

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. L5948

110<sup>TH</sup> AVE (TWNS 366)

OVER THE

NORTH BRANCH, MIDDLE FORK OF THE ZUMBRO RIVER

DISTRICT 6 – GOODHUE COUNTY

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DECEMBER 16, 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 Structure No. L5948, the North and South Abutments, were found to be generally in good to satisfactory condition, however, significant footing exposure was observed at both abutments. The maximum footing exposure reached up to 5 feet, but no foundation undermining was present. The channel bottom make-up along the abutments consisted of soft silt and no riprap or other scour preventive measures observed. The concrete of both abutments appeared to sound and in good condition with no significant defects.

INSPECTION FINDINGS:

- (A) The channel bottom material consisted of soft silt with up to 6 inches probe rod penetration.
- (B) The footings were exposed along the North and South Abutments with up to 5 feet of maximum vertical exposure. No undermining was present.

RECOMMENDATIONS:

- (A) Consideration should be given to placement of scour countermeasures along the exposed footing of both abutments in order to prevent further exposure and/or possible foundation undermining. Until the countermeasures are installed, the foundation exposure should be closely monitored during future underwater inspection and during or after events of high water and increased flow.
  
- (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,

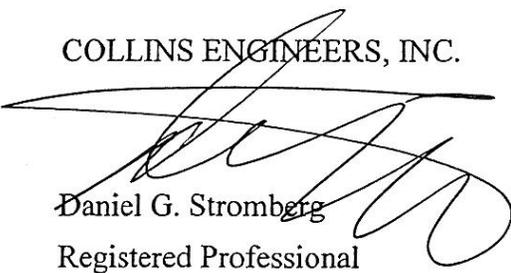
PROFESSIONAL ENGINEER

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: L5948

Feature Crossed: North Branch Middle Fork of Zumbro River

Feature Carried: 110<sup>th</sup> Ave

Location: District 6 – Goodhue County

Bridge Description: The superstructure consists of one span of multiple steel 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 L. Yoder (WSB)

Date: December 16, 2012

Weather Conditions: Overcast, 27° F

Underwater Visibility: 3 feet

Waterway Velocity: 0.5 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutments

General Shape: The abutments each consist of vertical reinforced concrete breast wall with skewed wingwalls. No bridge plans were available at the time of inspection, and the substructure foundation configuration is unknown.

Maximum Water Depth at Substructure Inspected: Approximately 7.9 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of headwall at the upstream opening.  
Assumed Elevation = 100.0

Water Surface: The waterline was approximately 8.7 feet below reference.  
Assumed Waterline Elevation = 91.3

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 4

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

Item 113: Scour Critical Bridges: Code R/12

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

X Yes \_\_\_\_\_ No

6. STRUCTURAL ELEMENT CONDITION RATING

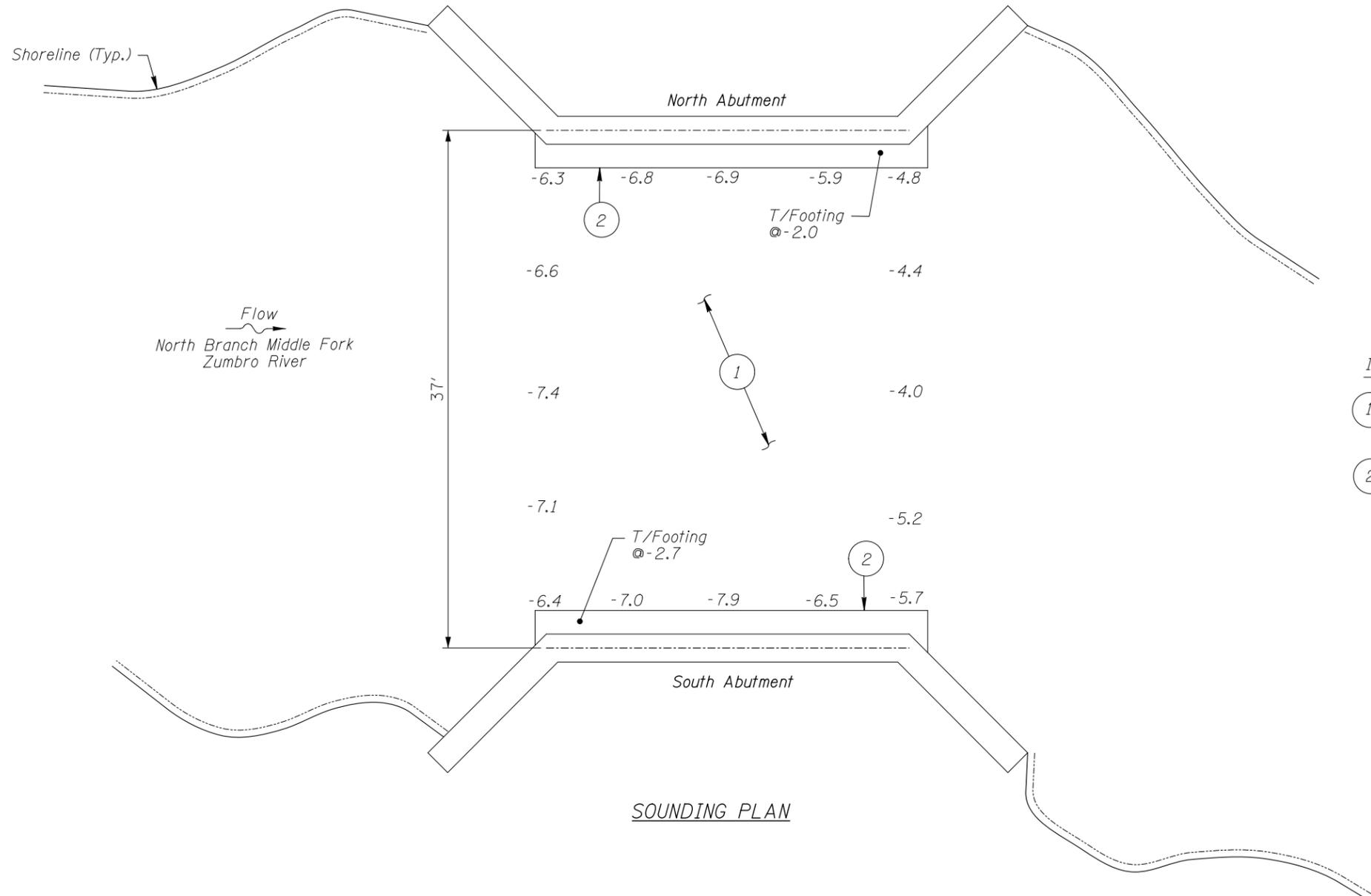
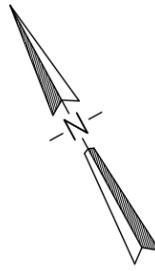
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
215	Concrete Abutment Wall	52	LF	52				
361	Scour	1	EA			1		
387	Concrete Wingwalls	4	EA	4				



Photograph 1. Overall View of the East Fascia, Looking West.



Photograph 2. Overall View of the West Fascia, Looking East.



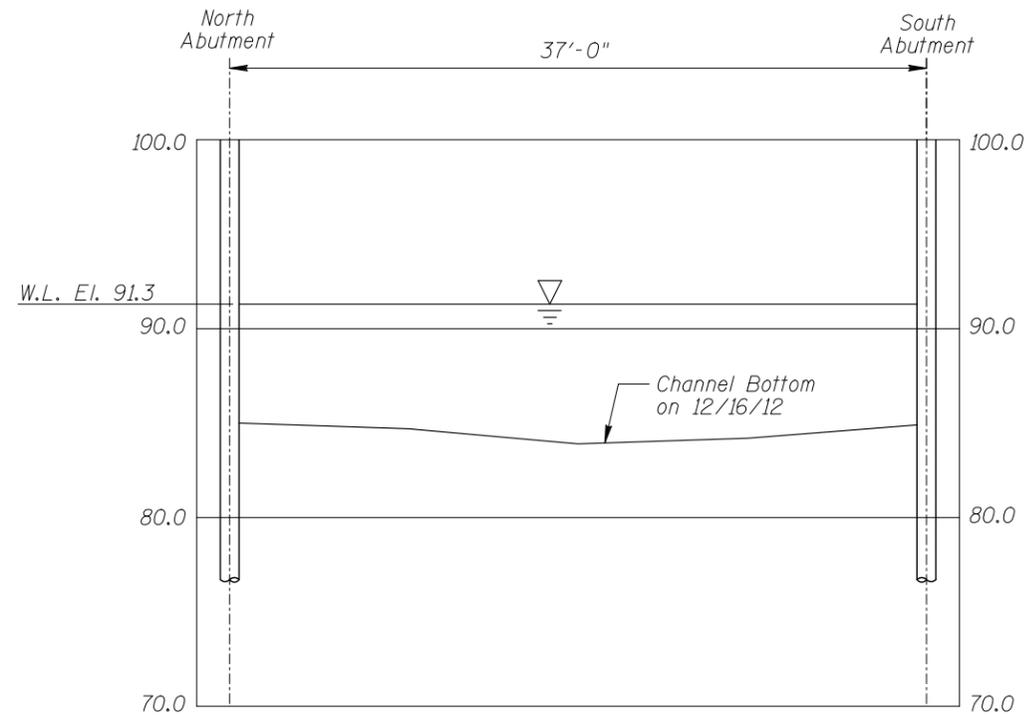
SOUNDING PLAN

- INSPECTION NOTES:
- ① The channel bottom material consisted of silt allowing up to 6 inches of probe rod penetration.
  - ② The footing was exposed along the North and South Abutments with up to 5 feet of maximum vertical face exposure.

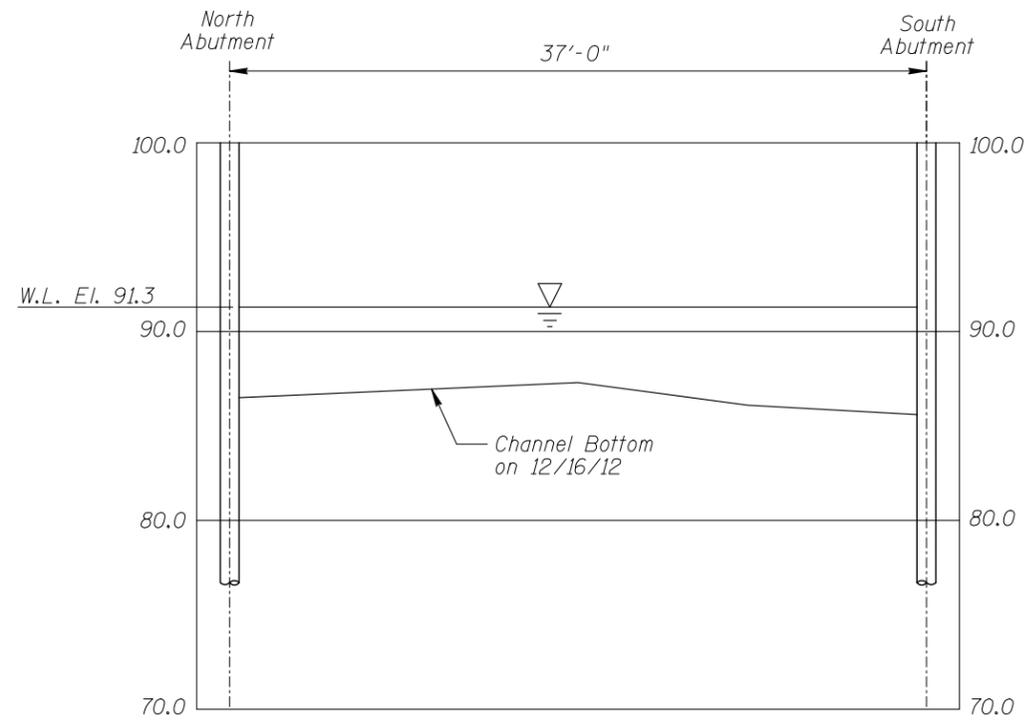
- GENERAL NOTES:
1. The North and South Abutments were inspected underwater.
  2. At the time of inspection on December 16, 2012, the waterline was located approximately 8.7 feet below the bottom of concrete deck at the mid-span at the upstream side. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 91.3.
  3. Soundings indicate the water depth at the time of inspection and are measured in feet.
  4. Soundings were taken parallel to the bridge at the quarter point intervals between the substructure units.

Legend  
 -5.2 Sounding Depth (12/16/12)

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 15948 OVER N BR MID FK ZUMBRO RIVER DISTRICT 6, GOODHUE COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: DEC. 2012
Checked By: BRL	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code:	<small>701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.wsbeng.com 763.541.4800 • Fax 763.541.1700 INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION</small>	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. 15948 OVER N BR MID FK ZUMBRO RIVER DISTRICT 6, GOODHUE COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: DEC. 2012
Checked By: BRL		Scale: 1"=10'
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, Inc. DATE: December 16, 2012

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

BRIDGE NO: L5948 WEATHER: Overcast, 27°F

WATERWAY CROSSED: North Branch Middle Fork Zumbro River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Kasey L. Yoder (WSB)

EQUIPMENT: Commercial Scuba, Survey Rod, Tape, Camera

TIME IN WATER: 8:00 A.M.

TIME OUT OF WATER: 9:00 A.M.

WATERWAY DATA: VELOCITY 0.5 ft/s

VISIBILITY 3.0 feet

DEPTH 7.9 foot maximum

ELEMENTS INSPECTED: North and South Abutments

REMARKS: Overall, the concrete of both abutments appeared to be sound with no significant deficiencies. The footings were exposed along the North and South Abutments with up to 5 feet of vertical exposure. No foundation undermining was present. The abutments were not armored with rip rap.

FURTHER ACTION NEEDED:  YES  NO

Consideration should be given to placement of scour countermeasures along the exposed footings of both abutments in order to prevent further exposure and/or possible foundation undermining. Until the countermeasures are installed, the foundation exposure should be closely monitored during future underwater inspection and during or after events of high water and increased flow.

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. L5948  
 INSPECTORS WSB & Associates, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace P.E.  
 WATERWAY CROSSED Zumbro River

INSPECTION DATE December 16, 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	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
	North Abutment	-6.9	N	7	7	7	N	6	4	5	N	7	4	7	N	N	8	N	N
	South Abutment	-7.9	N	7	7	7	N	6	4	5	N	7	4	7	N	N	8	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of both abutments appeared to be sound with no significant deficiencies. The footings were exposed along the North and South Abutments with up to 5 feet of vertical exposure. No foundation undermining was present. The abutments were not armored with rip rap.

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.