

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 19563 CANADA AVE over CANNON RIVER

DISTRICT: Metro

COUNTY: Dakota

CITY/TOWNSHIP: WATERFORD

STATE: Minnesota

Date of Inspection: 06/07/2016

Equipment Used:

Owner: Town or Township Highway Agency

Inspected By: Lovelace, Barritt

Report Written By: Barritt Lovelace

Report Reviewed By:

Final Report Date:



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UNDERWATER INSPECTION

REPORT SUMMARY

The substructure units inspected at Bridge No. 19563, Piers 1 and 2, were found to be in very good condition with no defects of structural significance. The concrete of all substructure units was smooth and sound. A scour pocket was observed at the upstream nose of Pier 2, otherwise, the channel bottom appeared to be stable and well established.

INSPECTION FINDINGS

- (A) The concrete surfaces above and below water were typically smooth and sound.
- (B) The channel bottom material along the channel side of both piers consisted of sandy silt and scattered cobbles allowing up to 4 inches of probe rod penetration.
- (C) The channel bottom material along the south side of Pier 1 and the north face of Pier 2 consisted of soft organic silt allowing up to 1 foot of probe rod penetration.
- (D) A 6 foot diameter 1.5 foot deep scour pocket was observed at the upstream nose of Pier 2.

RECOMMENDATIONS

Reinspect the submerged substructure units 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 #: 19563
Feature Intersected: CANNON RIVER
Facility Carried: CANADA AVE
District: Metro
County: 019 - Dakota

Bridge Description:

The superstructure consists of a reinforced concrete deck over three concrete multi-girder spans supported by two reinforced concrete abutments and two reinforced concrete piers. The substructure units are designated as the South Abutment, Piers 1 and 2, and the North Abutment.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E.
Inspection Diver: Garrett Owens, P.E.
Date of Underwater Inspection: 06/07/2016
Weather Conditions: Sunny, 65° F
Underwater Visibility (feet): 0.5
Waterway Velocity (ft/sec): 2.0

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 1 and 2

General Shape:

Each pier consists of a rectangular reinforced concrete shaft with rounded noses encasing nine driven steel H-piles.

Maximum Water Depth at Substructure(s) Inspected (feet): 5.7

4. WATERLINE DATUM

Water Level Reference: The top of pier cap at downstream end of Pier 1.
Waterline Elevation (feet): 880.2
Description: The waterline was approximately 13.9 feet below reference.

5. NBIS CODING INFORMATION

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

Item 60: Substructure: Code: 8
Item 61: Channel and Channel Protection: Code: 6
Item 62: Culvert: Code:
Item 92B: Underwater Inspection: Code: Y 48 06/2016

Item 113: Scour Critical Bridge:

Code: L

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
210	Reinforced Concrete Pier Wall	74	LF	74			
885	Scour	1	EA		1		

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 19563 (Canada Avenue over the Cannon River) was completed on June 7, 2016. The underwater inspection was conducted from shore. The inspection was conducted by a team consisting of a PE-Diver with a valid MnDOT Team Leader certification, a backup diver and a dive tender. The inspection utilized commercial dive equipment and techniques (SSA and/or SCUBA) in accordance with OSHA regulations. 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 Piers 1 and 2. According to the bridge inventory or design drawings, Piers 1 and 2 were founded on nine driven steel H-piles. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The routine underwater inspection frequency is recommended to remain at a maximum of 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: 19563

CANADA AVE over CANNON RIVER

Date: 09/02/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. Crew District 05 Maint. Area County 019 - Dakota City Township 19014 - WATERFORD Desc. Loc. 0.1 MI SE OF JCT CSAH 47 Sect., Twp., Range 20 - 112N - 19W Latitude 44 ° 29 ' 13.16 '' Longitude 93 ° 7 ' 44.09 '' Custodian 03 - Town or Township Highway Owner 03 - Town or Township Highway BMU Agreement Year Built 2010 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 3 - COUNTY Date Opened to Traffic 06/03/2010 On - Off System 0 - OFF Legislative District 36B Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 08 - TWNS Number 166 Roadway Name or Description CANADA AVE Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 001+00.191 Detour Length 3.0 mi. Lanes ON 2 UNDER 0 ADT 390 YEAR 2009 HCA DT ADTT % Functional Class 09 - Rural - Local	Userkey 59 Structurally Deficient N Functionally Obsolete N Sufficiency Rating 99.9 Routine Inspection Date 12/23/2015 Routine Inspection Frequency 12 Inspector Name Lovelace, Barritt Status A - Open																				
		+ NBI CONDITION RATINGS +																				
		Deck 8 Unsound Deck % Superstructure 8 Substructure 8 Channel 6 Culvert N																				
		+ NBI APPRAISAL RATINGS +																				
		Structure Evaluation 8 Deck Geometry 7 Underclearances N Waterway Adequacy 7 Approach Alignment 8																				
		+ SAFETY FEATURES +																				
		Bridge Railing 1 - MEETS STANDARDS GR Transition 1 - MEETS STANDARDS Appr. Guardrail 1 - MEETS STANDARDS GR Termini 1 - MEETS STANDARDS																				
		+ 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: 15%; text-align: center;">Freq</th> <th style="width: 15%; 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 style="text-align: center;">Y</td> <td style="text-align: center;">60</td> <td style="text-align: center;">06/07/2016</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	Y	60	06/07/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater	Y	60	06/07/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
		Drainage Area (sq. mi.) 944.0 Waterway Opening (sf.) 3064 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 L - STBL - Year 2007																				
		+ CAPACITY RATINGS +																				
		Design Load A - HL 93 Operating Rating 2 - HS TRUCK 46.2 Inventory Rating 2 - HS TRUCK 31.0 Posting VEH: SEMI: DBL: Rating Date 04/12/2012 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 5 - Prestress or Precast 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: 3 APPR: 0 TOTAL: Main Span Length 102.2 ft. Structure Length 292.9 ft. Deck Width (Out-to-Out) 35.3 ft. Deck Material 1 - Concrete Cast-in-Place Wear Surf Type 1 - Monolithic Concrete Wear Surf Install Year 2010 Wear Course/Fill Depth 0.00 ft. Deck Membrane 0 - None Deck Rebars 1 - Epoxy Coated Reinforcing Deck Rebars Install Year 2010 Structure Area (Out-to-Out) 10350 sq. ft. Roadway Area (Curb-to-Curb) 9376 sq. ft. Sidewalk Width 50A. Lt 0.00 ft. 50B. Rt 0.00 ft. Curb Height Lt 0.00 ft. Rt 0.00 ft. Rail Type Lt 51 Rt 51	If Divided NB-EB SB-WB Roadway Width 32.0 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. 32.0 ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 32.0 ft. Bridge Roadway Width 32.0 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) 8 - INTEGRAL Pier Foundation (Material/Type) 4 - PILE BENT Historic Status 5 - Not eligible																					
	+ PAINT +																					
	Year Painted Unsound Paint % Painted Area sq. ft. Primer Type Finish Type																					
	+ BRIDGE SIGNS +																					
	Posted Load 0 - Not Required Traffic 0 - Not Required Horizontal 0 - Not Required Vertical N - Not Applicable																					

MINNESOTA BRIDGE INSPECTION REPORT

10/19/2016

Inspector: CO Bridge

BRIDGE 19563 CANADA AVE OVER CANNON RIVER

County: Dakota	Location: 0.1 MI SE OF JCT CSAH 47	Length: 292.9 ft.
City:	Route: 08 - TWNS 166 Ref. Pt.: 001+00.191	Deck Width: 35.3 ft.
Township: 19014 - WATERFORD	Control Section:	Rdwy. Area/ Pct. Unsnd: 9376 sq. ft. / %
Section: 20 Township: 112N Range: 19W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 5 - Prestressed Concrete 2 - List: Stringer/Multi-beam or Girder	Local Agency Bridge Nbr.:	Culvert: N/A
NBI Deck: 8 Super: 8 Sub: 8 Chan: 6 Culv: N		Postings:
	Open, Posted, Closed: A - Open	
	MN Scour Code: L - STBL - LOW RISK	

Appraisal Ratings - Approach: 8 Waterway: 7		Unofficial Structurally Deficient N
Required Bridge Signs - Load Posting: 0 - Not Required	Traffic: 0 - Not Required	Unofficial Functionally Obsolete N
Horizontal: 0 - Not Required	Vertical: N - Not Applicable	Unofficial Sufficiency Rating 99.9

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
12	Reinforced Concrete Deck	Underwater	09/02/2016	10350 SF	10350	0	0	0
		Migrated Values		10350 SF	10350	0	0	0
	510 - Wearing Surfaces	Underwater	09/02/2016	9376 SF	9376	0	0	0
		Migrated Values		9376 SF	9376	0	0	0
Notes: Top of Concrete Deck with Epoxy Reinforcement Notes: [2015] Observed deck, no new noteworthy deficiencies.								
109	Prestressed Concrete Open Girder/Beam	Underwater	09/02/2016	1563 LF	1563	0	0	0
		Migrated Values		1563 LF	1563	0	0	0
210	Reinforced Concrete Pier Wall	Underwater	09/02/2016	74 LF	74	0	0	0
		Migrated Values		74 LF	74	0	0	0
Notes: [2012] Pier 1 north side has a void under the bottom of the pier wall, the streambed is lower than the actual wall. Pier 2 east side has a area of concrete that is very soft and spalls easily. [2013] Pier 2 west end has 1 SF of 1/2" deep spall. Pier 2 has a 3' long light crack at east side spall area. [2015] Pier 1 has 1SF of 1/2" spall on the east end.								
215	Reinforced Concrete Abutment	Underwater	09/02/2016	110 LF	110	0	0	0
		Migrated Values		110 LF	110	0	0	0
Notes: [2016] Migrator added 40 LF to abutment quantity to account for wingwalls (CS1:40 CS2:0 CS3:0 CS4:0). [2013] North abutment has 3 LF of light cracking. [2015] NW and SW corners have a 1.0' light diagonal crack where beam meets backwall.								
234	Reinforced Concrete Pier Cap	Underwater	09/02/2016	74 LF	74	0	0	0
		Migrated Values		74 LF	74	0	0	0
301	Pourable Joint Seal	Underwater	09/02/2016	64 LF	64	0	0	0
		Migrated Values		64 LF	64	0	0	0
310	Elastomeric Bearing	Underwater	09/02/2016	10 EA	10	0	0	0
		Migrated Values		10 EA	10	0	0	0
313	Fixed Bearing	Underwater	09/02/2016	22 EA	22	0	0	0
		Migrated Values		22 EA	22	0	0	0

BRIDGE 19563 CANADA AVE OVER CANNON RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
330	Metal Bridge Railing	Underwater	09/02/2016	621 LF	611	10	0	0
		Migrated Values		621 LF	611	10	0	0
Notes: [2012] 1 - 10' section of the east metal railing was damaged during a summer storm, a large cottonwood tree was blown over and fell on the railing. [2015] East rail second post from south end has a 3.0' horizontal crack under the post.								
515 -	Steel Protective Coating	Underwater	09/02/2016	999 SF	999	0	0	0
		Migrated Values		999 SF	999	0	0	0
Notes: [2016] Migrator assumed CS1 and a quantity of 999 SF.								
331	Reinforced Concrete Bridge Railing	Underwater	09/02/2016	633 LF	631	0	2	0
		Migrated Values		633 LF	631	0	2	0
Notes: [2012] A section of the east concrete bridge railing was damaged during a summer storm, a large cottonwood tree was blown over and fell on the railing. [2015] 36"X8"X3" deep area of concrete missing on outside of railing at the location of the damaged railing.								
800	Critical Deficiencies or Safety Hazards	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: NO CRITICAL FINDINGS OBSERVED DURING THE LAST INSPECTION.								
810	Concrete Decks - Cracking & Sealing	Underwater	09/02/2016	0 LF	0	0	0	0
		Migrated Values		0 LF	0	0	0	0
823	Gravel Approach Roadway	Underwater	09/02/2016	2 EA	2	0	0	0
		Migrated Values		2 EA	2	0	0	0
855	Secondary Members (Superstructure)	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: [2011] Diaphragms functioning as intended.								
885	Scour	Underwater	09/02/2016	1 EA	0	1	0	0
Notes: [2016] Underwater Inspection - A 6 foot diameter 1.5 foot deep scour pocket was observed at the upstream nose of Pier 2.								
891	Other Bridge Signing	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
892	Slopes & Slope Protection	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: [2012] 10'x4'x2' deep area of erosion at the NW corner of the bridge. [2013] 12'x5'x3' area of erosion on northwest corner beginning to impact shoulder. [2015] Erosion still present and needs to be repaired.								
893	Guardrail	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
894	Deck & Approach Drainage	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
900	Protected Species	Underwater	09/02/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: Use this element to track the presence of protected species living on this structure.								

BRIDGE 19563 CANADA AVE OVER CANNON RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
	General Notes:	Bridge 19563 (Sec.20,T112N,R19W) [2015] 9/28/2015, bridge inspected with a snooper.						
	58. Deck NBI:							
	36A. Brdg Railings NBI:							
	36B. Transitions NBI:							
	36C. Appr Guardrail NBI:							
	36D. Appr Guardrail Terminal NBI:							
	59. Superstructure NBI:							
	60. Substructure NBI:							
	61. Channel NBI:	[2016] Underwater Inspection - The channel bottom material along the south side of Pier 1 and the north face of Pier 2 consisted of soft organic silt allowing up to 1 foot of probe rod penetration. The channel bottom material along the channel side of both piers consisted of sandy silt and scattered cobbles allowing up to 4 inches of probe rod penetration.						
	62. Culvert NBI:							
	71. Waterway Adeq NBI:							
	72. Appr Roadway Alignment NBI:							
	Inventory Notes:	Bridge 19563 replaces L3275. New bridge entered in SIMS in January 2013 by MnDOT Bridge Office. Old bridge is CLOSED but remains inplace.						

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - South Elevation, Looking North



Photo 2 - Upstream Channel, Looking South

Pictures



Photo 3 - Downstream Channel, Looking North



Photo 4 - North Elevation, Looking South

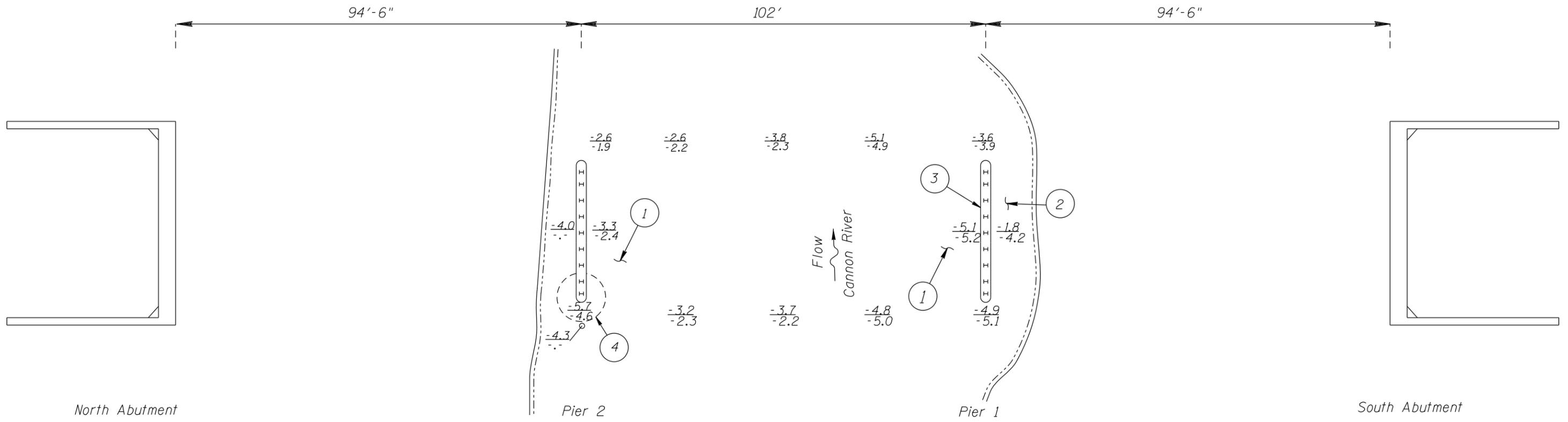
Pictures



Photo 5 - Typical View of Pier 1, Looking Northwest



Photo 6 - Pier 2, Looking Northwest



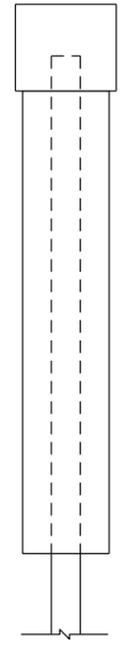
SOUNDING PLAN

INSPECTION NOTES:

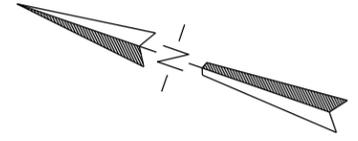
- ① The channel bottom material on the channel side of each pier consisted of sandy silt with randomly scattered cobbles allowing up to 4 inches of probe rod penetration.
- ② The channel bottom material along the south face of Pier 1 and the north face of Pier 2 consisted of soft organic silt allowing up to 1 foot of probe rod penetration.
- ③ The concrete surfaces of both piers were smooth and sound.
- ④ A scour depression, measuring approximately 6 feet diameter and 1.5 feet deep, was observed at the upstream nose of Pier 2.

GENERAL NOTES:

- 1. Piers 1 and 2 were inspected underwater.
- 2. At the time of inspection on June 7, 2016, the waterline was located approximately 13.9 feet below the top of the pier cap on the downstream end of Pier 1. This corresponds with a waterline elevation of 880.2 feet based on bridge plans dated 3/24/2009.
- 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.

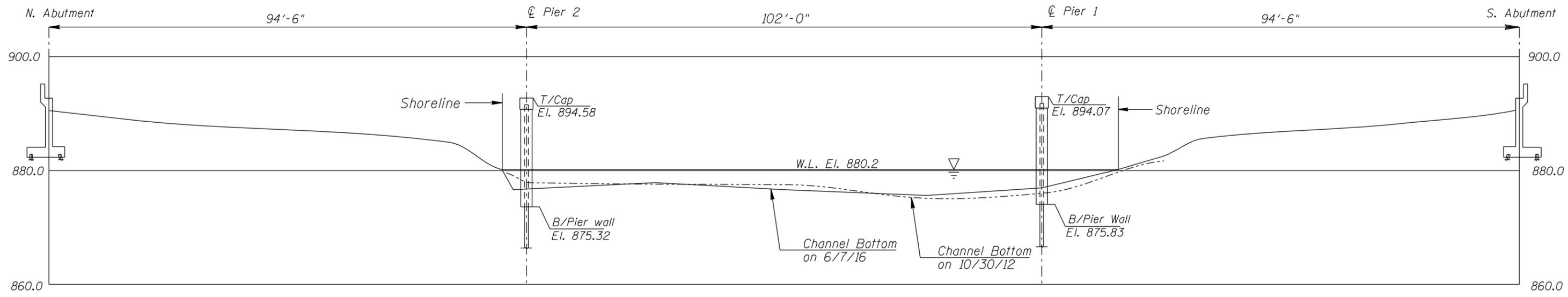


TYPICAL END VIEW OF PIERS

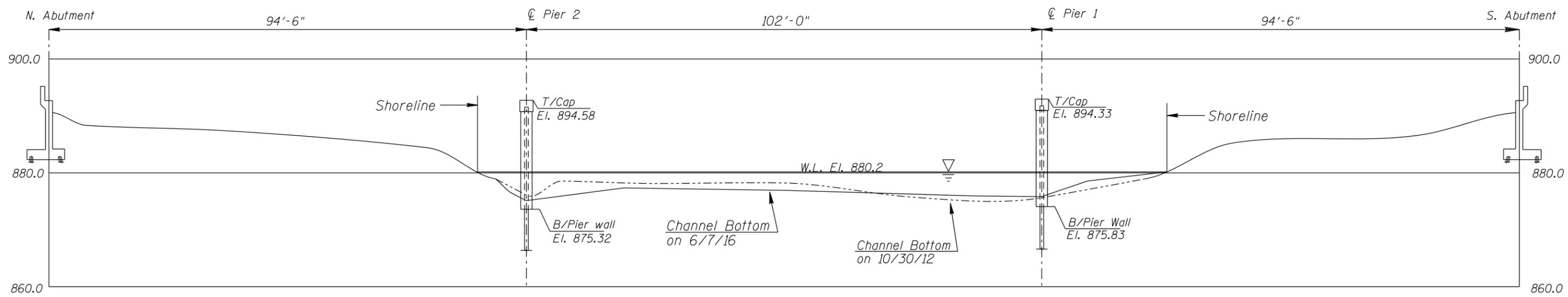


Legend
 -4.8 Sounding Depth from Waterline (6/7/16)
 -5.0 Sounding Depth from Waterline (10/30/12)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 19563 CANADA AVENUE OVER THE CANNON RIVER DAKOTA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: LBH	COLLINS ENGINEERS	Date: June 2016
Checked By: BRL		Scale: NTS
Project: 63-9687		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. 19563 CANADA AVENUE OVER THE CANNON RIVER DAKOTA COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: LBH	COLLINS ENGINEERS <small>1599 Selby Avenue Suite 206 St. Paul, MN 55104 (651) 646-8502 www.collinsengr.com</small>	Date: June 2016
Checked By: BRL		Scale: 1"=20'
Project: 63-9687		Figure No.: 2