UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 3072

PEDESTRIAN BRIDGE

OVER

ELM CREEK

CITY OF CHAMPLIN

MAY 20, 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. 3072, the North and South Abutments, were in fair condition with areas of section loss around the perimeter of both abutments. A 5 foot wide spall with up to 1 foot of penetration and exposed reinforcing steel was observed at the upstream and downstream fascias corners of the North Abutment and at the downstream fascia of the South Abutment. Both Abutments were undermined with up to 1 foot vertical cavity and up to 2.5 feet of horizontal penetration at the midpoint of each abutment wall. The channel bottom consisted of silty sand and cobbles with up to 4 inches of probe rod penetration.

INSPECTION FINDINGS:

(A) Random areas of section loss along the perimeter of the North and South Abutments extending from 1 foot above the waterline to the channel bottom with a typical penetration of 2 inches and a maximum penetration of 8 inches.

(B) The North and South Abutments were undermined from the upstream quarter point to the downstream quarter point with a typical penetration of 1 foot and a maximum penetration of 2.5 feet near the midpoint of the South Abutment wall. The vertical height of the undermining cavity typically measured 6 inches with a maximum vertical height of 1 foot.

(C) A 5 foot wide spall extending from 1 foot above the waterline to the channel bottom with typical penetration of 6 inches and a maximum penetration of 1 foot was observed at the upstream and downstream corners of the North Abutment and the downstream corner of the South Abutment. Reinforcing steel was completely exposed at the upstream and downstream corners of the North Abutment with up to 20 percent loss of section and reinforcing steel was partially exposed at the downstream corner of the South Abutment with up to 20 percent loss of section.

(D) A spall, measuring 6 inches in diameter with a maximum penetration of 8 inches, was observed 1 foot below the waterline at the downstream quarter point of the North Abutment with exposed reinforcing steel with up to 20 percent loss of section.

(E) Channel bottom consisted of silty sand and cobbles measuring up to 4 inches in diameter allowing a maximum probe rod penetration of 4 inches.

RECOMMENDATIONS:

(A) Monitor the undermining cavities at the North and South Abutments during future underwater inspections.

(B) Repair areas of spalled concrete where reinforcing steel is exposed by removing unsound concrete to a minimum of one inch behind reinforcing steel, cleaning and replacing reinforcing steel as required, and placing concrete designed to provide high durability with low permeability.

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

Respectfully submitted,

Inspection Team Leader:

Ryan P. Breen, P.E.

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: 3072

Feature Crossed: Elm Creek

Feature Carried: Pedestrian Bridge

Location: City of Champlin, Hennepin County

Bridge Description: The superstructure consisted of a single span concrete closed spandrel arch. The superstructure is supported by two concrete abutments, designated as the North and South Abutments.

2. INSPECTION DATA

Professional Engineer Diver: Ryan P. Breen, P.E.

Dive Team: Marc B. Parker, Michael J. Banasiak

Date: May 20, 2012

Weather Conditions: Rainy, 60°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 0.5 ft/s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutment

General Shape: North and South Abutments consisted of a reinforced concrete wall with two wing walls.

Maximum Water Depth at Substructure Inspected: 9.1 feet

4. WATERLINE DATUM

Water Level Reference: The top of the parapet wall at the midpoint of the upstream fascia.

Water Surface: The waterline was approximately 14.8 feet below reference. Water Elevation = 85.2

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

Item 60: Substructure: Code 5

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/05/12

Item 113: Scour Critical Bridges: Code G/12

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

X Yes _____No

6. STRUCTURAL ELEMENT CONDITION RATING:

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
215	Reinforced Concrete Abutment	48	EA		21		27	
361	Scour Smart Flag	1	EA			2		

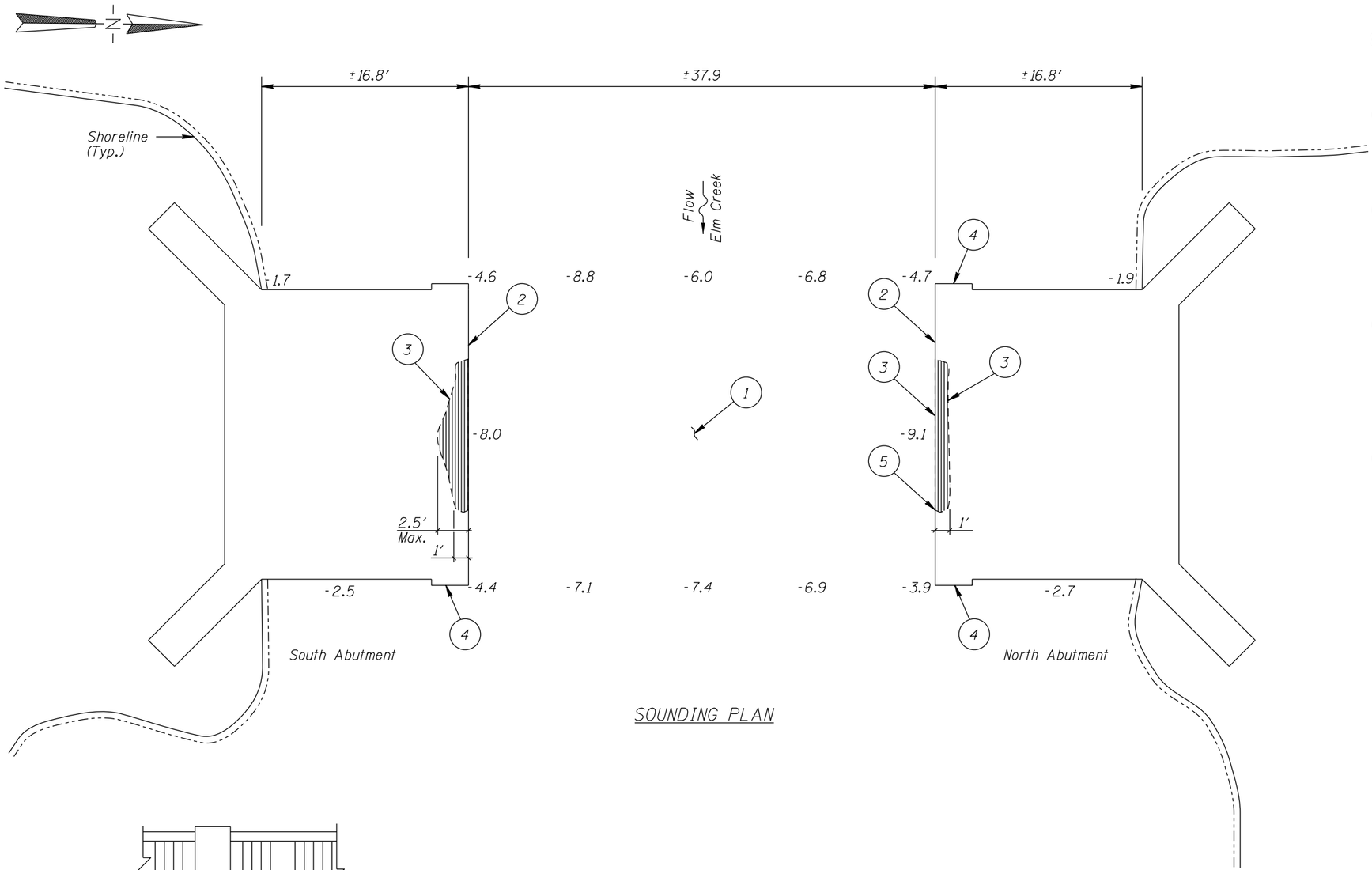
Photograph 1. View of Downstream Fascia, Looking Southwest.

Photograph 2. View of Upstream Fascia, Looking Southeast.

Photograph 3. View of Spall at East Corner of the South Abutment, Looking Southwest.

Photograph 4. View of Spall at East Corner of the North Abutment, Looking Southwest.

Photograph 5. View of Spall at West Corner of the North Abutment, Looking Southeast.



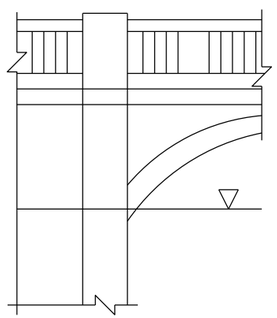
SOUNDING PLAN

INSPECTION NOTES:

1. Channel bottom material consisted of sand and cobbles up to 4 inches in diameter allowing 4 inches of probe rod penetration.
2. Areas of concrete section loss along the perimeter of the East and West Abutments extended from the channel bottom to 1 foot above the waterline with typical 2 inches and maximum 8 inches of penetration.
3. Undermining along the faces of both abutments from the upstream quarter point to the downstream quarter point with a undermining cavity 6 inches high and 1 foot of horizontal penetration and maximum 2.5 feet of penetration at the midpoint of the South Abutment.
4. Spalls located on the upstream and downstream fascias of the North Abutment and the downstream fascia of the South Abutment, measuring 5 feet wide, extended from the channel bottom to 1 foot above the waterline with typical 6 inches and maximum 1 foot of penetration. Fully exposed reinforcing steel was observed, with up to 20 percent loss of section.
5. Spall, measuring 6 inches in diameter, located 1 foot below the waterline at the downstream quarter point on the North Abutment with typical 6 inches and maximum 8 inches of penetration. Exposed reinforcing steel with up to 20 percent loss of section was observed.

Legend

-17.0	Sounding Depth from Waterline (5/20/12)
	Area of Undermining
1	Inspection Note Number



TYPICAL END VIEW OF ABUTMENTS

GENERAL NOTES:

1. North and South Abutments were inspected underwater.
2. At the time of inspection on May 20, 2012, the waterline was located approximately 14.8 feet below the top of the papapet wall above the midpoint of the arch span along the upstream fascia. Since elevation information was not available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 85.2.
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.

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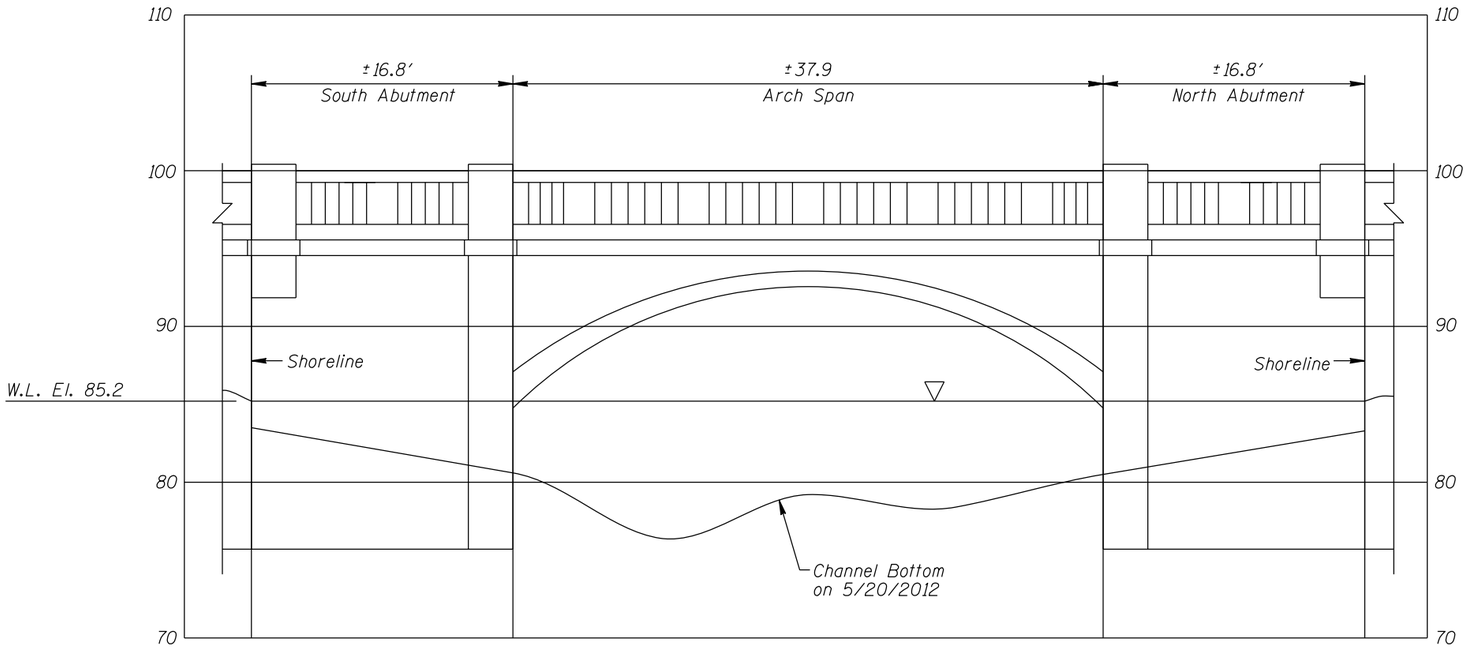
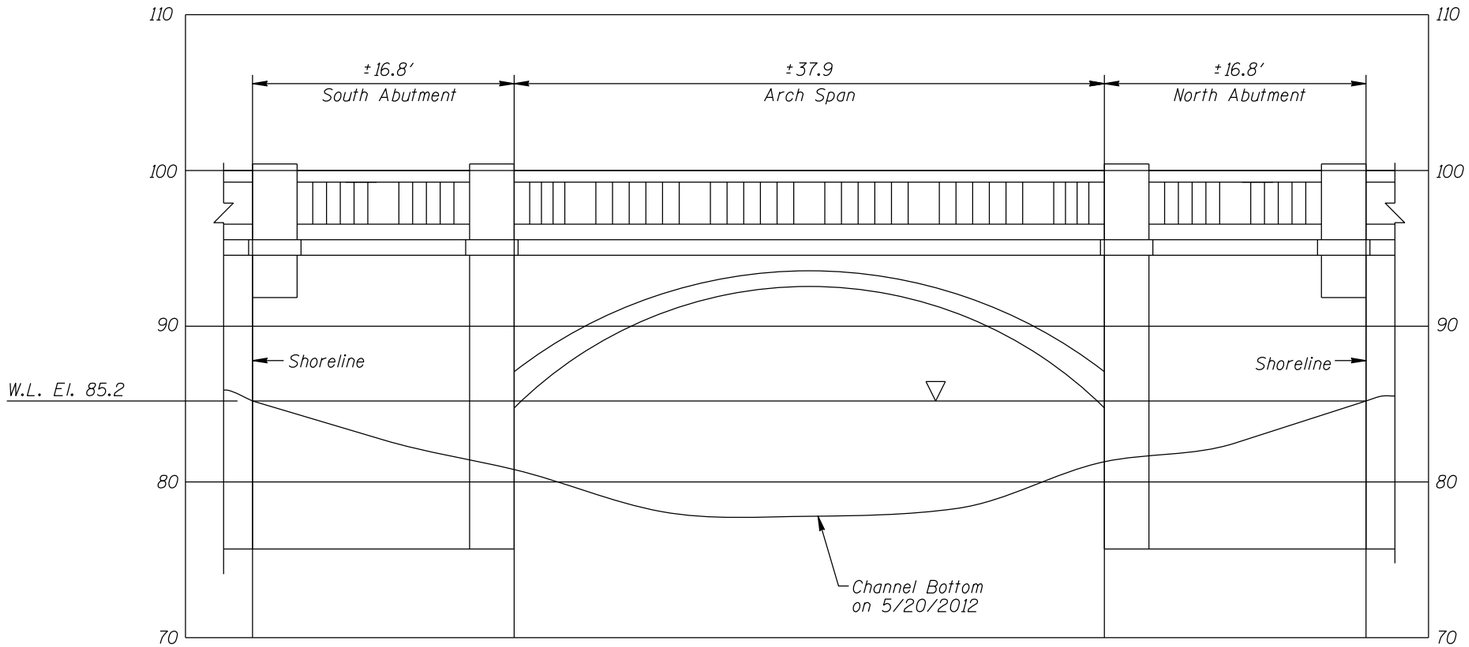
CITY OF CHAMPLIN

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: MAY, 2012
Checked By: RPB		Scale: NTS
Code: 74233072		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 900 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: MAY, 2012
Checked By: RPB		Scale: 1"=10'
Code: 74233072		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION

OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: May 20, 2012

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

BRIDGE NO: 3072 WEATHER: Rainy, 60°F

WATERWAY CROSSED: Elm Creek

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

OTHER _____

PERSONNEL: Marc B. Parker, Michael J. Banasiak

EQUIPMENT: Commercial Scuba, Lead Line, Sounding Pole, Hand Tools, Camera

TIME IN WATER: 11:50 A.M.

TIME OUT OF WATER: 12:20 P.M.

WATERWAY DATA: VELOCITY 0.5 ft/s

VISIBILITY 1.0 foot

DEPTH 9.1 feet maximum at North Abutment.

ELEMENTS INSPECTED: North and South Abutment

REMARKS: Overall, the North and South Abutments were in fair condition with areas of section loss around the perimeter of both abutments. A 5 foot wide spall with up to 1 foot of penetration and exposed reinforcing steel was observed at the upstream and downstream fascias of the North Abutment and at the downstream fascia of the South Abutment. Both abutments were undermined with up to a 1 foot vertical cavity and up to 2.5 feet of horizontal penetration at the midpoint of the South Abutment. The channel bottom consisted of silty sand and cobbles with up to 4 inches of probe rod penetration.

FURTHER ACTION NEEDED: X YES _____ NO

Monitor the undermining cavities at the North and South Abutments during future underwater inspections.

Repair areas of spalled concrete where reinforcing steel is exposed by removing unsound concrete to a minimum of one inch behind reinforcing steel, cleaning and replacing reinforcing steel as required, and placing concrete designed to provide high durability with low permeability.

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. 3072
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER. Ryan P. Breen, P.E.
WATERWAY CROSSED Elm Creek

INSPECTION DATE May 20, 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

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	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
	South Abutment	8.0’	N	5	N	7	N	5	5	N	7	7	5	5	N	N	5	N	N
	North Abutment	9.1’	N	5	N	7	N	5	5	N	7	7	5	5	N	N	5	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the North and South Abutments were in fair condition with areas of section loss around the perimeter of both abutments. A 5 foot wide spall with up to 1 foot of penetration and exposed reinforcing steel was observed at the upstream and downstream fascias of the North Abutment and at the downstream fascia of the South Abutment. Both abutments were undermined with up to a 1 foot vertical cavity and up to 2.5 feet of horizontal penetration at the midpoint of the South Abutment. The channel bottom consisted of silty sand and cobbles with up to 4 inches of probe rod 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.