

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 70535

CSAH NO. 1

OVER THE

MINNESOTA RIVER

METRO DISTRICT AND DISTRICT 7 – SCOTT COUNTY

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SEPTEMBER 10, 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 70535, Piers 1 and 2, were in good condition with no defects of structural significance observed. A moderate accumulation of timber debris was observed at the upstream end of Pier 2, and a dry scour depression was observed around Pier 3. Heavy embankment erosion was observed along the west shoreline.

INSPECTION FINDINGS:

- (A) A moderate accumulation of timber debris consisting of 1 foot diameter and smaller logs and branches was observed at the upstream nose of Pier 2 extending from the channel bottom up 4 feet and along the west face from the upstream end to the shaft midpoint extending from the channel bottom up 2 feet.
- (B) A 10 foot radius scour depression 5 to 6 feet deep was observed all around Pier 3 (on easterly bank with no standing water).
- (C) Moderate to heavy embankment erosion was present along the west bank due to a bend in the river and recent flooding.

RECOMMENDATIONS:

- (A) Monitor the extent of the timber debris accumulation at Pier 2, and if found to be increasing, removal during routine maintenance may become necessary.
- (B) Monitor channel bank erosion on the west bank 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,

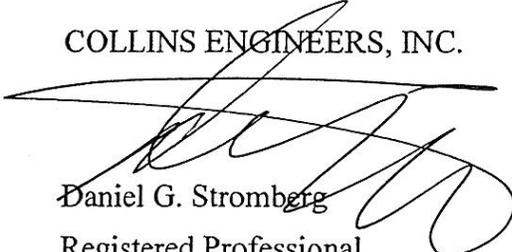
PROFESSIONAL ENGINEER

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: 70535

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 1

Location: Metro District and District 7 – Scott County

Bridge Description: The superstructure consists of four spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and three concrete piers. The piers are numbered 1 through 3 from west to east across the bridge.

2. INSPECTION DATA

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

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

Date: September 10, 2012

Weather Conditions: Sunny, 80°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.0 ft/s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers consist of an oblong rectangular concrete shaft supporting a hammerhead pier cap on top of a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 15.1 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 21.0 feet below reference.  
Waterline Elevation = 703.6

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 N/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
210	Reinforced Concrete Pier Wall	56	LF	56				
985	Slopes & Slope Protection	1	EA			1		



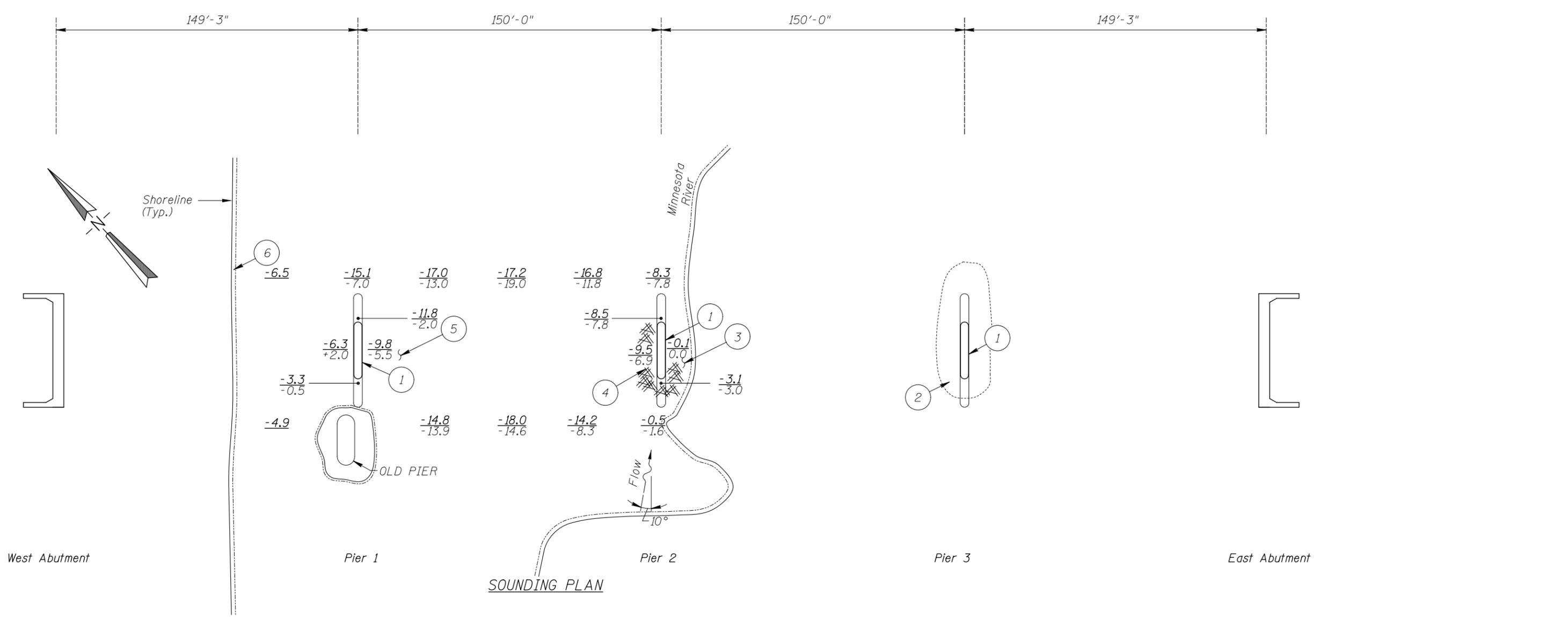
Photograph 1. View of Pier 1, Looking East.



Photograph 2. View of Pier 2, Looking West.



Photograph 3. View of Pier 3, Looking West.



**INSPECTION NOTES:**

- 1 The concrete was smooth and sound with no notable defects.
- 2 A 10 foot radius scour depression 5 to 6 feet deep was observed all around the perimeter of Pier 3. The scour hole was dry at the time of inspection.
- 3 The channel bottom consisted of silty clay and rocks with 12 inches maximum probe rod penetration.
- 4 A moderate accumulation of timber debris consisting of 1-foot-diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the west face from the upstream end of the midpoint from the channel bottom up 2 feet.
- 5 The channel bottom consisted of silty clay with 6 inches maximum probe rod penetration along the east face and 6" diameter rocks along the west face of Pier 1.
- 6 Heavy embankment erosion along the west shoreline consisting of up to 15 foot high vertical banks.

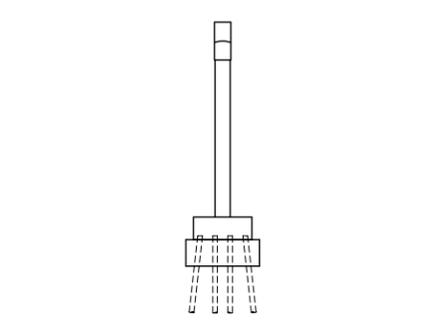
*Note*  
All soundings based on 2012 waterline location.

**GENERAL NOTES:**

- 1 Piers 1 and 2 were inspected underwater.
- 2 At the time of inspection on September 10, 2012, the waterline was located approximately 21.0 feet below bottom of the hammerhead pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 703.6 feet based on design drawings.
- 3 Soundings indicate the water depth at the time of the inspection and are measured in feet.
- 4 Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

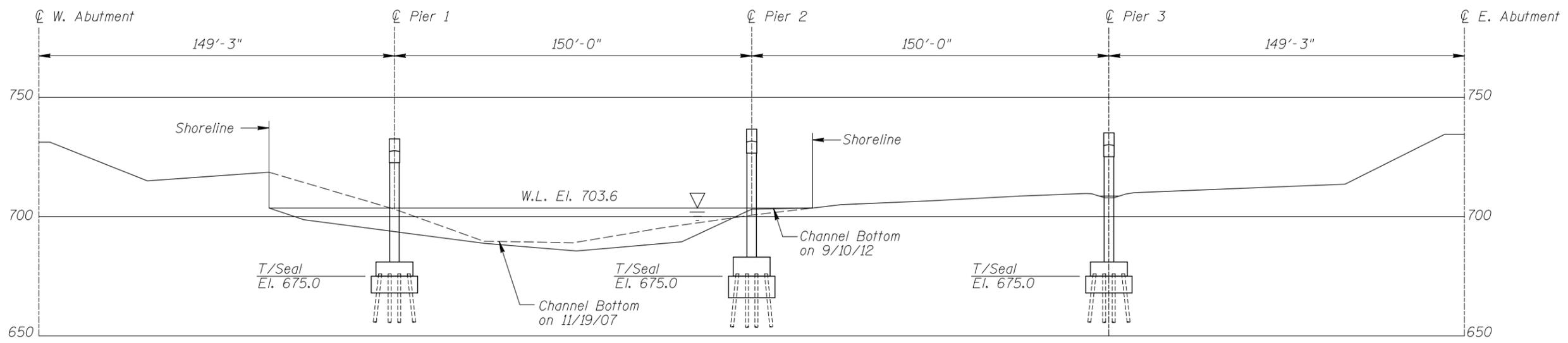
**Legend**

-5.2	Sounding Depth (9/9/12)
-5.2	Sounding Depth (11/19/07)
	Timber Debris
	Scour Depression

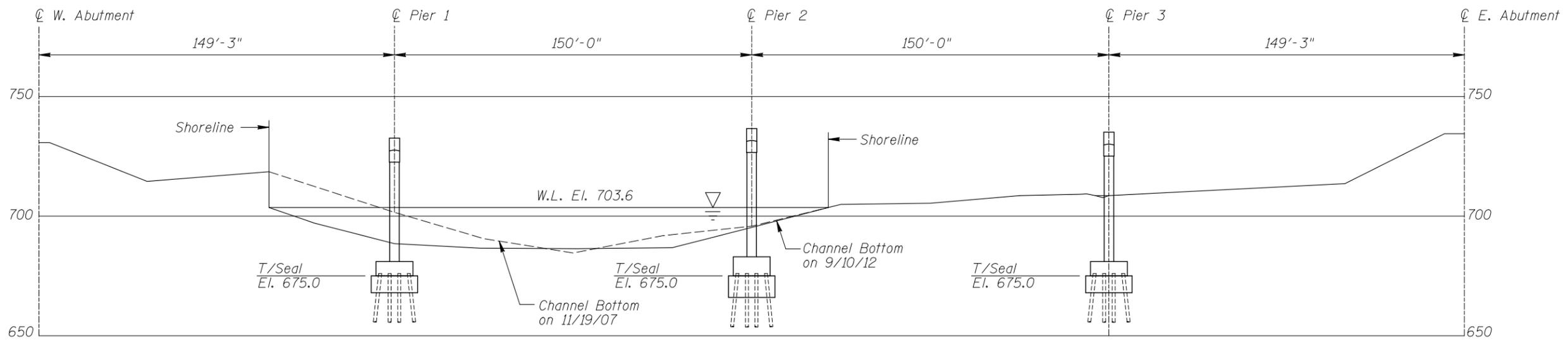


<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 70535 OVER THE MINNESOTA RIVER, METRO DISTRICT, SCOTT COUNTY, CITY OF BLAKELEY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 522170535	<small>701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.ws beng.com</small>	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. 70535 OVER THE MINNESOTA RIVER METRO DISTRICT, SCOTT COUNTY, CITY OF BLAKELEY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 522170535		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 10, 2012

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

BRIDGE NO: 70535      WEATHER: Sunny, 80°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION:  SCUBA       SURFACE SUPPLIED AIR  
 OTHER

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

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

TIME IN WATER: 1:00 p.m.

TIME OUT OF WATER: 1:45 p.m.

WATERWAY DATA: VELOCITY 1.0 ft/s

VISIBILITY 0.5 feet

DEPTH 15.1 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the concrete was smooth and sound with no significant structural defects. A moderate accumulation of timber debris consisting of 1 foot in diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the north face from the upstream end to the shaft midpoint from the channel bottom up 2 feet. A 10 feet radius scour depression 5 to 6 feet deep was observed all around Pier 3. Heavy embankment erosion was observed along the west shoreline.

FURTHER ACTION NEEDED:       YES       NO

Monitor the extent of the timber debris accumulation at Pier 2, and if found to be increasing, removal during routine maintenance may become necessary.

Monitor channel bank erosion along the west bank 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. 70535  
 INSPECTORS WSB & Associates and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.  
 WATERWAY CROSSED Minnesota River

INSPECTION DATE September 10, 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	15.1'	N	7	N	9	N	7	6	6	6	N	7	7	N	N	N	N	N
	Pier 2	9.5'	N	7	N	9	N	7	7	N	7	6	6	7	N	N	N	N	N
	Pier 3	N	N	7	N	9	N	7	6	7	7	N	6	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound with no significant structural defects. A moderate accumulation of timber debris consisting of 1 foot in diameter and smaller logs and branches was observed at the upstream nose of Pier 2 from the channel bottom up 4 feet and along the north face from the upstream end to the shaft midpoint from the channel bottom up 2 foot. A 10 feet radius scour depression 5 to 6 feet deep was observed all around Pier 3. Heavy embankment erosion was observed along the west shoreline.

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.