

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 92253

CSAH 88

OVER

ARMSTRONG CREEK

ST. LOUIS COUNTY



JUNE 19, 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. 92253, corrugated metal pipe culvert, was found to be in good condition with no defects of structural significance. The steel exhibited light surface corrosion extending from 1 foot below to 1 foot above the waterline. A layer of silt build-up, ranging from 2 inches at the midpoint to 1 foot at the openings, was observed on the bottom of the culvert.

INSPECTION FINDINGS:

- (A) The corrugated metal pipe exhibited light surface corrosion from 1 foot below to 1 foot above the waterline with no significant loss of section.
- (B) No observed displacement or distortion of the culvert ceiling was observed. The pipe was well aligned and had an overall good shape.
- (C) The channel bottom material consisted of medium silt mixed with sand and gravel allowing a maximum probe rod penetration of 4 inches. Typically a 2 inch thick layer of silt covered the bottom of the corrugated metal pipe. Towards the openings the silt layer increased to a minimum of 6 inches and a maximum of 1 foot thick.

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: 92253

Feature Crossed: Armstrong Creek

Feature Carried: CSAH 88

Location: St. Louis County

Bridge Description: The structure consists of a corrugated metal pipe culvert.

2. INSPECTION DATA

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

Dive Team: Clayton Brookins, Breanne Stromberg

Date: June 19, 2012

Weather Conditions: Rainy, 70° F

Underwater Visibility: None/Negligible

Waterway Velocity: 2 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Corrugated Steel Pipe Culvert.

General Shape: Oval Corrugated Metal Pipe.

Maximum Water Depth at Substructure Inspected: Approximately 4.5 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the Culvert pipe.

Water Surface: The waterline was approximately 2.0 feet below the reference.

Assumed Waterline Elevation 98.0.

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 7

Item 92B: Underwater Inspection: Code B/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
240	Corrugated Metal Pipe Culvert	60	LF	60				



Photograph 1. View of Upstream Opening, Looking North.



Photograph 2. View of Downstream Opening, Looking West.



Photograph 3. View of Upstream Opening Along Length of Pipe, Looking Northeast.



Photograph 4. View of Typical Steel Condition at the Waterline, Looking North.



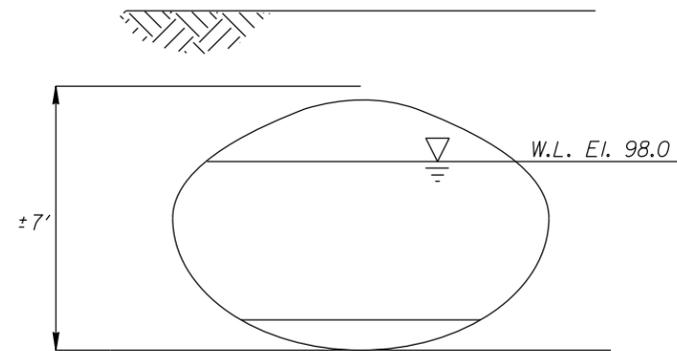
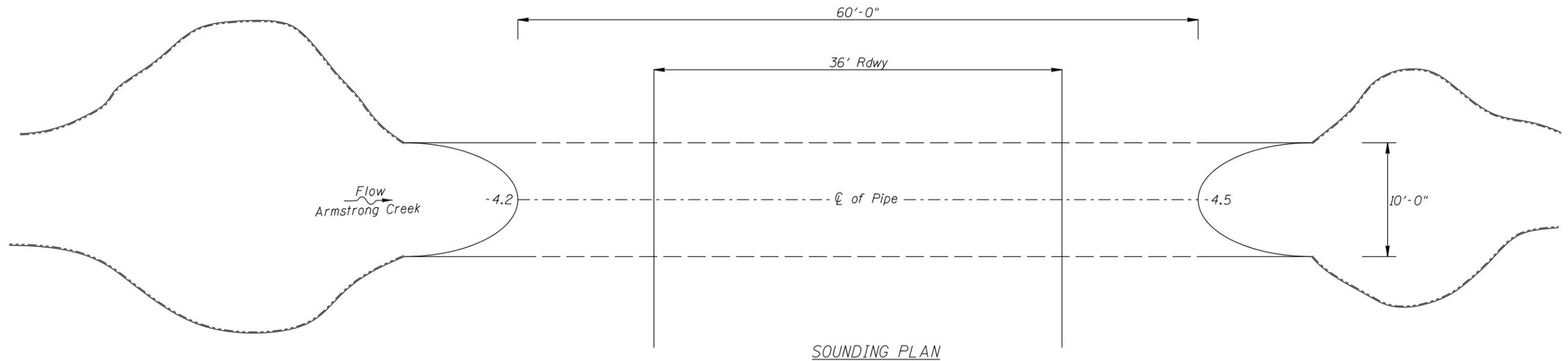
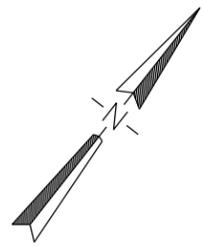
Photograph 5. View of Upstream Channel, Looking Southwest.



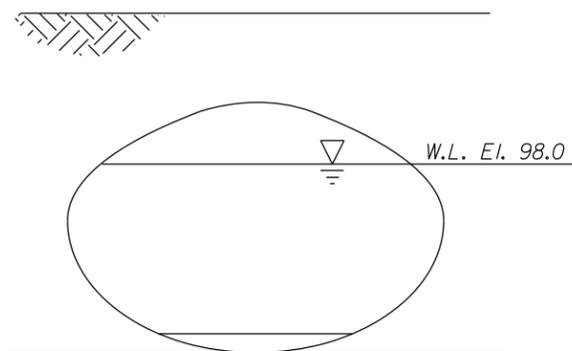
Photograph 6. View of Downstream Channel, Looking Northeast.



Photograph 7. View of CSAH 88 Over Culvert, Looking Southeast.



UPSTREAM PROFILE



DOWNSTREAM PROFILE

INSPECTION NOTES:

- ① The corrugated metal pipe exhibited light surface corrosion from 1 foot below to 1 foot above the waterline with no significant loss of section.
- ② No observed displacement or distortion of the culvert ceiling was observed. The pipe was well aligned and had an overall good shape.
- ③ The channel bottom material consisted of medium silt mixed with sand and gravel allowing a maximum probe rod penetration of 4 inches. Typically a 2 inch thick layer of silt covered the bottom of the corrugated metal pipe. Towards the openings the silt layer increased to a minimum of 6 inches and a maximum of 1 foot thick.

Legend

-0.4 Sounding Depth (6/19/2012)

GENERAL NOTES:

1. CMP Culvert was inspected underwater.
2. At the time of inspection, on June 19, 2012, the waterline was located approximately 2.0 feet below the top the pipe. Since insufficient elevation information was available, an elevation of 100.0 was assumed. This corresponds to a waterline elevation of 98.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 92253 CSAH 88 OVER ARMSTRONG CREEK ST LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BMS	COLLINS ENGINEERS	Date: JULY 2012
Checked By: LJ	123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: NTS
Code: 742392253		Figure No.: 1

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

INSPECTORS: Collins Engineers, Inc. DATE: May 19, 2012

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

BRIDGE NO: 92253 WEATHER: Rainy, 70° F

WATERWAY CROSSED: Elm Creek

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton Brookins, Breanne Stromberg

EQUIPMENT: Commercial Scuba, U/W Light, Hand Tools, Sounding Rod, Camera

TIME IN WATER: 12:00 p.m.

TIME OUT OF WATER: 1:00 p.m.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 2 feet

DEPTH 4.5 feet maximum

ELEMENTS INSPECTED: Corrugated Metal Pipe Culvert

REMARKS: Overall, the corrugated metal pipe culvert was found to be in good condition with no defects of structural significance. The steel exhibited light surface corrosion extending from 1 foot below to 1 foot above the waterline. A layer of silt ranging from 2 inches at the midpoint to 1 foot thick at the openings was observed on the bottom of the culvert.

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. 92253
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.
 WATERWAY CROSSED Armstrong Creek

INSPECTION DATE June 19, 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	CMP CULVERT	FOOTINGS	CULVERT DISTORTION	OTHER (HEADWALLS)	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
	CMP Culvert	4.5'	N	7	N	7	N	7	N	7	N	N	7	N	7	N	8	N	N

REMARKS: Overall, the corrugated metal pipe culvert was found to be in good condition with no defects of structural significance. The steel exhibited light surface corrosion extending from 1 foot below to 1 foot above the waterline. A layer of silt ranging from 2 inches at the midpoint to 1 foot thick at the openings was observed on the bottom of the culvert.

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.