

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 69624

CSAH 29

OVER THE

ST LOUIS RIVER

ST. LOUIS COUNTY

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JULY 25, 2012

PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY  
COLLINS ENGINEERS, INC.

AND  
WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected below water at Bridge No. 69624, Piers 1 and 2, were in good condition with no defects of structural significance. The channel bottom appeared stable and well established.

INSPECTION FINDINGS:

- (A) Concrete along the pier faces was generally smooth and sound.
- (B) The channel bottom consisted of sand and random riprap, 2 feet in diameter and smaller, allowing 6 inches of probe rod penetration.
- (C) Each footing was exposed, with the top of footing level with the waterline, and up to 5.7 feet of vertical exposure around all sides.

RECOMMENDATIONS:

- (A) Monitor footing exposure at both piers during future inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

WSB and Associates



Barritt Lovelace  
Registered Professional Engineer  
Bridge Safety Inspection Team Leader

Respectfully submitted,

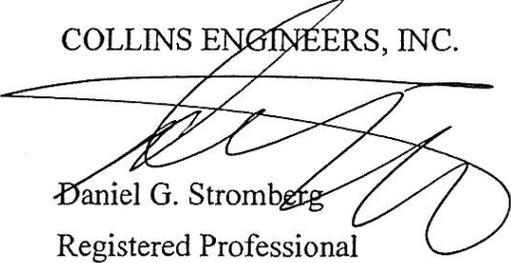
PROFESSIONAL ENGINEER

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: 69624

Feature Crossed: St Louis River

Feature Carried: CSAH 29

Location: St. Louis County

Bridge Description: The superstructure consists of three spans of precast beams supporting a reinforced concrete deck. The bridge is supported by two reinforced concrete abutments and two reinforced concrete piers.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E (WSB)

Dive Team: Kasey Yoder (WSB), John Loftus (Collins)

Date: July 25, 2012

Weather Conditions: Cloudy, 75° F

Underwater Visibility: 2.0 foot

Waterway Velocity: 2.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Each pier consisted of a hammerhead pier cap supported by an oblong concrete pier wall. At the time of inspection, no plans were available for this structure, therefore the substructure configuration is unknown.

Maximum Water Depth at Substructure Inspected: Approximately 5.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the upstream end of Pier 2.

Water Surface: The waterline was approximately 21.3 feet below reference.  
Waterline Elevation = 1233.91.

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 6

Item 92B: Underwater Inspection: Code B/07/12

Item 113: Scour Critical Bridges: N/02

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:

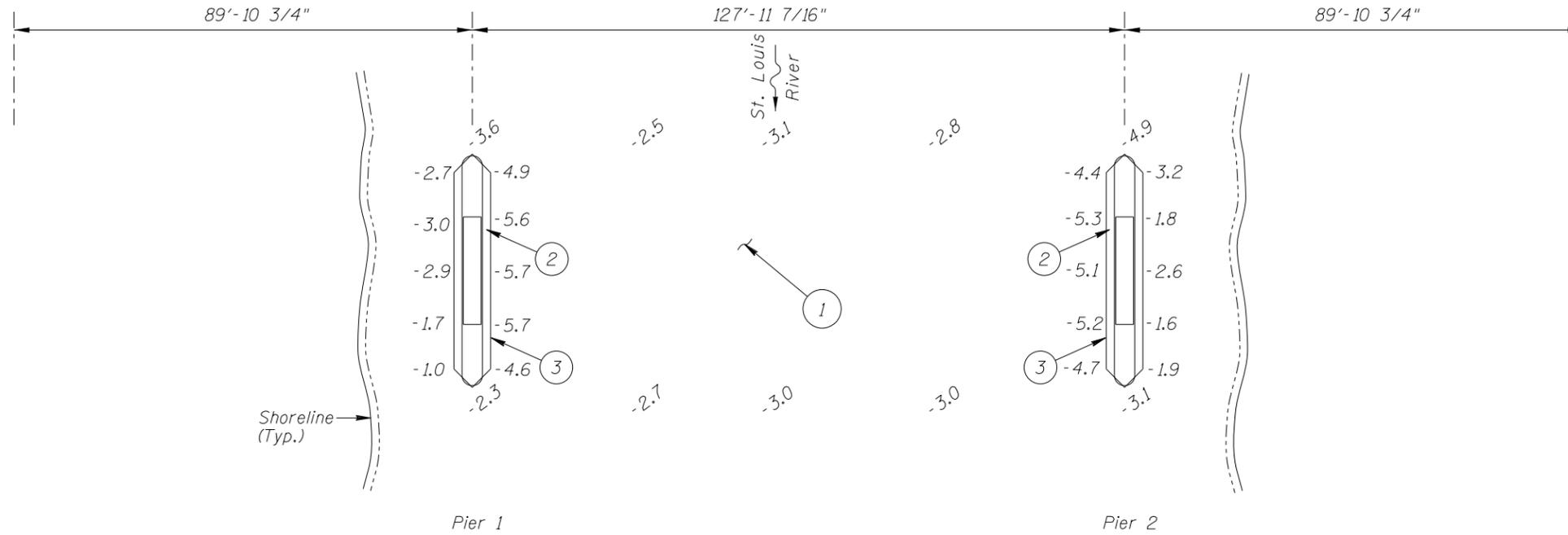
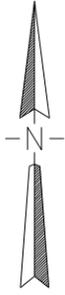
| Item # | Element Description | Quantity | Unit | Conditions |   |   |   |   |
|--------|---------------------|----------|------|------------|---|---|---|---|
|        |                     |          |      | 1          | 2 | 3 | 4 | 5 |
| 210    | Concrete Pier Wall  | 20       | LF   | 20         |   |   |   |   |
| 985    | Slopes              | 1        | EA   | 1          |   |   |   |   |



Photograph 1. View of Pier 1, Looking West.



Photograph 2. View of Pier 2, Looking West.



SOUNDING PLAN

Legend  
 -1.2 Sounding Depth from Waterline (7/25/12)

Note:  
 All soundings are based on 2012 waterline location.

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on July 25, 2012, the waterline was located approximately 21.3 feet below the top of the pier cap at the upstream end of Pier 2. This corresponds with a waterline elevation of 1233.91 feet based on bridge design plans dated July, 8, 1999.
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 sand with random pieces of riprap 24 inch diameter and smaller, allowing up to 6 inches of probe rod penetration.
- ② Concrete surfaces were typically smooth and sound
- ③ The footing was partially exposed with up to 5.7 feet of vertical exposure.

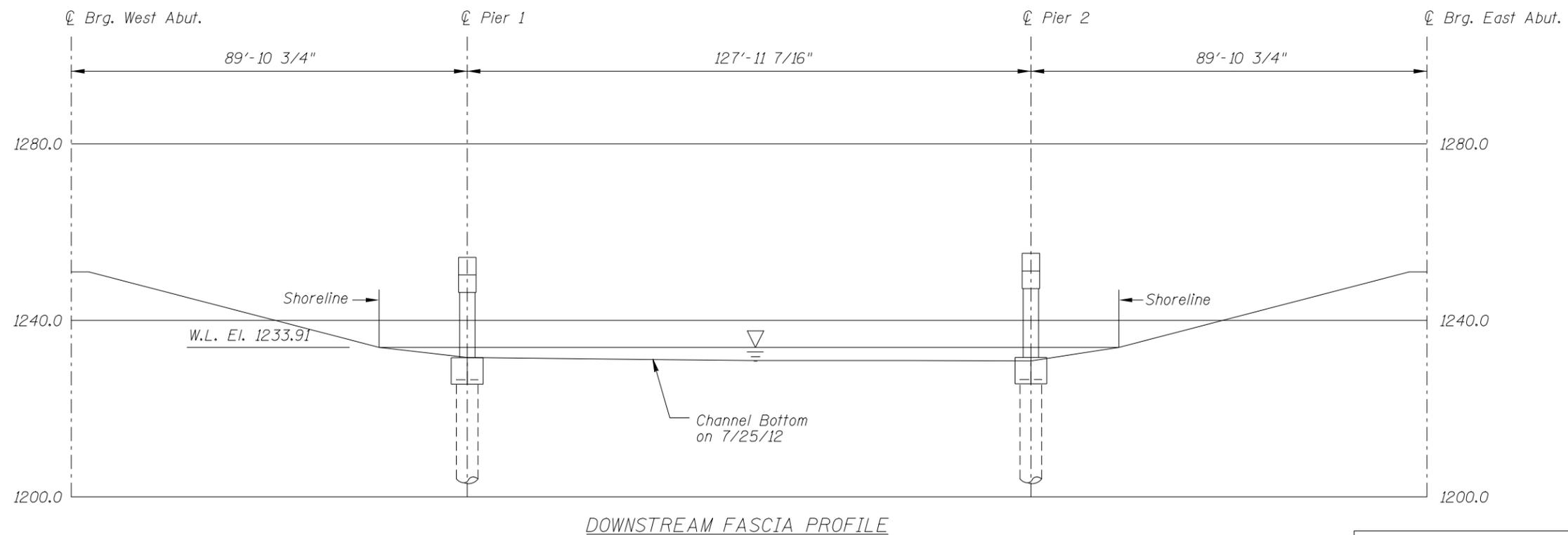
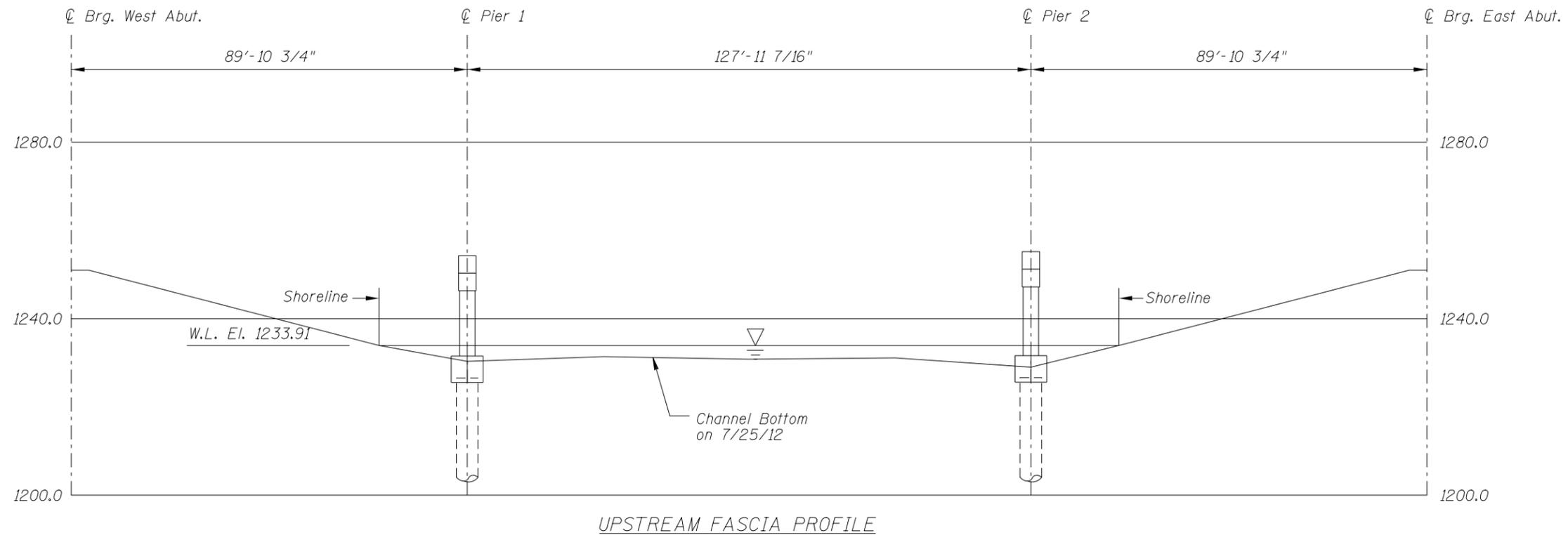
**MINNESOTA  
 DEPARTMENT OF TRANSPORTATION  
 UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 69624  
 OVER THE ST. LOUIS RIVER  
 DISTRICT I, ST. LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

|                 |   |                 |
|-----------------|---|-----------------|
| Drawn By: BJR   | <b>COLLINS ENGINEERS</b><br>123 North Wacker Drive<br>Suite 300<br>Chicago, IL 60606<br>(312) 704-9300<br>www.collinsengr.com | Date: JULY 2012 |
| Checked By: BRL |   | Scale: NTS      |
| Code: ---       |   | Figure No.: I   |

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Note:  
Refer to Figure 1 for General Notes.

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**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 69624  
OVER THE ST. LOUIS RIVER  
DISTRICT 1, ST. LOUIS COUNTY

**UPSTREAM AND DOWNSTREAM  
FASCIA PROFILES**

|                 |                              |   |   |
|-----------------|------------------------------|---|---|
| Drawn By: BJR   | <b>COLLINS<br/>ENGINEERS</b> | 123 North Wacker Drive<br>Suite 300<br>Chicago, IL 60606<br>(312) 704-9300<br>www.collinsengr.com | Date: JULY 2012<br>Scale: 1"=20'<br>Figure No.: 2 |
| Checked By: BRL |                              |   |   |
| ---             |                              |   |   |

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

INSPECTORS: WSB & Associates and Collins DATE: July 25, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 69624 WEATHER: Cloudy, 75° F

WATERWAY CROSSED: St Louis River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Kasey Yoder (WSB), John Loftus (Collins)

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

TIME IN WATER: 16:00

TIME OUT OF WATER: 16:50

WATERWAY DATA: VELOCITY 2 ft/sec.

VISIBILITY 2 feet

DEPTH 5.7 feet maximum

ELEMENTS INSPECTED: Pier 1 and Pier 2

REMARKS: Overall, Piers 1 and 2 were in good condition with no defects of structural significance. The footings were both exposed with up to 5.7 feet over vertical exposure. The channel bottom appeared stable and well established.

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. 69624  
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.  
 WATERWAY CROSSED St Louis River

INSPECTION DATE July, 25, 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 (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    |
|                    | Pier 1           | 5.7'                   | N            | 7                          | N        | 8            | 7               | 7                                    | 7     | 6                  | 6                     | 8                    | 6                                      | 7        | N     | N      | N               | N                              | N     |
|                    | Pier 2           | 5.3'                   | N            | 7                          | N        | 8            | 7               | 7                                    | 7     | 6                  | 6                     | 8                    | 6                                      | 7        | N     | N      | N               | N                              | N     |
|                    |                  |                        |              |                            |          |              |                 |                                      |       |                    |                       |                      |  |          |       |        |                 |                                |       |
|                    |                  |                        |              |                            |          |              |                 |                                      |       |                    |                       |                      |  |          |       |        |                 |                                |       |

\*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 and 2 were in good condition with no defects of structural significance. The footings were both exposed with up to 5.7 feet over vertical exposure. The channel bottom appeared stable and well established.

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.