

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 2796

10TH AVENUE

OVER THE

MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY, CITY OF MINNEAPOLIS



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 120)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge 2796, Pier 12, was in good condition below water with no structurally significant defects observed. The minor defects observed included light to moderate corrosion and various construction-related gaps between the sheet piling surrounding the pier base concrete on all sides of the pier. The channel bottom was stable with no evidence of significant scour or appreciable changes since the previous inspection, with the exception of some aggregation of channel bottom material at the downstream fascia of the bridge near the north shore. Overall, the conditions at the bridge have not changed appreciably since the last inspection.

INSPECTION FINDINGS:

- (A) Gaps were present in the steel sheeting at the east and west upstream quarter points of the pier. The gaps varied in width between the waterline and the channel bottom with a maximum width of 3 feet at the channel bottom on the east side of the pier. The gaps appear to be part of the original sheet pile construction, are unchanged from the last inspection, and do not affect the structural integrity of the pier.
- (B) The steel sheeting was in good condition, with a uniform 1/8 inch layer of corrosion extending from the top of the sheeting to the channel bottom, along with light aquatic growth and silt below the waterline.
- (C) A void between the horizontal C-channels and the vertical sheeting was observed at the east side upstream quarter point of the pier, 2.5 feet below the waterline. The void had a height of 2.5 feet with 3.5 feet of penetration. There was some settlement, displacement, and cracking of the concrete within the sheeting (see Note E) related to this void.

(D) The sheet piling was slightly separated (1 to 2 inch gap) around the base of the pier for a length of 20 feet along both sides of the pier.

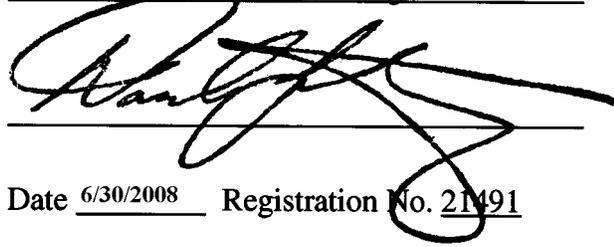
(E) The topside concrete surface (within the sheeting) was sound, however gaps and/or cracks with up to one foot maximum width were observed on both east and west sides of the pier.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure unit 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

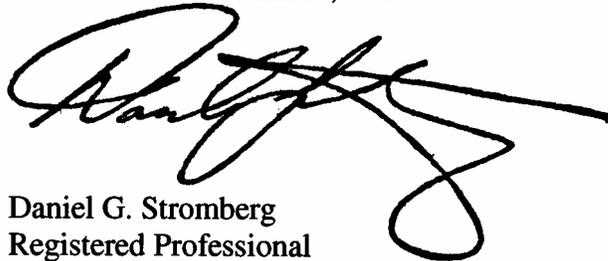


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

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: 2796

Feature Crossed: The Mississippi River

Feature Carried: 10TH Avenue

Location: District 5 - Hennepin County, City of Minneapolis

Bridge Description: The superstructure consists of a open-spandrel reinforced concrete arch supporting a reinforced concrete deck. The superstructure is supported on two reinforced concrete abutments and 19 reinforced piers numbered from the west end of the bridge. Only Pier 12 is located within the channel. No information on the foundation of Pier 12 was shown on the design drawings provided.

2. INSPECTION DATA

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

Dive Team: Todd Demski, John J. Loftus, Valerie Roustan.

Date: August 30, 2007

Weather Conditions: Sunny, ± 65° F

Underwater Visibility: 0.5 Feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 12

General Shape: The pier consists of an oblong rectangular shaft with rounded ends. The base of the pier shaft is encased with steel sheet piling encasement (protection) system which is pointed at the upstream end and filled with concrete.

Maximum Water Depth at Substructure Inspected: Approximately 15.5 feet.

4. WATERLINE DATUM

Water Level Reference: Spring line at Pier 12.

Water Surface: The waterline was approximately 10.4 feet below reference.
Waterline Elevation = 724.9.

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 8

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code U/96

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 the Southwest Embankment and Pier 11, Looking Southwest.



Photograph 2. View of the Downstream Nose of Pier 12, Looking Northwest.



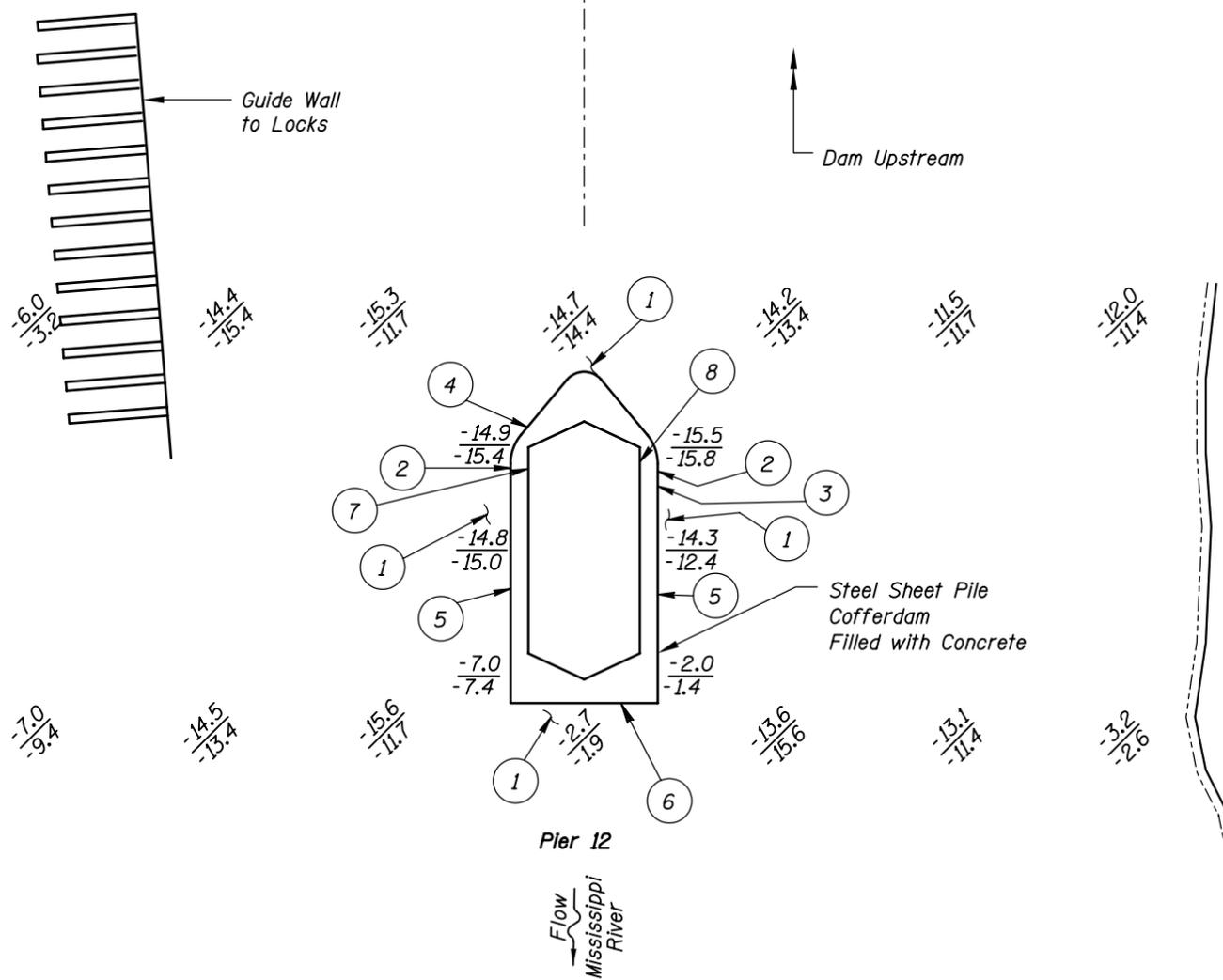
Photograph 3. View of the Concrete and Sheet Piling along East Side of Pier 12, Looking Southeast.



Photograph 4. View of the Concrete and Sheet Piling along West Side of Pier 12, Looking Southeast.



Photograph 5. View of Northeast Embankment and Pier 13, Looking Northeast.



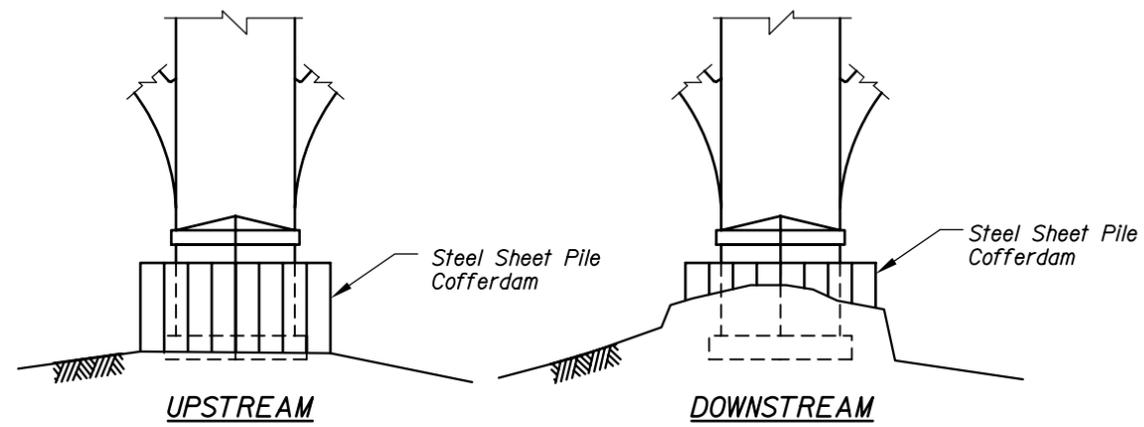
SOUNDING PLAN

GENERAL NOTES:

1. Pier 12 was inspected underwater.
2. At the time of inspection on August 30, 2007 the waterline was located approximately 10.4 feet below the spring line at Pier 12. This corresponds with a waterline elevation of 724.9
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 about 1/4 point intervals between the substructure units.

INSPECTION NOTES:

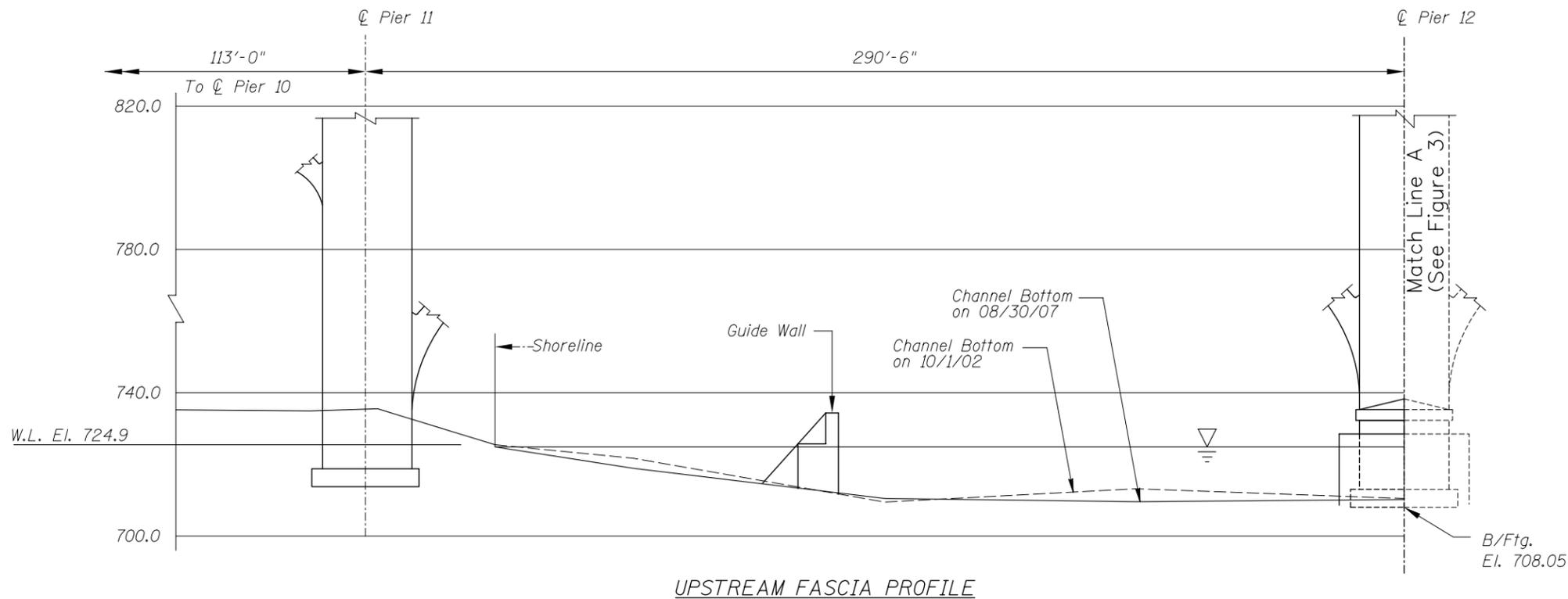
- 1 The channel bottom material, within 10 feet of the substructure unit, typically consisted of tightly packed riprap from 1 foot to 3 feet in size. Along the downstream end, the channel sloped up at a steep angle and was located approximately 2.4 feet below the waterline, the downstream channel bottom material consisted of cobbles of less than 6 inches in size and riprap from 1 foot to 4 feet in size.
- 2 Gaps in the lines of construction (not at interlocks), were observed in the steel sheeting at the east and west upstream 1/4 points with maximum widths located at the channel bottom. The west gap measured 15 inches in width and had a maximum penetration of 6 inches. The east side gap measured 36 inches in width and had no penetration.
- 3 A void between the horizontal C-channels and the vertical sheeting was observed at the east side upstream 1/4 point of the pier at 2.5 feet below the waterline with a height of 2.5 feet and 3.5 feet of maximum penetration.
- 4 The steel sheeting was in good condition with a uniform 1/8 inch layer of surface corrosion extending from the top of the sheeting to the channel bottom.
- 5 The steel sheet piling was slightly separated from the concrete around the base of the pier for a length of approximately 20 feet along the east and west sides.
- 6 There was a hole in the steel sheet piling at the downstream end measuring 1 inch in diameter.
- 7 The topside concrete surface within the sheeting was sound, however, gaps/ cracks up to 1' maximum width were observed on both east and west sides of pier 12.



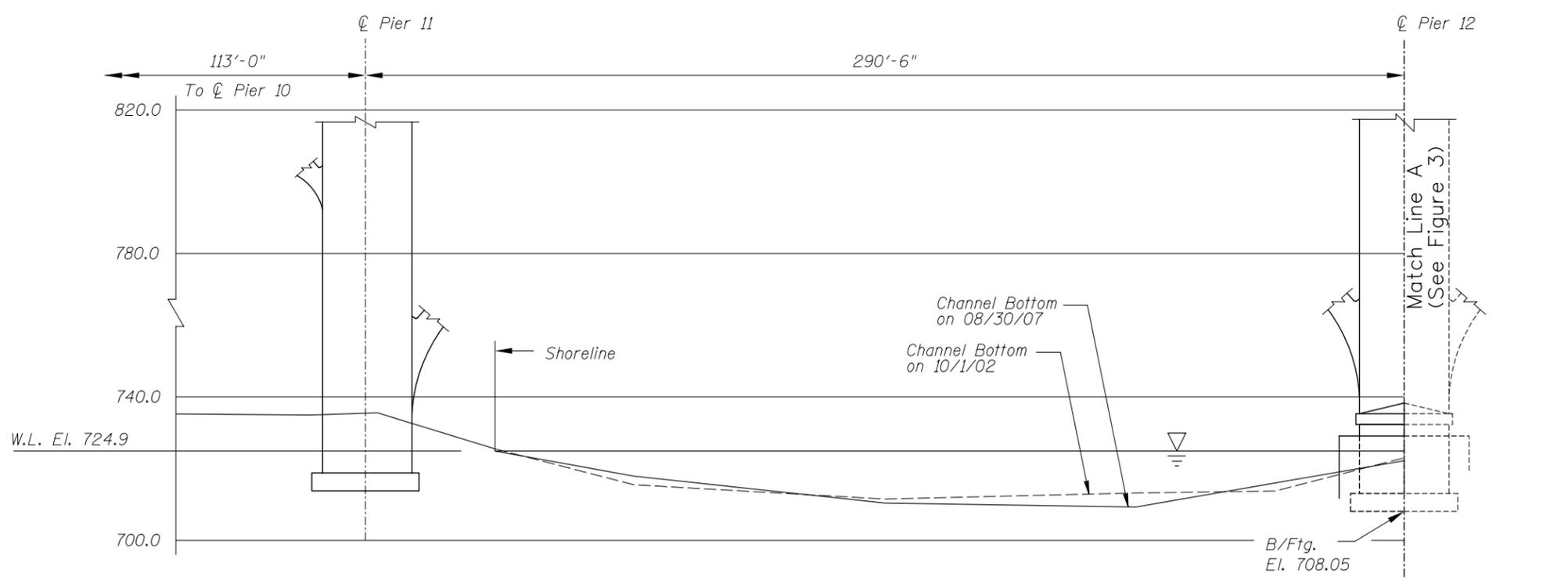
TYPICAL END VIEW OF PIER 12

Legend
 -14.0 Sounding Depth (08/30/07)
 -14.7 Sounding Depth (10/01/02)
Note
 All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 2796 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS		
INSPECTION AND SOUNDING PLAN		
Drawn By: DR	COLLINS ENGINEERS <small>128 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-8900 www.collinsengr.com</small>	Date: AUG. 2007
Checked By: DGS		Scale: NTS
Code: 52210120		Figure No.: 1



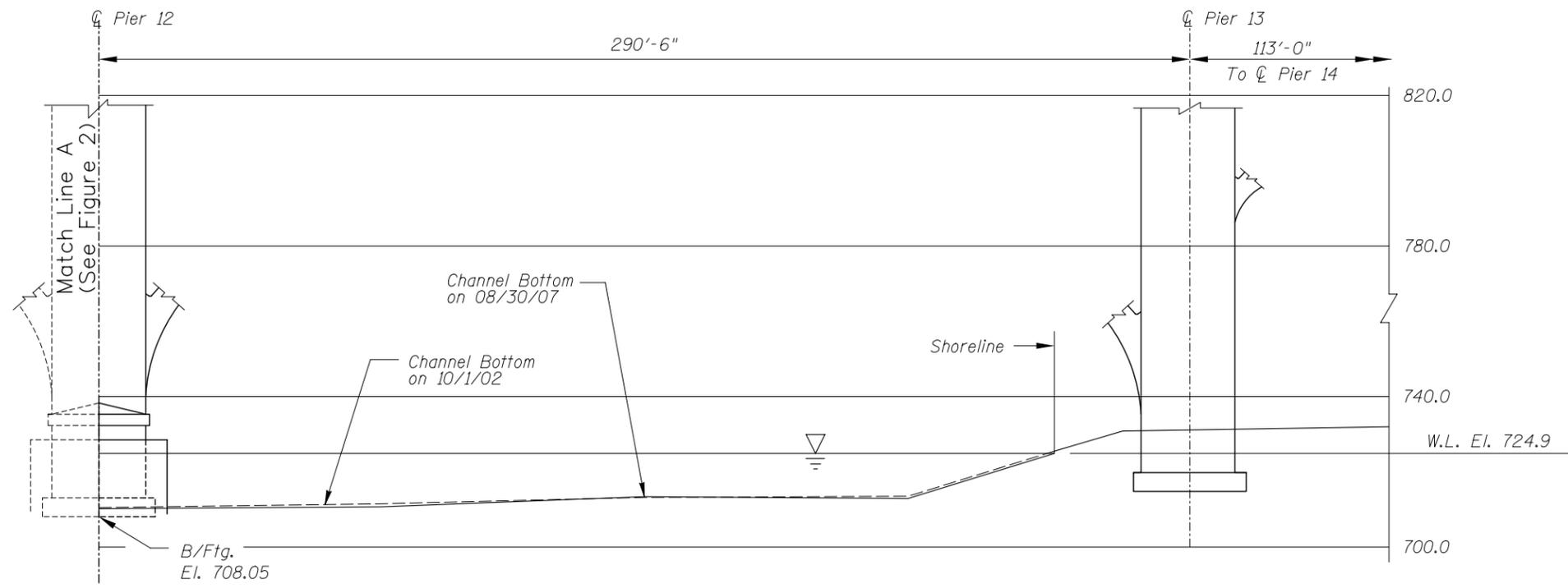
UPSTREAM FASCIA PROFILE



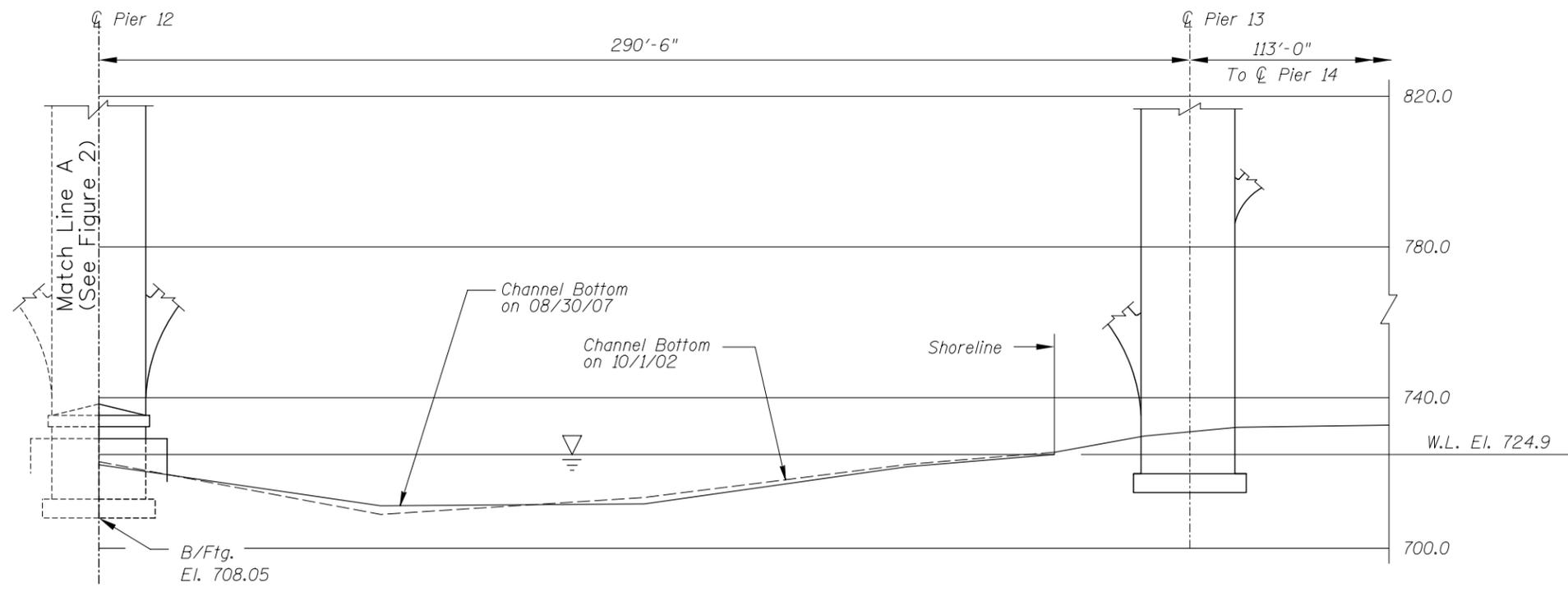
DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 2796 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: DR	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9800 www.collinsengr.com</small>	Date: AUG. 2007
Checked By: DGS		Scale: 1"=40'
Code: 52210120		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

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STRUCTURE NO. 2796 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: DR	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUG. 2007
Checked By: DGS		Scale: 1"=40'
Code: 52210120		Figure No.: 3

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

INSPECTORS: Collins Engineers, Inc. DATE: August 30, 2007

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

BRIDGE NO: 2796 WEATHER: Sunny, ±65° F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: _____ SCUBA SURFACE SUPPLIED AIR
_____ OTHER _____

PERSONNEL: Todd Demski, John J. Loftus, Valerie Roustan.

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

TIME IN WATER: 9:50 A.M.

TIME OUT OF WATER: 10:40 A.M.

WATERWAY DATA: VELOCITY ±1.0 f.p.s.

VISIBILITY 0.5 feet

DEPTH 15.5 feet maximum at Pier 12

ELEMENTS INSPECTED: Pier 12

REMARKS: Overall, the topside concrete surface (within the sheeting) at Pier 12 was sound; however, gaps/cracks up to 1 foot maximum in width were observed on both east and west sides. Gaps, which are not a structural concern (from original construction), were observed in the steel sheeting construction at the east and west upstream 1/4 points with maximum widths located at the channel bottom. A void, up to 2.5 feet high and 3.5 feet deep, was observed between the horizontal C-channels and the vertical sheeting near the east side upstream 1/4 point of the pier. A uniform layer of light to moderate corrosion was observed on the steel sheeting extending from the top of the sheeting to the channel bottom.

FURTHER ACTION NEEDED: _____ YES NO

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. 2796
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE August 30, 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 12	15.5'	7	7	N	9	N	7	8	8	8	N	8	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the topside concrete surface (within the sheeting) at Pier 12 was sound; however, gaps/cracks up to 1 foot maximum in width were observed on both east and west sides. Gaps, which are not a structural concern (from original construction), were observed in the steel sheeting construction at the east and west upstream 1/4 points with maximum widths located at the channel bottom. A void, up to 2.5 feet high and 3.5 feet deep, was observed between the horizontal C-channels and the vertical sheeting near the east side upstream 1/4 point of the pier. A uniform layer of light to moderate corrosion was observed on the steel sheeting extending from the top of the sheeting to the channel bottom.

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.