UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 08529

COTTONWOOD STREET

OVER THE

COTTONWOOD RIVER

DISTRICT 7 – BROWN 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. 08529, Piers 1 and 2, were generally in good condition. The steel pipe piles, exhibited light surface corrosion and minor pitting, but no significant section loss or defects of structural significance were observed. The channel bottom appeared in good condition with no evidence of significant scour.

INSPECTION FINDINGS:

(A) The channel bottom material consisted of sand, gravel, and cobbles allowing up to 6 inches of probe rod penetration.

(B) Coating failure and light surface corrosion was observed over approximately 20 percent of the surface area.

(C) Minor scour depressions were observed around the piles, measuring 1 foot radius and a depth of 1 foot.

RECOMMENDATIONS:

(A) The inspection of the submerged substructure units of Structure No. 08529 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

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

Respectfully submitted,

Inspection Team Leader:
WSB and Associates

Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

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: 08529

Feature Crossed: Cottonwood River

Feature Carried: Cottonwood Street

Location: District 7- Brown County

Bridge Description: The superstructure consists of three spans of multiple precast beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two steel pile bent piers. The piers are numbered 1 and 2 starting from the northeast end of the bridge.

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: Light Rain, 65° F

Underwater Visibility: 4.0 feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of a single line of seven steel piles supporting a concrete pile cap.

Maximum Water Depth at Substructure Inspected: Approximately 0.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 2.

Water Surface: The waterline was approximately 15.2 feet below reference.
Waterline Elevation = 798.4

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 7

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

Item 113: Scour Critical Bridges: Code L/08

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.
_____Yes X No

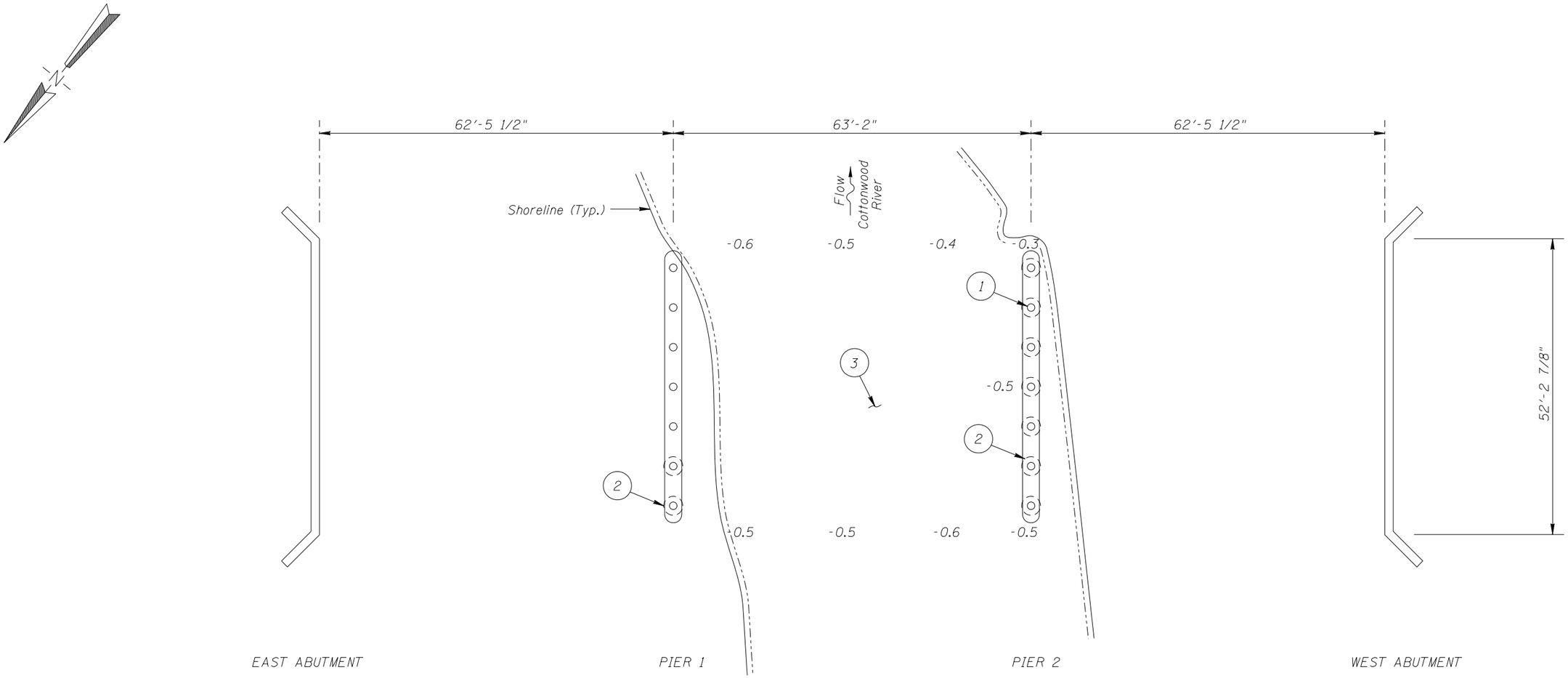
6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
382	Cast-In-Place Piling	14	EA	14				
985	Slopes and Slope Protection	1	EA	1				

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

Photograph 2. View of Pier 1, Looking South.

Photograph 3. View of Pier 2, Looking South.



SOUNDING PLAN

INSPECTION NOTES:

1. Steel piles exhibited 20% coating failure with light surface corrosion.
2. Minor scour depressions around piles 1 foot deep and 1 foot radius.
3. The channel bottom material consisted of silty sand silt allowing 6 inches of probe rod penetration.

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 15.2 feet below the top of pier cap at upstream end of Pier 2. This corresponds with a waterline elevation of 798.4 feet according to design plans dated February 29, 1994.
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.

TYPICAL END VIEW OF TOWERS

Legend

-18.0 Sounding Depth from Waterline (9/12/12)

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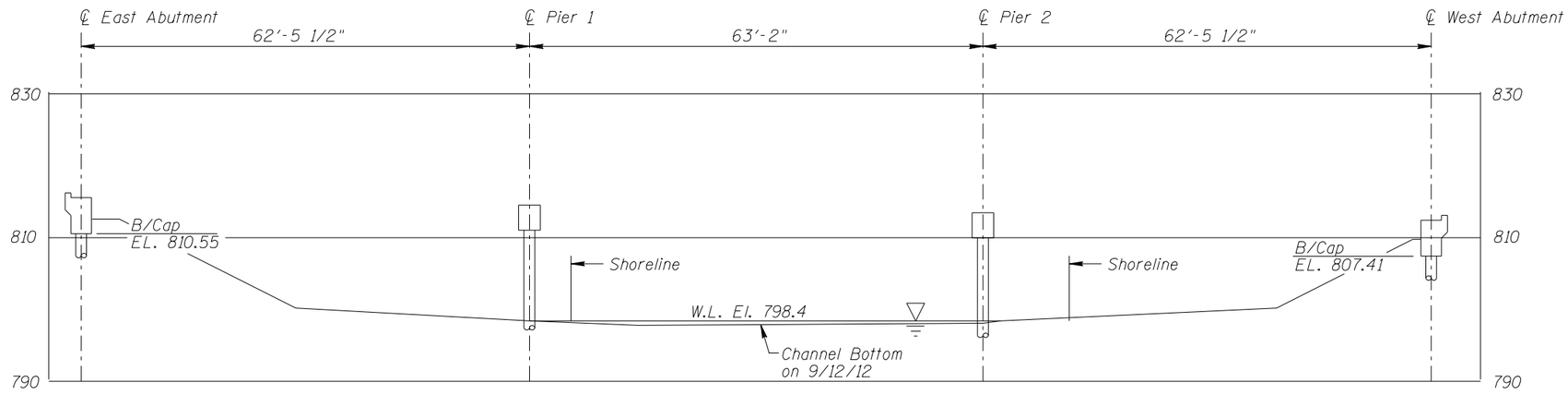
MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

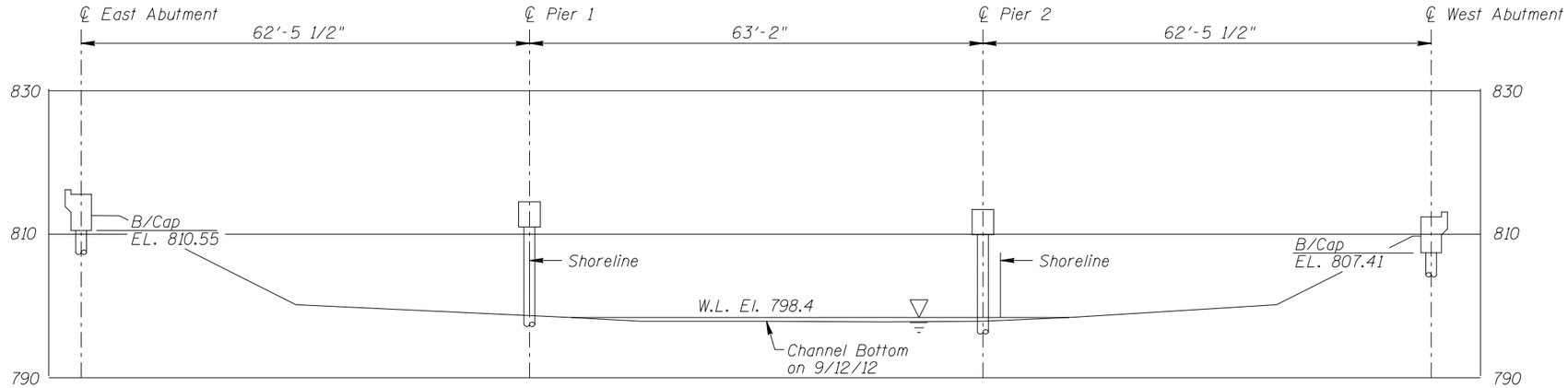
STRUCTURE NO. 08529
OVER THE COTTONWOOD RIVER
BROWN COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: BJR	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: SEP. 2012
Checked By: BRL		Scale: 1"=20'
Code: 742308529		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

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Drawn By: BJR		Date: SEP. 2012
Checked By: BRL		Scale: 1"=20'
Code: 742308529		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins Engineers DATE: September 12, 2012
ON-SITE TEAM LEADER: Barritt Lovelace, P.E.
BRIDGE NO: 08529 WEATHER: Light Rain, 65°F
WATERWAY CROSSED: Cottonwood River
DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
X OTHER Wading
PERSONNEL: Kasey Yoder (WSB), Lukas Janulis (Collins)
EQUIPMENT: Wet Suit, Sounding Rod, Camera
TIME IN WATER: 1:00 p.m.
TIME OUT OF WATER: 1:25 p.m.
WATERWAY DATA: VELOCITY 1 ft/sec
VISIBILITY 4.0 feet
DEPTH 0.5 feet maximum at Pier 2.
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, Piers 1 and 2 were in good condition. The steel pipe pile casing exhibited coating failure and light surface corrosion, but no measurable section loss was noted. Minor scour depressions were also observed around each pile at Pier 2 and 2 piles at Pier 1. The channel bottom appeared stable and well established.

FURTHER ACTION NEEDED: _____ YES X NO

The inspection of the submerged substructure units of Structure No. 08529 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

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. 08529
INSPECTORS WSB & Associates and Collins Engineers, Inc.
ON-SITE TEAM LEADER. Barritt Lovelace P.E.
WATERWAY CROSSED Cottonwood 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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	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’	7	N	N	8	N	7	7	7	7	N	7	N	7	N	7	N	N
	Pier 2	0.5’	7	N	N	8	N	7	7	7	7	N	7	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 and 2 were in good condition. The steel pipe pile casings exhibited coating failure and light surface corrosion, but no measurable section loss was noted. Minor scour depressions were also observed around each pile at Pier 2 and 2 piles at Pier 1. The channel bottom appeared stable and well established.

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.