

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 36515
CR NO. 82
OVER THE
W. FORK OF THE BLACK RIVER
DISTRICT 1 - KOOCHICHING 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. 36515, Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance observed. The steel pipe piles exhibited coating failure over 50 to 100 percent of their surface area with 1/4-inch-diameter corrosion nodules and 1/32-inch-deep pitting observed. The west bank exhibited signs of minor erosion and moderate accumulations of timber debris were observed at Piers 1 and 2. The channel bottom around the substructure units appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The steel pipe piles exhibited coating failure over 50 to 100 percent of their surface area with up to 1/4-inch-diameter corrosion nodules and 1/32-inch-deep pitting observed from 5 feet above the waterline to the channel bottom.
- (B) The west embankment was vertically eroded extending to 2 feet above the waterline at the upstream nose and to 4 feet above the waterline at the downstream nose of Pier 1.
- (C) A moderate accumulation of 1-foot-diameter-and-smaller timber debris was observed scattered throughout Pier 1 and a light accumulation of timber debris was observed along the upstream piles of Pier 2.

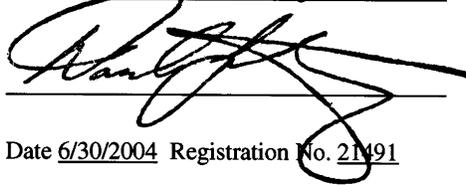
RECOMMENDATIONS:

- (A) Monitor timber debris accumulations at the piers, 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. Note that the substructure units could be inspected using waders during periods of low water levels.

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 'Dan G. Stromberg', is written over a horizontal line. Below this line is another horizontal line.

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 a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 36515

Feature Crossed: The West Fork of the Black River

Feature Carried: CR No. 82

Location: District 1 - Koochiching County

Bridge Description: The bridge superstructure consists of three spans of timber deck and stringers. The superstructure is supported by two steel pipe pile piers and two concrete abutments. The two piers are designated as Piers 1 and 2 starting from the west 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, Matthew J. Lengyel

Date: August 25, 2002

Weather Conditions: Sunny, $\pm 85^{\circ}$ F

Underwater Visibility: 1 to 2 feet

Waterway Velocity: ± 1 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each of the piers consists of a single row of four steel pipe piles under a concrete cap.

Maximum Water Depth at Substructure Inspected: Approximately 1.5 feet

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 2.

Water Surface: The waterline was approximately 14.1 feet below reference.
Assumed Waterline Elevation = 85.9.

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

Item 60: Substructure: Code 7

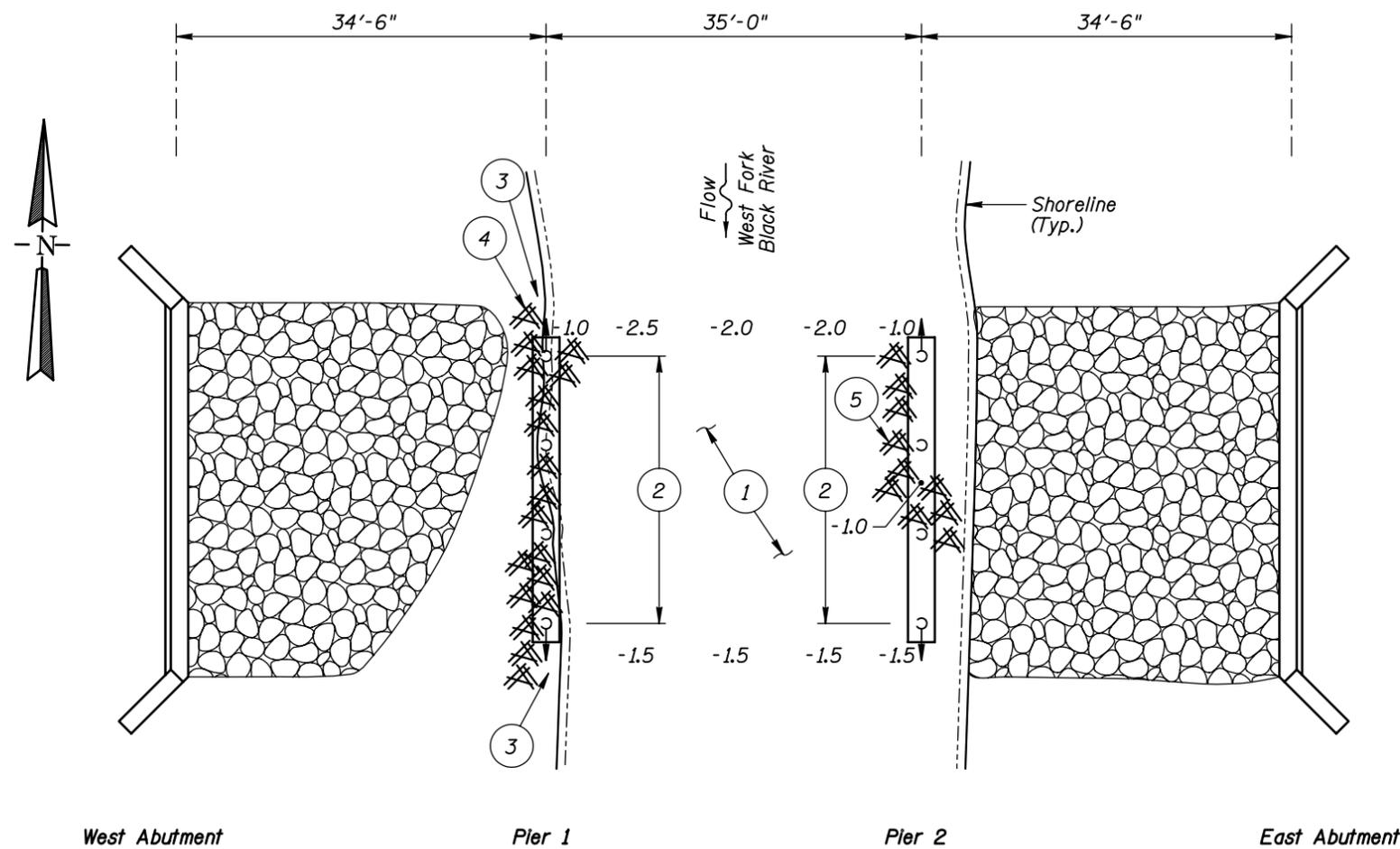
Item 61: Channel and Channel Protection: Code 6

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

Item 113: Scour Critical Bridges: Code I/02

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

Yes No



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 25, 2002, the waterline was located approximately 14.1 feet below the top of pier cap at upstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 85.9.
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 silty sand and gravel with approximately 3 to 6 inches of probe rod penetration.
- ② The steel pipe piles exhibited coating failure over 50 to 100 percent of their surface area with up to 1/4-inch-diameter corrosion nodules and 1/32-inch-deep pitting observed from 5 feet above the waterline to the channel bottom.
- ③ The west embankment exhibited minor vertical erosion extending 2 feet above the waterline at the upstream nose and 4 feet above the waterline at the downstream nose of Pier 1.
- ④ A moderate accumulation of 1-foot-diameter-and-smaller timber drift was scattered throughout Pier 1.
- ⑤ A light accumulation of timber drift was observed along the upstream piles of Pier 2.

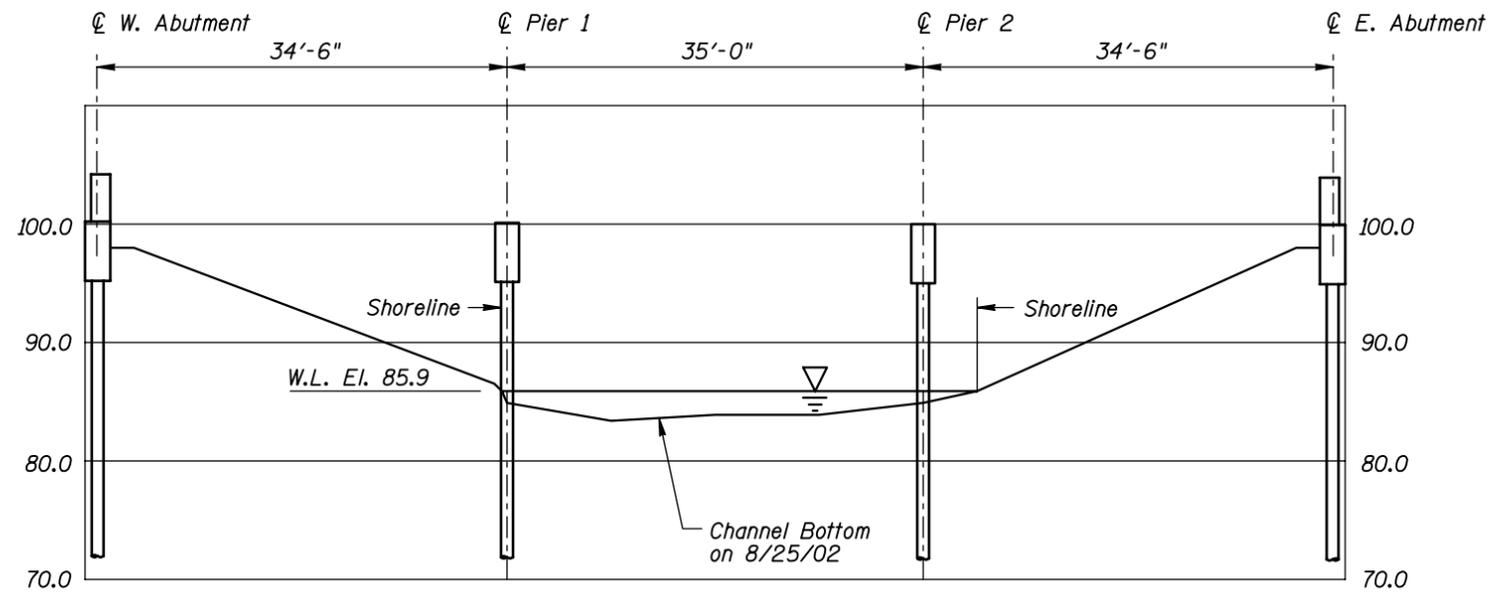


TYPICAL END VIEW OF PIERS

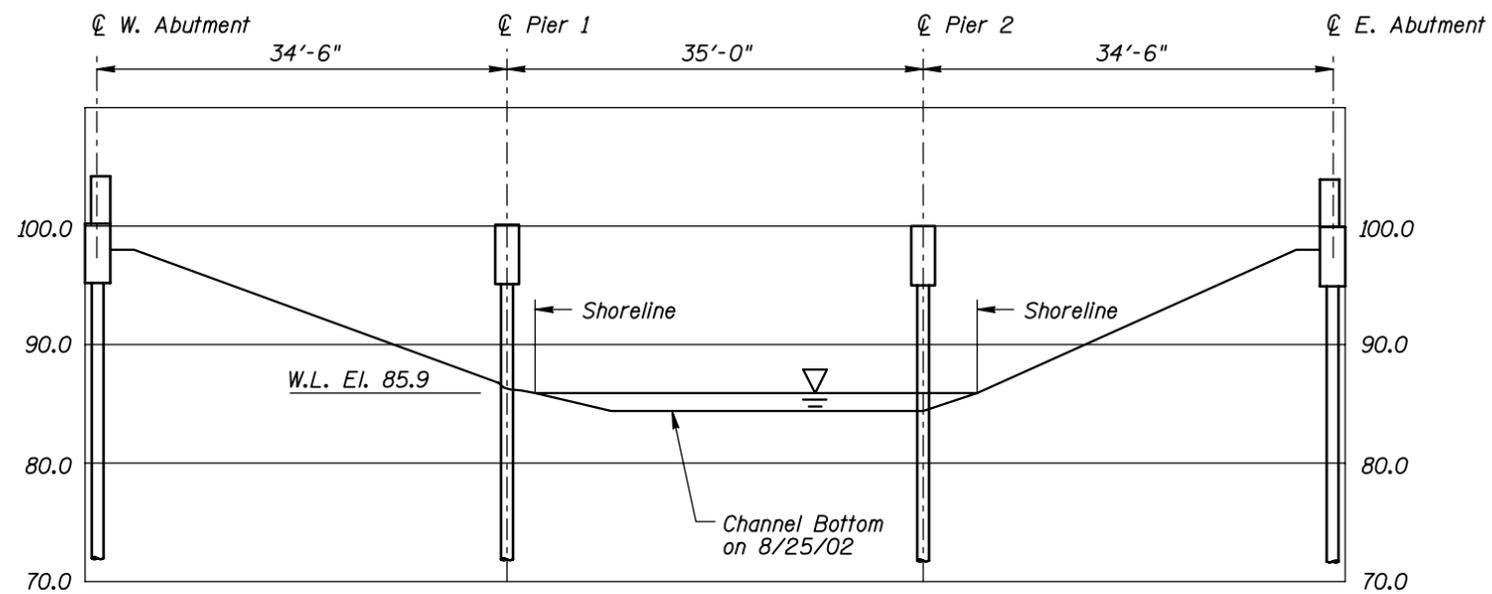
Legend

- 2.0 Sounding Depth from Waterline (8/25/02)
- 12" Diameter Steel Encased Concrete Pile
- Battered 12" Diameter Steel Encased Concrete Pile
- ⊗ Timber Debris
- ⊞ Riprap

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 36515 OVER THE WEST FORK OF THE BLACK RIVER DISTRICT 1, KOOCHICHING 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: 351236515		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. 36515 OVER THE WEST FORK OF THE BLACK RIVER DISTRICT 1, KOOCHICHING 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: 1/16"=1'
Code: 351236515		Figure No.: 2



Photograph 1. Overall View of Structure, Looking South.



Photograph 2. View of Pier 1, Looking Southwest.



Photograph 3. View of Pier 2, Looking Northeast.



Photograph 4. View of Typical Corrosion of Steel Piles, Looking East.

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

INSPECTORS: Collins Engineers, Inc.

DATE: August 25, 2002

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 36515

WEATHER: Sunny, " 85° F

WATERWAY CROSSED: The West Fork of the Black River

DIVING OPERATION:

SCUBA

SURFACE SUPPLIED AIR

OTHER Wading due to low water

PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel

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

TIME IN WATER: 11:00 A.M.

TIME OUT OF WATER: 11:15 A.M.

WATERWAY DATA: VELOCITY " 1 fps

VISIBILITY 1 to 2 feet

DEPTH 1.5 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the steel piles were in good to satisfactory condition. The steel pipe piles exhibited coating failure over 50 to 100 percent of their surface area with up to 1/4-inch-diameter corrosion nodules and 1/32-inch-deep pitting extending between 5 feet above the waterline and the channel bottom. The shoreline exhibited minor erosion along the length of Pier 1. Light to moderate accumulations of timber debris were observed at Piers 1 and 2.

FURTHER ACTION NEEDED: _____ YES NO

Monitor timber debris accumulations at piers, 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. Note that substructure units could be inspected using waders during periods of low water levels.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 36515
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., No. 21491
WATERWAY CROSSED W. Fork of Black River

INSPECTION DATE August 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	1.0'	7	N	N	9	N	7	8	6	7	6	6	N	7	N	7	N	N
	Pier 2	1.5'	7	N	N	9	N	7	8	8	8	7	7	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the steel piles were in good to satisfactory condition. The steel pipe piles exhibited coating failure over 50 to 100 percent of their surface area with up to 1/4-inch-diameter corrosion nodules and 1/32-inch-deep pitting extending between 5 feet above the waterline and the channel bottom. The shoreline exhibited minor erosion along the length of Pier 1. Light to moderate accumulations of timber debris were observed at Piers 1 and 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.