

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 05525  
CSAH NO. 29  
OVER THE  
MISSISSIPPI RIVER  
DISTRICT 3 - BENTON COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO. 3512 (CEI 82)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 05525, Piers 3 through 7, were found to be generally in good condition below water with no defects of structural significance observed. Partial footing exposure was observed at Piers 3, 4, 5, and 7. The channel bottom appears to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

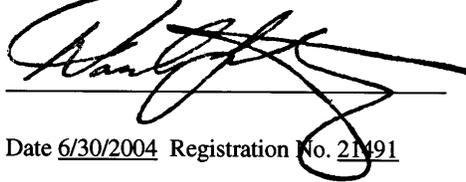
- (A) Light scaling was observed around the entire perimeter of all the piers with a maximum penetration of 1/8 inch, extending from 1 foot below to 2 feet below the waterline.
- (B) Piers 3 through 7 exhibited a hairline crack on each face at the midpoint of the shaft that extended from the top of the shaft to the channel bottom. Pier 7 also exhibited two hairline cracks at the quarter points of the shaft on the east face of the pier.
- (C) The footing at Pier 3 was exposed at the upstream nose and along the entire east face with up to 2.6 feet of vertical face exposed at the northeast corner.
- (D) The footing at Pier 4 was exposed along the entire east face, around the upstream nose, and along the upstream half of the west face with up to 5 inches of vertical face exposed.
- (E) The footing at Pier 5 was exposed along the entire east face and around the upstream nose with up to 1 foot of vertical face exposed at the southeast corner.
- (F) Portions of the top of footing at Pier 7 were exposed along the west face with up to 1 foot of vertical face exposed.

RECOMMENDATIONS:

- (A) 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: 05525

Feature Crossed: The Mississippi River

Feature Carried: CSAH No. 29

Location: District 3 - Benton County

Bridge Description: The superstructure consists of eleven spans of multiple precast concrete girders supporting a reinforced concrete deck. The superstructure is supported by ten reinforced concrete piers and two reinforced concrete abutments, all of which are founded on piling. The piers are numbered 1 through 10 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 Brookins

Date: September 27, 2002

Weather Conditions: Sunny, " 60EF

Underwater Visibility: " 2 Feet

Waterway Velocity: " 2.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 3 through 7.

General Shape: The piers each consist of three columns resting on a oblong rectangular concrete lower shaft with rounded noses supported by a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the shaft at the north end of Pier 3.

Water Surface: The waterline was approximately 12.7 feet below reference.  
Waterline Elevation = 993.4.

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

Item 60: Substructure: Code 7

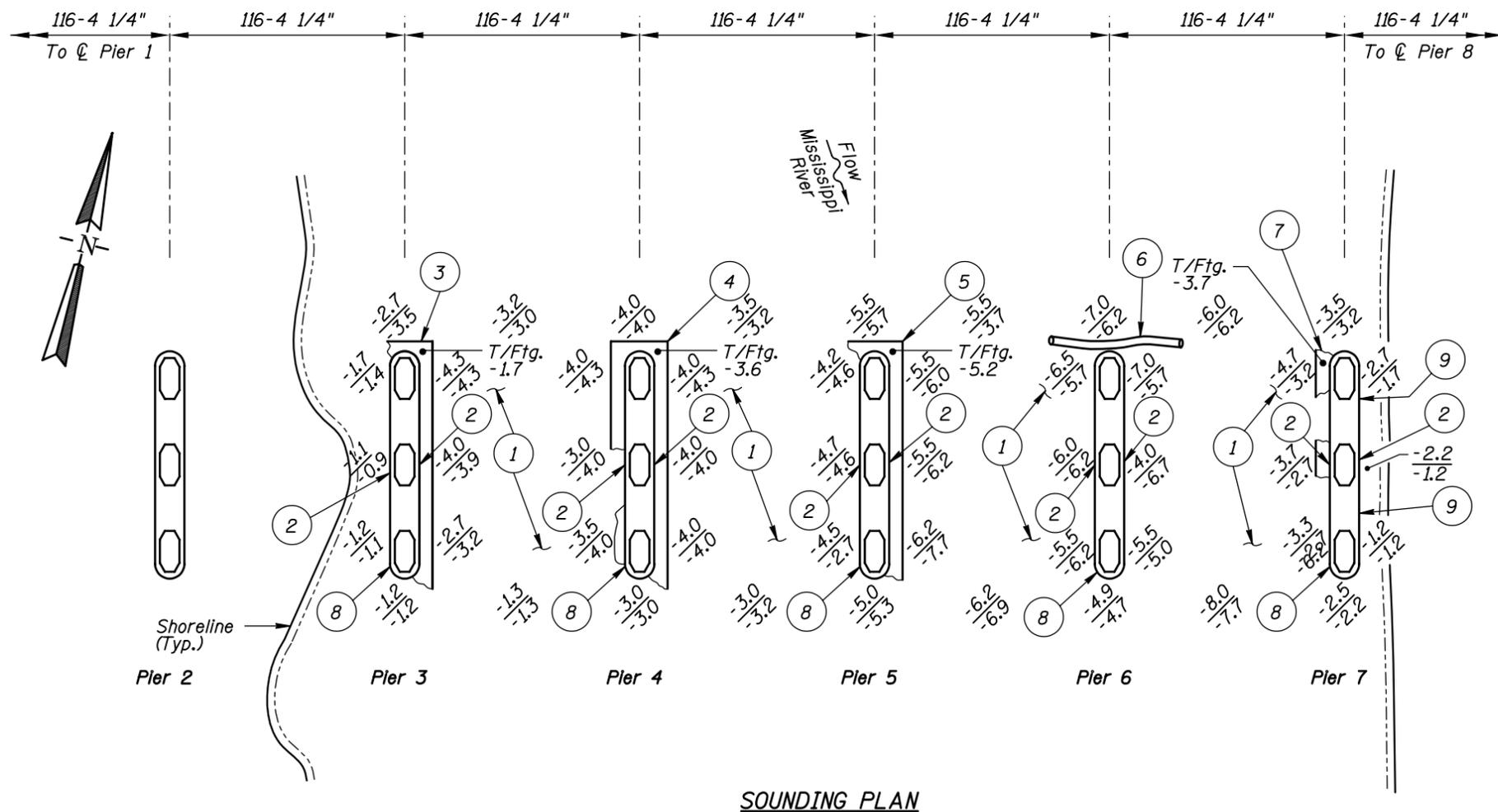
Item 61: Channel and Channel Protection: Code 6

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

Item 113: Scour Critical Bridges: Code J/91

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

Yes  No



**SOUNDING PLAN**

**GENERAL NOTES:**

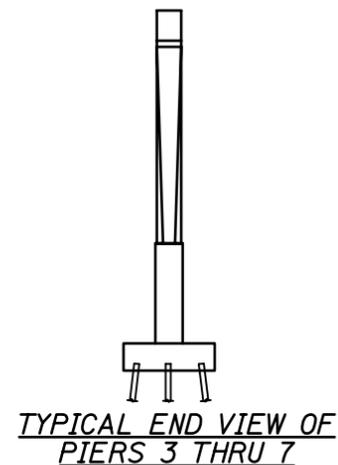
1. Piers 3 through 7 were inspected underwater.
2. At the time of inspection on September 27, 2002, the waterline was located approximately 12.7 feet below the top of the shaft at the upstream end of Pier 3. This corresponds to a waterline elevation of 993.4 based on the previous report dated September 5, 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 the mid points between the substructure units.

**INSPECTION NOTES:**

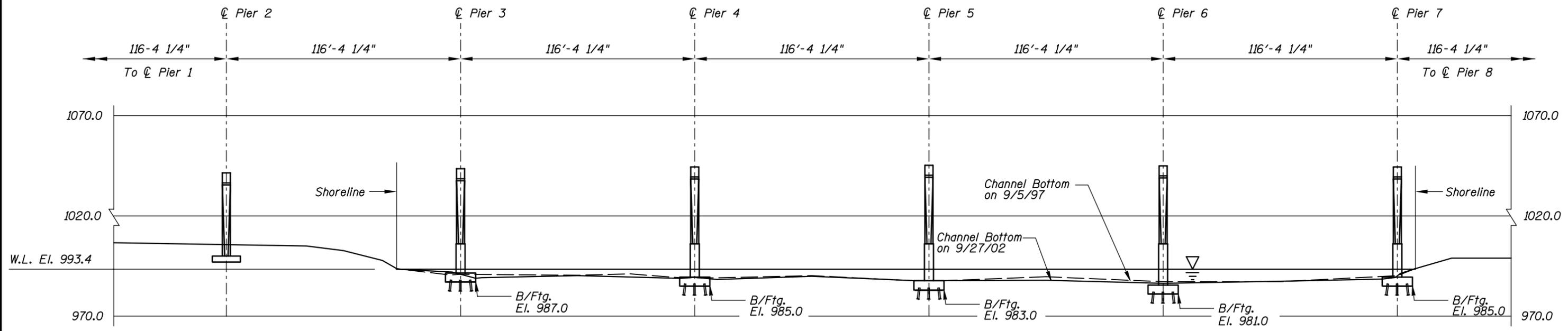
- 1 The channel bottom consisted of 6-inch to 1-foot-diameter rock with sand and with up to 3 inches of probe rod penetration.
- 2 Piers 3 through 7 exhibited a hairline crack on each face at the midpoint of the shaft that extended from the top of the shaft to the channel bottom.
- 3 The footing at Pier 3 was exposed at the upstream nose and along the entire east face with up to 2.6 feet of vertical face exposed at the northeast corner.
- 4 The footing at Pier 4 was exposed along the entire east face, around the upstream nose, and along the upstream half of the west face with up to 5 inches of vertical face exposed.
- 5 The footing at Pier 5 was exposed along the entire east face and around the upstream nose with up to 1 foot of vertical face exposed at the southeast corner.
- 6 A 1-foot-diameter log was observed on the channel bottom at the upstream end of Pier 6.
- 7 Portions of the top of footing at Pier 7 were exposed along the west face with up to 1 foot of vertical face exposed.
- 8 Light scaling was observed around the entire perimeter of all the piers with a maximum penetration of 1/8 inch, extending 1 foot below to 2 feet below the waterline.
- 9 Two hairline cracks were observed on the east face of Pier 7 at the quarter points.

**Legend**

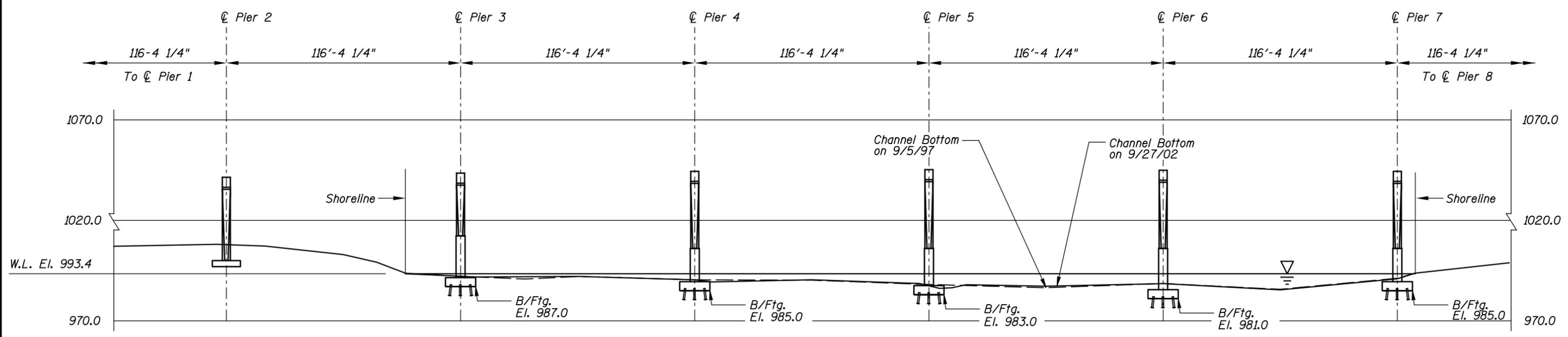
- 3.0 Sounding Depth from Waterline (9/27/02)
- 3.2 Sounding Depth from Waterline (9/5/97)



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 05525 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON 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: 35120082		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. 05525 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON 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: 35120082		Figure No.: 2



Photograph 1. Overall View of Structure, Looking South.



Photograph 2. View of Pier 3, Looking Northwest.



Photograph 3. View of Pier 4, Looking Northeast.



Photograph 4. View of Pier 5, Looking Northeast.



Photograph 5. View of Pier 6, Looking Northeast.



Photograph 6. View of Pier 7, Looking Northeast.

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

INSPECTORS: Collins Engineers, Inc.                      DATE: September 27, 2002  
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.  
BRIDGE NO: 05525    WEATHER: Sunny, " 60EF  
WATERWAY CROSSED: The Mississippi River  
DIVING OPERATION:    X            SCUBA                      SURFACE SUPPLIED AIR  
   OTHER

PERSONNEL: Michelle D. Koerbel, Clayton Brookins  
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Boat, Probe Rod, Camera  
TIME IN WATER: 2:50 P.M.  
TIME OUT OF WATER: 4:00 P.M.  
WATERWAY DATA: VELOCITY " 2.0 f.p.s.  
   VISIBILITY " 2 feet  
   DEPTH 7.0 feet maximum at Pier 6

ELEMENTS INSPECTED: Piers 3 through 7

REMARKS: Overall, the piers inspected were found to be in good condition below water with no defects of structural significance observed. Partial footing exposure was observed at Piers 3, 4, 5, and 7 with vertical face exposures ranging between 5 inches and 2.6 feet. Piers 3 through 7 exhibited a vertical hairline crack along the midpoint of the shaft on both sides of the pier. The channel bottom appears to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

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

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. 05525  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Shirley M. Walker, P.E.  
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 27, 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 3	4.3'	N	7	6	9	N	6	6	N	N	N	6	7	N	N	N	N	N
	Pier 4	4.0'	N	7	7	9	N	7	6	N	N	N	6	7	N	N	N	N	N
	Pier 5	6.2'	N	7	7	9	N	7	6	N	N	N	6	7	N	N	N	N	N
	Pier 6	7.0'	N	7	7	9	N	7	7	N	N	7	7	7	N	N	N	N	N
	Pier 7	4.7'	N	7	7	9	N	7	6	N	N	N	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the piers inspected were found to be in good condition below water with no defects of structural significance observed. Partial footing exposure was observed at Piers 3, 4, 5, and 7 with vertical face exposures ranging between 5 inches and 2.6 feet. Piers 3 through 7 exhibited a vertical hairline crack along the midpoint of the shaft on both sides of the pier. The channel bottom appears to be in stable condition with no evidence of significant scour or 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.