

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 92628 UT 9230 over COOLIDGE CREEK

DISTRICT: District 1

COUNTY: St. Louis

CITY/TOWNSHIP: T - 55 R - 15

STATE: Minnesota

Date of Inspection: 06/23/2016

Equipment Used:

Owner: Town or Township Highway Agency

Inspected By: Janulis, Lukas

Report Written By: Lukas Janulis

Report Reviewed By:

Final Report Date:



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UNDERWATER INSPECTION

REPORT SUMMARY

The substructure units inspected at Bridge No. 92628, the North and South Abutments, were found to be in fair to poor condition, with only minor defects of structural significance observed. The timber piles were typically sound apart from some random splits. A split through the full section 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.

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.

RECOMMENDATIONS

- (A) Consider repairing the split pile caps at the North and South Abutments.
- (B) Reinspect the submerged substructure at the normal maximum recommended (NBIS) interval of sixty (60) months.

Contractor: Collins Engineers, Inc.

Contractor Job Number: 9687

UNDERWATER INSPECTION

1. BRIDGE DATA

Bridge #: 92628
Feature Intersected: COOLIDGE CREEK
Facility Carried: UT 9230
District: District 1
County: 069 - St. Louis

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/Team Leader: Lukas Janulis
Inspection Diver: Lukas Janulis
Date of Underwater Inspection: 06/23/2016
Weather Conditions: Sunny, 70°F
Underwater Visibility (feet): 1 foot
Waterway Velocity (ft/sec): Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: The North and South Abutment.

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(s) Inspected (feet): 4.4 feet

4. WATERLINE DATUM

Water Level Reference: Top of the pile cap at the downstream end of the North Abutment.
Waterline Elevation (feet): 99.4 feet
Description: The waterline was approximately 0.6 feet below the reference.

5. NBIS CODING INFORMATION

(Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code: 4
Item 61: Channel and Channel Protection: Code: 5
Item 62: Culvert: Code:
Item 92B: Underwater Inspection: Code: Y 48 06/16

Item 113: Scour Critical Bridge:

Code: N

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

Yes

No

(Mark your selection with an X)

6. STRUCTURAL ELEMENT CONDITION RATING

ELEM #	Element Description	Quantity	Unit	Conditions			
				CS1	CS2	CS3	CS4
216	Timber Abutment	89	LF		55	31	3
228	Timber Piling	20	EA		5	12	3
884	Substructure Settlement & Mvmt	1	EA	1			
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 92628 (UT 9230 over Coolidge Creek) was completed on June 23, 2016. The underwater inspection was conducted from shore. The inspection was conducted by a team consisting of a Professional Engineer Diver with a valid MnDOT Team Leader certification, a backup diver and dive tender. The inspection utilized commercial dive equipment and techniques in accordance with OSHA regulations. Channel bottom profiles were taken along the upstream and downstream faces of the bridge and around the periphery of substructure units to determine the presence, location, and area of scour.

The bridge elements inspected consisted of two timber abutments. According to the bridge inventory, the North and South Abutment are founded on timber piles. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The maximum routine underwater inspection frequency is recommended to remain at 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.

Minnesota Structure Inventory Report

Bridge ID: 92628

UT 9230 over COOLIDGE CREEK

Date: 12/12/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. 755 Crew District 01 Maint. Area County 069 - St. Louis City Township 69081 - T - 55 R - 15 Desc. Loc. 6.0 MI SW OF JCT CSAH4 Sect., Twp., Range 35 - 055N - 15W Latitude 47 ° 12' 28.11 " Longitude 92 ° 12' 56.87 " Custodian 03 - Town or Township Highway Owner 03 - Town or Township Highway BMU Agreement Year Built 1969 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 3 - COUNTY Date Opened to Traffic On - Off System 0 - OFF Legislative District 05B Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 09 - UTDW Number 9230 Roadway Name or Description UT 9230 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 019+00.700 Detour Length 46.0 mi. Lanes ON 2 UNDER 0 ADT 50 YEAR 2003 HCA DT ADTT % Functional Class 08 - Rural - Minor Collector	Userkey 109 Structurally Deficient Y Functionally Obsolete N Sufficiency Rating 71.5 Routine Inspection Date 08/12/2016 Routine Inspection Frequency 12 Inspector Name Janulis, Lukas Status A - Open																				
		+ NBI CONDITION RATINGS +																				
		Deck 5 Unsound Deck % 80 Superstructure 5 Substructure 4 Channel 5 Culvert N																				
		+ NBI APPRAISAL RATINGS +																				
		Structure Evaluation 4 Deck Geometry 6 Underclearances N Waterway Adequacy 7 Approach Alignment 8																				
		+ SAFETY FEATURES +																				
		Bridge Railing 0 - SUBSTANDARD GR Transition N - NOT REQUIRED Appr. Guardrail N - NOT REQUIRED GR Termini N - NOT REQUIRED																				
		+ IN DEPTH INSP. +																				
		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">Y/N</th> <th style="width: 10%; text-align: center;">Freq</th> <th style="width: 20%; text-align: center;">Date</th> </tr> </thead> <tbody> <tr> <td>Frac. Critical</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Underwater</td> <td></td> <td style="text-align: center;">60</td> <td style="text-align: center;">06/23/2016</td> </tr> <tr> <td>Pinned Asbly.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Spec. Feat.</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y/N	Freq	Date	Frac. Critical				Underwater		60	06/23/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater		60	06/23/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
		Drainage Area (sq. mi.) Waterway Opening (sf.) 88 Navigation Control 0 - No nav. control on Pier Protection Nav. Clr. (ft.) Vert. 0.0 Horiz. 0.0 Nav. Vert. Lift Bridge Clear. (ft.) MN Scour Code N - STBL - LIM Year 1996																				
		+ CAPACITY RATINGS +																				
		Design Load 4 - H 20 Operating Rating 2 - HS TRUCK 48.4 Inventory Rating 2 - HS TRUCK 29.0 Posting VEH: SEMI: DBL: Rating Date 11/17/2014 Overweight Permit Codes A N - N/A B N - N/A C N - N/A																				
+ STRUCTURE +	+ RDWY DIMENSIONS +																					
Service On 1 - Highway Service Under 5 - Waterway Main Span Type 3 - Steel Main Span Design 01 - Beam Span Main Span Detail Appr. Span Type Appr. Span Design Appr. Span Detail Skew 0 Culvert Type Barrel Length Cantilever ID Number of Spans MAIN: 1 APPR: 0 TOTAL: Main Span Length 22.2 ft. Structure Length 24.4 ft. Deck Width (Out-to-Out) 25.2 ft. Deck Material 8 - Wood or Timber Wear Surf Type 6 - Bituminous Wear Surf Install Year Wear Course/Fill Depth 0.20 ft. Deck Membrane 0 - None Deck Rebars N - Not Applicable (no deck) Deck Rebars Install Year Structure Area (Out-to-Out) 615 sq. ft. Roadway Area (Curb-to-Curb) 581 sq. ft. Sidewalk Width 50A. Lt 0.00 ft. 50B. Rt 0.00 ft. Curb Height Lt 0.50 ft. Rt 0.50 ft. Rail Type Lt 37 Rt 37	If Divided NB-EB SB-WB Roadway Width 24.00 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 24.0 ft. Bridge Roadway Width 24.0 ft. Median Width On Bridge ft.																					
	+ MISC. BRIDGE DATA +																					
	Structure Flared 0 - No flare Parallel Structure N - No parallel structure Field Conn. ID Abutment Foundation (Material/Type) 2 - TIMBER 4 - PILE BENT Pier Foundation (Material/Type) N - N/A N - N/A Historic Status 5 - Not eligible																					
	+ PAINT +																					
	Year Painted Unsound Paint % 10 Painted Area sq. ft. Primer Type Finish Type																					
	+ BRIDGE SIGNS +																					
	Posted Load 0 - Not Required Traffic 0 - Not Required Horizontal 1 - Object Markers Vertical N - Not Applicable																					

MINNESOTA BRIDGE INSPECTION REPORT

12/21/2016

Inspector: CO Bridge

BRIDGE 92628 UT 9230 OVER COOLIDGE CREEK

County: St. Louis	Location: 6.0 MI SW OF JCT CSAH4	Length: 24.4 ft.
City:	Route: 09 - UTWN 9230 Ref. Pt.: 019+00.700	Deck Width: 25.2 ft.
Township: 69081 - T - 55 R - 15	Control Section:	Rdwy. Area/ Pct. Unsnd: 581 sq. ft. / 80%
Section: 35 Township: 055N Range: 15W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / 10%
Span Type: 3 - Steel 2 - Stringer/Multi-beam or Girder	Local Agency Bridge Nbr.: 755	Culvert: N/A
List:		Postings:
NBI Deck: 5 Super: 5 Sub: 4 Chan: 5 Culv: N		
	Open, Posted, Closed: A - Open	
	MN Scour Code: N - STBL - LIM SCOUR	

Appraisal Ratings - Approach: 8 Waterway: 7		Unofficial Structurally Deficient Y
Required Bridge Signs - Load Posting: 0 - Not Required	Traffic: 0 - Not Required	Unofficial Functionally Obsolete N
Horizontal: 1 - Object Markers	Vertical: N - Not Applicable	Unofficial Sufficiency Rating 71.5

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
31	Timber Deck	Underwater	12/12/2016	615 SF	0	540	75	0
		Routine	08/12/2016	615 SF	0	540	75	0
<p>Notes: [2016] Rotting board on SW. Water leaking through deck causing wood preservative to wash off deck boards. Broken board in NW corner replaced. Minor to moderate decay in exposed deck boards. [2015] Broken deck board NW corner of deck. [2014] Top backing board separating from deck on north end. [2013] Outer 1' of deck boards are decaying all the rest still sound.</p>								
510	Wearing Surfaces	Underwater	12/12/2016	581 SF	0	350	79	152
		Routine	08/12/2016	581 SF	0	350	79	152
<p>Notes: [2016] 3' of bituminous missing on north and south ends of deck (full width) and 2 potholes middle of deck. Cracks in bituminous are 1" and smaller in width. [2015] Broken deck board NW corner of deck. 2' of bituminous along entire width of deck removed on north end of deck. 2' to 3' of bituminous removed the entire width of deck on south end of deck. Bituminous cracks spaced as little as 7". [2014] Most of deck covered in gravel. Top backing board separating from deck on north end. [2013] 80% of bituminous wearing surface is unsound. Outer 1' of deck boards are decaying all the rest still sound. Deck is covered in gravel. Small sections peeled off the deck.</p>								
107	Steel Open Girder/Beam	Underwater	12/12/2016	262 LF	0	154	108	0
		Routine	08/12/2016	262 LF	0	154	108	0
<p>Notes: [2016-2015] Flaking rust on all beams at north and south abutments. Beam 5 has 0.25" of section loss near south abutment, south 8' of beam. Paint failure with surface corrosion along bottom flange of all beams [2014] Water within 6" of bottom of beams. [2013] Paint peeling on bottom flange on all beams with surface corrosion. Beams 6, 7 and 8 have flaking rust starting to form on bottom flange. The last 2 feet on north and south ends of beams have flaking rust. Paint peeling, some rust. Minor debris between beams.</p>								
515	Steel Protective Coating	Underwater	12/12/2016	1146 SF	0	0	0	1146
		Routine	08/12/2016	1146 SF	0	0	0	1146
<p>Notes: [2016] Paint failure on bottom and top flange. Some flaking paint and exposed steel on interior beam webs. Fascia beams have paint failing on outside surface.</p>								
216	Timber Abutment	Underwater	12/12/2016	89 LF	0	55	31	3
		Routine	08/12/2016	89 LF	0	55	31	3
<p>Notes: [2016] Migrator added 40 LF to abutment quantity to account for wingwalls. [2015] Splits on ends of north cap and on east end of south cap. Pile 2B has .5" gap between cap and pile. 3 piles total need shims on north abutment. Pile 5 on north has outer shell separating from pile. All wing caps are present. [2013] Bottom of North abutment is pushing in. Backfill is coming through backing wall on East end of North abutment. Wings are in proper position and alignment with moderate weathering SW cap removed.</p>								

BRIDGE 92628 UT 9230 OVER COOLIDGE CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
228	Timber Pile	Underwater	12/12/2016	20 EA	0	5	12	3
		Routine	08/12/2016	20 EA	0	5	12	3
<p>Notes: [2016] Added 8 piles for wing piles. Wing piles have moderate to extensive weathering with splits spaced 1" or less. NW wing piles have crushing around bolt connections. [2015] Pile 2B has .5" gap between cap and pile. 3 piles total need shims on north abutment. Pile 5 on north has outer shell separating from pile. [2014] Water within 6" of bottom of beams. [2013] North piling losing bearing due to North abutment movement. 4 piling have moderate splits and checks with minor decay.</p>								
235	Timber Pier Cap	Underwater	12/12/2016	49 LF	0	17	20	12
		Routine	08/12/2016	49 LF	0	17	20	12
<p>Notes: ***Monitor abutment caps*** [2016-2015] North cap has some rotation causing 3 piles to be losing bearing. Vegetation growth on ends of all caps. [2014] Water within 6" of bottom of beams. [2013] North cap has a through split that is 8 feet in length that starts on east end and goes towards the centerline. Split goes another 8 feet towards centerline but is only on top of cap. Moderate splits on the other 3 cap ends. Gravel is being deposit on both caps. There is separation between deck and backing wall over north cap.</p>								
313	Fixed Bearing	Underwater	12/12/2016	20 EA	0	4	16	0
		Routine	08/12/2016	20 EA	0	4	16	0
<p>Notes: [2016] All bearings except beams 1, 2, 8, and 10, have some section loss from flaking corrosion. Most bearings are buried in gravel. [2015] Most bearings have flaking rust and keeper plates missing. [2014] Water within 6" of bottom of beams. [2013] All bearings have flaking rust. 9 shear plates North and 9 shear plates South broken off. 5 shear plates N, and 4 S. broken off.</p>								
330	Metal Bridge Railing	Underwater	12/12/2016	54 LF	44	10	0	0
		Routine	08/12/2016	54 LF	44	10	0	0
<p>Notes: [2016] Paint is failing on rail posts with surface corrosion on exposed steel. [2015-2013] Rail is in good condition Flex Beam w/ steel posts.</p>								
	515 - Steel Protective Coating	Underwater	12/12/2016	223 SF	0	108	0	115
		Routine	08/12/2016	223 SF	0	108	0	115
<p>Notes: [2016] Paint is failing on rail posts with surface corrosion on exposed steel. Galvanizing on w-beam chalking.</p>								
800	Critical Deficiencies or Safety Hazards	Underwater	12/12/2016	1 EA	1	0	0	0
		Routine	08/12/2016	1 EA	1	0	0	0
<p>Notes: [2016-2013] No critical deficiencies or safety hazards found during this inspection.</p>								
823	Gravel Approach Roadway	Underwater	12/12/2016	2 EA	0	2	0	0
		Routine	08/12/2016	2 EA	0	2	0	0
<p>Notes: [2016] Holes had been filled in on north approach. North approach slightly lower than bridge deck. Grader has carried gravel from south approach onto deck. [2015-2014] Pothole on east end on of north approach next to deck.</p>								
881	Steel Section Loss	Underwater	12/12/2016	1 EA	0	0	1	0
		Routine	08/12/2016	1 EA	0	0	1	0
<p>Notes: [2016-2015] Section loss on beam 5 south abutment, about .25" of bottom flange corroded away. [2014-2013] Flaking rust starting to form on beams and beam ends, but section loss is minimal.</p>								
884	Substructure Settlement & Movement	Underwater	12/12/2016	1 EA	1	0	0	0
		Routine	08/12/2016	1 EA	1	0	0	0
<p>Notes: [2016-2015] Movement has not advanced. [2014] Water within 6" of bottom of beams. [2013] Bottom of North abutment pushing in causing piling to lose bearing. Piles in 80% contact with caps.</p>								

BRIDGE 92628 UT 9230 OVER COOLIDGE CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
885	Scour	Underwater	12/12/2016	1 EA	1	0	0	0
891	Other Bridge Signing	Underwater	12/12/2016	1 EA	1	0	0	0
		Routine	08/12/2016	1 EA	1	0	0	0
	Notes: [2016-2013] All signs present with no deterioration. 4 Delineators (Type III Object Markers).							
892	Slopes & Slope Protection	Underwater	12/12/2016	1 EA	1	0	0	0
		Routine	08/12/2016	1 EA	1	0	0	0
	Notes: [2016-2013] No notable erosion present. Slopes protected by vegetation.							
894	Deck & Approach Drainage	Underwater	12/12/2016	1 EA	0	1	0	0
		Routine	08/12/2016	1 EA	0	1	0	0
	Notes: [2016-2015] Gravel along edges of deck restricting flow to scuppers. [2014-2013] Gravel covering bituminous overlay causing ponding on deck.							
895	Sidewalk, Curb, & Median	Underwater	12/12/2016	1 EA	0	1	0	0
		Routine	08/12/2016	1 EA	0	1	0	0
	Notes: [2016-2015] Moderate decay. [2014-2013] Plow damage on east curb. Cracking and splitting.							
900	Protected Species	Underwater	12/12/2016	1 EA	1	0	0	0
		Routine	08/12/2016	1 EA	1	0	0	0
	Notes: [2016] No evidence of protected species present.							

General Notes: SLC District 6
 Inspected by: [2016] CG, ES : [2015] CG, TM : [2014] CG, BH : [2013] CG, JDO.
 Inspected by: [7-11-2012] Gary Vangen and Ron Dokken of Erickson Engineering.
 No Guardrail.

58. Deck NBI: [2016] Rotting board on SW. 3' of bituminous missing on north and south ends of deck and 2 potholes middle of deck. Cracks in bituminous are 1" and smaller in width. Minor to moderate decay in exposed deck boards. Water leaking through deck causing wood preservative to wash off deck boards. NW deck board has been replaced
 [2015] Broken deck board NW corner of deck. 2' of bituminous along entire width of deck removed on north end of deck. 2' to 3' of bituminous removed the entire width of deck on south end of deck. Bituminous cracks spaced as little as 7".
 [2014] Most of deck covered in gravel. Top backing board separating from deck on north end.
 [2013] 80% of bituminous wearing surface is unsound. Outer 1' of deck boards are decaying all the rest still sound.

36A. Brdg Railings NBI: Steel plate beam guardrail with steel posts and timber curb. Substandard for all speeds.

36B. Transitions NBI: Bridge wider than roadway and ADT <400.

36C. Appr Guardrail NBI: Bridge wider than roadway and ADT <400.

36D. Appr Guardrail Terminal NBI: Bridge wider than roadway and ADT <400.

59. Superstructure NBI: [2016-2015] Flaking rust on all beams at north and south abutment. Beam 5 has 0.25" of section loss near south abutment, south 8' of beam. Paint failure with surface corrosion along bottom flange of all beams.
 [2014] Water within 6" of bottom of beams.
 [2013] Paint peeling on bottom flange on all beams with surface corrosion. Beams 6, 7 and 8 have flaking rust starting to form on bottom flange. The last 2 feet on north and south ends of beams have flaking rust.

60. Substructure NBI: [2016-2015] Splits on ends of north cap and on east end of south cap. Pile 2 has .5" gap between cap and pile. 3 piles total need shims on north abutment. Pile 5 on north has outer shell separating from pile.
 [2014] Water within 6" of bottom of beams.
 [2013] Bottom of North abutment is pushing in causing piling to lose bearing. North cap has through spit on the east end. 4 piling have moderate splits and checks with minor decay.

61. Channel NBI: [2016-2015] Channel has lateral movement to the north, but not affecting road or bridge. Debris in channel but not restricting flow.

BRIDGE 92628 UT 9230 OVER COOLIDGE CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
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62. Culvert NBI:

71. Waterway Adeq NBI: [2016-2015] Slight chance of overtopping bridge. Sticks caught between beams indicating water has been up to beams.

72. Appr Roadway [2016-2013] No speed reduction required and no sight distance issues.
Alignment NBI:

Inventory Notes: [2015-2014] Bridge is located on UT 9230.

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - Upstream Fascia, Looking Northwest



Photo 2 - Downstream Fascia, Looking Southeast

Pictures



Photo 3 - North Abutment, Looking Northeast

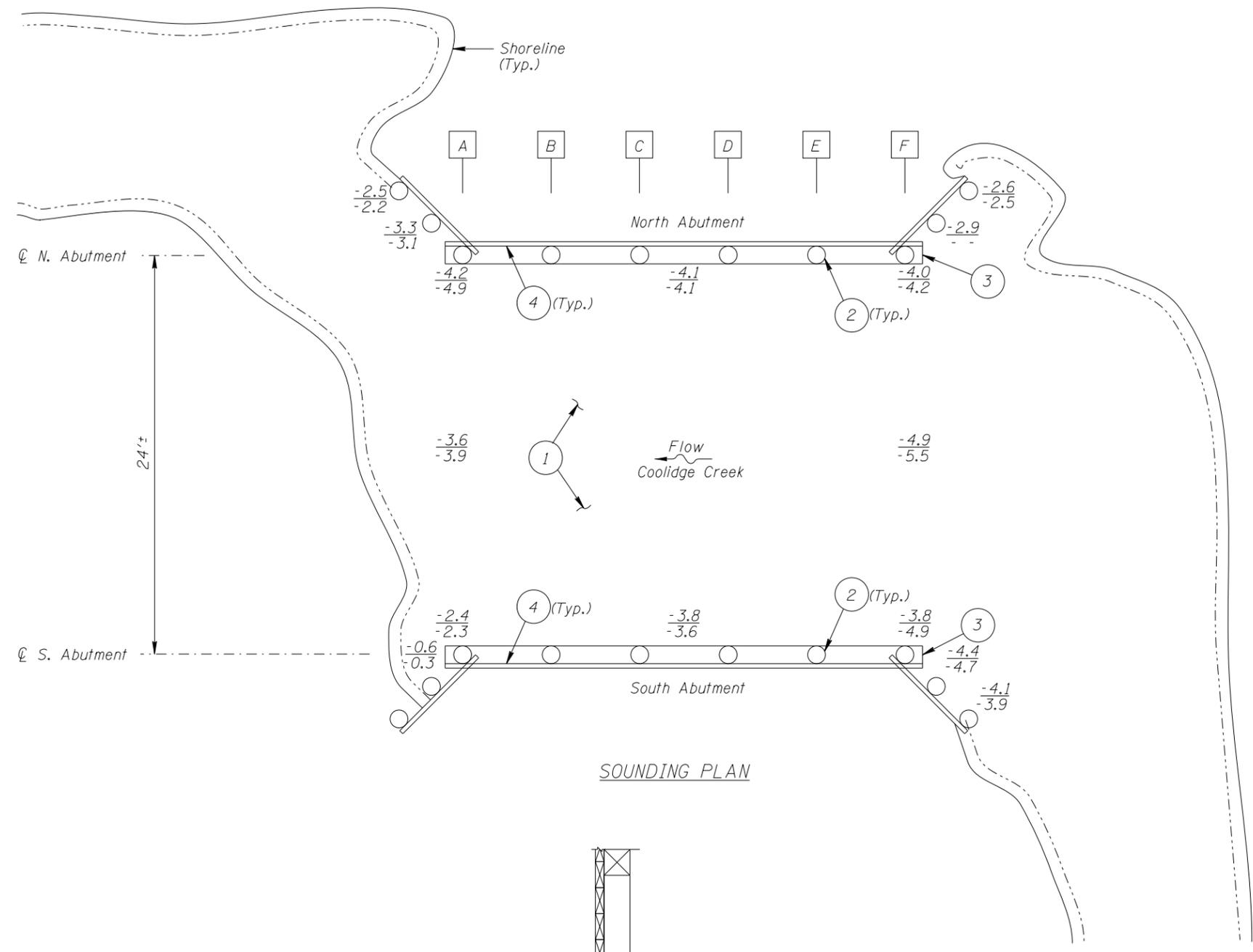


Photo 4 - South Abutment, Looking Southeast

Pictures



Photo 5 - Split Through North Abutment Pile Cap Upstream End, Looking Down



SOUNDING PLAN

TYPICAL END VIEW OF ABUTMENTS

GENERAL NOTES:

1. The North and South Abutments were inspected during the underwater inspection.
2. At the time of inspection on June 23, 2016, the waterline was located approximately 0.6 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 99.4.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

INSPECTION NOTES:

- 1 The channel bottom material typically consisted rocks, gravel, and silt allowing 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.

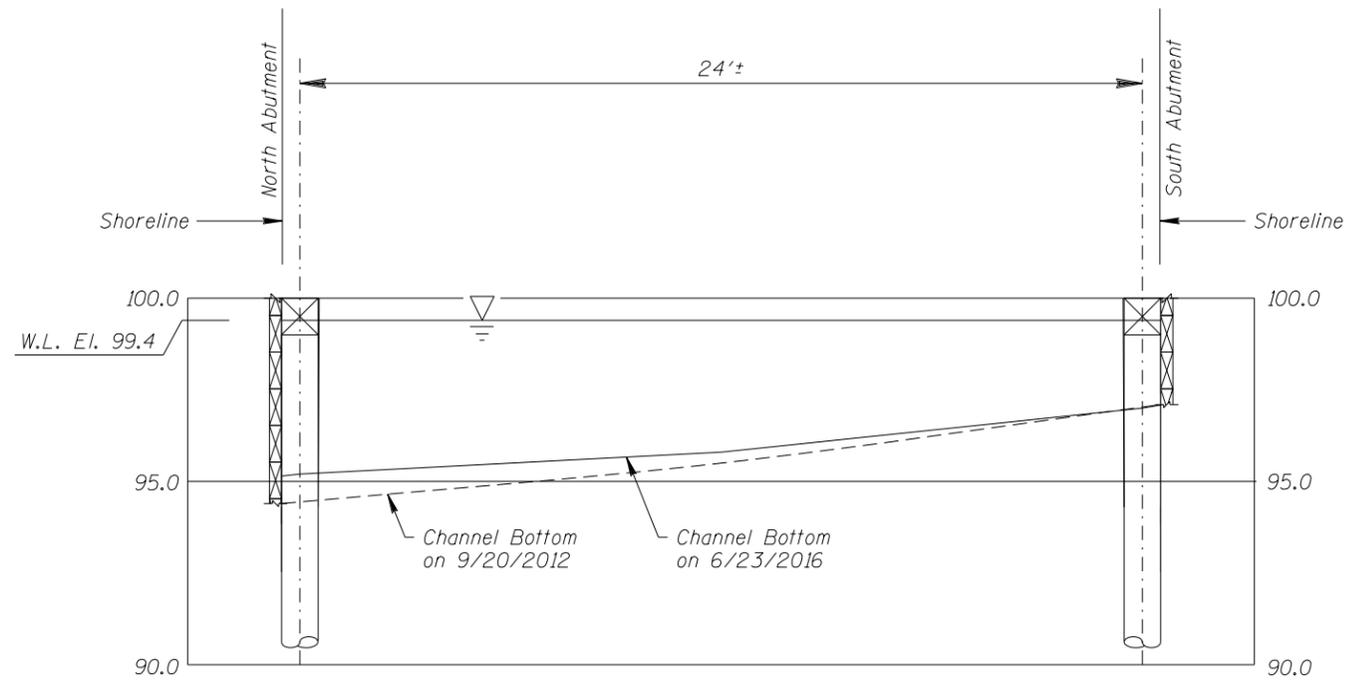
Legend

- 4.2 Sounding Depth from Waterline (6/23/2016)
- 4.9 Sounding Depth from Waterline (9/20/2012)
- A Pile Identification Designation
- 12-inch Diameter Timber Pile
- 1 Inspection Note Number

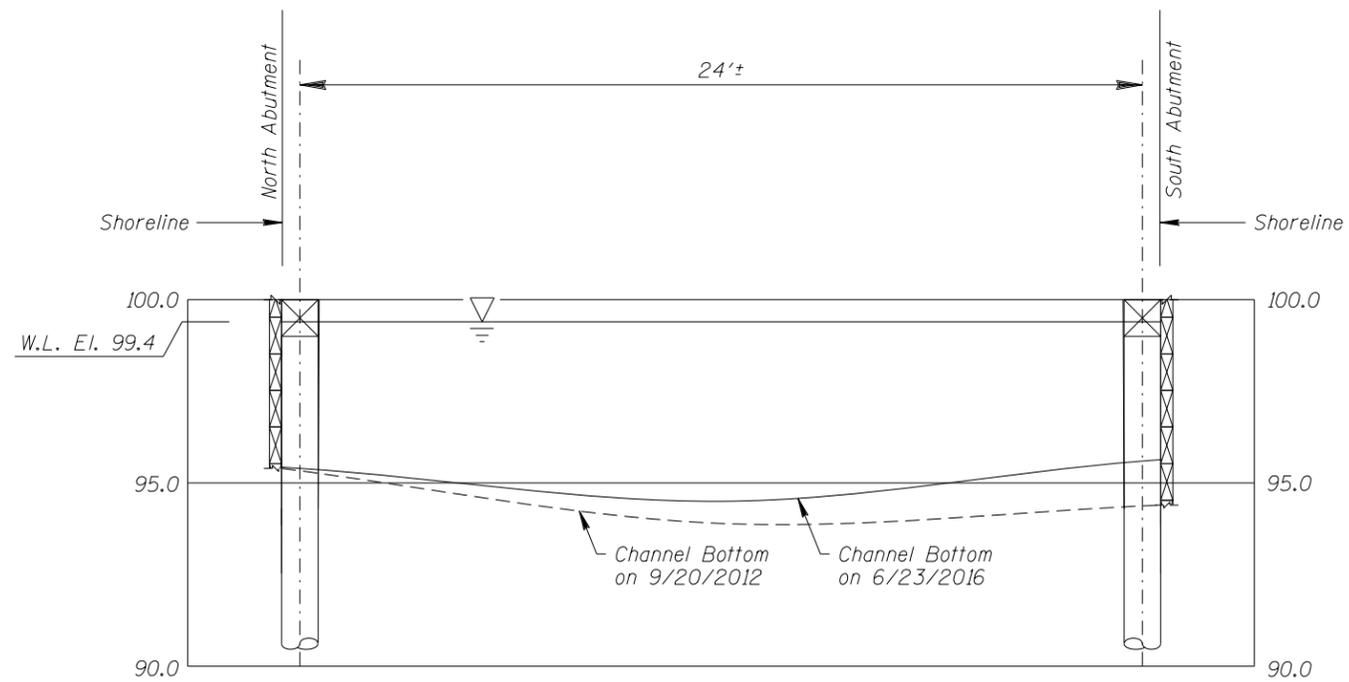
Note:

All soundings are based on 2016 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 92628 UT 9230 OVER COOLIDGE CREEK DISTRICT I, ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
DRAWN BY: PRH	COLLINS ENGINEERS	DATE: JUNE 23, 2016
CHECKED BY: LJ	<small>133 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	SCALE: NTS
CODE: 968792628		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 UT 9320 OVER COOLIDGE CREEK DISTRICT I, ST. LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
DRAWN BY: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	DATE: JUNE 23, 2016
CHECKED BY: LJ		SCALE: 1"=5'-0"
CODE: 968792628		FIGURE NO.: 2