

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. L8547

TWP NO. 371 (165th AVE)

OVER THE

NORTH BRANCH MIDDLE FORK OF THE ZUMBRO RIVER

DISTRICT 6 - GOODHUE COUNTY



SEPTEMBER 12, 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 units inspected at Bridge L8547, the North and South Abutments, were found to be in good to satisfactory condition below water. The timber piles and planking were generally found to be sound with only minor splits and checks, apart from the upstream pile of the South Abutment, which exhibited moderate deterioration and was not sound near the waterline. The channel bottom and embankments appeared to be in stable condition with no erosion observed.

INSPECTION FINDINGS:

- (A) The channel bottom material at the North Abutment consisted of soft silt with 2 feet of probe rod penetration.
- (B) Loss of backfill material was observed at the North Abutment due to a 1/2 inch wide gap in the backwall deck planking.
- (C) The channel bottom material at the South Abutment consisted of 6 inch diameter stone with silty sand infilling.
- (D) Pile 7 at the South Abutment exhibited delamination of the outer 1 inch of layer and sounded hollow from 1 foot above to 1 foot below the waterline.

RECOMMENDATIONS:

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

Inspection Team Leader

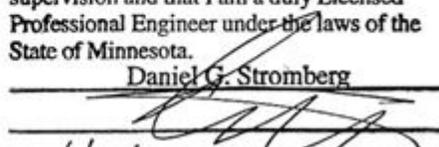


Roy A. Forsyth, PE
Date 6/30/2014 License# 49270

Respectfully submitted,

PROFESSIONAL ENGINEER

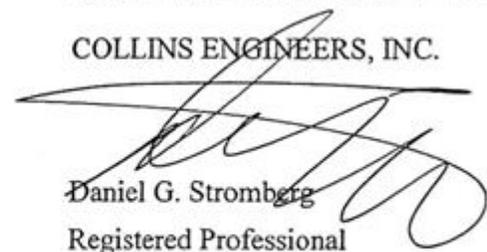
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



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: L8547

Feature Crossed: North branch middle fork of the Zumbro River

Feature Carried: TWP No. 371

Location: District 6 - Goodhue County

Bridge Description: The superstructure consists of a single span, multiple timber stringer structure supporting a timber deck. The superstructure is supported by two timber abutments. No design drawings or plans were available for this bridge; therefore, the exact configuration of substructure foundation is not known.

2. INSPECTION DATA

Professional Engineer/Team Leader: Roy A. Forsyth, P.E.

Dive Team: Brandon Corr, Charles Euwema

Date: September 12, 2012

Weather Conditions: Cloudy, 65°F

Underwater Visibility: 2 feet

Waterway Velocity: Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: The North and South Abutments.

General Shape: The abutments consist of a timber planking breastwall supported by seven timber piles adjoining skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 2.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of cap at the west end of the North Abutment.

Water Surface: The waterline was approximately 5.3 feet below reference.
Assumed Waterline Elevation = 94.7

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 B/09/12

Item 113: Scour Critical Bridges: R

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 |
| 228 | Timber Piles | 14 | EA | 13 | 1 | | | |
| 216 | Timber Abutment | 56 | LF | 54 | 2 | | | |
| 386 | Timber Wingwall | 4 | EA | 4 | | | | |
| 361 | Scour | 1 | EA | 1 | | | | |



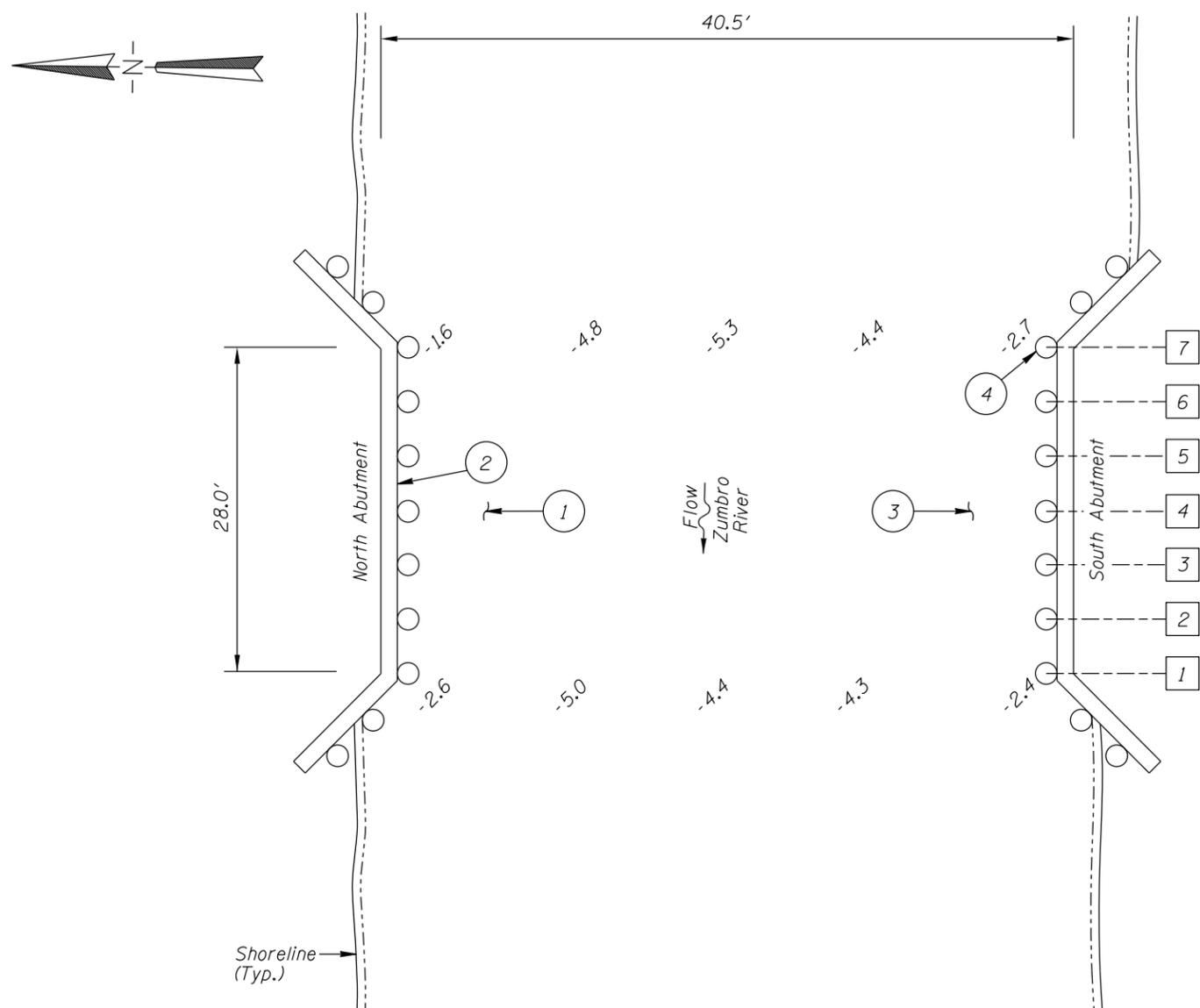
Photograph 1. Overall View of the Structure, Looking Northwest.



Photograph 2. View of South Abutment, Looking Southeast.



Photograph 3. View of North Abutment, Looking Northeast.



SOUNDING PLAN

GENERAL NOTES:

1. The North and South Abutments were inspected underwater.
2. At the time of inspection on September 12, 2012, the waterline was located approximately 5.3 feet below the top of cap at the west end of the North Abutment. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 94.7.
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 1/4 point intervals between the substructure units.
5. The timber piles and planking were typically sound and in good condition with only minor checks and splits.

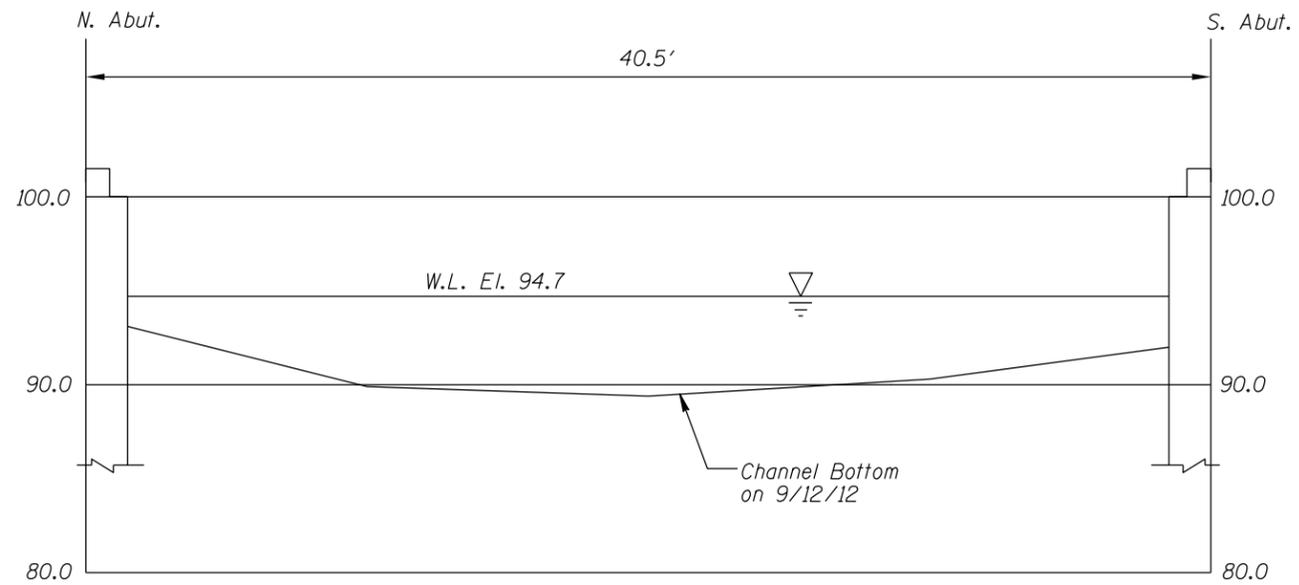
INSPECTION NOTES

- ① The channel bottom at the North Abutment consisted of soft silt with 2 feet of probe rod penetration.
- ② A 1/2 inch wide gap was observed in the deck planking of the North Abutment with apparent loss of backfill material present.
- ③ The channel bottom at the South Abutment consisted of 6 inch diameter stone with silty sand infilling.
- ④ Pile 7 at the South Abutment exhibited delamination of the outer 1 inch of shell and sounded hollow from 1 foot above to 1 foot below the waterline.

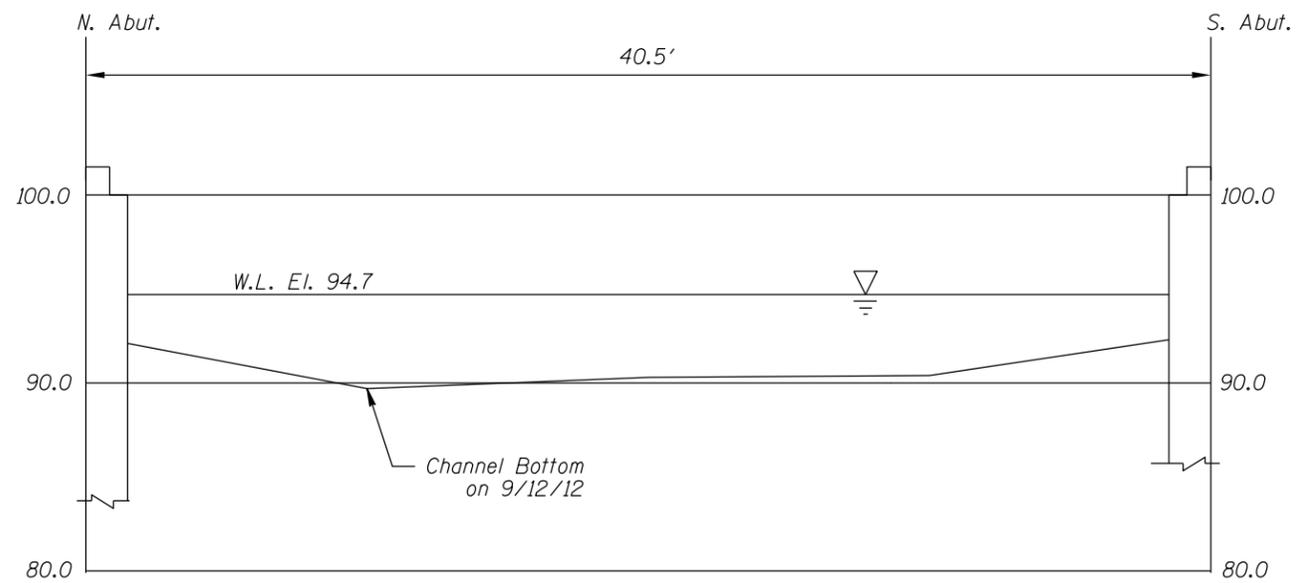
Legend

① Sounding Depth (9/12/12)

| | | |
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| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. L8547 OVER THE ZUMBRO RIVER DISTRICT 6, GOODHUE COUNTY | | |
| INSPECTION AND SOUNDING PLAN | | |
| Drawn By: JTF | COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> | Date: Sept. 2012 |
| Checked By: DGS | | Scale: NTS |
| Code: 52210144 | | Figure No.: 1 |



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:
Refer to Figure 1 for General Notes.

| | | |
|--|--|---------------------|
| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. L8547 OVER THE ZUMBRO RIVER DISTRICT 6, GOODHUE COUNTY | | |
| UPSTREAM AND DOWNSTREAM FASCIA PROFILES | | |
| Drawn By: JTF | COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> | Date: Sept. 2012 |
| Checked By: DGS | | Scale: NTS (U.O.N.) |
| Code: 35120144 | | Figure No.: 2 |

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. L8547
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Roy A. Forsyth, P.E.
 WATERWAY CROSSED North Branch Middle Fork of the Zumbro River

INSPECTION DATE September 12, 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 (ABUTMENT BACKWALL) | 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 | 2.6' | 7 | N | N | 7 | 6 | 7 | N | N | N | N | 7 | N | N | 7 | N | N | N |
| | South Abutment | 2.7' | 6 | N | N | 7 | N | 6 | N | N | N | N | 7 | N | N | 6 | N | N | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: The channel bottom at the North Abutment consisted of soft silt with 2 feet of probe rod penetration. A 1/2 inch wide gap was observed in the deck planking of the North Abutment. The channel bottom at the South Abutment consisted of 6 inch diameter stone with silty sand infilling. Pile 7 at the South Abutment exhibited delamination of the outer 1 inch of shell and sounded hollow from 1 foot above to 1 foot below the waterline.

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.

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

INSPECTORS: Collins Engineers, Inc. DATE: September 12, 2012

ON-SITE TEAM LEADER: Roy A. Forsyth, P.E.

BRIDGE NO: L8547 WEATHER: Cloudy, 65°F

WATERWAY CROSSED: North Branch Middle Fork of the Zumbro River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR
 OTHER Wade at substructure, swim in channel

PERSONNEL: Brandon Corr, Charles Euwema

EQUIPMENT: Waders, Scraper, Sounding Pole, Camera, Probe Rod

TIME IN WATER: 4:45 p.m.

TIME OUT OF WATER: 5:05 p.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 2.0 feet

DEPTH 2.7 feet maximum at the South Abutment

ELEMENTS INSPECTED: The North and South Abutments

REMARKS: The channel bottom at the North Abutment consisted of soft silt with 2 feet of probe rod penetration. A 1/2 inch wide gap was observed in the deck planking of the North Abutment. The channel bottom at the South Abutment consisted of 6 inch diameter stone with silty sand infilling. Pile 7 at the South Abutment exhibited delamination of the outer 1 inch of shell and sounded hollow from 1 foot above to 1 foot below the waterline.

FURTHER ACTION NEEDED: _____ YES NO

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