

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 93454
BARRETT ROAD NORTH
OVER THE
PAAVOLA CREEK
ST. LOUIS COUNTY



SEPTEMBER 17, 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. 93454, the North and South Abutments, were found to be in satisfactory condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/4 inch wide and 1 inch deep. The timber backwall and wingwalls were sound and tight with no observed loss of backfill. The backwall and wingwall boards exhibited splitting or checking similar to the piles. The channel bottom appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The channel bottom material typically consisted rocks and gravel with a maximum probe rod penetration of 3 inches.
- (B) The timber piles were typically sound with no hallow sound or major splits. Random splits or checks were typical at all piles. The splitting or checking was up to 1/4 inch wide and 1 inch deep.
- (C) The timber backwall and wingwalls of the both abutments were sound and tight with no noticeable loss of backfill material. Random splits or checks were typical at nearly all wall boards. The splitting or checking was up to 1/4 inch wide and 1 inch deep.

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 93454

Feature Crossed: Paavola Creek

Feature Carried: Barrett Road North

Location: St. Louis County

Bridge Description: The superstructure consisted of a timber deck supported by ten steel I-Beams. The superstructure was supported by two abutments consisting of five 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 17, 2012

Weather Conditions: Cloudy, 50° F

Underwater Visibility: None / Negligible

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: The North and South Abutments

General Shape: The North and South Abutments each consist of five timber 12 inch diameter piles with a 12 inch by 12 inch timber pile cap. The backwall and wingwalls are comprised of 4 inch by 12 inch timber boards.

Maximum Water Depth at Substructure Inspected: Approximately 1.3 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 5.7 feet below the reference.
Waterline Elevation 94.3.

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 A/09/12

Item 113: Scour Critical Bridges: Code F/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 Piles	14	EA	0	14	0	0	n/a
216	Timber Abutment	39	LF	0	39	0	0	n/a
386	Timber Wingwalls	4	EA	0	4	0	0	n/a
360	Settlement	1	EA	1	0	0	n/a	n/a
985	Slopes and Slope Protection	1	EA	1	0	0	n/a	n/a



Photograph 1. Overall View of Structure, Looking West



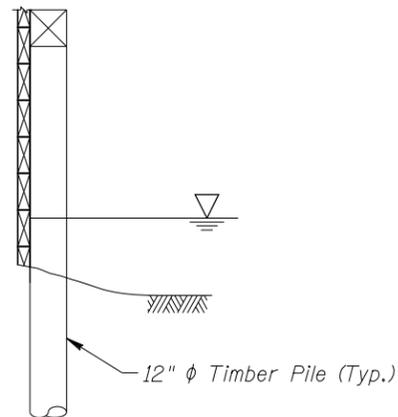
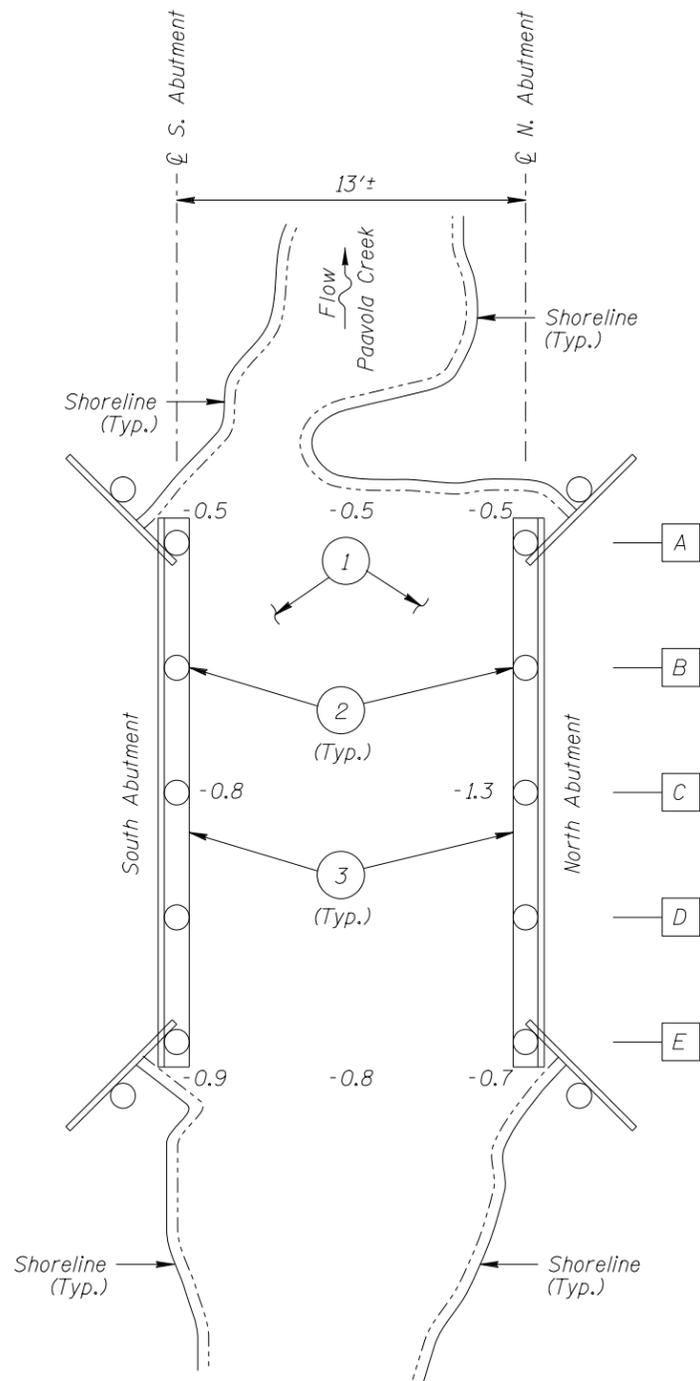
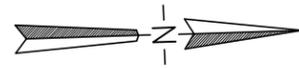
Photograph 2. View of the North Abutment, Looking Northeast.



Photograph 3. View of the South Abutment, Looking Southeast.



Photograph 4. View of the Typical Timber Conditions around the Waterline, Looking Northwest.



TYPICAL END VIEW OF ABUTMENTS

SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material typically consisted rocks and gravel with up to 3 inches of probe rod penetration.
- 2 The timber piles were typically sound with random splits or checks up to 1/4 inch wide and 1 inch deep.
- 3 The timber backwall and wingwalls were typically sound and tight with no noticeable loss of backfill or defects of structural significance. The backwall and wingwall boards exhibited random splits or checks up to 1/4 inch wide and 1 inch deep.

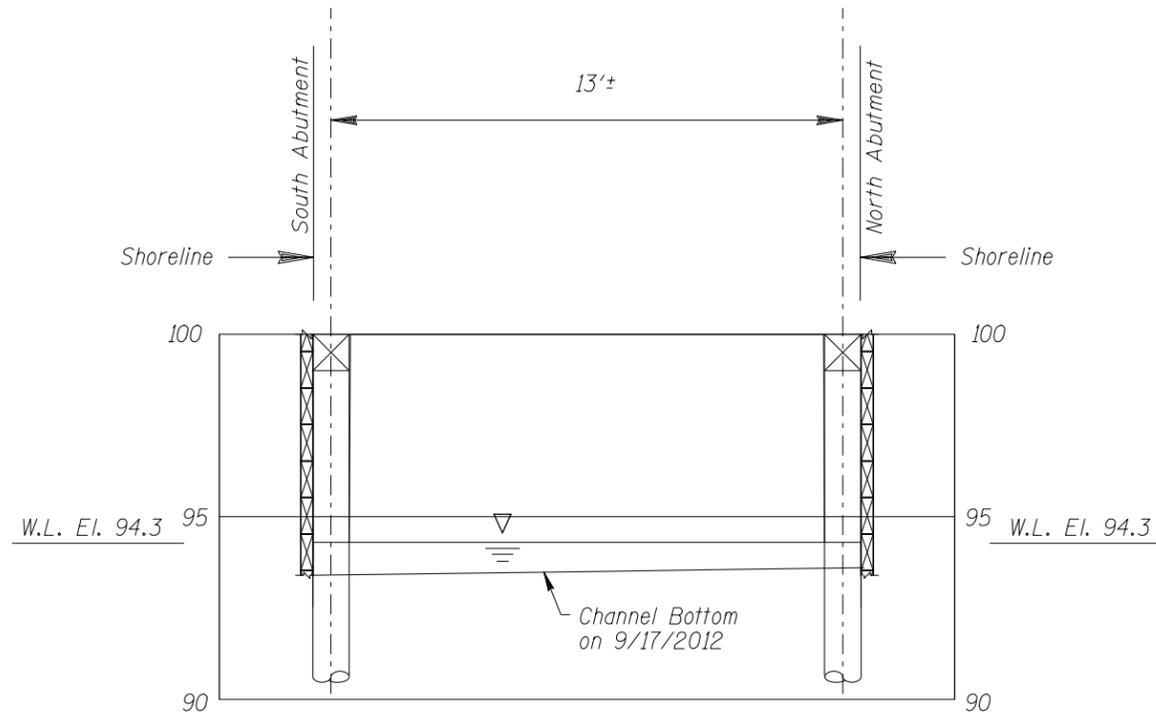
GENERAL NOTES:

1. The North and South Abutments were inspected during the underwater inspection.
2. At the time of inspection on September 17, 2012, the waterline was located approximately 5.7 feet below the top of the pile cap at the upstream end of the South Abutment. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 94.3.
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 1/2 point intervals between the substructure units.

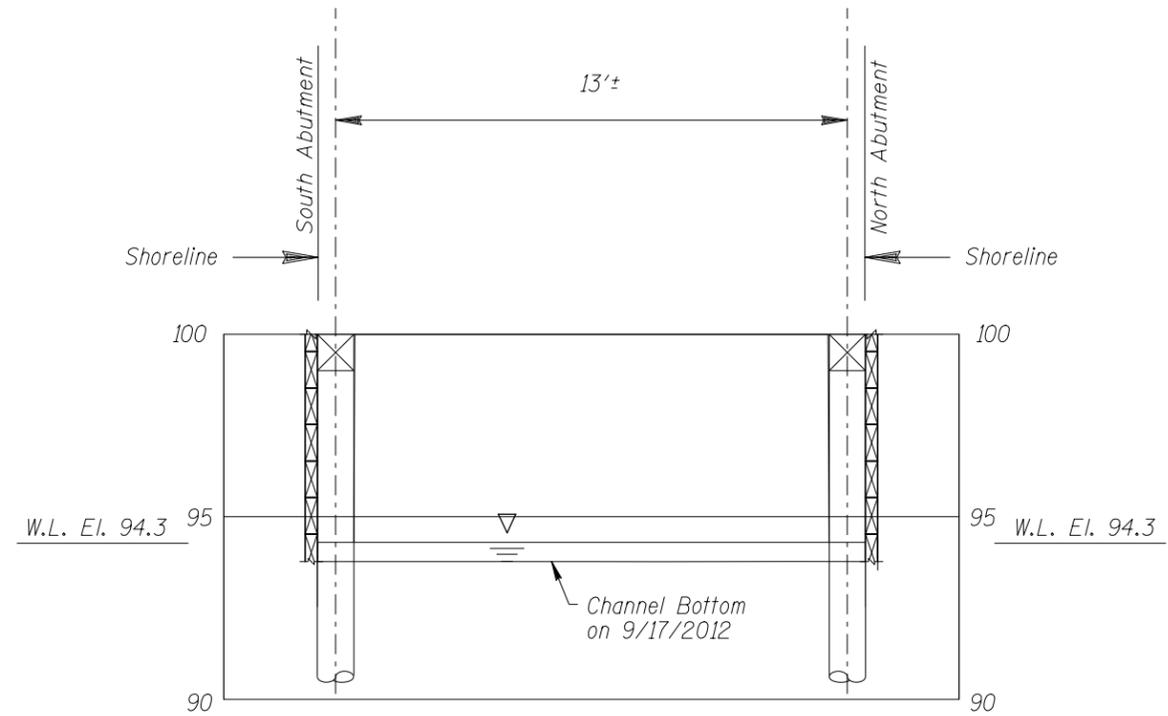
Legend

- 17.0 Sounding Depth from Waterline (9/17/2012)
- A Pile Identification Designation
- 12-inch Diameter Timber Pile
- ① Inspection Note Number

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 93454 BARRETT ROAD NORTH OVER THE THE PAAVOLA CREEK ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MBP	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCTOBER, 2012
Checked By: LJ		Scale: NTS
Code: 742393454		Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 93454 BARRETT ROAD NORTH OVER THE PAAVOLA 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: OCTOBER, 2012
Checked By: LJ		Scale: 1"=5'
Code: 742393454		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: September 17, 2012
ON-SITE TEAM LEADER: Nicholas R. Triandafilou, P.E.
BRIDGE NO: 93454 WEATHER: Cloudy, 50° F
WATERWAY CROSSED: Paavola Creek
DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
 OTHER Inspection by Wadding
PERSONNEL: Marc B. Parker, Clayton G. Brookins
EQUIPMENT: Dry Suit, Probe Rod, Camera, Hand Tools
TIME IN WATER: 4:40 P.M.
TIME OUT OF WATER: 4:55 P.M.
WATERWAY DATA: VELOCITY None / Negligible
VISIBILITY None / Negligible
DEPTH 1.3 feet maximum at the North Abutment
ELEMENTS INSPECTED: The North and South Abutments
REMARKS: Overall, the North and South Abutments, were found to be in satisfactory condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/4 inch wide and 1 inch deep. The timber backwall and wingwalls were sound and tight with no observed loss of backfill. The backwall and wingwall boards exhibited splitting or checking similar to the piles. The channel bottom appeared to be stable with no evidence of significant scour.

FURTHER ACTION NEEDED: _____ YES NO

The inspection of the submerged substructure units of Structure No. L9571 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.

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. 93454
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Nicholas R. Triandafilou, P.E.
 WATERWAY CROSSED Paavola Creek

INSPECTION DATE September 17, 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	1.3'	6	N	N	N	6	6	N	N	N	N	7	N	N	6	N	N	N
	South Abutment	0.9'	6	N	N	N	6	6	N	N	N	N	7	N	N	6	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the North and South Abutments, were found to be in satisfactory condition, with no defects of structural significance. The timber piles were typically sound with random splits or checks up to 1/4 inch wide and 1 inch deep. The timber backwall and wingwalls were sound and tight with no observed loss of backfill. The backwall and wingwall boards exhibited splitting or checking similar to the piles. The channel bottom appeared to be stable with no evidence of significant scour.

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.