

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6564

CSAH 11

OVER THE

ZUMBRO RIVER

WABASHA COUNTY



SEPTEMBER 14, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

Structure No. 6564, was found to be generally in good condition with no defects of structural significance observed below the water. The channel bottom was silty sand and gravel. Pier 1 had timber debris accumulation present along the west face of the pier extending up to 5 feet above the waterline. Partial footing exposure was observed near the upstream end of Pier 1 with a maximum vertical face exposure of 1.5 feet. Pier 2 exhibited a scour depression at the upstream nose with a maximum depth of 2 feet.

INSPECTION FINDINGS:

- (A) There was a 3 foot radius by 2 foot deep scour depression at the upstream nose of Pier 2.
- (B) The channel bottom material consisted of silty sand and gravel with 2 inch penetration.
- (C) Timber debris accumulation, consisting of 12 inch diameter and smaller logs, was present from the channel bottom to 5 feet above the waterline between shore and the west face of Pier 1.
- (D) The footing was partially exposed from the northwest corner of Pier 1 around the upstream nose to the upstream east 1/4-point with a maximum vertical face exposure of 1.5 feet. The top of footing was located 5.5 feet below water surface.

RECOMMENDATIONS:

- (A) Monitor the extent of footing exposure as well as timber debris accumulation during future underwater inspections.
- (B) 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,

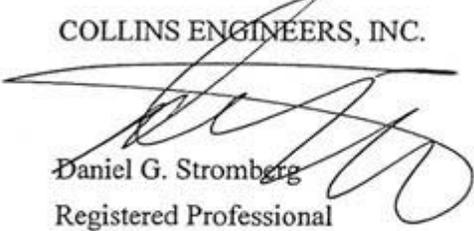
PROFESSIONAL ENGINEER

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: 6564

Feature Crossed: Zumbro River

Feature Carried: CSAH 11

Location: Wabasha County

Bridge Description: The superstructure consists of four spans of multiple steel beams supported by two reinforced concrete abutments and three reinforced concrete piers. The substructure units are designated as West Abutment, Piers 1 through 3 and East Abutment.

2. INSPECTION DATA

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

Dive Team: Charles R. Euwema, Brandon Corr

Date: September 14, 2012

Weather Conditions: Sunny, 75° F

Underwater Visibility: 5.0 feet

Waterway Velocity: 1.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructures Inspected: Piers 1 and 2.

General Shape: The piers have oblong rectangular shafts with diamond shaped noses and are founded on rectangular footings.

Maximum Water Depth at Substructure Inspected: Approximately 7.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of pier cap at downstream nose of Pier 2.

Water Surface: The waterline was approximately 18.7 feet below reference.
Assumed Waterline Elevation = 81.3

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 6

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

Item 113: Scour Critical Bridges: Code O

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
210	Concrete Pier Wall	77	LF	77				
361	Scour Smart Flag	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



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



Photograph 2. View of Pier 3, Looking Southwest.



Photograph 3. View of Pier 2, Looking West.



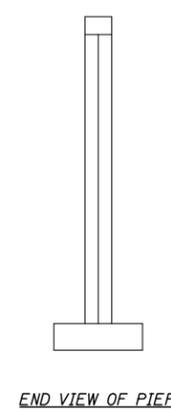
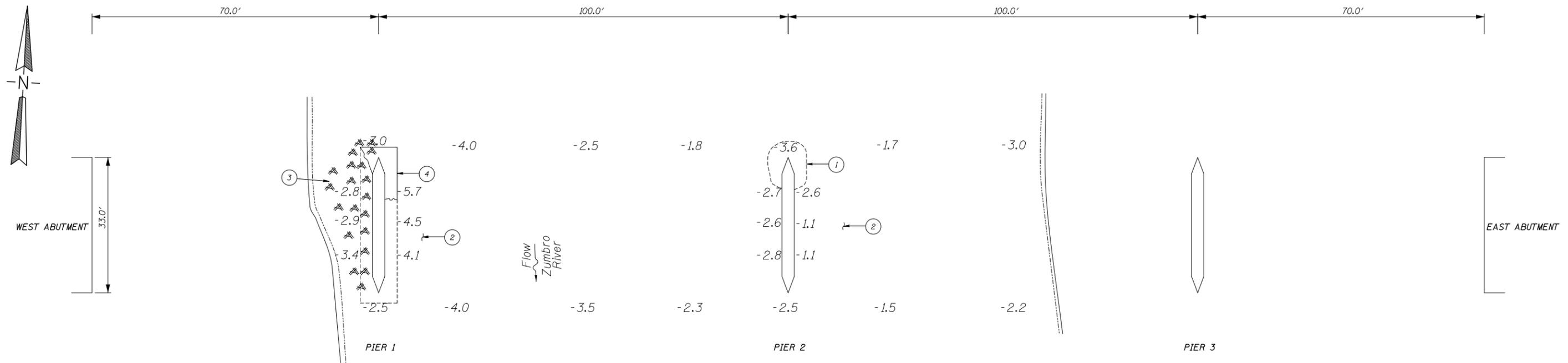
Photograph 4. View of Pier 1, Looking Southwest.



Photograph 5. View of East Abutment, Looking Southeast.



Photograph 6. View of West Abutment, Looking Northwest.



GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on September 14, 2012, the waterline was located approximately 18.7 feet below the top of the pier cap of the downstream nose of Pier 2. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference, the waterline elevation was 81.3.
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 quarter -point intervals between the substructure units as well as around the structures.

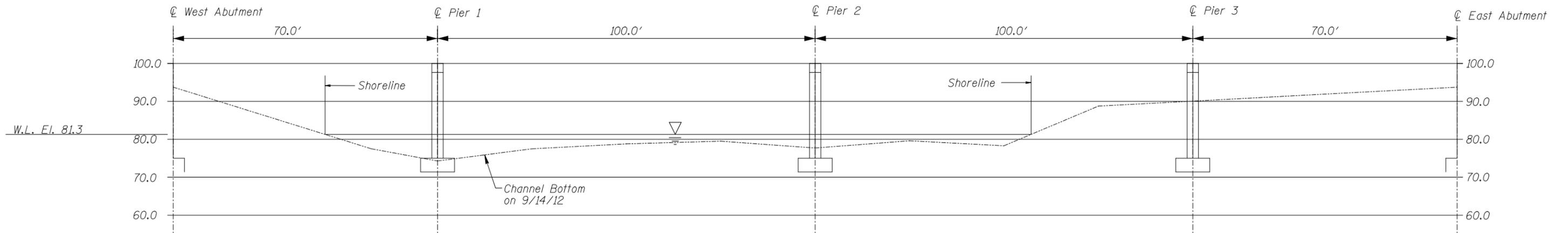
INSPECTION NOTES:

- ① There was a 3 foot radius by 2 foot deep scour depression at the upstream nose of Pier 2.
- ② The channel bottom material consisted of silty sand and gravel allowing 2 inches of probe rod penetration.
- ③ Moderate accumulation of timber debris, consisting of 1 foot diameter and smaller drift pieces, was observed from the channel bottom to 5 feet above waterline between the shore and the west face of Pier 1.
- ④ The footing was partially exposed from the northwest corner of Pier 1 around the upstream nose to the upstream 1/4-point along the east face of the pier with a maximum vertical face exposure of 1.5 feet. The top of the footing was located at approximately 5.5 feet below the water surface.

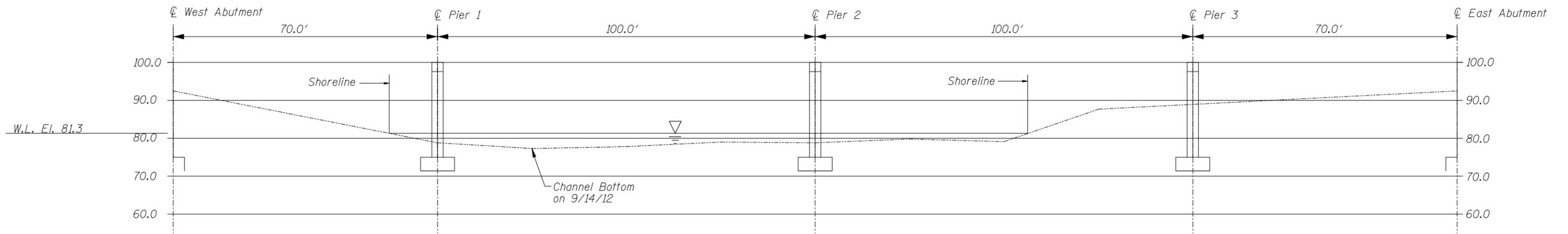
Legend

- 2.6 Sounding Depth from Waterline (9/14/12)
- ① Inspection Node Number
- Timber Debris

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6564 OVER ZUMBRO RIVER WABASHA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEPT. 2012
Checked By: RAF		Scale: NTS
Code: 74236564		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6564 OVER ZUMBRO RIVER WABASHA COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEPT. 2012
Checked By: RAF		Scale: NTS
Code: 74236564		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: September 14, 1012

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

BRIDGE NO: 6564 WEATHER: Sunny, 75° F

WATERWAY CROSSED: Zumbro River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Charles R. Euwema, Brandon Corr

EQUIPMENT: Dry Suit, Sounding Pole, Camera.

TIME IN WATER: 3:15 P.M.

TIME OUT OF WATER: 4:00 P.M.

WATERWAY DATA: VELOCITY 1 ft/s

VISIBILITY 5.0 feet

DEPTH 7.0 feet maximum at Pier 1.

ELEMENTS INSPECTED: Pier 1 and Pier 2

REMARKS: Overall the structure was found to be generally in good condition with no defects of structural significance observed. The channel bottom was silty sand and gravel. Minor scour depression was observed at the upstream nose of Pier 2 measuring up to 2 feet deep. Moderate accumulation of timber debris was located along the west face of Pier 1 extending up to 5 feet above the waterline. The footing was partially exposed near the upstream end of Pier 1 with a maximum vertical face exposure of 1.5 feet.

FURTHER ACTION NEEDED: YES NO

Monitor the extent of footing exposure and timber debris accumulation during future underwater inspections.

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. 6564
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER. Roy A Forsyth, P.E.
 WATERWAY CROSSED Zumbro River

INSPECTION DATE September 14, 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
	Pier 1	7.0'	N	7	7	N	N	7	6	7	7	6	6	7	N	N	7	N	N
	Pier 2	3.6'	N	7	N	N	N	7	6	7	7	N	6	7	N	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall the structure was found to be generally in good condition with no defects of structural significance observed. The channel bottom was silty sand and gravel. Minor scour depression was observed at the upstream nose of Pier 2 measuring up to 2 feet deep. Moderate accumulation of timber debris was located along the west face of Pier 1 extending up to 5 feet above the waterline. The footing was partially exposed near the upstream end of Pier 1 with a maximum vertical face exposure of 1.5 feet.

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.