

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # L4177 CSAH 116 over HUNTING SHACK RIVER

DISTRICT: District 1 COUNTY: St. Louis CITY/TOWNSHIP: T - 65 R - 16

STATE: Minnesota

Date of Inspection: 06/19/2016

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 inspected at structure No. L4177, a corrugated metal pipe culvert, was found to be generally in satisfactory to fair condition below water with no defects of structural significance. The corrugated steel pipe exhibited light surface corrosion at the waterline with no significant loss of section. The culvert openings were well armored with riprap.

INSPECTION FINDINGS

- A) The culvert exhibited good galvanizing and only minor surface corrosion with negligible loss of section.
- B) The culvert alignment was in good condition with no deflections or distortions. The joints/fasteners were in place and secure.
- C) The culvert pipe bottom was fairly clean of any infill with only randomly interspersed sandy gravel as well as small rocks.
- D) The culvert openings were well protected against scour/erosion by up to 1 foot diameter riprap.

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 #: L4177
Feature Intersected: HUNTING SHACK RIVER
Facility Carried: CSAH 116
District: District 1
County: 069 - St. Louis
Bridge Description:
The structure consists of a corrugated metal pipe culvert.

2. INSPECTION DATA

Professional Engineer/Team Leader: Lukas Janulis
Inspection Diver: Lukas Janulis
Date of Underwater Inspection: 06/19/2016
Weather Conditions: Overcast, 80°F
Underwater Visibility (feet): 2.0 feet
Waterway Velocity (ft/sec): Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Corrugated Metal Pipe Culvert.
General Shape:
Oval Corrugated Metal Pipe.

Maximum Water Depth at Substructure(s) Inspected (feet): Approximately 3.4 feet

4. WATERLINE DATUM

Water Level Reference: Top of the Culvert pipe at the crown of the downstream opening.
Waterline Elevation (feet): 96.3 feet
Description: The waterline was approximately 3.7 feet below 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: 8
Item 62: Culvert: Code: 5
Item 92B: Underwater Inspection: Code: Y 48 06/2016

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
240	Steel Culvert	56	LF			56	
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge L4177 (CSAH 116 over Hunting Shack River) was completed on June 19, 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. Due to waterway conditions at the time of the inspection, the inspection could be accomplished by wading in accordance with OSHA regulations. Profiles were taken along the upstream and downstream openings to determine the presence, location and area of scour.

The bridge element inspected was the corrugated metal pipe. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for bottom foundations. The 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 and 10% Level II intensity efforts.

Minnesota Structure Inventory Report

Bridge ID: L4177

CSAH 116 over HUNTING SHACK RIVER

Date: 08/12/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. 341 Crew District 01 Maint. Area County 069 - St. Louis City Township 69111 - T - 65 R - 16 Desc. Loc. 11.2 MI E OF JCT CR670 Sect., Twp., Range 2 - 065N - 16W Latitude 48 ° 8 ' 8.36 " Longitude 92 ° 21 ' 2.58 " Custodian 02 - County Highway Agency Owner 02 - County Highway Agency BMU Agreement Year Built 1956 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 0 - NO PLAN Date Opened to Traffic On - Off System 1 - ON Legislative District 06A Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 04 - CSAH Number 116 Roadway Name or Description CSAH 116 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 008+00.830 Detour Length 75.0 mi. Lanes ON 2 UNDER 0 ADT 210 YEAR 2008 HCA DT ADTT % Functional Class 07 - Rural - Major Collector	Userkey 109 Structurally Deficient N Functionally Obsolete N Sufficiency Rating 80.7 Routine Inspection Date 06/08/2015 Routine Inspection Frequency 24 Inspector Name Janulis, Lukas Status A - Open																				
		+ NBI CONDITION RATINGS +																				
		Deck N Unsound Deck % Superstructure N Substructure N Channel 8 Culvert 5																				
		+ NBI APPRAISAL RATINGS +																				
		Structure Evaluation 5 Deck Geometry N Underclearances N Waterway Adequacy 8 Approach Alignment 7																				
		+ 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;">06/19/2016</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	06/19/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater		60	06/19/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
		Drainage Area (sq. mi.) Waterway Opening (sf.) 81 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																				
		+ CAPACITY RATINGS +																				
		Design Load 4 - H 20 Operating Rating 1 - H TRUCK 22.0 Inventory Rating 1 - H TRUCK 16.0 Posting VEH: SEMI: DBL: Rating Date 2/1/1991 <p style="text-align: center;">Overweight Permit Codes</p> 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 3 - Steel Main Span Design 15 - Pipe Arch Main Span Detail Appr. Span Type Appr. Span Design Appr. Span Detail Skew 25 LEFT Culvert Type 12'8"X8'1" Barrel Length 56 Cantilever ID	If Divided NB-EB SB-WB Roadway Width 28.00 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 38.0 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																				
Number of Spans MAIN: 1 APPR: 0 TOTAL: Main Span Length 14.0 ft. Structure Length 14.0 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 3.00 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																						

MINNESOTA BRIDGE INSPECTION REPORT

08/30/2016

Inspector: CO Bridge

BRIDGE L4177 CSAH 116 OVER HUNTING SHACK RIVER

County: St. Louis	Location: 11.2 MI E OF JCT CR670	Length: 14.0 ft.
City:	Route: 04 - CSAH 116 Ref. Pt.: 008+00.830	Deck Width: 0.0 ft.
Township: 69111 - T - 65 R - 16	Control Section:	Rdwy. Area/ Pct. Unsnd: sq. ft. / %
Section: 2 Township: 065N Range: 16W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 3 - Steel 19 - Culvert (includes frame culverts)	Local Agency Bridge Nbr.: 341	Culvert: 12'8"X8'1"
List:		Postings:
NBI Deck: N Super: N Sub: N Chan: 8 Culv: 5		
	Open, Posted, Closed: A - Open	
	MN Scour Code: E - CULVERT	

Appraisal Ratings - Approach: 7	Waterway: 8	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	80.7

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
240	Steel Culvert	Underwater	08/12/2016	56 LF	0	0	56	0
		Migrated Values		56 LF	0	0	56	0
	Notes: [2015-2014] Culvert has minor surface corrosion at waterline with no significant section loss (2012 Underwater inspection). No sign of distortion or deflection. [2013] Rusting with much pitting of steel at water line consistent throughout barrel. RUSTING AT BOTTOM. SOMEWHAT SHORT FOR ROAD. DEFLECTION AT CENTER OF PIPE APROX. 6" (1996).							
	515 - Steel Protective Coating	Underwater	08/12/2016	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.							
800	Critical Deficiencies or Safety Hazards	Underwater	08/12/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
	Notes: [2015-2013] No critical findings during inspection.							
871	Roadway Over Culvert	Underwater	08/12/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
	Notes: [2015-2013] No signs of settlement or undermining. Gravel.							
885	Scour	Underwater	08/12/2016	1 EA	1	0	0	0
891	Other Bridge Signing	Underwater	08/12/2016	1 EA	0	0	1	0
		Migrated Values		1 EA	0	0	1	0
	Notes: [2015-2013] Culvert markers are absent.							
892	Slopes & Slope Protection	Underwater	08/12/2016	2 EA	0	2	0	0
		Migrated Values		2 EA	0	2	0	0
	Notes: [2015-2013] No notable slope erosion present. Roadway shoulder to top of culvert openings making slopes steep. Riprap and established veg. Steep.							
894	Deck & Approach Drainage	Underwater	08/12/2016	2 EA	1	1	0	0
		Migrated Values		2 EA	1	1	0	0
	Notes: [2015] Shoulder washing above south end of culvert. [2014-2013] No erosion.							

BRIDGE L4177 CSAH 116 OVER HUNTING SHACK RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
900	Protected Species	Underwater	08/12/2016	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: SLC District 4
 Inspected by: [2015] CG, ZK : [2014] BH, CG [2013] BH, JDO.
 Needs delineators.
 No Guardrail.

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: [2015-2014] Culvert bottom fairly clean with only randomly interspersed sandy gravel as well as small rocks (2012 Underwater inspection). Banks protected around culvert by riprap and vegetation. River slow moving no noticeable bank erosion.

62. Culvert NBI: [2015-2014] Culvert has minor surface corrosion at waterline with no significant section loss (2012 Underwater inspection). No sign of distortion or deflection.
 [2013] Rusting with much pitting of steel at water line

71. Waterway Adeq NBI: [2015] High water staining about 2' below top of culvert.

72. Appr Roadway Alignment NBI: [2015-2014] Curve to east affecting sight distance. No speed reduction required.

Inventory Notes:

 Inspector's Signature

 Reviewer's Signature

Pictures



Photo 1 - Upstream Opening of the Culvert Pipe, Looking North



Photo 2 - Downstream Opening of the Culvert Pipe, Looking South

Pictures



Photo 3 - Overall View through Culvert Pipe, Looking South

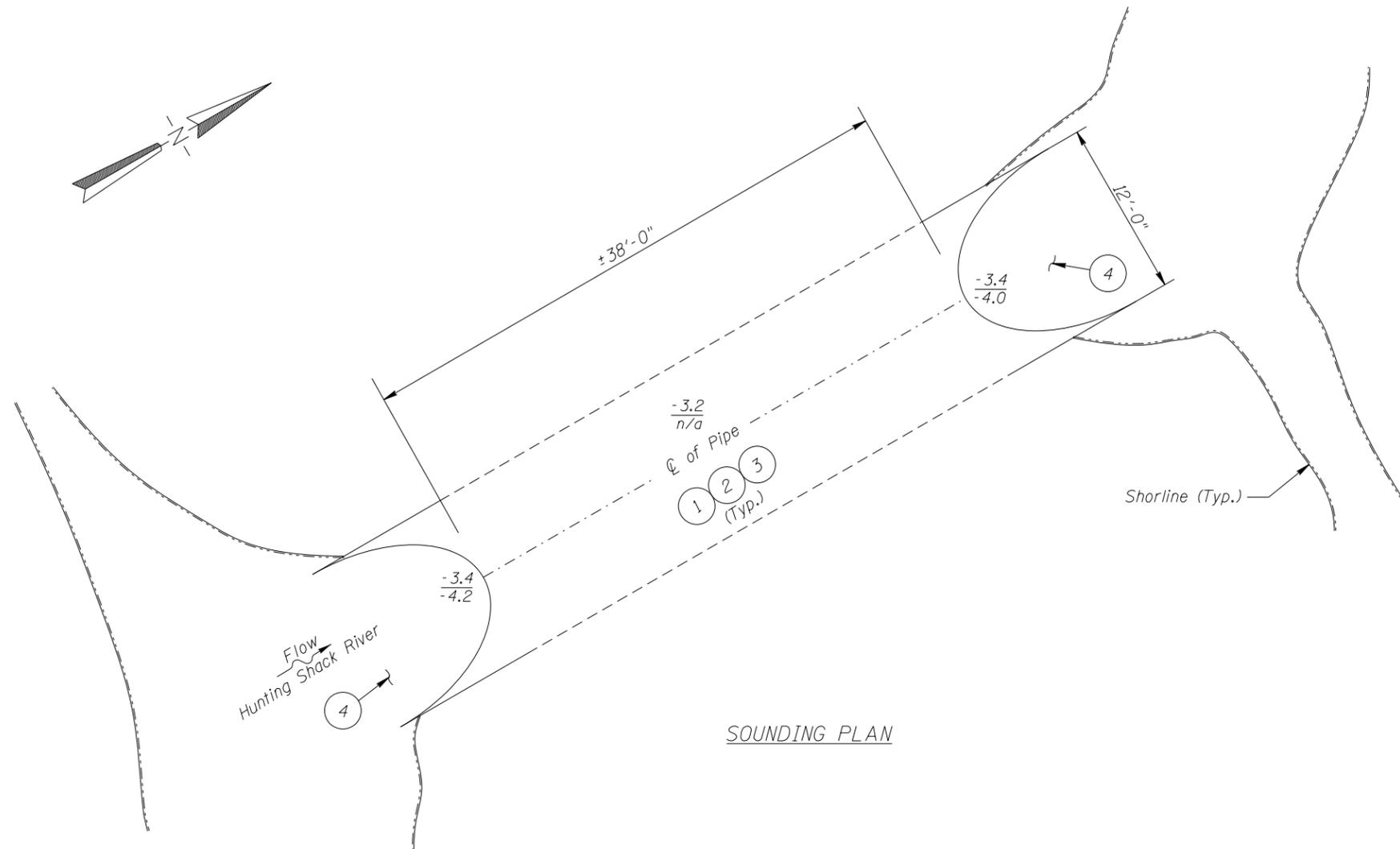


Photo 4 - Typical Culvert Joint Condition, Looking East

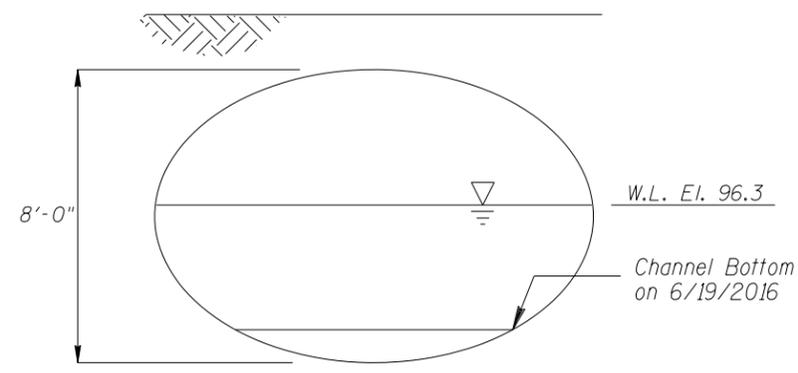
Pictures



Photo 5 - Typical Steel Condition and Surface Corrosion near Waterline, Looking East



SOUNDING PLAN



DOWNSTREAM/UPSTREAM PROFILE

GENERAL NOTES:

1. CMP Culvert was inspected underwater.
2. At the time of inspection, on June 19, 2016, the waterline was located approximately 3.7 feet below the top of the pipe at the crown of the downstream opening. Since insufficient elevation information was available, a reference elevation of 100.0 was assumed. This corresponds to a waterline elevation of 96.3.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

INSPECTION NOTES:

- ① The culvert exhibited good galvanizing and only minor surface corrosion with negligible loss of section.
- ② The culvert alignment was in good condition with no deflections or distortions. The joints/fasteners were in place and secure.
- ③ The culvert pipe bottom was fairly clean of any infill with only randomly interspersed sandy gravel as well as small rocks.
- ④ The culvert openings were well protected against scour/erosion by up to 1 foot diameter riprap.

Legend

- 3.4 Sounding Depth (6/19/2016)
- 4.2 Sounding Depth (6/22/2012)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. L4177 CSAH 116 OVER HUNTING SHACK RIVER ST LOUIS COUNTY		
INSPECTION, SOUNDING PLAN, AND UPSTREAM/DOWNSTREAM PROFILES		
Drawn By: MRS	COLLINS ENGINEERS	Date: JUNE 19, 2016
Checked By: LJ	<small>133 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 9687L4177		Figure No.: 1