UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 86515

CSAH NO. 42

OVER THE

MISSISSIPPI RIVER

DISTRICT 3 - WRIGHT COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 102)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 86515, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. Since the previous inspection, footing exposure was now observed around the entire perimeter of Pier 3, but no undermining was present. Minor localized scour depressions were present at Piers 1 and 2. Light to moderate accumulations of timber debris were observed at Piers 1, 2 and 3.

INSPECTION FINDINGS:

(A) The concrete of Piers 1 through 3 was typically smooth and sound with random minor areas of poor consolidation with up to 1/2 inch penetration.

(B) Light to moderate accumulations of timber debris were observed around the upstream noses of Piers 1, 2 and 3.

(C) Since the previous inspection, a 4-foot-radius by 1.5-foot-deep scour depression has developed at the upstream end of Pier 2. There was also a 1-foot-deep scour depression around the entire perimeter of both the upstream and downstream columns of Pier1.

(D) The top of the footing was exposed at 11.1 feet below water line around the entire perimeter of Pier 3. The maximum vertical exposure was 4.3 feet at the midpoint of the south face. No undermining was observed.

RECOMMENDATIONS:

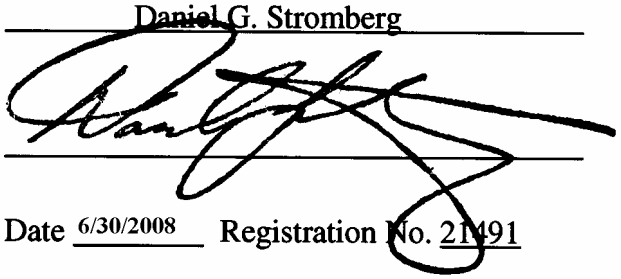
(A) Monitor the accumulation of timber debris around the piers, and if found to be increasing, removal may become necessary during future routine bridge maintenance.

(B) Scour screening evaluation indicates bridge is stable for potential scour; therefore, just monitor the scour and footing exposure during future inspections.

(C) 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.

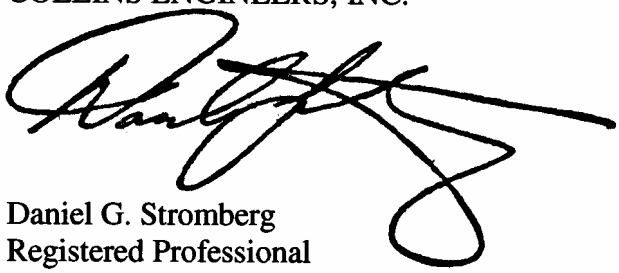
Daniel G. Stromberg



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: 86515

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 42

Location: District 3 - Wright County

Bridge Description: The superstructure consists of four spans of multiple concrete girders. 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 from south to north across the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan.

Date: August 14, 2007

Weather Conditions: Partly Cloudy, 70°F

Underwater Visibility: 1.0 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 two octagonal, eight-sided columns, one on each end of a rectangular pile supported footing, supporting a hammerhead cap, with a connecting diaphragm wall between the lower half of the columns.

Maximum Water Depth at Substructure Inspected: Approximately 15.9 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 3.

Water Surface: The waterline was approximately 23.7 feet below reference.
Waterline Elevation = 850.3.

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/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

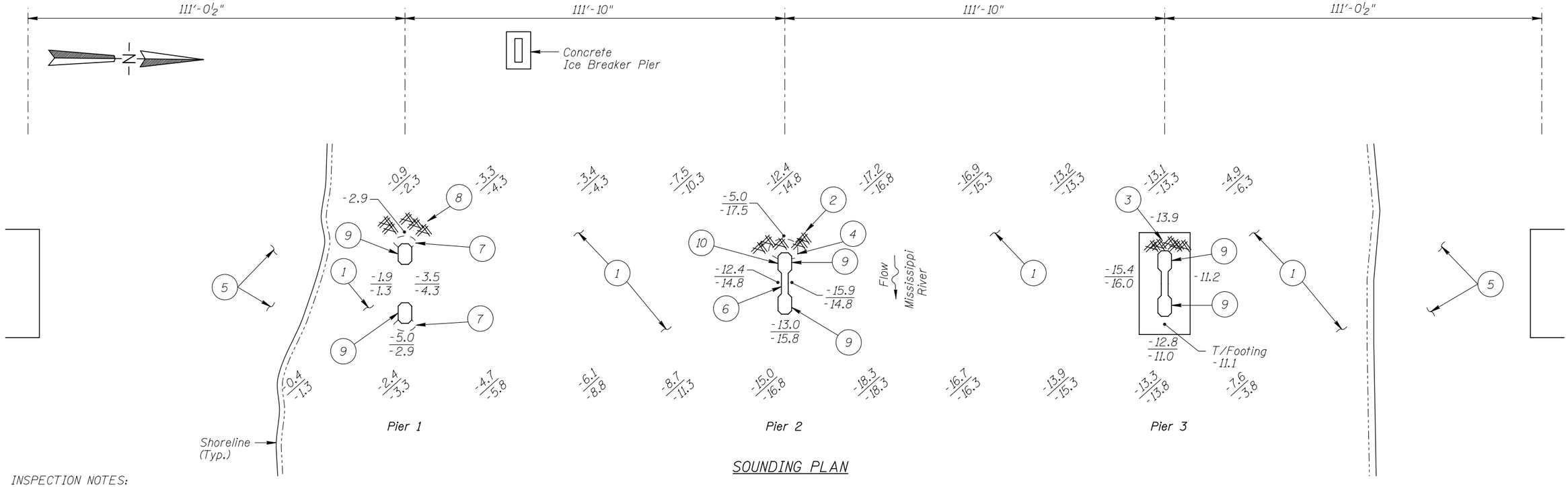
Photograph 1. Overall View of the Structure, Looking Northwest.

Photograph 2. View of Pier 1 and South Abutment, Looking South.

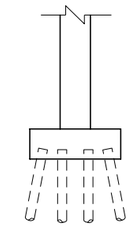
Photograph 3. View of Pier 2, Looking South.

Photograph 4. View of Pier 3 and North Abutment, Looking North.

Photograph 5. View of area of impact damage at the Southeast Corner of the Upstream Column of Pier 2, Looking Northwest.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

INSPECTION NOTES:

(1) The channel bottom material consisted of sand, gravel and scattered cobbles, 1-foot-diameter and smaller, with up to 1 foot of probe rod penetration.

(2) A light accumulation of timber debris consisting of logs 1-foot-diameter or smaller was observed at the upstream nose of Pier 2. IAccumulation extended from channel bottom up 2 feet, 5 feet long in the North-South direction by 3 feet wide in the East-West direction.

(3) A moderate accumulation of 2-foot-diameter and smaller timber debris was observed at the upstream nose of the pier extending from the channel bottom up 4 feet, 10 feet long in the North-South direction and 4 feet wide in the East-West direction.

(4) A 4-foot-radius, 1.5-foot-deep scour pocket was observed at the upstream nose of the Pier 2.

(5) The embankments consisted of 1- to 2-foot-diameter cobbles.

(6) A horizontal steel H-pile strut was observed 3 feet below the top of web wall and protruded 4 inches from each side of the web wall. There was no associated spalling present.

(7) 1-foot-deep scour pocket was observed around the entire perimeter of both the upstream and downstream columns of Pier 1. The pockets typically extended up to 4 feet off the column faces.

(8) A light accumulation of 10-inch-diameter and smaller timber debris was observed at the upstream end of the Pier 1. The debris extended from channel bottom to 2 feet above waterline and was approximately 5 feet wide in the East-West direction by 15 feet long in the North-South direction.

(9) The concrete of the columns and webwalls (Piers 1 through 3) and footing (Pier 3) was typically smooth and sound with random, minor areas of poor cosolidation with penetration up to 1/2 inch.

(10) Area of impact demage observed in the South-East corner of the upstream column of Pier 2. The impact demage extended from waterline to 1 foot above. It was 8 inches wide and exibited a maximum penetration of 1 inch with no exposed rebar.

GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on August 14, 2007, the waterline was located approximately 23.7 feet below the top of the cap at the upstream end of Pier 3. This corresponds to a waterline elevation of 853.0.
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.

Legend

-2.0 / -5.2	Sounding Depth (8/14/07) / Sounding Depth (9/24/02)
	Timber Debris
	Scour Depression

Note:

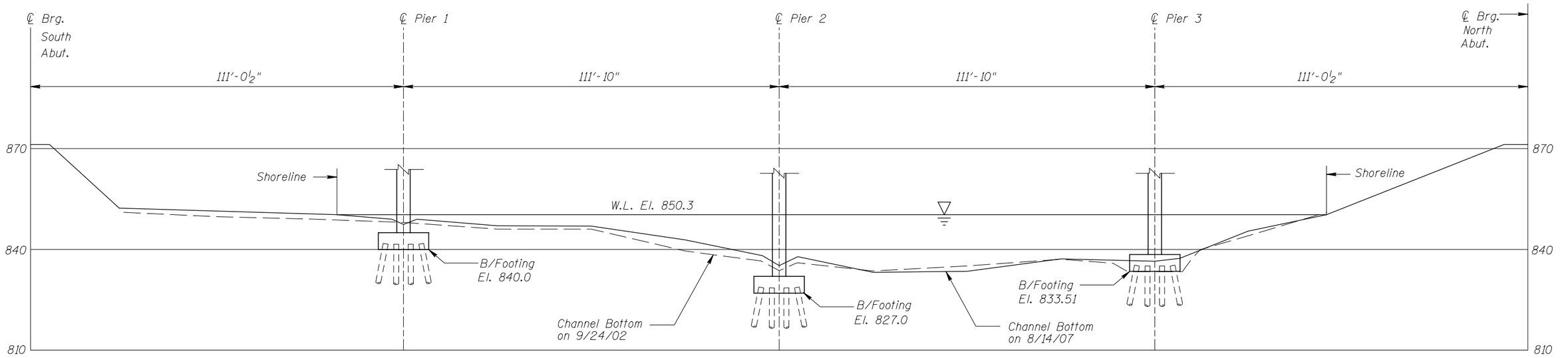
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

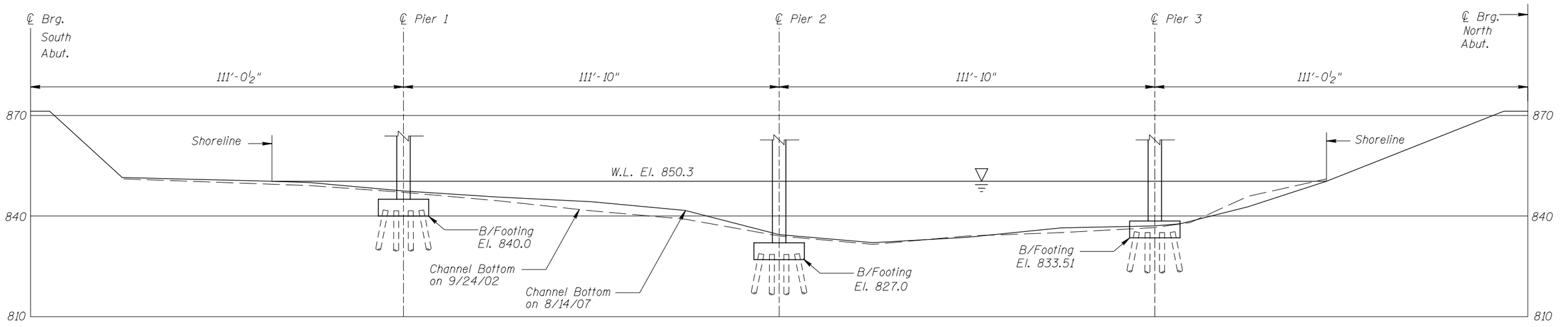
STRUCTURE NO. 86515
OVER THE MISSISSIPPI RIVER
DISTRICT 3, WRIGHT COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210102		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. 86515
OVER THE MISSISSIPPI RIVER
DISTRICT 3, WRIGHT COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=30'
Code: 52210102		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 14, 2007

ON-SITE TEAM LEADER: Brad A. Syler, P.E., S.E.

BRIDGE NO: 86515 WEATHER: Partly Cloudy, 70°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X 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: 2:00 P.M.

TIME OUT OF WATER: 2:59 P.M.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 1.0 foot

DEPTH 15.9 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of the columns and webwalls (Piers 1 through 3) and footing (Pier 3) was typically smooth and sound with random minor areas of poor consolidation with up to 1/2 inch penetration. The top of the footing was exposed at 11.1 feet below water line around the entire perimeter of Pier 3. The maximum vertical exposure was 4.3 ft. at the midpoint of the south face with no undermining observed. An area of impact damage was observed at the south east corner of the upstream column of Pier 2 extending from the waterline to 1 foot above by 8 inch wide with a maximum penetration of 1 inch with no exposed reinforcement. Moderate to light accumulations of timber debris were observed at the upstream ends of Piers 1, 2 and 3. The channel bottom overall appeared to be firm and in stable condition, but minor localized scour pockets were still present at Piers 1 and 2 as noted in the previous inspection.

FURTHER ACTION NEEDED: _____ YES ____X___NO

Monitor the accumulation of timber debris around the piers, and if found to be increasing, removal may become necessary during future routine bridge maintenance.

Scour screening evaluation indicates bridge is stable for potential scour; therefore, just monitor the scour and footing exposure 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. 86515
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Mississippi River

INSPECTION DATE August 14, 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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	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
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	3.5’	N	8	N	9	N	8	7	7	7	7	7	8	N	N	N	N	N
	Pier 2	15.9’	N	8	N	9	N	8	6	N	N	7	6	8	N	N	N	N	N
	Pier 3	15.4’	N	8	7	9	N	7	6	8	8	6	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the columns and webwalls (Piers 1 through 3) and footing (Pier 3) was typically smooth and sound with random minor areas of poor consolidation with up to 1/2 inch penetration. The top of the footing was exposed at 11.1 feet below water line around the entire perimeter of Pier 3. The maximum vertical exposure was 4.3 ft. at the midpoint of the south face with no undermining observed. An area of impact damage was observed at the south east corner of the upstream column of Pier 2 extending from the waterline to 1 foot above by 8 inch wide with a maximum penetration of 1 inch with no exposed reinforcement. Moderate to light accumulations of timber debris were observed at the upstream ends of Piers 1, 2 and 3. The channel bottom overall appeared to be firm and in stable condition, but minor localized scour pockets were still present at Piers 1 and 2 as noted in the previous inspection.

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.