

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 36517

CSAH NO. 75

OVER THE

LITTLE FORK RIVER

DISTRICT 1 - KOOCHICHING COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 26)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 36517, Pier 2, was found to be in good condition below water with no defects of structural significance. The channel bottom around Pier 2 was presently firm and appeared stable with minor scour and no significant changes since the last inspection. The footing was exposed at both the upstream and downstream noses of the pier.

INSPECTION FINDINGS:

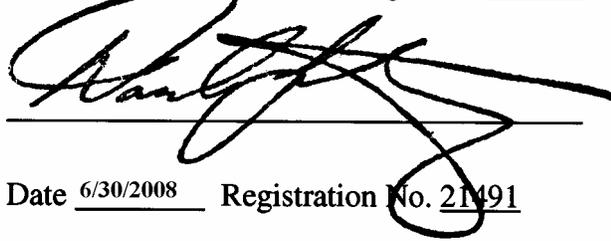
- (A) There was minor top of footing exposure around upstream and downstream noses, with no vertical face exposure.
- (B) Minor scour depression, 3 feet in radius and 0.5 feet deep was observed at the downstream column of Pier 2 and a 5-foot-radius and 1.5-foot-deep scour pocket was observed at the upstream column of Pier 2.
- (C) A band of concrete scaling 1 foot high was located at the waterline with  $\frac{1}{4}$  inch maximum penetration.
- (D) A light accumulation of timber debris consisting of 8 inch diameter and smaller branches was observed at the upstream nose of Pier 2.

RECOMMENDATIONS:

- (A) Footing exposures should be monitored during future inspections.
- (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 6/30/2008 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: 36517

Feature Crossed: Little Fork River

Feature Carried: CSAH No. 75

Location: District 3 - Koochiching County

Bridge Description: The superstructure is four spans of multiple steel stringers supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The pier and abutment footings are supported by steel H-piles. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 25, 2007

Weather Conditions: Sunny, 50°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2

General Shape: Pier consists of a rectangular pier cap with rounded ends supported by two circular shafts connected with a slender diaphragm wall. The pier shaft is supported on a continuous rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 3.2 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the east end of Pier 2.

Water Surface: The waterline was approximately 24.7 feet below reference.  
Water Elevation = 1192.1.

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

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/07

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.

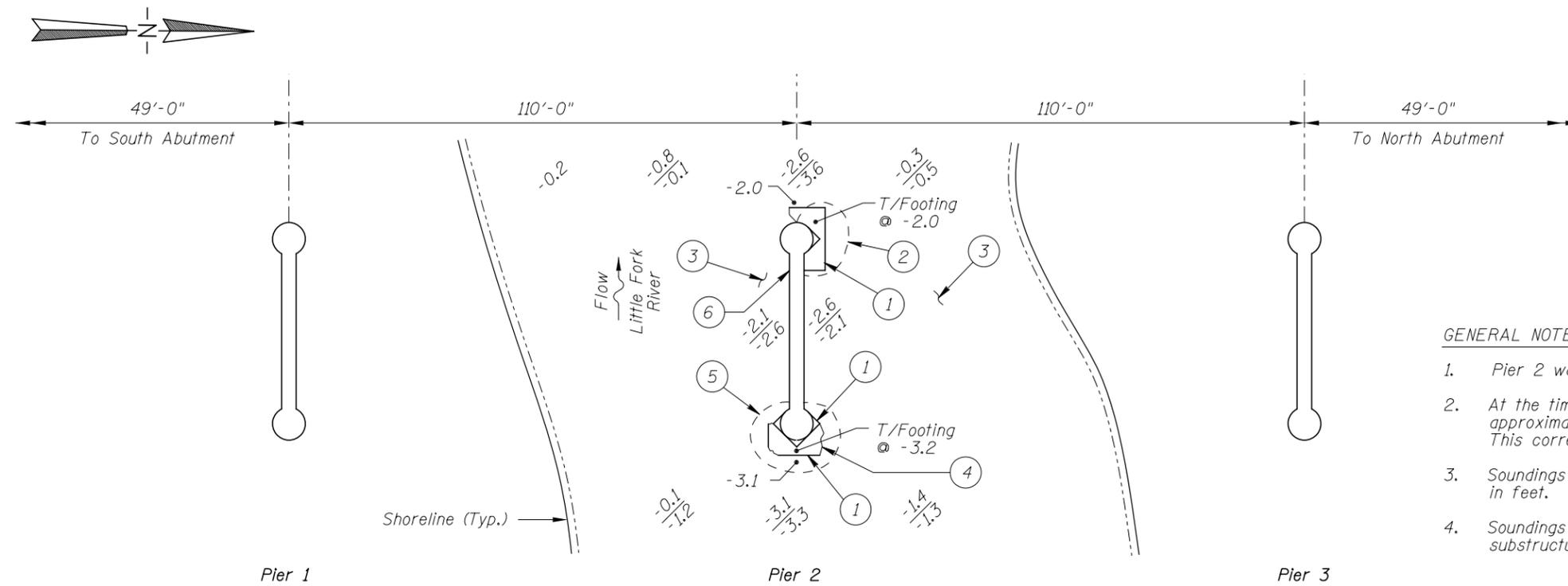
      Yes   X  No



Photograph 1. Overall View, Looking Southeast.



Photograph 2. Pier 2, Looking Southeast.



**SOUNDING PLAN**

**GENERAL NOTES:**

1. Pier 2 was inspected at this bridge.
2. At the time of inspection on August 25, 2007, the waterline was located approximately 24.7 feet below the top of cap on the upstream end of Pier 2. This corresponds to a waterline elevation of 1192.1.
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:**

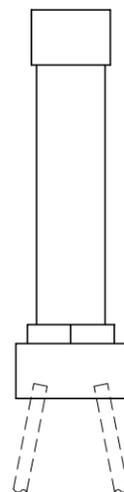
- ① The footing was exposed at both noses of the pier approximately as shown. The exposure was primarily only the top of the footing with no vertical exposure.
- ② Minor scour depression, 3 feet in radius and 0.5 foot deep, was observed at the downstream column of the pier.
- ③ The channel bottom material consisted of a firm, sandy gravel and scattered riprap with up to 1 inch probe rod penetration.
- ④ A light accumulation of timber debris consisting of 8 inches diameter and smaller branches was observed at the upstream nose of Pier 2, extending from waterline to channel bottom.
- ⑤ Minor scour depression, 5 feet in radius and 1.5 feet deep was observed at the upstream column of Pier 2.
- ⑥ A band of scaling 1 foot high was located at waterline with 1/4 inch max penetration.

**Legend**

- 2.0 Sounding Depth (8/25/07)
- 1.0 Sounding Depth (8/28/02)

**Note:**

All soundings based on 2007 waterline location.



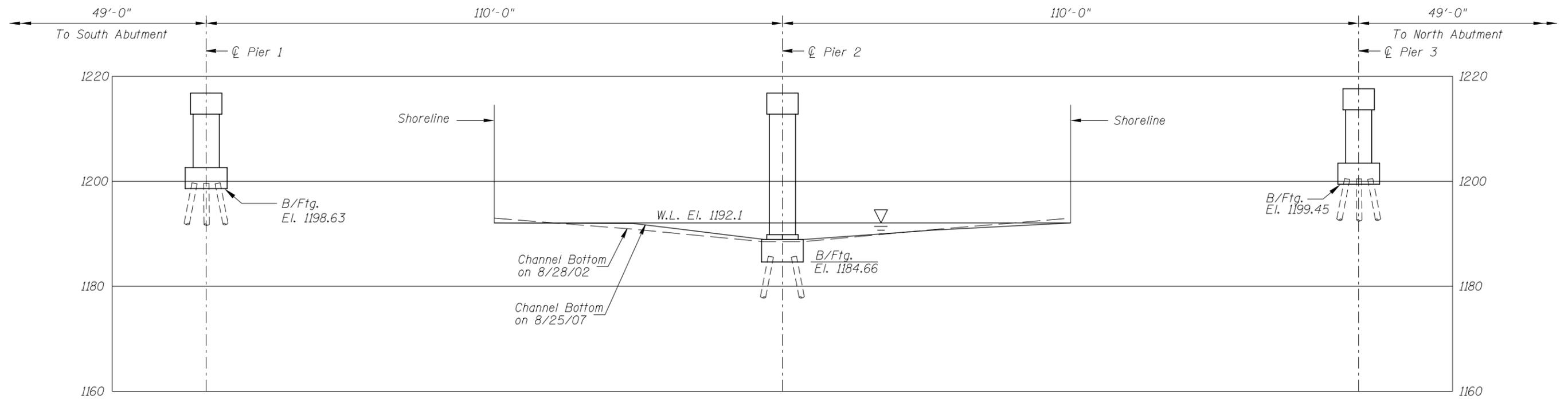
**TYPICAL END VIEW OF PIERS**

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

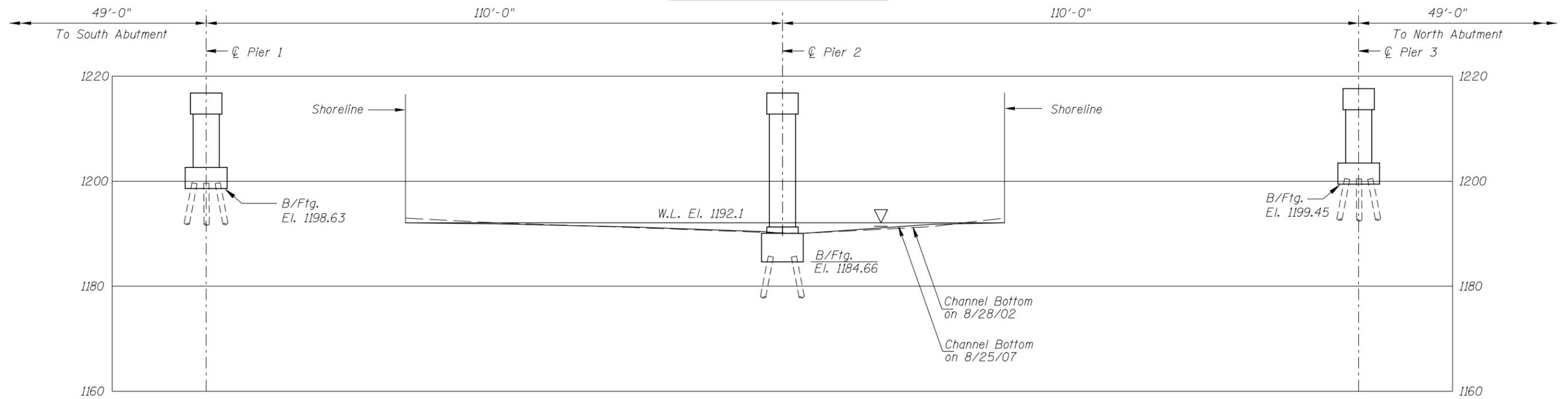
STRUCTURE NO. 36517  
OVER THE LITTLE FORK RIVER  
DISTRICT I, KOOCHICHING COUNTY

**INSPECTION AND SOUNDING PLAN**

Drawn By: PRH	<b>COLLINS ENGINEERS</b> <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210026		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. 36517 OVER THE LITTLE FORK RIVER DISTRICT 1, KOOCHICHING COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS</b>	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=20'
Code: 52210026		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 25, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 36517 WEATHER: Sunny, 50°F

WATERWAY CROSSED: Little Fork River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 6:10 p.m.

TIME OUT OF WATER: 6:35 p.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s

VISIBILITY 2.0 feet

DEPTH 3.2 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: Overall, the concrete below water was in smooth and sound condition with no significant deficiencies. Minor top of footing exposure was detected around the upstream and downstream noses of the pier, with no vertical exposure. Minor scour depression, 3 feet in radius and 0.5 feet deep was observed at the downstream column of the pier and a similar depression, 5 feet in radius and 1.5 feet deep was observed at the upstream column of the pier. A band of scaling 1 foot high was located at the waterline with 1/4 inch maximum penetration. A light accumulation of timber debris was observed at the upstream nose of Pier 2.

FURTHER ACTION NEEDED:  YES  NO

Footing exposures should be monitored during future 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. 36517  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.  
 WATERWAY CROSSED Little Fork River

INSPECTION DATE August 25, 2007  
 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	3.2'	N	8	8	9	N	8	6	8	8	7	6	8	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete below water was in smooth and sound condition with no significant deficiencies. Minor top of footing exposure was detected around the upstream and downstream noses of the pier, with no vertical exposure. Minor scour depression, 3 feet in radius and 0.5 feet deep was observed at the downstream column of the pier and a similar depression, 5 feet in radius and 1.5 feet deep was observed at the upstream column of the pier. A band of scaling 1 foot high was located at the waterline with 1/4 inch maximum penetration. 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.