

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 93278

CSAH 52

OVER THE

PICNIC CREEK

ST. LOUIS COUNTY



SEPTEMBER 20, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 93278, the East and West Abutments, were found to be in good condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/8 inch wide and 1 inch deep. The timber backwalls were typically sound with random gaps between boards up to 2 inch wide with no appreciable loss of backfill observed. A moderate accumulation of timber debris was observed across the downstream fascia.

INSPECTION FINDINGS:

- (A) The channel bottom material typically consisted of rocks and stones up to 6 inches in diameter and silt infill with a maximum probe rod penetration of 6 inches.
- (B) The timber piles were typically sound with random splitting or checking up to 1/8 inch wide and 1 inch deep.
- (C) The backwall boards were typically sound with random gaps between the boards up to 2 inches wide. No appreciable loss of backfill was observed.
- (D) A moderate accumulation of timber debris, consisting of 2 inch diameter and smaller branches, was observed across the downstream fascia and extending from the channel bottom to 1 foot above the waterline.

RECOMMENDATIONS:

- (A) The inspection of the submerged substructure units of Structure No. 93278 can most likely be accomplished in the future without using 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.
- (B) Reinspect the submerged substructure at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

Nicholas R. Triandafilou

Nicholas R. Triandafilou, P.E.

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.

[Signature]
Daniel G. Stromberg

Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 93278

Feature Crossed: Picnic Creek

Feature Carried: CSAH 52

Location: St. Louis County

Bridge Description: The superstructure consists of a timber deck supported by steel I-Beams. The superstructure is supported by two abutments consisting of seven 12 inch diameter timber piles, a 12 inch by 12 inch timber pile cap, and a timber backwall.

2. INSPECTION DATA

Professional Engineer Diver: Nicholas R. Triandafilou, P.E.

Dive Team: Marc B. Parker, Clay G. Brookins

Date: September 20, 2012

Weather Conditions: Cloudy, 45° F

Underwater Visibility: 1 foot

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: The East and West Abutments

General Shape: The East and West Abutments each consist of seven timber 12 inch diameter piles with a 12 inch by 12 inch timber pile cap. The backwall and wingwalls were comprised of 3 inch by 12 inch timber boards.

Maximum Water Depth at Substructure Inspected: Approximately 0.8 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the pile cap at the upstream end of the West Abutment

Water Surface: The waterline was approximately 5.1 feet below the reference.

Waterline Elevation 94.9

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 A/09/12

Item 113: Scour Critical Bridges: Code J/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
228	Timber Piling	14	EA	14	0	0	0	n/a
216	Timber Abutment	66	LF	66	0	0	0	n/a
386	Timber Wingwalls	4	EA	4	0	0	0	n/a
985	Slopes and Slope Protection	1	EA	1	0	0	n/a	n/a



Photograph 1. Overall View of Structure, Looking North.



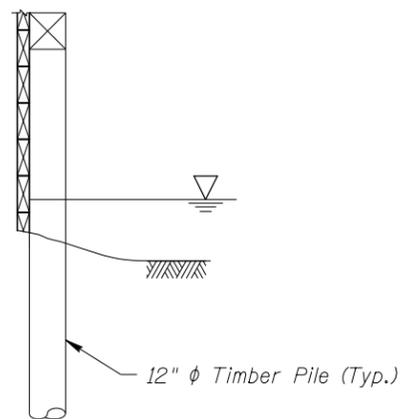
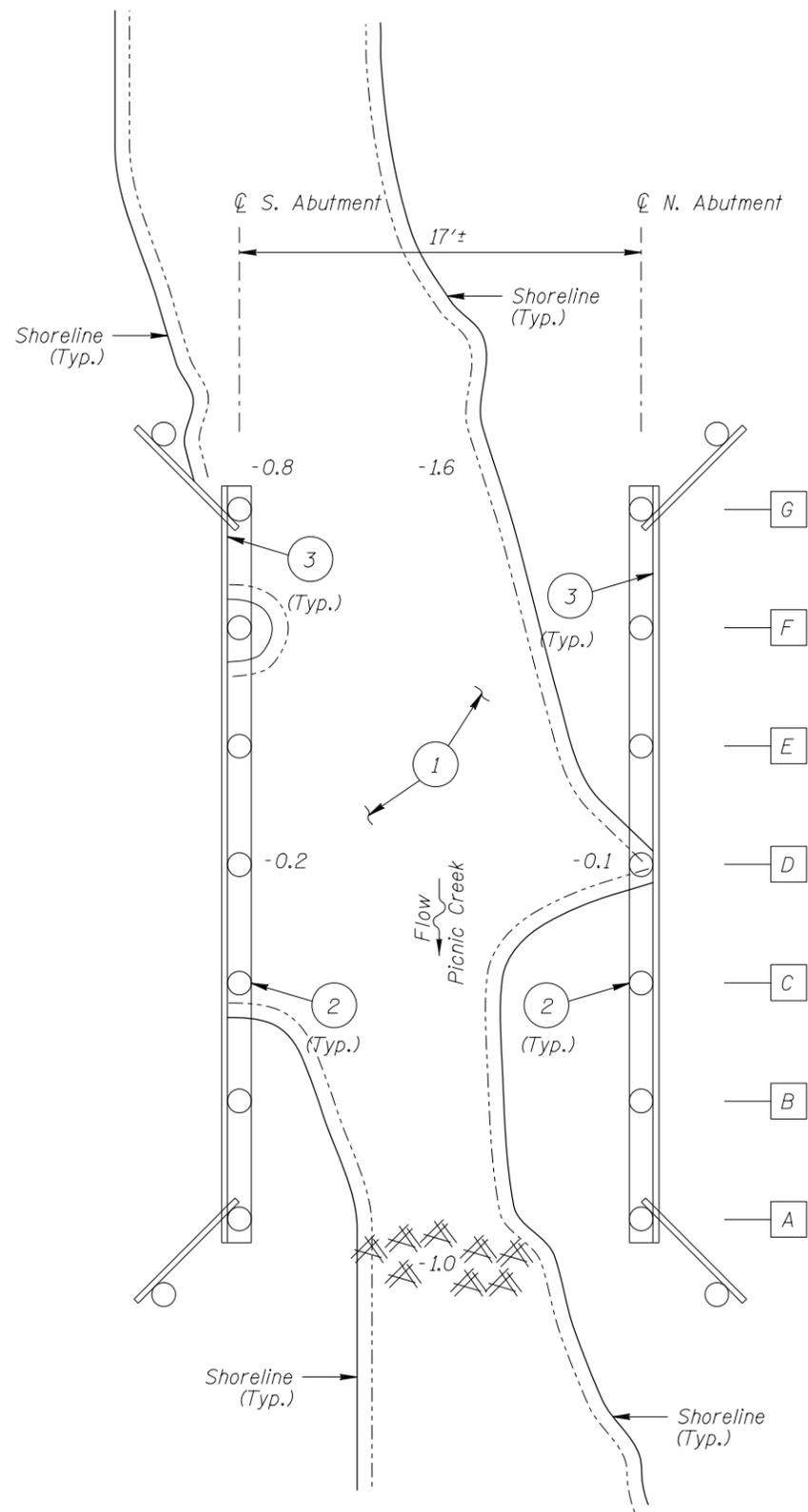
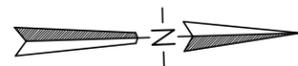
Photograph 2. View of the East Abutment, Looking Northeast.



Photograph 3. View of the West Abutment, Looking Southwest.



Photograph 4. View of Typical Gaps in the Northwest Wingwall Boards, Looking West.



TYPICAL END VIEW OF ABUTMENTS

SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material typically consisted of rocks and stones up to 6 inches in diameter and silt infill with a maximum probe rod penetration of 6 inches.
- 2 The timber piles were typically sound with random splitting or checking up to $\frac{1}{8}$ inch wide and 1 inch deep.
- 3 The backwall boards were typically sound with random gaps between the boards up to 2 inches wide. No appreciable loss of backfill was observed.
- 4 A moderate accumulation of timber debris, consisting of 2 inch diameter and smaller branches, was observed across the downstream fascia and extending from the channel bottom to 1 foot above the waterline.

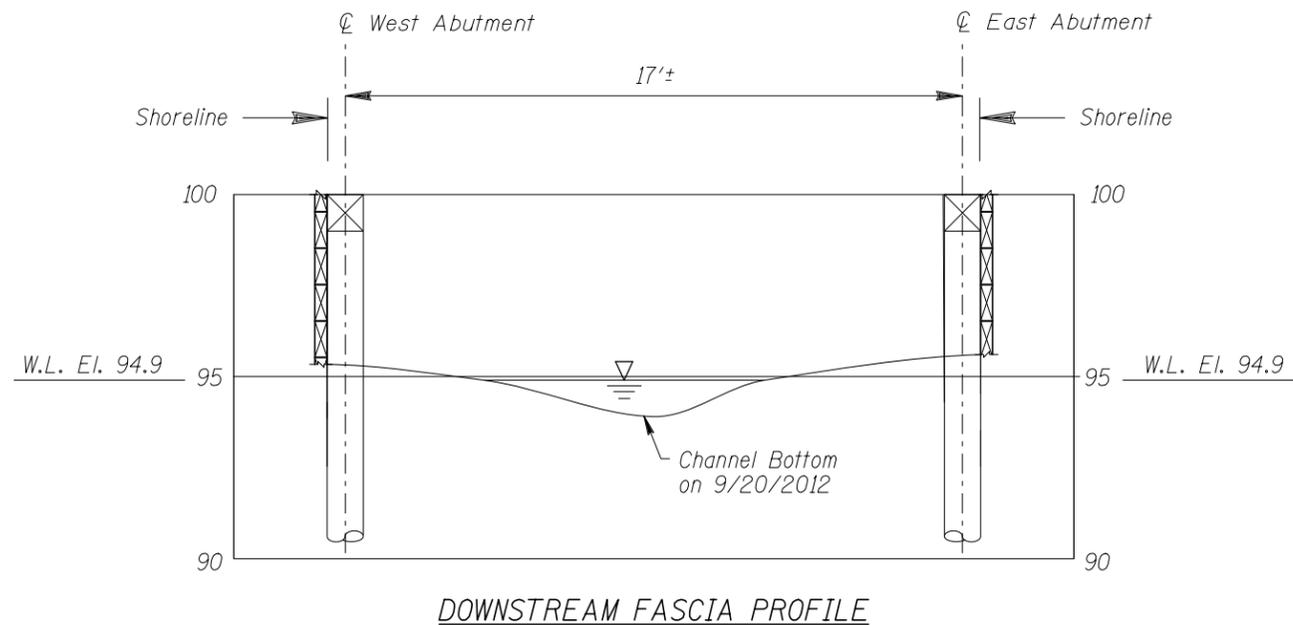
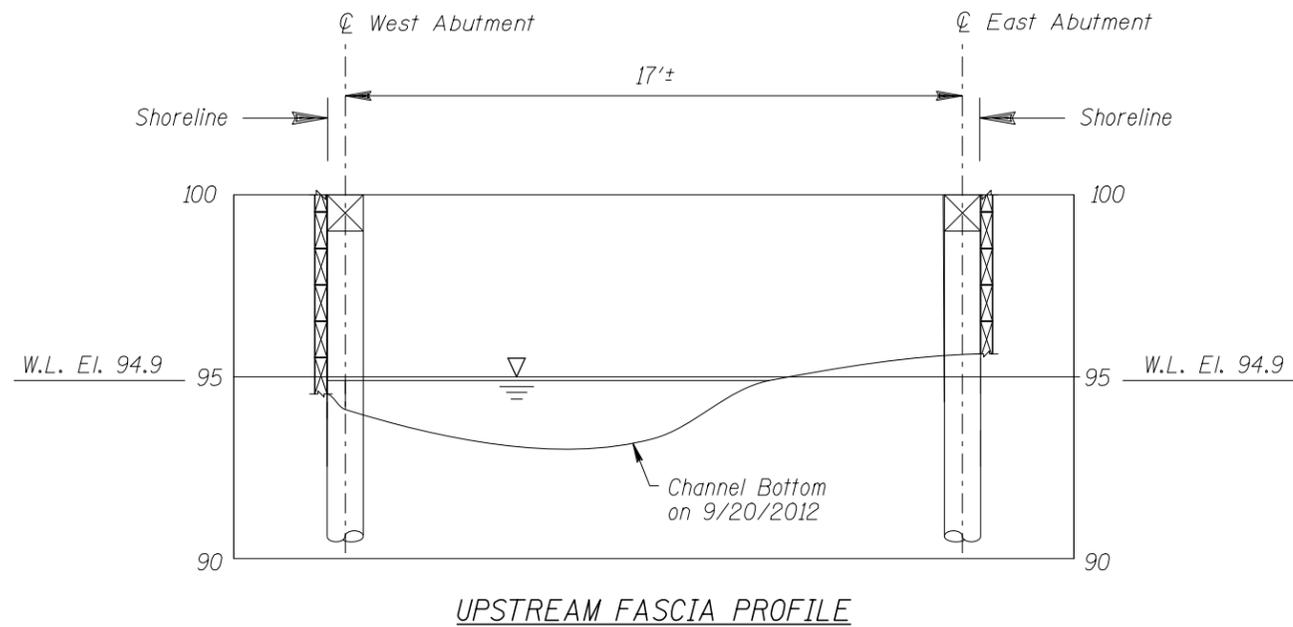
GENERAL NOTES:

1. The East and West Abutments were inspected during the underwater inspection.
2. At the time of inspection on September 20, 2012, the waterline was located approximately 5.1 feet below the top of the pile cap at the upstream end of the West Abutment. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 94.9.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

Legend

- 1.0 Sounding Depth from Waterline (9/20/2012)
- A Pile Identification Designation
- 12 inch Diameter Timber Pile
- ⊗ Timber Debris
- ① Inspection Note Number

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 93278 CSAH 52 OVER THE PICNIC CREEK ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MBP	COLLINS ENGINEERS	Date: NOVEMBER, 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 742393278		Figure No.: I



Note: _____
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 93278 CSAH 52 OVER THE PICNIC CREEK ST. LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: MBP	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: NOVEMBER, 2012
Checked By: LJ		Scale: 1"=5'
Code: 742393278		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 20, 2012

ON-SITE TEAM LEADER: Nicholas R. Triandafilou, P.E.

BRIDGE NO: 93278 WEATHER: Cloudy, 45° F

WATERWAY CROSSED: Stream

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR

OTHER Inspection by Wading

PERSONNEL: Marc B. Parker, Clayton G. Brookins

EQUIPMENT: Dry Suit, Probe Rod, Camera, Hand Tools

TIME IN WATER: 12:30 P.M.

TIME OUT OF WATER: 1:00 P.M.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY 1 foot

DEPTH 0.8 feet maximum at the West Abutment

ELEMENTS INSPECTED: The East and West Abutments

REMARKS: Overall, the substructure units inspected underwater were found to be in good condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/8 inch wide and 1 inch deep. The timber backwalls were typically sound with random gaps between boards up to 2 inch wide with no appreciable loss of backfill observed. A moderate accumulation of timber debris was observed across the downstream fascia.

FURTHER ACTION NEEDED: _____ YES NO

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

The inspection of the submerged substructure units of Structure No. 93278 can most likely be accomplished in the future without using 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.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 93278
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Nicholas R. Triandafilou, P.E.
 WATERWAY CROSSED Picnic Creek

INSPECTION DATE September 20, 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 (BACKWALL)	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	0.1'	7	N	N	N	7	7	N	N	N	6	6	N	N	7	N	N	N
	South Abutment	0.8'	7	N	N	N	7	7	N	N	N	6	6	N	N	7	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the substructure units inspected underwater were found to be in good condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/8 inch wide and 1 inch deep. The timber backwalls were typically sound with random gaps between boards up to 2 inch wide with no appreciable loss of backfill observed. A moderate accumulation of timber debris was observed across the downstream fascia.

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.