

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69505
CSAH NO. 8
OVER THE
ST. LOUIS RIVER
DISTRICT 1 – ST. LOUIS COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 2)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 69505, the West and East Piers, were in good condition with no defects of structural significance observed. A moderate accumulation of timber debris was observed at the upstream end of the West Pier. The channel bottom appeared to be in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

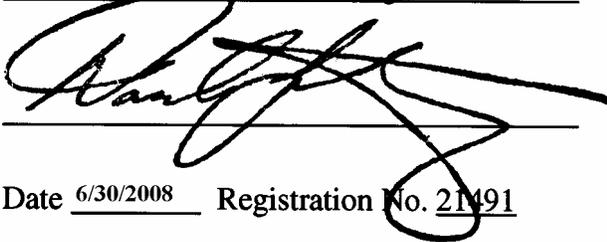
- (A) The concrete exhibited light scaling from 4 feet above the waterline to the channel bottom with exposed aggregated and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch.
- (B) A moderate accumulation of 1-foot-diameter and smaller timber debris was observed at the upstream end and along the shore side of the West Pier extending from the channel bottom to 1 foot above the waterline. The drift accumulation extended 5 feet upstream of the pier and 4 feet into the adjoining spans.

RECOMMENDATIONS:

- (A) Monitor timber drift accumulation at West Pier, and if found to be increasing in the future, removal operations may be required at that time.
- (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.

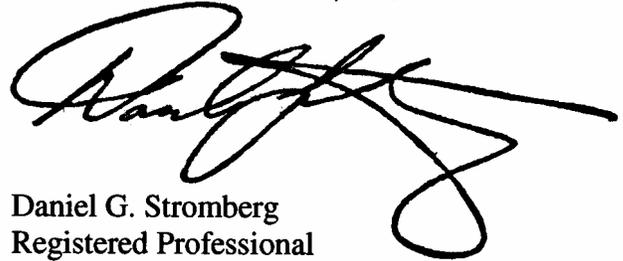
Daniel G. Stromberg



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: 69505

Feature Crossed: St. Louis River

Feature Carried: CSAH No. 8

Location: District 1 – St. Louis County

Bridge Description: The superstructure consists of three spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and two concrete piers.

2. INSPECTION DATA

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

Dive Team: John J. Loftus, Valerie Rouston

Date: August 29, 2007

Weather Conditions: Sunny, 65°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Piers

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 4.2 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of the East Pier.

Water Surface: The waterline was approximately 17.3 feet below reference.
Assumed Waterline Elevation = 82.7.

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 5

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

Item 113: Scour Critical Bridges: Code N/02

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

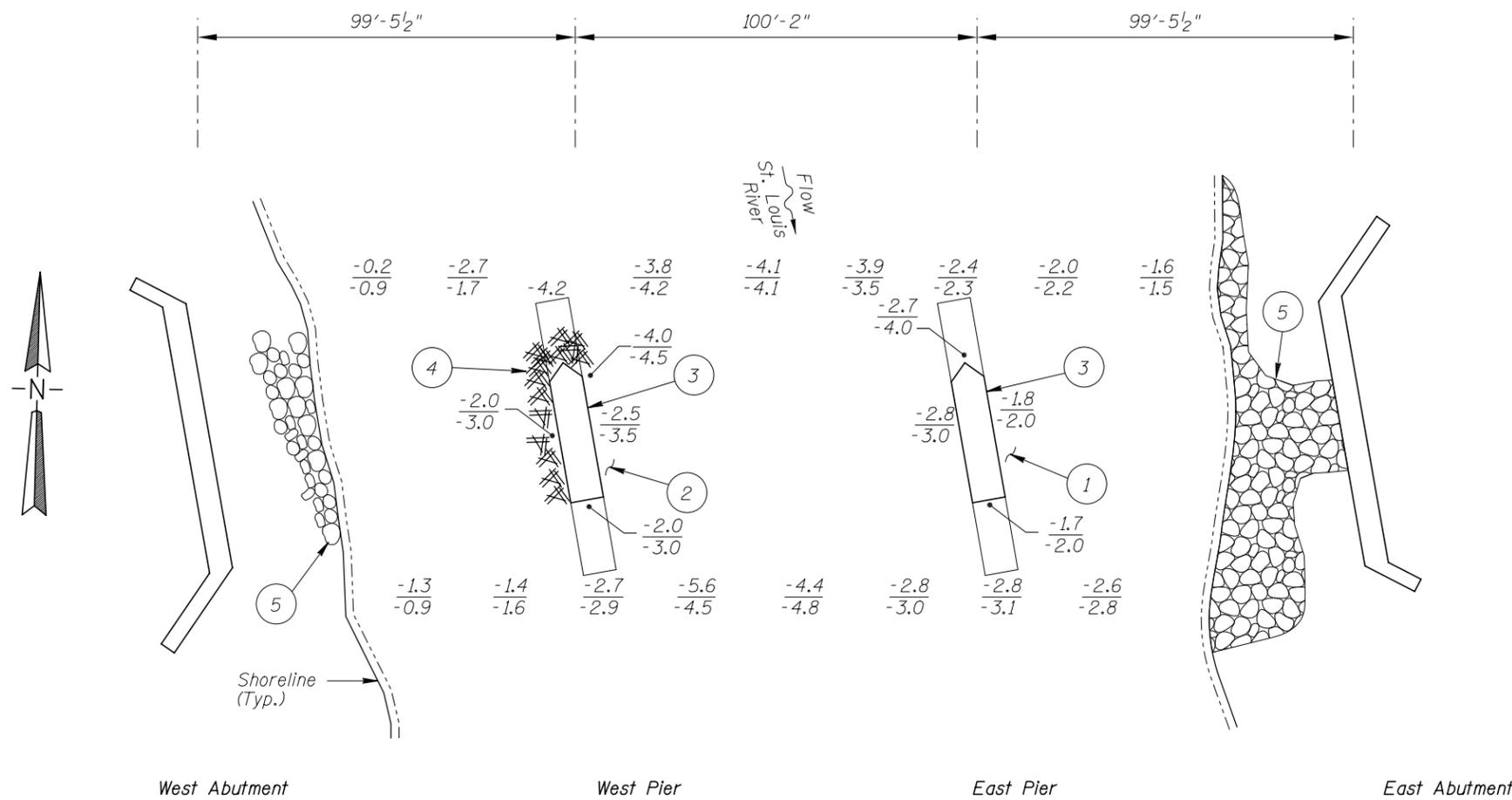
 Yes X No



Photograph 1. View of East Pier and East Embankment, Looking Southeast.



Photograph 2. View of West Pier and Timber Debris, Looking Southeast.



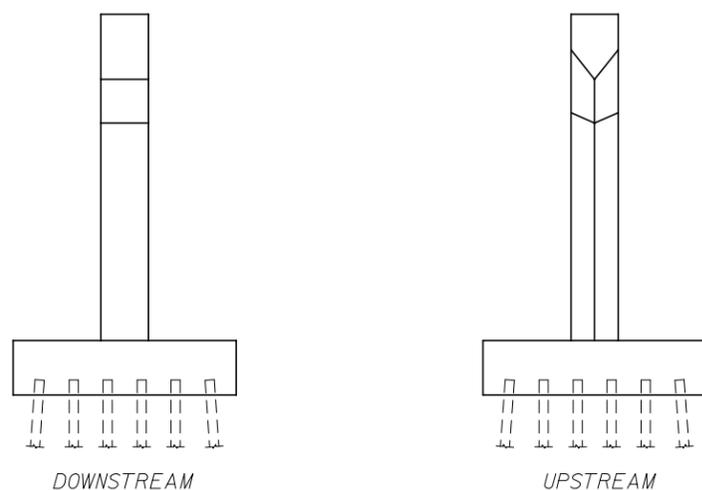
SOUNDING PLAN

GENERAL NOTES:

1. The West Pier and East Pier were inspected underwater.
2. At the time of inspection on August 29, 2007, the waterline was located approximately 17.3 feet below the top of the pier cap at the upstream end of East Pier. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 82.7.
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 1- to 2-foot-diameter riprap and cobbles.
2. The channel bottom consisted of 1 to 2 inches of soft silt over a firm mix of 1-to 2-foot-diameter riprap and cobbles.
3. The concrete exhibited light scaling from 4 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch.
4. A moderate accumulation of 1-foot-diameter and smaller timber debris was observed at the upstream end and along the shore side of the West Pier extending from the channel bottom to 1 foot above the waterline. The drift extended 5 feet upstream of the pier and 4 feet into the adjoining spans.
5. 1- to 2-foot-diameter riprap and cobbles were observed at the embankments.



TYPICAL END VIEW OF PIERS

Legend

- 8.0 Sounding Depth (8/29/07)
- 8.0 Sounding Depth (8/30/02)

Timber Debris

Riprap

Note:

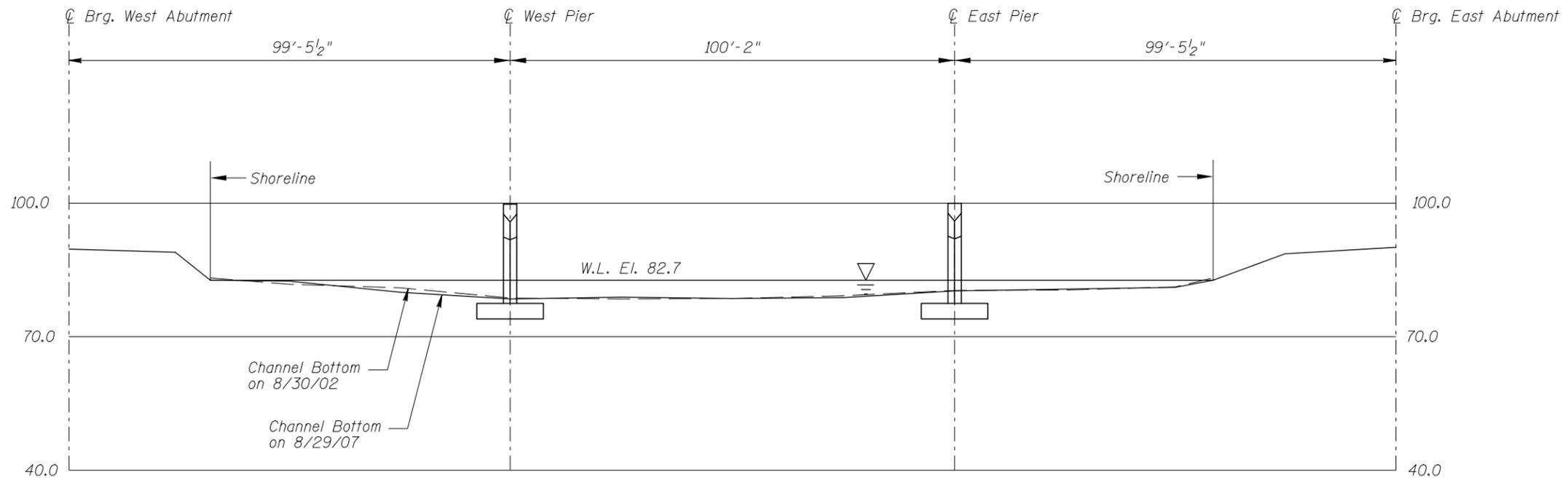
All soundings based on 2007 waterline location.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

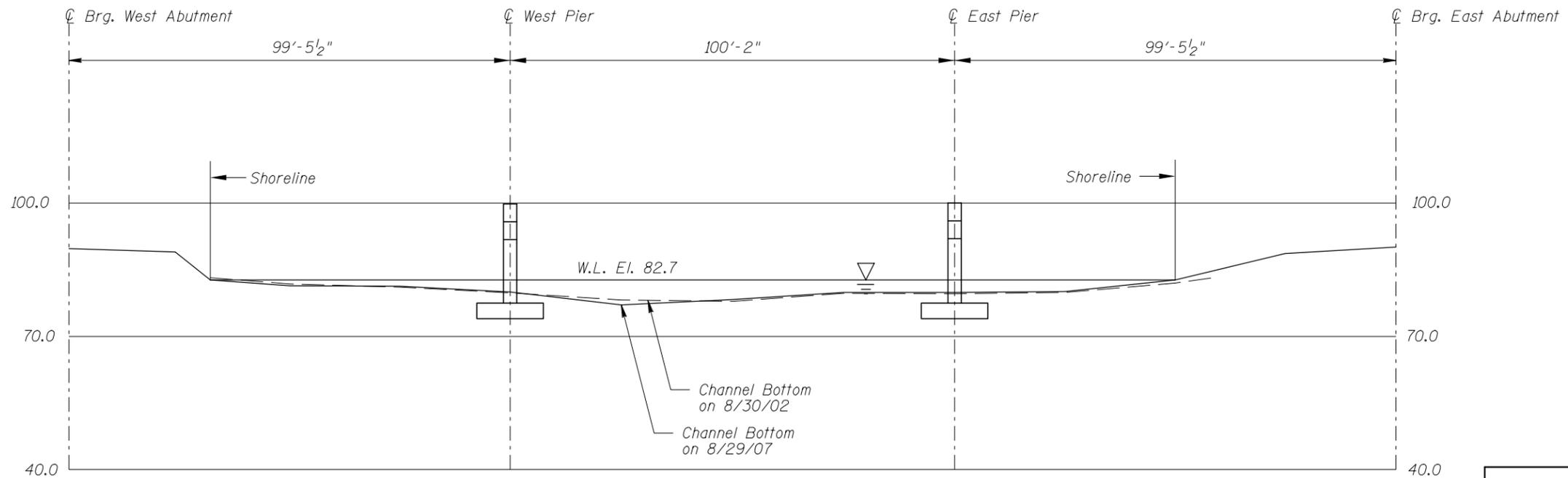
STRUCTURE NO. 69505
OVER THE ST. LOUIS RIVER
DISTRICT I, ST. LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

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: NTS
Code: 522169505		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. 69505 OVER THE ST. LOUIS RIVER DISTRICT I, ST. LOUIS 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"=30'
Code: 522169505		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 29, 2007

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

BRIDGE NO: 69505 WEATHER: Sunny, 65°F

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J.. Loftus, Valerie Roustan

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

TIME IN WATER: 12:30 p.m.

TIME OUT OF WATER: 12:50 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 2.0 feet

DEPTH 4.5 feet maximum the West Pier

ELEMENTS INSPECTED: East and West Piers

REMARKS: Overall, the concrete was in good, sound condition with light scaling from 4 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch. A moderate accumulation of timber debris was observed extending 5 feet upstream, 4 feet into the adjoining spans, and from the channel bottom to 1 foot above the waterline at the upstream end of the West Pier.

FURTHER ACTION NEEDED: YES NO

Monitor timber drift accumulation at West Pier, and if found to be increasing in the future, removal operations may be required at that time.

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. 69505
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED St. Louis River

INSPECTION DATE August 29, 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
	West Pier	4.5'	N	7	N	9	N	7	7	N	7	5	5	7	N	N	N	N	N
	East Pier	2.8'	N	7	N	9	N	7	7	N	8	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good, sound condition with light scaling from 4 feet above the waterline to the channel bottom with exposed aggregate and typical penetrations of 1/8 inch and maximum penetrations ranging from 1/4 inch to 1/2 inch. A moderate accumulation of timber debris was observed extending 5 feet upstream, 4 feet into the adjoining spans, and from the channel bottom to 1 foot above the waterline at the upstream end of the West Pier.

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.