

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 08527

CSAH NO. 13/35

OVER THE

MINNESOTA RIVER

DISTRICT 7 - BROWN 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 substructure units inspected at Bridge No. 08527, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. A minor scour depression as well as a moderate accumulation of timber debris were observed at the upstream end of Pier 2. Some channel bottom degradation has occurred in the vicinity of the bridge since the last underwater inspection.

INSPECTION FINDINGS:

- (A) The concrete surfaces of the piers were found to be smooth and sound with no significant structural defects observed.
- (B) A scour depression 5 feet in radius by 1 to 2 feet in depth was observed at the upstream end of Pier 2.
- (C) A moderate accumulation of timber debris consisting of logs and branches 1 foot in diameter and smaller was observed at the upstream end and between the downstream two columns of Pier 2 extending from the channel bottom up 4 feet.
- (D) Some channel degradation has occurred in the vicinity of the bridge since the last underwater inspection. Water depth soundings indicate the channel bottom elevation has lowered approximately 2 to 6 feet.

RECOMMENDATIONS:

- (A) Monitor the accumulations of timber debris around Pier 2, and if found to be progressing in the future, removal operations may be necessary at that time.
- (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,

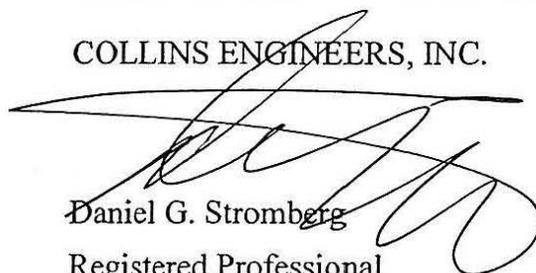
PROFESSIONAL ENGINEER

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: 08527

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 13/35

Location: District 7 - Brown County

Bridge Description: The bridge superstructure consists of eight spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments, three reinforced concrete piers, and four concrete bent piers. All of the concrete substructure footings are supported by concrete piles. The piers are numbered starting from the southern 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: Cloudy, 60°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 0.5 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: Pier 1 consists of two cylindrical reinforced concrete columns supporting a rectangular reinforced concrete pier cap. Pier 2 consists of four cylindrical reinforced concrete columns. The upper portions of the columns at both piers are connected by slender reinforced concrete diaphragms and each column is supported by a square footing founded on piles. Bent two is comprised of a slender reinforced concrete wall with rectangular footing also supported on piles.

Maximum Water Depth at Substructure Inspected: Approximately 8.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 22.7 feet below reference. Waterline Elevation = 787.3.

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 7

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code I/12

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
2205	Reinforced Concrete Column	6	EA	6				
985	Slopes & Slope Protection	1	EA	1				



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



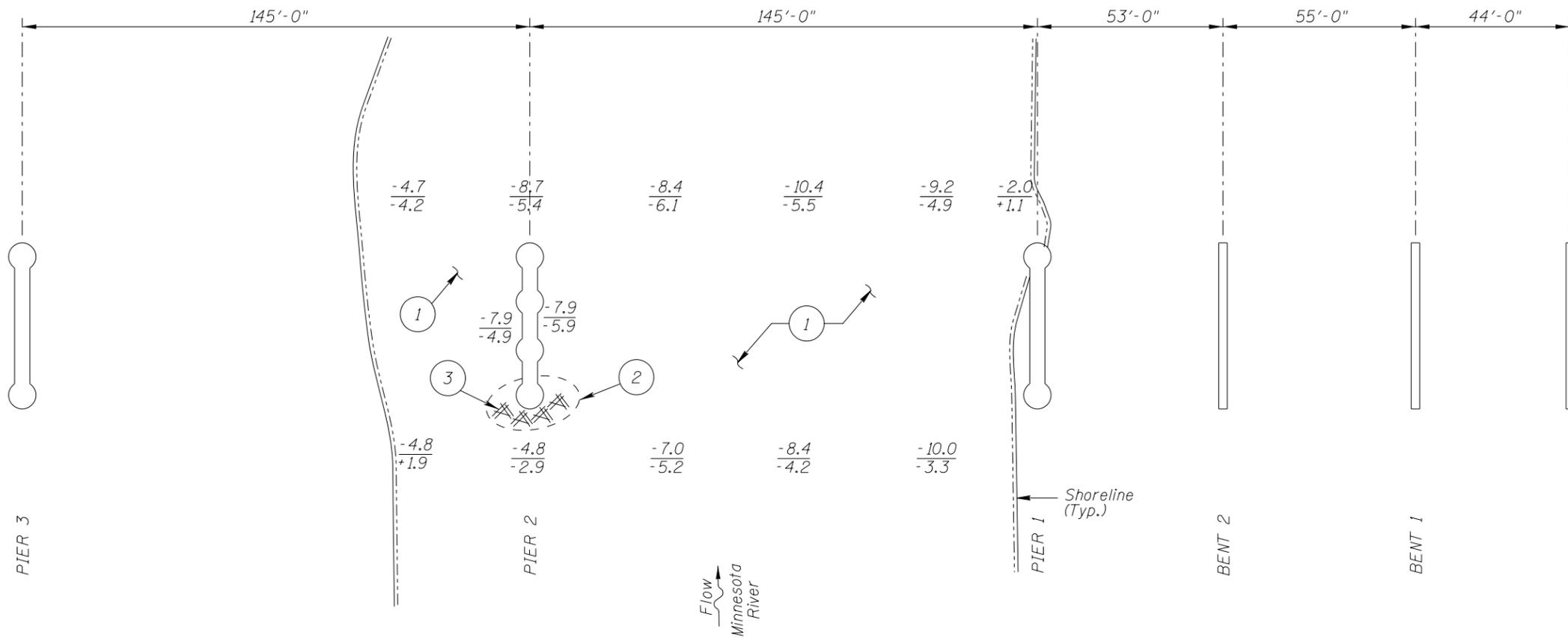
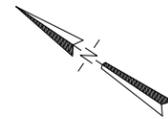
Photograph 2. Overall View of Pier 1, Looking Southeast.



Photograph 3. View of Pier 2, Looking Southeast.



Photograph 4. View of Bent 2, Looking Southeast.



- INSPECTION NOTES:**
- 1 Channel bottom material consisted of soft to medium silty sand with 1.5 feet of maximum probe rod penetration.
 - 2 Minor scour depression 5 feet radius by 1 to 2 feet deep was observed at the upstream end of Pier 2.
 - 3 Moderate accumulation of timber debris consisting of 1 foot diameter and smaller logs and branches was observed at the upstream end of Pier 2 from the channel bottom up 5 feet, and also between downstream two columns, a light accumulation of timber debris consisting of 8 inches diameter and smaller branches extended from channel bottom up 3 feet.

SOUNDING PLAN

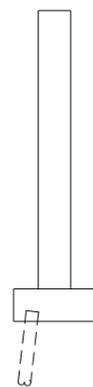
GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on September 12, 2012, the waterline was located approximately 22.7 feet below the top of Pier 1 on the downstream end. This corresponds to a waterline elevation of 787.3.
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 as well as around the pier structures.

Legend

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

Note:
All soundings based on 2012 waterline location.



TYPICAL END VIEW OF EACH PIER SECTION

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

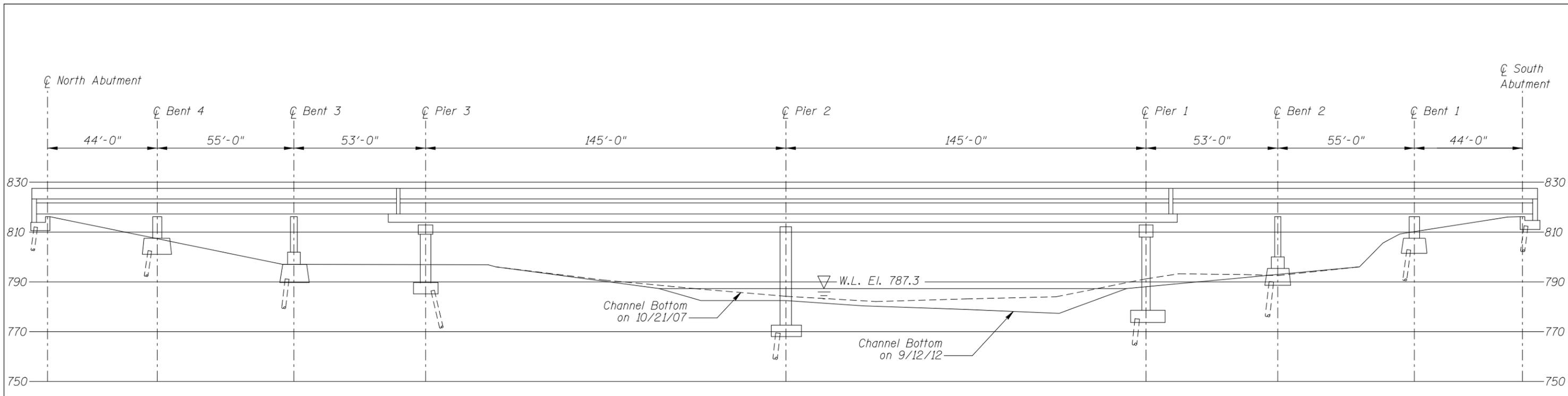
STRUCTURE NO. 08527
CSAH 13 OVER THE MINNESOTA RIVER
DISTRICT 7, BROWN COUNTY

INSPECTION AND SOUNDING PLAN

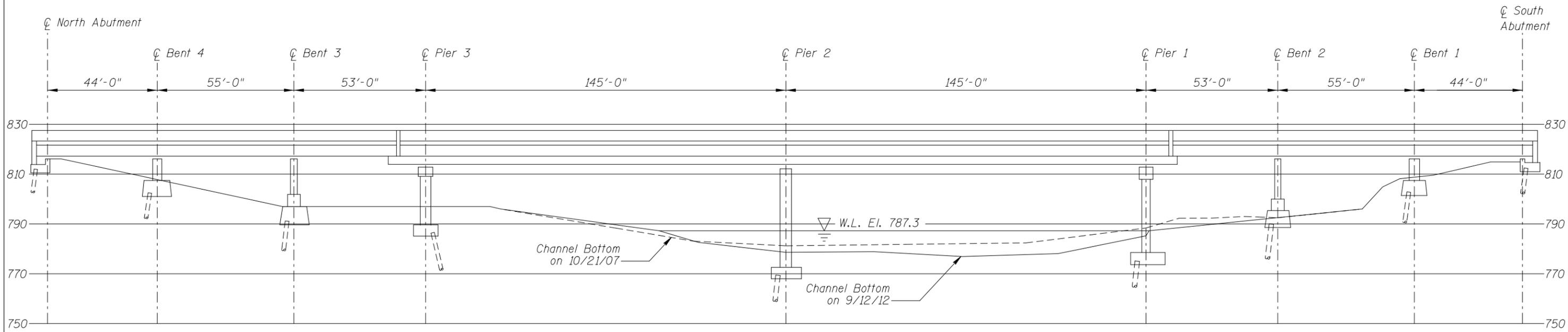
Drawn By: BJR	COLLINS ENGINEERS	Date: SEP. 2012
Checked By: BRL		Scale: NTS
Code: 52218527		Figure No.: 1

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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 08527 CSAH 13 OVER THE MINNESOTA RIVER DISTRICT 7, BROWN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 52218527		Figure No.: 2

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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: 08527 WEATHER: Cloudy, 60°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

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

EQUIPMENT: Drysuit, Probe Rod, Lead Line, Sounding Pole, Camera

TIME IN WATER: 8:45 a.m.

TIME OUT OF WATER: 9:30 a.m.

WATERWAY DATA: VELOCITY 0.5 ft/s

VISIBILITY 0.5 feet

DEPTH 8.7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. A scour depression 5 feet in radius by 1 to 2 feet in depth was observed at the upstream end of Pier 2. A moderate accumulation of timber debris consisting of logs and branches 1 foot in diameter and smaller was observed at the upstream end and between the downstream two columns of Pier 2 extending from the channel bottom up 4 feet.

FURTHER ACTION NEEDED: YES NO

Monitor the accumulation of timber debris around Pier 2.

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. 08527
 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

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 1	2.0'	N	7	N	9	N	7	7	7	N	N	7	7	N	N	N	N	N
	Pier 2	8.7'	N	7	N	9	N	7	7	7	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. A scour depression 5 feet in radius by 1 to 2 feet in depth was observed at the upstream end of Pier 2. A moderate accumulation of timber debris consisting of logs and branches 1 foot in diameter and smaller was observed at the upstream end and between the downstream two columns of Pier 2 extending from the channel bottom up 4 feet.

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.