

UNDERWATER BRIDGE INSPECTION REPORT

---

STRUCTURE NO. 62580  
RASPBERRY ISLAND ROAD  
OVER THE  
MISSISSIPPI RIVER  
DISTRICT 9 - RAMSEY COUNTY

---



---

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

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete substructure units inspected at Bridge No. 62580, Piers 1, 2, 3 and 4, were found to generally be in good condition with no defects of structural significance observed. Typically, the concrete shafts were in good and sound condition and the submerged steel piles exhibited only light surface corrosion. The bottom of the concrete shaft of Pier 4 exhibited poorly formed concrete with some reinforcing steel protruding from the bottom of the shaft. The channel bottom appeared stable with no evidence of significant scour.

INSPECTION FINDINGS:

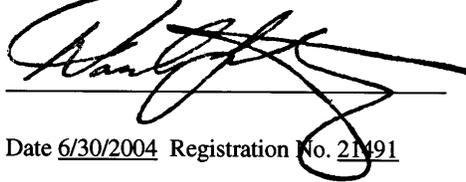
- (A) Typically, the concrete shafts of Piers 1 through 4 were in good and sound condition and extended to 2 feet below the waterline. The submerged steel piles exhibited light surface corrosion with rust nodules up to 1/16 inch in diameter.
- (B) Timber formwork and steel angles were observed at the base of the concrete shaft of Pier 4. The bottom of the concrete shaft was poorly formed and exhibited rough edges with steel reinforcing protruding from the bottom.
- (C) Minor timber debris was observed between Pier 4 and the shoreline and consisted of a tree with an 8 foot diameter root ball.
- (D) A minor accumulation of timber debris, with pieces up to 12 inches in diameter, was observed on the channel bottom randomly scattered throughout the piles of Pier 3.

RECOMMENDATIONS:

- (A) 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



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 62580

Feature Crossed: Mississippi River

Feature Carried: Raspberry Island Bridge

Location: District 9 – Ramsey County

Bridge Description: The bridge superstructure consists of a five span cast-in-place concrete slab with concrete overlay. The superstructure is supported by four concrete piers and two concrete abutments on steel H-piles. The piers are numbered 1 to 4 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: October 2, 2002

Weather Conditions: Cloudy, " 45E F

Underwater Visibility: " 0.5 feet

Waterway Velocity: " 1f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, 3, and 4.

General Shape: The piers each consist of an oblong rectangular concrete shaft with rounded or beveled noses, which extends approximately 2 feet below the waterline, where encased multiple steel H-piles extend down into the channel bottom.

Maximum Water Depth at Substructure Inspected: Approximately 8.2 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the shaft at Pier 2.

Water Surface: The waterline was approximately 11.1 feet below reference.

Assumed Waterline Elevation = 88.9

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

Item 60: Substructure: Code 7

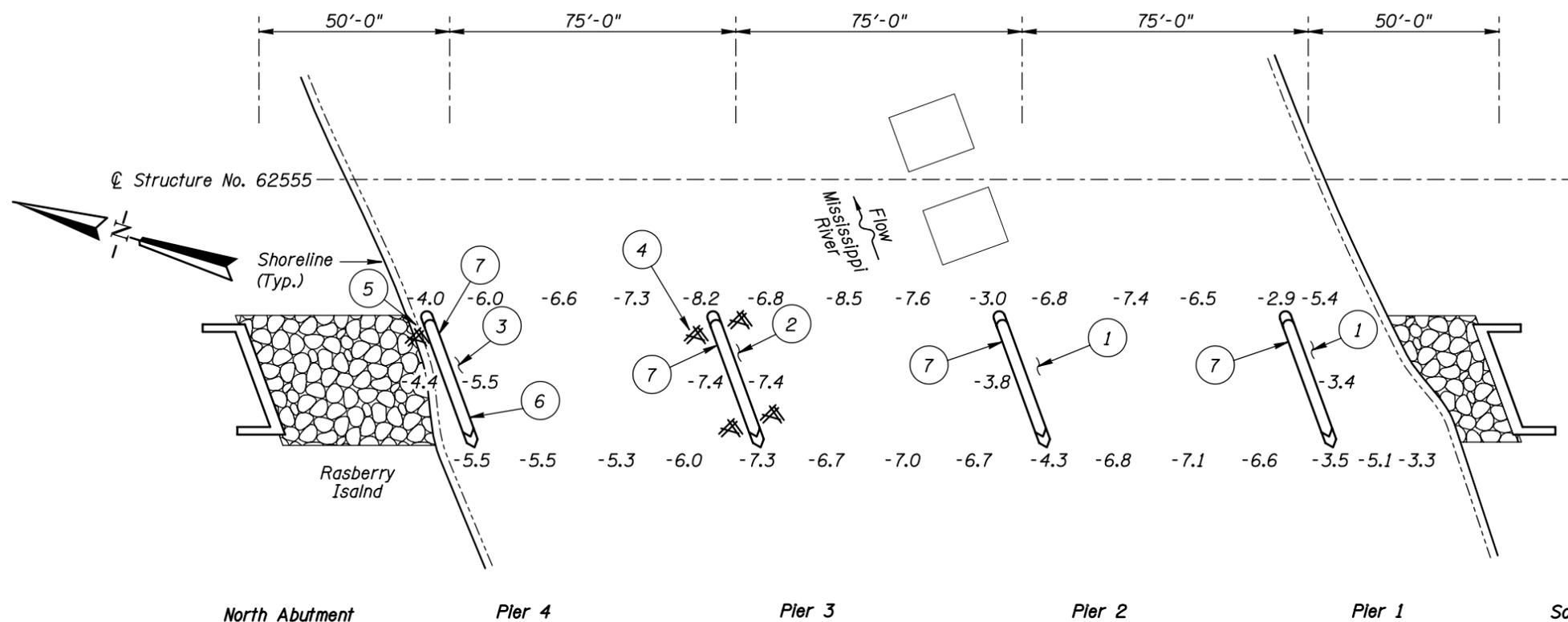
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/10/02

Item 113: Scour Critical Bridges: Code J/02

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

Yes  No



**GENERAL NOTES:**

1. Piers 1 through 4 were inspected underwater.
2. At the time of inspection on October 2, 2002, the waterline was located approximately 11.1 feet below the top of the shaft of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 88.9.
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.

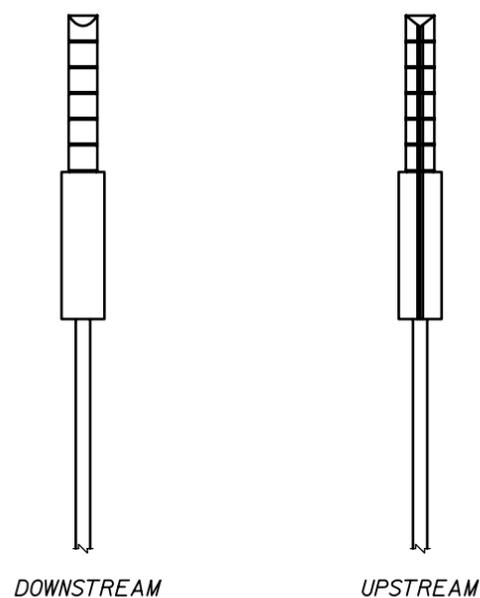
**SOUNDING PLAN**

**INSPECTION NOTES:**

- 1 The channel bottom consisted of 2 inch diameter gravel with random riprap at the upstream end.
- 2 The channel bottom consisted of sand with up to 6 inches of probe rod penetration.
- 3 The channel bottom consisted of 6 inch diameter cobbles and gravel.
- 4 A minor accumulation of timber debris, with pieces up to 12 inches in diameter, was observed on the channel bottom randomly scattered throughout the piles of Pier 3.
- 5 Minor timber debris was observed between Pier 4 and the shoreline and consisted of a tree with an 8 foot diameter root ball.
- 6 Timber formwork and steel angles were observed at the base of the concrete shaft of Pier 4. The bottom of the shaft was poorly formed with rough edges and reinforcing steel protruding from the base observed.
- 7 The concrete shaft was in good and sound condition and extended 2 feet below the waterline. The submerged steel piles exhibited light surface corrosion with rust nodules up to 1/16 inch in diameter.

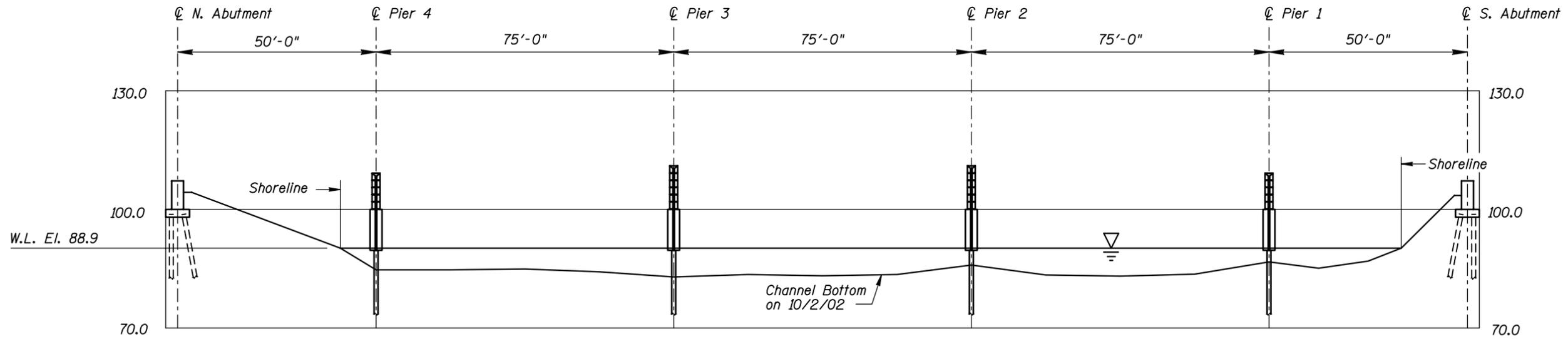
**Legend**

- 4.1 Sounding Depth from Waterline (10/2/02)
- ⊗ Timber Debris

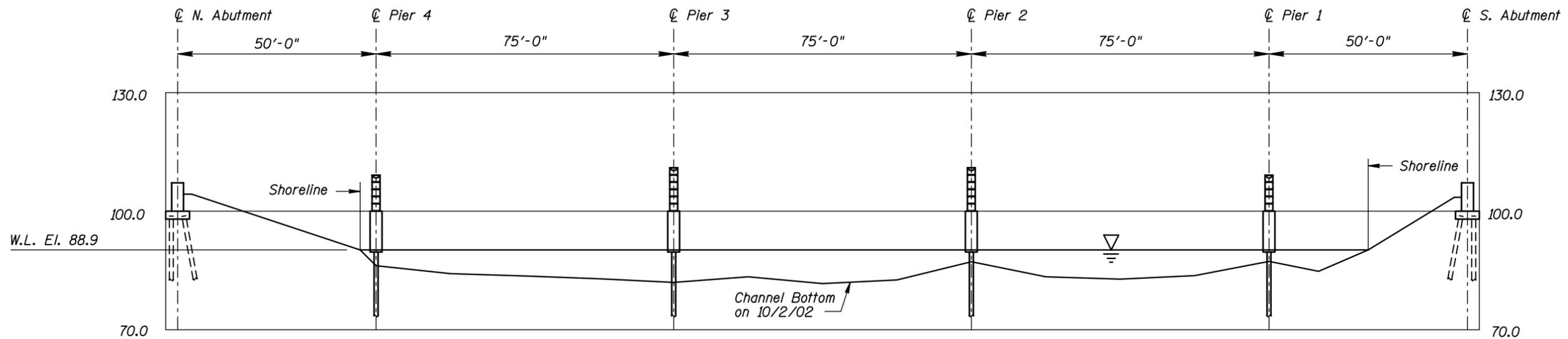


**TYPICAL END VIEW OF PIERS**

|                                                                                    |                                                                          |                 |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------|
| <b>MINNESOTA<br/>DEPARTMENT OF TRANSPORTATION<br/>UNDERWATER BRIDGE INSPECTION</b> |                                                                          |                 |
| STRUCTURE NO. 62580<br>OVER THE MISSISSIPPI RIVER<br>DISTRICT 9, WASHINGTON COUNTY |                                                                          |                 |
| <b>INSPECTION AND SOUNDING PLAN</b>                                                |                                                                          |                 |
| Drawn By: PRH                                                                      | <b>COLLINS ENGINEERS, INC.</b>                                           | Date: OCT. 2002 |
| Checked By: MDK                                                                    | 300 W. WASHINGTON, STE. 600<br>CHICAGO, ILLINOIS 60606<br>(312) 704-9300 | Scale: NTS      |
| Code: 35I262580                                                                    |                                                                          | Figure No.: 1   |



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

|                                                                                                                                          |                                                                          |                 |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------|
| <b>MINNESOTA<br/>DEPARTMENT OF TRANSPORTATION<br/>UNDERWATER BRIDGE INSPECTION</b>                                                       |                                                                          |                 |
| STRUCTURE NO. 62580<br>OVER THE MISSISSIPPI RIVER<br>DISTRICT 9, WASHINGTON COUNTY<br><b>UPSTREAM AND DOWNSTREAM<br/>FASCIA PROFILES</b> |                                                                          |                 |
| Drawn By: PRH                                                                                                                            | <b>COLLINS ENGINEERS, INC.</b>                                           | Date: OCT. 2002 |
| Checked By: MDK                                                                                                                          | 300 W. WASHINGTON, STE. 600<br>CHICAGO, ILLINOIS 60606<br>(312) 704-9300 | Scale: 1"=30'   |
| Code: 35I262580                                                                                                                          |                                                                          | Figure No.: 2   |



Photograph 1. Overall View of the Structure, Looking Southeast



Photograph 2. Overall View of Pier 1, Looking Southeast



Photograph 3. Overall View of Pier 2, Looking Northwest



Photograph 4. Overall View of Pier 3, Looking Southeast



Photograph 5. Overall View of Pier 4, Looking Northwest.

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

INSPECTORS: Collins Engineers, Inc. DATE: October 2, 2002  
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.  
BRIDGE NO: 62580 WEATHER: Cloudy, " 45E F  
WATERWAY CROSSED: Mississippi River  
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR  
OTHER

PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel  
EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera  
TIME IN WATER: 8:30 a.m.  
TIME OUT OF WATER: 10:10 a.m.  
WATERWAY DATA: VELOCITY " 1 fps  
VISIBILITY " 0.5 feet  
DEPTH 8.3 feet maximum at Pier 3

ELEMENTS INSPECTED: Piers 1, 2, 3, and 4

REMARKS: Overall, Piers 1 through 4 were in good condition with no structurally significant defects observed. The concrete shafts were in good condition and extended to approximately 2 feet below the waterline, and the submerged steel piles below the shafts exhibited only light surface corrosion with rust nodules up to 1/16 inch in diameter. The base of the concrete shaft of Pier 4 was poorly formed and exhibited rough edges with steel reinforcing protruding from the bottom. Minor accumulations of timber debris were observed on the channel bottom at Piers 3 and 4.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES  X  NO

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. 62580  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Shirley M. Walker, P.E.  
WATERWAY CROSSED Mississippi River

INSPECTION DATE October 2, 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           | 3.5'                   | 7            | 8                          | N        | 9            | N     | 7                                    | 8       | N                  | 9                     | N                    | 8                                      | 8        | 7     | N      | N               | N                              | N     |
|                    | Pier 2           | 4.3'                   | 7            | 8                          | N        | 9            | N     | 7                                    | 8       | N                  | N                     | N                    | 8                                      | 8        | 7     | N      | N               | N                              | N     |
|                    | Pier 3           | 8.2'                   | 7            | 8                          | N        | 9            | N     | 7                                    | 8       | N                  | N                     | 7                    | 7                                      | 8        | 7     | N      | N               | N                              | N     |
|                    | Pier 4           | 5.5'                   | 7            | 7                          | N        | 9            | N     | 7                                    | 8       | N                  | 9                     | 7                    | 7                                      | 7        | 7     | N      | N               | N                              | N     |

\*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 through 4 were in good condition with no structurally significant defects observed. The concrete shafts were in good condition and extended to approximately 2 feet below the waterline, and the submerged steel piles below the shafts exhibited only light surface corrosion with rust nodules up to 1/16 inch in diameter. The base of the concrete shaft of Pier 4 was poorly formed and exhibited rough edges with steel reinforcing protruding from the bottom. Minor accumulations of timber debris were observed on the channel bottom at Piers 3 and 4.

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.