

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 18506

CSAH NO. 31

OVER THE

RABBIT LAKE

DISTRICT 3 – CROW WING COUNTY



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. 18506, the North and South Abutments, were found to be in good condition with no defects of structural significance. The timber bents exhibited very minor checking and there was some light aquatic growth on the steel sheeting backwalls and wingwalls below the waterline. The channel bottom around the substructure units consisted of silty sand, which appeared well established and stable with no evidence of significant scour observed.

INSPECTION FINDINGS:

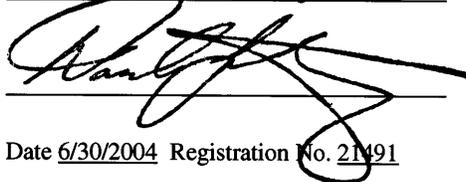
- (A) Very minor checking generally with widths less than 1/8 inch was observed on all of the timbers.
- (B) Light aquatic growth was present on the steel sheeting backwall and wingwall below the waterline.

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.

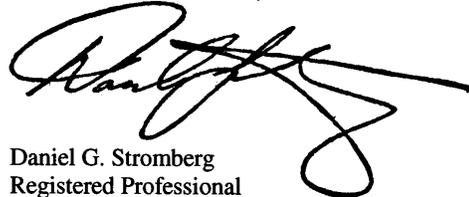
Daniel G. Stromberg



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: 18506

Feature Crossed: Rabbit Lake

Feature Carried: CSAH No. 31

Location: District 3 – Crow Wing County

Bridge Description: The bridge superstructure consists of one span of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two timber pile abutments. The abutments consist of timber piles with a timber pile cap and cross bracing. The backwall and wingwalls of each abutment consist of steel sheeting.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker

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

Date: September 26, 2002

Weather Conditions: Sunny, " 50E F

Underwater Visibility: " 5 Feet

Waterway Velocity: Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutments.

General Shape: Each abutment consists of five timber piles interconnected with timber cross bracing and a timber pile cap. The timber piles are in front of steel sheet piles which form the backwall and two skewed wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 17 feet.

4. WATERLINE DATUM

Water Level Reference: The top of pier cap on the west end of the North Abutment.

Water Surface: The waterline was approximately 6.5 feet below reference.

Assumed Waterline Elevation = 93.5

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

Item 60: Substructure: Code 8

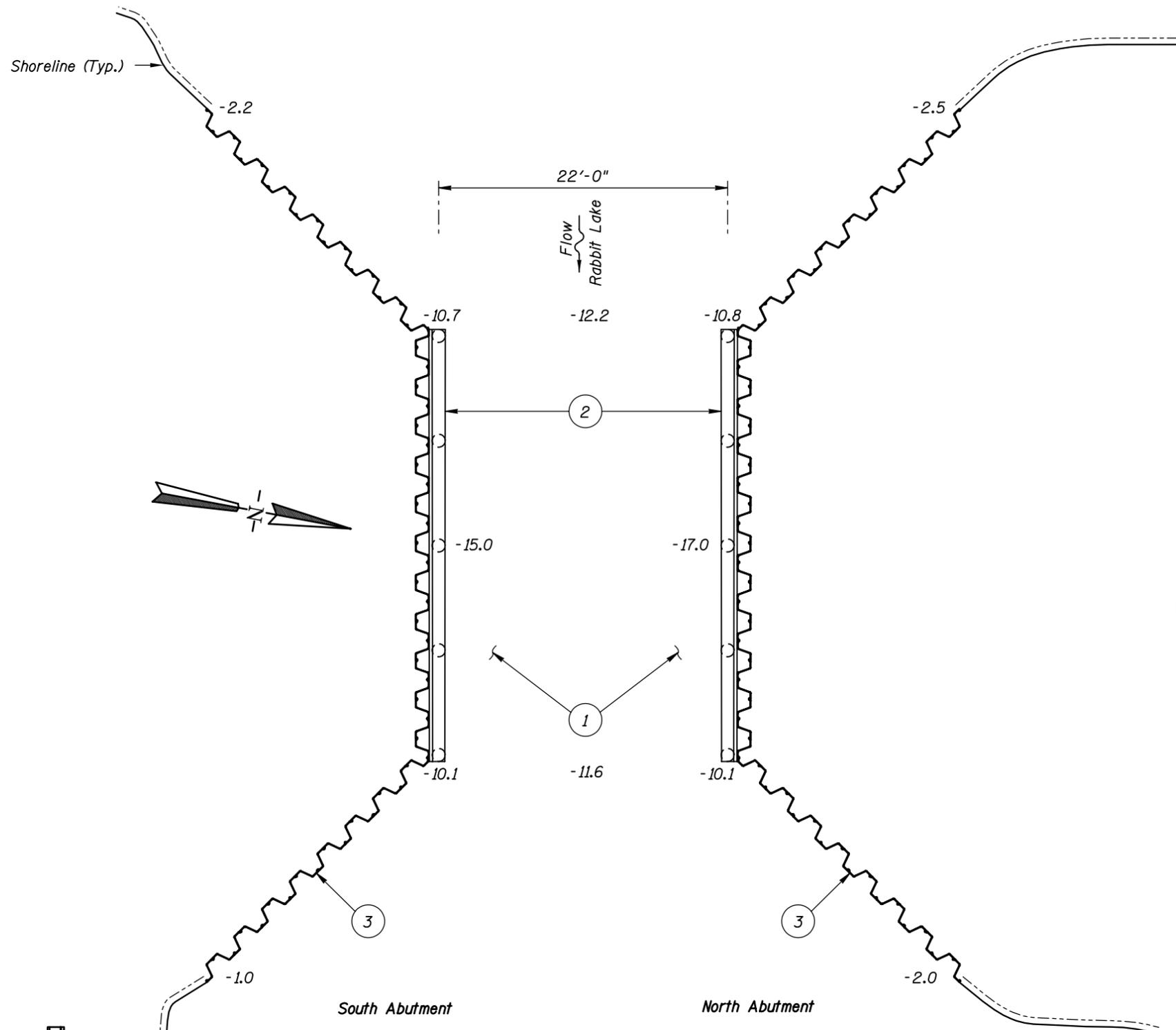
Item 61: Channel and Channel Protection: Code 8

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

Item 113: Scour Critical Bridges: Code J/02

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

Yes No



TYPICAL END VIEW OF SOUTH ABUTMENT
(N. Abutment Opp. Hand)

SOUNDING PLAN

- Legend
- 5.2 Sounding Depth from Waterline (9/26/02)
 - () Timber Pile

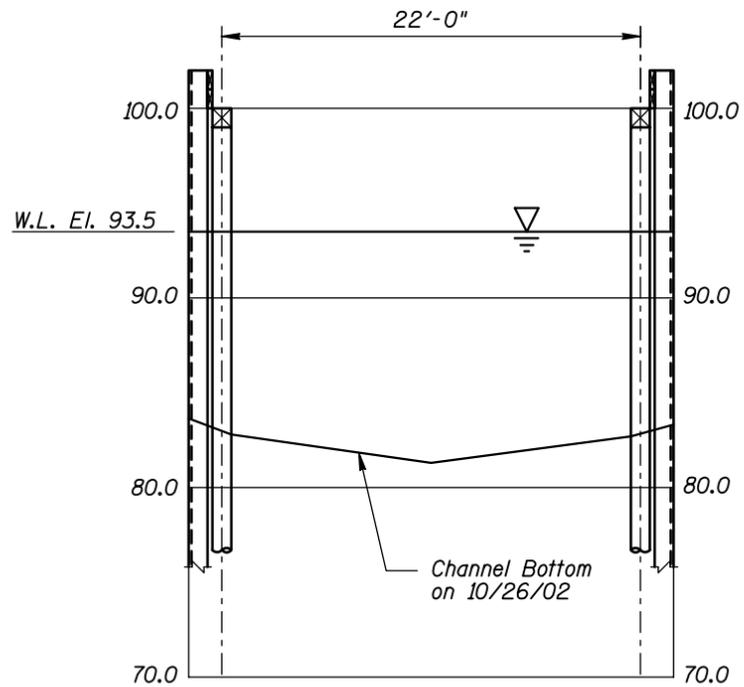
GENERAL NOTES:

1. The North and South Abutments were inspected underwater.
2. At the time of inspection on October 26, 2002, the waterline was located approximately 6.5 feet below the top of the pile cap at the upstream end of the North Abutment. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 93.5.
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 the mid point intervals between the substructure units.

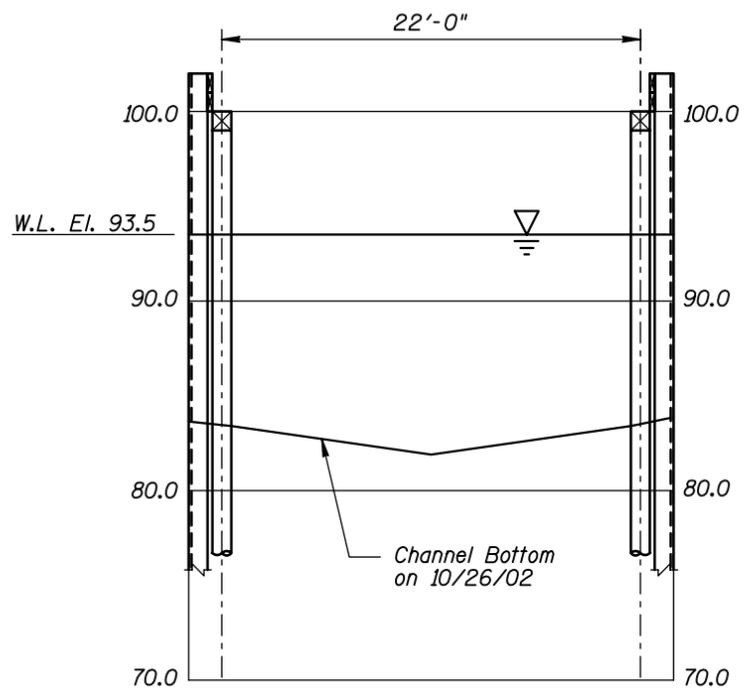
INSPECTION NOTES:

- ① Channel bottom consisted of silty sand with 2 to 4 inches of probe rod penetration.
- ② Very minor checking with width generally less than 1/8 inch on all timber members.
- ③ Light aquatic growth on the steel sheeting below the waterline.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 18506 OVER RABBIT LAKE DISTRICT 3, CROW WING COUNTY		
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: 351218506		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. 18506 OVER RABBIT LAKE DISTRICT 3, CROW WING COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=10'
Code: 351218506		Figure No.: 2



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



Photograph 2. View of South Abutment, Looking Southwest.



Photograph 3. View of North Abutment, Looking Northeast.

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

INSPECTORS: Collins Engineers, Inc. DATE: September 26, 2002

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

BRIDGE NO: 18506

WEATHER: Sunny, " 50EF

WATERWAY CROSSED: Rabbit Lake

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

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

TIME IN WATER: 1:20 p.m.

TIME OUT OF WATER: 1:40 p.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY" 5 feet

DEPTH 17 feet maximum at North Abutment

ELEMENTS INSPECTED: North and South Abutments

REMARKS: Overall, the timber piling and bracing of the North and South Abutments was in good condition with no significant deterioration. In addition, the steel sheeting backwall was also in overall good condition with minimal deformation. All timber members exhibited very minor checking and there was light aquatic growth on the steel sheeting below the waterline. There was no notable scour or other channel bottom deficiencies.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

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. 18506
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED Rabbit Lake

INSPECTION DATE September 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

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE					CHANNEL					GENERAL						
			PIILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (STEEL SHEETING)	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
	North Abutment	17.0'	8	N	N	9	8	8	N	8	8	N	8	N	8	8	8	N	N
	South Abutment	15.0'	8	N	N	9	8	8	N	8	8	N	8	N	8	8	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the timber piling and bracing of the North and South Abutments was in good condition with no significant deterioration. In addition, the steel sheeting backwall was also in overall good condition with minimal deformation. All timber members exhibited very minor checking and there was light aquatic growth on the steel sheeting below the waterline. There was no notable scour or other channel bottom deficiencies.

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.