

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 36523
CSAH NO. 18
OVER THE
EAST FORK OF THE RAPID RIVER
DISTRICT 1 - KOOCHICHING COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 36523, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. At the time of the inspection, the channel bottom appeared stable with no significant scour.

INSPECTION FINDINGS:

- (A) The protective coating on the piles exhibited signs of breakdown and surface corrosion from 6 inches above the waterline to the channel bottom. Also, nodules were observed ¼ inch maximum size. No appreciable section loss was observed and the corrosion coverage was 10 to 20 percent.

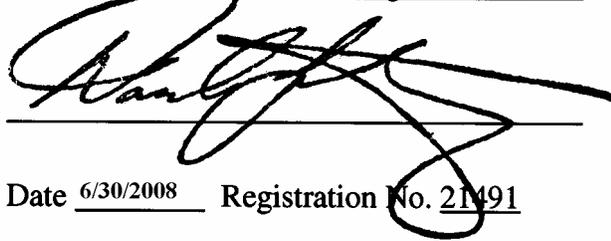
- (B) Two 1.5-foot-diameter tree trunks were observed along the west side of Pier 1 and a light accumulation of 6-inch-diameter timber debris was observed scattered throughout the piles of both Piers 1 and 2 extending from the channel bottom to the waterline.

RECOMMENDATIONS:

- (A) Reinspect all substructure units underwater within the normal maximum (NBIS) interval of five (5) years. Monitor the drift accumulations and if found to be increasing in future, removal may be warranted at that time.

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

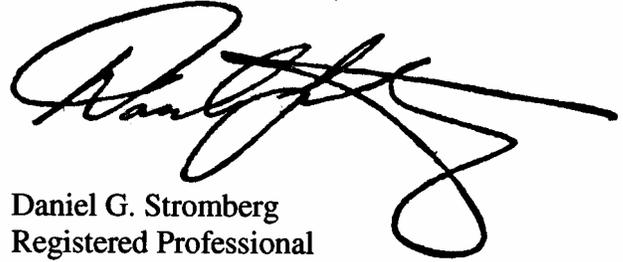


A large, stylized handwritten signature in black ink, written over a horizontal line. The signature is cursive and appears to read 'Daniel G. Stromberg'.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, written over a horizontal line. The signature is cursive and appears to read 'Daniel G. Stromberg'.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 36523

Feature Crossed: East Fork of the Rapid River

Feature Carried: CSAH No. 18

Location: District 1 - Koochiching County

Bridge Description: The superstructure consists of three spans of multiple prestressed concrete beams. The superstructure is supported by two reinforced concrete abutments founded on piles and two steel encased concrete pile piers. The piers are numbered 1 and 2 starting from the west 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 26, 2007

Weather Conditions: Sunny, 56°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Piers 1 and 2 consist of a single line of seven steel encased concrete piles (concrete filled pipe piles) supporting a reinforced concrete cap.

Maximum Water Depth at Substructure Inspected: Approximately 3.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 10.4 feet below reference.
Assumed Water Elevation = 89.6.

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/08/07

Item 113: Scour Critical Bridges: I/02

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

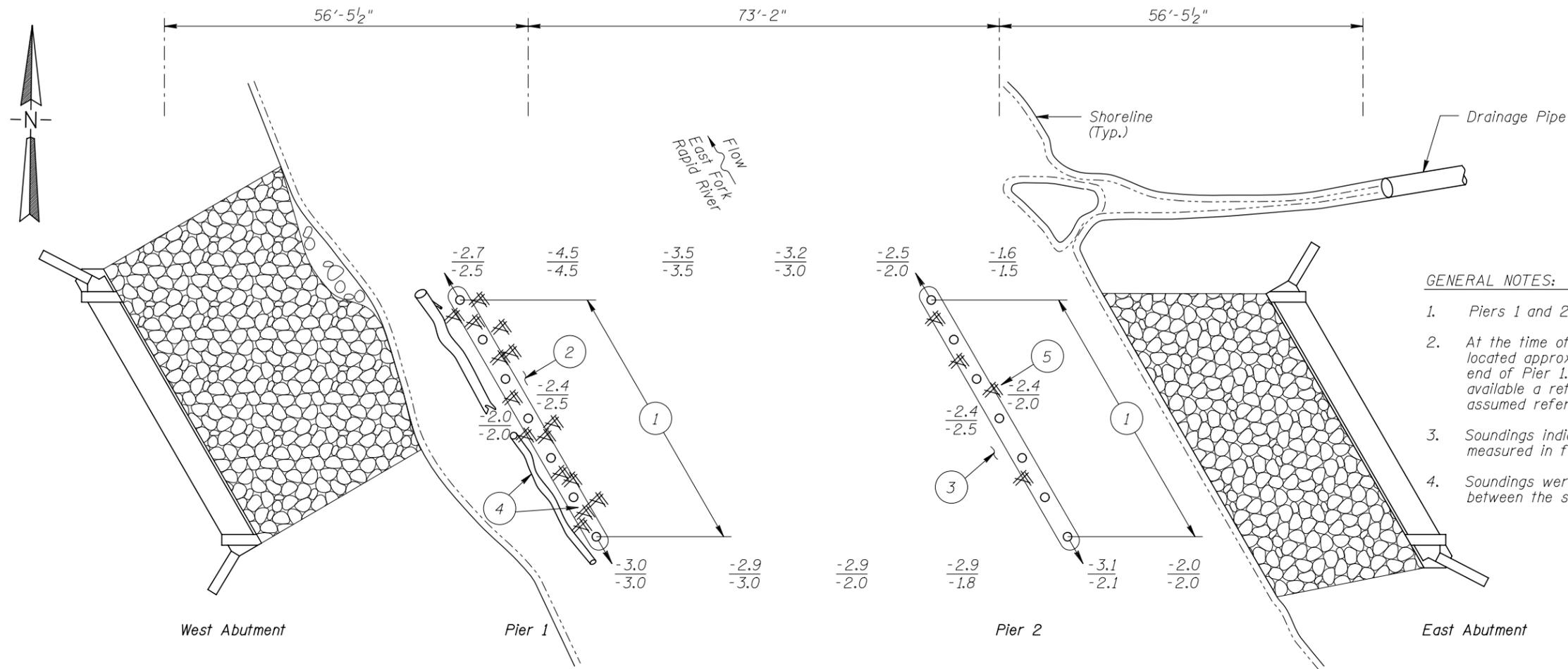
 Yes X No



Photograph 1. View of Pier 1, Looking Northwest.



Photograph 2. View of Pier 2, Looking Northeast.



GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 26, 2007, the waterline was located approximately 10.4 feet below the top of pier cap at downstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 89.6.
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.

SOUNDING PLAN

INSPECTION NOTES:

- 1 The coating on the steel encased concrete piles (concrete filled pipe piles) exhibited signs of breakdown and surface corrosion 6 inches above waterline to channel bottom. Nodules were observed 1/4 inch maximum size. No appreciable section loss was observed and the coverage was 10-20%.
- 2 The channel bottom at Pier 1 consisted of soft silt with a maximum probe rod penetration of 1 foot and occasional riprap.
- 3 The channel bottom at Pier 2 consisted of soft silt with a maximum probe rod penetration of 6 inches.
- 4 Two 1.5-foot-diameter tree trunks were observed along the west side of Pier 1 and a moderate accumulation of 6-inch-diameter timber debris was observed scattered throughout the piles from the channel bottom to the waterline.
- 5 A light accumulation of 6-inch-diameter timber debris was observed scattered throughout the piles.



TYPICAL END VIEW OF PIERS

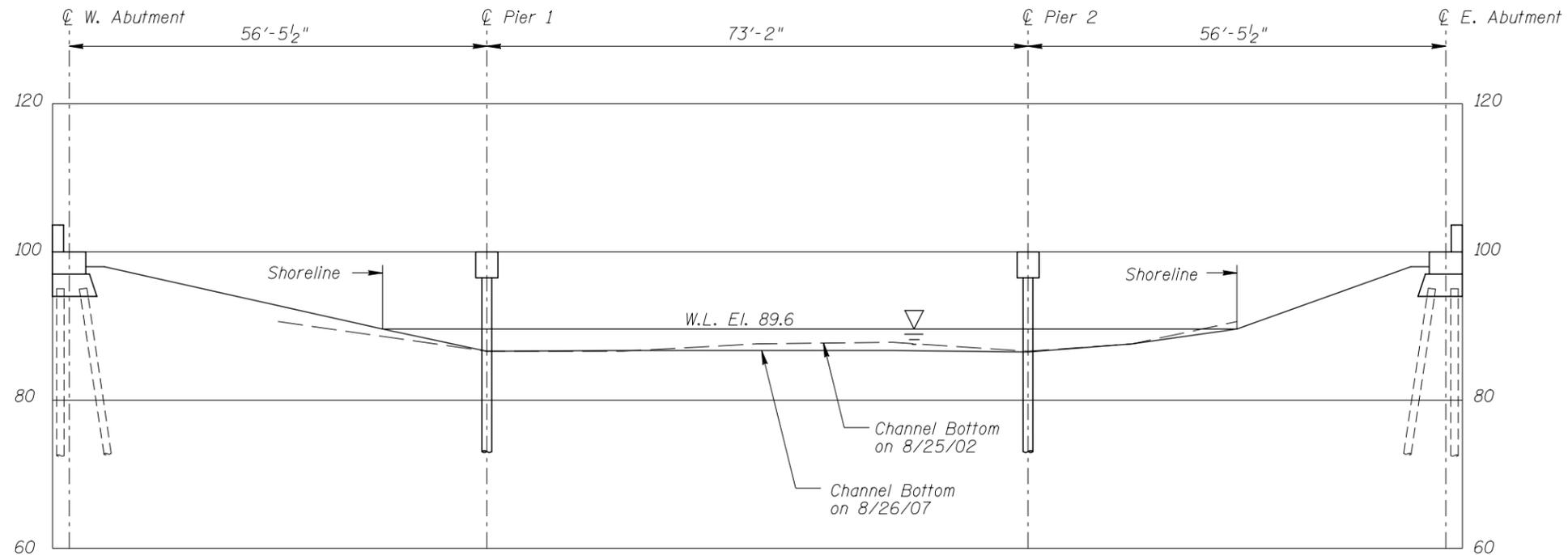
Legend

- 2.0 Sounding Depth (8/26/07)
- 2.0 Sounding Depth (8/25/02)
- 16" Diameter Steel Encased Concrete Pile
- Battered 16" Diameter Steel Encased Concrete Pile
- ▨ Riprap

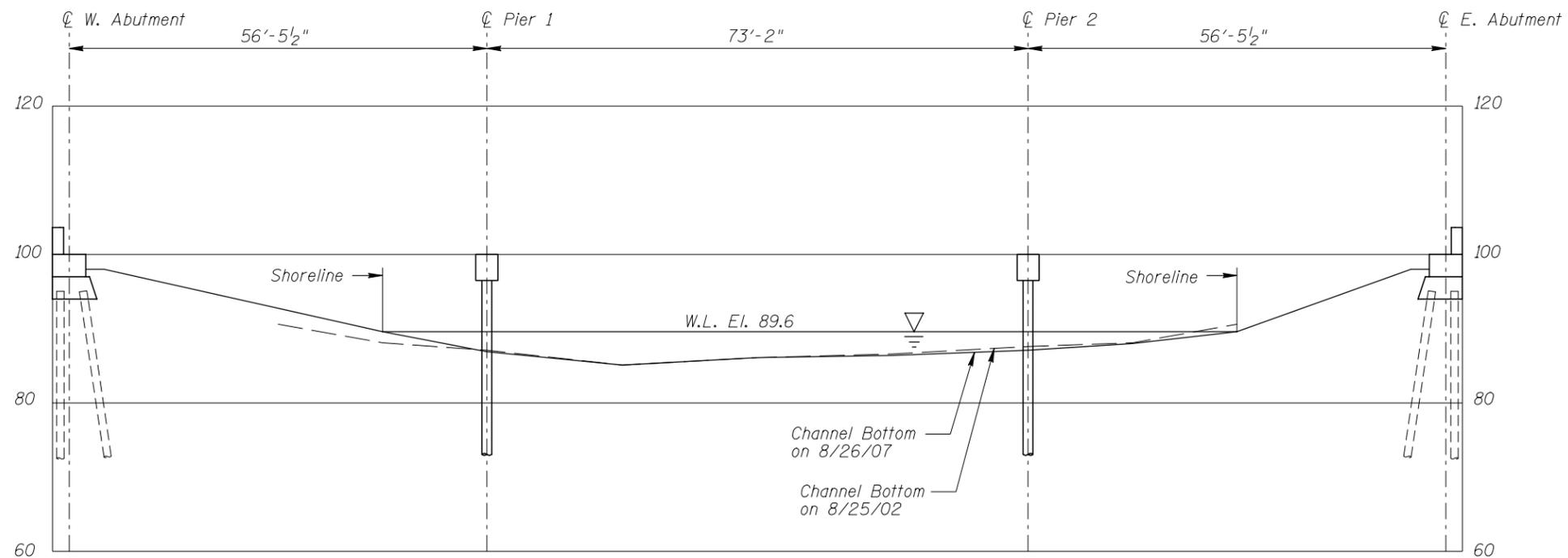
Note:

All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 36523 OVER THE EAST FORK OF THE RAPID RIVER DISTRICT I, KOOCHICHING COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 522136523		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. 36523
OVER THE EAST FORK OF THE RAPID RIVER
DISTRICT I, KOOCHICHING COUNTY

**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=20'
Code: 522136523		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 26, 2007

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

BRIDGE NO: 36523 WEATHER: Sunny, 56°F

WATERWAY CROSSED: East Fork of the Rapid 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: 9:00 a.m.

TIME OUT OF WATER: 9:30 a.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 2.0 feet

DEPTH 3.1 feet maximum at Piers 1 and 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the steel encased concrete piles were in good condition with no defects of structural significance observed. However, the protective coating on the piles exhibited signs of breakdown and surface corrosion 6 inches above the waterline to the channel bottom. Also, nodules were observed, ¼ inch diameter maximum size. No appreciable section loss was observed and the coverage was 10 to 20 percent. Two 1.5-foot-diameter tree trunks were observed along the west side of Pier 1 and a moderate accumulation of 6-inch-diameter timber debris was observed scattered throughout the piles of Piers 1 and 2 from the channel bottom to the waterline.

FURTHER ACTION NEEDED: YES NO

Monitor accumulations of timber debris around piers during future inspection of the bridge, and if found to be increasing, removal operations may be warranted at that time.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 36523
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED East Fork of the Rapid River

INSPECTION DATE August 26, 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 1	3.0'	7	N	N	9	N	7	8	8	8	7	7	N	7	N	N	N	N
	Pier 2	3.1'	7	N	N	9	N	7	8	8	8	7	7	N	7	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the steel encased concrete piles were in good condition with no defects of structural significance observed. However, the protective coating on the piles exhibited signs of breakdown and surface corrosion 6 inches above the waterline to the channel bottom. Also, nodules were observed, 1/4 inch diameter maximum size. No appreciable section loss was observed and the coverage was 10 to 20 percent. Two 1.5-foot-diameter tree trunks were observed along the west side of Pier 1 and a moderate accumulation of 6-inch-diameter timber debris was observed scattered throughout the piles of Piers 1 and 2 from the channel bottom to the waterline.

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.