UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7402910 (SEN-224-1207)
US-224 OVER SANDUSKY RIVER
SENECA COUNTY, OH
DISTRICT 2

May 2020

10/9/2020

Prepared for:

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

Prepared by:

COLLINS ENGINEERS INC.

124 Venture Court, Suite 10

Lexington, Kentucky 40511

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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 – Phillip Osborn, E.I.T. – Collins Engineers, Inc.

Inspection Date(s): May 28, 2020

Water Visibility:	<1 ft	***Water Velocity:***	1 ft/s
Water Temperature:	78 °F	***Weather:***	Partly Cloudy – 87 °F
Waterline Elevation:	734.8 ft	***Type of Boat:***	Kayak
Coordinates:	41.095769°N, -83.199088°W		
Access Location:	West Shoreline (Days Inn Parking Lot)		
Dive Mode:	Surface Supplied Air		
Waterline Reference:	7.5 ft below the top of cap at the downstream nose of Pier 2.		
Maximum Depth at SSU:	7.6 ft – Downstream Quarter Point on the North Face of Pier 3		
Shoreline Conditions:	The east and west shorelines consisted of well protected, well-vegetated, mild slopes with no signs of erosion and a steel sheet pile wall on the southwest embankment.		

Summary of Findings:

- **Pier 1:**
  - The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration.
  - The submerged portions of the pier were smooth and south with no defects noted.
  - A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the southwest corner of the pier just downstream of the timber debris.
  - Severe timber debris accumulation consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to a 15 ft radius around the upstream nose from channel bottom to 4 ft about the waterline.
- **Pier 2:**
  - The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration.
  - The submerged portions of the pier were smooth and south with no defects noted.
  - A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the northeast corner of the pier just downstream of the timber debris.
  - Heavy timber debris accumulation consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to a 10 ft radius around the upstream nose from channel bottom to 2 ft about the waterline.

- **Pier 3:**
  - The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration.
  - The submerged portions of the pier were smooth and south with no defects noted.
  - Moderate timber debris accumulation consisting of logs up to 1 ft diameter were observed on the upstream nose extending along the north face from the channel bottom to 2 ft about the waterline.
- **Pier 4:**
  - The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration.
  - The submerged portions of the pier were smooth and south with no defects noted.
  - Light timber debris accumulation consisting of branches up to 6 in. diameter were observed on the upstream nose extending up to a 5 ft radius around the upstream nose from the channel bottom to 2 ft about the waterline.

Summary of Recommendations:

- Remove timber debris at all Piers.
- Monitor scour during routine underwater inspections.

Underwater Inspection Coding:

NBI Ratings:

Item	Description	Coding	Condition
60	Substructure	7 – Good Condition	No Defects Observed
61	Channel	5 – Fair Condition	Minor Scour, Timber Debris Accumulation
62	Culvert	N/A	
92B	UW Insp. Frequency	60 Months	
93B	Insp. Date	05 28 20	
113	Scour Critical Bridges	8 – Above 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 US-224 Bridge over Sandusky River in Seneca County, OH. Collins Engineers, Inc. (Collins) conducted the underwater investigation for District 2 of the Ohio Department of Transportation (ODOT) on May 28, 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. 7402910 (SEN-224-1207) spans 806.85 ft, carrying US-224 over Sandusky River and is approximately 95 ft wide. The bridge superstructure is constructed of five steel beam 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 Piers 1 through 4. Existing record drawings were 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 Phillip Osborn, E.I.T.) conducted the underwater inspection. The inspection was conducted using surface supplied air diving equipment. During the inspection, the inspectors worked from a kayak 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, 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 4 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 7402910 (SEN-224-1207) was located approximately 7.5 ft below the top of cap at the downstream nose of Pier 2, which corresponds to a waterline elevation of 734.8 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 east and west shorelines consisted of well protected, well-vegetated, mild slopes with no signs erosion and a steel sheet pile wall on the southwest embankment. 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 around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration. The submerged portions of the pier were smooth and south with no defects noted. A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the southwest corner of the pier just downstream of the timber debris. Severe timber debris accumulation consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to a 15 ft radius around the upstream nose from channel bottom to 4 ft about the waterline. Refer to Figure 6 in Exhibit 1 for detailed inspection notes of Pier 1. Refer to Photographs 9 and 10 in Exhibit 2 for views of Pier 1.

2.2.2 Pier 2

The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration. The submerged portions of the pier were smooth and south with no defects noted. A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the northeast corner of the pier just downstream of the timber debris. Heavy timber debris accumulation consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to a 10 ft radius around the upstream nose from channel bottom to 2 ft about the waterline. Refer to Figure 7 in Exhibit 1 for detailed inspection notes of Pier 2. Refer to Photographs 11 and 12 in Exhibit 2 for views of Pier 2.

2.2.3 Pier 3

The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration. The submerged portions of the pier were smooth and south with no defects noted. Moderate timber debris accumulation consisting of logs up to 1 ft diameter were observed on the upstream nose extending along the north face from the channel bottom to 2 ft about the waterline. Refer to Figure 8 in Exhibit 1 for detailed inspection notes of Pier 3. Refer to Photographs 13 and 14 in Exhibit 2 for views of Pier 3.

2.2.4 Pier 4

The channel bottom material around the pier consisted of timber debris with twigs and silt overly with up to 6 in. probe rod penetration. The submerged portions of the pier were smooth and south with no defects noted. Light timber debris accumulation consisting of branches up to 6 in. diameter were observed on the upstream nose extending up to a 5 ft radius around the upstream nose from the channel bottom to 2 ft about the waterline.

Refer to Figure 9 in Exhibit 1 for detailed inspection notes of Pier 4. Refer to Photographs 15 through 17 in Exhibit 2 for views of Pier 4 and typical concrete condition at the waterline.

3.0 EVALUATION AND RECOMMENDATIONS

Overall, the submerged substructure units of Structure No. 7402910 (SEN-224-1207) were in good condition below water. A comparison of the soundings recorded during the previous inspection on June 24, 2015 and the soundings taken during this inspection revealed no significant change in the channel bottom profile in the vicinity of the structure. The minor scour depressions observed at Piers 1 through 4 are not a concern at this time given that the bottom of the footing is embedded in the channel bottom. The channel bottom configuration should continue to be closely monitored during future underwater inspections to verify that the scour depressions at Piers 1 through 4 are not increasing and that all footings remain adequately embedded in the channel bottom.

The timber debris accumulations at Piers 1 through 4 is obstructing channel flow, is the cause of scour, 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.

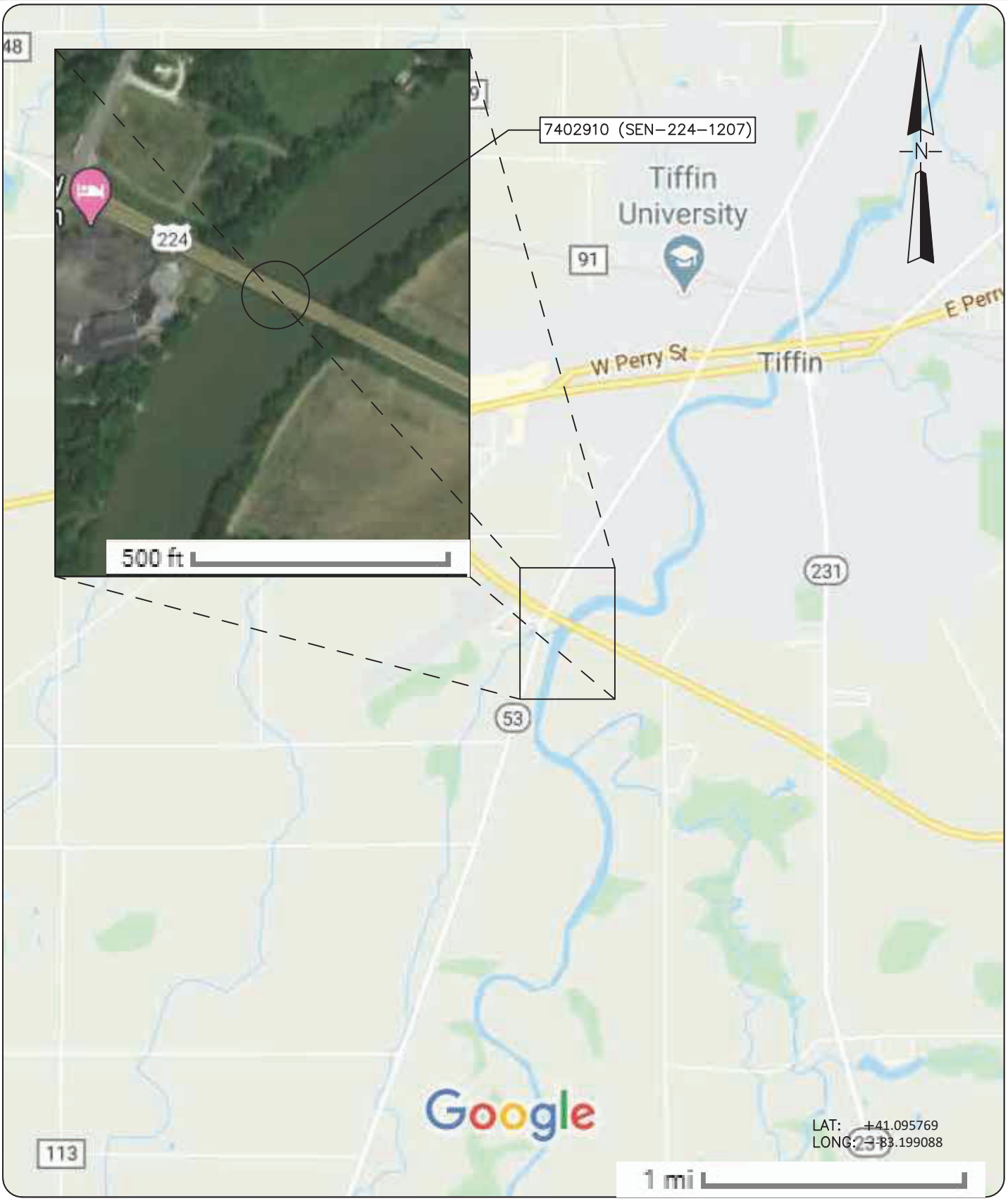
It is recommended that the submerged substructure units of Structure No. 7402910 (SEN-224-1207) be next inspected underwater at an interval not to exceed 60 months, no later than May 28, 2025.

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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US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910
(SEN-224-1207)
LOCATION MAP
SENECA COUNTY, OHIO

INSPECTED BY: MOR	CEI PROJECT: 55–12239.00
DRAWN BY: BLV	DATE: 28 MAY 2020
CHECKED BY: JMJ	SHEET NO: 1

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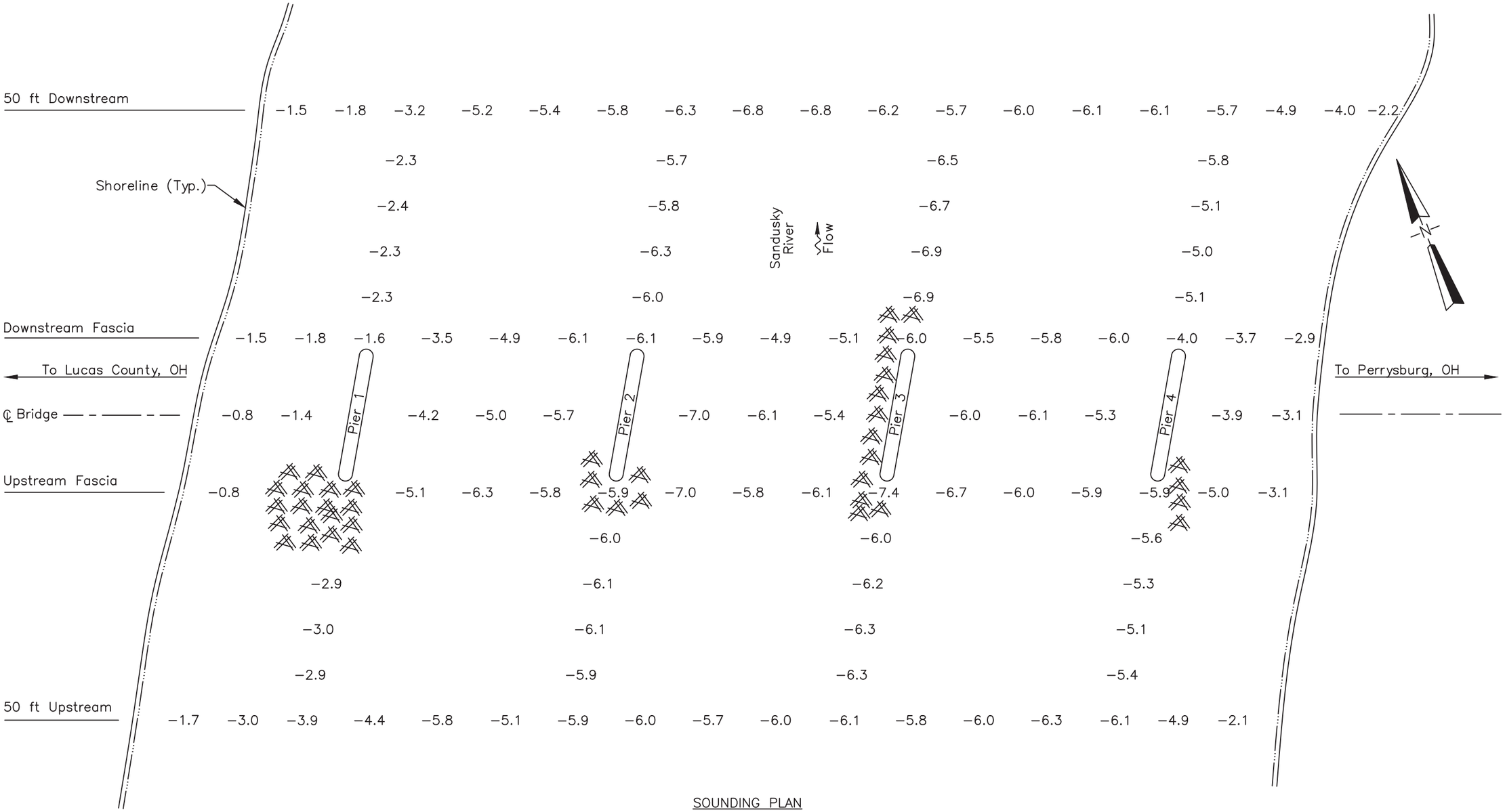

SOUNDING PLAN

GENERAL NOTES:

1. Piers 1, 2, 3, and 4 were inspected underwater. Substructure units are labeled according to previous report.
2. At the time of inspection on May 28, 2020, the waterline was located approximately 7.5 ft below Top of Cap at downstream nose of Pier 2 (EL. +742.3 ft). This corresponds with a waterline elevation of +734.8 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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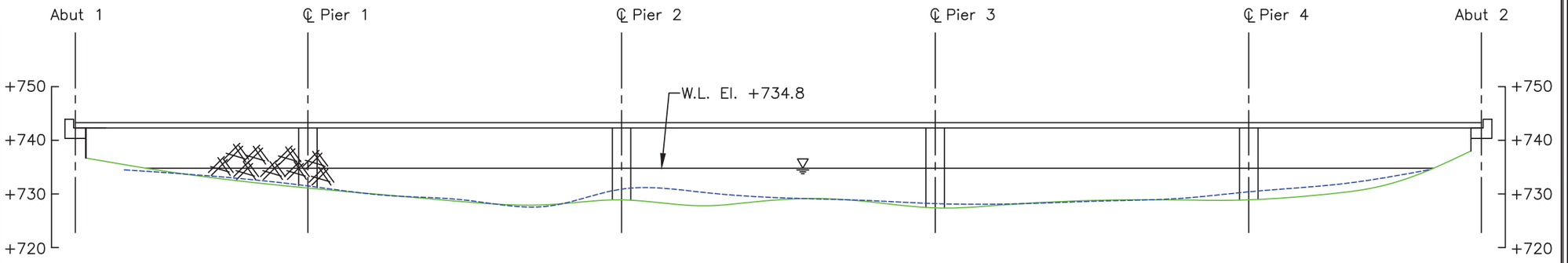
US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
SOUNDING PLAN
SENECA COUNTY, OHIO

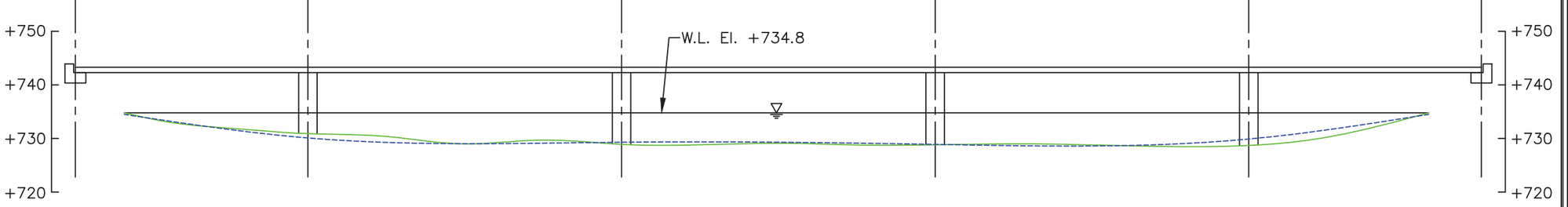
CEI PROJECT	55−12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	2

UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	5.6
1/4	7.9
1/2	12.5
3/4	12.6
P1	12.7
1/4	12.8
1/2	12.9
3/4	13.0
P2	13.1
1/4	13.2
1/2	13.3
3/4	13.4
P3	13.5
1/4	13.6
1/2	13.7
3/4	13.8
P4	13.9
1/4	14.0
1/2	14.1
3/4	8.3
A2	4.5

*Profile taken from top of deck to channel bottom



CHANNEL CROSS SECTION
UPSTREAM FASCIA
(LOOKING DOWNSTREAM)



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)

Note:

Footing elevations unknown due to unavailable design drawings.

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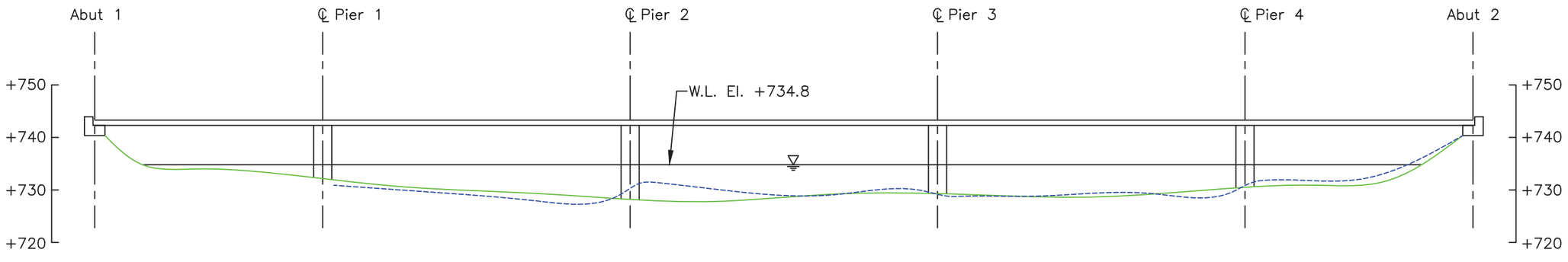
US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
CROSS SECTIONS - UPSTREAM
SENECA COUNTY, OHIO

CEI PROJECT	55–12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	3



CHANNEL CROSS SECTION
STRUCTURE CENTERLINE
(LOOKING DOWNSTREAM)

Note:

Footing elevations unknown due to unavailable design 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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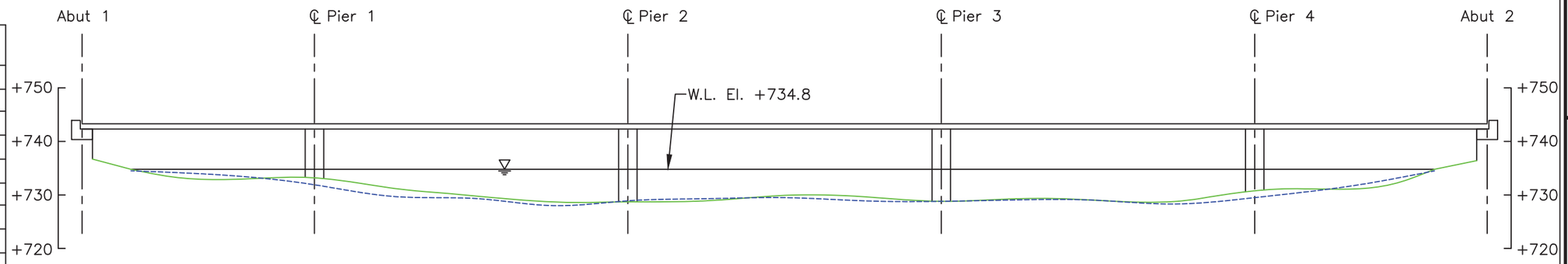
US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
CROSS SECTIONS - CENTERLINE
SENECA COUNTY, OHIO

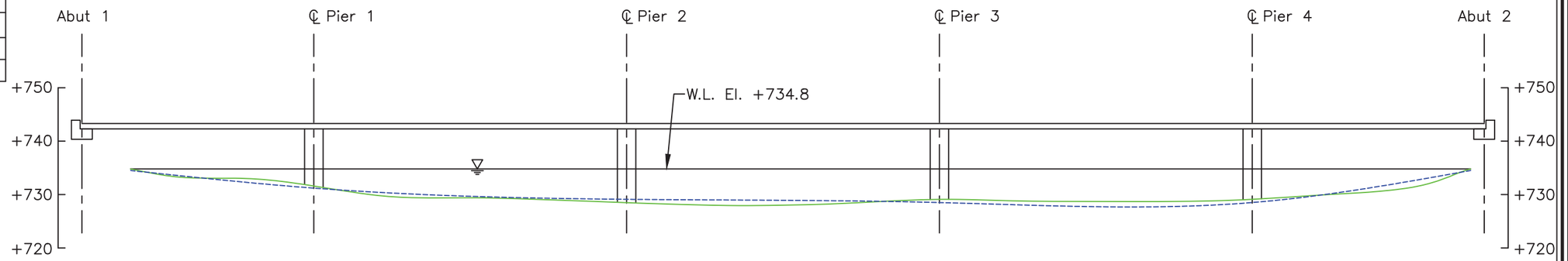
CEI PROJECT	55–12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	4

UPSTREAM FASCIA LOOKING DOWNSTREAM	
Location	Y(ft)*
A1	5.7
1/4	7.8
1/2	12.5
3/4	12.6
P1	12.7
1/4	12.8
1/2	12.9
3/4	13.0
P2	13.1
1/4	13.2
1/2	13.3
3/4	13.4
P3	13.5
1/4	13.6
1/2	13.7
3/4	13.8
P4	13.9
1/4	14.0
1/2	14.1
3/4	9.4
A2	5.9

*Profile taken from top of deck to channel bottom



CHANNEL CROSS SECTION
DOWNSTREAM FASCIA
(LOOKING DOWNSTREAM)



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)

Note:

Footing elevations unknown due to unavailable design drawings.

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US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
CROSS SECTIONS - DOWNSTREAM
SENECA COUNTY, OHIO

CEI PROJECT 55–12239.00
INSPECTED BY: MOR
DRAWN BY: BLV
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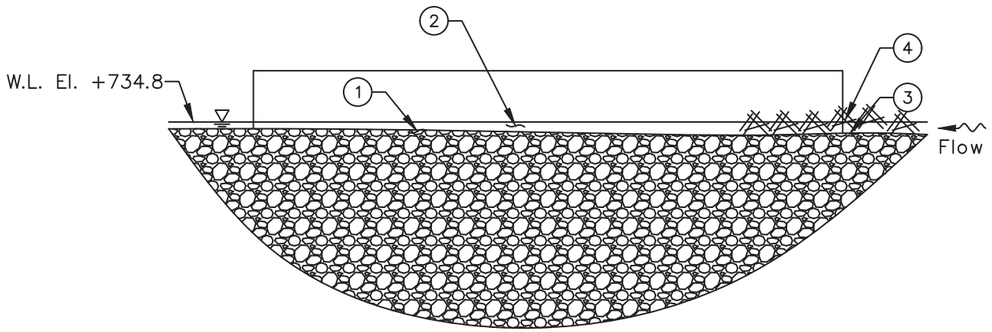
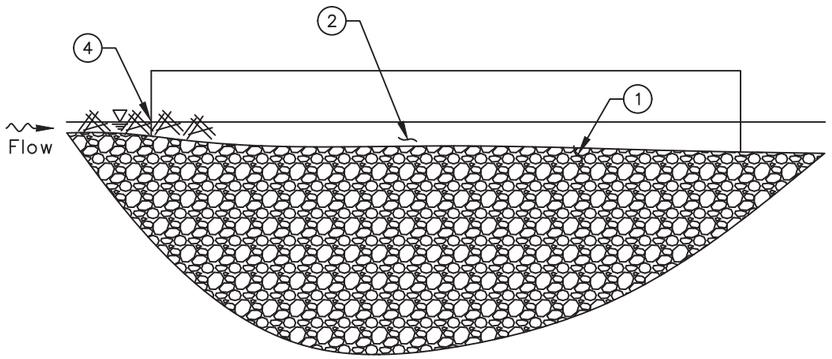
DATE: MAY 2020
SHEET NO: 5



WEST ELEVATION
(LOOKING EAST)



EAST ELEVATION
(LOOKING WEST)

PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of timber debris with silt overlay with approximately 6 in. probe rod penetration.
2. The submerged portions of the pier were sound and smooth with no defects observed.
3. A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the southwest corner of the pier just downstream of the timber debris.
4. Severe timber debris consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to 15 ft radius around the upstream ose from channel bottom to 4 ft above the waterline.

LEGEND

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

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US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
PIER 1
SENECA COUNTY, OHIO

CEI PROJECT	55–12239.00
INSPECTED BY:	MOR
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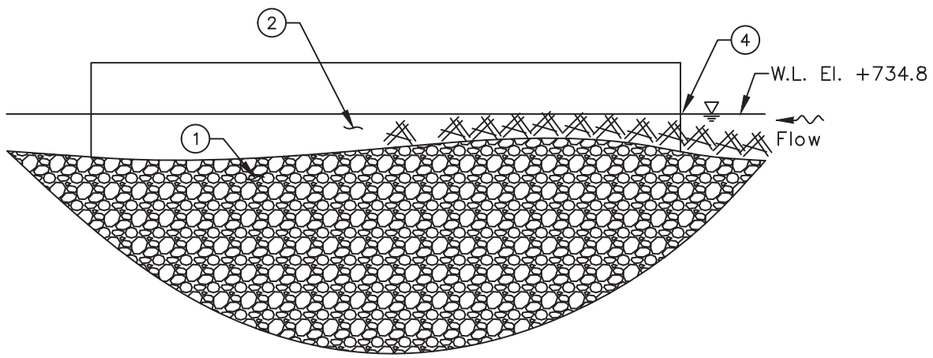
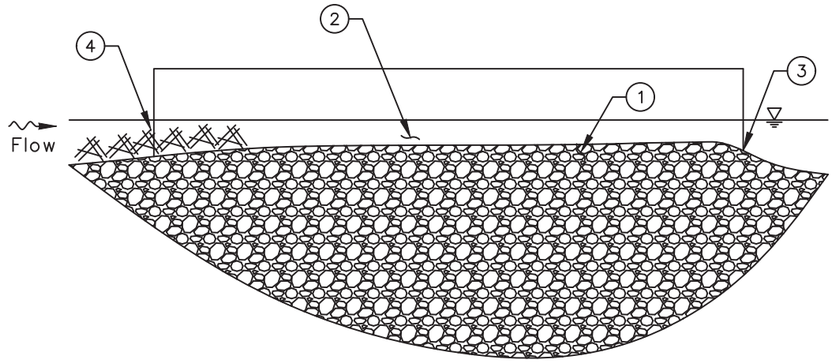
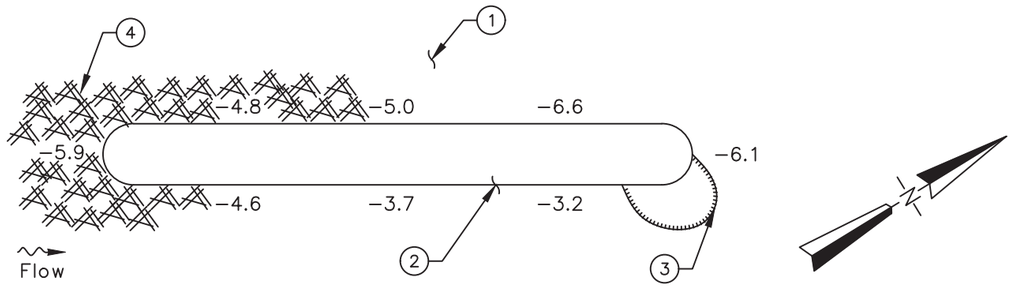
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	6



WEST ELEVATION
(LOOKING EAST)



EAST ELEVATION
(LOOKING WEST)



PLAN

INSPECTION NOTES:

1. The channel bottom material consisted of timber debris with silt overlay with approximately 6 in. probe rod penetration.
2. The submerged portions of the pier were sound and smooth with no defects observed.
3. A scour depression measuring approximately 10 ft diameter by 2 ft deep was observed on the northeast corner of the pier just downstream of the timber debris.
4. Heavy timber debris consisting of logs up to 2 ft diameter were observed on the upstream nose extending up to 10 ft radius around the upstream nose and along the north face from channel bottom to 2 ft above the waterline.

LEGEND

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

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US-224 OVER SANDUSKY RIVER
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PIER 2
SENECA COUNTY, OHIO

CEI PROJECT	55–12239.00
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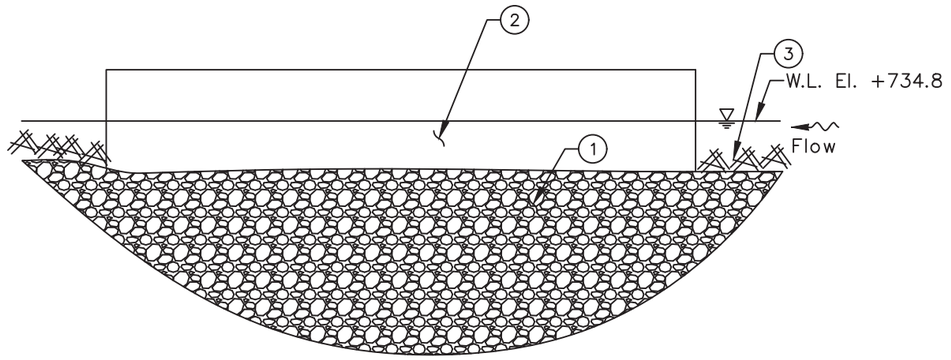
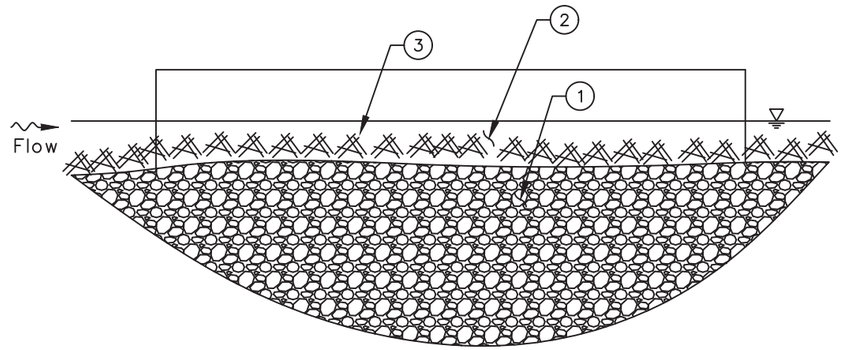
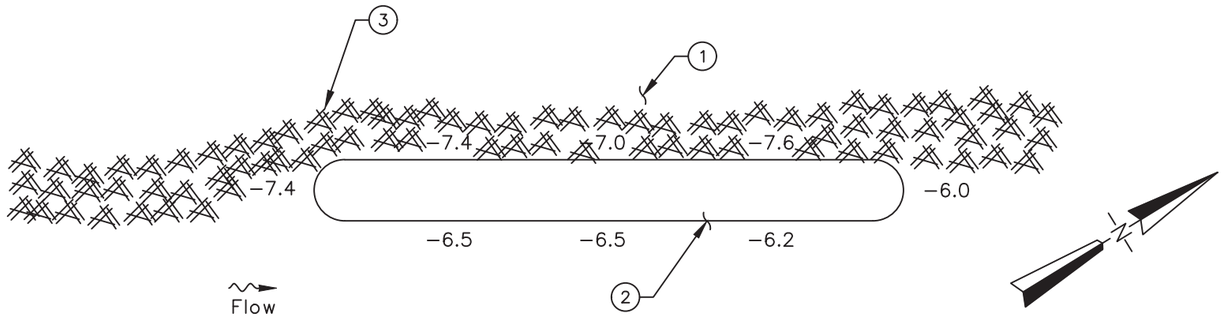
DATE:	MAY 2020
SHEET NO:	7



WEST ELEVATION
(LOOKING EAST)



EAST ELEVATION
(LOOKING WEST)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of timber debris with silt overlay with approximately 6 in. probe rod penetration.

(2) The submerged portions of the pier were sound and smooth with no defects observed.

(3) Moderate timber debris consisting of logs up to 1 ft diameter were observed on the upstream nose extending along the north face from channel bottom to 2 ft above the waterline.

LEGEND

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

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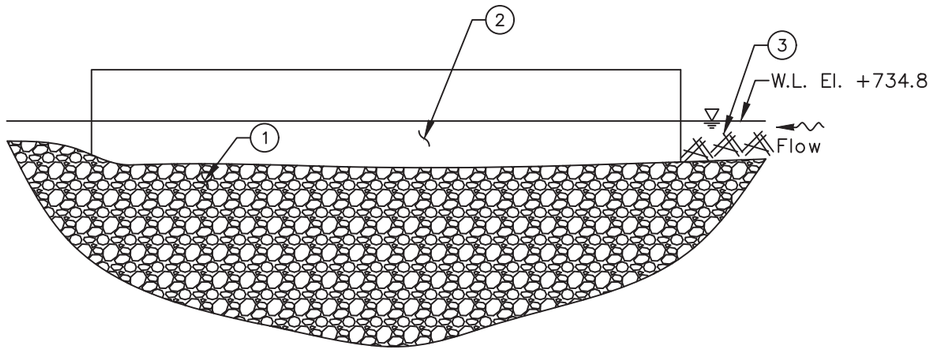
Fax: 859-367-0140

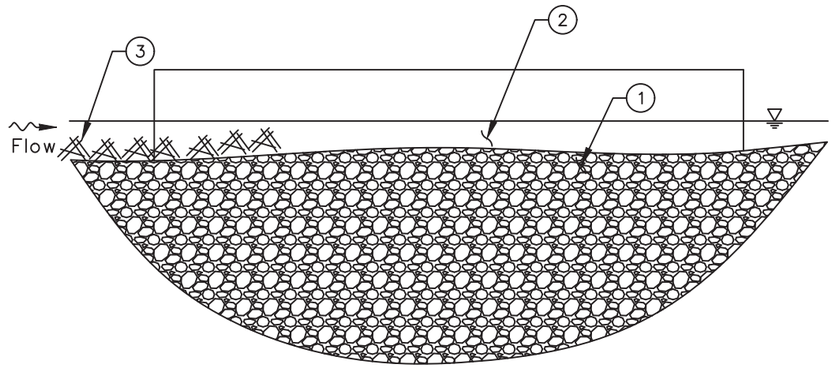
Ohio Department of Transportation, District 2
317 East Poe Rd.
Bowling Green, OH 45601
Phone: 419-353-8131

US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
PIER 3
SENECA COUNTY, OHIO

CEI PROJECT	55–12239.00
INSPECTED BY:	MOR
DRAWN BY:	BLV
CHECKED BY:	JMJ
DATE:	MAY 2020
SHEET NO:	8



WEST ELEVATION
(LOOKING EAST)



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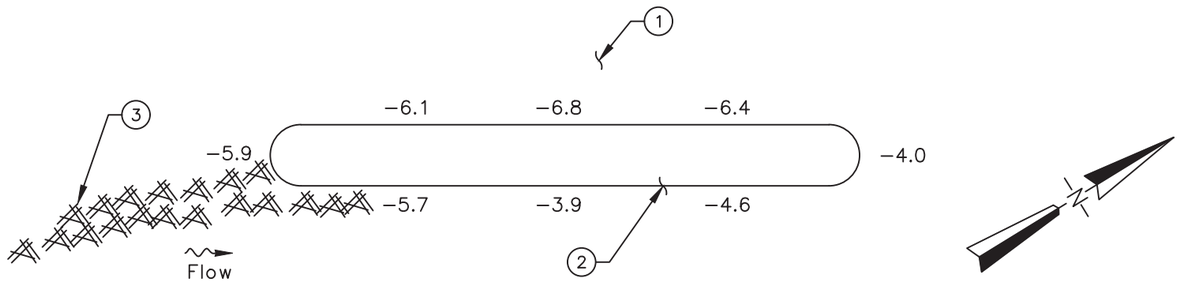
(LOOKING WEST)



PLAN

INSPECTION NOTES:

(1) The channel bottom material consisted of timber debris with silt overlay with approximately 6 in. probe rod penetration.

(2) The submerged portions of the pier were sound and smooth with no defects observed.

(3) Light timber debris consisting of branches up to 6 in. diameter were observed on the upstream nose extending up to a 5 ft radius from channel bottom to the waterline.

LEGEND

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

COLLINS ENGINEERS
124 Venture Court, Ste 10
Lexington, KY 40511
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US-224 OVER SANDUSKY RIVER
STRUCTURE NO. 7402910 (SEN-224-1207)
PIER 4
SENECA COUNTY, OHIO

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

EXHIBIT 2 – INSPECTION PHOTOGRAPHS

Photograph No. 1: Overall View of Structure No. 7402910 (SEN-224-1207), Looking North.

Photograph No. 2: Overall View of Structure No. 7402910 (SEN-224-1207), Looking South.

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

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

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

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

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 Northeast.

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

Photograph No. 10: View of the West Face of Pier 1, Looking Northeast.

Photograph No. 11: View of the West Face of Pier 2, Looking Southwest.

Photograph No. 12: View of the East Face of Pier 2, Looking Northeast.

Photograph No. 13: View of the East Face of Pier 3, Looking Southwest.

Photograph No. 14: View of the West Face of Pier 3, Looking Northeast.

Photograph No. 15: View of the East Face of Pier 4, Looking Southwest.

Photograph No. 16: View of the West Face of Pier 4, Looking Northeast.

Photograph No. 17: View of the Typical Concrete Condition at the Waterline, 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: 7402910 Bridge Number (County-Route-SLM-SD): SEN-224-1207

Superstructure Type Main Span Type: STEEL BEAM

Approach Span: REINFORCED CONCRETE

Substructure Type Abutment Type: REINFORCED CONCRETE

Pier Type: REINFORCED CONCRETE

Total Pier Count: 4

Total Pier Count in water: 4

Foundations: UNKNOWN

Feature Intersected SANDUSKY 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___ ft
If Yes, waterway river point	___N/A__	Scour Critical (item 113):	___8____
Anticipated water visibility depth	___<1___ ft	POA in place: Y/N	
Anticipated Dive depth	___8___ 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

____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.)

_WEST SHORELINE (DAYS IN PARKING LOT)____

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

_____

_AT THE UPSTREAM NOSE OF PIER 3_____

_____

Reference Datum: Top of Cap at the Downstream 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, 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