

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 14523

MSAS NO. 129 (12th AVENUE / 15th AVENUE)

OVER THE

RED RIVER OF THE NORTH

DISTRICT 4 - CLAY COUNTY, FARGO, ND / MOORHEAD, MN



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 14523, Piers 2 and 3, were in good condition with no defects of structural significance observed. The channel bottom appears to be stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

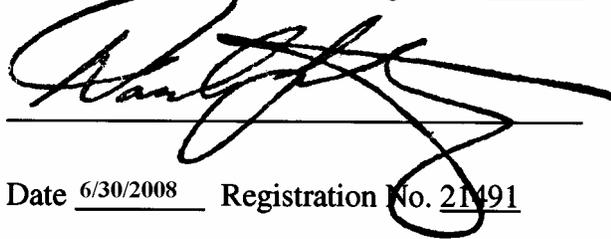
- (A) The concrete surfaces of the piers above and below water were smooth and sound with random minor areas of poor consolidation with $\frac{1}{4}$ inch maximum penetration.
- (B) A heavy accumulation of timber debris consisting of 2 foot diameter and smaller logs and branches was observed around the entire perimeter of Pier 2, extending from the channel bottom to 5 feet above the waterline. The debris extended 20 feet off the upstream nose, 10 feet off the downstream nose, 30 feet off the east face, and 10 feet off the west face.
- (C) A light accumulation of timber debris, consisting of 6 inch diameter and smaller limbs and branches was observed around the entire perimeter of Pier 3, extending from the channel bottom to 1 foot above the waterline. The debris extended 3 feet off all the faces and noses.

RECOMMENDATIONS:

- (A) Remove the timber debris during future maintenance operations.
- (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



Date 6/30/2008 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: 14523

Feature Crossed: Red River of the North

Feature Carried: MSAS No. 129 (12th Avenue / 15th Avenue)

Location: District 4 - Clay County, Fargo, ND / Moorhead, MN

Bridge Description: The Bridge is a five span structure consisting of a multiple prestressed I-beam superstructure supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and four intermediate concrete piers. The piers are numbered 1 through 4 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Rouston

Date: August 22, 2007

Weather Conditions: Sunny, 75° F

Underwater Visibility: Negligible/None.

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3.

General Shape: The piers consist of a rectangular pier shaft supporting a rectangular cap.

Maximum Water Depth at Substructure Inspected: Approximately 8.4 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 12.2 feet below reference.

Waterline Elevation = 871.5.

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 5

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code F/07

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

 Yes X No



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



Photograph 2. View of Pier 1, Looking East.



Photograph 3. View of Pier 2, Looking Northwest.



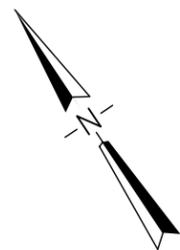
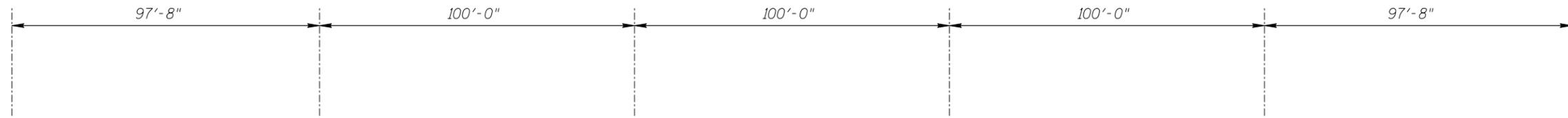
Photograph 4. View of Pier 2, Looking Southwest.



Photograph 5. View of Pier 3, Looking Northwest



Photograph 6. View of Pier 4, Looking Northwest



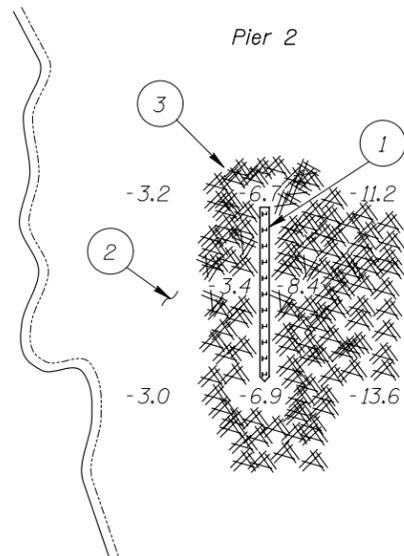
W. Abutment



Pier 1

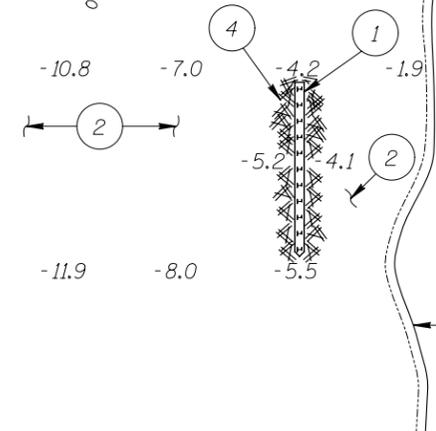


Pier 2



Flow
Red River
of the North

Pier 3



Shoreline
(Typ.)

Pier 4



E. Abutment



SOUNDING PLAN

INSPECTION NOTES:

- 1 Overall, the concrete was smooth and sound with random minor areas of poor consolidation with 1/4 inch maximum penetration.
- 2 The channel bottom consisted of soft clay with a probe rod penetration up to 1.5 feet and random 12-inch-diameter cobbles.
- 3 A heavy accumulation of timber debris consisting of 2-foot-diameter or smaller logs and branches was observed around the entire perimeter of Pier 2 extending from the channel bottom to 5 feet above the waterline. The debris extended 20 feet off the upstream nose, 10 feet off the downstream nose, 30 feet off the East face, and 10 feet off the West face.
- 4 A light accumulation of timber debris consisting of 6-inch-diameter and smaller limbs and branches was observed around the entire perimeter of Pier 3 extending from the channel bottom to 1 foot above the waterline. The debris extended 3 feet out from all faces and noses.

Legend

-5.2 Sounding Depth (8/22/07)

Timber Debris

Note:

All soundings based on 2007 waterline location.



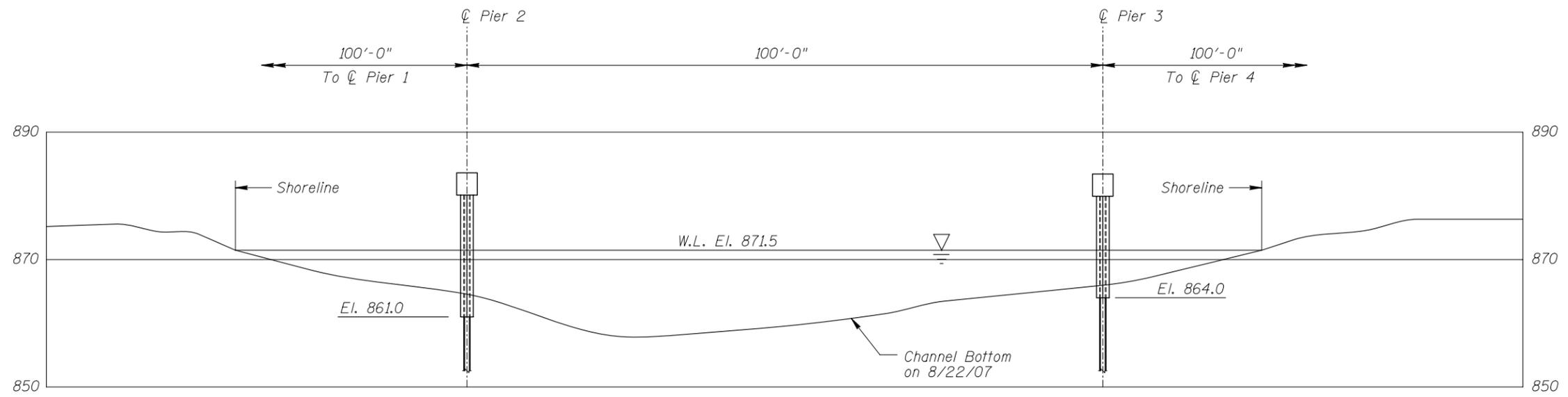
UPSTREAM



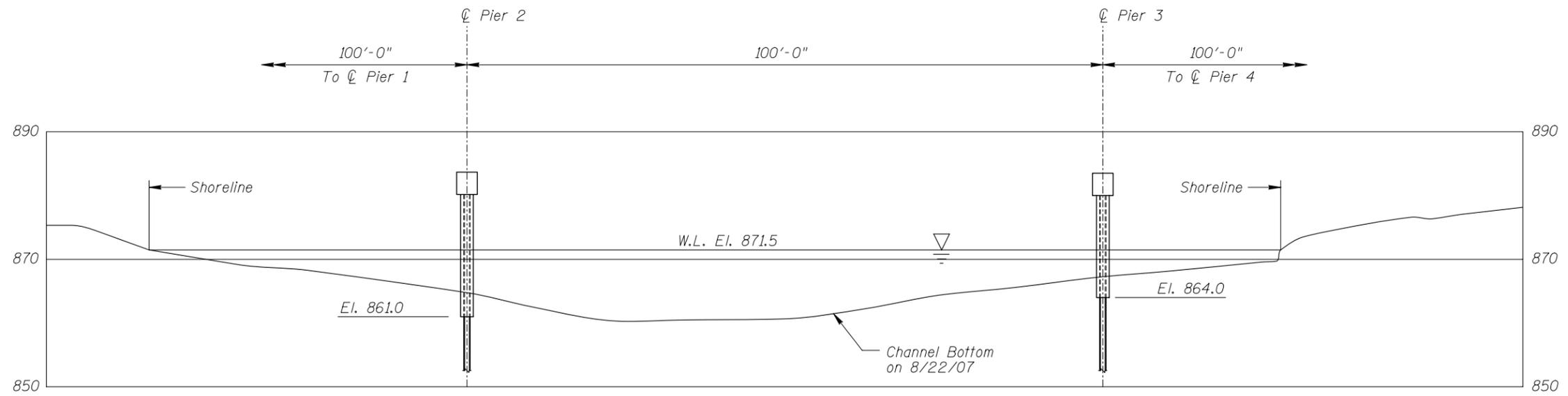
DOWNSTREAM

TYPICAL END VIEW OF PIERS 2 & 3

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 14523 OVER RED RIVER OF THE NORTH DISTRICT 4, CLAY COUNTY, CITY OF MOORHEAD		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUG., 2007
Checked By: MDK		Scale: NTS
Code: 522114523		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. 14523 OVER RED RIVER OF THE NORTH DISTRICT 4, CLAY COUNTY, CITY OF MOORHEAD		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUG., 2007
Checked By: MDK		Scale: 1"=20'
Code: 522114523		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 22, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 14523 WEATHER: Sunny, 75° F

WATERWAY CROSSED: Red River of the North

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

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

TIME IN WATER: 10:00 a.m.

TIME OUT OF WATER: 10:30 a.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY Negligible/None

DEPTH 8.4 feet maximum at Pier 3.

ELEMENTS INSPECTED: Piers 2 and 3

REMARKS: Overall, the concrete was smooth and sound with random minor areas of poor consolidation with 1/4 inch maximum penetration. A heavy accumulation of timber debris consisting of 2 foot diameter and smaller logs and branches was observed around the entire perimeter of Pier 2. A light accumulation of timber debris consisting of 6 inch diameter pieces of drift was observed around the entire perimeter of Pier 3. The channel bottom material was soft clay with some cobbles and appeared stable.

FURTHER ACTION NEEDED: YES NO

Remove the timber debris during future maintenance operations.

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. 14523
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
 WATERWAY CROSSED Red River of the North

INSPECTION DATE August 22, 2007

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	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 2	8.4'	N	8	N	9	N	8	7	6	5	4	5	8	N	N	N	N	N
	Pier 3	3.7'	N	8	N	9	N	8	7	6	N	7	7	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound with random minor areas of poor consolidation with ¼ inch maximum penetration. A heavy accumulation of timber debris consisting of 2 foot diameter and smaller logs and branches was observed around the entire perimeter of Pier 2. A light accumulation of timber debris consisting of 6 inch diameter pieces of drift was observed around the entire perimeter of Pier 3. The channel bottom material was soft clay with some cobbles and appeared stable.

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.