

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27538
CSAH NO. 52, HENNEPIN AVENUE
OVER THE
EAST CHANNEL OF THE MISSISSIPPI RIVER
HENNEPIN COUNTY



OCTOBER 28, 2012

PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27538, Piers 2 and 3, were found to be in good condition with no defects of structural significance observed. Vertical cracking as well as minor scaling was observed on both pier faces. A light accumulation of timber debris was observed along the upstream nose of Pier 2. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) The channel bottom material around Pier 2 consisted of silty sand with up to 1 foot of probe rod penetration.
- (B) The channel bottom material around Pier 3 consisted of silty sand with up to 1 foot of probe rod penetration and scattered riprap typically less than 1 foot in diameter except at the pier noses where the riprap was 2 to 4 feet in diameter.
- (C) Light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. A 1 foot diameter log was observed along the West face of Pier 2.
- (D) The concrete at Piers 2 and 3 exhibited minor scaling with up to 1/8 inch penetration.
- (E) Vertical cracks (1/16 inch maximum width) were observed on both faces of Pier 2 (4 on each face) extending from channel bottom to top of the pier shaft.
- (F) Vertical cracks (1/16 inch maximum width) were observed on east face of Pier 3 (5 cracks) and west face of Pier 3 (4 cracks) extending from channel bottom to top of the shaft (typically).

RECOMMENDATIONS:

- (A) 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,

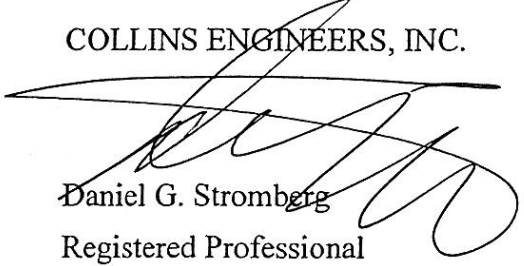
PROFESSIONAL ENGINEER

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: 27538

Feature Crossed: East Channel of the Mississippi River

Feature Carried: CSAH No. 52 (Hennepin Avenue)

Location: Hennepin County

Bridge Description: The bridge superstructure consists of four spans of multiple steel beams. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the bridge. Piers 1 through 3 are supported by spread footings founded on sandstone.

2. INSPECTION DATA

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

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: October 28, 2012

Weather Conditions: Cloudy, 45°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3

General Shape: Piers 2 and 3 are rectangular with two columns and an open web that sit on a lower rectangular shaft with rounded noses. The piers are founded on a rectangular spread footing which is founded on sandstone.

Maximum Water Depth at Substructure Inspected: Approximately 8.7 feet.

4. WATERLINE DATUM

Water Level Reference: The benchmark reference at Elevation 803.05 located on Pier 3.

Water Surface: The waterline was approximately 4.3 feet below reference.

Waterline Elevation = 798.8.

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/10/12

Item 113: Scour Critical Bridges: Code N/02

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

Yes No

6. STRUCTURAL ELEMENT CONDITION RATING

| Item # | Element Description | Quantity | Unit | Conditions | | | | |
|--------|-------------------------------|----------|------|------------|-----|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 |
| 210 | Reinforced Concrete Pier Wall | 100 | LF | | 100 | | | |
| 985 | Slopes | 1 | EA | 1 | | | | |



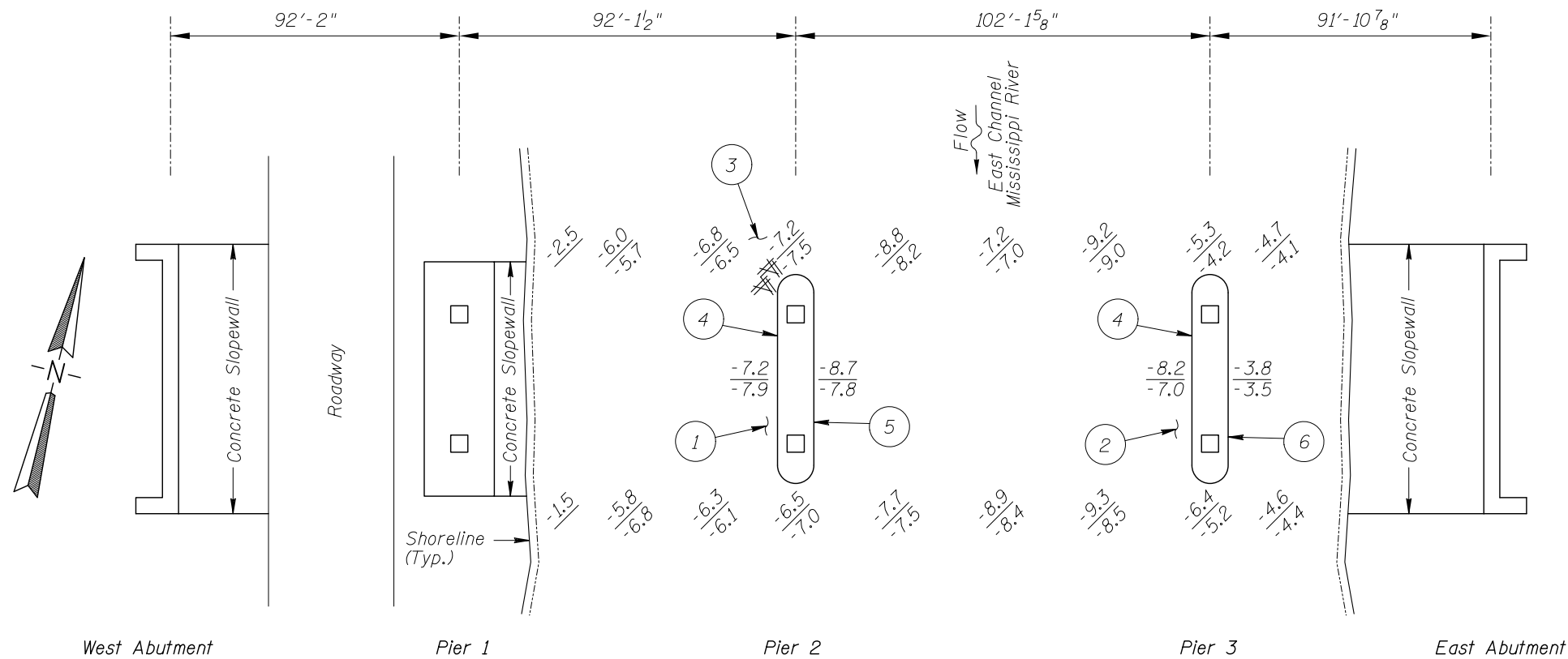
Photograph 1. Overall View of Structure, Looking South.



Photograph 2. View of Pier 2, Looking West.



Photograph 3. View of Pier 3, Looking East.



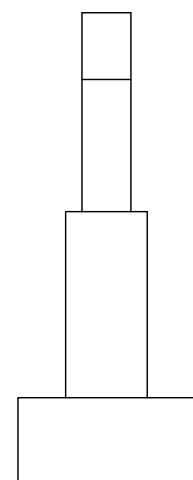
GENERAL NOTES:

1. Piers 2 and 3 were inspected underwater.
2. At the time of inspection on October 28, 2012 the waterline was located approximately 4.3 feet below the benchmark reference at Elevation 803.05 on Pier 3. Based on the reference this corresponds with a waterline elevation of 798.8.
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 material around Pier 2 consisted of silty sand with up to 1 foot of probe rod penetration.
- 2 The channel bottom material around Pier 3 consisted of silty sand with up to 1 foot of probe rod penetration and scattered riprap typically less than 1 foot in diameter except at the pier noses where the riprap was 2 to 4 feet in diameter.
- 3 Light accumulation of timber debris, mainly smaller branches, was observed on the channel bottom at the upstream nose of Pier 2. A 1-foot-diameter log was observed along the West face of Pier 2.
- 4 The concrete at Piers 2 and 3 exhibited minor scaling with up to 1/8 inch penetration.
- 5 Vertical cracks (1/16 inch maximum width) were observed on both faces of Pier 2 (4 on each face) extending from channel bottom to top of the pier shaft.
- 6 Vertical cracks (1/16 inch maximum width) were observed on east face of Pier 3 (5 cracks) and west face of Pier 3 (4 cracks) extending from channel bottom to top of the shaft (typically).

SOUNDING PLAN



TYPICAL END VIEW OF PIERS 2 AND 3

Legend

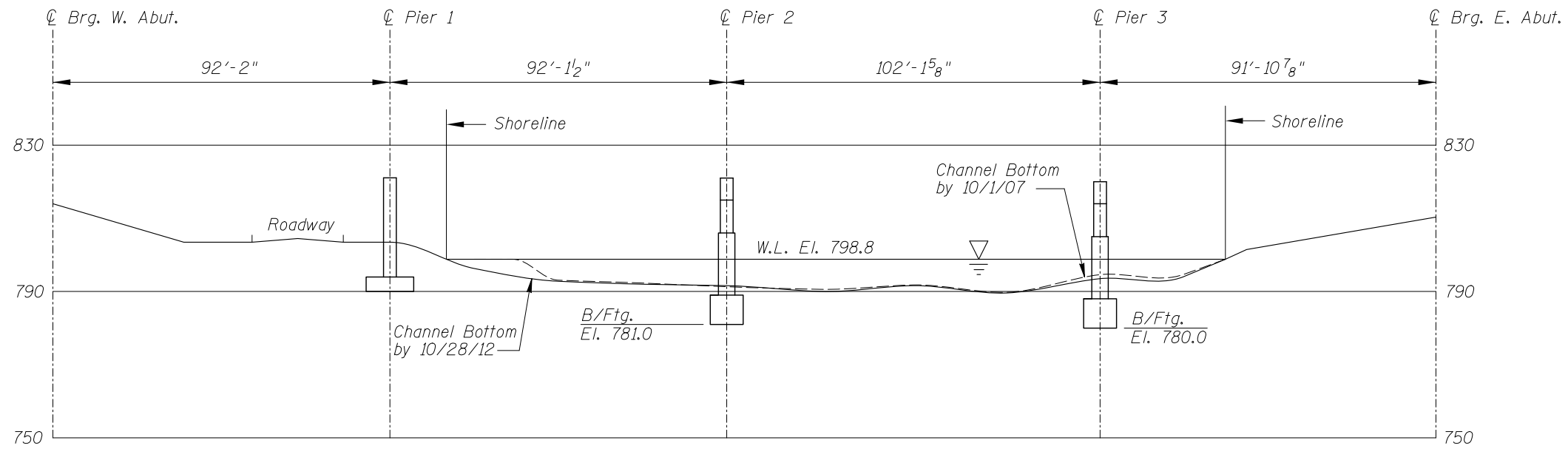
- 3.0 Sounding Depth (10/28/12)
- 3.0 Sounding Depth (10/1/07)
- Timber Debris

Note:

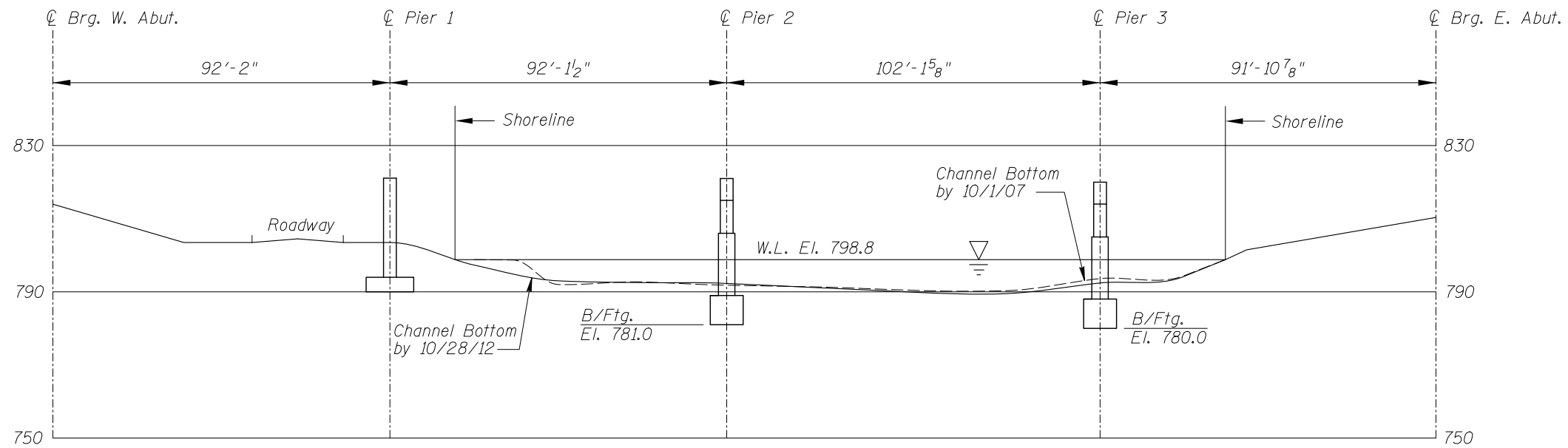
All soundings based on 2012 waterline location.

| | | |
|--|------------------------------|------------------|
| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. 27538 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER HENNEPIN COUNTY | | |
| INSPECTION AND SOUNDING PLAN | | |
| Drawn By: CRE | COLLINS ENGINEERS | Date: OCT., 2012 |
| Checked By: LJ | | Scale: NTS |
| Code: 742327538 | | Figure No.: 1 |

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

| | | |
|--|--|------------------|
| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. 27538 OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER HENNEPIN COUNTY | | |
| UPSTREAM AND DOWNSTREAM FASCIA PROFILES | | |
| Drawn By: CRE | COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> | Date: OCT., 2012 |
| Checked By: LJ | | Scale: 1"=40' |
| Code: 742327538 | | Figure No.: 2 |

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

INSPECTORS: Collins Engineers, Inc. DATE: October 28, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace P.E. (WSB)

BRIDGE NO: 27538 WEATHER: Cloudy, 45°F

WATERWAY CROSSED: East Channel of the Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Lukas Janulis, P.E.

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

TIME IN WATER: 13:50

TIME OUT OF WATER: 14:05

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 0.5 feet

DEPTH 8.7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 2 and 3

REMARKS: Overall, Piers 2 and 3 were found to be in good condition with no defects of structural significance observed. Vertical cracking as well as minor scaling was observed on both pier faces. A light accumulation of timber debris was observed along the upstream nose of Pier 2. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

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. 27538
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt R. Lovelace P.E. (WSB)
 WATERWAY CROSSED East Channel of the Mississippi River

INSPECTION DATE October 28, 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 2 | 8.7' | N | 7 | N | N | N | 7 | 8 | 8 | 8 | 7 | 7 | 7 | N | N | N | N | N |
| | Pier 3 | 8.2' | N | 7 | N | N | N | 7 | 8 | 8 | 8 | N | 8 | 7 | N | N | N | N | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 2 and 3 were found to be in good condition with no defects of structural significance observed. Vertical cracking as well as minor scaling was observed on both pier faces. A light accumulation of timber debris was observed along the upstream nose of Pier 2. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

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.