

# 2016 UNDERWATER BRIDGE INSPECTION REPORT



## BRIDGE # 76518 CSAH 22 over POMME DE TERRE RIVER

DISTRICT: District 4      COUNTY: Swift      CITY/TOWNSHIP: FAIRFIELD  
STATE: Minnesota

Date of Inspection: 06/18/2016

Equipment Used:

Owner: County Highway Agency

Inspected By: Forsyth, Roy

Report Written By: Roy Forsyth

Report Reviewed By:

Final Report Date:



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## UNDERWATER INSPECTION

### REPORT SUMMARY

The substructure units inspected at Bridge No. 76518, Pier 1 and 2, were found to be generally in good condition below water with no defects of structural significance observed. All of the steel piles exhibited 100 percent loss of paint coating with light surface corrosion and 1/8 inch maximum pitting from 1 foot above the water line to the channel bottom. There was a scour hole encroaching on the northwest wing wall. The channel bottom material typically consisted of sand with 6 inches of probe rod penetration.

### INSPECTION FINDINGS

(A) All of the steel piles exhibited 100 percent loss of paint coating with light surface corrosion and 1/8 inch maximum pitting from 1 foot above the water line to the channel bottom.

(B) There was a scour hole encroaching on the northwest wing wall.

(C) The channel bottom material typically consisted of sand with 6 inches of probe rod penetration.

### RECOMMENDATIONS

(A) 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 #: 76518  
Feature Intersected: POMME DE TERRE RIVER  
Facility Carried: CSAH 22  
District: District 4  
County: 076 - Swift

#### Bridge Description:

The bridge superstructure was 3 main spans of precast concrete girders supporting a cast in place concrete deck. The substructure consisted of 2 reinforced concrete abutments and 2 reinforced concrete pier caps supported by steel CIP concrete piles. The piers were identified as the East and West Bents from east to west respectively.

### 2. INSPECTION DATA

Professional Engineer/Team Leader: Roy Forsyth  
Inspection Diver: Marc Stern  
Date of Underwater Inspection: 06/18/2016  
Weather Conditions: Sunny, 75°F  
Underwater Visibility (feet): 0 ft.  
Waterway Velocity (ft/sec): 0.5 ft/s

### 3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: West and East Bents

#### General Shape:

Each pier consists of a reinforced concrete pier cap founded on steel CIP concrete piles.

Maximum Water Depth at Substructure(s) Inspected (feet): 3.8

### 4. WATERLINE DATUM

Water Level Reference: Top of pier cap at the upstream end of West Bent  
Waterline Elevation (feet): 1031.8  
Description: The waterline was approximately 9.3 feet below the reference.

### 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: 7  
Item 62: Culvert: Code:  
Item 92B: Underwater Inspection: Code: Y 48 06/2016

Item 113: Scour Critical Bridge:

Code: I

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
225	Steel or CIP Piling	10	EA		10		
885	Scour	1	EA		1		

## UNDERWATER INSPECTION

### INSPECTION PROCEDURES

The routine underwater inspection of Bridge 76518 (CSAH 22 over the Pomme De Terre River) was completed on June, 18, 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. Due to waterway conditions at the time of inspection, the inspection could be accomplished by wading 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 2 bents consisting of 5 CIP piles each. According to the bridge inventory or design drawings, East and West Bents were founded on steel CIP concrete pilings. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for bottom of 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: 76518

CSAH 22 over POMME DE TERRE RIVER

Date: 08/12/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +			
Agency Br. No. Crew	Bridge Match ID (TIS) 0	Userkey 116			
District 04 Maint. Area	Roadway O/U Key Route On Structure	Structurally Deficient N			
County 076 - Swift	Route Sys 04 - CSAH Number 22	Functionally Obsolete N			
City	Roadway Name or Description	Sufficiency Rating 98.0			
Township 76008 - FAIRFIELD	CSAH 22	Routine Inspection Date 10/21/2015			
Desc. Loc. 0.4 MI E OF JCT CSAH 7	Level of Service 1 - MAINLINE	Routine Inspection Frequency 24			
Sect., Twp., Range 9 - 122N - 42W	Roadway Type 2 - 2-way traffic	Inspector Name Forsyth, Roy			
Latitude 45° 23' 2.42"	Control Section (TH Only)	Status A - Open			
Longitude 95° 56' 43.98"	Reference Point 008+00.430	+ NBI CONDITION RATINGS +			
Custodian 02 - County Highway Agency	Detour Length 3.0 mi.	Deck 8	Unsound Deck %		
Owner 02 - County Highway Agency	Lanes ON 2 UNDER 0	Superstructure 8			
BMU Agreement	ADT 215 YEAR 2008	Substructure 7			
Year Built 1992	HCA DT	Channel 7			
MN Year Reconstructed	Functional Class 07 - Rural - Major Collector	Culvert N			
FHWA Year Reconstructed	+ RDWY DIMENSIONS +			+ NBI APPRAISAL RATINGS +	
MN Temporary Status	If Divided NB-EB SB-WB	Structure Evaluation 7			
Bridge Plan Location 3 - COUNTY	Roadway Width 36.00 ft. ft.	Deck Geometry 8			
Date Opened to Traffic	Vertical Clearance ft. ft.	Underclearances N			
On - Off System 1 - ON	Max. Vert. Clear. ft. ft.	Waterway Adequacy 7			
Legislative District 20A	Horizontal Clear. ft. ft.	Approach Alignment 8			
Potential ABC 2 - N/A	Lateral Clearance ft. ft.	+ SAFETY FEATURES +			
+ STRUCTURE +	Appr. Surface Width 34.0 ft.	Bridge Railing 1 - MEETS STANDARDS			
Service On 1 - Highway	Bridge Roadway Width 36.0 ft.	GR Transition 0 - SUBSTANDARD			
Service Under 5 - Waterway	Median Width On Bridge ft.	Appr. Guardrail 0 - SUBSTANDARD			
Main Span Type 5 - Prestress or Precast	+ MISC. BRIDGE DATA +			+ IN DEPTH INSP. +	
Main Span Design 01 - Beam Span	Structure Flared 0 - No flare	Field Conn. ID	Y/N	Freq Date	
Main Span Detail	Parallel Structure N - No parallel structure	Abutment Foundation (Material/Type) 3 - FTG PILE	Frac. Critical N		
Appr. Span Type	Pier Foundation (Material/Type) 8 - CIP	Pier Foundation (Material/Type) 4 - PILE BENT	Underwater Y	06/18/2016	
Appr. Span Design	Historic Status 5 - Not eligible		Pinned Asbly. N		
Appr. Span Detail	+ PAINT +			Spec. Feat.	
Skew 15 RIGHT	Year Painted	Unsoun d Paint %			
Culvert Type	Painted Area sq. ft.	Primer Type			
Barrel Length	Finish Type				
Cantilever ID	+ BRIDGE SIGNS +			+ WATERWAY +	
	Posted Load 0 - Not Required	Traffic 0 - Not Required	Drainage Area (sq. mi.) 836.0		
	Horizontal 0 - Not Required	Horizontal N - Not Applicable	Waterway Opening (sf.) 1010		
	Vertical N - Not Applicable		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 1 - LOW RISK Year 1998		
			+ CAPACITY RATINGS +		
			Design Load 9 - HS 25 (OR GREATER)		
			Operating Rating 2 - HS TRUCK 42.0		
			Inventory Rating 2 - HS TRUCK 25.0		
			Posting VEH: SEMI: DBL:		
			Rating Date 12/10/2015		
			Overweight Permit Codes		
			A 1 - No Restriction	B 1 - No Restriction C 1 - No Restriction	

# MINNESOTA BRIDGE INSPECTION REPORT

09/12/2016

Inspector: CO Bridge

## BRIDGE 76518 CSAH 22 OVER POMME DE TERRE RIVER

County: Swift	Location: 0.4 MI E OF JCT CSAH 7	Length: 120.7 ft.
City:	Route: 04 - CSAH 22 Ref. Pt.: 008+00.430	Deck Width: 39.3 ft.
Township: 76008 - FAIRFIELD	Control Section:	Rdwy. Area/ Pct. Unsnd: 4349 sq. ft. / %
Section: 9 Township: 122N Range: 42W 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: 7 Chan: 7 Culv: N		Postings:
	Open, Posted, Closed: A - Open	
	MN Scour Code: I - 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 98.0

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	06/18/2016	4744 SF	4744	0	0	0
		Migrated Values		4744 SF	4744	0	0	0
Notes: Top of Concrete Deck with Epoxy Reinforcement Notes: [2016] Migrator assumed CS1.								
510 - Wearing Surfaces		Underwater	06/18/2016	4349 SF	4349	0	0	0
		Migrated Values		4349 SF	4349	0	0	0
Notes: Top of Concrete Deck with Epoxy Reinforcement Notes:								
109	Prestressed Concrete Open Girder/Beam	Underwater	06/18/2016	479 LF	479	0	0	0
		Migrated Values		479 LF	479	0	0	0
215	Reinforced Concrete Abutment	Underwater	06/18/2016	122 LF	122	0	0	0
		Migrated Values		122 LF	122	0	0	0
Notes: [2016] Migrator added 40 LF to abutment quantity to account for wingwalls (CS1:40 CS2:0 CS3:0 CS4:0). One crack in center of East abutment and one crack in West abutment between 1st and 2nd beam (North side). 10-21-15								
225	Steel Pile	Underwater	06/18/2016	10 EA	0	10	0	0
		Migrated Values		10 EA	10	0	0	0
Notes: [								
515 - Steel Protective Coating		Underwater	06/18/2016	80 SF	60	20	0	0
		Migrated Values		999 SF	999	0	0	0
Notes: [2016] Underwater Inspection - All of the steel piles exhibited 100 percent loss of paint coating with light surface corrosion and 1/8 inch maximum pitting from 1 foot above the water line to the channel bottom.								
234	Reinforced Concrete Pier Cap	Underwater	06/18/2016	82 LF	82	0	0	0
		Migrated Values		82 LF	82	0	0	0
311	Movable Bearing	Underwater	06/18/2016	12 EA	12	0	0	0
		Migrated Values		12 EA	12	0	0	0
313	Fixed Bearing	Underwater	06/18/2016	12 EA	12	0	0	0
		Migrated Values		12 EA	12	0	0	0

**BRIDGE 76518 CSAH 22 OVER POMME DE TERRE RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
331	Reinforced Concrete Bridge Railing	Underwater	06/18/2016	239 LF	239	0	0	0
		Migrated Values		239 LF	239	0	0	0
Notes: Minor cracking on both rails. Painted in 2001. 10-21-15								
800	Critical Deficiencies or Safety Hazards	Underwater	06/18/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: NO CRITICAL FINDINGS OBSERVED DURING THE LAST INSPECTION.								
822	Bituminous Approach Roadway	Underwater	06/18/2016	2 EA	0	2	0	0
		Migrated Values		2 EA	0	2	0	0
Notes: Patched in 2001. Need monitoring yearly. 10-21-15								
883	Concrete Shear Cracking	Underwater	06/18/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
885	Scour	Underwater	06/18/2016	1 EA	0	1	0	0
Notes: [2016] Underwater Inspection - There was a scour hole encroaching on the northwest wing wall of the West Abutment.								
891	Other Bridge Signing	Underwater	06/18/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: Bridge end markers all in-place. 10-21-15								
892	Slopes & Slope Protection	Underwater	06/18/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
894	Deck & Approach Drainage	Underwater	06/18/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
900	Protected Species	Underwater	06/18/2016	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.								

General Notes: No visible scour. 2' of water in channel. 10-21-15

58. Deck NBI:

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail Terminal NBI:

59. Superstructure NBI: 2016] Underwater Inspection - Changed to All of the steel piles exhibited 100 percent loss of paint coating with light surface corrosion and 1/8 inch maximum pitting from 1 foot above the water line to the channel bottom.

60. Substructure NBI:

61. Channel NBI:

62. Culvert NBI:

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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71. Waterway Adeq NBI:

72. Appr Roadway  
Alignment NBI:

Inventory Notes:

Roy Forsyth

Inspector's Signature

Reviewer's Signature

## Pictures



Photo 2 - View of East Abutment, looking east.



Photo 3 - View of West Abutment, looking west.

# Pictures



Photo 4 - View of West Bent, looking east.

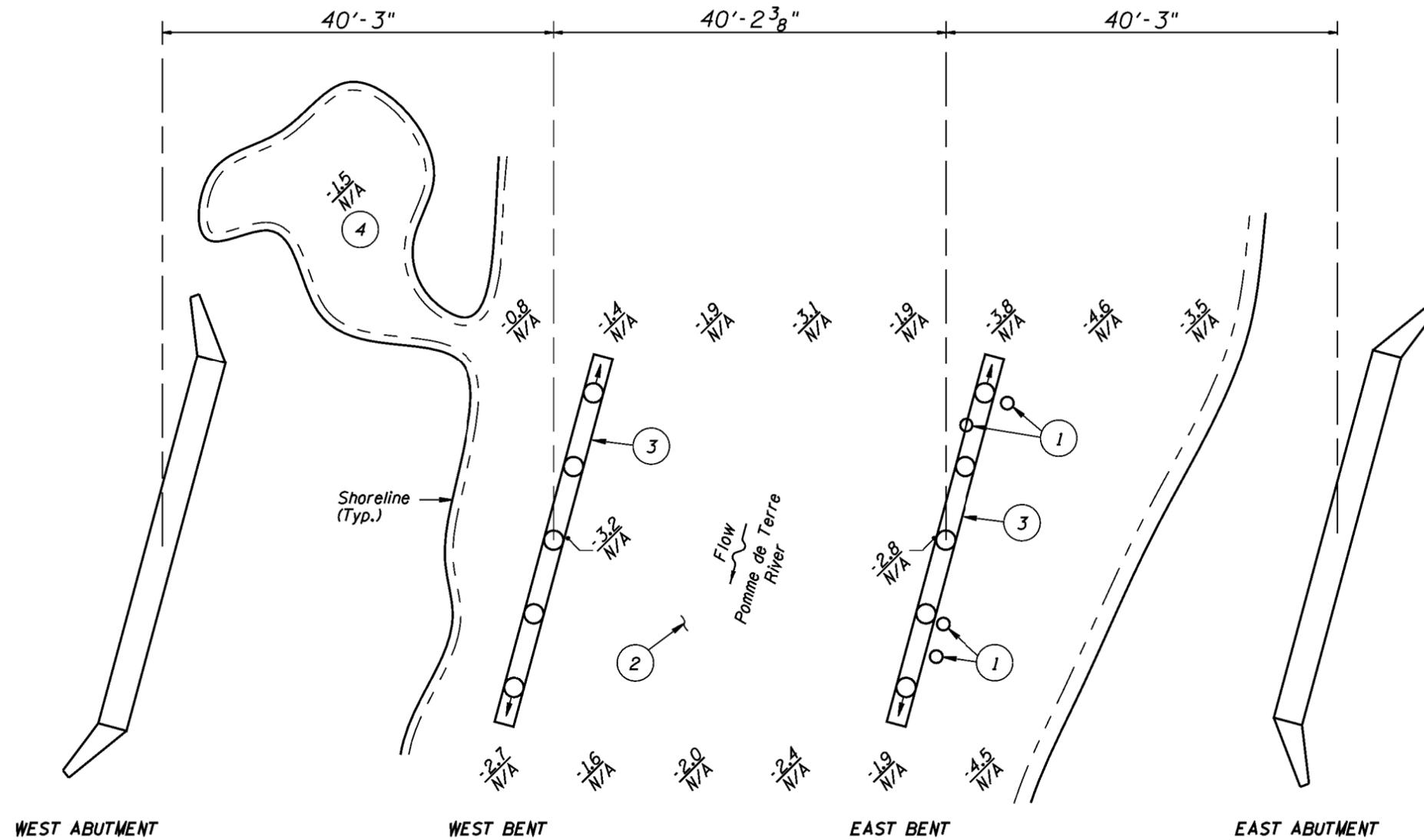


Photo 5 - View of East Bent, looking east.

## Pictures



Photo 6 - View of scour hole at the northwest wing wall, looking north.



**INSPECTION AND SOUNDING PLAN**

**GENERAL NOTES:**

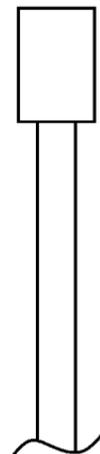
- 1 The East and West Bents were inspected underwater.
- 2 At the time of inspection on June 18, 2016, the waterline was located approximately 9.3 feet below the top of pier cap at the upstream nose of the West Bent. This corresponds with a waterline elevation of 1031.8 feet based on detailed drawings.
- 3 Soundings indicate the water depth at the time of the inspection and are measured in feet. All soundings based on 2016 waterline location.
- 4 Soundings were taken parallel to the bridge at 1/4-point intervals between the substructure units.

**INSPECTION NOTES:**

- 1 There were abandoned timber piles cutoff 1 foot below the waterline.
- 2 The channel bottom material consisted of sand with 6 inches of maximum probe rod penetration.
- 3 All piles exhibited 100 percent loss of painted coating with light surface corrosion and 1/8 inch maximum pitting from 1 foot above the waterline to the channel bottom.
- 4 There was a scour hole encroaching on the Northwest wingwall of the West Abutment.

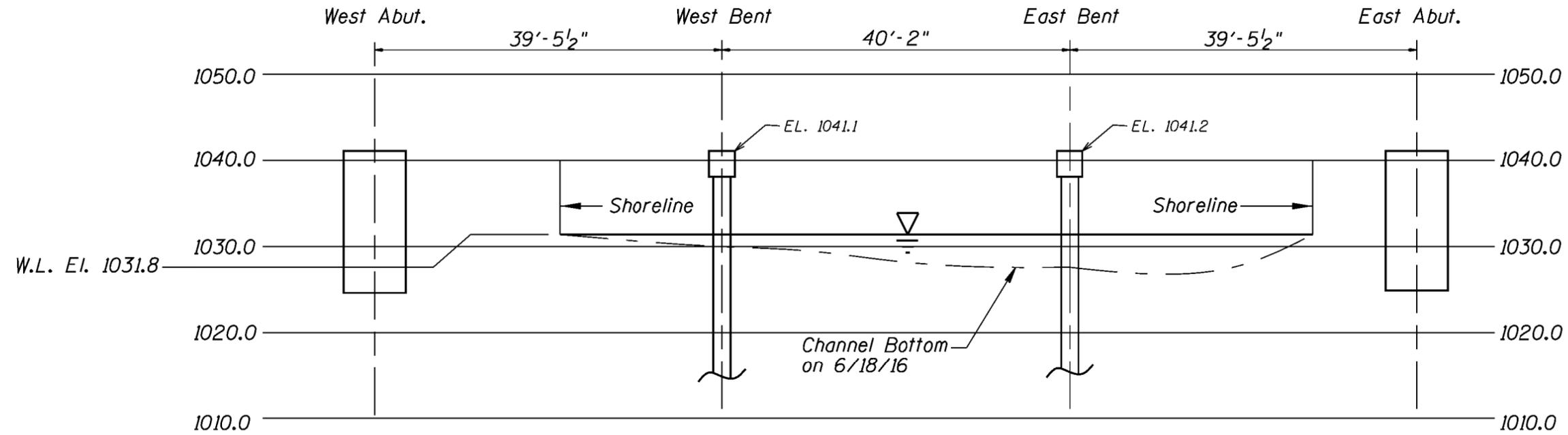
**Legend**

- 0.4 Sounding Depth (6/18/16)
- N/A Sounding Depth (2012)
- Cast-in-place Concrete Pile
- ◐ Angled Cast-in-place Concrete Pile
- Abandoned Timber Pile

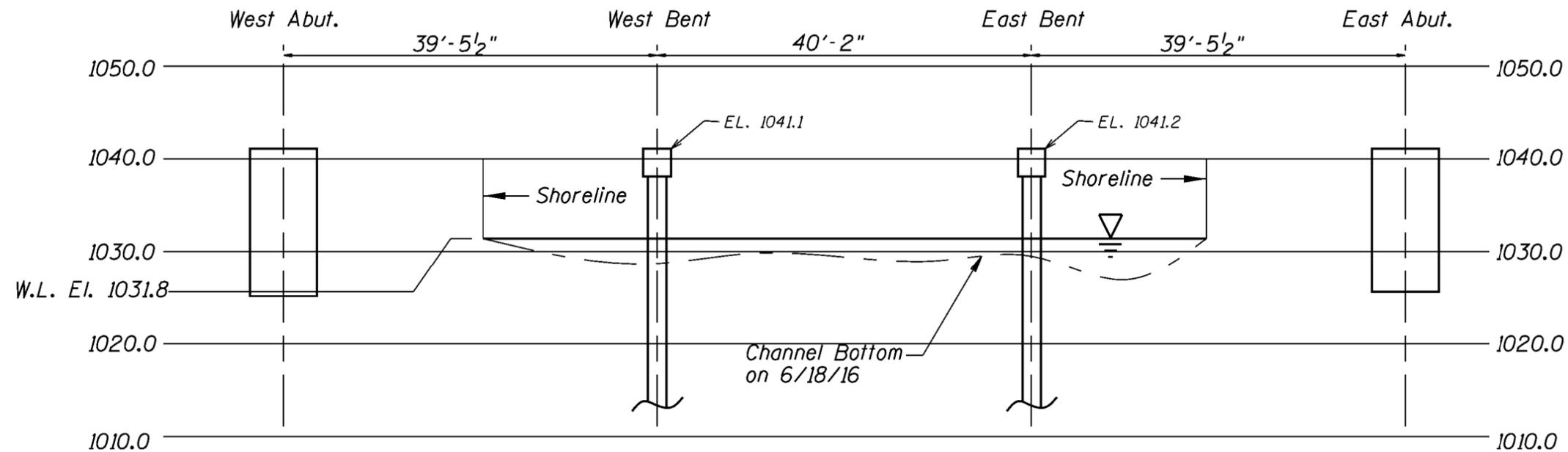


**TYPICAL END VIEW OF PIERS**

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 76518 OVER THE POMME DE TERRE RIVER DISTRICT 4, SWIFT COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: JCG	<b>COLLINS ENGINEERS</b> <small>1599 Selby Ave. Suite 206 St. Paul, MN, 55104 (651) 646-8502 www.collinsengr.com</small>	Date: 6/18/2016
Checked By: RAF		Scale: NTS
Project: 63-9687		Figure No.: 1



**UPSTREAM FASCIA PROFILE**



**DOWNSTREAM FASCIA PROFILE**

**Note:**  
Refer to Figure 1 for General Notes.

**Legend**  
— Channel Bottom per 2016 Inspection

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 76518 OVER THE POMME DE TERRE RIVER DISTRICT 4, SWIFT COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: JCG	<b>COLLINS ENGINEERS</b>	Date: 6/18/2016
Checked By: RAF		Scale: NTS
Project: 63-9687		Figure No.: 2