of Pier 2, a 3-foot-radius area of the footing was exposed with no significant defects and no vertical face exposure.
- (C) Light to moderate scaling was observed on Piers 1 and 2, respectively, with a maximum penetration of 1 inch.
- (D) A light accumulation of timber debris was observed at the upstream end of Pier 2.

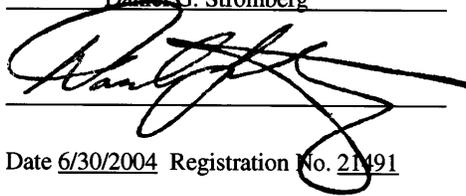
RECOMMENDATIONS:

- (A) Monitor the concrete deterioration of the footing on Pier 1. If found to be progressing to a worse extent in the future, consideration could be given to repair by removing the unsound concrete and reforming with a concrete mix designed to promote high durability and low permeability.

- (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 6/30/2004 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: 02501

Feature Crossed: The Rum River

Feature Carried: CSAH No. 24

Location: District 5 - Anoka County

Bridge Description: The superstructure consists of four spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and three concrete piers founded on piles. The piers are numbered 1 through 3 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 24, 2002

Weather Conditions: Partly Cloudy, " 55EF

Underwater Visibility: " 3.0 Feet

Waterway Velocity: " 4.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of two oblong rectangular shafts of hammerhead design with rounded noses supported by a rectangular footing founded on piles under each shaft.

Maximum Water Depth at Substructure Inspected: Approximately 3.3 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 2.

Water Surface: The waterline was approximately 23.6 feet below reference.
Waterline Elevation = 885.1.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

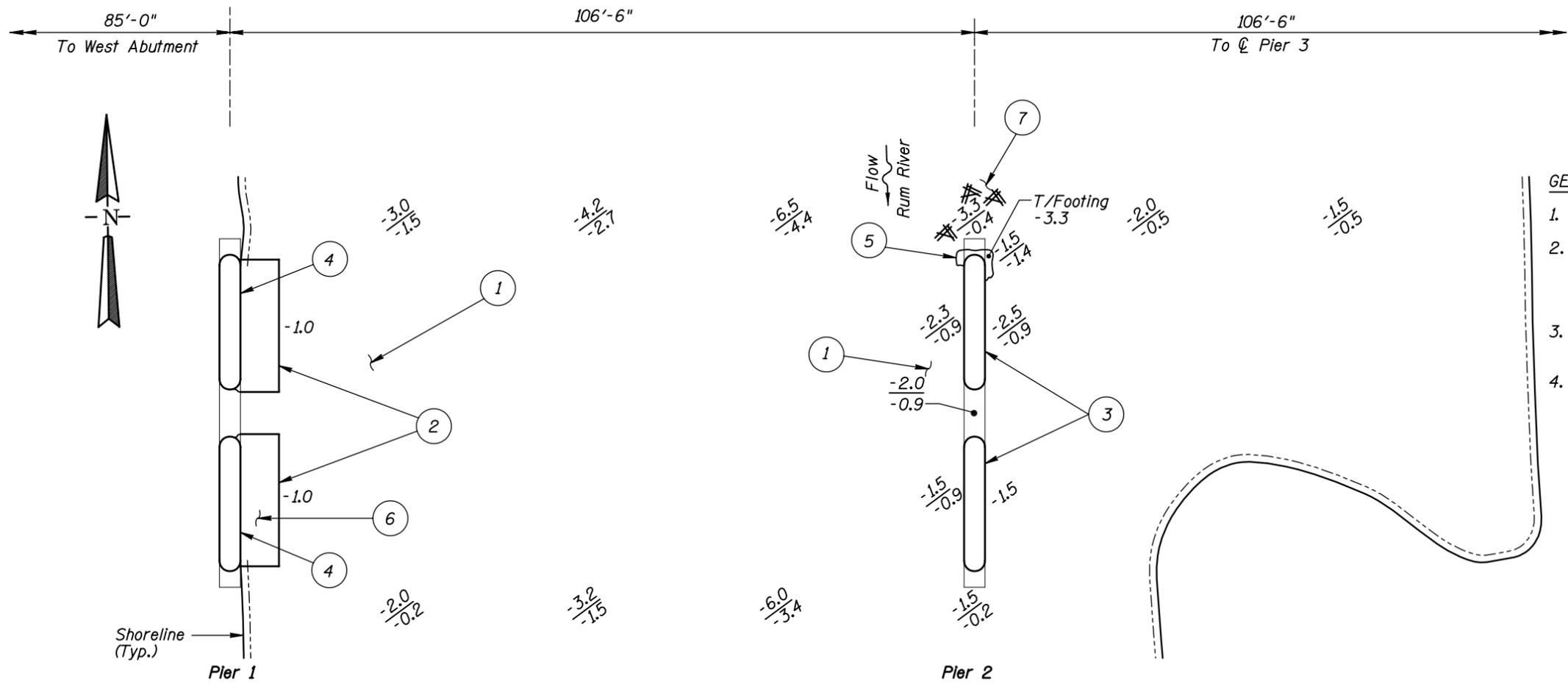
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code N/96

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

_____ Yes X No



GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 24, 2002, the waterline was located approximately 23.6 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds to a waterline elevation of 885.1 based on the previous report dated September 12, 1997.
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.

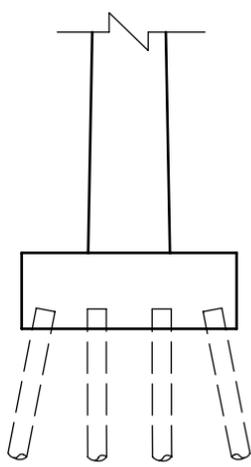
SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material consisted of 2-foot-diameter and smaller riprap.
- 2 The footing was exposed along the east side of Pier 1 with 1 foot of the vertical face exposed.
- 3 Moderate scaling was observed from the channel bottom to 1 foot above the waterline with a maximum penetration of 1 inch. The heaviest scaling was along the west face and the upstream nose of the pier.
- 4 Light scaling was observed along the east face of the pier from the top of the footing to 2 feet above the footing with a maximum penetration of 1/8 inch.
- 5 A 3-foot-radius area of the top of footing was exposed at the upstream end of the pier with no vertical face exposure.
- 6 Heavy scaling and cracking was observed on the top of the footing from the shaft to the footing edge with a maximum penetration of 5 inches. Numerous 1/16-inch- to 1/2-inch-wide cracks and areas of section loss were also observed on the top of footing from the pier shaft to the edge of the footing.
- 7 A light accumulation of 1-foot-diameter and smaller timber debris was observed at the upstream end of the pier.

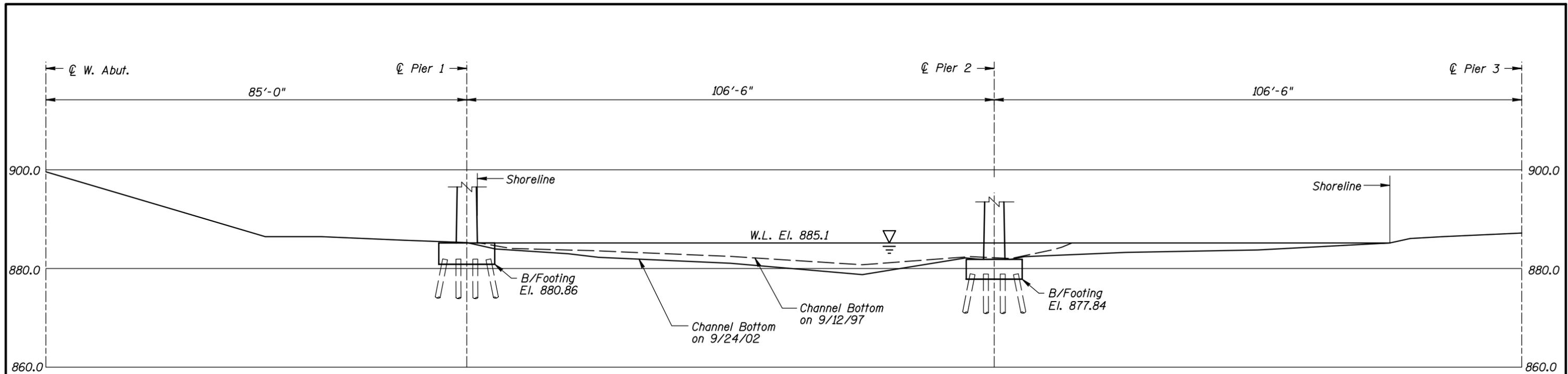
Legend

- 2.0 Sounding Depth from Waterline (9/24/02)
- 0.5 Sounding Depth from Waterline (9/12/97)
- Timber Debris

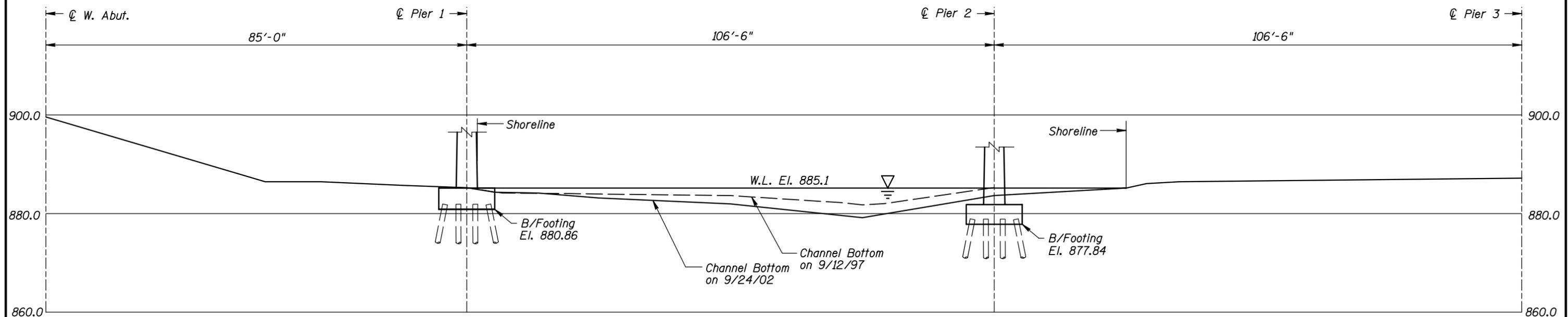


TYPICAL END VIEW OF PIERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 02501 OVER THE RUM RIVER DISTRICT 5, ANOKA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120103		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. 02501 OVER THE RUM RIVER DISTRICT 5, ANOKA COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002
Checked By: MDK		Scale: 1"=20'
Code: 35120103		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 2, Looking West.



Photograph 4. View of Typical Scaling at the Waterline at Pier 2, Looking East.

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

INSPECTORS: Collins Engineers, Inc. DATE: September 24, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 02501 WEATHER: Partly Cloudy, " 55EF
WATERWAY CROSSED: The Rum River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
X OTHER Wading at lesser water depths
PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 1:15 P.M.
TIME OUT OF WATER: 2:00 P.M.
WATERWAY DATA: VELOCITY " 4.0 f.p.s.
VISIBILITY " 3.0 feet
DEPTH 3.3 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2.

REMARKS: Overall, the concrete was in good to satisfactory condition. The top of footing and 1 foot of vertical face was exposed along the east side of Pier 1. The footing at the upstream end of Pier 2 was also exposed, but had no vertical face exposure. Moderate scaling was observed from the channel bottom to 1 foot above the waterline with up to 1 inch of penetration at Pier 2. Heavy scaling, section loss and cracking was observed on the top of the downstream portion of the exposed footing of Pier 1 with penetrations of up to 5 inches. A light accumulation of timber debris was observed at the upstream nose of Pier 2.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the concrete deterioration of the footing on Pier 1, and if found to be worsening in the future, consideration could be given to repair by removing the unsound concrete and reforming with a concrete mix designed to promote high durability and low permeability.

Reinspect the submerged substructure units 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. 02501
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Rum River

INSPECTION DATE September 24, 2002
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	1.0'	N	7	6	9	N	6	7	N	N	N	7	6	N	N	6	N	N
	Pier 2	3.3'	N	7	7	9	N	7	7	N	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good to satisfactory condition. The top of footing and 1 foot of vertical face was exposed along the east side of Pier 1. The footing at the upstream end of Pier 2 was also exposed, but had no vertical face exposure. Moderate scaling was observed from the channel bottom to 1 foot above the waterline with up to 1 inch of penetration at Pier 2. Heavy scaling, section loss and cracking was observed on the top of the downstream portion of exposed footing of Pier 1 with penetrations of up to 5 inches. A light accumulation of timber debris 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.