UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 4805917 (LUC-65-0535)
SR 65 OVER MAUMEE RIVER
LUCAS COUNTY, OH
DISTRICT 2

May 2020

10/9/2020

Prepared for:

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

Prepared by:

COLLINS ENGINEERS INC.

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Lexington, Kentucky 40511

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Project: ODOT District 2 Underwater Bridge Inspections - 2020

Purpose of Project: To perform a detailed visual and tactile underwater investigation of scour critical 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.

Inspection Date(s): May 12, 2020

Water Visibility:	1 ft	***Water Velocity:***	1 ft/s
Water Temperature:	55 °F	***Weather:***	Clear – 50 °F
Waterline Elevation:	572.8 ft	***Type of Boat:***	23 ft Carolina Skiff
Coordinates:	41.6597965°N, -83.5114504°W		
Access Location:	Walbridge Park Boat Ramp		
Dive Mode:	Surface Supplied Air		
Waterline Reference:	13.9 ft below the top of footing at the upstream nose of Pier 2.		
Maximum Depth at SSU:	37.0 ft – Upstream North Corner of Pier 4		
Shoreline Conditions:	The north and south shorelines consisted of sparsely vegetated, well-protected, moderate slopes with no signs of erosion.		

Summary of Findings:

- **Pier 1:**
  - The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration.
  - The submerged portions of the pier were sound and smooth with no defects observed.
- **Pier 2:**
  - The channel bottom material consisted of sand, silt, and cobbles with approximately 6 in. probe rod penetration.
  - The submerged portions of the pier exhibited heavy scaling up to 1/2 in. deep from the channel bottom to the waterline.
- **Pier 3:**
  - The channel bottom material consisted of sand with silt overlay with 6 to 8 in. of probe rod penetration with scattered cobbles.
  - Scattered spalls were observed on seal concrete measuring up to 1 ft diameter.
  - The submerged portions of the pier exhibited moderate scaling up to 1/4 in.
- **Bascule Pier 4:**
  - The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration.
  - The submerged portions of the pier were sound and smooth with no defects observed.

- A band of moderate scaling was observed from -10 ft to -2 ft below the waterline up to 1/4 in. deep.

- **Bascule Pier 5:**
  - The channel bottom material consisted of scattered riprap up to 12 in. diameter with silt infill with up to 6 in. probe rod penetration.
  - A band of moderate scaling was observed from -10 ft to -2 ft below the waterline up to 1/4 in. deep.
- **Pier 6:**
  - The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration.
  - The submerged portions of the pier were sound and smooth with no defects observed.

Summary of Recommendations:

- Repair spalls on Pier 3.
- Monitor scaling on Piers 2 through 5.

Underwater Inspection Coding:

NBI Ratings:

Item	Description	Coding	Condition
60	Substructure	6 – Satisfactory Condition	Spall, Heavy Concrete Scaling
61	Channel	5 – Fair Condition	Timber Debris Accumulation
62	Culvert	N/A	
92B	UW Insp. Frequency	60 Months	
93B	Insp. Date	05 12 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	780	0	780	0	0
220	Reinforced Concrete Pile Cap / Footing	LF	500	500	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 SR 65 Bridge over Maumee River in Lucas County, OH. Collins Engineers, Inc. (Collins) conducted the underwater investigation for District 2 of the Ohio Department of Transportation (ODOT) on May 12, 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. 4805917 (LUC-65-0535) spans 1552 ft, carrying SR 65 over Maumee River and is approximately 140 ft wide. The bridge superstructure is constructed of 10 steel girder and twin leaf bascule spans. The roadway orientation of the longitudinal axis of the bridge is south to north. The substructure units are labeled as Abutments 1 and 2, Piers 1, 2, 3, and 6, and Bascule Piers 4 and 5. 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 two engineer divers (Matthew Rogers, E.I.T. and 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 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 Piers 1 through 6 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 4805917 (LUC-65-0535) was located approximately 13.9 ft below the top of footing at the upstream nose of Pier 2, which corresponds to a waterline elevation of 572.8 ft. During the inspection, the waterway was flowing at approximately 1 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 sparsely vegetated, well-protected, moderate slopes with no signs of 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 1

The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration. The submerged portions of the pier were sound and smooth with no defects observed. Refer to Figure 6 in Exhibit 1 for detailed inspection notes of Pier 1. Refer to Photograph 9 in Exhibit 2 for views of Pier 1.

2.2.2 Pier 2

The channel bottom material consisted of sand, silt, and cobbles with approximately 6 in. probe rod penetration. The submerged portions of the pier exhibited heavy scaling up to 1/2 in. deep from the channel bottom to the waterline. Refer to Figure 7 in Exhibit 1 for detailed inspection notes of Pier 2. Refer to Photographs 10 and 11 in Exhibit 2 for views of Pier 2.

2.2.3 Pier 3

The channel bottom material consisted of sand with silt overlay with 6 to 8 in. of probe rod penetration with scattered cobbles. Scattered spalls were observed on seal concrete measuring up to 1 ft diameter. The submerged portions of the pier exhibited moderate scaling up to 1/4 in. Refer to Figure 8 in Exhibit 1 for detailed inspection notes of Pier 3. Refer to Photographs 12 and 13 in Exhibit 2 for views of Pier 3.

2.2.4 Bascule Pier 4

The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration. The submerged portions of the pier were sound and smooth with no defects observed. A band of moderate scaling was observed from -10 ft to -2 ft below the waterline up to 1/4 in. deep. Refer to Figure 9 in Exhibit 1 for detailed inspection notes of Bascule Pier 4. Refer to Photographs 14 and 15 in Exhibit 2 for views of Bascule Pier 4.

2.2.5 Bascule Pier 5

The channel bottom material consisted of scattered riprap up to 12 in. diameter with silt infill with up to 6 in. probe rod penetration. A band of moderate scaling was observed from -10 ft to -2 ft below the waterline up to 1/4 in. deep. Refer to Figure 10 in Exhibit 1 for detailed inspection notes of Bascule Pier 5. Refer to Photographs 16 through 19 in Exhibit 2 for views of Bascule Pier 5, typical concrete condition at the waterline, and typical fender condition at the waterline.

2.2.6 Pier 6

The channel bottom material consisted of sand, gravel, and cobbles with approximately 2 in. probe rod penetration. The submerged portions of the pier were sound and smooth with no defects observed. Refer to Figure 11 in Exhibit 1 for detailed inspection notes of Pier 6.

3.0 EVALUATION AND RECOMMENDATIONS

Overall, the inspected substructure units of Structure No. 4805917 (LUC-65-0535) were in satisfactory condition. A comparison of the soundings recorded during the previous inspection on June 25, 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 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 spalls at Pier 3 are not structural concerns at this time; however, they should be repaired to prevent further deterioration. The repairs should include removal of unsound concrete to a minimum of 1 in. behind the reinforcing steel, cleaning and replacing reinforcing steel as required, and placing concrete designed to provide high durability with low permeability.

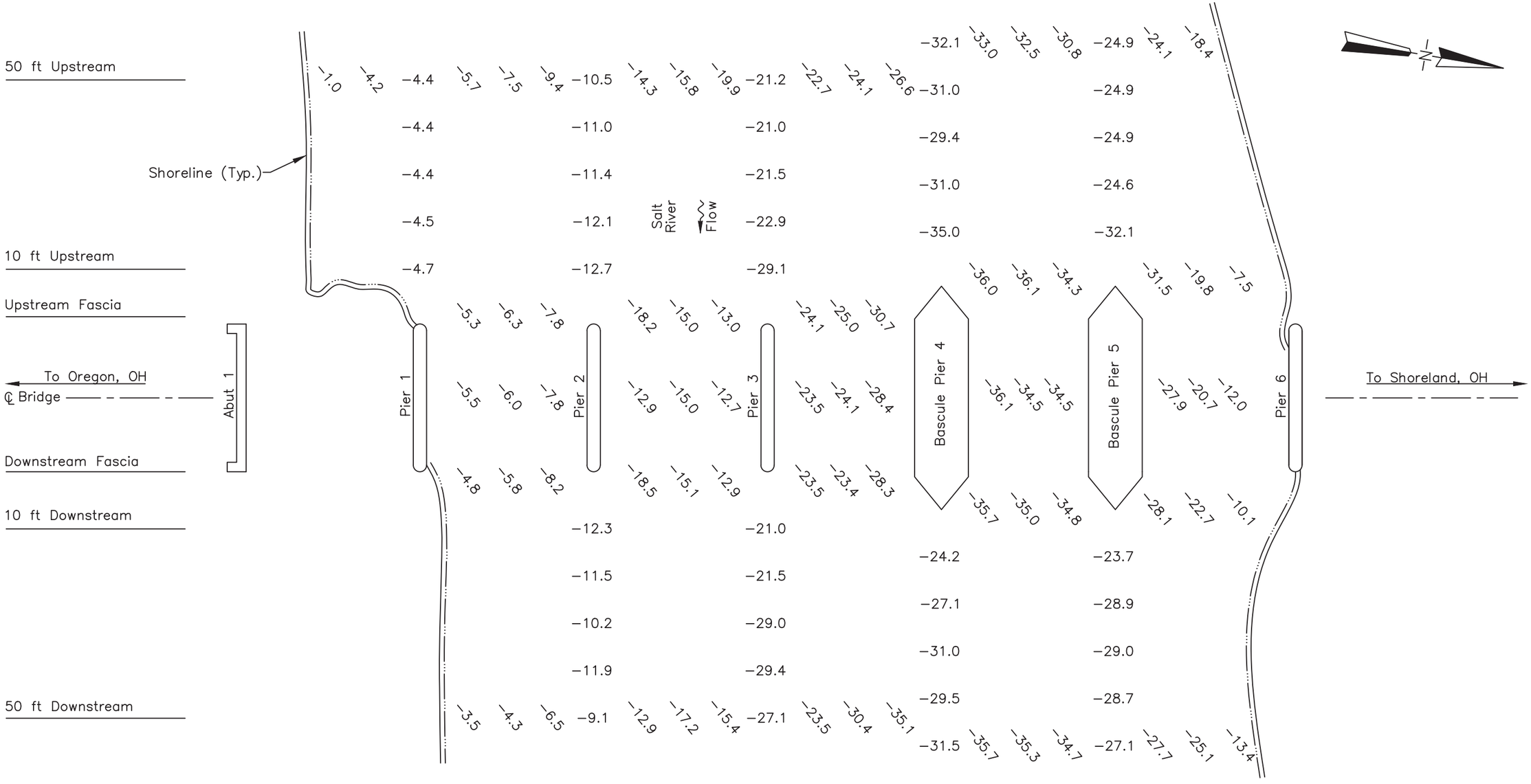
It is recommended that the submerged substructure units of Structure No. 4805917 (LUC-65-0535) be next inspected underwater at an interval not to exceed 60 months, no later than May 12, 2025.

Respectfully Submitted,
COLLINS ENGINEERS, INC.

Joshua Johnson, P.E.
Project Manager

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

EXHIBIT 1 – FIGURES



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater. Substructure units are labeled according to available record drawings.
2. At the time of inspection on May 12, 2020, the waterline was located approximately 13.9 ft below Top of Footing at upstream nose of Pier 2 (EL. +558.9 ft). This corresponds with a waterline elevation of +572.8 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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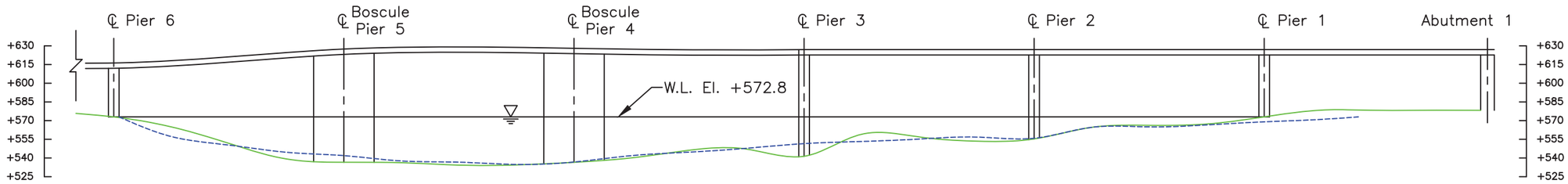
SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
SOUNDING PLAN
LUCAS COUNTY, OHIO

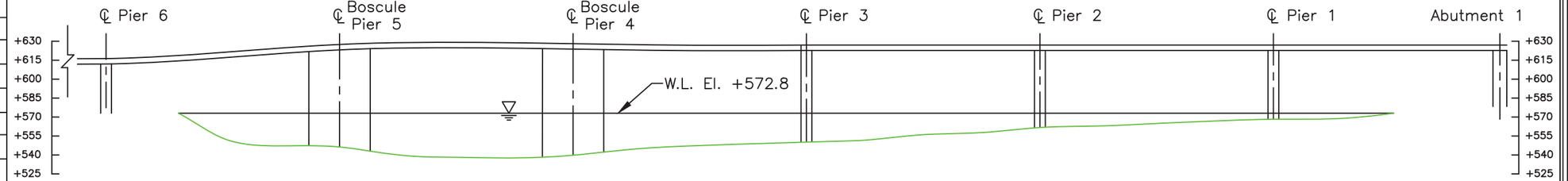
CEI PROJECT 55–12239.00
INSPECTED BY: MOR
DRAWN BY: BLV
CHECKED BY: JMJ
DATE: MAY 2020
SHEET NO: 2



CHANNEL CROSS SECTION
UPSTREAM FASCIA
(LOOKING DOWNSTREAM)

UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	37.0
1/4	41.5
1/2	42.1
3/4	47.8
P1	47.7
1/4	53.3
1/2	54.6
3/4	56.4
P2	65.4
1/4	67.3
1/2	74.4
3/4	72.6
P3	79.4
1/4	74.2
1/2	75.3
3/4	81.3
P4	84.8
1/4	86.8
1/2	86.9
3/4	85.1
P5	84.8
1/4	79.8
1/2	66.1
3/4	48.5
P6	40.4

*Profile taken from top of deck



CHANNEL CROSS SECTION
50 FT UPSTREAM
(LOOKING DOWNSTREAM)

LEGEND

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

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SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
CROSS SECTIONS - UPSTREAM
LUCAS COUNTY, OHIO

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INSPECTED BY: MOR
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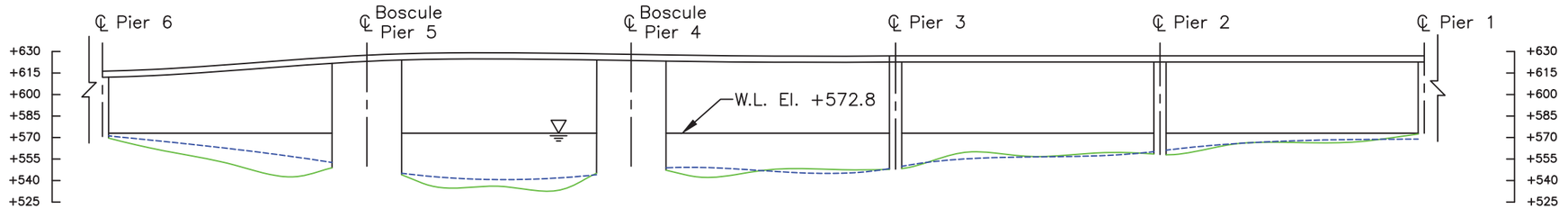
DATE: MAY 2020
SHEET NO: 3



CHANNEL CROSS SECTION
STRUCTURE CENTERLINE
(LOOKING DOWNSTREAM)

Note:

Footing elevations unknown due to unavailable record drawings.

LEGEND

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

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CROSS SECTIONS - CENTERLINE
LUCAS COUNTY, OHIO

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DATE:	MAY 2020
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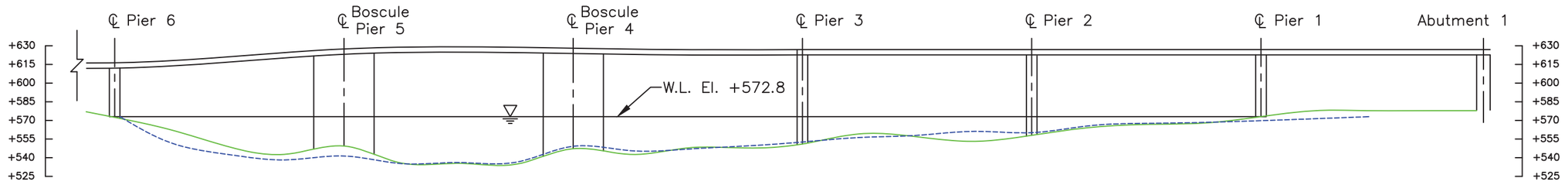
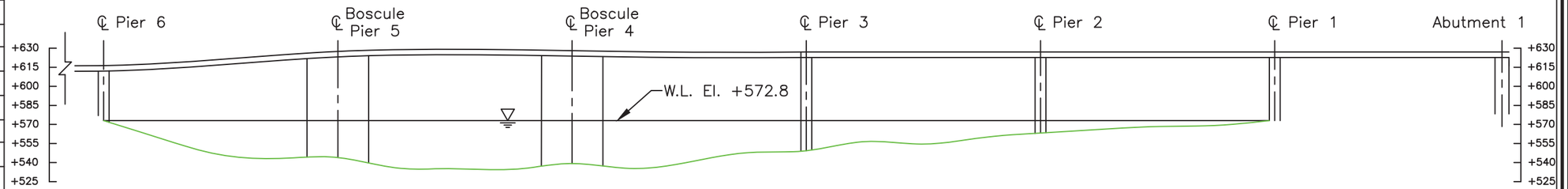


CHANNEL CROSS SECTION
DOWNSTREAM FASCIA
(LOOKING DOWNSTREAM)

DOWNSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	37.9
1/4	39.0
1/2	35.7
3/4	44.6
P1	47.7
1/4	52.8
1/2	54.1
3/4	56.8
P2	62.9
1/4	62.5
1/2	64.5
3/4	67.6
P3	70.4
1/4	73.6
1/2	73.7
3/4	78.9
P4	74.8
1/4	86.5
1/2	85.8
3/4	85.6
P5	72.8
1/4	76.4
1/2	69.0
3/4	50.8
P6	39.8

*Profile taken from top of deck



CHANNEL CROSS SECTION
50 FT DOWNSTREAM
(LOOKING DOWNSTREAM)

LEGEND

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

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SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
CROSS SECTIONS - DOWNSTREAM
LUCAS COUNTY, OHIO

CEI PROJECT	55–12239.00
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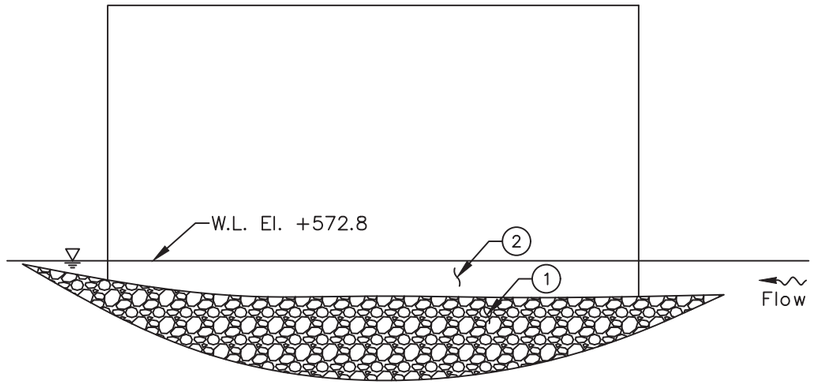
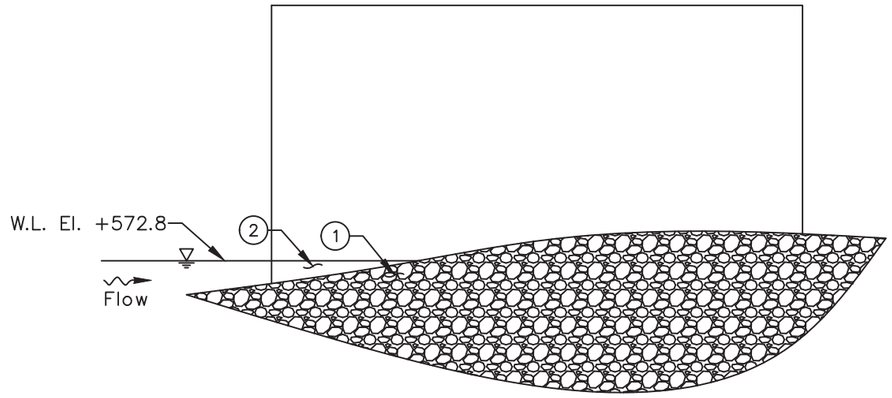
SHEET NO:	5



NORTH ELEVATION
(LOOKING SOUTH)



SOUTH ELEVATION
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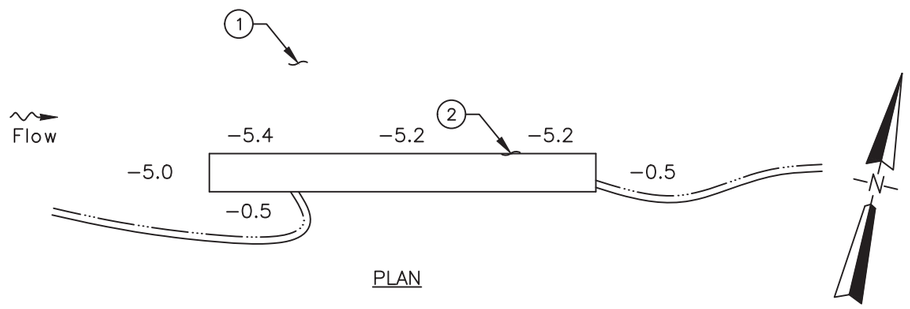

PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of sand, gravel and cobbles with approximately 2 in probe rod penetration.
2. The submerged portions of the pier were sound and smooth with no defects observed.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – May 2020
	Timber Debris
	Water Surface

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SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
PIER 1
LUCAS COUNTY, OHIO

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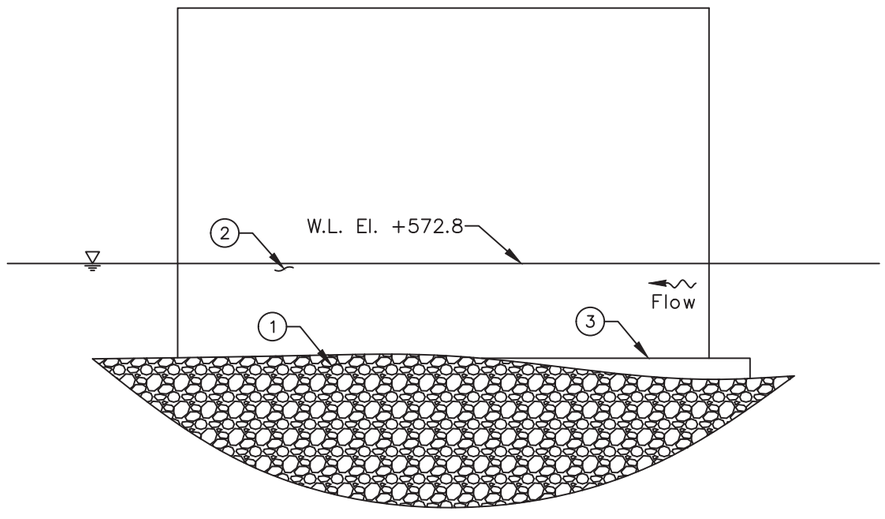
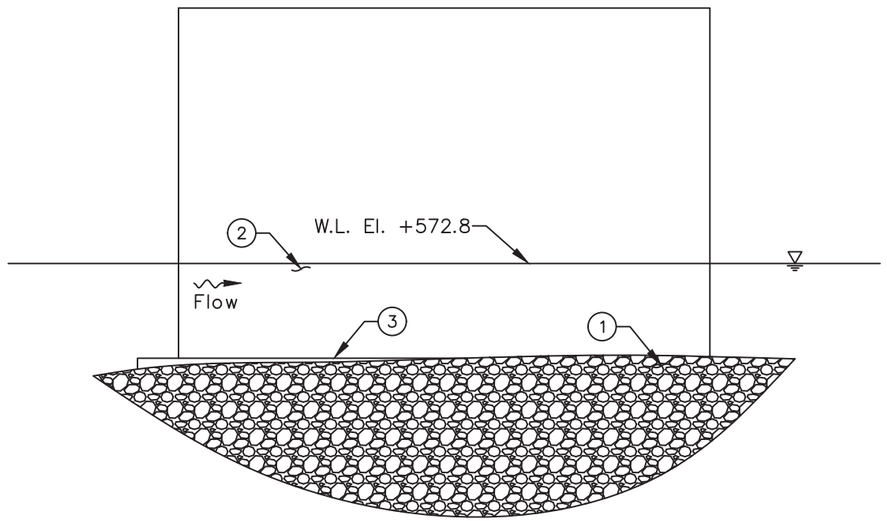
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	6



NORTH ELEVATION
(LOOKING SOUTH)



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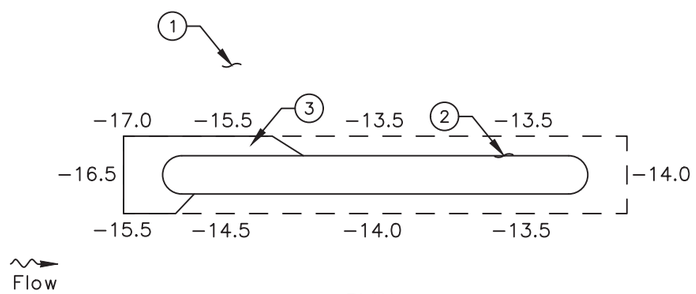
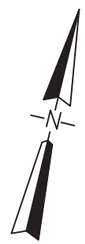
(LOOKING NORTH)



PLAN



INSPECTION NOTES:

1. The channel bottom material consisted of sand, gravel and cobbles with approximately 2 in. probe rod penetration.
2. The submerged portions of the pier exhibited heavy scaling up to 1/2 in. deep from the channel bottom to the waterline.
3. The top of footing was exposed along the upstream nose to the upstream 1/4 point of the north face at −13.9 ft (EL. +558.9 ft) with a maximum vertical exposure of 3.1 ft at the northwest corner.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – May 2020
	Timber Debris
	Water Surface

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PIER 2
LUCAS COUNTY, OHIO

CEI PROJECT
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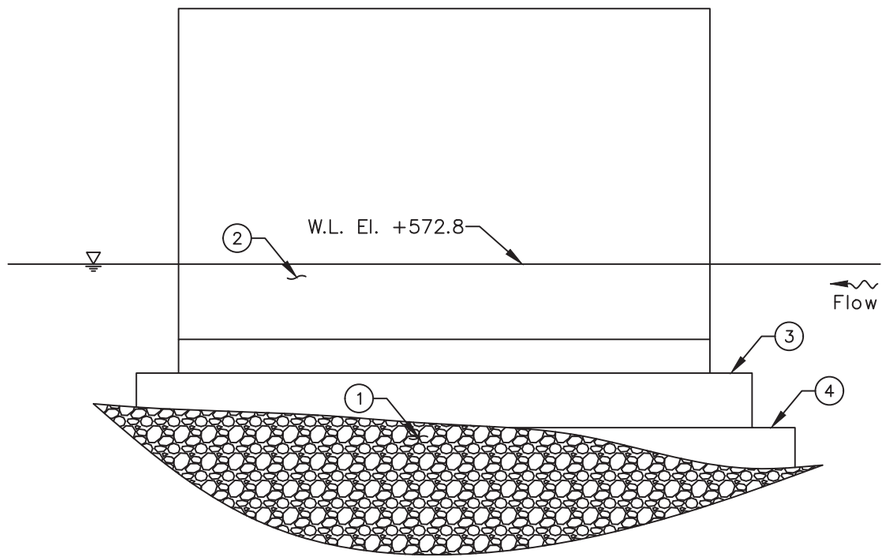
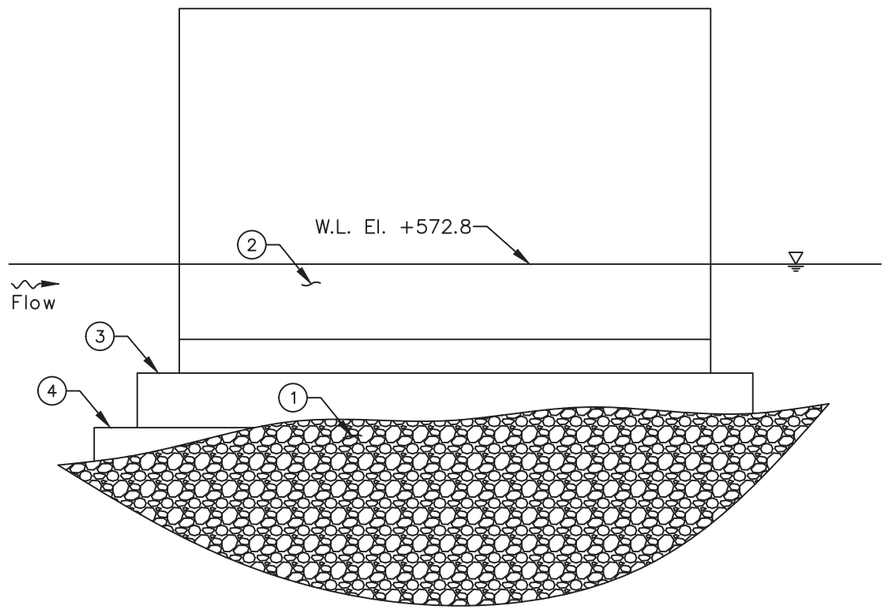
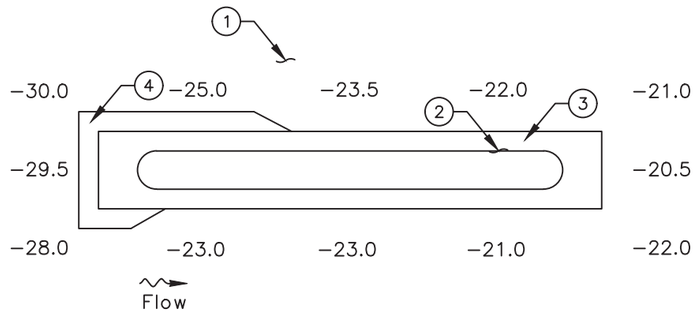


NORTH ELEVATION
(LOOKING SOUTH)



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of sand and scattered cobbles with silt overlay with up to 8 in. probe rod penetration.

(2) The submerged portions of the pier exhibited moderate scaling up to 1/4 in. deep extending from the top of footing to the waterline.

(3) The top of footing was located at −16.0 ft (EL. +556.8 ft) and was exposed around the entire pier. The footing concrete was observed to be smooth and sound with no defect noted.

(4) The top of seal was located at −24.0 ft (EL. +548.8 ft) and was exposed from the southwest corner around the upstream nose along the north face to approximately the midpoint of the pier with a maximum vertical exposure of 6.0 ft at the northwest corner. The seal concrete exhibited scattered spalls measuring approximately 1 ft diameter by 2 in. deep with no exposed steel reinforcement.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – May 2020
	Timber Debris
	Water Surface

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PIER 3
LUCAS COUNTY, OHIO

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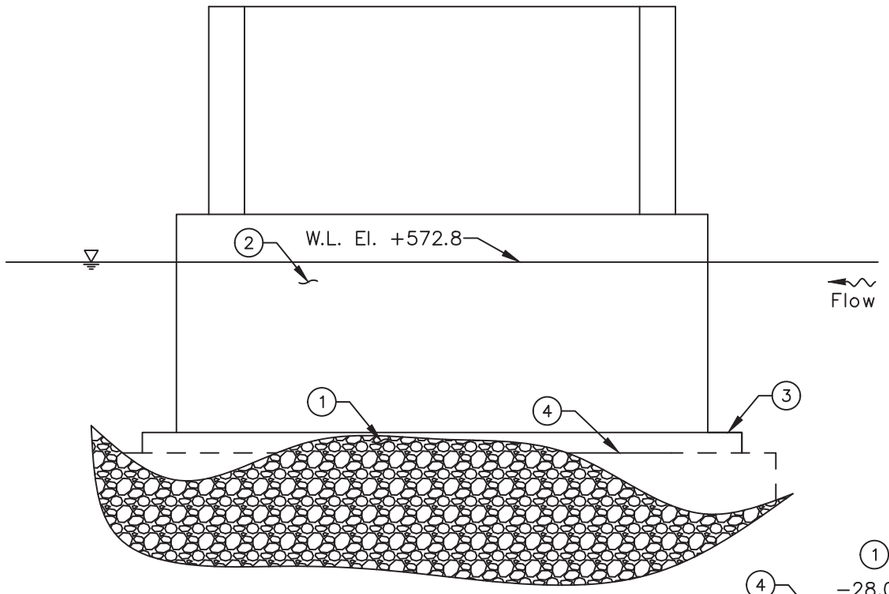
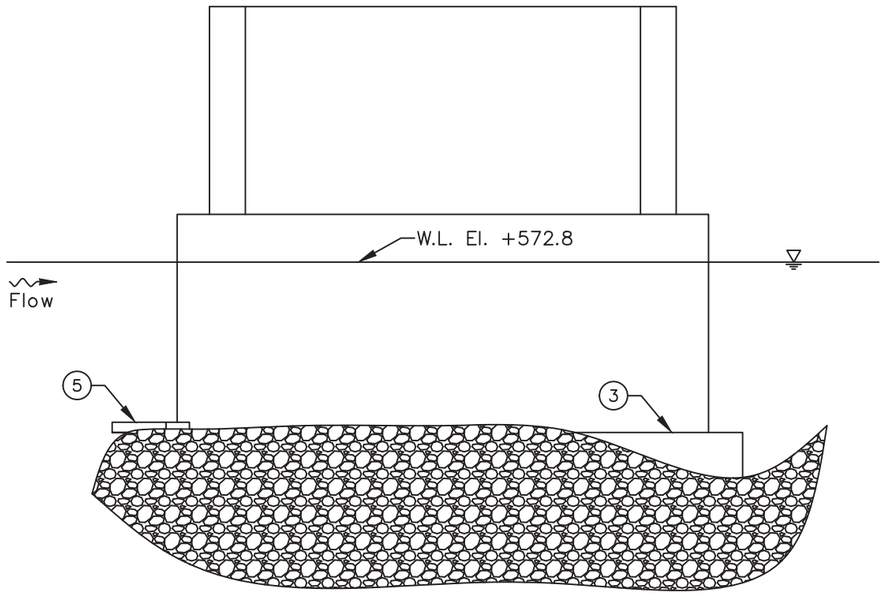
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	8



NORTH ELEVATION
(LOOKING SOUTH)



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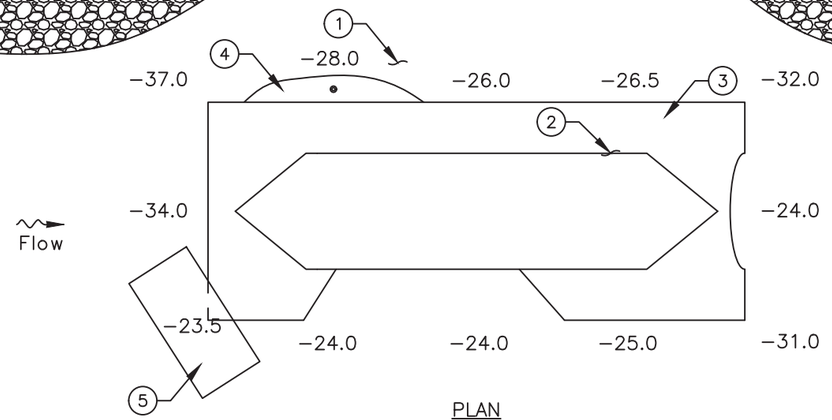
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of scattered rip−rap up to 12 in. diameter with silt infill with up to 6 in. probe rod penetration.

(2) The submerged portions of the pier exhibited moderate scaling up to 1/4 in. deep extending from −10 ft to −2 ft. Otherwise the submerged portions of the pier were observed to be smooth and sound with no defects noted.

(3) The top of footing was located at −25.0 ft (EL. +547.8 ft) and was exposed from the southeast corner along the downstream nose to the north face and upstream nose ending at approximately the upstream quarter point with a maximum vertical exposure of 12.0 ft at the northwest corner. The footing concrete was observed to be smooth and sound with no defect noted.

(4) The top of seal was located at −28.0 ft (EL. +544.8 ft) and was observed along the north face extending from 5 ft east of the upstream nose to approximately the mid−point of the pier.

(5) One concrete slab was observed leaning on the upstream nose at the southwest corner measuring approximately 10 ft wide by 20 ft long by 8 in. deep.

LEGEND

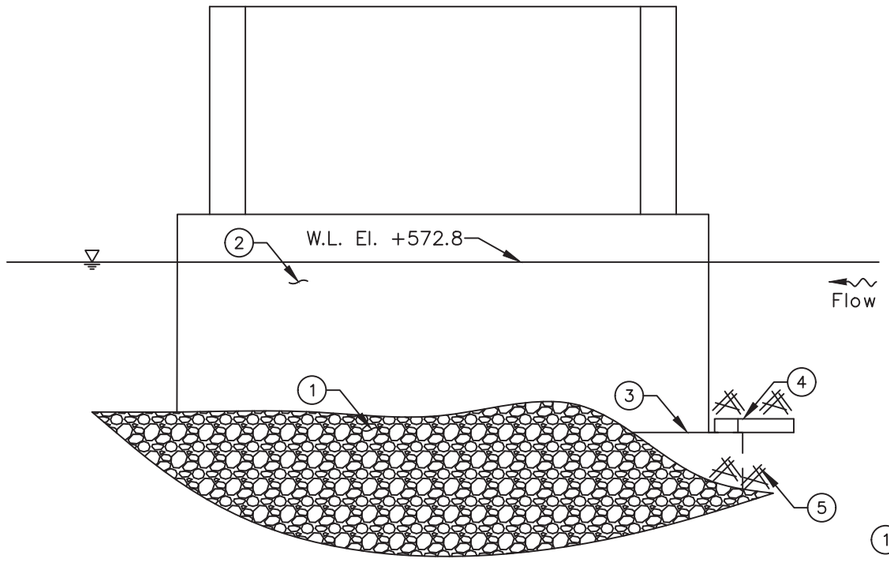
−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom − May 2020
	Timber Debris
	Water Surface

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

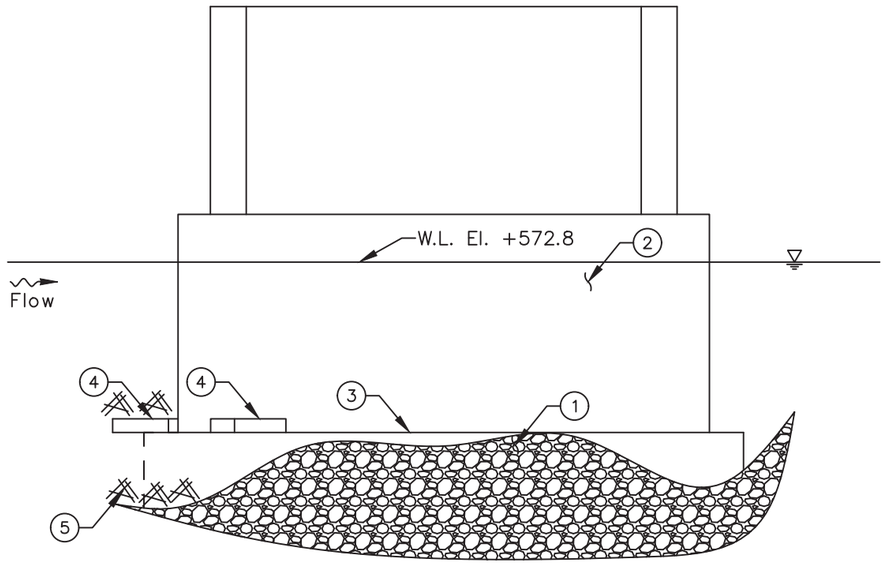
Ohio Department of Transportation, District 2
317 East Poe Rd.
Bowling Green, OH 45601
Phone: 419-353-8131

SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
PIER 4
LUCAS COUNTY, OHIO

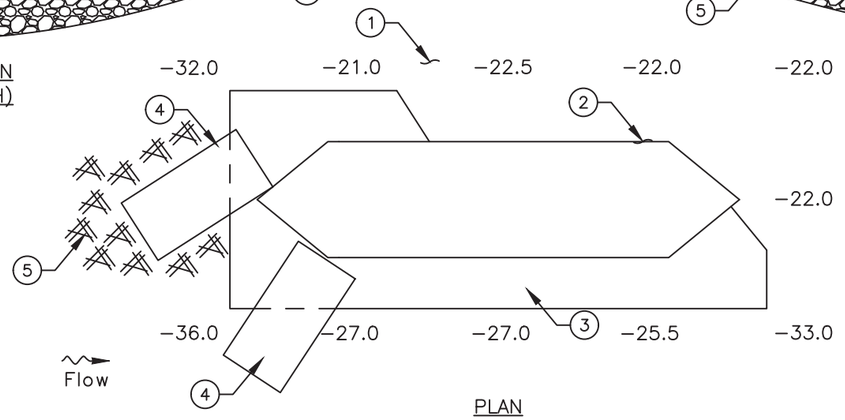
CEI PROJECT	55−12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	9



NORTH ELEVATION
(LOOKING SOUTH)



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of scattered rip−rap up to 12 in. diameter with silt infill with up to 6 in. probe rod penetration.

2. The submerged portions of the pier exhibited moderate scaling up to 1/4 in. deep extending from −10 ft to −2 ft. Otherwise the submerged portions of the pier were observed to be smooth and sound with no defects.

3. The top of footing was located at −25.0 ft (EL. +547.8 ft) and was exposed from the southeast corner along the south face and upstream nose ending at approximately the upstream quarter point with a maximum vertical exposure of 11.0 ft at the southwest corner. The footing concrete was observed to be smooth and sound with no defect noted.

4. Two concrete slabs were observed leaning on the upstream nose measuring approximately 10 ft wide by 20 ft long by 8 in. deep.

5. Moderate timber debris accumulation consisting of logs and branches up to 12 in. diameter were observed on the upstream nose along the channel bottom and caught on the concrete slabs.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom − May 2020
	Timber Debris
	Water Surface

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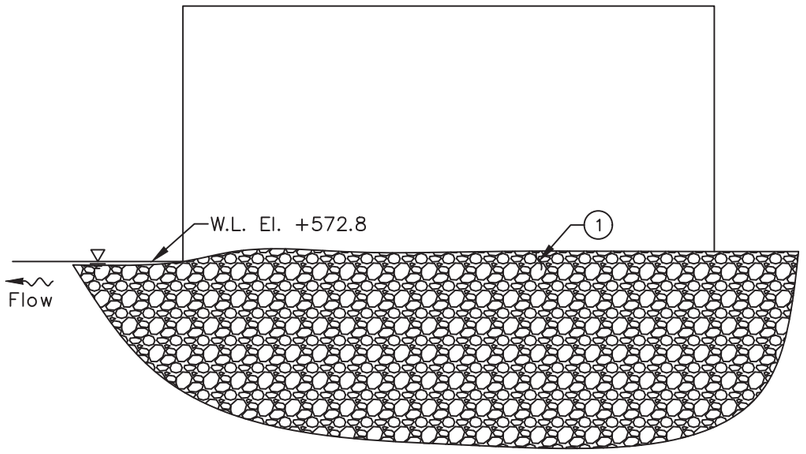
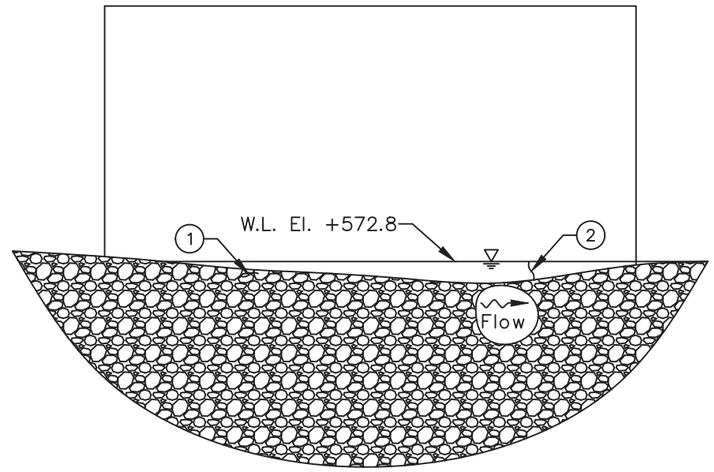
Bowling Green, OH 45601
Phone: 419-353-8131

SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
PIER 5
LUCAS COUNTY, OHIO

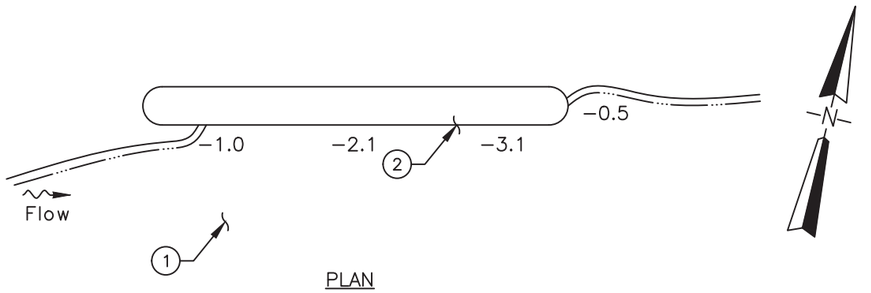
CEI PROJECT	55−12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	10



NORTH ELEVATION
(LOOKING SOUTH)



SOUTH ELEVATION
(LOOKING NORTH)



PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of sand, gravel and cobbles with approximately 2 in probe rod penetration.
2. The submerged portions of the pier were sound and smooth with no defects observed.

LEGEND

−2.7	Sounding Depth from Waterline (ft)
———	Approximate Channel Bottom – May 2020
	Timber Debris
	Water Surface

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317 East Poe Rd.
Bowling Green, OH 45601
Phone: 419-353-8131

SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917 (LUC-65-0535)
PIER 6
LUCAS COUNTY, OHIO

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

EXHIBIT 2 – INSPECTION PHOTOGRAPHS

Photograph No. 1: Overall View of Structure No. 4805917 (LUC-65-0535), Looking Northeast.

Photograph No. 2: Overall View of Structure No. 4805917 (LUC-65-0535), Looking South.

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

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

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

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

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

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

Photograph No. 9: View of the North Face of Pier 1, Looking East.

Photograph No. 10: View of the North Face of Pier 2, Looking Southeast.

Photograph No. 11: View of the South Face of Pier 2, Looking North.

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

Photograph No. 13: View of the South Face of Pier 3, Looking North.

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

Photograph No. 15: View of the South Face of Bascule Pier 4, Looking North.

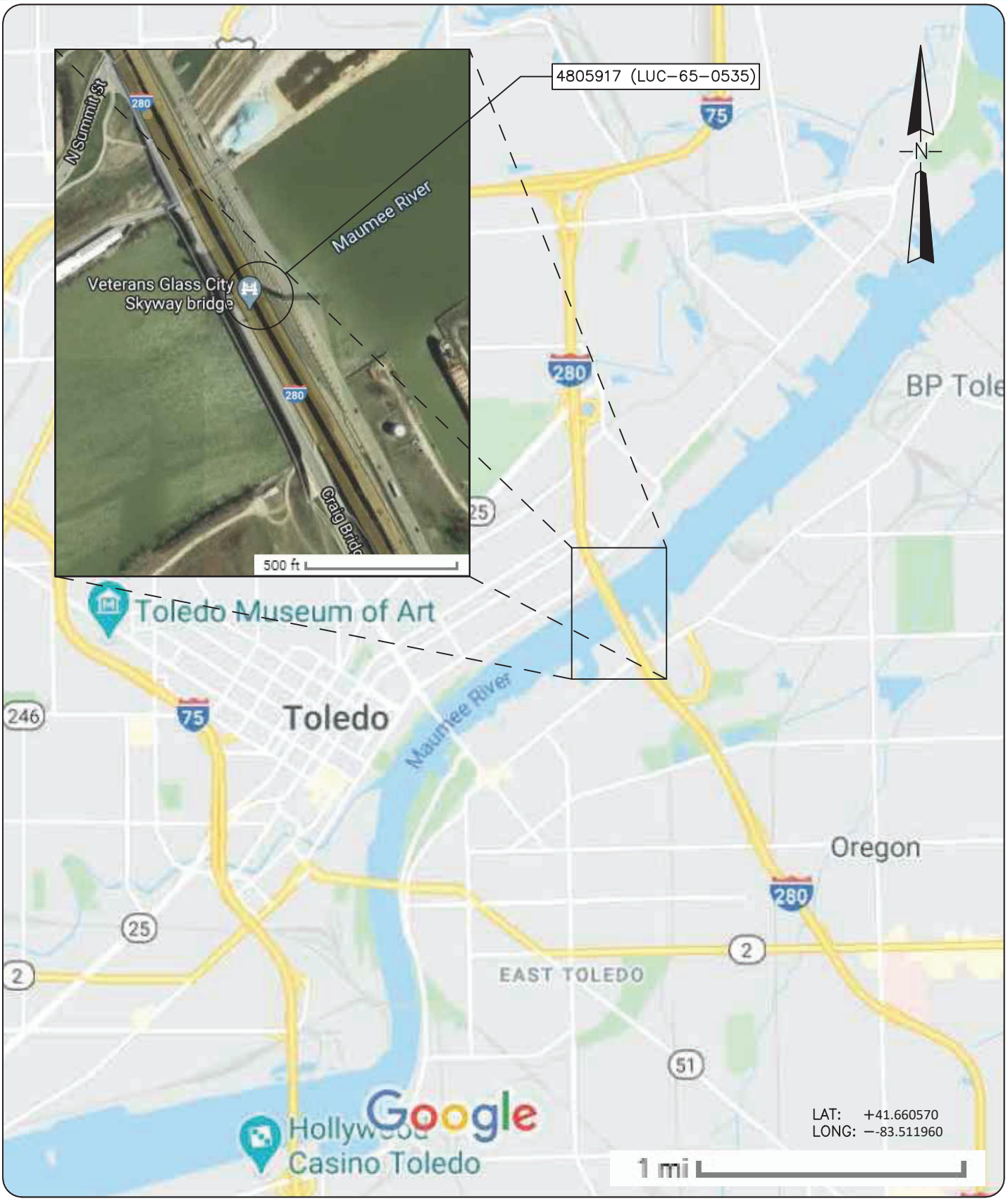
Photograph No. 16: View of the North Face of Bascule Pier 5, Looking South.

Photograph No. 17: View of the South Face of Bascule Pier 5, Looking North.

Photograph No. 18: View of the Typical Concrete Condition at the Waterline, Looking Southwest.

Photograph No. 19: View of the Typical Fender Condition at the Waterline, Looking Southwest.

EXHIBIT 3 – UNDERWATER DIVE INSPECTION PROCEDURE CHECKLIST



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SR-65 OVER MAUMEE RIVER
STRUCTURE NO. 4805917
(LUC-65-0535)
LOCATION MAP
LUCAS COUNTY, OHIO

INSPECTED BY: MOR	CEI PROJECT: 55-12239.00
DRAWN BY: BBM	DATE: 12 MAY 2020
CHECKED BY: JMJ	SHEET NO: 1

\\NASUNI-KY\KY\PROJECTS\55 - LEXINGTON\55-12239.00 - ODOT D2 UW INSP 2020\ENGINEERING\BRIDGES\4805917\4805917 (LUC-65-0535).DWG9/27/2020 9:33:21 PM

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: 4805917 Bridge Number (County-Route-SLM-SD): LUC-65-0535

Superstructure Type	Main Span Type: STEEL GIRDER AND TWIN LEAF BASCULE
	Approach Span: REINFORCED CONCRETE
Substructure Type	Abutment Type: REINFORCED CONCRETE
	Pier Type: REINFORCED CONCRETE
	Total Pier Count: 8
	Total Pier Count in water: 7
	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	Coast Guard Station Toledo	419-729-2034	
Property Owner			
Access Equipment			
Lake or River draw-down	Lift Bridge	419-936-2020	
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**

If Yes, waterway river point _____

Anticipated water visibility depth __1___ ft

Anticipated Dive depth _37___ ft

Anticipated current __1___ ft

Scour Critical (item 113): __5_____

POA in place: Y/**N**

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	7	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

____Shore

__X_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.)

WALLBRIDGE PARK BOAT RAMP

_____

e. The maximum depth of the channel is typically measured_____ feet from

BETWEEN PIERS 4 AND 5 AT THE CENTERLINE

_____

Reference Datum: 13.9FT. BELOW THE TOP OF FOOTING AT THE UPSTREAM NOSE OF PIER 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