

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. 3512 (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 all of the piers. Light to heavy accumulations of timber debris were observed at Piers 1, 2 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, 2, and 3 exhibited vertical hairline cracks at the midpoint of the pier shaft, extending from the top of the above water step to the waterline on both faces. In addition, Pier 3 exhibited vertical hairline cracks at the upstream and downstream quarter points, extending from the top of the same step to the waterline on both faces.
- (B) A moderate accumulation of timber debris, with pieces up to 2 feet in diameter, was observed at the upstream end of Pier 1, extending along the west face of the pier to the downstream nose.
- (C) A light accumulation of timber debris, with pieces up to 1 foot in diameter, was observed at the upstream end of Pier 2 on the channel bottom.
- (D) A moderate to heavy accumulation of timber debris consisting of two tree trunks, each 18 inches in diameter, along the west face and four tree trunks, up to 2 feet in diameter, along the east face was observed at Pier 3.

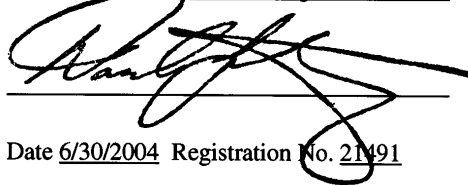
RECOMMENDATIONS:

- (A) Monitor the timber debris at all of 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

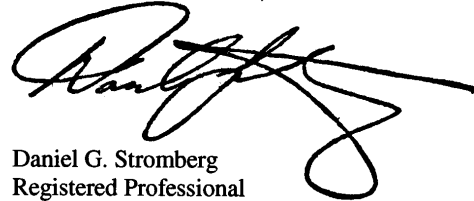


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2004 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: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: September 29, 2002

Weather Conditions: Cloudy, " 60E F

Underwater Visibility: " 0.5 feet

Waterway Velocity: " 1 fps

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 16.5 feet.

4. WATERLINE DATUM

Water Level Reference: Benchmark on Pier 1, Elevation 805.11.

Water Surface: The waterline was approximately 5.8 feet below reference.
Waterline elevation = 799.3.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

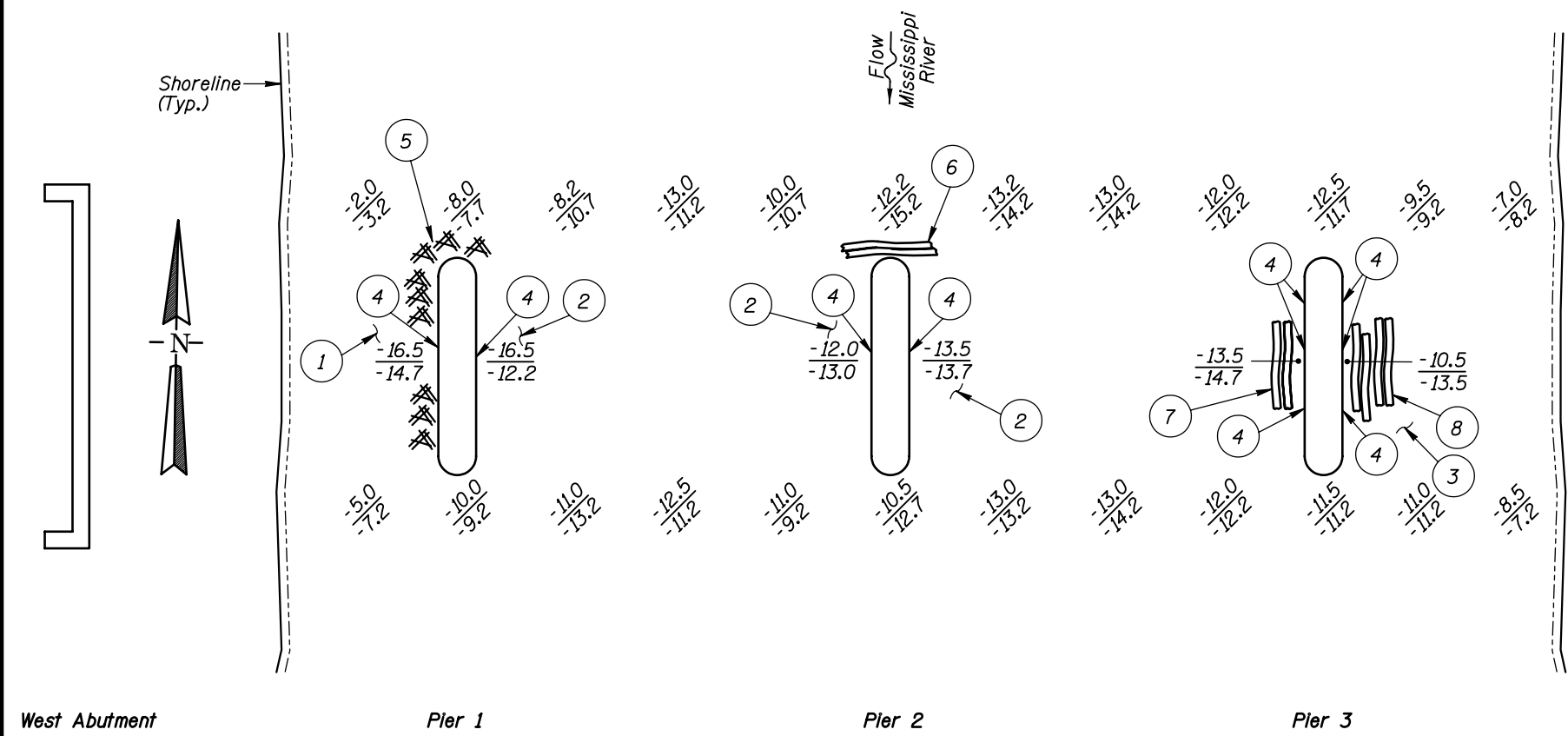
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/02

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 No



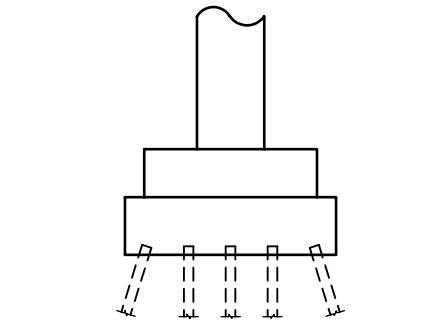
SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on September 29, 2002 the waterline was located approximately 5.8 feet below Benchmark Elevation 805.11 marked on Pier 1. This corresponds to a waterline elevation of 799.3 based on the previous report dated September 25, 1992.
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 Scattered riprap, up to 4 feet in diameter, and steel debris was observed on the channel bottom along the downstream east face of Pier 3.
- 4 A vertical hairline crack extended from the top of the above water step in the shaft portion on the pier to the waterline.
- 5 A moderate accumulation of timber debris, with pieces up to 2 feet in diameter, was observed at the upstream end of Pier 1 and extending along the west face of the pier.
- 6 A light accumulation of timber debris, with pieces up to 1 foot in diameter, was observed at the upstream end of Pier 2.
- 7 Timber debris consisting of two tree trunks, 18 inches in diameter, was observed along the west face of Pier 3.
- 8 Timber debris consisting of four tree trunks, up to 2 feet in diameter, was observed along the east face of Pier 3.

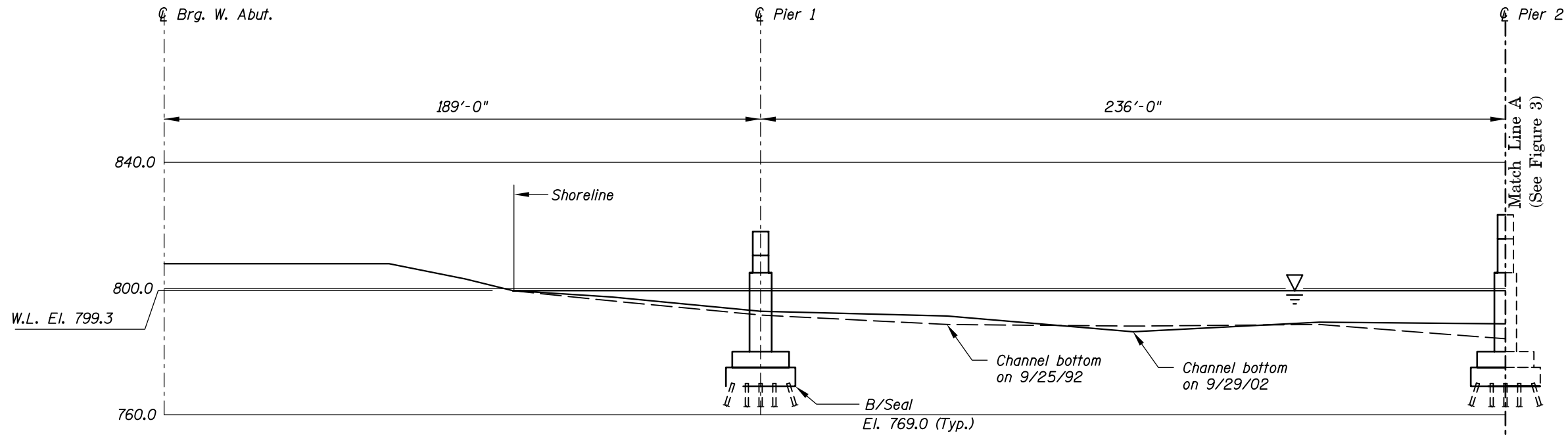


TYPICAL END VIEW OF PIERS

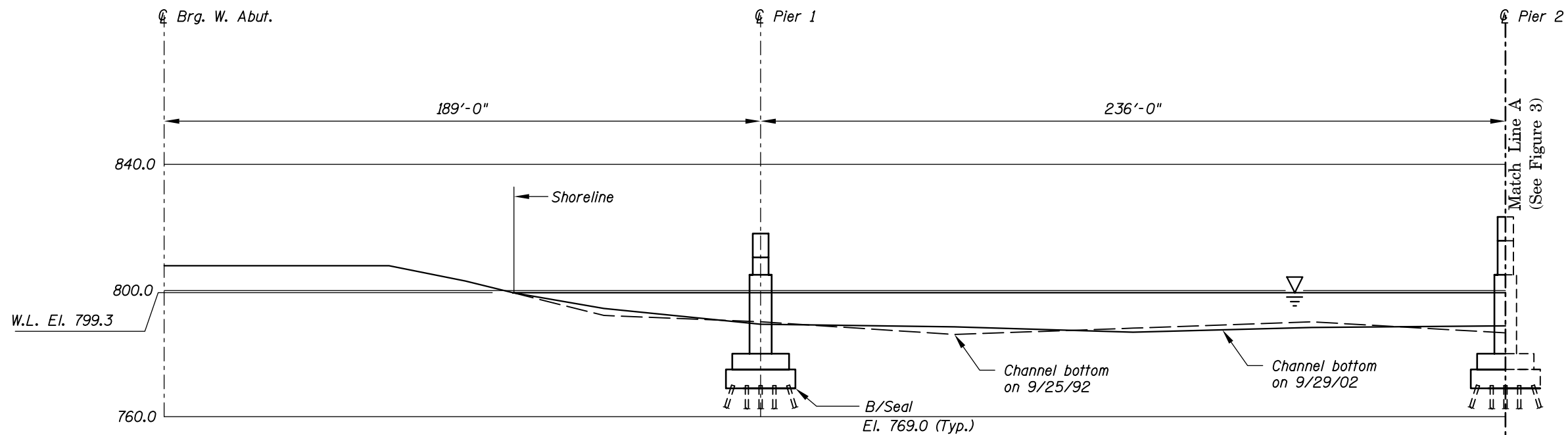
Legend

-2.0	Sounding Depth from Waterline (9/29/02)
-5.2	Sounding Depth from Waterline (9/25/92)
	Timber Debris

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, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120116		Figure No.: 1



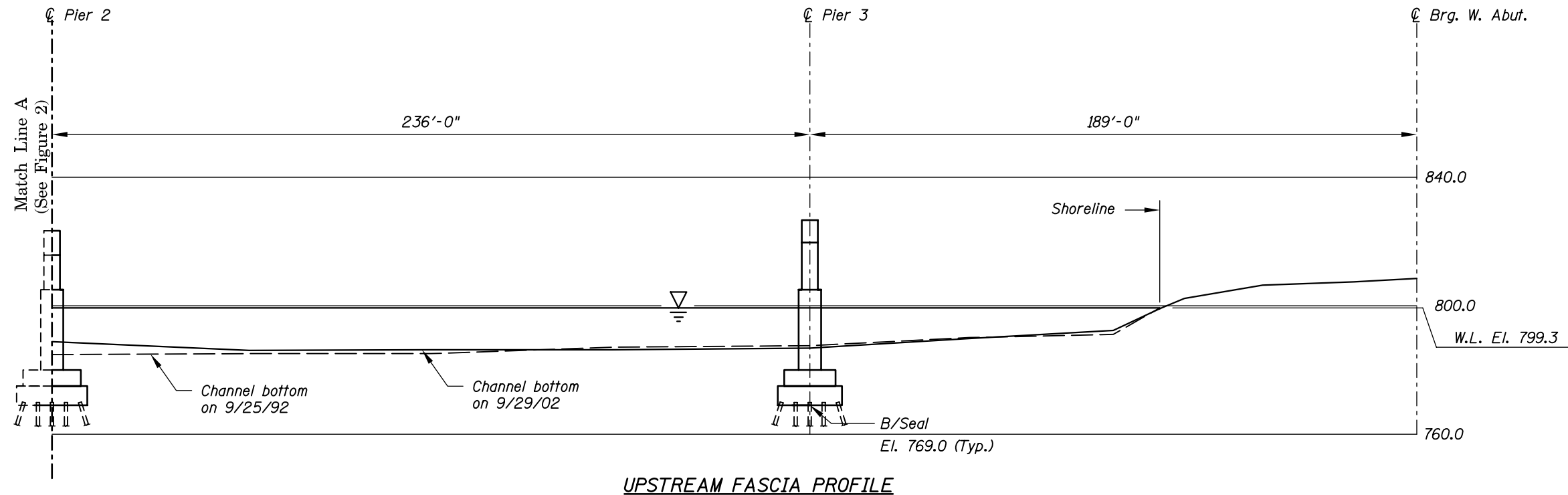
UPSTREAM FASCIA PROFILE



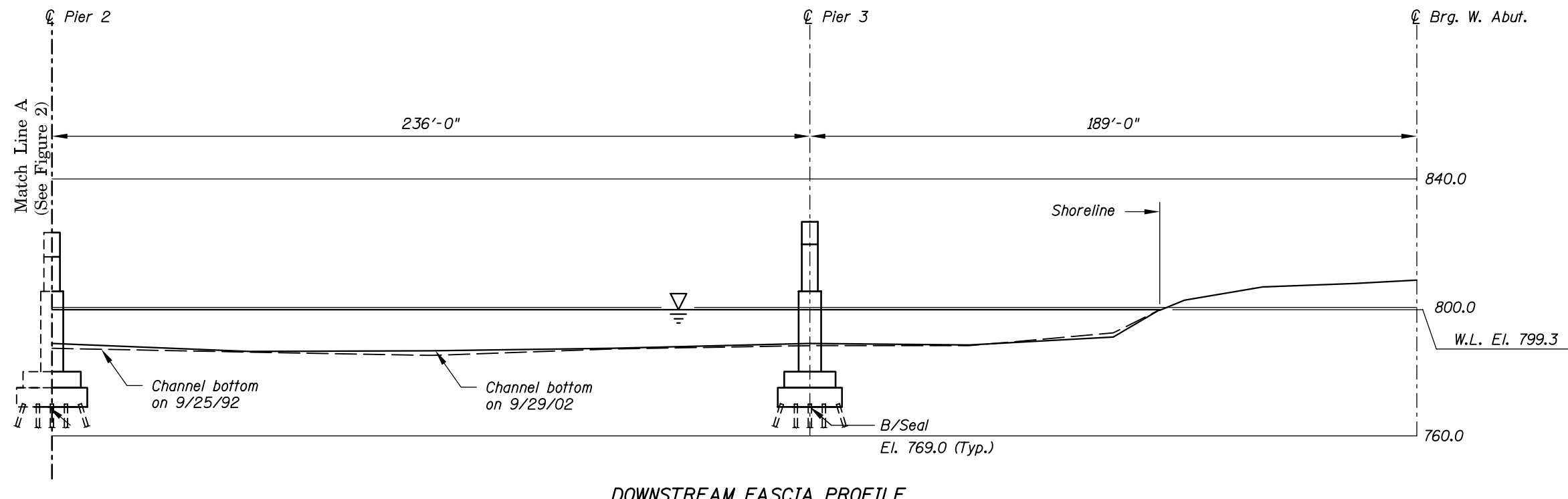
DOWNSTREAM FASCIA PROFILE

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		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002
Checked By: MDK		Scale: 1"=40'
Code: 35I20I16		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		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002
Checked By: MDK		Scale: 1"=40'
Code: 35I20I16		Figure No.: 3



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



Photograph 2. View of Pier 1, Looking Southeast



Photograph 3. View of Pier 2, Looking Northeast.



Photograph 4. View of Pier 3, Looking Southwest.



Photograph 5. View of Pier 3 Crack at Downstream Quarter Point, Looking West

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

INSPECTORS: Collins Engineers, Inc. DATE: September 29, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 27608 WEATHER: Overcast, " 60E F
WATERWAY CROSSED: Mississippi River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera
TIME IN WATER: 1:05 p.m.
TIME OUT OF WATER: 1:35 p.m.
WATERWAY DATA: VELOCITY " 1 f.p.s.
VISIBILITY " 0.5 feet
DEPTH 16.5 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: The concrete of the piers was in good condition with no structurally significant defects observed. Several vertical hairline cracks were observed above the waterline on all of the piers at the midpoint on both faces. Pier 3 also exhibited vertical hairline cracks at the upstream and downstream quarter points of the shaft. Light to heavy accumulations of timber debris were observed at Piers 1, 2 and 3.

FURTHER ACTION NEEDED: _____ YES _____ X _____ 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 Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 29, 2002

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	16.5'	N	7	N	9	N	7	8	N	N	7	7	7	N	N	9	N	N
	Pier 2	13.5'	N	7	N	9	N	7	8	N	N	7	7	7	N	N	9	N	N
	Pier 3	13.5'	N	6	N	9	N	6	8	N	N	6	6	6	N	N	9	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete of the piers was in good condition with no structurally significant defects observed. Several vertical hairline cracks were observed above the waterline on all of the piers at the midpoint on both faces. Pier 3 also exhibited vertical hairline cracks at the upstream and downstream quarter points of the shaft. Light to heavy accumulations of timber debris were observed at Piers 1, 2 and 3.

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.