

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69J24

CSAH 108

OVER THE

FLINT CREEK

ST. LOUIS COUNTY



SEPTEMBER 19, 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. 69J24, the North and South culverts, were found to be in good condition, with no defects of structural significance. The concrete of the culverts was typically smooth and sound. Several joints between the concrete box segments exhibited gaps up to 1/2 inch wide where the lap joint could be seen through the gap. The concrete aprons were covered with a layer of silt, up to 1 foot thick, at both openings of the culver. The floor of the culvert was exposed and free of debris throughout the length of both culverts.

INSPECTION FINDINGS:

- (A) The channel bottom material typically consisted of silt with a maximum probe rod penetration of 2 feet.
- (B) The concrete of both culverts was typically sound with light scaling with a maximum penetration of 1/16 inch.
- (C) The concrete floor was exposed and free of debris throughout the length of both culverts.
- (D) The aprons of both culverts were covered by a layer of silt at the east and west openings from approximately the headwall to the apron toe. The silt layer was typically 0.8 feet and 1 foot thick at the east and west openings respectively.
- (E) Several joints along both culverts had a 1/2 inch wide gap between box segments. A lap joint was visible through the gap, but there was no surrounding embankment exposed.

RECOMMENDATIONS:

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

Inspection Team Leader:

Nicholas R. Triandafilou

Nicholas R. Triandafilou, 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.

[Signature]
Daniel G. Stromberg

Registered Professional

Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 69J24

Feature Crossed: Flint Creek

Feature Carried: CSAH 431

Location: St. Louis County

Bridge Description: The North and South Culverts consisted of precast segmental concrete box sections.

2. INSPECTION DATA

Professional Engineer Diver: Nicholas R. Triandafilou, P.E.

Dive Team: Marc B. Parker, Clay G. Brookins

Date: September 19, 2012

Weather Conditions: Cloudy, 50° F

Underwater Visibility: 3 feet

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: The North and South Culverts

General Shape: The North and South Culverts consisted of precast segmental concrete box sections. The concrete box sections were 13 feet wide by 8.5 feet high and 4 feet long. The segments are connected through a lap joint and fasteners.

Maximum Water Depth at Substructure Inspected: Approximately 5.1 feet.

4. WATERLINE DATUM

Water Level Reference: Top of the east headwall at the midpoint of the South Culvet.

Water Surface: The waterline was approximately 2.4 feet below the reference.
Waterline Elevation 97.6

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 8

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code E/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
241	Concrete Culvert	102	LF	102	0	0	0	n/a
388	Concrete Headwall	4	EA	4	0	0	0	n/a
985	Slopes and Slope Protection	1	EA	1	0	0	n/a	n/a



Photograph 1. Overall View of Structure, Looking East.



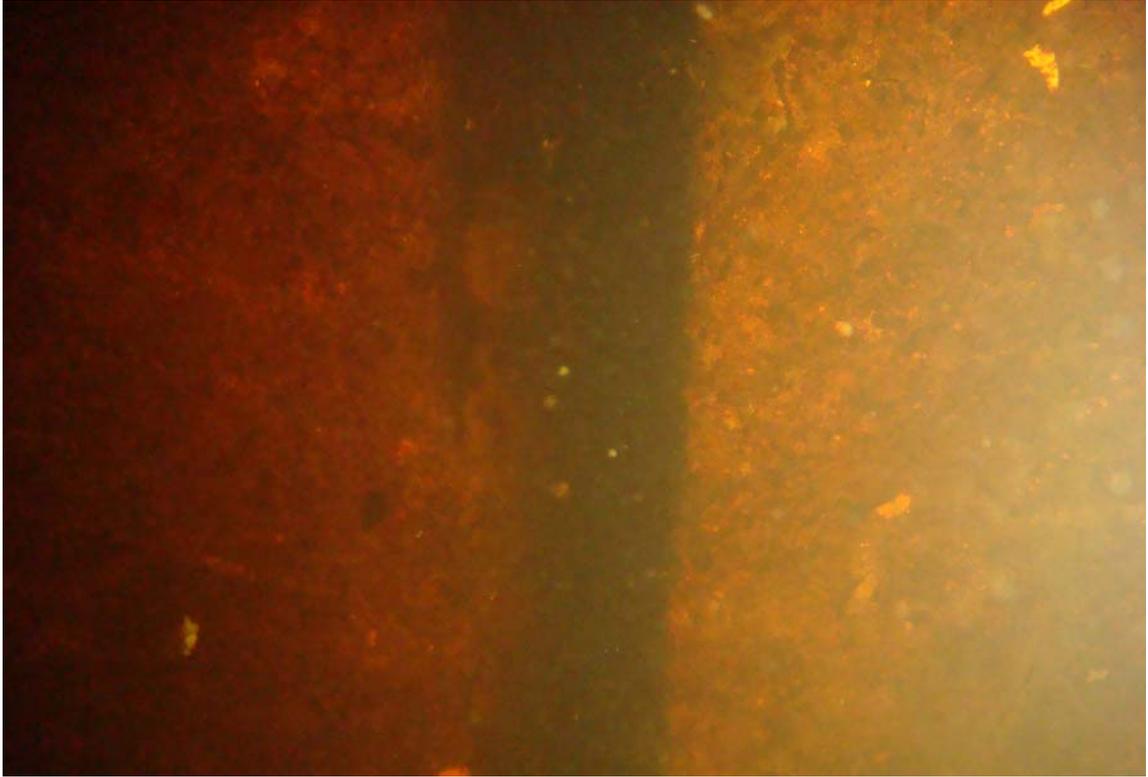
Photograph 2. View of the North Culvert, Looking West.



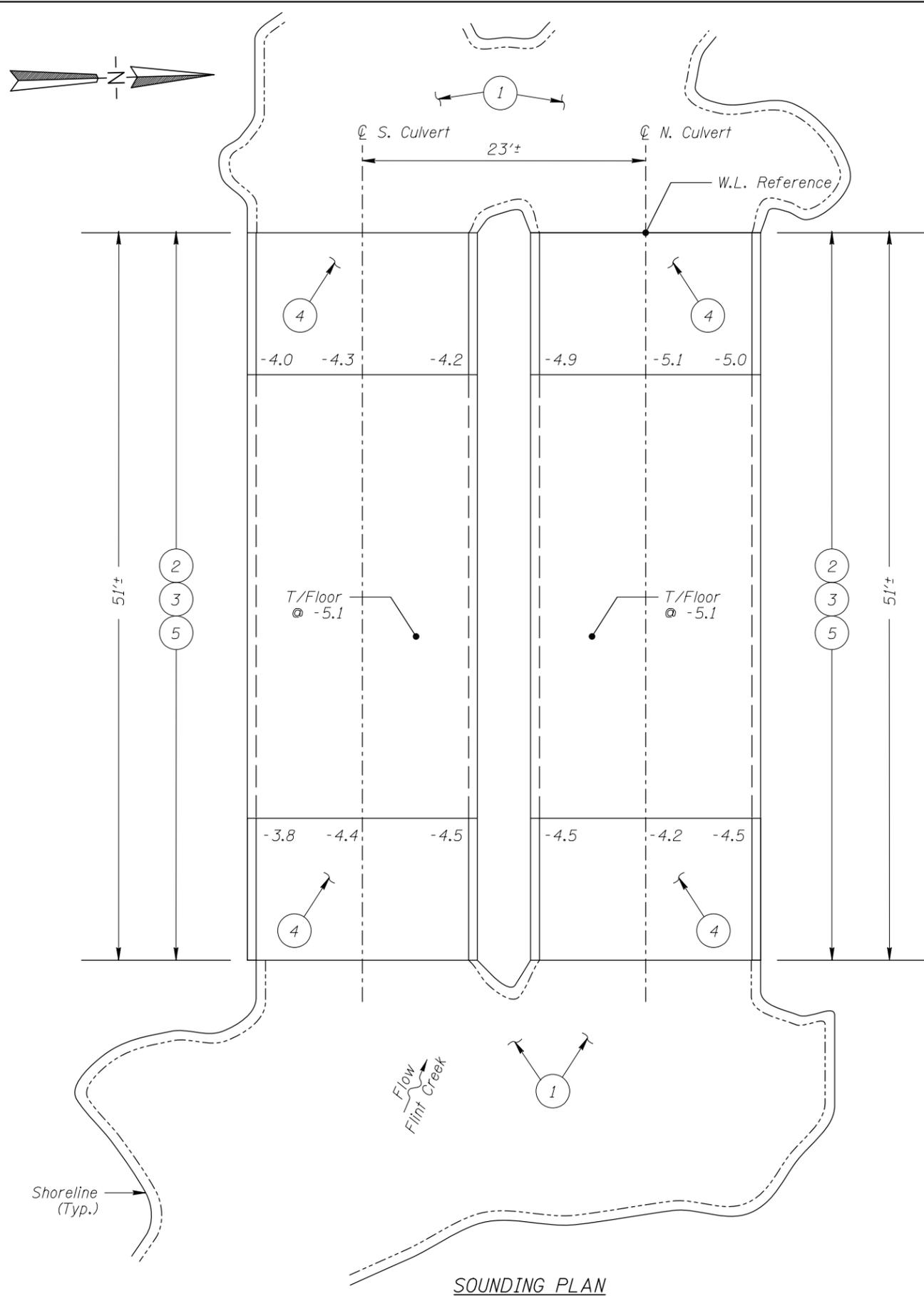
Photograph 3. View South Culvert, Looking West.



Photograph 4. View of the Typical Concrete Condition at the Waterline, Looking North.



Photograph 5. View of a Typical 1/2 inch Wide Gap Between Box Segments, Looking North.



SOUNDING PLAN

INSPECTION NOTES:

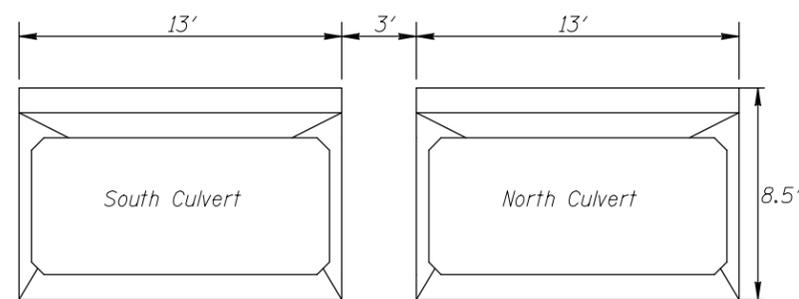
- ① The channel bottom material typically consisted of silt with a maximum probe rod penetration of 2 feet.
- ② The concrete of both culverts was typically sound with light scaling with a maximum penetration of 1/16 inch.
- ③ The concrete floor was exposed throughout the length of both culverts.
- ④ The aprons of both culverts were covered by a layer of silt at the east and west openings from approximately the headwall to the apron toe. The silt layer was typically 0.8 feet and 1 foot thick at the east and west openings respectively.
- ⑤ Several joints along both culverts had a 1/2 inch wide gap between box segments. A lap joint was visible through the gap.

GENERAL NOTES:

- 1. The North and South Culverts were inspected during the underwater inspection.
- 2. The culverts consisted of 4 foot long precast concrete segmental box sections.
- 3. At the time of inspection on September 19, 2012, the waterline was located approximately 2.4 feet below the top of the east headwall at the midspan of the south culvert. Since elevation information was not available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 97.6.
- 4. Soundings indicate the water depth at the time of inspection and are measured in feet.

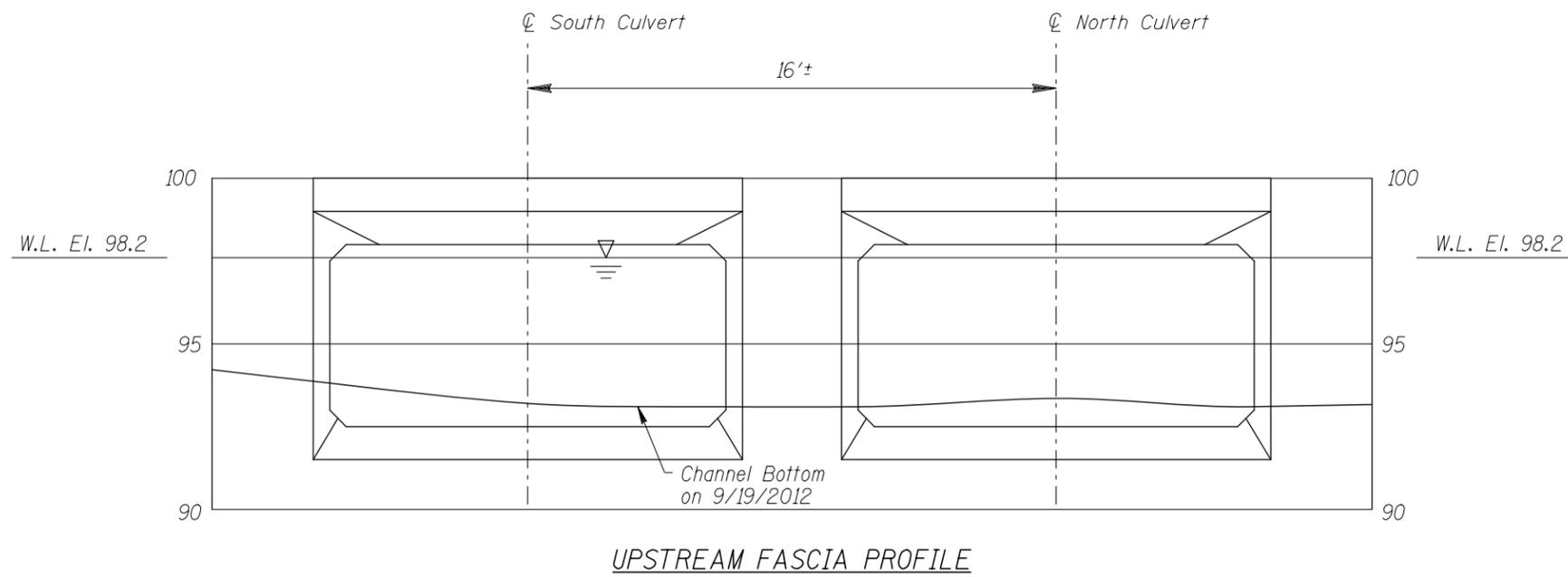
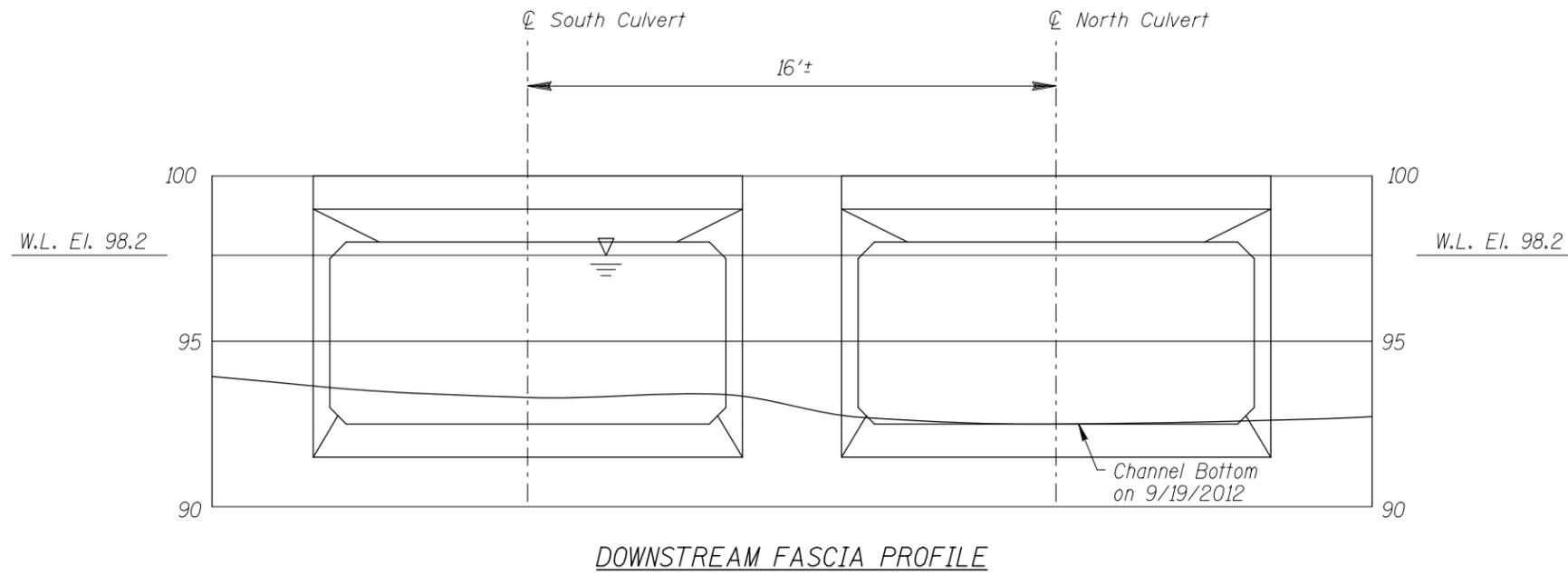
Legend

- 1.0 Sounding Depth from Waterline (9/20/2012)
- ① Inspection Note Number



TYPICAL END VIEW OF CULVERTS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 69J24 CSAH 108 OVER THE FLINT CREEK ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: MBP	COLLINS ENGINEERS	Date: NOVEMBER, 2012
Checked By: LJ		Scale: NTS
Code: 742369J24		Figure No.: I
123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com		



Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 69J24 CSAH 108 OVER THE FLINT CREEK ST. LOUIS COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: MBP	COLLINS ENGINEERS	Date: NOVEMBER, 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: 1"=5'
Code: 742369J24		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 19, 2012

ON-SITE TEAM LEADER: Nicholas R. Triandafilou, P.E.

BRIDGE NO: 69J24 WEATHER: Cloudy, 50° F

WATERWAY CROSSED: Flint Creek

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Clayton G. Brookins

EQUIPMENT: Commercial Scuba, Probe Rod, Camera, Hand Tools

TIME IN WATER: 10:30 A.M.

TIME OUT OF WATER: 11:10 A.M.

WATERWAY DATA: VELOCITY None / Negligible

VISIBILITY 3 feet

DEPTH 5.1 feet maximum

ELEMENTS INSPECTED: The North and South Culvert

REMARKS: Overall, the substructure units inspected underwater were found to be in good condition, with no defects of structural significance. The concrete of the culverts was typically smooth and sound. Several joints between the concrete box segments exhibited gaps up to 1/2 inch wide where the lap joint could be seen through the gap. The concrete aprons were covered with a layer of silt, up to 1 foot thick, at both openings of the culver. The floor of the culvert was exposed and free of debris throughout the length of both culverts.

FURTHER ACTION NEEDED: YES NO

Reinspect the submerged substructure 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. 69J24
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Nicholas R. Triandafilou, P.E.
 WATERWAY CROSSED Flint Creek

INSPECTION DATE September 19, 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	SUBSTRUCTURE						CHANNEL					GENERAL						
		MAXIMUM DEPTH OF WATER	PIILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (CULVERT)	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
	North Culvert	5.1'	N	N	N	7	7	7	N	N	N	8	8	7	N	N	N	N	N
	South Culvert	5.1'	N	N	N	7	7	7	N	N	N	8	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the substructure units inspected underwater were found to be in good condition, with no defects of structural significance. The concrete of the culverts was typically smooth and sound. Several joints between the concrete box segments exhibited gaps up to 1/2 inch wide where the lap joint could be seen through the gap. The concrete aprons were covered with a layer of silt, up to 1 foot thick, at both openings of the culvert. The floor of the culvert was exposed and free of debris throughout the length of both culverts.

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.