

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 55517  
EAST CENTER STREET  
OVER THE  
ZUMBRO RIVER  
DISTRICT 6 - RICE COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO.5221

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 55517, East and West Abutments and Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. The channel bottom appeared to be stable, and the scour protection system in-place around the substructure units was in good condition. There were, however, light and heavy accumulations of timber debris observed at the upstream ends of Piers 1 and 2, respectively.

INSPECTION FINDINGS:

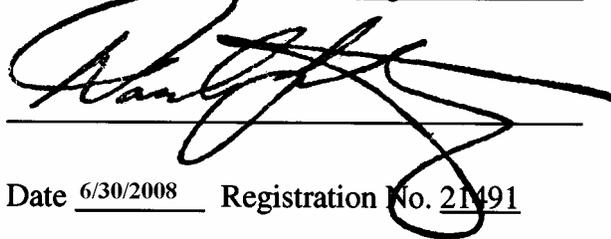
- (A) An area of poor consolidation was located 1 foot above the waterline along a joint at the upstream end of the West Abutment that measured 1 foot in diameter with up to 6 inches of penetration.
- (B) The concrete of the substructure units was typically smooth and sound with random minor areas of poor consolidation noted having to 1 inch of penetration.
- (C) A vertical hairline crack extended from the bottom of the pier cap to the channel bottom at the downstream quarter point along the west side of Pier 2.
- (D) A light accumulation of 6-inch-diameter and smaller timber debris was observed at the upstream end of Pier 1.
- (E) A heavy accumulation of 1.5-foot-diameter and smaller timber debris was observed at the upstream end of Pier 2 and extended along both faces of the pier from the channel bottom up to 5 feet above the waterline.

RECOMMENDATIONS:

- (A) The heavy accumulation of timber debris at Pier 2 should be removed during routine maintenance.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

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



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Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 55517

Feature Crossed: Zumbro River

Feature Carried: East Center Street

Location: District 6 – Rice County

Bridge Description: The superstructure consists of three spans of multiple steel stringers supporting a reinforced concrete deck. The bridge is supported by two reinforced concrete abutments and two reinforced concrete piers, which are founded on steel piles. The piers are numbered 1 and 2 from the west to east.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 24, 2007

Weather Conditions: Sunny, 58° F

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible / None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Abutments and Piers 1 and 2.

General Shape: The piers consist of oblong rectangular shafts with a pointed upstream end and a rounded downstream end that are supported by rectangular footings that are founded on steel H-piles. The abutments consist of solid vertical walls with perpendicular wingwalls. A sloped concrete scour-protection apron surrounds each of the piers and extends along both abutments.

Maximum Water Depth at Substructure Inspected: Approximately 4.9 feet at Pier 2.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the north end of Pier 1.

Water Surface: The waterline was approximately 14.0 feet below reference.  
Waterline Elevation = 974.4.

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 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code F/07

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

       Yes   X   No



Photograph 1. Overall View of Bridge, Looking Southeast.



Photograph 2. View of Pier 1, Looking South.



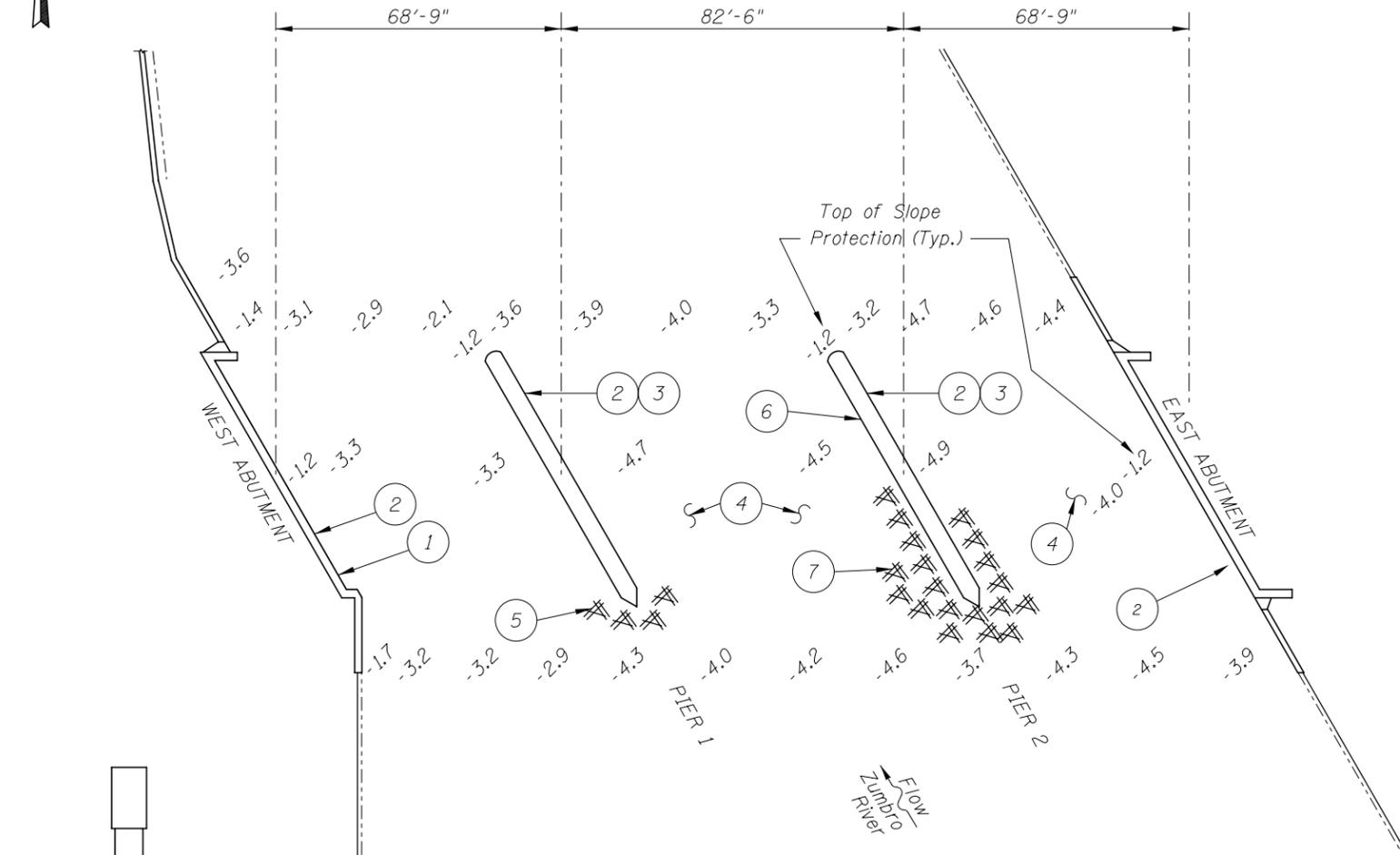
Photograph 3. View of Pier 2, Looking Northeast. Note the heavy accumulation of timber debris at the upstream end of the pier.



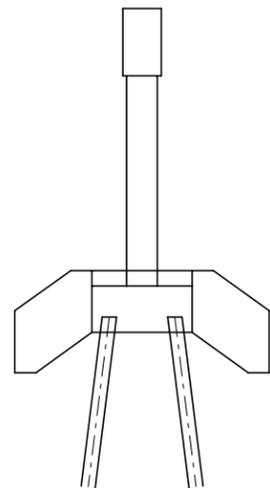
Photograph 4. View of the East Abutment, Looking Northeast.



Photograph 5. View of the West Abutment, Looking Southwest.



SOUNDING PLAN



TYPICAL END VIEW OF EACH PIER SECTION

INSPECTION NOTES:

- 1 An area of poor consolidation was located 1 foot above the waterline along a joint at the upstream end of the West Abutment that measured 1 foot in diameter with up to 6 inches of penetration.
- 2 The concrete was typically smooth and sound with random minor areas of poor consolidation with up to 1 inch of penetration. A sloped concrete slope protection was around both abutments, and was typically in good condition.
- 3 Three steel beams on 6-foot centers were embedded in the concrete pier shafts near the waterline at both the upstream and downstream ends of Piers 1 and 2.
- 4 The channel bottom consisted of sandy silt with up to 6 inches of probe rod penetration.
- 5 A light accumulation of 6-inch-diameter and smaller timber debris was observed at the upstream end of Pier 1.
- 6 A vertical hairline crack extended from the bottom of the pier cap to the channel bottom.
- 7 A heavy accumulation of 1.5-foot-diameter and smaller timber debris was observed at the upstream end of Pier 2 that extended along both sides of the pier and from the channel bottom up to 5 feet above the waterline.

GENERAL NOTES:

1. Piers 1 and 2 and East and West Abutments were inspected underwater/
2. At the time of inspection, on October 24, 2007, the waterline was located approximately 14.0 feet below the top of Pier 1 on the downstream end. This corresponds to a waterline elevation of 974.4.
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 as well as around the pier structures.

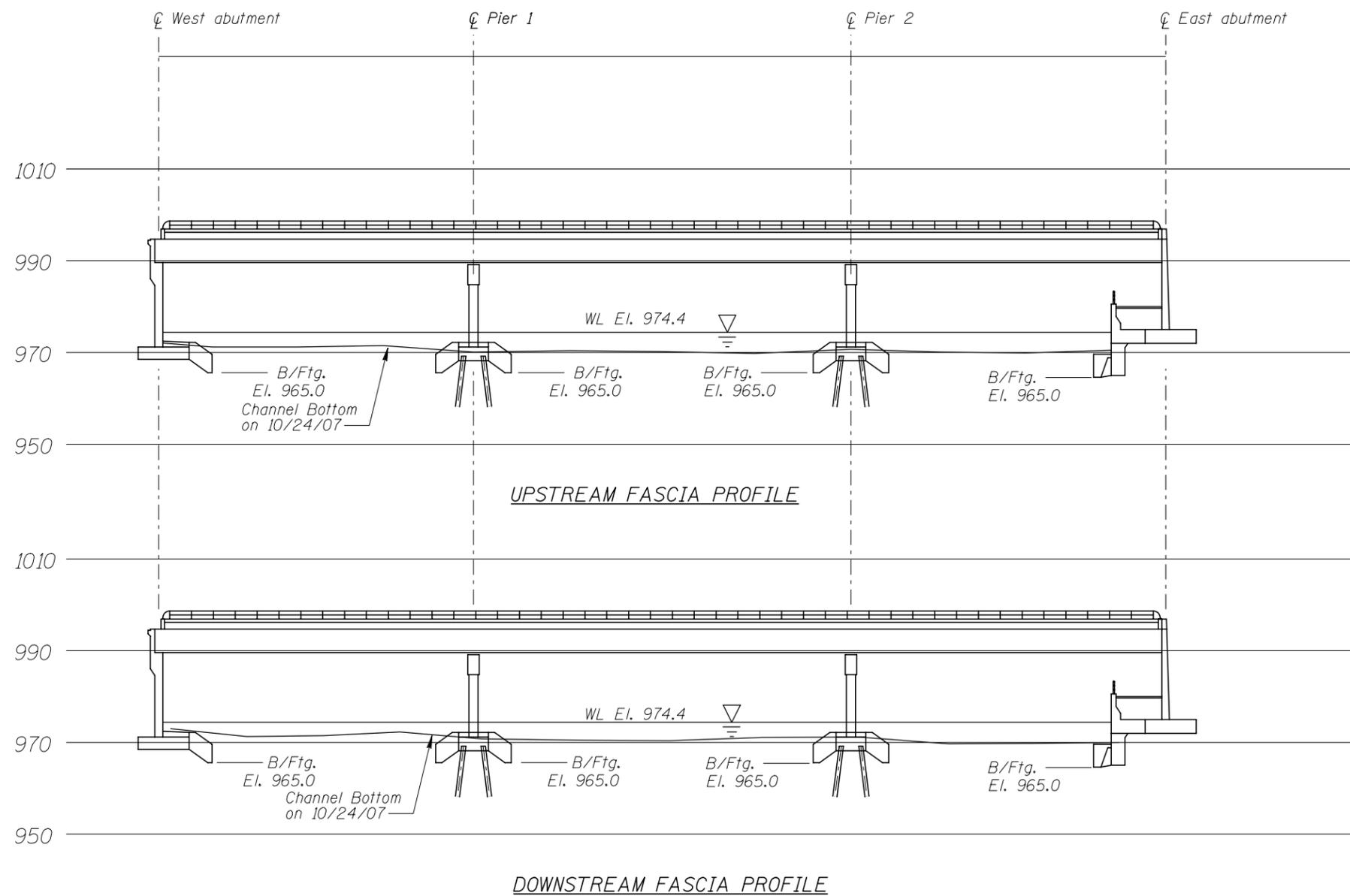
Legend

- 0.4 Sounding Depth (10/24/07)
- Timber Debris

Note:

All soundings based on 2007 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 55517 OVER THE ZUMBRO RIVER DISTRICT 6, RICE COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: RR	<b>COLLINS ENGINEERS</b> <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT. 2007
Checked By: MDK		Scale: NTS
Code: 52210037		Figure No.: 1



Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 55517 OVER THE ZUMBRO RIVER DISTRICT 6, RICE COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: RR	<b>COLLINS ENGINEERS</b> <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT. 2007
Checked By: MDK		Scale: 1"=30'
Code: 52210037		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 24, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 55517 WEATHER: Sunny, 58° F

WATERWAY CROSSED: Zumbro River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

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

TIME IN WATER: 2:10 P.M.

TIME OUT OF WATER: 2:40 P.M.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY ± 1.0 feet

DEPTH 4.9 feet maximum at Pier 2.

ELEMENTS INSPECTED: East and West Abutments and Piers 1 and 2

REMARKS: The concrete was typically in smooth and sound condition with random minor areas of poor consolidation with up to 1 inch of penetration. There was a 1-foot-diameter area of poor consolidation with up to 6 inches of penetration was noted along the West Abutment. A vertical hairline crack that extended from the bottom of the pier cap to the channel bottom along the west side of Pier 2. Light and heavy accumulations of timber debris were noted at the upstream ends of Piers 1 and 2, respectively.

FURTHER ACTION NEEDED:  YES  NO

The heavy accumulation of timber debris at Pier 2 should be removed during routine maintenance.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 55517  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491  
 WATERWAY CROSSED Zumbro River

INSPECTION DATE October 24, 2007  
 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
	West Abutment	3.6'	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N
	Pier 1	4.7'	N	7	N	9	N	7	8	N	N	7	8	7	N	N	N	N	N
	Pier 2	4.9'	N	7	N	9	N	7	8	N	N	6	6	7	N	N	N	N	N
	East Abutment	4.4'	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: The concrete was typically in smooth and sound condition with random minor areas of poor consolidation with up to 1 inch of penetration. There was a 1-foot-diameter area of poor consolidation with up to 6 inches of penetration was noted along the West Abutment. A vertical hairline crack that extended from the bottom of the pier cap to the channel bottom along the west side of Pier 2. Light and heavy accumulations of timber debris were noted at the upstream ends of Piers 1 and 2, respectively.

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.