

2017 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 97918 CR 725 over HELLEWEGS CREEK

DISTRICT: District 1

COUNTY: St. Louis

CITY/TOWNSHIP: NORTHLAND

STATE: Minnesota

Date of Inspection: 09/13/2016

Equipment Used:

Owner: County Highway Agency

Inspected By: Janulis, Lukas

Report Written By: Lukas Janulis

Report Reviewed By:

Final Report Date:



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UNDERWATER INSPECTION

REPORT SUMMARY

The substructure unit inspect at Bridge No. 97918, a pre-cast concrete pipe arch culvert, was found to be in good condition, with no defects of structural significance below water. The concrete of all exposed surfaces was smooth and sound with no notable deterioration. All of the joints were in good condition with no gaps or escaping backfill. The culvert floor was exposed throughout and up to 1 foot of toe exposure was observed at the upstream opening. The overall condition of the culvert has not changed since the previous underwater inspection. According to the bridge inventory the culvert should consist of 3 precast pipes, however, at the time of the inspection only one pipe was able to be located due to heavy vegetation at both the upstream and downstream ends.

INSPECTION FINDINGS

(A) The channel bottom material at the upstream opening of the culvert typically consisted of soft silt and small timber debris allowing a maximum probe rod penetration of 1 foot.

(B) The channel bottom material at the downstream opening of the culvert typically consisted of sandy silt and stones allowing a maximum probe rod penetration of 6 inches.

(C) All exposed concrete surfaces were smooth and sound.

(D) All concrete joints were well aligned and with no notable gaps between culvert sections.

(E) The floor of the culvert was exposed throughout the length of the culvert and at the upstream toe with a maximum vertical toe exposure of 1 foot.

RECOMMENDATIONS

(A) Reinspect the submerged substructure unit 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 #: 97918
Feature Intersected: HELLEWEGS CREEK
Facility Carried: CR 725
District: District 1
County: 069 - St. Louis
Bridge Description:

The substructure consists of an 8 foot wide by 5 foot high precast concrete pipe arch culvert.

2. INSPECTION DATA

Professional Engineer/Team Leader: Lukas Janulis
Inspection Diver: Lukas Janulis
Date of Underwater Inspection: 09/13/2016
Weather Conditions: Cloudy, 61F
Underwater Visibility (feet): 2.0 feet
Waterway Velocity (ft/sec): Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Concrete pipe culvert
General Shape:

An 8 foot wide by 5 foot wide precast concrete pipe arch culvert.

Maximum Water Depth at Substructure(s) Inspected (feet): 6.5 feet

4. WATERLINE DATUM

Water Level Reference: The top of the culvert inversion at the upstream opening.
Waterline Elevation (feet): 102.2 feet
Description: The waterline was located 2.2 feet above the reference.

5. NBIS CODING INFORMATION

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

Item 60: Substructure: Code:
Item 61: Channel and Channel Protection: Code: 6
Item 62: Culvert: Code: 7
Item 92B: Underwater Inspection: Code: Y 48 09/2016

Item 113: Scour Critical Bridge:

Code: E

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
241	Concrete Culvert	264	LF	264			
870	Culvert End Treatment	6	EA	6			
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 97918 (C.R. 725 over Hellewegs Creek) was completed on September 13, 2016. The underwater inspection was conducted from shore. The inspection was conducted by a team consisting of a Professional Engineer Diver with a valid MnDOT Team Leader certification, a backup diver and dive tender. The inspection utilized commercial dive equipment and techniques in accordance with OSHA regulations. Channel bottom profiles were taken along the upstream and downstream openings to determine the presence, location and area of scour. The element inspected was the precast concrete arch culvert. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The maximum routine underwater inspection frequency is recommended to remain at 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.

Minnesota Structure Inventory Report

Bridge ID: 97918

CR 725 over HELLEWEGS CREEK

Date: 01/27/2017

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. 189 Crew District 01 Maint. Area County 069 - St. Louis City Township 69053 - NORTHLAND Desc. Loc. 0.1 MI W OF JCT TH 53 Sect., Twp., Range 34 - 053N - 17W Latitude 47 ° 1' 31.64 " Longitude 92 ° 28' 29.50 " Custodian 02 - County Highway Agency Owner 02 - County Highway Agency BMU Agreement Year Built 1993 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 3 - COUNTY Date Opened to Traffic 9/1/1993 On - Off System 0 - OFF Legislative District 05B Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 07 - CNTY Number 725 Roadway Name or Description CR 725 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 013+00.060 Detour Length 8.0 mi. Lanes ON 2 UNDER 0 ADT 55 YEAR 2003 HCA DT ADTT % Functional Class 09 - Rural - Local	Userkey 109 Structurally Deficient N Functionally Obsolete N Sufficiency Rating 100.0 Routine Inspection Date 09/15/2016 Routine Inspection Frequency 48 Inspector Name Janulis, Lukas Status A - Open																				
		+ NBI CONDITION RATINGS +																				
		Deck N Unsound Deck % Superstructure N Substructure N Channel 6 Culvert 7																				
		+ NBI APPRAISAL RATINGS +																				
		Structure Evaluation 7 Deck Geometry N Underclearances N Waterway Adequacy 7 Approach Alignment 8																				
		+ SAFETY FEATURES +																				
		Bridge Railing N - NOT REQUIRED GR Transition N - NOT REQUIRED Appr. Guardrail N - NOT REQUIRED GR Termini N - NOT REQUIRED																				
		+ IN DEPTH INSP. +																				
		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">Y/N</th> <th style="width: 10%; text-align: center;">Freq</th> <th style="width: 20%; text-align: center;">Date</th> </tr> </thead> <tbody> <tr> <td>Frac. Critical</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Underwater</td> <td></td> <td style="text-align: center;">60</td> <td style="text-align: center;">09/13/2016</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	09/13/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater		60	09/13/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
		Drainage Area (sq. mi.) 22.0 Waterway Opening (sf.) 105 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 E - CULVERT Year 1993																				
		+ CAPACITY RATINGS +																				
		Design Load 5 - HS 20 Operating Rating 2 - HS TRUCK 33.0 Inventory Rating 2 - HS TRUCK 22.0 Posting VEH: SEMI: DBL: Rating Date 10/1/1996 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 15 - Pipe Arch Main Span Detail Appr. Span Type Appr. Span Design Appr. Span Detail Skew 45 RIGHT Culvert Type 102"X62" Barrel Length 88 Cantilever ID Number of Spans MAIN: 3 APPR: 0 TOTAL: Main Span Length 12.0 ft. Structure Length 51.0 ft. Deck Width (Out-to-Out) 0.0 ft. Deck Material N - Not Applicable Wear Surf Type 8 - Gravel Wear Surf Install Year Wear Course/Fill Depth 3.50 ft. Deck Membrane N - Not Applicable (applies Deck Rebars N - Not Applicable (no deck) Deck Rebars Install Year Structure Area (Out-to-Out) 0 sq. ft. Roadway Area (Curb-to-Curb) 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 NN Rt NN	If Divided NB-EB SB-WB Roadway Width 34.00 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 34.0 ft. Bridge Roadway Width 0.0 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) N - N/A Pier Foundation (Material/Type) N - N/A 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

02/03/2017

BRIDGE 97918 CR 725 OVER HELLEWEGS CREEK

County: St. Louis	Location: 0.1 MI W OF JCT TH 53	Length: 51.0 ft.
City:	Route: 07 - CNTY 725 Ref. Pt.: 013+00.060	Deck Width: 0.0 ft.
Township: 69053 - NORTHLAND	Control Section:	Rdwy. Area/ Pct. Unsnd: sq. ft. / %
Section: 34 Township: 053N Range: 17W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 1 - Concrete 19 - Culvert (includes frame culverts)	Local Agency Bridge Nbr.: 189	Culvert: 102"X62"
List:		Postings:
NBI Deck: N Super: N Sub: N Chan: 6 Culv: 7		
	Open, Posted, Closed: A - Open	
	MN Scour Code: E - CULVERT	

Appraisal Ratings - Approach: 8 Waterway: 7	Unofficial Structurally Deficient N
Required Bridge Signs - Load Posting: 0 - Not Required	Unofficial Functionally Obsolete N
Horizontal: 0 - Not Required	Unofficial Sufficiency Rating 100.0
Traffic: 0 - Not Required	
Vertical: N - Not Applicable	

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
241	Reinforced Concrete Culvert	Underwater	01/27/2017	264 LF	264	0	0	0
		Routine	09/15/2016	264 LF	264	0	0	0
Notes: [2016] 1.25' of water over top of culverts. Unable to see culverts. [2014] Water over top of culverts due to beaver dam to south. [2013] May 13 culvert under water. [2012 Underwater] All exposed concrete surfaces were smooth and sound. All joints were well aligned and with no notable gaps between sections. WATER TO TOP OF OPENING OF CENTERLINE AT N END, TOO DEEP TO OBSERVE ANYTHING (""99,""00,""01). Water over pipes 2011.								
800	Critical Deficiencies or Safety Hazards	Underwater	01/27/2017	1 EA	1	0	0	0
		Routine	09/15/2016	1 EA	1	0	0	0
Notes: [2016-2013] No critical deficiencies or safety hazards found during this inspection.								
870	Culvert End Treatment	Underwater	01/27/2017	6 EA	6	0	0	0
		Routine	09/15/2016	6 EA	6	0	0	0
Notes: [2016] 1.25' of water over top of aprons. Unable to see aprons. [2014] Water over aprons due to beaver dam to south. [2013] No change. [2012 Underwater] All exposed concrete surfaces were smooth and sound. All joints were well aligned and with no notable gaps between sections.								
871	Roadway Over Culvert	Underwater	01/27/2017	1 EA	1	0	0	0
		Routine	09/15/2016	1 EA	1	0	0	0
Notes: [2016-2013] No signs of settlement or undermining. Gravel.								
885	Scour	Underwater	01/27/2017	0 EA	1	0	0	0
891	Other Bridge Signing	Underwater	01/27/2017	1 EA	0	0	1	0
		Routine	09/15/2016	1 EA	0	0	1	0
Notes: [2016-2013] No culvert markers.								
892	Slopes & Slope Protection	Underwater	01/27/2017	1 EA	1	0	0	0
		Routine	09/15/2016	1 EA	1	0	0	0
Notes: [2016-2013] Slopes are protected by vegetation. (Slopes mostly underwater)								

BRIDGE 97918 CR 725 OVER HELLEWEGS CREEK

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
894	Deck & Approach Drainage	Underwater	01/27/2017	1 EA	1	0	0	0
		Routine	09/15/2016	1 EA	1	0	0	0
Notes: [2016-2013] No notable ponding or drainage-related slope erosion,								
900	Protected Species	Underwater	01/27/2017	1 EA	1	0	0	0
		Routine	09/15/2016	1 EA	1	0	0	0
Notes: [2016] No protected species present.								

General Notes: SLC District 5
 Inspected by: [2016] CG : [2014] CG, BH : [2013] BH, CG.
 [2016-2013] Beaver dam located 50' downstream of culverts.

58. Deck NBI:

36A. Brdg Railings NBI: Roadway meets minimum requirements for Minnesota rule 8820.9920 for ADT 50 - 149. No guardrail required.

36B. Transitions NBI: Roadway meets minimum requirements for Minnesota rule 8820.9920 for ADT 50 - 149. No guardrail required.

36C. Appr Guardrail NBI: Roadway meets minimum requirements for Minnesota rule 8820.9920 for ADT 50 - 149. No guardrail required.

36D. Appr Guardrail Terminal NBI: Roadway meets minimum requirements for Minnesota rule 8820.9920 for ADT 50 - 149. No guardrail required.

59. Superstructure NBI:

60. Substructure NBI:

61. Channel NBI: [2016] Deterioration to channel banks due to constant high water.
 [2014] Beaver dam blocking stream to south of bridge.
 [2012 Underwater] Floor of the culvert was exposed throughout the length of the culvert.

62. Culvert NBI: [2016] 1.25' of water over top of culverts. Unable to see culverts.
 [2014] Water over top of culverts due to beaver dam to south.
 [2012] All exposed concrete surfaces were smooth and sound. All joints were well aligned and with no notable gaps between sections.

71. Waterway Adeq NBI: [2016-2014] Water frequently over top or to tops of culverts.

72. Appr Roadway Alignment NBI: [2016-2014] Road flat and straight. No speed reduction required.

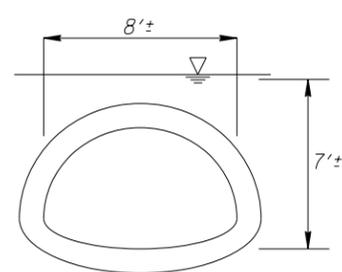
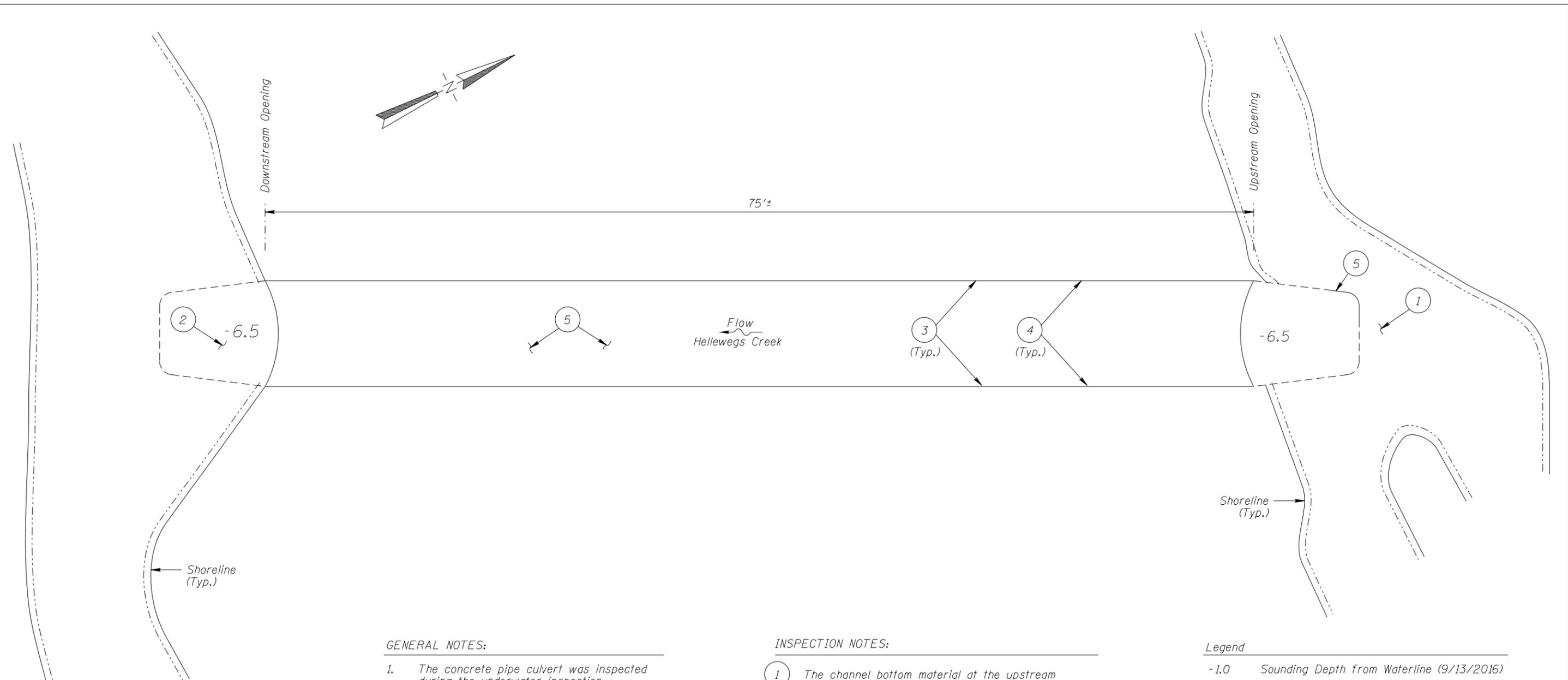
 Inspector's Signature

 Reviewer's Signature

Pictures



Photo 1 - Upstream Opening (Submerged), Looking Northeast



TYPICAL END VIEW OF CULVERT

GENERAL NOTES:

1. The concrete pipe culvert was inspected during the underwater inspection.
2. At the time of inspection on September 13, 2016, the waterline was located approximately 2.2 feet above the top of the culvert at the upstream opening. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 102.2.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

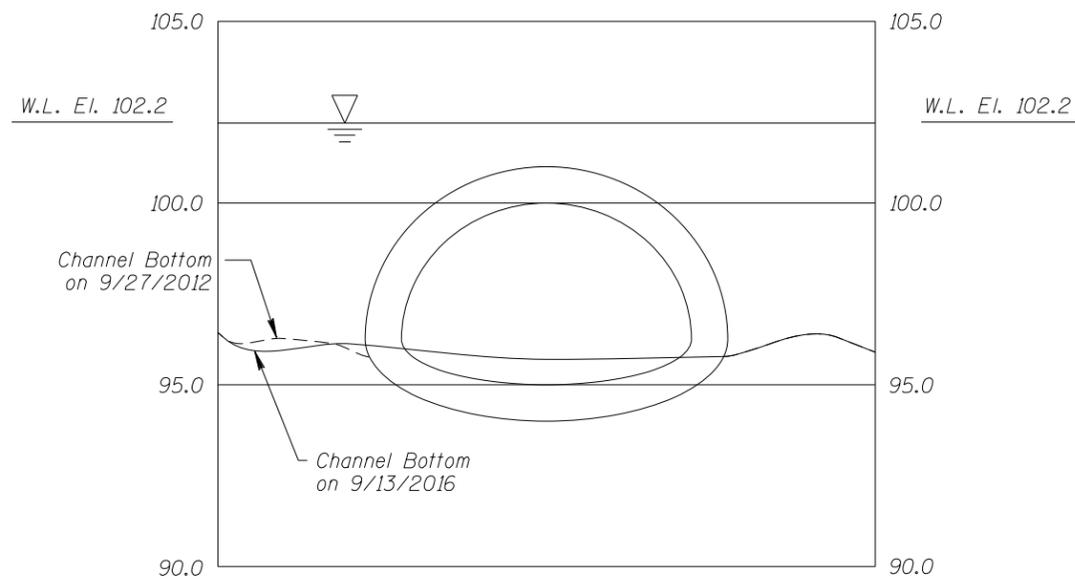
INSPECTION NOTES:

1. The channel bottom material at the upstream opening of the culvert typically consisted of soft silt and small timber debris allowing a maximum probe rod penetration of 1 foot.
2. The channel bottom material at the downstream opening of the culvert typically consisted of sandy silt and stones allowing a maximum probe rod penetration of 6 inches.
3. All exposed concrete surfaces were smooth and sound.
4. All concrete joints were well aligned and with no notable gaps between culvert sections.
5. The floor of the culvert was exposed throughout the length of the culvert and at the upstream toe with a maximum vertical toe exposure of 1 foot.

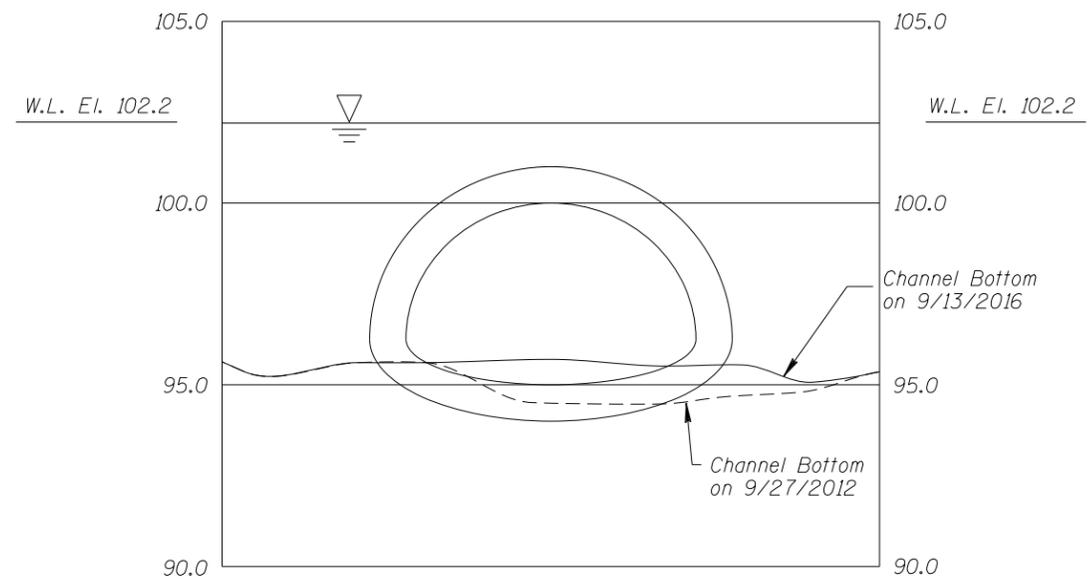
Legend

- 1.0 Sounding Depth from Waterline (9/13/2016)
- A Pile Identification Designation
- 1 Inspection Note Number

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 97918 CR 725 OVER THE HELLEWAGS CREEK DISTRICT 1, ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
DRAWN BY: RT	COLLINS ENGINEERS	DATE: SEPT 13, 2016
CHECKED BY: LJ	<small>133 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	SCALE: NTS
CODE: 968797918		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. 97918 CR 725 OVER THE HELLEWAGS CREEK DISTRICT 1, ST. LOUIS COUNTY UPSTREAM AND DOWNTREAM FASCIA PROFILES		
DRAWN BY: RT	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	DATE: SEPT 13, 2016
CHECKED BY: LJ		SCALE: NTS
CODE: 968797918		FIGURE NO.: 2