UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 13505

CSAH 19

OVER THE

SUNRISE RIVER

CHISAGO COUNTY

MAY 19, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 13505, Piers 1 and 2 were generally in good condition below water with no defects of structural significance observed. The timber piles generally exhibited checking typically 1/8 inch wide, up to 1/4 inch wide maximum with the timber typically allowing awl penetrations of 1/8 inch. Areas of light deterioration including outer shell splitting up to ½ inch deep were observed on the west face of Pier 1, Pile F as well as the south face of Pier 2, Pile B. The deterioration extended from 2 feet above the waterline to 1 foot below waterline. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

INSPECTION FINDINGS:

(A) Channel bottom consisted of sand and cobbles up to 18 inches diameter with no probe rod penetration.

(B) Timber piles and cross bracing were generally sound with checking typically 1/8 inch wide and up to ¼ inch wide maximum. Timber typically allowed awl penetrations of 1/8 inch.

(C) Outer shell splitting was observed on the west face of Pier 1, Pile F as well as the south face of Pier 2, Pile B. The deterioration extended from 2 feet above waterline to 1 foot below waterline and was typically ½ inch deep.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Respectfully submitted,

Inspection Team Leader:

Ryan P. Breen, P.E.

PROFESSIONAL ENGINEER
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 6/30/14 License # 21491

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 13505

Feature Crossed: Sunrise River

Feature Carried: CSAH 19

Location: Chisago County

Bridge Description: The superstructure consists of a timber deck supported by two timber piers and two abutments with 12 by 12 inch timber caps. Piers consist of seven 12 inch diameter timber piles and abutments consist of eight 12 inch diameter timber piles. The substructure units are designated as the West Abutment, Piers 1 and 2, and the East Abutment. Piles are designated A through G from south to north.

2. INSPECTION DATA

Professional Engineer/ Team Leader: Ryan P. Breen, P.E.

Dive Team: Marc B. Parker, Michael J. Banasiak

Date: May 19, 2012

Weather Conditions: Sunny, 80 ºF

Underwater Visibility: 1 ft.

Waterway Velocity: 2 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Piers 1 and 2 each consist of seven 12 inch diameter timber piles with a 12 inch by 12 inch timber cap.

Maximum Water Depth at Substructure Inspected: Approximately 3.9 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 8.1 feet below reference.
Assumed Waterline Elevation: 91.9

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 7

Item 92B: Underwater Inspection: Code B/05/12

Item 113: Scour Critical Bridges: Code I

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

_____ Yes X No

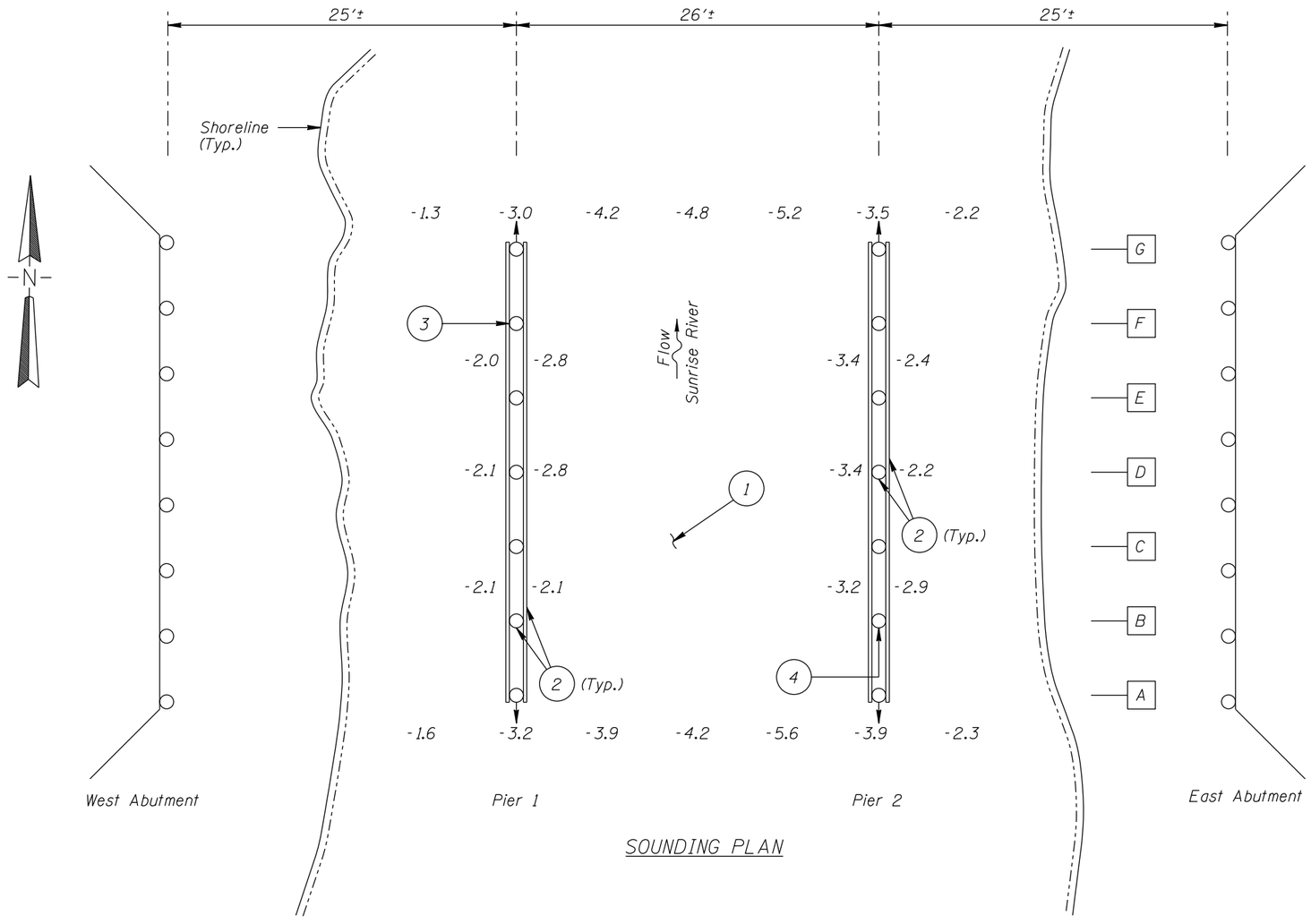
6. STRUCTURAL ELEMENT CONDITION RATING:

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
228	Timber Piling	14	LF	12	2			

Photograph 1. View of Pier 1, Looking Northeast.

Photograph 2. View of Pier 2, Looking Southeast.

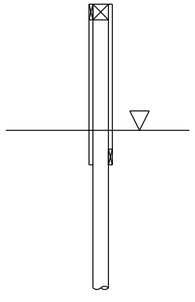
Photograph 3. View of timber splitting at Pier 1, Pile F, Looking Southeast.



SOUNDING PLAN

INSPECTION NOTES:

1. Channel bottom material consisted of sand and cobbles up to 6 inches in diameter with no probe rod penetration.
2. Timber piles and cross-bracing were generally sound with typical 1/8 inch wide to 1/4 inch wide maximum checking and 1/8 inch of timber awl penetration.
3. Area of minor outer shell splitting located on the west side of Pile F at Pier 1 extended from 2 feet above the waterline to 1 foot below the waterline with up to 1/2 inch of penetration.
4. Area of minor outer shell splitting located on the south side of Pile B at Pier 2 extended from 2 feet above the waterline to 1 foot below the waterline with up to 1/2 inch of penetration.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on May 19, 2012, the waterline was located approximately 8.1 feet below the top of the pile cap at the downstream end of Pier 1. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 91.9.
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.

Legend

-17.0	Sounding Depth from Waterline (5/19/12)
A	Pile Identification Designation
○	12"ϕ Timber Pile
○↓	12"ϕ Battered Timber Pile
1	Inspection Note Number

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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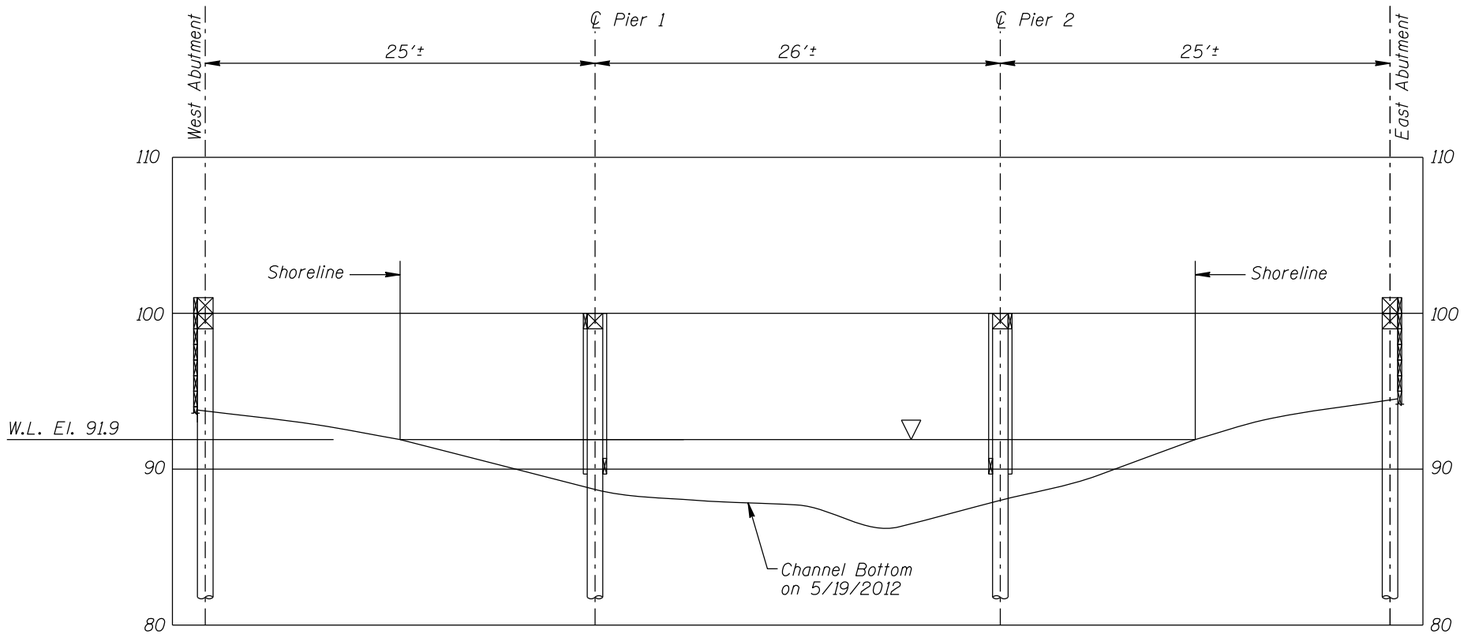
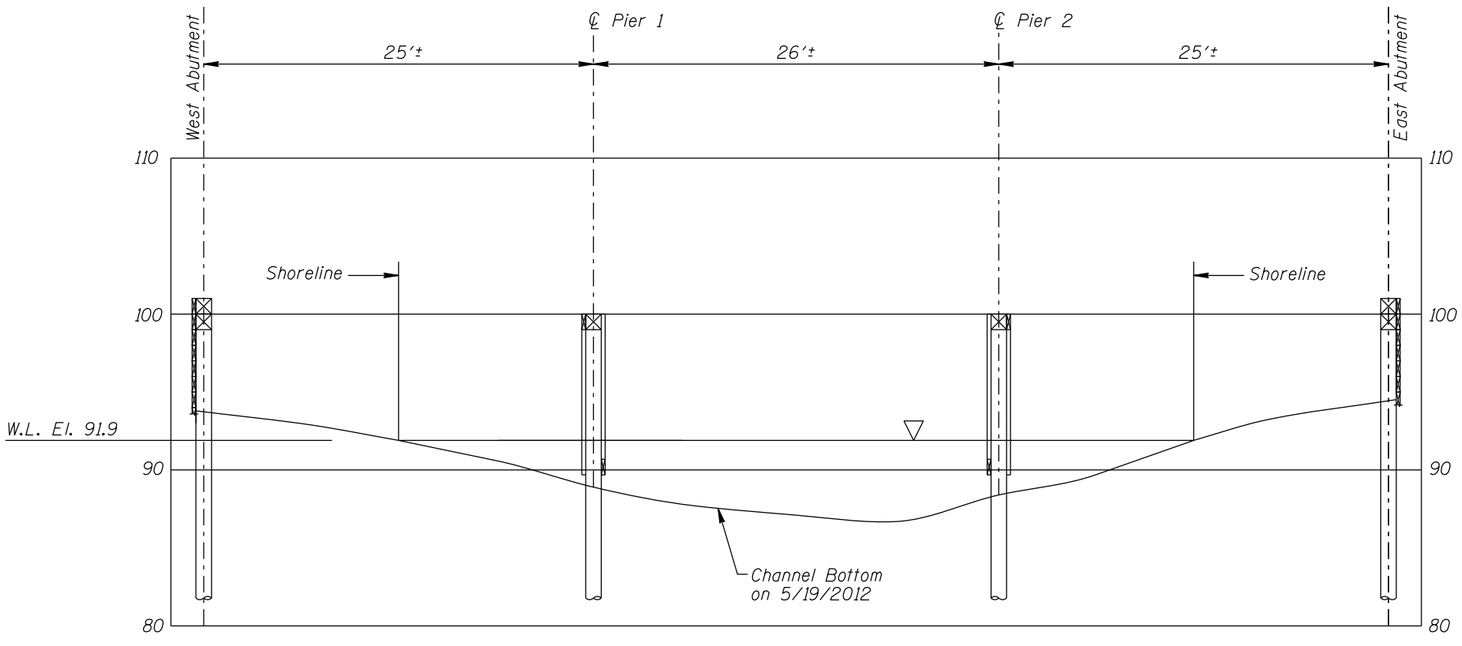
CSAH 19 OVER THE THE SUNRISE RIVER
CHICAGO COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAY, 2012
Checked By: RPB		Scale: NTS
Code: 13505		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAY, 2012
Checked By: RPB		Scale: 1"=10'
Code: 13503		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: May 19, 2012

ON-SITE TEAM LEADER: Ryan P. Breen

BRIDGE NO: 13505 WEATHER: Sunny, 80°F

WATERWAY CROSSED: Sunrise River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Marc B. Parker, Michael J. Banasiak

EQUIPMENT: Commercial Scuba, U/W Light, Hand Tools, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 10:30 A.M.

TIME OUT OF WATER: 11:25 A.M.

WATERWAY DATA: VELOCITY 2 ft/sec

VISIBILITY 1 ft

DEPTH 3.9 feet maximum at Pier 5

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the piers were in good condition with no defects of structural significance observed. The timber piles generally exhibited checking typically 1/8 inch wide and, up to 1/4 inch wide maximum with the timber typically allowing awl penetrations of 1/8 inch. Areas of light deterioration including outer shell splitting up to 1/2 inch deep were observed on the west face of Pier 1, Pile F as well as the south face of Pier 2, Pile B. The splitting extended from 2 feet above the waterline to 1 foot below waterline. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 13505
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Ryan P. Breen, P.E.
WATERWAY CROSSED Sunrise River

INSPECTION DATE May 19, 2012

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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (CROSS-BRACKING)	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	3.2	7	N	N	8	7	7	N	7	7	7	7	N	N	7	7	N	N
	Pier 2	3.9	7	N	N	8	7	7	N	7	7	7	7	N	N	7	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the piers were in good condition with no defects of structural significance observed. The timber piles generally exhibited checking typically 1/8 inch wide and, up to 1/4 inch wide maximum with the timber typically allowing awl penetrations of 1/8 inch. Areas of light deterioration including outer shell splitting up to 1/2 inch deep were observed on the west face of Pier 1, Pile F as well as the south face of Pier 2, Pile B. The splitting extended from 2 feet above the waterline to 1 foot below waterline. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

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.