UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 52504

CSAH NO. 24

OVER THE

MINNESOTA RIVER

DISTRICT 7 - NICOLLET COUNTY

SEPTEMBER 12, 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 concrete of the substructure units inspected at Bridge No. 52504, Piers 1, 2, and 3, was found to be in good condition with no defects of structural significance observed. Local scour was observed at Piers 2 and 3 with no footings exposure at either of the piers. Overall, the channel bottom exhibited minor degradation as compared to the last underwater inspection.

INSPECTION FINDINGS:

(A) Overall, the concrete below water was in good condition with no structurally significant defects observed.

(B) A scour depression was observed around the upstream nose of Piers 2 and 3, and measured up to 2 feet in depth by approximately 6 feet in radius.

RECOMMENDATIONS:

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

Respectfully submitted,

Inspection Team Leader:
WSB and Associates

Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

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: 52504

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 24

Location: District 7 - Nicollet County

Bridge Description: The bridge superstructure consists of a five span, multiple steel girder structure supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The piers are supported on spread footings. The piers are numbered 1 through 4 starting from the north 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 12, 2012

Weather Conditions: Rain, 57^{o} F

Underwater Visibility: 1.0 foot

Waterway Velocity: 0.5 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: The piers each consist of an oblong rectangular shaft with rounded ends supporting a hammerhead pier cap. The piers are supported by rectangular spread footings.

Maximum Water Depth at Substructure Inspected: Approximately 5.0 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 31.3 feet below reference. Assumed Waterline Elevation = 68.7.

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 A/09/12

Item 113: Scour Critical Bridges: Code M/02

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

_____ Yes X No

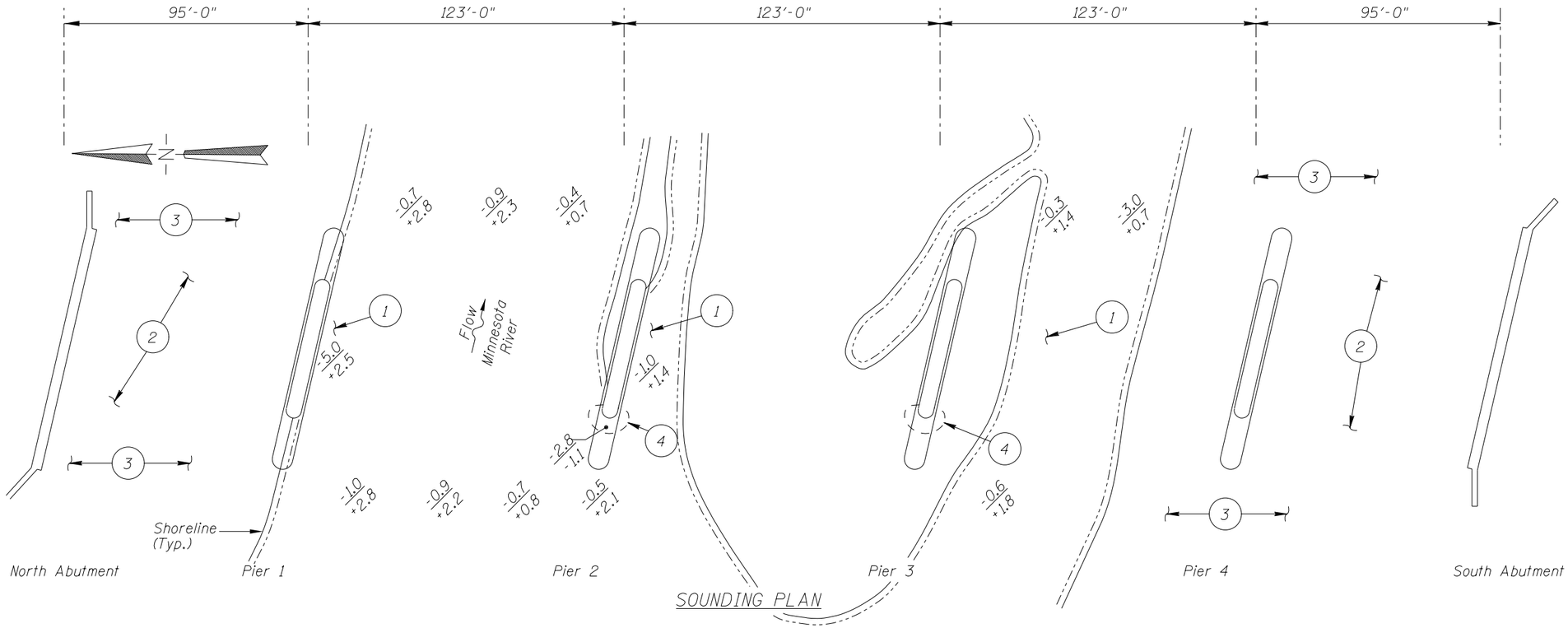
6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
205	Reinforced Concrete Column	3	EA	3				
361	Scour	1	EA	1				
985	Slopes & Slope Protection	2	EA		2			

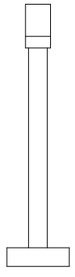
Photograph 1. View of Pier 1, Looking South.

Photograph 2. View of the Pier 2, Looking South.

Photograph 3. View of Pier 3, Looking North.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

INSPECTION NOTES:

1. The channel bottom material around the pier consisted of sand with up to 1 foot of probe rod penetration.
2. The riverbanks beneath the bridge consisted of silty sand along the shoreline with riprap in front of the abutment walls.
3. The upstream and downstream shorelines exhibited steep vertical erosion of the banks.
4. A scour depression was observed around the upstream nose of Piers 2 and 3 and measured up to 2 feet deep by approximately 6 feet in radius.

GENERAL NOTES:

1. Pier 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 12, 2012, the waterline was located approximately 31.3 feet below the top of the pier cap at the downstream 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 68.7.
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.

Legend

-5.2	Sounding Depth (9/12/12)
-5.2	Sounding Depth (10/21/07)
	Scour Depression
	Timber Debris

Note:

All soundings based on 2012 waterline location.

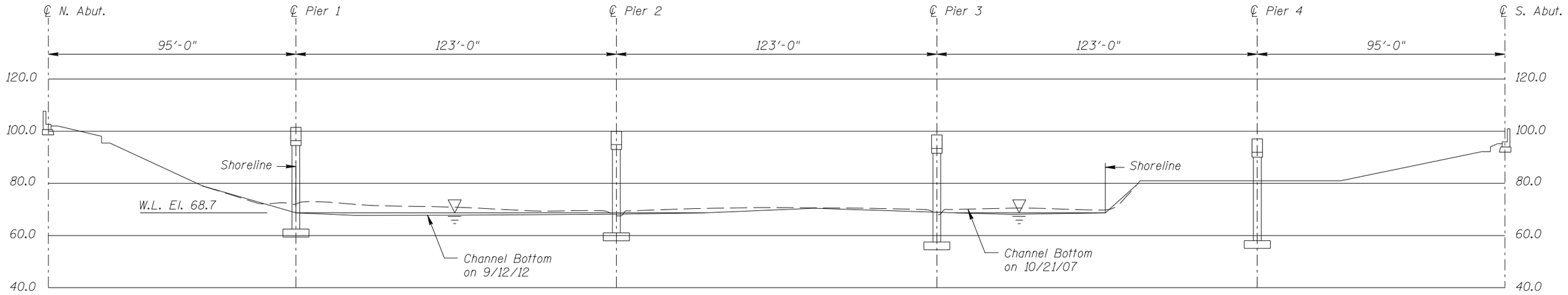
MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 52504
OVER THE MINNESOTA RIVER
DISTRICT 7, NICOLLET COUNTY

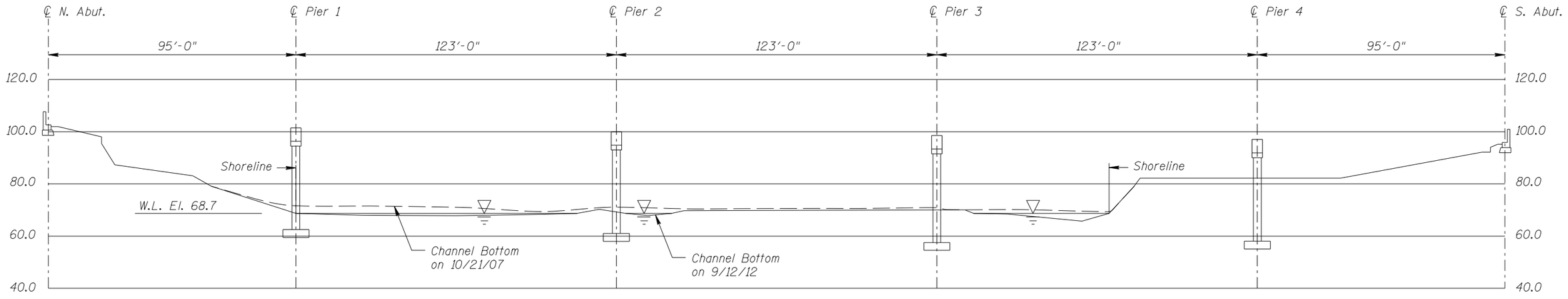
INSPECTION AND SOUNDING PLAN

WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
www.wsbeng.com
763-541-4800 • Fax 763-541-1700
INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION

Drawn By: BJR	COLLINS ENGINEERS, P.C. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: SEP. 2012
Checked By: BRL		Scale: NTS
Code: 552152504		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
www.wsbeng.com
763-541-4800 - Fax 763-541-1700
INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 52504
OVER THE MINNESOTA RIVER
DISTRICT 7, NICOLLET COUNTY

UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: BJR	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 522152504		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: WSB & Associates and Collins Engineers DATE: September 12, 2012

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

BRIDGE NO: 52504 WEATHER: Rain, 57° F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: _____ SCUBA _____ SURFACE SUPPLIED AIR

X OTHER Wading

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

EQUIPMENT: Dry Suit, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 2:40 P.M.

TIME OUT OF WATER: 3:10 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/s

VISIBILITY 1.0 foot

DEPTH 5.0 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1, 2 and 3

REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. A scour depression was observed at the upstream nose of Piers 2 and 3, and measured up to 2 feet deep by approximately 6 feet in radius. No footing exposure was present within the scour depressions.

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. 52504
INSPECTORS WSB & Associates and Collins Engineers, Inc.
ON-SITE TEAM LEADER Barritt Lovelace, P.E
WATERWAY CROSSED Minnesota River

INSPECTION DATE September 12, 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	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	5.0’	N	7	N	9	N	7	7	6	7	7	6	7	N	N	N	N	N
	Pier 2	2.8’	N	7	N	9	N	7	7	N	N	7	7	7	N	N	N	N	N
	Pier 3	N	N	7	N	9	N	7	7	N	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. A scour depression was observed at the upstream nose of Piers 2 and 3, and measured up to 2 feet deep by approximately 6 feet in radius. No footing exposure was present within the scour depressions.

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.