

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 5767

CR NO. 1

OVER THE

RED RIVER OF THE NORTH

DISTRICT 2 - POLK COUNTY, CITY OF NIELSVILLE



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 5765, Pier 1, was in good condition with no defects of structural significance observed. The channel bottom appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) Moderate to heavy timber debris consisting of logs and branches 3 feet diameter and smaller was observed at the south (upstream) end and along the entire east face of Pier 1. The debris extended from the channel bottom up 3 feet and 6 feet off the upstream nose towards the east.
- (B) Light scaling was observed at the waterline along the entire perimeter of the pier with 1/8 inch maximum penetration.
- (C) A scour depression 1 foot deep by 4 feet in radius was observed at the upstream column of Pier 1 underneath the debris.
- (D) Vertical cracks up to 1/8 inch wide were located on both faces of Pier 1 extending from the strut to the channel bottom at the midpoint of the pier.

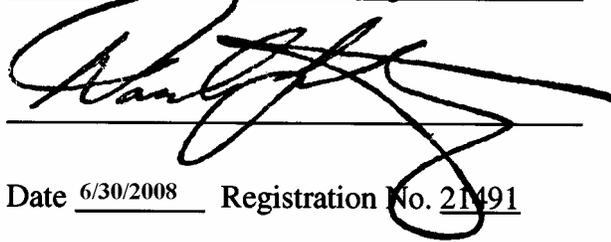
RECOMMENDATIONS:

- (A) Monitor the timber debris accumulation, and if found to be increasing in the future, removal operations may become warranted.

- (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

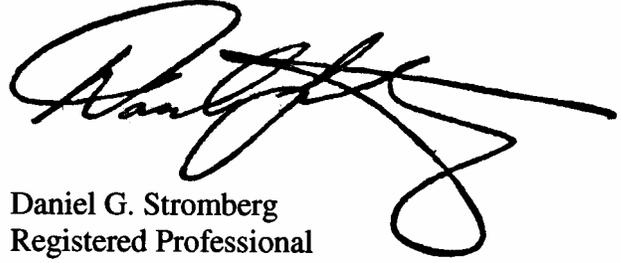


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 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: 5767

Feature Crossed: Red River of the North

Feature Carried: CR No. 1

Location: District 2 - Polk County, City of Nielsville

Bridge Description: The superstructure consists of two steel through truss spans. The superstructure is supported by two reinforced concrete abutments and one reinforced concrete pier. The abutments are supported by treated timber piles. The pier is supported by untreated timber piles. The substructure units are designated West Abutment, Pier 1, and East Abutment.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Denis Redzic, Valerie Roustan

Date: September 18, 2007

Weather Conditions: Cloudy, 58°F

Underwater Visibility: None/Negligible

Waterway Velocity: 1 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1.

General Shape: The pier consists of a reinforced concrete cap supported by two multi-sided columns connected by a slender diaphragm wall braced with an integral horizontal strut. The pier is founded on a rectangular footing supported by timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 6.0 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 34.3 feet below reference.

Waterline Elevation = 65.7.

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

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/07

Item 113: Scour Critical Bridges: Code F/07

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

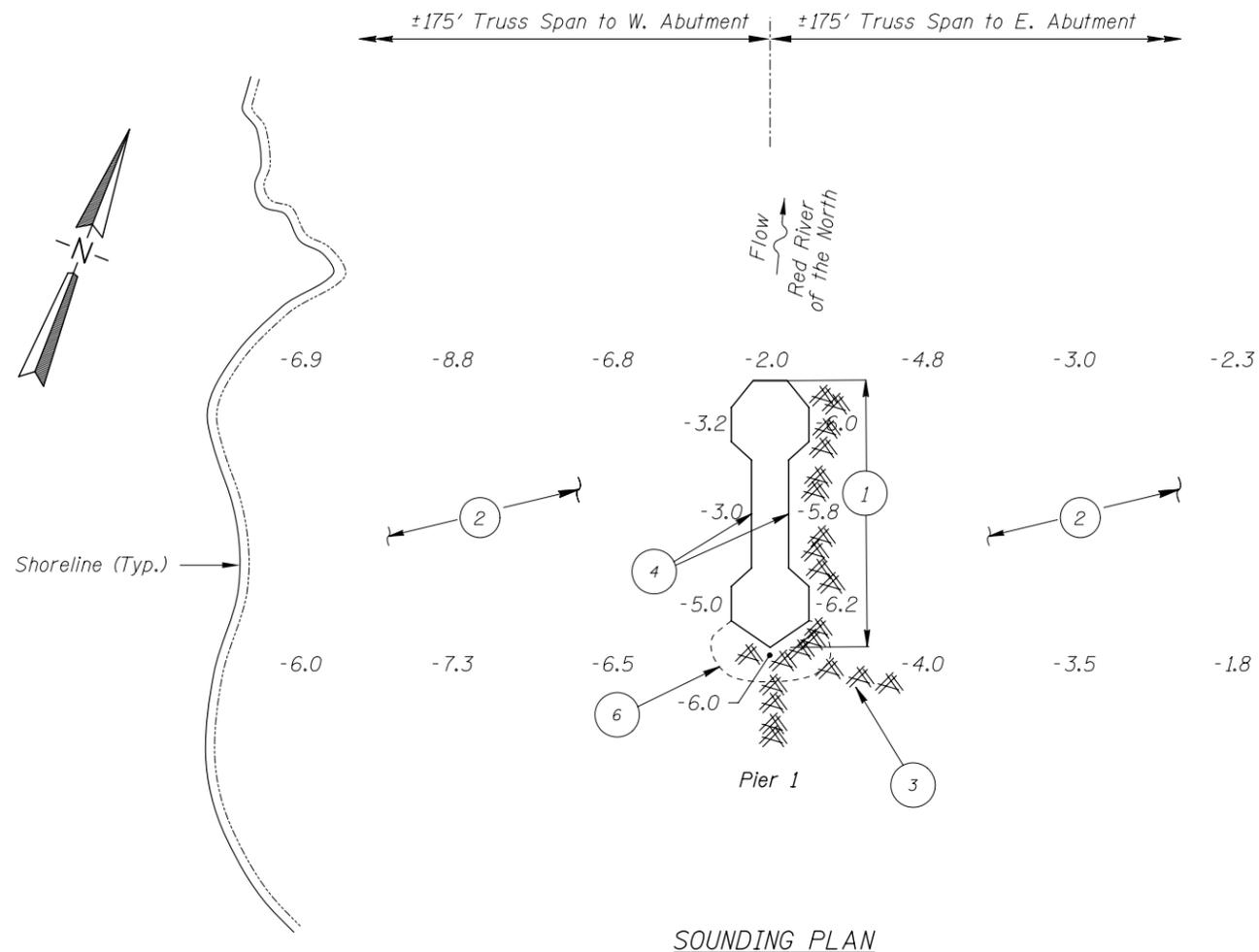
 Yes X No



Photograph 1. View of the Pier 1, Looking East.



Photograph 2. View of Pier 1, Looking Northwest.

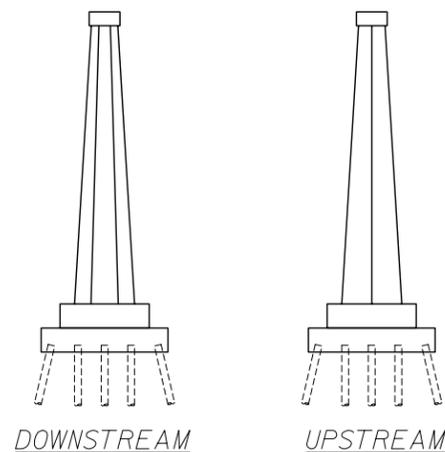


GENERAL NOTES:

1. Pier 1 was inspected underwater.
2. At the time of inspection on September 18, 2007, the waterline was located approximately 34.3 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 65.7.
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 the truss panel points between the substructure units.

GENERAL NOTES:

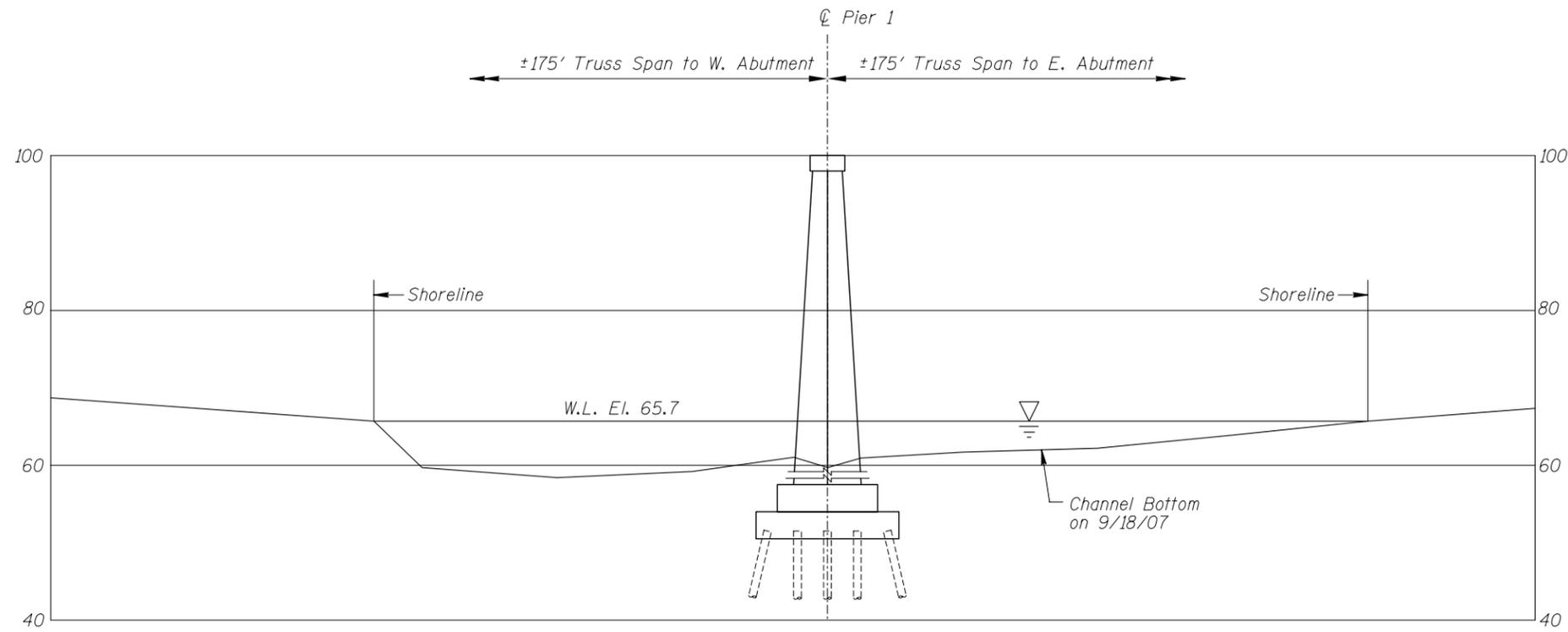
- ① Overall, concrete was smooth and sound with no significant defects.
- ② The channel bottom consisted of sandy silt.
- ③ Timber debris consisting of logs and branches 3 feet in diameter and smaller was observed at the south end of Pier 1. The debris extended from channel bottom up 3 feet 6 feet off the upstream nose towards east. On east face, debris extended above water from upstream nose to midpoint, and from midpoint to downstream nose, it was present from waterline to channel bottom.
- ④ Vertical crack up to 1/8 inch wide was located on both faces of Pier 1 at midpoint extending from strut to channel bottom.
- ⑤ Light scaling was observed at waterline along the entire perimeter of Pier 1 with 1/8 inch of maximum penetration.
- ⑥ A scour depression 1 foot deep by 4 foot radius was observed at upstream column of Pier 1 underneath the debris.



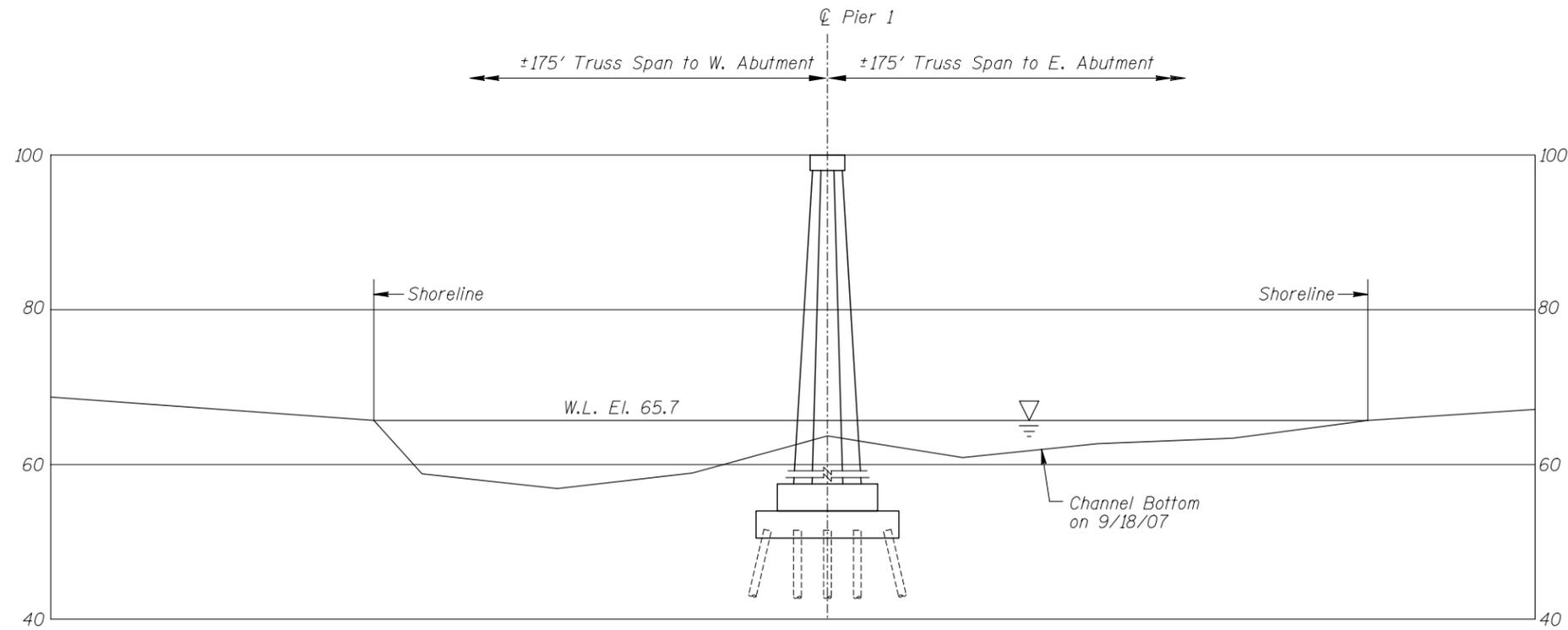
TYPICAL END VIEWS OF PIER

- Legend**
- 5.0 Sounding Depth (9/18/07)
 - XXXXX Timber Debris
 - Scour Depression

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 5767 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF NIELSVILLE		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEPT., 2007
Checked By: MDK		Scale: NTS
Code: 52215767		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 5767 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF NIELSVILLE		
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: SEPT., 2007
Checked By: MDK		Scale: NTS, (U.N.O.)
Code: 52215767		Figure No.: 2

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

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

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

BRIDGE NO: 5767 WEATHER: Cloudy, 58°F

WATERWAY CROSSED: Red River of the North

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Denis Redzic, Valerie Roustan

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

TIME IN WATER: 4:00 p.m.

TIME OUT OF WATER: 4:30 p.m.

WATERWAY DATA: VELOCITY 1 f.p.s

VISIBILITY Negligible/None

DEPTH 6.0 feet maximum at Pier 1.

ELEMENTS INSPECTED: Pier 1

REMARKS: Overall, the concrete was smooth and sound. Moderate to heavy timber debris consisting of logs and branches 3 feet diameter and smaller was observed at the south end and around the entire east face of Pier 1. Light scaling was observed at the waterline along the entire perimeter of the pier. A scour depression 1 foot deep by 4 feet in radius was observed at the upstream column of Pier 1 underneath the debris. Vertical cracks 1/8 inch wide were located on both faces of Pier 1 from the strut to the channel bottom at midpoint of pier wall.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.

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. 5767
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Red River of the North

INSPECTION DATE September 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	6.0'	N	8	N	9	N	8	8	7	N	6	6	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

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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.