

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 08520

MSAS NO. 110

OVER THE

MINNESOTA RIVER

DISTRICT 7 - BROWN COUNTY, CITY OF NEW ULM

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 129)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete surfaces of the substructure units inspected at Bridge No. 08520, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. A moderate accumulation of timber debris was observed at the upstream end of Pier 1. In addition, Pier 1 exhibited footing exposure with up to 3 feet of vertical face exposure along the east face of the pier, representing an increase by approximately 1 foot since the previous inspection. Other than the increased footing exposure at Pier 1, the channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A moderate accumulation of timber debris, which included pieces up to 10 inches in diameter, was observed from the channel bottom to 2 feet above the channel bottom at the upstream nose and extending along both faces of Pier 1 to the upstream quarter points.
- (B) The top of the footing was exposed at Pier 1 from the upstream quarter point on the west face, around the upstream nose, and along the entire east face with up to 3 feet of vertical face exposure along the east face.
- (C) Pier 3 was not underwater, but exhibited footing exposure around the entire pier with up to 2 feet of vertical face exposure due to a dry scour depression.

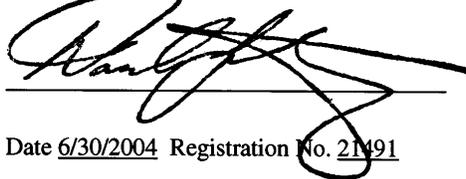
RECOMMENDATIONS:

- (A) Monitor the timber debris at Pier 1, and if found to be increasing in the future, removal operations may become warranted.

- (B) Because the bridge has been evaluated to be scour critical, monitor the footing exposure during high flows and also during future inspections, and if found to be increasing, countermeasures may be warranted.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years, unless a period of high flow creates the need for a sooner inspection.

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.

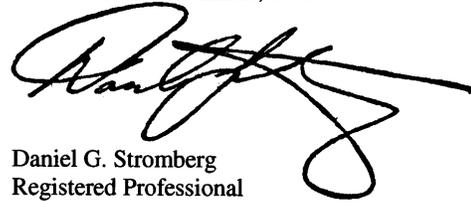
Daniel G. Stromberg



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: 08520

Feature Crossed: The Minnesota River

Feature Carried: 20<sup>th</sup> Street (MSAS No. 110)

Location: District 7 - Brown County, City of New Ulm

Bridge Description: The superstructure consists of multiple steel beams over four spans. The superstructure is supported on two reinforced concrete abutments and three reinforced concrete piers. The pier and abutment footings are supported on steel piles. The piers are numbered 1 through 3 starting at the west end.

2. INSPECTION DATA

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

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

Date: November 1, 2002

Weather Conditions: Sunny, " 30EF

Underwater Visibility: " 1 foot

Waterway Velocity: ' " 1 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Rectangular pier shafts with rounded noses that rest on rectangular footings founded on steel piles.

Maximum Water Depth at Substructure Inspected: Approximately 10 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 25.5 feet below reference.

Waterline Elevation = 786.7

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

Item 60: Substructure: Code 7

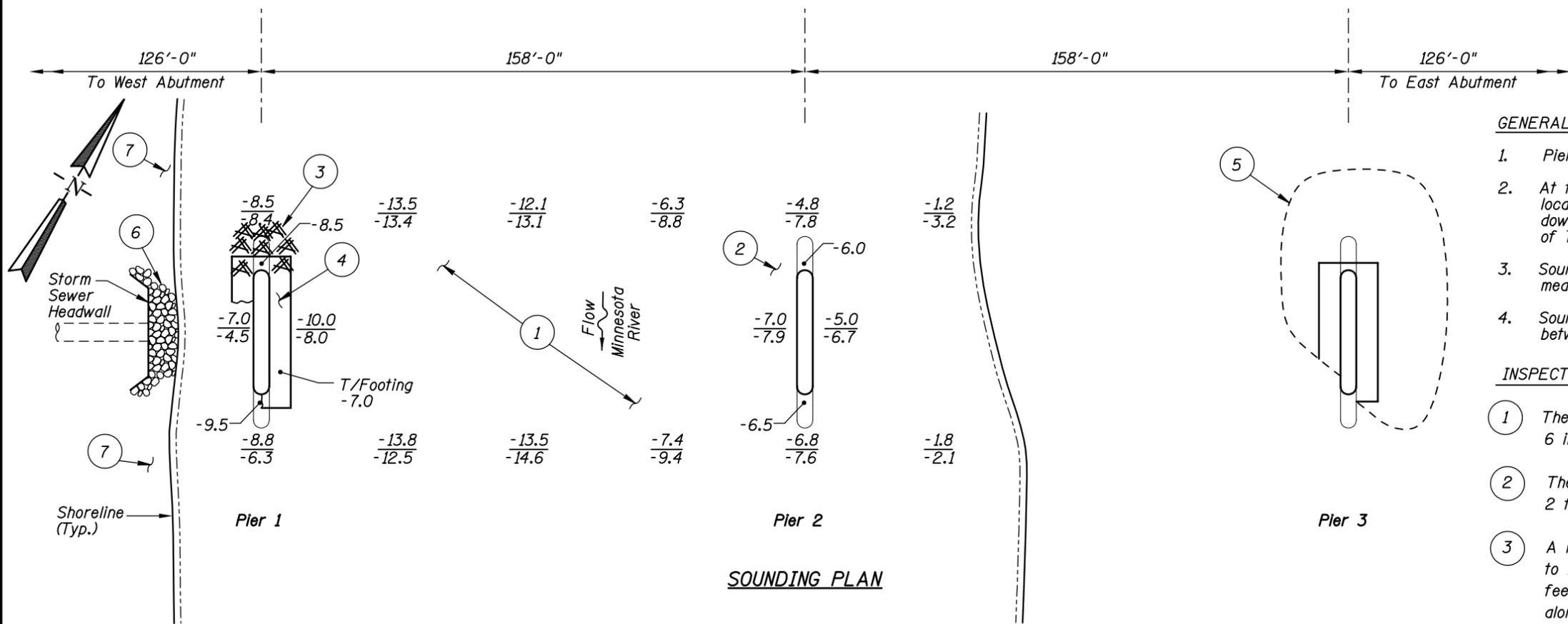
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/11/02

Item 113: Scour Critical Bridges: Code R/95

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

Yes  No



**GENERAL NOTES:**

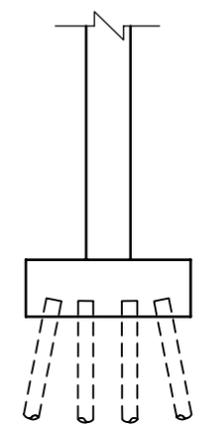
1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on November 1, 2002, the waterline was located approximately 25.5 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 786.7 based on the previous report dated September 21, 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 The channel bottom consisted of firm gravel and riprap, typically 6 inches in diameter, with up to 2 inches of probe rod penetration.
- 2 The channel bottom around Pier 2 consisted of soft silt with up to 2 feet of probe rod penetration.
- 3 A moderate accumulation of timber debris, which included pieces up to 10 inches in diameter, was observed from the channel bottom to 2 feet above the channel bottom at the upstream nose and extending along both faces of Pier 1 to the upstream quarter points.
- 4 The top of the footing was exposed at Pier 1 from the upstream quarter point on the west face, around the upstream nose, and along the entire east face with up to 3 feet of vertical face exposure along the east face.
- 5 The top of the footing was exposed at Pier 3 around the majority of the pier with up to 2 feet of vertical face exposure due to a dry scour depression.
- 6 The storm sewer headwall was well protected with riprap up to 3 feet in diameter.
- 7 Vertical bank erosion was observed upstream and downstream of the structure along the west embankment.

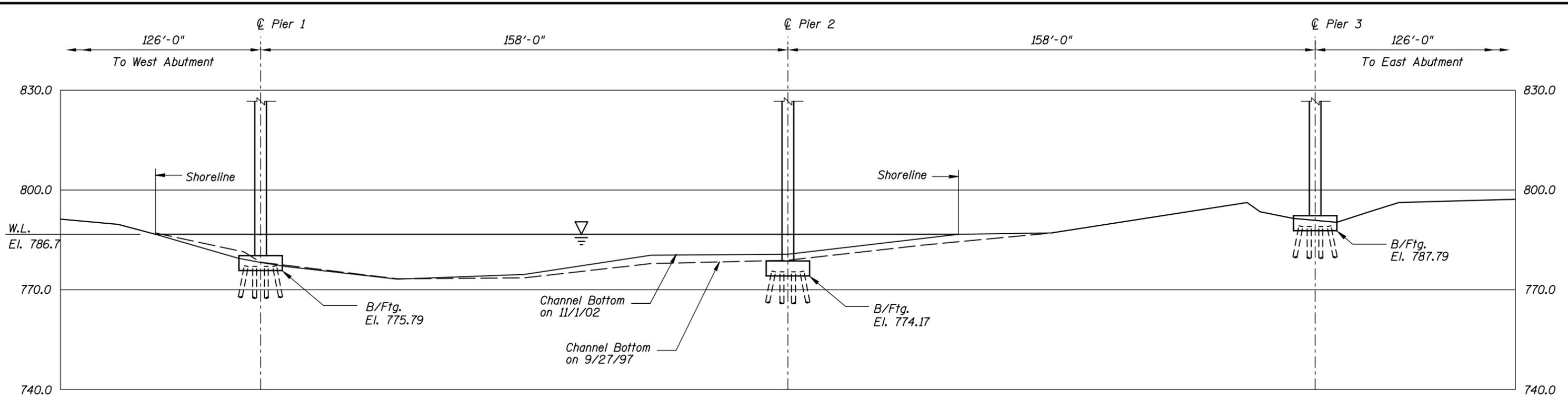
**Legend**

- 2.0 Sounding Depth from Waterline (11/1/02)
- 5.2 Sounding Depth from Waterline (9/21/97)
- Riprap
- Dry Scour Depression
- Timber Debris

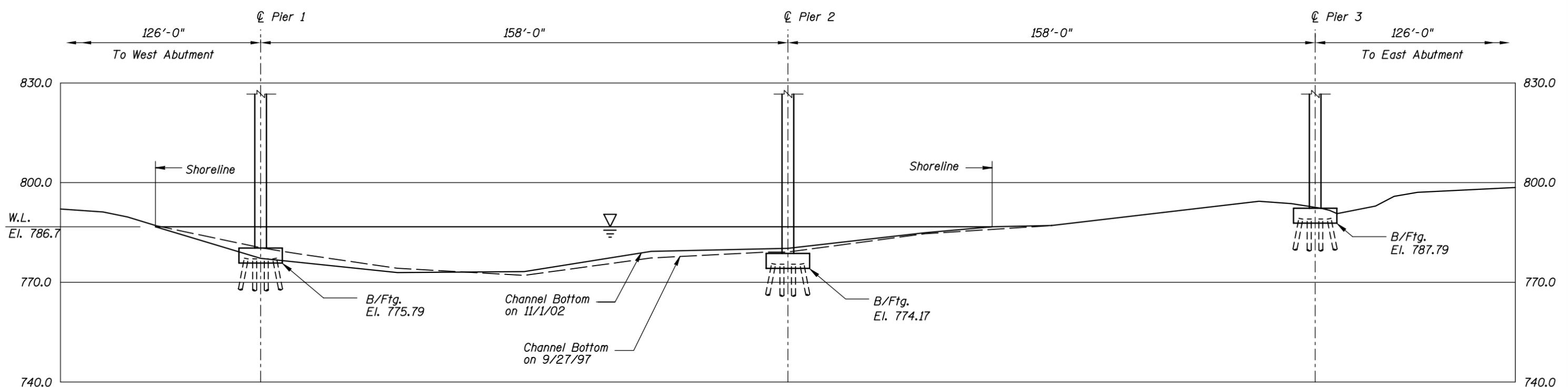


**TYPICAL END VIEW OF PIERS**

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 08520 OVER THE MINNESOTA RIVER DISTRICT 7, BROWN COUNTY, CITY OF NEW ULM		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: NOV. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120129		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. 08520 OVER THE MINNESOTA RIVER DISTRICT 7, BROWN COUNTY, CITY OF NEW ULM		
<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: NOV. 2002
Checked By: MDK		Scale: 1"=30'
Code: 35I20I29		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking Southwest.



Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of Pier 3, Looking Northwest.

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

INSPECTORS: Collins Engineers, Inc.

DATE: November 1, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 08520

WEATHER: Sunny, " 30EF

WATERWAY CROSSED: Minnesota 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, Probe Rod, Camera

TIME IN WATER: 2:30 p.m.

TIME OUT OF WATER: 2:45 p.m.

WATERWAY DATA: VELOCITY " 1 f.p.s.

VISIBILITY " 1 foot

DEPTH 10 feet at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete of the pier shafts was in good condition with no structurally significant defects observed. The footing at Pier 1 was exposed from the upstream quarter point along the west face, around the upstream nose, and along the entire east face with up to 3 feet of vertical face exposed along the east face. There was also a moderate accumulation of timber debris, with pieces up to 10 inches in diameter, observed at the upstream nose and along the upstream side of both faces of Pier 1.

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

Monitor the timber debris at Pier 1, and if found to be increasing in the future, removal operations may become warranted

Because the bridge has been evaluated to be scour critical, monitor the footing exposure during high flows and also during future inspections, and if found to be increasing, countermeasures may be warranted.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years, unless a period of high flow creates the need for sooner inspection.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 08520  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Shirley M. Walker, P.E.  
WATERWAY CROSSED The Minnesota River

INSPECTION DATE November 1, 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	10.0'	N	8	7	9	N	7	6	N	N	7	6	8	N	N	N	N	N
	Pier 2	7.0'	N	8	N	9	N	8	7	N	N	N	7	8	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the pier shafts was in good condition with no structurally significant defects observed. The footing at Pier 1 was exposed from the upstream quarter point along the west face, around the upstream nose, and along the entire east face with up to 3 feet of vertical face exposed along the east face. There was also a moderate accumulation of timber debris, with pieces up to 10 inches in diameter, observed at the upstream nose and along the upstream side of both faces 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.