UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 04511

CSAH No. 12

OVER THE

MISSISSIPPI RIVER

DISTRICT 2 - BELTRAMI COUNTY

AUGUST 13, 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 inspected at Structure No. 04511, Pier 1, was found to be generally in good condition with no defects of structural significance observed. Minor light timber debris was observed at the upstream nose. A minor local scour depression was observed at the downstream nose of the pier. This report represents an initial underwater inspection of this structure.

INSPECTION FINDINGS:

(A) Minor timber debris consisting of twigs was observed at the upstream nose of Pier 1.

(B) A minor scour depression, 3 foot radius and 1 foot deep, was observed at the downstream nose of Pier 1.

(C) The streambed material consisted of cobbles.

(D) The west and east embankments had sparse riprap, 2 foot to 3 foot in diameter, with signs of erosion observed.

(E) Overall, the concrete of Pier 1 was smooth and sound.
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,

Daniel G. Stromberg

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.

Date: 01/30/14   License #21491

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional Engineer, State of Minnesota
1. **BRIDGE DATA**

Bridge Number: 04511

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 12

Location: District 2 - Beltrami County

Bridge Description: The superstructure consists of reinforced concrete deck over steel girders supported by two reinforced concrete abutments and one reinforced concrete pier. The substructure units are designated as West Abutment, Pier 1, and East Abutment.

2. **INSPECTION DATA**

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.

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

Date: August 13, 2012

Weather Conditions: Sunny, 70° F

Underwater Visibility: 4.0 feet

Waterway Velocity: 1.5 ft/sec
3. **SUBSTRUCTURE INSPECTION DATA**

Substructure Inspected: Pier 1.

General Shape: Pier 1 is a tapered pier with two openings in the pier face founded on an unknown foundation.

Maximum Water Depth at Substructure Inspected: 4.0 feet at Pier 1.

4. **WATERLINE DATUM**

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

Water Surface: The waterline was approximately 11.7 feet below reference. Assumed Waterline Elevation = 88.3

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/08

   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

<table>
<thead>
<tr>
<th>Item #</th>
<th>Element Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>205</td>
<td>Reinforced Concrete Column</td>
<td>1</td>
<td>EA</td>
<td>1</td>
</tr>
<tr>
<td>985</td>
<td>Slopes</td>
<td>1</td>
<td>EA</td>
<td>1</td>
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<tr>
<td>361</td>
<td>Scour</td>
<td>1</td>
<td>EA</td>
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</table>
Photograph 1. Overall View of Downstream Fascia, Looking North.

Photograph 2. Overall View of Pier 1, Looking East.
Photograph 3. View of Pier 1, Looking West.

Photograph 4. View of the West Abutment, Looking West
Photograph 5. View of the East Abutment, Looking Northeast.

GENERAL NOTES:

1. Piers I was inspected underwater.
2. At the time of inspection on August 13, 2013, the waterline was located approximately 4.7 feet below top of pier cap at the downstream nose of Pier I. This corresponds to a waterline elevation of 88.3 feet based on an assumed bench mark elevation of 100.0 feet.
3. Soundings indicate the water depth at the time of the inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

GENERAL NOTES:

1. Minor timber debris consisting of twigs was observed at the upstream nose of Pier I.
2. A minor scour depression, 3 foot radius and 1 foot deep, was observed at the downstream nose of Pier I.
3. The streamed material consisted of cobbles.
4. The west and east embankments had sparse riprap, 2 foot to 3 foot in diameter, and signs of erosion were observed.
5. Overall, the concrete of Pier I was smooth and sound.
UPSTREAM FASCIA PROFILE

Channel Bottom on 8/13/12

DOWNSTREAM FASCIA PROFILE

Channel Bottom on 8/13/12

Notes:
Refer to Figure 3 for General Notes.
MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.
BRIDGE NO: 04511                           WEATHER: Sunny, 70° F
WATERWAY CROSSED: Mississippi River
DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
                  X OTHER Wade
PERSONNEL: Jason A. Cook, James A. Hitchman
EQUIPMENT: Dry Suit, Camera, Sounding Rod, Hammer
TIME IN WATER: 10:00 A.M.                  TIME OUT OF WATER: 10:20 A.M.
WATERWAY DATA: VELOCITY 1.5 ft/sec
                  VISIBILITY 4.0 feet
                  DEPTH 4.0 feet maximum at Pier 1
ELEMENTS INSPECTED: Pier 1
REMARKS: The structure inspected at Structure No. 04511, Pier 1, was found to be
generally in good condition with no defects of structural significance observed. Minor
timber debris was observed at the upstream nose. A minor local scour depression was
observed at the downstream nose of the pier. The channel bottom material typically
consisted of cobbles.

FURTHER ACTION NEEDED: YES X 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. 04511
INSPECTION DATE August 13, 2012
INSPECTORS Ayres Associates
ON-SITE TEAM LEADER Brian K. Schroeder, P.E.
WATERWAY CROSSED Mississippi River

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.

<table>
<thead>
<tr>
<th>CONDITION RATING</th>
<th>SUBSTRUCTURE</th>
<th>CHANNEL</th>
<th>GENERAL</th>
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<tr>
<td>UNIT REFERENCE NO.</td>
<td>MAXIMUM DEPTH OF WATER</td>
<td>PILING</td>
<td>COLUMNS, SHAFTS, OR FACES*</td>
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<tr>
<td>Pier Abutment</td>
<td>4.0'</td>
<td>N</td>
<td>7</td>
</tr>
</tbody>
</table>

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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.