

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69623

CSAH NO. 27

OVER THE

ST. LOUIS RIVER

DISTRICT 1 - ST. LOUIS COUNTY



JULY 24, 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 unit inspected at Bridge No. 69623, Pier 1, was found to be in good condition, although a heavy accumulation of timber debris was observed at the upstream nose of Pier 1. The channel bottom appeared to be in stable condition with no evidence of significant scour. The substructure condition and channel bottom configuration were comparable to what was reported during the previous underwater inspection.

INSPECTION FINDINGS:

- (A) The concrete of Pier 1 was smooth and sound with no notable deterioration.
- (B) A heavy accumulation of timber debris consisting of logs and branches up to 12 inches in diameter was observed at the upstream nose of Pier 1. The accumulation extended approximately 20 off the upstream nose and along both faces of the pier.
- (C) A band of light scaling was observed around the entire perimeter of Pier 1 extending from 0.5 feet below to 2 feet below the waterline, with 1/8 inch maximum penetrations.

RECOMMENDATIONS:

- (A) Remove the heavy accumulation of timber debris at the upstream nose and along the faces of Pier 1 to alleviate scour influence at the pier and to minimize any further accumulation.

- (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,

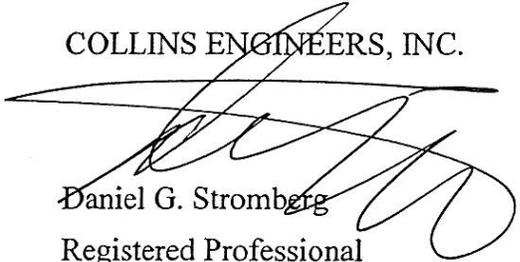
PROFESSIONAL ENGINEER

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: 69623

Feature Crossed: St. Louis River

Feature Carried: CSAH No. 27

Location: District 1 - St. Louis County

Bridge Description: Bridge No. 69623 consists of a two span, multiple prestressed concrete beam superstructure supported by two concrete abutments and one concrete pier.

2. INSPECTION DATA

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

Dive Team: Kasey Yoder (WSB), John Loftus (Collins)

Date: July 24, 2012

Weather Conditions: Sunny, 70° F

Underwater Visibility: 1.0 foot

Waterway Velocity: 1.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1

General Shape: The pier consists of an oblong rectangular shaft with rounded noses, which rests upon a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 6.7 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 25.0 feet below reference.
Waterline Elevation = 1267.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/07/12

Item 113: Scour Critical Bridges: Code N/02

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	23	LF	23				
985	Slopes	1	EA		1			

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

INSPECTORS: WSB & Associates and Collins DATE: July 24, 2012

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

BRIDGE NO: 69623 WEATHER: Sunny, 70 F

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Kasey Yoder (WSB), John Loftus (Collins)

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

TIME IN WATER: 17:45

TIME OUT OF WATER: 18:00

WATERWAY DATA: VELOCITY 1.5 ft/sec

VISIBILITY 1.0 feet

DEPTH 6.7 feet maximum at Pier 1

ELEMENTS INSPECTED: Pier 1

REMARKS: Overall, the concrete was smooth and sound. A heavy accumulation of timber debris, extending 20 feet upstream of the upstream nose and 20 feet off each face of the pier, was observed at Pier 1. Light scaling was observed around the entire perimeter of Pier 1 from 0.5 feet below the waterline to 2 feet below the waterline with 1/8 inch maximum penetration.

FURTHER ACTION NEEDED: YES NO

Remove the heavy accumulation of timber debris at the upstream nose and along the faces of Pier 1 to alleviate scour influence and any further accumulation.

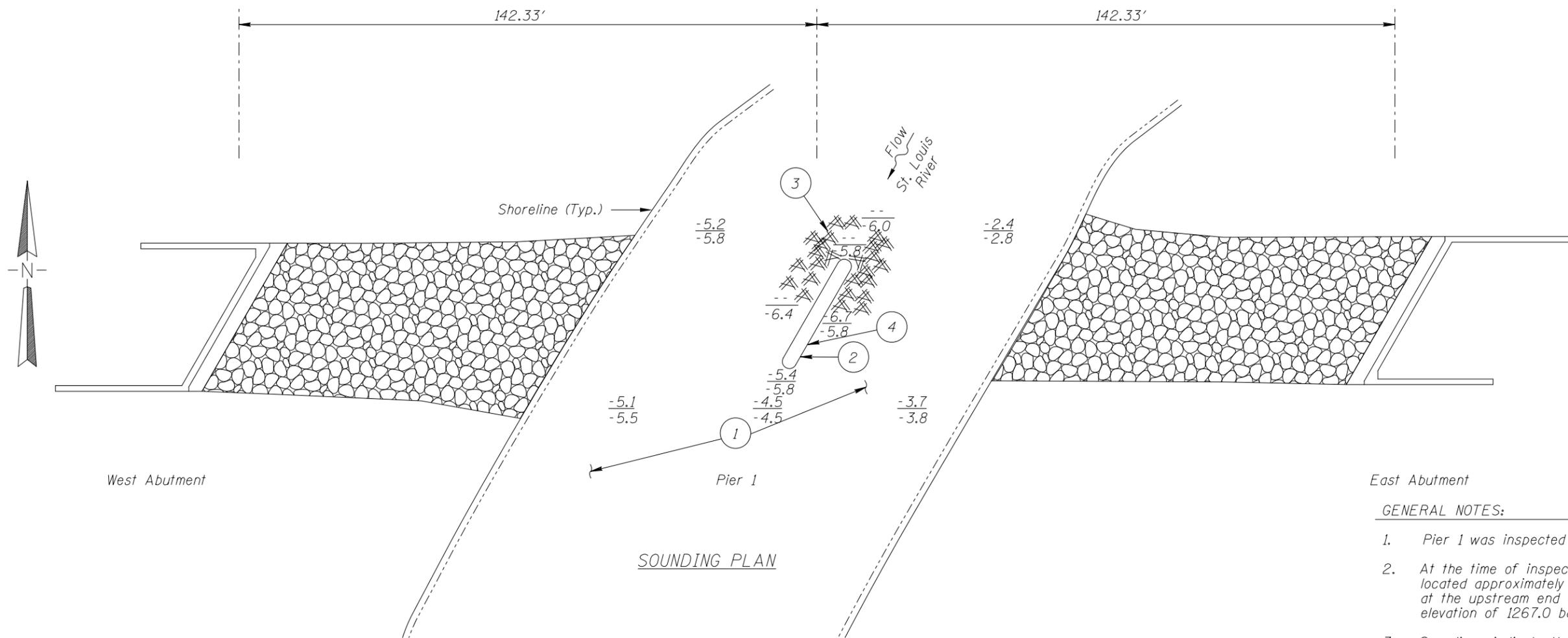
Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.



Photograph 1. Overall View of Structure, Looking Southwest.



Photograph 2. View of Pier 1 and Drift Accumulation, Looking Southeast.



East Abutment

GENERAL NOTES:

1. Pier 1 was inspected underwater.
2. At the time of inspection on July 24, 2012, the waterline was located approximately 25.0 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds to a waterline elevation of 1267.0 based on design drawings.
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.

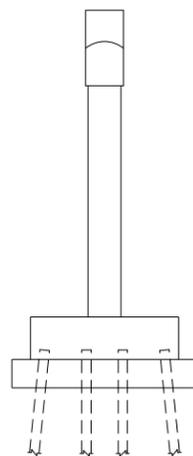
SOUNDING PLAN

INSPECTION NOTES:

1. The channel bottom consisted of soft silt with 1.5 to 2 feet of probe rod penetration and riprap at the upstream nose of Pier 1.
2. The concrete of Pier 1 was smooth and sound.
3. A heavy accumulation of timber debris consisting of logs and branches up to 12 inch in diameter was observed around the upstream half of Pier 1 extending from the channel bottom to 4 feet above the waterline. The accumulation extended approximately 20 feet off the pier nose and faces.
4. Light scaling was observed around entire pier from 0.5 foot below to 2 feet below the waterline with 1/8 inch maximum penetration.

Legend

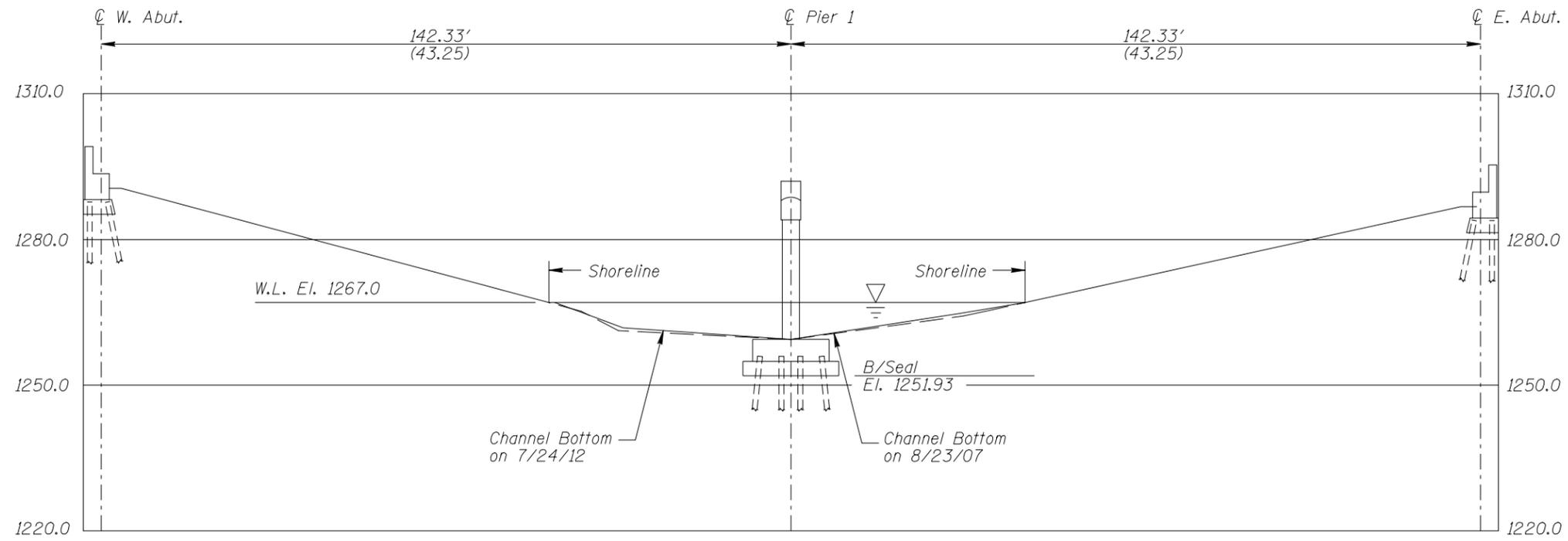
- 6.5 Sounding Depth (7/24/12)
- 6.0 Sounding Depth (8/23/07)
-  Timber Debris
-  Riprap



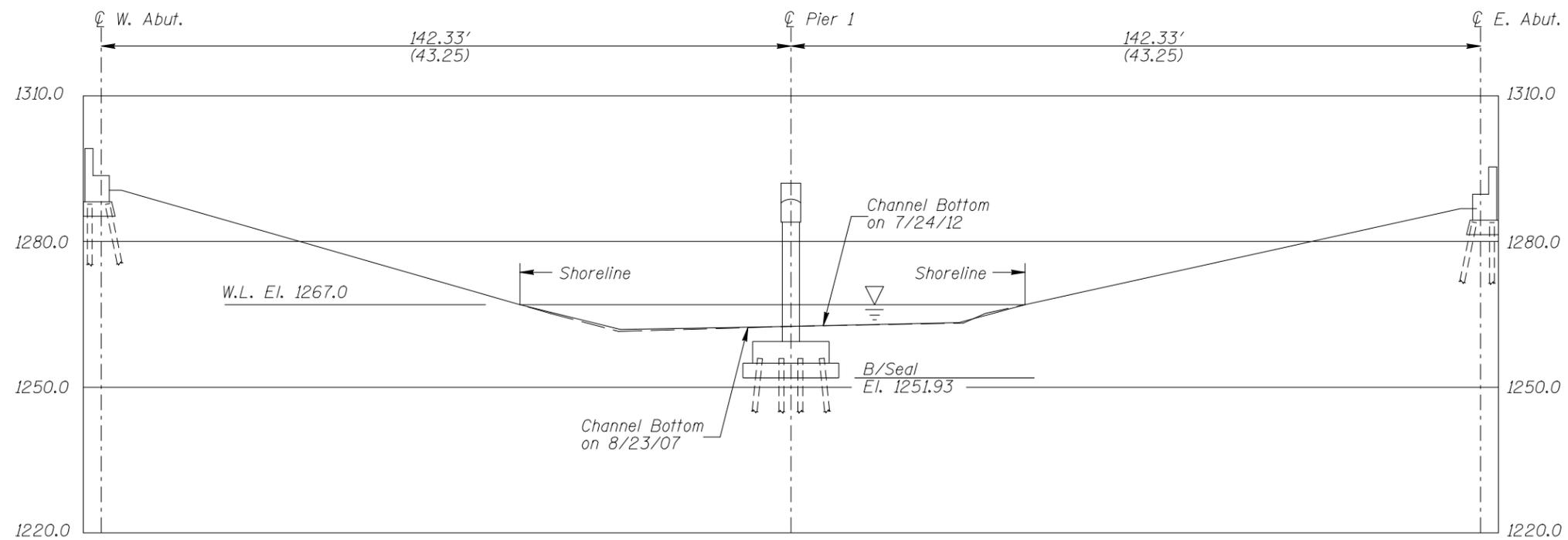
TYPICAL END VIEW OF PIERS

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MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 69623 OVER THE ST. LOUIS RIVER DISTRICT I, ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BJR	COLLINS ENGINEERS	Date: JULY 2012
Checked By: BRL		Scale: NTS
Code: 522169623		Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.



MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 69623 OVER THE ST. LOUIS RIVER DISTRICT I, ST. LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	COLLINS ENGINEERS	Date: JULY 2012
Checked By: BRL		Scale: 1"=30'
Code: 52269623		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 69623
 INSPECTORS WSB & Associates, Inc. and Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED St. Louis River

INSPECTION DATE July 24, 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 (BRACING)	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	6.7'	N	8	N	8	N	8	8	7	7	5	6	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound. A heavy accumulation of timber debris, extending 20 feet upstream of the upstream nose and 20 feet off each face of the pier, was observed at Pier 1. Light scaling was observed around the entire perimeter of Pier 1 from 0.5 feet below the waterline to 2 feet below the waterline with 1/8 inch maximum penetration.

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.