

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 88699

CR 877

OVER THE

LESTER RIVER

ST. LOUIS COUNTY



JUNE 18, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure inspected at Structure No. 88699, a concrete box culvert, was found to be in good condition with no defects of structural significance. A band of light scaling was observed around the waterline along the length of the culvert. The apron was mostly exposed at the upstream opening of the culvert with minimal vertical apron toe exposure.

INSPECTION FINDINGS:

- (A) A band of light scaling was observed around the waterline along the length of the culvert with a typical penetration of 1/16 inch and a maximum penetration of 1/8 inch.
- (B) The concrete throughout the culvert ceiling was sound with no significant structural defects.
- (C) The top of the concrete apron at the upstream opening of the culvert was partially exposed. The channel bottom at the upstream opening of the culvert was approximately level with the top of the concrete apron with minimal vertical apron toe exposure present. The channel bottom material consisted of 1 to 2 inch diameter cobblestones and smaller gravel.
- (D) The flow of the waterway is directed towards the southerly side of the culvert resulting in more concrete apron exposure along the south half of the culvert opening and some minor erosion along the southern banks.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:
Daniel G. Stromberg, P.E.

Respectfully submitted,

PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.

Daniel G. Stromberg

Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 88699

Feature Crossed: Lester Creek

Feature Carried: CR 877

Location: St. Louis County

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

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E.

Dive Team: Clayton Brookins, Breanne Stromberg

Date: June 18, 2012

Weather Conditions: Sunny, 80° F

Underwater Visibility: 2 feet

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Culvert.

General Shape: 12 foot wide Precast Box Culvert.

Maximum Water Depth at Substructure Inspected: Approximately 3.0 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the upstream headwall.

Water Surface: The waterline was approximately 4.3 feet below the reference.

Assumed Waterline Elevation 95.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 62: Culvert: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code A/06/12

Item 113: Scour Critical Bridges: Code E/12

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
241	Reinforced Conc. Culvert	38	LF	38				
388	Wingwalls / Headwalls	2	EA	2				



Photograph 1. View of the Upstream Opening of the Culvert, Looking East.



Photograph 2. View of the Downstream Opening of the Culvert, Looking Northwest.



Photograph 3. View of the Typical Concrete Condition near the Waterline, Looking Southeast.



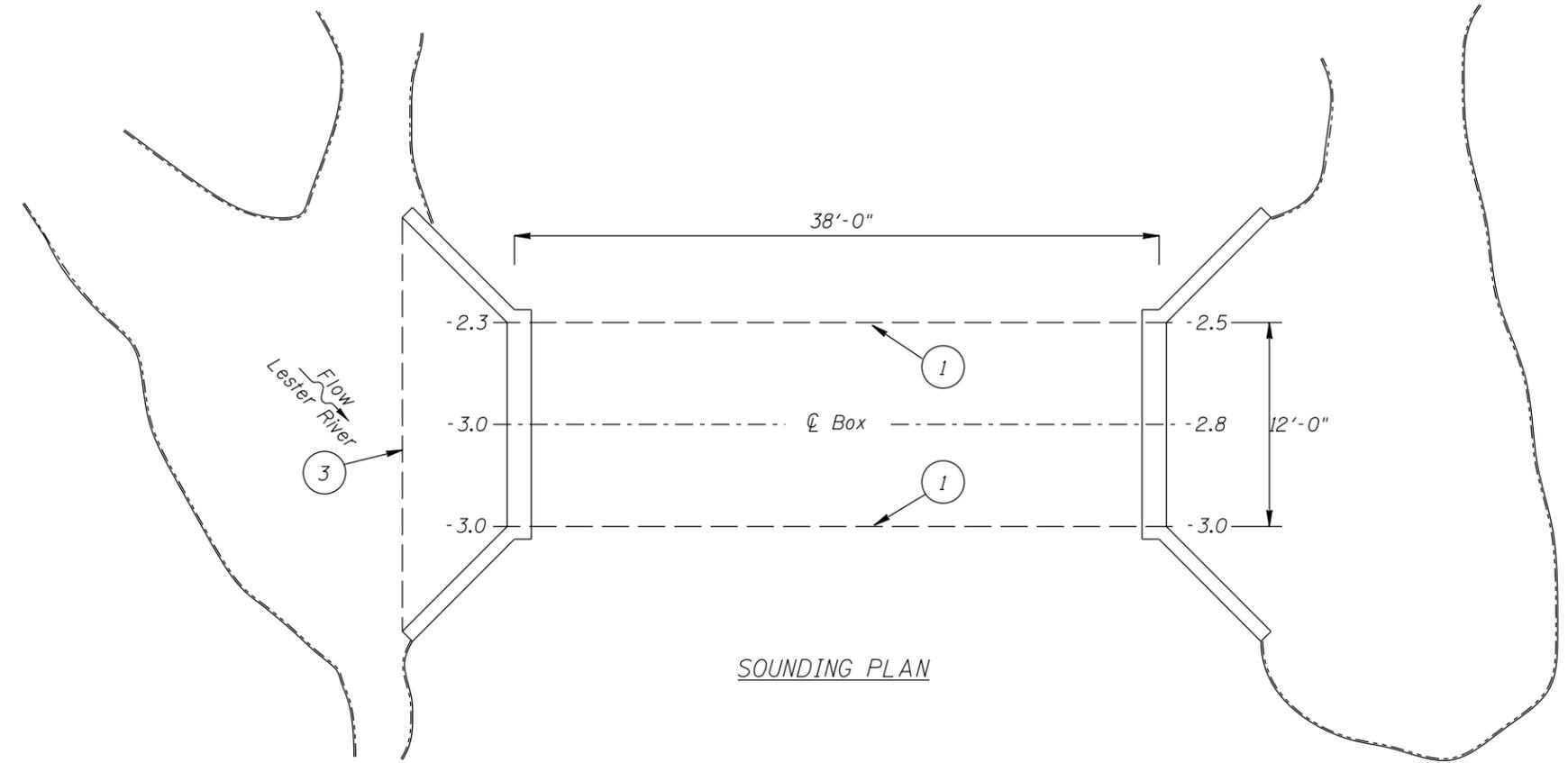
Photograph 4. View of the Upstream Channel, Looking West.



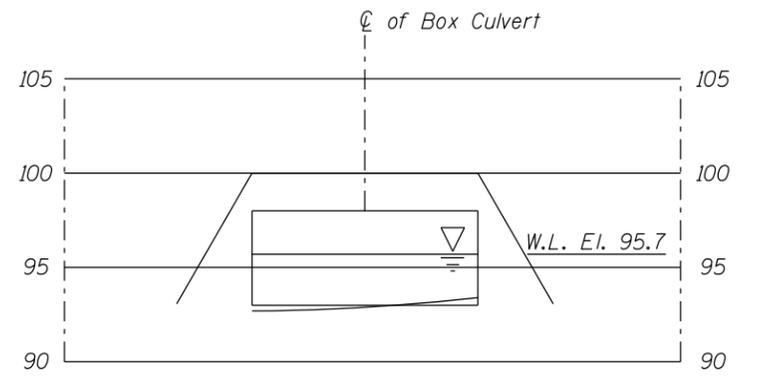
Photograph 5. View of the Downstream Channel, Looking East.



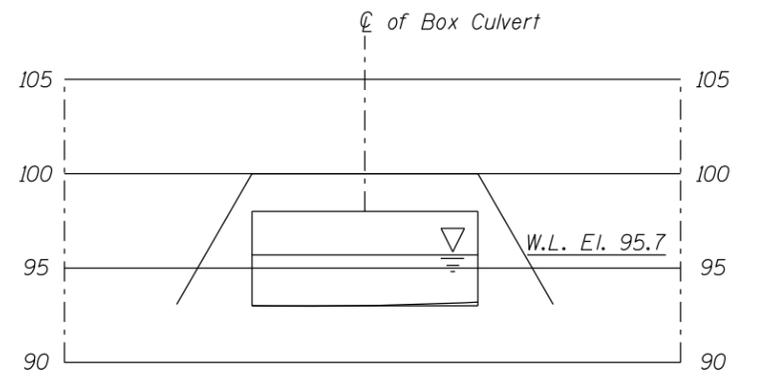
Photograph 6. View of CR 877 Over the Concrete Culvert, Looking North.



SOUNDING PLAN



UPSTREAM OPENING PROFILE



DOWNSTREAM OPENING PROFILE

INSPECTION NOTES:

- 1 A band of light scaling was observed around the waterline along the length of the culvert with a typical penetration of 1/16 inch and a maximum penetration of 1/8 inch.
- 2 The concrete throughout the culvert ceiling was sound with no significant structural defects.
- 3 The top of the concrete apron at the upstream opening of the culvert was partially exposed. The channel bottom at the upstream opening of the culvert was approximately level with the top of the concrete apron with minimal vertical apron toe exposure present. The channel bottom material consisted of 1 to 2 inch diameter cobblestones and smaller gravel.
- 4 The flow of the waterway is directed towards the southerly side of the culvert resulting in more concrete apron exposure along the south half of the culvert opening and some minor erosion along the southern banks.

GENERAL NOTES:

1. Concrete Box Girder was inspected underwater.
2. At the time of inspection, on June 18, 2012, the waterline was located approximately 4.3 feet below the top of upstream headwall. Since insufficient elevation information was available, a reference elevation of 100.0 was assumed. This corresponds to a waterline elevation of 95.7.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

Legend
-0.4 Sounding Depth (6/18/2012)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 88699 CSAH 877 OVER LESTER RIVER ST LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BMS	COLLINS ENGINEERS	Date: JULY 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 742388699		Figure No.: 1

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: June 18, 2012

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 88699 WEATHER: Sunny, 80° F

WATERWAY CROSSED: Lester River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton Brookins, Breanne Stromberg

EQUIPMENT: Commercial Scuba, U/W Light, Scraper, Lead Line, Probe Rod, Camera

TIME IN WATER: 3:45 P.M.

TIME OUT OF WATER: 4:15 P.M.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY 2 Feet

DEPTH 3.0 feet maximum

ELEMENTS INSPECTED: Culvert

REMARKS: Overall, the concrete box culvert was found to be in good condition with no defects of structural significance. A band of light scaling was observed around the waterline along the length of the culvert. The concrete apron was partially exposed at the upstream opening of the culvert with minimal vertical apron toe exposure present.

FURTHER ACTION NEEDED: YES NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 88699
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg
 WATERWAY CROSSED Lester River

INSPECTION DATE June 18, 2012
 NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE					CHANNEL					GENERAL						
			PIILING	CONCRETE CULVERT	FOOTINGS	DISPLACEMENT	OTHER (HEADWALL/WINGWALL)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Culvert	3.0'	N	7	N	8	7	7	N	6	N	N	6	7	N	N	8	N	N

*UNDERWATER PORTION ONLY

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NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.