

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 23503

CSAH NO. 25

OVER THE

ROOT RIVER

DISTRICT 6 - FILLMORE COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 149)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete of the substructure unit inspected at Bridge No. 23503, Pier 2, was found to be in good condition with no defects of structural significance observed. A scour depression approximately 3 feet deeper than the surrounding channel bottom was detected at the upstream nose of Pier 2. The pier footing was exposed with no undermining detected. The channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A 1-foot-diameter, 10-foot-long tree with branchy debris was observed on the channel bottom at the upstream end of Pier 2.
- (B) The submerged concrete of Pier 2 was in good and sound condition with only random light scaling observed from the top of the footing to 1 foot above the waterline.
- (C) The footing at Pier 2 was exposed along the entire east side, around the upstream end, and to the downstream quarter point along the west side, with a maximum vertical face exposure of 2.8 feet at the upstream end. The footing fully entered the mudline with no undermining detected.
- (D) A scour depression was observed at the upstream end of Pier 2 with a radius of 3 feet and a depth of 3 feet.
- (E) Two areas of section loss, possibly related to impact damage, were observed at the upstream end of Pier 2, at 0.5 feet and 1.5 feet above the waterline, each being 2 feet long by 1 inch wide with 1/2 inch of penetration.

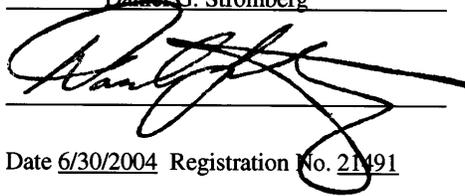
RECOMMENDATIONS:

- (A) Monitor the scour depression and footing exposure at Pier 2 during future inspections. If these conditions progress, repairs can be considered including filling the scour hole at the upstream end of Pier 2 by designing and placing properly sized riprap.

- (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.

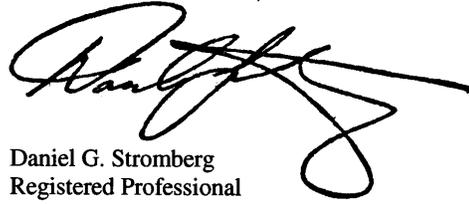
Daniel G. Stromberg



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: 23503

Feature Crossed: The Root River

Feature Carried: CSAH No. 25

Location: District 6 - Fillmore County

Bridge Description: The bridge superstructure is a four span, multiple steel girder bridge. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers and abutment footings are supported by timber piles. The piers are numbered 1 through 3 starting at 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. Brookings

Date: October 3, 2002

Weather Conditions: Cloudy, " 50E F

Underwater Visibility: " 3 Feet

Waterway Velocity: " 1.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2.

General Shape: The pier consists of a rectangular concrete shaft with rounded ends supporting a hammerhead pier cap and founded on a rectangular pile supported footing.

Maximum Water Depth at Substructure Inspected: Approximately 4.1 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 20.2 feet below reference.
Waterline Elevation = 731.1.

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

Item 60: Substructure: Code 7

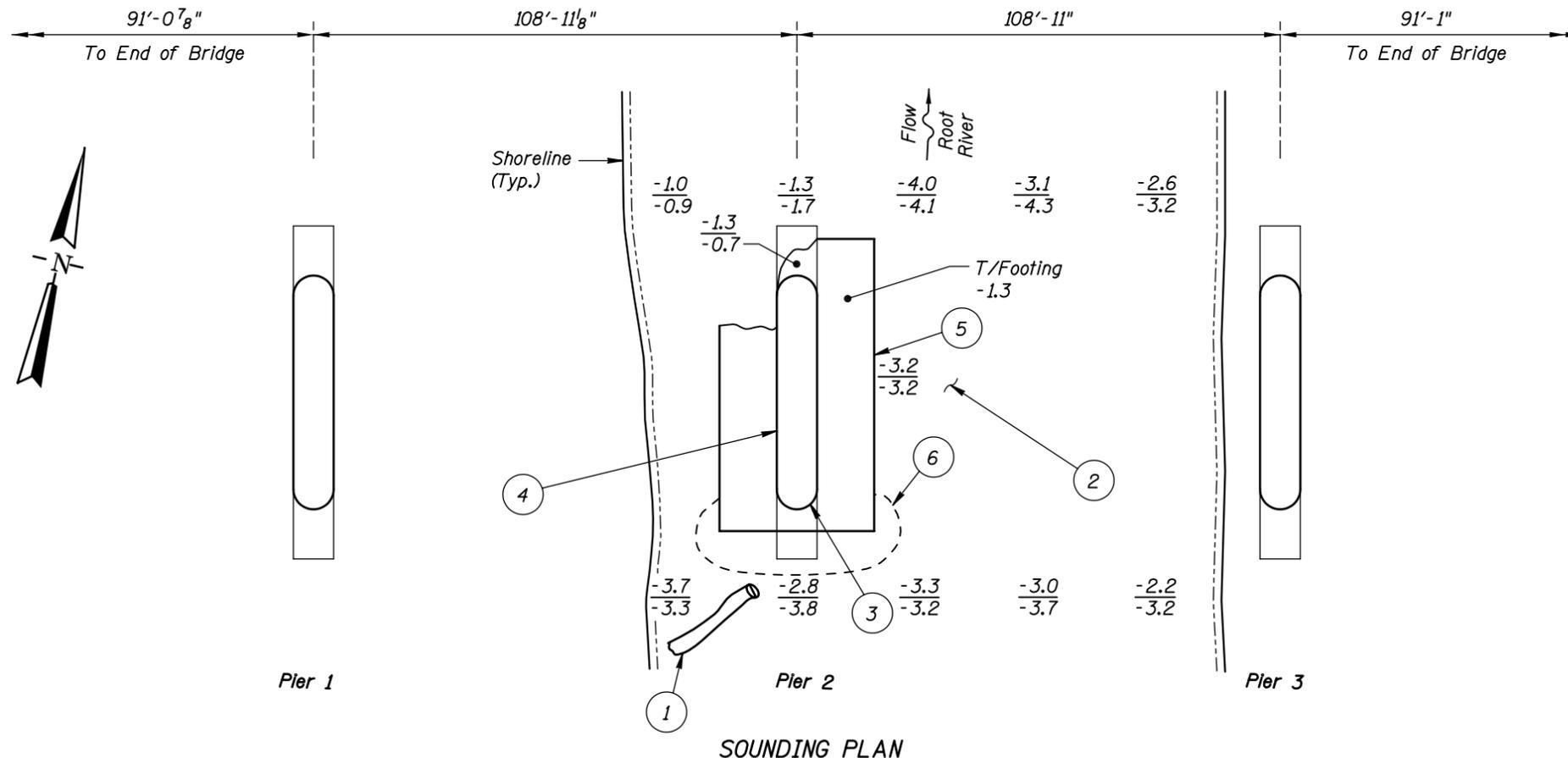
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/02

Item 113: Scour Critical Bridges: Code J/92

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

_____ Yes X No



SOUNDING PLAN

GENERAL NOTES:

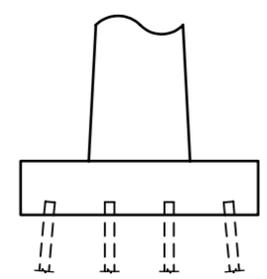
1. Pier 2 was inspected underwater.
2. At the time of inspection on October 3, 2002, the waterline was located approximately 20.2 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds with a waterline elevation of 731.1 based on the previous report dated September 29, 1997.
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.

INSPECTION NOTES:

- ① A 1-foot-diameter, 10-foot-long tree with branchy debris was observed on the channel bottom.
- ② The channel bottom material consisted of fine sandy gravel with 6 inches of maximum probe rod penetration.
- ③ Two horizontal impact related voids were observed on the upstream nose of Pier 2 above the waterline, 2-foot-long by 1-inch-wide with 1/2 inch of penetration and exposed aggregate.
- ④ Light scaling of concrete was observed from the top of the footing to 1 foot above the waterline.
- ⑤ The footing was exposed with 2.8 feet of vertical exposure at the upstream end and 1.7 feet of exposure at the downstream end. There was no undermining of the footing present. The concrete was smooth and in good condition.
- ⑥ A 3-foot-radius, 3-foot-deep scour depression was observed at the upstream end of Pier 2.

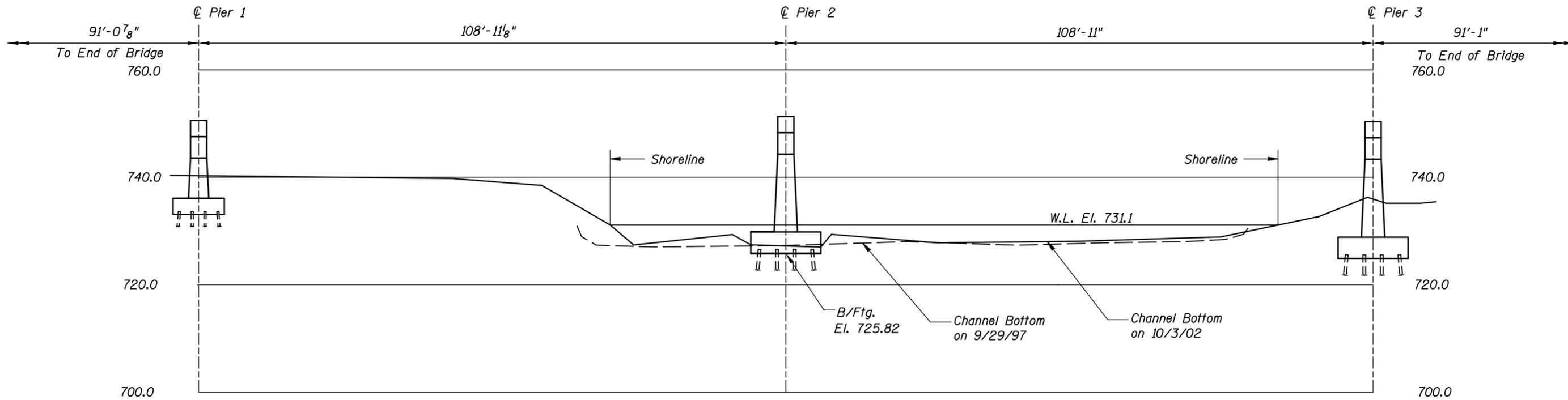
Legend

- 4.0 Sounding Depth from Waterline (10/3/02)
- 4.1 Sounding Depth from Waterline (9/29/97)

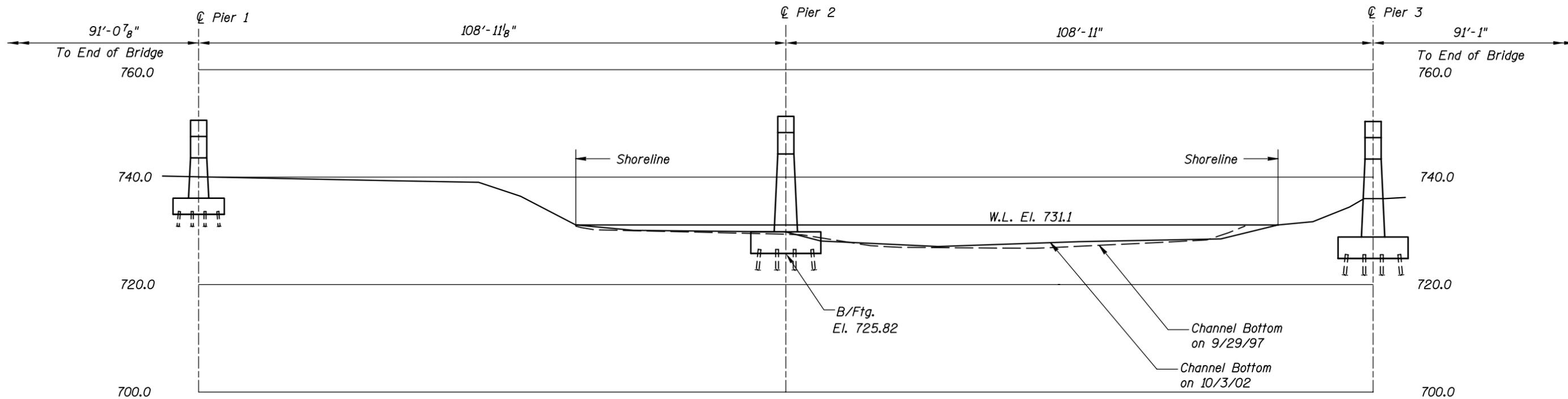


TYPICAL END VIEW OF PIERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 23503 OVER THE ROOT RIVER DISTRICT 6, FILLMORE COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I20I49		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. 23503
OVER THE ROOT RIVER
DISTRICT 6, FILLMORE COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH
Checked By: MDK
Code: 35120149

COLLINS ENGINEERS, INC.
300 W. WASHINGTON, STE. 600
CHICAGO, ILLINOIS 60606
(312) 704-9300

Date: OCT. 2002
Scale: 1"=20'
Figure No.: 2



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



Photograph 2. View of Pier 2, Looking Northwest.



Photograph 3. View of Pier 2, Looking Southeast.



Photograph 4. View of Pier 3, Looking North.

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

INSPECTORS: Collins Engineers, Inc. DATE: October 3, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 23503 WEATHER: Cloudy, " 50E F
WATERWAY CROSSED: The Root River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Camera
TIME IN WATER: 2:25 p.m.
TIME OUT OF WATER: 2:40 p.m.
WATERWAY DATA: VELOCITY " 1.5 f.p.s.
VISIBILITY " 3 feet
DEPTH 4.1 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: The concrete was in good condition with light scaling observed from the top of the footing to 1 foot above the waterline. Two impact related voids were also observed on the upstream nose of Pier 2 above the waterline. The pier footing was exposed with a maximum vertical exposure of 2.8 feet at the upstream end. The channel bottom appeared stable with no appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the scour depression and footing exposure at Pier 2 during future inspections. If these conditions progress, repairs can be considered including filling the scour hole at the upstream end of Pier 2 by designing and placing properly sized riprap.

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. 23503
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Shirley M. Walker, P.E.
 WATERWAY CROSSED The Root River

INSPECTION DATE October 3, 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 2	4.1'	N	7	7	9	N	7	6	N	N	7	6	7	N	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete was in good condition with light scaling observed from the top of the footing to 1 foot above the waterline. Two impact related voids were also observed on the upstream nose of Pier 2 above the waterline. The pier footing was exposed with a maximum vertical exposure of 2.8 feet at the upstream end. The channel bottom appeared stable with no appreciable changes since 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.