

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 97373
CSAH 37
OVER
HEIR CREEK
DISTRICT 2 - CLEARWATER COUNTY



AUGUST 13, 2012
PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
AYRES ASSOCIATES & COLLINS ENGINEERS, INC.
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure inspected at Bridge No. 97373, a corrugated aluminum arch culvert, was found to be in good condition. There were no defects of structural significance observed. The channel bottom inspected upstream and downstream of the substructure was presently stable with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps, deficiencies, or surface corrosion observed.
- (B) The culvert floor was occasionally covered with up to 3 to 6 inches of silty sand and gravel.
- (C) The channel bottom outside of the culvert consisted of riprap covered with silty sand allowing 6 inches of probe rod penetration.

RECOMMENDATIONS:

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

Inspection Team Leader

Ayres Associates, Inc.



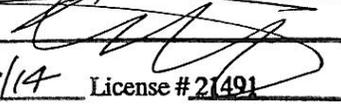
Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

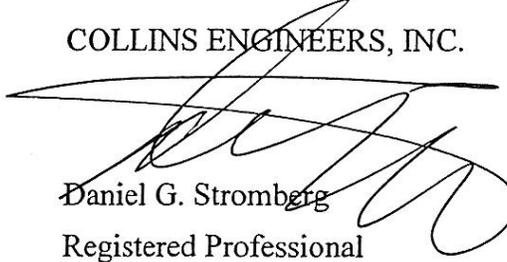
PROFESSIONAL ENGINEER

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: 97373

Feature Crossed: Heir Creek

Feature Carried: CSAH 37

Location: District 2 - Clearwater County

Bridge Description: The structure consisted of one corrugated aluminum arch culvert.

2. INSPECTION DATA

Professional Engineer Diver: Brian K. Schroeder, P.E

Dive Team: Jason A. Cook, James A. Hitchman

Date: August 13, 2012

Weather Conditions: Sunny, 69° F

Underwater Visibility: 4.0 feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Barrel and headwalls of corrugated aluminum culvert.

General Shape: The structure consisted of one, 54 foot long by 6.5 foot high by 15.3 foot wide, corrugated aluminum arch culvert.

Maximum Water Depth at Substructure Inspected: Approximately 4.8 feet.

4. WATERLINE DATUM

Water Level Reference: The crown of the culvert at the upstream opening.

Water Surface: The waterline was approximately 1.1 feet below reference.
Water Elevation = 1519.82.

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

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code E/02

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
243	Culvert	52	LF	52				
388	Culvert Headwall	2	EA	2				



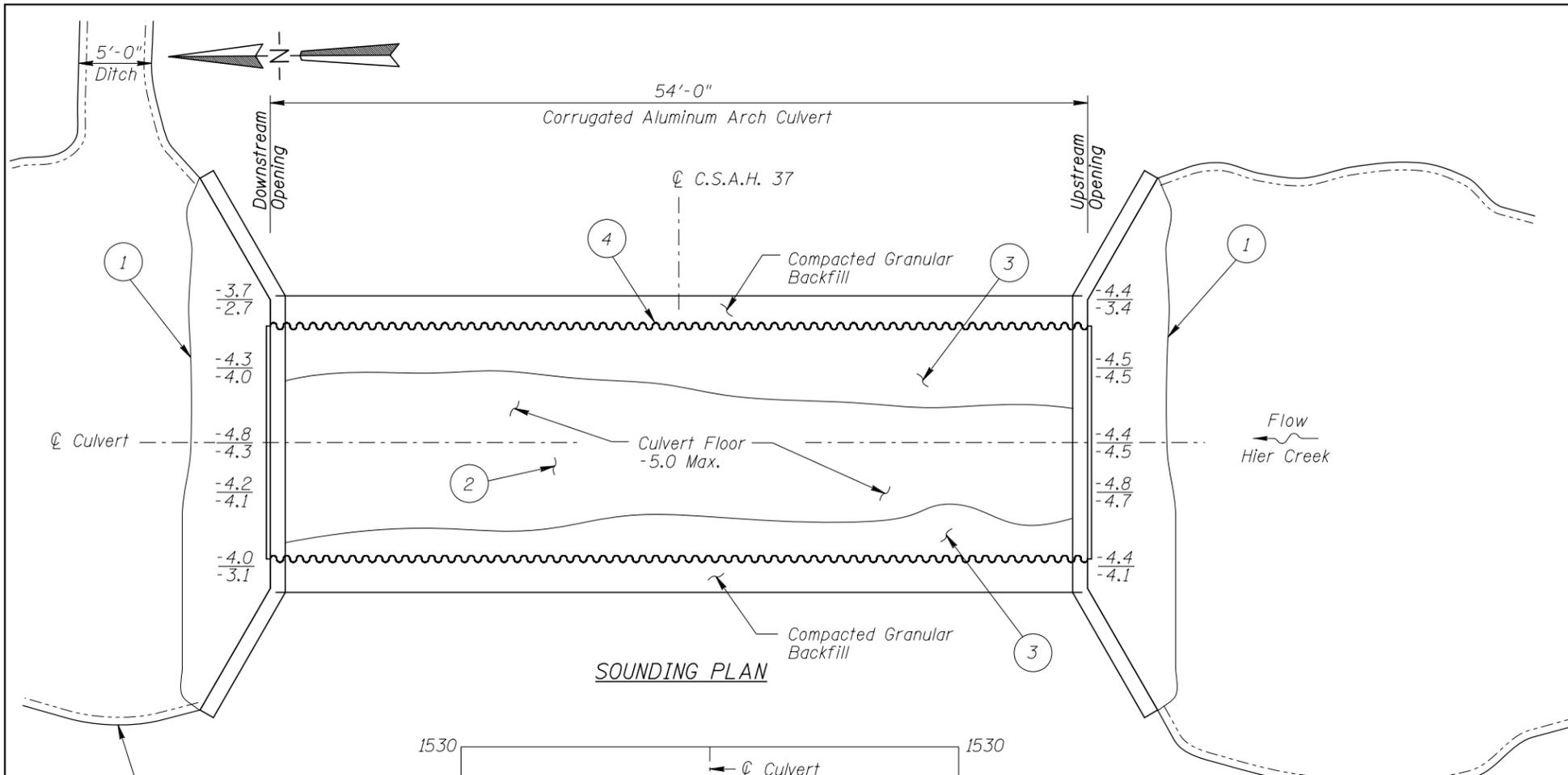
Photograph 1. Overall View of Structure, Looking North.



Photograph 2. Overall View of Structure, Looking South.



Photograph 3. View of Interior Top of Culvert, Looking South.



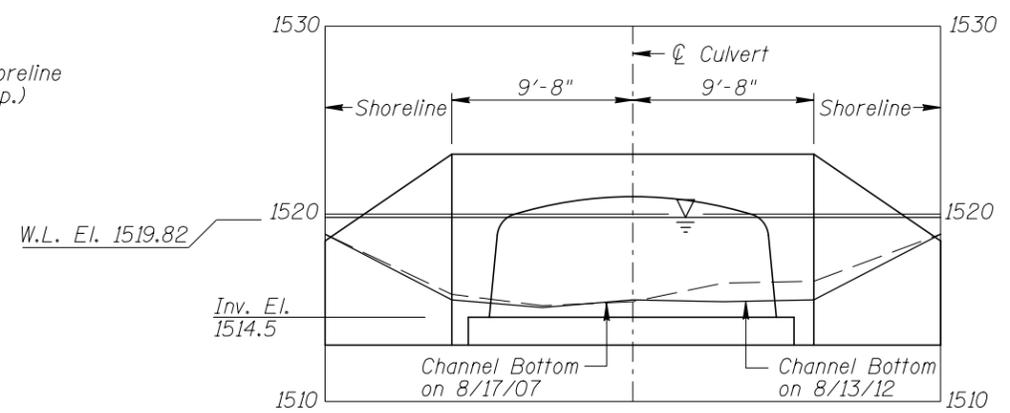
GENERAL NOTES:

1. The barrel and headwalls of the corrugated aluminum arch culvert were inspected underwater.
2. At the time of inspection on August 13, 2012, the waterline was located approximately 1.1 feet below the top of the culvert at the upstream opening. This corresponds to a waterline elevation of 1519.82 at the upstream opening based on design plans dated 1994.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the culvert at 1/4 point intervals at the upstream and downstream ends.

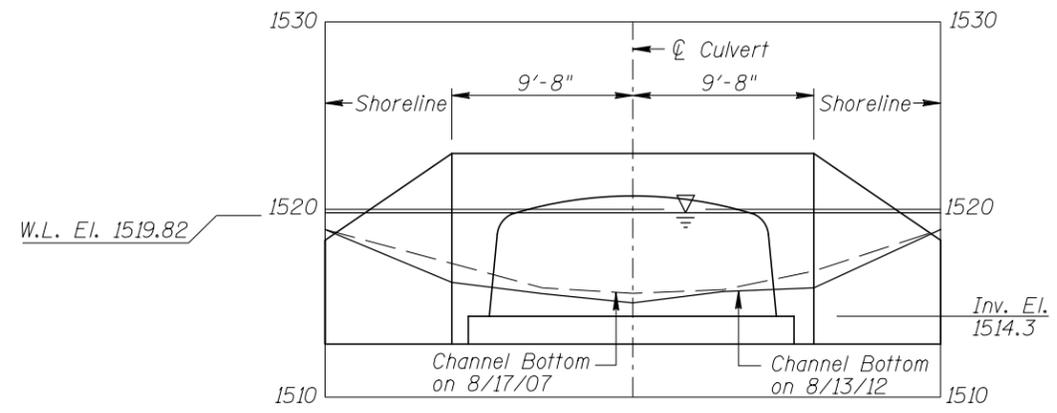
INSPECTION NOTES:

- ① The channel bottom consisted of riprap covered with silty sand with 6 inches of probe rod penetration.
- ② Culvert floor was occasionally covered with up to 3 inches of silty, sandy gravel.
- ③ The culvert floor along both walls of the barrel was covered with a 6-inch layer of silty, sandy gravel.
- ④ The corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps and no deficiencies observed.

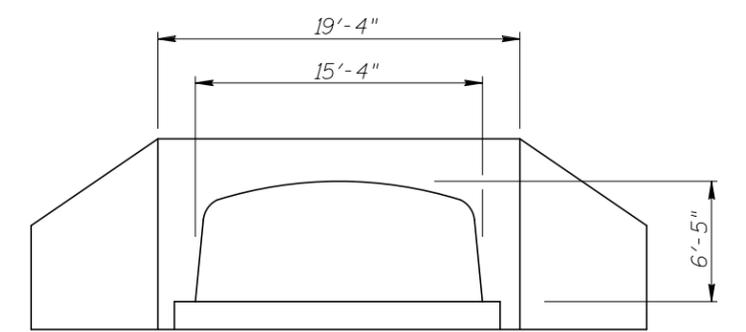
SOUNDING PLAN



UPSTREAM OPENING PROFILE
(Looking Downstream)



DOWNSTREAM OPENING PROFILE
(Looking Upstream)



TYPICAL END VIEW OF CULVERT

Legend

-3.8	Sounding Depth (8/13/12)
-3.8	Sounding Depth (8/17/07)

Note:
All soundings based on 2012 waterline location.

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**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 97373
OVER HIER CREEK
DISTRICT 2, CLEARWATER COUNTY

**INSPECTION AND SOUNDING PLAN
UPSTREAM AND DOWNSTREAM
OPENING PROFILES**

Drawn By: CJM	AYRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: AUG 2012
Checked By: BKS		Scale: 1"=10'
Code: 52210035		Figure No.: 1

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

INSPECTORS: Ayres Associates DATE: August 13, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 97373 WEATHER: Sunny, 69° F

WATERWAY CROSSED: Heir Creek

DIVING OPERATION: _____ SCUBA SURFACE SUPPLIED AIR
_____ OTHER _____

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: SSA, U/W Light, Hammer, Underwater Camera, Sounding Pole, Camera

TIME IN WATER: 12:40 P.M.

TIME OUT OF WATER: 1:00 P. M.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 4.0 Feet

DEPTH 4.8 feet at both headwalls

ELEMENTS INSPECTED: Corrugated aluminum arch culvert

REMARKS: Overall, the corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps and no deficiencies observed. The culvert floor was occasionally covered with up to 3 inches of silty sand and gravel. The channel bottom outside of the culvert consisted of riprap covered with silty sand with 6 inches of probe rod penetration.

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. 97373
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Heir Creek

INSPECTION DATE August 13, 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	CORROGATED ALUMINUM, 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	ALUMINUM	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	4.8'	N	7	N	9	N	7	8	N	N	8	8	N	8	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS Overall, the corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps and no deficiencies observed. The culvert floor was occasionally covered with up to 3 inches of silty sand and gravel. The channel bottom outside of the culvert consisted of riprap covered with silty sand with 6 inches of probe rod penetration.

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.