

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 88639 CR 615 over CREEK

DISTRICT: District 1

COUNTY: St. Louis

CITY/TOWNSHIP: WAASA

STATE: Minnesota

Date of Inspection: 06/23/2016

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. 88639, a concrete box culvert, was found to be generally in satisfactory to fair condition below the water with no defects of structural significance. Light scaling was observed on all concrete surfaces throughout the length of the culvert with a typical penetration of 1/4 inch. An area of poorly consolidated concrete was observed near the west wall on the downstream end of the culvert. A portion of the concrete floor was covered by a 3 to 12 inch thick layer of gravel and silt.

INSPECTION FINDINGS

- A) Channel bottom material consisted of fairly soft sandy silt allowing 6 to 12 inches of probe rod penetration.
- B) Concrete was in good and sound condition. 1/4 inch deep scaling was observed on all surfaces.
- C) The culvert floor downstream was partially covered by a 3 to 6 inch thick layer of silt and gravel.
- D) An area of poor consolidation was observed on the west culvert wall with 2 to 3 inches of penetration.
- E) Upstream 10 to 15 feet of culvert floor was covered by 6 inches to 12 inches of silt infill.

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 #: 88639
Feature Intersected: CREEK
Facility Carried: CR 615
District: District 1
County: 069 - St. Louis
Bridge Description:

The structure consists of a precast concrete box culvert (12 foot wide opening).

2. INSPECTION DATA

Professional Engineer/Team Leader: Lukas Janulis
Inspection Diver: Lukas Janulis
Date of Underwater Inspection: 06/23/2016
Weather Conditions: Sunny, 75°F
Underwater Visibility (feet): 2.0 feet
Waterway Velocity (ft/sec): Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Culvert.

General Shape:

12 foot wide by 4.5 feet high Precast Box Culvert.

Maximum Water Depth at Substructure(s) Inspected (feet): Approximately 3.6 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the upstream headwall.
Waterline Elevation (feet): 97.8 feet
Description: The waterline was approximately 2.2 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: 7
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
241	Concrete Culvert	33	LF		30	3	
870	Culvert End Treatment	2	EA		2		
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 88639 (CR 615 over Creek) was completed on June 23, 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 surface supplied air 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 bridge element inspected consisted of a precast concrete box culvert (12 foot wide opening). 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: 88639

CR 615 over CREEK

Date: 08/16/2016

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
Agency Br. No. 282 Crew District 01 Maint. Area County 069 - St. Louis City Township 69067 - WAASA Desc. Loc. 0.3 MI E OF JCT CR318 Sect., Twp., Range 22 - 060N - 14W Latitude 47 ° 39 ' 57.16 " Longitude 92 ° 6 ' 43.64 " Custodian 02 - County Highway Agency Owner 02 - County Highway Agency BMU Agreement Year Built 1938 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 3 - COUNTY Date Opened to Traffic On - Off System 0 - OFF Legislative District 05A Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 07 - CNTY Number 615 Roadway Name or Description CNTY 615 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 008+00.150 Detour Length 9.0 mi. Lanes ON 2 UNDER 0 ADT 315 YEAR 2003 HCA DT ADTT % Functional Class 08 - Rural - Minor Collector	Userkey 109 Structurally Deficient N Functionally Obsolete N Sufficiency Rating 87.8 Routine Inspection Date 07/10/2015 Routine Inspection Frequency 24 Inspector Name Janulis, Lukas Status A - Open																				
	+ RDWY DIMENSIONS +	+ NBI CONDITION RATINGS +																				
	If Divided NB-EB SB-WB Roadway Width 30.00 ft. ft. Vertical Clearance ft. ft. Max. Vert. Clear. ft. ft. Horizontal Clear. ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 32.0 ft. Bridge Roadway Width 0.0 ft. Median Width On Bridge ft.	Deck N Unsound Deck % Superstructure N Substructure N Channel 7 Culvert 5																				
+ STRUCTURE +	+ MISC. BRIDGE DATA +	+ NBI APPRAISAL RATINGS +																				
Service On 1 - Highway Service Under 5 - Waterway Main Span Type 1 - Concrete Main Span Design 13 - Box Culvert Main Span Detail Appr. Span Type Appr. Span Design Appr. Span Detail Skew 0 Culvert Type W124 Barrel Length 32 Cantilever ID Number of Spans MAIN: 1 APPR: 0 TOTAL: Main Span Length 12.0 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 0.30 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	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	Structure Evaluation 5 Deck Geometry N Underclearances N Waterway Adequacy 7 Approach Alignment 8																				
	+ PAINT +	+ SAFETY FEATURES +																				
	Year Painted Unsound Paint % Painted Area sq. ft. Primer Type Finish Type	Bridge Railing N - NOT REQUIRED GR Transition N - NOT REQUIRED Appr. Guardrail 0 - SUBSTANDARD GR Termini 0 - SUBSTANDARD																				
	+ BRIDGE SIGNS +	+ IN DEPTH INSP. +																				
	Posted Load 0 - Not Required Traffic 0 - Not Required Horizontal 1 - Object Markers Vertical N - Not Applicable	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 10%; text-align: center;">Y/N</th> <th style="width: 10%; text-align: center;">Freq</th> <th style="width: 10%; 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;">06/23/2016</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	06/23/2016	Pinned Asbly.				Spec. Feat.			
	Y/N	Freq	Date																			
Frac. Critical																						
Underwater		60	06/23/2016																			
Pinned Asbly.																						
Spec. Feat.																						
		+ WATERWAY +																				
		Drainage Area (sq. mi.) Waterway Opening (sf.) 48 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 0 - Other/Unknown Operating Rating 2 - HS TRUCK 33.0 Inventory Rating 2 - HS TRUCK 22.0 Posting VEH: SEMI: DBL: Rating Date 2/1/1991 Overweight Permit Codes A N - N/A B N - N/A C N - N/A																				

MINNESOTA BRIDGE INSPECTION REPORT

08/31/2016

Inspector: CO Bridge

BRIDGE 88639 CR 615 OVER CREEK

County: St. Louis	Location: 0.3 MI E OF JCT CR318	Length: 14.0 ft.
City:	Route: 07 - CNTY 615 Ref. Pt.: 008+00.150	Deck Width: 0.0 ft.
Township: 69067 - WAASA	Control Section:	Rdwy. Area/ Pct. Unsnd: sq. ft. / %
Section: 22 Township: 060N Range: 14W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 1 - Concrete 19 - Culvert (includes List: frame culverts)	Local Agency Bridge Nbr.: 282	Culvert: W124
NBI Deck: N Super: N Sub: N Chan: 7 Culv: 5	Open, Posted, Closed: A - Open	Postings:
	MN Scour Code: E - CULVERT	

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: 1 - Object Markers	Vertical: N - Not Applicable	Unofficial Sufficiency Rating 87.8

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	08/16/2016	33 LF	0	30	3	0
		Migrated Values		33 LF	0	30	3	0
	Notes: [2015] Water to top of culvert unable to see anything. [2013] Moderate scaling of wetted perimeter of culvert. No evidence of spalling or delam.							
800	Critical Deficiencies or Safety Hazards	Underwater	08/16/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
	Notes: [2015-2013] No critical findings during this inspection.							
870	Culvert End Treatment	Underwater	08/16/2016	2 EA	0	2	0	0
		Migrated Values		2 EA	0	2	0	0
	Notes: [2015-2013] Moderate scaling of wetted perimeter.							
871	Roadway Over Culvert	Underwater	08/16/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
	Notes: [2015] No signs of settlement or undermining. [2013] Well maintained. Gravel							
885	Scour	Underwater	08/16/2016	1 EA	1	0	0	0
891	Other Bridge Signing	Underwater	08/16/2016	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
	Notes: [2015] All signs present with no deterioration. [2013] 4 Delineators.							
892	Slopes & Slope Protection	Underwater	08/16/2016	2 EA	2	0	0	0
		Migrated Values		2 EA	2	0	0	0
	Notes: [2015] No notable erosion present. [2013] Established veg.							
894	Deck & Approach Drainage	Underwater	08/16/2016	2 EA	2	0	0	0
		Migrated Values		2 EA	2	0	0	0
	Notes: [2015] No notable drainage-related slope erosion.							

BRIDGE 88639 CR 615 OVER CREEK

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	08/16/2016	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 : [2013] JRS, JDO.
[2015] Water to top of culvert. Possible addition to underwater inspections.
Beaver dam downstream?
No Guardrail.
Underwater Inspection - 6/23/2016 - Collins Engineers, Inc

58. Deck NBI:

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI: Roadway does not meet minimum requirements for Minnesota rule 8820.9920.

36D. Appr Guardrail
Terminal NBI: Roadway does not meet minimum requirements for Minnesota rule 8820.9920.

59. Superstructure NBI:

60. Substructure NBI:

61. Channel NBI: [2015] Possible beaver dam water not moving. Water level to top of culvert.

62. Culvert NBI: [2015] Water to top of culvert unable to see anything.
[2013] Moderate scaling of wetted perimeter of culvert. No evidence of spalling or delam.

71. Waterway Adeq NBI: [2015] Water to top of culvert slight chance of overtopping.

72. Appr Roadway
Alignment NBI: [2015] No sight distance issues or speed reduction required.

Inventory Notes:

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - Overall View of Downstream Culvert Opening, Looking South



Photo 2 - Overall View of Upstream Culvert Opening, Looking North

Pictures

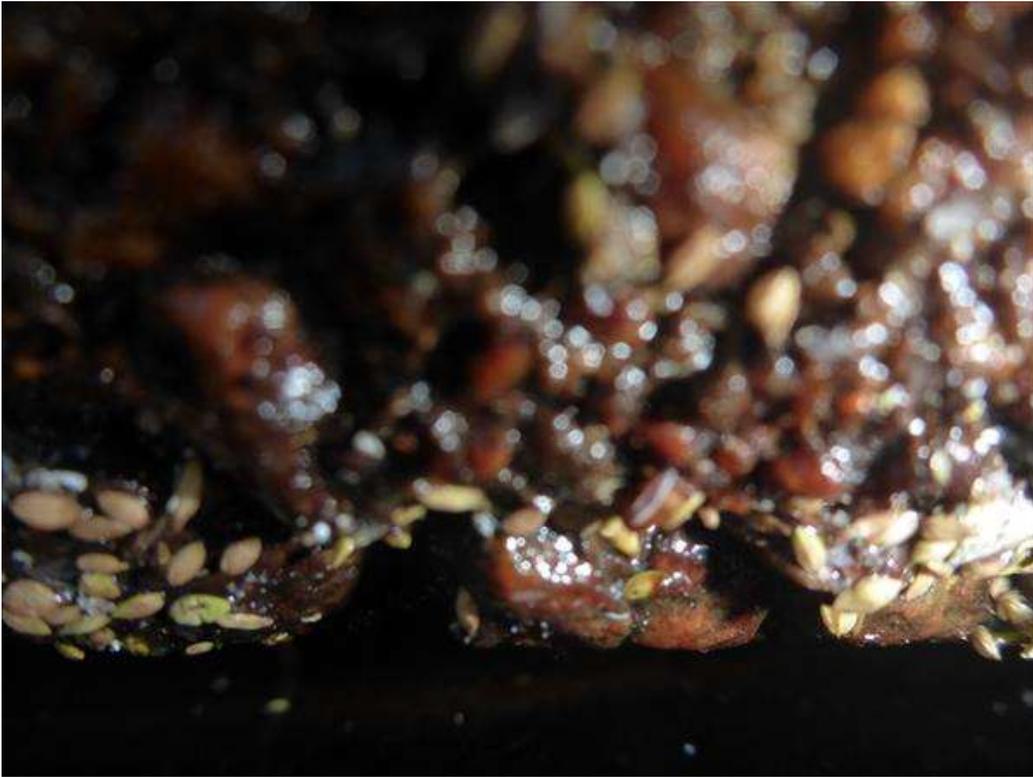


Photo 3 - Typical Concrete Condition at Waterline, Looking North



Photo 4 - Typical Concrete Condition Underwater, Looking West

Pictures

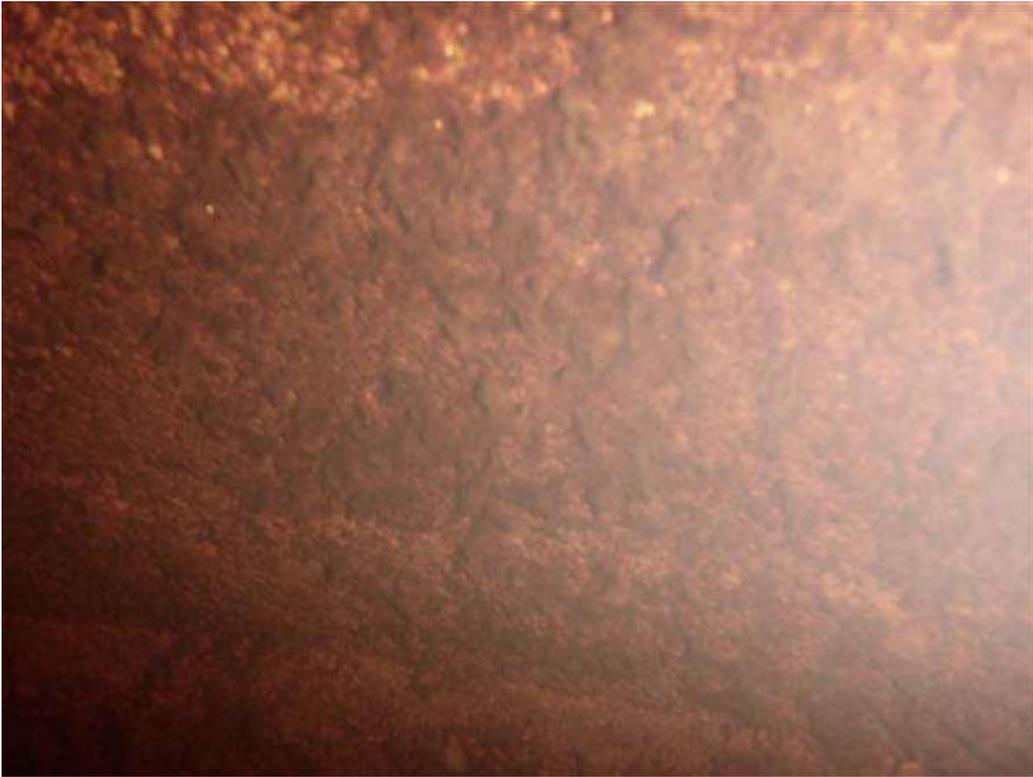


Photo 5 - Typical Concrete Condition Underwater, Looking West

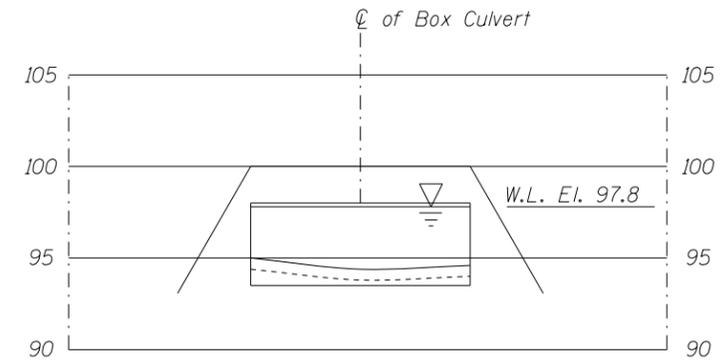
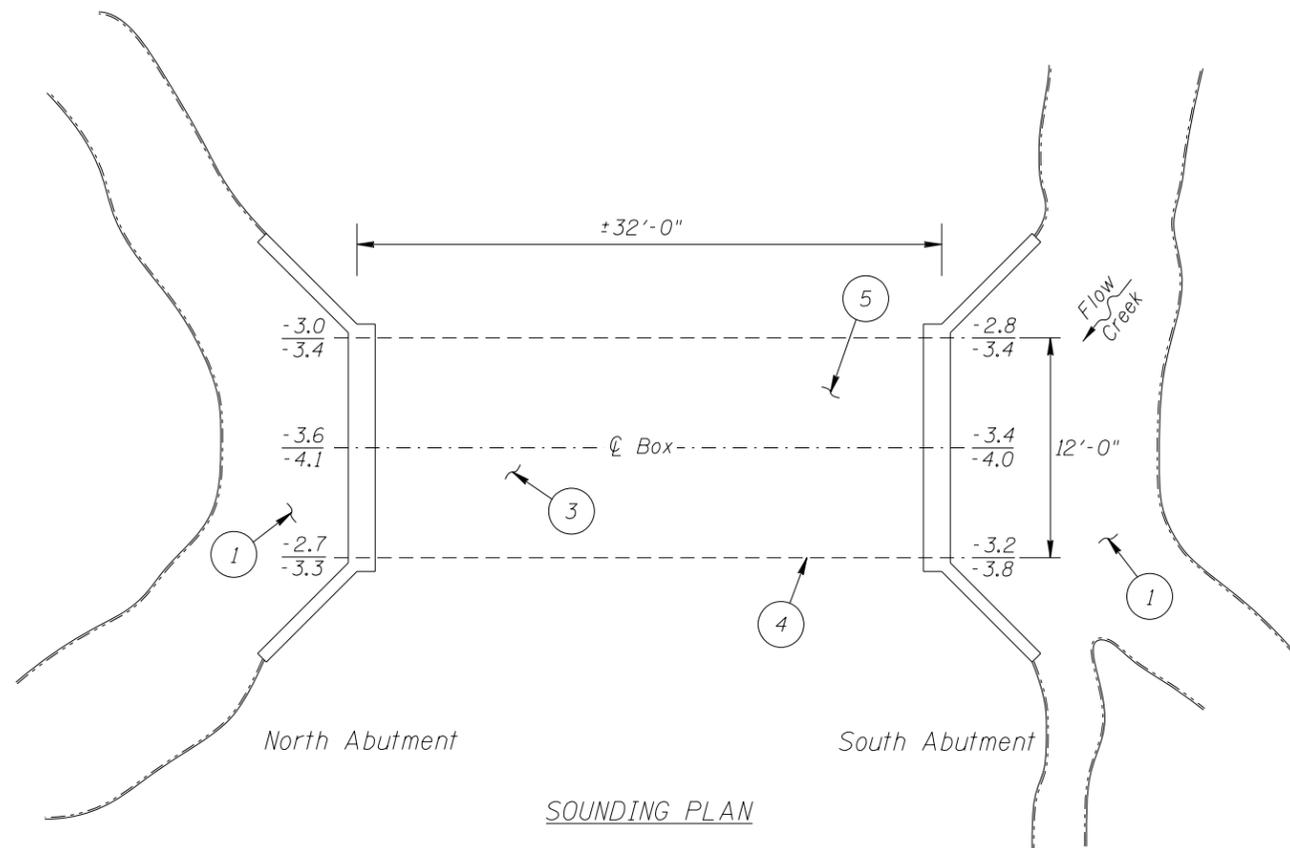
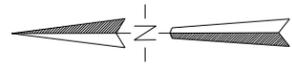


Photo 6 - Typical Concrete Condition Underwater, Looking East

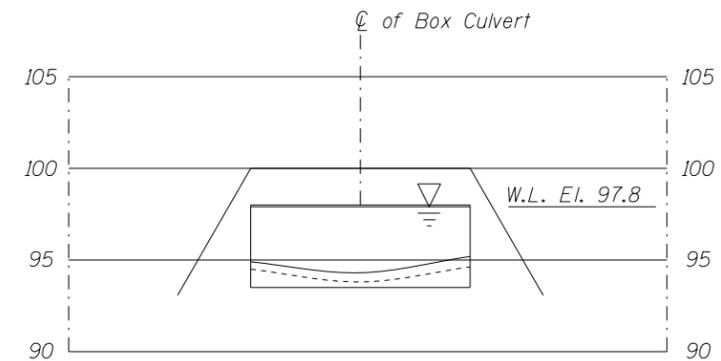
Pictures



Photo 7 - View of Roadway above the Culvert, Looking West



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

INSPECTION NOTES:

- 1 Channel bottom material consisted of fairly soft sandy silt allowing 6 to 12 inches of probe rod penetration.
- 2 Concrete was in good and sound condition. 1/4 inch deep scaling was observed on all surfaces.
- 3 The culvert floor near the downstream opening was partially covered by a 3 to 6 inch thick layer of silt and gravel, and near the middle portion of the culvert, the floor was typically free of any infill/debris.
- 4 An area of poor consolidation was observed on the west culvert wall with 2 to 3 inches of penetration.
- 5 Upstream 10 to 15 feet of culvert floor was covered by 6 inches to 12 inches of silt infill.

GENERAL NOTES:

1. Concrete Box Culvert was inspected underwater.
2. At the time of inspection, on June 23, 2016, the waterline was located approximately 2.2 feet below the top of upstream headwall. Since insufficient elevation information was available, an elevation of 100.0 was assumed. This corresponds to a waterline elevation of 97.8.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

Legend

- 3.4 Sounding Depth (6/23/2016)
- 4.0 Sounding Depth (6/21/2012)
- Channel Bottom (6/23/2016)
- - - - Channel Bottom (6/21/2012)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 88639 CR 615 OVER CREEK DISTRICT 1, ST. LOUIS COUNTY		
INSPECTION, SOUNDING PLAN, AND FASCIA PROFILES		
DRAWN BY: MRS	COLLINS ENGINEERS <small>133 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	DATE: JUNE 23, 2016
CHECKED BY: LJ		SCALE: NTS
CODE: 968788639		FIGURE NO.: 1