UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 62082

CSAH 3 (Lake Street/Marshall Avenue)

OVER THE

MISSISSIPPI RIVER

HENNEPIN/RAMSEY COUNTY

AUGUST 29, 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 unit inspected at Bridge No. 62082, Pier 5, was found to be in overall good condition with no defects of structural significance observed. In general, the concrete of the pier was sound with only some random minor hairline cracking. A scour depression was observed at the upstream half of the pier resulting in footing exposure with up to full vertical height of the footing exposed.

INSPECTION FINDINGS:

(A) The channel bottom material consisted of sand and concrete rubble allowing up to 6 inches of probe rod penetration. There were also random pieces of scrap steel scattered around the pier on the channel bottom.

(B) The concrete around the pier was in good and sound condition with a light layer of aquatic growth that extended from the waterline to the channel bottom.

(C) Footing exposure was observed at the upstream nose of Pier 5 and extended for ¾ of the pier length along both sides of the pier. At the upstream nose, the full 7 feet (height of footing) of the vertical face was exposed. The footing and seal exposure was due to localized scour, with an approximate depth of 5 to 7 feet, around the upstream end of the pier.

(D) Hairline vertical cracks were observed extending from the top of the pier to the channel bottom.

RECOMMENDATIONS:

(A) Monitor the exposure of the footing and partial exposure of the seal at the upstream nose of Pier 5, and if found to be progressing, additional measures may then be warranted.

(B) 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: 62082

Feature Crossed: Mississippi River

Feature Carried: CSAH 3 (Lake Street/Marshall Avenue)

Location: Hennepin/Ramsey County

Bridge Description: The bridge superstructure consists of a multi-span reinforced concrete arch. The superstructure is supported by two reinforced concrete abutments and eight reinforced concrete piers. The pier that is located in the center of the waterway (Pier 5) is supported on caissons.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R. Lovelace, P.E. (WSB)

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: August 29, 2012

Weather Conditions: Cloudy, 40°F

Underwater Visibility: 2.0 feet

Waterway Velocity: 1.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 5

General Shape: Pier 5 is rectangular with pointed noses. The base of Pier 5 (rectangular footing and seal combination) is supported on twelve 7-foot-diameter caissons.

Maximum Water Depth at Substructure Inspected: Approximately 13.3 feet.

4. WATERLINE DATUM

Water Level Reference: The benchmark reference located on Pier 5.

Water Surface: The waterline was approximately 10.2 feet below reference.
Waterline Elevation = 724.8.

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/10/12

Item 113: Scour Critical Bridges: Code N/02

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

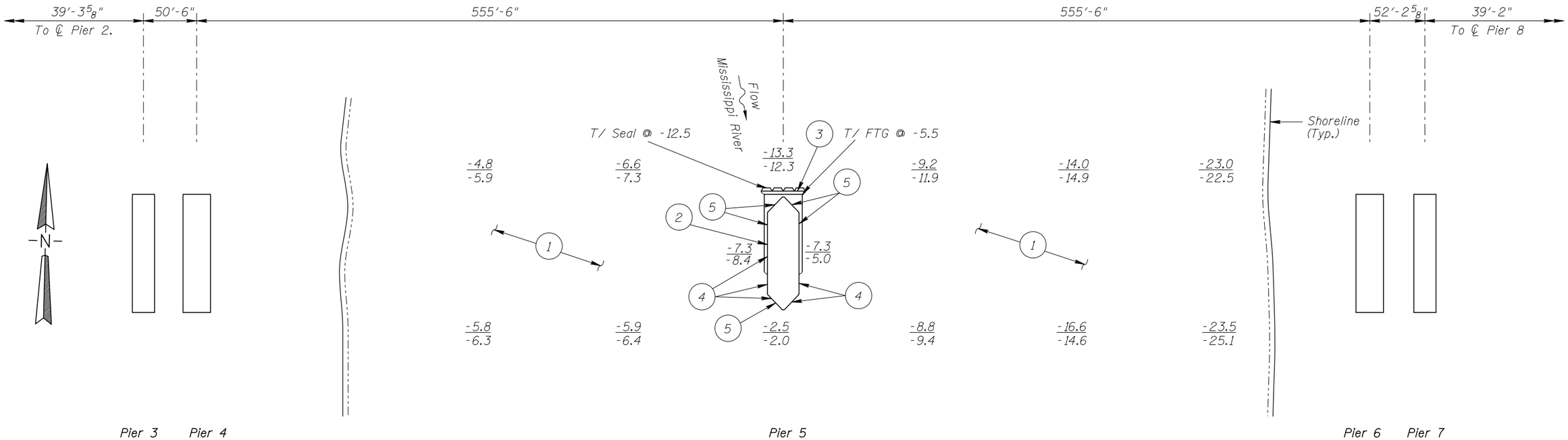
_____ Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

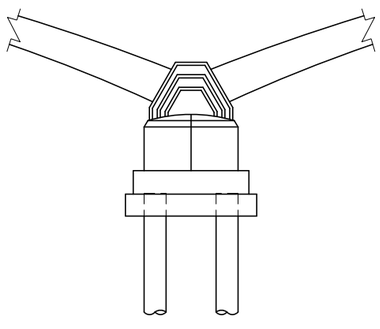
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	107	LF		107			
985	Slope and Slope Protection	1	EA		1			
361	Scour Smart Flag	1	EA		1			

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

Photograph 2. View of Pier 5, Looking Northwest.



SOUNDING PLAN



TYPICAL END VIEW OF PIER

INSPECTION NOTES:

1. The channel bottom material consisted of sand and concrete rubble with up to 6 inches of probe rod penetration. There was also random pieces of scrap steel scattered around the pier on the channel bottom.

2. The concrete around the pier was in good and sound condition with a light layer of aquatic growth that extended from the waterline to the channel bottom.

3. Footing exposure was observed at the upstream nose of Pier 5 and extended for 3/4 of the pier length along both sides of the pier. At the upstream nose, the full 7 feet of the vertical face of the footing was exposed (top of seal was even with the channel bottom). The footing and seal exposure is due to localized scour, with an approximate depth of 5 to 7 feet, around the upstream end of the pier.

4. A hairline vertical crack was observed extending from the top of the pier to the channel bottom.

5. A hairline vertical crack was observed extending from the top of the pier to 1 foot above channel bottom.

GENERAL NOTES:

1. Pier 5 was inspected underwater.

2. At the time of inspection, on October 29, 2012, the waterline was located in the top chamber approximately 10.2 feet below the top of the pier shaft nose on the downstream end of Pier 5. This cooresponds with a waterline elevation of 724.8 based on the design drawings.

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.

Note:

All soundings based on 2012 waterline location.

Legend

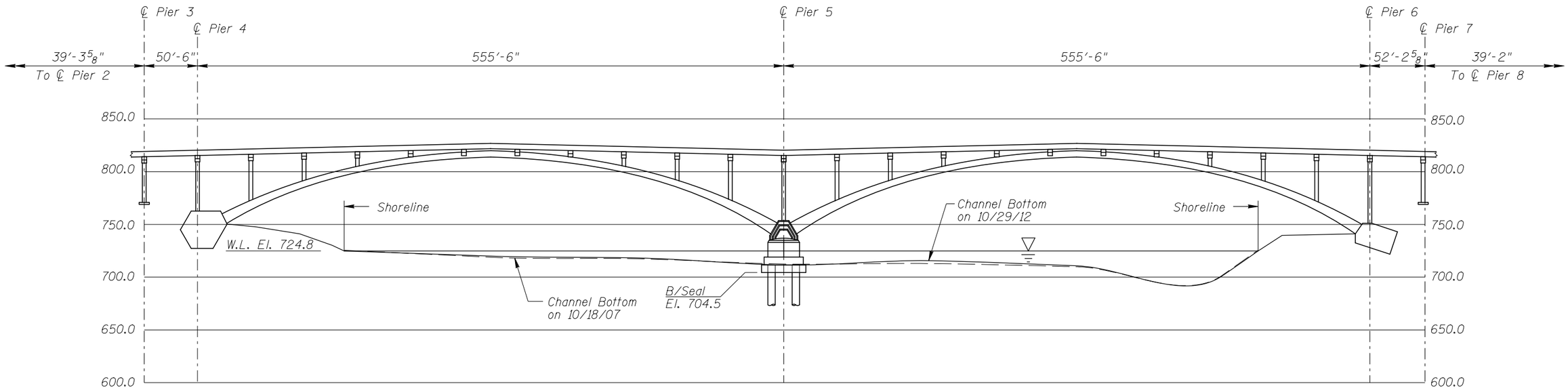
-5.9	Sounding Depth (10/29/12)
-5.2	Sounding Depth (10/18/07)
⌒	Sheet Piling

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

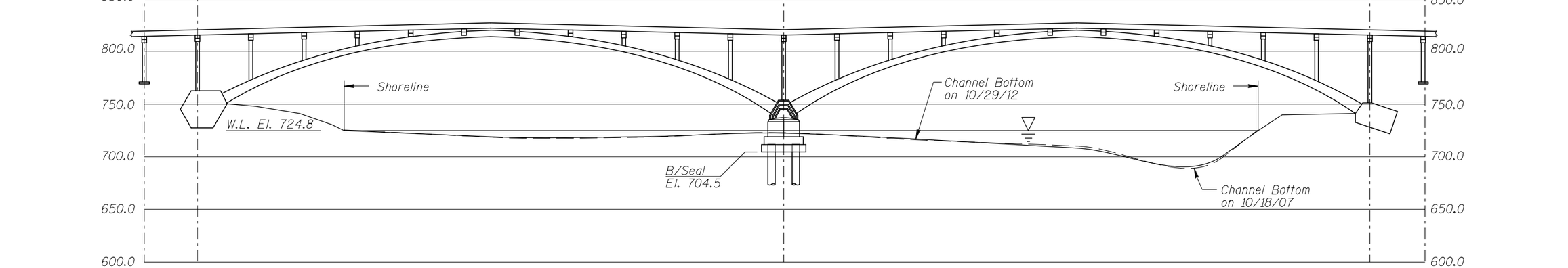
STRUCTURE NO. 62082
OVER THE MISSISSIPPI RIVER
HENNEPIN COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: CRE	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2012
Checked By: LJ		Scale: NTS
Code: 742362082		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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DEPARTMENT OF TRANSPORTATION
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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: CRE	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2012
Checked By: LJ		Scale: 1"=100'
Code: 742362082		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: August 29, 2012

ON-SITE TEAM LEADER: Barritt R. Lovelace, P.E. (WSB)

BRIDGE NO: 62082 WEATHER: Cloudy, 40º F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Marc B. Parker, Lukas Janulis

EQUIPMENT: Commercial Scuba, U/W Light, Probe Rod, Lead Line, Sounding Pole, Scraper, Camera, 14ft boat

TIME IN WATER: 1:50 p.m.

TIME OUT OF WATER: 2:30 p.m.

WATERWAY DATA: VELOCITY 1.5 ft/sec

VISIBILITY 2.0 feet

DEPTH 13.3 feet maximum at Pier 5

ELEMENTS INSPECTED: Pier 5

REMARKS: Overall, Pier 5, was found to be in overall good condition with no defects of structural significance observed. In general, the concrete of the pier was sound with only some random minor hairline cracking. A scour depression was observed at the upstream half of the pier resulting in footing exposure with up to full vertical height of the footing exposed.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the exposure of the footing and partial exposure of the seal at the upstream nose of the pier, and if found to be progressing, additional measures may then be warranted.

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. 62082
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Barritt Lovelace, P.E. (WSB)
WATERWAY CROSSED Mississippi River

INSPECTION DATE August 29, 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.		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
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 5	13.3'	N	7	7	8	N	7	6	N	N	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, Pier 5, was found to be in overall good condition with no defects of structural significance observed. In general, the concrete of the pier was sound with only some random minor hairline cracking. A scour depression was observed at the upstream half of the pier resulting in footing exposure with up to full vertical height of the footing exposed.

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.