

UNDERWATER BRIDGE INSPECTION REPORT

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



OCTOBER 28, 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. 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) The channel bottom along the west face of Pier 1 consisted of riprap up to 2 feet in diameter. Elsewhere, the channel bottom material typically consisted of silty sand allowing up to 1 foot of probe rod penetration.
- (B) Vertical crack (1/16 inch wide maximum) extended from the top of the above water step in shaft to the waterline on both sides of Pier 1.
- (C) Timber debris consisting of two tree trunks, 2 feet in diameter, was observed along the east face of Pier 3.
- (D) Overall, the concrete of all piers was smooth and sound.
- (E) Light to moderate accumulation of timber debris located along the upstream nose and the west side of Pier 1 was observed scattered along the channel bottom extending up 4 feet.
- (F) Vertical cracks (1/16 inch wide maximum) were observed from above water step in shaft to the waterline on the west face of Pier 3.
- (G) Riprap and concrete rubble was observed at the upstream nose of Piers 2 and 3. At

Pier 3, it extended along east side as well

RECOMMENDATIONS:

- (A) Monitor the timber debris accumulations 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 sixty (60) months.

Inspection Team Leader:
WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

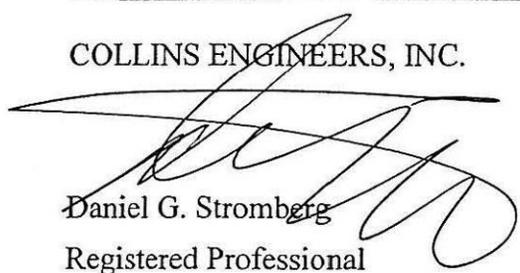
PROFESSIONAL ENGINEER

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: 27608

Feature Crossed: Mississippi River

Feature Carried: Broadway Avenue

Location: 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: Barritt R. Lovelace, P.E. (WSB)

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: October 28, 2012

Weather Conditions: Cloudy, 40° F

Underwater Visibility: 3.0 feet

Waterway Velocity: None

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 17.2 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 = 798.81.

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/10/12

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	207	LF	202	5			
985	Slopes	1	EA	1				



Photograph 1. View of Pier 1, Looking Southwest.



Photograph 2. View of Pier 2, Looking Southwest



Photograph 3. View of Pier 3, Looking Southwest.

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

INSPECTORS: Collins Engineers, Inc. DATE: October 28, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace, P.E. (WSB)

BRIDGE NO: 27608 WEATHER: Cloudy, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER _____

PERSONNEL: Marc B. Parker, Lukas Janulis, P.E.

EQUIPMENT: Commercial Scuba, Probe Rod, Lead Line, Sounding Pole, Fathometer, U/W
Light, Scraper, Camera, 14ft Boat with Motor.

TIME IN WATER: 11:15 a.m.

TIME OUT OF WATER: 11:45 a.m.

WATERWAY DATA: VELOCITY None

VISIBILITY 3.0 feet

DEPTH 17.2 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: Overall, the concrete of the piers was smooth and sound 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.

FURTHER ACTION NEEDED: _____ YES NO

Monitor the timber debris accumulations 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 sixty (60) months.

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 Barritt Lovelace, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 28, 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.

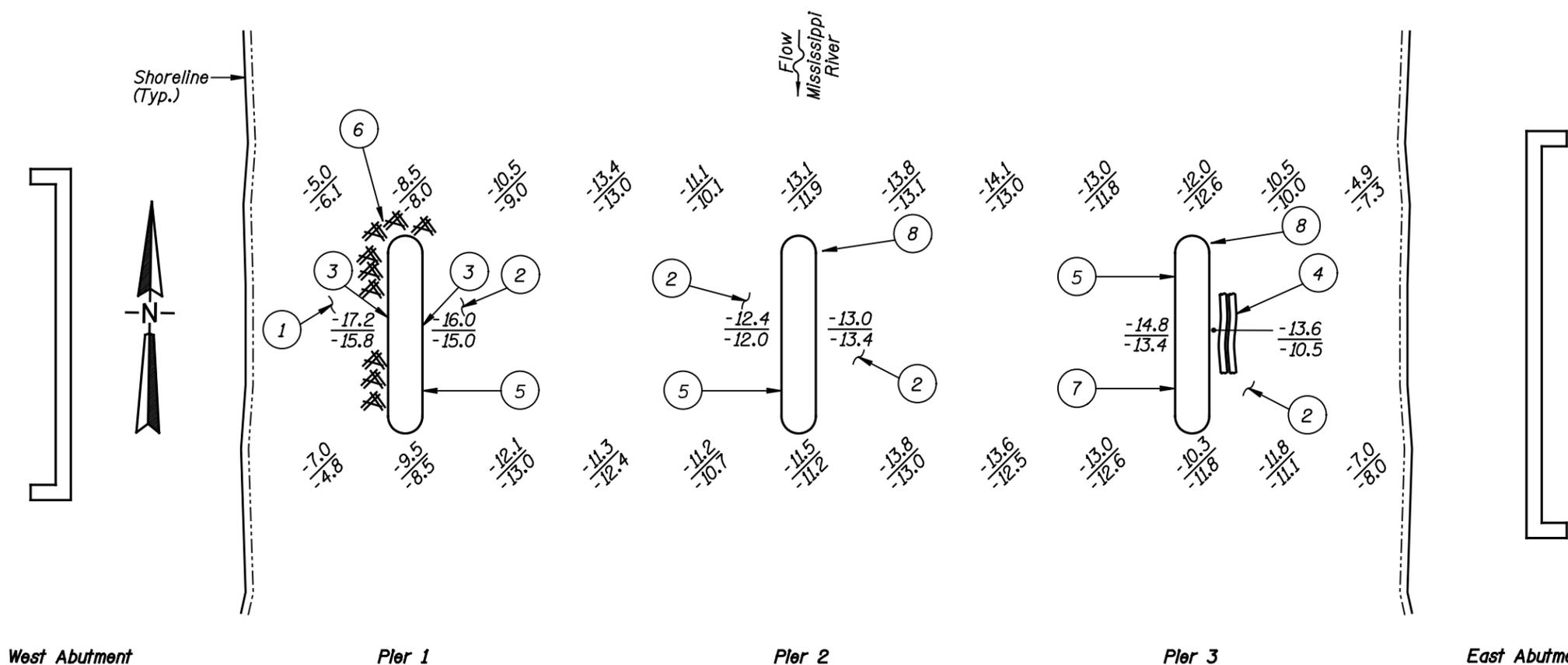
CONDITION RATING

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	17.2'	N	7	N	8	N	7	N	7	7	6	7	7	N	N	N	N	N
	Pier 2	13.1'	N	7	N	8	N	7	N	N	N	N	8	7	N	N	N	N	N
	Pier 3	14.8'	N	7	N	8	N	7	N	7	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was smooth and sound 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.

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.



GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on October 28, 2012 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 pier shaft step 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, the concrete was smooth and sound.
- ⑥ Light to moderate accumulation of timber debris located along the upstream nose and the west side of Pier 1 was observed scattered along the channel bottom extending up 4 feet.
- ⑦ Vertical cracks (1/16 inch wide maximum) were observed from the top of the pier shaft step the waterline on the west face of Pier 3.
- ⑧ Riprap and concrete rubble was observed at upstream nose of Piers 2 and 3. At Pier 3, it extended along east side as well.

SOUNDING PLAN

Legend

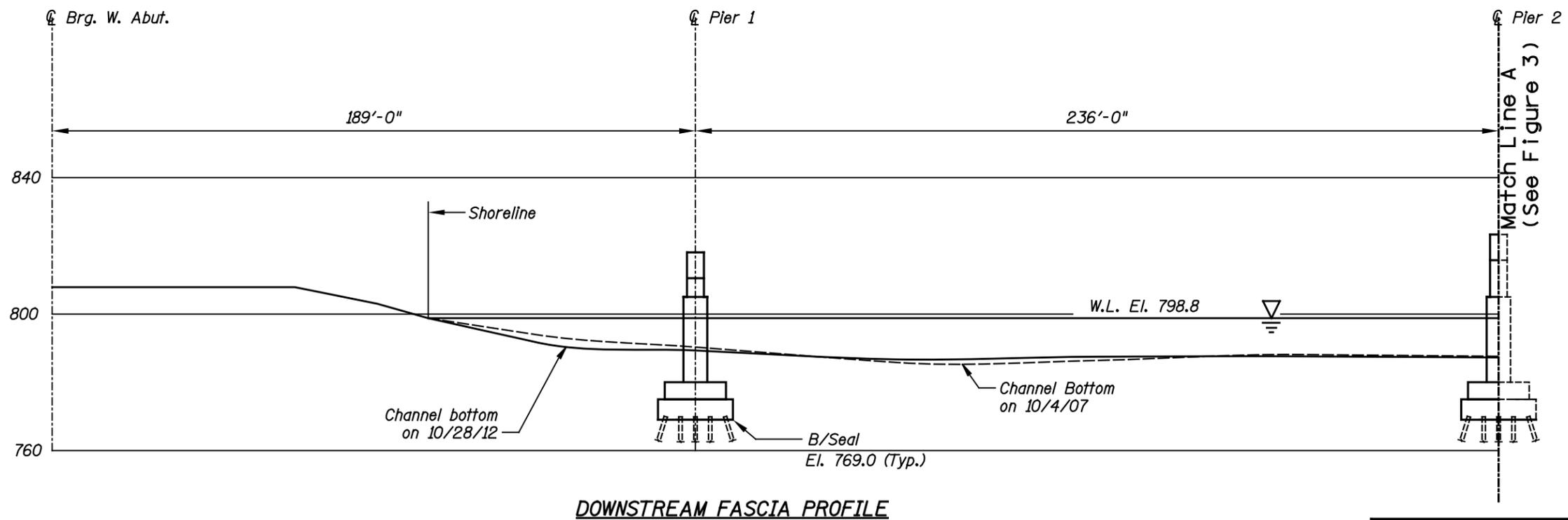
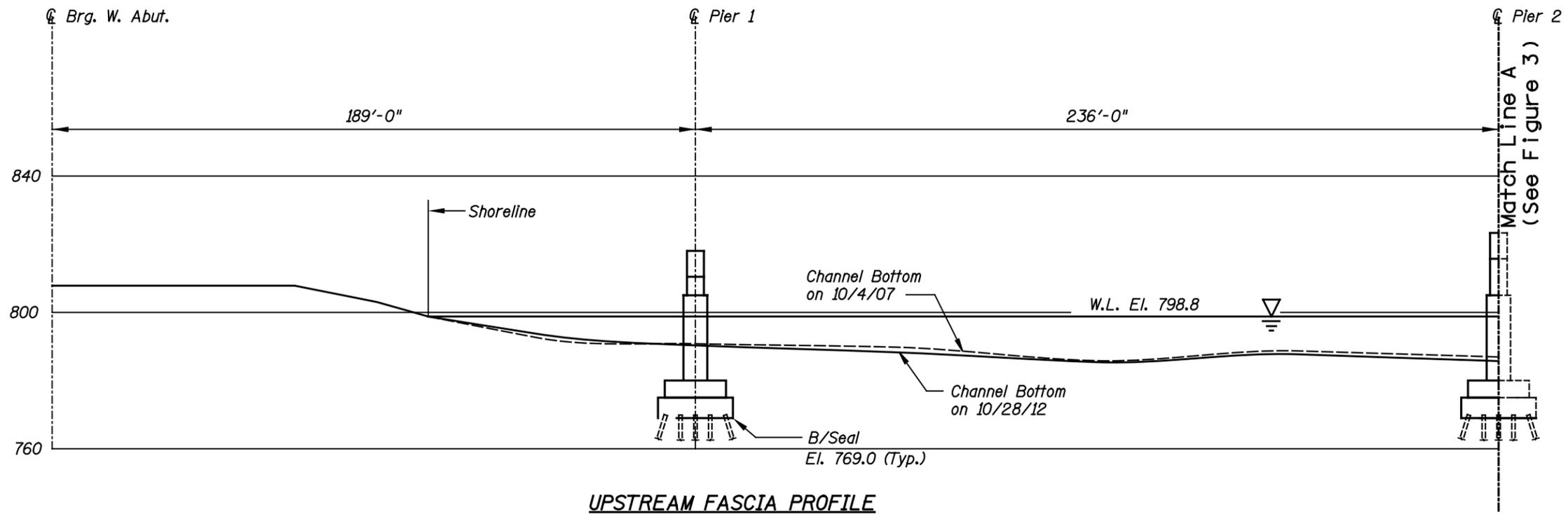
- 2.0 Sounding Depth (10/28/12)
- 5.2 Sounding Depth (10/1/07)
- Timber Debris

Note:

All soundings based on 2012 waterline location.

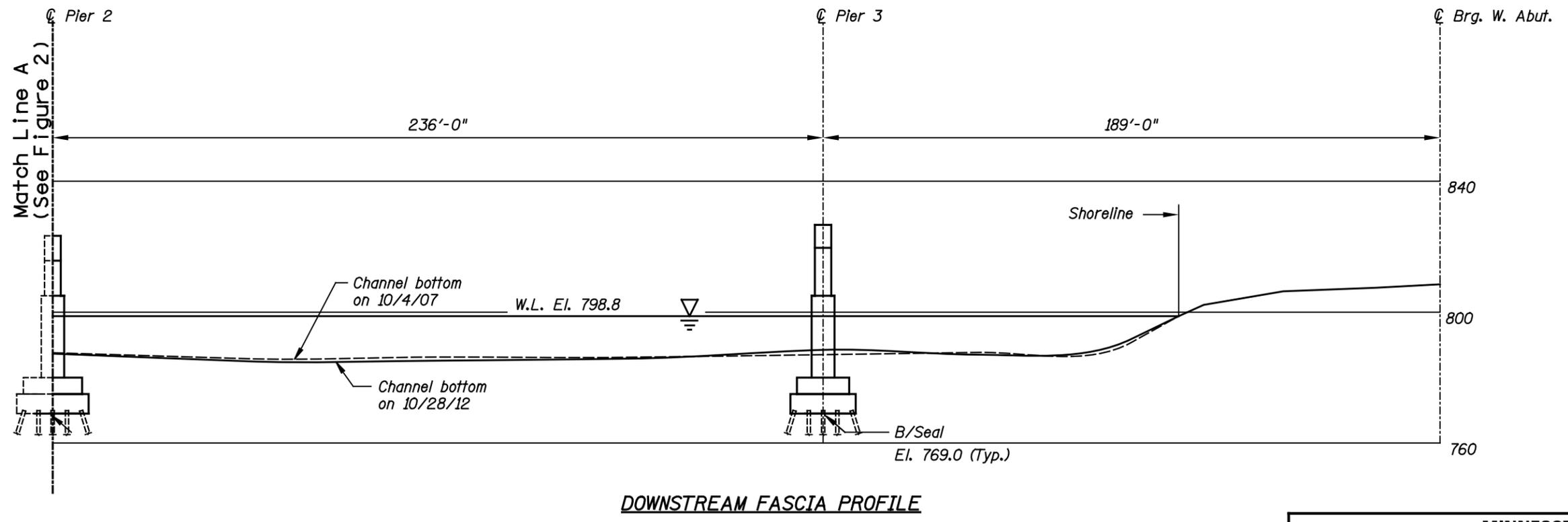
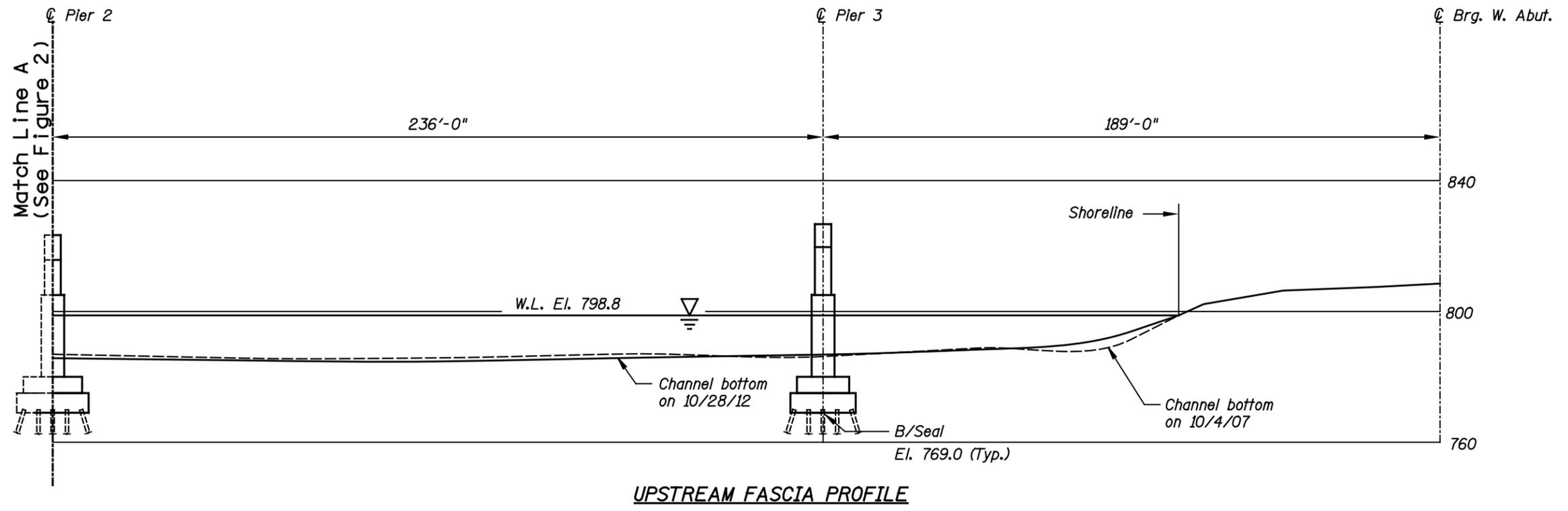
MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CRE	COLLINS ENGINEERS	Date: OCT., 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 742327608		Figure No.: 1

TYPICAL END VIEW OF PIERS



Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES I		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2012
Checked By: LJ		Scale: 1"=40'
Code: 742327608		Figure No.: 2



Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27608 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES II		
Drawn By: CRE	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT., 2012
Checked By: LJ		Scale: 1"=40'
Code: 742327608		Figure No.: 3