

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 30505

CSAH NO. 14

OVER THE

RUM RIVER

DISTRICT 3 - ISANTI COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY  
COLLINS ENGINEERS, INC.

JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 30505, Piers 1 and 2, were found to be in good condition with no significant structural defects observed. The northwest corner of the West Abutment foundation was exposed and exhibited approximately 2 feet of undermining due to bank erosion. A minor scour depression was observed at the upstream nose of Pier 1. A moderate to heavy accumulation of timber debris was present around the upstream nose of Pier 2. The channel bottom around the piers appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

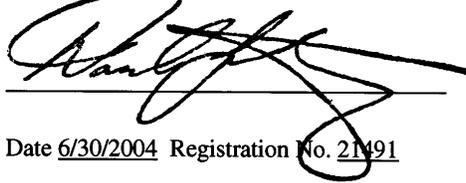
- (A) A scour pocket, 2 foot in radius and 1 foot deep, was observed at the upstream nose of Pier 1.
- (B) A moderate to heavy accumulation of 10-inch-diameter-and-smaller timber debris was observed at the upstream nose of Pier 2 extending from the channel bottom to 5 feet above the waterline. A 1-foot-diameter log was also observed on the channel bottom along the east face of Pier 1.
- (C) A portion of the west embankment exhibited minor erosion that has caused undermining at the north end of the West Abutment.

RECOMMENDATIONS:

- (A) Monitor timber drift accumulation at Pier 2, and if found to be progressing (to an excessive extent), removal may be warranted at that time.
  
- (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 handwritten signature in black ink, appearing to read 'Daniel 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 'Daniel G. Stromberg', is written over the company name.

Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 30505

Feature Crossed: The Rum River

Feature Carried: CSAH No. 14

Location: District 3 - Isanti County

Bridge Description: The bridge superstructure consists of three spans of multiple steel girders supported by two concrete hammerhead type piers and two concrete abutments. The piers are numbered 1 and 2 starting from the east end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker

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

Date: September 25, 2002

Weather Conditions: Rain,  $\pm 50^{\circ}$  F

Underwater Visibility:  $\pm 2$  foot

Waterway Velocity:  $\pm 1.5$  fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each pier consists of an oblong rectangular shaft with rounded noses, and rests upon a rectangular concrete footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 6.5 Feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 15.4 feet below reference.  
Assumed Waterline Elevation = 84.6.

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

Item 60: Substructure: Code 8

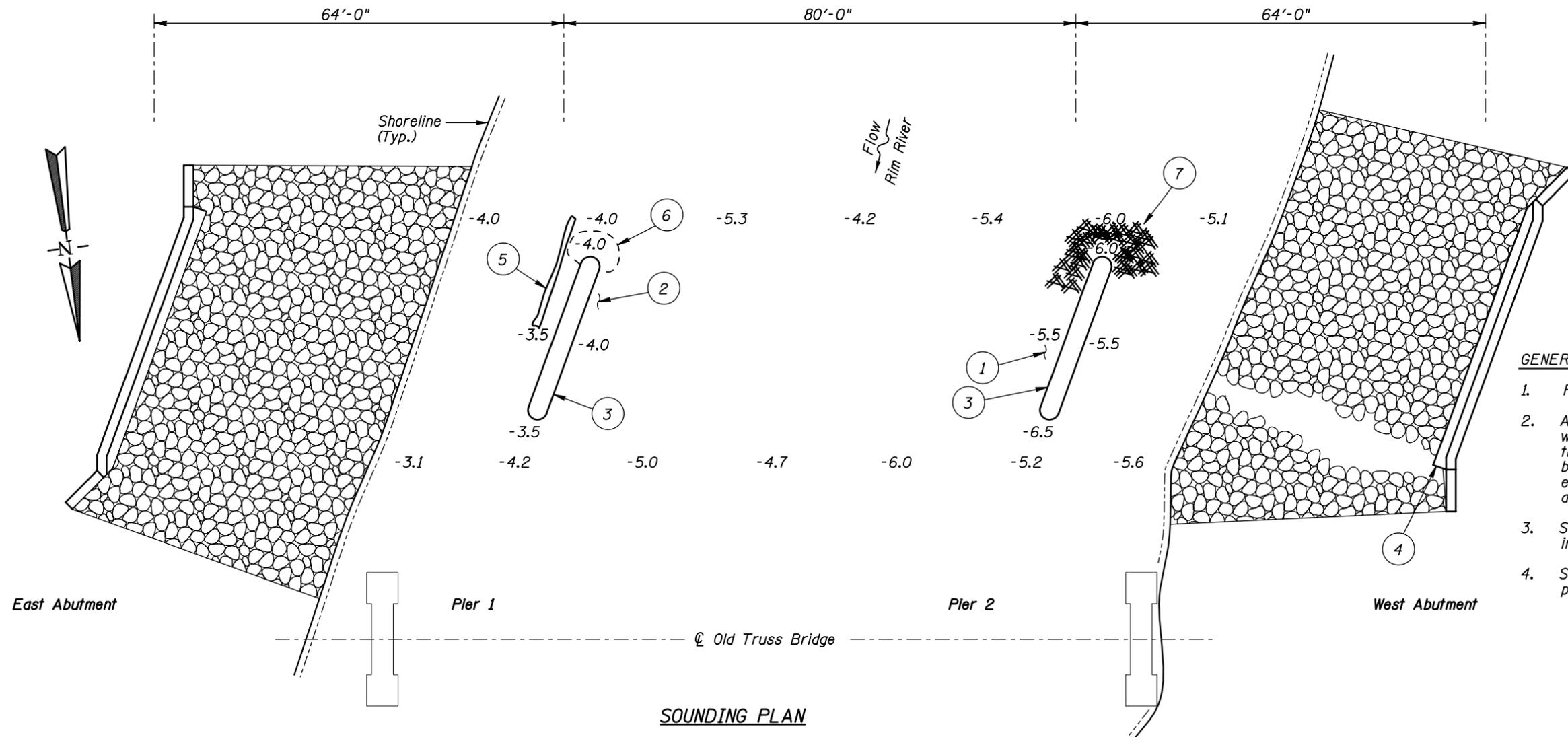
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code O/02

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

Yes  No

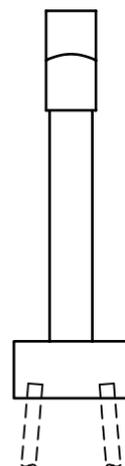


**GENERAL NOTES:**

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 25, 2002, the waterline was located approximately 15.4 feet below the top of the pier cap of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 84.6.
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 consisted of 4-inch-diameter cobbles with 1 inch of probe rod penetration.
2. The channel bottom consisted of sand with scattered 1-foot-diameter riprap with up to 6 inches of probe rod penetration.
3. The concrete of the substructure units was in good condition with no notable defects.
4. A portion of the west embankment exhibited minor erosion that has caused undermining at the north end of the West Abutment.
5. A 1-foot-diameter log was observed on the channel bottom along east face of Pier 1.
6. A scour pocket, 2 foot in radius and 1 foot deep, was observed at the upstream nose of Pier 1.
7. A moderate to heavy accumulation of 10-inch-diameter and smaller timber debris was observed at the upstream nose of Pier 2 extending from the channel bottom to 5 feet above the waterline.

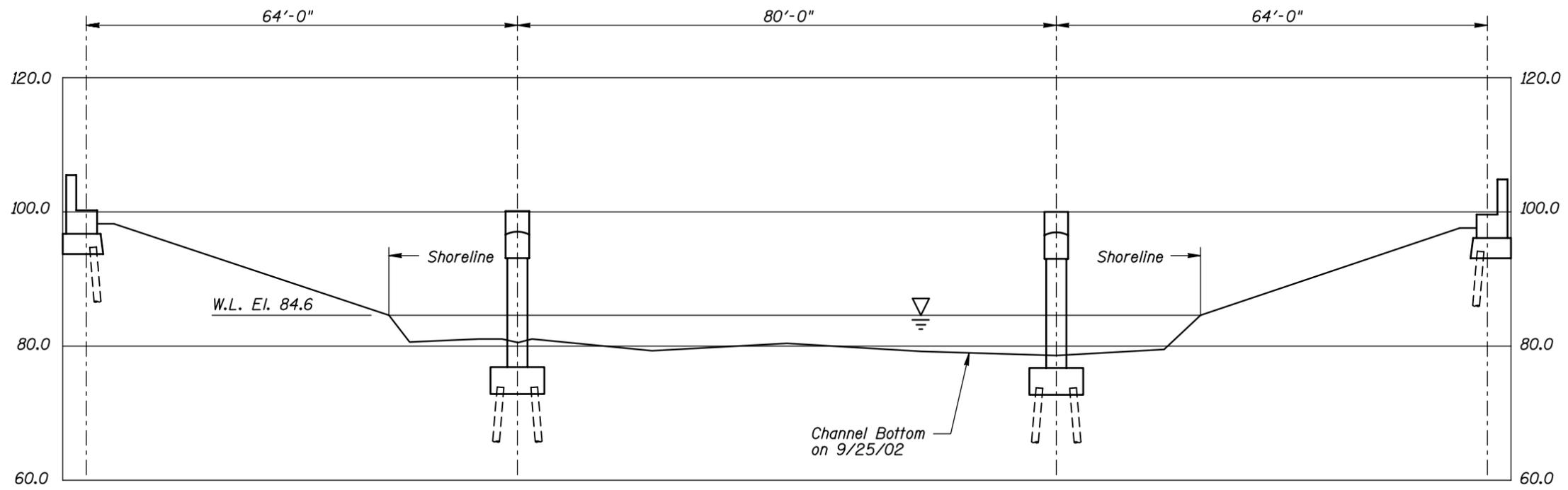


**TYPICAL END VIEW OF PIERS**

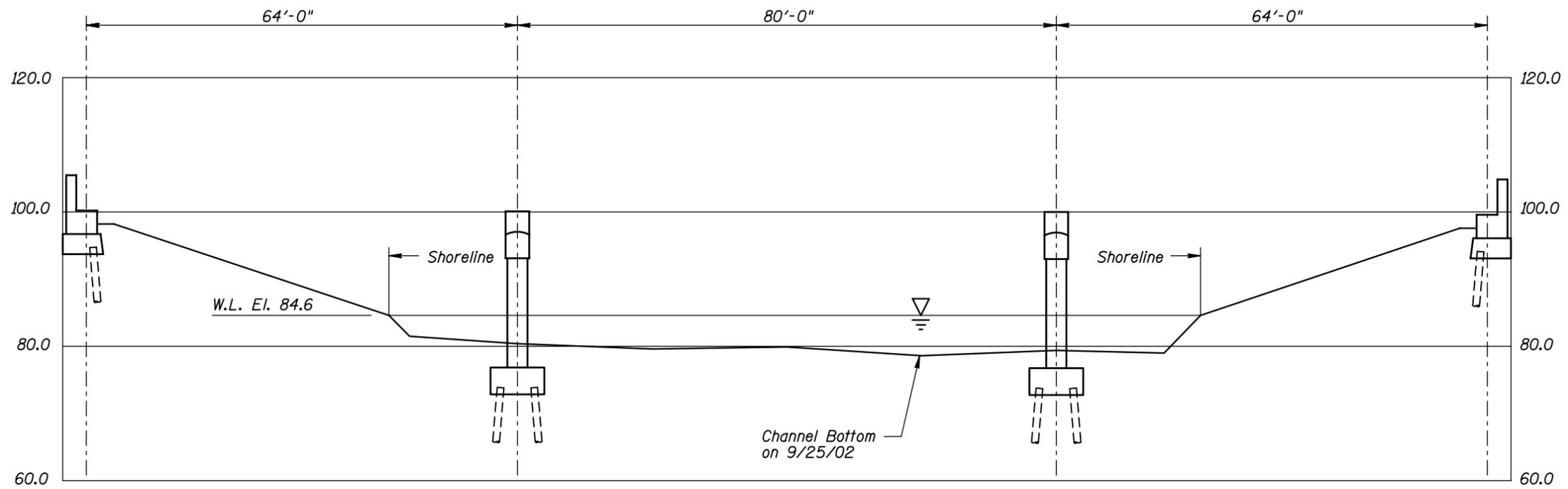
**Legend**

- 6.0 Sounding Depth from Waterline (9/25/02)
- Timber Debris
- Riprap
- Scour Depression

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 30505 OVER THE RUM RIVER DISTRICT 3, ISANTI 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: 351230305		Figure No.: 1



**UPSTREAM FASCIA PROFILE**



**DOWNSTREAM FASCIA PROFILE**

Notes:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 30505 OVER THE RUM RIVER DISTRICT 3, ISANTI 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"=20'
Code: 351230305		Figure No.: 2



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



Photograph 2. View of Pier 1, Looking West.



Photograph 3. View of Pier 2, Looking Southeast.



Photograph 4. View of Undermining at Northwest Corner of West Abutment, Looking North.

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

INSPECTORS: Collins Engineers, Inc.

DATE: September 25, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 30505

WEATHER: Rain, " 50° F

WATERWAY CROSSED: The Rum River

DIVING OPERATION:   X           SCUBA           SURFACE SUPPLIED AIR  
  OTHER

PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel

EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 12:45 P.M.

TIME OUT OF WATER: 1:15 P.M.

WATERWAY DATA: VELOCITY " 1.5 fps

VISIBILITY " 2 foot

DEPTH 6.5 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete of the piers was in very good to good condition with no notable defects. A moderate to heavy accumulation of 10-inch-diameter-and-smaller timber debris was observed at the upstream end of Pier 2, and a 1-foot-diameter log was observed along the east face of Pier 1. A minor scour pocket, 2 foot in radius and 1 foot deep, was observed at the upstream nose of Pier 1, and a portion of the west embankment exhibited minor erosion which has caused undermining at the northern corner of the West Abutment wall.

FURTHER ACTION NEEDED:       \_\_\_\_\_ YES      X   NO

Monitor timber drift accumulation, and if found to be progressing (to an excessive extent), removal may be warranted at that time.

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. 30505  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Shirley M. Walker, P.E.  
WATERWAY CROSSED Rum River

INSPECTION DATE September 25, 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	4.0'	N	8	N	9	N	8	7	N	N	7	7	8	N	N	N	N	N
	Pier 2	6.5'	N	8	N	9	N	8	8	7	7	6	6	8	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in very good to good condition with no notable defects. A moderate to heavy accumulation of 10-inch-diameter-and-smaller timber debris was observed at the upstream end of Pier 2, and a 1-foot-diameter log was observed along the east face of Pier 1. A minor scour pocket, 2 foot in radius and 1 foot deep, was observed at the upstream nose of Pier 1, and a portion of the west embankment exhibited minor erosion which has caused undermining at the northern corner of the West Abutment wall.

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.