

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. L4675

TWP NO. 71

OVER THE

WEISEL CREEK

FILLMORE COUNTY

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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 unit inspected at Bridge No. L4675, the East and West Abutments, were found to be in satisfactory condition. The masonry exhibited moderate deterioration of the mortar joints along the waterline. A minor localized scour depression was observed at the upstream corner of the East Abutment. A 1.5 feet wide ledge in the East Abutment wall construction was exposed with a maximum vertical face exposure of 3 feet. No significant changes in the exposure have occurred since the previous inspection. A moderate accumulation of debris consisting of 1 foot diameter and smaller branches, a corrugated metal pipe and metal wire mesh was observed along the East Abutment extending from the channel bottom to the waterline.

INSPECTION FINDINGS:

- (A) The abutments were in satisfactory condition with moderate deterioration of the masonry and a loss of joint mortar from the waterline to 2 feet below the waterline with typical penetrations of 4 inches and maximum penetrations of 12 inches.
- (B) A minor scour depression, 1 foot deep with a radius of 4 feet, was observed at the upstream corner of the East Abutment. The bottom of the depression was lined with riprap.
- (C) A 1.5 feet wide ledge (possible footing) was exposed along the entire breastwall of the abutment with up to 3 feet of vertical face exposure. There was no undermining below the ledge detected.
- (D) A moderate accumulation of debris consisting of 1 foot diameter and smaller branches, a corrugated metal pipe and metal wire mesh was observed along the East Abutment extending from the channel bottom to the waterline.

RECOMMENDATIONS:

- (A) Since insufficient bridge foundation information was available, monitor the East Abutment for any further ledge (possible footing) exposure and/or undermining during future inspections.
  
- (B) 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: L4675

Feature Crossed: Weisel Creek

Feature Carried: TWP No. 71

Location: Fillmore County

Bridge Description: The superstructure consists of a single span, multiple steel beam bridge. The superstructure is supported by two masonry abutments. No foundation information was available.

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: 3.0 feet

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Abutments.

General Shape: The abutments each consist of a masonry breast wall, flanked by wingwalls flared back at an angle of approximately 45 degrees. The wingwalls taper from full height at the abutment to half height at the ends. No abutment foundation information was available.

Maximum Water Depth at Substructure Inspected: Approximately 7.5 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the northernmost steel beam at the West Abutment.

Water Surface: The waterline was approximately 13.7 feet below reference.  
Assumed Waterline Elevation = 86.3.

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

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/12

Item 113: Scour Critical Bridges: Code G

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
217	Masonry Abutment	40	LF		40			
985	Slopes & Slope Protection	1	EA	1				



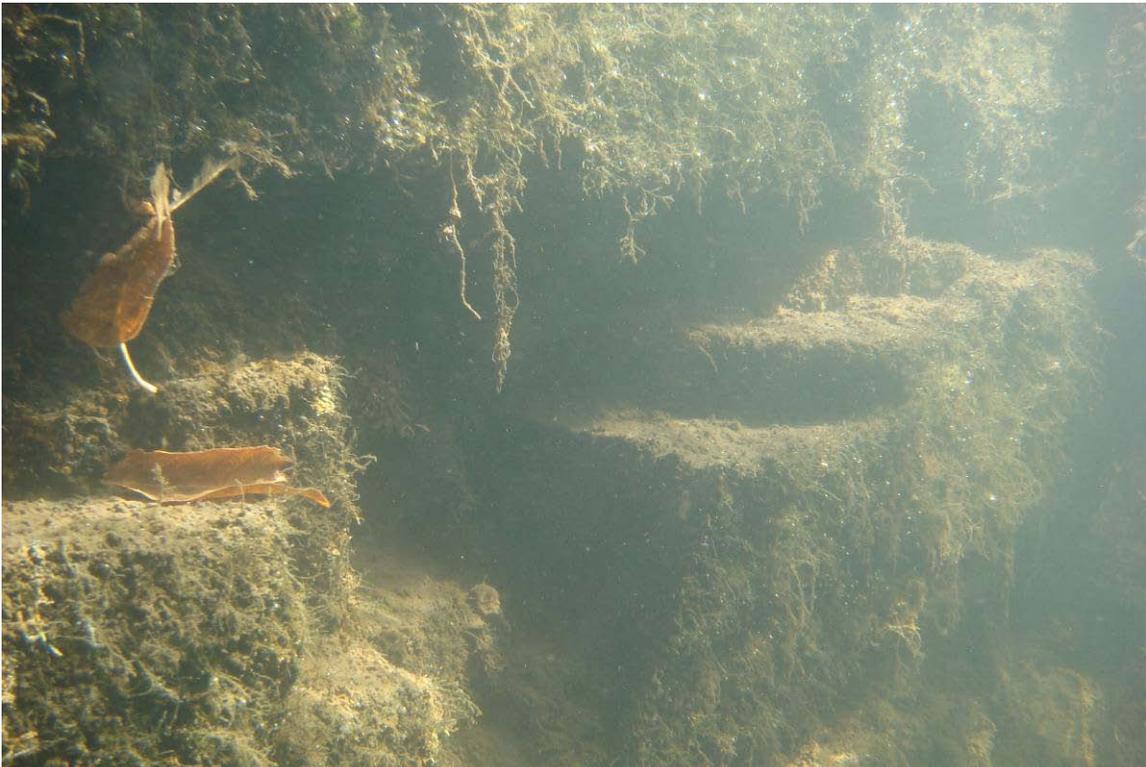
Photograph 1. Overall View of the Structure, Looking Southwest.



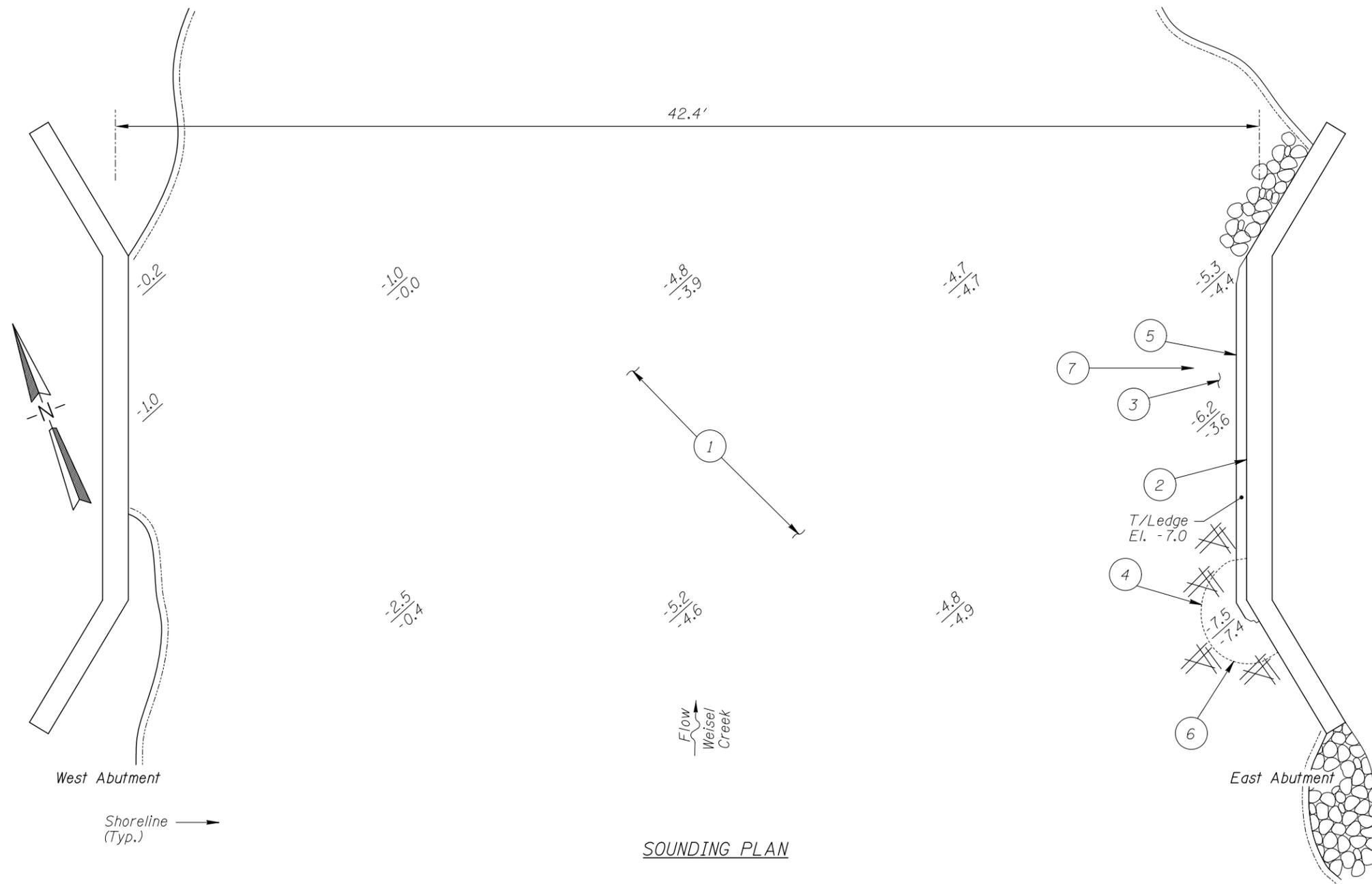
Photograph 2. View of East Abutment, Looking Southeast.



Photograph 3. View of West Abutment, Looking Southwest.



Photograph 4. View of Typical Mortar Loss and Masonry Condition Around Waterline, Looking East.



SOUNDING PLAN

GENERAL NOTES:

1. The East and West Abutments were inspected underwater.
2. At the time of inspection on October 4, 2012, the waterline was located approximately 13.7 feet below the bottom of steel on the northernmost beam at the West Abutment. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 86.3.
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 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- ① The channel bottom material consisted of a soft silt material allowing 2 feet of maximum probe rod penetration.
- ② The mortar in the joints was deteriorated along the abutment wall from the waterline to 2 feet below the waterline with 4 inch typical penetrations, and 12 inch maximum penetrations near the waterline.
- ③ Riprap was observed along the entire face of the abutment, extending 3 feet into the channel.
- ④ A minor scour depression was observed, 1.5 foot deep with a radius of 4 feet. Riprap lined the bottom of the depression.
- ⑤ A 1.5-foot-wide ledge (possible footing) was exposed along the breastwall with up to 3 feet of vertical exposure and with no undermining detected.
- ⑥ Moderate accumulation of timber debris consisting of 1 foot diameter and smaller branches and a section of corrugated metal pipe was observed at the upstream fascia of the East Abutment.
- ⑦ Metal wire mesh debris was observed on the downstream half of the East Abutment.

Legend

- 2.0 Sounding Depth (10/4/12)
- 5.2 Sounding Depth (10/25/07)

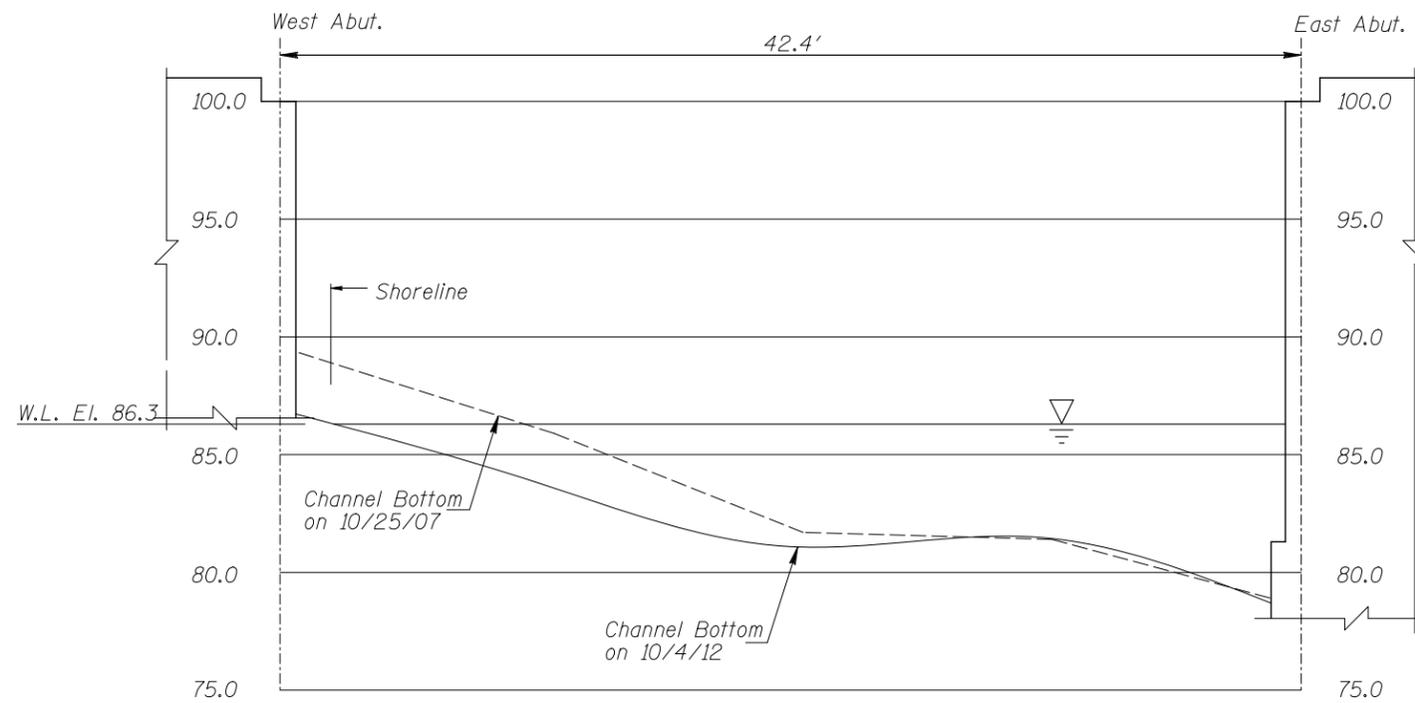
 Riprap

 Timber Debris

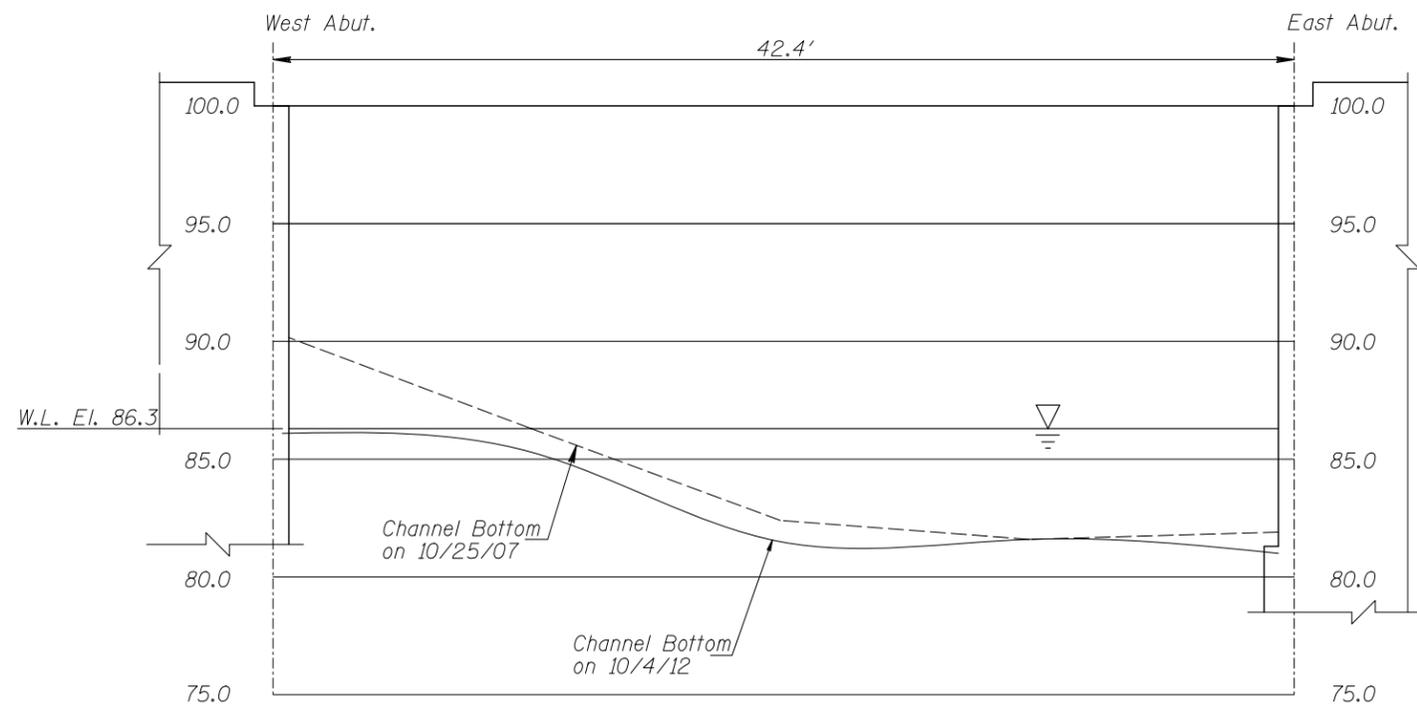
Note:

All soundings based on 2012 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. L4675 TWP. 71 OVER WEISEL CREEK FILLMORE COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BMS	<b>COLLINS ENGINEERS</b>	Date: JAN., 2013
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 7423L4675		Figure No.: 1



**UPSTREAM FASCIA PROFILE**  
Vertical Scale: 1/8" = 1'-0"



**DOWNSTREAM FASCIA PROFILE**  
Vertical Scale: 1/8" = 1'-0"

Note:  
Refer to Figure 1 for General Notes.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. L4675 TWP 71 OVER WEISEL CREEK FILLMORE COUNTY		
<b>UPSTREAM AND DOWNSTREAM FASCIA PROFILES</b>		
Drawn By: BMS	<b>COLLINS ENGINEERS</b> <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: JAN., 2013
Checked By: LJ		Scale: NTS (U.O.N.)
Code: 7423L4675		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: L4675 WEATHER: Sunny, 55°F

WATERWAY CROSSED: Weisel Creek

DIVING OPERATION:  SCUBA  SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Marc B. Parker, Breanne M. Stromberg

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

TIME IN WATER: 3:00 P.M.

TIME OUT OF WATER: 3:45 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 3.0 feet

DEPTH 7.5 feet maximum at East Abutment

ELEMENTS INSPECTED: East and West Abutments

REMARKS: The masonry of the abutments exhibited moderate deterioration of the mortar joints along the waterline. A minor localized scour depression was observed at the upstream corner of the East Abutment. A 1.5 feet wide ledge in the East Abutment wall construction was exposed with a maximum vertical face exposure of 3 feet. No significant changes in the exposure have occurred since the previous inspection. A moderate accumulation of debris consisting of 1 foot diameter and smaller branches, a corrugated metal pipe and metal wire mesh was observed along the East Abutment extending from the channel bottom to the waterline.

FURTHER ACTION NEEDED:  YES  NO

Since insufficient bridge foundation information was available, monitor the East Abutment for further ledge (possible footing) exposure and/or undermining during future inspections.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. L4675  
 INSPECTORS Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.  
 WATERWAY CROSSED Weisel Creek

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					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	East Abutment	7.5'	N	6	N	8	N	6	8	N	N	6	6	N	N	N	6	N	6
	West Abutment	0.2'	N	6	N	8	N	6	N	N	N	N	7	N	N	N	6	N	6

\*UNDERWATER PORTION ONLY

REMARKS: The masonry of the abutments exhibited moderate deterioration of the mortar joints along the waterline. A minor localized scour depression was observed at the upstream corner of the East Abutment. A 1.5 feet wide ledge in the East Abutment wall construction was exposed with a maximum vertical face exposure of 3 feet. No significant changes in the exposure have occurred since the previous inspection. A moderate accumulation of debris consisting of 1 foot diameter and smaller branches, a corrugated metal pipe and metal wire mesh was observed along the East Abutment extending from the channel bottom to the waterline.

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.