

UNDERWATER BRIDGE INSPECTION REPORT

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



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 35)

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:

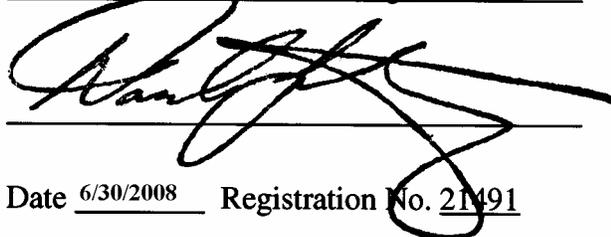
- (A) The corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps, deficiencies, or surface corrosion observed.
- (B) The culvert floor was occasionally covered with up to 3 inches of silty sand and gravel.
- (C) The channel bottom outside of the culvert consisted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

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

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.

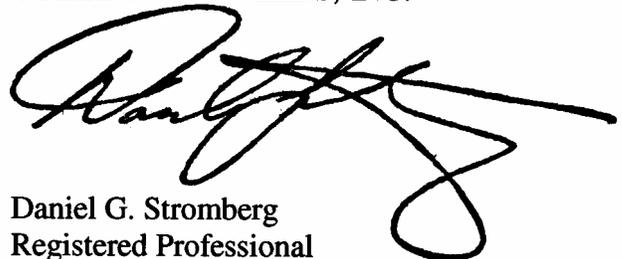
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

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: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 17, 2007

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 4.3 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 1.5 feet below reference.
Water Elevation = 1519.42.

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

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/08/07

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



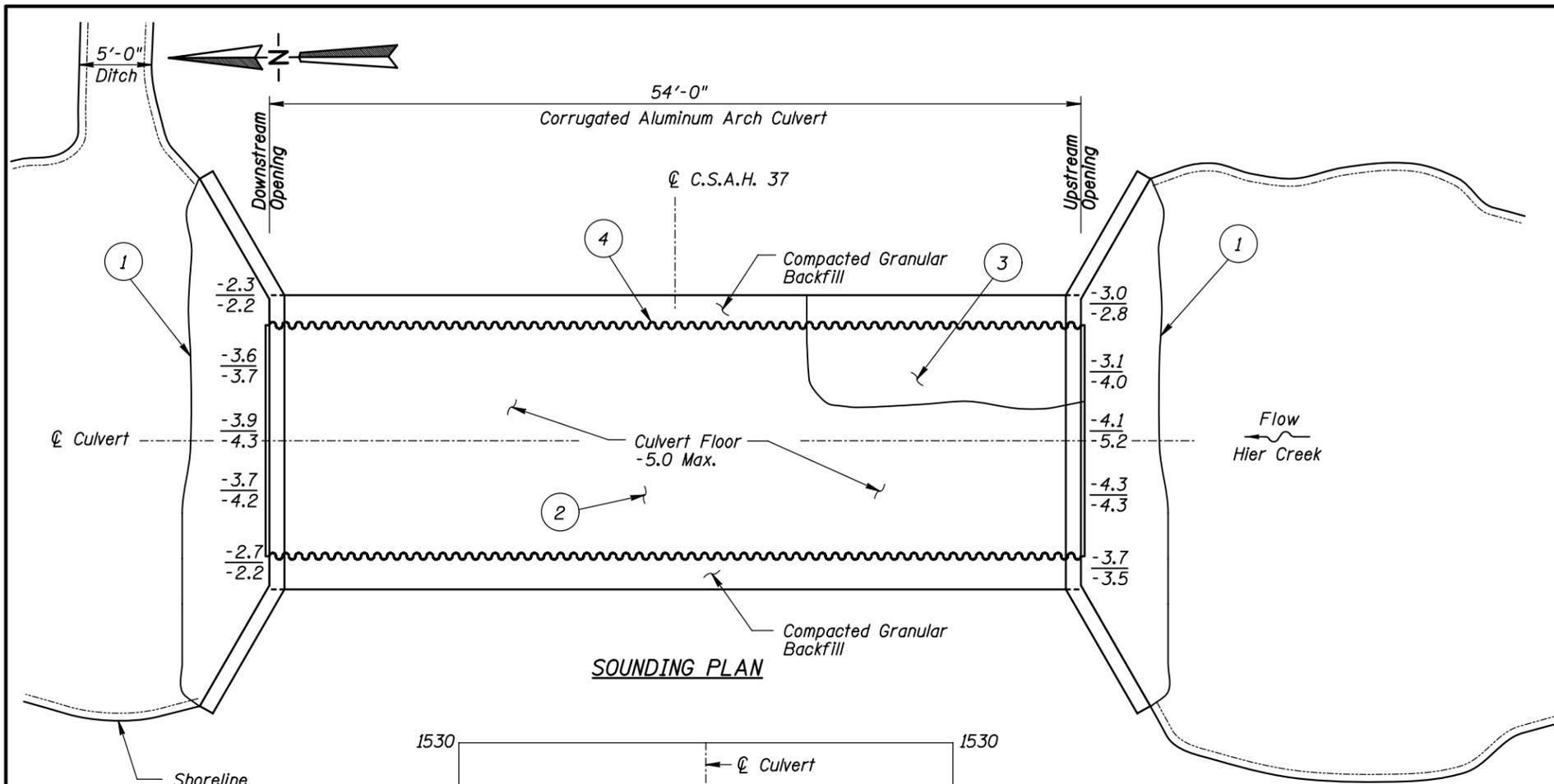
Photograph 1. Overall View of Structure, Looking North.



Photograph 2. Overall View of Structure, Looking South.



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



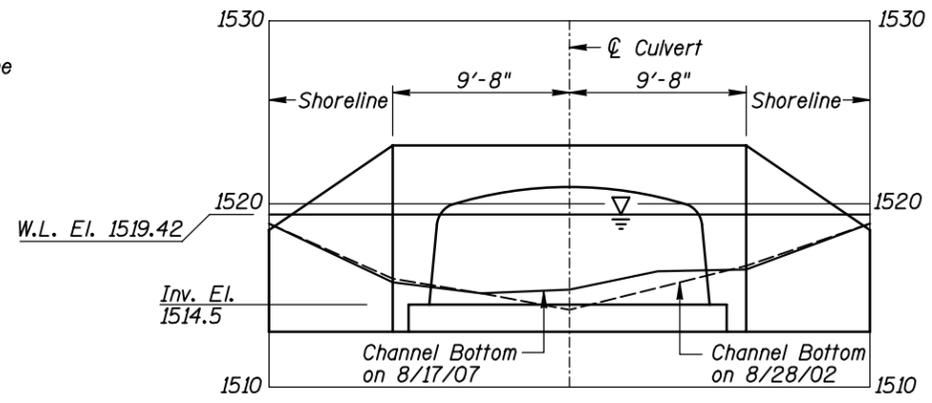
GENERAL NOTES:

1. The barrel and headwalls of the corrugated aluminum arch culvert were inspected underwater.
2. At the time of inspection on August 17, 2007, the waterline was located approximately 1.5 feet below the top of the culvert at the upstream opening. This corresponds to a waterline elevation of 1519.42 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.

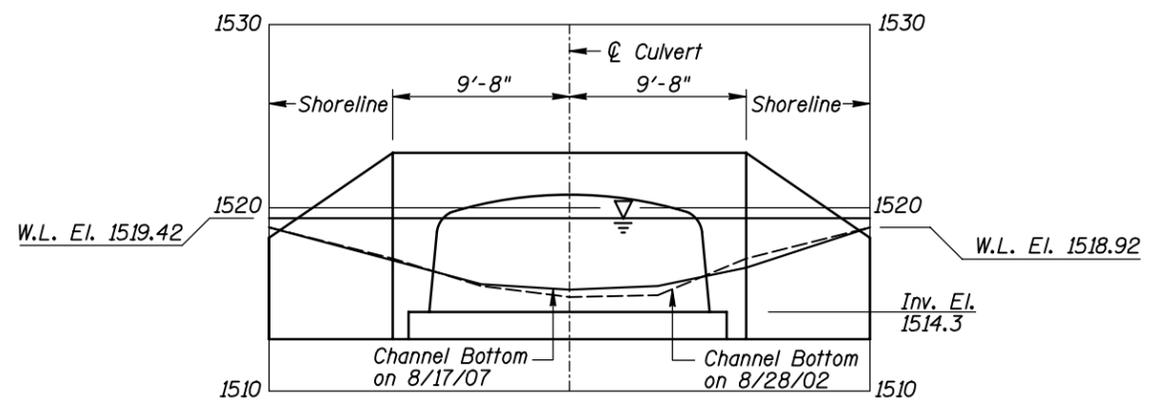
INSPECTION NOTES:

- 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 Area of culvert floor covered with a 6-inch layer of silty, sandy gravel located on the east side of the culvert floor from the upstream opening to the upstream quarter point of the culvert.
- ④ The corrugated aluminum arch culvert was sound with all joints secure and properly fitted with no gaps and no deficiencies observed.

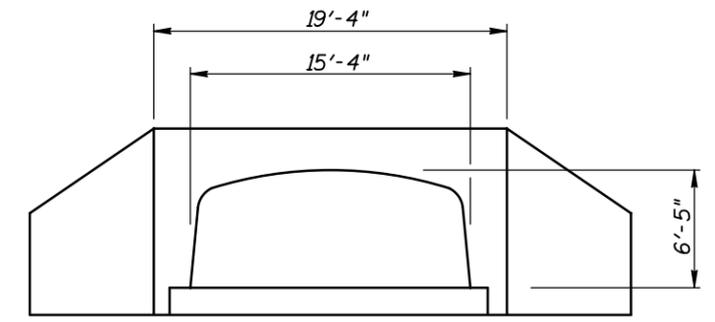
SOUNDING PLAN



UPSTREAM OPENING PROFILE
(Looking Downstream)



DOWNSTREAM OPENING PROFILE
(Looking Upstream)



TYPICAL END VIEW OF CULVERT

Legend

- 3.8 Sounding Depth (8/28/02)
- 3.8 Sounding Depth (8/17/07)

Note:

All soundings based on 2007 waterline location.

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: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: 1"=10'
Code: 52210035		Figure No.: 1

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

INSPECTORS: Collins Engineers, Inc. DATE: August 17, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E

BRIDGE NO: 97373 WEATHER: Sunny, 69° F

WATERWAY CROSSED: Heir Creek

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod,
Camera

TIME IN WATER: 9:30 A.M.

TIME OUT OF WATER: 10:00 A. M.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 4.0 Feet

DEPTH 4.3 feet at the south headwall

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 five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 97373
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
 WATERWAY CROSSED Heir Creek

INSPECTION DATE August 17, 2007
 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	4.3'	N	8	N	9	N	8	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.