

UNDERWATER BRIDGE INSPECTION REPORT

---

STRUCTURE NO. 36516

UT NO. 79

OVER

BEAVER BROOK

DISTRICT 1 - KOOCHICHING COUNTY

---



---

PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY  
COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 5A)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected below water at Bridge No. 36516, Pier 1, was found to be in good condition with no defects of structural significance observed. The channel bottom appeared stable with no significant scour and no significant changes since the last inspection.

INSPECTION FINDINGS:

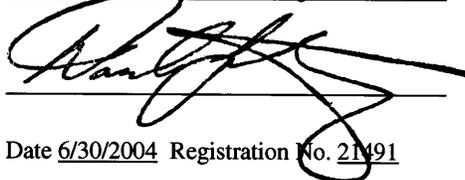
- (A) Random areas of coating failure and light surface corrosion were observed on all piles with some minor pitting, but with no significant section loss or other defects observed.
- (B) There was some light timber drift on the channel bottom scattered amongst the pier piles.

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.

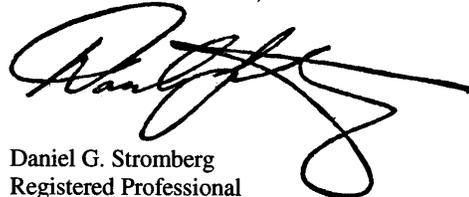
Daniel G. Stromberg



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: 36516

Feature Crossed: Beaver Brook

Feature Carried: UT No. 79

Location: District 1 - Koochiching County

Bridge Description: The superstructure consists of two spans of reinforced concrete beams and deck, which is supported by two reinforced concrete abutments and one steel shell pile pier.

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 24, 2002

Weather Conditions: Sunny,  $\pm 77^{\circ}$  F

Underwater Visibility:  $\pm 2.0$  Foot

Waterway Velocity:  $\pm 1.0$  fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1.

General Shape: Pier 1 consists of six concrete filled steel shell piles supporting a reinforced concrete cap.

Maximum Water Depth at Substructure Inspected: Approximately 2.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the east end of Pier 1.

Water Surface: The waterline was approximately 12.8 feet below reference.  
Waterline Elevation = 1114.7.

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

Item 60: Substructure: Code 7

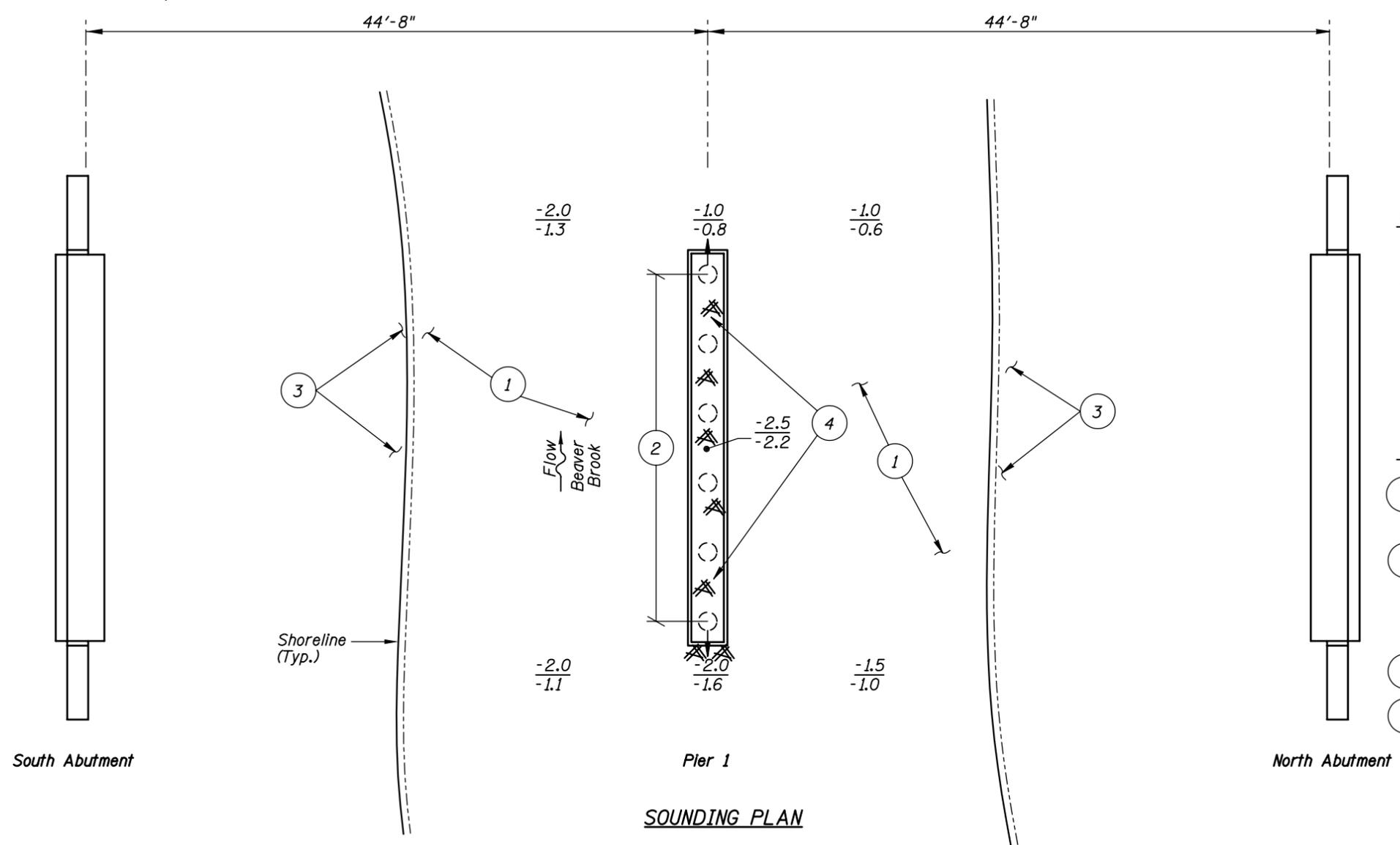
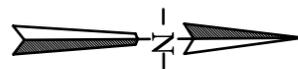
Item 61: Channel and Channel Protection: Code 7

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

Item 113: Scour Critical Bridges: Code I/92

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

\_\_\_\_\_ Yes  X  No



**GENERAL NOTES:**

1. Pier 1 was inspected underwater.
2. At the time of inspection on August 24, 2002, the waterline was located approximately 12.8 feet below the top of pier cap at upstream fascia of Pier 1. This corresponds with a waterline elevation of 114.7 feet based on previous report dated August 21, 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:**

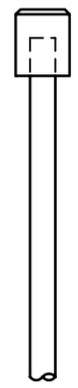
- 1 The channel material consisted of silty sand and random scattered riprap with a maximum probe rod penetration of 6 inches.
- 2 Up to 50 percent coating failure and up to 25 percent nodular corrosion ranging in size from 1/4 inch to 1 inch in diameter was observed from 1-1/2 feet above the waterline to the mudline on all of the steel pipe piles. Typical pitting under the nodules was 1/32 inch with some pitting up to 1/16 inch.
- 3 The banks consisted of 6 inch to 3 feet diameter riprap.
- 4 Light timber debris consisting of logs ranging from 6 inches to 1 foot in diameter were observed among the piles.

South Abutment

Pier 1

North Abutment

**SOUNDING PLAN**

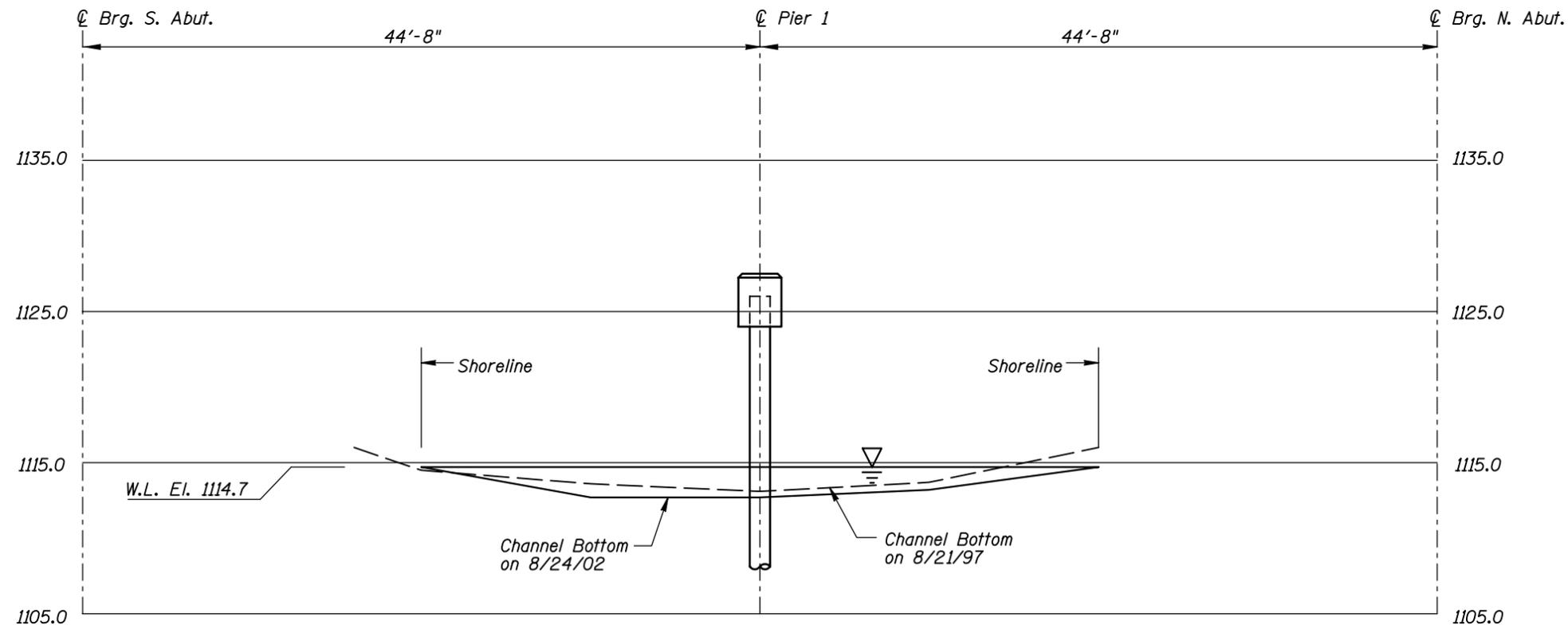


**TYPICAL END VIEW OF PIER**

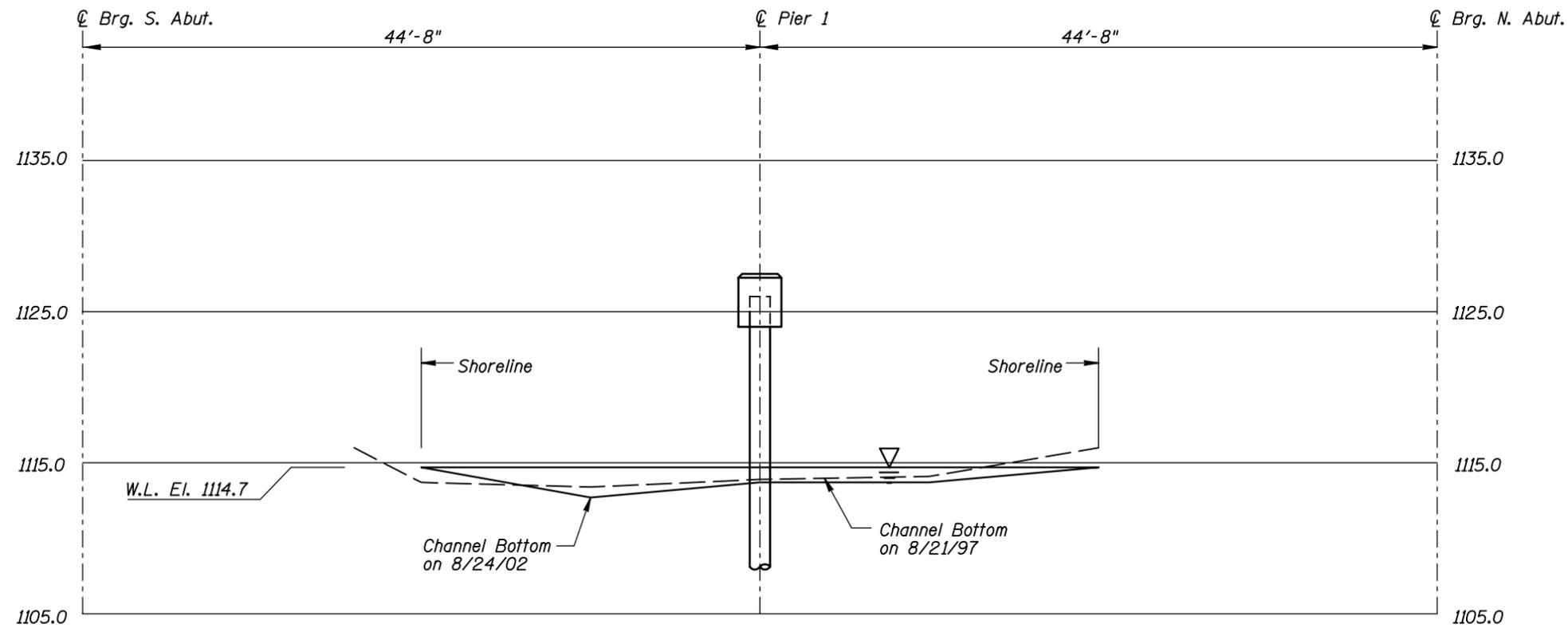
**Legend**

- 2.0 Sounding Depth from Waterline (8/24/02)
- 1.3 Sounding Depth from Waterline (8/21/97)
- Cast-In-Place Concrete Pile
- Cast-In-Place Concrete Battered Pile
- ⌘ Timber Debris

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 36516 OVER BEAVER BROOK DISTRICT 1, KOOCHICHING COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: PRH	<b>COLLINS ENGINEERS, INC.</b>	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I2005A		Figure No.: 1



**UPSTREAM FASCIA PROFILE**



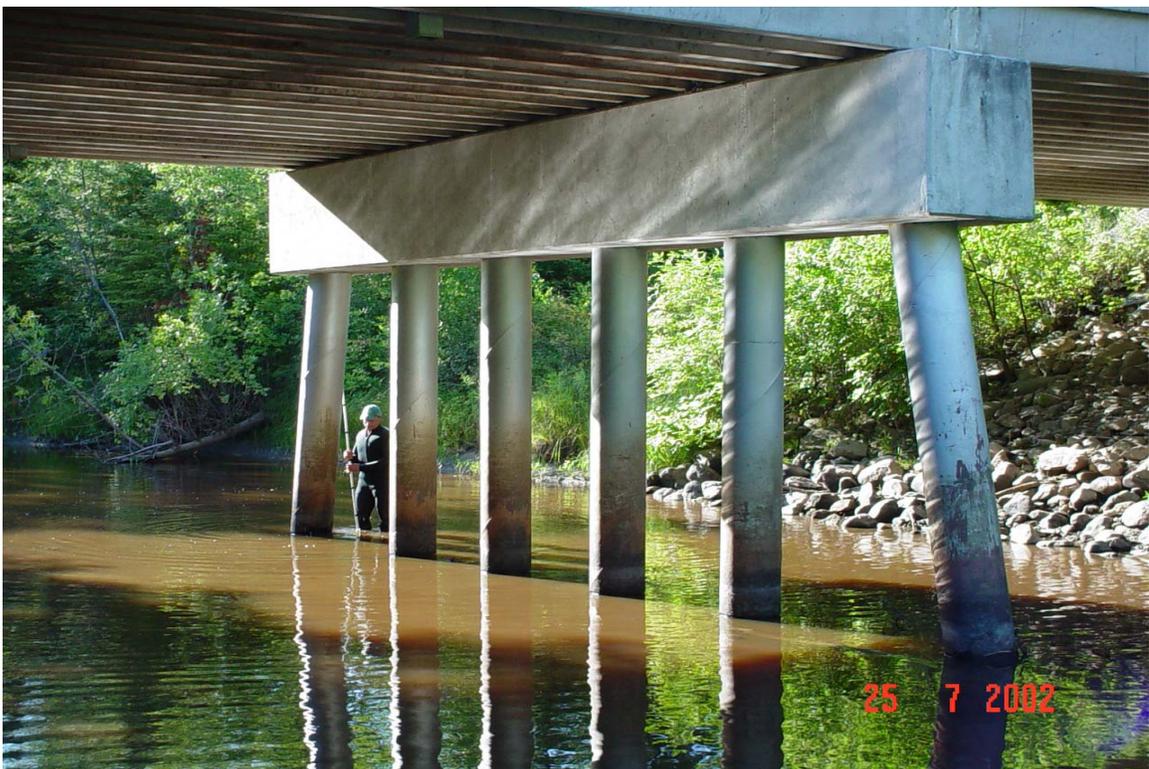
**DOWNSTREAM FASCIA PROFILE**

*Note:*  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 36516 OVER BEAVER BROOK DISTRICT 1, KOOCHICHING COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: PRH	 <b>COLLINS ENGINEERS, INC.</b> 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: AUG. 2002
Checked By: MDK		Scale: 1"=10'
Code: 35I2005A		Figure No.: 2



Photograph 1. Overall View of Bridge, Looking Northeast.



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Typical Pitting and Rust Nodules at the 2<sup>nd</sup> Pile in from the Upstream Fascia of Pier 1, Looking Northeast.



MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 36516  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491  
WATERWAY CROSSED The Beaver Brook

INSPECTION DATE August 24, 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	2.5'	7	7	N	9	N	7	9	N	9	6	7	N	7	N	8	N	N

\*UNDERWATER PORTION ONLY

REMARKS: The steel shell piles were in good, sound condition, with 50% coating failure, and up to 25% nodular corrosion, with nodules ranging in size from 1/4 inch diameter to a maximum of 1 inch diameter. When removed, nodules revealed typical pitting ranging from 1/32 inch penetration to 1/16 inch of penetration.

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.