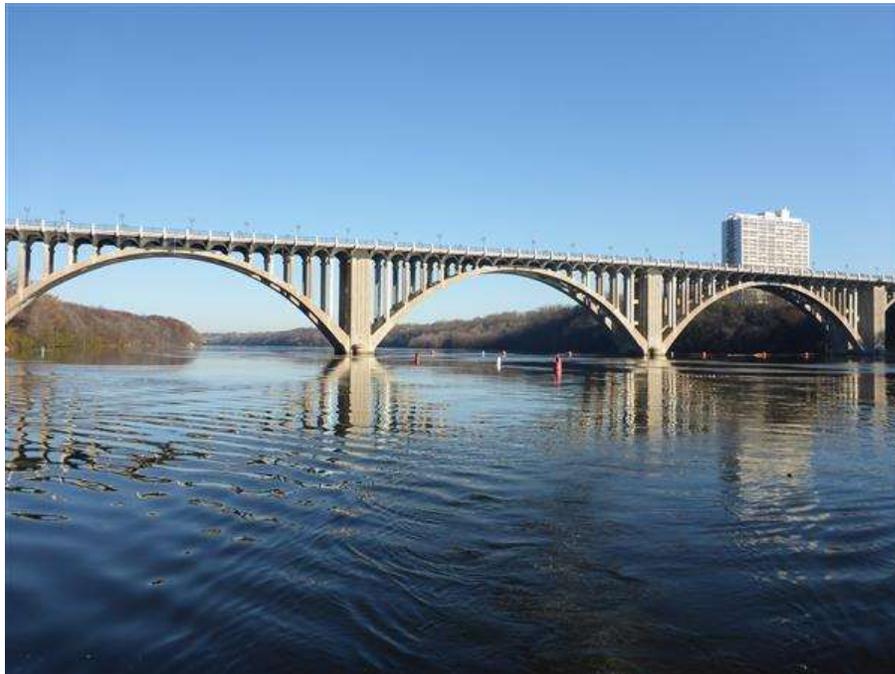


2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 3575 CSAH 42(FORD PKY) over MISS R; MISS BL

DISTRICT: Metro

COUNTY: Ramsey

CITY/TOWNSHIP: St Paul

STATE: Minnesota

Date of Inspection: 11/04/2016

Equipment Used:

Owner: County 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. 3575, Piers 7 through 9, were found to be in good to satisfactory condition with no defects of structural significance observed. Footing exposure was observed around the upstream portion of Piers 8 and 9. In addition, minor undermining was observed at the northeast corner of Pier 8. The extent of footing exposure has reduced slightly as compared to the previous underwater inspection. Aside from some localized areas of scour around Piers 8 and 9, the channel bottom around the substructure units appeared stable with evidence of concrete rubble/construction debris placement around the piers during the most recent superstructure rehabilitation.

INSPECTION FINDINGS

(A) Overall, the concrete was satisfactory condition with light to moderate scaling around the perimeter of the piers, with random areas of section loss (1 to 3 inches of penetration typical), from 2 feet above to 2 feet below the waterline.

(B) An area of concrete was spalled, 2 feet by 2 feet with 2 inches of penetration, at 3 feet below the waterline.

(C) The footing was exposed around the upstream third of Pier 8 and along the upstream face of Pier 9. Timber formwork was encountered along the footings of Piers 8 and 9. The exposed portion of the footings exhibited widespread heavy scaling with 1 to 2 feet of penetration and a maximum vertical face exposure of 6 feet (full height) at Pier 8. No vertical face exposure at Pier 9.

(D) The footing at the northeast corner of Pier 8 was undermined, with a cavity measuring 3 feet long by 1 foot high with up to 1 foot of horizontal penetration.

(E) A void was found in the side of the footing, measuring 2 feet in diameter with 3 feet of penetration, located at the northeast corner of Pier 8.

(F) Areas of silty sand deposition (infilling) were located at the downstream ends of Piers 8 and 9 covering the footings.

(G) The channel bottom consisted of gravel and sand with scattered concrete rubble, reinforcing steel and riprap around the substructure units. The concrete rubble had protruding reinforcing steel and appeared to have been placed / dropped as part of bridge rehabilitation.

(H) Localized scour depressions were observed around the upstream end of Piers 8 and 9 with typical depths of 5 to 10 feet, and concrete rubble with protruding reinforcing steel was found on the base of the scour depression.

RECOMMENDATIONS

(A) Monitor footing exposures at Piers 8 and 9 and undermining and voiding at Pier 8 during future underwater inspections for further vertical face exposure and/or undermining. The extent of footing exposure/undermining does not appear to be structurally significant at this time since the piers are founded on deep driven caissons (as per bridge plans).

(B) 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 #: 3575
Feature Intersected: MISS R; MISS BL
Facility Carried: CSAH 42(FORD PKY)
District: Metro
County: 062 - Ramsey
Bridge Description:

The superstructure consists of eleven spans of various configurations. The three spans over the river each consist of a 300 foot long open spandrel, reinforced concrete arch. The reinforced concrete deck is supported by intermediate concrete pedestals cast into the arches. The arches are supported at the piers, which are supported by footings founded on multiple concrete caissons (Piers 8 and 9) or by spread footing (Pier 7).

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R. Lovelace, P.E.
Inspection Diver: Barritt R. Lovelace, P.E.
Date of Underwater Inspection: 11/04/2016
Weather Conditions: Sunny, 62°F
Underwater Visibility (feet): 2.0
Waterway Velocity (ft/sec): 2.0

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 7, 8, and 9

General Shape:

The piers consist of two rectangular reinforced concrete columns which intersect the arches at a common rectangular concrete footing (pier base). Pier 7 is supported by a rectangular spread footing. Piers 8 and 9 are supported by a rectangular footing founded on four large diameter concrete caissons.

Maximum Water Depth at Substructure(s) Inspected (feet): 28.0

4. WATERLINE DATUM

Water Level Reference: Bench mark on south end of Pier 9.
Waterline Elevation (feet): 725.4
Description: The waterline was approximately 4.6 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 11/2016

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
205	Reinforced Concrete Column	6	EA	6			
220	Reinforced Concrete Footing	30	LF		30		
885	Scour	1	EA		1		

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 3575 (Ford Parkway over the Mississippi River) was completed on November 4, 2016. The underwater inspection was conducted from a 21 ft boat. 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 three reinforced concrete piers. According to the bridge inventory or design drawings, Pier 7 is founded on spread footings while Piers 8 and 9 are founded on reinforced concrete footings supported by four concrete caissons . 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: 3575

CSAH 42(FORD PKY) over MISS R; MISS BL

Date: 02/02/2017

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. Crew District 05 Maint. Area County 062 - Ramsey City St Paul Township Desc. Loc. AT W CO LINE Sect., Twp., Range 17 - 028N - 23W Latitude 44 ° 55 ' 4.36 " Longitude 93 ° 12 ' 4.77 " Custodian 04 - City or Municipal Highway Owner 02 - County Highway Agency BMU Agreement Year Built 1927 MN Year Reconstructed 2002 FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 4 - MUNICIPAL Date Opened to Traffic On - Off System 1 - ON Legislative District 62A Potential ABC 2 - N/A	Bridge Match ID (TIS) 1 Roadway O/U Key Route On Structure Route Sys 04 - CSAH Number 42 Roadway Name or Description FORD PKWY-CSAH42 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 000+00.000 Detour Length 3.0 mi. Lanes ON 4 UNDER 4 ADT 17100 YEAR 2009 HCA DT ADTT % Functional Class 16 - Urban - Minor Arterial	Userkey 199 Structurally Deficient N Functionally Obsolete Y Sufficiency Rating 78.9 Routine Inspection Date 06/12/2016 Routine Inspection Frequency 12 Inspector Name Lovelace, Barritt Status A - Open																				
		+ NBI CONDITION RATINGS +																				
		Deck 7 Unsound Deck % Superstructure 7 Substructure 6 Channel 6 Culvert N																				
	+ RDWY DIMENSIONS +	+ NBI APPRAISAL RATINGS +																				
	If Divided NB-EB SB-WB Roadway Width 56.00 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. 55.9 ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 56.0 ft. Bridge Roadway Width 56.0 ft. Median Width On Bridge ft.	Structure Evaluation 5 Deck Geometry 5 Underclearances 3 Waterway Adequacy 9 Approach Alignment 9																				
+ STRUCTURE +		+ SAFETY FEATURES +																				
Service On 5 - Highway-pedestrian Service Under 6 - Highway - waterway Main Span Type 1 - Concrete Main Span Design 12 - Arch Main Span Detail V - OPEN SPANDREL ARCH Appr. Span Type 1 - Concrete Appr. Span Design 06 - Deck Girder Appr. Span Detail Skew 0 Culvert Type Barrel Length Cantilever ID	+ MISC. BRIDGE DATA +	Bridge Railing 1 - MEETS STANDARDS GR Transition N - NOT REQUIRED Appr. Guardrail N - NOT REQUIRED GR Termini N - NOT REQUIRED																				
	Structure Flared 0 - No flare Parallel Structure N - No parallel structure Field Conn. ID Abutment Foundation (Material/Type) 1 - CONC 2 - SPRD ROCK Pier Foundation (Material/Type) 1 - CONC 2 - SPRD ROCK Historic Status 1 - On National Register	+ IN DEPTH INSP. +																				
	+ PAINT +	<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>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;">11/04/2016</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	11/04/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater		60	11/04/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
Number of Spans MAIN: 5 APPR: 6 TOTAL: Main Span Length 327.4 ft. Structure Length 1523.6 ft. Deck Width (Out-to-Out) 83.5 ft. Deck Material 1 - Concrete Cast-in-Place Wear Surf Type 4 - Low Slump Concrete Wear Surf Install Year 2001 Wear Course/Fill Depth 0.16 ft. Deck Membrane 0 - None Deck Rebars 1 - Epoxy Coated Reinforcing Deck Rebars Install Year Structure Area (Out-to-Out) 123889 sq. ft. Roadway Area (Curb-to-Curb) 85321 sq. ft. Sidewalk Width 50A. Lt 10.20 ft. 50B. Rt 10.20 ft. Curb Height Lt 0.75 ft. Rt 0.75 ft. Rail Type Lt 51 Rt 51	+ BRIDGE SIGNS +	Drainage Area (sq. mi.) Waterway Opening (sf.) 99999 Navigation Control 1 - Nav. control on waterway Pier Protection 1 - Not required Nav. Clr. (ft.) Vert. 52.0 Horiz. 200.0 Nav. Vert. Lift Bridge Clear. (ft.) 0 MN Scour Code N - STBL - LIM Year 1996																				
	Year Painted Unsound Paint % Painted Area sq. ft. Primer Type Finish Type	+ CAPACITY RATINGS +																				
	Posted Load 0 - Not Required Traffic 0 - Not Required Horizontal 0 - Not Required Vertical N - Not Applicable	Design Load 9 - HS 25 (OR GREATER) Operating Rating 1 - H TRUCK 23.0 Inventory Rating 1 - H TRUCK 13.8 Posting VEH: SEMI: DBL: Rating Date 8/1/1973 Overweight Permit Codes A N - N/A B N - N/A C N - N/A																				

MINNESOTA BRIDGE INSPECTION REPORT

02/03/2017

BRIDGE 3575 CSAH 42(FORD PKY) OVER MISS R; MISS BL

County: Ramsey	Location: AT W CO LINE	Length: 1523.6 ft.
City: St Paul	Route: 04 - CSAH 42 Ref. Pt.: 000+00.000	Deck Width: 83.5 ft.
Township:	Control Section:	Rdwy. Area/ Pct. Unsnd: 85321 sq. ft. / %
Section: 17 Township: 028N Range: 23W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 1 - Concrete 11 - Arch - Deck	Local Agency Bridge Nbr.:	Culvert: N/A
List:		Postings:
NBI Deck: 7 Super: 7 Sub: 6 Chan: 6 Culv: N		
	Open, Posted, Closed: A - Open	
	MN Scour Code: N - STBL - LIM SCOUR	

Appraisal Ratings - Approach: 9	Waterway: 9	Unofficial Structurally Deficient	N
Required Bridge Signs - Load Posting: 0 - Not Required	Traffic: 0 - Not Required	Unofficial Functionally Obsolete	Y
Horizontal: 0 - Not Required	Vertical: N - Not Applicable	Unofficial Sufficiency Rating	78.9

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	11/04/2016	19581 SF	19553	25	3	0
		Routine	06/12/2016	19581 SF	19553	25	3	0
Notes: There are numerous transverse cracks with efflorescence showing thru the bottom of the slab under the sidewalk. 2011-16 3 sq. ft. of spalls - 1 inch or deeper. 2016 West end - from pier 12 to beam line h, east of pier 11. (140+33.03 to 140+89 = 56') East end - from beam line a, west of pier 6 to pier 2-1. (153+41 to 155+25.26 = 184.26') (west end 56') + (east end 184.26') = 240.26 LF. 2016 Deck width is 81.5' x 240.26' = 19,581 SF total. 2016								
510	Wearing Surfaces	Underwater	11/04/2016	13455 SF	11749	0	1706	0
		Routine	06/12/2016	13455 SF	11749	0	1706	0
Notes: The deck was replaced in 2003-2004. There are numerous 0.010" transverse hairline cracks in the N. and S. shoulder/ bicycle lane. 2005-16 Wear surface quantity = West end from pier 12 to beam line h, east of pier 11. (140+33.03 to 140+89 = 56') East end from beam line a, west of pier 6 to pier 2-1. (153+41 to 155+25.26 = 184.26') Roadway width 56' x length 240.26' = 13,455 sq. ft. of LS overlay. 2016 See element # 895 for sidewalk notes and deficiencies. 2016 Sidewalk width 11.5' x length 1519' X 2 = 34,937 sq. ft. of concrete walk. 2016 Need to verify the walk width on each side. (11' 6") 2016								
13	Prestressed Concrete Deck	Underwater	11/04/2016	102614 SF	102614	0	0	0
		Routine	06/12/2016	102614 SF	102614	0	0	0
Notes: From beam line h, east of pier 11 to beam line a, west of pier 6. 2016 Station 140+89 (beam line h) to station 153+41 (beam line a) = 1,252 feet. Deck width is 81.5'. 2016 81.5' x 1,252' = 102,038 SF. 2016 Outlook is approximately 8' x 18' = 144 SF. 2016 4 outlooks total x 144 = 576 SF. 2016 576 SF + 102,038 SF = 102,614 SF total. 2016								
510	Wearing Surfaces	Underwater	11/04/2016	70112 SF	70112	0	0	0
		Routine	06/12/2016	70112 SF	70112	0	0	0
Notes: Roadway width 56' X length 1,252' = 70,112 sq. ft. of LS overlay. 2016 From beam line h, east of pier 11 to beam line a, west of pier 6. 2016 Station 140+89 (beam line h) to station 153+41 (beam line a) = 1,252 feet.								

BRIDGE 3575 CSAH 42(FORD PKY) OVER MISS R; MISS BL

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
109	Prestressed Concrete Open Girder/Beam	Underwater	11/04/2016	5900 LF	5900	0	0	0
		Routine	06/12/2016	5900 LF	5900	0	0	0
<p>Notes: Post-tensioned concrete girder / beam - transverse. 2016 From pier 11 to pier 6. 2016 72 beam lines total. 2016 There is a 2 sq. ft. spall 8 ft. north of the centerline on the west face of floor beam h of span 7. 2006-08 The W. face of Floor beam E is spalled and delaminated for 6 sq. ft. and cracked E. of span 8. 2006-14 Minor to moderate cracking is present. 2015-16</p>								
110	Reinforced Concrete Open Girder/Beam	Underwater	11/04/2016	2594 LF	1705	876	13	0
		Routine	06/12/2016	2594 LF	1705	876	13	0
<p>Notes: The north girder in span 10 from point u to point a (these are points shown on the bridge plans) has numerous vertical cracks up to 0.025 " from construction (assumed jackhammer damage). The east half of the beam in this span is old and the west half is recent reconstruction and both have cracks. The cracks in the west half of this girder are hairline cracks. 2007-12 NOTE THIS AREA IN FUTURE INSPECTIONS Minor to moderate cracking is present. 2015-16 13 LF of spalls - some with exposed rebar. 2016</p>								
116	Reinforced Concrete Stringer	Underwater	11/04/2016	6860 LF	6809	50	1	0
		Routine	06/12/2016	6860 LF	6809	50	1	0
<p>Notes: In span 9, the S. arched stringer has a 2 sq. ft. delamination on the south face and west side of the midspan between floorbeams t and u. 2006-07 There is a sawcut 1" deep on the inside face of stringer C (arched stringer at Floorbeam D). 2006-08 There is a 1 sq. ft. spall on the bottom of beam 8 (arched stringer) of span 9, between points D and E 2 ft. E. of the center of the expansion joint opening. 2006-08 The east half of the north arched stringer has several fracture cracks up to 0.025" from construction damage. 2007 Minor to moderate cracking is present. 2015-16</p>								
144	Reinforced Concrete Arch	Underwater	11/04/2016	2594 LF	1669	883	42	0
		Routine	06/12/2016	2594 LF	1669	883	42	0
<p>Notes: Spalls deeper than 1" are present. 2016 Some spalls have exposed rebar that are corroded / rusted. 2016 Wide cracks are present. 2016</p> <p>Old element 385 - Arch Spandrel Column Notes: Quantity = 152 columns total. 2016 4 have delamination's CS-2. 2016 4 have spalls with exposed rebar present CS-3. 2016</p>								
155	Reinforced Concrete Floor Beam	Underwater	11/04/2016	796 LF	438	350	8	0
		Routine	06/12/2016	796 LF	438	350	8	0
<p>Notes: Minor to moderate cracking is present. 2015-16 Changed quantity to 796 in 2016.</p>								
205	Reinforced Concrete Column	Underwater	11/04/2016	29 EA	15	12	2	0
		Routine	06/12/2016	29 EA	15	12	2	0
<p>Notes: N. Face of pier 9 has a 1' & 4' spalled area 2" deep about 5' below the bottom of the deck. The north spandrel column at span 10 point a has several vertical hairline cracks. 2007-14 Minor to moderate cracking is present. 2015-16 S. face of pier 8 has a 1 SF spall. 2016</p>								
215	Reinforced Concrete Abutment	Underwater	11/04/2016	288 LF	274	14	0	0
		Routine	06/12/2016	288 LF	274	14	0	0
<p>Notes: Runoff water daylights at east abut. 2011-16 Access opening into east abut. see photos. 2011-16 W. abut - N. side has some minor undermining. 2014-16 Moderate width cracks with leaching is present. 2016</p>								

BRIDGE 3575 CSAH 42(FORD PKY) OVER MISS R; MISS BL

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
220	Reinforced Concrete Pile Cap/Footing	Underwater	11/04/2016	30 LF	0	30	0	0
<p>Notes: [2016] Underwater Inspection - The footing was exposed around the upstream third of Pier 8 and along the upstream face of Pier 9. Timber formwork was encountered along the footings of Piers 8 and 9. The exposed portion of the footings exhibited widespread heavy scaling and one large void with up to 3 feet of penetration and a maximum vertical face exposure of 6 feet (full height) at Pier 8. No vertical face exposure at Pier 9.</p>								
234	Reinforced Concrete Pier Cap	Underwater	11/04/2016	1070 LF	706	360	4	0
		Routine	06/12/2016	1070 LF	706	360	4	0
<p>Notes: The NE top corner of the N. spandrel column cap is spalled for 6 sq. in. at pt. D span 8. 2006-12 4 column capitols have spalls, 1 SF each. 2016</p>								
300	Strip Seal Expansion Joint	Underwater	11/04/2016	794 LF	794	0	0	0
		Routine	06/12/2016	794 LF	794	0	0	0
<p>Notes: The metal extrusion is down by nearly 2" at many of the expansion joints. 2005-16 Leaky joints. At bridge rail between walk and roadway. 2011-16</p>								
301	Pourable Joint Seal	Underwater	11/04/2016	322 LF	108	112	87	15
		Routine	06/12/2016	322 LF	108	112	87	15
<p>Notes: The east approach joint is spalled and cracked for 15 feet at the north end. 2016 The west approach joint needs to be resealed. 2012-16 Complete adhesion failure 87 feet - CS3. 2016 Minor adhesion failure 112 feet - CS2. 2016</p>								
321	Reinforced Concrete Approach Slab	Underwater	11/04/2016	2026 SF	1721	102	203	0
		Routine	06/12/2016	2026 SF	1721	102	203	0
<p>Notes: Minor to moderate deterioration. 2013-16 Unsealed moderate cracking is present. 2013-16 Minor spalling present. 2013-16 E. approach undermined at MH/paving block location. 2014 Ramsey County filled void with foam. 2014 The blacktop patch adjacent to the E. approach paving block seems to have heaved up a little. 2015 Temporary patches are present. 2016 Wide cracks are present. 2016 The E. approach is settling / sinking at the east edge - EB lanes. 2016</p>								
330	Metal Bridge Railing	Underwater	11/04/2016	5292 LF	4778	514	0	0
		Routine	06/12/2016	5292 LF	4778	514	0	0
<p>Notes: Railing joint areas rusted solid,-breaking mounting loose from parapet on both sides. 2010-13 EB is worst. 2010 Repaired 4 bridge railing joints 2011. Repaired 36 bridge railing joint locations on the S. side, in 2014. Steel top rail has moderate corrosion. 2013-15 Some of the welds on the vehicle railing are deteriorating. monitor 2016 Ornamental metal railing is at the outside of the walks. 2011</p>								
	515 - Steel Protective Coating	Underwater	11/04/2016	13230 SF	0	12716	0	514
		Routine	06/12/2016	13230 SF	0	12716	0	514
<p>Notes: Paint / coating system has minor to extensive failure. 2015 Recommend railing maintenance (prep and paint) 2014-15 All paint is faded and chalky. 2016 Paint at some bases is missing and rust is prevalent. 2016</p>								
331	Reinforced Concrete Bridge Railing	Underwater	11/04/2016	3430 LF	232	3180	18	0
		Routine	06/12/2016	3430 LF	232	3180	18	0
<p>Notes: Rust staining is present from steel railing above. 2016 Scale and pop outs are present through out. 2016 Spalls at cover plates and expansion areas. Greater than 1" deep. 2016</p>								

BRIDGE 3575 CSAH 42(FORD PKY) OVER MISS R; MISS BL

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
800	Critical Deficiencies or Safety Hazards	Underwater	11/04/2016	1 EA	1	0	0	0
		Routine	06/12/2016	1 EA	1	0	0	0
Notes: NO CRITICAL FINDINGS OBSERVED DURING THE LAST INSPECTION. 2016								
810	Concrete Decks - Cracking & Sealing	Underwater	11/04/2016	8097 LF	8097	0	0	0
		Routine	06/12/2016	8097 LF	8097	0	0	0
Notes: There are numerous 0.010" transverse hairline cracks in the N. and S. shoulder/ bicycle lane. 2005-16 There are numerous 0.010" transverse hairline cracks in the N. and S. sidewalks. 2016								
880	Impact Damage	Underwater	11/04/2016	1 EA	1	0	0	0
		Routine	06/12/2016	1 EA	1	0	0	0
Notes: Minor scrapes at MRB. No significant damage. 2016								
883	Concrete Shear Cracking	Underwater	11/04/2016	1 EA	1	0	0	0
		Routine	06/12/2016	1 EA	1	0	0	0
Notes: Use this element to monitor the presence of shear cracking on concrete elements. Pay particular attention to the concrete pier caps.								
885	Scour	Underwater	11/04/2016	1 EA	0	1	0	0
Notes: [2016] Underwater Inspection - Localized scour depressions were observed around the upstream end of Piers 8 and 9 with typical depths of 5 to 10 feet, and concrete rubble with protruding reinforcing steel was found on the base of the scour depression.								
890	Load Posting or Vertical Clearance Signing	Underwater	11/04/2016	1 EA	1	0	0	0
		Routine	06/12/2016	1 EA	1	0	0	0
Notes: The vertical clearance signs are in place and in good condition. 2016 They are located on the roadway that runs under the bridge, at the east end. (St. Paul side) 2016								
892	Slopes & Slope Protection	Underwater	11/04/2016	1 EA	0	0	0	1
		Routine	06/12/2016	1 EA	0	0	0	1
Notes: There is minor washing out at the S. side of Pier 6 and the north side of pier 12. 2007 The north bank of the west abutment moderate erosion around the drainage pipe. See inspection pictures 5-7 in photo library dated 2008-10 [2009] Very significant washout continuing on the St. Paul side of the structure. Material being transported from the slope and under the structure down to the riverbank creating a large berm. Additional erosion has added to the material down slope on the East side. 2010-16 Severe erosion, repairs are recommended. 2012-16								
894	Deck & Approach Drainage	Underwater	11/04/2016	1 EA	0	0	0	1
		Routine	06/12/2016	1 EA	0	0	0	1
Notes: Runoff from sidewalks creates dripline at the bridge edges below at the slope areas. 2013-16 Saturated soils at the abuts. Water runs frequently creating erosion. W and E sides 2013-16 End of pipe drainage area has severe erosion issue. E.side near pier 6. 2013-16 CB lead creating undermined area at E.approach paving block/MH location. 2014 Ramsey County foamed the void under the pavement. 2014 MH at E.approach found to be plugged with debris. 2014 Notified bridge owner - Ramsey County. 2014 Drainage system has failed, Runoff has resulted in slope erosion. 2014-16								
895	Sidewalk, Curb, & Median	Underwater	11/04/2016	1 EA	0	0	0	1
		Routine	06/12/2016	1 EA	0	0	0	1
Notes: Numerous transverse cracks & random cracks in the walks. 2005-15 Sidewalk width 11.5' X length 1516' X 2 = 34,880 sq. ft. of concrete walk. 2016 3" settlement SW approach walk. 2016 2" settlement NW approach walk. 2016								

BRIDGE 3575 CSAH 42(FORD PKY) OVER MISS R; MISS BL

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
899	Miscellaneous Items	Underwater	11/04/2016	1 EA	1	0	0	0
		Routine	06/12/2016	1 EA	1	0	0	0
Notes: Construction debris on top of bridge members from reconstruction of deck. 2011-14 There is 64 light standards on the bridge. 2016								
900	Protected Species	Underwater	11/04/2016	1 EA	0	1	0	0
		Routine	06/12/2016	1 EA	0	1	0	0
Notes: Swallows and Peregrine Falcons are present. 2016								

General Notes: The vertical control monument is at the west end of the north railing. 2007
Received as-built plans from the county in 2011.

58. Deck NBI: Minor cracking, leaching and wear. 2013-15

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail
Terminal NBI:

59. Superstructure NBI: Minor scaling and cracking. 2011

60. Substructure NBI: Minor to moderate deterioration. 2015
Light to moderate scaling present at the piers. 2015

61. Channel NBI: See underwater inspection from 2012.
Collins Engineering, Inc.
Job No. 7423

62. Culvert NBI:

71. Waterway Adeq NBI:

72. Appr Roadway
Alignment NBI:

Inspector's Signature

Reviewer's Signature

Pictures

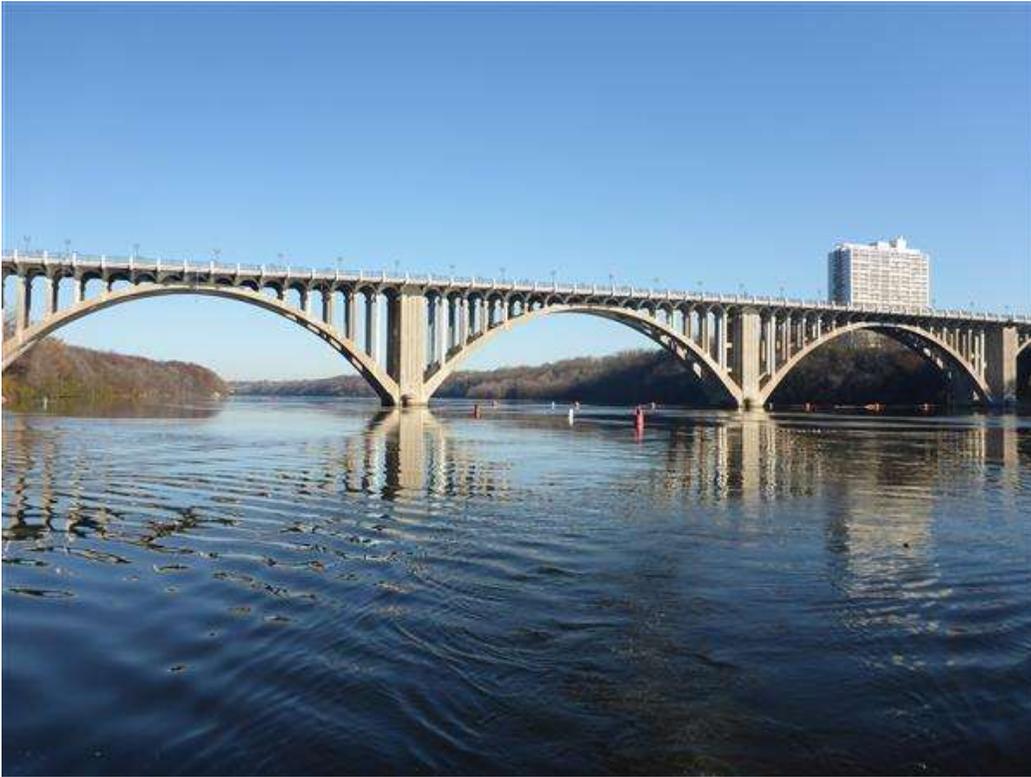


Photo 1 - Downstream Elevation Looking North



Photo 2 - Upstream View Looking South

Pictures



Photo 3 - View of East Shoreline Looking South



Photo 4 - Typical View of Pier 7 Looking Southeast

Pictures



Photo 5 - Typical View of Pier 8 Looking Southwest

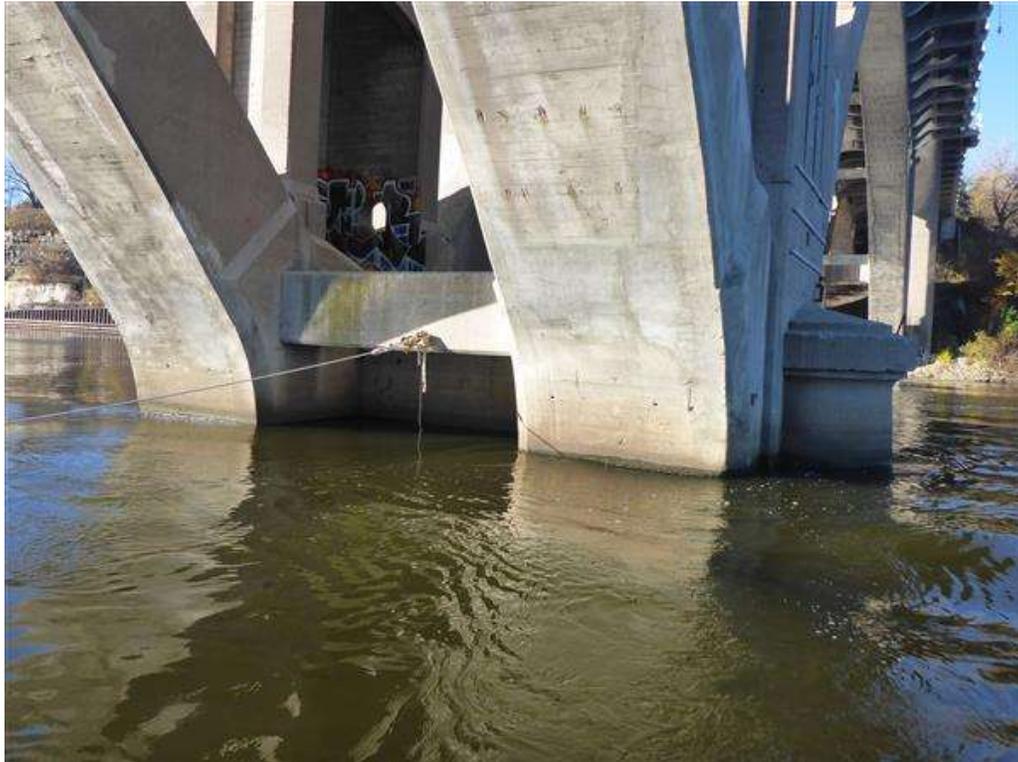


Photo 6 - Typical View of Pier 9 Looking Southwest

Pictures



Photo 7 - View of Pier 9 Looking Northeast

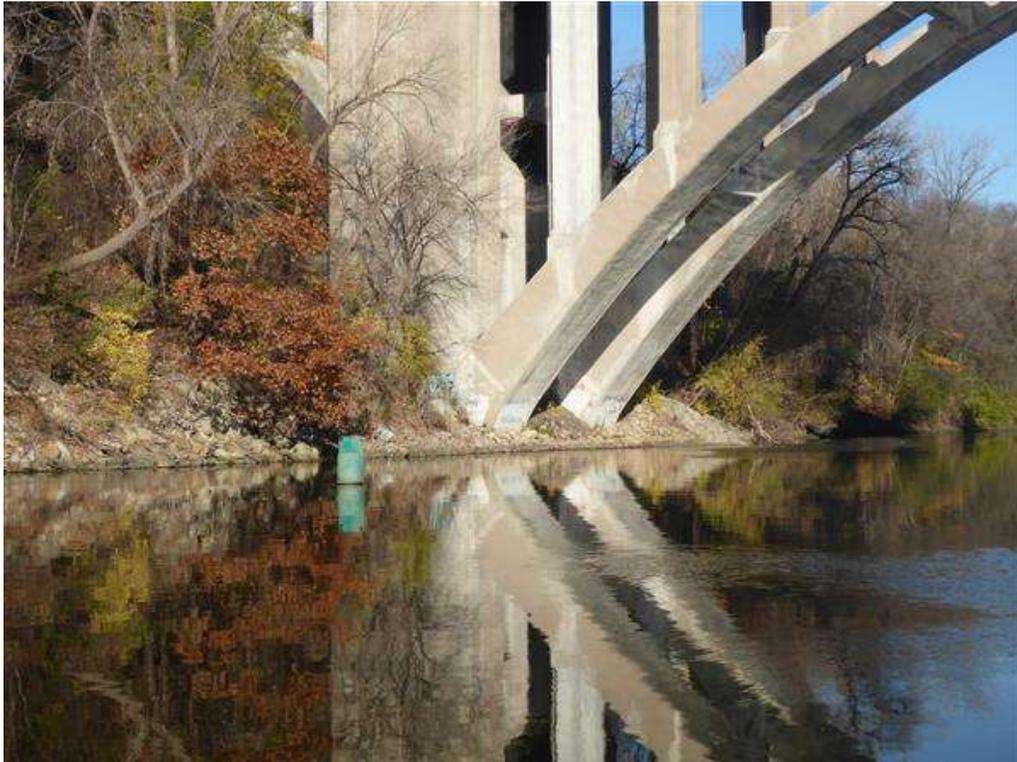
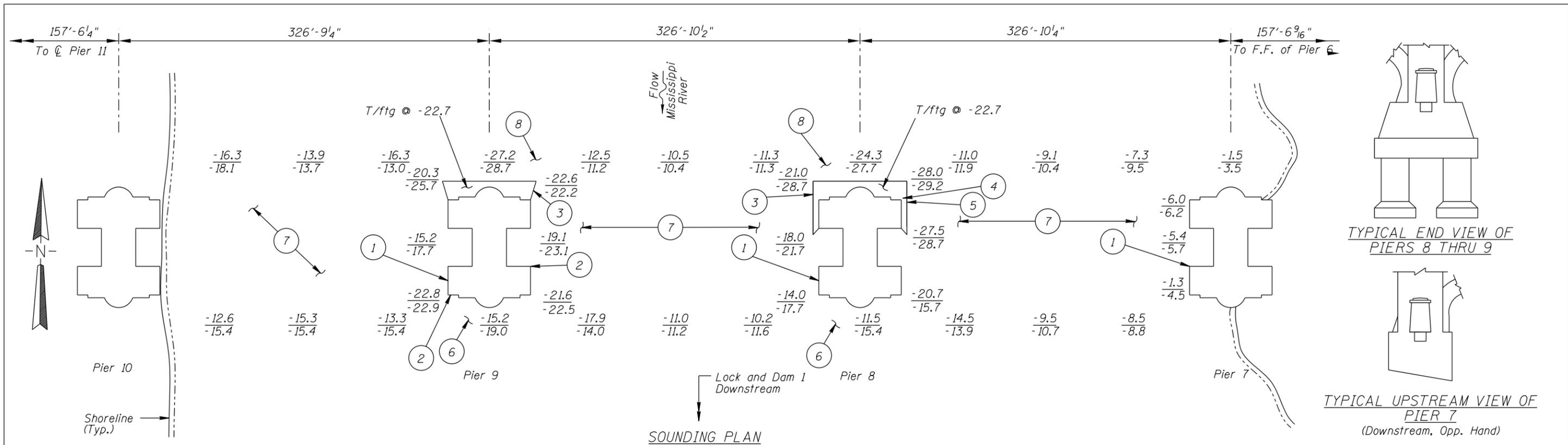


Photo 8 - Typical View of Shoreline and Pier 10 Looking Northwest



SOUNDING PLAN

GENERAL NOTES:

1. Piers 7, 8 and 9 were inspected underwater.
2. At the time of inspection on November 4, 2016, the waterline was located approximately 4.6 feet below the Bench Mark reference joint of El. 730.0 at the downstream end of Pier 9. This corresponds with a waterline elevation of 725.4 based on the reference.
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.

INSPECTION NOTES:

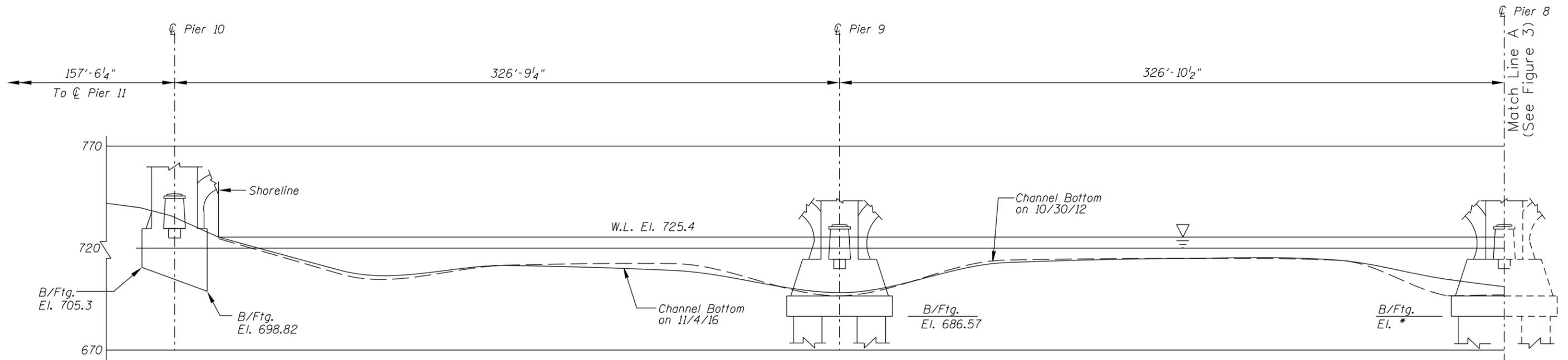
INSPECTION NOTES: (cont.)

- 1 Overall, the concrete was satisfactory condition with light to moderate scaling around the perimeter of the piers, with random areas of section loss (1 to 3 inches of penetration typical), from 2 feet above to 2 feet below the waterline.
- 2 An area of concrete was spalled, 2 feet by 2 feet with 2 inches of penetration, at 3 feet below the waterline.
- 3 The footing was exposed around the upstream third of Pier 8 and along the upstream face of Pier 9. Timber formwork was encountered along the footings of Piers 8 and 9. The exposed portion of the footings exhibited widespread heavy scaling with 1 to 2 feet of penetration and a maximum vertical face exposure of 6 feet (full height) at Pier 8. No vertical face exposure at Pier 9.
- 4 The footing at the northeast corner of Pier 8 was undermined, with a cavity measuring 3 feet long by 1 foot high with up to 1 foot of horizontal penetration.
- 5 A void was found in the side of the footing, measuring 2 feet in diameter with 3 feet of penetration, located at the northeast corner of Pier 8.
- 6 Areas of silty sand deposition (infilling) were located at the downstream ends of Piers 8 and 9 covering the footings.

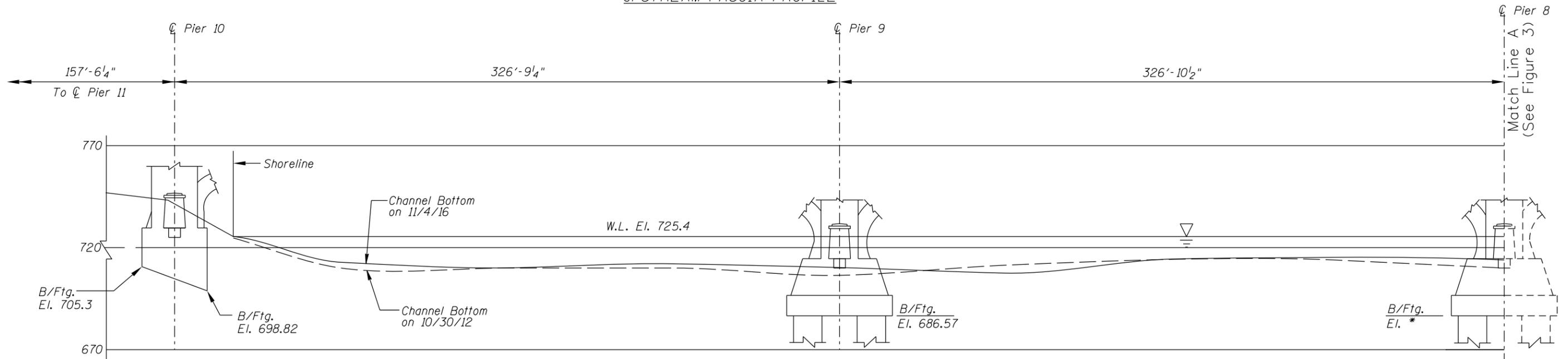
- 7 The channel bottom consisted of gravel and sand with scattered concrete rubble, reinforcing steel and riprap around the substructure units. The concrete rubble had protruding reinforcing steel and appeared to have been placed / dropped as part of bridge rehabilitation.
- 8 Localized scour depressions were observed around the upstream end of Piers 8 and 9 with typical depths of 5 to 10 feet, and concrete rubble with protruding reinforcing steel was found on the base of the scour depression.

Legend	Note:
-2.0	Sounding Depth (11/4/16)
-5.2	Sounding Depth (10/30/12)
All soundings based on 2016 waterline location.	

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 3575 OVER THE MISSISSIPPI RIVER CITY OF ST. PAUL, RAMSEY COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: GRO	COLLINS ENGINEERS	Date: JAN. 2017
Checked By: CRS		Scale: NTS
Project: 63-9687		Figure No.: 1



UPSTREAM FASCIA PROFILE

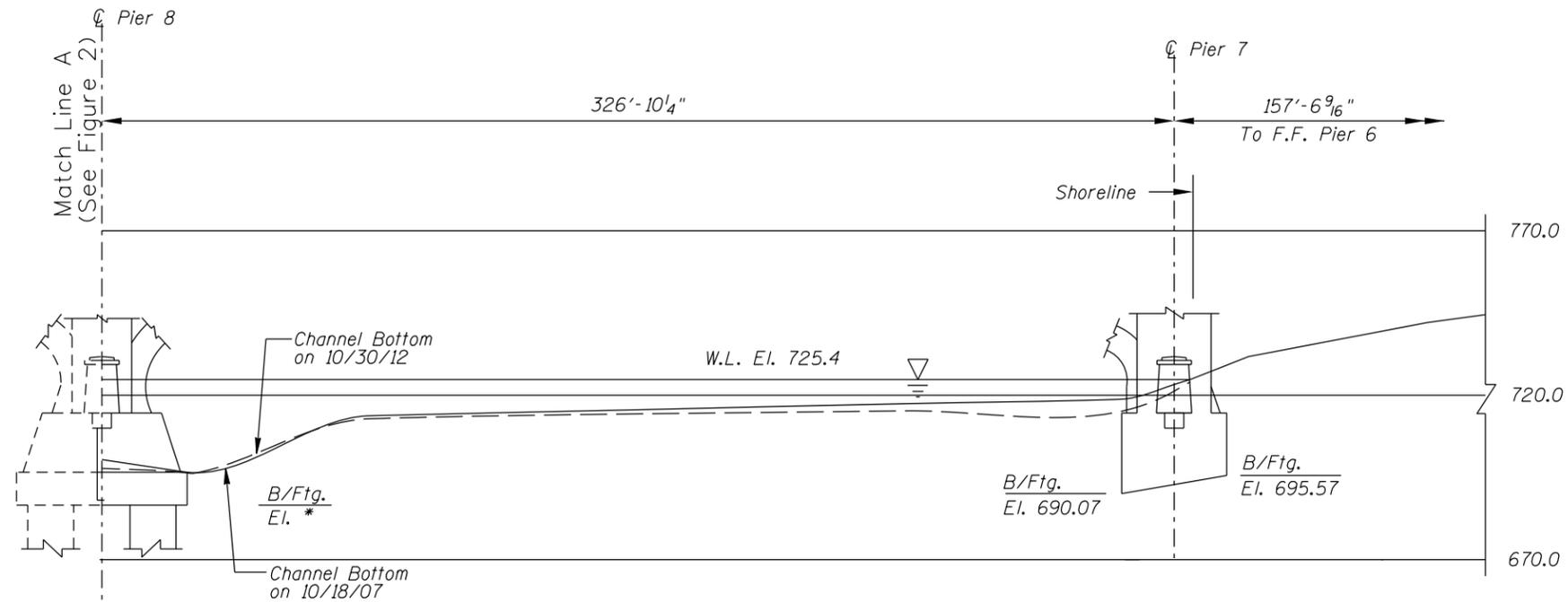


DOWNSTREAM FASCIA PROFILE

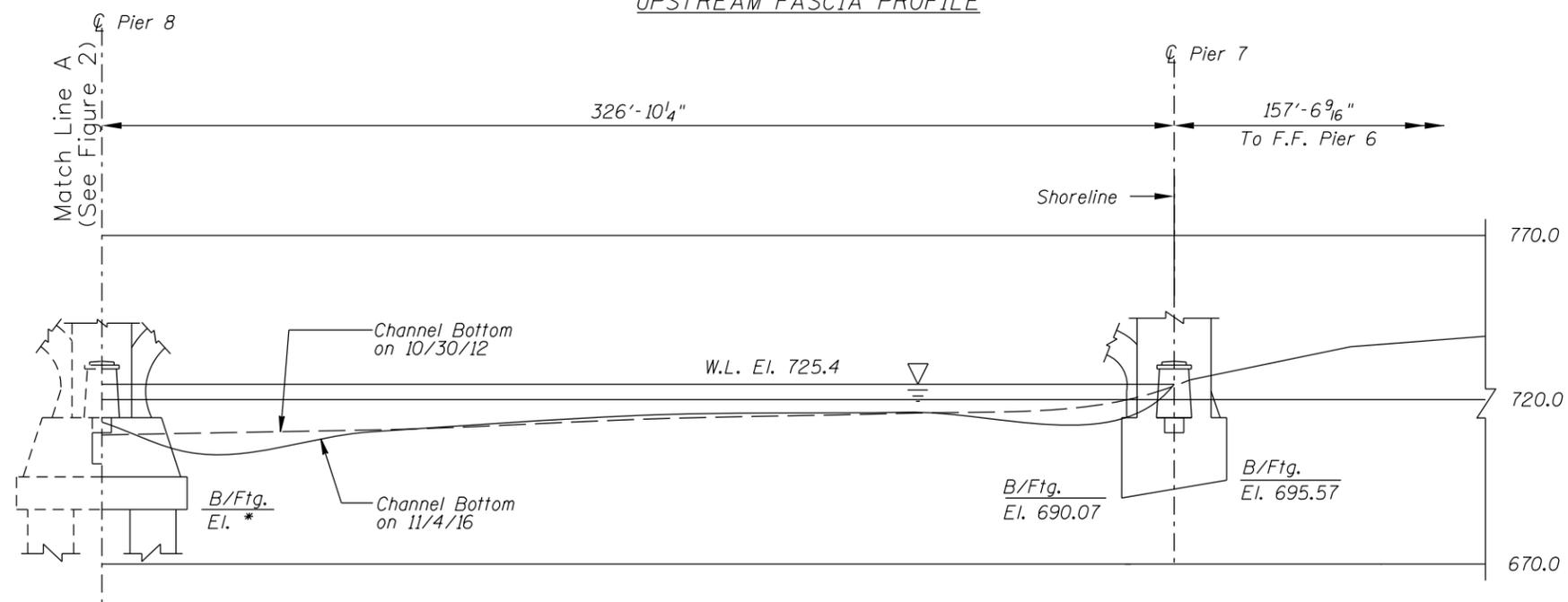
* The bottom of footing elevation noted on the Design Plans does not correspond to the soundings and/or undermining detected at the time of the underwater inspection.

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 3575 OVER THE MISSISSIPPI RIVER CITY OF ST. PAUL, RAMSEY COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: GRO	COLLINS ENGINEERS <small>1599 Selby Avenue Suite 206 St. Paul, MN 55104 (651) 646-8502 www.collinsengr.com</small>	Date: JAN. 2017
Checked By: CRS		Scale: 1"=50'
Project: 63-9687		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

* The bottom of footing elevation noted on the Design Plans does not correspond to the soundings and/or undermining detected at the time of the underwater inspection.

Note:

Refer to Figure 1 for General Notes.

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STRUCTURE NO. 3575 OVER THE MISSISSIPPI RIVER CITY OF ST. PAUL, RAMSEY COUNTY		
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Checked By: CRS		Scale: 1"=50'
Project: 63-9687		Figure No.: 3