

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 58510
CSAH NO. 61
OVER THE
SNAKE RIVER
DISTRICT 1 - PINE COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 72)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 58510, Piers 1 through 4, were found to be in good to satisfactory condition with light to moderate corrosion and pitting along the pile surfaces. The steel deterioration has progressed since the previous inspection, but has still not compromised the piers' structural integrity. The channel bottom around the substructure units and the shorelines appeared stable with no significant scour or changes since the last inspection.

INSPECTION FINDINGS:

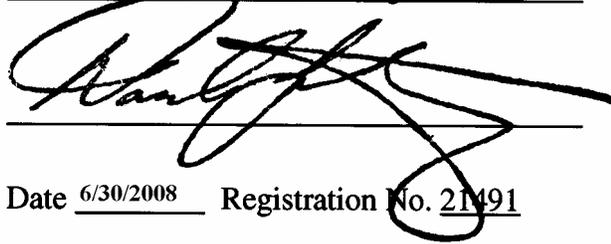
- (A) There was light to moderate corrosion (10% minimum – 75% maximum), with up to ½ inch diameter nodular rust covering approximately 50% to 100% of the surface area of the piles with up to 1/8 inch deep pitting, extending from 6 inches above the waterline to 1.5 feet below the waterline.
- (B) Four deformations were found on the easternmost pile of Pier 4. These deformations measured up to 2 inches deep and 8 inches in diameter and were accompanied by moderate corrosion and some pitting, especially for the one located near the waterline.
- (C) Metal dock framing debris was observed around the two upstream piles of Pier 1.

RECOMMENDATIONS:

- (A) 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

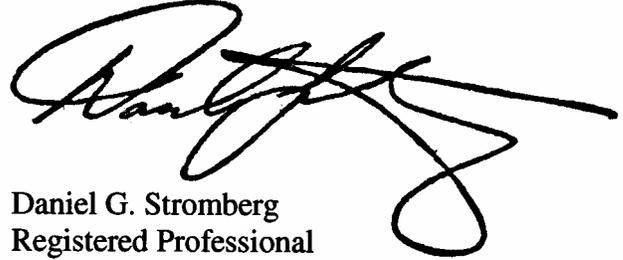


A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line. Below this line is another horizontal line.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line. Below this line is another horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 58510

Feature Crossed: Snake River

Feature Carried: CSAH No. 61

Location: District 1 - Pine County

Bridge Description: The superstructure consists of five spans of precast concrete deck slabs. The superstructure is supported by four piers and two concrete abutments. The piers are numbered 1 through 4 starting from the south end of the bridge. Each pier consists of a concrete cap supported by twelve concrete filled, steel shell piles.

2. INSPECTION DATA

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

Dive Team: John J. Loftus, Valerie Roustan

Date: August 23, 2007

Weather Conditions: Cloudy, 81° F

Underwater Visibility: 2.0 feet

Waterway Velocity: 0.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 4.

General Shape: Each pier consists of a rectangular shaped concrete cap supported by twelve concrete filled, steel shell piles in a single row.

Maximum Water Depth at Substructure Inspected: Approximately 10.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 9.9 feet below reference.
Water Elevation = 932.9.

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

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 7

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

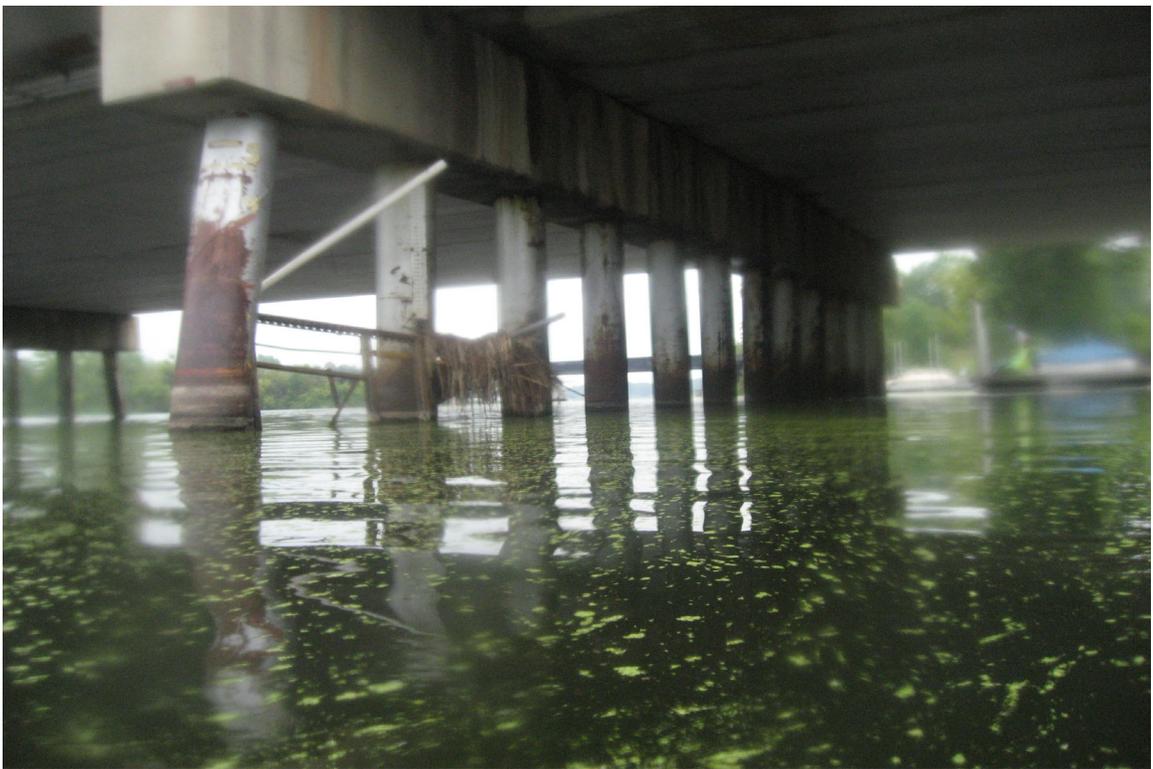
Item 113: Scour Critical Bridges: Code J/97

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. Overall View of Structure, Looking Northwest.



Photograph 2. View of Pier 1, Looking Northeast.



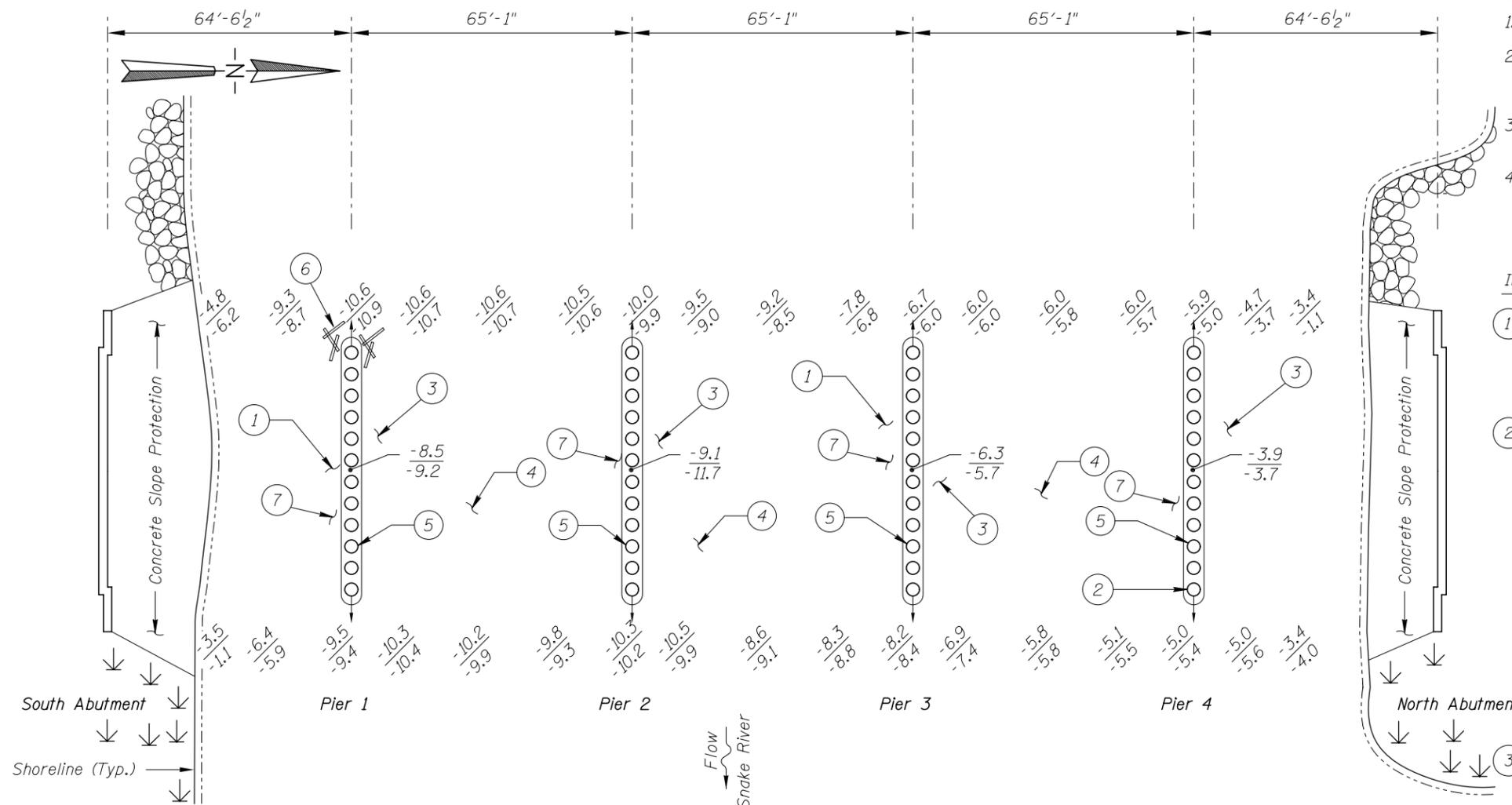
Photograph 3. View of Pier 2, Looking Northeast.



Photograph 4. View of Pier 3, Looking Southeast.



Photograph 5. View of Pier 4, Looking Southeast.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 through 4 were inspected underwater.
2. At the time of inspection on August 23, 2007, the waterline was located 9.9 feet below the top of the pile cap at the downstream end of Pier 1. This corresponds to a waterline elevation of 932.9.
3. Soundings indicate water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 points intervals between the substructure units.

INSPECTION NOTES:

- ① A light amount of scattered timber debris 3 inch diameter and smaller was observed on the south side of Piers 1 and 2 along the channel bottom and upstream half of Pier 3 had light to moderate 6 inch diameter and smaller debris from channel bottom to 3 feet below the waterline.
- ② Four deformations were present on the east and south side of the easternmost pile:
 - A. A 6 inch wide by 3 inch high by 2 inch deep dent was located 4 feet below water on the south face.
 - B. A 6 inch by 3 inch high by 1 inch deep dent located at 3 feet below the waterline.
 - C. A 6 inch diameter by 2 inch deep dent located at the waterline. This dent was accompanied by 1/8 inch deep corrosion pitting.
 - D. An 8 inch diameter by 1 inch deep dent located at 1.5 foot below the waterline.
- ③ Timber piles from an earlier structure were located along the north side of each pier. The tops of the piles were located at 2 feet above channel bottom.
- ④ Channel bottom material consisted of gravelly sand with scattered riprap and cobbles, and 2 inch maximum probe rod penetration.
- ⑤ Light to moderate corrosion (10% min to 75% max) on all piles from 2 feet above the waterline to the channel bottom with up to 1/2 inch diameter rust nodules covering approximately 50% to 100% of the surface area of the piles, with a maximum of 1/8 inch deep pitting from 6 inches above water to 1.5 inches below water.
- ⑥ Metal dock framing debris was observed around the two upstream piles of Pier 1.
- ⑦ A light accumulation of grassy vegetation was observed around all of the piers.

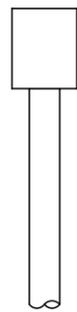
Legend

- 2.0 Sounding Depth (8/23/07)
- 5.2 Sounding Depth (9/25/02)
- Concrete Filled Pipe Pile
- Concrete Filled Battered Pipe Pile
- ⊠ Riprap
- ↓ Grassy Vegetation

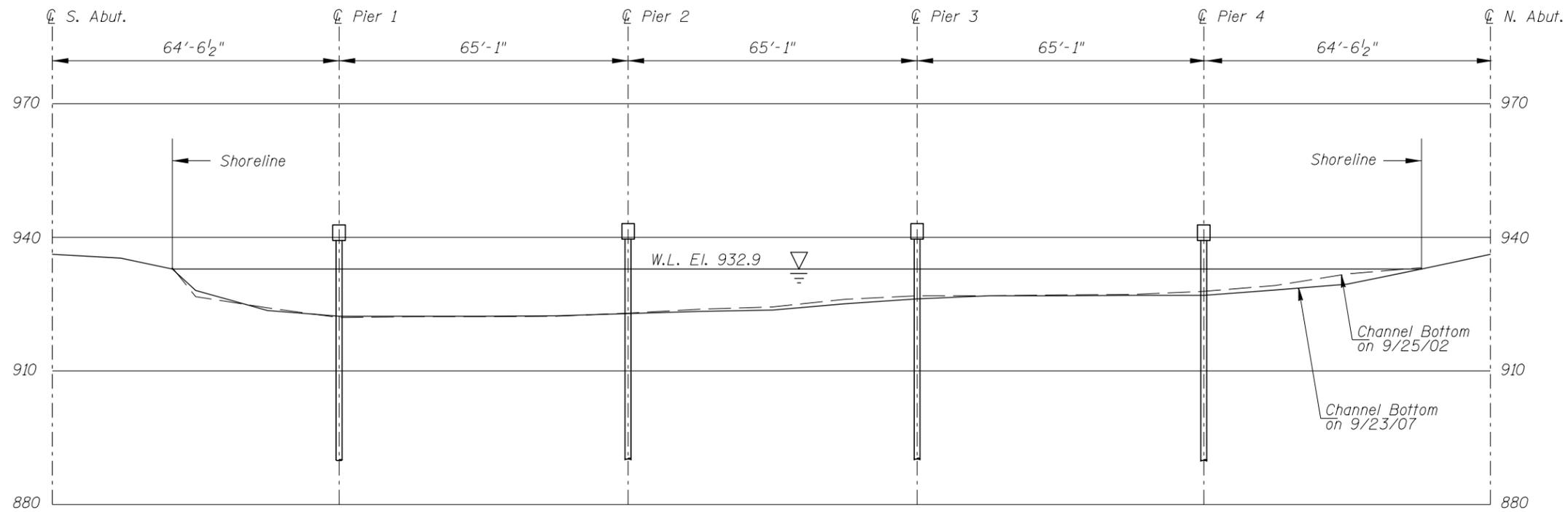
Note:

All soundings based on 2007 waterline location.

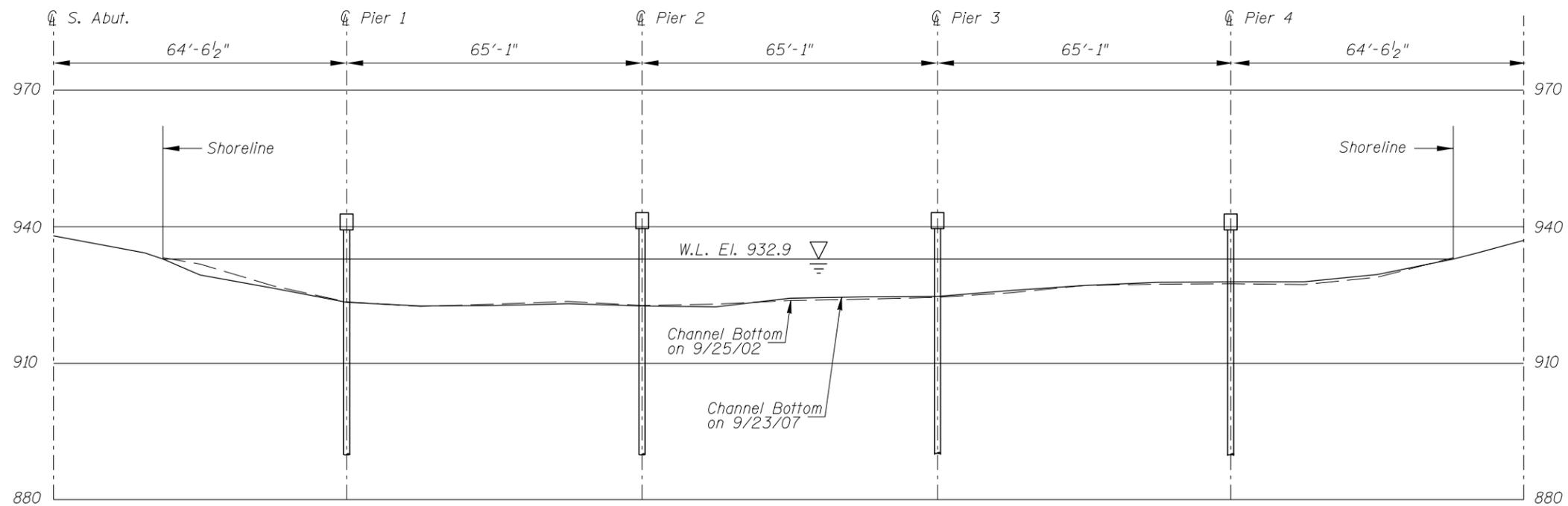
TYPICAL END VIEW OF PIERS



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 58510 OVER THE SNAKE RIVER DISTRICT 1, PINE COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52210072		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 58510
 OVER THE SNAKE RIVER
 DISTRICT 1, PINE COUNTY
 UPSTREAM AND DOWNSTREAM
 FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=30'
Code: 52210072		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 23, 2007

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

BRIDGE NO: 58510 WEATHER: Cloudy, 81° F

WATERWAY CROSSED: Snake River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Probe Rod, Camera

TIME IN WATER: 3:00 p.m.

TIME OUT OF WATER: 3:30 p.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s

VISIBILITY 2.0 feet

DEPTH 10.6 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 through 4

REMARKS: Overall, the steel piles were in good to satisfactory condition with light to moderate corrosion and up to 1/2 inch diameter nodular rust covering approximately 50% to 100% of the surface area of the piles with up to 1/8 inch deep pitting from 6 inches above to 1.5 feet below the waterline. Four dents were observed on the easternmost pile of Pier 4. Abandoned timber piles were observed in random locations along all piers extending from the channel bottom up approximately 2 feet. Light accumulations of timber debris were observed along south side of Piers 1 and 2, and the upstream half of Pier 3 had a light to moderate accumulation of debris from the channel bottom up 3 feet. Also, an accumulation of metal dock framing was observed at the upstream piles of Pier 1. The channel bottom consisted of sandy gravel with cobbles and appeared stable with no evidence of significant scour.

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. 58510
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Snake River

INSPECTION DATE August 23, 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 (BRACING)	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	10.6'	6	N	N	9	N	6	8	8	8	7	7	N	6	N	6	N	N
	Pier 2	10.3'	6	N	N	9	N	6	8	N	N	7	7	N	6	N	6	N	N
	Pier 3	8.2'	6	N	N	9	N	6	8	N	N	7	7	N	6	N	6	N	N
	Pier 4	5.9'	6	N	N	9	N	6	8	8	8	N	8	N	6	N	6	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the steel piles were in good to satisfactory condition with light to moderate corrosion and up to 1/2 inch diameter nodular rust covering approximately 50% to 100% of the surface area of the piles with up to 1/8 inch deep pitting from 6 inches above to 1.5 feet below the waterline. Four dents were observed on the easternmost pile of Pier 4. Abandoned timber piles were observed in random locations along all piers extending from the channel bottom up approximately 2 feet. Light accumulations of timber debris were observed along south side of Piers 1 and 2, and the upstream half of Pier 3 had a light to moderate accumulation of debris from the channel bottom up 3 feet. Also, an accumulation of metal dock framing was observed at the upstream piles of Pier 1. The channel bottom consisted of sandy gravel with cobbles and appeared stable with no evidence of significant scour.

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.