

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 66515

CSAH NO. 1

OVER THE

CANNON RIVER

RICE COUNTY



MAY 23, 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. 66515, Piers 1 and 2 and the West Abutment, were found to be in good condition with no defects of structural significance observed. Light scaling and cracking was observed on the concrete of the substructure units. The channel bottom appeared to be in stable condition with evidence of minor local scour observed at Piers 1 and 2.

INSPECTION FINDINGS:

- (A) The concrete was generally sound with light scaling from the channel bottom to 1.5 feet above the waterline with ¼ inch maximum penetration. There were also random minor cracks on the pier shafts and abutment walls.
- (B) A scour depression 5 feet in radius, 1.5 feet deep was observed at the upstream end and along the west face of Pier 2.
- (C) A scour depression 8 feet in radius, 2.5 feet deep was observed at the upstream nose of Pier 1.
- (D) A light accumulation of timber debris, consisting of logs up to 1 foot diameter, was observed at the upstream nose of Pier 1 extending along the entire west face of the pier.

RECOMMENDATIONS:

- (A) Monitor accumulations of timber debris and possibly consider removal operations if accumulation continues to increase in the future.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:



Ryan P. Breen, P.E.

Respectfully submitted,

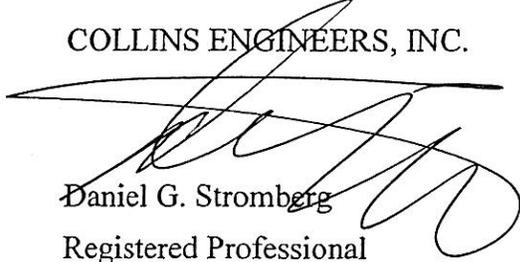
PROFESSIONAL ENGINEER

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: 66515

Feature Crossed: Cannon River

Feature Carried: CSAH No. 1

Location: District 6 - Rice County

Bridge Description: The bridge consists of three spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete hammerhead piers. The piers are numbered from west to east.

2. INSPECTION DATA

Professional Engineer/Team Leader: Ryan P. Breen, PE

Dive Team: Michael Banasiak, Marc Parker

Date: May 23, 2012

Weather Conditions: Cloudy, 65°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 4.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2 and the West Abutment.

General Shape: The piers consist of a reinforced concrete shaft supporting a reinforced concrete hammerhead cap. The abutments consist of a reinforced concrete breast wall with skewed concrete wingwalls. No design drawings were available, and foundation configuration is unknown.

Maximum Water Depth at Substructure Inspected: Approximately 4.6 feet.

4. WATERLINE DATUM

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

Water Surface: The waterline was approximately 12.4 feet below reference.

Waterline Elevation = 909.1

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/05/12

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	Reinforced Conc. Pier Wall	64	LF	64				
215	Reinforced Concrete Abutment Wall	32	LF	32				



Photograph 1. View of Pier 1, Looking Northwest.



Photograph 2. View of Pier 2, Looking Northeast.



Photograph 3. View of West Abutment, Looking Northwest.

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

INSPECTORS: Collins Engineers, Inc. DATE: May 23, 2012

ON-SITE TEAM LEADER: Ryan P. Breen, PE

BRIDGE NO: 66515 WEATHER: Cloudy, 65°F

WATERWAY CROSSED: Cannon River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Michael Banasiak, Marc Parker

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

TIME IN WATER: 8:30 a.m.

TIME OUT OF WATER: 9:15 a.m.

WATERWAY DATA: VELOCITY 4.0 f.p.s

VISIBILITY 1.0 foot

DEPTH 4.6 feet maximum at Pier 1

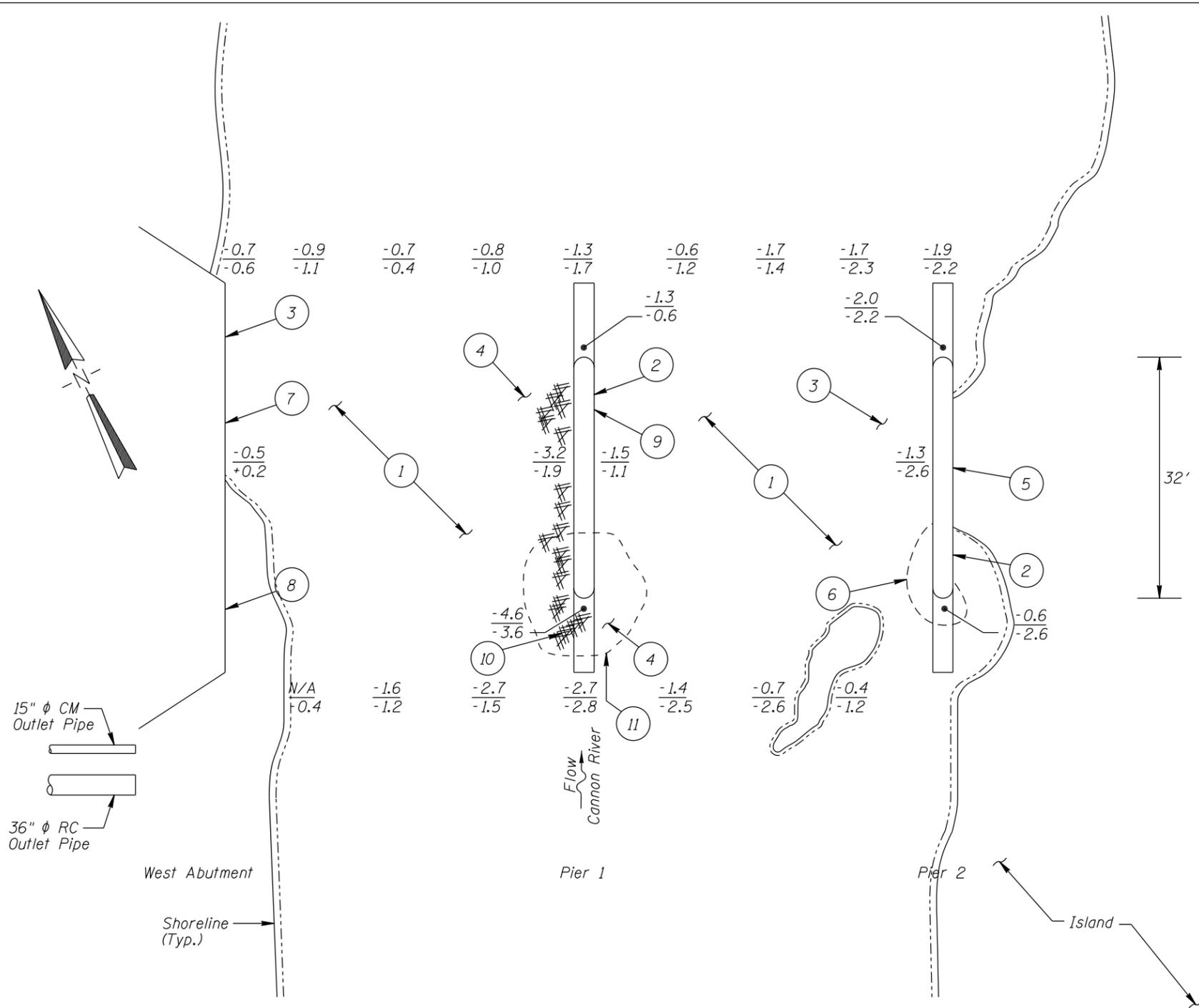
ELEMENTS INSPECTED: West Abutment and Piers 1 and 2

REMARKS: The concrete was generally sound with light scaling from the channel bottom to 1.5 feet above the waterline with ¼ inch maximum penetration. There were also minor cracks on the pier shafts and abutment walls. A scour depression 5 feet in radius, 1.5 feet deep was observed at the upstream end and along the west face of Pier 2. A scour depression 8 feet in radius, 2.5 feet deep was observed at the upstream nose of Pier 1. A light accumulation of timber debris, consisting of 1 foot diameter and smaller logs and branches, was observed extending from the upstream nose of Pier 1 down the entire west face.

FURTHER ACTION NEEDED: YES NO

Monitor accumulations of timber debris and possibly consider removal operations if accumulation continues to increase in the future.

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



SOUNDING PLAN

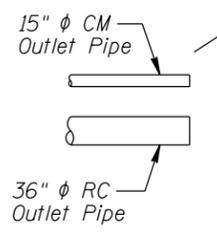
±150' to
Structure No. 66518
over the Cannon River
Overflow

GENERAL NOTES:

1. Piers 1 and 2 and the West Abutment were inspected underwater.
2. At the time of inspection on May 23, 2012, the waterline was located approximately 12.4 feet below the top of the cap at the north end of Pier 1 of Structure No. 66518. This corresponds to a waterline elevation of 909.1 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.

INSPECTION NOTES:

- 1 The channel bottom material consisted of soft silt allowing 9 inches of maximum probe rod penetration.
- 2 Light scaling was observed on concrete shaft of both piers, extending from the channel bottom to 1.5 feet above the waterline with a maximum penetration of 1/4 inch.
- 3 The channel bottom along the west face of Pier 2 consisted of 5 to 8 inch diameter cobbles with no appreciable probe rod penetration.
- 4 The channel bottom material around Pier 1 consisted of coarse gravel overlaying 18 inch diameter and smaller riprap with no appreciable probe rod penetration.
- 5 A 1/16 inch wide vertical crack with light efflorescence was observed on the east face of Pier 2, extending from the bottom of the pier cap to the channel bottom.
- 6 A scour depression 5 feet in radius, 1.5 feet deep was observed at the upstream end and along the west face of Pier 2.
- 7 A vertical crack 1/32 inch wide was observed at the midpoint of the West Abutment, extending from 6 feet above the waterline to the channel bottom.
- 8 Vertical cracks with efflorescence and moisture, 1/32 inch wide, were observed extending from bridge seat to channel bottom at 8 feet and 16 feet away from upstream corner of West Abutment.
- 9 A 1/32 inch wide vertical crack was observed at Pier 1 extending from the bottom of the pier cap to the channel bottom.
- 10 Light accumulation of timber debris was located at the upstream nose of Pier 1, consisting of logs up to 1 foot in diameter, extending along entire west face the pier.
- 11 A scour depression 8 feet in radius and 2.5 feet deep was observed at upstream nose of Pier 1.



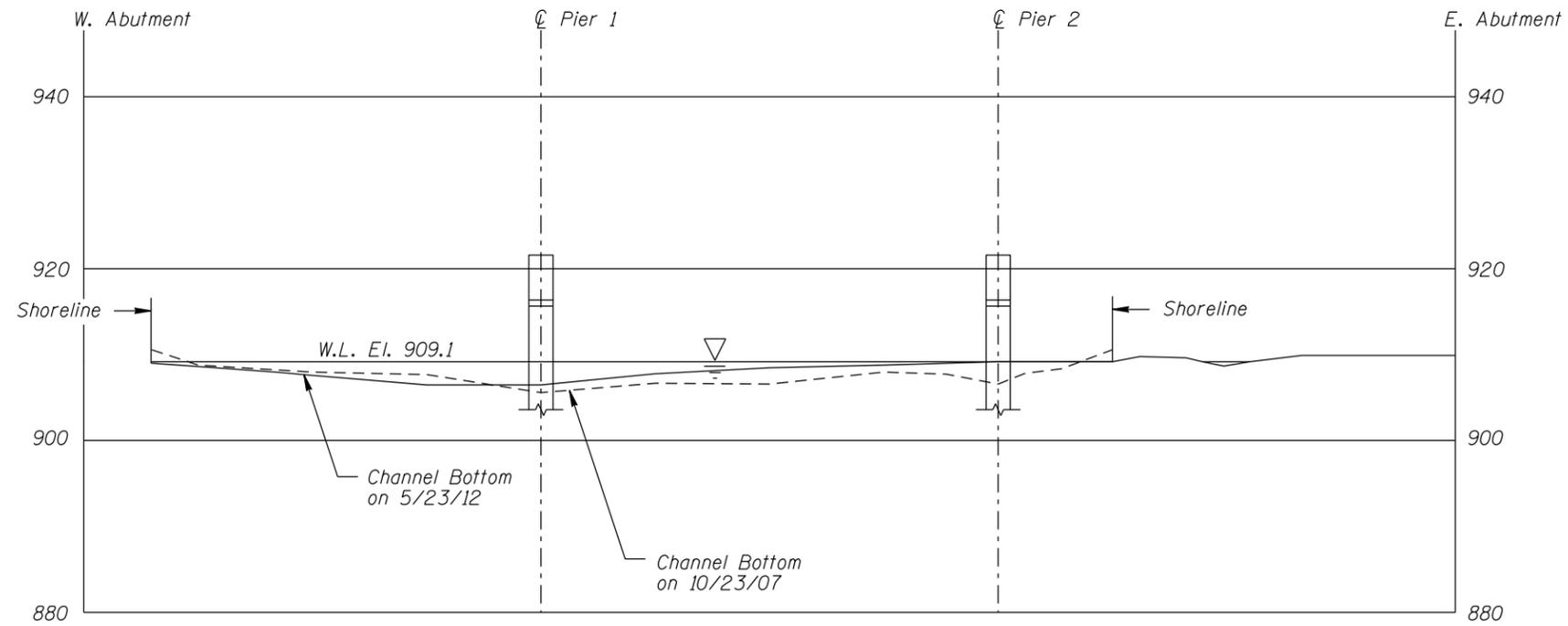
TYPICAL END VIEW OF PIERS

Legend

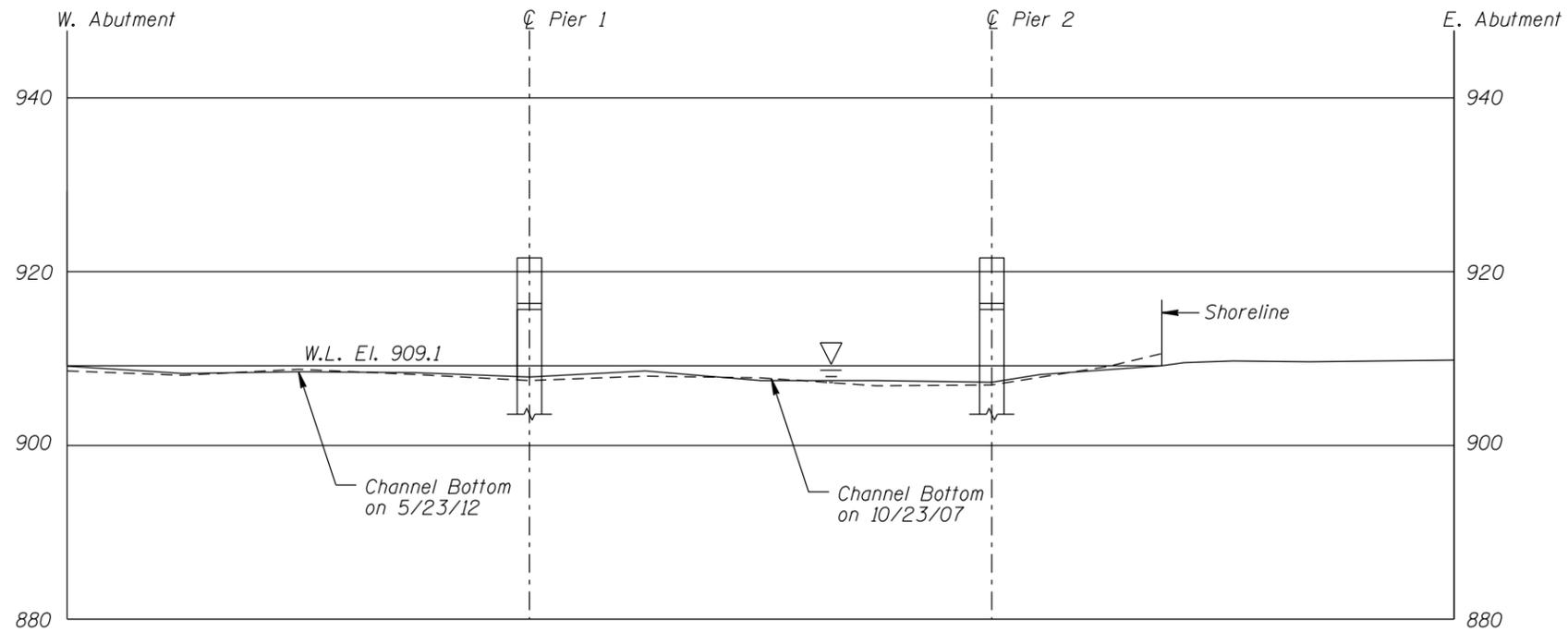
- 9.0 Sounding Depth (5/23/12)
- 9.0 Sounding Depth (10/23/07)
- Scour Depression
- Timber Debris

Note:
All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 66515 CSAH NO. 1 OVER THE CANNON RIVER RICE COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BMS	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: MAY 2012
Checked By: RPB		Scale: NTS
Code: 7423665I5		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 66515 CSAH NO. 1 OVER THE CANNON RIVER RICE COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BMS	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: MAY 2012
Checked By: RPB		Scale: NTS
Code: 742366515		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 66515
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Ryan P. Breen, P.E.
 WATERWAY CROSSED Cannon River

INSPECTION DATE May 23, 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
	West Abutment	0.7'	N	7	N	8	N	7	7	7	N	N	7	7	N	N	N	N	N
	Pier 1	4.6'	N	7	N	8	N	7	6	N	N	6	6	7	N	N	N	N	N
	Pier 2	2.0'	N	7	N	8	N	7	6	N	N	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete was generally sound with light scaling from the channel bottom to 1.5 feet above the waterline with ¼ inch maximum penetration. There were also minor cracks on the pier shafts and abutment walls. A scour depression 5 feet in radius, 1.5 feet deep was observed at the upstream end and along the west face of Pier 2. A scour depression 8 feet in radius, 2.5 feet deep was observed at the upstream nose of Pier 1. A light accumulation of timber debris, consisting of 1 foot diameter and smaller logs and branches, was observed extending from the upstream nose of Pier 1 down the entire west face.

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.