

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 70535
CSAH NO. 1
OVER THE
MINNESOTA RIVER
DISTRICT M-7 – SCOTT 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 70535, Piers 1, 2 and 3, were in good condition with no defects of structural significance observed. A moderate accumulation of timber debris was observed at the upstream end of Pier 2, and a scour depression was observed around Pier 3. Otherwise, the channel bottom at the bridge appeared to be stable with no conditions of major concern at this time.

INSPECTION FINDINGS:

- (A) A moderate accumulation of timber debris consisting of 1 foot diameter and smaller logs and branches was observed at the upstream nose of Pier 2 extending from the channel bottom up 4 feet and along the north face from the upstream end to the shaft midpoint extending from the channel bottom up 2 feet.
- (B) A 10 foot radius scour depression 5 to 6 feet deep was observed all around the upstream nose and along northwest face of Pier 3 (on easterly bank with standing water).

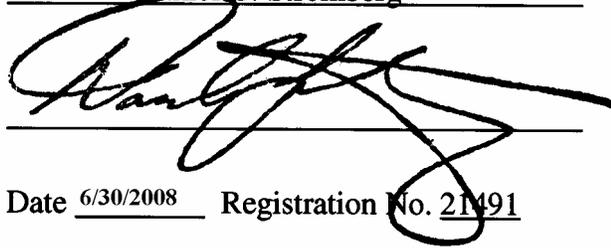
RECOMMENDATIONS:

- (A) Monitor the extent of the timber debris accumulation at Pier 2, and if found to be increasing, removal during routine maintenance may become necessary.

- (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.

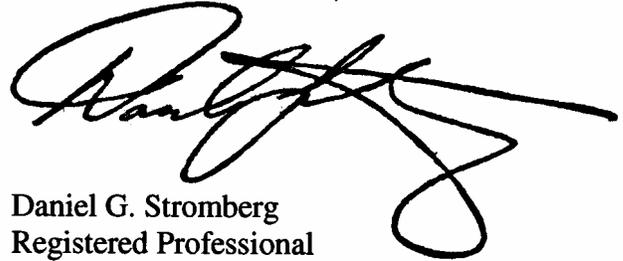
Daniel G. Stromberg



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: 70535

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 1

Location: District M-7 – Scott County

Bridge Description: The superstructure consists of four spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and three concrete piers. The piers are numbered 1 through 3 from west to east across the bridge.

2. INSPECTION DATA

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

Dive Team: Clayton Brookins, Valerie Roustan

Date: November 19, 2007

Weather Conditions: Cloudy, 50°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: The piers consist of an oblong rectangular concrete shaft supporting a hammerhead pier cap on top of a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 12.8 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 16.0 feet below reference.
Waterline Elevation = 698.7.

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/11/07

Item 113: Scour Critical Bridges: Code F/07

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 of the Structure, Looking Southwest.



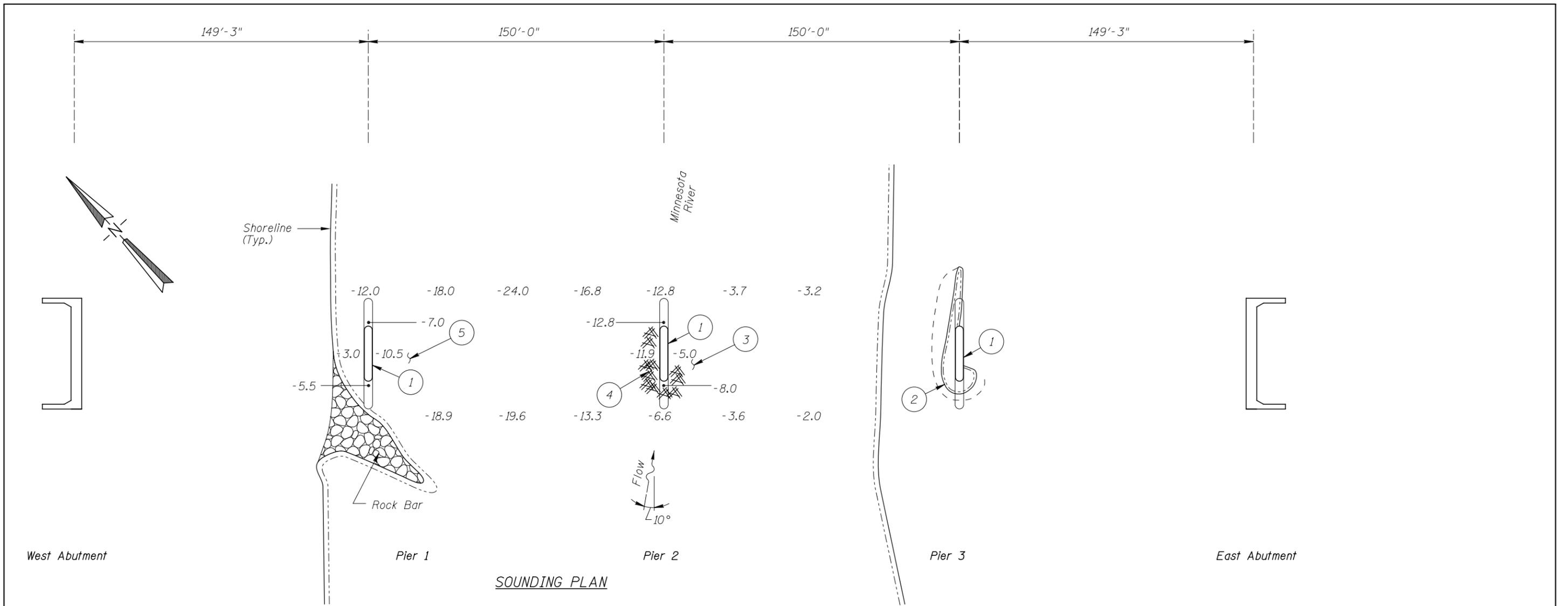
Photograph 2. View of Pier 1 and Timber Debris Upstream of Bridge, Looking Northeast.



Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of Pier 3, Looking Northeast.



SOUNDING PLAN

INSPECTION NOTES:

- ① The concrete was smooth and sound with no notable defects.
- ② A 10-foot-radius scour depression 5 to 6 feet deep (2 feet to 3 feet of standing water in scour depression) was observed all around the upstream nose and north-west face of Pier 3.
- ③ The channel bottom consisted of firm silty clay and rocks with 3 inches maximum probe rod penetration.
- ④ A moderate accumulation of timber debris consisting of 1-foot-diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the north face from the upstream end of the midpoint from the channel bottom up 2 feet.
- ⑤ The channel bottom consisted of silty clay with 6 inches maximum probe rod penetration at the north face; at the downstream end it was firmer with 3 inches maximum probe rod penetration; at the upstream end it consisted of rocks 2 feet in diameter and smaller with no probe rod penetration; at the south face it was softer with 6 inches of maximum probe rod penetration.

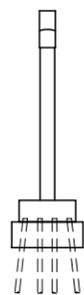
GENERAL NOTES:

- 1. Piers 1, 2, and 3 were inspected underwater.
- 2. At the time of inspection on November 19, 2007, the waterline was located approximately 16.0 feet below bottom of the hammerhead pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 708.6 feet based on design drawings.
- 3. Soundings indicate the water depth at the time of the inspection and are measured in feet.
- 4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

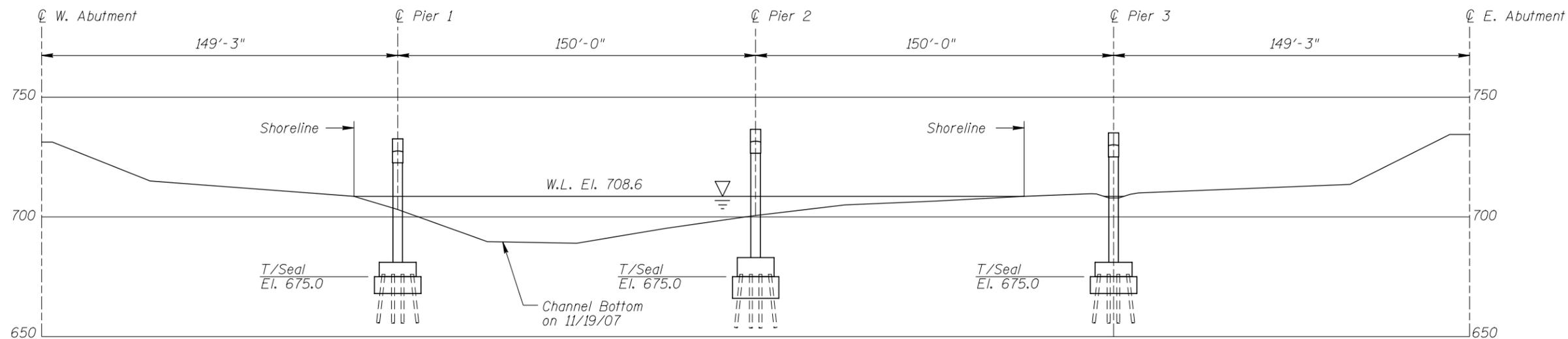
Legend

- 7.0 Sounding Depth (11/19/07)
- Timber Debris
- Scour Depression

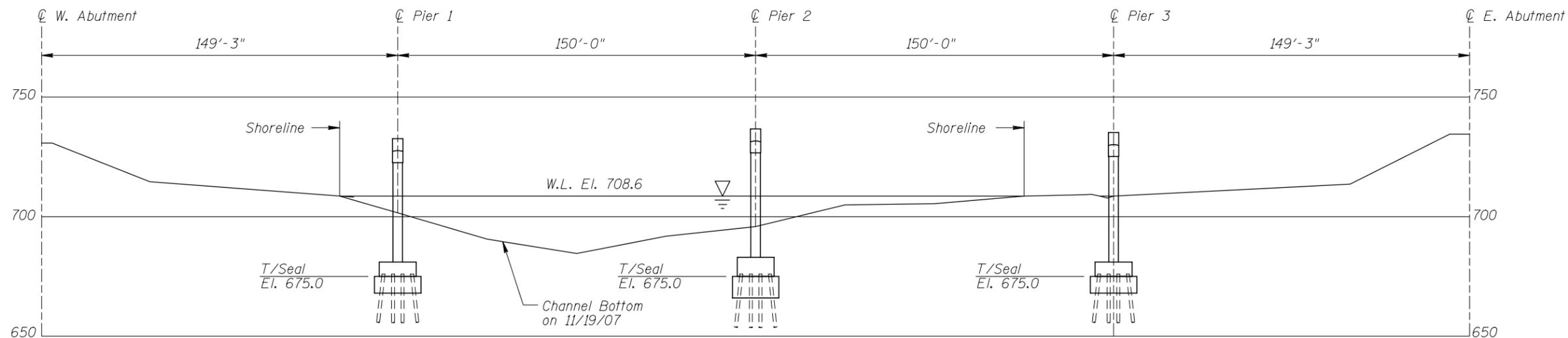
TYPICAL END VIEW OF PIERS



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 70535 OVER THE MINNESOTA RIVER, DISTRICT M/7, SCOTT COUNTY, CITY OF BLAKELEY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH Checked By: MDK Code: 522170535	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: NOV., 2007 Scale: NTS 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. 70535 OVER THE MINNESOTA RIVER DISTRICT M/7, SCOTT COUNTY, CITY OF BLAKELEY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS	Date: NOV., 2007
Checked By: MDK		Scale: 1"=40'
Code: 522170535		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: November 19, 2007

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

BRIDGE NO: 70535 WEATHER: Cloudy, 50°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton Brookins, Valerie Roustan

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

TIME IN WATER: 11:30 a.m.

TIME OUT OF WATER: 12:00 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 0.5 feet

DEPTH 12.8 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete was smooth and sound with no significant structural defects. A moderate accumulation of timber debris consisting of 1 foot in diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the north face from the upstream end to the shaft midpoint from the channel bottom up 2 foot. A 10 feet radius scour depression 5 to 6 feet deep was observed all around the upstream nose and northwest face of Pier 3 (on easterly bank with standing water).

FURTHER ACTION NEEDED: YES NO

Monitor the extent of the timber debris accumulation at Pier 2, and if found to be increasing, removal during routine maintenance may become necessary.

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. 70535
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Minnesota River

INSPECTION DATE November 19, 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	12.0'	N	7	N	9	N	7	7	7	7	N	7	7	N	N	N	N	N
	Pier 2	12.8'	N	7	N	9	N	7	7	N	7	6	6	7	N	N	N	N	N
	Pier 3	2.0'	N	7	N	9	N	7	6	7	7	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound with no significant structural defects. A moderate accumulation of timber debris consisting of 1 foot in diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the north face from the upstream end to the shaft midpoint from the channel bottom up 2 foot. A 10 feet radius scour depression 5 to 6 feet deep was observed all around the upstream nose and northwest face of Pier 3 (on easterly bank with standing water).

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.