

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 07569

CSAH NO. 90

OVER THE

BLUE EARTH RIVER

DISTRICT 7 - BLUE EARTH COUNTY

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SEPTEMBER 13, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

AND

WSB & ASSOCIATES, INC.

JOB NO. 2107

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 and 3. Both river banks exhibited vertically eroded slopes. Mostly light amounts of timber debris have accumulated at the upstream nose of Pier 2.

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 and 3. The maximum depth of the localized scour was 2.5 feet and no footing exposure was detected.
- (C) A light accumulation of timber debris was observed around the upstream nose and along the east face of Pier 2, extending from the channel bottom to 1 foot above the waterline.
- (D) 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 vertical erosion along the river banks and the scour depressions around the upstream nose of Piers 2 and 3 during future inspections.
  
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

WSB and Associates



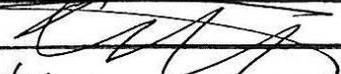
Barritt Lovelace  
Registered Professional Engineer  
Bridge Safety Inspection Team Leader

Respectfully submitted,

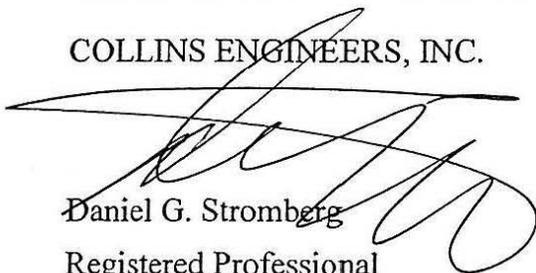
PROFESSIONAL ENGINEER

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: 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: Barritt Lovelace, P.E.

Dive Team: Kasey Yoder (WSB), Lukas Janulis (Collins)

Date: September 13, 2012

Weather Conditions: Sunny, 55°F

Underwater Visibility: 1 foot

Waterway Velocity: None/Negligible

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 4.3 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 27.3 feet below reference.  
Assumed Waterline Elevation = 72.7

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/09/12

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

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	162	LF	162				
985	Slopes & Slope Protection	1	EA		1			



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



Photograph 2. View of Pier 2, Looking West.



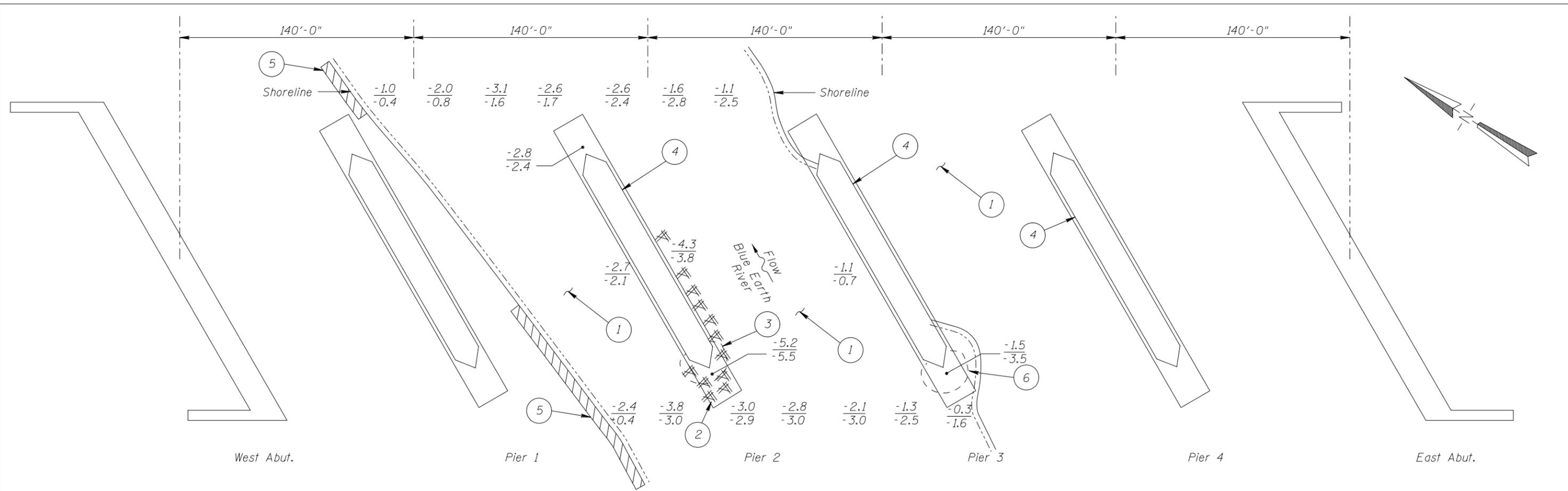
Photograph 3. View of Pier 3, Looking West.



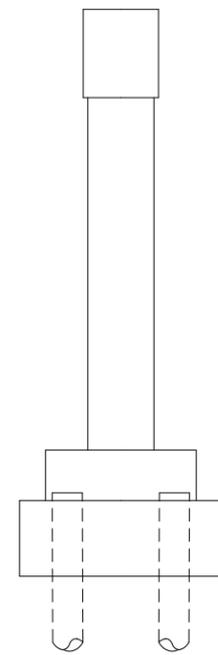
Photograph 4. View of Pier 4, Looking West.



Photograph 5. View of Bank Erosion on Downstream Side, Looking East.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 2 and 3 were inspected underwater. Pier 4 (normally located in the waterway) was also inspected approx. up to the high waterline.
2. At the time of inspection on September 13, 2012, the waterline was located approximately 27.3 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 72.7.
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 Light accumulation of timber debris was observed around the upstream nose and along the east face of Pier 2, extending from the channel bottom to 1 foot above the waterline.
- 3 Scour depression with a 5 foot radius and 2.5 feet of depth was observed around the upstream nose of Pier 2.
- 4 Overall the concrete of the piers was in good condition and only exhibited random vertical cracks.
- 5 Vertical bank erosion was observed along the river bank, consisting of up to 15 feet high vertical cut embankments.
- 6 A 3 feet radius scour depression 1.5 feet deep was observed at the upstream end of Pier 3.

Legend

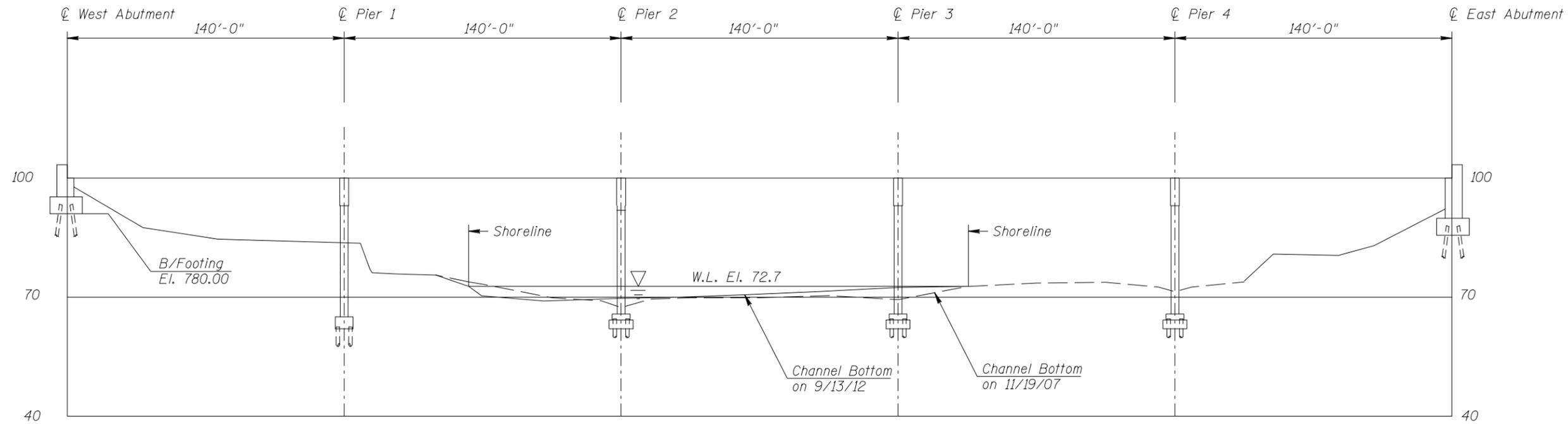
- 2.0 Sounding Depth (9/13/12)
- 5.2 Sounding Depth (11/19/07)
- Timber Debris
- Scour Depression
- Embankment Erosion

Note:

All soundings based on 2012 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 07569 OVER THE BLUE EARTH RIVER DISTRICT 7, BLUE EARTH COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: NTS
Code: 5221028A	<small>701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.wsbenr.com</small>	Figure No.: I

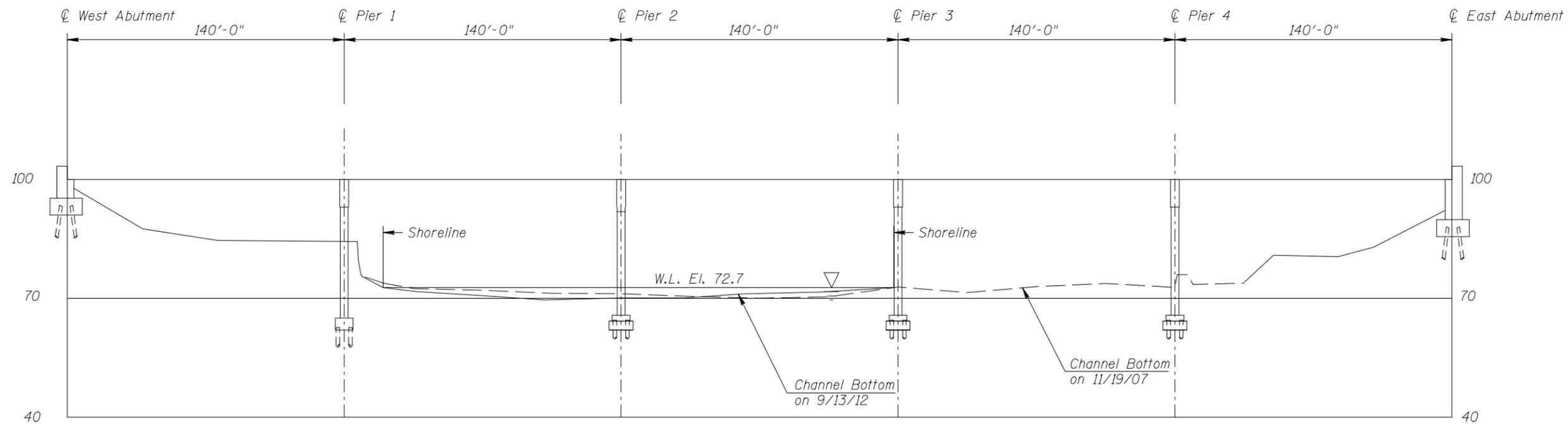




**UPSTREAM FASCIA PROFILE**

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: BJR  
Checked By: BRL  
Code: 5221028A

**COLLINS ENGINEERS**  
123 North Wacker Drive  
Suite 300  
Chicago, IL 60606  
(312) 704-9300  
www.collinsengr.com

Date: SEP. 2012  
Scale: AS NOTED  
Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins Engineers DATE: September 13, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 07569

WEATHER: Sunny, 55°F

WATERWAY CROSSED: Blue Earth River

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR

OTHER

PERSONNEL Kasey Yoder (WSB), Lukas Janulis (Collins)

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

TIME IN WATER: 7:45 A.M.

TIME OUT OF WATER: 8:15 A.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY 1 foot

DEPTH 5.2 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 2, 3, and 4

REMARKS: Overall the concrete of all piers was smooth and sound. Minor localized scour pockets were observed at the upstream nose of Piers 2 and 3. The embankments on both sides of the channel exhibited erosion with up to 15 feet high vertical cut banks. No significant changes have occurred to the substructure condition or the channel bottom configuration since the previous inspection.

FURTHER ACTION NEEDED:  YES  NO

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

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. 07569  
INSPECTORS WSB & Associates and Collins Engineers, Inc.  
ON-SITE TEAM LEADER Barritt Lovelace, P.E  
WATERWAY CROSSED Blue Earth River

INSPECTION DATE September 13, 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

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	4.3'	N	7	N	8	N	7	6	6	6	7	6	7	N	N	N	N	N
	Pier 3	1.5'	N	7	N	8	N	7	7	N	N	8	7	7	N	N	N	N	N
	Pier 4	N	N	7	N	8	N	7	7	6	6	N	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall the concrete of all piers was smooth and sound. Minor localized scour pockets were observed at the upstream nose of Piers 2 and 3. The embankments on both sides of the channel exhibited erosion with up to 15 feet high vertical cut banks. No significant changes have occurred to the substructure condition or the channel bottom configuration since the previous inspection.

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.