

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 57503
CSAH NO. 7
OVER THE
RED LAKE RIVER
DISTRICT 2 - PENNINGTON COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 164)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 57503, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. A heavy accumulation of timber debris extending from the mudline to the waterline was observed at the upstream nose and along the sides of Pier 1, as well as extending 20 feet into the adjoining spans. The timber debris obscured an 8-inch length of exposed reinforcing steel at the upstream end of Pier 1 that was noted in the previous inspection. As noted in the previous inspection, a minor scour depression was observed at the upstream end of Pier 2.

INSPECTION FINDINGS:

- (A) An 8-inch length of exposed reinforcing steel that was observed 2 feet below the waterline at the upstream end of Pier 1 during the previous inspections could not be confirmed due to the heavy accumulations of timber debris around the upstream end of Pier 1.
- (B) A minor scour depression, which was 2 to 3 foot in diameter and 1 foot deep, was observed at the upstream end of Pier 2.
- (C) A heavy accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed around the upstream nose from the channel bottom to the waterline and extending 10 feet upstream, 20 feet into the adjoining spans, and along the sides of Pier 1.

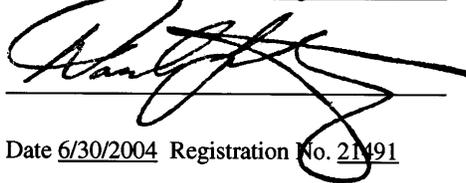
RECOMMENDATIONS:

- (A) Remove the timber debris from around Pier 1 to alleviate further accumulations, scour influence, and excessive lateral loads on the pier.

- (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

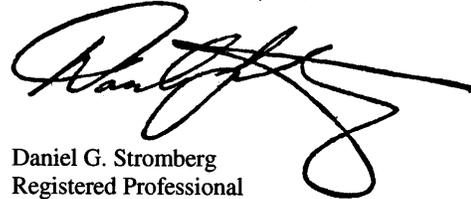


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 57503

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 7

Location: District 2 - Pennington County

Bridge Description: The bridge superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered starting from the west end of the bridge. No design drawings were provided.

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, " 75E F

Underwater Visibility: " 2.0 feet

Waterway Velocity: " 1.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of a rectangular reinforced concrete shaft with rounded ends. They support a rectangular reinforced concrete hammerhead pier cap with tapered ends.

Maximum Water Depth at Substructure Inspected: Approximately 7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the north end of Pier 2.

Water Surface: The waterline was approximately 8.5 feet below reference.
Assumed Waterline Elevation = 91.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

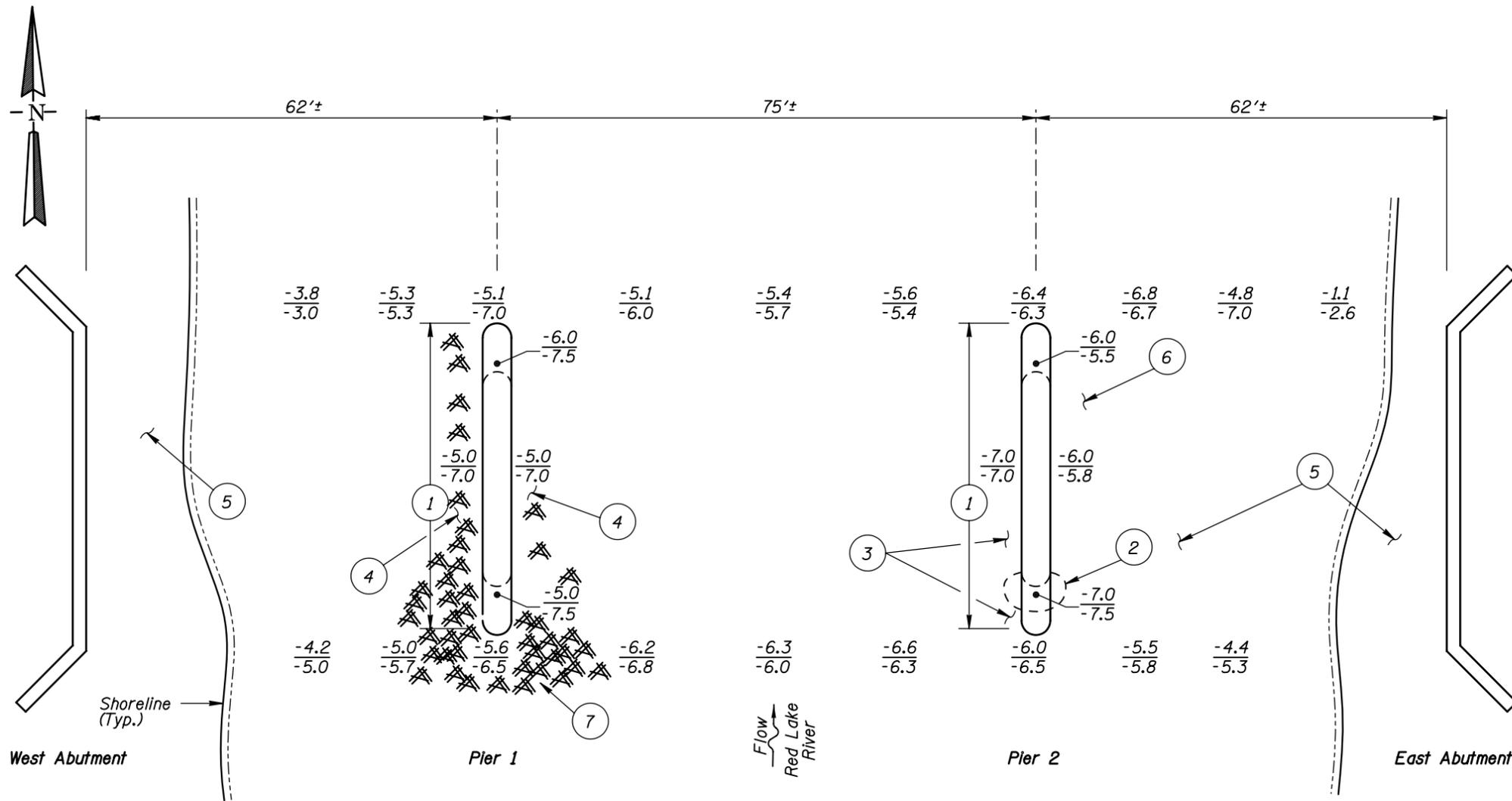
Item 61: Channel and Channel Protection: Code 5

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 No



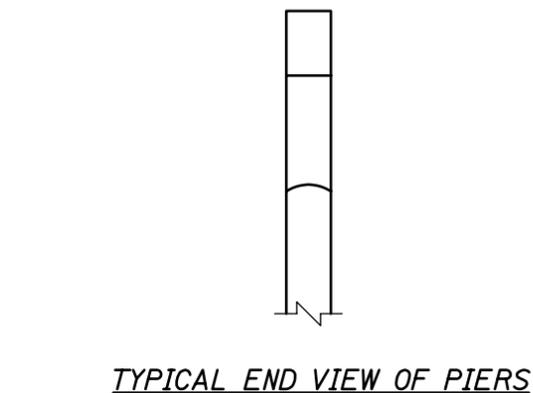
SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 27, 2002, the waterline was located approximately 8.5 feet below the top of the pier cap on the downstream end of Pier 2. Design plans were not available, therefore a reference of 100.0 was assumed. Based on the assumed reference the waterline elevation was 91.5.
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 were in good condition, except for an 8-inch length of exposed reinforcing steel located 1-1/2 foot below the waterline at the upstream end of Pier 1, which was noted in the previous inspection on 9/07/97 but was obscured by timber debris during this inspection.
- ② A minor scour depression, 1 foot deep with a radius of 2 to 3 feet, was observed at the upstream end of Pier 2.
- ③ The channel bottom consisted of sand with scattered heavy riprap and no penetration at the upstream end and west side of Pier 2.
- ④ The channel bottom consisted of soft, sandy infill with up to 2 feet of probe rod penetrations along both sides of Pier 1.
- ⑤ The channel bottom on the upstream east side of Pier 2 and the slopes at the abutments consisted of gravel with random accumulations of heavy riprap.
- ⑥ The channel bottom on the downstream east side of Pier 2 consisted of sandy infill with probe rod penetrations of 6 inches.
- ⑦ A heavy accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed around the upstream nose extending from the channel bottom to the waterline. The debris extended 10 feet upstream, 20 feet into the adjoining spans, along the east upstream half and along the entire west side of Pier 1.

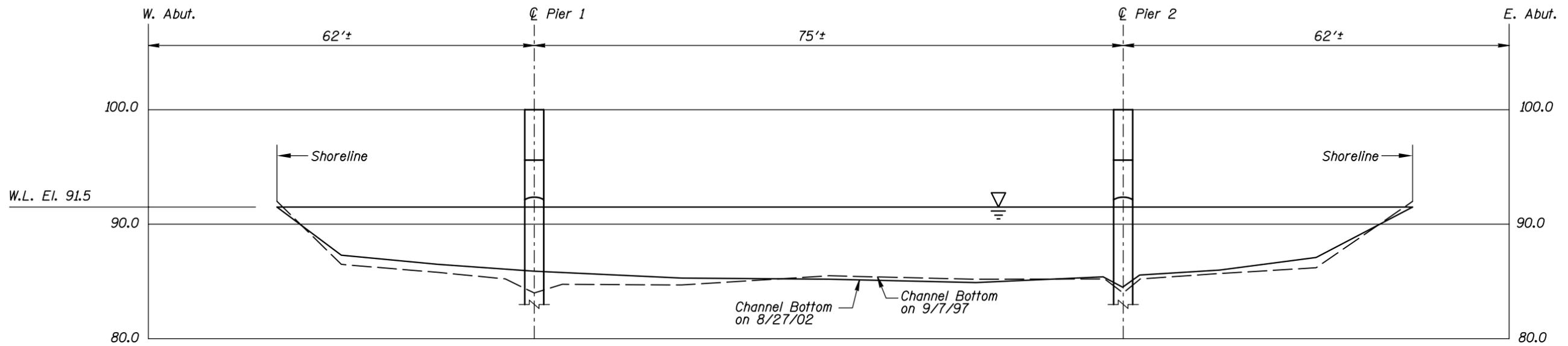


TYPICAL END VIEW OF PIERS

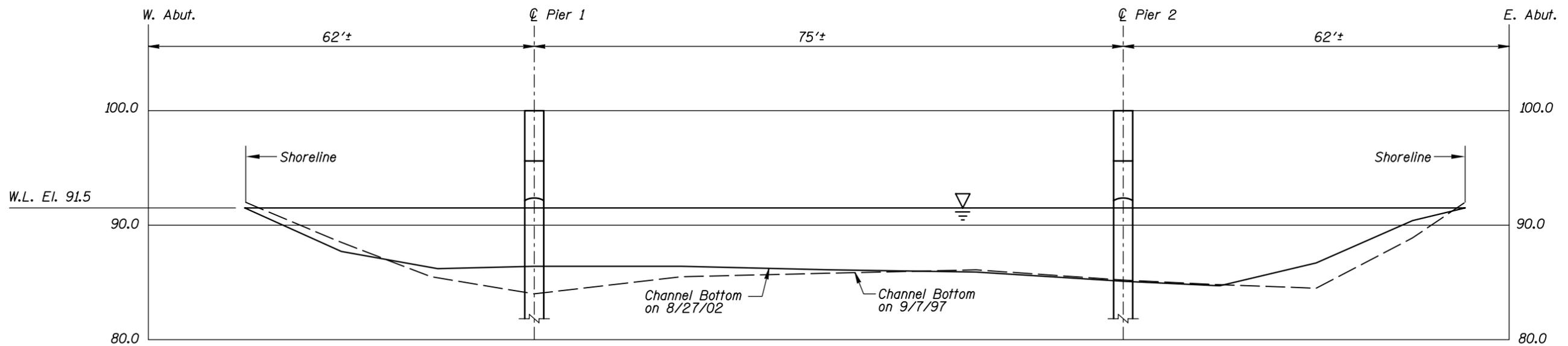
Legend

- 6.0 Sounding Depth from Waterline (8/27/02)
- 6.5 Sounding Depth from Waterline (9/7/02)
- Timber Debris
- Scour Depression

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| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. 57503 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY | | |
| INSPECTION AND SOUNDING PLAN | | |
| Drawn By: PRH | COLLINS ENGINEERS, INC. | Date: AUG. 2002 |
| Checked By: MDK | 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300 | Scale: NTS |
| Code: 35120164 | | Figure No.: 1 |



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:
Refer to Figure 1 for General Notes.

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|--|--|---------------------|
| MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION | | |
| STRUCTURE NO. 57503 OVER THE RED LAKE RIVER DISTRICT 2, PENNINGTON COUNTY | | |
| UPSTREAM AND DOWNSTREAM FASCIA PROFILES | | |
| Drawn By: PRH | COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300 | Date: AUG. 2002 |
| Checked By: MDK | | Scale: NTS (U.O.N.) |
| Code: 35I20I64 | | Figure No.: 2 |



Photograph 1. Overall View of the Structure, Looking Southeast.



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Northwest.



Photograph 4. View of Timber Debris at Pier 1, Looking East.

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: 57503

WEATHER: Sunny, " 75E F

WATERWAY CROSSED: The Red Lake River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Michelle D. Koerbel, Matt J. Lengyel

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

TIME IN WATER: 10:20 a.m.

TIME OUT OF WATER: 10:50 a.m.

WATERWAY DATA: VELOCITY " 1.5 f.p.s.

VISIBILITY " 2.5 feet

DEPTH 7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were in good condition. The channel bottom appeared stable with evidence of a minor scour depression at the upstream end of Pier 2. A heavy accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed around the upstream nose from the channel bottom to the waterline and extending 10 feet upstream, 20 feet into the adjacent spans, and along the sides of Pier 1. An 8 inch length of exposed reinforcing steel that was observed at the upstream end of Pier 1 during previous inspections could not be confirmed due to the heavy accumulations of timber debris.

FURTHER ACTION NEEDED: X YES NO

Remove the timber debris from around Pier 1 to alleviate further accumulations, scour influence, and excessive lateral loading on the pier.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 57503
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Red Lake River

INSPECTION DATE August 27, 2002
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 1 | 6.0' | N | 7 | N | 9 | N | 7 | 7 | 8 | 8 | 5 | 5 | 7 | N | N | N | N | |
| | Pier 2 | 7.0' | N | 8 | N | 9 | N | 8 | 7 | 8 | 8 | 8 | 7 | 8 | N | N | N | N | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were in good condition. The channel bottom appeared stable with evidence of a minor scour depression at the upstream end of Pier 2. A heavy accumulation of timber debris, which included timbers up to 1 foot in diameter, was observed around the upstream nose from the channel bottom to the waterline and extending 10 feet upstream, 20 feet into the adjacent spans, and along the sides of Pier 1. An 8 inch length of exposed reinforcing steel that was observed at the upstream end of Pier 1 during previous inspections could not be confirmed due to the heavy accumulations of timber debris.

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.