

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 07024

173RD STREET

OVER THE

WATONWAN RIVER

DISTRICT 7 – BLUE EARTH COUNTY

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SEPTEMBER 11, 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. 73510, Piers 1 and 2, were generally in good condition. The steel pipe piles, exhibited light surface corrosion and minor pitting, but no significant section loss or defects of structural significance were observed. The channel bottom appeared to be well established with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The channel bottom material consisted of sand, gravel, and cobbles allowing up to 2 inches of probe rod penetration.
- (B) Coating failure and light surface corrosion was observed from 5 feet above the waterline to the channel bottom.
- (C) A moderate accumulation of timber debris consisting of logs and branches up to 1.5 feet in diameter was observed along the east side of the upstream half of Pier 2. The accumulation extended 20 feet off the upstream pile of the pier, from 6 feet above the waterline to the channel bottom.

RECOMMENDATIONS:

- (A) The inspection of the submerged substructure units of Structure No. 07024 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.
  
- (B) Monitor timber accumulation at Pier 2 during future inspections.
  
- (C) 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,

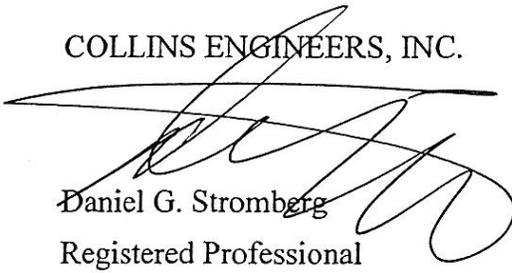
PROFESSIONAL ENGINEER

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: 07024

Feature Crossed: Watonwan River

Feature Carried: 173rd Street

Location: District 7- Blue Earth County

Bridge Description: The superstructure consists of three spans of multiple steel beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two steel pile bent piers. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

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

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

Date: September 11, 2012

Weather Conditions: Sunny, 95° F

Underwater Visibility: 1.0 foot

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers consist of a single line of thirteen steel piles supporting a concrete pile cap.

Maximum Water Depth at Substructure Inspected: Approximately 2.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 2.

Water Surface: The waterline was approximately 19.4 feet below reference.  
Waterline Elevation = 889.1

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 U/09

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

X Yes \_\_\_\_\_ No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
382	Cast-In-Place Piling	26	EA	26				
361	Scour	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



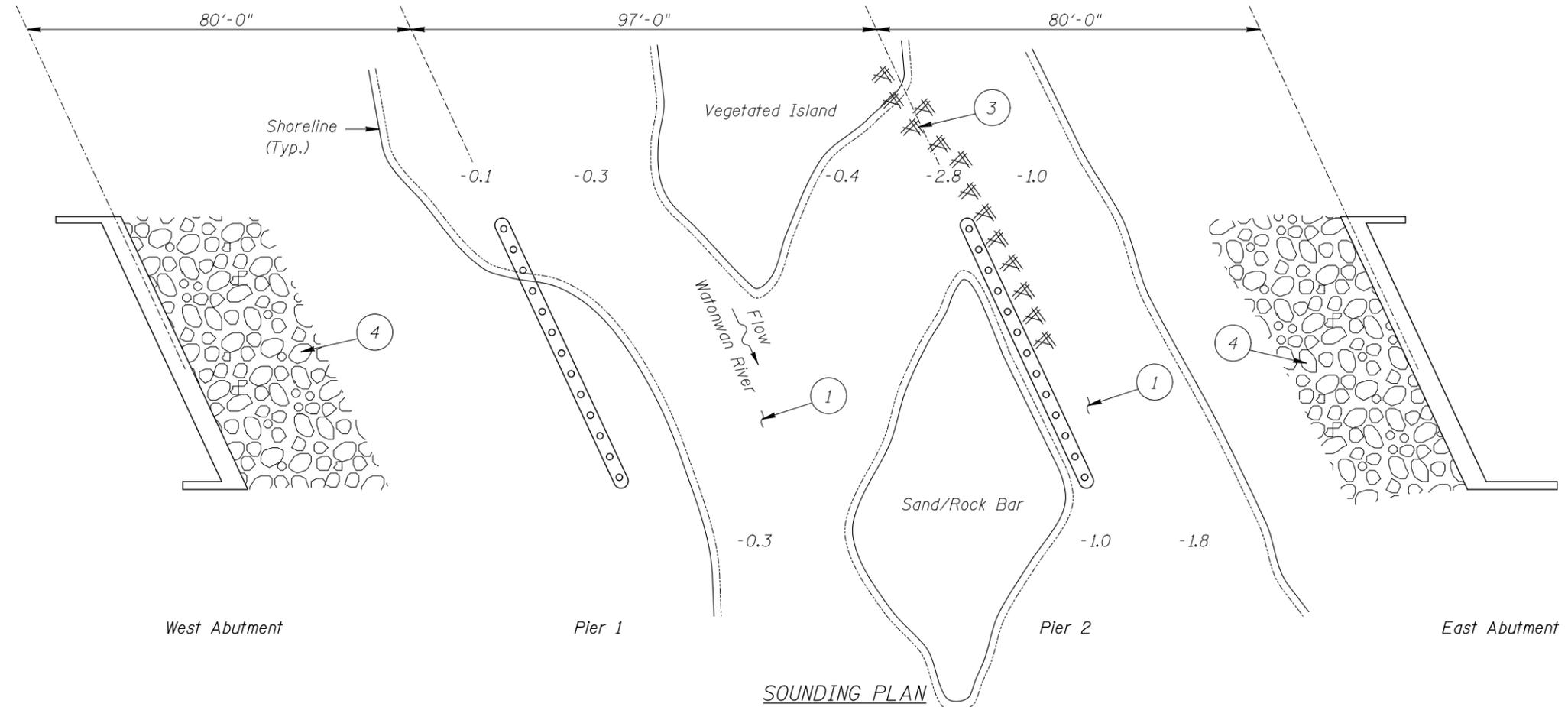
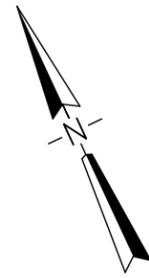
Photograph 1. Overall View of the Structure, Looking North.



Photograph 2. View of Pier 1, Looking East.



Photograph 3. View of Pier 2, Looking West.



**GENERAL NOTES:**

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 11, 2012, the waterline was located approximately 19.4 feet below the top of pier cap at the upstream end of Pier 2. This corresponds to a waterline elevation of 889.1 according to design drawings dated June 21, 1982.
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 typically consisted of sand, gravel, and cobbles allowing up to 2 inches of probe rod penetration.
2. The steel pipe piles typically exhibited coating failure from the channel bottom to 5 feet above the waterline with light surface corrosion and no appreciable loss of section.
3. Moderate timber debris accumulation, consisting of up to 1.5 foot diameter trees and branches, was observed along the upstream half on the east side of pier 2 extending from the channel bottom to 6 feet above the waterline and up to 20 feet off the upstream pile of the pier.
4. The east and west abutments were well armored by up to 2 foot diameter riprap.

**Legend**

- 5.5 Sounding Depth from Waterline (9/11/12)
- Timber Debris

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

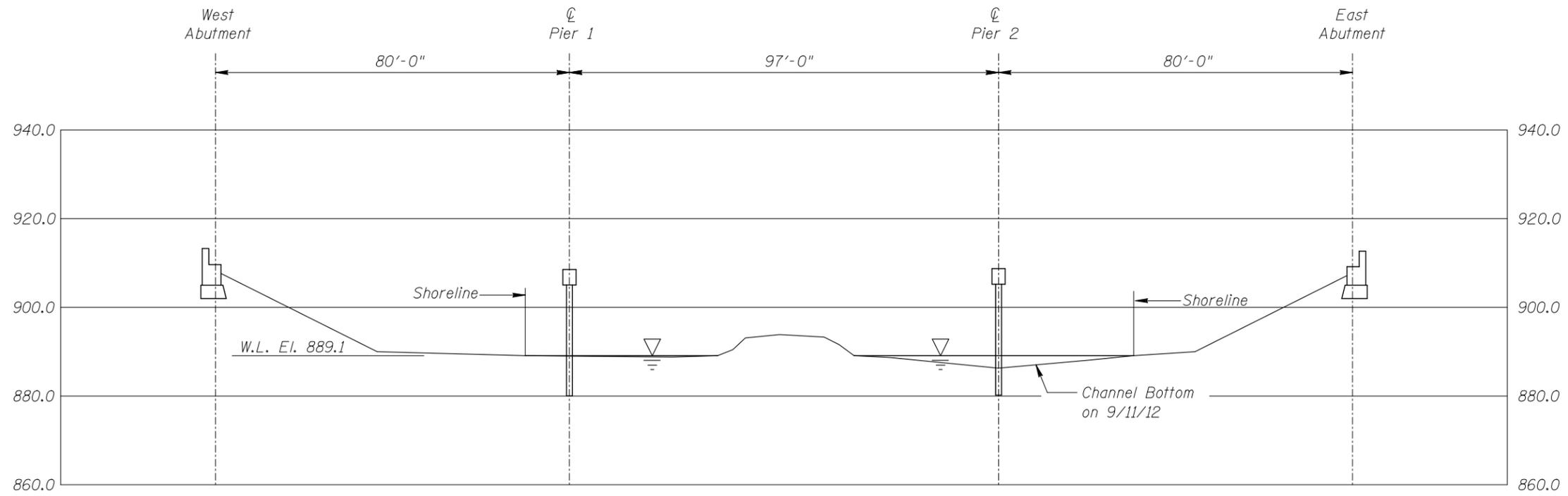
STRUCTURE NO. 07024  
OVER THE WATONWAN RIVER  
DISTRICT 7, BLUE EARTH COUNTY

**INSPECTION AND SOUNDING PLAN**

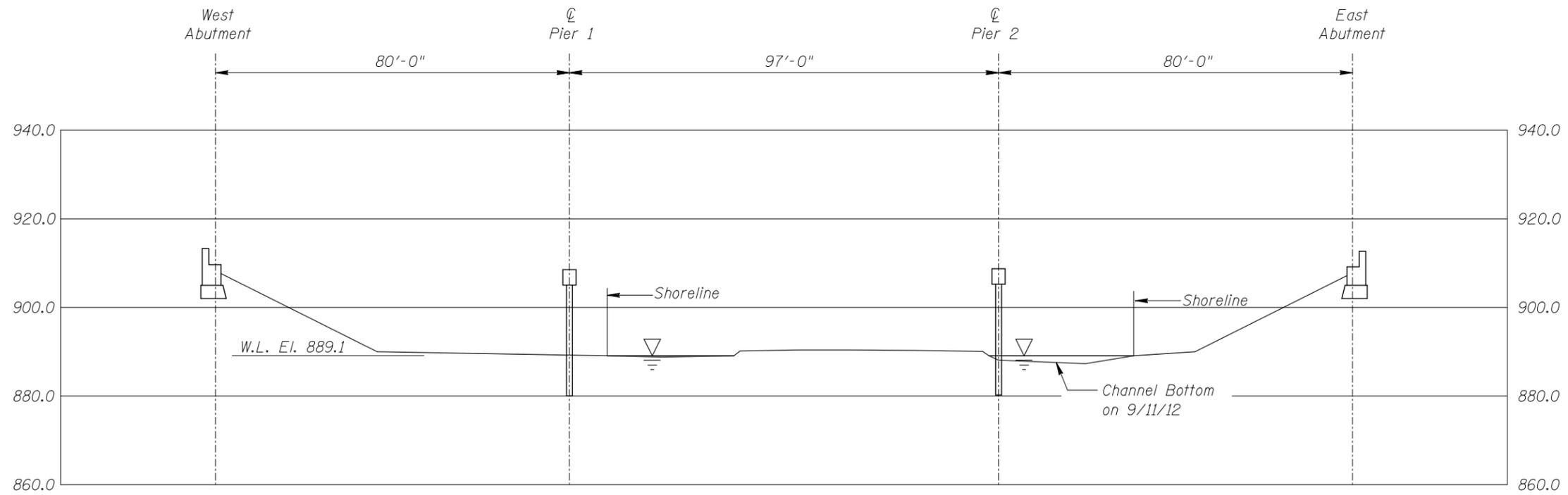
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: NTS
Code: ---		Figure No.: 1

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 07024 OVER THE WATONWAN RIVER DISTRICT 7, BLUE EARTH COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=30'
Code: ---		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins DATE: September 11, 2012

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

BRIDGE NO: 07024 WEATHER: Sunny, 95°F

WATERWAY CROSSED: Watonwan River

DIVING OPERATION: \_\_\_\_\_ SCUBA \_\_\_\_\_ SURFACE SUPPLIED AIR  
 OTHER Wading

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

EQUIPMENT: Wet Suit, Sounding Rod, Camera, Lead Line

TIME IN WATER: 1:15 p.m.

TIME OUT OF WATER: 1:30 p.m.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 1.0 foot

DEPTH 2.8 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, Piers 1 and 2 were in good conditions. The steel pipe pile casing exhibited coating failure and light surface corrosion, but no measurable section loss was noted. Moderate accumulation of timber debris was observed at the upstream end along the east side of Pier 2. The channel bottom appeared stable and well established.

FURTHER ACTION NEEDED: \_\_\_\_\_ YES  NO

The inspection of the submerged substructure units of Structure No. 07024 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped and qualified inspector will have to perform the inspections during a period of low water and low flow. As channel bottom contours and water depths can change abruptly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascia to determine whether a wading inspection is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

Monitor timber accumulation at Pier 2 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. 07024  
 INSPECTORS WSB & Associates and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER. Barritt Lovelace P.E.  
 WATERWAY CROSSED Watowan River

INSPECTION DATE September 11, 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 (SEAL)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/SEDIMENT)	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	0.1'	7	N	N	8	N	7	N	7	7	N	7	N	7	N	7	N	N
	Pier 2	2.8'	7	N	N	8	N	7	N	7	7	6	6	N	7	N	7	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 1 and 2 were in good conditions. The steel pipe pile casing exhibited coating failure and light surface corrosion, but no measurable section loss was noted. Moderate accumulation of timber debris was observed at the upstream end along the east side of Pier 2. The channel bottom appeared stable and well established.

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.