

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 57504

CSAH NO. 31

OVER THE

THIEF RIVER

DISTRICT 2 - PENNINGTON COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 38)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 57504, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. Timber debris was observed at both piers, with heavy accumulations extending from the upstream end of Pier 1 to the south shoreline. The channel bottom around the substructure units appeared to be in stable condition with no evidence of significant scour and no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A heavy accumulation of timber debris was observed at the upstream end of Pier 1 extending to the midpoint of the south side of Pier 1. The timber debris also extended to the south shoreline, and overall, extended from the channel bottom to 5 feet above the waterline. A light to moderate accumulation of timber debris was observed at the upstream end of Pier 2 extending from the channel bottom to 4.5 feet below the waterline. Scattered timber debris was also observed along the channel sides of both piers.
- (B) Overall, the concrete piers were in good condition with no significant defects observed.

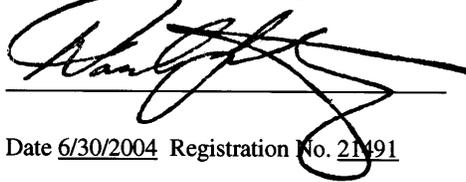
RECOMMENDATIONS:

- (A) Remove accumulations of timber debris at both piers and from within the channel to alleviate further accumulation, scour influence, and any excessive lateral force on the piers.

- (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.

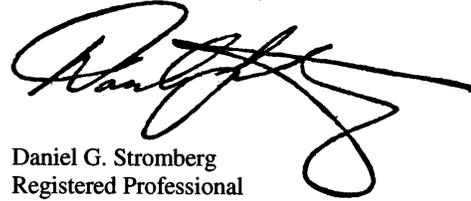
Daniel G. Stromberg

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: 57504

Feature Crossed: The Thief River

Feature Carried: CSAH No. 31

Location: District 2 - Pennington County

Bridge Description: The bridge superstructure consists of three spans of multiple precast concrete quad-tees supporting a concrete deck. The superstructure is supported by two reinforced concrete abutments and two concrete piers. The piers are comprised of steel H-pile bents encased in concrete. The piers are numbered starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg  
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matt J. Lengyel

Date: August 27, 2002

Weather Conditions: Sunny, " 75EF

Underwater Visibility: " 2 Feet

Waterway Velocity: " 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of a rectangular slender concrete shaft and a rectangular pier cap, both with rounded ends. The concrete shaft encases a single row of eight steel H-piles, and runs from the cap into the channel bottom.

Maximum Water Depth at Substructure Inspected: Approximately 11.0 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 10.1 feet below reference.

Waterline Elevation = 1114.7.

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

Item 60: Substructure: Code 7

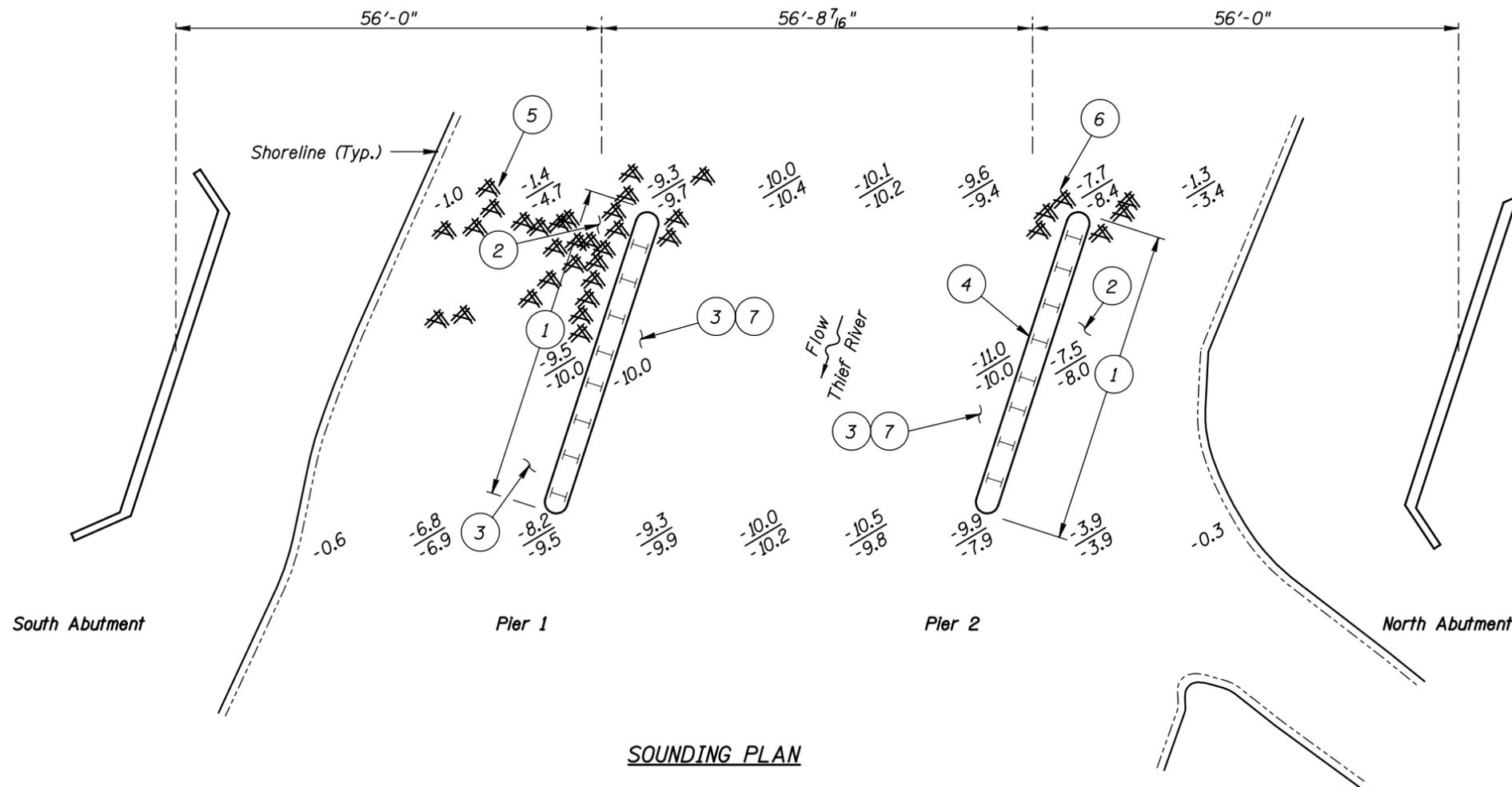
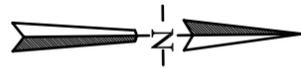
Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/08/02

Item 113: Scour Critical Bridges: Code J/93

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

\_\_\_\_\_ Yes  X  No



**SOUNDING PLAN**

**TYPICAL END VIEW OF PIERS**

**Legend**

- 6.0 Sounding Depth from Waterline (8/27/02)
- 6.5 Sounding Depth from Waterline (9/6/97)
- H Steel H-Pile
- Timber Debris

**GENERAL NOTES:**

1. Piers 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 27, 2002, the waterline was located approximately 10.1 feet below the top of the cap at the downstream end of Pier 1. This corresponds with a waterline elevation of 1114.7 based on previous report dated September 6, 1997.
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:**

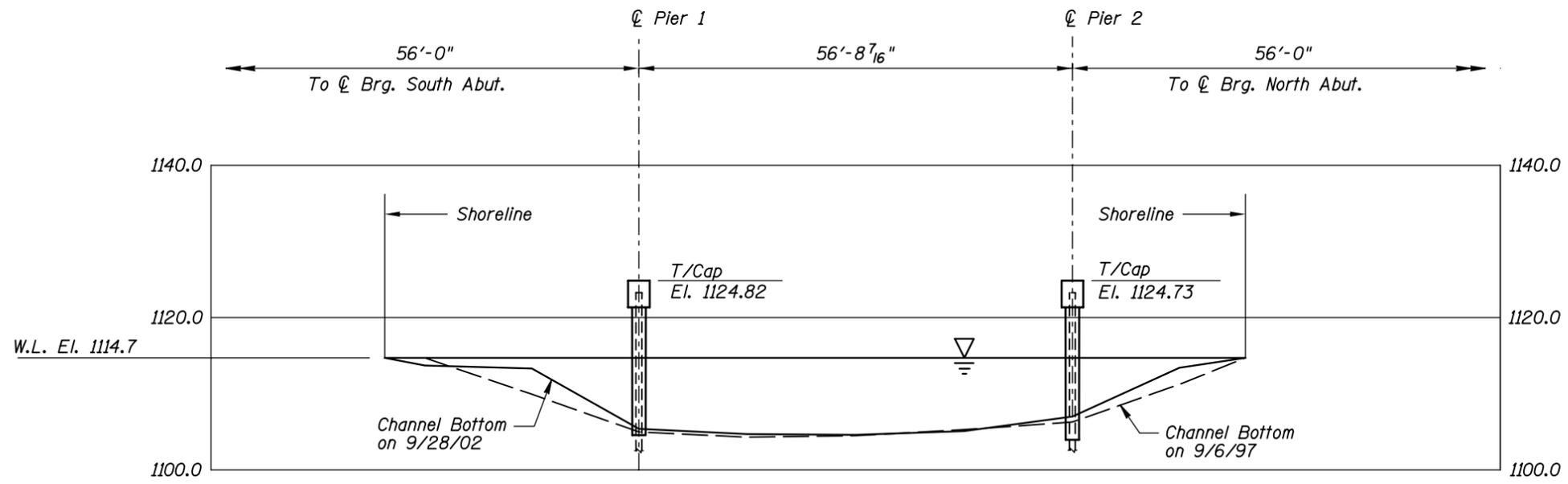
- 1 Overall, the concrete piers were in good condition with no scaling or defects of structural significance observed.
- 2 The channel bottom consisted of soft silty sand infilling with up to 1.5 foot of probe rod penetrations.
- 3 The channel bottom consisted of 1 to 6 inches of soft silt over firm gravel, cobbles and scattered riprap.
- 4 Vertical timber planking was observed along the middle portion of the south side of Pier 2 extending 6 inches above the channel bottom.
- 5 A heavy accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed at the upstream end of Pier 1, extending to the midpoint of the south side of Pier 1, to the south shoreline, and from the channel bottom to 5 feet above the waterline.
- 6 A light to moderate accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed at the upstream end of Pier 2 extending from the channel bottom to 4.5 feet below the waterline.
- 7 Scattered timber debris, which included timbers up to 6 inches in diameter, was observed along the channel sides of the piers.

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

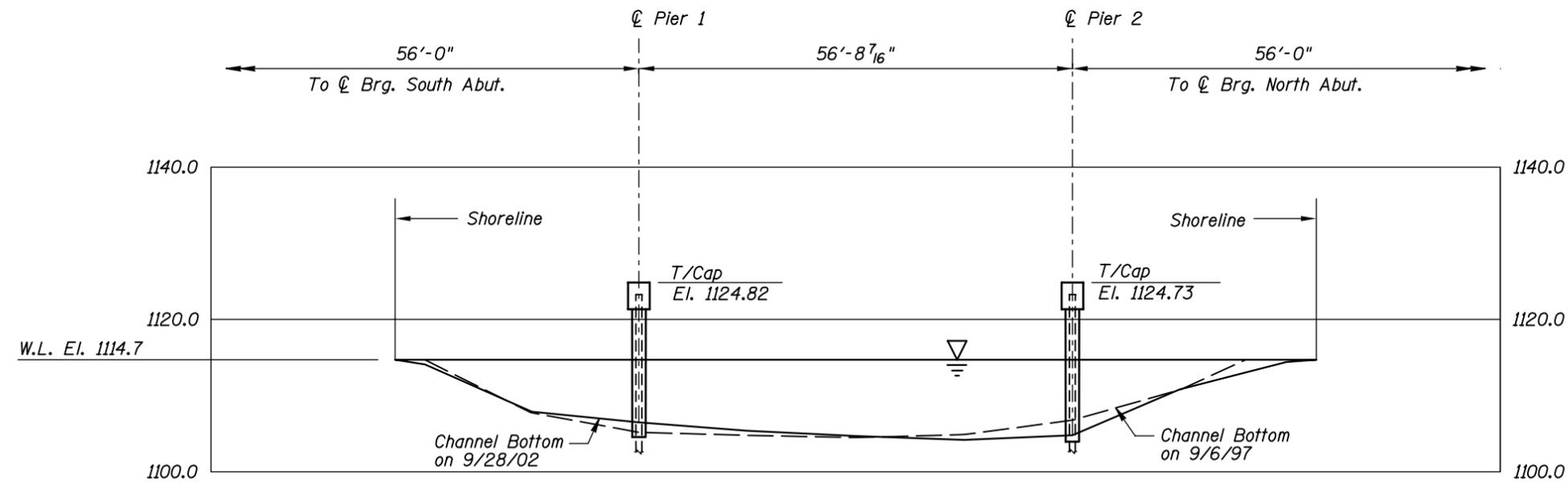
STRUCTURE NO. 57504  
OVER THE THIEF RIVER  
DISTRICT 2, PENNINGTON COUNTY

**INSPECTION AND SOUNDING PLAN**

Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120038		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 57504 OVER THE THIEF RIVER DISTRICT 2, PENNINGTON COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=20'
Code: 35I20038		Figure No.: 2



Photograph 1. Overall View of Structure, Looking Northwest.



Photograph 2. View of Pier 1, Looking Northeast.



Photograph 3. View of Pier 2, Looking Northwest.



Photograph 4. View Timber Debris at Pier 1, Looking West.

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

INSPECTORS: Collins Engineers, Inc.

DATE: August 27, 2002

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

BRIDGE NO: 57504

WEATHER: Partly Cloudy, " 75E F

WATERWAY CROSSED: The Thief River

DIVING OPERATION:   X           SCUBA           SURFACE SUPPLIED AIR  
  OTHER

PERSONNEL: Michelle D. Koerbel, Matt J. Lengyel

EQUIPMENT: Scuba, U/W Light, Probe Rod, Lead Line, Sounding Pole, Scraper, Camera

TIME IN WATER: 11:45 a.m.

TIME OUT OF WATER: 12:10 p.m.

WATERWAY DATA: VELOCITY " 1.0 f.p.s.

VISIBILITY " 2 Feet

DEPTH 11.0 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were in good condition with no defects of structural significance observed. A heavy accumulation of timber debris was observed at the upstream end and along the south side of Pier 1 and extended to the south shoreline. A light to moderate accumulation of timber debris was observed at the upstream end of Pier 2. The channel bottom appeared stable with no evidence of significant scour.

FURTHER ACTION NEEDED:      X   YES              NO

Remove accumulations of timber debris at both piers and from within the channel to alleviate further accumulation, scour influence, and any excessive lateral force on the piers.

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. 57504  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491  
WATERWAY CROSSED The Thief River

INSPECTION DATE August 27, 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	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	10.0'	N	7	N	9	N	7	8	N	8	5	5	7	N	N	N	7	N
	Pier 2	11.0'	N	7	N	9	N	7	8	N	8	6	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were in good condition with no defects of structural significance observed. A heavy accumulation of timber debris was observed at the upstream end and along the south side of Pier 1 and extended to the south shoreline. A light to moderate accumulation of timber debris was observed at the upstream end of Pier 2. The channel bottom 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.