UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 8706786 (WOO-475-0386R)
I-475 NB OVER MAUMEE RIVER
WOOD COUNTY, OH
DISTRICT 2

April 2020

10/9/2020

Prepared for:

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

Prepared by:

COLLINS ENGINEERS INC.

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EXECUTIVE SUMMARY

Project: ODOT District 2 Underwater Bridge Inspections - 2020

Purpose of Project: To perform a detailed visual and tactile underwater investigation of underwater bridges for District 2 of the Ohio Department of Transportation.

Inspection Team: 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.
Team Member – Kevin Mitchell, E.I.T. – Collins Engineers, Inc.

Inspection Date(s): April 20, 2020

Water Visibility:	1 ft	***Water Velocity:***	1.5 ft/s
Water Temperature:	50 °F	***Weather:***	Clear – 55 °F
Waterline Elevation:	580.5 ft	***Type of Boat:***	10 ft Kayak
Coordinates:	41.5452765°N, -83.6829563°W		
Access Location:	Canoe Launch 50 ft Upstream on the North Embankment		
Dive Mode:	Surface Supplied Air		
Waterline Reference:	9.5 ft below gauge painted on the North Face of Pier 5.		
Maximum Depth at SSU:	5.2 ft – Downstream Corner of the South Face 2		
Shoreline Conditions:	The north and south shorelines consisted of well-vegetated, gentle slopes with no erosion.		

Summary of Findings:

- **Pier 2:**
  - The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration. The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline.
  - The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft.
  - Moderate timber debris consisting of logs up to 36 in. diameter extending up to 5 ft upstream of the upstream nose and +10 ft off both faces from the channel bottom to the waterline.
  - Top of footing was exposed at 3.8 ft below the waterline around the entire perimeter with a maximum vertical exposure of 0.3 ft on the northwest corner.
- **Pier 3:**
  - The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration.
  - The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline.
  - The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft.

  - Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.4 ft at the midpoint along the south face.
- **Pier 4:**
  - The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration.
  - The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline.
  - The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft.
  - Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.3 ft on the northeast.
- **Pier 5:**
  - The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration.
  - The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline.
  - The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft.
  - Top of footing was exposed at 4.0 ft below the waterline from the midpoint of the south face around the upstream nose ending at the northeast corner with a maximum vertical exposure of 0.9 ft on the northwest.

Summary of Recommendations:

- Remove timber debris at Pier 2.
- Monitor surface corrosion and steel pitting on all Pier icebreakers.
- Monitor concrete scaling on Piers 2 through 5.

Underwater Inspection Coding:

NBI Ratings:

Item	Description	Coding	Condition
60	Substructure	7 – Good Condition	Minor Steel Surface Corrosion and Pitting
61	Channel	6 – Satisfactory Condition	Timber Debris Accumulation
62	Culvert	N/A	
92B	UW Insp. Frequency	60 Months	
93B	Insp. Date	04 20 20	
113	Scour Critical Bridges	5 – Within Foundation Limits	Stable (Inspector Recommended)

AASHTO National Bridge Element (NBE) Ratings:

Element #	Description	Units	Total	Condition State			
				1	2	3	4
210	Reinforced Concrete Pier Wall	LF	120	120	0	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.

1.0 INTRODUCTION

1.1 Purpose and Scope

This report consists of the results of a detailed underwater investigation performed at the I-475 NB (WOO-475-0386R) Bridge over Maumee River in Wood County, OH. Collins Engineers, Inc. (Collins) conducted the underwater investigation for District 2 of the Ohio Department of Transportation (ODOT) on April 20, 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. 8706786 (WOO-475-0386R) spans 943.3 ft, carrying I-475 NB over Maumee River and is approximately 60 ft wide. The bridge superstructure is constructed of seven steel girder spans. The roadway orientation of the longitudinal axis of the bridge is north to south. The substructure units are labeled as Abutments 1 and 2 and Piers 2 through 7. 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.

A three-person team consisting of a professional engineer-diver and team leader (Joshua Johnson, P.E.) and three engineer divers (Matthew Rogers, E.I.T., Nicholas Lane, and Kevin Mitchell, E.I.T.) conducted the underwater inspection. The inspection was conducted using surface supplied air diving equipment. During the inspection, the inspectors worked from the shore and a note taker on the shore 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 and a digital fathometer. 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 Piers 2 through 5 and at 10 feet intervals in-line with the piers, 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 8706786 (WOO-475-0386R) was located approximately 9.5 ft below gauge painted on the North Face of Pier 5, which corresponds to a waterline elevation of 580.5 ft. During the inspection, the waterway was flowing at approximately 1.5 ft per second. The bridge pier skew was consistent with the channel alignment and does not require attention at this time. The north and south shorelines consisted of well-vegetated, gentle slopes with no erosion. Refer to Photographs 3 through 8 in Exhibit 2 for views of the shorelines near the structure.

2.2 Substructure Conditions

2.2.1 Pier 2

The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration. The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline. The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft. Moderate timber debris consisting of logs up to 36 in. diameter extending up to 5 ft upstream of the upstream nose and +10 ft off both faces from the channel bottom to the waterline. Top of footing was exposed at 3.8 ft below the waterline around the entire perimeter with a maximum vertical exposure of 0.3 ft on the northwest corner. Refer to Figure 8 in Exhibit 1 for detailed inspection notes of Pier 2. Refer to Photographs 9 and 10 in Exhibit 2 for views of Pier 2.

2.2.2 Pier 3

The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration. The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline. The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft. Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.4 ft at the midpoint along the south face. Refer to Figure 9 in Exhibit 1 for detailed inspection notes of Pier 3. Refer to Photographs 11 and 12 in Exhibit 2 for views of Pier 3.

2.2.3 Pier 4

The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration. The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the channel bottom to +8 ft above the waterline. The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft. Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.3 ft on the northeast corner. Refer to Figure 10 in Exhibit 1 for detailed inspection notes of Pier 4. Refer to Photographs 13 and 14 in Exhibit 2 for views of Pier 4.

2.2.4 Pier 5

The channel bottom material consisted of cobbles and riprap up to 12 in. diameter and no probe rod penetration. The submerged portions of the pier exhibited light scaling up to 1/16 in. deep extending from the

channel bottom to +8 ft above the waterline. The steel icebreaker exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. deep extending from the channel bottom to +8 ft. Top of footing was exposed at 4.0 ft below the waterline from the midpoint of the south face around the upstream nose ending at the northeast corner with a maximum vertical exposure of 0.9 ft on the northwest. Refer to Figure 11 in Exhibit 1 for detailed inspection notes of Pier 5. Refer to Photographs 15 through 17 in Exhibit 2 for views of Pier 5 and typical concrete and steel condition at the waterline.

3.0 EVALUATION AND RECOMMENDATIONS

Overall, the inspected substructure units of Structure No. 8706786 (WOO-475-0386R) were in good condition. A comparison of the soundings recorded during the previous inspection on November 10, 2015 and the 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 pier footings remain adequately embedded in the channel bottom.

The timber debris accumulations at Pier 2 is obstructing channel flow and should be removed at this time. Removal of the timber debris will reduce excessive lateral loads on the pier, limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.

The scaling observed on Piers 2 through 5 is not a structural concern at this time given its size compared to the overall pier size, and as a result, no repairs are recommended. This area should be monitored during future inspections for increasing extent or severity of the scaling and exposure of reinforcing steel. If the extent or severity of the scaling is observed to be increasing or reinforcing steel becomes exposed, it may be necessary to repair the area at that time.

The surface corrosion and pitting of the icebreaker steel observed at Piers 2 through 5 is not a structural concern at this time given its size compared to the overall icebreaker size, and as a result, no repairs are recommended. These areas should be monitored during future inspections for increasing extent or severity of the corrosion and pitting. If the extent or severity of the corrosion and pitting is observed to be increasing, it may be necessary to repair the areas at that time.

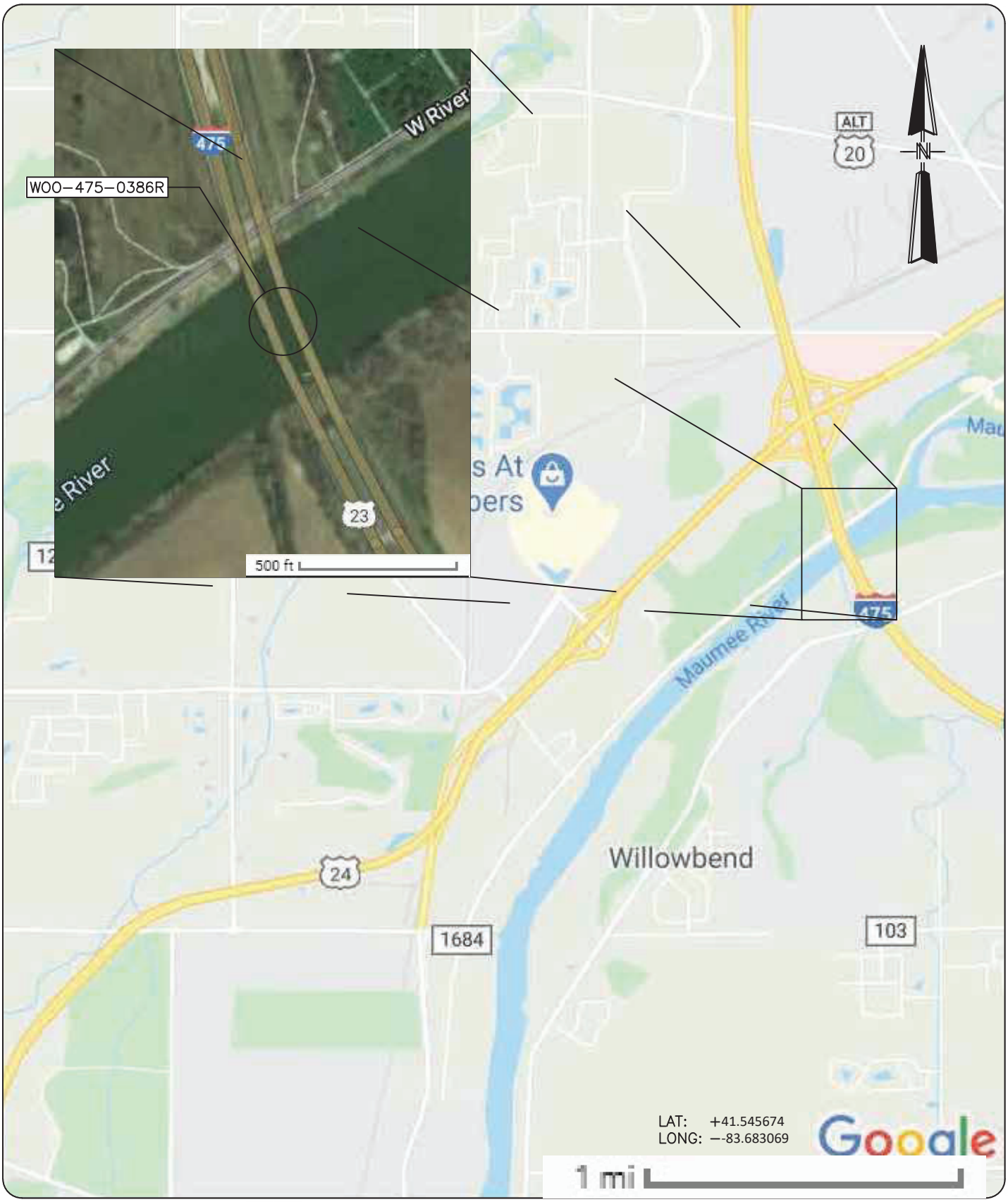
It is recommended that the submerged substructure units of Structure No. 8706786 (WOO-475-0386R) be next inspected underwater at an interval not to exceed 60 months, no later than April 20, 2025.

Respectfully Submitted,
COLLINS ENGINEERS, INC.

Joshua Johnson, P.E.
Project Manager

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

EXHIBIT 1 – FIGURES



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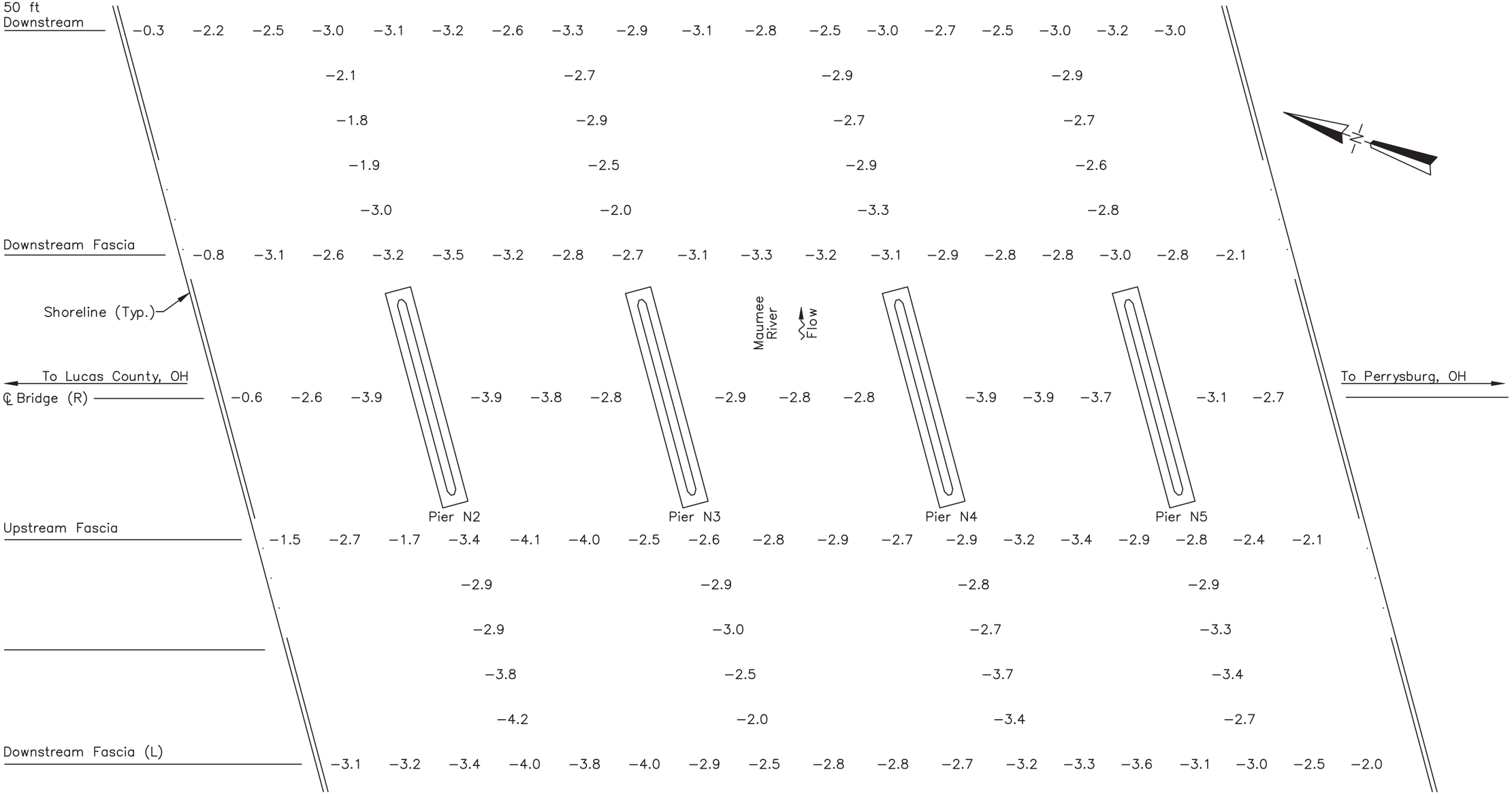
I-475 NB OVER MAUMEE RIVER
STRUCTURE NO. WOO-475-0386R

LOCATION MAP

WOOD COUNTY, OHIO

INSPECTED BY: MOR	CEI PROJECT: 55–12239.00
DRAWN BY: BLV	DATE: 20 APR 2020
CHECKED BY: JMJ	SHEET NO: 1



SOUNDING PLAN

GENERAL NOTES:

1. Piers N2, N3, N4, and N5 were inspected underwater. Substructure units are labeled according to previous report.
2. At the time of inspection on April 20, 2020, the waterline was located approximately 9.5 ft below the Gauge painted on the north face of Pier S5 (EL. +590.0 ft). This corresponds with a waterline elevation of +580.5 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 piers upstream and downstream up to 50 ft.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
	Timber Debris

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SOUNDING PLAN
WOOD COUNTY, OHIO

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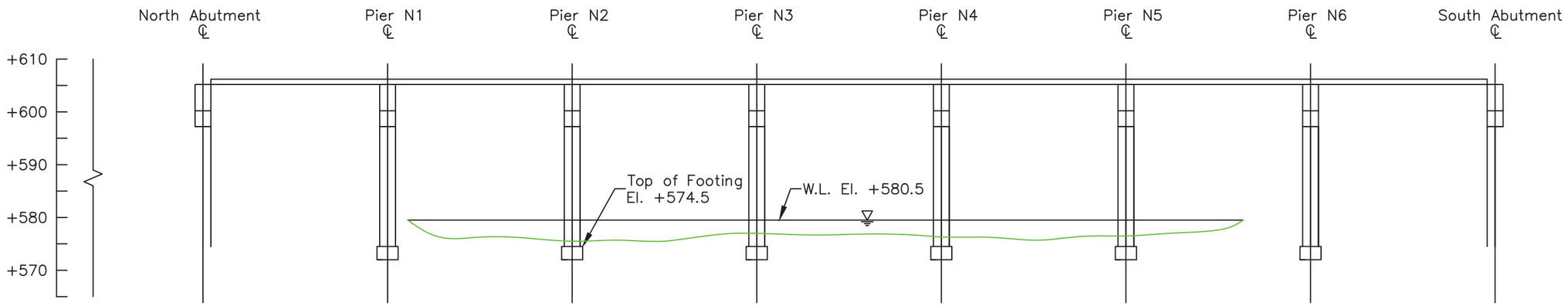

CHANNEL CROSS SECTION
50FT UPSTREAM
(LOOKING DOWNSTREAM)

Note:

Footing elevation for reference.

LEGEND

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

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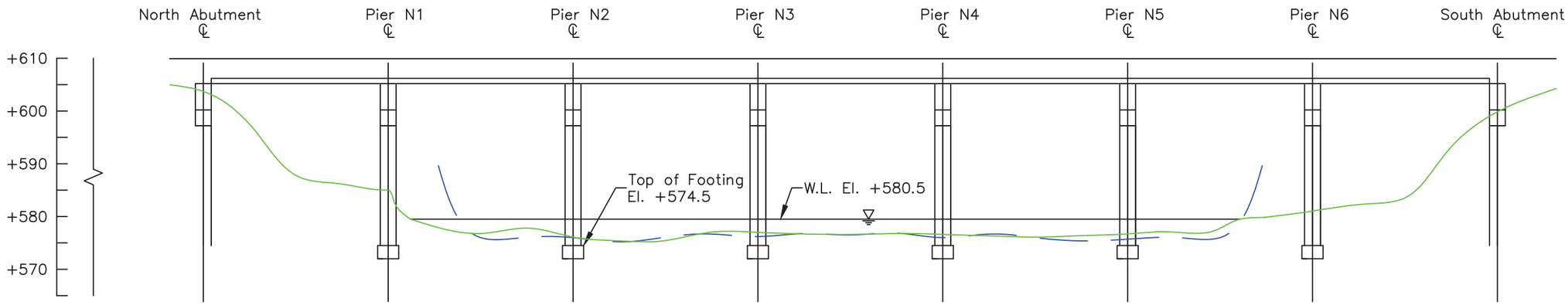
SHEET NO:	3



UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	7.2
1/4	15.3
1/2	23.5
3/4	24.7
PN1	25.9
1/4	30.2
1/2	34.5
3/4	34.8
PN2	35.1
1/4	35.1
1/2	35.2
3/4	35.2
PN3	35.3

*Profile taken from Bottom of Deck

UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
1/4	35.3
1/2	35.3
3/4	35.4
PN4	35.4
1/4	35.3
1/2	35.1
3/4	34.9
PN5	34.8
1/4	33.6
1/2	32.5
3/4	31.1
PN6	29.9
1/4	28.6
1/2	27.4
3/4	19.2
A2	11.0

CHANNEL CROSS SECTION
UPSTREAM FASCIA
(LOOKING DOWNSTREAM)

Note:

Footing elevation for reference.

LEGEND

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

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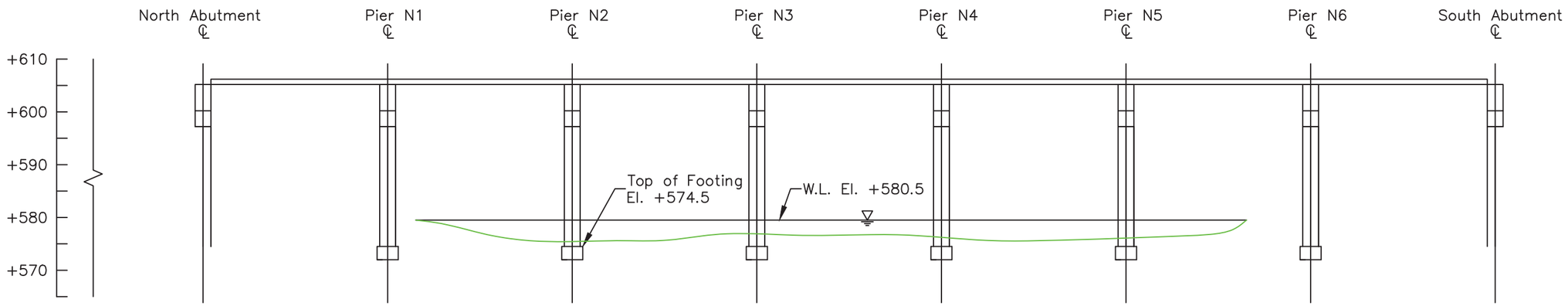

STRUCTURE CENTERLINE
CHANNEL CROSS SECTION
(LOOKING DOWNSTREAM)

Note:

Footing elevation for reference.

LEGEND

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

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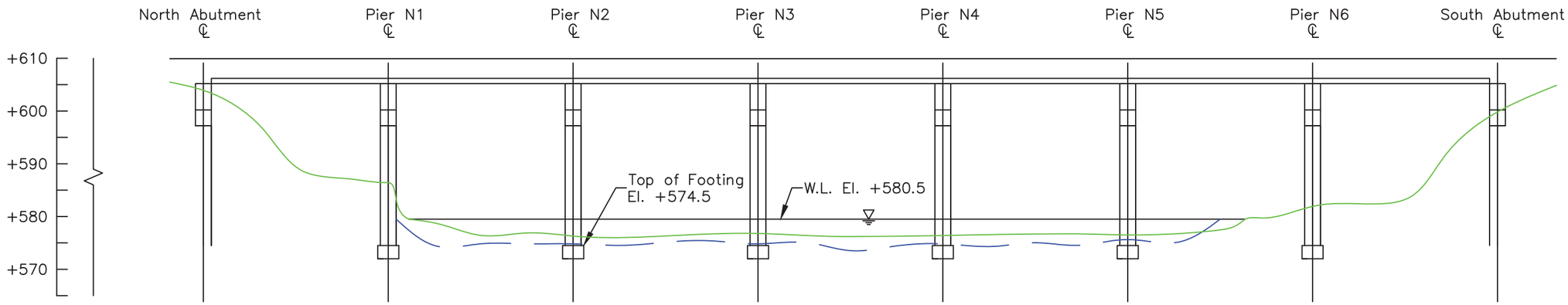

DOWNSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	7.0
1/4	14.6
1/2	22.2
3/4	23.8
PN1	24.5
1/4	29.0
1/2	33.5
3/4	33.9
PN2	34.3
1/4	34.3
1/2	34.4
3/4	34.5
PN3	34.6

*Profile taken from Bottom of Deck

DOWNSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
1/4	34.6
1/2	34.6
3/4	34.7
PN4	34.7
1/4	34.5
1/2	34.4
3/4	34.3
PN5	34.2
1/4	33.8
1/2	33.4
3/4	31.2
PN6	29.0
1/4	28.5
1/2	28.0
3/4	19.6
A2	11.1

CHANNEL CROSS SECTION
DOWNSTREAM FASCIA
(LOOKING DOWNSTREAM)

Note:

Footing elevation for reference.

LEGEND

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

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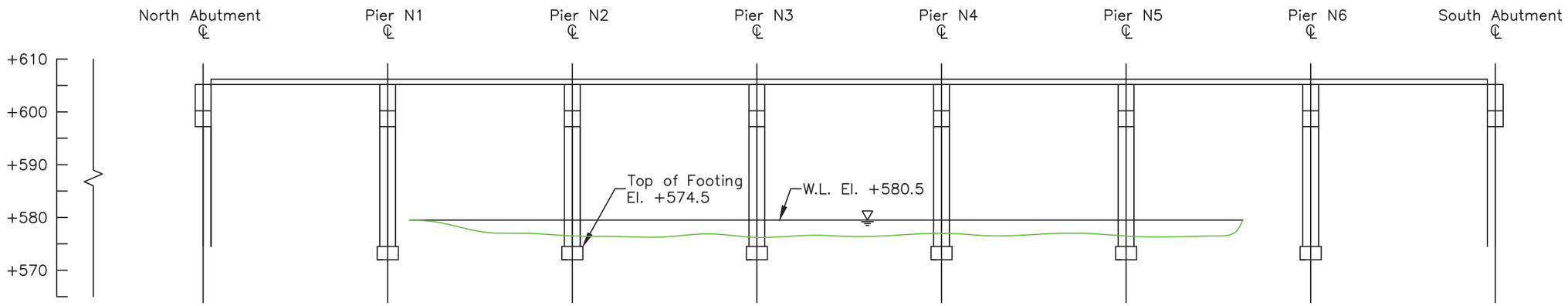

CHANNEL CROSS SECTION
50FT DOWNSTREAM
(LOOKING DOWNSTREAM)

Note:

Footing elevation for reference.

LEGEND

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

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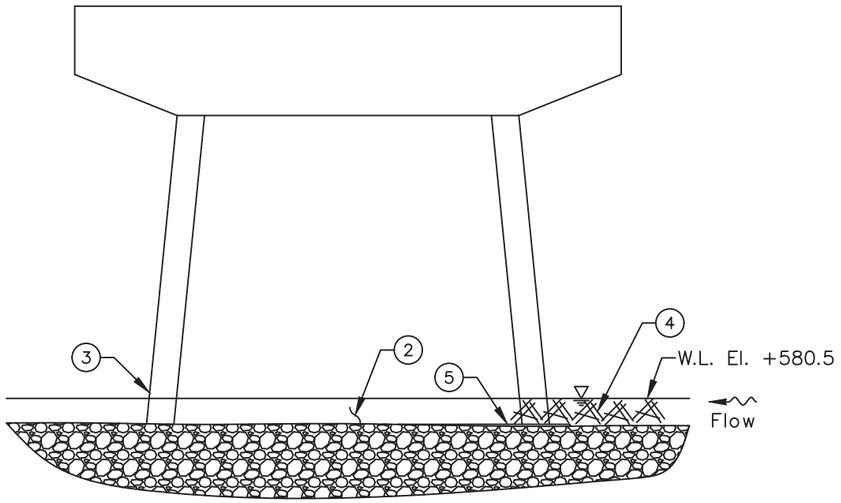
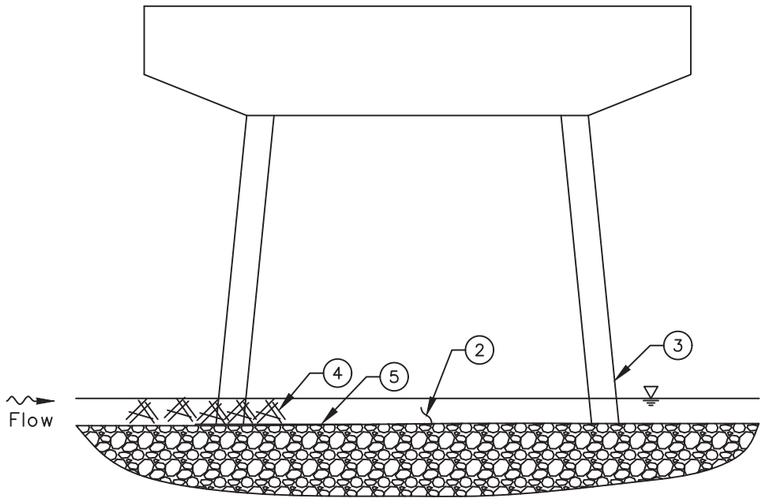
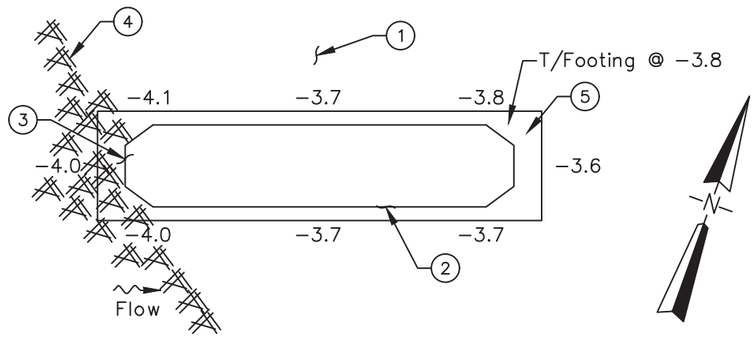


NORTH ELEVATION
(LOOKING SOUTH



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of cobbles and riprap up to 12 in. diameter with no probe rod penetration.
2. The submerged portions of the pier exhibited light scaling up to 1/16 in. from the channel bottom to 8 ft above the waterline.
3. The steel ice–breakers exhibited light surface corrosion with rust nodules up to 2 in diameter and pitting up to 1/32 in. diameter from the channel bottom to 8 ft above the waterline.
4. Moderate accumulation of timber debris, consisting of logs up to 36 in. diameter, extending up to 5 ft upstream of the upstream nose and 10 ft off both faces, and extending from the channel bottom to the waterline.
5. Top of footing was exposed at 3.8 ft below the waterline around the entire perimeter with a maximum vertical exposure of 0.3 ft on the northwest corner.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – July 2015
	Timber Debris
	Water Surface

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I-475 NB OVER MAUMEE RIVER
STRUCTURE NO. WOO-475-0386R
PIER N2
WOOD COUNTY, OHIO

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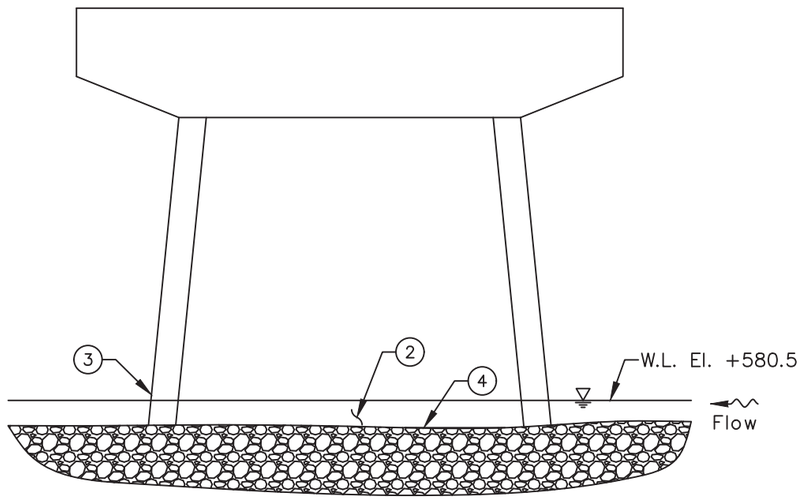
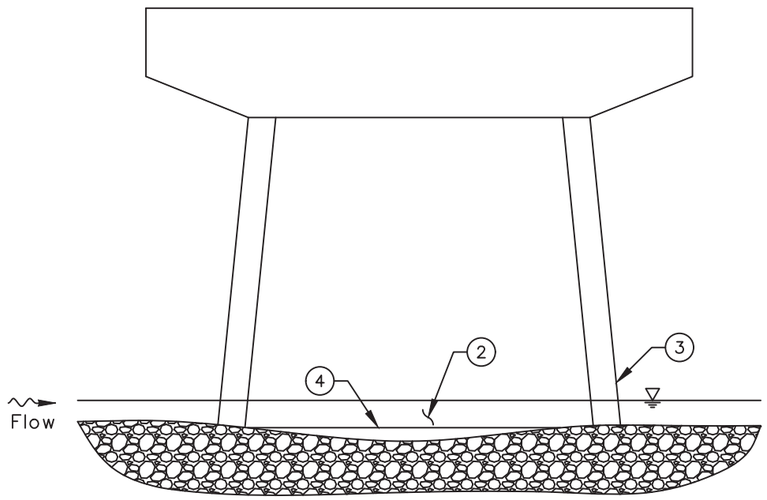
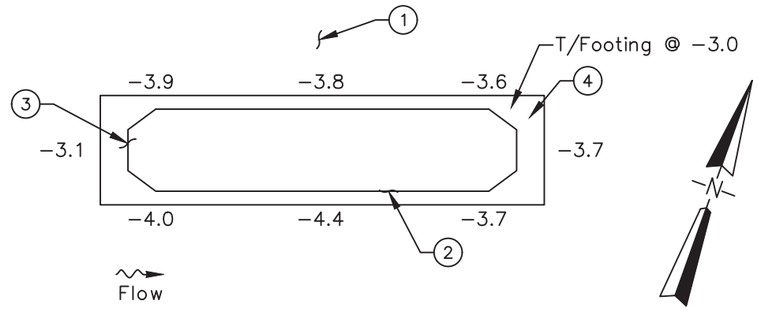


NORTH ELEVATION
(LOOKING SOUTH



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of cobbles and riprap up to 12 in diameter with no probe rod penetration.

(2) The submerged portions of the pier exhibited light scaling up to 1/16 in. from the channel bottom to 8 ft above the waterline.

(3) The steel ice−breakers exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. diameter from the channel bottom to 8 ft above the waterline.

(4) Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.4 ft at the midpoint along the south face.

LEGEND

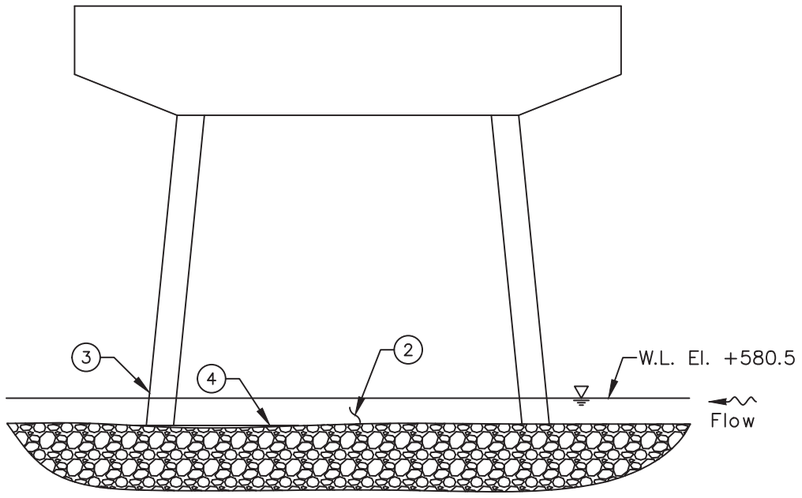
−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom − July 2015
	Timber Debris
	Water Surface

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

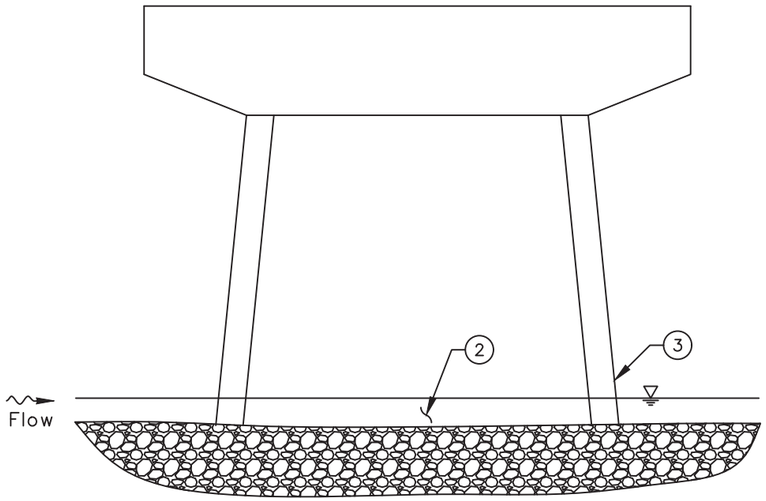
Ohio Department of Transportation, District 2
317 East Poe Rd.
Bowling Green, OH 45601
Phone: 419-353-8131

I-475 NB OVER MAUMEE RIVER
STRUCTURE NO. WOO-475-0386R
PIER N3
WOOD COUNTY, OHIO

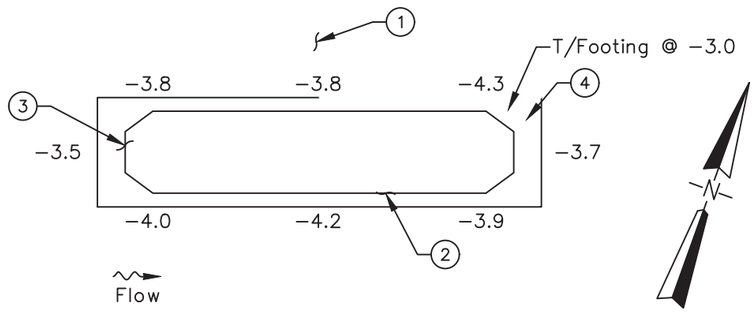
CEI PROJECT 55−12239.00
INSPECTED BY: MOR
DRAWN BY: BLV
CHECKED BY: JMJ
DATE: APR 2020
SHEET NO: 9



NORTH ELEVATION
(LOOKING SOUTH



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of cobbles and riprap up to 12 in. diameter with no probe rod penetration.

(2) The submerged portions of the pier exhibited light scaling up to 1/16 in. from the channel bottom to 8 ft above the waterline.

(3) The steel ice–breakers exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. diameter from the channel bottom to 8 ft above the waterline.

(4) Top of footing was exposed at 3.0 ft below the waterline around the entire perimeter with a maximum vertical exposure of 1.3 ft on the northeast corner.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – July 2015
	Timber Debris
	Water Surface

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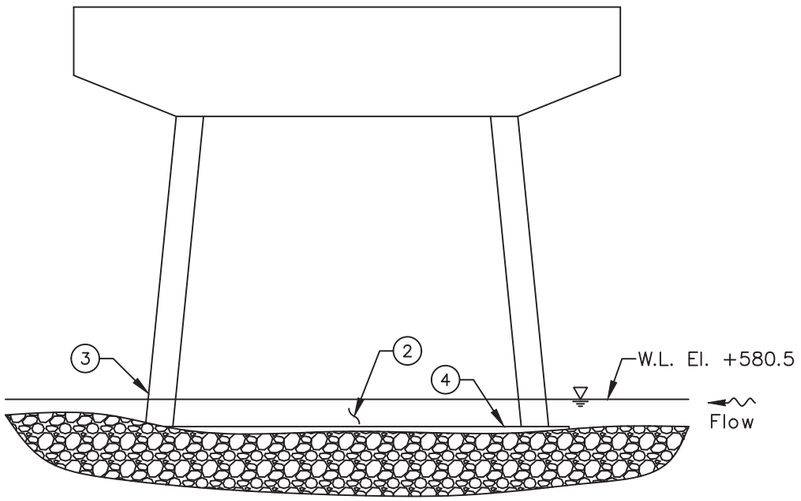
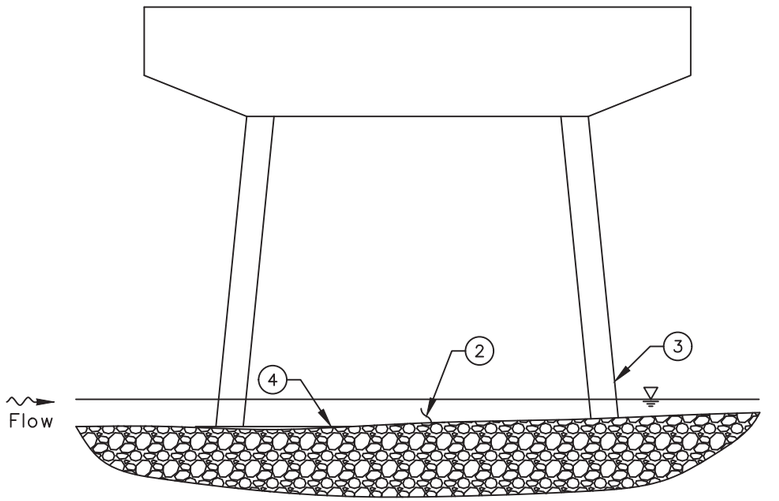
Bowling Green, OH 45601
Phone: 419-353-8131

I-475 NB OVER MAUMEE RIVER
STRUCTURE NO. WOO-475-0386R
PIER N4
WOOD COUNTY, OHIO

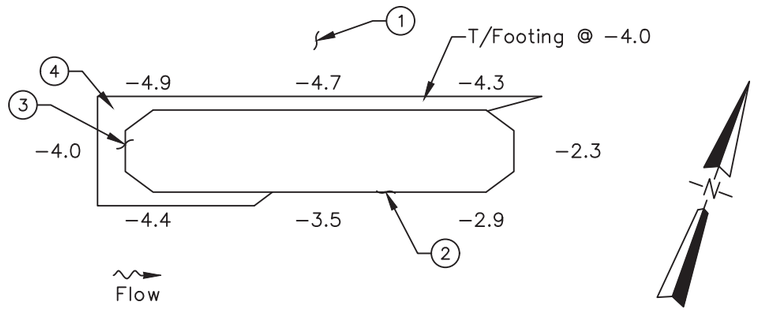
CEI PROJECT	55–12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	APR 2020
SHEET NO:	10



NORTH ELEVATION
(LOOKING SOUTH



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of cobbles and riprap up to 12 in. diameter with no probe rod penetration.
2. The submerged portions of the pier exhibited light scaling up to 1/16 in. from the channel bottom to 8 ft above the waterline.
3. The steel ice–breakers exhibited light surface corrosion with rust nodules up to 2 in. diameter and pitting up to 1/32 in. diameter from the channel bottom to 8 ft above the waterline.
4. Top of footing was exposed at 4.0 ft below the waterline from the midpoint of the south face around the upstream nose ending at the northeast corner with a maximum vertical exposure of 0.9 ft on the northwest corner.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – July 2015
	Timber Debris
	Water Surface

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Bowling Green, OH 45601
Phone: 419-353-8131

I-475 NB OVER MAUMEE RIVER
STRUCTURE NO. WOO-475-0386R
PIER N5
WOOD COUNTY, OHIO

CEI PROJECT 55–12239.00
INSPECTED BY: MOR
DRAWN BY: BLV
CHECKED BY: JMJ
DATE: APR 2020
SHEET NO: 11

EXHIBIT 2 – INSPECTION PHOTOGRAPHS

Photograph No. 1: Overall View of Structure No. 8706786 (WOO-475-0386R), Looking Southwest.

Photograph No. 2: Overall View of Structure No. 8706786 (WOO-475-0386R), Looking Southeast.

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

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

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

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

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

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

Photograph No. 9: View of the North Face of Pier 2, Looking Southeast.

Photograph No. 10: View of the South Face of Pier 2, Looking Northwest.

Photograph No. 11: View of the North Face of Pier 3, Looking Southeast.

Photograph No. 12: View of the South Face of Pier 3, Looking Northwest.

Photograph No. 13: View of the North Face of Pier 4, Looking Southeast.

Photograph No. 14: View of the South Face of Pier 4, Looking Northwest.

Photograph No. 15: View of the North Face of Pier 5, Looking Southeast.

Photograph No. 16: View of the South Face of Pier 5, Looking Northwest.

Photograph No. 17: View of the Typical Concrete and Steel Condition at the Waterline, Looking East.

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: 8706786 Bridge Number (County-Route-SLM-SD): WOO-475-0386R

Superstructure Type Main Span Type: STEEL GIRDER

Approach Span: REINFORCED CONCRETE

Substructure Type Abutment Type: REINFORCED CONCRETE

Pier Type: REINFORCED CONCRETE

Total Pier Count: 6

Total Pier Count in water: 4

Foundations: UNKNOWN

Feature Intersected MAUMEE RIVER

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,

_X__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 – 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 / N	Anticipated current	__1.5_ ft
If Yes, waterway river point	__N/A__	Scour Critical (item 113):	___5_____
Anticipated water visibility depth	__1___ ft	POA in place:	Y/N
Anticipated Dive depth	__5.2___ ft	Scour Monitoring devices present:	Y/N

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	4	100% LEVEL I 10% LEVEL II
Abutment	N/A	
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

__X_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

_X__Surface Supplied with communication

b. The channel bottom should be sounded utilizing

__X_Digital fathometer

__X_Telescoping survey rod

____ acoustic imaging

c. During the inspection, the divers should work from

__X_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.)

_Canoe launch 50 ft upstream on the north embankment___

e. The maximum depth of the channel is typically measured_40__ feet from UPSTREAM NOSE OF PIER 2

Reference Datum: 9.5 ft below the gauge painted on the North Face of Pier 5

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, INC Date: 9/25/2020

Updated By: _____ Date: _____

Updated By: _____ Date: _____

Updated By: _____ Date: _____

Updated By: _____ Date: _____

Updated By: _____ Date: _____

VIII. Other Narrative Not Included In Previous Sections