

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 07569
CSAH NO. 90
OVER THE
BLUE EARTH RIVER
DISTRICT 7 - BLUE EARTH COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 28A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 07569, Piers 2, 3, and 4, were in good condition with no defects of structural significance observed. The channel bottom around the substructure units consisted of firm material, which was well established and appeared stable with only minor local scour at the upstream end of Piers 2, 3, and 4. Both river banks exhibited vertically eroded slopes. Mostly light amounts of timber debris have accumulated at the upstream nose of Piers 2 and 3.

INSPECTION FINDINGS:

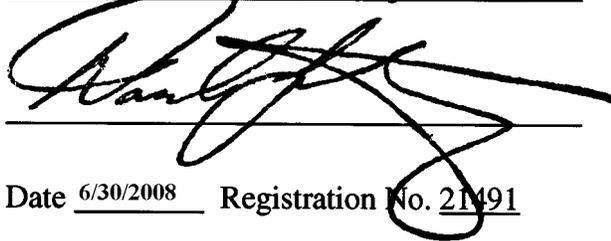
- (A) The concrete surfaces of all piers were in good condition with no defects of structural significance observed and only the presence of random minor cracks. At Piers 3 and 4, three cracks at the upstream and downstream quarter points and on both sides, hairline to 1/32 inch wide, were observed extending from the channel bottom to the bottom of the cap. At Pier 2, cracks were observed at the upstream and downstream eighth points and midpoints on both sides.
- (B) Minor scour depressions were present at the upstream end of Piers 2, 3, and 4. The maximum depth of the localized scour was 2.5 feet and no footing exposure was detected.
- (C) A small amount of 2-inch-diameter and smaller timber debris was observed from the upstream end of Pier 3 to the quarter point on both sides extending from the channel bottom up 1 foot.
- (D) A light accumulation of timber debris was observed around the upstream nose and along the west face of Pier 2.
- (E) Both river banks exhibited steep vertical slopes due to erosion. The erosion along the northerly bank cuts past / through Pier 1.

RECOMMENDATIONS:

- (A) Monitor the accumulation of timber debris around the upstream nose of Piers 2 and 3, and if it progresses further, removal may be required so it does not adversely affect the piers or their surrounding channel bottom.
- (B) Monitor the vertical erosion along the river banks and the scour depressions around the upstream nose of Piers 2, 3, and 4 during future inspections.
- (C) 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: 07569

Feature Crossed: Blue Earth River

Feature Carried: CSAH No. 90

Location: District 7 - Blue Earth County

Bridge Description: The superstructure consists of a five spans of multiple prestressed concrete beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The abutment footings are founded on steel H-piles, while the pier footings are founded on 48 inch diameter caissons. The piers are numbered 1 through 4 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E.,S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: November 19, 2007

Weather Conditions: Cloudy, 50°F

Underwater Visibility: 2 feet

Waterway Velocity: 1 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2, 3, and 4

General Shape: Each pier consists of a rectangular reinforced concrete shaft supporting a concrete hammerhead cap. The pier shafts have tapered ends with blunt noses. The piers have rectangular footings founded on caissons.

Maximum Water Depth at Substructure Inspected: Approximately 4.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the north end of Pier 3.

Water Surface: The waterline was approximately 26.3 feet below reference.
Assumed Waterline Elevation = 73.7

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 B/11/07

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



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



Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 1, Looking South.



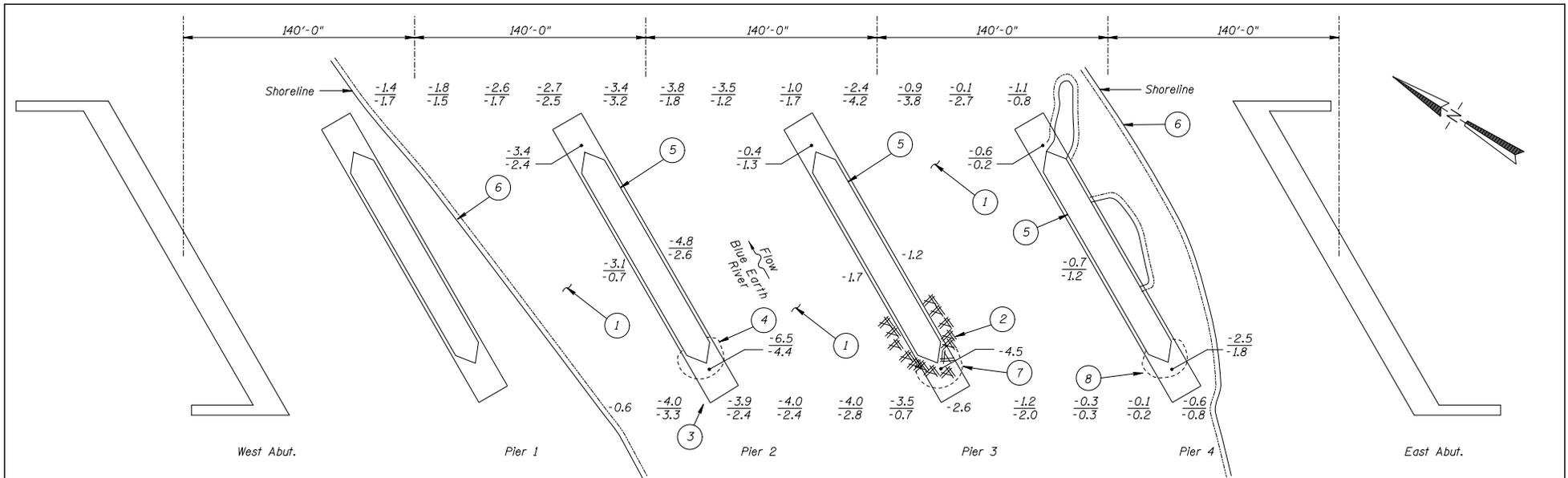
Photograph 4. View of Pier 2, Looking East.



Photograph 5. View of Pier 3, Looking North.



Photograph 6. View of Pier 4, Looking North.



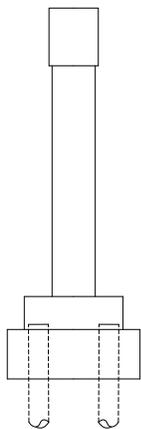
SOUNDING PLAN

GENERAL NOTES:

1. Piers 2 through 4 were inspected underwater.
2. At the time of inspection on November 19, 2007, the waterline was located approximately 26.3 feet below the top of the pier cap at the downstream end of Pier 3. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 73.7.
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 material around the substructure units consisted of sand, gravel, and 2 to 4 feet diameter cobbles with up to 1 inch of probe rod penetration.
- 2 A small amount of timber debris consisting of branches 2 inches and smaller was observed from the upstream end of Pier 3 to the quarter point on both sides from the channel bottom up 1 foot.
- 3 Light accumulation of timber debris was observed around the upstream nose and along the west face of Pier 2.
- 4 Scour depression with a 7 foot radius and 2.5 feet of depth was observed around the upstream nose of Pier 2.
- 5 Overall the concrete of the piers was in good condition and only exhibited random vertical cracks.
- 6 Vertical bank erosion was observed all along the river bank.
- 7 A 7 feet radius scour depression 2 feet deep was observed at the upstream end of Pier 3.
- 8 A 5 feet radius scour depression 2 feet deep was observed at the upstream end of Pier 4.



TYPICAL END VIEW OF PIERS

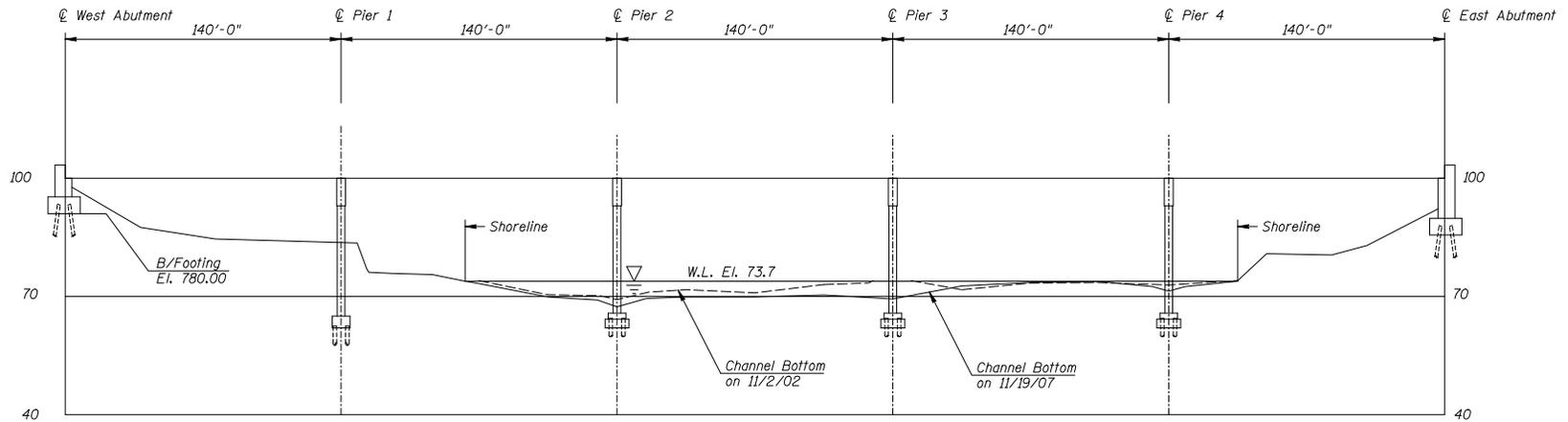
Legend

- 2.0 Sounding Depth (11/19/07)
- 5.2 Sounding Depth (11/2/02)
- Timber Debris
- Scour Depression

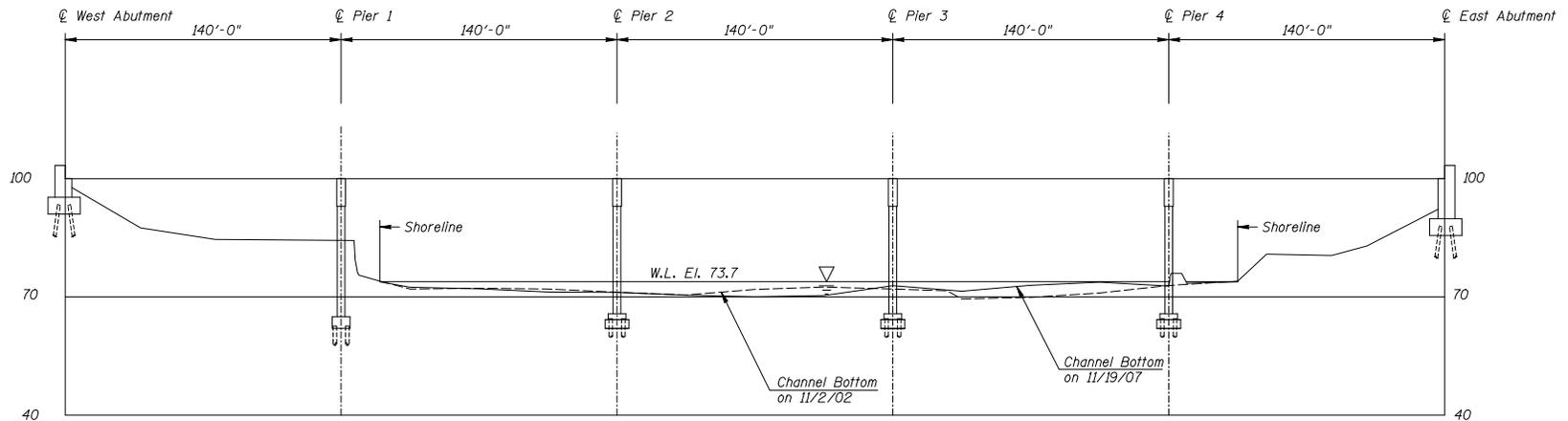
Note:

All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 07569 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: PRH	COLLINS ENGINEERS	Date: NOV., 2007
Checked By: MDK		Scale: NTS
Code: 5221028A		Figure No.: 1



UPSTREAM FASCIA PROFILE
 Horizontal Scale : 1"=60'-0"
 Vertical Scale : 1"=30'-0"



DOWNSTREAM FASCIA PROFILE
 Horizontal Scale : 1"=60'-0"
 Vertical Scale : 1"=30'-0"

Note:
 Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 07569 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS	Date: NOV. 2007
Checked By: MDK		Scale: AS NOTED
Code: 5221028A		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: November 19, 2007

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

BRIDGE NO: 07569 WEATHER: Cloudy, 50°F

WATERWAY CROSSED: Blue Earth River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

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

TIME IN WATER: 1:50 P.M.

TIME OUT OF WATER: 2:20 P.M.

WATERWAY DATA: VELOCITY 1 f.p.s.

VISIBILITY 2 feet

DEPTH 4.8 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 2, 3, and 4

REMARKS: Overall, the concrete was in good condition with no defects of structural significance. Random minor vertical cracks hairline to 1/32 inch wide were observed on both faces of Piers 2, 3 and 4. A local scour depression was observed, maximum 2 to 2.5 feet deep with no footing exposure, at the upstream end of Piers 2, 3, and 4. Light accumulations of timber debris were encountered around the upstream nose and along the side faces of Piers 2 and 3, respectively. Both river banks exhibited steep vertical slopes due to erosion.

FURTHER ACTION NEEDED: YES NO

Monitor the accumulation of timber debris around the upstream nose of Piers 2 and 3, and if it progresses further, removal may be required so it does not adversely affect the piers or their surrounding channel bottom.

Monitor the vertical erosion along the river banks and the scour depressions around the upstream nose of Piers 2, 3, and 4 during future inspections.

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. 07569
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
 WATERWAY CROSSED Blue Earth River

INSPECTION DATE November 19, 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	3.0'	N	7	N	9	N	7	6	6	6	8	6	7	N	N	N	N	N
	Pier 3	5.6'	N	7	N	9	N	7	6	N	N	8	6	7	N	N	N	N	N
	Pier 4	2.5'	N	7	N	9	N	7	6	7	7	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance. Random minor vertical cracks hairline to 1/32 inch wide were observed on both faces of Piers 2, 3 and 4. A local scour depression was observed, maximum 2 to 2.5 feet deep with no footing exposure, at the upstream end of Piers 2, 3, and 4. Light accumulations of timber debris were encountered around the upstream nose and along the side faces of Piers 2 and 3, respectively. Both river banks exhibited steep vertical slopes due to erosion.

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.