BRIDGE # 89188
MSAS 104(7TH ST) over ZUMBRO RIVER

DISTRICT: District 6      COUNTY: Olmsted      CITY/TOWNSHIP: Rochester

STATE: Minnesota

Date of Inspection: 06/15/2016
Equipment Used:

Owner: City or Municipal Highway Agency

Inspected By: Forsyth, Roy

Report Written By: Roy Forsyth
Report Reviewed By:
Final Report Date:
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UNDERWATER INSPECTION

REPORT SUMMARY

The substructure units inspected below water at Bridge No. 89188, the West Abutment and Piers 1, 2, and 3, were found to be in good to satisfactory condition. Several hairline to 1/4-inch-wide cracks were noted along the pier shafts and the abutment wall, with a very slight, 1/8-inch differential noted along the northern quarter point of Pier 1. The channel bottom appeared to be stable, and the scour protection system in-place around the substructure units was in good condition.

INSPECTION FINDINGS

(A) The concrete piers were typically in smooth and sound condition.

(B) Two vertical 1/8-inch-wide cracks were observed at the upstream and downstream 1/4 points along the pier shaft of Piers 2 and 3 and extended from the top of the pier to the top of the concrete scour protection. Both cracks extended through the full depth of the pier shaft.

(C) Four vertical hairline to 1/4-inch-wide cracks were observed along the Pier 1 shaft and extended from the top of the pier to top of the concrete scour protection. All cracks extended through the full depth of the pier shaft.

(D) A 1/8-inch differential (east / west) was observed at the top of the Pier 1 shaft at the northern 1/4-inch wide crack.

(E) A vertical 1/8-inch-wide crack was observed at the upstream 1/4 point along the West Abutment and extended from the top of the abutment to the concrete scour protection.

(F) A 4-inch-diameter spall was observed near the 12 inch storm sewer at the upstream 1/4 point along the West Abutment with up to 2 inches of penetration and an associated hairline crack that extended up.

(G) A 1/16-inch wide vertical crack was observed at the middle joint of the West Abutment.

(H) A hairline crack was observed at the downstream 1/4 point of the West Abutment and extended from the top of abutment to top of concrete scour protection.

(I) The channel bottom consisted of silty sand with 3 inches of probe rod penetration around all substructure units.

RECOMMENDATIONS

(A) Monitor the cracking along the pier shafts at Piers 1, 2 and 3 and the West Abutment, with special attention to the minor 1/8-inch wide differential along the northern end of Pier 1 for any further progression and/or movement.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Contractor: Collins Engineers, Inc.
Contractor Job Number: 9687
UNDERWATER INSPECTION

1. **BRIDGE DATA**
   
   Bridge #: 89188  
   Feature Intersected: ZUMBRO RIVER  
   Facility Carried: MSAS 104(7TH ST)  
   District: District 6  
   County: 055 - Olmsted  
   
   Bridge Description: 
   The superstructure consists of four spans of multiple reinforced concrete beams supporting a reinforced concrete deck. The bridge is supported by two reinforced concrete abutments and three reinforced concrete piers, which are founded on timber piles. The piers are numbered 1 through 3 from the west to east.

2. **INSPECTION DATA**
   
   Professional Engineer/Team Leader: Roy A. Forsyth  
   Inspection Diver: Marc Stern  
   Date of Underwater Inspection: 06/15/2016  
   Weather Conditions: Sunny, 80°F  
   Underwater Visibility (feet): 1.0 ft  
   Waterway Velocity (ft/sec): None/Negligible

3. **SUBSTRUCTURE INSPECTION DATA**
   
   Substructure(s) Inspected: West Abutment and Piers 1, 2, and 3  
   General Shape:  
   Oblong rectangular shafts with pointed upstream and downstream ends supported by rectangular footings that are founded on timber piles. A sloped concrete scour-protection apron surrounds each of the piers and also extends along the West Abutment.  
   Maximum Water Depth at Substructure(s) Inspected (feet): 7.5

4. **WATERLINE DATUM**
   
   Water Level Reference: The top of the pier cap at the north end of Pier 1.  
   Waterline Elevation (feet): 975.4.  
   Description: The waterline was approximately 7.8 feet below reference.

5. **NBIS CODING INFORMATION**
   (Minnesota specific codes are used for 92B and 113)
   
   Item 60: Substructure: Code: 6  
   Item 61: Channel and Channel Protection: Code: 8  
   Item 62: Culvert: Code:
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes  X  No  (Mark your selection with an X)

### 6. STRUCTURAL ELEMENT CONDITION RATING

<table>
<thead>
<tr>
<th>ELEM #</th>
<th>Element Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>CS1</th>
<th>CS2</th>
<th>CS3</th>
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<tr>
<td>215</td>
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<td>65</td>
<td>LF</td>
<td>61</td>
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<td>885</td>
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<td>1</td>
<td>EA</td>
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The routine underwater inspection of Bridge 89188 (7th Street over the Zumbro River) was completed on June 15, 2016. The underwater inspection was conducted from 14 ft boat. The inspection was conducted by a team consisting of a PE-Diver with a valid MnDOT Team leader certification, a backup diver and a dive tender. The inspection utilized commercial dive equipment and techniques (SSA and/or SCUBA) in accordance with OSHA regulations. Profiles were taken along the upstream and downstream faces of the bridge and around the periphery of substructure units to determine the presence, location and area of scour. The bridge elements inspected consisted of 1 reinforced concrete abutment and 3 reinforced concrete pier walls. According to the bridge inventory or design drawings, the West Abutment and Piers 1, 2, and 3 were founded on concrete pile footings. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for bottom foundations. The routine underwater inspection frequency is recommended to remain at a maximum of 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.
### Minnesota Structure Inventory Report

**Bridge ID:** 89188  
**MSAS 104(7TH ST) over ZUMBRO RIVER**  
**Date:** 07/28/2016

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<tr>
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<td><strong>Roadway O/U Key</strong></td>
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<td><strong>County</strong></td>
<td><strong>Route Sys</strong></td>
<td>Functionally Obsolete Y</td>
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<tr>
<td><strong>City</strong></td>
<td><strong>Roadway Name or Description</strong></td>
<td>Sufficiency Rating 42.7</td>
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<td>Routine Inspection Date 05/04/2015</td>
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<td><strong>Level of Service</strong></td>
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<td><strong>Substructure</strong></td>
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<td><strong>Rail Type</strong></td>
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### ROADWAY DIMENSIONS

- **If Divided**
  - **NB-EB**
  - **SB-WB**

- **Roadway Width**
  - 44.00 ft.

- **Vertical Clearance**
  - ft.

- **Max. Vert. Clear.**
  - ft.

- **Horizontal Clear.**
  - 43.9 ft.

- **Lateral Clearance**
  - ft.

- **Appr. Surface Width**
  - 56.0 ft.

- **Bridge Roadway Width**
  - 44.0 ft.

- **Median Width On Bridge**
  - ft.

### MISC. BRIDGE DATA

- **Structure Flared**
  - 0 - No flare

- **Parallel Structure**
  - N - No parallel structure

- **Field Conn. ID**
  - **Abutment**
    - 1 - CONC
  - **Foundation (Material/Type)**
    - 3 - FTG PILE
  - **Pier Foundation (Material/Type)**
    - 1 - CONC
    - 3 - FTG PILE

- **Historic Status**
  - 5 - Not eligible

### PAINT

- **Year Painted**
  - 26

- **Unsound Paint %**
  - N - Not Required

- **Patched Painted Area**
  - sq. ft.

- **Primer Type**
  - N - Not Required

- **Finish Type**
  - N - Not Required

### BRIDGE SIGNS

- **Posted Load**
  - 2 - Vehicle & Semi (Type R12-5)

- **Traffic**
  - 0 - Not Required

- **Horizontal**
  - 0 - Not Required

- **Vertical**
  - N - Not Applicable

### WATERWAY

- **Drainage Area (sq. mi.)**
  - 259.4

- **Waterway Opening (sq. ft.)**
  - 3430

- **Navigation Control**
  - 0 - No nav. control on

- **Pier Protection**
  - 0 - STBL -

- **Nav. Ctr. (ft.) Vert.**
  - 0 - 0.0 Horiz. 0.0

- **Nav. Vert. Lift Bridge Clear. (ft.)**
  - 0 - NOT REQUIRED

- **MN Scour Code**
  - 1 - P - STBL -

- **Year**
  - 2007

### CAPACITY RATING

- **Design Load**
  - A - HL 93

- **Operating Rating**
  - 3 - HL 93

- **Inventory Rating**
  - 3 - HL 93

- **Posting VEH**
  - 26 - SEMI: 34 DBL: 32

- **Rating Date**
  - 07/20/2016

- **Overweight Permit Codes**
  - A - X - Denied  
  - B - X - Denied  
  - C - X - Denied
**MINNESOTA BRIDGE INSPECTION REPORT**

**BRIDGE 89188 ** **MSAS 104(7TH ST) OVER ZUMBRO RIVER**

| County: Olmsted | Location: 0.3 MI E OF JCT TH 63 | Length: 254.5 ft. |
| City: Rochester | Route: 05 - MSAS 104 | Deck Width: 60.0 ft. |
| Township: | Control Section: | Paint Area/ Pct. Unsnd: sq. ft. / % |
| Section: 36 Township: 107N Range: 14W Maint. Area: | | |
| Span Type: 2 - Concrete Continuous 3 - Girder and Floorbeam System | | |
| List: Local Agency Bridge Nbr.: | Culvert: N/A | |
| Appraisal Ratings - Approach: 8 Waterway: 6 | MN Scour Code: P - STBL - PROT INPL | | |
| Required Bridge Signs - Load Posting: 2 - Vehicle & Semi (Type R12-5) Traffic: 0 - Not Required | Unofficial Structurally Deficient N | |
| Horizntal: 0 - Not Required Vertical: N - Not Applicable | Unofficial Functionally Obsolete Y | |
| | Unofficial Sufficiency Rating 42.7 | |

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<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
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<td>12</td>
<td>Reinforced Concrete Deck</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>15270 SF</td>
<td>14965</td>
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<td>15270 SF</td>
<td>14965</td>
<td>0</td>
<td>305</td>
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Notes: Transverse cracks with efflorescence on underside of slab. Concrete end dams are cracked. Some spalling observed at the first span from the east abutment.

[2013] Longitudinal crack at centerline. [2015] - Span 4 North overhang has large areas of spall/delam. [2015] - There are transverse cracks with efflorescence in all spans. Span 4 has a spall with exposed conduit on the South side of G1 at the abutment. Span 3 has an area of poorly consolidated concrete between G3 and G4 near pier 3.

| 510 | Wearing Surfaces | Underwater | 06/15/2016 | 11194 SF | 11194 | 0 | 0 | 0 |
| | Migrated Values | | | 11194 SF | 11194 | 0 | 0 | 0 |

Notes: Low Slump Overlay with Uncoated Rebar Notes: [-2011] Random alligator cracking is evident over a majority of concrete surface. [2013] Moderate size cracks of moderate density. [2015] - No spalls or delams noted.

| 110 | Reinforced Concrete Open Girder/Beam | Underwater | 06/15/2016 | 1506 LF | 1496 | 4 | 6 | 0 |
| | Migrated Values | | | 1506 LF | 1496 | 4 | 6 | 0 |

Notes: . 1989 - Peoples Natural Gas hung new gas main on south side of girder number 6. 2001 - Crack at bearing plate at E abutment on girder 1. 2001 - Large spall at bearing plate at E abutment on girder 6. 2006 - N. edge 2 spalls, 1 delam. at east span @ conduit. 2008 - Crack at bearing plate girder # 6. 2010- Vertical cracks

[2011 - 2013] Shear/Spall 1"x6" at east end girders 1 and girder 6. Light vertical cracks moderate density, over length of girders, on all spans [2015] - Span 4 Beam 1 East end has a shear crack 7' from the beam end. Beam 6 East end has a shear crack and two diagonal cracks. [2015] - Snoop inspection needed for closer insp. and monitoring. [2015] - Beams were inspected using an underdeck snooper truck 11/09/2015. All girders have minor vertical cracks approx. 5’ from piers. There is a small rebar spall on the bottom of G3 in span 2 near pier 2.

| 210 | Reinforced Concrete Pier Wall | Underwater | 06/15/2016 | 164 LF | 146 | 18 | 0 | 0 |
| | Migrated Values | | | 164 LF | 146 | 18 | 0 | 0 |

Notes: EAST PIER 1/16' wide vertical crack in pier wall under and between girders number 5-6. 1/8' wide vertical crack in pier wall under girder number 2. Vertical crack down center of diaphragm support. Concrete spall in diaphragm support. Water leakage on pier cap and down pier wall. CENTER PIER 1/16' wide vertical cracks in pier wall under and between girders number 1-2, 2-3, and under girder number 5. Vertical crack down center of diaphragm support. Water leakage on pier cap and down pier wall. WEST PIER 1/8' wide vertical cracks in pier wall under and between girders number 1-2, 2-3, and 4-6. 1/4' wide vertical crack in pier wall under girder number 5. Vertical crack down center of diaphragm support. [2015] - As noted. [2016 Underwater Inspection] - All noted cracks extend below water to the top of concrete scour protection.
## Reinforced Concrete Abutment

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 168 LF

### Migrated Values
- **Quantity:** 168 LF
- **CS 1:** 143
- **CS 2:** 25
- **CS 3:** 0
- **CS 4:** 0

**Notes:** [2016] Migrator added 40 LF to abutment quantity to account for wingwalls (CS1:30 CS2:10 CS3:0 CS4:0).

**East Abutment**
Vertical cracks on abutment face at 0.5', 8', 15', 23.5', 44', 53' (from N). Vertical crack on abutment face at 0.5' is 1/8' wide. Vertical crack on face of NW wingwall, 10.5' from connection with abutment. Vertical crack 1/8' wide on SE wingwall, near connection with abutment. 1/4' deep scaling on abutment face under girder number 1 and between girders number 5-6. Scaling of bridge seat. Black stains at various locations along length of abutment. Back wall has spalled at SE corner of bridge by movement of the superstructure.

**[2011] 4'x5' delam N end**

**[2013] E Abutment N end 100 sq-ft scaling.**

**[2015] - North end wing interface has a 6' x 5' spall.**

**West Abutment**
Vertical crack on abutment face extending up from 12' storm sewer pipe. Concrete spalled off around storm sewer, material behind abutment washing out. Vertical crack on face of SW wingwall, near south end of wingwall. Minor scaling of abutment face under between girders number 5-6. 1996 - 2'x2' spall at SW corner around elec. conduit.

**[1995] - 2'x2' spall at SW corner around elec. conduit.**

**Wingwall notes:** 1995 - 2015 Minor vertical crack at NE wingwall.

## Strip Seal Expansion Joint

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 75 LF

### Migrated Values
- **Quantity:** 75 LF
- **CS 1:** 37
- **CS 2:** 38
- **CS 3:** 0
- **CS 4:** 0

**Notes:** Cork expansion material between wingwalls and abutments is deteriorating and/or missing. 1995 - Strip seal joint has some minor leakage noted along abutments, joint is impacted w/ debris.

**[2013] [2015] - West end has 4' of protection angle that is missing.**

## Movable Bearing

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 24 EA

### Migrated Values
- **Quantity:** 24 EA
- **CS 1:** 16
- **CS 2:** 8
- **CS 3:** 0
- **CS 4:** 0

**Notes:** Rocker bearing devices are leaning at 10 to 15 degrees east of plum at east abutment. Bridge sole plates are rusting.

**[2015] - West abutment and pier 1 bearings are set in expansion to the West. East abutment and pier 3 bearings are in expansion to the East. There is heavy corrosion on the sole plates of bearings B1 and B6.**

## Fixed Bearing

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 6 EA

### Migrated Values
- **Quantity:** 6 EA
- **CS 1:** 4
- **CS 2:** 2
- **CS 3:** 0
- **CS 4:** 0

**Notes:** [2011] No defects noted. [2015] - As noted.

## Metal Bridge Railing

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 499 LF

### Migrated Values
- **Quantity:** 499 LF
- **CS 1:** 163
- **CS 2:** 336
- **CS 3:** 0
- **CS 4:** 0

**Notes:** [2016] Migrator assumed concrete/metal combination type rail. 1995 - Significant spalls under crash posts # 15 - 17 on North side, exposed rebar. Repaired rail at N side between posts 7 & 8 needs paint.

**[2011] paint failure.**

**[2015] - Several connection areas on the rail have flaking rust with paint failure and active corrosion. South rail section 14 and North rail sections 8 & 17 have bent upright posts.**

**515 - Steel Protective Coating**

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 999 SF

### Migrated Values
- **Quantity:** 999 SF
- **CS 1:** 999
- **CS 2:** 0
- **CS 3:** 0
- **CS 4:** 0

**Notes:** [2016] Migrator assumed CS1 and a quantity of 999 SF.

## Reinforced Concrete Bridge Railing

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 499 LF

### Migrated Values
- **Quantity:** 499 LF
- **CS 1:** 163
- **CS 2:** 336
- **CS 3:** 0
- **CS 4:** 0

**Notes:** [2016] Migrator assumed concrete/metal combination type rail. 1995 - Significant spalls under crash posts # 15 - 17 on North side, exposed rebar. Repaired rail at N side between posts 7 & 8 needs paint.

**[2011] paint failure.**

**[2015] - Several connection areas on the rail have flaking rust with paint failure and active corrosion. South rail section 14 and North rail sections 8 & 17 have bent upright posts.**

## Critical Deficiencies or Safety Hazards

**Report Type:** Underwater  
**Inspection Date:** 06/15/2016  
**Quantity:** 1 EA

### Migrated Values
- **Quantity:** 1 EA
- **CS 1:** 1
- **CS 2:** 0
- **CS 3:** 0
- **CS 4:** 0

**Notes:** NO CRITICAL FINDINGS OBSERVED DURING THE LAST INSPECTION. [2015]
### Plow Fingers

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plow Fingers</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: Two plow fingers at east end of bridge are missing. One plow finger at west end of bridge is missing. 1996 - 1 additional plow finger is missing on E end of bridge (3 total). 2008 - 2 missing E end, 1 missing W end.


### Bituminous Approach Roadway

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bituminous Approach Roadway</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>2 EA</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>2 EA</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: Bit. approaches have settled at ends of bridge.

[2011] light to moderate cracking
[2015] - East approach has several unsealed cracks and deterioration at the joint.
West approach has settled 1 - 1 1/2" with transverse open cracks.

### Secondary Members (Superstructure)

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Members (Superstructure)</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>65 EA</td>
<td>55</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>65 EA</td>
<td>55</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: 1995 - 2015 End diaphrams are cracked and spalling.

### Concrete Shear Cracking

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Shear Cracking</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: [2015] - Shear cracking found in 2015 inspection. See element 110. New pictures taken.

### Scour

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scour</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: P - Stable due to protection. Inspect countermeasures. [2015]

### Slopes & Slope Protection

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slopes &amp; Slope Protection</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: 1990 - Corps of Engineers flood control project reworked slopes.


### Deck & Approach Drainage

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deck &amp; Approach Drainage</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: Water from drains is leaking on fascia girders. 1995 - Water runs along bottom of fascia arch to bearing devices. [2015] NC

### Sidewalk, Curb, & Median

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk, Curb, &amp; Median</td>
<td>Underwater</td>
<td>06/15/2016</td>
<td>1 EA</td>
<td>1</td>
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<td>Migrated Values</td>
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<td></td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: Transverse and longitudinal cracks on surface of walk. Concrete spalls on face of north curb near concrete crash posts number 7-8. Concrete spalls on face of south curb near concrete crash post numbers 9, 16, and 17-18. Light to medium scaling of curbs and walks, scaling more prevalent on east ? of north side. Large spalls on underside of north walk under concrete crash posts 15, 16, 17. Longitudinal cracking through walks under and between concrete crash posts. 1996 - Major scaling w/ minor spalls on S outside sidewalk fascia between crash posts #1 & #4. 2008 - Large cracks at SW corner under sidewalk slight eff. S edge of walk chipping away. 2' x 2' spall under walk at S side E Abutment. 9' Spall under post 8 south.

Concrete walk at SE corner settled 3/4'. Bit. walk at NW corner cracked and settled 1'. Cracked walk at 2nd and 3rd panel at SE corner. Cracked walk at 2nd and 3rd panel at SW corner. Settled curb at NW corner.

[2011] Severe spalling/raveling along both walk/curbs. SE panel broken/tipping. [2015] - South sidewalk has 30' of severely deteriorated concrete with deep spalling and exposed rebar with moderate LOS.

### Protected Species

<table>
<thead>
<tr>
<th>ELEMENT NAME</th>
<th>REPORT TYPE</th>
<th>INSP. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
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<tbody>
<tr>
<td>Protected Species</td>
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<td>06/15/2016</td>
<td>1 EA</td>
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<td>0</td>
</tr>
<tr>
<td>Migrated Values</td>
<td>Underwater</td>
<td></td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: Use this element to track the presence of protected species living on this structure.

---

**General Notes:**

Inspectors: David Moore, Brian Monosmith.

Channel & Protection

Corps of Engineers flood control, channel work with riprap, retaining wall construction at NW and SW corners and east side.
Schedule bridge for snooper inspection.

58. Deck NBI: NBI is 6 due to minor spall/delam on deck underside.

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail Terminal NBI:

59. Superstructure NBI: NBI is 5 due to structural/shear cracking at beam ends.

60. Substructure NBI: [2016 Underwater inspection] - NBI changed to 6 due to cracking.

61. Channel NBI: Flood control project, protected by rip rap and concrete wall.

62. Culvert NBI:

71. Waterway Adeq NBI:

72. Appr Roadway Alignment NBI:

Inventory Notes:

Roy Forsyth
Inspector's Signature

Reviewer's Signature
Photo 2 - View of West Abutment, looking west.

Photo 3 - View of East Abutment, looking east.
Photos

Photo 4 - View of Pier 1, looking west.

Photo 5 - View of Pier 2, looking west.
Photo 6 - View of Pier 3, looking west.
The concrete piers were typically in smooth and sound condition.

Two vertical 1/8-inch-wide cracks were observed at the upstream and downstream points along the pier shaft and extended from the top of the pier to the top of the concrete scour protection. Both cracks extended through the full depth of the pier shaft.

The channel bottom consisted of silty sand with 3 inches of penetration around the substructure units.

Four vertical hairline to 1/4-inch-wide cracks were observed along the Pier 1 shaft and extended from the top of the pier to the top of the concrete scour protection. All cracks extended through the full depth of the pier shaft.

A 1/8-inch differential (east / west) was observed at the top of the Pier 1 shaft at the northernmost 1/4-inch-wide crack.

A vertical 1/8-inch-wide crack was observed at the upstream 1/4 point along West Abutment and extended from the top of the abutment to the concrete scour protection.

A 4-inch-diameter spot was observed near the 32-inch storm sewer pipe along the West Abutment with up to 2 inches of penetration and an associated hairline crack that extended up.

A 1/8-inch-wide vertical crack was observed at the middle joint of the West Abutment.

A hairline crack was observed at the downstream 1/4 point of the West Abutment and extended from the top of the abutment to the top of concrete scour protection.

GENERAL NOTES:

1. Piers 1 through 3 and the West Abutment were inspected underwater.
2. At the time of inspection, on June 15, 2016, the waterline was located approximately 7.8 feet below the top of Pier 1 on the north end. This corresponds to a waterline elevation of 975.4.
3. Soundings indicate the water depth at the time of inspection and are measured in feet. All soundings based on 2016 waterline location.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.

LEGEND

-0.4 Sounding Depth 16/15/16
-0.4 Sounding Depth 10/02/16

TYPICAL END VIEW OF EACH PIER SECTION