

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 23513

CSAH NO. 36

OVER THE

ROOT RIVER

FILLMORE COUNTY



OCTOBER 4, 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 units inspected at Bridge No. 23513, Piers 1 through 3, were found to be in good condition with no appreciable deterioration and no defects of structural significance observed. Local scour was observed at Piers 1 and 2 with the footing exposed at Pier 1. The maximum vertical face exposure of the footing was 3.5 feet at Pier 1 with no undermining present. A moderate accumulation of timber debris was observed at Pier 2. The channel bottom appeared stable with only minor local scour at the piers and no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A minor scour depression was observed at the upstream end of Pier 1 measuring 1.5 foot deep and 10 feet in radius. The footing was exposed around the entire perimeter of Pier 1, with a maximum vertical face exposure of 3.5 feet at the upstream end and with no undermining detected.
- (B) A minor scour depression was observed at the upstream nose of Pier 2 and measured 1 foot deep by approximately 6 feet in radius with no footing exposure observed.
- (C) A moderate accumulation of timber debris was observed at the upstream nose of Pier 2, consisting of 1.5 feet diameter logs and branches including one tree trunk forked around the nose. The debris extended from the channel bottom to the waterline.

RECOMMENDATIONS:

- (A) Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.
- (B) Since scour screening indicated that bridge is at low risk for scour, only monitor the footing exposure and extent of scour during future inspections.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:
Daniel G. Stromberg, P.E.

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: 23513

Feature Crossed: Root River

Feature Carried: CSAH No. 36

Location: Fillmore County

Bridge Description: The bridge superstructure consists of a five span, multiple prestressed concrete 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 untreated timber piles and the abutments are supported on treated timber piles. The piers are numbered 1 through 4 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E.

Dive Team: Marc B. Parker, Breanne M. Stromberg

Date: October 4, 2012

Weather Conditions: Sunny, 55° F

Underwater Visibility: 4 feet

Waterway Velocity: 1.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 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 a rectangular footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 5.0 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 18.3 feet below reference.
Waterline Elevation = 772.7.

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 B/10/12

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	Concrete Pier Wall	54	LF	54				
220	Concrete Footing	1	EA	1				
361	Scour	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



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



Photograph 2. View of Pier 1, Looking Southwest.



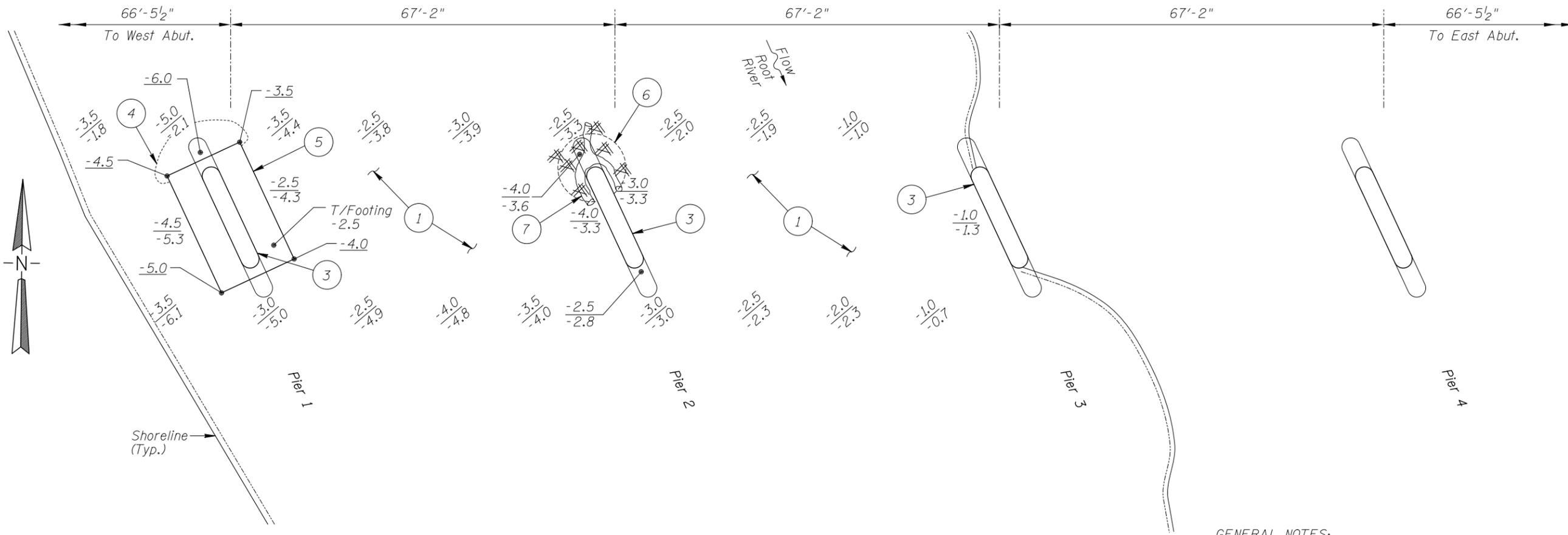
Photograph 3. View of Pier 2, Looking Southwest.



Photograph 4. View of Pier 3, Looking Northeast.



Photograph 5. View of Pier 1 Footing Exposure, Looking Down.



Note:
All soundings based on 2012 waterline location.

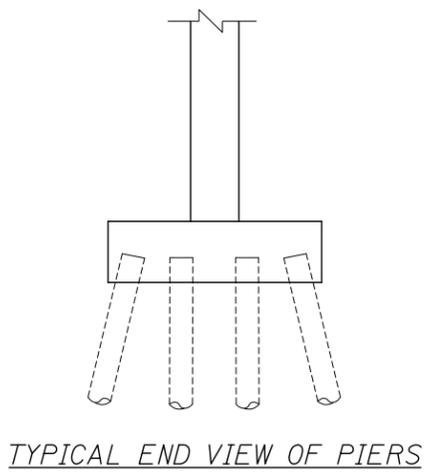
SOUNDING PLAN

- GENERAL NOTES:**
- Piers 1, 2, and 3 were inspected underwater.
 - At the time of inspection on October 4, 2012 the waterline was located approximately 18.3 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds to a waterline elevation of 772.7.
 - Soundings indicate the water depth at the time of inspection and are measured in feet.
 - Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

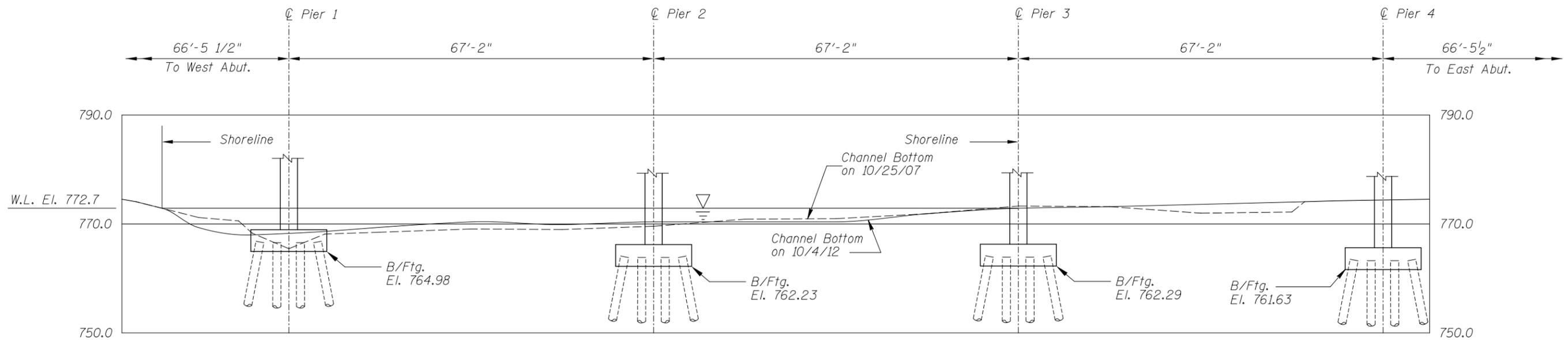
- INSPECTION NOTES:**
- The channel bottom material consisted of firm silty sand with gravel and scattered 5 inch diameter cobbles allowing maximum probe rod penetrations of 2 to 4 inches.
 - The channel bottom material consisted of soft silt over gravel allowing a maximum probe rod penetration of 1.5 feet.
 - The concrete of the piers was in good and sound condition with no significant deterioration.
 - A scour depression, 1.5 feet deep and 10 feet in radius, was observed at the upstream nose of Pier 1.
 - The top of the footing was exposed around the entire perimeter of Pier 1 with up to 3.5 feet of vertical footing exposure at the upstream end of the pier with no undermining observed.
 - A scour depression, 1 foot deep and 6 feet in radius, was observed at the upstream nose of Pier 2.
 - A moderate accumulation of timber debris was observed at the upstream nose of Pier 2 consisting of 1.5 feet diameter and smaller trees and branches (including a tree trunk forked around the nose) that extends from the channel bottom to the waterline.

Legend

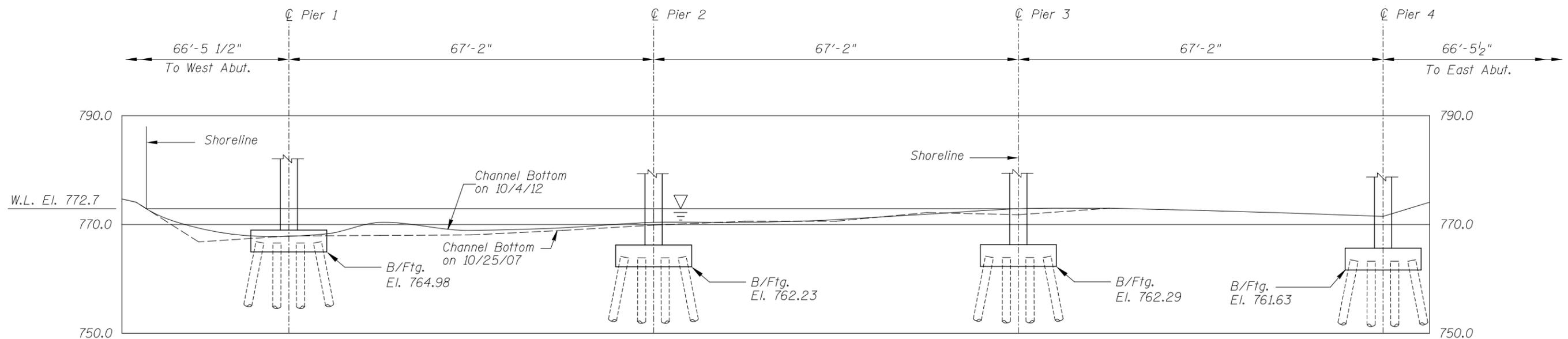
-3.8	Sounding Depth (10/4/12)
-3.8	Sounding Depth (10/25/07)
	Timber Debris
	Scour Depression



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 23513 CSAH 36 OVER THE ROOT RIVER FILLMORE COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MBP	COLLINS ENGINEERS	Date: JAN., 2013
Checked By: LJ		Scale: NTS
Code: 742323513		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 23513 CSAH 36 OVER THE ROOT RIVER FILLMORE COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: MBP	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: JAN., 2013
Checked By: LJ		Scale: 1"=20'
Code: 742323513		Figure No.: 2

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

INSPECTORS: Collins Engineers, Inc. DATE: October 4, 2012

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.

BRIDGE NO: 23513 WEATHER: Sunny, 55° F

WATERWAY CROSSED: Root River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Breanne M. Stromberg

EQUIPMENT: Commercial Scuba, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 12:40 P.M.

TIME OUT OF WATER: 1:10 P.M.

WATERWAY DATA: VELOCITY 1.5 ft/sec

VISIBILITY 4.0 feet

DEPTH 5.0 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 Through 3

REMARKS: Overall, the concrete of the piers was in good and sound condition with no structurally significant defects observed. Local scour was observed at Piers 1 and 2 with the footing exposed at Pier 1. The maximum vertical face exposure of the footing was 3.5 feet at the upstream end of Pier 1. A moderate accumulation of timber debris was observed at Pier 2. The channel bottom appeared stable with only minor local scour at the piers and no appreciable changes since the previous inspection.

FURTHER ACTION NEEDED: YES NO

Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.

Since scour screening indicated that bridge is at low risk for scour, only monitor the footing exposure and extent of scour 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. 23513
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.
 WATERWAY CROSSED Root River

INSPECTION DATE October 4, 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 (REINFORCING)	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	7	8	N	7	6	8	8	N	6	7	N	N	N	N	N
	Pier 2	4.0'	N	7	N	8	N	7	7	N	N	6	6	7	N	N	N	N	N
	Pier 3	1.0'	N	7	N	8	N	7	7	7	8	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good and sound condition with no structurally significant defects observed. Local scour was observed at Piers 1 and 2 with the footing exposed at Pier 1. The maximum vertical face exposure of the footing was 3.5 feet at Pier 1 with no undermining present. A moderate accumulation of timber debris was observed at Pier 2. The channel bottom appeared stable with only minor local scour at the piers and no appreciable changes since the previous inspection.

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.