

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 15505  
CR 23 OVER THE  
CLEARWATER RIVER  
DISTRICT 2 - CLEARWATER COUNTY

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AUGUST 13, 2012  
PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
AYRES ASSOCIATES & COLLINS ENGINEERS, INC.  
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 15505, North and South Abutments, were found to generally be in good condition with no defects of structural significance. The channel bottom around the substructure units appeared stable with no evidence of significant scour. Since the last underwater inspection riprap has been placed along North and South Abutments, resulting in no substructure units located in waterway.

INSPECTION FINDINGS:

- (A) The timber piles, pile caps, and sheeting exhibited checking up to ¼ inch wide and allowed typical awl penetrations between ¼ inch and ½ inch in depth. The pile to sheeting connection hardware was galvanized steel with minor surface corrosion and no appreciable loss of section on the lower connections (1 foot above waterline). The joints between the wall sheeting were tight with no appreciable loss of fill observed.

RECOMMENDATIONS:

- (A) The inspection of the submerged substructures units of Structure No. 15505 can most likely be accomplished in the future without the use of a dive team. To perform the underwater inspection, a properly equipped qualified inspector will have to enter the water during a period of low flow. As channel bottom contours and depths of flow can change quickly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascias to determine whether wading 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, in which case the submerged substructure units should be inspected at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader

Ayres Associates, Inc.



Brian K. Schroeder  
Registered Professional Engineer  
State of Minnesota

Respectfully submitted,

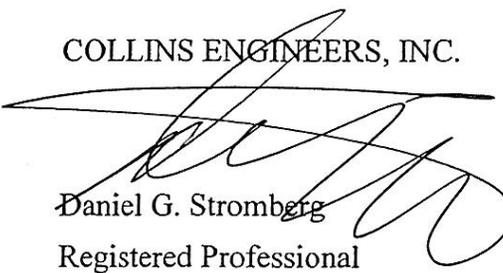
PROFESSIONAL ENGINEER

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: 15505

Feature Crossed: Clearwater River

Feature Carried: TWP Road – CR 23

Location: District 2 - Clearwater County

Bridge Description: The bridge superstructure consists of a single span precast reinforced concrete deck beam structure supported by two timber pile abutments.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, James A. Hitchman

Date: August 13, 2012

Weather Conditions: Partly Sunny, 71°F

Underwater Visibility: 3.0 feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutment.

General Shape: Abutments consisted of timber caps and wall sheeting supported by timber piles.

Maximum Water Depth at Substructure Inspected: None. No substructure units in water.

4. WATERLINE DATUM

Water Level Reference: The top of pile cap at east end of North Abutment.

Water Surface: The waterline was approximately 6.2 feet below reference.  
Waterline Elevation = 93.8.

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

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code I

Item 113: Scour Critical Bridges: Code G/07

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
206	Timber Columns	14	EA		14			
216	Timber Abutment	56	LF	56				



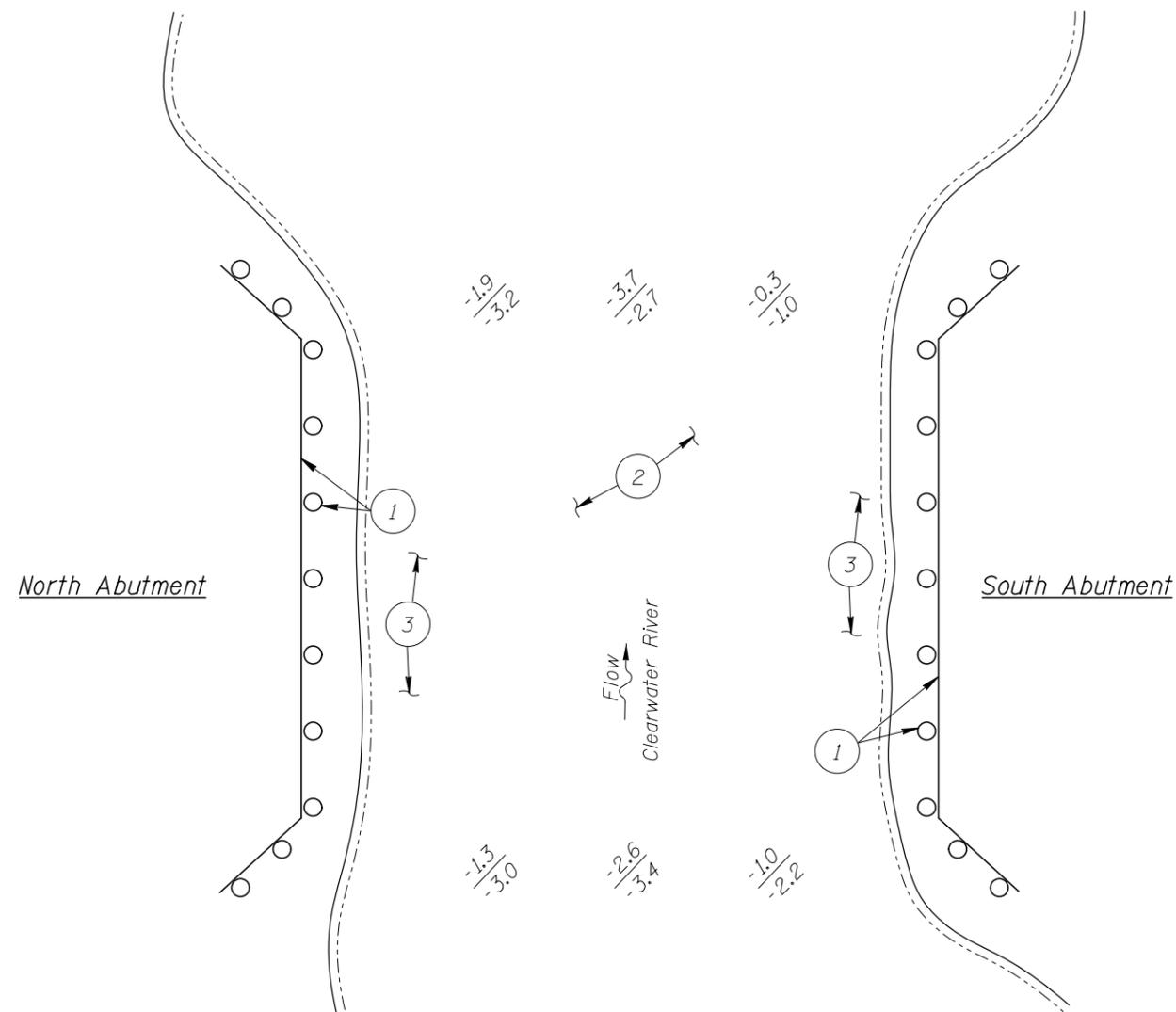
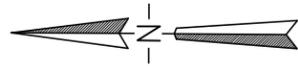
Photograph 1. Overall View of Bridge, Looking Northeast.



Photograph 2. View of North Abutment, Looking North.



Photograph 3. View of South Abutment, Looking South.



SOUNDING PLAN

INSPECTION NOTES:

- 1 The timber piles, pile caps and backwall plank (sheeting) checking up to 1/4 inch wide and typical awl penetrations between 1/4 inch and 1/2 inch deep. The galvanized connection hardware exhibited minor surface corrosion on the lower connections with no appreciable loss of section.
- 2 The channel bottom consisted of silty sand with up to 2 feet of probe rod penetration.
- 3 Riprap was present at the North and South Abutments, extending 4 feet past the face of the abutments.

GENERAL NOTES:

1. The North and South Abutments were inspected underwater.
2. At the time of inspection, on August 13, 2012, the waterline was located approximately 6.2 feet below the top of the pile cap at the east end of the North Abutment. Since insufficient elevation information was available, an elevation of 100.0 was assumed. This corresponds to a waterline elevation of 93.8.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to upstream and downstream fascias at 1/4 point intervals.

Legend

- 0.4 Sounding Depth (8/13/12)
- 0.4 Sounding Depth (8/17/07)

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 15505  
OVER CLEARWATER RIVER  
DISTRICT 2, CLEARWATER COUNTY

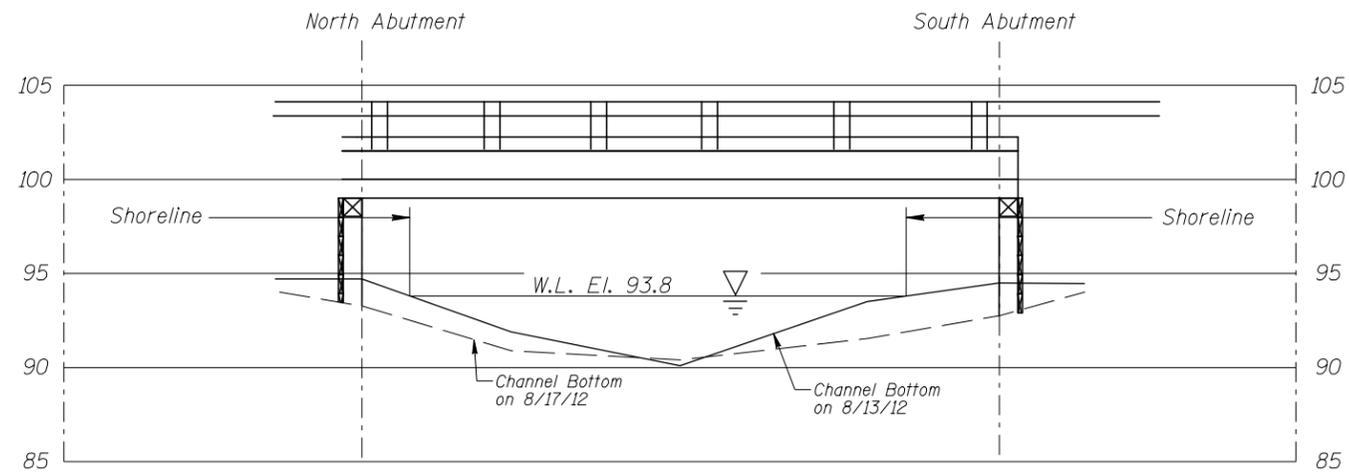
INSPECTION AND SOUNDING PLAN

**COLLINS  
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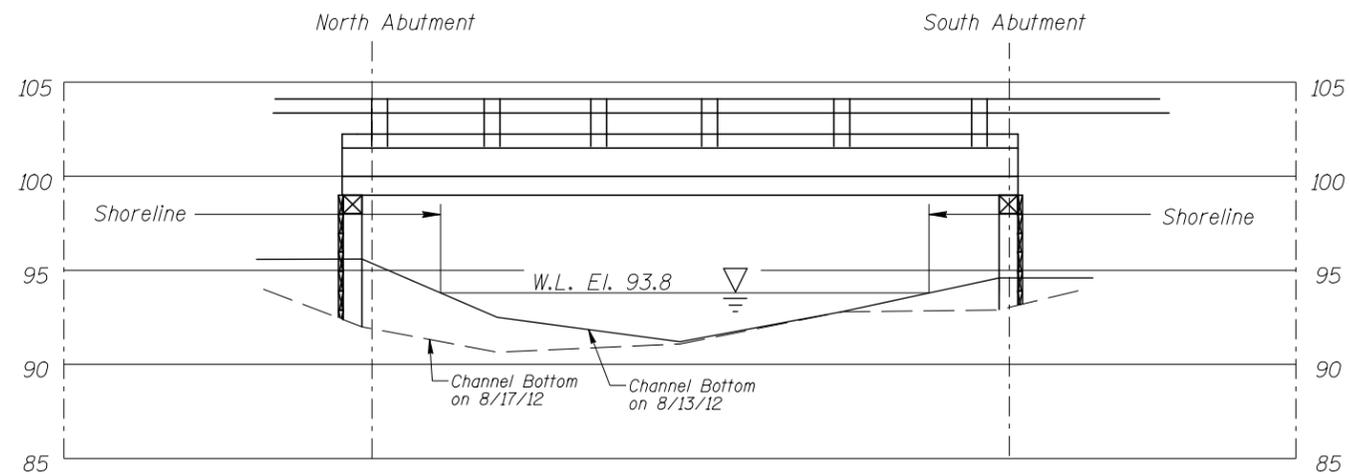
Drawn By: CJM  
Checked By: BKS  
Code: 52210033

**AYRES  
ASSOCIATES**  
3433 Oakwood Hills Parkway  
Eau Claire, WI 54701  
www.AyresAssociates.com

Date: AUG. 2012  
Scale: NTS  
Figure No.: 1



DOWNSTREAM FASCIA PROFILE



UPSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 15505 OVER CLEARWATER RIVER DISTRICT 2, CLEARWATER COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: CJM	<b>AYRES ASSOCIATES</b> <small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small>	Date: AUG. 2012
Checked By: BKS		Scale: 1"=20'
Code: 52210033		Figure No.: 2

**COLLINS ENGINEERS**  
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MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: Ayres Associates DATE: August 13, 2012

ON-SITE TEAM LEADER: Brian K. Schroder, P.E.

BRIDGE NO: 15505 WEATHER: Partly Sunny, 71°F

WATERWAY CROSSED: Clearwater River

DIVING OPERATION: \_\_\_\_\_ SCUBA \_\_\_\_\_ SURFACE SUPPLIED AIR

X OTHER None

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: Sounding Pole, Hammer, Camera

TIME IN WATER: 3:15 p.m.

TIME OUT OF WATER: 3:25 p.m.

WATERWAY DATA: VELOCITY None/Negligible.

VISIBILITY 3.0 feet

DEPTH No substructure units in water.

ELEMENTS INSPECTED: North and South Abutments

REMARKS: Overall, the timber piles, pile caps, and wall sheeting exhibited checking up to 1/4 inch wide and allowed typical awl penetrations between 1/4 in. and 1/2 in. The pile to sheeting connection hardware was galvanized steel with minor surface corrosion and no appreciable loss of section on the lower connections (1 foot above waterline). The joints between the wall sheeting were tight with no appreciable loss of fill observed.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES \_\_\_ X \_\_\_ NO

(A) The inspection of the submerged substructure units of Structure No. 15505 can most likely be accomplished in the future without the use of a dive team. To perform the underwater inspection, a properly equipped qualified inspector will have to enter the water during a period of low flow. As channel bottom contours and depths of flow can change quickly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascias to determine whether wading 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, in which case the submerged substructure units should be inspected 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. 15505  
INSPECTORS Ayres Associates  
ON-SITE TEAM LEADER Brian K. Schroeder, P.E.  
WATERWAY CROSSED Clearwater River

INSPECTION DATE August 13, 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 (SHEETING)	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
	North Abutment	N/A	7	7	N	8	7	6	N	N	N	N	8	N	N	6	N	N	N
	South Abutment	N/A	7	7	N	8	7	6	N	N	N	N	8	N	N	6	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the timber piles, pile caps, and wall sheeting exhibited checking up to ¼ inch wide and allowed typical awl penetrations between ¼ in. and ½ in. The pile to sheeting connection hardware was galvanized steel with minor surface corrosion and no appreciable loss of section on the lower connections (1 foot above waterline). The joints between the wall sheeting were tight with no appreciable loss of fill observed.

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.