

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6632
CSAH NO. 39
OVER THE
RED RIVER OF THE NORTH
DISTRICT 2 - NORMAN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 43)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 6632, Pier 1, was found to be in good condition below water with no defects of structural significance observed. A heavy accumulation of timber debris, however, was observed at the upstream nose of the pier. A notable amount of aggradation of channel bottom material was observed at the downstream nose of the pier since the last inspection. Although well beyond the scope of an underwater inspection, it should also be noted that the rocker bearings at the West Abutment were considerably rolled back towards the abutment wall at the time of the inspection.

INSPECTION FINDINGS:

- (A) A heavy accumulation of timber debris, consisting of logs and branches up to 2 feet in diameter, was observed at the upstream end of Pier 1 and extended from the channel bottom up to the waterline. In addition, a moderate accumulation of timber debris was observed around the entire perimeter of the pier.
- (B) The concrete of Pier 1 was typically in good condition with random areas of minor popouts and exposed aggregate on both faces.
- (C) The east bank of the channel exhibited heavy erosion that has resulted in an approximately 10 feet high vertical bank under the bridge.

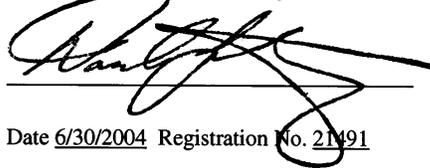
RECOMMENDATIONS:

- (A) Remove the accumulation of timber debris from around the perimeter of Pier 1 during routine maintenance, to inhibit further accumulation and restrict scour influence.

- (B) Reinspect the submerged substructure unit 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: 6632

Feature Crossed: The Red River of the North

Feature Carried: CSAH No. 39

Location: District 2 - Norman County

Bridge Description: The superstructure consists of a two-span, steel through truss. The superstructure is supported by two reinforced concrete abutments and one reinforced concrete pier. The abutments are supported by treated timber piles and the pier is supported by untreated timber piles.

2. INSPECTION DATA

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

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

Date: October 28, 2002

Weather Conditions: Cloudy, $\pm 35^{\circ}$ F

Underwater Visibility: Negligible/None

Waterway Velocity: ± 1.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1.

General Shape: The pier consists of two reinforced concrete columns connected by a full height concrete webwall. The pier is supported by a rectangular footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 12 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the curb at the upstream end of Pier 1.

Water Surface: The waterline was approximately 37.0 feet below reference.
Waterline Elevation = 842.0.

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

Item 60: Substructure: Code 7

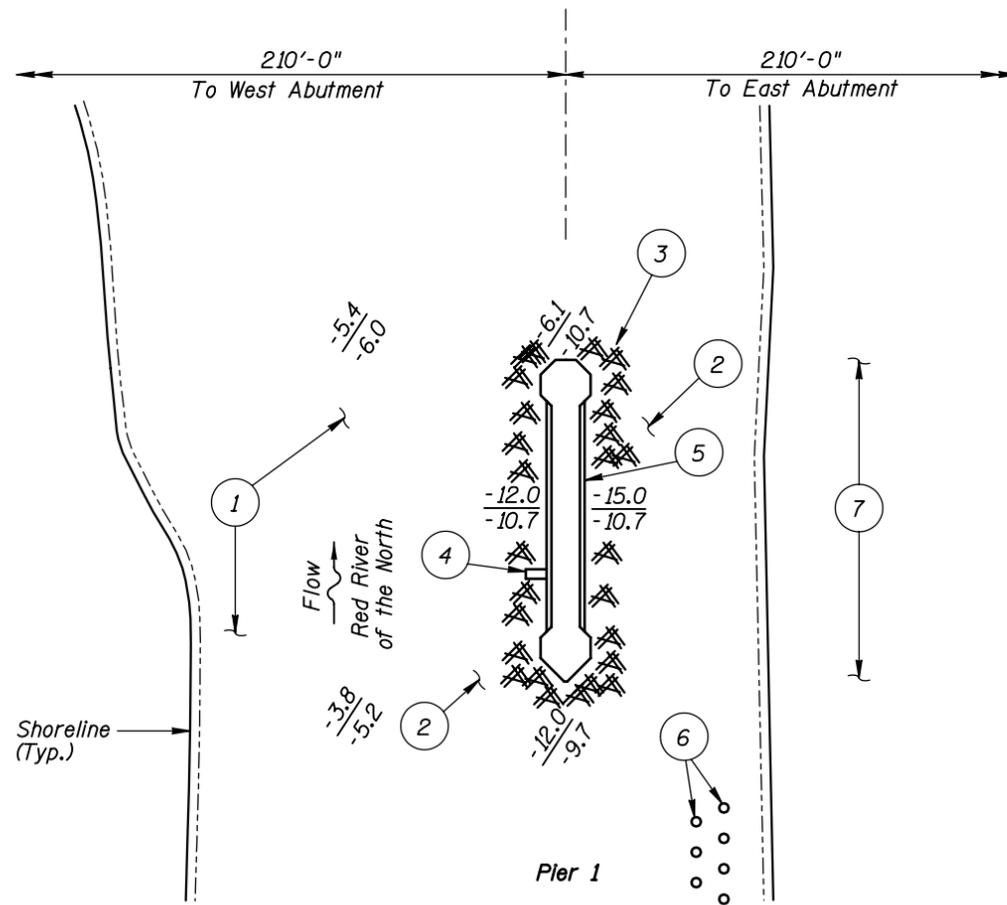
Item 61: Channel and Channel Protection: Code 5

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

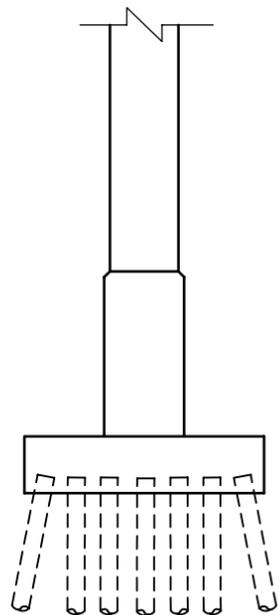
Item 113: Scour Critical Bridges: Code I/91

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

Yes No



SOUNDING PLAN



END VIEW OF PIER

GENERAL NOTES:

1. Pier 1 was inspected underwater.
2. At the time of inspection on October 28, 2002, the waterline was located approximately 37.0 feet below the top of the curb at the downstream end of Pier 1. This corresponds with a waterline elevation of 842.0 based on the previous report dated September 9, 1997.
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.

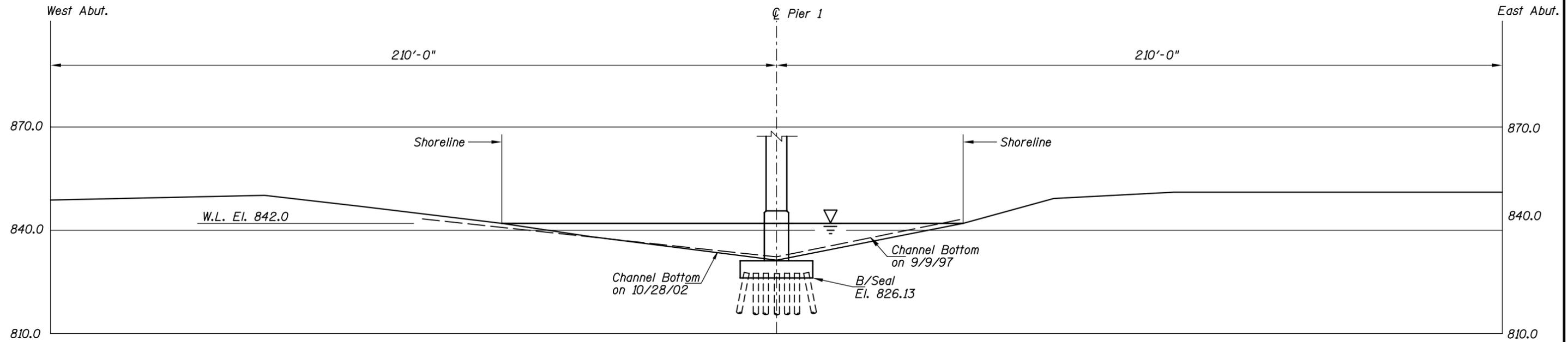
INSPECTION NOTES:

- 1 The channel bottom material consisted of silty clay with up to 1 foot of probe rod penetration.
- 2 The channel bottom material around the pier consisted of 2 inch diameter cobbles, gravel, and silty clay with up to 2 feet of probe rod penetration.
- 3 Moderate timber debris was observed around the entire perimeter of Pier 1, with a heavy accumulation at the upstream nose which extended from the channel bottom up to the waterline with pieces having a maximum diameter of 2 feet.
- 4 An I-beam was observed protruding through the pier face at the upstream 1/4 point on the west side, 2 feet above the channel bottom.
- 5 The concrete of the pier was typically in good condition with random areas of minor popouts and exposed aggregate on both faces.
- 6 Abandoned timber piles cut off 1 to 2 feet below the waterline were observed along the upstream east bank of the channel.
- 7 The east bank of the channel exhibited heavy erosion and resulted in an approximately 10 feet high vertical bank under the bridge.

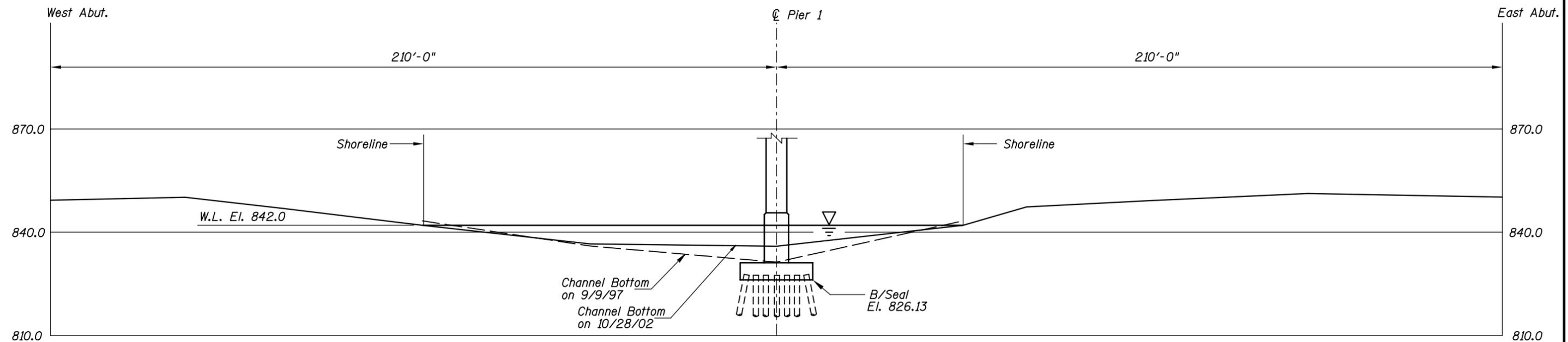
Legend

- 2.0 Sounding Depth from Waterline (10/28/02)
- 5.2 Sounding Depth from Waterline (9/9/97)
- Timber Pile
- ⊗ Timber Debris

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6632 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I20043		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6632 OVER THE RED RIVER OF THE NORTH DISTRICT 2, NORMAN COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	 COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: OCT. 2002
Checked By: MDK		Scale: 1"=30'
Code: 35I20043		Figure No.: 2



Photograph 1. Overall View of the West Bank, Looking Southwest.



Photograph 2. View of Pier 1, Looking South.



Photograph 3. Overall View of the East Bank, Looking East.



Photograph 4. View of the Timber Debris at the Upstream Nose of Pier 1, Looking West.



Photograph 5. View of the Rocker Bearing at the West Abutment, Looking North.



Photograph 6. View of the Rocker Bearing at the West Abutment, Looking North.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6632
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Red River of the North

INSPECTION DATE September 28, 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 (BRACING)	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	12.0'	N	7	N	9	N	7	8	N	N	5	5	8	N	N	9	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of Pier 1 was found to be in good condition below water with no defects of structural significance observed. A heavy accumulation of timber debris was observed around the upstream end of the pier, and moderate amounts of drift were present around the remainder of the pier. During the underwater inspection, it was noted that the rocker bearings at the West Abutment were rolled back towards the abutment wall at the time of the inspection. Given the cold temperatures during the inspection the rockers should have been rolled forward, which could be an indication of improper installation of the rocker bearings, or an indication of movement of the substructure units since the bridges original construction.

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.