UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 57518

CSAH NO. 3

OVER THE

RED LAKE RIVER

DISTRICT 2 - PENNINGTON COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 9A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 57518, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. The channel bottom consisted of firm material which was well established and stable with no evidence of scour.

INSPECTION FINDINGS:

(A) The surfaces of the concrete filled steel pipe piles were painted with a protective coating and were in good condition.

(B) Light to moderate accumulations of timber debris were encountered at both piers. There was also a heavy accumulation of grassy vegetation from the waterline to the channel bottom at the upstream end of both piers.

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: 57518

Feature Crossed: The Red Lake River

Feature Carried: CSAH No. 3

Location: District 2 - Pennington County

Bridge Description: The superstructure consists of three spans of multiple precast concrete beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two concrete filled steel pipe pile piers. The piers are numbered 1 and 2 starting from the west end of the bridge. No design drawings were available.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 26, 2002

Weather Conditions: Sunny, ± 85^{o} F

Underwater Visibility: ± 2.0 feet

Waterway Velocity: ± 2.5 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of a single row of six concrete filled steel pipe piles. The piles at each end are battered in the direction parallel to the pier. The piles support a rectangular reinforced concrete pile cap with rounded ends.

Maximum Water Depth at Substructure Inspected: Approximately 10.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap on the south side of Pier 1.

Water Surface: The waterline was approximately 9.0 feet below reference.
Assumed Waterline Elevation = 91.0.

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

Item 60: Substructure: Code 7

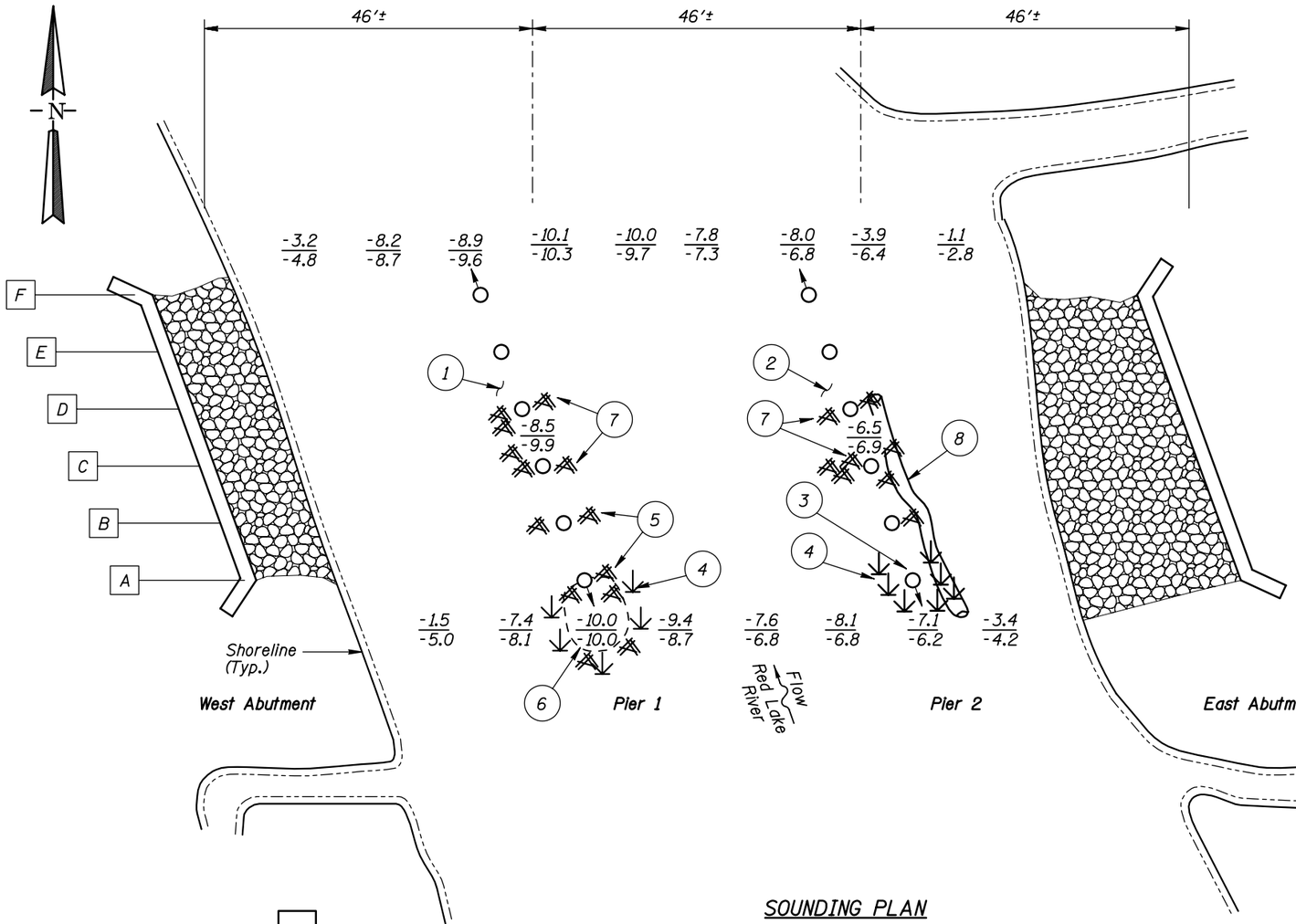
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/02

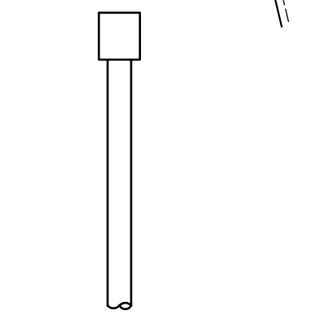
Item 113: Scour Critical Bridges: Code G/97

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

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF BENTS

GENERAL NOTES:

1. Bents 1 and 2 were inspected at this bridge.
2. At the time of inspection on August 26, 2002, the waterline was located approximately 9.0 feet below the top of the pile cap on the upstream end of Pier 1. Design plans were not available, therefore a reference of 100.0 was assumed. Based on the assumed reference the waterline elevation was 91.0.
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.
5. The protective coating exhibited up to 10% of coating failure with half of the failure area showing very light surface corrosion and the other half exposing the primer.

INSPECTION NOTES:

(1) The channel bottom material around Pier 1 consisted of sandy gravel with 3 inches of probe rod penetration.

(2) The channel bottom material around Pier 2 consisted of sand with 12 inches of probe rod penetration.

(3) Area of soft, sandy infilling with 1 to 1.5 feet probe rod penetration was located at the downstream side of Pile A at Pier 2.

(4) A moderate (Pier 1) to heavy (Pier 2) accumulation of grassy vegetation was observed at the upstream nose of both piers, 5 feet wide by 4 feet long, extending from the waterline to channel bottom.

(5) Up to 3 inch diameter timber debris and organic material was observed around the two upstream piles of Pier 1 and extended from the waterline to the mudline and 4 feet out from the piles.

(6) A 6 foot diameter by 1-1/2 foot deep scour depression was observed around the upstream pile of Pier 1.

(7) Up to 3 inch diameter timber drift and organic material was observed around Piles C and D of Pier 1 and around Piles B, C, and D of Pier 2. The drift and organic material extended from the waterline to the mudline and 2 feet out from the piles.

(8) A 1 foot diameter log on the east side of Pier 2 extended from the the downstream fascia of Pier 2 to Pile D of Pier 2.

Legend

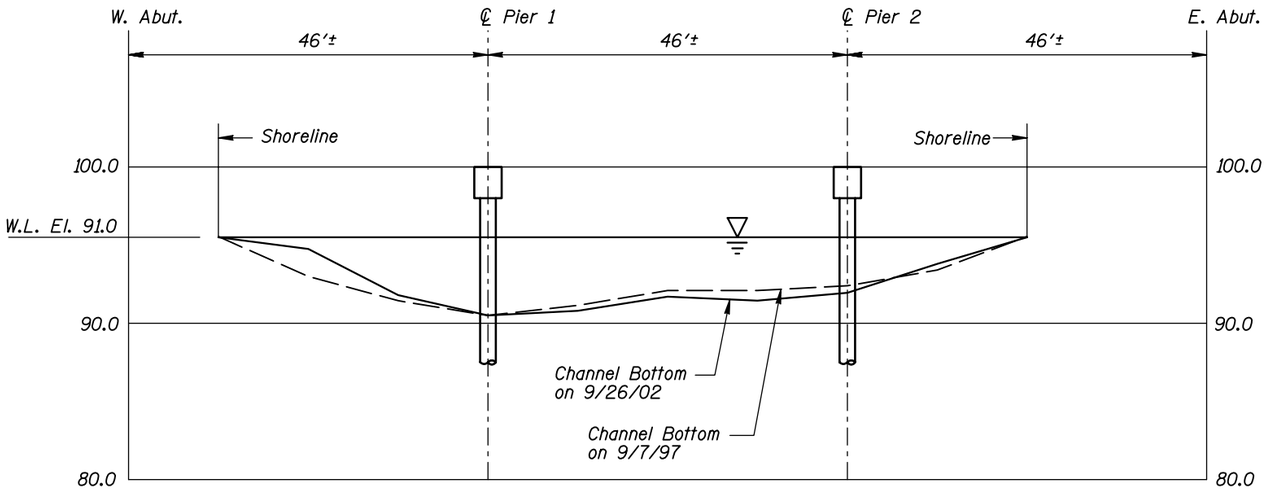
-8.0 / -6.8	Sounding Depth from Waterline (8/26/02) / (9/7/97)
○	Steel Pile
○→	Battered Steel Pile
A	Pile Designation Identification
↓	Grassy Vegetation
	Riprap
	Scour Depression
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

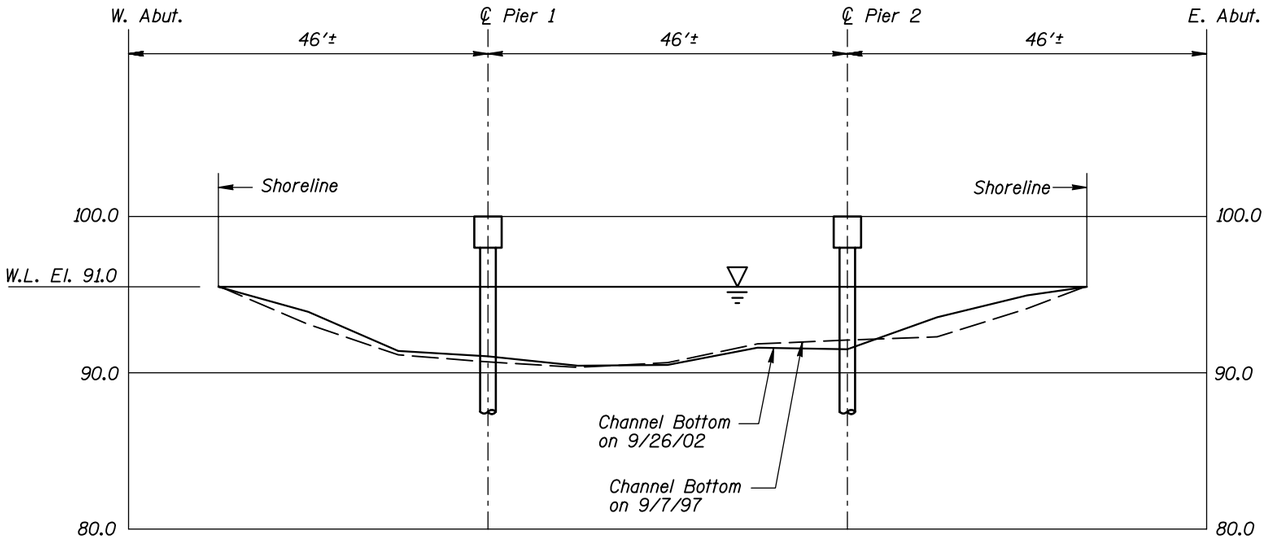
STRUCTURE NO. 57518
OVER THE RED LAKE RIVER
DISTRICT 2, PENNINGTON COUNTY

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: 35I2009A		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=20'
Code: 3512009A		Figure No.: 2

Photograph 1. Overall View of Structure, Looking Southwest.

Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking Northwest.

Photograph 4. View of Debris at the Upstream Pile of Pier 1, Looking East.

Photograph 5. View of Debris at Piles C and D of Pier 1, Looking Northeast.

Photograph 6. View of Debris Along Pier 2, Looking West.

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

INSPECTORS: Collins Engineers, Inc. DATE: August 26, 2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 57518 WEATHER: Sunny, "85° F
WATERWAY CROSSED: The Red Lake River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 2:30 P.M.
TIME OUT OF WATER: 3:00 P.M.
WATERWAY DATA: VELOCITY "2.5 fps
VISIBILITY "2.0 Feet
DEPTH 10.0 feet maximum at Pier 1
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, the piers were in good condition with 10% coating failure from 2 to 3 feet below the waterline to the waterline, exposing the primer coating and some very light surface corrosion. A 3 foot diameter by 1.5 foot deep scour depression was observed at the upstream pile of Pier 1. Both Piers 1 and 2 had accumulations of 3 inch diameter and smaller timber debris with organic material intermixed around the upstream piles, that extended from the channel bottom to the waterline and up to 4 feet away from the piles. A 1 foot diameter log was observed along the four upstream piles of Pier 2.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Ideally, remove timber debris and organic material during regular maintenance of 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. 57518
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Red Lake River

INSPECTION DATE August 26, 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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	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
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	10.0’	7	N	N	9	N	7	7	N	8	6	7	N	7	N	8	N	N
	Pier 2	8.0’	7	N	N	9	N	7	8	N	8	7	8	N	7	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the piers were in good condition with 10% coating failure from 2 to 3 feet below the waterline to the waterline, exposing the primer coating and some very light surface corrosion. A 3 foot diameter by 1.5 foot deep scour depression was observed at the upstream pile of Pier 1. Both Piers 1 and 2 had accumulations of 3 inch diameter and smaller timber debris with organic material intermixed around the upstream piles, that extended from the channel bottom to the waterline and up to 4 feet away from the piles. A 1 foot diameter log was observed along the four upstream piles of Pier 2.

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.