

# 2016 UNDERWATER BRIDGE INSPECTION REPORT



## BRIDGE # 66520 TWP 51 over STRAIGHT RIVER

DISTRICT: District 6

COUNTY: Rice

CITY/TOWNSHIP: WALCOTT

STATE: Minnesota

Date of Inspection: 05/25/2016

Equipment Used: A-62

Owner: County Highway Agency

Inspected By: Owens, Garrett

Report Written By: Garrett Owens

Report Reviewed By:

Final Report Date:



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## UNDERWATER INSPECTION

### REPORT SUMMARY

The substructure units inspected at Bridge No. 66520, Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance observed. The channel bottom appeared stable with no significant scour, although with a heavy accumulation of timber debris present at Pier 1. Additionally, there is timber debris up to 5 inches in diameter along the upstream piles of pier 2. The concrete encasements along the lower portions of the columns exhibited spalling/section loss with up to 3 to 6 inches of penetration.

### INSPECTION FINDINGS

(A) Timber debris was observed along the west face of Pier 2 that consisted of a full tree and smaller branches and extended from the channel bottom to the bottom of the cap.

(B) The columns of Pier 2 were encased in up to 6 inches of additional concrete from the channel bottom to 1.1 feet above the waterline. The encasements exhibited form irregularities (embedded form boards) and spalling with up to 3 inches of penetration.

(C) The columns of Pier 1 were encased in up to 6 inches of additional concrete from the channel bottom to 2.8 feet above the waterline. The encasements exhibited form irregularities (embedded form boards) and spalling with up to 6 inches of penetration.

(D) The channel bottom material consisted of bedrock at the upstream and downstream columns with up to 2 inches of gravel and soft silt infilling along the middle columns with minimal probe rod penetrations.

(E) A hard bottom was found up to 3 feet to the east upstream end of Pier 2.

(F) Timber debris up to 5 inches in diameter is present near the upstream piles of Pier 1.

### RECOMMENDATIONS

(A) Monitor concrete deterioration at the concrete column encasements during future underwater inspections.

(B) Remove timber debris at the piers.

(C) 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 #: 66520  
Feature Intersected: STRAIGHT RIVER  
Facility Carried: TWP 51  
District: District 6  
County: 066 - Rice

#### Bridge Description:

The bridge consists of three spans of multiple steel stringers supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are labeled Piers 1 and 2 starting from the east end of the bridge.

### 2. INSPECTION DATA

Professional Engineer/Team Leader: Cory R. Stuber, P.E.  
Inspection Diver: Garrett R. Owens, P.E.  
Date of Underwater Inspection: 05/25/2016  
Weather Conditions: Cloudy, 80°F  
Underwater Visibility (feet): 1.0  
Waterway Velocity (ft/sec): 0.5

### 3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 1 and 2.

#### General Shape:

The piers each consist of four round concrete columns supporting an oblong concrete pier cap.

Maximum Water Depth at Substructure(s) Inspected (feet): 3.2

### 4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 1.  
Waterline Elevation (feet): 88.4  
Description: The waterline was approximately 11.6 feet below reference.

### 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 62: Culvert: Code:  
Item 92B: Underwater Inspection: Code: Y 48 05/2016

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
205	Reinforced Concrete Column	8	EA		8		
885	Scour	1	EA	1			

## UNDERWATER INSPECTION

### INSPECTION PROCEDURES

The routine underwater inspection of Bridge 66520 (TWP 51 over the Straight River) was completed on May 25, 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 Piers 1 and 2. According to the bridge inventory or design drawings, Piers 1 and 2 consist of four round concrete columns supporting an oblong concrete pier cap.. 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: 66520

TWP 51 over STRAIGHT RIVER

Date: 08/29/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
<b>Agency Br. No.</b> Crew <b>District</b> 06 <b>Maint. Area</b> <b>County</b> 066 - Rice <b>City</b> <b>Township</b> 66009 - WALCOTT <b>Desc. Loc.</b> 1.8 MI E OF JCT CSAH 19 <b>Sect., Twp., Range</b> 9 - 109N - 20W <b>Latitude</b> 44 ° 16 ' 7.69 " <b>Longitude</b> 93 ° 13 ' 24.94 " <b>Custodian</b> 02 - County Highway Agency <b>Owner</b> 02 - County Highway Agency <b>BMU Agreement</b> <b>Year Built</b> 1979 <b>MN Year Reconstructed</b> <b>FHWA Year Reconstructed</b> <b>MN Temporary Status</b> <b>Bridge Plan Location</b> 3 - COUNTY <b>Date Opened to Traffic</b> <b>On - Off System</b> 0 - OFF <b>Legislative District</b> 26B <b>Potential ABC</b> 2 - N/A	<b>Bridge Match ID (TIS)</b> 0 <b>Roadway O/U Key</b> Route On Structure <b>Route Sys</b> 08 - TWNS <b>Number</b> 51 <b>Roadway Name or Description</b> TWNS 51 <b>Level of Service</b> 1 - MAINLINE <b>Roadway Type</b> 2 - 2-way traffic <b>Control Section (TH Only)</b> <b>Reference Point</b> 001+00.820 <b>Detour Length</b> 3.0 mi. <b>Lanes</b> <b>ON</b> 2 <b>UNDER</b> 0 <b>ADT</b> 95 <b>YEAR</b> 1985 <b>HCA DT</b> <b>ADTT</b> % <b>Functional Class</b> 09 - Rural - Local	<b>Userkey</b> 106 <b>Structurally Deficient</b> N <b>Functionally Obsolete</b> N <b>Sufficiency Rating</b> 98.0 <b>Routine Inspection Date</b> 04/27/2015 <b>Routine Inspection Frequency</b> 24 <b>Inspector Name</b> Owens, Garrett <b>Status</b> A - Open																				
	+ RDWY DIMENSIONS +	+ NBI CONDITION RATINGS +																				
	<b>If Divided</b> <b>NB-EB</b> <b>SB-WB</b> <b>Roadway Width</b> 32.00 ft. ft. <b>Vertical Clearance</b> ft. ft. <b>Max. Vert. Clear.</b> ft. ft. <b>Horizontal Clear.</b> ft. ft. <b>Lateral Clearance</b> ft. ft. <b>Appr. Surface Width</b> 32.0 ft. <b>Bridge Roadway Width</b> 32.0 ft. <b>Median Width On Bridge</b> ft.	<b>Deck</b> 7 <b>Unsound Deck %</b> <b>Superstructure</b> 7 <b>Substructure</b> 6 <b>Channel</b> 6 <b>Culvert</b> N																				
+ STRUCTURE +	+ MISC. BRIDGE DATA +	+ NBI APPRAISAL RATINGS +																				
<b>Service On</b> 1 - Highway <b>Service Under</b> 5 - Waterway <b>Main Span Type</b> 4 - Steel Continuous <b>Main Span Design</b> 01 - Beam Span <b>Main Span Detail</b> <b>Appr. Span Type</b> <b>Appr. Span Design</b> <b>Appr. Span Detail</b> <b>Skew</b> 0 <b>Culvert Type</b> <b>Barrel Length</b> <b>Cantilever ID</b>  <b>Number of Spans</b> <b>MAIN:</b> 3 <b>APPR:</b> 0 <b>TOTAL:</b> <b>Main Span Length</b> 80.0 ft. <b>Structure Length</b> 210.6 ft. <b>Deck Width (Out-to-Out)</b> 35.3 ft. <b>Deck Material</b> 1 - Concrete Cast-in-Place <b>Wear Surf Type</b> 1 - Monolithic Concrete <b>Wear Surf Install Year</b> <b>Wear Course/Fill Depth</b> 0.00 ft. <b>Deck Membrane</b> 0 - None <b>Deck Rebars</b> 0 - None <b>Deck Rebars Install Year</b> <b>Structure Area (Out-to-Out)</b> 7434 sq. ft. <b>Roadway Area (Curb-to-Curb)</b> 7395 sq. ft. <b>Sidewalk Width</b> <b>50A. Lt</b> 0.00 ft. <b>50B. Rt</b> 0.00 ft. <b>Curb Height</b> <b>Lt</b> 0.25 ft. <b>Rt</b> 0.25 ft. <b>Rail Type</b> <b>Lt</b> 22 <b>Rt</b> 22	<b>Structure Flared</b> 0 - No flare <b>Parallel Structure</b> N - No parallel structure <b>Field Conn. ID</b> 4 - Bolted <b>Abutment Foundation (Material/Type)</b> 3 - FTG PILE <b>Pier Foundation (Material/Type)</b> 1 - CONC 4 - PILE BENT <b>Historic Status</b> 5 - Not eligible	<b>Structure Evaluation</b> 6 <b>Deck Geometry</b> 8 <b>Underclearances</b> N <b>Waterway Adequacy</b> 9 <b>Approach Alignment</b> 8																				
	+ PAINT +	+ SAFETY FEATURES +																				
	<b>Year Painted</b> 1979 <b>Unsound Paint %</b> <b>Painted Area</b> 0 sq. ft. <b>Primer Type</b> 6 <b>Finish Type</b> K - Unpainted 3309 Steel	<b>Bridge Railing</b> 1 - MEETS STANDARDS <b>GR Transition</b> 0 - SUBSTANDARD <b>Appr. Guardrail</b> 0 - SUBSTANDARD <b>GR Termini</b> 0 - SUBSTANDARD																				
	+ BRIDGE SIGNS +	+ IN DEPTH INSP. +																				
	<b>Posted Load</b> 0 - Not Required <b>Traffic</b> 0 - Not Required <b>Horizontal</b> 1 - Object Markers <b>Vertical</b> N - Not Applicable	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Y/N</th> <th style="text-align: center;">Freq</th> <th style="text-align: center;">Date</th> </tr> </thead> <tbody> <tr> <td><b>Frac. Critical</b></td> <td style="text-align: center;">N</td> <td></td> <td></td> </tr> <tr> <td><b>Underwater</b></td> <td style="text-align: center;">Y</td> <td style="text-align: center;">60</td> <td style="text-align: center;">05/25/2016</td> </tr> <tr> <td><b>Pinned Asbly.</b></td> <td style="text-align: center;">N</td> <td></td> <td></td> </tr> <tr> <td><b>Spec. Feat.</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y/N	Freq	Date	<b>Frac. Critical</b>	N			<b>Underwater</b>	Y	60	05/25/2016	<b>Pinned Asbly.</b>	N			<b>Spec. Feat.</b>			
	Y/N	Freq	Date																			
<b>Frac. Critical</b>	N																					
<b>Underwater</b>	Y	60	05/25/2016																			
<b>Pinned Asbly.</b>	N																					
<b>Spec. Feat.</b>																						
		+ WATERWAY +																				
		<b>Drainage Area (sq. mi.)</b> 431.5 <b>Waterway Opening (sf.)</b> 1907 <b>Navigation Control</b> 0 - No nav. control on <b>Pier Protection</b> - <b>Nav. Clr. (ft.)</b> <b>Vert.</b> 0.0 <b>Horiz.</b> 0.0 <b>Nav. Vert. Lift Bridge Clear. (ft.)</b> <b>MN Scour Code</b> I - LOW RISK <b>Year</b>																				
		+ CAPACITY RATINGS +																				
		<b>Design Load</b> 5 - HS 20 <b>Operating Rating</b> 2 - HS TRUCK 38.8 <b>Inventory Rating</b> 2 - HS TRUCK 23.3 <b>Posting VEH:</b> <b>SEMI:</b> <b>DBL:</b> <b>Rating Date</b> 9/17/2009 <b>Overweight Permit Codes</b> <b>A</b> N - N/A <b>B</b> N - N/A <b>C</b> N - N/A																				

# MINNESOTA BRIDGE INSPECTION REPORT

09/10/2016

Inspector: CO Bridge

## BRIDGE 66520 TWP 51 OVER STRAIGHT RIVER

County: Rice	Location: 1.8 MI E OF JCT CSAH 19	Length: 210.6 ft.
City:	Route: 08 - TWNS 51 Ref. Pt.: 001+00.820	Deck Width: 35.3 ft.
Township: 66009 - WALCOTT	Control Section:	Rdwy. Area/ Pct. Unsnd: 7395 sq. ft. / %
Section: 9 Township: 109N Range: 20W Maint. Area:		Paint Area/ Pct. Unsnd: 0 sq. ft. / %
Span Type: 4 - Steel Continuous 2 - List: Stringer/Multi-beam or Girder	Local Agency Bridge Nbr.:	Culvert: N/A
NBI Deck: 7 Super: 7 Sub: 6 Chan: 6 Culv: N		Postings:
	Open, Posted, Closed: A - Open	
	MN Scour Code: 1 - LOW RISK	

Appraisal Ratings - Approach: 8 Waterway: 9		Unofficial Structurally Deficient N
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 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	05/25/2016	7434 SF	7285	0	149	0
		Migrated Values		7434 SF	7285	0	149	0
Notes: [2015]-[2013] There are scattered transverse cracks beneath the deck with efflorescence in spans 2 & 3 and scattered along both overhangs with some leaching.								
510	- Wearing Surfaces	Underwater	05/25/2016	7395 SF	7395	0	0	0
		Migrated Values		7395 SF	7395	0	0	0
Notes: Top of Concrete Deck with Uncoated Rebar Notes: [2015] Gravel along the shoulders of deck are now 1 to 6 feet wide. [2013] No spalls, delaminations, or patches noted. There are scattered areas across the deck surface where the deck concrete aggregate is exposed. Both shoulders have gravel 1 to 3 feet wide and up to 2 inches deep extending most of the length of the deck.								
107	Steel Open Girder/Beam	Underwater	05/25/2016	840 LF	824	16	0	0
		Migrated Values		840 LF	824	16	0	0
Notes: There are cover plates welded to the negative moment areas of the beams over both piers.								
[2015] Same/add; Near the bearing areas, there is minor flaking rust with incidental section loss, 16LF.								
[2013] All beams have a yellowish orange to light brown color with scattered areas of minor surface pitting.								
515	- Steel Protective Coating	Underwater	05/25/2016	999 SF	980	0	19	0
		Migrated Values		999 SF	980	0	19	0
Notes: [2016] Migrator assumed quantity of 999 SF and estimated the condition states.								
205	Reinforced Concrete Column	Underwater	05/25/2016	8 EA	0	8	0	0
		Migrated Values		8 EA	0	8	0	0
Notes: Pier #1:								
[2015] Same/add; Column 1 has spalling at the base that has exposed the sheeting collar.								
[2013] All four columns have a larger concrete collar poured around the bottom at the waterline. The concrete is not round and uniform at columns 1 & 2. Columns 1,2,4 have minor to moderate scaling and deterioration present at the waterline.								
Pier #2:								
[2015]-[2013] All four columns have a larger concrete collar poured around the bottom at the waterline. Column 2 has a small 1" X 12" rebar spall along the west side near the bottom.								

**BRIDGE 66520 TWP 51 OVER STRAIGHT RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
215	Reinforced Concrete Abutment	Underwater	05/25/2016	112 LF	108	4	0	0
		Migrated Values		112 LF	108	4	0	0
Southeast Wingwall: [2015]-[2013] The wingwall shows little or no deterioration at the time of this inspection.								
Northwest Wingwall: [2015]-[2013] The wingwall shows little or no deterioration at the time of this inspection.								
234	Reinforced Concrete Pier Cap	Underwater	05/25/2016	72 LF	72	0	0	0
		Migrated Values		72 LF	72	0	0	0
Notes: Pier #1: [2015]-[2013] There are a few minor hairline vertical cracks.								
Pier #2: [2015]-[2013] There are a few minor hairline vertical cracks.								
313	Fixed Bearing	Underwater	05/25/2016	8 EA	8	0	0	0
		Migrated Values		8 EA	8	0	0	0
Notes: Fixed bearings are located at the piers.								
Pier #1: [2015]-[2013] The fixed bearings show little or no deterioration at the time of the inspection.								
Pier #2: [2015]-[2013] The fixed bearings show little or no deterioration at the time of the inspection.								
331	Reinforced Concrete Bridge Railing	Underwater	05/25/2016	420 LF	392	28	0	0
		Migrated Values		420 LF	392	28	0	0
Notes: [2015]-[2013] There are 3 to 5 vertical cracks per rail section with some staining or leaching. The cork deflection joints on both sides have completely deteriorated. There is graffiti painted on both rails.								
South Rail: [2015]-[2013] The railing shows little deterioration at the time of this inspection.								
North Rail: [2015]-[2013] The 4th section from the east end has a 4' long minor scrape.								
800	Critical Deficiencies or Safety Hazards	Underwater	05/25/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: [2015]-[2013] No critical finding were observed at the time of this inspection.								
810	Concrete Decks - Cracking & Sealing	Underwater	05/25/2016	0 LF	0	0	0	0
		Migrated Values		0 LF	0	0	0	0
Notes: [2015]-[2013] There is approximately 400 linear feet of unsealed deck cracks.								

**BRIDGE 66520 TWP 51 OVER STRAIGHT RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
823	Gravel Approach Roadway	Underwater	05/25/2016	2 EA	0	2	0	0
		Migrated Values		2 EA	0	2	0	0
<p>Notes: West Approach:                      [2015] The gravel roadway over the culvert was in good condition with no signs of settlement at the time of this inspection.                      [2013] The gravel roadway has numerous small potholes forming.</p> <p>East Approach:                      [2015] The gravel roadway over the culvert was in good condition with no signs of settlement at the time of this inspection.                      [2013] The gravel roadway has numerous small potholes forming.</p>								
883	Concrete Shear Cracking	Underwater	05/25/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
<p>Notes: Use this element to monitor the presence of shear cracking on concrete elements. Pay particular attention to the concrete pier caps.</p>								
885	Scour	Underwater	05/25/2016	1 EA	1	0	0	0
891	Other Bridge Signing	Underwater	05/25/2016	1 EA	0	0	1	0
		Migrated Values		1 EA	0	0	1	0
<p>Notes: Signs Required: Horizontal Clearance.                      [2015]-[2013] The northwest corner delineator sign is missing. The southwest sign has memorial graffiti on and around it.</p>								
892	Slopes & Slope Protection	Underwater	05/25/2016	1 EA	0	1	0	0
		Migrated Values		1 EA	0	1	0	0
<p>Notes: [2015]-[2013] There are minor areas of slope erosion along the northwest and northeast wingwalls.</p>								
894	Deck & Approach Drainage	Underwater	05/25/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
<p>Notes: [2015]-[2013] All deck drains are open at the time of this inspection.</p>								
899	Miscellaneous Items	Underwater	05/25/2016	1 EA	0	1	0	0
		Migrated Values		1 EA	0	1	0	0
<p>Notes: [2015]-[2013] Yes swallow nests.                      [2015]-[2013] The cork joints between the wingwalls and the abutments have deteriorated.                      [2015]-[2013] There is a conduit pipe in-place through the bottom portion of the north railing, the wire is exposed at the east end of the railing.</p>								
900	Protected Species	Underwater	05/25/2016	1 EA	0	1	0	0
		Migrated Values		1 EA	0	1	0	0
<p>Notes: [2016] Migrator determined the presence of swallows on this structure based on data in the inventory or comments in the general/miscellaneous notes.</p>								

General Notes: Bridge 66520

NOTE: Built in 1979.

NOTE: Bridge was inspected using under deck snooper truck in 2015.

NOTE: Bridge was inspected in 2015 by Robert Pyfferoen, Aaron Forthun and Tony Bale.

Channel:

[2015]-[2013] NBI 7 There are minor areas of bank erosion both up and down stream and timber debris lodged around Pier #2.

**BRIDGE 66520 TWP 51 OVER STRAIGHT RIVER**

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
	58. Deck NBI:	[2015]-[2013]	7	Good Condition				
	36A. Brdg Railings NBI:	[2015]-[2013]	1	MEETS STANDARDS				
	36B. Transitions NBI:	[2015]-[2013]	0	SUBSTANDARD				
	36C. Appr Guardrail NBI:	[2015]-[2013]	0	SUBSTANDARD				
	36D. Appr Guardrail Terminal NBI:	[2015]-[2013]	0	SUBSTANDARD				
	59. Superstructure NBI:	[2015]-[2013]	7	Good Condition				
	60. Substructure NBI:	[2015]-[2013]	6	Satisfactory Condition				
	61. Channel NBI:	[2015]-[2013]	7	Needs minor repairs. Minor bank erosion.				
	62. Culvert NBI:							
	71. Waterway Adeq NBI:	[2015]-[2013]	9	Bridge Above Flood Water Elevations				
	72. Appr Roadway Alignment NBI:	[2015]	8	Equal to present desirable criteria				
		[2013]	9	Superior to present desirable criteria				
	Inventory Notes:							

Garrett Owens  
Inspector's Signature

Reviewer's Signature

# Pictures



Photo 1 - South Elevation, Looking North



Photo 2 - North Elevation, Looking South

## Pictures



Photo 3 - Pier 1 and Timber Debris, Looking East



Photo 4 - Pier 1 and Timber Debris, Looking West

## Pictures



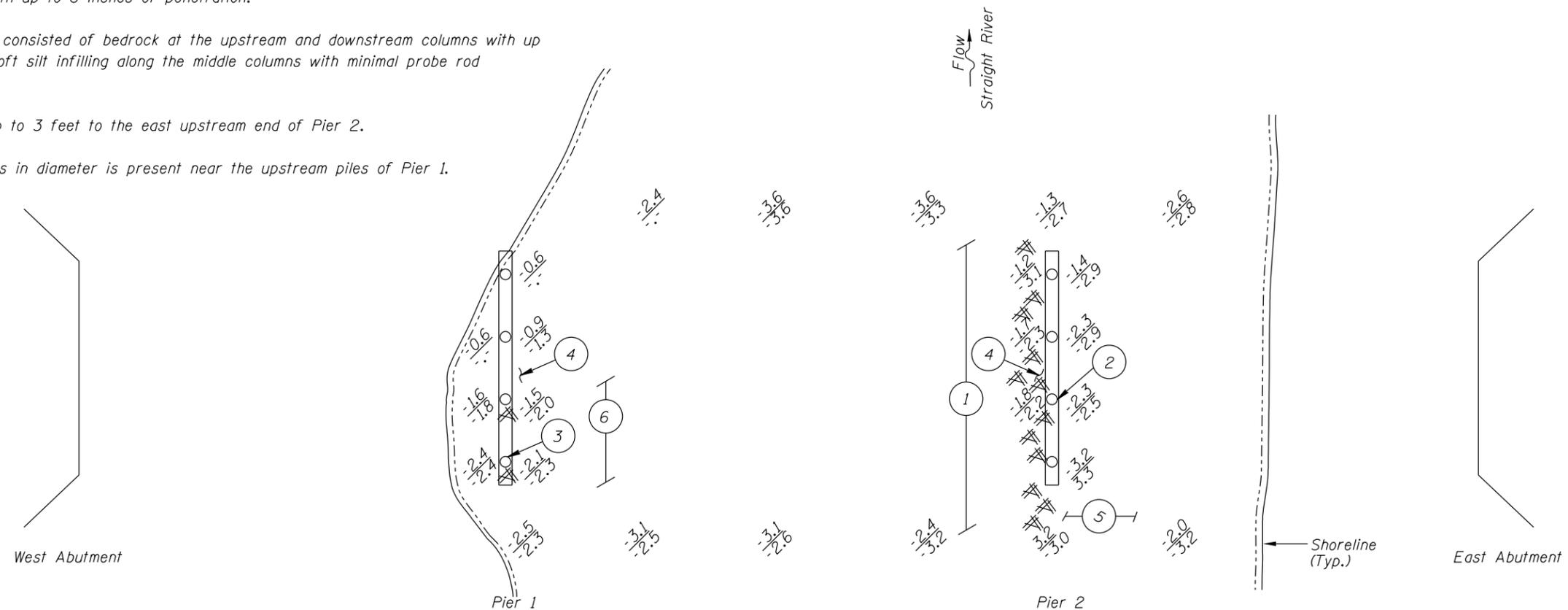
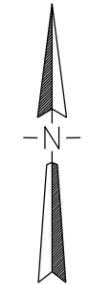
Photo 5 - Spalling on Upstream Pile of Pier 1, Looking East



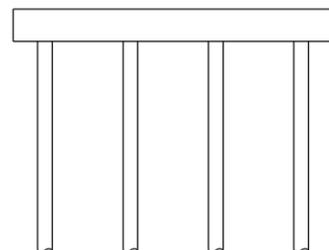
Photo 6 - View of 2nd and 3rd Piles from Upstream Side of Pier 1, Looking East

INSPECTION NOTES:

- 1 Timber debris was observed along the west face of Pier 2 that consisted of a full tree and smaller branches and extended from the channel bottom to the bottom of the cap.
- 2 The columns of Pier 2 were encased in up to 6 inches of additional concrete from the channel bottom to 1.1 feet above the waterline. The encasements exhibited form irregularities (embedded form boards) and spalling with up to 3 inches of penetration.
- 3 The columns of Pier 1 were encased in up to 6 inches of additional concrete from the channel bottom to 2.8 feet above the waterline. The encasements exhibited form irregularities (embedded form boards) and spalling with up to 6 inches of penetration.
- 4 The channel bottom material consisted of bedrock at the upstream and downstream columns with up to 2 inches of gravel and soft silt infilling along the middle columns with minimal probe rod penetrations.
- 5 A hard bottom was found up to 3 feet to the east upstream end of Pier 2.
- 6 Timber debris up to 5 inches in diameter is present near the upstream piles of Pier 1.



SOUNDING PLAN



TYPICAL PIER ELEVATION

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on May 25, 2016, the waterline was located approximately 11.6 feet below the top of the pier cap at the downstream end of Pier 2. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference, the waterline elevation was 88.4.
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 as well as around the pier structures.

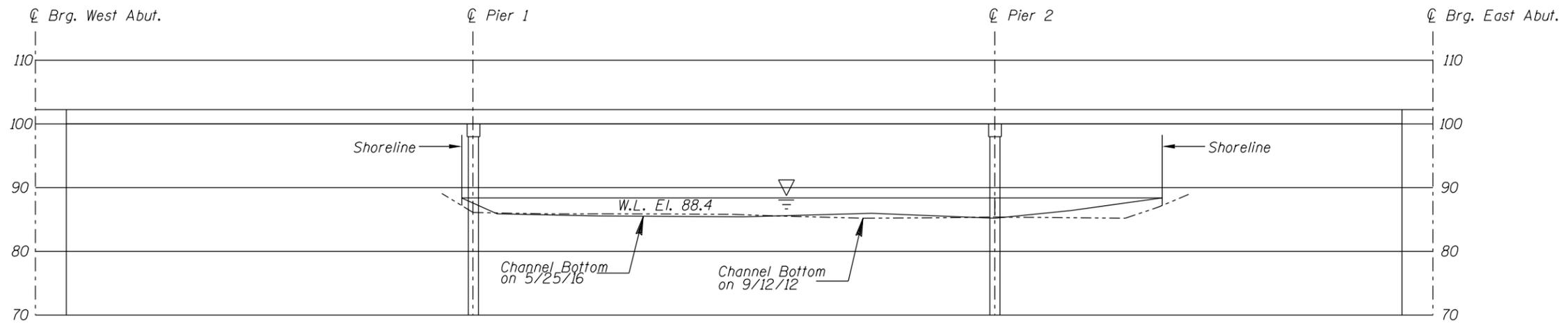
Legend

- 0.4 Sounding Depth (5/25/16)
- 0.4 Sounding Depth (9/12/12)
- Timber Debris
- .- Sounding Depth not previously taken
- n/a Sounding Depth not accessible due to debris

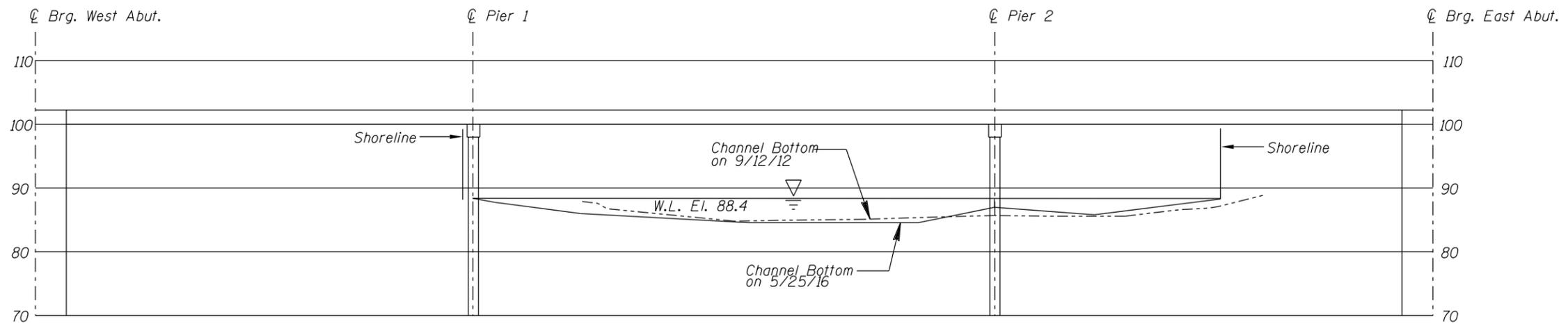
Note:

All soundings based on 2016 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 66520 OVER THE STRAIGHT RIVER DISTRICT 6, RICE COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: LBH	<b>COLLINS ENGINEERS</b> <small>1599 Selby Avenue Suite 206 St. Paul, MN 55104 (651) 646-8502 www.collinsengr.com</small>	Date: June 2016
Checked By: BRL		Scale: NTS
Project 63-9687		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 66520 OVER THE STRAIGHT RIVER DISTRICT 6, RICE COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: LBH	<b>COLLINS ENGINEERS</b> <small>1599 Selby Avenue Suite 205 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