

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 5767  
CR NO. 1  
OVER THE  
RED RIVER OF THE NORTH  
DISTRICT 2 - POLK COUNTY, CITY OF NIELSVILLE

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AUGUST 30, 2012  
PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
AYRES ASSOCIATES & COLLINS ENGINEERS, INC.  
JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 5765, Pier 1, was in good condition with no defects of structural significance observed. The channel bottom appeared to be stable with no evidence of significant scour. Moderate accumulation of timber debris was observed at the pier. The substructure condition and channel bottom configuration were generally comparable to the findings of the previous underwater inspection.

INSPECTION FINDINGS:

- (A) Moderate to heavy timber debris consisting of logs and branches 3 feet diameter and smaller was observed around the upstream nose and along the east face of Pier 1. The debris extended from the channel bottom to the waterline and 6 feet off the pier.
- (B) Light scaling was observed at the waterline along the entire perimeter of the pier with 1/8 inch maximum penetration.
- (C) A scour depression 0.5 foot deep by 4 feet in radius was observed at the upstream column of Pier 1 underneath the debris.
- (D) Vertical cracks up to 1/8 inch wide were located on both faces of Pier 1 extending from the strut to the channel bottom at the midpoint of the pier.

RECOMMENDATIONS:

- (A) Monitor the timber debris accumulation, and if found to be increasing in the future, removal operations may become warranted.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

Ayres Associates, Inc.



Brian K. Schroeder  
Registered Professional Engineer  
State of Minnesota

Respectfully submitted,

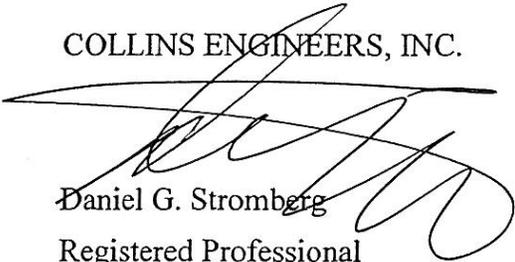
PROFESSIONAL ENGINEER

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: 5767

Feature Crossed: Red River of the North

Feature Carried: CR No. 1

Location: District 2 - Polk County, City of Nielsville

Bridge Description: The superstructure consists of two steel through truss spans. The superstructure is supported by two reinforced concrete abutments and one reinforced concrete pier. The abutments are supported by treated timber piles. The pier is supported by untreated timber piles. The substructure units are designated West Abutment, Pier 1, and East Abutment.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.

Dive Team: Jason A. Cook, Anthony J. Coffaro

Date: August 30, 2012

Weather Conditions: Cloudy, 75°F

Underwater Visibility: None/Negligible

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1.

General Shape: The pier consists of a reinforced concrete cap supported by two multi-sided columns connected by a slender diaphragm wall braced with an integral horizontal strut. The pier is founded on a rectangular footing supported by timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.1 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 32.7 feet below reference.

Waterline Elevation = 67.3

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 6

Item 92B: Underwater Inspection: Code B/08/12

Item 113: Scour Critical Bridges: Code I

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	26	LF		26			
985	Slopes and Slope Protection	1	EA		1			



Photograph 1. View of the Pier 1, Looking East.



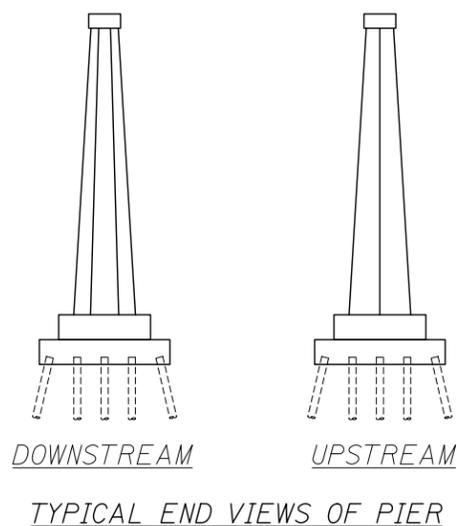
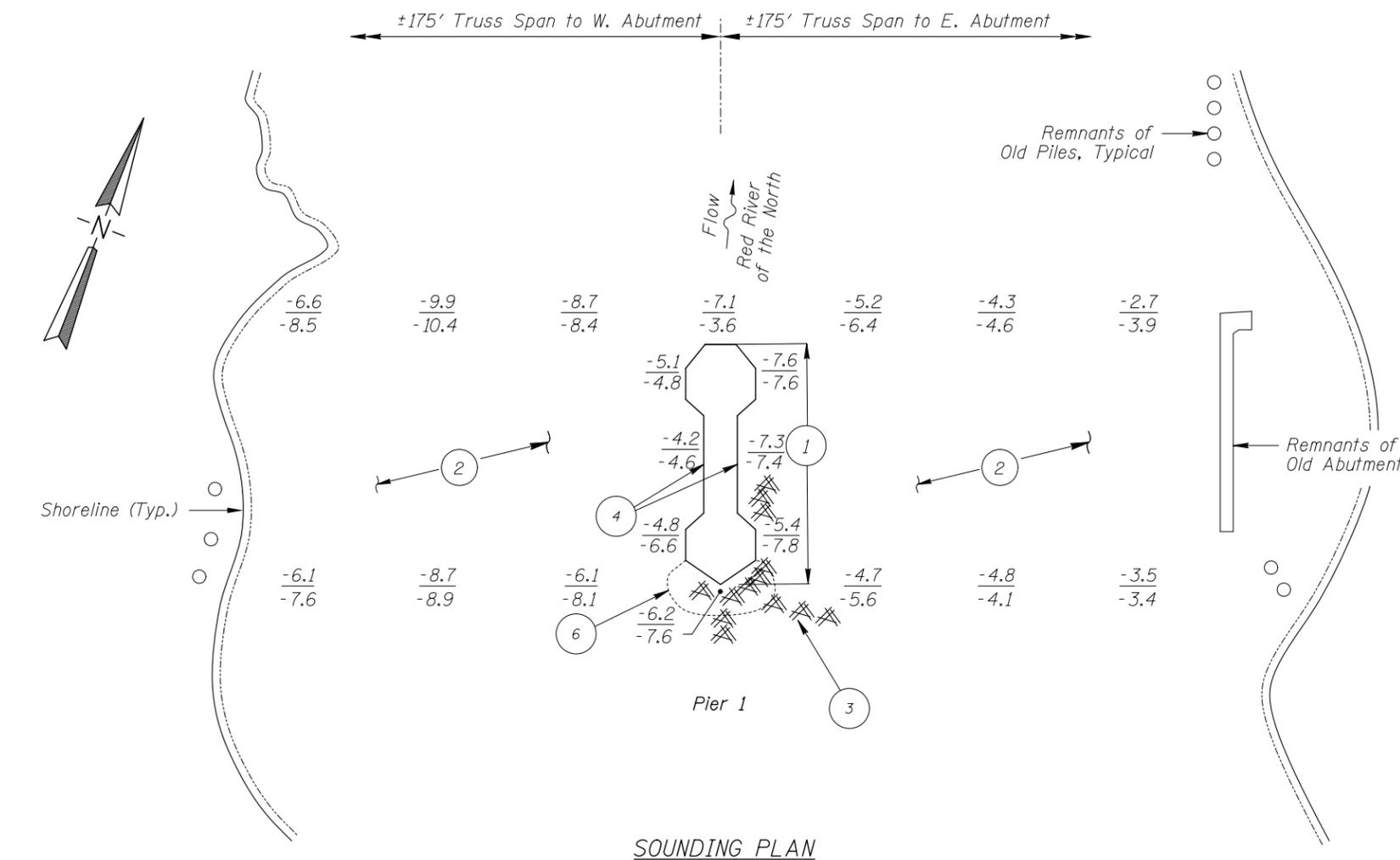
Photograph 2. View of Pier 1, Looking West.

GENERAL NOTES:

1. Pier 1 was inspected underwater.
2. At the time of inspection on August 30, 2012, the waterline was located approximately 32.7 feet below the top of the pier cap at the downstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 67.3.
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 the truss panel points between the substructure units.

GENERAL NOTES:

- ① Overall, concrete was smooth and sound with no significant defects.
- ② The channel bottom consisted of sandy silt.
- ③ Timber debris consisting of logs and branches 3 feet in diameter and smaller was observed around the upstream nose and along the upstream half of the east face of Pier 1. The debris extended from channel bottom to the waterline and 6 feet off the pier.
- ④ Vertical crack up to 1/8 inch wide was located on both faces of Pier 1 near the midpoint extending from strut to channel bottom.
- ⑤ Light scaling was observed at waterline along the entire perimeter of Pier 1 with 1/8 inch of maximum penetration.
- ⑥ A scour depression 0.5 feet deep by 4 foot radius was observed at upstream column of Pier 1 underneath the debris.



Legend

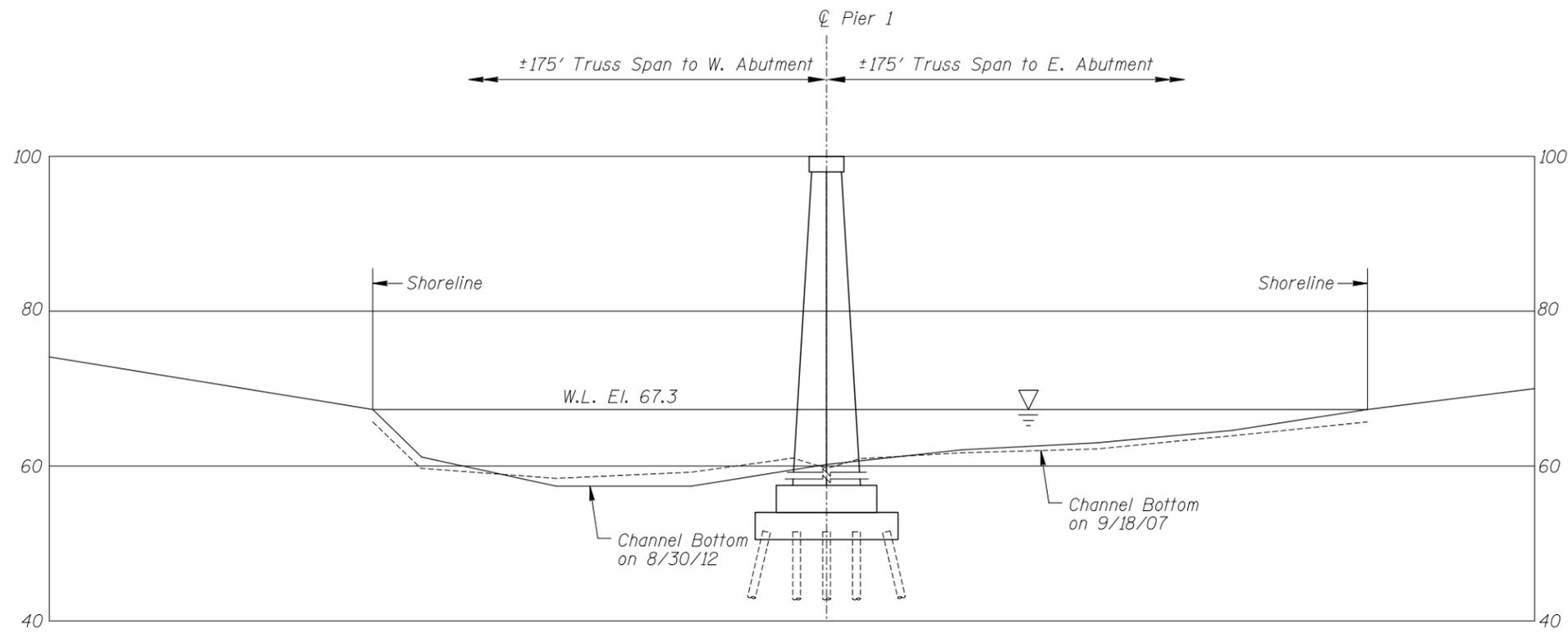
- 2.0 Sounding Depth (8/30/12)
- 5.2 Sounding Depth (9/18/07)
- Timber Debris
- Scour Depression

Note:

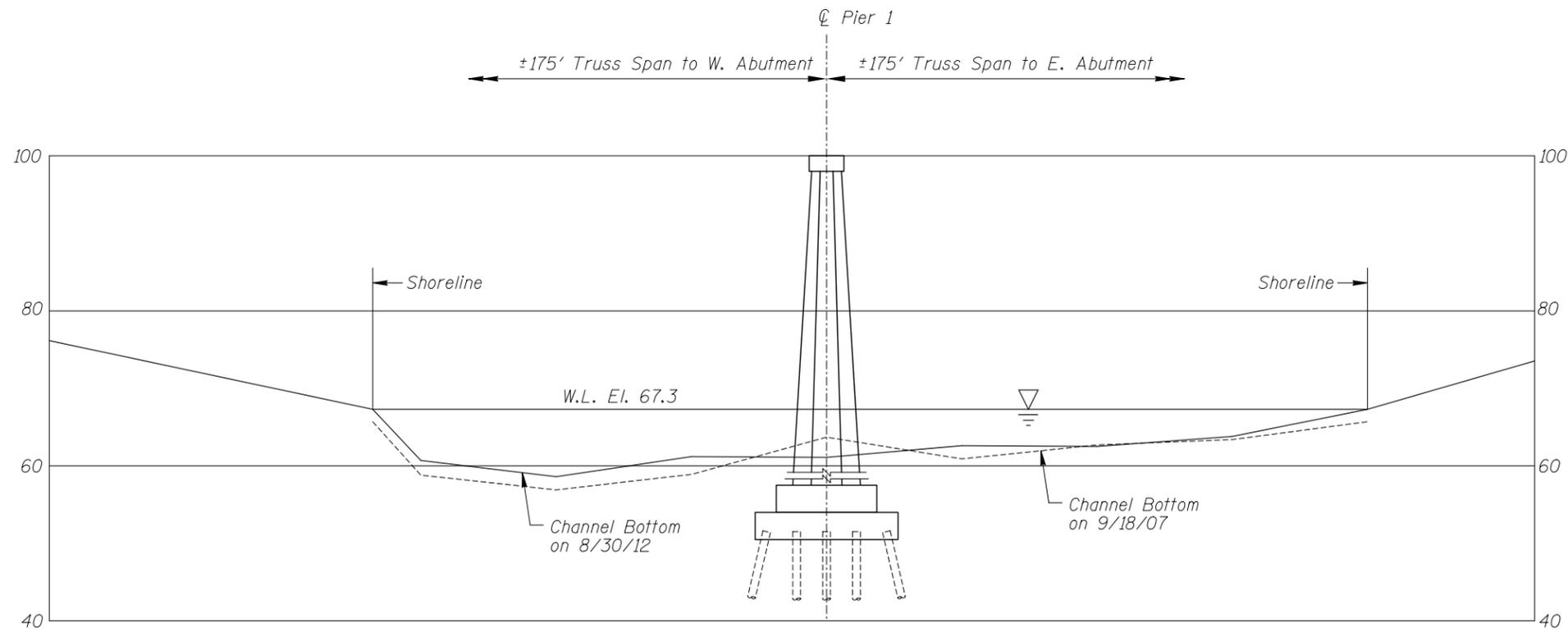
All soundings based on 2012 waterline location.

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<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 5767 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF NIELSVILLE		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: JAC	<b>AVRES ASSOCIATES</b> 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: SEPT, 2012
Checked By: BKS		Scale: NTS
Code: 74235767		Figure No.: 1



**UPSTREAM FASCIA PROFILE**  
Vertical Scale: 1"=20'-0"



**DOWNSTREAM FASCIA PROFILE**  
Vertical Scale: 1"=20'-0"

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 5767 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF NIELSVILLE		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: JAC	<b>AVRES ASSOCIATES</b> 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com	Date: SEPT, 2012
Checked By: BKS		Scale: NTS, (U.N.O.)
Code: 74235767		Figure No.: 2

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

INSPECTORS: Ayres Associates DATE: August 30, 2012

ON-SITE TEAM LEADER: Brian K. Schroeder, P.E.

BRIDGE NO: 5767 WEATHER: Cloudy, 75°F

WATERWAY CROSSED: Red River of the North

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Jason A. Cook, Anthony J. Coffaro

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

TIME IN WATER: 2:15 PM

TIME OUT OF WATER: 2:45 PM

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY None/Negligible

DEPTH 7.6 feet maximum at Pier 1.

ELEMENTS INSPECTED: Pier 1

REMARKS: Overall, the concrete was smooth and sound. Moderate to heavy timber debris consisting of logs and branches 3 feet diameter and smaller was observed around upstream nose and the east face of Pier 1. Light scaling was observed along the entire perimeter of the pier. A scour depression 0.5 foot deep by 4 feet in radius was observed at the upstream column of Pier 1 underneath the debris. Vertical cracks 1/8 inch wide were located on both faces of Pier 1 from the strut to the channel bottom at midpoint of pier wall.

FURTHER ACTION NEEDED:  YES  NO

Monitor the timber debris, and if found to be increasing in the future, removal operations may become 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. 5767  
 INSPECTORS Ayres Associates  
 ON-SITE TEAM LEADER Brian K. Schroeder, P.E.  
 WATERWAY CROSSED Red River of the North

INSPECTION DATE August 30, 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	7.6'	N	7	N	9	N	7	7	7	N	6	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound. Moderate to heavy timber debris consisting of logs and branches 3 feet diameter and smaller was observed around upstream nose and the east face of Pier 1. Light scaling was observed along the entire perimeter of the pier. A scour depression 0.5 foot deep by 4 feet in radius was observed at the upstream column of Pier 1 underneath the debris. Vertical cracks 1/8 inch wide were located on both faces of Pier 1 from the strut to the channel bottom at midpoint of pier wall.

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.