

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 02545  
CR NO. 116  
OVER THE  
RUM RIVER  
DISTRICT 5 - ANOKA COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO. 3512 (CEI 106)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 02545, Piers 1 through 3, were found to be in good condition with no defects of structural significance observed. The channel bottom in most instances appeared stable, however, minor localized scour has developed since the previous inspection exposing a portion of the footing at Pier 1. The top of the footing at Pier 3 was detected with a probe rod beneath 2 to 3 inches of sand.

INSPECTION FINDINGS:

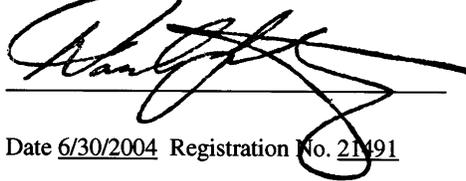
- (A) Five hairline vertical cracks were observed along the face of Pier 1 extending from the top of pier to the waterline. On each side of Pier 3 at the downstream quarter point, a hairline crack extended from the top to the pier to the channel bottom.
- (B) A 3-foot-radius by 1-foot-deep scour depression was observed at the upstream end of Pier 3 along with a light accumulation of timber debris that extended for 20 feet along the west face. A 4-foot-radius by 1.5-foot-deep scour depression with a light accumulation of timber debris was also observed at the upstream end of Pier 1.
- (C) The top of footing was detected beneath 2 to 3 inches of sand with a probe rod along the mid portion of Pier 3. The top of footing was exposed along 15 feet of the east face of Pier 1 with 1 to 2 inches of the vertical face also exposed.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.
  
- (B) Monitor footing exposure and drift accumulations during future underwater inspections.

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 'Daniel G. Stromberg', is written over two horizontal lines.

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Daniel 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: 02545

Feature Crossed: The Rum River

Feature Carried: CR No. 116

Location: District 5 - Anoka County

Bridge Description: The superstructure consists of a four span concrete beam structure supported by two concrete abutments on piles and three concrete piers on piles, numbered 1 to 3 starting from the west.

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: Sunny, " 45EF

Underwater Visibility: " 1.5 Feet

Waterway Velocity: " 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3.

General Shape: The pier shafts are rectangular with flat noses. The piers are supported by rectangular footings founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 1.

Water Surface: The waterline was approximately 12.2 feet below reference.  
Waterline Elevation = 845.2.

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

Item 60: Substructure: Code 7

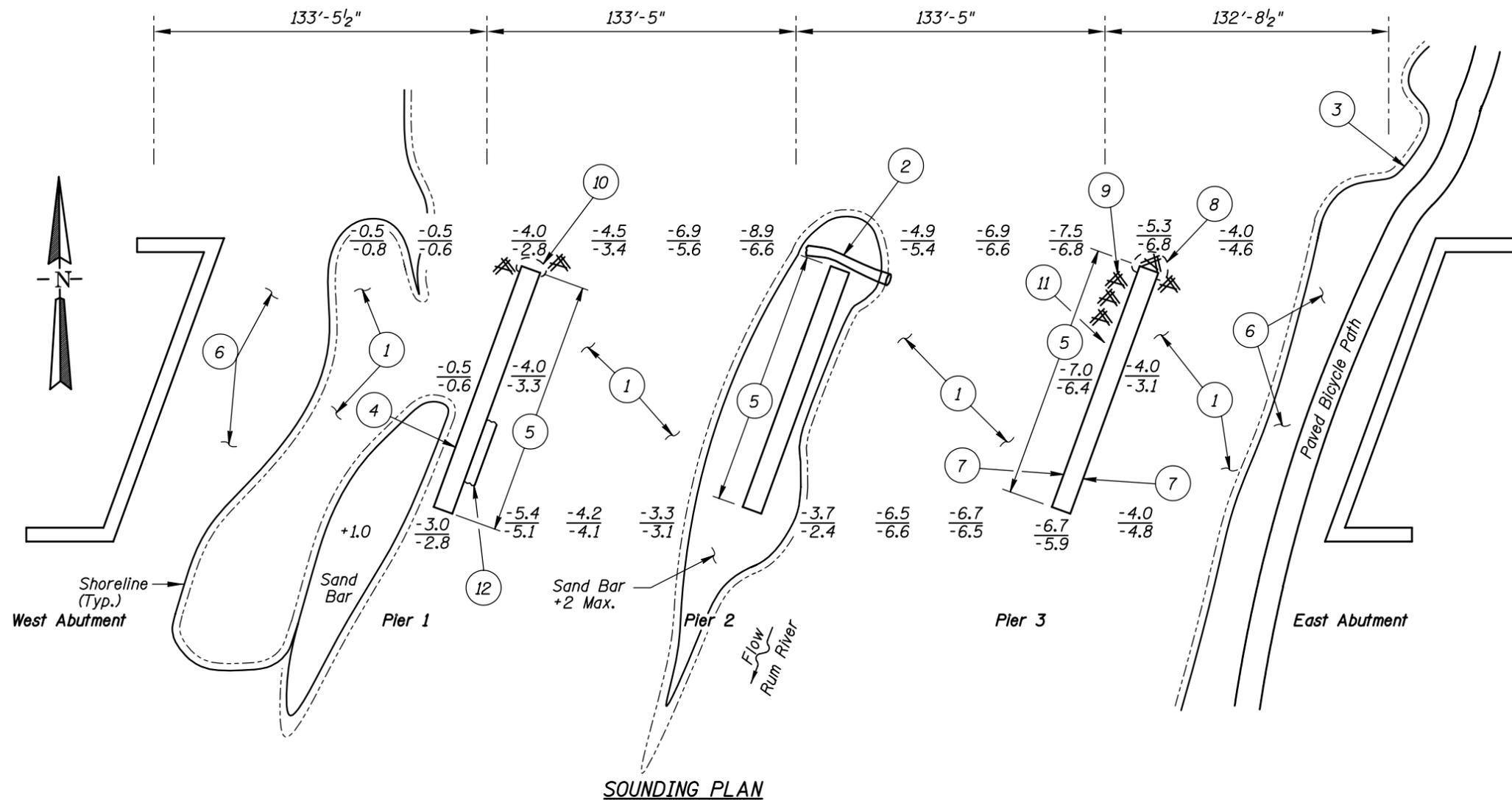
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/9/02

Item 113: Scour Critical Bridges: Code I/92

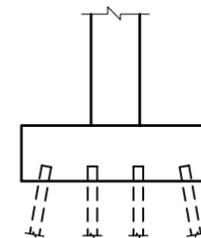
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes  No



**GENERAL NOTES:**

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 24, 2002, the waterline was located approximately 12.2 feet below the top of the cap at the upstream end of Pier 1. This corresponds to a waterline elevation of 845.2 based on the previous report dated September 15, 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.



**TYPICAL END VIEW OF PIERS**

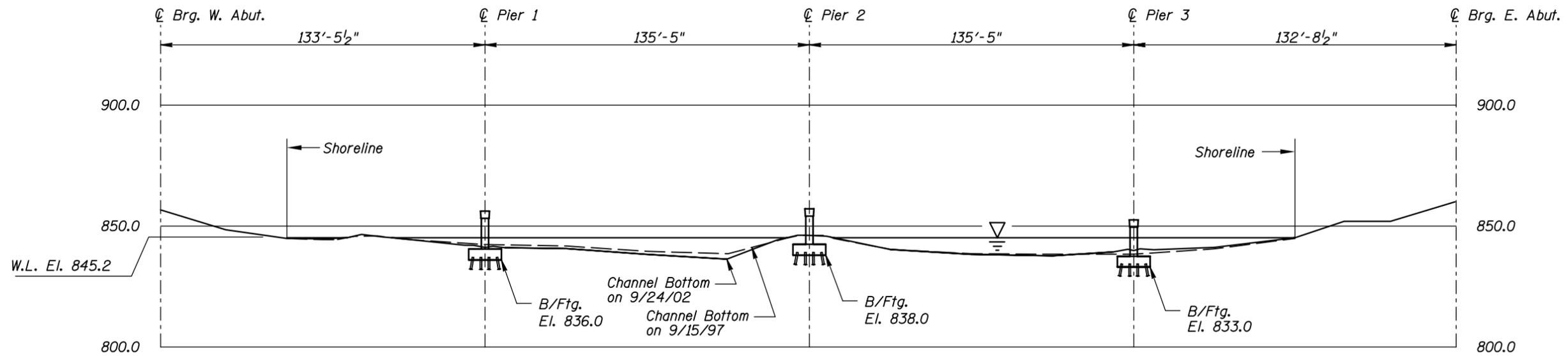
**INSPECTION NOTES:**

- 1 The channel bottom consisted of sandy gravel with 1 foot of probe rod penetration.
- 2 A 1.5-foot-diameter tree trunk along with 1- to 2-foot-diameter riprap was observed at the upstream end.
- 3 Previously eroded area had been infilled with marshy growth.
- 4 5 hairline vertical cracks were observed along the face of Pier 1 extending from the top of pier to the waterline.
- 5 The concrete was smooth and in good, sound condition.
- 6 The embankments consisted of grouted riprap.
- 7 A hairline crack was observed on both faces of Pier 3 extending from the top of the pier cap to the channel bottom.
- 8 A 3-foot-radius, 1-foot-deep scour pocket was observed at the upstream end of the pier.
- 9 A light accumulation of 4-inch-diameter timber debris was observed at the upstream nose and extending 20 feet along the west face.
- 10 A 4-foot-radius, 1.5-foot-deep scour pocket was observed at the upstream end of the pier with a light accumulation of timber debris.
- 11 The top of footing was detected beneath 2 to 3 inches of sand with the probe rod along the mid portion of the pier.
- 12 The top of footing was exposed along 15 feet of the east face of the pier with 1 to 2 inches of the vertical face exposed.

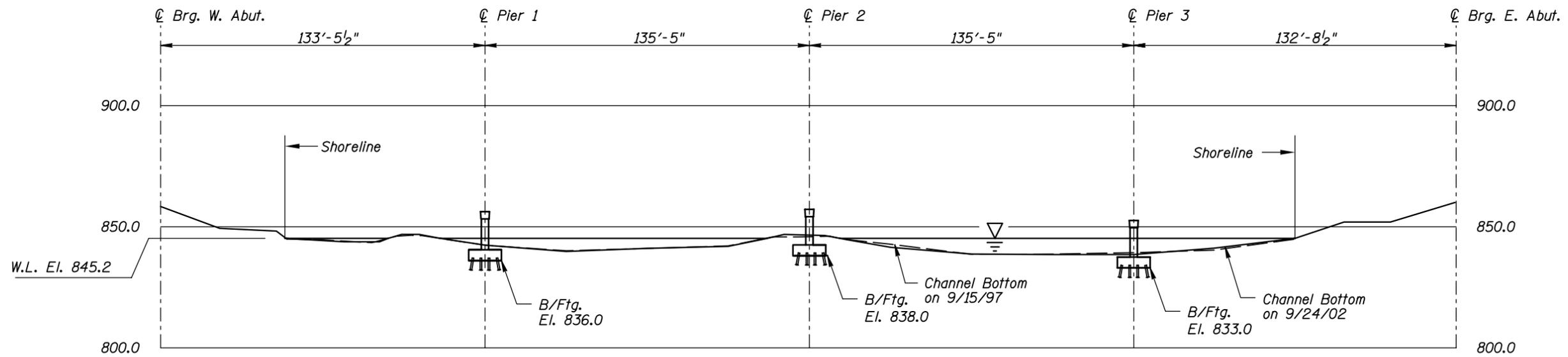
**Legend**

- 2.0 Sounding Depth from Waterline (9/24/02)
- 5.2 Sounding Depth from Waterline (9/15/97)
- Timber Debris
- Scour Depression

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 02545 OVER THE RUM RIVER DISTRICT 5, ANOKA COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120106		Figure No.: 1



**UPSTREAM FASCIA PROFILE**



**DOWNSTREAM FASCIA PROFILE**

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 02545 OVER THE RUM RIVER DISTRICT 5, ANOKA COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b> 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002
Checked By: MDK		Scale: 1"=50'
Code: 35120106		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking East.



Photograph 3. View of Upstream End of Pier 2, Looking West.



Photograph 4. View of Pier 3, Looking West.



Photograph 5. View of Bike Path Along the East Abutment, Looking South.



Photograph 6. View of West Abutment, Looking North.

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: 02545

WEATHER: Sunny, " 45E F

WATERWAY CROSSED: The Rum River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR  
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

EQUIPMENT: Scuba, Sounding Pole, Camera, u/w Light, Scraper, Probe Rod, Lead Line

TIME IN WATER: 9:50 A.M.

TIME OUT OF WATER: 10:30 A. M.

WATERWAY DATA: VELOCITY " 0.5 f.p.s.

VISIBILITY " 1.5 feet

DEPTH 7.0 feet maximum at Pier 3.

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: Overall, the concrete was in good, sound condition with no structurally significant defects observed. Several hairline cracks were observed on Piers 1 and 3. The top of footing was detected beneath 2 to 3 inches of sand with a probe rod along the mid portion of Pier 3, and the top of footing was exposed along 15 feet of the east face of Pier 1 with 1 to 2 inches of the vertical face also exposed. A 3-foot-radius, 1-foot-deep scour pocket was observed at the upstream end of Pier 3 along with a light accumulation of timber debris that extended 20 feet along the west face. A 4-foot-radius, 1.5-foot-deep scour pocket with a light accumulation of timber debris was also observed at the upstream end of Pier 1.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES \_\_\_\_\_ X \_\_\_\_\_ NO

Monitor footing exposure and drift accumulations during future underwater inspections.

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. 02545  
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	4.0'	N	7	8	9	N	7	6	N	8	7	7	7	N	N	N	N	N
	Pier 2	0.0'	N	7	N	9	N	7	N	N	N	7	7	7	N	N	N	N	N
	Pier 3	7.0'	N	7	N	9	N	7	6	N	8	7	7	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good, sound condition with no structurally significant defects observed. Several hairline cracks were observed on Piers 1 and 3. The top of footing was detected beneath 2 to 3 inches of sand with a probe rod along the mid portion of Pier 3, and the top of footing was exposed along 15 feet of the east face of Pier 1 with 1 to 2 inches of the vertical face also exposed. A 3-foot-radius, 1-foot-deep scour pocket was observed at the upstream end of Pier 3 along with a light accumulation of timber debris that extended 20 feet along the west face. A 4-foot-radius, 1.5-foot-deep scour pocket with a light accumulation of timber debris was also observed at the upstream end of Pier 1.

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.