

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 60019

MSAS NO. 119

OVER THE

RED LAKE RIVER

DISTRICT 2 - POLK COUNTY, CITY OF EAST GRAND FORKS



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 39)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 60019, Piers 6 and 7, were found to be in good condition with no defects of structural significance observed. Since the previous inspection, the footing exposure at the center and upstream columns of Pier 7 has increased in length and height with up to 3.4 feet of vertical exposure. A large accumulation of timber debris was observed at the upstream nose of Pier 7, which partially hindered the inspection of the pier. The channel bottom around the substructure units consisted of firm material, which appeared stable with no significant scour at the time of the inspection. Since the last inspection, there has been some degradation around Pier 6.

INSPECTION FINDINGS:

- (A) The concrete surface of both piers was found to be in good condition with no significant structural defects observed.
- (B) The top of the footing of the upstream column at Pier 7 was exposed around the entire column with a maximum vertical face exposure of 3.4 feet along the south face of the column footing. The west side of the column footing could not be accessed due to a heavy accumulation of timber debris.
- (C) The top of the footing of the center column of Pier 7 was exposed for a length of 6 feet along the south face with up to 11 inches of vertical face exposure.

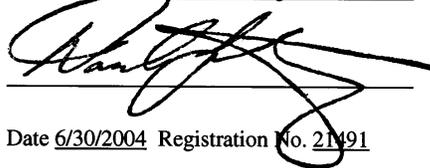
- (D) A heavy accumulation of timber debris, consisting of 1 to 2 feet diameter logs, was observed at the upstream end of Pier 7 and extended from the channel bottom to 6 feet above the waterline. The timber debris extended from the upstream end of Pier 7 to the north shoreline and along the shore to the center column of the pier. There was also light drift at Pier 6 and around the remainder of Pier 7.
- (E) The downstream column of Pier 6 exhibited a local scour depression that measured 2 feet of deep by approximately 3 feet in radius.

RECOMMENDATIONS:

- (A) Remove the heavy accumulation of timber debris at the upstream nose of Pier 7 during routine maintenance.
- (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.

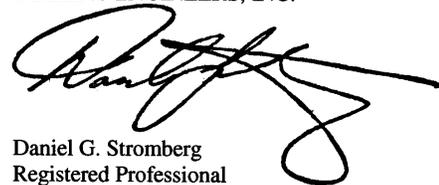
Daniel G. Stromberg



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: 60019

Feature Crossed: The Red Lake River

Feature Carried: MSAS No. 119

Location: District 2 - Polk County, City of East Grand Forks

Bridge Description: The bridge superstructure consists of twelve spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments, four reinforced concrete piers, and seven steel bent piers. All of the concrete substructure footings are supported by steel H-piles. The piers are numbered 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 28, 2002

Weather Conditions: Rain and Snow, $\pm 35^{\circ}$ F

Underwater Visibility: ± 0.5 feet

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 6 and 7

General Shape: The piers each consist of three cylindrical reinforced concrete columns supporting a rectangular reinforced concrete pier cap. The upper portion of the columns is connected by slender reinforced concrete diaphragms and each column is supported by a square footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 7.

Water Surface: The waterline was approximately 31.0 feet below reference.
Waterline Elevation = 800.0.

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

Item 60: Substructure: Code 7

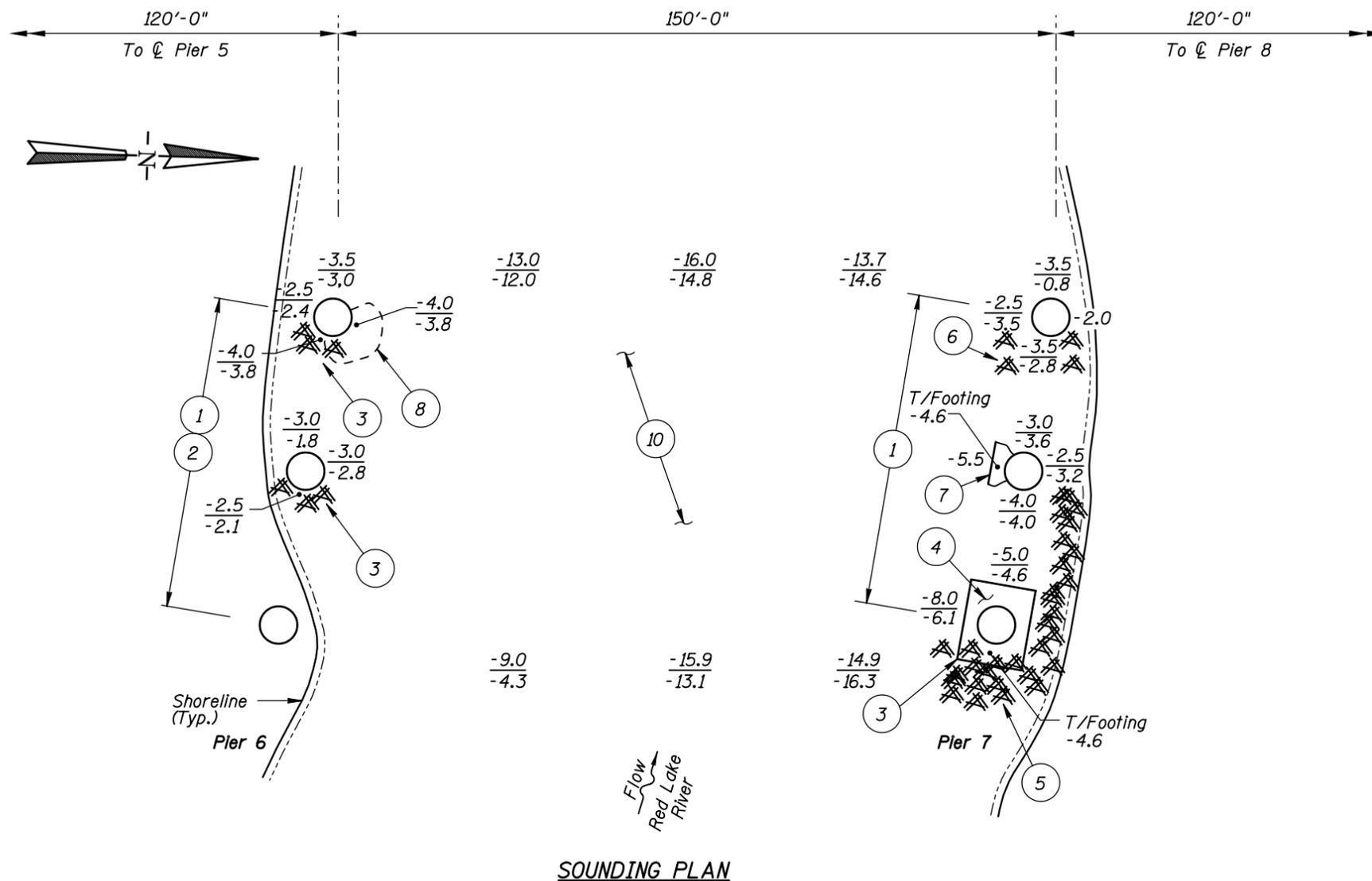
Item 61: Channel and Channel Protection: Code 5

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

Item 113: Scour Critical Bridges: Code F/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:

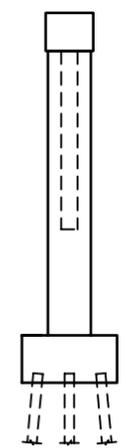
1. Piers 6 and 7 were inspected underwater.
2. At the time of inspection on October 28, 2002, the waterline was located approximately 31.1 feet below the top of the pier cap at the downstream end of Pier 7. This corresponds to a waterline elevation of 800.0 based on the previous report dated September 6, 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 Overall, the concrete piers were found to be in good and sound condition with no significant deterioration.
- 2 The bottom of the web wall of the pier was located approximately 3 inches above the waterline.
- 3 A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed at the upstream sides of both the center and downstream columns of the pier.
- 4 The top of the footing of the upstream column of Pier 7 was exposed around the entire column with a maximum vertical face exposure of 3.4 feet along the south face of the column footing. The west side of the column footing could not be accessed due to a heavy accumulation of timber debris.
- 5 A heavy accumulation of timber debris, consisting of 1 to 2 foot diameter logs, was observed around the upstream end of the pier and extended from the channel bottom up to approximately 6 feet above the waterline. The timber debris extended from the pier to the north shore and from the upstream column to the center column of the pier.
- 6 A light accumulation of timber debris, consisting of 6 to 8 inch diameter branches, was observed around the downstream column of Pier 7.
- 7 The top of the footing of the center column of Pier 7 was exposed along the south face for 6 feet with up to 11 inches of vertical face exposure.
- 8 The downstream column of the pier exhibited a local scour depression that measured 2 feet deep by approximately 3 feet in radius.
- 9 The channel bottom consisted of hard packed silt with up to 3 inches of probe rod penetration.

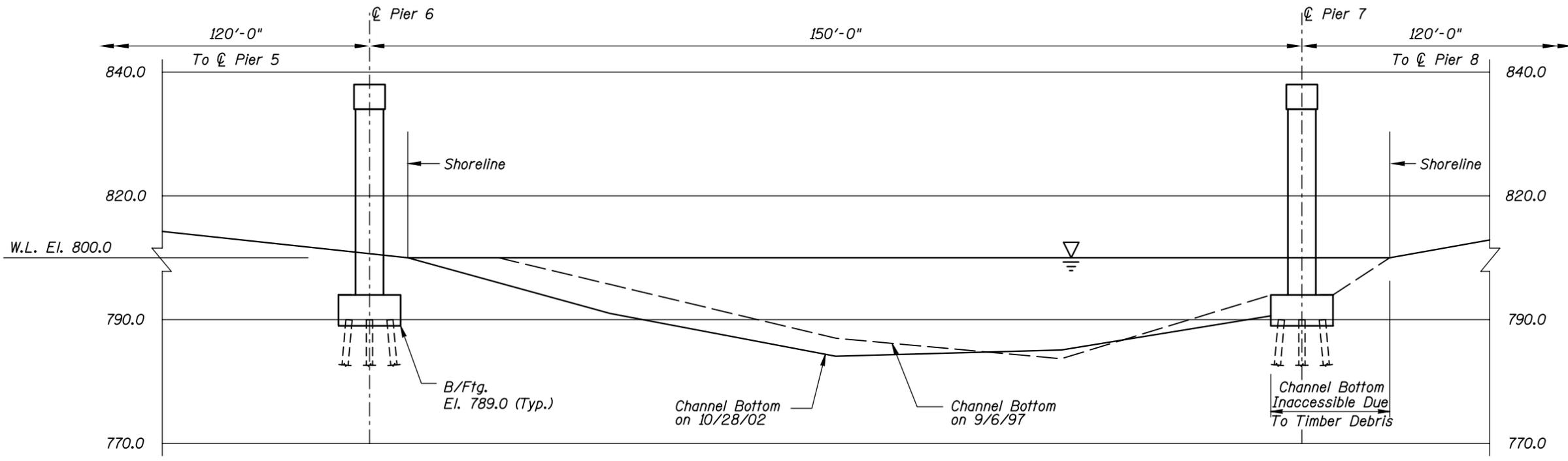
Legend

- 2.0 Sounding Depth from Waterline (10/28/02)
- 5.2 Sounding Depth from Waterline (9/6/97)
- Timber Debris
- Scour Depression

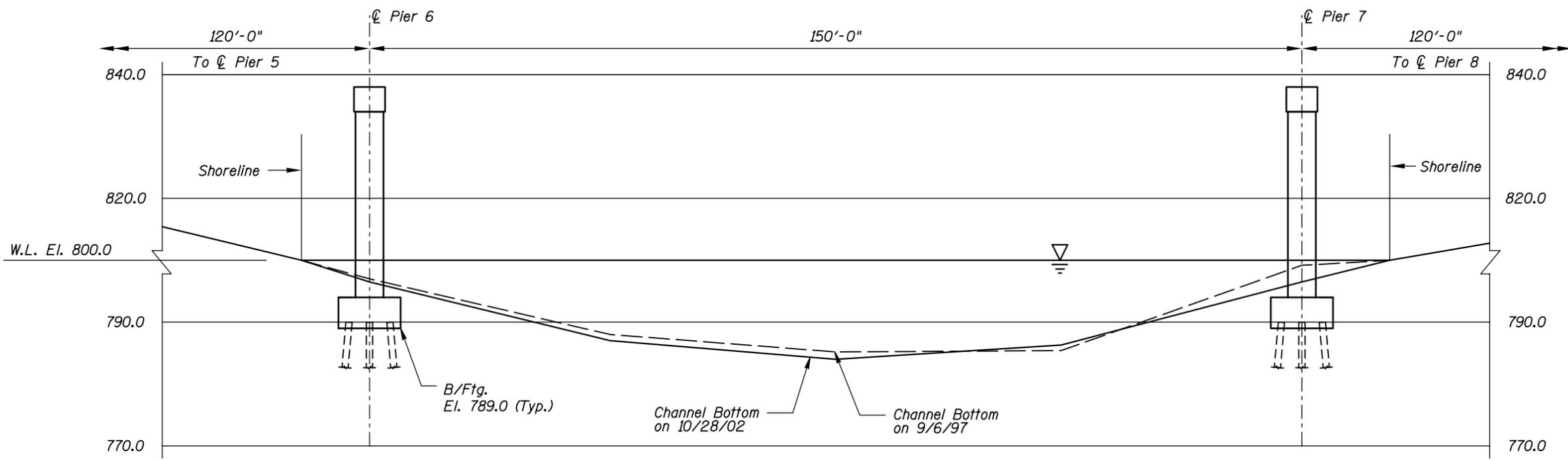


TYPICAL END VIEW OF PIERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 60019 OVER THE RED LAKE RIVER DISTRICT 2, POLK COUNTY, CITY OF EAST GRAND FORKS		
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: 35120039		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. 60019 OVER THE RED LAKE RIVER DISTRICT 2, POLK COUNTY, CITY OF EAST GRAND FORKS		
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"=20'
Code: 35120039		Figure No.: 2



Photograph 1. View of the Structure, Looking Southwest.



Photograph 2. Overall View of Pier 6, Looking Southwest.



Photograph 3. Overall View of Pier 7, Looking Northeast.



Photograph 4. Overall View of Pier 8, Looking Northwest.



Photograph 5. View of Timber Debris at the Upstream Nose of Pier 7, Looking West.



Photograph 6. View of Timber Debris at the Upstream Nose of Pier 7, Looking Southeast.



Photograph 7. View of Erosion of the South Bank at Pier 6, Looking Northeast.



Photograph 8. View of Timber Debris at the Pier Cap of Pier 6, Looking North.

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

INSPECTORS: Collins Engineers, Inc. DATE: October 28, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 60019 WEATHER: Rain/Snow, " 35° F
WATERWAY CROSSED: The Red Lake 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: 8:50 A.M.

TIME OUT OF WATER: 9:35 A.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY " 0.5 feet

DEPTH 8 feet maximum at Pier 7

ELEMENTS INSPECTED: Piers 6 and 7

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. The footing of Pier 7 was exposed at the center and upstream columns with a maximum vertical face exposure of 3.4 feet at the upstream column at the time of the inspection. A large accumulation of timber debris consisting of 1 to 2 feet diameter logs was observed at the upstream and center columns of Pier 7. There was also light drift at Pier 6. The channel bottom consisted of firm material, which appeared stable with no significant scour at the time of the inspection.

FURTHER ACTION NEEDED: X YES _____ NO

Remove the heavy accumulation of timber debris at the upstream nose of Pier 7 during routine maintenance.

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. 60019
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED Red Lake River

INSPECTION DATE October 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 6	4.0'	N	8	N	9	N	8	6	7	7	7	7	8	N	N	N	N	N
	Pier 7	8.0'	N	8	7	9	N	7	6	7	7	5	5	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. The footing of Pier 7 was exposed at the center and upstream columns with a maximum vertical face exposure of 3.4 feet at the upstream column at the time of the inspection. A large accumulation of timber debris consisting of 1 to 2 feet diameter logs was observed at the upstream and center columns of Pier 7. There was also light drift at Pier 6. The channel bottom consisted of firm material, which appeared stable with no significant scour at the time of the inspection.

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.