

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 92628

FLORIDA

OVER THE

COOLIDGE 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. 92628, the North and South Abutments, were found to be in satisfactory condition, with only minor defects of structural significance observed. The timber of the piles and backwall was typically in good condition. A split through the full height of the pile cap at the North and South Abutments was observed running the full length of the cap. A minor rotation of the pile cap has resulted from the split. A moderate accumulation of timber debris was observed at the South Abutment.

INSPECTION FINDINGS:

- (A) The channel bottom material typically consisted rocks, gravel, and silt with up to 6 inches of probe rod penetration.
- (B) The timber piles were typically sound allowing typical awl penetrations of 1/16 inch and exhibiting random splits or checks up to 1/16 inch wide and 1 inch deep.
- (C) A split through the full height of the North and South Abutment pile caps was observed running the entire length of the caps. The splits were typically 1/8 inch wide and up to 1 inch wide at the last 5 feet of the upstream and downstream ends. Both pile caps exhibited minor rotation (less than 3°) as a result of the split.
- (D) The timber backwall was typically sound and tight with no noticeable loss of backfill or defects of structural significance.
- (E) A moderate accumulation of timber debris was observed at the South Abutment, consisting of 4 inch diameter and smaller branches extending from the channel bottom to the deck underside and up to 10 feet off the face of the South Abutment.

RECOMMENDATIONS:

- (A) The timber debris accumulation at the South Abutment did not appear to significantly affect the channel flow, and as a result, does not require removal at this time. If the debris accumulation increases in size or density, it may be necessary to remove the debris to reduce excessive lateral loads on the abutment, limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.
- (B) Monitor the split in the North and South Abutment pile caps. If noticeable settlement or rotation is found to be developing, consideration should be given to repairing or replacing the timber pile caps.
- (C) 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: 92628

Feature Crossed: Collidge Creek

Feature Carried: Florida

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 six 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: Raining, 45° F

Underwater Visibility: 1 foot

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 six 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 4.8 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the pile cap at the downstream end of the North Abutment.

Water Surface: The waterline was approximately 0.7 feet below the reference.
Waterline Elevation 99.3.

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 6

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code N/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	12	EA	0	12	0	0	n/a
216	Timber Abutment	49	LF	0	49	0	0	n/a
235	Timber Pile Cap	49	LF	0	49	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



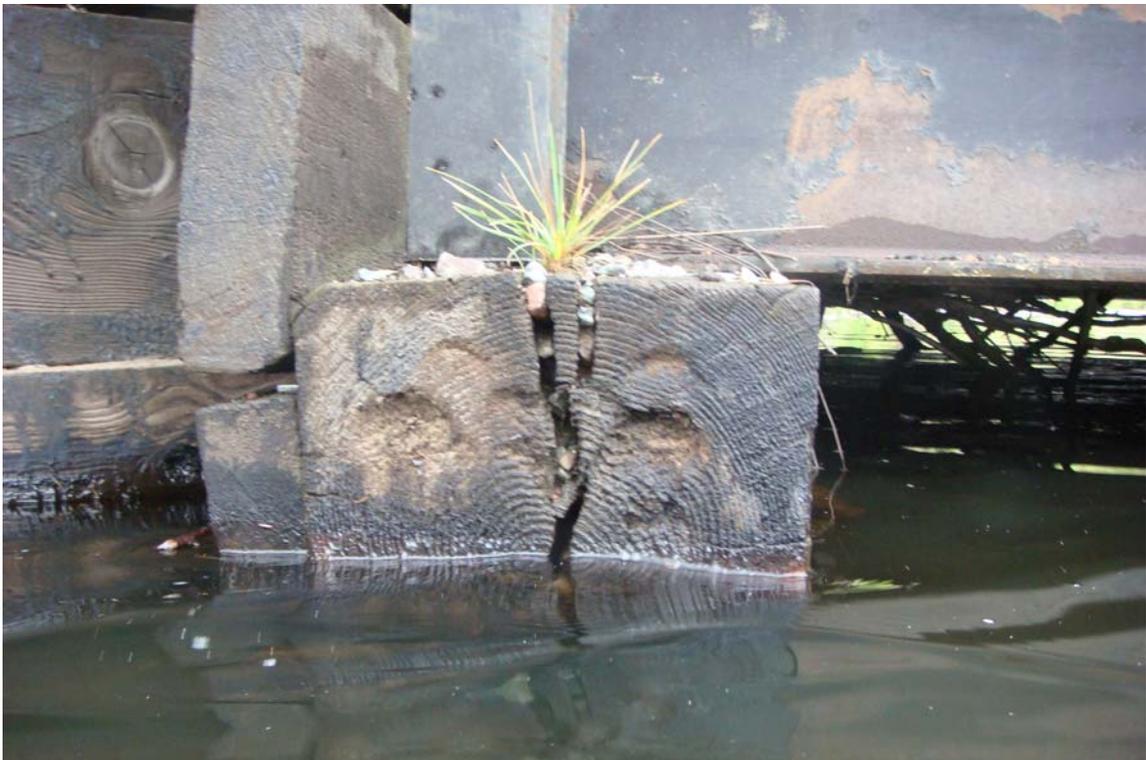
Photograph 1. Overall View of Structure, Looking East



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



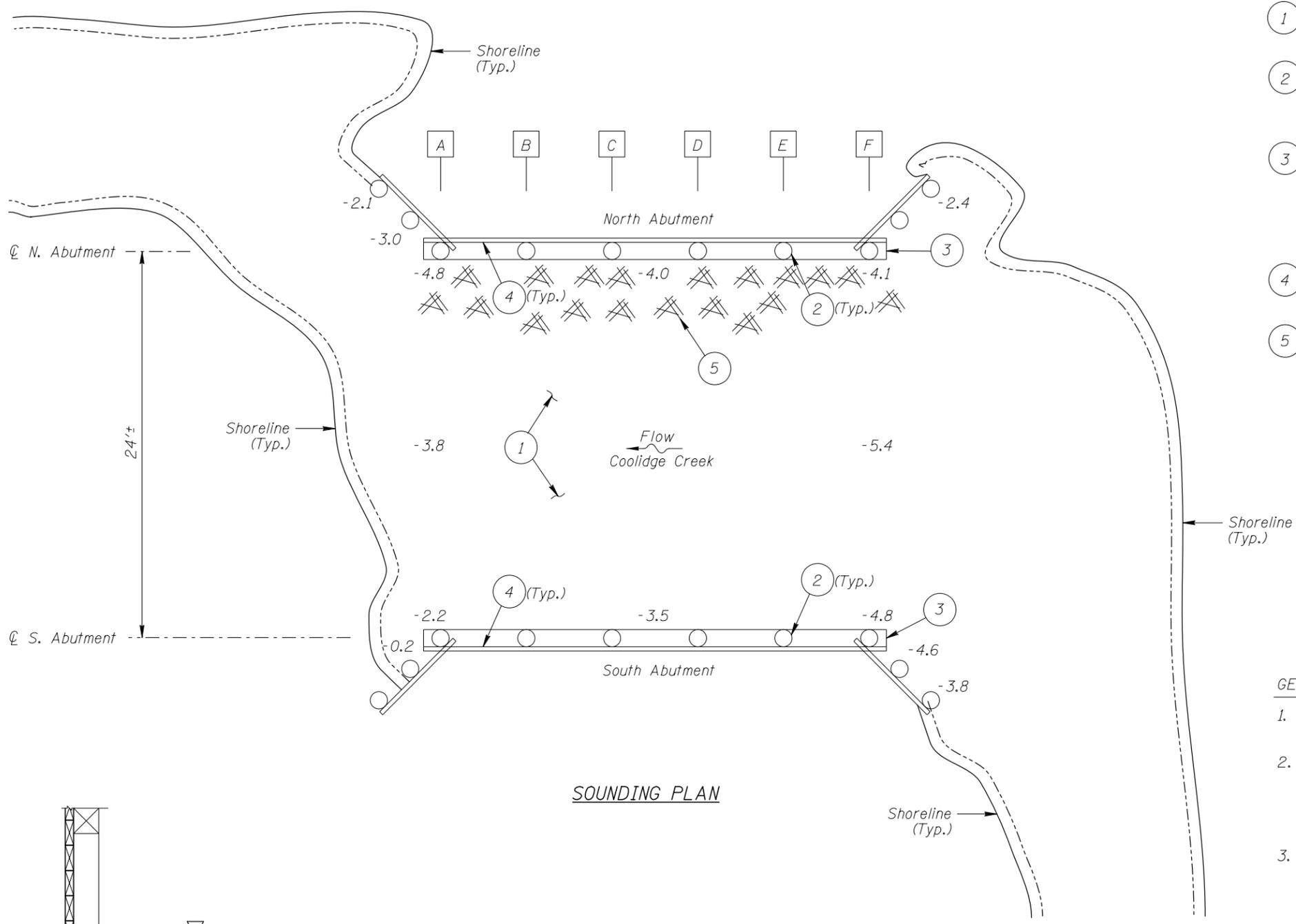
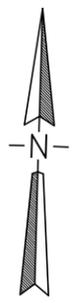
Photograph 3. View of the South Abutment, Looking Southwest.



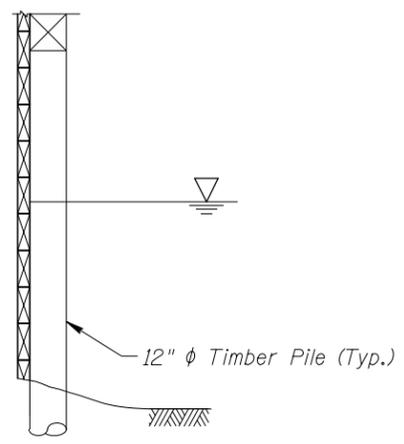
Photograph 4. View of the Split in the South Abutment Pile Cap, Looking West.



Photograph 5. View of the Timber Debris Accumulation at the South Abutment, Looking South



SOUNDING PLAN



TYPICAL END VIEW OF ABUTMENTS

INSPECTION NOTES:

- 1 The channel bottom material typically consisted rocks, gravel, and silt with up to 6 inches of probe rod penetration.
- 2 The timber piles were typically sound allowing typical awl penetration of 1/16 inch and exhibiting random splits or checks up to 1/16 inch wide and 1 inch deep.
- 3 A split through the full height of the North and South Abutment pile cap was observed running the entire length of the cap. The split was typically 1/8 inch wide and up to 1 inch wide at the last 5 feet of the upstream and downstream ends. Both pile caps exhibited a minor rotation (less than 3°) as a result of the split.
- 4 The timber backwall was typically sound and tight with no noticeable loss of backfill or defects of structural significance.
- 5 A moderate accumulation of timber debris was observed at the South Abutment consisting of 4 inch diameter and smaller branches extending from the channel bottom to the deck underside and up to 10 feet off the face of the South Abutment.

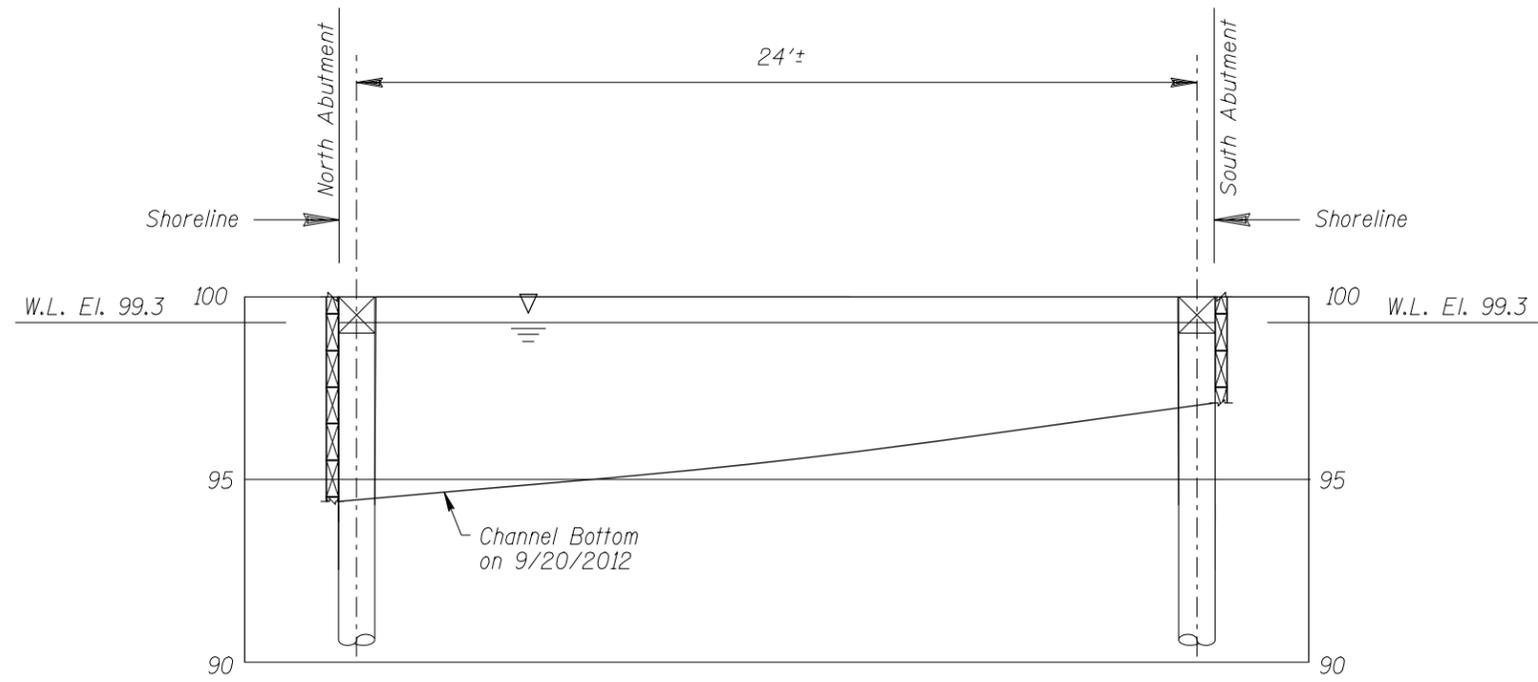
GENERAL NOTES:

1. The North and South Abutments were inspected during the underwater inspection.
2. At the time of inspection on September 20, 2012, the waterline was located approximately 0.7 feet below the top of the pile cap at the downstream nose of the North Abutment. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 99.3.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

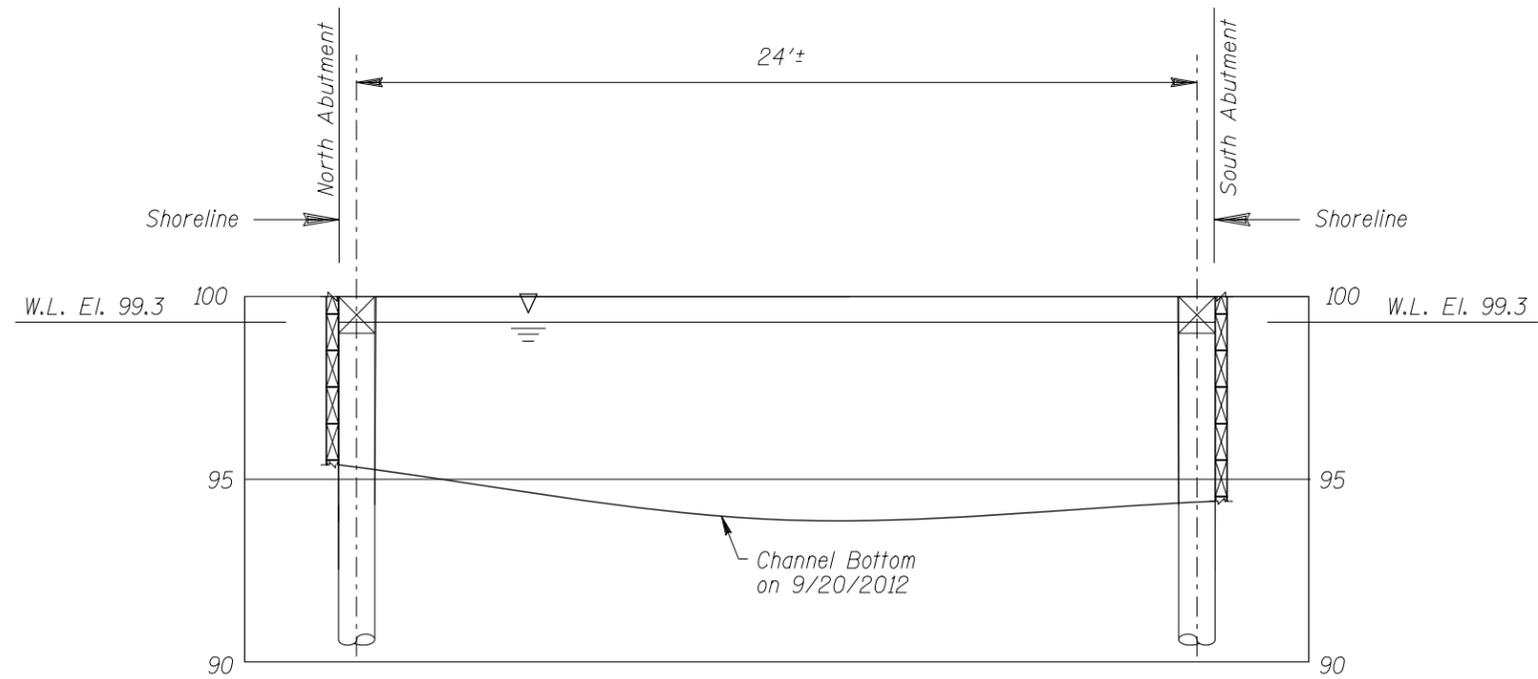
Legend

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

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 92628 FLORIDA OVER THE COOLIDGE 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: 742392628		Figure No.: 1



DOWNSTREAM FASCIA PROFILE



UPSTREAM FASCIA PROFILE

Note: _____
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 92628 FLORIDA OVER THE COOLIDGE 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: 742392628		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: 92628 WEATHER: Raining, 45° F

WATERWAY CROSSED: Coolidge Creek

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Clayton G. Brookins

EQUIPMENT: Commercial Scuba, Probe Rod, Camera, Hand Tools

TIME IN WATER: 10:50 A.M.

TIME OUT OF WATER: 11:15 A.M.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY 1 foot

DEPTH 4.8 feet maximum at the North and South Abutments

ELEMENTS INSPECTED: The North and South Abutments

REMARKS: Overall, the North and South Abutments, were found to be in satisfactory condition, with only minor defects of structural significance observed. The timber of the piles and backwall was typically in good condition. A split through the full height of the pile cap at the North and South Abutments was observed running the full length of the cap. A minor rotation of the pile cap has resulted from the split. A moderate accumulation of timber debris was observed at the South Abutment.

FURTHER ACTION NEEDED: _____ YES ___ X ___ NO

The timber debris accumulation at the South Abutment did not appear to significantly affect the channel flow, and as a result, does not require removal at this time. If the debris accumulation increases in size or density, it may be necessary to remove the debris to reduce excessive lateral loads on the abutment, limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.

Monitor the split in the North and South Abutment pile caps. If noticeable settlement or rotation is found to be developing, consideration should be given to repairing or replacing the timber pile caps.

Reinspect the submerged substructure 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. 92628
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Nicholas R. Triandafilou, P.E.
 WATERWAY CROSSED Coolidge 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	4.8'	6	N	N	6	7	6	N	N	7	N	7	N	N	6	N	N	N
	South Abutment	4.8'	6	N	N	6	7	6	N	N	7	6	6	N	N	6	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the North and South Abutments, were found to be in satisfactory condition, with only minor defects of structural significance observed. The timber of the piles and backwall was typically in good condition. A split through the full height of the pile cap at the North and South Abutments was observed running the full length of the cap. A minor rotation of the pile cap has resulted from the split. A moderate accumulation of timber debris was observed at the South Abutment.

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.