

## BRIDGE INSPECTION REPORT

1808311  
Structure File Number

BRIDGE NUMBER CUY 00090 2043 L

YEAR BUILT 1952

DIST 12 Bridge Type 322 TYPE SERVICE 1 5 CEI OUTLET CHANNEL

<b>DECK</b>	out/out 78.3 Deck Area 14,413 sqft		2 INTEGRAL CONCRETE (MONOLITHIC)	
1. FLOOR	1 REINF CONCRT (PRESTRSD, PRECAST)	1	2. WEARING SURFACE	Thk 2 Wear Date 8/2/2005 1
3. CURBS, SIDEWALKS AND WALKWAYS	Left N NONE / Right N NONE		4. MEDIAN	Lanes on 4
5. RAILING	1 REINFORCED CONCRETE PARAPET	1	6. DRAINAGE	3 SCUPPERS & DWNSPTS 1
7. EXPANSION JOINTS	N NONE		8. SUMMARY	7
<b>SUPERSTRUCTURE</b>			3 ROLLED STEEL	
9. ALIGNMENT	Max Spans 60	1	10. BEAMS/GIRDERS/SLAB	2
11. DIAPHRAGMS or CROSSFRAMES		1	12. JOISTS/STRINGERS	
13. FLOOR BEAMS			14. FLOOR BEAM CONNECTIONS	
15. VERTICALS			16. DIAGONALS	
17. END POSTS			18. TOP CHORD	
19. LOWER CHORD			20. LOWER LATERAL BRACING	
21. TOP LATERAL BRACING			22. SWAY BRACING	
23. PORTALS			24. BEARING DEVICES	3 SLIDING (BRONZE) 2
25. ARCH			26. ARCH COLUMNS or HANGERS	
27. SPANDREL WALLS			28. PROTECTIVE COATING SYSTEM	Paint Date 1/1/1993 5 PAINT SYSTEM OZE 7
29. PINS/HANGERS/HINGES			30. FATIGUE PRONE CONNECTIONS	
31. LIVE LOAD RESPONSE		S	32. SUMMARY	6
<b>SUBSTRUCTURE</b>			6 STUB-CAPPED PILE (SINGLE ROW PILES)	
33. ABUTMENTS	6 STUB-CAPPED PILE (SINGLE ROW PILES)	1	34. ABUTMENT SEATS	Abutment: ON PILING 1
35. PIERS		2	36. PIER SEATS	B TOWER Piers: ON PILING 1
37. BACKWALLS			38. WINGWALLS	1
39. FENDERS and DOLPHINS	Piers = 02 NN NN Spans = 3		40. SCOUR	2 1
41. SLOPE PROTECTION	N NONE-NATURAL PROTECTION(GRA)		42. SUMMARY	Dive Date 9/26/2007 6
<b>CULVERTS</b>				
43. GENERAL	N NONE/NOT APPLICABLE		44. ALIGNMENT	
45. SHAPE			46. SEAMS	
47. HEADWALLS or ENDWALLS	Culvert Length 0		48. SCOUR	Culvert Fill Depth 0
49.			50. SUMMARY	
<b>CHANNEL</b>				
51. ALIGNMENT		1	52. PROTECTION	5 RIP RAP (DUMPED ROCK OR ROCK) 1
53. WATERWAY ADEQUACY	8 SLIGHT CHANCE OVERTOPPING	1	54. SUMMARY	7
<b>APPROACHES</b>				
55. PAVEMENT	2 BITUMINOUS	1	56. APPROACH SLABS	1
57. GUARDRAIL	1 STEEL BEAM	1	58. RELIEF JOINTS	
59. EMBANKMENT		1	60. SUMMARY	Percent Legal = 150 8
<b>GENERAL</b>				
61. NAVIGATION LIGHTS			62. WARNING SIGNS	Maint Resp 1 OHIO TRAN DEPT
63. SIGN SUPPORTS	Signs on = N MVC on = 9999 Under C = 0		64. UTILITIES	
65. VERTICAL CLEARANCE	Under NC = 0	N	66. GENERAL APPRAISAL & OPERATIONAL STATUS	6 A
67. INSPECTED BY			68. REVIEWED BY	

SIGNED

PE Number

AWH  
INITIALS

SIGNED

70223 AWH  
PE Number INITIALS

DATE 10/21/2010

1 1 1 1 1 N N 1  
SURVEY

DATE 2/14/2011

## DECK

FLOOR: SPALL IN BAY #5 BETWEEN 1ST & 2ND XFRAMES WEST OF PIER #1; SEE ATTACHED PHOTOS 1 & 2 DATED 10/05/05. PLYWOOD CAST INTO FLOOR ALONG LEFT FACE OF TOP FLANGE OF LEFT BEAM ABOVE FINISH CHANNEL PROTECTION; SEE ATTACHED PHOTOS 3 & 4 DATED 11/07/05. A FEW CRACKS. FLOOR <1% DETERIORATED. WEARING SURFACE: A FEW CRACKS. <1% DETERIORATED. DRAINAGE: PARTIALLY PLUGGED SCUPPERS.

## SUPERSTRUCTURE

BEAMS: PACK RUST BETWEEN SOME COVER PLATES & BOTTOM FLANGES. RUSTED SECTION LOSS. RUSTING SECTION LOSS OF LEFT BEAM WITH RUSTED THRU HOLES IN COVER PLATES IN SPAN #2. BOTTOM FLANGE COVER PLATE OF BEAM #5 IS BENT IN SPAN #2 NEAR PIER #2; SEE ATTACHED PHOTO 6 DATED 10/05/05. NO COPE HOLES AT INTERSECTING WELDS WHERE BEAMS ARE JOINED ABOVE PIERS. CROSSFRAMES: SEE PHOTO DATED 10/29/09. PCS: 2% RUST. 1-5% DETERIORATED.

## SUBSTRUCTURE

ABUTMENTS: CRACKS. MINOR DELAMINATIONS. PIERS: FAILED PATCHES AND SPALLS ON COLUMNS; SEE ATTACHED PHOTOS 7 & 8 DATED 9/25/07. CAP SPALL ABOVE P2C5R; SEE ATTACHED PHOTO 9 DATED 10/05/05. SCOUR: CONCRETE ENCASEMENTS OF 3 COLUMNS OF PIER #1 ARE UNDERMINED. NO CHANGE FROM LAST DIVE INSPECTION ON 9/25/07 THAT IS ATTACHED WITH THIS REPORT.

## APPROACHES

PAVEMENT: A FEW CRACKS.

## GENERAL

KB DRY SUIT ON 10/21/10 WITH AH & AP.

CUY-90-2043L CEI outlet channel  
SFN 1808311 by acp



Cracked weld.JPG





1808311 10\_5\_05 P1 floor spall span 1 bay 5.jpg



1808311 10\_5\_05 P2 closeup of P1.jpg



1808311 11\_7\_05 P3 plywood cast into floor.jpg



1808311 11\_7\_05 P4 closeup of P3.jpg





1808311 10\_5\_05 P6 bent beam 5 cover plate.jpg



1808311 10\_5\_05 P7 deep spalling of P1C15.jpg



1808311 10\_5\_05 P8 deep spalling of P1C15.jpg



1808311 10\_5\_05 P9 cap spall above P2C5R.jpg



1808311

Structural File Number

CUY-00090-2046L

Bridge Number

September 25, 2007

Inspection Date

**Underwater Inspection Report for:**

**Interstate 90 over C.E.I Outlet**  
Cuyahoga County, Ohio  
(Three Span Steel Beam Bridge)



*General Elevation View*

**Personnel on site during inspection:**

**ODOT**

Ms. Andrea Persanyi

**Contractor**

Mr. Don W. Wilkins (Primary Diver/ Supervisor)  
Mr. James A. Ritchie (Backup Diver/ Inspector)  
Mr. Chris J. Kupper (Backup Diver/ Inspector)  
Mr. Brian B. Butler (Tender)

**Prepared for:**

ODOT District 12  
5500 Transportation Blvd  
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**Prepared by:**



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### Appendix

Appendix A Photographs

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## 1. Introduction

Marine Solutions, Inc (MSI) conducted a routine underwater inspection of the CUY-00090-2046L bridge over the C.E.I water outlet plant in the City of Cleveland, Ohio. The inspection was completed on September 25, 2007. Details of the inspection, along with observed conditions and conclusions, are provided within this report. Supplemental drawings, pictures and a location map are provided within the Appendixes.

## 2. Description of Structure

Bridge CUY-00090-2046L (SFN 1808311) carries Interstate 90 over the C.E.I water outlet located in Cuyahoga County, Ohio. The bridge has an overall length of approximately 184 feet. The structure is a three span steel beam bridge supported by 40 concrete encased steel pier pilings.

## 3. Inspection Procedure

The inspection was performed on September 25, 2007. A visual/tactile inspection was performed on the portions of the piers located below the water surface. Soundings were performed up to 30 feet out from each face of the pier. Original plans were not available for review.

Inspection Mode: *Surface Supplied Air diving (SSA)*

Flow Direction / Velocity: *North/ < 1 knot*

Channel Bottom: *Silt, sand, gravel, and cobbles*

Scour Checked By: *N/A*

Equipment Used: *Superlite 37 helmet with hardwire communication to the surface, wet suit, digital camera, survey rod, lights*

Hazards Encountered: *< 2 ft of visibility*

Hydrographic Reference: Pier 1, top of concrete pile cap to the water surface, 7.9 feet

## 4. Observed Conditions

### General

- The bottom material consists of silt, sand, gravel and cobbles.
- Light to moderate scaling is present on the concrete surface of the pier below the water surface.
- Light biological growth is present on the concrete surface of the pier below the water surface.
- Zebra mussel coverage on the concrete surface of the piles below the water surface was 95 to 100 percent.

### Pier 1

- Pile 1, area of section loss up to 1 inch tall by 6 inches wide with up to 2 inches of penetration located on the north face.



- Pile 2, area of section loss up to 6 inches tall by 6 inches wide with up to 4 inches of penetration located on the northwest face.
- Pile 4, area of section loss up to 2 inch tall with up to 2.5 inches of penetration located at the bottom of the north face and extending around to the south face.
- Pile 5, area of section loss up to 4 inch tall with up to 3.5 inches of penetration located at the bottom of the north face and extending around to the south face.
- Pile 6, area of section loss above the water surface with exposed rebar. There are also sand bags around the entire pile at the bottom.
- Pile 7, area of section loss up to 4 inch tall with up to 4 inches of penetration located at the bottom of the north face and extending around to the south face.
- Pile 14, area of section loss up to 10 inch tall with up to 6 inches of penetration located at the bottom of the west face and extending around to the east face.
- Pile 15, area of section loss up to 4 inch tall with up to 6 inches of penetration located at the bottom of the west face and extending around to the south face.

#### **Pier 2**

- Pile 1, area of section loss up to 4 inch tall with up to 1.5 inches of penetration located at the water surface.
- Pile 19, area of section loss up to 6 inch diameter with up to 1/2 inch of penetration located at the surface on the southeast face.

## **5. Conclusions**

The condition of the bridge during the 2007 inspection was consistent with the 2006 inspection report. Several of the piles have new and or additional areas of section loss. The bridge is in good condition with only minor deficiencies noted.

Appendix A  
Photographs





Photo by B. Butler 09/25/07

Photo 1. Elevation view looking upstream (south).



Photo by B. Butler 09/25/07

Photo 2. Pier 1L (southeast).



Photo by B. Butler 09/25/07

Photo 3. Pier 2L (southwest).



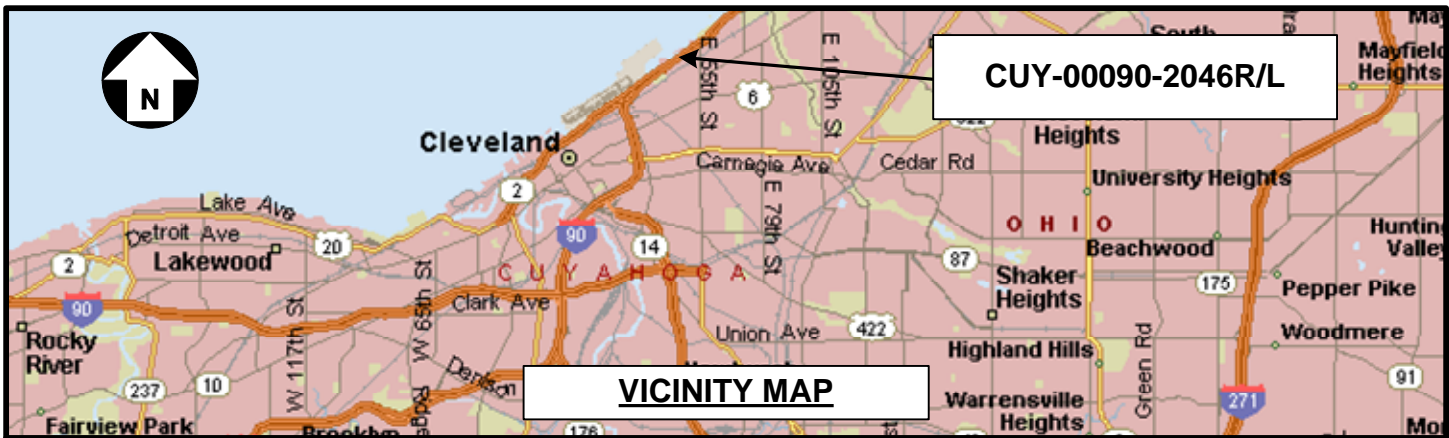
Photo by B. Butler 09/25/07


Photo 4. Typical Section Loss.



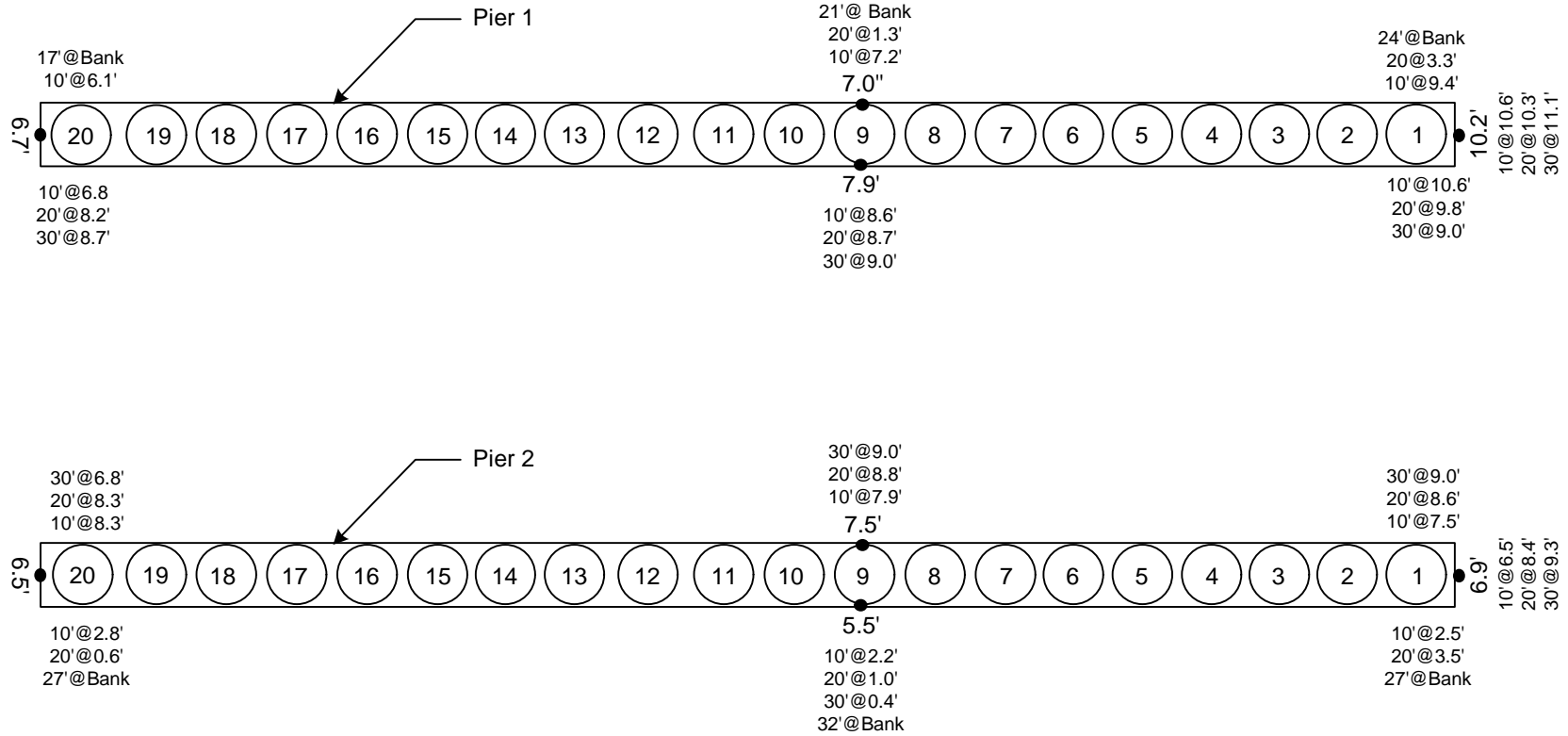
Appendix B

Figures



 <p><b>MSI</b> MARINE SOLUTIONS, INC. ENGINEERING &amp; COMMERCIAL DIVING SERVICES</p>	GRAPHIC SCALE: <b>Not To Scale</b>		PROJECT: ODOT District 12 2007 Underwater Bridge Inspections		
	INSPECTION DATE: September 25, 2007		SHEET: <b>CUY-00090-2046R/L</b> Cuyahoga County Ohio		PAGE NO.: <b>B-1</b>
	DRAWN BY: DW	CKD. BY: ANW	<b>Location Map</b>		FIG. NO.: <b>1</b>
	MSI JOB NO.: <b>MSI2007008</b>				
	FILE NAME: CUY-00090-2046R/L Location Map				





GRAPHIC SCALE:  
**Not to Scale**

INSPECTION DATE: **October 25, 2007**

DRAWN BY: **DW** CKD. BY: **ANW**

FMSM JOB NO.: **MSI2007008**

FILE NAME: **CUY-00090-2046L - Plan**

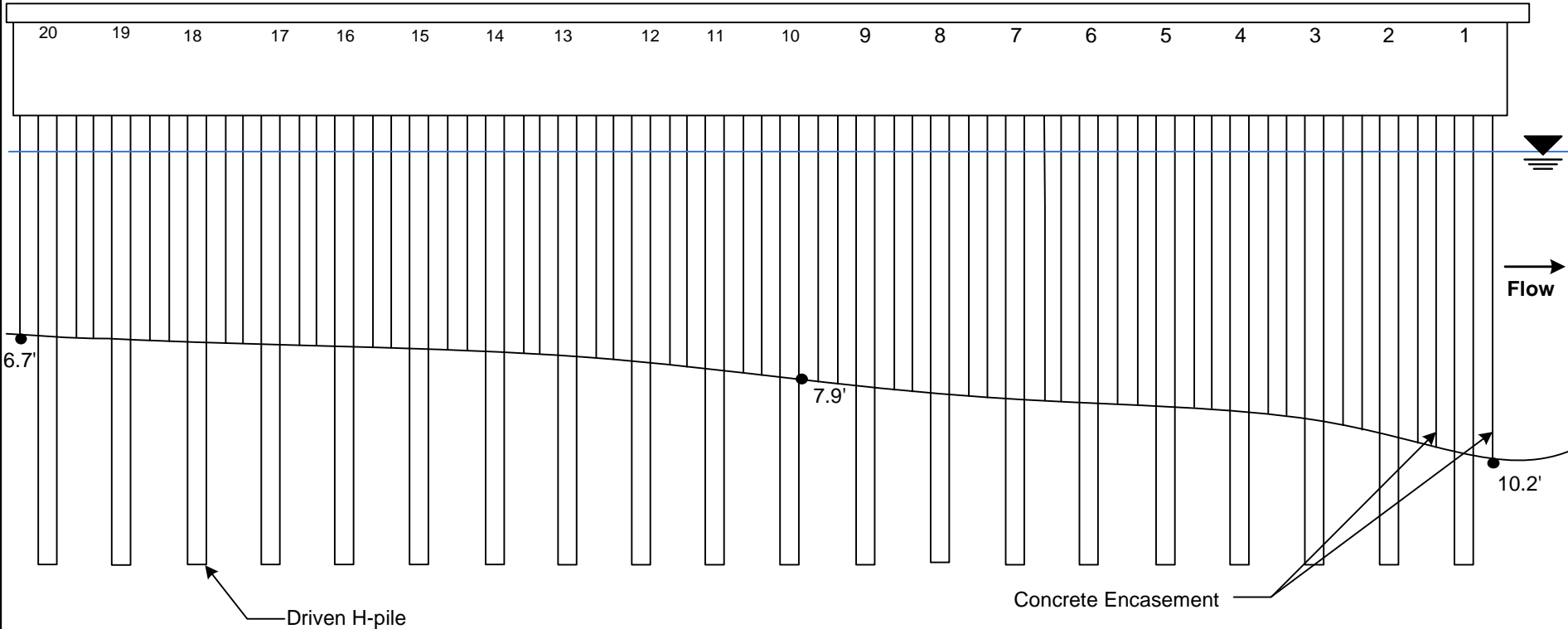
PROJECT: **ODOT District 12  
2007 Underwater Bridge Inspections**

SHEET: **CUY-00090-2046L  
I90 over C.E.I Outlet  
City of Cleveland**

Substructure Plan View

PAGE NO.: **B-2**

FIG. NO.: **2**



Pier 1 Looking West



GRAPHIC SCALE:  
**Not to Scale**

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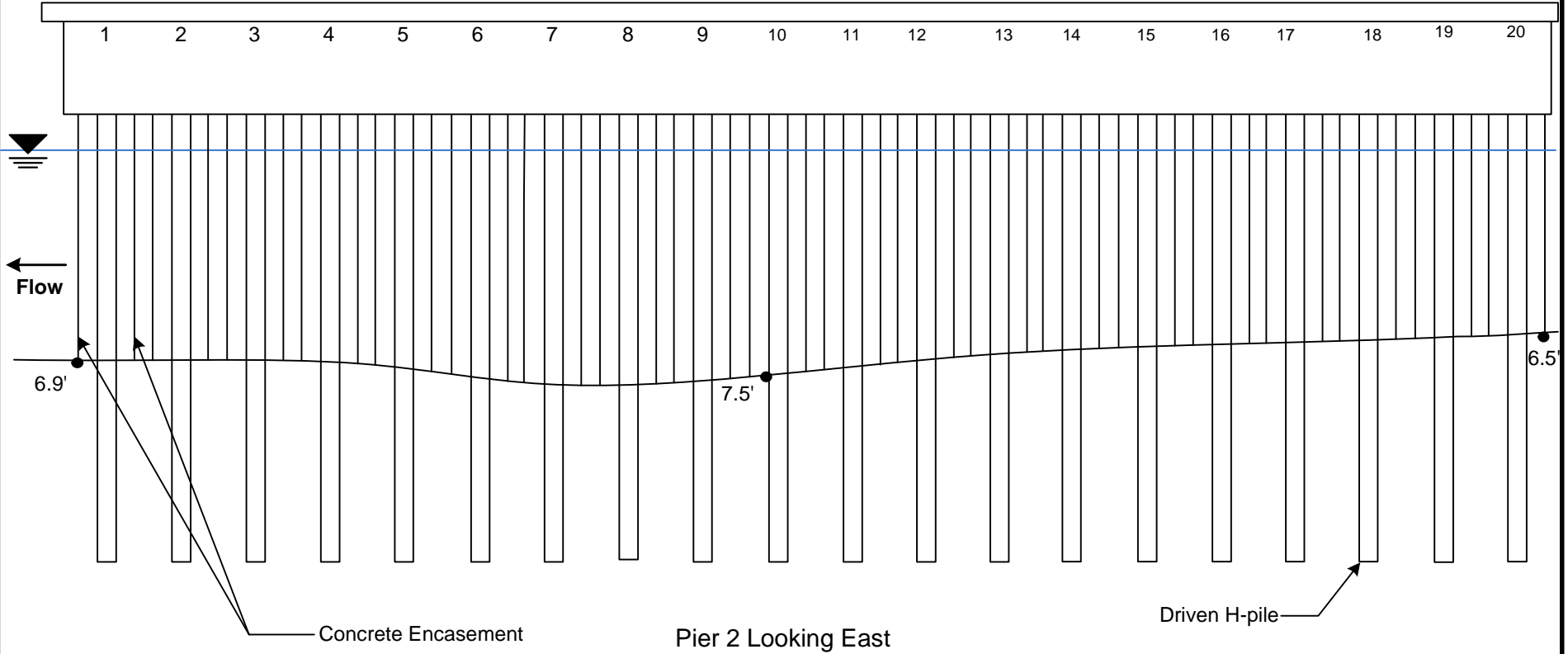
DRAWN BY: DW      CKD. BY: ANW

FMSM JOB NO.: MSI2007008

FIG. NO.:  
**3**

FILE NAME: CUY-00090-2046L - Pier 1

Pier 1 Looking West



GRAPHIC SCALE:  
**Not to Scale**

INSPECTION DATE: **October 25, 2007**

DRAWN BY: **DW** CKD. BY: **ANW**

FMSM JOB NO.: **MSI2007008**

FILE NAME: **CUY-00090-2046L - Pier 2**

PROJECT: **ODOT District 12  
2007 Underwater Bridge Inspections**

SHEET: **CUY-00090-2046L  
I90 over C.E.I Outlet  
City of Cleveland**

**Pier 2 Looking East**

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**B-4**

FIG. NO.:  
**4**