UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. L4198

CR 666

OVER

SECOND 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. L4198, a corrugated steel pipe culvert, was found to be in good condition with no defects of structural significance. A band of light surface corrosion was observed at the waterline. A light to moderate accumulation of timber debris at both openings of the culvert was promoting sediment deposition and obstructing water flow through the culvert.

INSPECTION FINDINGS:

(A) The corrugated steel pipe exhibited light surface corrosion from 2 feet above to 2 feet below the waterline with no significant loss of section.

(B) A light to moderate timber debris accumulation was observed at both ends of the culvert and extended across the width of the opening resulting in a somewhat obstructed flow.

(C) The channel bottom material through the culvert consisted of a layer of silt, approximately 8 inches thick, over firm sand. At the openings the channel bottom material consisted of a layer of silt, approximately 12 to 18 inches thick, over scattered rocks.

RECOMMENDATIONS:

(A) Monitor the timber debris accumulation at both ends of the culvert and if found to be increasing in extent, removal operations may be warranted.

(B) The inspection of the submerged substructure units of Structure No. L4198 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspection during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascias to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

(C) 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: L4198

Feature Crossed: Second Creek

Feature Carried: CR 666

Location: St. Louis County

Bridge Description: The structure consists of a corrugated steel 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: Raining, 70^{o} F

Underwater Visibility: 1 foot

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Corrugated Steel Pipe Culvert.

General Shape: 10 foot Diameter Corrugated Steel Pipe.

Maximum Water Depth at Substructure Inspected: Approximately 3.0 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the Culvert pipe at the center of the upstream opening.

Water Surface: The waterline was approximately 5.0 feet below the reference.
Assumed Waterline Elevation 95.0.

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 6

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.

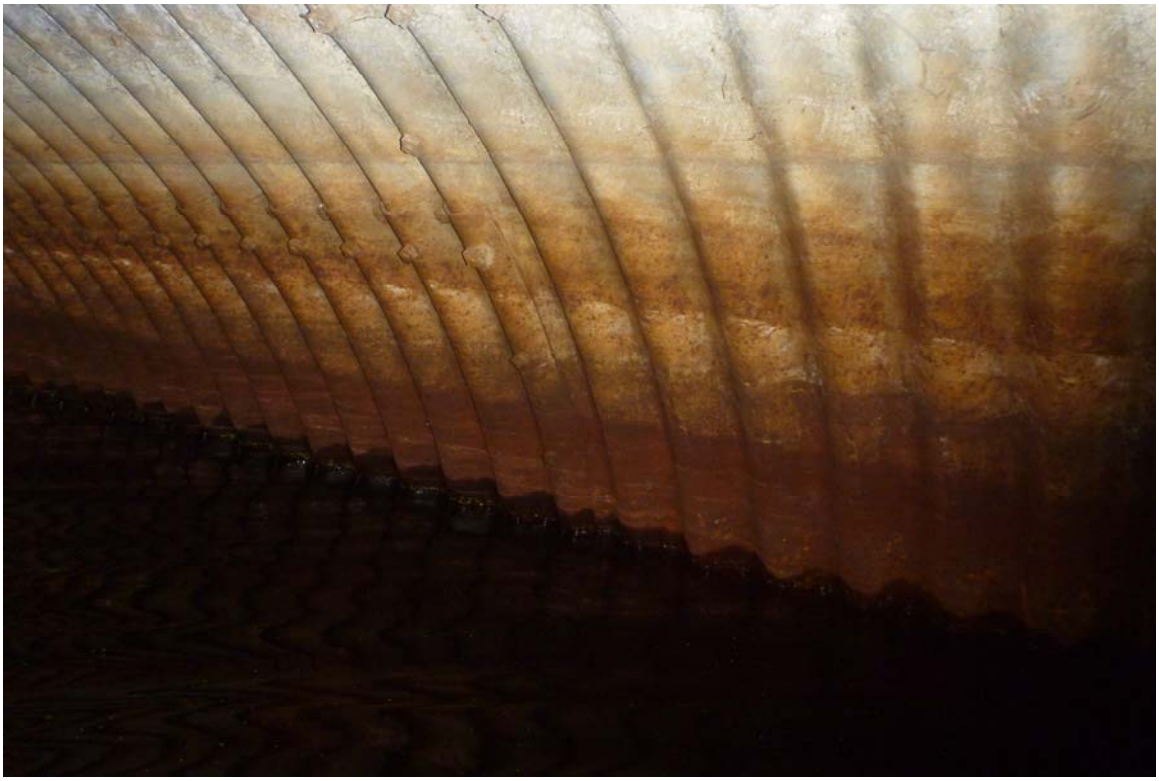
_____ Yes ___X__ No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
240	Corrugated Metal Pipe Culvert	50	LF	50				

Photograph 1. View of the Upstream Opening Showing Timber Debris Accumulation, Looking Southeast.

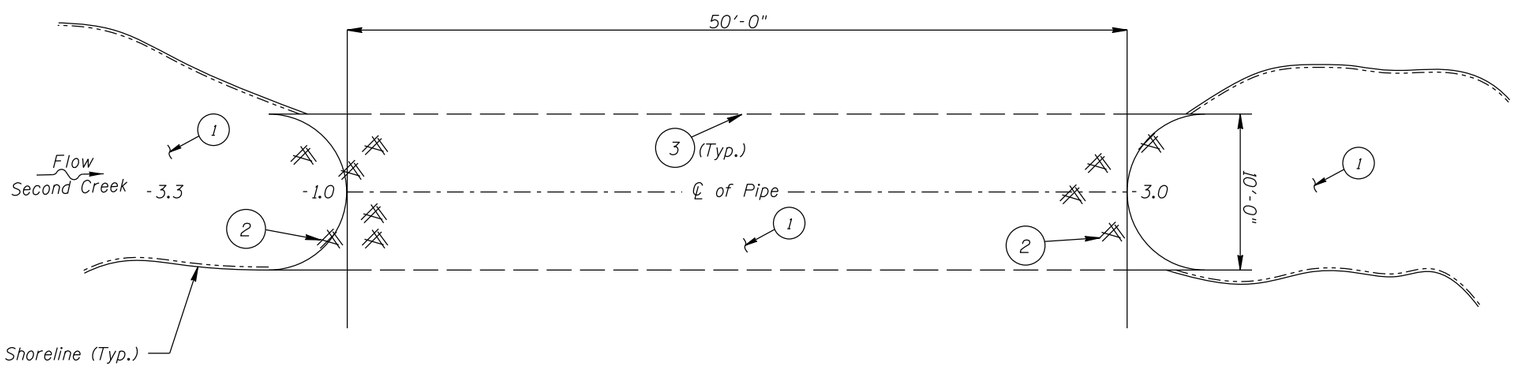
Photograph 2. View of Downstream Opening Showing Timber Debris Accumulation, Looking Northeast.



Photograph 3. Typical View of the Steel Condition at the Waterline, Looking South.

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

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



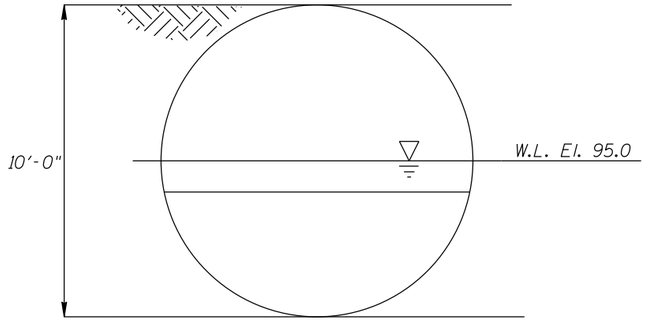
SOUNDING PLAN

INSPECTION NOTES:

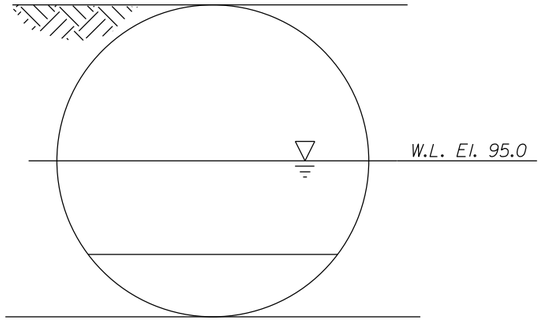
1. The channel bottom material through the culvert consisted of a layer of silt, approximately 8 inches thick, over firm sand. At the openings the channel bottom material consisted of a layer of silt, approximately 12 to 18 inches thick, over scattered rocks.

2. A light to moderate timber debris accumulation was observed at both ends of the culvert and extended across the width of the opening resulting in a somewhat obstructed flow.

3. The corrugated steel pipe exhibited light surface corrosion from 2 feet above to 2 feet below the waterline with no significant loss of section. The joints and alignment was satisfactory with no deflection or distortion.



UPSTREAM PROFILE



DOWNSTREAM PROFILE

GENERAL NOTES:

1. CMP Culvert was inspected underwater.
2. At the time of inspection, on June 19, 2012, the waterline was located approximately 5.0 feet below the top of the pipe. Since insufficient elevation information was available, a reference elevation of 100.0 was assumed. This corresponds to a waterline elevation of 95.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

Legend

-0.4 Sounding Depth (6/19/2012)

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. L4198
CSAH 666 OVER SECOND CREEK
ST LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: BMS	COLLINS ENGINEERS 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: JULY 2012
Checked By: LJ		Scale: NTS
Code: 7423L4198		Figure No.: 1

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

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

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

BRIDGE NO: L4198 WEATHER: Raining, 70° F

WATERWAY CROSSED: Elm Creek

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR

X OTHER Inspection by Wading

PERSONNEL: Clayton Brookins, Breanne Stromberg

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

TIME IN WATER: 4:45 P.M.

TIME OUT OF WATER: 5:45 P.M.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY 1 foot

DEPTH 3.0 feet maximum

ELEMENTS INSPECTED: Corrugated Metal Pipe Culvert

REMARKS: Overall, the corrugated steel pipe culvert was found to be in good condition with no defects of structural significance. A band of light surface corrosion was observed at the waterline. A light to moderate accumulation of timber debris at both openings of the culvert was obstructing water flow through the culvert. The channel bottom appeared stable with no signs of degradation.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the timber debris accumulation at both ends of the culvert and if found to be increasing in extent, removal operations may be warranted.

The inspection of the submerged substructure units of Structure No. L4198 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspection during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascias to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

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. L4198
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.
WATERWAY CROSSED Second 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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	CULVERT	FOOTINGS	CMP DISPLACEMENT	OTHER (CMP PIPE)	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	N	N	7	7	7	N	N	7	6	6	N	7	N	N	N	N

REMARKS: Overall, the corrugated steel pipe culvert, was found to be in good condition with no defects of structural significance. A band of light surface corrosion was observed at the waterline. A light to moderate accumulation of timber debris at both openings of the culvert was obstructing water flow through the culvert. The channel bottom appeared stable with no signs of degradation.

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.