

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27608
BROADWAY AVENUE
OVER
THE MISSISSIPPI RIVER
DISTRICT 5 - HENNEPIN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 116)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27608, Piers 1, 2 and 3, were found to be in good condition with no structurally significant defects observed. Several vertical hairline cracks were observed above the waterline on Piers 1 and 3. Light to moderate accumulations of timber debris were observed at Piers 1 and 3. The channel bottom around the substructure units appeared stable with no evidence of significant scour and with no significant changes in configuration since the last inspection.

INSPECTION FINDINGS:

- (A) Piers 1 and 3 exhibited vertical hairline to 1/16 inch cracks at the midpoint and at the upstream and downstream quarter points of the pier shaft, extending from the top of the above water step to the waterline on both faces at Pier 1 and on west face only at Pier 3.
- (B) A light to moderate accumulation of timber debris located along the upstream nose and to the west side of Pier 1 was observed scattered along the channel bottom extending up 2 feet.
- (C) Timber debris consisting of two tree trunks, 2 feet in diameter, was observed along the east face of Pier 3.

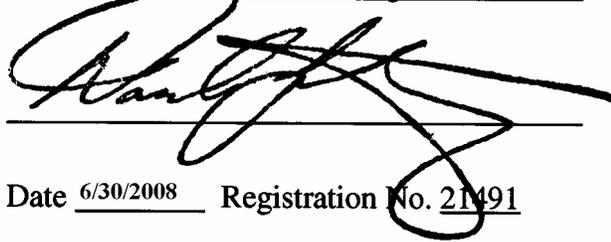
RECOMMENDATIONS:

- (A) Monitor the timber debris at the piers, and if found to be increasing in the future, removal operations may become warranted.

- (B) 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

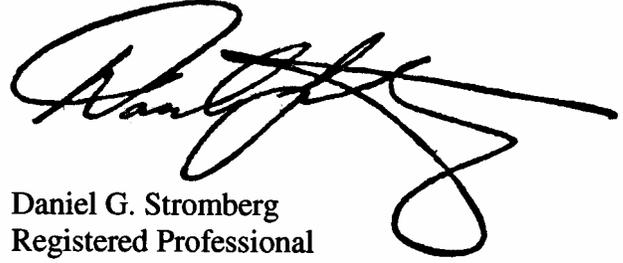


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27608

Feature Crossed: Mississippi River

Feature Carried: Broadway Avenue

Location: District 5 - Hennepin County

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

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 4, 2007

Weather Conditions: Sunny, 65° F

Underwater Visibility: 0.5 feet

Waterway Velocity: 0.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2 and 3.

General Shape: All piers consist of oblong rectangular concrete shafts with rounded ends that rest on rectangular footings/seals founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 15.8 feet.

4. WATERLINE DATUM

Water Level Reference: The benchmark reference at Elevation 805.11 on Pier 1

Water Surface: The waterline was approximately 6.3 feet below reference.
Waterline elevation = 798.8.

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 7

Item 92B: Underwater Inspection: Code B/10/07

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



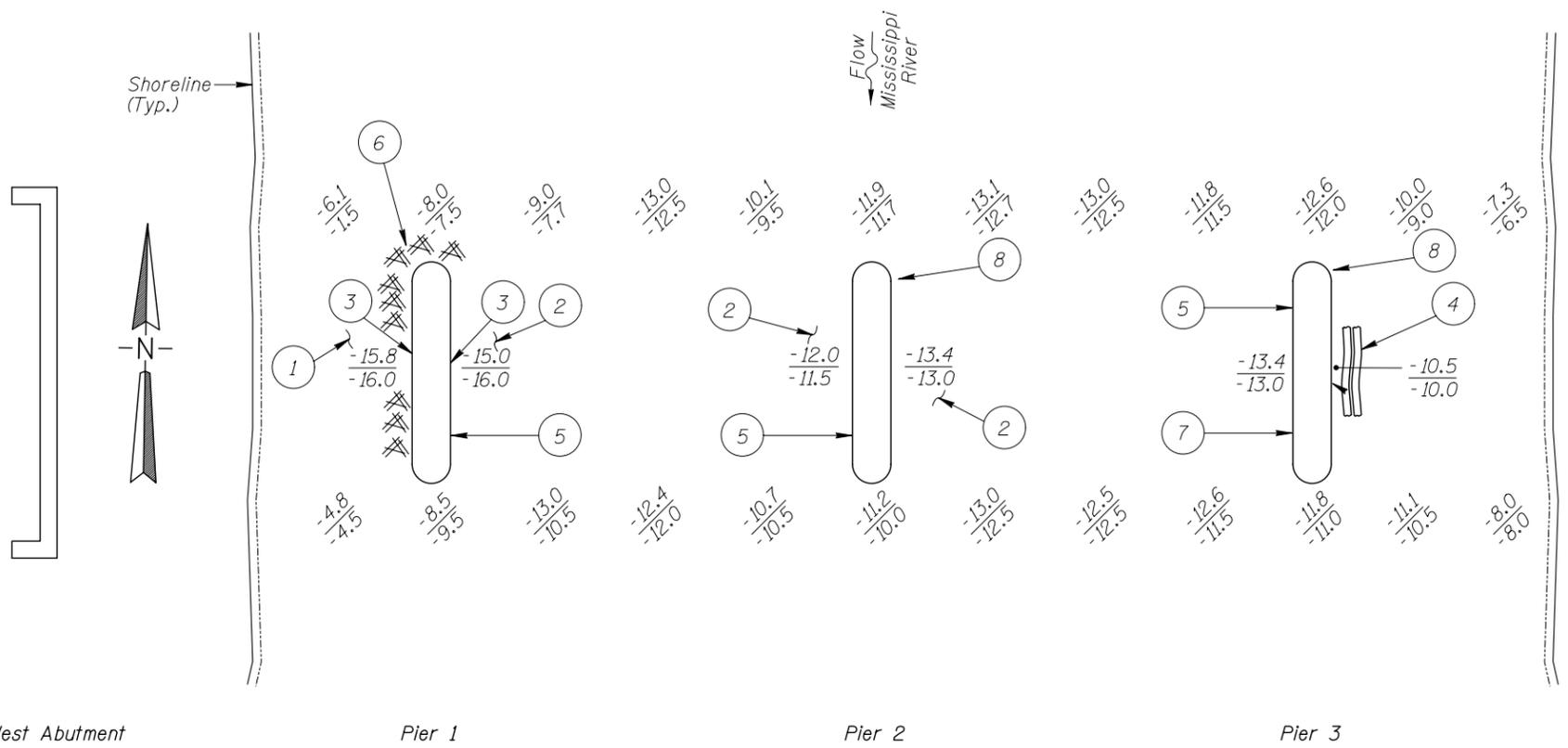
Photograph 1. View of Pier 1, Looking Northeast.



Photograph 2. View of Pier 2, Looking Northeast



Photograph 3. View of Pier 3, Looking Northeast.



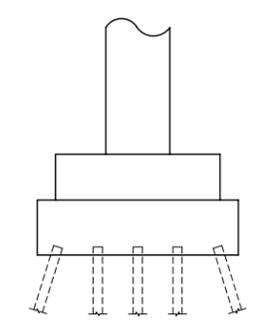
SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on October 4, 2007 the waterline was located approximately 6.3 feet below Benchmark Elevation 805.11 marked on Pier 1. This corresponds to a waterline elevation of 798.8.
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.

INSPECTION NOTES:

- 1 The channel bottom consisted of riprap up to 2 feet in diameter along the west face of Pier 1.
- 2 The channel bottom consisted of silty sand with up to 1 foot of probe rod penetration.
- 3 Vertical crack (1/16 inch wide maximum) extended from the top of the above water step in shaft to the waterline.
- 4 Timber debris consisting of two tree trunks, 2 feet in diameter, was observed along the east face of Pier 3.
- 5 Overall, concrete was smooth and sound.
- 6 Light to moderate accumulation of timber debris located along the upstream nose and to the west side of Pier 1 was observed scattered along the channel bottom extending up 2 feet.
- 7 Vertical cracks (1/16 inch wide maximum) were observed from above water step in shaft to the waterline on west side of Pier 3.
- 8 Rip-rap and concrete rubble was observed at upstream nose of Piers 2 and 3. On Pier 3, it extended along east side as well.



TYPICAL END VIEW OF PIERS

Legend

-2.0 Sounding Depth (10/1/07)
 -5.2 Sounding Depth (9/29/02)

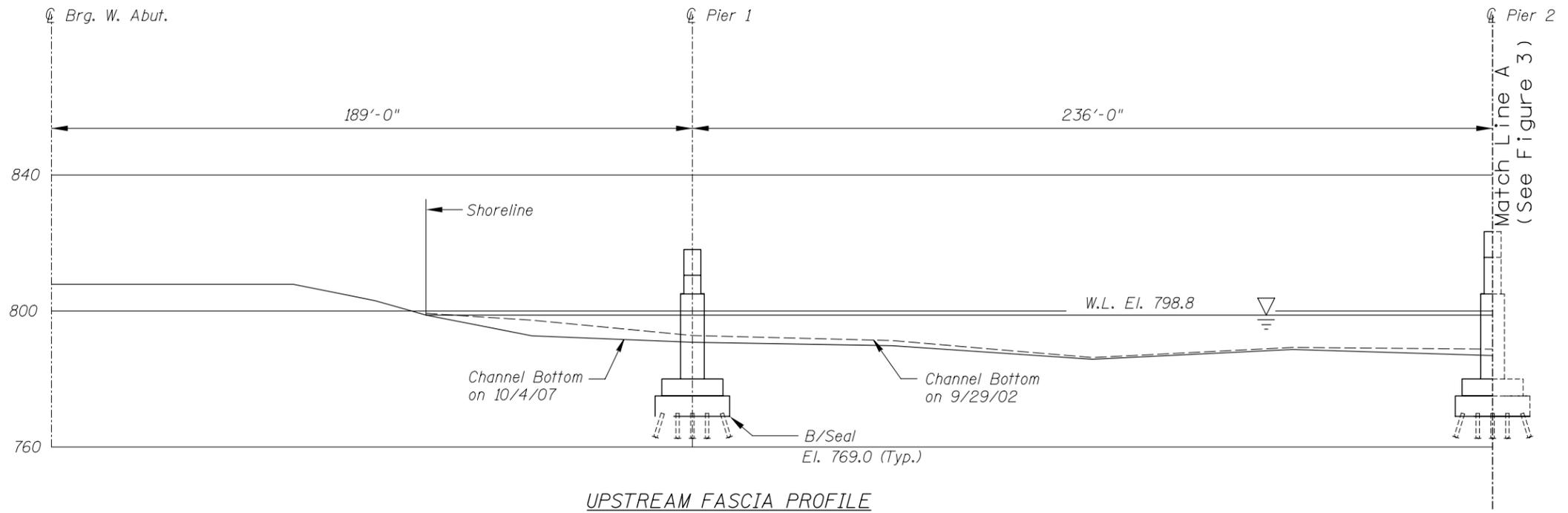
Timber Debris

Note:

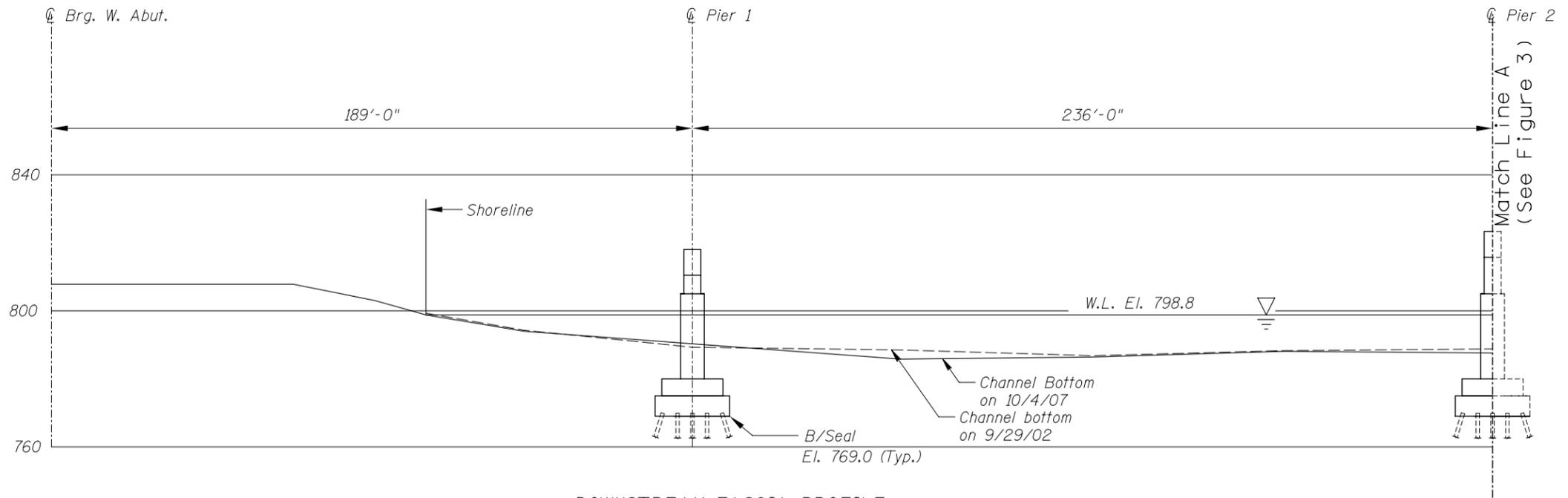
All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: OCT., 2007
Checked By: MDK		Scale: NTS
Code: 52210116		Figure No.: 1

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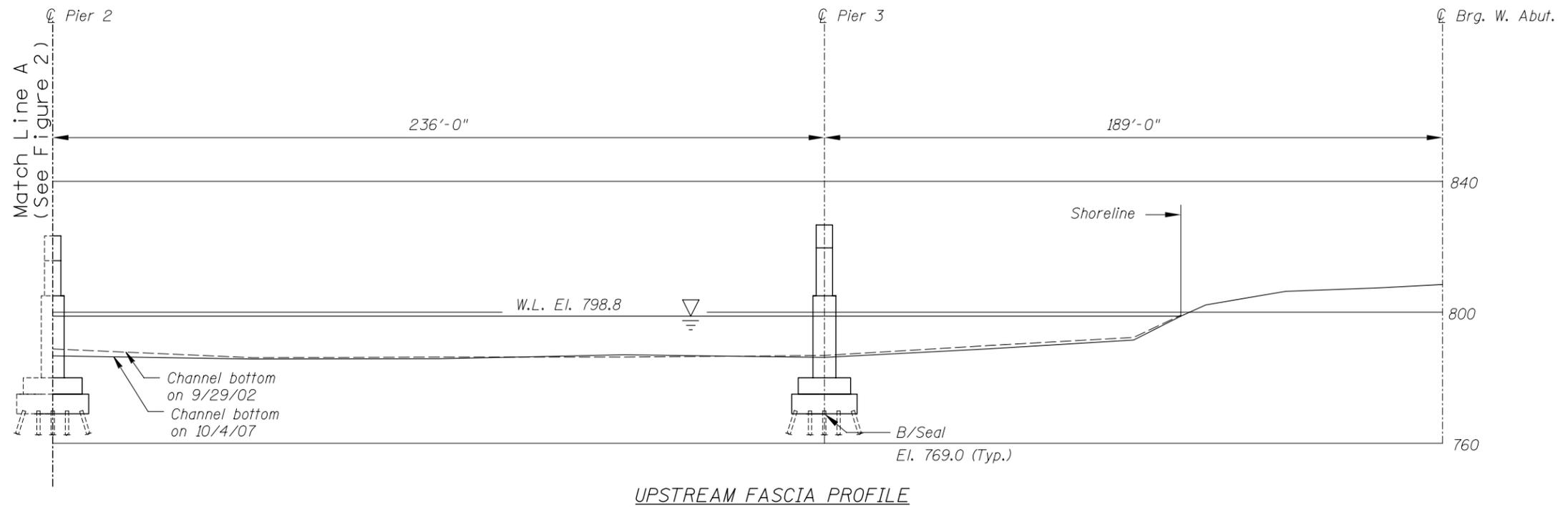
UPSTREAM FASCIA PROFILE



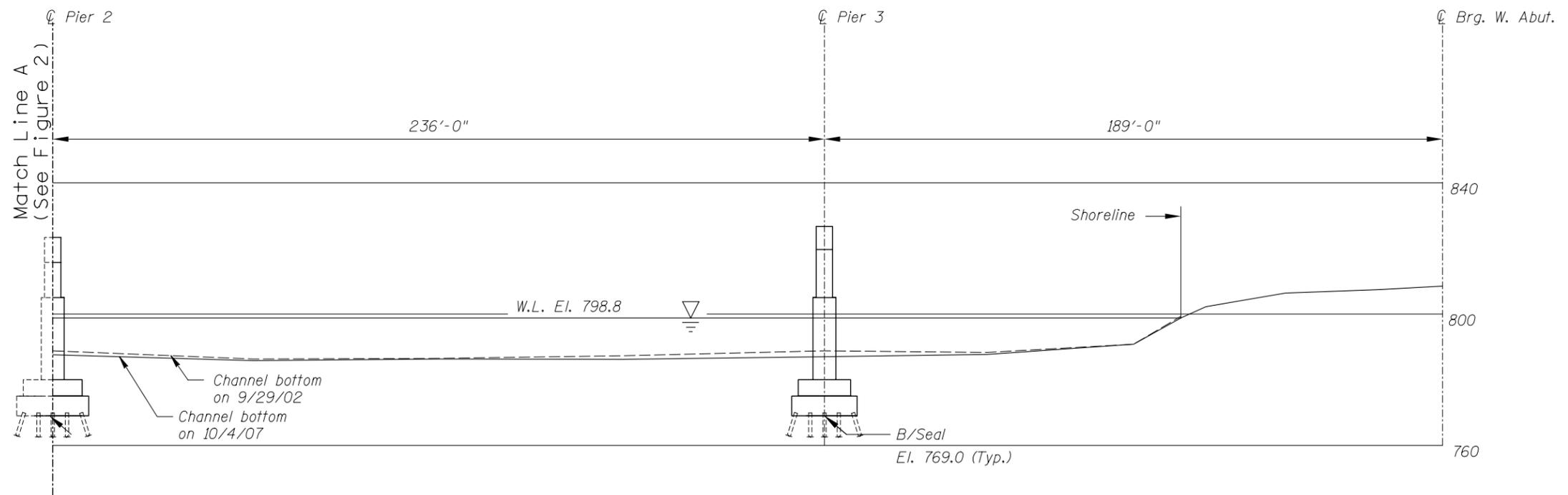
DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES I		
Drawn By: PRH	COLLINS ENGINEERS	Date: OCT., 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210116		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES II		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210116		Figure No.: 3

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

INSPECTORS: Collins Engineers, Inc. DATE: October 4, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 27608 WEATHER: Sunny, 65°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, Fathometer, U/W Light,
Scraper, Camera

TIME IN WATER: 10:15 a.m.

TIME OUT OF WATER: 10:40 a.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s.

VISIBILITY 0.5 feet

DEPTH 15.8 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: Overall, the concrete of the piers was smooth and sound. Several vertical hairline to 1/16 inch cracks were observed above the waterline on the faces of Piers 1 and 3. Light to moderate accumulation of timber debris located along the upstream nose and to the west of Pier 1 was observed scattered along the channel bottom extending up 2 feet. Timber debris consisting of two tree trunks, 2 feet in diameter, was observed along the west face of Pier 3. Riprap and concrete rubble was observed at the upstream nose of Piers 2 and 3, and at Pier 3, it also extended along the east side.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris at all of the piers, and if found to be increasing in the future, removal operations may become warranted.

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. 27608
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 04, 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 1	15.8'	N	7	N	9	N	7	8	7	7	7	7	7	N	N	N	N	N
	Pier 2	13.4'	N	8	N	9	N	8	8	N	N	N	8	8	N	N	N	N	N
	Pier 3	13.4'	N	7	N	9	N	7	8	7	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was smooth and sound. Several vertical hairline to 1/16 inch cracks were observed above the waterline on the faces of Piers 1 and 3. Light to moderate accumulation of timber debris located along the upstream nose and to the west of Pier 1 was observed scattered along the channel bottom extending up 2 feet. Timber debris consisting of two tree trunks, 2 feet in diameter, was observed along the west face of Pier 3. Riprap and concrete rubble was observed at the upstream nose of Piers 2 and 3, and at Pier 3, it also extended along the east side.

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.