

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 75501
COUNTY STATE AID HIGHWAY 10
OVER THE
POMME DE TERRE RIVER
DISTRICT 4 – STEVENS COUNTY



SEPTEMBER 24, 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 units inspected at Bridge No. 75501, Piers 1 through 3, and East and West Abutments, were found to be generally in good to satisfactory condition with no defects of structural significance observed. All of the timber piles were generally solid and in good condition with only light weathering allowing up to 1/8 inch awl penetration. Minor outer shell delaminations with up to 1/2 inch thickness were noted on all piles, between 1 foot above and 1 foot below the waterline. Several of the pile braces exhibited splits through the fastener, up to 2 inches wide and 3 feet long, at the pile to brace connection. Overall, the channel bottom configuration appeared to be in good and stable condition.

INSPECTION FINDINGS:

- (A) Channel bottom material around Piers 1 and 3 consisted of up to 3 foot diameter rock with randomly scattered cobbles allowing no probe rod penetration.
- (B) The channel bottom material around Pier 2 consisted of sandy gravel with 6 inch diameter and smaller cobbles allowing negligible probe rod penetration.
- (C) All of the timber piles of the inspected substructure units were solid with light weathering allowing up to 1/8 inch awl penetration. Additionally, between 1 foot below and 1 foot above the waterline, the timber piles exhibited minor outer shell delaminations with 1/4 inch to 1/2 inch thickness.
- (D) There was an up to 2 inch wide gap in wall planking of the West Abutment backwall, located near the waterline.
- (E) Splits through the brace-to-pile fastener, up to 2 inches wide and 3 feet long, were noted on several braces of Piers 1 through 3.

RECOMMENDATIONS:

- (A) The deficient cross bracing connections should be restored/repared during routine bridge maintenance. Until corrected, monitor the cross bracing deterioration and cracking, and if found to be progressing to a more detrimental condition that would threaten the lateral stability of the bridge, corrective measures would be warranted at that time.

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

Inspection Team Leader

Ayres Associates, Inc.



Brian K. Schroeder
Registered Professional Engineer
State of Minnesota

Respectfully submitted,

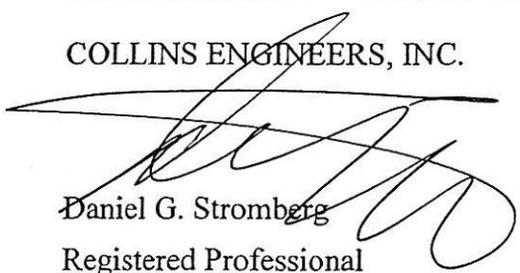
PROFESSIONAL ENGINEER

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: 75501

Feature Crossed: Pomme de Terre River

Feature Carried: County State Aid Highway 10

Location: District 4 – Stevens County

Bridge Description: The superstructure consists of four spans of timber beams supported by two timber abutments and three timber pile bent piers. The substructure units are designated as West Abutment, Piers 1 through 3 and East Abutment.

2. INSPECTION DATA

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

Dive Team: Ricardo S. Narvaez, Jason A. Cook

Date: September 24, 2012

Weather Conditions: Sunny, 60° F

Underwater Visibility: 2.0 feet

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3, East and West Abutments.

General Shape: Each pier consists of a timber cap supported by ten driven timber piles with timber cross bracing. Each abutment has bulkhead timber wall planking and is supported by nine driven timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 8.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of bent cap at the upstream end of Pier 1.
Assumed Elevation of 100.0 feet.

Water Surface: The waterline was approximately 5.9 feet below reference.
Assumed Waterline Elevation = 94.1.

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/09/12

Item 113: Scour Critical Bridges: Code I

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
216	Timber Abutment	95	LF	94	1			
228	Timber Piling	48	EA	48				
985	Slopes and Slope Protection	1	EA	1				



Photograph 1. View of the West Abutment, Looking Southwest.



Photograph 2. View of Pier 1, Looking Southwest.



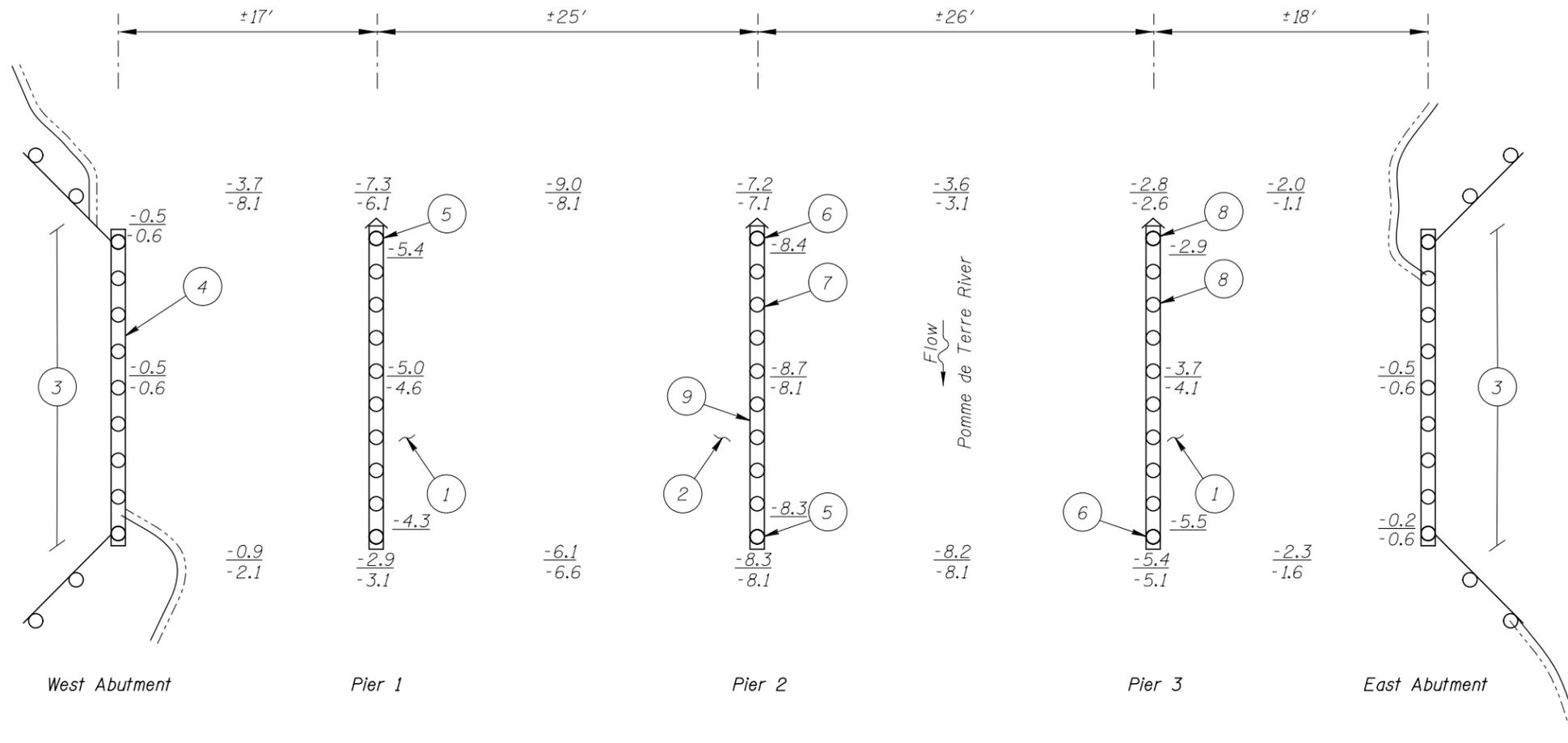
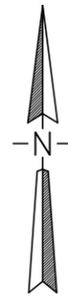
Photograph 3. View of Pier 2, Looking Southwest.



Photograph 4. View of Pier 3, Looking Southeast.



Photograph 5. View of the East Abutment, Looking Northeast.



SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material consisted of up to 3 foot diameter rocks with randomly scattered cobbles allowing no probe rod penetration.
- 2 The channel bottom material consisted of sandy gravel with 6 inch diameter and smaller cobbles allowing negligible probe rod penetration.
- 3 All of the timber piles were typically solid with only light weathering and material integrity allowing up to 1/8 inch awl penetration.
- 4 There was an up to 2 inch wide gap in the West Abutment bulkhead timber planking, located approximately 6 inches above the waterline.
- 5 Bracing split, 3 feet long and up to 1/2 inch wide, through pile fastener.
- 6 Bracing split, 1 foot long and up to 1/2 inch wide, through pile fastener.
- 7 Bracing split, 2 feet long and up to 1/4 inch wide, through pile fastener.
- 8 Bracing split, 2 feet long and up to 2 inches wide, through pile fastener.
- 9 Old abandoned timber pile was cut off at 1 foot above the waterline.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

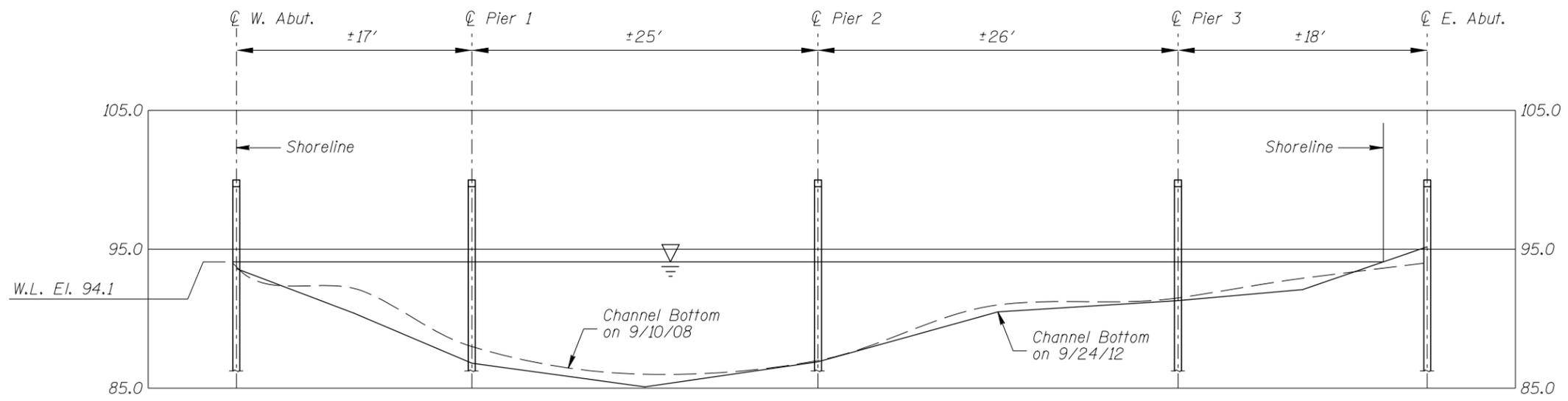
- 1 Piers 1 through 3 and the West and East Abutments were inspected underwater.
- 2 At the time of inspection on September 24, 2012, the waterline was located 5.9 feet below the top of the bent cap at the upstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 94.1.
- 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 mid point intervals between the substructure units.
- 5 All timber piles typically exhibited minor outer shell delamination, 1/4 inch to 1/2 inch in thickness, extending between 1 foot above and 1 foot below the waterline.

Legend

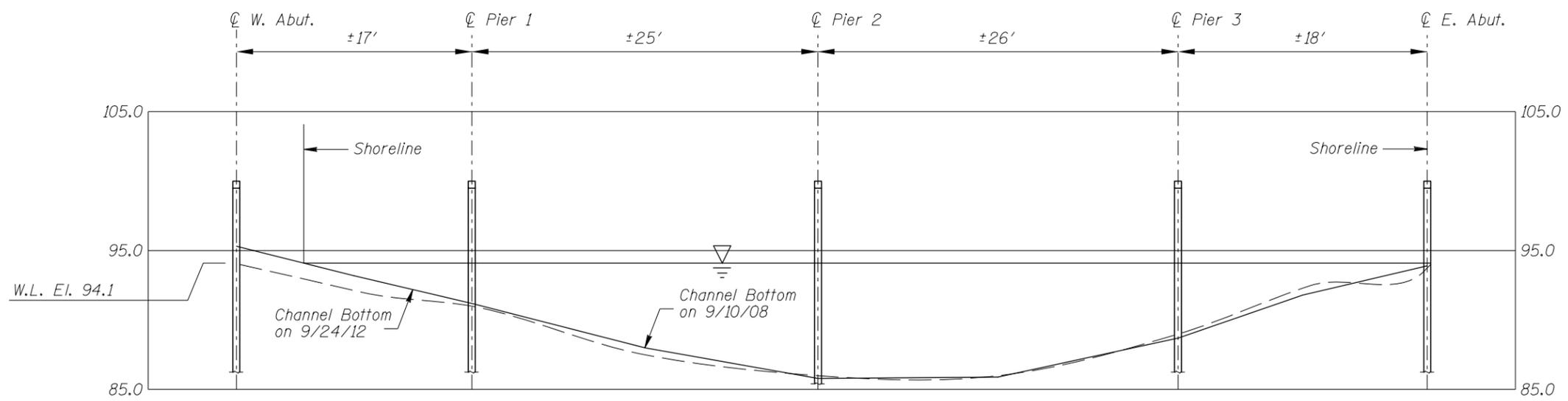
- 2.5 Sounding Depth from Waterline (9/24/12)
- 5.0 Sounding Depth from Waterline (9/10/08)
- Timber Pile

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 75501 OVER THE POMME DE TERRE RIVER DISTRICT 4, STEVENS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JAC	AVRES ASSOCIATES 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.avresassociates.com	Date: SEPT., 2012
Checked By: BKS		Scale: NTS
Code: 547375501		Figure No.: 1

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION	
STRUCTURE NO. 75501 OVER THE POMME DE TERRE RIVER DISTRICT 4, STEVENS COUNTY	
UPSTREAM AND DOWNSTREAM FASCIA PROFILES	
Drawn By: JAC	Date: SEPT., 2012
Checked By: BKS	Scale: 1"=10'
Code: 547375501	Figure No.: 2

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

INSPECTORS: Ayres Associates DATE: September 24, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 75501 WEATHER: Sunny, 60° F

WATERWAY CROSSED: Pomme de Terre River

DIVING OPERATION: _____ SCUBA SURFACE SUPPLIED AIR
_____ OTHER _____

PERSONNEL: Ricardo S. Narvaez, Jason A. Cook

EQUIPMENT: SSA, Camera, Sounding Rod, Hammer, Probe Rod

TIME IN WATER: 3:40 P.M.

TIME OUT OF WATER: 4:00 P.M.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 2.0 feet

DEPTH 8.7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 through 3, East and West Abutments

REMARKS: Overall, the substructure units inspected were found to be generally in good condition with no defects of structural significance observed. All of the timber piles were generally solid and in good condition with only light weathering allowing up to 1/8 inch awl penetration. Minor outer shell delaminations with up to 1/2 inch thickness were noted on all piles, between 1 foot above and 1 foot below the waterline. Several of the pile braces exhibited splits through the fastener, up to 2 inches wide and 3 feet long, at the pile to brace connection. Overall, the channel bottom configuration appeared to be in good and stable condition.

FURTHER ACTION NEEDED: _____ YES NO

The deficient cross bracing connections should be restored/repaired during routine bridge maintenance. Until corrected, monitor the cross bracing deterioration and cracking, and if found to be progressing to a more detrimental condition that would threaten the lateral stability of the bridge, corrective measures would be warranted at that time.

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. 75501
 INSPECTORS Ayres Associates
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
 WATERWAY CROSSED Pomme de Terre River

INSPECTION DATE September 24, 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 (BRACES)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL (UPSTREAM NOSING)	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
	West Abutment	0.5'	7	N	N	7	N	7	N	7	7	N	7	N	N	7	7	N	N
	East Abutment	0.5'	7	N	N	7	N	7	N	7	7	N	7	N	N	7	7	N	N
	Pier 1	7.3'	7	N	N	7	6	7	N	N	N	N	7	N	7	7	7	N	N
	Pier 2	8.7'	7	N	N	7	6	7	N	N	N	N	7	N	7	7	7	N	N
	Pier 3	5.5'	7	N	N	7	6	7	N	N	N	N	7	N	7	7	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the substructure units inspected were found to be generally in good condition with no defects of structural significance observed. All of the timber piles were generally solid and in good condition with only light weathering allowing up to 1/8 inch awl penetration. Minor outer shell delaminations with up to 1/2 inch thickness were noted on all piles, between 1 foot above and 1 foot below the waterline. Several of the pile braces exhibited splits through the fastener, up to 2 inches wide and 3 feet long, at the pile to brace connection. Overall, the channel bottom configuration appeared to be in good and stable condition.

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.