

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 55520
CSAH NO. 12
OVER THE
ZUMBRO RIVER
DISTRICT 6 - OLMSTED 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:

The substructure units inspected at Bridge No. 55520, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. The channel bottom, consisting of silt and firm clay around Pier 1 and fine silty organic material around Piers 2 and 3, appeared stable with no significant changes since the previous inspection. The top of footing along the east face of Pier 1 was exposed with 1 foot of maximum vertical exposure.

INSPECTION FINDINGS:

- (A) The channel bottom material around Piers 2 and 3 consisted of fine silty organics with greater than 2 feet of probe rod penetration.
- (B) The channel bottom material around Pier 1 consisted of 6 to 12 inch layer of soft silt over firm clay.
- (C) Minor voids due to poor consolidation of the concrete were observed at various locations along the piers, typically up to 1 inch in diameter with up to 1/2 inch of penetration.
- (D) The footing was partially exposed along the east face of Pier 1 with a maximum vertical face exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities.
- (E) The upstream nose of Pier 2 stops at 6 feet below water and cuts back 1.5 feet.

RECOMMENDATIONS:

- (A) Monitor the extent of footing exposure at Pier 1 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,

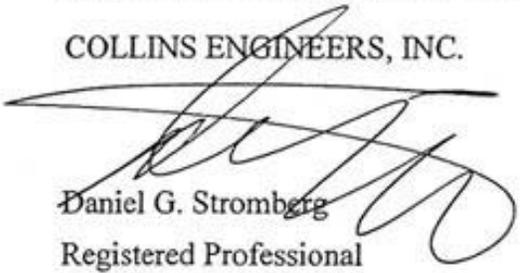
PROFESSIONAL ENGINEER

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: 55520

Feature Crossed: Zumbro River

Feature Carried: CSAH No. 12

Location: District 6 - Olmsted County

Bridge Description: The superstructure consists of a four span, multiple steel girder bridge. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The pier footings are supported on steel piles. The piers are numbered 1 through 3 starting at the west end of the bridge.

2. INSPECTION DATA

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

Dive Team: Brandon Corr, Charles Euwema

Date: September 14, 2012

Weather Conditions: Sunny, 70°F

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: The piers consist of a rectangular concrete shaft with rounded ends, supported by a rectangular footing founded on steel piles. The top of footing location of Pier 1 as observed during the filed inspection conducted on 9/14/2012 was found to be inconsistent with the bridge plans dated 11/20/1974. The observed top of footing was found to be approximately 4 to 5 feet higher than indicated in the plans.

Maximum Water Depth at Substructure Inspected: Approximately 13.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the webwall at Pier 2.

Water Surface: The waterline was approximately 15.9 feet below reference.
Waterline Elevation = 914.1

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 I/91

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	Reinforced Concrete Pier Wall	84	LF		84			



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



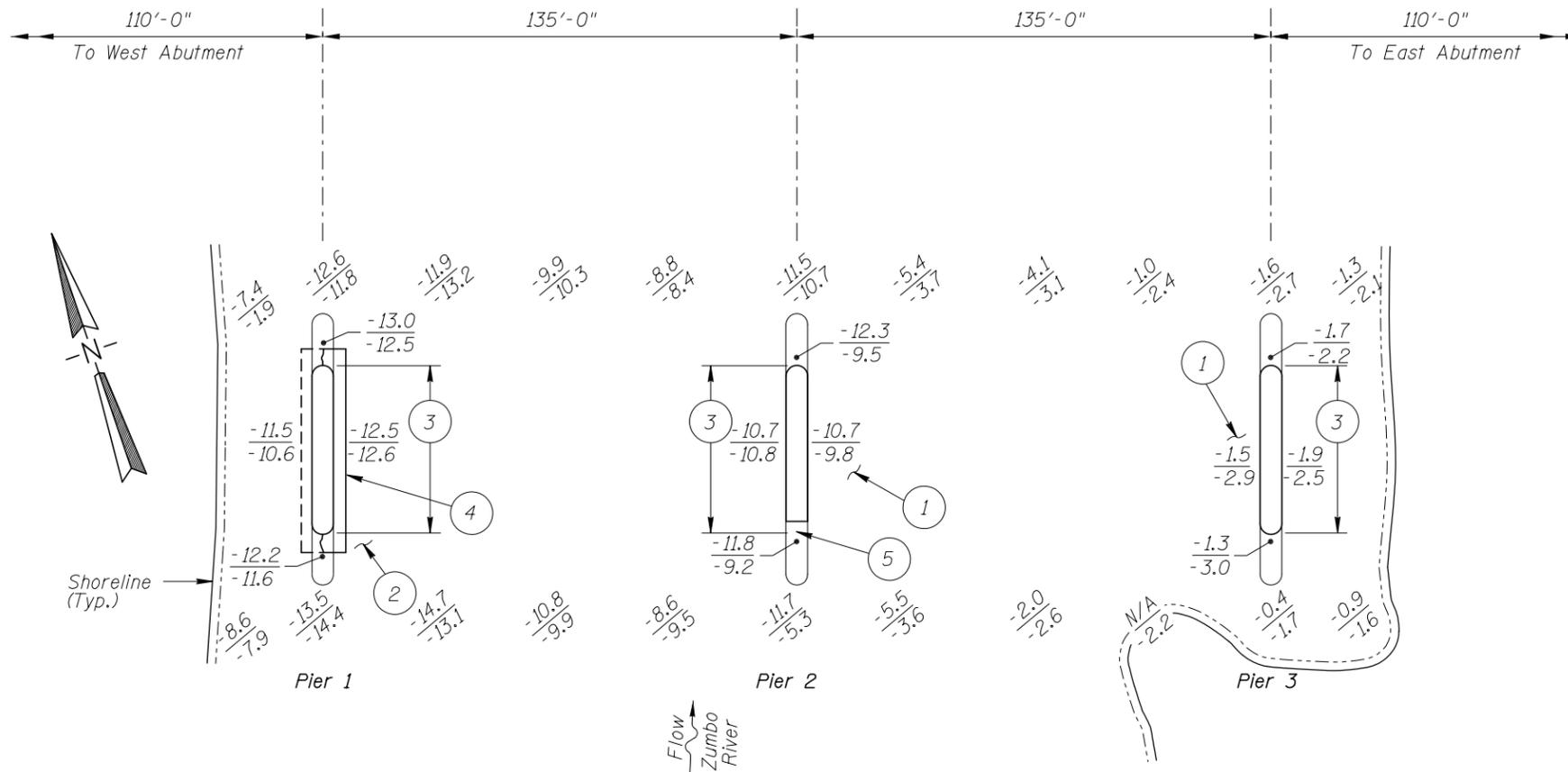
Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Northwest.



Photograph 4. View of Pier 3, Looking East.



GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 14, 2012, the waterline was located approximately 15.9 feet below the top of the webwall of Pier 2. This corresponds with a waterline elevation of 914.1 based on the previous report dated October 29, 2007.
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.

INSPECTION NOTES:

- 1 The channel bottom material around Piers 2 and 3 consisted of fine silty organics with greater than 2 feet of probe rod penetration.
- 2 The channel bottom material around Pier 1 consisted of 6 to 12 inch layer of soft silt infill over firm clay.
- 3 Minor voids due to poor consolidation of the concrete were observed at various locations along the piers, typically up to 1 inch in diameter with up to 1/2 inch of penetration.
- 4 The footing was exposed along the east face of Pier 1 with a maximum of vertical face exposure of 1 foot. The surface of the footing was rough and irregular.
- 5 The upstream nose of Pier 2 stops at 6 feet below water and cuts back 1.5 feet.

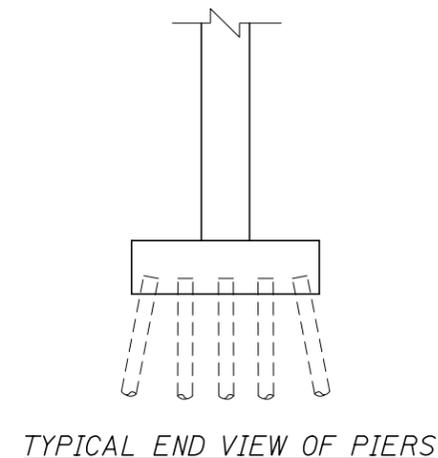
Legend

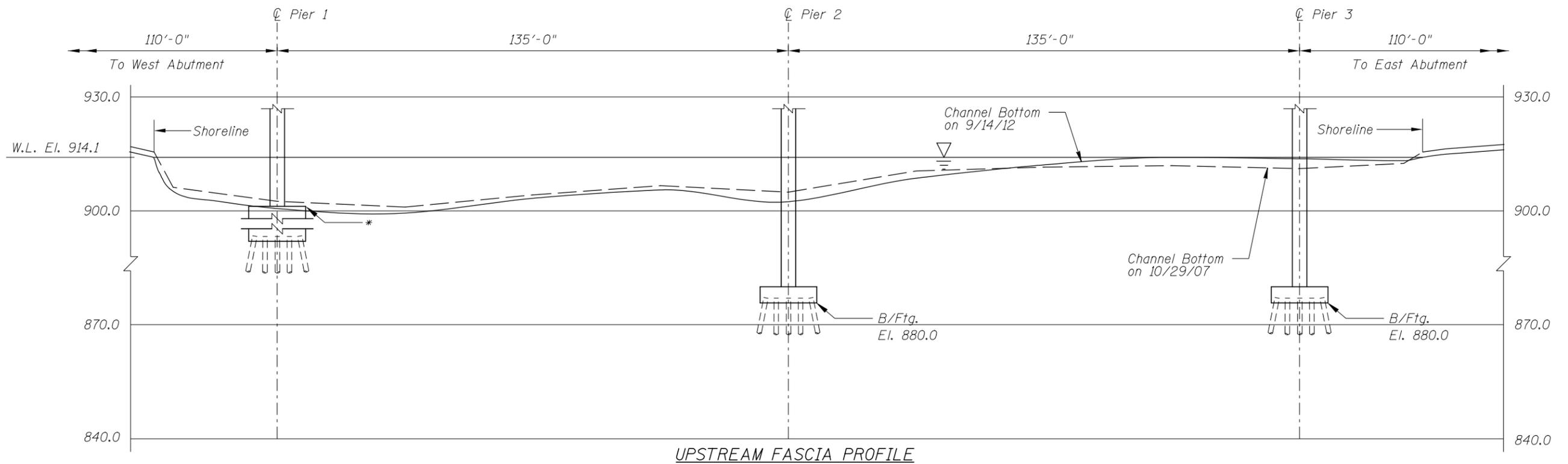
- 2.0 Sounding Depth from Waterline (9/14/12)
- 5.2 Sounding Depth from Waterline (10/29/07)

Note:

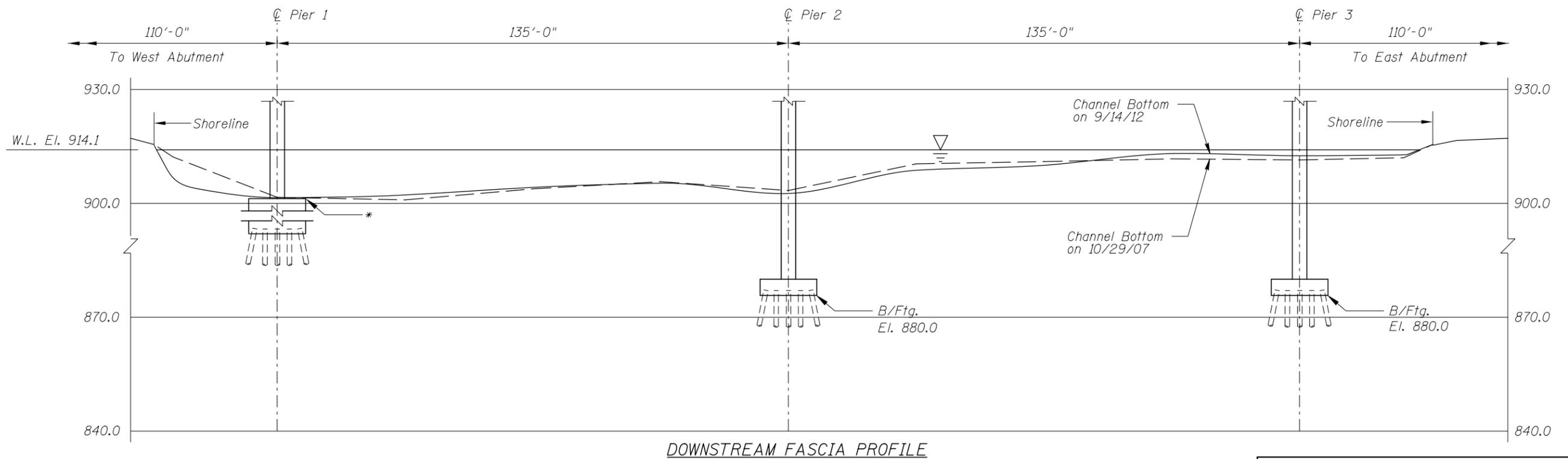
All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 55520 OVER THE ZUMBRO RIVER DISTRICT 6, OLMSTED COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JTF	COLLINS ENGINEERS	Date: Sept. 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 742355520		Figure No.: 1





UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

* T/Footing configuration shown as per field observations on 9/14/12 is inconsistent with the bridge plans dated 11/20/74.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 55520 OVER THE ZUMBRO RIVER DISTRICT 6, OLMSTED 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: LJ		Scale: 1"=30'
Code: 742355520		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: September 14, 2012

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

BRIDGE NO: 55520 WEATHER: Sunny, 70°F

WATERWAY CROSSED: Zumbro River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Brandon Corr, Charles Euwema

EQUIPMENT: Commercial Scuba, U/W light, Scraper, Sounding Pole, Probe Rod,
Camera

TIME IN WATER: 10:00 a.m.

TIME OUT OF WATER: 10:35 a.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 1.0 foot

DEPTH 13.0 Feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of all piers was in good condition below water with minor widespread areas of poor consolidation. The footing was partially exposed along the east face of Pier 1 with a maximum vertical exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities. No significant changes have occurred to the channel bottom configuration or the substructure condition since the previous underwater inspection.

FURTHER ACTION NEEDED: YES NO

Monitor the extent of footing exposure at Pier 1 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. 55520
 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	13.0'	N	7	6	9	N	7	6	8	8	7	6	7	N	N	N	N	N
	Pier 2	12.3'	N	7	N	9	N	7	8	N	N	7	7	7	N	N	N	N	N
	Pier 3	1.9'	N	7	N	9	N	7	8	8	8	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of all piers was in good condition below water with minor widespread areas of poor consolidation. The footing was partially exposed along the east face of Pier 1 with a maximum vertical exposure of 1 foot. The surface of the footing was rough with 6 to 12 inch diameter irregularities. No significant changes have occurred to the channel bottom configuration or the substructure condition since the previous underwater inspection.

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.