



# UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6200214 (OTT-2-1654)  
SR 2 OVER LACARPE CREEK  
OTTAWA COUNTY, OH  
DISTRICT 2

April 2020

*Prepared for:*



10/9/2020

*Prepared by:*

**COLLINS**  
**ENGINEERS** INC.

124 Venture Court, Suite 10

Lexington, Kentucky 40511

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### EXECUTIVE SUMMARY

<b>Project:</b>	ODOT District 2 Underwater Bridge Inspections - 2020		
<b>Purpose of Project:</b>	To perform a detailed visual and tactile underwater investigation of scour critical bridges for District 2 of the Ohio Department of Transportation.		
<b>Inspection Team:</b>	Team Leader – Joshua Johnson, P.E. – Collins Engineers, Inc. Team Member – Matthew Rogers, E.I.T. – Collins Engineers, Inc. Team Member – Nicholas Lane – Collins Engineers, Inc.		
<b>Inspection Date(s):</b>	April 23, 2020		
<b>Water Visibility:</b>	0 ft	<b>Water Velocity:</b>	0 ft/s
<b>Water Temperature:</b>	45 °F	<b>Weather:</b>	Overcast – 45 °F
<b>Waterline Elevation:</b>	576.34 ft	<b>Type of Boat:</b>	Kayak
<b>Coordinates:</b>	41.529195°N, -83.01744°W		
<b>Access Location:</b>	Rest Area at the Northwest Corner of Structure		
<b>Dive Mode:</b>	Surface Supplied Air		
<b>Waterline Reference:</b>	0.2 ft Above the Bottom of Cap on the Upstream Nose of Bent 2		
<b>Maximum Depth at SSU:</b>	7.1 ft – Upstream Quarter Point on the North Face of Bent 2		
<b>Shoreline Conditions:</b>	The east and west shorelines consisted of well-vegetated, well-protected, mild slopes, with no erosion.		

#### Summary of Findings:

- **Abutment 1:**
  - The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
  - Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall.
- **Bent 1:**
  - The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
  - The submerged portions of the bent were sound and smooth with no defects observed.
  - Full-height hairline cracks spaced 4 ft on center throughout the bent cap.
- **Bent 2:**
  - The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
  - The submerged portions of the bent were sound and smooth with no defects observed.
  - Full-height hairline cracks spaced 4 ft on center throughout the bent cap.
  - Area of delamination on the north and south faces of the bent cap, measuring 1 ft high by 3 ft long.

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- **Abutment 2:**

- The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
- Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall.
- An area of delamination with failed patch was observed.

***Summary of Recommendations:***

- Monitor hairline cracks in Bents and Abutments for future propagation.
- Monitor areas of delamination on Bent 2 and Abutment 2.

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### *Underwater Inspection Coding:*

#### **NBI Ratings:**

<b>Item</b>	<b>Description</b>	<b>Coding</b>	<b>Condition</b>
60	Substructure	7 – Good Condition	Areas of Delamination, Hairline Concrete Cracking
61	Channel	8 – Very Good Condition	No Defects Observed
62	Culvert	N/A	
92B	UW Insp. Frequency	60 Months	
93B	Insp. Date	04 23 20	
113	Scour Critical Bridges	5 – Within Foundation Limits	Stable (Inspector Recommended)

#### **AASHTO National Bridge Element (NBE) Ratings:**

<b>Element #</b>	<b>Description</b>	<b>Units</b>	<b>Total</b>	<b>Condition State</b>			
				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
225	Steel Pile	EA	32	32	0	0	0
215	Reinforced Concrete Abutment	LF	100	97	3	0	0
234	Bent Cap, Reinforced Concrete	LF	80	74	6	0	0

Note: Ratings were developed using the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges. The recommended ratings consider inspected elements located within the waterway and conditions existing below the water surface only. Additional consideration is necessary for the assignment of overall condition ratings for this bridge.

# UNDERWATER INSPECTION

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)  
Ottawa County, OH • April 2020



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## 1.0 INTRODUCTION

### 1.1 Purpose and Scope

This report consists of the results of a detailed underwater investigation performed at the SR 2 Bridge over Lacarpe Creek in Ottawa County, OH. Collins Engineers, Inc. (Collins) conducted the underwater investigation for District 2 of the Ohio Department of Transportation (ODOT) on April 23, 2020. The primary purpose of the investigation was as follows:

- Determine the condition of the substructure components located in the water at the time of the inspection from the waterline to the channel bottom.
- Obtain channel bottom depth measurements along the bridge fascias, upstream and downstream of the bridge, and around the submerged substructure units.
- Obtain channel profile cross sections at the upstream and downstream fascias.
- Determine the condition of the shorelines in the vicinity of the structure.
- Obtain photographs of the bridge and any significant defects.

In addition, a brief inspection was made of areas that could be submerged during periods of high water. The following report includes a description of the structure, the method of investigation, a description of existing conditions, an evaluation and recommendations based on the conditions, inspection figures, and photographs.

### 1.2 General Description of the Structure

Structure No. 6200214 (OTT-2-1654) spans 66 ft, carrying SR 2 over Lacarpe Creek and is approximately 80 ft wide. The bridge superstructure is constructed of three continuous concrete slab bridge spans. The roadway orientation of the longitudinal axis of the bridge is west to east. The substructure units are labeled as Abutments 1 and 2 and Bents 1 and 2. Existing design drawings were not available at the time of the inspection. Refer to Figure 1 in Exhibit 1 for a Location Map of the bridge. Refer to Photographs 1 and 2 in Exhibit 2 for overall views of the bridge.

### 1.3 Method of Investigation

A detailed field inspection was conducted to determine the physical condition of the submerged bridge substructure units from the waterline to the channel bottom. A brief visual examination of the substructure units above the waterline was also made.



## UNDERWATER INSPECTION

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)  
Ottawa County, OH • April 2020



A three-person team consisting of a professional engineer-diver and team leader (Joshua Johnson, P.E.), an engineer-diver (Matthew Rogers, E.I.T.), and a technician-diver (Nicholas Lane) conducted the underwater inspection. The inspection was conducted using surface supplied air diving equipment. During the inspection, the inspectors worked from a boat and a note taker in the boat recorded the inspection notes.

The underwater inspection consisted of a visual and tactile examination of the accessible surfaces of the substructure units from the waterline to the channel bottom with particular attention given to any observed areas of deterioration or apparent distress. Approximately 10 percent of the total area on the underwater surfaces of the substructure units was cleaned so that the condition could be more closely examined. Photographs were taken to document the general conditions and observed deficiencies. Underwater photographs could not be obtained due to poor water conditions. The type of channel bottom material, the presence or extent of scour, the presence or extent of riprap, the presence or extent of drift and debris, and the location of any foundation exposure or undermining were noted.

Channel bottom soundings were performed utilizing a telescoping survey rod, digital fathometer, and pneumofathometer. Soundings were collected at quarter points along the bridge centerline as well as at quarter points along the upstream and downstream fascias and 50 ft fascias. Additional soundings were collected adjacent to Abutments 1 and 2 and Bents 1 and 2 and at 10 foot intervals in-line with the bents, upstream and downstream, and the waterline was referenced to a known elevation on the bridge. A sounding plan was developed using the soundings and approximate location of the shorelines. Refer to Figures 2 through 5 in Exhibit 1 for the sounding plan and channel cross sections that show the channel limits and water depths around the structure.

## 2.0 EXISTING CONDITIONS

### 2.1 General Conditions

At the time of the inspection, the waterline of 6200214 (OTT-2-1654) was located approximately 0.2 ft above the bottom of cap at the upstream nose of Bent 2, which corresponds to a waterline elevation of 576.34 ft. During the inspection, the waterway was flowing at approximately 0 ft per second. The bridge bent skew was consistent with the channel alignment and does not require attention at this time. The east and west shorelines consisted of well-vegetated, well-protected, mild slopes, with no erosion. Refer to Photographs 3 through 8 in Exhibit 2 for views of the shorelines near the structure.



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### 2.2 Substructure Conditions

#### 2.2.1 *Abutment 1*

The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration. Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall. Refer to Figure 6 in Exhibit 1 for detailed inspection notes of Abutment 1. Refer to Photographs 3 through 5 in Exhibit 2 for views of Abutment 1 at the shoreline.

#### 2.2.2 *Bent 1*

The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration. The submerged portions of the bent were sound and smooth with no defects observed. Full-height hairline cracks spaced 4 ft on center throughout the bent cap. Refer to Figure 7 in Exhibit 1 for detailed inspection notes of Bent 1. Refer to Photographs 9 and 10 in Exhibit 2 for views of Bent 1.

#### 2.2.3 *Bent 2*

The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration. The submerged portions of the bent were sound and smooth with no defects observed. Full-height hairline cracks spaced 4 ft on center throughout the bent cap. An area of delamination was observed on the north and south faces of the bent cap, measuring 1 ft high by 3 ft long. Refer to Figure 8 in Exhibit 1 for detailed inspection notes of Bent 2. Refer to Photographs 11 through 15 in Exhibit 2 for views of Bent 2, typical concrete condition at the waterline, and typical substructure joint conditions.

#### 2.2.4 *Abutment 2*

The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration. Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall. An area of delamination with failed patch was observed. Refer to Figure 9 in Exhibit 1 for detailed inspection notes of Bent 2. Refer to Photographs 6 through 8 in Exhibit 2 for views of Abutment 2 at the shoreline.

### 3.0 EVALUATION AND RECOMMENDATIONS

Overall, the inspected substructure units of Structure No. 6200214 (OTT-2-1654) were in good condition. A comparison of the soundings recorded during the previous inspection on June 25, 2015 and the

## UNDERWATER INSPECTION

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)  
Ottawa County, OH • April 2020



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soundings taken during this inspection revealed no significant change in the channel bottom profile in the vicinity of the structure. Although no channel deficiencies were observed, the channel bottom should continue to be monitored during future underwater inspections to verify that localized scour or overall channel degradation is not occurring and that the bent footings remain adequately embedded in the channel bottom.

The hairline cracking at Abutments 1 and 2 and Bents 1 and 2 are not structural concerns at this time. However, the cracks do provide a means for water infiltration and freeze-thaw damage. It is therefore recommended that these cracks be monitored during future underwater inspections. If further crack propagation or increased crack widths are observed, it may be necessary to repair the cracks by injection or patching with a repair material suitable for underwater applications.

It is recommended that the submerged substructure units of Structure No. 6200214 (OTT-2-1654) be next inspected underwater at an interval not to exceed 60 months, no later than April 23, 2025.

Respectfully Submitted,  
COLLINS ENGINEERS, INC.

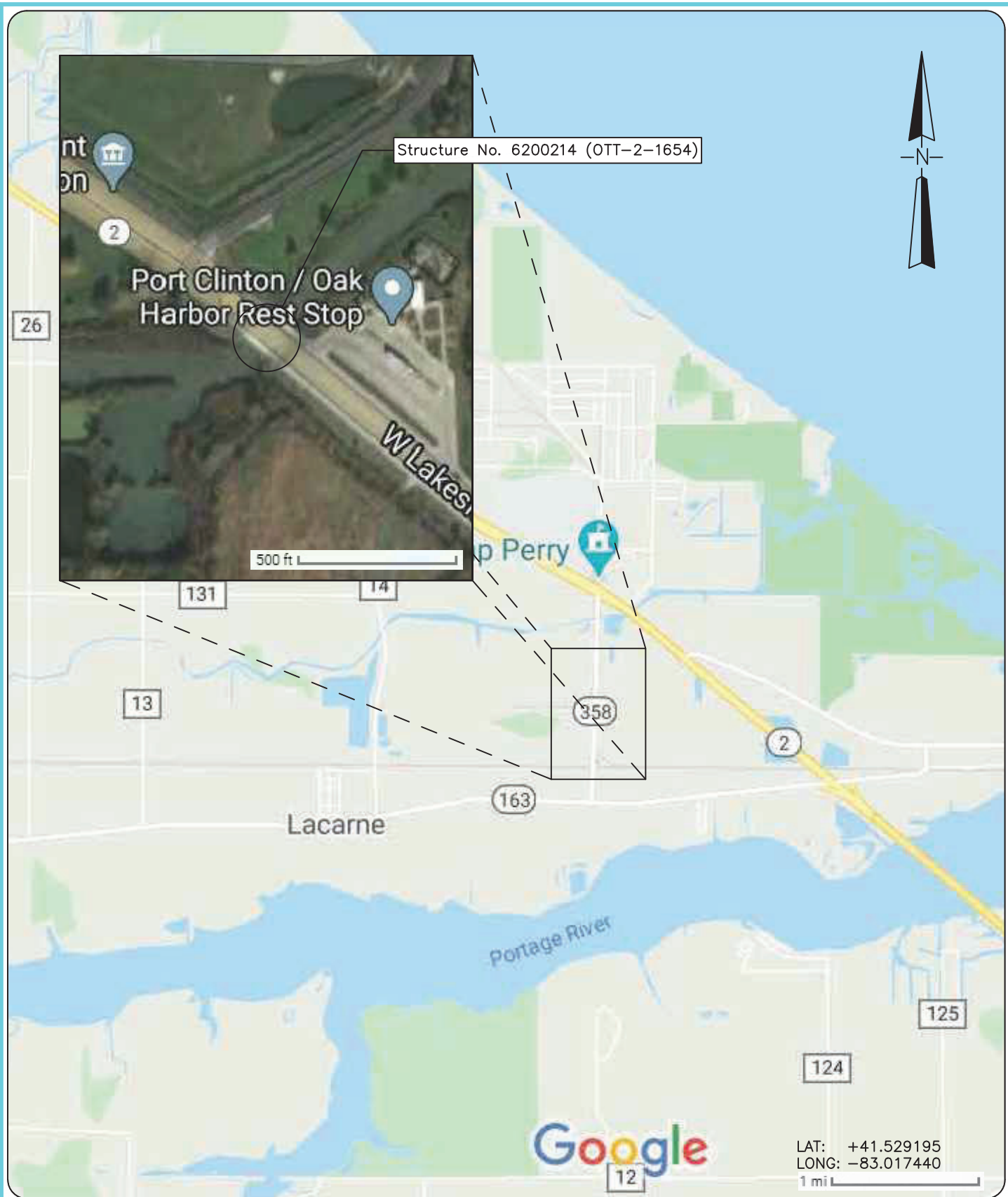
A handwritten signature in black ink, appearing to read "J. Johnson", is written over a light gray rectangular background.

Joshua Johnson, P.E.  
Project Manager

Originated by:  
Kevin Mitchell, E.I.T.



## EXHIBIT 1 – FIGURES



**COLLINS ENGINEERS**

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 Lexington, KY 40511  
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 Fax: 859-367-0140



Ohio Department of  
 Transportation, District 2  
 317 Poe Rd  
 Bowling Green, OH 43402  
 Phone: 419-353-8131

**SR-2 OVER LACARPE CREEK  
 STRUCTURE NO. 6200214  
 (OTT-2-1654)  
 LOCATION MAP  
 OTTAWA COUNTY, OHIO**

INSPECTED BY:  
 MOR

CEI PROJECT:  
 55-12239.00

DRAWN BY:  
 BLV

DATE:  
 23 APR 2020

CHECKED BY:  
 JMJ

SHEET NO:  
**1**

50 ft Downstream

10 ft Downstream

Downstream Fascia

To Bono, OH

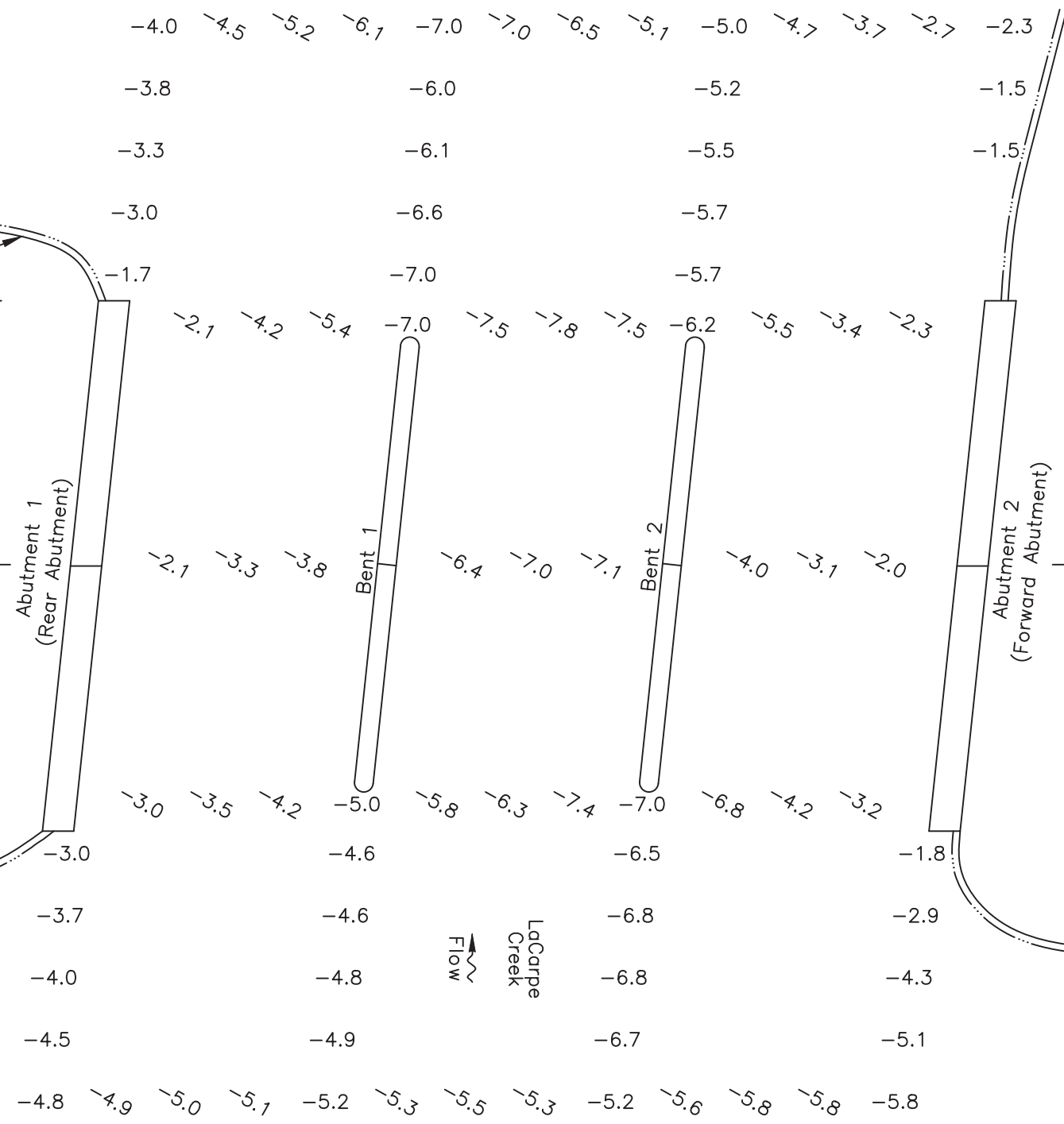
☉ Bridge

Upstream Fascia

10 ft Upstream

50 ft Upstream

Shoreline (Typ.)



SOUNDING PLAN

GENERAL NOTES:

1. Abutments 1 and 2 and Bents 1 and 2 were inspected underwater. Substructure units are labeled according to available record drawings.
2. At the time of inspection on April 23, 2020, the waterline was located approximately 0.2 ft above Bottom of Cap at upstream nose of Bent 2 (EL. +576.14 ft). This corresponds with a waterline elevation of +576.34 ft.
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 the upstream and downstream fascias, at 10 ft intervals between the substructure units, and at 10 ft intervals in-line with the bents upstream and downstream up to 50 ft.

LEGEND

- 2.7 Sounding Depth from Waterline (ft)
- ⊗ Timber Debris

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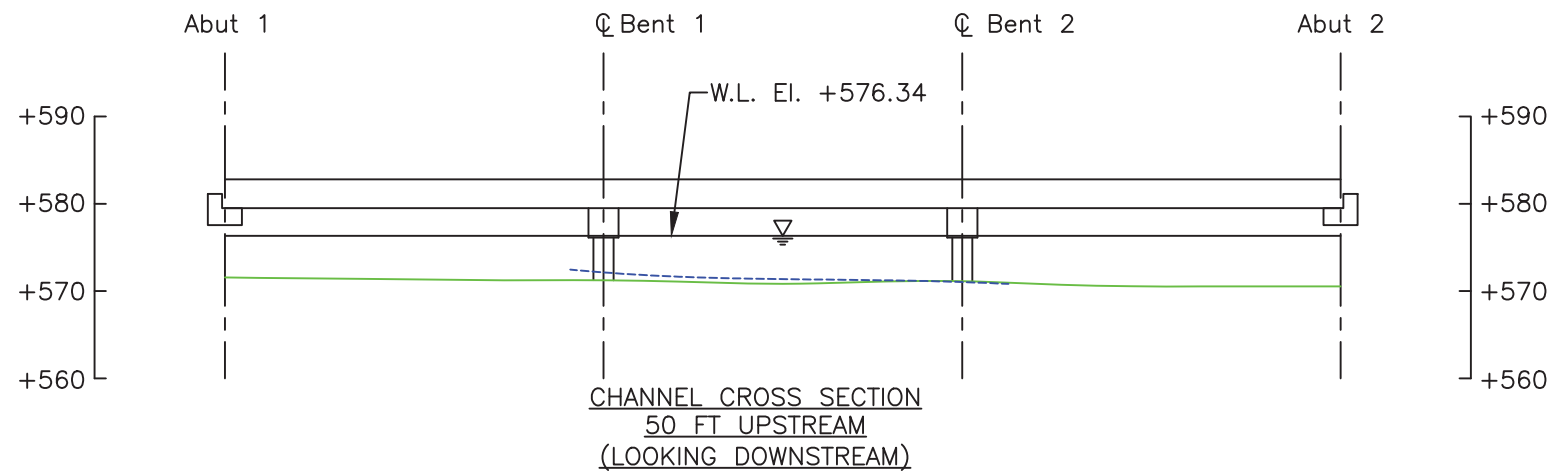
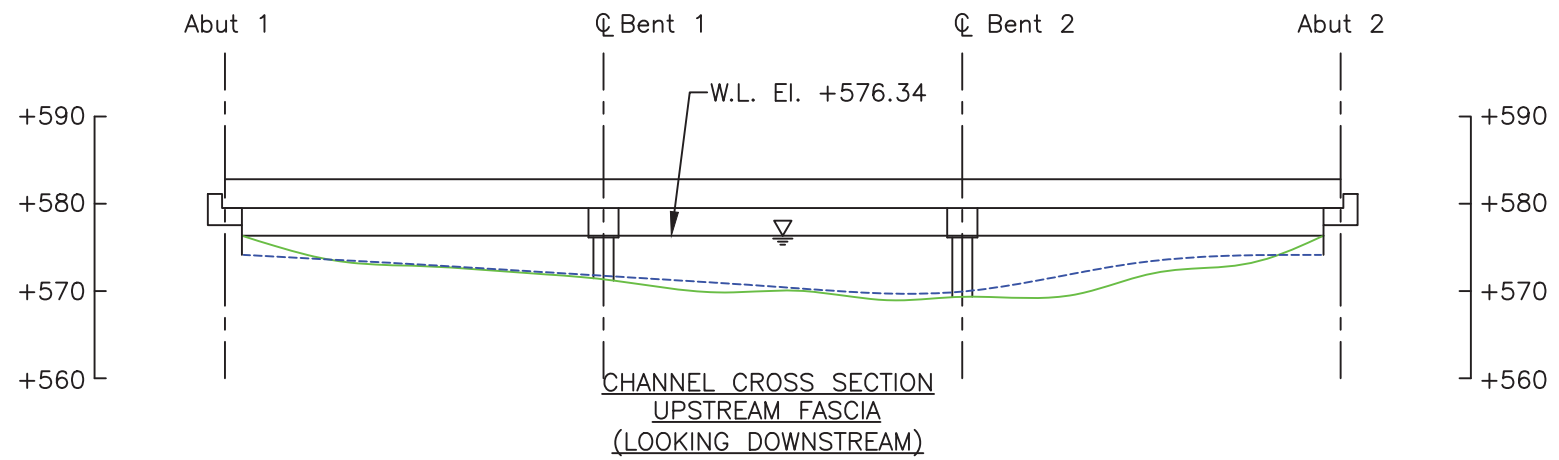
Ohio Department of Transportation, District 2  
 317 East Poe Rd.  
 Bowling Green, OH 45601  
 Phone: 419-353-8131

SR-2 OVER LACARPE CREEK  
 STRUCTURE NO. 6200214 (OTT-2-1654)  
 SOUNDING PLAN  
 OTTAWA COUNTY, OHIO

CEI PROJECT  
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 MOR  
 DRAWN BY:  
 BLV  
 CHECKED BY:  
 JMJ  
 DATE:  
 APR 2020  
 SHEET NO:  
 2

UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	6.3
1/4	6.3
1/2	6.8
3/4	7.5
B1	8.3
1/4	9.1
1/2	9.6
3/4	10.7
B2	10.3
1/4	10.1
1/2	7.5
3/4	6.5
A2	5.1

\*Profile taken from top of deck



**LEGEND**

- Approximate Channel Bottom – April 2020
- - - Approximate Channel Bottom – June 2015
- - - Approximate Channel Bottom – June 2010 (No Data)
- Timber Debris
- Water Surface
- +450 Elevation (ft)

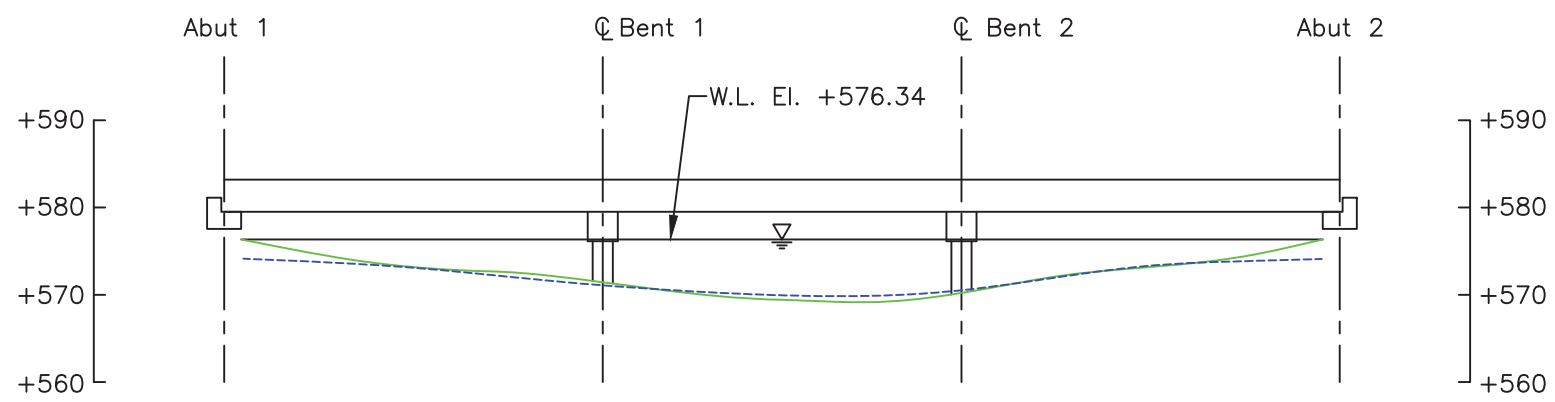
Note: \_\_\_\_\_  
Footing elevations unknown due to unavailable record drawings.

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**SR-2 OVER LACARPE CREEK  
STRUCTURE NO. 6200214 (OTT-2-1654)  
CROSS SECTIONS - UPSTREAM  
OTTAWA COUNTY, OHIO**

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MOR  
DRAWN BY:  
BLV  
CHECKED BY:  
JMJ  
DATE:  
APR 2020  
SHEET NO:  
**3**



CHANNEL CROSS SECTION  
STRUCTURE CENTERLINE  
(LOOKING DOWNSTREAM)

LEGEND

- Approximate Channel Bottom – April 2020
- - - Approximate Channel Bottom – June 2015
- - - Approximate Channel Bottom – June 2010 (No Data)
- Timber Debris
- Water Surface
- +450 Elevation (ft)

Note:

Footings elevations unknown due to unavailable record drawings.

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SR-2 OVER LACARPE CREEK  
STRUCTURE NO. 6200214 (OTT-2-1654)  
CROSS SECTIONS - CENTERLINE  
OTTAWA COUNTY, OHIO

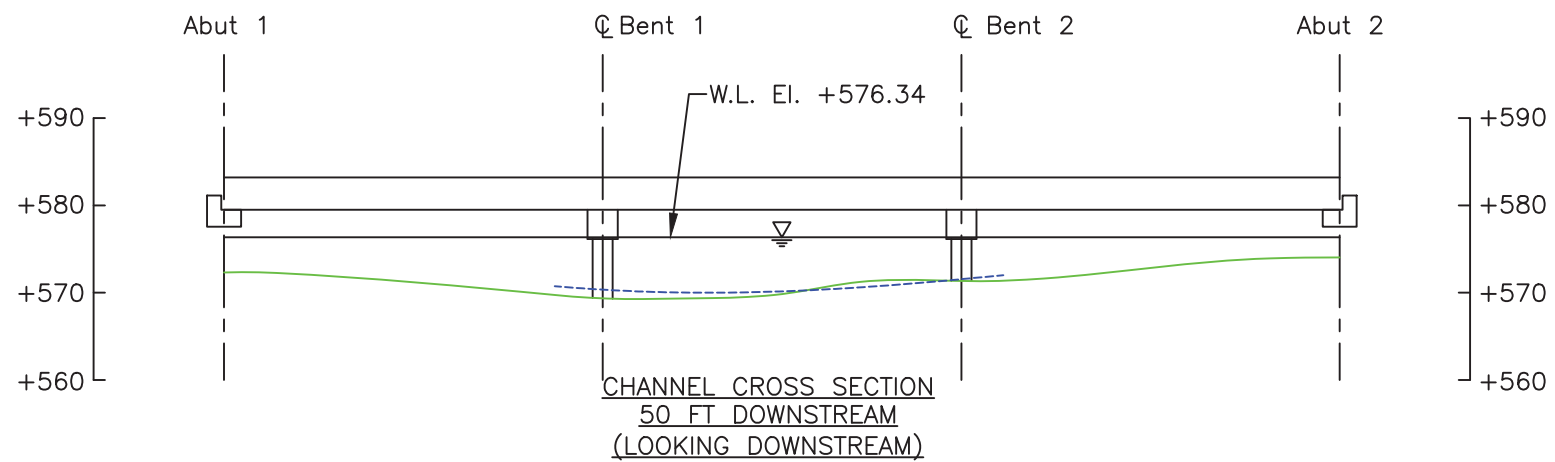
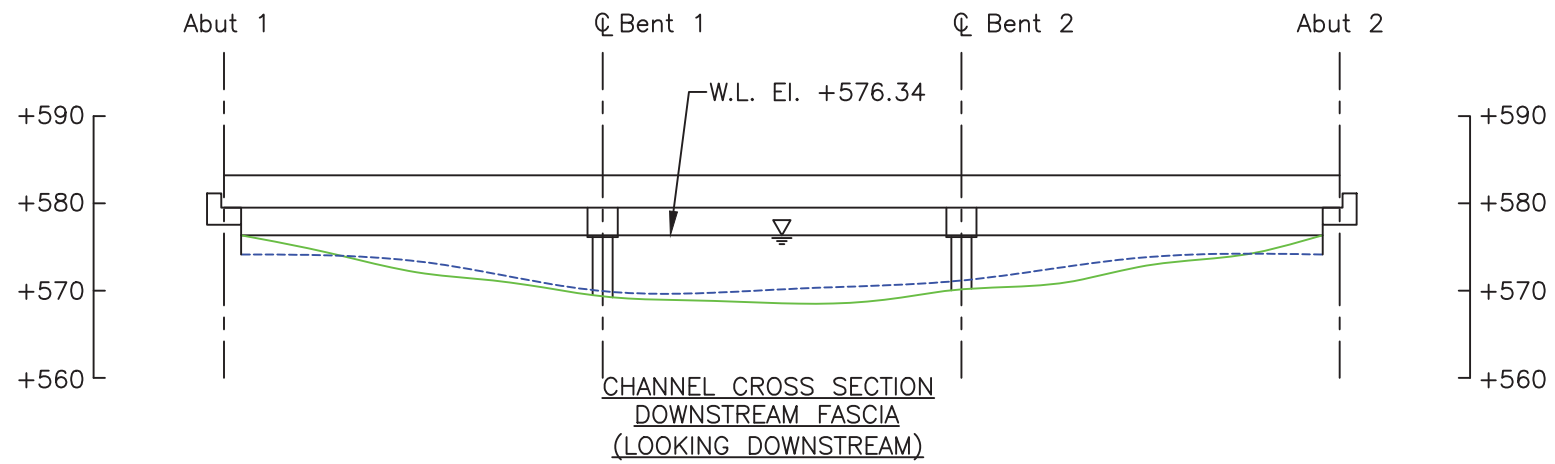
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INSPECTED BY:  
MOR  
DRAWN BY:  
BLV  
CHECKED BY:  
JMJ  
DATE:  
APR 2020  
SHEET NO:  
4



**DOWNSTREAM FASCIA  
LOOKING DOWNSTREAM**

Location	Y(ft)*
A1	5.4
1/4	5.8
1/2	7.9
3/4	9.1
B1	10.7
1/4	11.2
1/2	11.5
3/4	11.2
B2	9.9
1/4	9.2
1/2	7.1
3/4	6.0
A2	3.7

\*Profile taken from top of deck



**LEGEND**

- Approximate Channel Bottom – April 2020
- - - Approximate Channel Bottom – June 2015
- - - Approximate Channel Bottom – June 2010 (No Data)
- Timber Debris
- Water Surface
- +450 Elevation (ft)

**Note:**

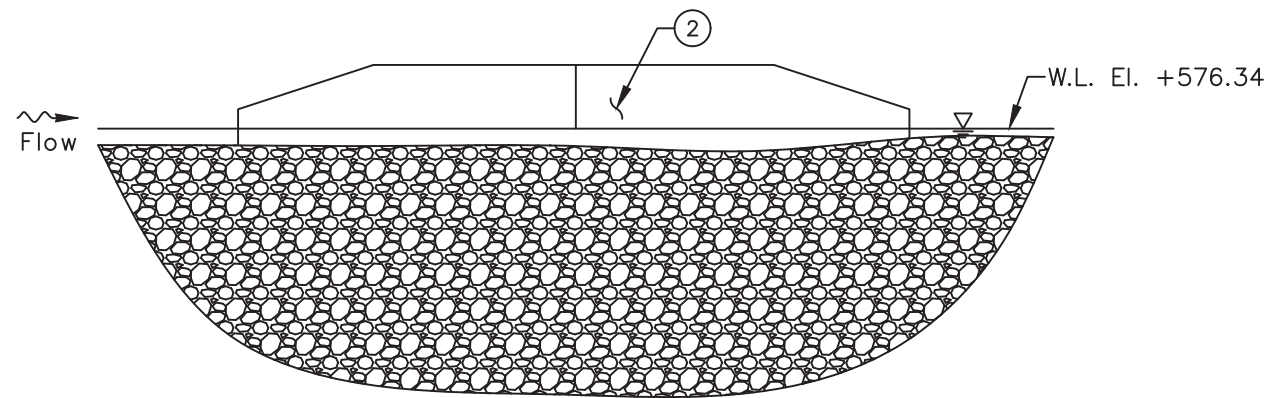
Footing elevations unknown due to unavailable record drawings.

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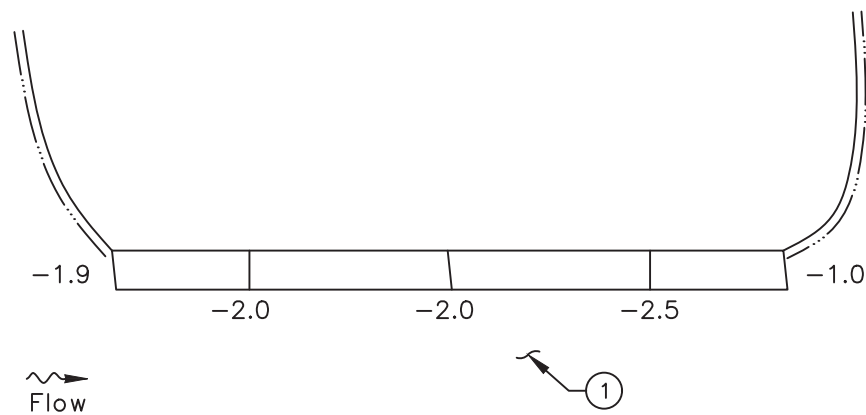
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**SR-2 OVER LACARPE CREEK  
STRUCTURE NO. 6200214 (OTT-2-1654)  
CROSS SECTIONS - DOWNSTREAM  
OTTAWA COUNTY, OHIO**

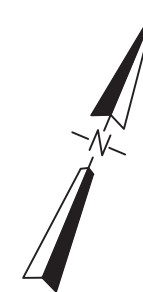
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CHECKED BY:  
JMJ  
DATE:  
APR 2020  
SHEET NO:  
**5**



SOUTH ELEVATION  
(LOOKING NORTH)



PLAN



LEGEND

- 2.7 Sounding Depth from Waterline (ft)
- Approximate Channel Bottom - April 2020
- Timber Debris
- Water Surface

INSPECTION NOTES: \_\_\_\_\_

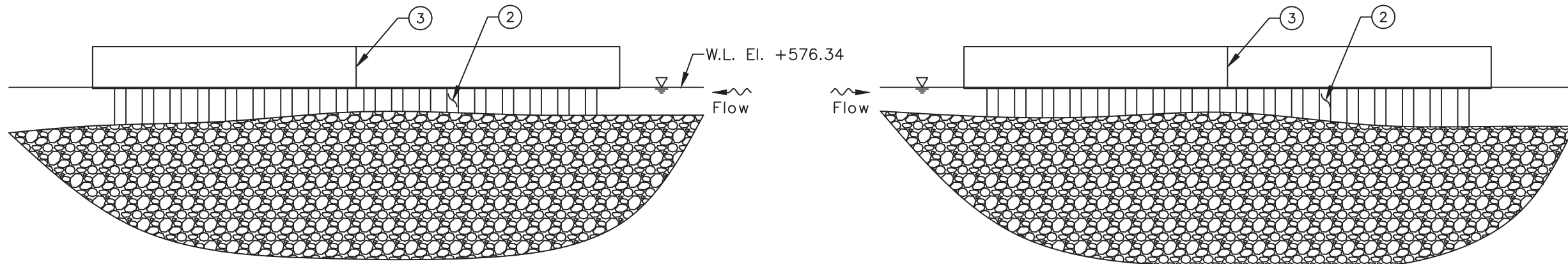
- ① The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
- ② Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall.

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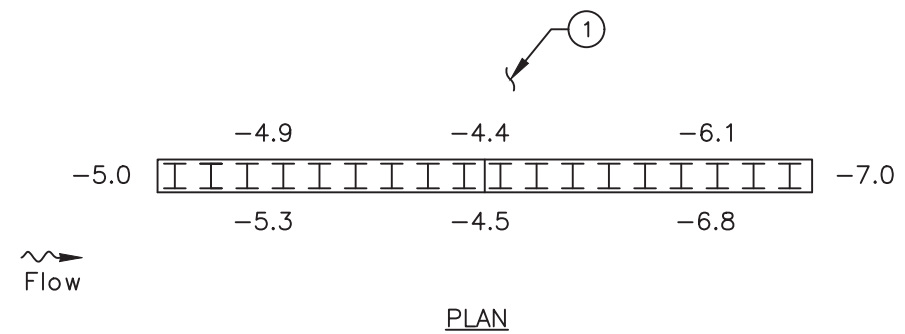
SR-2 OVER LACARPE CREEK  
 STRUCTURE NO. 6200214 (OTT-2-1654)  
 ABUTMENT 1  
 OTTAWA COUNTY, OHIO

CEI PROJECT  
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 INSPECTED BY:  
 MOR  
 DRAWN BY:  
 BLV  
 CHECKED BY:  
 JMJ  
 DATE:  
 APR 2020  
 SHEET NO:  
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NORTH ELEVATION  
 (LOOKING SOUTH)

SOUTH ELEVATION  
 (LOOKING NORTH)



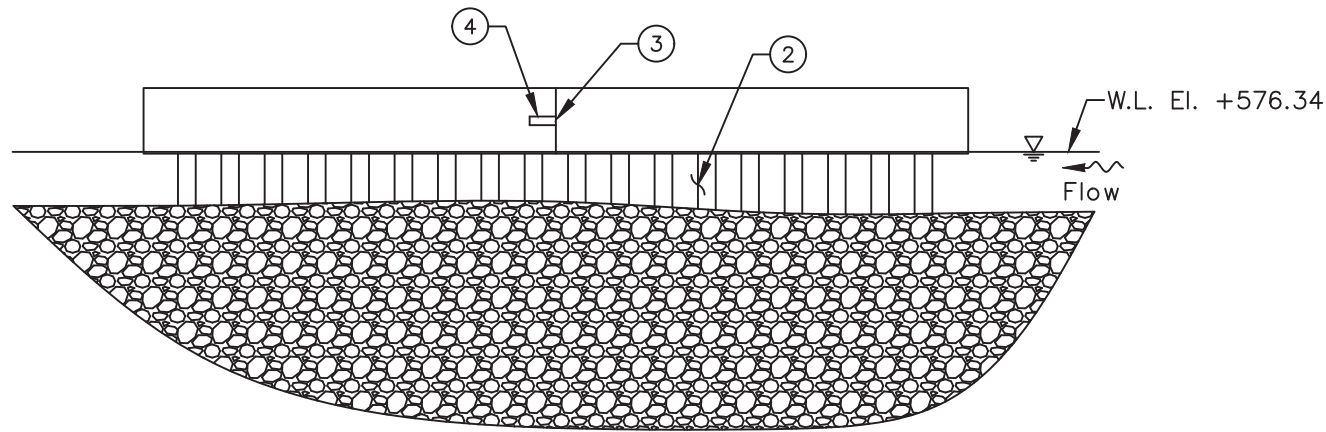
PLAN

LEGEND

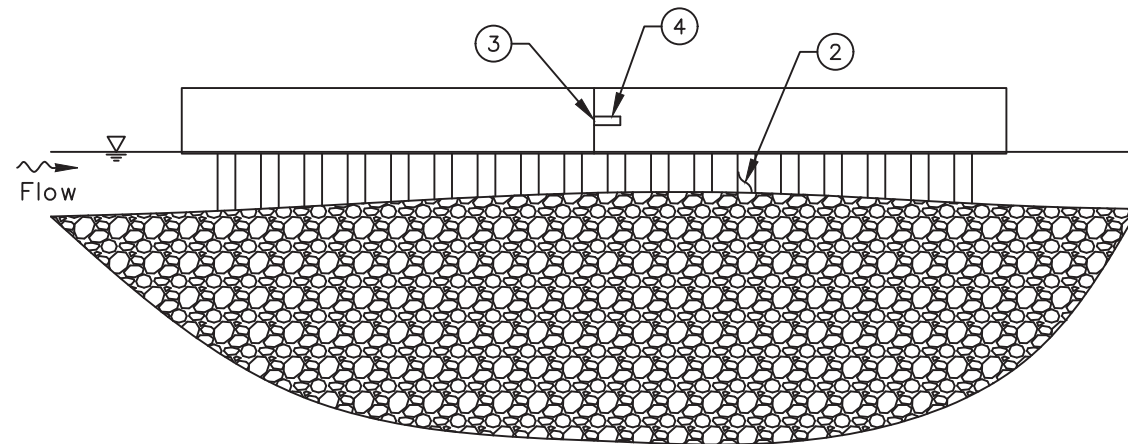
- 2.7 Sounding Depth from Waterline (ft)
- Approximate Channel Bottom - April 2020
- Timber Debris
- Water Surface

INSPECTION NOTES:

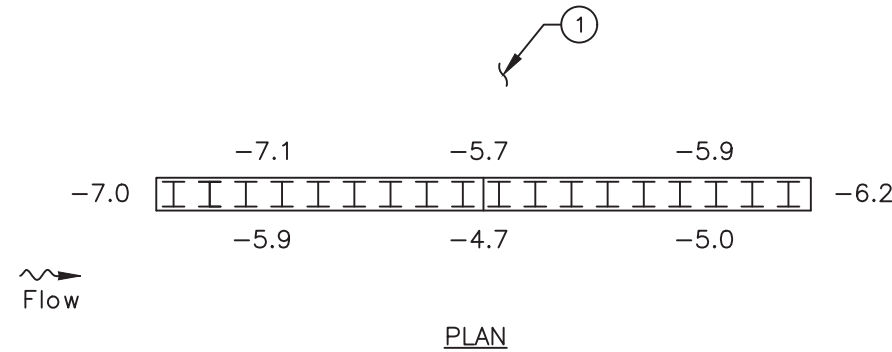
- ① The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
- ② The submerged portions of the pier were sound and smooth with no defects observed.
- ③ Full-height hairline cracks spaced 4 ft on center throughout the bent cap.



NORTH ELEVATION  
(LOOKING SOUTH)



SOUTH ELEVATION  
(LOOKING NORTH)



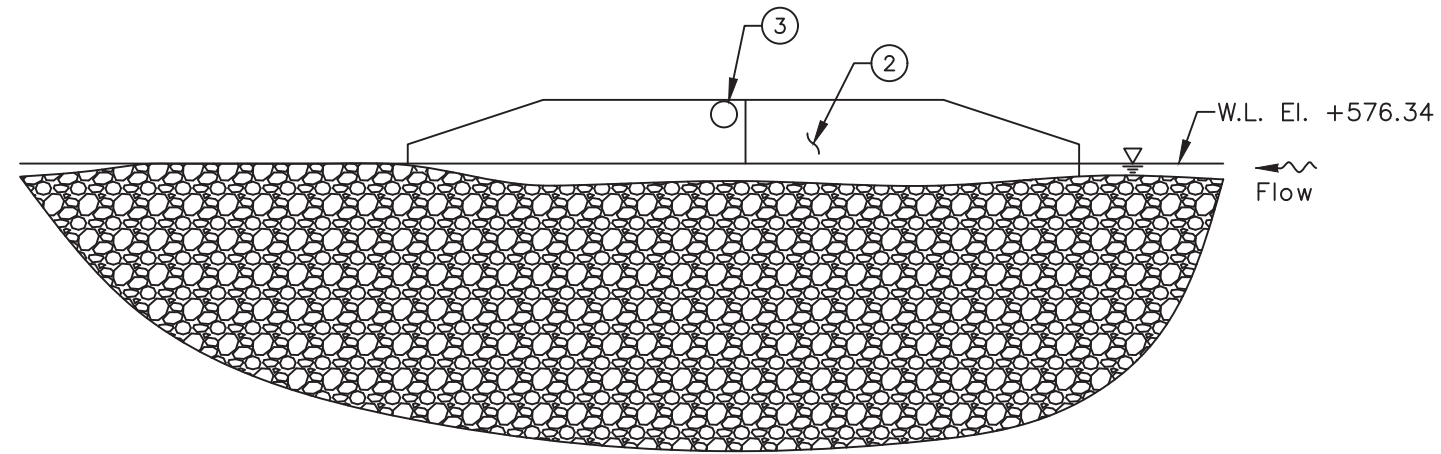
PLAN

INSPECTION NOTES:

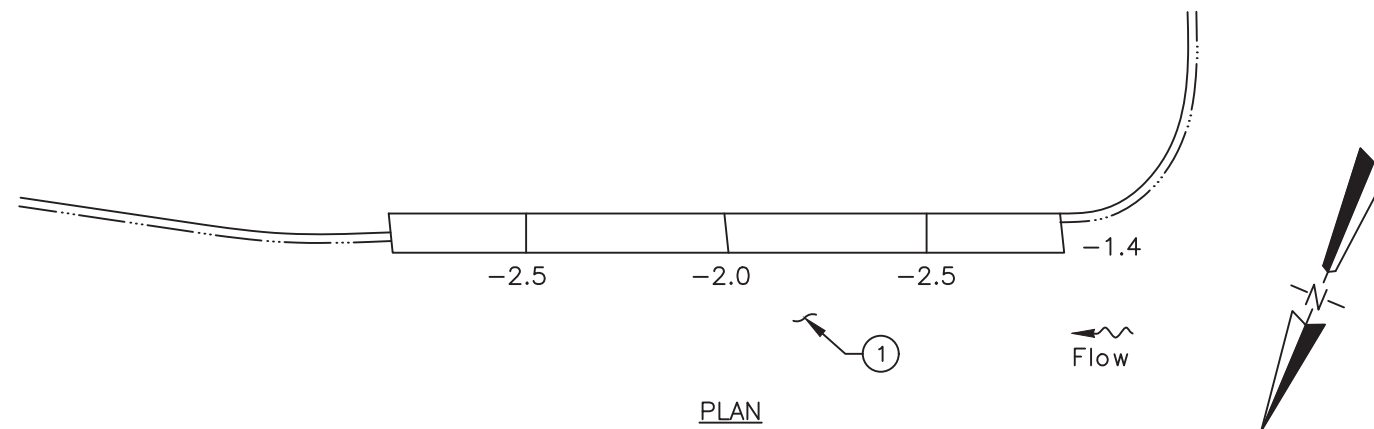
- ① The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
- ② The submerged portions of the pier were sound and smooth with no defects observed.
- ③ Full-height hairline cracks spaced 4 ft on center throughout the bent cap.
- ④ An area of delamination was observed on the north and south faces of the bent cap, measuring 1 ft high by 3 ft long.

LEGEND

- 2.7 Sounding Depth from Waterline (ft)
- Approximate Channel Bottom - April 2020
- ⊘ Timber Debris
- ∇ Water Surface



NORTH ELEVATION  
(LOOKING SOUTH)



PLAN

INSPECTION NOTES:

- ① The channel bottom material consisted of sand and silt with approximately 12 in. probe rod penetration.
- ② Random hairline cracks with efflorescence approximately 5 ft long were observed on the abutment wall.
- ③ An area of delamination with failed patch was observed.

LEGEND

- 2.7 Sounding Depth from Waterline (ft)
- Approximate Channel Bottom – April 2020
- ⊘ Timber Debris
- ▽ Water Surface

**COLLINS ENGINEERS**  
 124 Venture Court, Ste 10  
 Lexington, KY 40511  
 Phone: 859-367-0097  
 Fax: 859-367-0140

Ohio Department of Transportation, District 2  
 317 East Poe Rd.  
 Bowling Green, OH 45601  
 Phone: 419-353-8131

SR-2 OVER LACARPE CREEK  
 STRUCTURE NO. 6200214 (OTT-2-1654)  
 ABUTMENT 2  
 OTTAWA COUNTY, OHIO

CEI PROJECT  
 55-12239.00  
 INSPECTED BY:  
 MOR  
 DRAWN BY:  
 BLV  
 CHECKED BY:  
 JMJ  
 DATE:  
 APR 2020  
 SHEET NO:  
 9



## EXHIBIT 2 – INSPECTION PHOTOGRAPHS



**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 1: Overall View of Structure No. 6200214 (OTT-2-1654), Looking Southwest.



Photograph No. 2: Overall View of Structure No. 6200214 (OTT-2-1654), Looking Northeast.



**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 3: View of the West Embankment Upstream of the Structure, Looking North.



Photograph No. 4: View of the West Embankment at the Structure, Looking North.

UNDERWATER INSPECTION

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 5: View of the West Embankment Downstream of the Structure, Looking West.



Photograph No. 6: View of the East Embankment Upstream of the Structure, Looking South.





Photograph No. 7: View of the East Embankment at the Structure, Looking East.



Photograph No. 8: View of the East Embankment Downstream of the Structure, Looking East.

**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 9: View of the West Face of Bent 1, Looking South.



Photograph No. 10: View of the East Face of Bent 1, Looking West.



**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 11: View of the West Face of Bent 2, Looking South.



Photograph No. 12: View of the East Face of Bent 2, Looking West.

**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 13: View of the Typical Concrete Condition at the Waterline, Looking Southwest.



Photograph No. 14: View of the Typical Joint at Abutment, Looking East.



**UNDERWATER INSPECTION**

SR 2 over Lacarpe Creek • Structure No. 6200214 (OTT-2-1654)

Ottawa County, OH • April 2020



Photograph No. 15: View of the Typical Joint at Bent, Looking West.





EXHIBIT 3 – UNDERWATER DIVE INSPECTION  
PROCEDURE CHECKLIST

**Underwater Dive Inspection Procedure Checklist**

Acceptable written procedures communicate to the next dive team what is necessary to ensure a safe and successful inspection. Each bridge requiring underwater dive techniques must have a unique written inspection procedure. The prior inspection report does not suffice for the required procedures. It is valuable to review the last inspection notes, but they do not serve the same purpose as a stand-alone inspection procedure.

This document shall be completed for all underwater dive inspections. This document shall be reviewed prior to performing the field work and it shall be updated when necessary.

**I. Bridge Identification**

a. Agency with Inspection Responsibility: ODOT DISTRICT 2

Dive Frequency: 60 months

SFN: 6200214 Bridge Number (County-Route-SLM-SD): OTT-2-1654

Superstructure Type Main Span Type: CONTINUOUS CONCRETE SLAB

Approach Span: REINFORCED CONCRETE

Substructure Type Abutment Type: REINFORCED CONCRETE

Pier Type: REINFORCED CONCRETE BENTS

Total Pier Count: 2

Total Pier Count in water: 2

Foundations: UNKNOWN

Feature Intersected LACARPE CREEK

**b. Photographs**

Endview



Elevation



Underside

**II. Office and Field Assessment**

Prior to the inspection, obtain and review copies of the previous underwater inspection reports, routine inspection reports, scour and hydraulic information, and design plans in preparation of the inspection.

Divers should pay particular attention given to any observed areas of deterioration, the channel conditions and factors that may accelerate material deterioration. Changes shall be noted in the inspection procedure. Site conditions should be reviewed prior to diving.

a. Channel Conditions

- Waterway features
- Rapid stream flows,
- Significant debris accumulation
- Constricted waterway openings
- Soft or unstable streambeds
- Meandering channels
- Other which may promote scour and undermining of substructure elements
- Navigable Waterway
- Flow Controls

b. Anticipated Water conditions which

may affect the inspection

- Cold Water (Apprx. Temp\_\_\_)
- Black water
- Rapid stream flows
- Near military facility
- Tribal fishing
- Water quality
- History of Log jams

c. Identify factors that may accelerate the deterioration of the bridge elements:

- Highly corrosive water
- Unprotected steel members
- Other

Risk Factor Narrative:

III. **Contacts Prior to Work**

District 2 Bridge Engineer: David Geckle, P.E.

Email: [david.geckle@dot.ohio.gov](mailto:david.geckle@dot.ohio.gov) – Phone: 419-373-4377

Point of contact for immediate action such as closing the bridge due to findings)

Contact Bridge Owner 14 (number) days before the proposed underwater inspection.

Special contracting and scheduling procedures prior to inspection, include recommended lead time

Entity	Contact Name and Title	Contact Phone	Lead Time
Coast Guard			
Property Owner			
Access Equipment			
Lake or River draw-down			
Canal dry time			
Tree removal			
Other:			
Other:			

IV. **Dive Team Shall Include the Following:**

Dive Team Narrative:

The dive team consisted of one Team Leader (NBIS, P.E., ADCI) and two Team Members (NBIS, UW, ADCI).

*Example: The Bridge shall be investigated using a three-member dive team: one supervisor to monitor rack box and take notes, one diver, and one tender/standby diver. There shall be one NBIS Team Leader onsite at all times.*

V. **Site Information**

Navigable waterway:	Y / <u>N</u>	Anticipated current	<u>0</u> ft
If Yes, waterway river point	_____	Scour Critical (item 113):	<u>5</u>
Anticipated water visibility depth	<u>0</u> ft	POA in place:	Y/ <u>N</u>
Anticipated Dive depth	<u>7.1</u> ft	Scour Monitoring devices present:	Y/ <u>N</u>

Verify the Scope of Services when work is contracted for the procedure for underwater elements that are not in water during an inspection.

Site Information Narrative:



The underwater inspection consists of a visual and tactile examination of the accessible surfaces of the substructure items in water. Additional items should reference the scope of services in the contract.

For reference the following items are in water:

Item	Number of Units	Level of Inspection (1, 2 or 3) with Commentary
Piers and Number of Columns	2	100%LEVEL I 10% LEVEL II
Abutment	2	100%LEVEL I 10% LEVEL II
Culvert	N/A	
Scour Countermeasures	N/A	
Fenders or Dolphins	N/A	

Photographs should be taken, if water clarity permits, for typical conditions, conditions that have changed since last inspection and significant or noteworthy deficiencies. The type of channel bottom material, the presence or extent of scour, the presence or extent of riprap, the presence or extent of drift and debris, and the location of any foundation exposure or undermining shall be quantified. Include depth, length, height and location of deficiencies.

VI. Equipment and Field Logistics

a. The inspection should be conducted

using:

Chest waders

Hip waders

Diving equipment

SCUBA (Note that ADCI Consensus Standards require communication systems be employed for both SCUBA and Surface-Supplied (whether air or mixed-gas) dive modes)

SCUBA with communication

Surface Supplied with

communication

b. The channel bottom should be sounded

utilizing

Digital fathometer

Telescoping survey rod

acoustic imaging

c. During the inspection, the divers should

work from

Shore

Boat

Either

The note taker should work alongside the dive team.

d. Access to the waterway should be obtained from the shore (north bank, southwest quadrant, driveway 30 yards north etc.)

REST AREA A THE NORTHWEST CORNER OF THE STRUCTURE

e. The maximum depth of the channel is typically measured \_\_\_\_\_ feet from

MIDPOINT OF THE DOWNSTREAM FASCIA BETWEEN BENTS 1 AND 2.

Reference Datum: .2FT. ABOVE THE BOTTOM CAP ON THE DOWNSTREAM FASCIA BETWEEN BENTS 1 AND 2.

Soundings should be dictated by the scope of work. When not detailed in the scope they should be repeated from the previous soundings. If neither exist then they need to be taken in a grid pattern between substructure units 100' upstream and 100' downstream.

**VII. Inspection Procedure History**

Created: COLLINS ENGINEERS Date: 09/25/2020

Updated By: \_\_\_\_\_ Date: \_\_\_\_\_

Updated By: \_\_\_\_\_ Date: \_\_\_\_\_

Updated By: \_\_\_\_\_ Date: \_\_\_\_\_

Updated By: \_\_\_\_\_ Date: \_\_\_\_\_

Updated By: \_\_\_\_\_ Date: \_\_\_\_\_

**VIII. Other Narrative Not Included In Previous Sections**