

UNDERWATER BRIDGE INSPECTION REPORT

---

STRUCTURE NO. 07532

CSAH NO. 20

OVER THE

WILLOW CREEK

DISTRICT 7 – BLUE EARTH COUNTY

---



SEPTEMBER 11, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

AND

WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 07532, North and South Abutments, were generally in satisfactory condition. The abutments were not located in the waterway at the time of inspection. The abutments exhibited hairline to 1/8 inch wide cracks on the concrete surfaces. Both abutments were well armored by 1 to 1.5 foot diameter riprap. The channel bottom appeared to be well established with no evidence of significant scour.

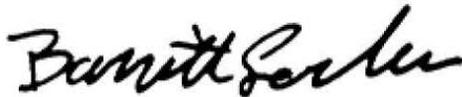
INSPECTION FINDINGS:

- (A) The channel bottom material consisted of gravel, cobbles, and 1 foot diameter riprap with no appreciable probe rod penetration.
- (B) The North and South Abutments were armored by 1 to 1.5 foot riprap.
- (C) Widespread hairline to 1/8 inch wide horizontal cracks with some exudation were observed on the concrete surfaces of both abutments from 5 feet to 10 feet above the waterline.

RECOMMENDATIONS:

- (A) The inspection of the submerged substructure units of Structure No. 07532 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 inspections 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 fascia 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.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:  
WSB and Associates



Barritt Lovelace  
Registered Professional Engineer  
Bridge Safety Inspection Team Leader

Respectfully submitted,

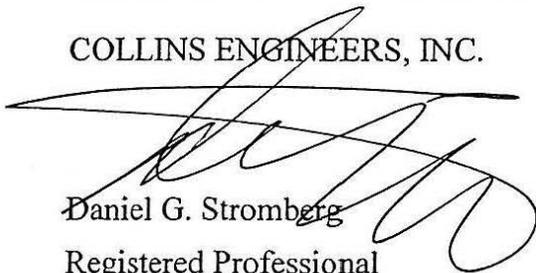
PROFESSIONAL ENGINEER

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: 07532

Feature Crossed: Willow Creek

Feature Carried: CSAH No. 20

Location: District 7- Blue Earth County

Bridge Description: The superstructure consists of one span of multiple prestressed concrete beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E (WSB)

Dive Team: Kasey Yoder (WSB), Lukas Janulis (Collins)

Date: September 11, 2012

Weather Conditions: Sunny, 75° F

Underwater Visibility: 0.5 feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutments

General Shape: The abutments consisted of reinforced concrete supported by piles.

Maximum Water Depth at Substructure Inspected: None

4. WATERLINE DATUM

Water Level Reference: The bottom of the concrete deck at midspan along the west fascia.

Water Surface: The waterline was approximately 13.5 feet below reference.  
Assumed Waterline Elevation = 86.5

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

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code A/09/12

Item 113: Scour Critical Bridges: Code O/08

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
215	Concrete Abutment Wall	75	LF		75			
985	Slopes and Slope Protection	1	EA	1				



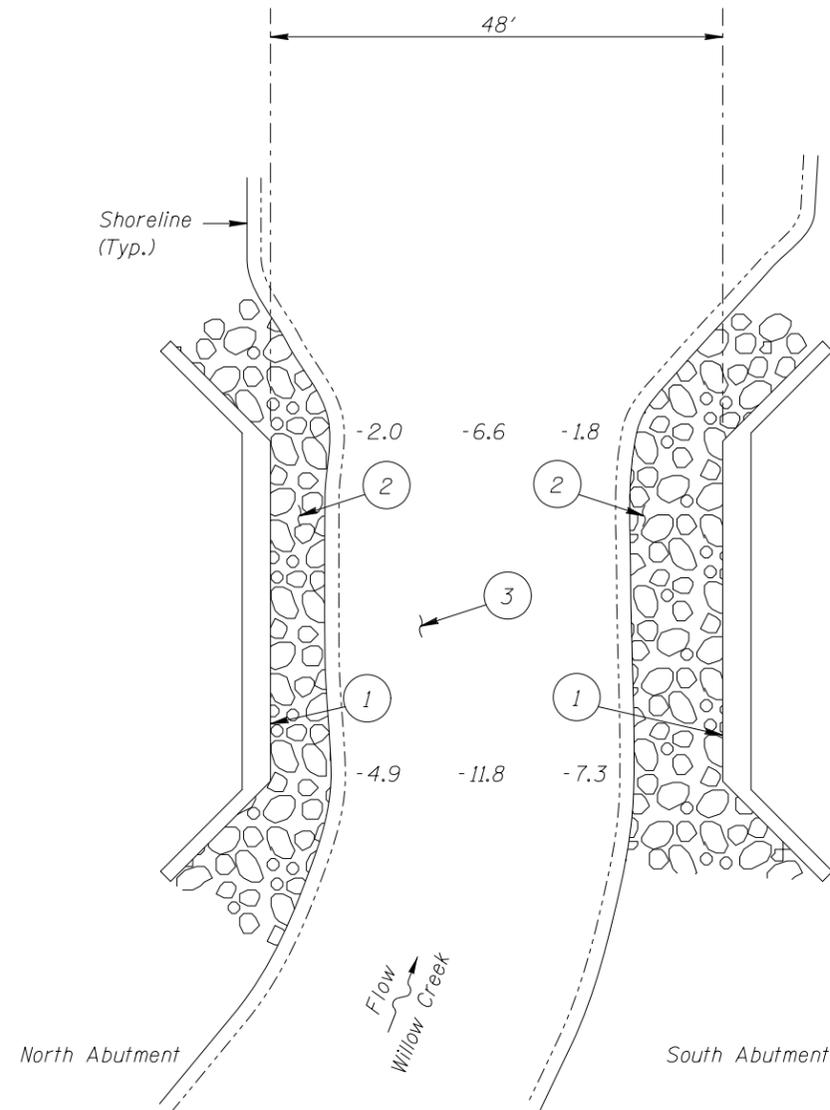
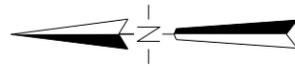
Photograph 1. Overall View of the Structure, Looking West.



Photograph 2. View of North Abutment, Looking Northeast.



Photograph 3. View of South Abutment, Looking Southwest.



SOUNDING PLAN

Legend  
 -5.5 Sounding Depth from Waterline (9/11/12)

GENERAL NOTES:

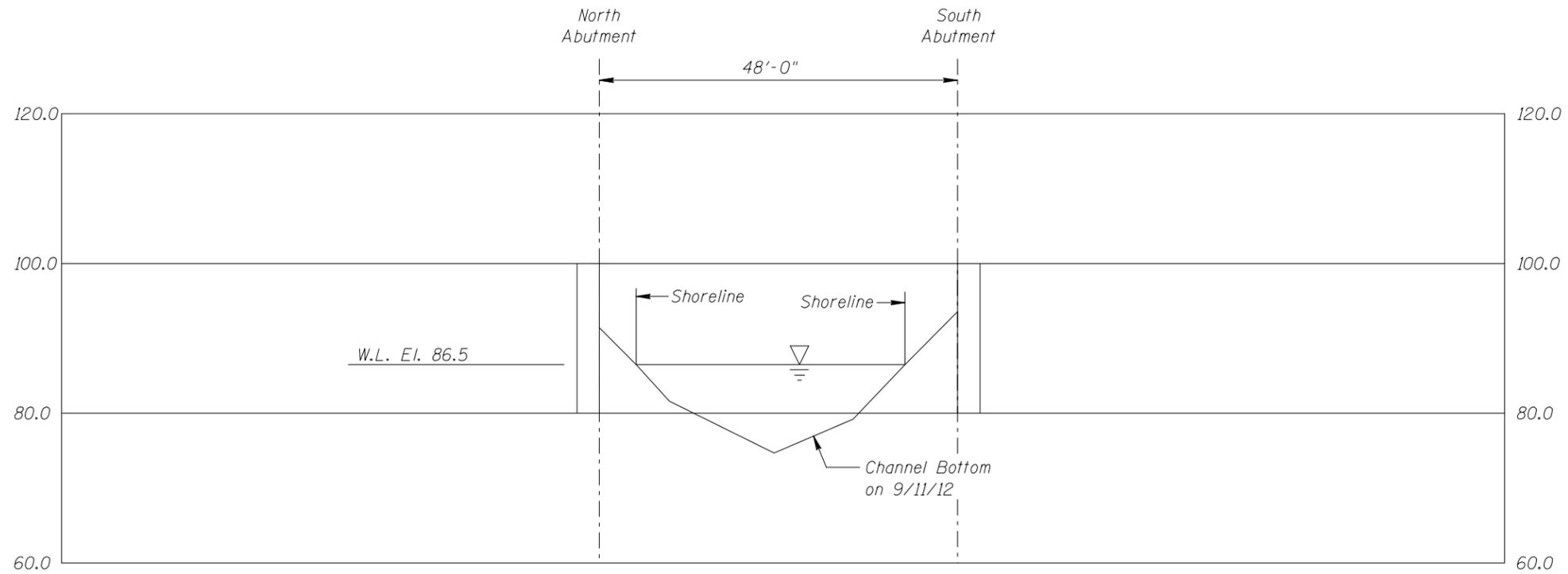
1. At the time of inspection on September 11, 2012, the waterline was located approximately 13.5 feet below the bottom of the concrete deck at the midspan along the west facia. Design plans were not available, therefore a reference of 100.0 was assumed. Based on the assumed reference the waterline elevation was 86.5
2. Soundings indicate the water depth at the time of inspection and are measured in feet.
3. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

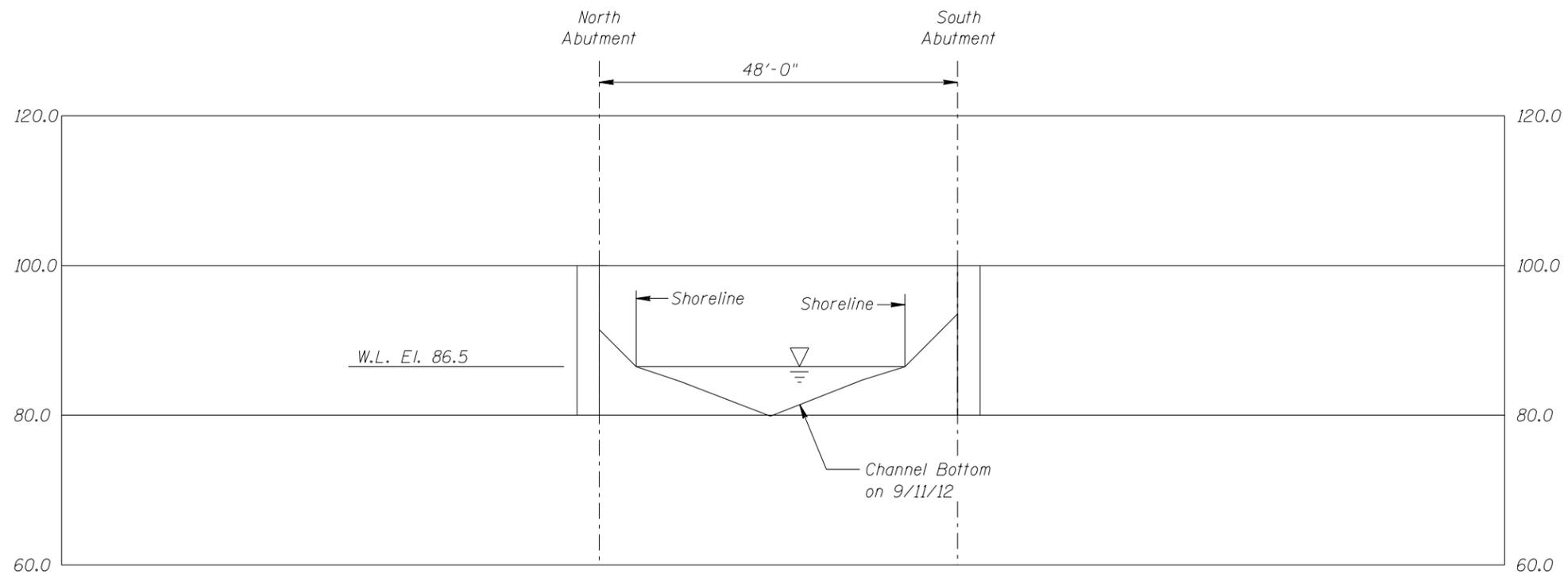
- 1 Widespread hairline to 1/8 inch wide horizontal cracks with some exudation were observed on the concrete surfaces of both abutments from 5 feet to 10 feet above the waterline.
- 2 1 to 1.5 foot diameter riprap was armoring the North and South Abutments.
- 3 The channel bottom material typical consisted of firm gravel, cobbles and 1 foot diameter riprap allowing no appreciable probe rod penetration.



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 07532 OVER THE WILLOW CREEK DISTRICT 7, BLUE EARTH COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: NTS
Code: ---		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. G7532 OVER THE WILLOW CREEK DISTRICT 7, BLUE EARTH COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=30'
Code: ---		Figure No.: 2

123 North Wacker Drive  
Suite 300  
Chicago, IL 60606  
(312) 704-9300  
www.collinsengr.com

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

INSPECTORS: WSB & Associates and Collins DATE: September 11, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 07532 WEATHER: Sunny, 75°F

WATERWAY CROSSED: Willow Creek

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

PERSONNEL: Kasey Yoder (WSB), Lukas Janulis (Collins)

EQUIPMENT: Sounding Rod, Camera, Lead Line, Hammer

TIME IN WATER: 10:15 a.m.

TIME OUT OF WATER: 10:25 a.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 0.5 feet

DEPTH 11.8 in the channel

ELEMENTS INSPECTED: North and South Abutments (Located out of the waterway)

REMARKS: The concrete up to the high waterline was in satisfactory condition with widespread horizontal cracks, measuring up to 1/8 inch wide. Some exudation was present along the cracks. Both abutments were well protected against scour by 1.0 to 1.5 foot diameter riprap.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES  NO

The inspection of the submerged substructure units of Structure No. 07532 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 inspections 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 fascia 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. 07532  
 INSPECTORS WSB & Associates and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER, Barritt Lovelace P.E.  
 WATERWAY CROSSED Willow Creek

INSPECTION DATE September 11, 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 (SEAL)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/SEDIMENT)	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
	North Abutment	Dry	N	6	N	8	N	6	7	7	7	N	7	6	N	N	7	N	N
	South Abutment	Dry	N	6	N	8	N	6	7	7	7	N	7	6	N	N	7	N	N

\*UNDERWATER PORTION ONLY

REMARKS: The concrete up to the high waterline was in satisfactory condition with widespread horizontal cracks, measuring up to 1/8 inch wide. Some exudation was present along the cracks. Both abutments were well protected against scour by 1.0 to 1.5 foot diameter riprap.

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.