

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 4886

CR NO. 19

OVER THE

CLEARWATER RIVER

DISTRICT 2 - CLEARWATER COUNTY



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. 4886, East and West Abutments, were found to generally be in satisfactory condition with no defects of structural significance. The channel bottom around the substructure units appeared stable with no evidence of significant scour. There was, however, partial footing exposure observed at both abutments with up to 6 inches of vertical face exposure.

INSPECTION FINDINGS:

- (A) Overall, above and below waterline, the concrete of the abutments was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces.
- (B) Loss of section along the joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, measuring 1 foot in diameter with a maximum penetration of 1.5 inches.
- (C) Spalling was observed at East Abutment below northernmost beam seat, 8 inches in diameter with a maximum penetration of 1 inch.
- (D) The south end of southwest wingwall had delaminated areas measuring 1 foot wide, 3 feet high and 6 inches deep.
- (E) Random vertical cracks extending from bridge seat down 4 feet hairline to 1/16 inch wide were typically spaced at approximately every 5 feet along both abutments faces.
- (F) Footing exposure was observed along a 15 foot section of the East Abutment near the midpoint with maximum vertical exposure of 6 inches.

- (G) Footing exposure was observed along a 10 foot section of the West Abutment near the midpoint with no vertical exposure.

RECOMMENDATIONS:

- (A) Monitor footing exposure at East and West Abutments during future inspections.
- (B) Reinspect the submerged substructure units 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: 4886

Feature Crossed: Clearwater River

Feature Carried: CR No. 19

Location: District 2 - Clearwater County

Bridge Description: The bridge superstructure consists of a single span of multiple steel girders (I-Beams) supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete 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, 73°F

Underwater Visibility: 4.0 Feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Abutments.

General Shape: Solid wall reinforced concrete abutment with skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 4.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of bearing seat at the south end of West Abutment.

Water Surface: The waterline was approximately 2.8 feet below reference.

Assumed Waterline Elevation = 97.2.

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 7

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code I

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
219	Concrete Abutment	44	LF	36	8			
387	Concrete Wingwall	4	EA		2	2		



Photograph 1. Overall View of Bridge, Looking Southeast.



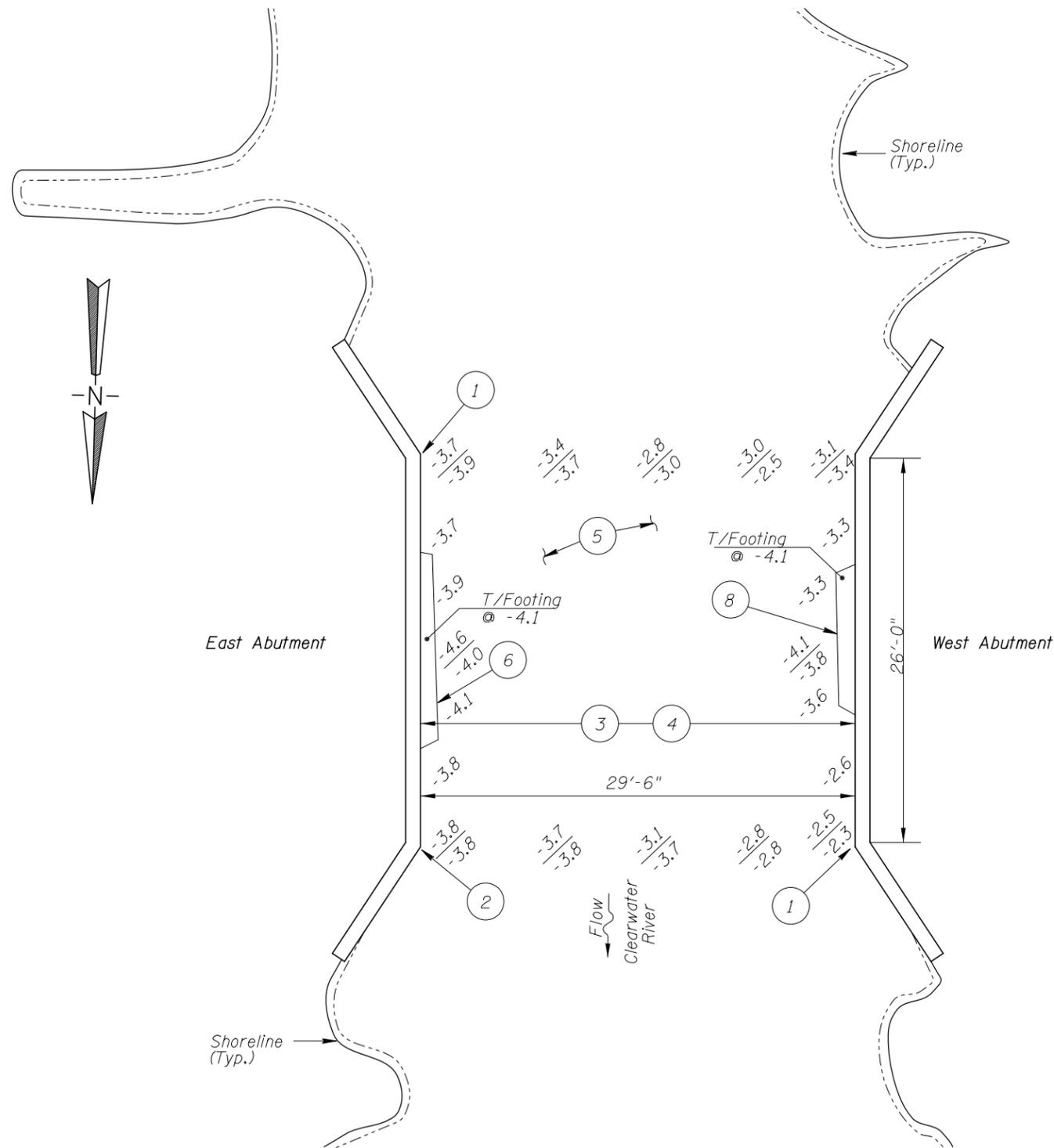
Photograph 2. View of East Abutment, Looking Northeast.



Photograph 3. View of West Abutment, Looking Northwest.

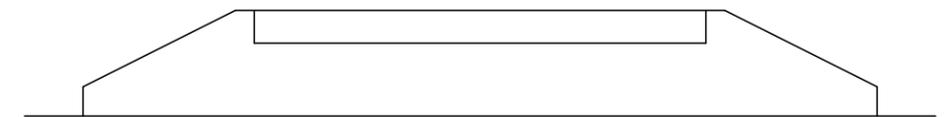


Photograph 4. View of Deteriorate Concrete at South end of Southwest Wingwall.



INSPECTION NOTES:

- 1 Loss of section at the joint between the southeast wingwall and East Abutment. It was located 4.8 feet below the top of the wing wall measuring 1 foot in diameter with a maximum penetration of 1.5 inches with no exposed reinforcing steel.
- 2 Spall was observed at East Abutment below northernmost beam seat measuring 8 inches in diameter, with a maximum penetration of 1 inch with no exposed reinforcing steel.
- 3 Random vertical cracks extending from the bridge seat down 4 feet measuring from hairline to 1/16 inches wide located approximately every 5 feet along both abutment faces.
- 4 Above and below the waterline the concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces.
- 5 The channel bottom consisted of silty sand with 1 foot of probe rod penetration.
- 6 Footing exposure was observed along a 15 foot section at the East Abutment near the midpoint with 6 inches of maximum vertical exposure.
- 7 The end of Southwest wingwall was delaminated. The area measured 1 foot wide, 3 feet high, with 6 inches of penetration, with no exposed reinforcing steel.
- 8 Footing exposure was observed along a 10 foot section at the West Abutment near the midpoint with no vertical face exposure.



TYPICAL ELEVATION VIEW OF EACH ABUTMENT

GENERAL NOTES:

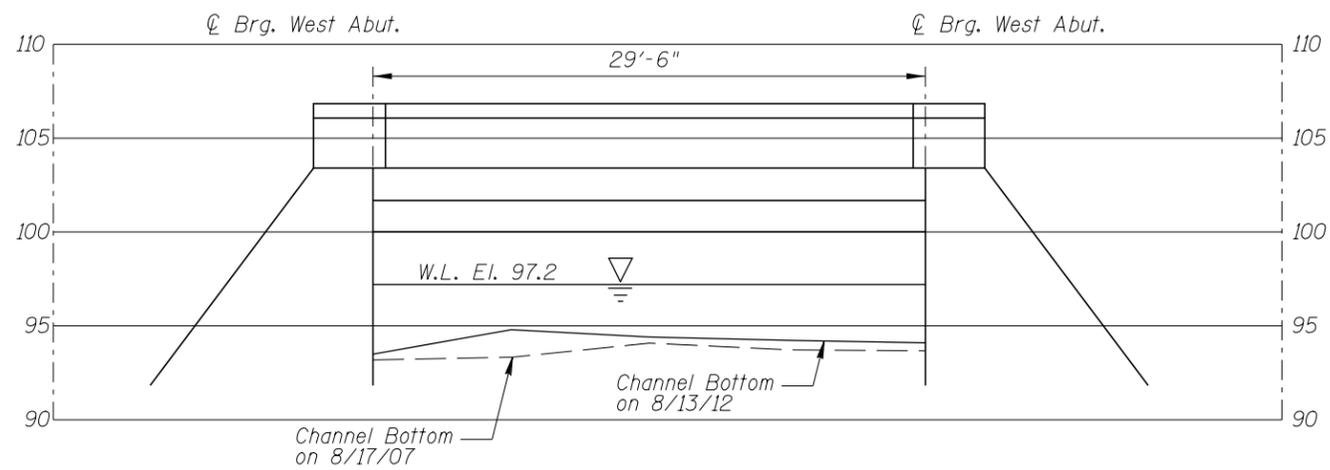
1. The East and West Abutments were inspected underwater.
2. At the time of inspection, on August 13, 2012, the waterline was located approximately 2.8 feet below the top of the bearing seat at the south end of the West Abutment. Due to lack of design plan information, the reference elevation was assumed to be 100.0 feet. This corresponds to waterline elevation of 97.2 feet.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to north and south fascias at 1/4 point intervals.

Legend

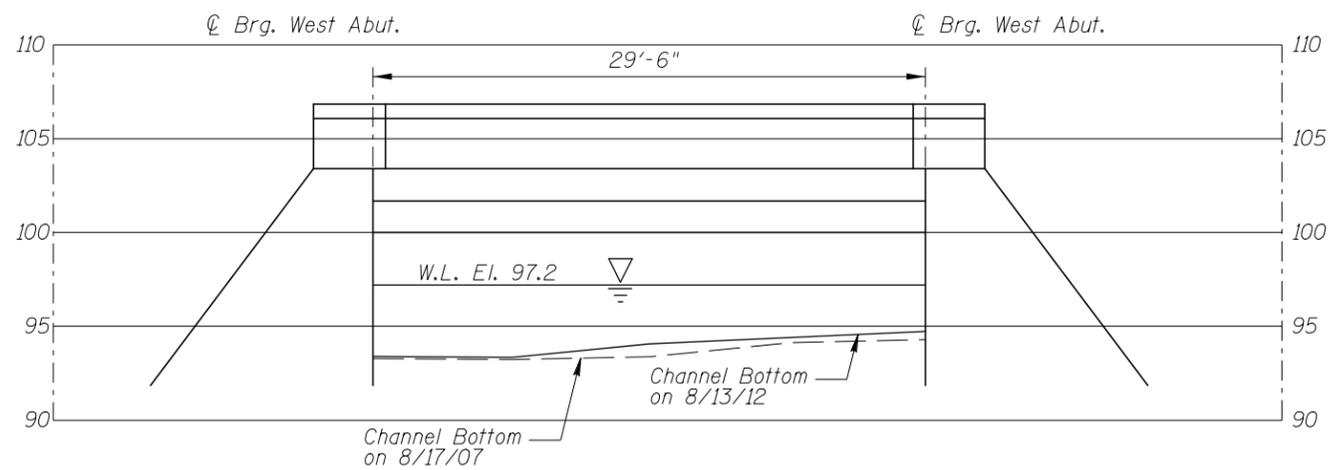
- 0.4 Sounding Depth (8/13/12)
- 0.4 Sounding Depth (8/18/07)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 4886 OVER THE HEIR CREEK DISTRICT 2, CLEARWATER COUNTY, CITY OF BAGELY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CJM	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: AUG 2012
Checked By: BKS		Scale: NTS
Code: 52210038		Figure No.: 1

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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. 4886 OVER THE HEIR CREEK DISTRICT 2, CLEARWATER COUNTY, CITY OF BAGELY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Drawn By: CJM Checked By: BKS Code: 52210038	AYRES ASSOCIATES <small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small> Date: AUG 2012 Scale: 1"=10' Figure No.: 2

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. Schroeder, P.E.

BRIDGE NO: 4886 WEATHER: Partly Sunny, 73°F

WATERWAY CROSSED: Clearwater River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
X OTHER Wade

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: Scuba, Sounding Pole, U/W Light, Hammer, Camera

TIME IN WATER: 2:15 p.m.

TIME OUT OF WATER: 2:35 p.m.

WATERWAY DATA: VELOCITY None/Negligible.

VISIBILITY 4.0 Feet

DEPTH 4.6 Feet maximum at East Abutment

ELEMENTS INSPECTED: East and West Abutments

REMARKS: Overall, above and below waterline, concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces. Spalling was observed at East Abutment below northernmost I-beam seat, 8 inches in diameter with a maximum penetration of 1 inch. Loss of section at joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, with 1 foot in diameter with a maximum penetration of 1.5 inches. The south end of southwest wingwall was delaminated (1 foot wide, 3 feet high and 6 inches deep). No exposed reinforcement was observed. Random vertical cracks extending from bridge seat down 4 feet, hairline to 1/16 inches wide, were present at approximately every 5 feet along both abutments faces. Footing exposure was observed along a 15 foot of the East Abutment near the midpoint with maximum vertical exposure of 6 inches and along a 10 foot section of the West Abutment with no vertical exposure.

FURTHER ACTION NEEDED: _____ YES ___ X ___ NO

Monitor the footing exposure at East and West Abutments during future 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. 4886
 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 (BRACING)	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
	East Abutment	4.6'	N	6	7	9	N	6	7	8	N	N	7	6	N	N	N	N	N
	West Abutment	4.1'	N	6	7	9	N	6	7	8	N	N	7	6	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, above and below waterline, concrete was typically smooth and sound with areas of hairline map cracking on the wingwalls and on the abutment faces. Spalling was observed at East Abutment below northernmost I-beam seat, 8 inches in diameter with a maximum penetration of 1 inch. Loss of section at joint between southeast wingwall and East Abutment was located 4.8 feet below top of wingwall, with 1 foot in diameter with a maximum penetration of 1.5 inches. The south end of southwest wingwall was delaminated (1 foot wide, 3 feet high and 6 inches deep). No exposed reinforcement was observed. Random vertical cracks extending from bridge seat down 4 feet, hairline to 1/16 inches wide, were present at approximately every 5 feet along both abutments faces. Footing exposure was observed along a 15 foot section of the East Abutment near the midpoint with maximum vertical exposure of 6 inches and along a 10 foot section of the West Abutment with no vertical 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.