

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 57504

CSAH NO. 31

OVER THE

THIEF RIVER

DISTRICT 2 - PENNINGTON COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (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. 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 light accumulation of timber debris consisting of 6-inch-diameter or smaller branches was observed around the entire pier shaft from the channel bottom up 2 feet and extending up to 3 feet off of Pier 1 noses and faces.
- (B) Similar accumulation of timber debris was observed from the upstream quarter point on the north face around the upstream nose to the upstream quarter point on the south face of Pier 2. The debris extended from the channel bottom up 4 feet and up to 2 feet off of the pier faces and 6 feet off of the pier nose.
- (B) Overall, the concrete piers were in good condition with no significant defects observed.

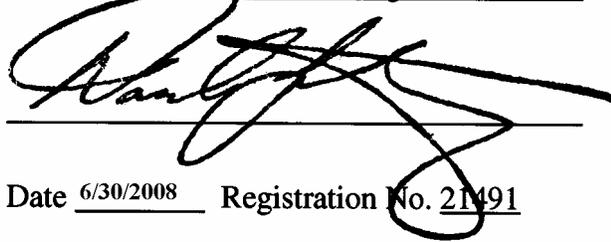
RECOMMENDATIONS:

- (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 'Daniel G. Stromberg', is written over a 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.

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: Bradley A. Syler, P.E., S.E.

Dive Team: John Loftus, Valerie Rouston

Date: August 18, 2007

Weather Conditions: Sunny, 69 °F

Underwater Visibility: 2 Feet

Waterway Velocity: 0.5 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 9.6 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 10.3 feet below reference.

Waterline Elevation = 1114.5.

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/08/07

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



Photograph 1. Overall View of Structure, Looking Southeast.



Photograph 2. View of Pier 1, Looking Southeast.



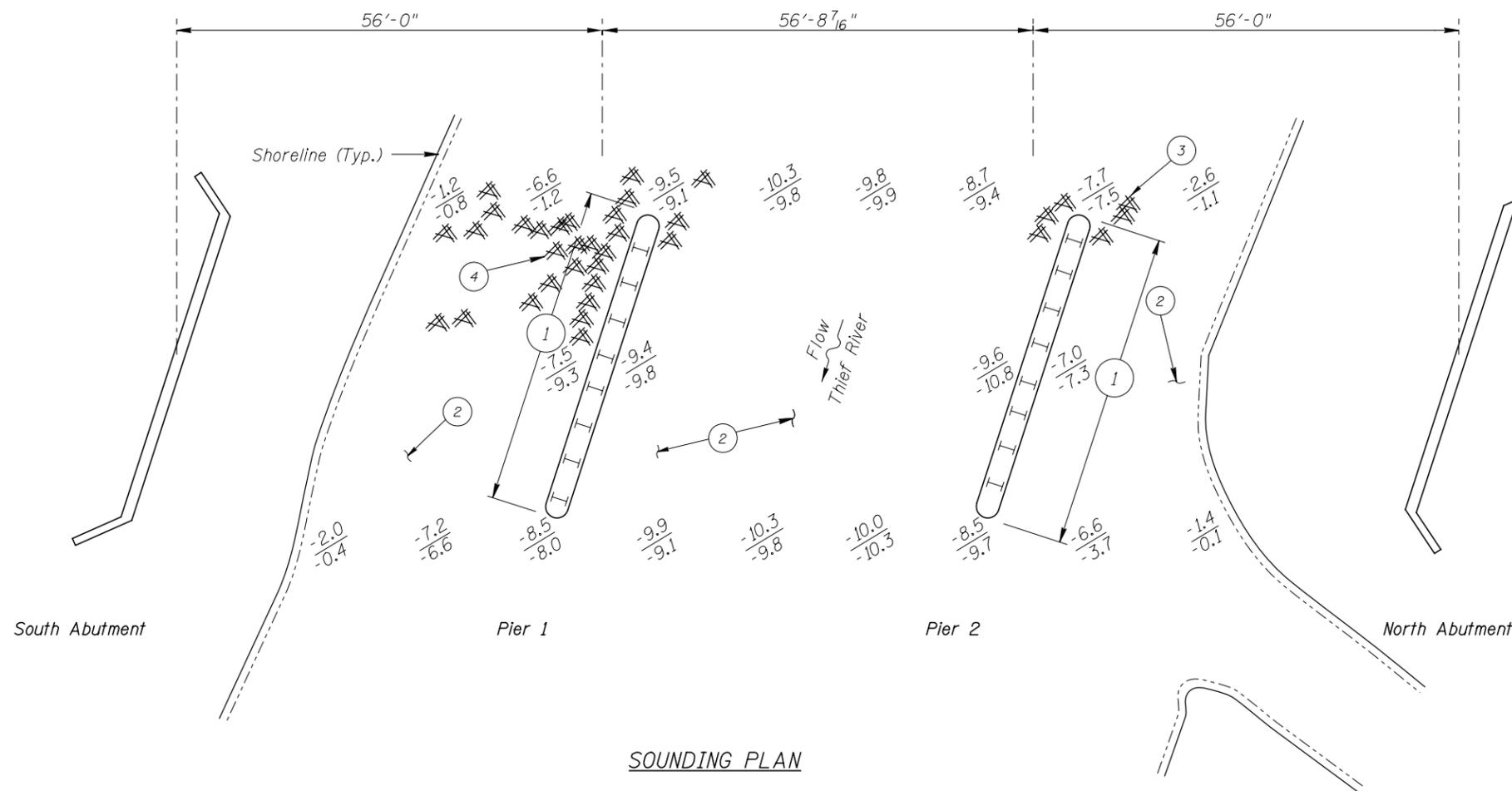
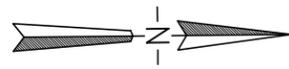
Photograph 3. View of Pier 2, Looking South.



Photograph 4. View of South Abutment, Looking Southeast.



Photograph 5. View of North Abutment, Looking Northwest.



GENERAL NOTES:

1. Piers 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 18, 2007, the waterline was located approximately 10.3 feet below the top of the cap at the downstream end of Pier 1. This corresponds with a waterline elevation of 1114.5 based on previous report dated August 27, 2002.
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 of piers was smooth and sound. Minor areas of impact damage were observed on the upstream nose of Pier 1 from the waterline to 4 feet above waterline with up to 1/2 inch penetration.
- 2 The channel bottom around the entire perimeter of Pier 1 and 2 consisted of 1 to 6 inches of soft silt over firm gravel, cobbles and scattered riprap.
- 3 A light accumulation of timber debris consisting of 6 inch in diameter or smaller branches was observed around the entire Pier 1 shaft from channel bottom up 2 feet and up to 3 feet off the pier faces and noses.
- 4 A light accumulation of timber debris consisting of 12 inches in diameter or smaller logs and branches was observed from the upstream 1/4 point on north face around the upstream nose to the upstream 1/4 point on the south face of Pier 2. The debris extended from channel bottom up 4 feet and up to 2 feet off pier faces and 6 feet off pier nose.

South Abutment

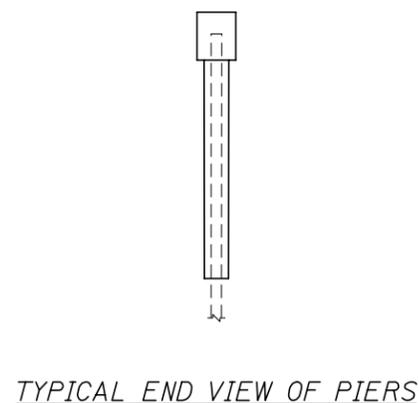
Pier 1

Pier 2

North Abutment

Flow
Thief River

Shoreline (Typ.)



Legend

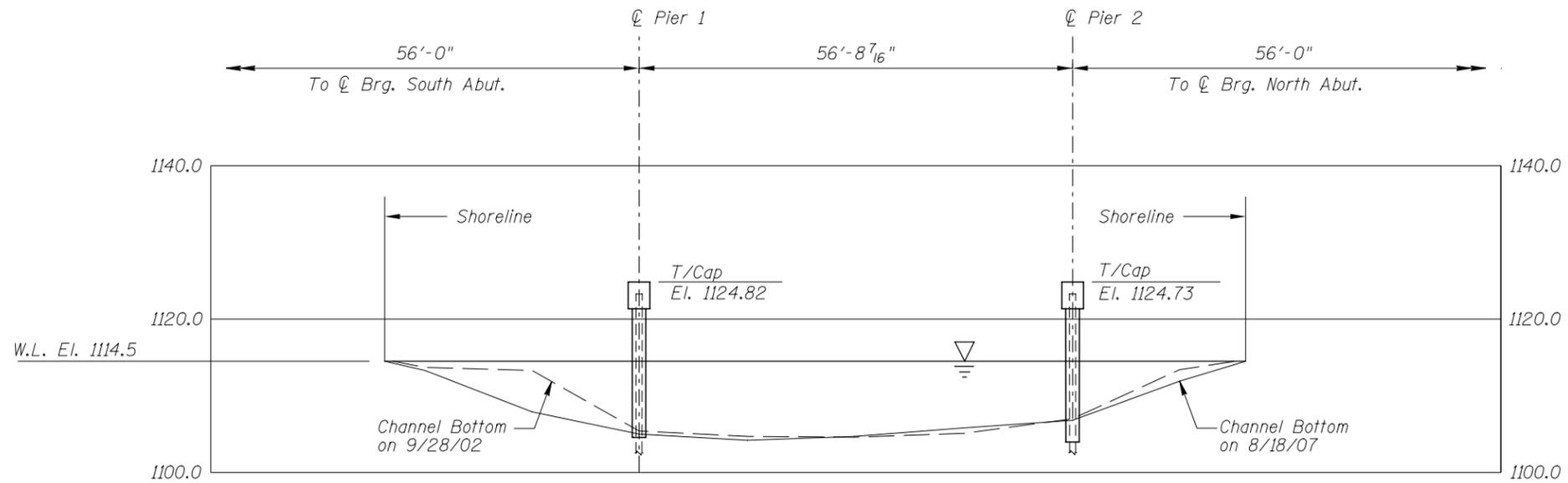
- 6.0 Sounding Depth from Waterline (8/18/07)
- 6.5 Sounding Depth from Waterline (8/27/02)
- H Steel H-Pile
- Timber Debris

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

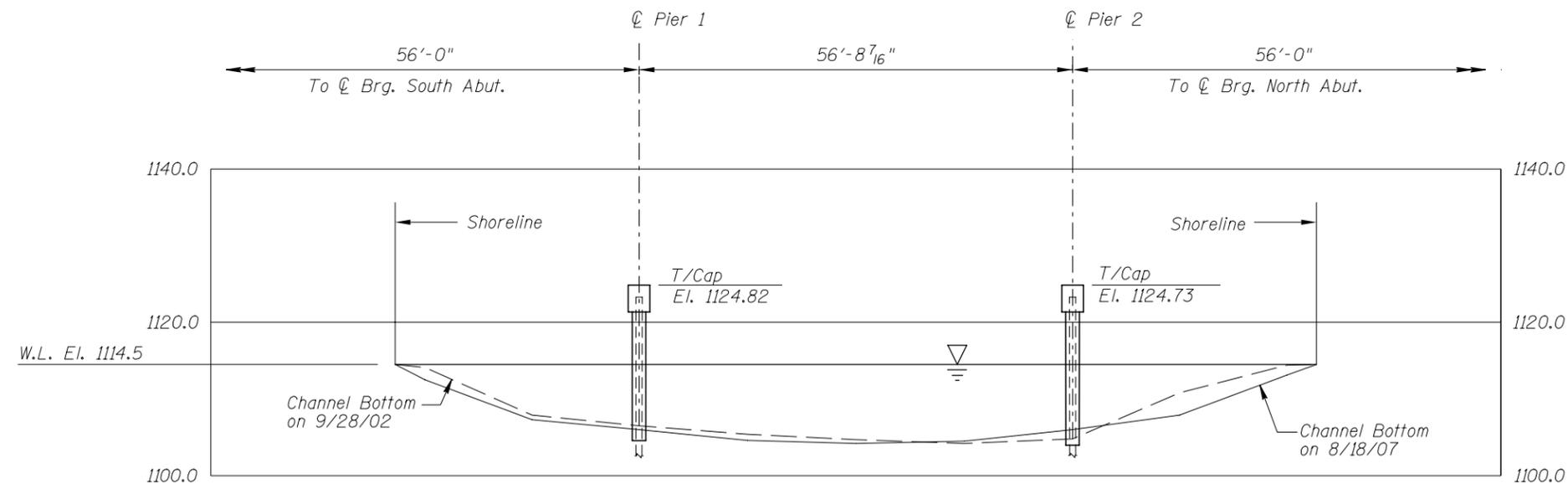
STRUCTURE NO. 57504
OVER THE THIEF RIVER
DISTRICT 2, PENNINGTON COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS	Date: AUG. 2007
Checked By: MDK	<small>133 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 52210038		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. 57504 OVER THE THIEF RIVER DISTRICT 2, PENNINGTON 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: AUG. 2007
Checked By: MDK		Scale: 1"=20'
Code: 52210038		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 18, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 57504 WEATHER: Sunny, 69 °F

WATERWAY CROSSED: The Thief River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John Loftus, Valerie Roustan

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

TIME IN WATER: 2:15 P.M.

TIME OUT OF WATER: 2:45 P.M.

WATERWAY DATA: VELOCITY 0.5 f.p.s.

VISIBILITY 2 Feet

DEPTH 9.6 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 light accumulation of timber debris consisting of 6-inch-diameter and smaller branches was observed around the entire Pier 1 shaft from the channel bottom up 2 feet and up to 3 feet off of the pier perimeters. A light accumulation of timber debris consisting of 12-inch-diameter or smaller logs and branches was observed from the upstream quarter point on the North face around the upstream nose to the upstream quarter point on the South face of Pier 2. The debris extended from the channel bottom up 4 feet and 2 to 6 feet off of the pier perimeter. The channel bottom appeared stable with no evidence of significant scour.

FURTHER ACTION NEEDED: 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., S.E.
 WATERWAY CROSSED The Thief River

INSPECTION DATE August 18, 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	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	9.5'	N	7	N	9	N	7	8	7	7	8	7	7	N	N	N	N	N
	Pier 2	9.6'	N	7	N	9	N	7	8	7	7	8	7	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 light accumulation of timber debris consisting of 6-inch-diameter and smaller branches was observed around the entire Pier 1 shaft from the channel bottom up 2 feet and up to 3 feet off of the pier perimeters. A light accumulation of timber debris consisting of 12-inch-diameter or smaller logs and branches was observed from the upstream quarter point on the North face around the upstream nose to the upstream quarter point on the South face of Pier 2. The debris extended from the channel bottom up 4 feet and 2 to 6 feet off of the pier perimeter. 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.