

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 07581

CSAH 42

OVER THE

MINNESOTA RIVER

DISTRICT 7 – BLUE EARTH COUNTY



SEPTEMBER 12, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

AND

WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 07581, Piers 1 and 2, were generally in good condition. The concrete of the inspected substructure units was smooth and sound with some minor cracking noted. Timber debris was observed at the upstream end of Pier 2 along with a large log at Pier 1. Footing exposure was encountered around the entire perimeter of Pier 2 with up to 5.5 feet of maximum vertical face exposure.

INSPECTION FINDINGS:

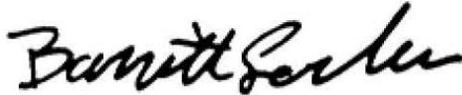
- (A) The channel bottom material consisted of soft silt with some random riprap around Pier 2 allowing up to 1.5 feet of probe rod penetration.
- (B) Concrete surfaces of Piers 1 and 2 were smooth and sound with no appreciable defects noted with the exception of some vertical cracks.
- (C) 1/8 inch wide diagonal cracks were observed near the upstream and downstream 1/4 points on the faces of both piers extending from top of footing (or channel bottom) to approximately 3 feet above the waterline.
- (D) Moderate accumulation of timber, consisting primarily of 1.5 foot diameter tree and associated drift pieces, was observed across the upstream nose of Pier 2 extending from the channel bottom to 2 feet above the waterline and up to 12 feet off the pier nose.
- (E) A 1 foot diameter tree was observed along the channel bottom at the upstream nose and along the north face of Pier 1.
- (F) The footing was exposed around mostly of the perimeter of Pier 2 apart from the downstream corner along the north face. Vertical face exposure varied from a few inches at the upstream end, 1.5 feet at the downstream end to 5.5 feet maximum near the center along the south face of the pier.

RECOMMENDATIONS:

- (A) Monitor footing exposure at Pier 2 during future underwater inspections and consider counter measures to mitigate scour at Pier 2.
- (B) Monitor timber debris at Piers 1 and 2 during future underwater inspections.
- (C) 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,

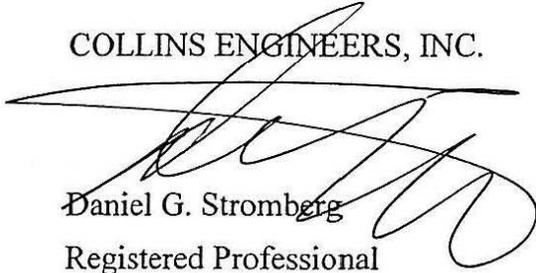
PROFESSIONAL ENGINEER

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: 07581

Feature Crossed: Minnesota River

Feature Carried: CSAH 42

Location: District 7- Blue Earth County

Bridge Description: The superstructure consists of a concrete deck supported by four prestressed beam spans supported by two reinforced concrete abutments and three intermediate reinforced concrete piers. The substructure units are designated as the South Abutment, Piers 1 through 3, and the North Abutment.

2. INSPECTION DATA

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

Dive Team: Kasey Yoder (WSB), Lukas Janulis (Collins)

Date: September 12, 2012

Weather Conditions: Rain, 56° F

Underwater Visibility: 1.0 foot

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each pier consists of a reinforced concrete pier cap supported on a rectangular reinforced concrete shaft with round noses founded on a rectangular concrete footing.

Maximum Water Depth at Substructure Inspected: Approximately 9.4 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap on the upstream end of Pier 1.

Water Surface: The waterline was approximately 31.0 feet below reference.

Waterline Elevation = 762.45

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code N/12

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

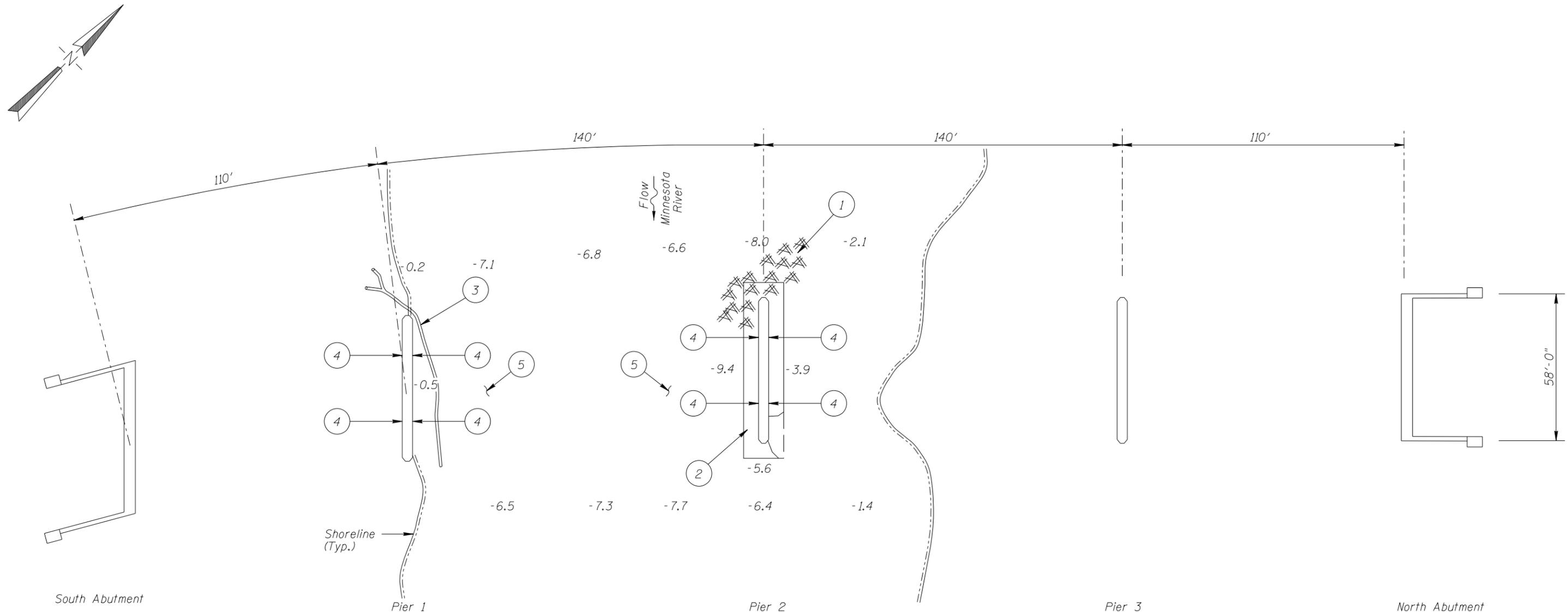
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Concrete Pier Wall	80	LF	80				
361	Scour	1	EA		1			
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. View of Pier 2, Looking South.



Photograph 2. View of Pier 1, Looking South.



INSPECTION NOTES:

- 1 A moderate accumulation of timber debris, consisting primarily of 1.5 foot diameter tree and associated drift pieces, was observed across the upstream nose of Pier 2, extending from the channel bottom to 2 feet above the waterline and up to 12 feet off the pier nose.
- 2 Footing was exposed around the entire perimeter of Pier 2 apart from the downstream corner along the north face. Vertical face exposure varied from few inches at the upstream end, 1.5 feet at the downstream end, to 5.5 feet maximum near the midpoint along the south face of the pier.
- 3 A 1 foot diameter tree was observed along the channel bottom at the upstream nose and along the north face of pier 1.
- 4 1/8 inch wide diagonal cracks were observed near the upstream and downstream 1/4 points on the faces of both piers. Extending from top of footing (or channel bottom) to approx. 3 feet above the waterline.
- 5 The channel bottom material around Piers 1 and 2 primarily consisted of soft silt allowing up to 1.5 feet of probe rod penetration with some randomly scattered riprap along the north face of Pier 2.

SOUNDING PLAN

GENERAL NOTES:

- 1. Piers 1 and 2 were inspected underwater.
- 2. At the time of inspection on September 12, 2012, the waterline was located approximately 31.0 feet below the top of pier cap at downstream end of Pier 2. This corresponds with a waterline elevation of 762.5 feet according to design plans dated June 2, 2004.
- 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

- 7.0 Sounding Depth from Waterline (9/12/12)

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

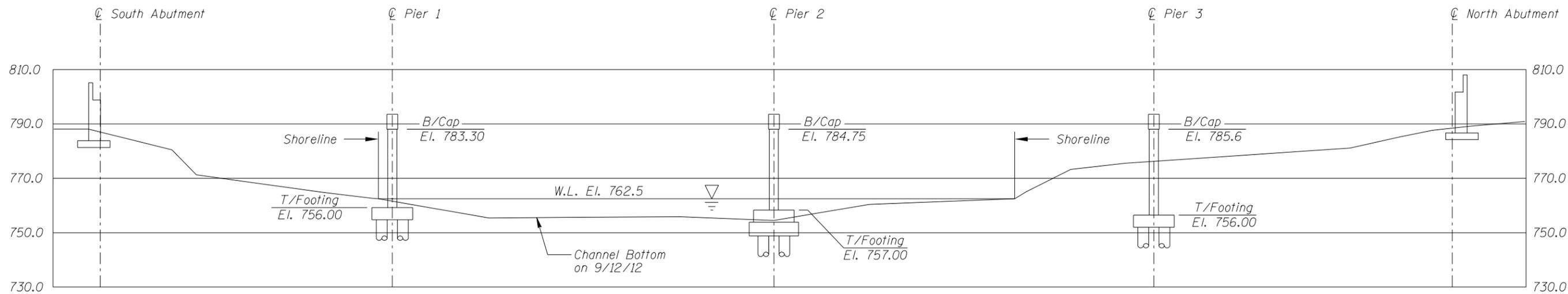
STRUCTURE NO. 07581
OVER THE MINNESOTA RIVER
BLUE EARTH COUNTY

INSPECTION AND SOUNDING PLAN

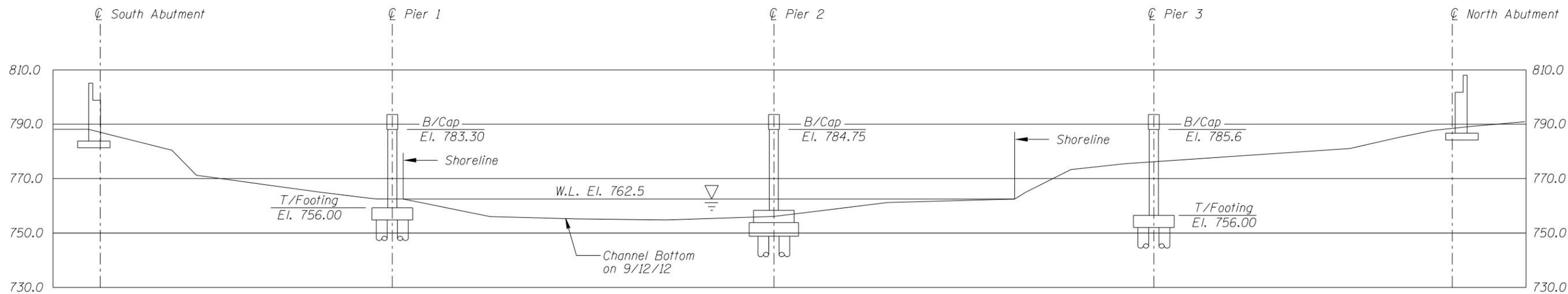
Drawn By: BJR	COLLINS ENGINEERS	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 742307581		Figure No.: I

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 07581 OVER THE MINNESOTA RIVER BLUE EARTH COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 742307581		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins DATE: September 12, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 07581 WEATHER: Rain, 56°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Kasey Yoder (WSB), Lukas Janulis (Collins)

EQUIPMENT: Commercial Scuba, Sounding Rod, Camera, Hand Tools

TIME IN WATER: 4:25 p.m.

TIME OUT OF WATER: 4:55 p.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 1.0 foot

DEPTH 9.4 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the bridge was of new construction with concrete piers in very good condition. The concrete surfaces were smooth and sound and exhibited no appreciable deficiencies. Light to moderate timber debris accumulations were observed at both piers. The footing was exposed around the entire perimeter of Pier 2 with up to 5.5 feet of maximum vertical face exposure.

FURTHER ACTION NEEDED: YES NO

Monitor footing exposure at Pier 2 during future underwater inspections and consider counter measures to mitigate scour at Pier 2.

Monitor timber debris at Piers 1 and 2 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. 07581
 INSPECTORS WSB & Associates and Collins Engineers, Inc.
 ON-SITE TEAM LEADER. Barritt Lovelace P.E.
 WATERWAY CROSSED Minnesota River

INSPECTION DATE September 12, 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 (SEAL)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/SEDIMENT)	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	0.5'	N	8	N	9	N	8	N	7	7	7	7	8	N	N	N	N	N
	Pier 2	9.4'	N	8	8	9	N	8	6	7	7	6	6	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the bridge was of new construction with concrete piers in very good condition. The concrete surfaces were smooth and sound and exhibited no appreciable deficiencies. Light to moderate timber debris accumulations were observed at both piers. The footing was exposed around the entire perimeter of Pier 2 with up to 5.5 feet of maximum vertical face exposure.

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.