

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)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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 in to 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.

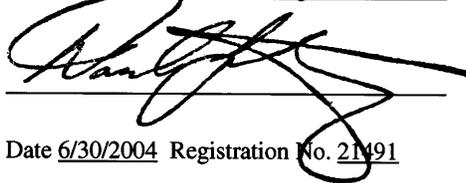
RECOMMENDATIONS:

- (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

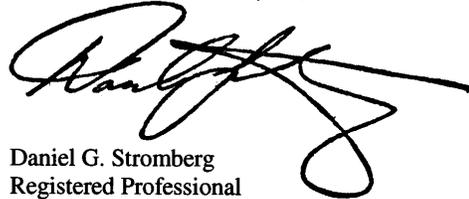


A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

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: 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, " 80E F

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

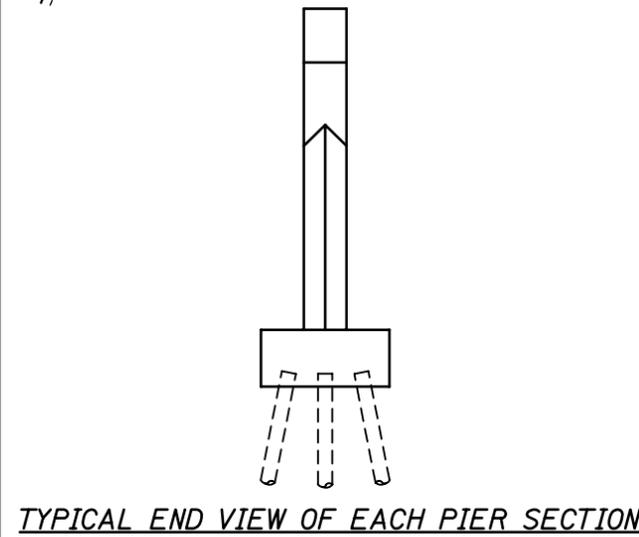
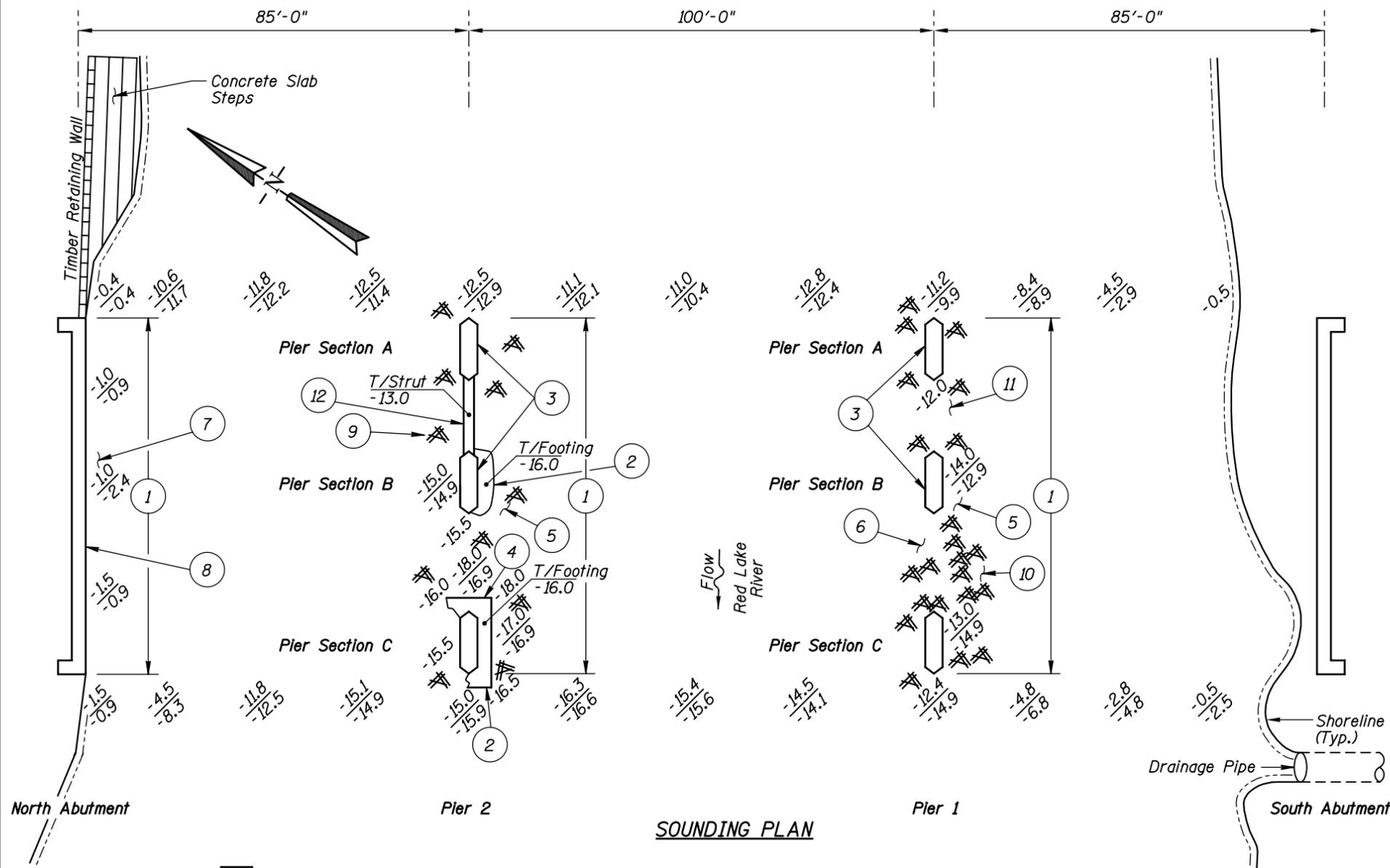
Item 61: Channel and Channel Protection: Code 6

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 No



GENERAL NOTES:

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 1115.1 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 as well as around the pier structures.

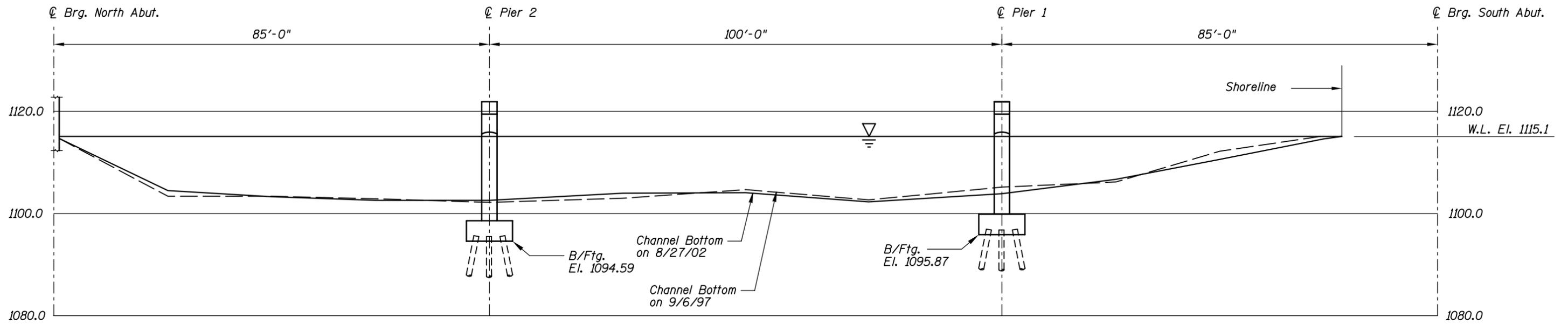
INSPECTION NOTES:

- 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 B of Pier 2.
- 3 Light scaling was observed on the shafts of Sections A and B from the waterline to 1 foot below the waterline with a maximum penetration of 1/4 inch.
- 4 Timber formwork was observed around the footing at Section C of Pier 2.
- 5 The channel bottom consisted of sand, gravel and cobbles with 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 cobbles 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 channel bottom to 2 feet above the channel bottom.
- 10 A heavy accumulation of 1-foot-timber debris was observed from 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 strut connecting Sections A and B of Pier 2 exhibited 3 feet of vertical exposure.

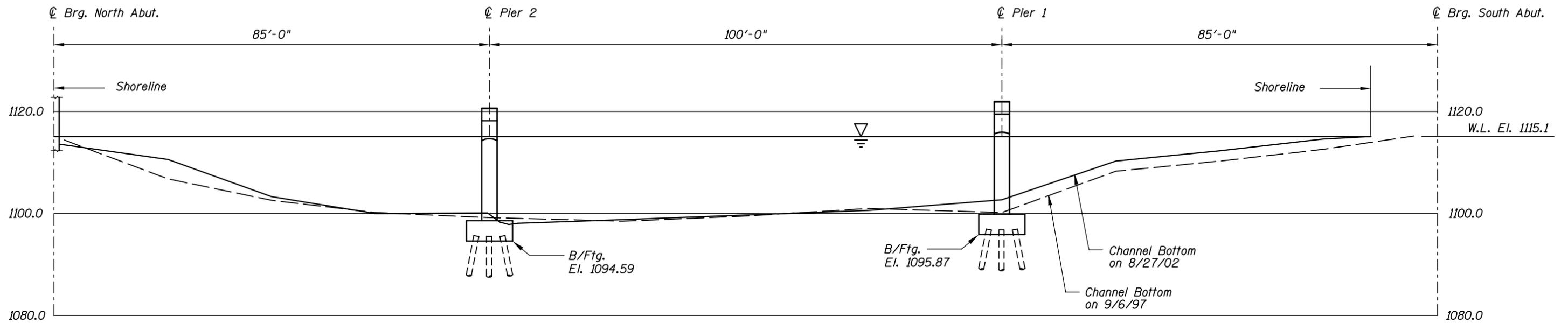
Legend

- 0.4 Sounding Depth from Waterline (8/27/02)
- 0.4 Sounding Depth from Waterline (9/6/97)
- Timber Debris

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 6613 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: 35120037		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. 6613 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: 1"=20'
Code: 35120037		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Northeast.



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, " 80EF

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.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6613
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	14'	N	7	N	9	N	7	7	N	N	6	6	7	N	N	N	N	
	Pier 2	18'	N	7	7	9	N	7	5	N	N	7	5	7	N	N	N	N	
	North Abutment	1.5'	N	7	N	9	N	7	8	8	8	9	8	7	N	N	N	N	

*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.