

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 92453
CSAH NO. 15
OVER THE
SOUTH BRANCH OF THE BUFFALO RIVER
DISTRICT 4 - CLAY COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 53)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 92453, the North Abutment and Piers 1 and 2, were found to be in good to satisfactory condition. The timber piles exhibited some minor vertical checking up to 1/8 inch wide. Piers 1 and 2 also exhibited some missing and/or broken timber bracing. The gaps between the timber planking along the abutments and wingwalls, noted in the previous inspection, have been repaired with metal striping. The channel bottom appeared stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The timber piles at the North Abutment and Piers 1 and 2 exhibited random vertical checking with a typical width of 1/16 inch and a maximum width of 1/8 inch.
- (B) The gaps between the timber planking along the backwall and wingwalls of both abutments, noted in the previous inspection, have been repaired with metal bands to halt backfill loss.
- (C) The diagonal timber brace at Pier 1 was attached only at the upstream pile and no longer contributing to the lateral stability of the structure, while the diagonal timber bracing at Pier 2 was completely missing.
- (D) The horizontal timber brace directly below the pier cap was broken and no longer engaged at the upstream pile of Pier 2.

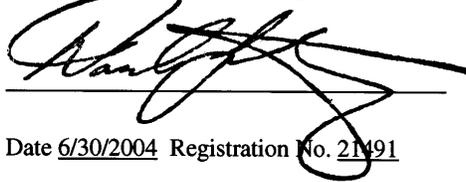
RECOMMENDATIONS:

- (A) Repair missing and/or broken timber bracing at Piers 1 and 2 to reestablish the lateral stability of the structures.

- (B) 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

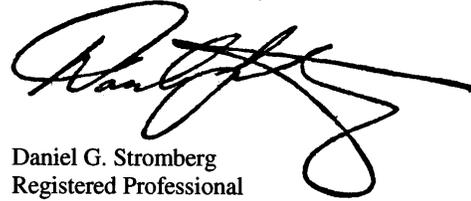


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2004 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: 92453

Feature Crossed: The South Branch of the Buffalo River

Feature Carried: CSAH No. 15

Location: District 4 - Clay County

Bridge Description: The superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two piers and two abutments consisting of concrete caps supported by seven timber piles. The abutments also have two timber piles along each skewed wingwall. The piers are numbered 1 and 2 starting from the north end of the bridge. No design plans were available for this bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: October 29, 2002

Weather Conditions: Rain, " 35EF

Underwater Visibility: " 1.5 Feet

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2, and North Abutment.

General Shape: Each pier and abutment consists of a concrete cap supported by seven timber piles. The piles of the piers were originally interconnected by horizontal and diagonal timber bracing. The abutments have adjacent skewed wingwalls which consist of two timber piles under a timber cap. The abutment breastwalls and wingwalls are constructed of horizontal planking behind the piles.

Maximum Water Depth at Substructure Inspected: Approximately 3.5 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the west end of Pier 1.

Water Surface: The waterline was approximately 8.0 feet below reference.
Assumed Waterline Elevation = 92.0.

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

Item 60: Substructure: Code 5

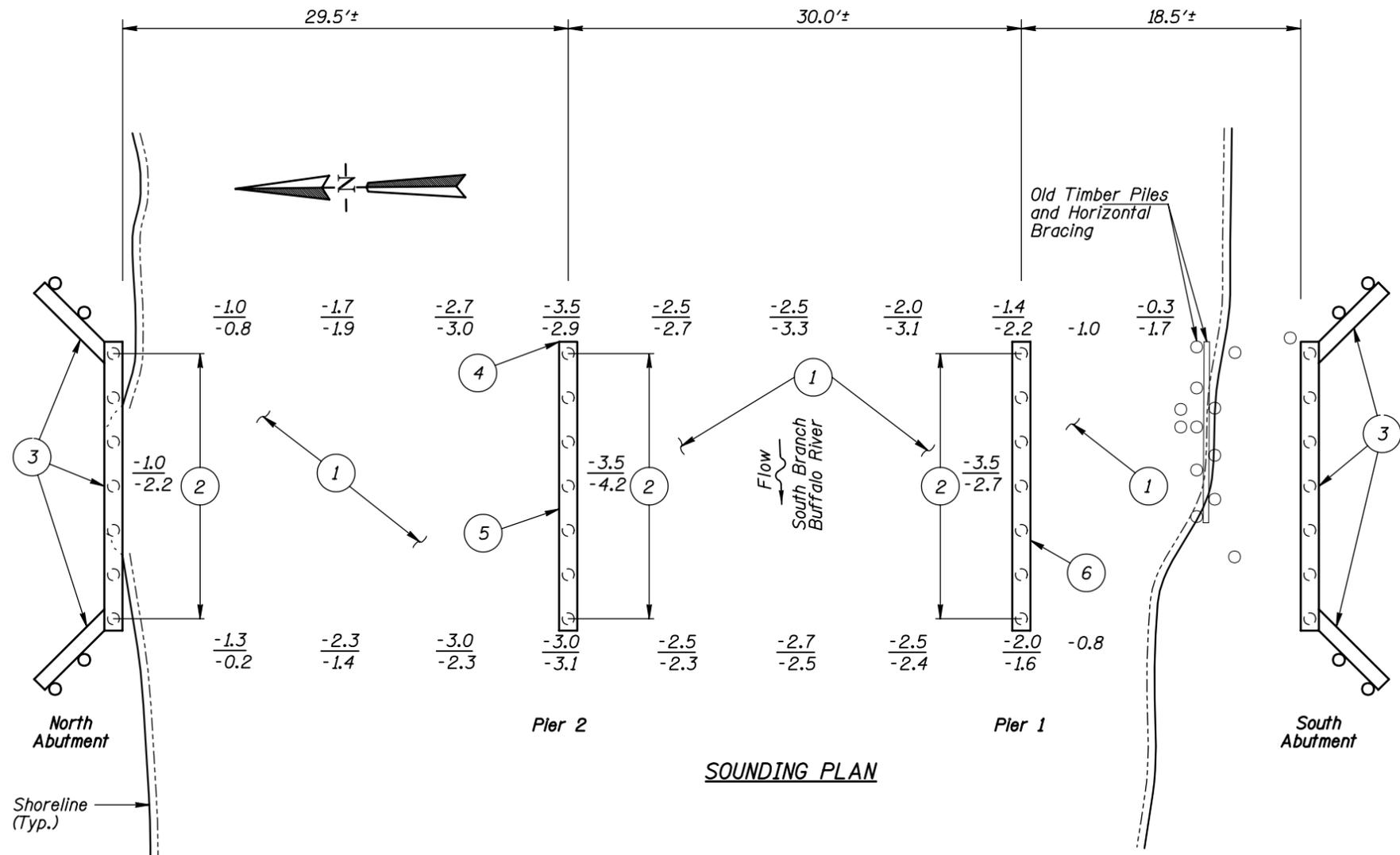
Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/10/02

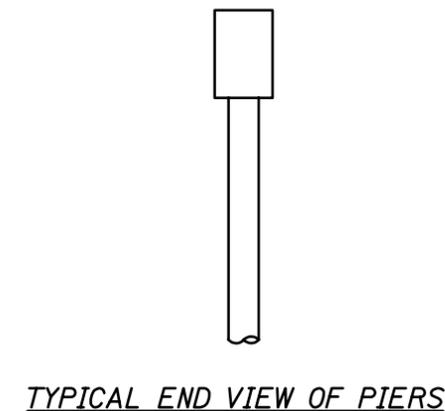
Item 113: Scour Critical Bridges: Code I/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. The North Abutment, and Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 29, 2002, the waterline was located approximately 8.0 feet below the top of the pier cap at the downstream 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 92.0.
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.

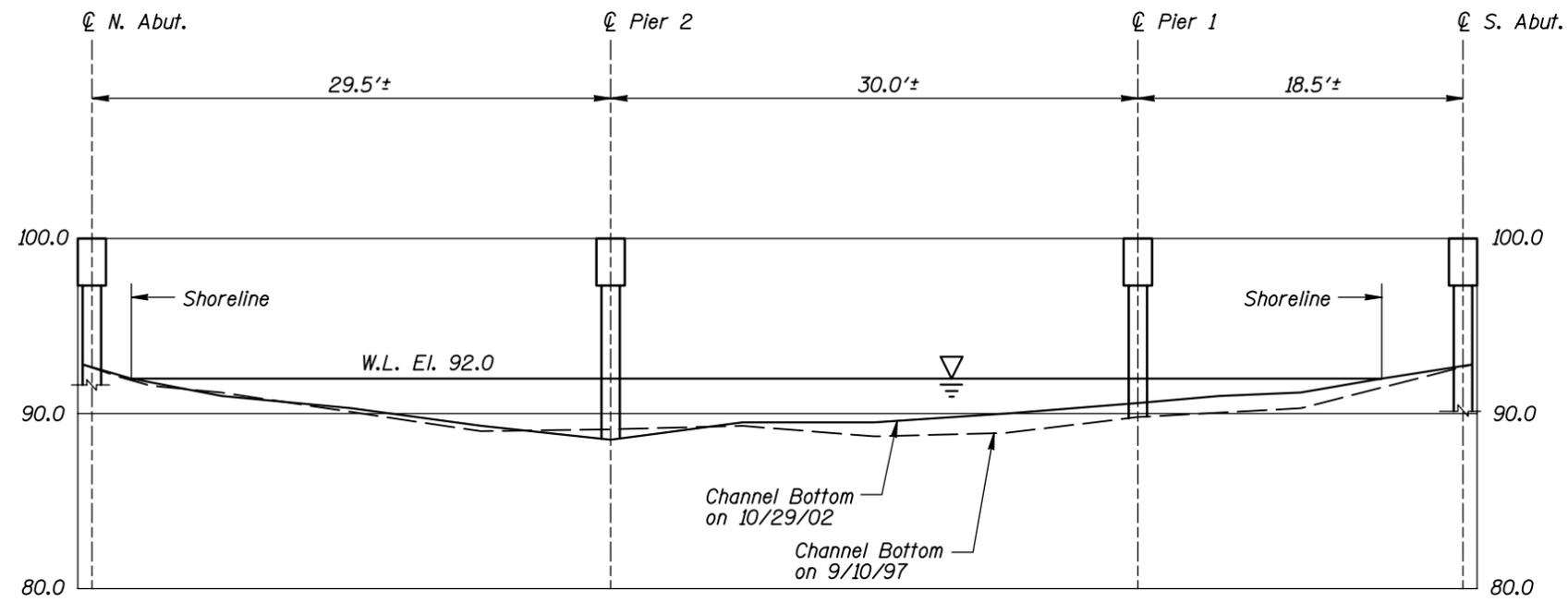
INSPECTION NOTES:

- 1 The channel bottom consisted of firm, silty clay with up to 2 inches of probe rod penetration.
- 2 The timber piles exhibited vertical checking with a typical width of 1/16 and a maximum width of 1/8 inch.
- 3 The gaps between the timber planking along the backwall and wingwalls have been repaired with metal bands to halt backfill loss.
- 4 The horizontal timber brace directly below the pier cap was broken and no longer engaged at the upstream pile at Pier 2.
- 5 The diagonal timber bracing at Pier 2 was completely missing.
- 6 The diagonal timber brace at Pier 1 was attached only at the upstream pile and no longer contributed to the lateral stability of the structure.

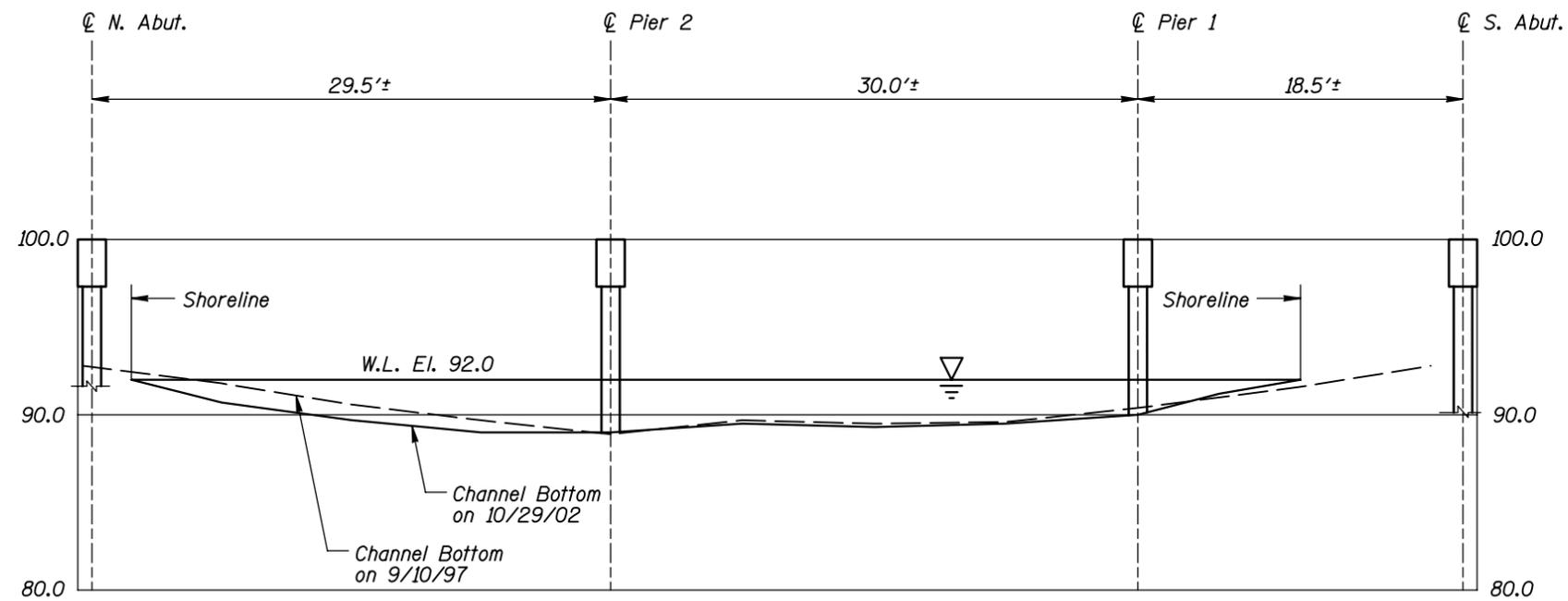
Legend

- 2.0 Sounding Depth from Waterline (10/29/02)
- 5.2 Sounding Depth from Waterline (9/10/97)
- Timber Pile
- Timber Pile (under cap)
- Old Timber Pile

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 92453 OVER SOUTH BRANCH OF THE BUFFALO RIVER DISTRICT 4, CLAY COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I20053		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. 92453 OVER SOUTH BRANCH OF THE BUFFALO RIVER DISTRICT 4, CLAY COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: OCT. 2002
Checked By: MDK		Scale: 1"=10'
Code: 35I20053		Figure No.: 2



Photograph 1. View of Overall Structure, Looking West.



Photograph 2 View of Pier 1, Looking Northeast.



Photograph 3. View of Pier 2, Looking Southwest.



Photograph 4. View of North Abutment, Looking Northwest.

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

INSPECTORS: Collins Engineers, Inc. DATE: October 29, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 92453 WEATHER: Rain, " 35EF
WATERWAY CROSSED: The South Branch of the Buffalo River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 9:10 P.M.
TIME OUT OF WATER: 9:25 P.M.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY " 1.5 feet
DEPTH 3.5 feet maximum at Piers 1 and 2

ELEMENTS INSPECTED: North Abutment and Piers 1 and 2

REMARKS: The timber piers and abutments were in good to satisfactory condition. The timber piles exhibited some random minor vertical checking up to 1/8 inch wide. The diagonal timber brace at Pier 1 was attached only at the upstream pile and no longer contributing to the lateral stability of the structure, while the diagonal timber bracing at Pier 2 was completely missing. The gaps between the timber planking along the abutments and wingwalls, noted in the previous inspection, have been repaired with metal striping to halt backfill loss. The channel bottom appeared stable with no evidence of significant scour or appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: X YES NO

Repair missing and/or broken timber bracing at Piers 1 and 2 to reestablish the lateral stability of the structures.

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. 92453
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The South Branch of the Buffalo River

INSPECTION DATE October 29, 2002
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
	North Abutment	1.0'	7	7	N	9	N	7	8	8	7	N	8	N	N	7	7	7	N
	Pier 1	3.5'	7	N	N	9	5	5	8	N	N	N	8	N	N	7	7	N	N
	Pier 2	3.5'	7	N	N	9	5	5	8	N	N	N	8	N	N	7	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: The timber piers and abutments were in good to satisfactory condition. The timber piles exhibited some random minor vertical checking up to 1/8 inch wide. The diagonal timber brace at Pier 1 was attached only at the upstream pile and no longer contributing to the lateral stability of the structure, while the diagonal timber bracing at Pier 2 was completely missing. The gaps between the timber planking along the abutments and wingwalls, noted in the previous inspection, have been repaired with metal striping to halt backfill loss. The channel bottom appeared stable with no evidence of significant scour or appreciable changes since 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.