

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6676
CSAH NO. 25
OVER THE
RED RIVER OF THE NORTH
DISTRICT 2 - NORMAN COUNTY



JULY 14, 2012
PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
AYRES ASSOCIATES & COLLINS ENGINEERS, INC.
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 6676, Pier 2, was in good condition with no structurally significant defects observed. At the time of the inspection, the channel was partially restricted by a moderate accumulation of timber debris in and around numerous abandoned timber piles cut-off just above the waterline in the eastern portion of the channel. The channel bottom around Pier 2 appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A light accumulation of timber debris was observed around the entire perimeter of Pier 2.
- (B) Numerous abandoned timber piles were present along the eastern side of the channel. Most of these piles were below the waterline and were catching timber drift and causing it to accumulate in the channel at the bridge.
- (C) Heavy bank erosion was located along the entire eastern shoreline in the vicinity of the bridge, having 10 foot vertical banks, loss of soil, and exposed tree roots.
- (D) The concrete surfaces of Pier 2 were smooth and sound with random areas of poor consolidation and section loss with up to ½ inch maximum penetration and no exposed reinforcing steel.
- (E) Areas of intermittent voids/honeycombing were observed at the waterline of Pier 2 typically measuring 12 inches by 12 inches by 2 inches of penetration.

RECOMMENDATIONS:

- (A) Ideally, the accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to removing or cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.

- (B) Reinspect the submerged substructure unit at the normal maximum recommended (NBIS) interval of sixty (60) months.

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.

Brian K. Schroeder

Name



Signature

Date 08/10/12

Registration No. 43576

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 6676

Feature Crossed: Red River of the North

Feature Carried: CSAH No. 25

Location: District 2 - Norman County

Bridge Description: The two main spans consist of steel through trusses and the two approach spans consist of multiple steel beams. The substructure includes two reinforced concrete abutments and three reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the structure.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E./ Ricardo S. Narvaez

Dive Team: Jason Cook, Adam Enderby

Date: July 14, 2012

Weather Conditions: Partly Sunny, 75° F

Underwater Visibility: None/Negligible

Waterway Velocity: 3.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2

General Shape: The pier consists of two multi-sided columns connected with a full height, solid shaft web wall. No foundation information for Pier 2 was furnished.

Maximum Water Depth at Substructure Inspected: Approximately 8.6 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 29.4 feet below reference.
Waterline Elevation = 840.4.

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 5

Item 92B: Underwater Inspection: Code B/07/12

Item 113: Scour Critical Bridges: Code I/94

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
205	Concrete Columns	2	EA	2				
210	Concrete Pier Wall	19	LF	19				
985	Slopes and Slope Protection	1	EA	1				



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



Photograph 2. View of Pier 2, Looking Southwest.



Photograph 3. View of Pier 2, Looking Southeast.

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

INSPECTORS: Ayres Associates DATE: July 14, 2012

ON-SITE TEAM LEADER: Ricardo S. Narvaez

BRIDGE NO: 6676 WEATHER: Partly Sunny, 75° F

WATERWAY CROSSED: Red River over the North

DIVING OPERATION: _____ SCUBA SURFACE SUPPLIED AIR
_____ OTHER _____

PERSONNEL: Jason Cook, Adam Enderby

EQUIPMENT: SSA, U/W Light, Hammer, Sounding Pole, Lead Line, Camera

TIME IN WATER: 9:20 a.m.

TIME OUT OF WATER: 9:40 a.m.

WATERWAY DATA: VELOCITY 3.0 f.p.s.

VISIBILITY None/ Negligible

DEPTH 8.6 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: The concrete surfaces of Pier 2 were smooth and sound with random minor areas of poor consolidation and section loss. Intermittent voids/honeycombing were observed at the waterline typically measuring 12 inches by 12 inches by 2 inches deep. A light accumulation of timber debris was observed around the entire perimeter of Pier 2. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks along the east shoreline were heavily eroded as noted in the previous inspection.

FURTHER ACTION NEEDED: YES NO

Ideally, both the accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to removing or cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.

FURTHER ACTION NEEDED CONTINUED:

Reinspect the submerged substructure unit 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. 6676
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Ricardo S. Narvaez
 WATERWAY CROSSED Red River of the North

INSPECTION DATE July 14, 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.

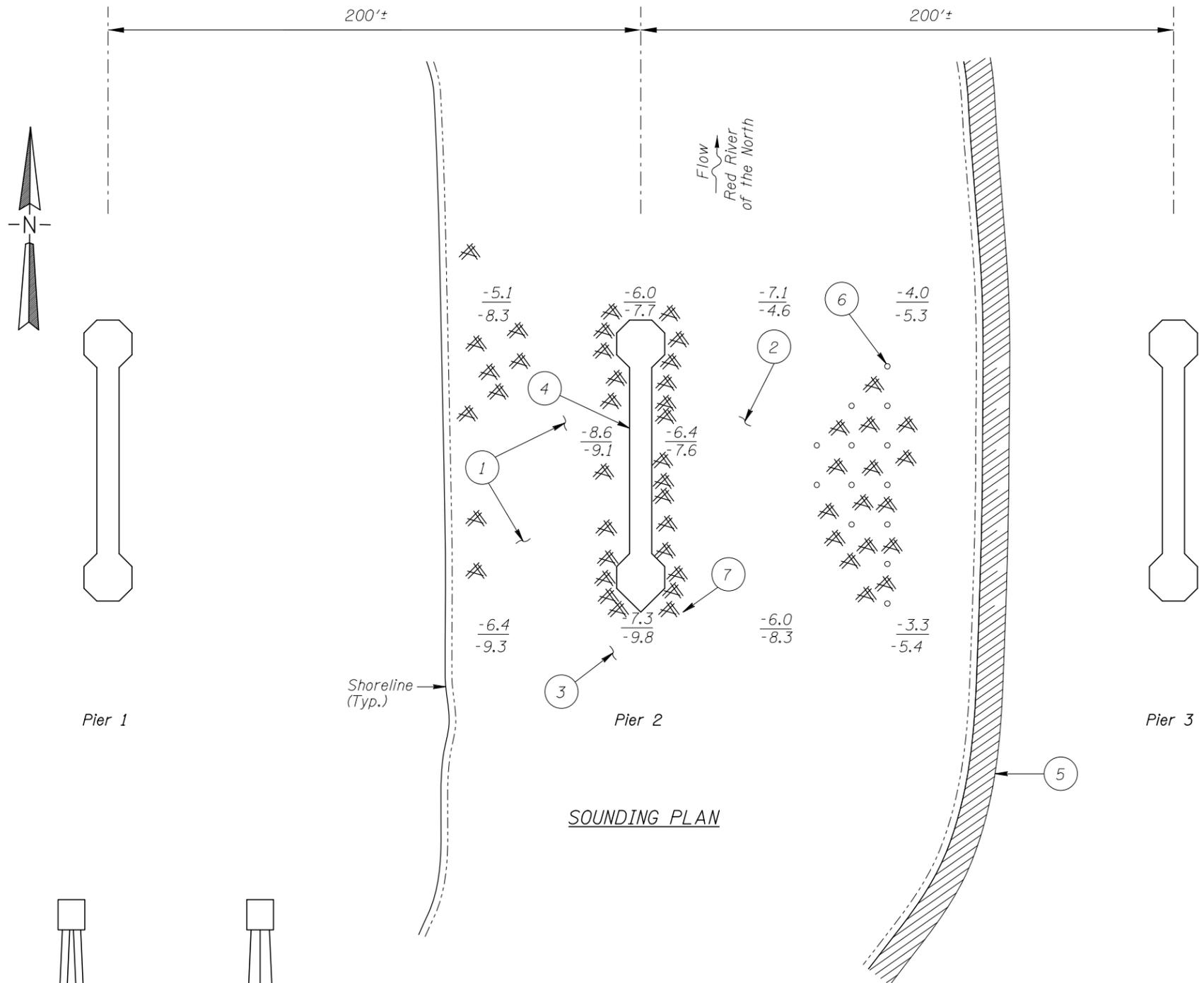
CONDITION RATING

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 2	8.6'	N	7	N	8	N	7	7	5	N	5	5	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete surfaces of Pier 2 were smooth and sound with random minor areas of poor consolidation and section loss. Intermittent voids/honeycombing was observed at the waterline typically measuring 12 inches by 12 inches by 2 inches deep. A light accumulation of timber debris was observed around the entire perimeter of Pier 2. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks on the east side were heavily eroded as noted in the previous 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.

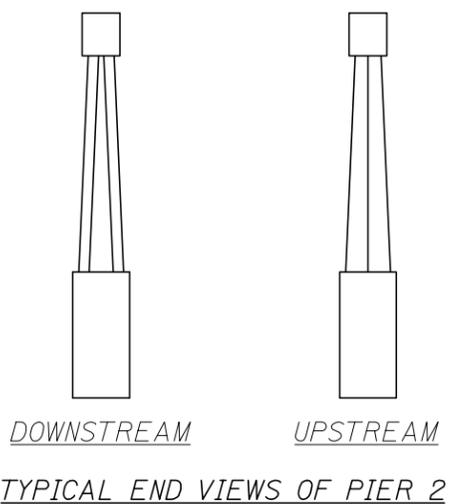


GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on July 14, 2012, the waterline was located approximately 29.4 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 840.4.
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 material along the west side of Pier 2 consisted of silt and gravel with up to 6 inches of maximum penetration.
- 2 The channel bottom material along the east side of Pier 2 consisted of clayey silt with up to 12 inches of maximum penetration.
- 3 The channel bottom material at the upstream nose of Pier 2 consisted of hard clay with 2 to 4 inches of maximum penetration.
- 4 The concrete surfaces of Pier 2 were smooth and sound. Random minor areas of poor consolidation and section loss with up to 1/2 inch maximum penetration and no exposed reinforcing steel were present. Intermittent voids/honeycombing were observed at the waterline of Pier 2 typically measuring 12 inches by 12 inches with 2 inches of penetration.
- 5 Heavy bank erosion was located along the entire eastern shoreline in the vicinity of the bridge, having 10 foot vertical banks, loss of soil, and exposed tree roots.
- 6 Abandoned timber piles with scattered accumulated timber drift hung up on and throughout piles.
- 7 A light accumulation of timber debris was observed around the entire perimeter of Pier 2.



SOUNDING PLAN

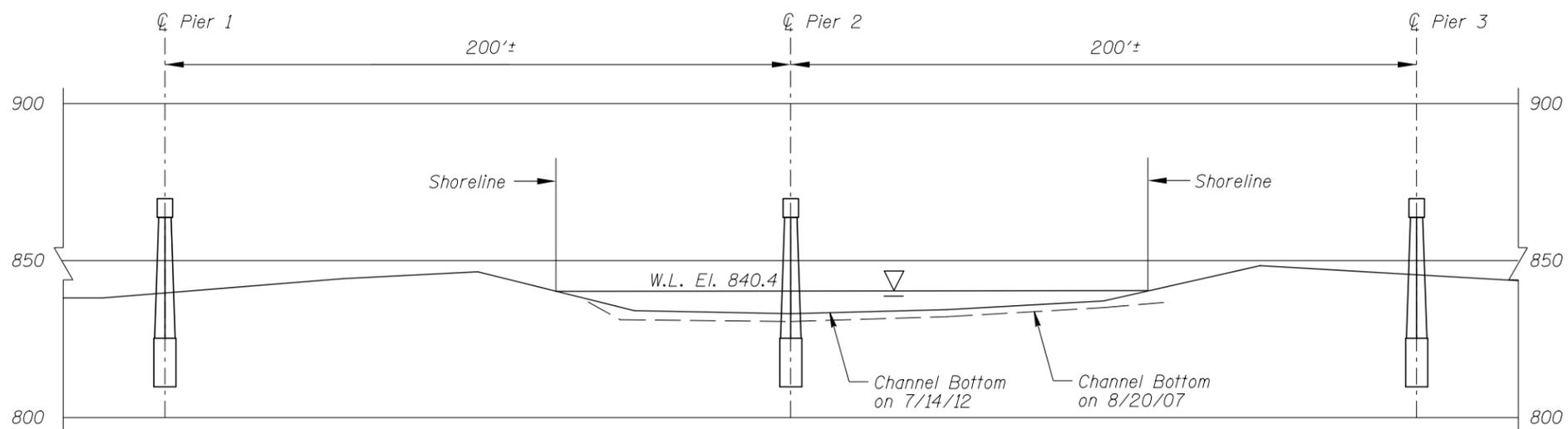
Legend

- 2.0 Sounding Depth (7/14/12)
- 5.2 Sounding Depth (8/20/07)
- o Cut Off Pile
- Bank Erosion
- Timber Debris

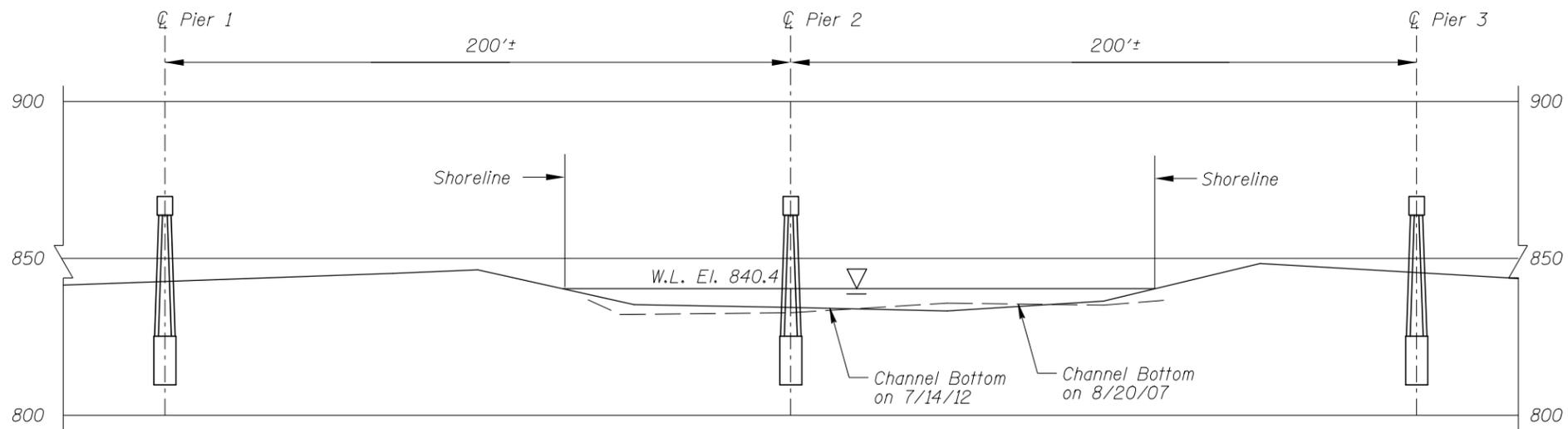
Note:
All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION	
STRUCTURE NO. 6676 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN COUNTY	
INSPECTION AND SOUNDING PLAN	
Drawn By: JAC Checked By: BKS Code: 52210042	<div style="text-align: center;">AYRES ASSOCIATES</div> Date: JULY 2012 Scale: NTS Figure No.: 1

COLLINS ENGINEERS
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UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION					
STRUCTURE NO. 6676 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN COUNTY					
UPSTREAM AND DOWNSTREAM FASCIA PROFILES					
COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	<table border="1"> <tr> <td>Drawn By: JAC</td> <td rowspan="3" style="text-align: center;">AYRES ASSOCIATES</td> </tr> <tr> <td>Checked By: BKS</td> </tr> <tr> <td>Code: 52210042</td> </tr> </table>	Drawn By: JAC	AYRES ASSOCIATES	Checked By: BKS	Code: 52210042
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