

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 02526

CSAH NO. 7

OVER THE

RUM RIVER

METRO DISTRICT - ANOKA COUNTY

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SEPTEMBER 9, 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. 02526, Piers 1 and 2, were found to generally be in good condition with no defects of structural significance. A light to moderate accumulation of timber debris was observed at Pier 2. The top of footing at Pier 2 was exposed within a localized area with no vertical exposure.

INSPECTION FINDINGS:

- (A) Overall, the concrete of the piers was in smooth, sound condition with no structural defects; however, light scaling was observed from the waterline to 3 feet above the waterline with a maximum penetration of 1/8 inch.
- (B) A light to moderate accumulation of 12 inch-diameter and smaller timber debris was observed at Pier 2 from the downstream quarter point of the south face, around the upstream nose to the downstream quarter point of the north face. The timber debris extended from the channel bottom to the waterline and up to 5 feet off the pier faces.
- (C) The top of footing was partially exposed along the south face near the downstream 1/4 point of Pier 2 with no vertical face exposure.

RECOMMENDATIONS:

- (A) Footing exposure and timber debris accumulation should be monitored during future inspections.
  
- (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,

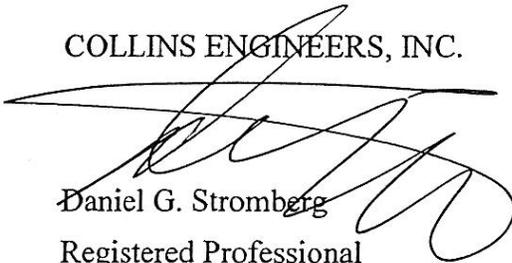
PROFESSIONAL ENGINEER

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: 02526

Feature Crossed: The Rum River

Feature Carried: CSAH No. 7

Location: Metro District - Anoka County

Bridge Description: The bridge superstructure consists of four spans of multiple prestressed concrete girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The abutments are founded on concrete cast-in-place piles, while the piers are supported by rectangular concrete footings which are founded on timber piles. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

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

Dive Team: Brad Robinson (WSB), Lukas Janulis (Collins)

Date: September 9, 2012

Weather Conditions: Sunny, 68°F

Underwater Visibility: 2 feet

Waterway Velocity: 0.5 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of a rectangular shaft supporting a hammerhead pier cap, both with rounded ends. The pier shaft is supported by a rectangular concrete footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 8.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the Pier 1 on the downstream end.

Water Surface: The waterline was approximately 15.1 feet below reference.  
Waterline Elevation = 847.1

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 B/09/12

Item 113: Scour Critical Bridges: Code I/91

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

Yes  No

6. STRUCTURAL ELEMENT CONDITION RATING:

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Concrete Pier Wall	56	LF	56				
985	Slopes	1	EA			1		



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



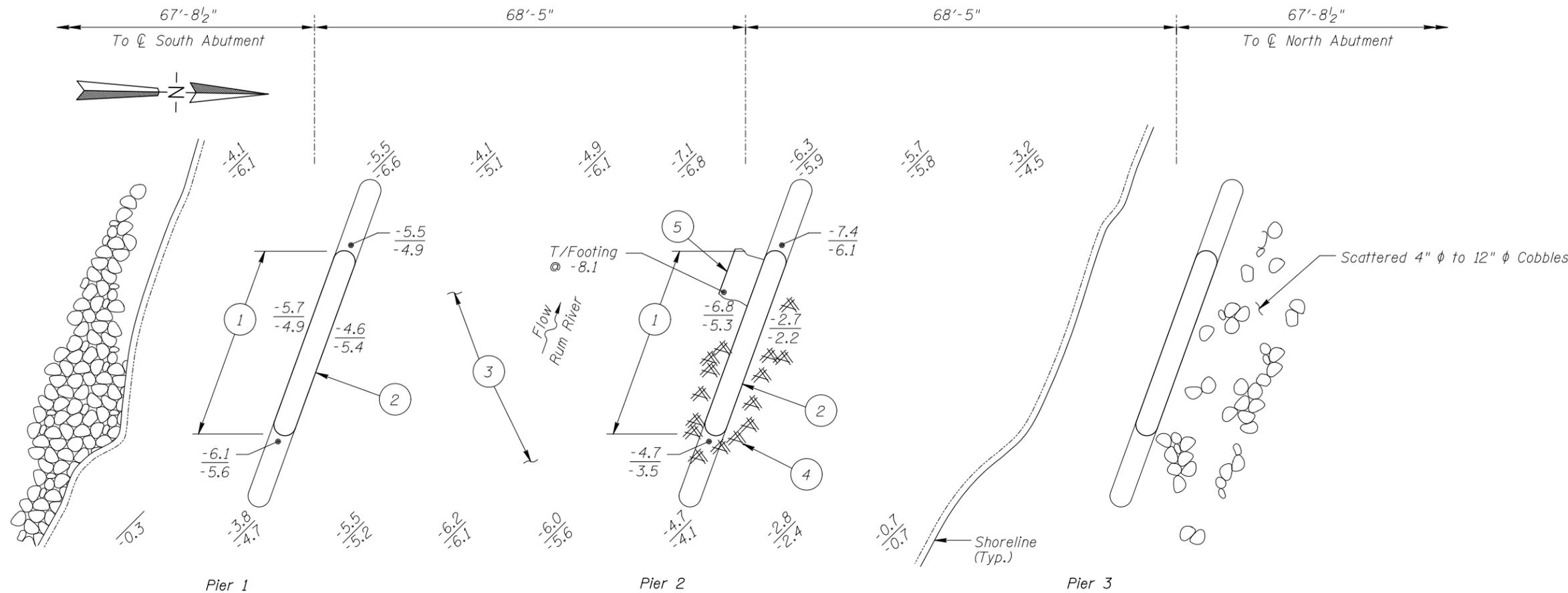
Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 2, Looking South.



Photograph 4. View of Pier 3, Looking South.



**SOUNDING PLAN**

**INSPECTION NOTES:**

- ① Overall, the concrete of the piers was smooth and sound with no defects of structural significance.
- ② A band of light scaling was observed on Piers 1 and 2 from the waterline up 3 feet with a maximum penetration of 1/8 inch.
- ③ The channel bottom consisted of firm sand with 2 to 3 inches of probe rod penetration and 12-inch-diameter riprap located at the upstream noses of Piers 1 and 2 and along the south face of Pier 1.
- ④ A light to moderate accumulation of timber debris consisting of logs and branches, 12 inch diameter or smaller, was observed from the downstream 1/4 point of south face, around the upstream nose, to the downstream 1/4 point of the north face. The debris extended from the channel bottom to the waterline and up to 5 feet off the pier faces.
- ⑤ The top of footing was partially exposed along the south face near the downstream 1/4 point of Pier 2 with no vertical face exposure present.

**GENERAL NOTES:**

- 1. Piers 1 and 2 were inspected underwater.
- 2. At the time of inspection on September 9, 2012, the waterline was located approximately 15.1 feet below the top of Pier 1 at the downstream end. This corresponds to a waterline elevation of 847.1.
- 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**

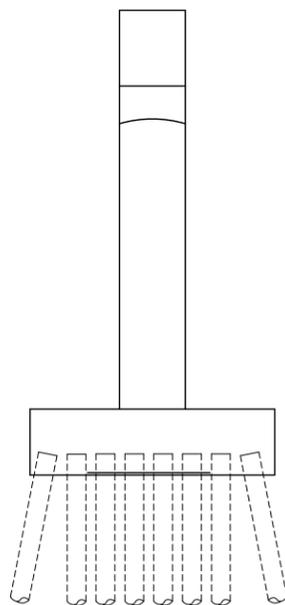
- 2.0 Sounding Depth (9/9/12)
- 3.8 Sounding Depth (8/14/07)

Timber Debris

Riprap

**Note:**

All soundings based on 2012 waterline location.

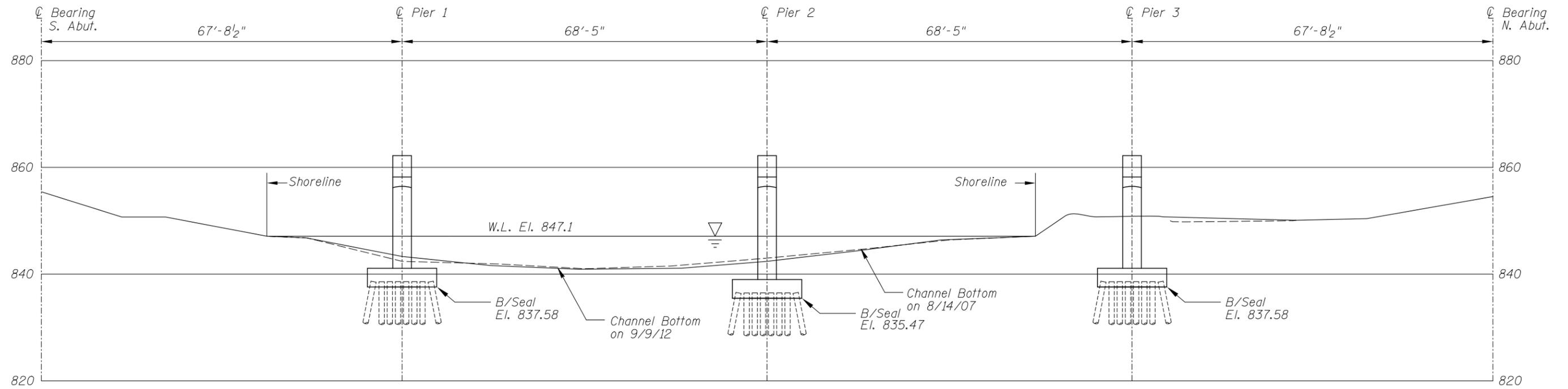


**TYPICAL END VIEW OF PIERS**

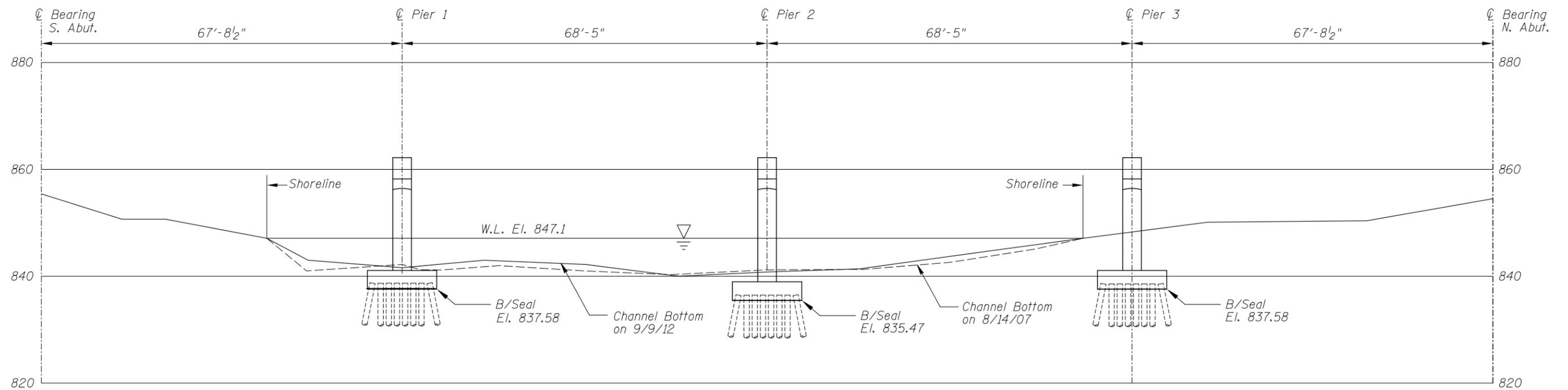
<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>	
STRUCTURE NO. 02526 OVER THE RUM RIVER METRO DISTRICT, ANOKA COUNTY	
<b>INSPECTION AND SOUNDING PLAN</b>	
Drawn By: BJR	Date: SEP. 2012
Checked By: BRL	Scale: NTS
Code: 52210105	Figure No.: 1

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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. 02526 OVER THE RUM RIVER METRO DISTRICT, ANOKA COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b> <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993</small>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=20'
Code: 52210105		Figure No.: 2

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

INSPECTORS: WSB & Associates and Collins Engineers      DATE: September 9, 2012

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

BRIDGE NO: 02526      WEATHER: Sunny, 68°F

WATERWAY CROSSED: The Rum River

DIVING OPERATION:  SCUBA       SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Brad Robinson (WSB), Lukas Janulis (Collins)

EQUIPMENT: Commercial Scuba, Sounding Pole, Camera, u/w Light, Scraper, Probe Rod

TIME IN WATER: 4:40 P.M.

TIME OUT OF WATER: 5:00 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 2 feet

DEPTH 8.1 feet maximum at Pier 2.

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete piers were in good condition with no defects of structural significance, however, light scaling was observed from the waterline up 3 feet around Pier 1 and 2 with a maximum penetration of 1/8 inch. A light to moderate accumulation of timber debris was observed at Pier 2 from downstream quarter point of the south face, around the upstream nose to the downstream quarter point of the north face. The debris extended from the channel bottom up to the waterline and 5 feet off the pier faces. Top of footing was exposed at Pier 2 at 8.1 feet below the waterline near the downstream 1/4 point along the south side of pier.

FURTHER ACTION NEEDED:       YES       NO

Monitor footing exposure at Pier 2 and give consideration to the removal of drift accumulations if found to be increasing 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. 02526  
 INSPECTORS WSB & Associates and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.  
 WATERWAY CROSSED Rum River

INSPECTION DATE September 9, 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	6.1'	N	7	N	8	N	7	7	N	7	7	7	7	N	N	N	N	N
	Pier 2	8.1'	N	7	7	8	N	7	7	N	6	6	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were in good condition with no defects of structural significance, however, light scaling was observed from the waterline up to 3 feet around Pier 1 and 2 with a maximum penetration of 1/8 inch. A light to moderate accumulation of timber debris was observed at Pier 2 from downstream quarter point of the south face, around the upstream nose to the downstream quarter point of the north face. The debris extended from the channel bottom up to the waterline and 5 feet off the pier faces. Top of footing was exposed at Pier 2 at 8.1 feet below the waterline near the downstream 1/4 point along the south side of pier.

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.