

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 73540

10TH STREET BRIDGE (MSAS NO. 101)

OVER THE

MISSISSIPPI RIVER

DISTRICT 3 - STEARNS COUNTY, CITY OF ST. CLOUD



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 84)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 73540, Piers 2, 3, 4 and 5, were found to be in good condition with no defects of structural significance observed. A vertical crack was observed in the webwall of Pier 4 with a maximum width of 1/4 inch. There was footing exposure observed at the upstream end of both Piers 4 and 5 with a maximum vertical face exposure of 2.5 feet. The channel bottom appears to be in stable condition with only minor localized scour observed at the upstream ends of the piers and with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

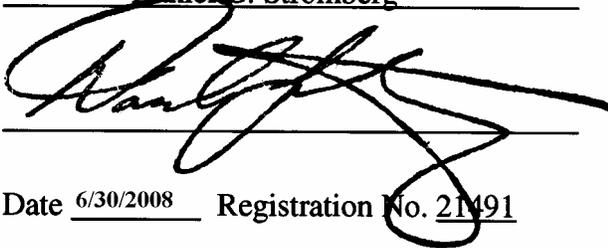
- (A) Footing exposure was observed at the upstream end of Piers 4 and 5. The exposure at Pier 4 extended 8 feet downstream on the east and west sides of the pier with a maximum vertical face exposure of 2 feet. The exposure at Pier 5 extended 5 feet to the downstream on both sides of the pier with a maximum vertical face exposure of 2.5 feet.
- (B) Minor scour depressions, typically 5 foot in radius and 2 to 3 feet deep, were observed around the upstream ends of all the piers, resulting in the footing exposure at Piers 4 and 5.
- (E) A light to moderate accumulations of timber debris were observed around the entire perimeter of Piers 2 and 4 and at the upstream end of Piers 3.

RECOMMENDATIONS:

- (A) Scour screening assessment indicates stable rating therefore, presently it is only necessary to monitor extent of scour and footing exposure during future inspections.
- (B) Remove the accumulation timber debris around the piers during routine bridge maintenance.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

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.

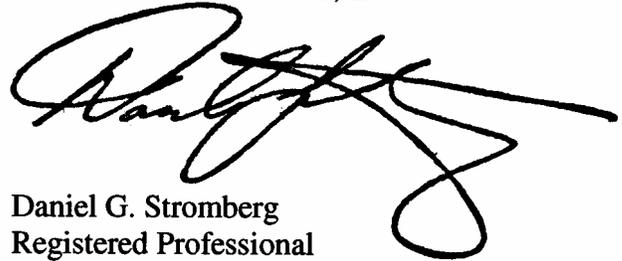
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 73540

Feature Crossed: Mississippi River

Feature Carried: 10th Street Bridge (MSAS No. 101)

Location: District 3 - Stearns County, City of St. Cloud

Bridge Description: The superstructure consists of seven spans of multiple prestressed concrete beams. The superstructure is supported by two reinforced concrete abutments and six reinforced concrete piers. The piers are numbered 1 through 6 starting from the west end of the bridge. The footings of all the substructure units are supported on steel H-piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Rouston.

Date: August 14, 2007

Weather Conditions: Partly Cloudy, 70°F

Underwater Visibility: 2.0 Feet

Waterway Velocity: 0.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 through 5.

General Shape: Each of the piers consists of two flared columns which extend down to form a single oblong rectangular shaft, which is supported by a rectangular footing/seal combination founded on steel H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 16.1 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap at the south end of Pier 5.

Water Surface: The waterline was approximately 28.3 feet below reference.
Waterline Elevation = 980.8.

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/08/07

Item 113: Scour Critical Bridges: Code N/92

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

 Yes X No



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



Photograph 2. View of Pier 2, Looking Southwest.



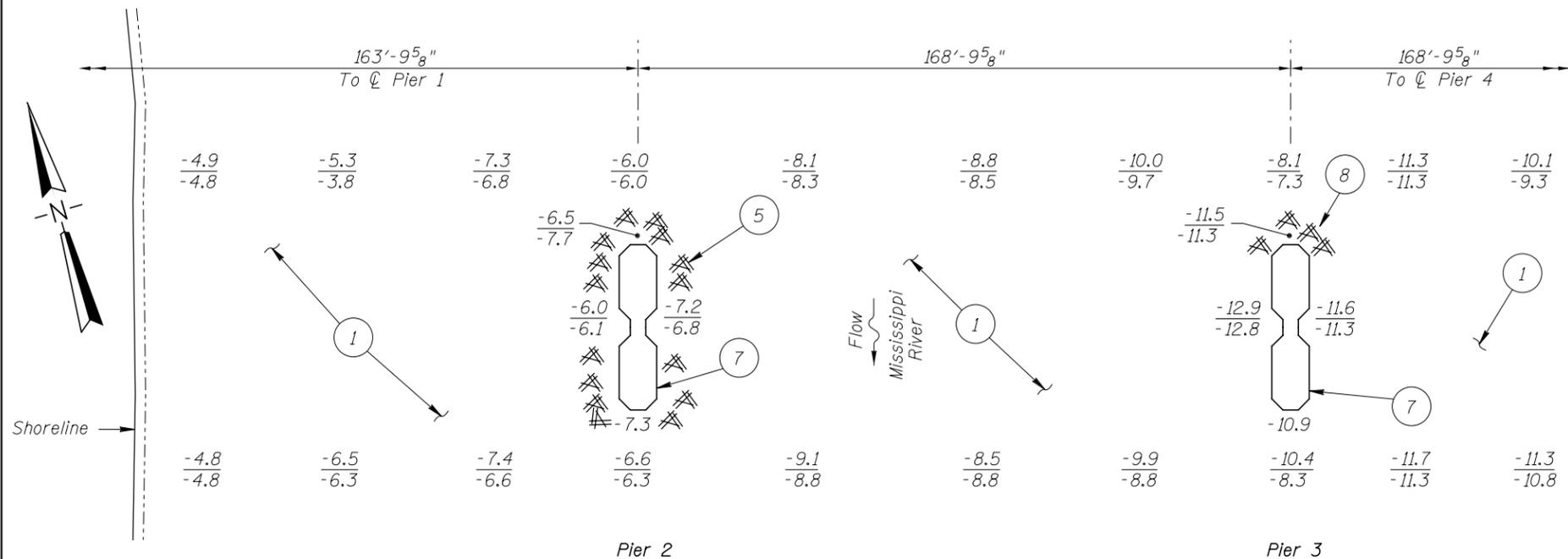
Photograph 3. View of Pier 3, Looking Southwest.



Photograph 4. View of Pier 4, Looking Southeast.



Photograph 5. View of Pier 5, Looking Southwest.



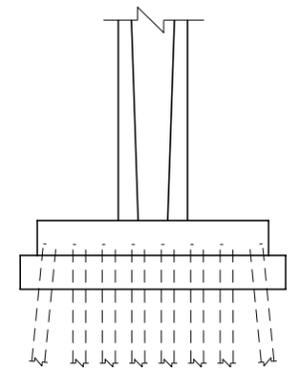
SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material consisted of sandy gravel and random cobbles with a maximum probe rod penetration of 6 inches.
- 2 The channel bottom material consisted of silt with a maximum probe rod penetration of 2 feet at the upstream end of Pier 5.
- 3 Footing exposure was observed at the upstream end of Pier 4, extending 8 feet downstream on the east and west sides of the pier with a maximum vertical face exposure of 2 feet at the upstream nose.
- 4 Footing exposure was observed at the upstream end of Pier 5, extending 5 feet downstream on both sides of the pier, with a maximum vertical face exposure of 3 feet at the upstream nose.
- 5 A light accumulation of 8-inch-diameter and smaller timber debris was observed around the entire perimeter of Piers 2 and 4 extending from the channel bottom to the waterline and up to 3 feet off of the noses and faces.
- 6 Minor scour depressions, typically 5 foot in radius and 2 to 3 feet deep, were observed around the upstream ends of all the piers, resulting in footing exposure at Piers 4 and 5.
- 7 The submerged concrete of the piers and exposed footings was in smooth and sound condition with minor random areas of poor consolidation with 1/4 inch maximum penetration.
- 8 A light accumulation of timber debris, consisting of up to 8-inch-diameter branches, was observed at the upstream nose of Pier 3 from the channel bottom up 2 feet. The debris was approximately 8 feet long (E/W) by 3 feet wide (N/S).

GENERAL NOTES:

1. Piers 2 through 5 were inspected underwater.
2. At the time of inspection on August 15, 2007, the waterline was located approximately 28.3 feet below the bottom of the pier cap at the downstream end of Pier 5. This corresponds to a waterline elevation of 980.8.
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.



TYPICAL END VIEW OF PIERS

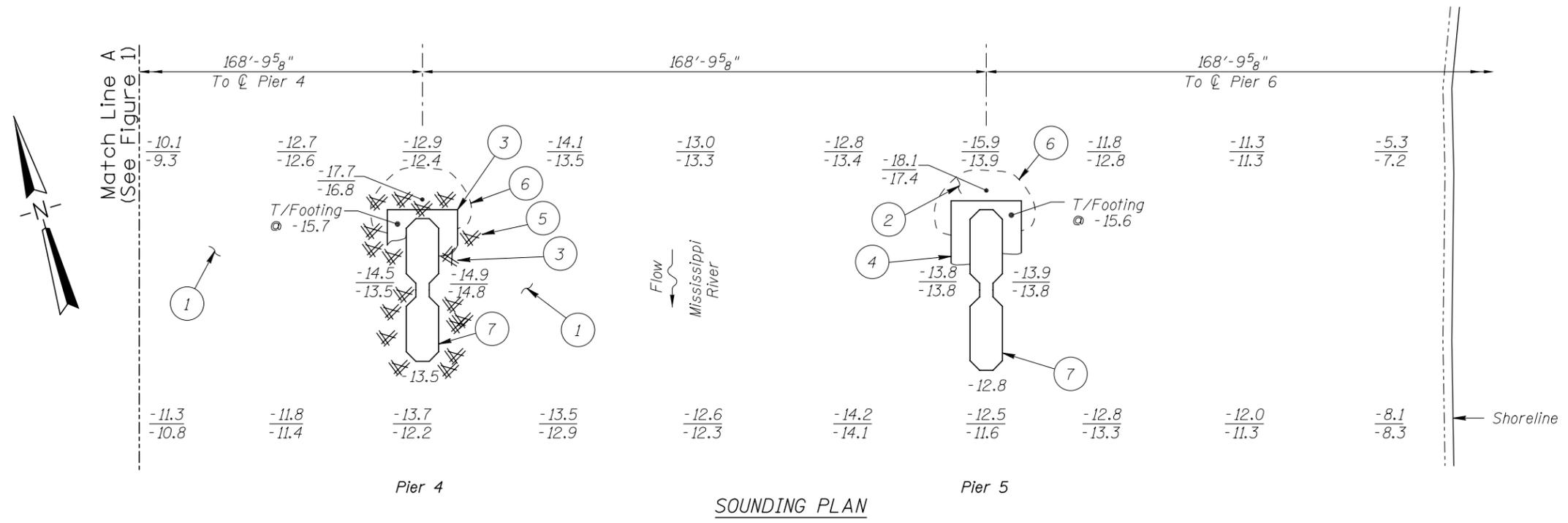
Legend

- 7.0 Sounding Depth (8/15/07)
- 6.8 Sounding Depth (9/27/02)
- Timber Debris
- Scour Depression

Note:

All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 73540 OVER THE MISSISSIPPI RIVER DISTRICT 3, STEARNS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK	<small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52210084		Figure No.: I



Notes:
 Refer to Figure 1 for General Notes.
 Refer to Figure 1 for Inspection Notes.

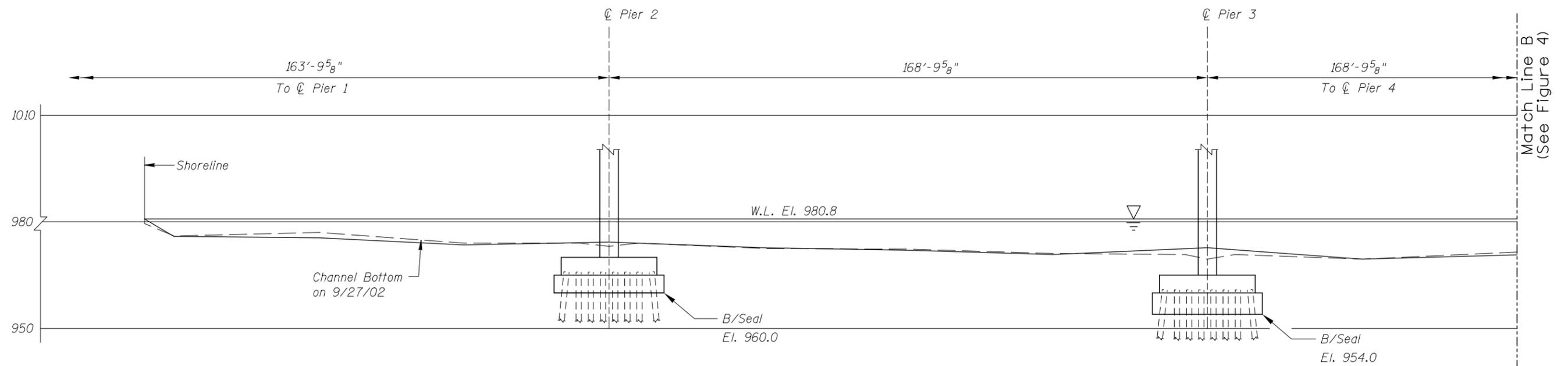
Legend
 -7.0 Sounding Depth (8/15/07)
 -6.8 Sounding Depth (9/27/02)

Timber Debris
 Scour Depression

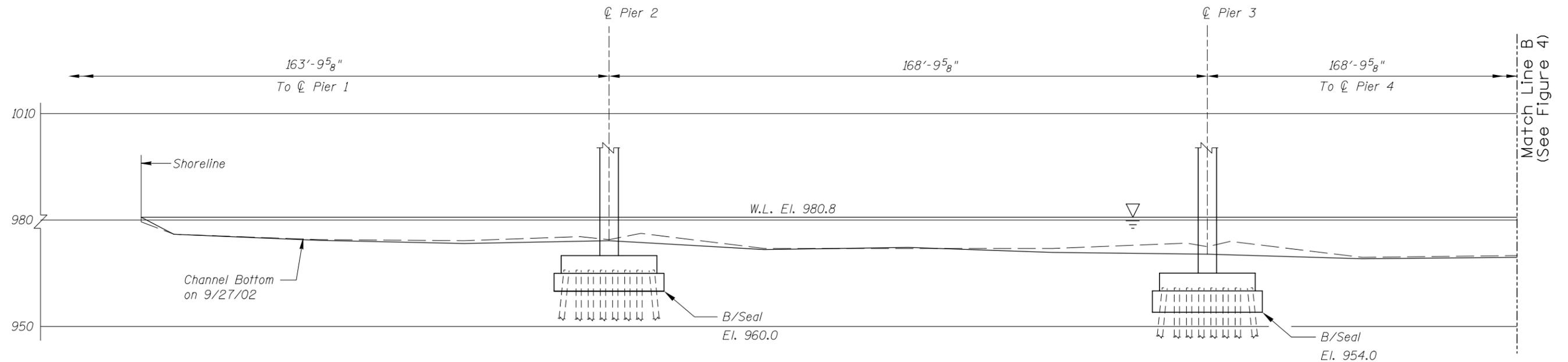
Note:
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INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
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Code: 52210084		Figure No.: 2

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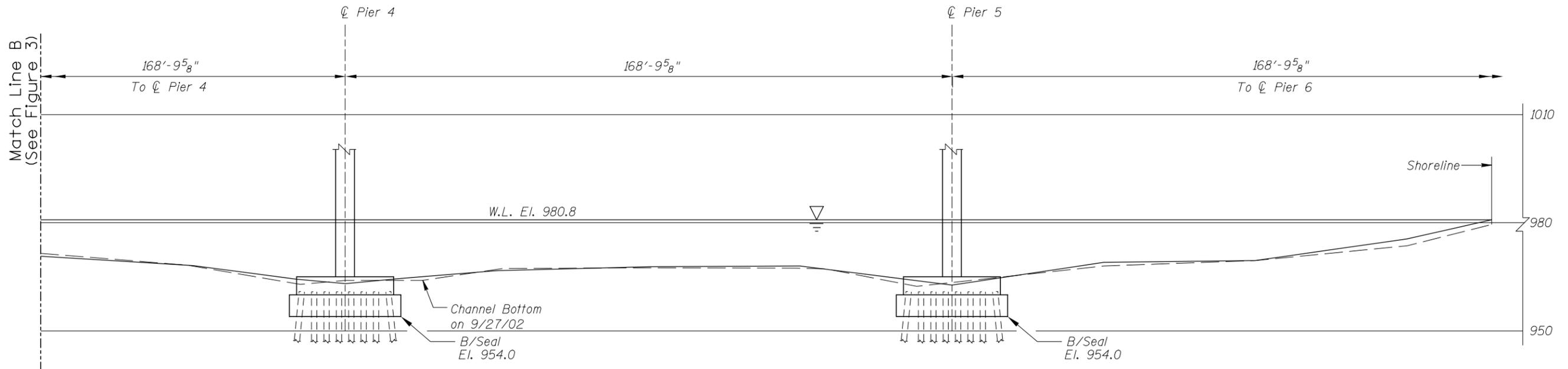
UPSTREAM FASCIA PROFILE



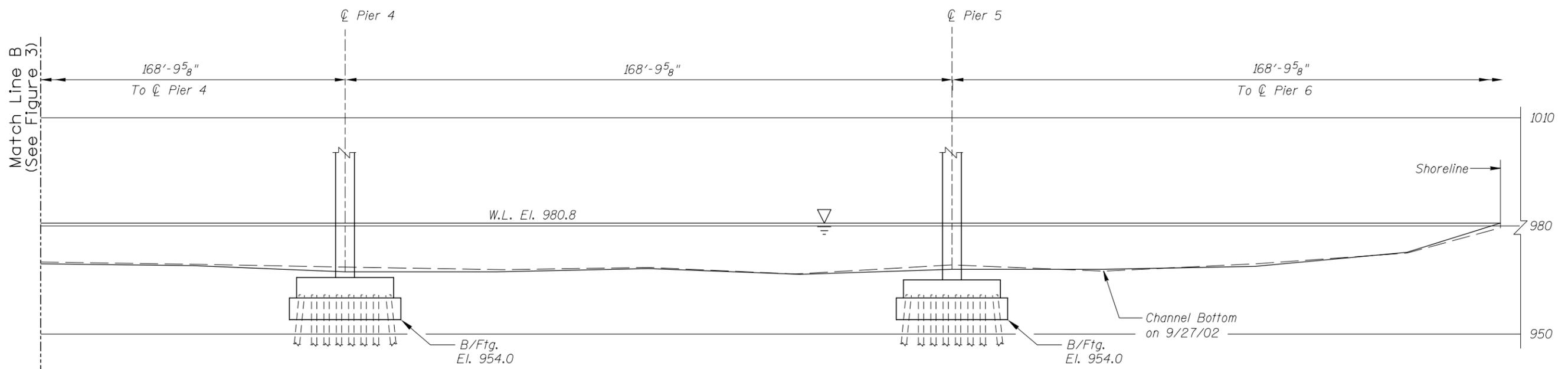
DOWNSTREAM FASCIA PROFILE

Notes:
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 73540 OVER THE MISSISSIPPI RIVER DISTRICT 3, STEARNS COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 522I0084		Figure No.: 3



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Notes:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 73540 OVER THE MISSISSIPPI RIVER DISTRICT 3, STEARNS COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210084		Figure No.: 4

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

INSPECTORS: Collins Engineers, Inc. DATE: August 14, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 73540 WEATHER: Partly Cloudy, 70°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Fathometer, Boat, Probe Rod, Camera

TIME IN WATER: 9:00 A.M.

TIME OUT OF WATER: 9:45 A.M.

WATERWAY DATA: VELOCITY 0.5 f.p.s

VISIBILITY 2.0 feet

DEPTH 16.1 feet maximum at Pier 5.

ELEMENTS INSPECTED: Piers 2, 3, 4, and 5

REMARKS: Overall, the submerged concrete of the piers and exposed footings was in smooth and sound condition with minor random areas of poor consolidation with ¼ inch maximum penetration. Footing exposure was observed at the upstream end of both Piers 4 and 5 with a maximum vertical face exposure of 2.5 feet at Pier 5 and 2 feet at Pier 4. A light to moderate accumulation of timber debris was observed around the entire perimeter of Piers 2 and 4, and at the upstream end of Pier 3. The channel bottom appeared stable with minor localized scour observed at the upstream end of the piers and no appreciable changes since the previous report.

FURTHER ACTION NEEDED: YES NO

Scour screening assessment indicates stable rating, therefore, only monitor extent of scour and footing exposure during future inspections.

Remove the accumulation timber debris around the piers during routine bridge maintenance.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 73540
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE August 14, 2007
 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 2	7.3'	N	7	N	9	N	7	8	N	N	6	6	7	N	N	7	N	N
	Pier 3	12.9'	N	7	N	9	N	7	7	N	N	7	7	7	N	N	7	N	N
	Pier 4	15.9'	N	7	7	9	N	7	7	N	N	6	6	7	N	N	7	N	N
	Pier 5	16.1'	N	7	7	9	N	7	7	N	N	N	7	7	N	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged concrete of the piers and exposed footings was in smooth and sound condition with minor random areas of poor consolidation with ¼ inch maximum penetration. Footing exposure was observed at the upstream end of both Piers 4 and 5 with a maximum vertical face exposure of 2.5 feet at Pier 5 and 2 feet at Pier 4. A light to moderate accumulation of timber debris was observed around the entire perimeter of Piers 2 and 4, and at the upstream end of Pier 3. The channel bottom appeared stable with minor localized scour observed at the upstream end of the piers and no appreciable changes since the previous report.

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.