

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 69J13

RAILROAD STREET

OVER

STORM SEWER

CITY OF DULUTH

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MAY 17, 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 culvert inspected at Structure No. 69J13, a concrete box culvert, was found to be in good condition with no defects of structural significance.

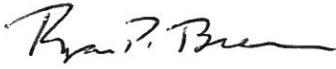
INSPECTION FINDINGS:

- (A) Overall, the concrete of the culvert was in good condition with no notable deterioration.
- (B) The joints between the culvert sections exhibited from  $\frac{1}{4}$  to 1 inch maximum horizontal gap (no clear openings due to tongue and groove arrangement), and vertically, there was up to a  $\frac{1}{2}$  inch differential across various joints.
- (C) The culvert floor was typically covered by a layer of up to 6inch-thick silt build-up.

RECOMMENDATIONS:

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

Inspection Team Leader:



Ryan P. Breen, P.E.

Respectfully submitted,

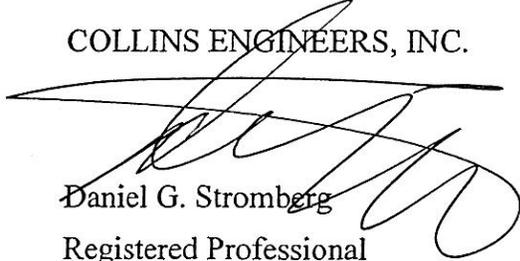
PROFESSIONAL ENGINEER

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: 69J13

Feature Crossed: Storm Sewer

Feature Carried: Railroad Street

Location: District 1 – St. Louis County, City of Duluth

Bridge Description: The structure consists of a precast concrete box culvert. The inlet top is covered with a metal grate (needs to be removed to facilitate inspection).

2. INSPECTION DATA

Professional Engineer Diver: Ryan P. Breen, P.E.

Dive Team: Marc B. Parker, Michael J. Banasiak

Date: May 17, 2012

Weather Conditions: Cloudy, 60° F

Underwater Visibility: None / Negligible

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Culvert

General Shape: Precast Concrete Box Culvert (12' wide by 4' high).

Maximum Water Depth within the Culvert Inspected: Approximately 1.2 feet.

4. WATERLINE DATUM

Water Level Reference: Culvert ceiling at west end.

Water Surface: The waterline was approximately 2.9 feet below the reference.

Waterline Elevation 601.5.

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 8

Item 92B: Underwater Inspection: Code A/05/12

Item 113: Scour Critical Bridges: Code E/07

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:

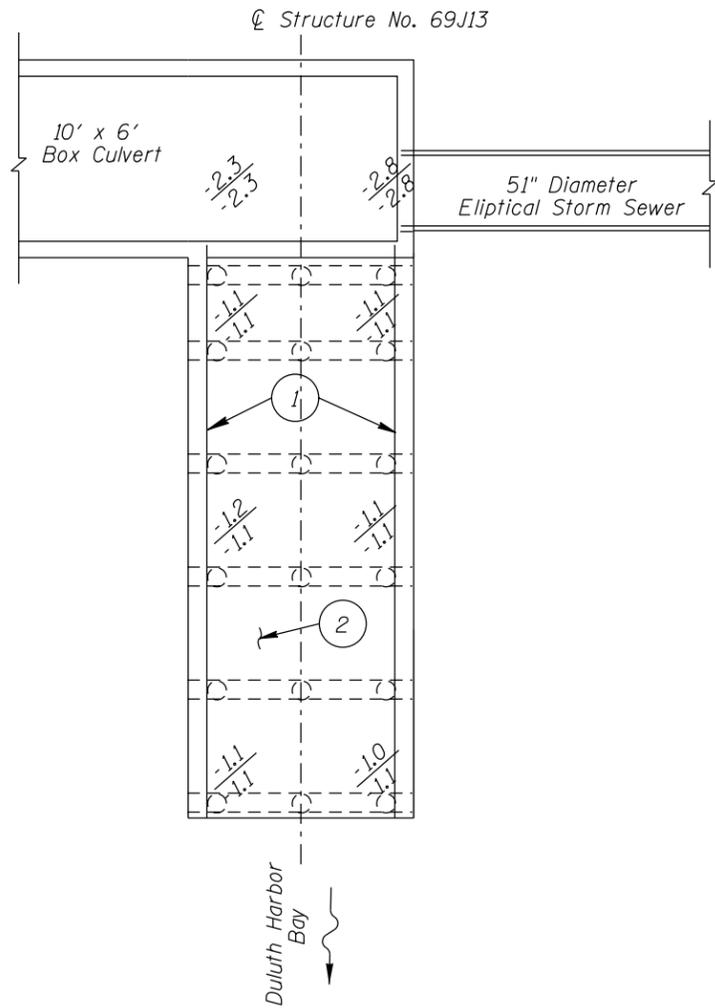
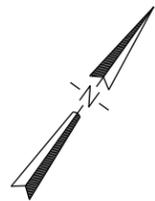
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
241	Reinforced Conc. Culvert	40	LF	40				



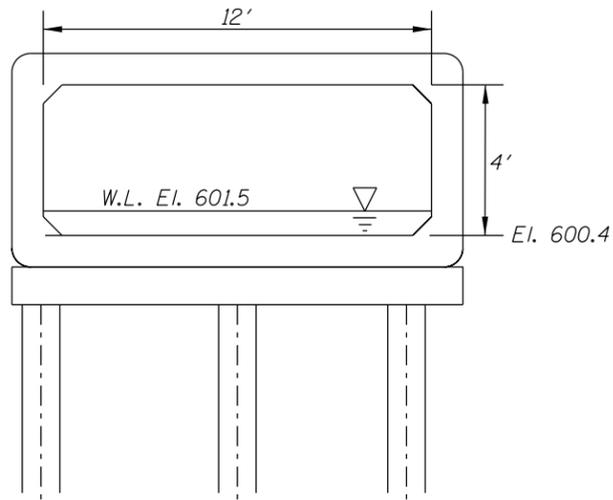
Photograph 1. View of Roadway Above Culvert and Grating Covering Culvert Opening, Looking East.



Photograph 2. View of Upstream End of Culvert, Looking Northeast.



SOUNDING PLAN



TYPICAL END VIEW OF CULVERT

GENERAL NOTES:

1. The entire length of the box culvert was inspected underwater.
2. At the time of inspection, on May 17, 2012, the waterline was located approximately 2.9 feet below the top of the culvert opening at the north end of the culvert. This corresponds to a waterline elevation of 601.5 based on design plans.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

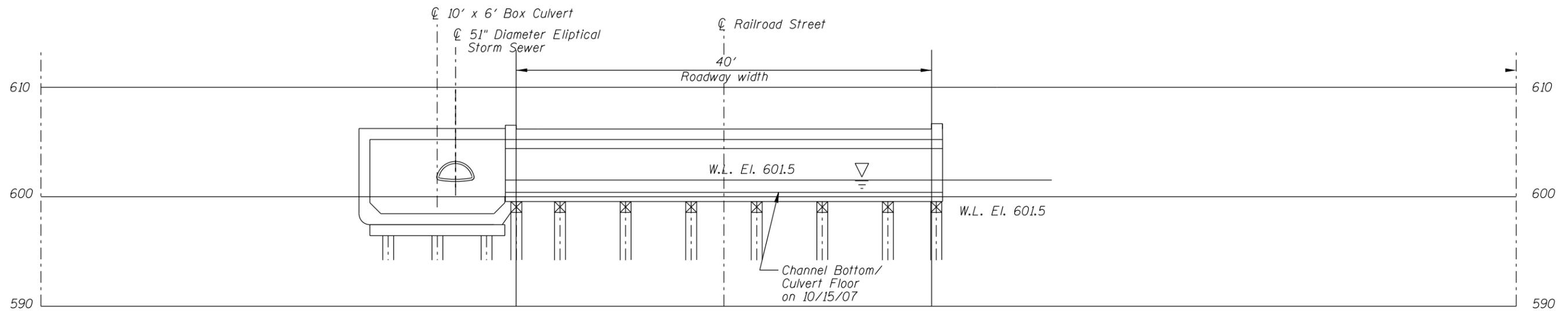
INSPECTION NOTES:

1. The concrete was smooth and sound with no notable deterioration. The joints between culvert segments exhibited 1/4- to 1-inch-wide gaps (at tongue and groove arrangement with no complete separations of joints) and up to 1/2 inch differentials between faces across joints.
2. A 6-inch-thick layer of soft silt covered most of the concrete floor of the culvert.

Legend

- 0.4 Sounding Depth (05/17/12)
- 0.4 Sounding Depth (10/15/07)

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 69J13 RAILROAD STREET OVER THE STORM SEWER CITY OF DULUTH		
INSPECTION AND SOUNDING PLAN		
Drawn By: BMS	<b>COLLINS ENGINEERS</b>	Date: MAY 2012
Checked By: RPB	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 742396J13		Figure No.: 1



☉ CULVERT PROFILE

Note: \_\_\_\_\_  
 Refer to Figure 1 for General Notes.

<b>MINNESOTA          DEPARTMENT OF TRANSPORTATION          UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 69J13 RAILROAD STREET OVER THE STORM SEWER CITY OF DULUTH <b>CULVERT PROFILE</b>		
Drawn By: BMS Checked By: RPB Code: 742396J13	<b>COLLINS          ENGINEERS</b>	123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com
		Date: MAY 2012 Scale: 1"=5' Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: May 17, 2012

ON-SITE TEAM LEADER: Ryan P. Breen, P.E.

BRIDGE NO: 69J13 WEATHER: Cloudy, 60° F

WATERWAY CROSSED: Storm Sewer

DIVING OPERATION: \_\_\_\_\_ SCUBA \_\_\_\_\_ SURFACE SUPPLIED AIR  
 OTHER Wading

PERSONNEL: Marc B. Parker, Michael J. Banasiak

EQUIPMENT: Dry Suit, U/W Light, Scraper, Lead Line, Probe Rod, Camera

TIME IN WATER: 6:00 p.m.

TIME OUT OF WATER: 6:20 p.m.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY None / Negligible

DEPTH 1.2 feet maximum

ELEMENTS INSPECTED: Culvert

REMARKS: Overall, the concrete of the structure was smooth and sound with no notable deterioration. The culvert section joints exhibited from ¼ to 1 inch maximum horizontal gap (at tongue and groove) connection with no complete separation of joint and vertically there was up to a ½ inch differential across joints. The top of the culvert floor was covered by a layer of silt, up to 6 inches thick.

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. 69J13  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Ryan P. Breen, P.E.  
 WATERWAY CROSSED Storm Sewer

INSPECTION DATE May 17, 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					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	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	1.2'	N	7	N	8	N	7	8	N	N	N	8	7	N	N	N	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.