

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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AUGUST 16, 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. 57504, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. A light accumulation of 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 twigs and small branches was observed at the upstream half of the south face from the channel bottom up 1 foot and extending up to 3 feet off of Pier 1 noses and faces.
- (B) Similar accumulation of timber debris was observed around Pier 2. The debris extended from the channel bottom up 1 foot and up to 2 feet off of the pier faces and noses.
- (C) Overall, the concrete piers were in good condition with no significant defects observed.

RECOMMENDATIONS:

- (A) 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,

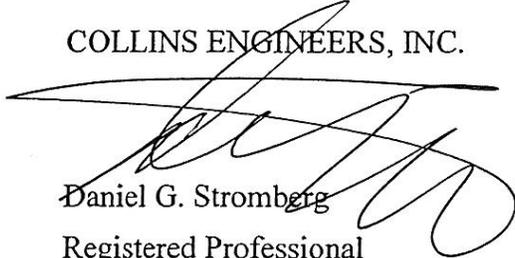
PROFESSIONAL ENGINEER

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: 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: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, James A. Hitchman

Date: August 16, 2012

Weather Conditions: Sunny, 63 °F

Underwater Visibility: 2 Feet

Waterway Velocity: 0.5 ft/sec

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 round 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 10.0 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 10.3 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/08/12

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
205	Reinforced Concrete Column	2	EA	2				
985	Slopes	1	EA	1				



Photograph 1. Overall View of Structure, Looking West.



Photograph 2. View of Pier 1, Looking Northwest.



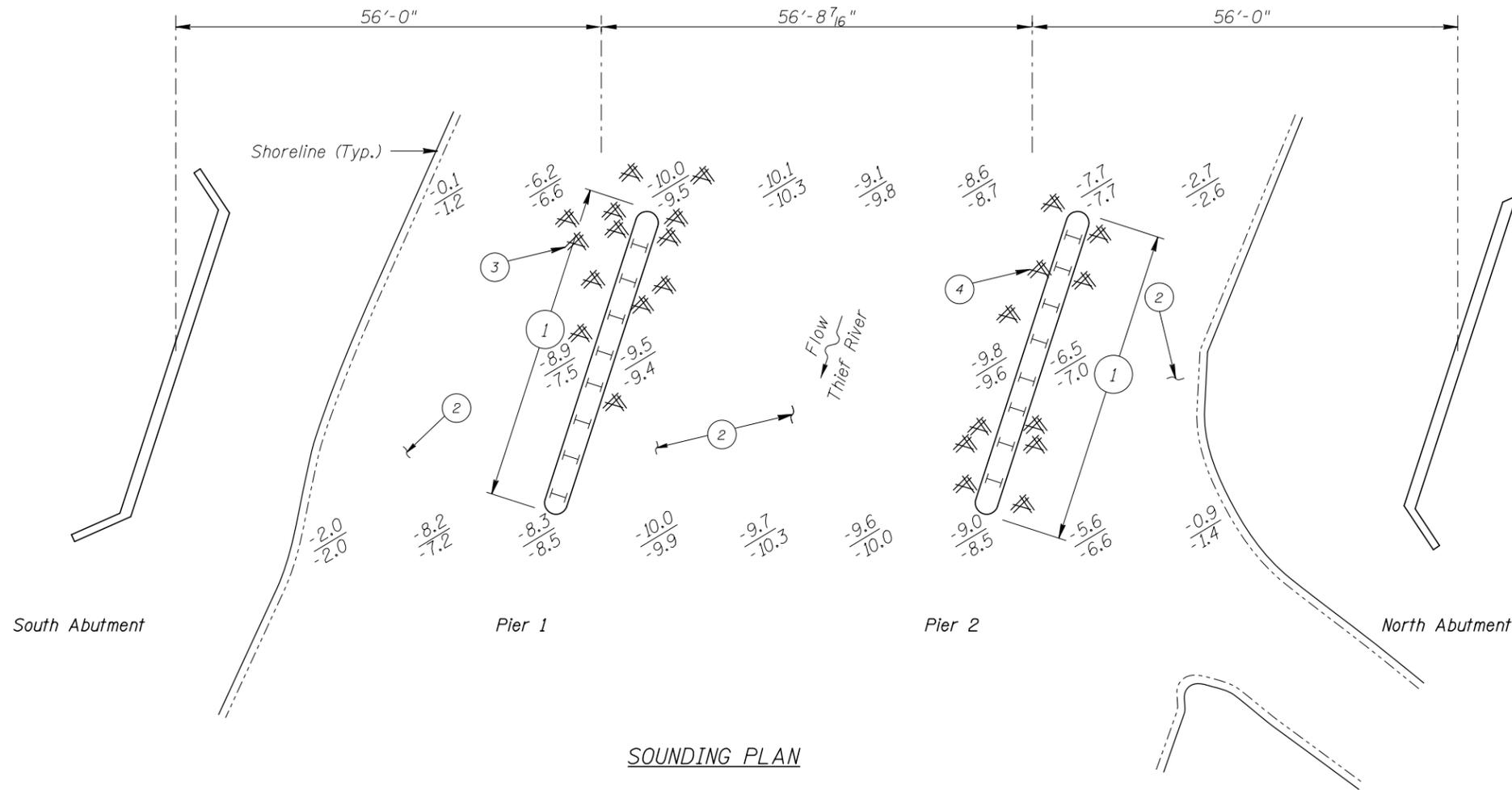
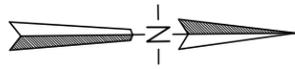
Photograph 3. View of Pier 2, Looking Northwest.



Photograph 4. View of South Abutment, Looking South.



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 16, 2012, 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 114.5 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 twigs and small branches was observed around at the upstream half of the south face from the channel bottom up 1 foot and extending up to 3 feet off Pier 1 noses and faces.
- ④ A light accumulation of timber debris consisting of twigs and small branches was observed around Pier 2 extending from the channel bottom up 1 foot and up to 2 feet off the pier faces and noses.

**Legend**

- 6.0 Sounding Depth from Waterline (8/16/12)
- 6.5 Sounding Depth from Waterline (8/18/07)
- 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**

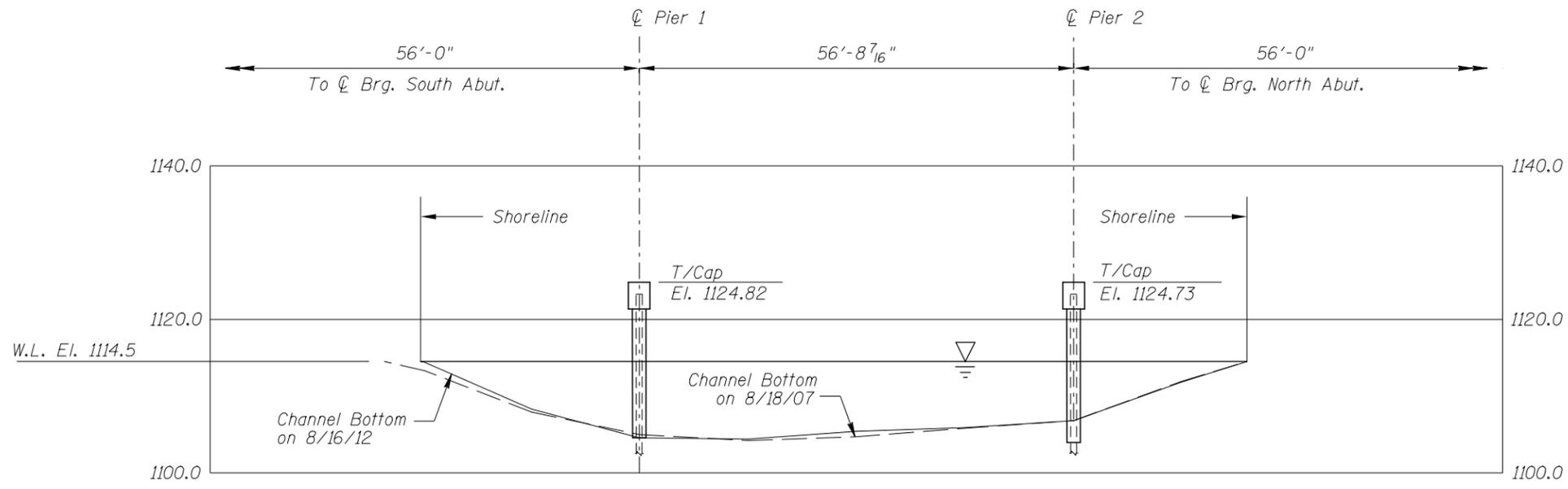
**TYPICAL END VIEW OF PIERS**

**COLLINS ENGINEERS**  
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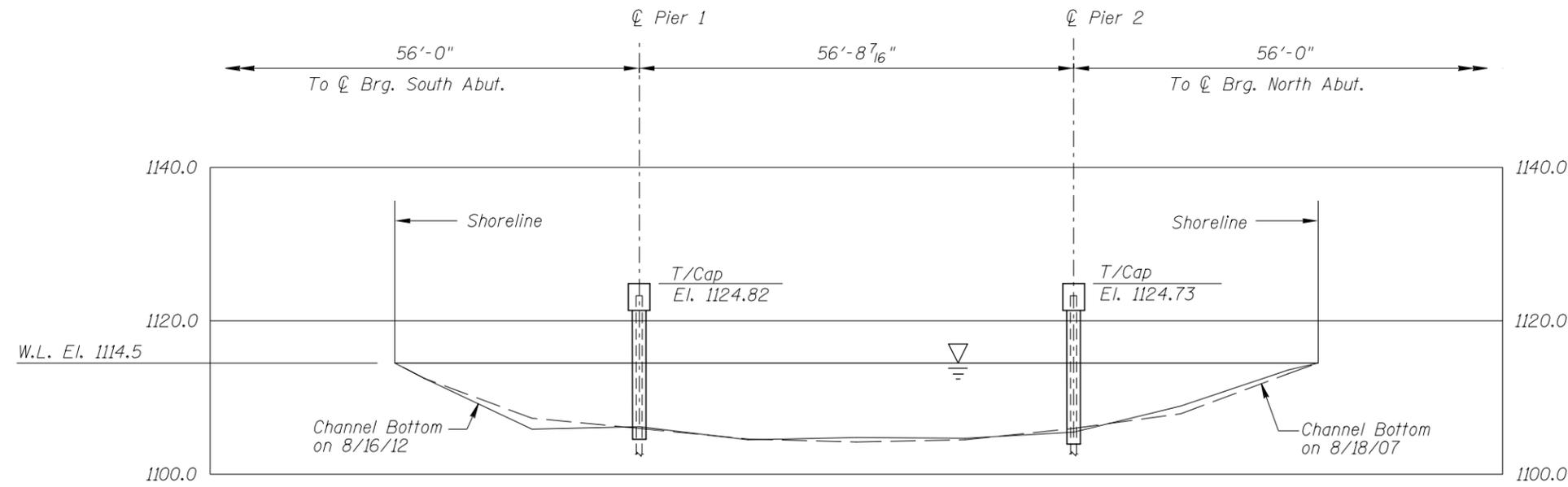
Drawn By: JAC  
Checked By: BKS  
Code: 52210038

**AVRES ASSOCIATES**  
3433 Oakwood Hills Parkway  
Eau Claire, WI 54701  
www.AyresAssociates.com

Date: AUG. 2012  
Scale: NTS  
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: JAC	Date: AUG, 2012
Checked By: BKS	Scale: 1"=20'
Code: 52210038	Figure No.: 2

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

INSPECTORS: Ayres Associates DATE: August 16, 2012

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

BRIDGE NO: 57504 WEATHER: Sunny, 63 °F

WATERWAY CROSSED: The Thief River

DIVING OPERATION: \_\_\_\_\_ SCUBA  SURFACE SUPPLIED AIR  
\_\_\_\_\_ OTHER \_\_\_\_\_

PERSONNEL: Jason A. Cook, James A. Hitchman

EQUIPMENT: SSA, U/W Light, Sounding Pole, Hammer, Camera

TIME IN WATER: 2:50 P.M.

TIME OUT OF WATER: 3:10 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 2 Feet

DEPTH 10.0 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: A light accumulation of timber debris consisting of twigs and small branches was observed at the upstream half of the south face from the channel bottom up 1 foot and extending up to 3 feet off of Pier 1 noses and faces. Similar accumulation of timber debris was observed around Pier 2. The debris extended from the channel bottom up 1 foot and up to 2 feet off of the pier faces and noses. Overall, the concrete piers were in good condition with no significant defects observed.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES  NO

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. 57504  
 INSPECTORS Ayres Associates  
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.  
 WATERWAY CROSSED The Thief River

INSPECTION DATE August 16, 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	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	N	7	7	7	7	7	N	N	N	N	N
	Pier 2	9.8'	N	7	N	9	N	7	N	7	7	7	7	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: A light accumulation of timber debris consisting of twigs and small branches was observed at the upstream half of the south face from the channel bottom up 1 foot and extending up to 3 feet off of Pier 1 noses and faces. Similar accumulation of timber debris was observed around Pier 2. The debris extended from the channel bottom up 1 foot and up to 2 feet off of the pier faces and noses. Overall, the concrete piers were in good condition with no significant defects observed.

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.