

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 05525
CSAH NO. 29
OVER THE
MISSISSIPPI RIVER
DISTRICT 3 - BENTON COUNTY



OCTOBER 26, 2012

PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 05525, Piers 3 through 7, were found to be generally in good condition below water with no defects of structural significance observed. Random hairline cracking was observed on all the piers from the top of pier shafts to the channel bottom, and light concrete scaling was present near the waterline. Otherwise the concrete was typically smooth and sound. Partial footing exposure was observed at Piers 3, 4 and 5 and was comparable to previous inspections. The channel bottom appears to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The channel bottom consisted of 6 inch to 1 foot diameter cobbles with sand allowing up to 3 inches of probe rod penetration.
- (B) Piers 3 through 7 exhibited random hairline cracks extending from the top of the shaft to the channel bottom.
- (C) The footings at Piers 3, 4, and 5 were partially exposed, with the maximum vertical face exposure ranging between 2.2 feet at Pier 3, 4 inches at Pier 4, and 7 inches at Pier 5.
- (D) A band of light scaling was observed around the entire perimeter of all piers with a maximum penetration of 1/8 inch, extending 1.5 feet to 1.5 feet above the waterline.

RECOMMENDATIONS:

- (A) Monitor the extent of footing exposure during future underwater inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

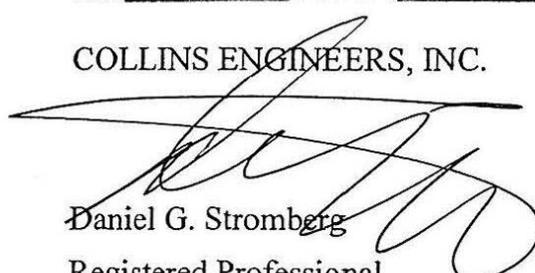
PROFESSIONAL ENGINEER

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 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg

Registered Professional

Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 05525

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 29

Location: District 3 - Benton County

Bridge Description: The superstructure consists of eleven spans of multiple precast concrete girders supporting a reinforced concrete deck. The superstructure is supported by ten reinforced concrete piers and two reinforced concrete abutments, all of which are founded on piling. The piers are numbered 1 through 10 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R. Lovelace, P.E. (WSB)

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: October 26, 2012

Weather Conditions: Cloudy, 40°F

Underwater Visibility: 2.0 Feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 3 through 7.

General Shape: The piers each consist of three columns resting on an oblong rectangular concrete lower shaft with rounded noses supported by a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 5.4 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the shaft at the north end of Pier 3.

Water Surface: The waterline was approximately 13.8 feet below reference.
Waterline Elevation = 992.3.

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/10/12

Item 113: Scour Critical Bridges: Code L

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

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Concrete Pier Wall	250	LF	250				
361	Scour Smart Flag	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. View of Pier 3, Looking Northwest.



Photograph 2. View of Pier 4, Looking Northeast.



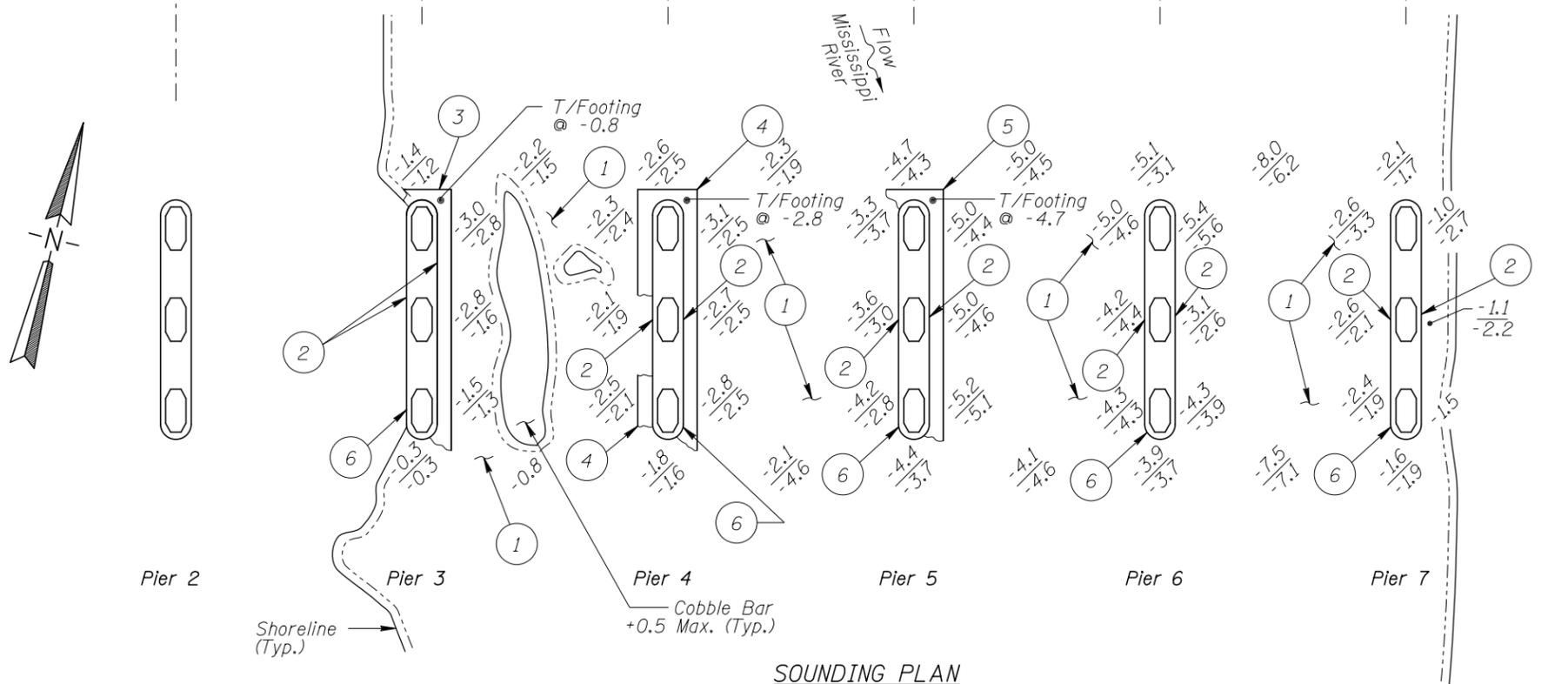
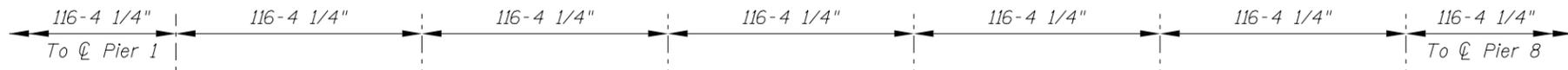
Photograph 3. View of Pier 5, Looking Northeast.



Photograph 4. View of Pier 6, Looking Northeast.



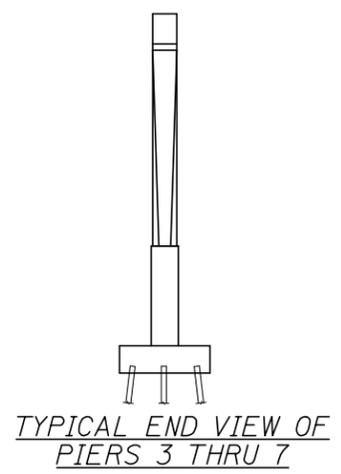
Photograph 5. View of Pier 7, Looking Northeast.



SOUNDING PLAN

- GENERAL NOTES:**
- Piers 3 through 7 were inspected underwater.
 - At the time of inspection on October 26, 2012, the waterline was located approximately 13.8 feet below the top of the shaft at the upstream end of Pier 3. This corresponds to a waterline elevation of 992.3.
 - Soundings indicate the water depth at the time of inspection and are measured in feet.
 - Soundings were taken parallel to the bridge at the mid points between the substructure units.

- INSPECTION NOTES:**
- The channel bottom material consisted of 6-inch to 1-foot-diameter cobbles with sand allowing up to 3 inches of probe rod penetration.
 - Piers 3 through 7 exhibited random hairline cracks on each face extending from the top of the shaft to the channel bottom.
 - The footing at Pier 3 was exposed at the upstream nose and along the entire east face with up to 2.2 feet of vertical face exposed at the northeast corner.
 - The footing at Pier 4 was exposed along the entire east face, around the upstream nose, and up to the upstream quarter as well as an 8 foot section along the downstream quarter on the west face with up to 4 inches of vertical face exposed.
 - The footing at Pier 5 was exposed along the entire east face and around the upstream nose with up to 7 inches of vertical face exposed at the southeast corner.
 - A band of light scaling was observed around the entire perimeter of all the piers with a maximum penetration of 1/8 inch, extending 1.5 feet below to 1.5 feet above the waterline.



Legend

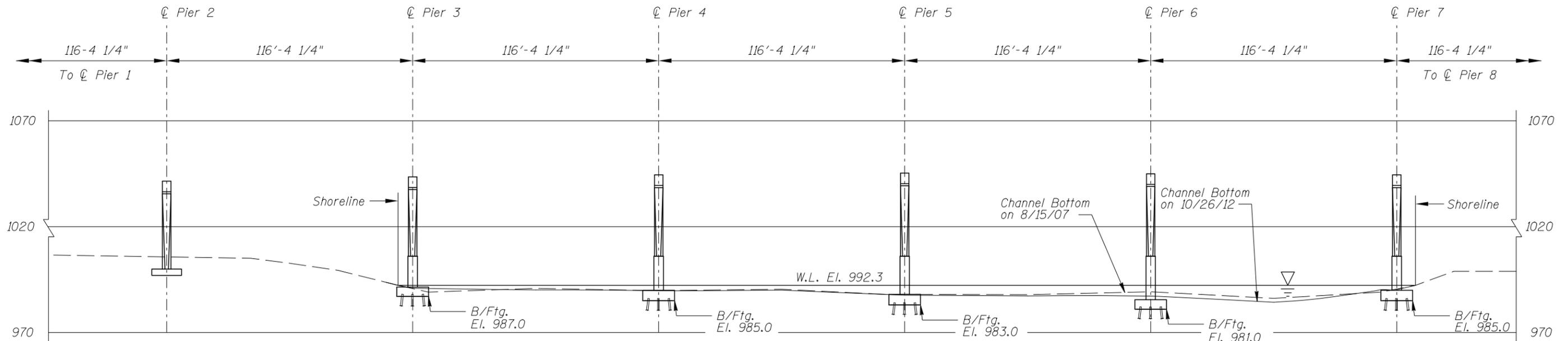
-3.0 Sounding Depth (10/26/12)

-3.2 Sounding Depth (8/15/07)

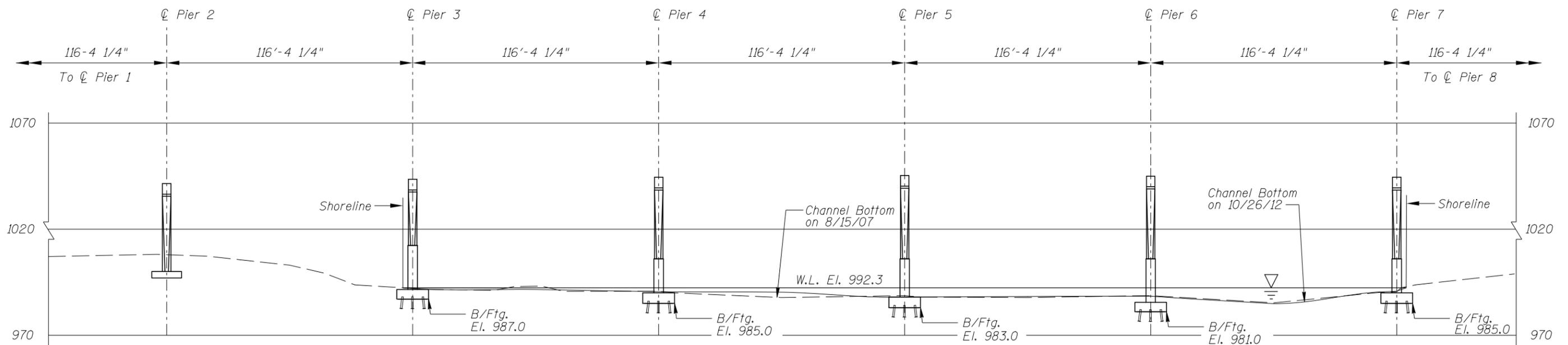
Note:

All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 05525 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JTF	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCTOBER, 2012
Checked By: LJ		Scale: NTS
Code: 74235525		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. 05525 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: JTF	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCTOBER, 2012
Checked By: LJ		Scale: 1"=50'
Code: 74235525		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 26, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace, P.E. (WSB)

BRIDGE NO: 05525 WEATHER: Cloudy, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Lukas Janulis

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

TIME IN WATER: 10:30 A.M.

TIME OUT OF WATER: 11:00 A.M.

WATERWAY DATA: VELOCITY 1.0 ft/sec

VISIBILITY 2.0 feet

DEPTH 5.4 feet maximum at Pier 6

ELEMENTS INSPECTED: Piers 3 through 7

REMARKS: Overall, the concrete surfaces of pier shafts and footings (where exposed) were found to be generally in good condition below water with no defects of structural significance observed. However, random hairline cracking was observed on all the piers from the top of pier shafts to the channel bottom along with a band of minor scaling near the waterline. Partial footing exposure was observed at Piers 3, 4 and 5. The channel bottom appeared to be in stable condition with no evidence of significant scour or appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: YES NO

Monitor the extent of footing exposure during future underwater inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 05525
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 26, 2012

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 3	3.0'	N	7	7	8	N	7	6	8	8	N	6	7	N	N	N	N	N
	Pier 4	3.1'	N	7	7	8	N	7	6	N	N	N	6	7	N	N	N	N	N
	Pier 5	5.2'	N	7	7	8	N	7	6	N	N	N	6	7	N	N	N	N	N
	Pier 6	5.4'	N	7	N	8	N	7	7	N	N	N	7	7	N	N	N	N	N
	Pier 7	2.6'	N	7	7	8	N	7	6	7	7	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete surfaces of pier shafts and footings (where exposed) were found to be generally in good condition below water with no defects of structural significance observed. However, random hairline cracking was observed on all the piers from the top of pier shafts to the channel bottom along with a band of minor scaling near the waterline. Partial footing exposure was observed at Piers 3, 4 and 5. The channel bottom appeared to be in stable condition with no evidence of significant scour or appreciable changes since 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.