UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6613
CSAH NO. 17
OVER THE
RED LAKE RIVER
DISTRICT 2 - PENNINGTON COUNTY, CITY OF THIEF RIVER FALLS

PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 37)
REPORT SUMMARY:

The substructure units inspected at Bridge No. 6613, the North Abutment and Piers 1 and 2, were found to be in good condition with no defects of structural significance. Pier 2 exhibited partial footing exposure at Section C, and the concrete strut connecting Sections A and B was also exposed. A light accumulation of timber debris was observed at Pier 2 and moderate to heavy accumulations were encountered at Pier 1. The channel bottom around the substructure units consisted of firm material, which was well established and stable with no evidence of significant scour and no appreciable changes since the last inspection.

INSPECTION FINDINGS:

(A) The footing at Section C of Pier 2 was exposed around most of the pier section with a maximum vertical face exposure of 2 feet at the upstream end, and the concrete strut connecting Sections A and B of Pier 2 exhibited 3 feet of vertical exposure. The top of the footing at Section B of Pier 2 was also exposed on the southerly side.

(B) There was a light accumulation of 6-inch-diameter and smaller timber debris along Pier 2 on the channel bottom. A moderate accumulation of 1-foot-diameter timber debris was observed on the channel bottom to 5 feet above the channel bottom along Section A of Pier 1. The debris continued along the shore side of the pier and developed into a heavy accumulation that extended from the channel bottom to the waterline.

(C) A vertical crack was observed in the construction joint at the North Abutment, typically 1/16 inch wide and up to 1/8 inch wide at the bottom.

(D) Light scaling was observed on the shafts of Sections A and B at Piers 1 and 2 from the waterline to 1 foot below the waterline with a maximum penetration of 1/4 inch.
RECOMMENDATIONS:

(A) Remove accumulated timber debris from around both piers during routine maintenance of the bridge.

(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

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional Engineer, State of Minnesota

Date 6/30/2004 Registration No. 21091
1. **BRIDGE DATA**

Bridge Number: 6613

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 17

Location: District 2 - Pennington County, City of Thief River Falls

Bridge Description: The bridge superstructure consists of three spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two concrete piers. The piers each consist of three sections. The pier and abutment footings are founded on steel H-piles. The piers are numbered starting from the south end of the bridge.

2. **INSPECTION DATA**

Professional Engineer Diver: Daniel G. Stromberg  
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matt J. Lengyel

Date: August 27, 2002

Weather Conditions: Sunny, "80EF

Underwater Visibility: "2 Feet

Waterway Velocity: "0.5 f.p.s.
3. **SUBSTRUCTURE INSPECTION DATA**

Substructure Inspected: North Abutment and Piers 1 and 2.

General Shape: The reinforced concrete hammerhead piers each consist of three sections. Sections A and B are tied together at the cap, with Section C a separate shaft. The pier shafts are supported by a rectangular reinforced concrete footing founded on steel H-piles. The reinforced concrete abutments consist of a transverse breast wall with perpendicular wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 18 feet.

4. **WATERLINE DATUM**

Water Level Reference: The top of Pier 2 on the northeast end.

Water Surface: The waterline was approximately 6.8 feet below reference.

   Waterline Elevation = 1115.1

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/08/02

Item 113: Scour Critical Bridges: Code I/94

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

_____ Yes ____X__ No
1. The North Abutment and Piers 1 and 2 were inspected underwater.

2. At the time of inspection, on August 27, 2002, the waterline was located approximately 6.8 feet below the top of Pier 2 on the upstream end. This corresponds to a waterline elevation of 115.1 based on the previous report dated September 6, 1991.

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 as well as around the pier structures.

**INSPECTION NOTES:**

1. Overall, the concrete piers and abutments were in good condition with no defects of structural significance.

2. Section C of Pier 2 exhibited partial footing exposure with a maximum vertical exposure of 2 feet along the upstream end. The top of the footing only was exposed at Section A of Pier 2.

3. Light scaling was observed on the bottom of the sections A and B from the waterline to 1 foot below the waterline with a maximum penetration of 1/4 inch.

4. Timber forming was observed around the footing at Section C of Pier 2.

5. The channel bottom consisted of sand, gravel, and cobble with some probe rod penetrations from 6 inches to 1 foot.

6. The channel bottom consisted of soft sandy infilling along the downstream channel side and between sections B and C of Pier 1.

7. The channel bottom consisted of silt and cobble at the North Abutment with probe rod penetrations of 6 inches to 1 foot.

8. A vertical crack was observed in the construction joint at the North Abutment, typically 1/16 inch wide and up to 1/8 inch wide at the bottom.

9. A light accumulation of 6-inch-diameter and smaller timber debris was observed along Pier 2 from the bottom to 2 feet above the channel bottom.

10. A heavy accumulation of 1-foot-timber debris was observed along the channel bottom to the waterline.

11. A moderate accumulation of 1-foot-diameter and smaller timber debris was observed on the channel bottom to 5 feet above the channel bottom along Section A of Pier 1.

12. The concrete strait connecting Sections A and B of Pier 2 exhibited 3 feet of vertical exposure.

**Legend:**

- **A:** Sounding Depth From Waterline (8/27/02)
- **B:** Sounding Depth From Waterline (9/16/97)
- **H:** Timber Debris

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**MINNESOTA DEPARTMENT OF TRANSPORTATION**

**UNDERWATER BRIDGE INSPECTION**

**STRUCTURE NO. 663**

**OVER THE RED LAKE RIVER**

**DISTRICT 2, PENNINGTON COUNTY**

**INSPECTION AND SOUNDING PLAN**

**Design Firm:**

- **Collins Engineers, Inc.**

**Checklist:**

- **Design:**
  - **Drawn By:** P.H.
  - **Checked By:** M. M.
  - **Reviewed By:**
  - **Signature:**
  - **Date:** Aug 2002

**Scale:**

- **N/TS:**
  - **Dimensions:**
  - **Figure No.:** 1

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**TYPICAL END VIEW OF EACH PIER SECTION**

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**GENERAL NOTES:**

- The North Abutment and Piers 1 and 2 were inspected underwater.
- At the time of inspection, on August 27, 2002, the waterline was located approximately 6.8 feet below the top of Pier 2 on the upstream end. This corresponds to a waterline elevation of 115.1 based on the previous report dated September 6, 1991.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.
MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 663
OVER THE RED LAKE RIVER
DISTRICT 2, PENNINGTON COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Notes:
Refer to Figure 1 for General Notes.
Photograph 1. Overall View of the Structure, Looking Southwest.

Photograph 2. View of Pier 1, Looking Northwest.

Photograph 4. View of Timber Debris at Pier 1, Looking Northwest.
MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc.  DATE: August 27, 2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 6613  WEATHER: Sunny, "80E'
WATERWAY CROSSED: The Red Lake River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER PERSONNEL: Michelle D. Koerbel, Matt J. Lengyel
EQUIPMENT: Scuba, U/W Light, Probe Rod, Lead Line, Sounding Pole, Scraper, Camera
TIME IN WATER: 1:05 p.m.
TIME OUT OF WATER: 1:50 p.m.
WATERWAY DATA: VELOCITY "0.5 f.p.s.
   VISIBILITY" 2 Feet
   DEPTH 18 feet maximum at Pier 2
ELEMENTS INSPECTED: North Abutment and Piers 1 and 2
REMARKS: Overall, the concrete was in good condition with no defects of structural significance.
The footing at Section C of Pier 2 was exposed with a maximum vertical exposure of 2 feet. The top
of the footing only was exposed at Section B of Pier 2. The concrete strut connecting the two
upstream columns of Pier 2 was also exposed with a maximum vertical exposure of 3 feet. The pier
shafts exhibited light scaling at the waterline with maximum penetrations of 1/4 inch. Light to
moderate accumulation of timber debris was observed at Piers 2 and 1, respectively. At the time of
the inspection, the South Abutment was no longer in the water as in the previous report.

FURTHER ACTION NEEDED: X YES NO

Remove accumulated timber debris from around both piers during routine maintenance of the bridge.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval
of five (5) years.
## UNDERWATER INSPECTION CONDITION RATING FORM

**BRIDGE NO.** 6613  
**INSPECTION DATE** August 27, 2002  
**ON-SITE TEAM LEADER** Daniel G. Stromberg, P.E. 21491  
**WATERWAY CROSSED** The Red Lake River  

**CONDITION RATING**

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<th>UNIT REFERENCE NO.</th>
<th>MAXIMUM DEPTH OF WATER</th>
<th>PILING</th>
<th>COLUMNS, SHAFTS, OR FACES*</th>
<th>FOOTINGS</th>
<th>DISPLACEMENT</th>
<th>OTHER</th>
<th>OVERALL SUBSTRUCTURE CONDITION CODE</th>
<th>SCOUR</th>
<th>EMBANKMENT EROSION</th>
<th>EMBANKMENT PROTECTION</th>
<th>OTHER (DRIFT/DEBRIS)</th>
<th>OVERALL CHANNEL &amp; PROTECTION CONDITION</th>
<th>CONCRETE</th>
<th>STEEL</th>
<th>TIMBER</th>
<th>LOSS OF SECTION</th>
<th>PREVIOUS REPAIR OR MAINTENANCE</th>
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*UNDERWATER PORTION ONLY

**REMARKS:** Overall, the concrete was in good condition with no defects of structural significance. The footing at Section C of Pier 2 was exposed with a maximum vertical exposure of 2 feet. The top of the footing only was exposed at Section B of Pier 2. The concrete strut connecting the two upstream columns of Pier 2 was also exposed with a maximum vertical exposure of 3 feet. The pier shafts exhibited light scaling at the waterline with maximum penetrations of 1/4 inch. Light to moderate accumulation of timber debris was observed at Piers 2 and 1, respectively. At the time of the inspection, the South Abutment was no longer in the water as in the previous report.

**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.