

# UNDERWATER BRIDGE INSPECTION REPORT



NBI Item 60 Rating: 6  
NBI Item 61 Rating: 7  
NBI Item 113 Rating: 8

Bridge Number: CUY-00090-2043R  
Inspection Date: 12/5/2012  
Division: District 12  
River: Cuyahoga Outlet Channel

Engineer of Record: David Reser  
Team Leader: Fred Meek  
Substructures Inspected: Bents 1 and 2  
Team Members:  
KRR, JML



## Summary of Scour and Channel Conditions:

There is no significant local or general scour present at the bridge site. There are no significant restrictions in the channel that will adversely impact flow.

## Summary of Structural Conditions:

The inspected substructure units are in good condition. There are some spalls with exposed steel in the concrete encasements, some poor/deteriorating locations of concrete on the encasements, and areas of hollowness at some locations of the concrete encasements. Refer to Photos 1 and 2 for overall views of the bridge and substructure configuration.

## Summary Evaluation of Previous Corrective Actions:

There have been no corrective actions performed on the substructure units inspected since the previous underwater bridge inspection.

## Summary of Repair Recommendations:

Restore the deteriorated concrete cover to the areas of exposed reinforcement and at the spalled areas of the concrete encasements.



Route: I 90  
Inventory Direction: West to East  
County: Cuyahoga  
Location: .6 mi. East of Martin Luther King Jr. Dr.  
Bridge Length: 184 FT  
Superstructure Type: Steel Multi-Beam  
Substructure Type: CIP Concrete Piles w/Encasements  
Foundation Type: Concrete Encased Steel H-Piles  
Total Substructure Units: 4  
Substructure Units in Water: 2  
Deepest Water Depth: 10 FT  
Water Velocity: 0 FPS  
Underwater Visibility: 0.25 FT  
Water Temperature: 48 °F

## Attachments Included:

- A - Drawings
- B - ODOT FORM BR-86



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## Channel Evaluation:

The channel bottom is in good condition and is well aligned with the substructure units. Refer to Photos 3 and 4. The channel is armored with large rock. There is some moderate timber debris along the east shoreline. A jetty north of this structure protects this bridge. The channel bottom material consists of silt, sand, gravel, cobbles and trash debris.

## Scour Conditions:

There is no significant local or general scour present at the bridge site.

## Substructure Condition:

This inspection includes 30 total piles, 15 at each pile bent. The piles are covered by concrete encasements. The bridge is inventoried from West to East. The piles at the West Pile Bent (Bent 1) and the East Pile Bent (Bent 2) are numbered from left to right when facing upstation (East).

The piles have light to moderate scale, typically 1/8" D and up to 1/4" D. There is light algae growth below the waterline.

The following piles have hollow sounding, soft, concrete encasements in the splash zone, in the outer inch of the encasement, starting 5' above the channel bottom and extending 1' above the waterline: B1P11 through P14, and B2P4 and B2P7 through B2P15. Refer to Photos 5 and 6.

(B=Bent/P=Pile)

B2P4 has a spall in the concrete encasement at a cold joint, 3' H x full circumference of the concrete encasement x 3" D, with two (2) pieces of exposed vertical and two (2) pieces of horizontal reinforcement in the north quadrant, and one (1) piece of exposed horizontal reinforcement in the south quadrant, starting 4' above the channel bottom. The vertical steel is exposed up to 1'-6" high, and the horizontal piece is exposed up to 1'-8" long. The exposed steel is in good condition, with light surface corrosion. Refer to Photo 7.

B2P11 has random spalls up to 2"D, with efflorescence, starting 6' below the top of the concrete encasement, extending down to the channel bottom. The largest of these spalls is 3" H x 1' W x 2" D, 1' above the channel bottom at the south quadrant. The concrete encasement has one (1) piece of exposed secondary horizontal reinforcement at the south quadrant, near the waterline. The concrete at the waterline is soft and waterlogged. Refer to Photo 8.

## Repair Recommendations:

Restore the deteriorated concrete cover to the areas of exposed reinforcement, at the spalled areas of the concrete encasements for Piles 4 and 11 at Bent 2.



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**Photo 1 - Downstream (North) Fascia Looking South**



**Photo 2 - Typical Bent Configuration, Bent 1**



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**Photo 3 - Channel View Looking Upstream (South)**



**Photo 4 - Channel View Looking Downstream (North)**



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Photo 5 - Bent 1, Pile 14, Typical Condition of Concrete at Hollow Sounding Area



Photo 6 - Bent 2, Pile 9, Typical Area of Hollow Sounding Concrete



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Photo 7 - Bent 2, Pile 4, Spall with Exposed Reinforcement in the Concrete Encasement

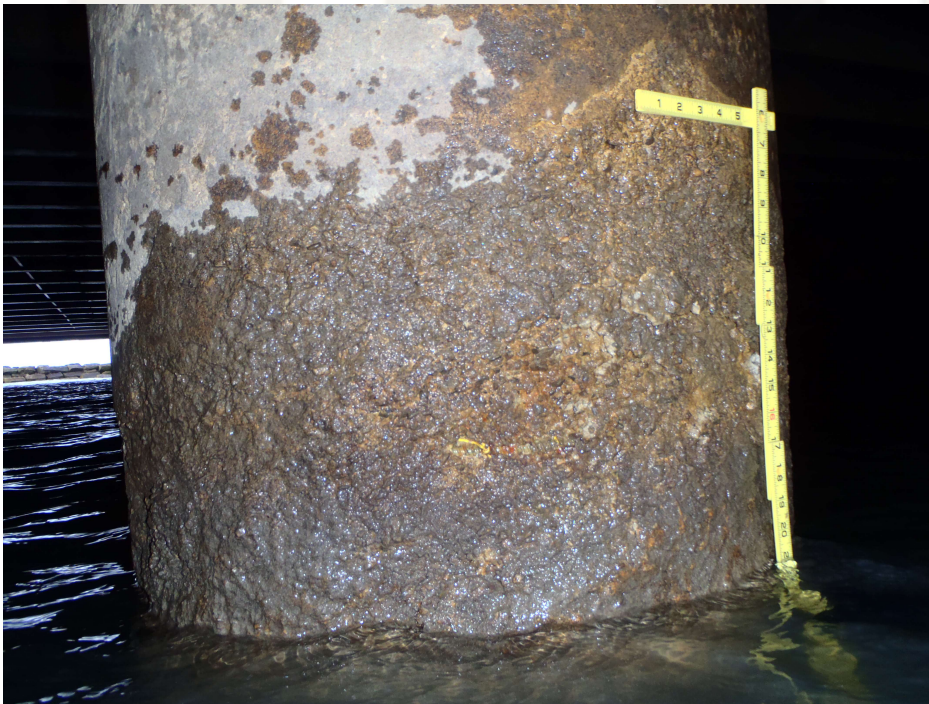


Photo 8 - Bent 2, Pile 11, Condition of Pile



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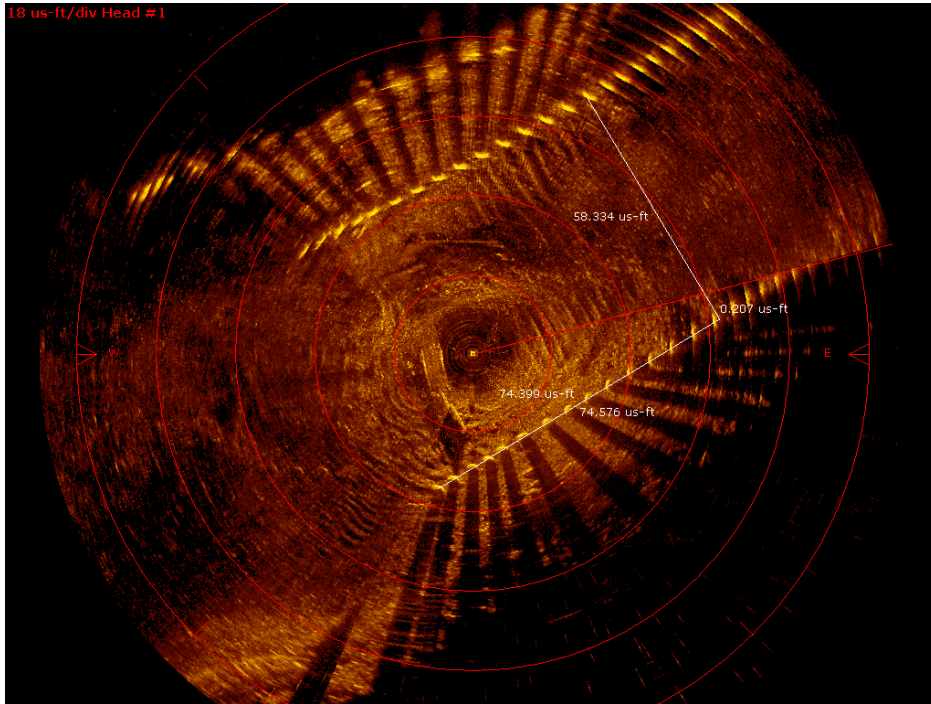


Photo 9 - Span 2, Sonar Image of Channel Bottom at 90' Radius

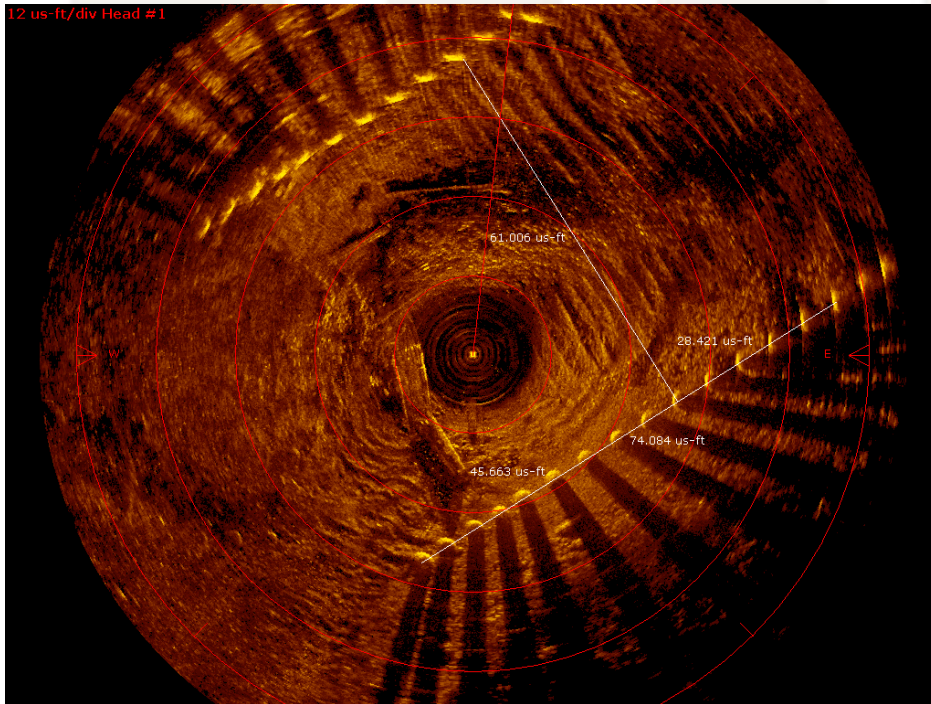


Photo 10 - Span 2, Sonar Image of Channel Bottom at 60' Radius



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## INSPECTION SOUNDING DATA

Station	(L)	(R)
Span 1, 1/2	0.00	0.00
Span 1, 3/4	565.14	565.04
Bent 1	564.84	564.24
Span 2, 1/4	563.64	561.94
Spans 2, 1/2	562.64	560.84
Spans 2, 3/4	562.84	561.04
Bent 2	564.64	563.74
Span 3, 1/4	567.54	567.24
Span 3, 1/2	0.00	569.67

All sounding data is presented in elevations referenced to the construction plans. If plans were not provided, a reference datum of 100.00 was used.

At the time of the inspection, the waterline was located at ELEV 570.34

A measurement of 0.00 reflects the channel bank at this location.

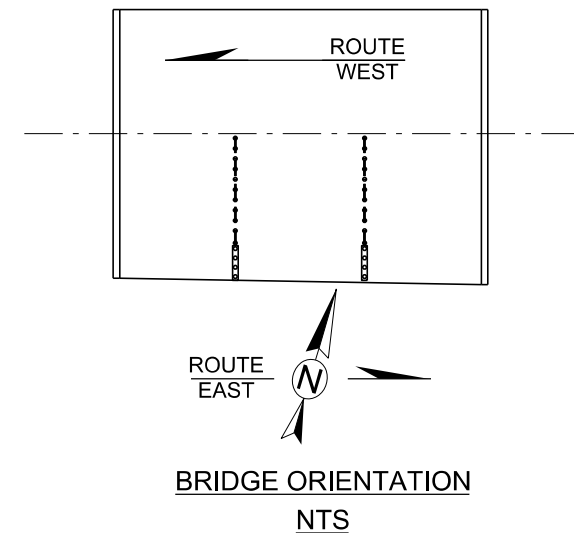
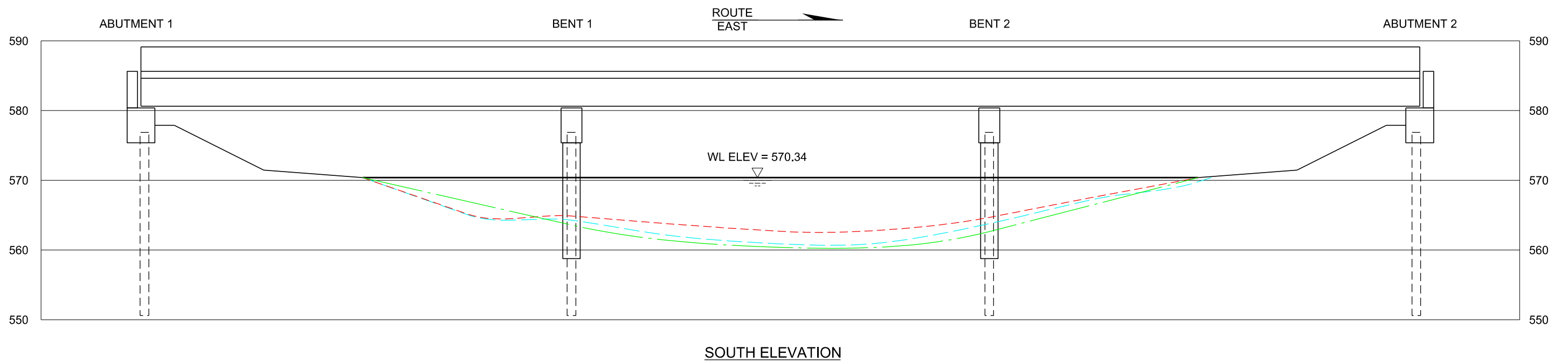


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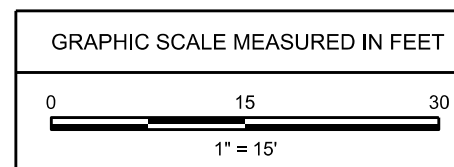




CHANNEL PROFILE LEGEND	
ORIGINAL	
2012 - UPSTREAM FASCIA	
2012 - DOWNSTREAM FASCIA	

**GENERAL NOTES:**

1. AT THE TIME OF INSPECTION ON 12-05-2012, THE WATERLINE ELEVATION WAS 570.34 FT, BASED ON THE DATA TAKEN FROM THE U.S.G.S. MONITORING STATION.
2. REFER TO THE INSPECTION SOUNDING DATA FOR DETAILED CHANNEL BOTTOM ELEVATIONS.

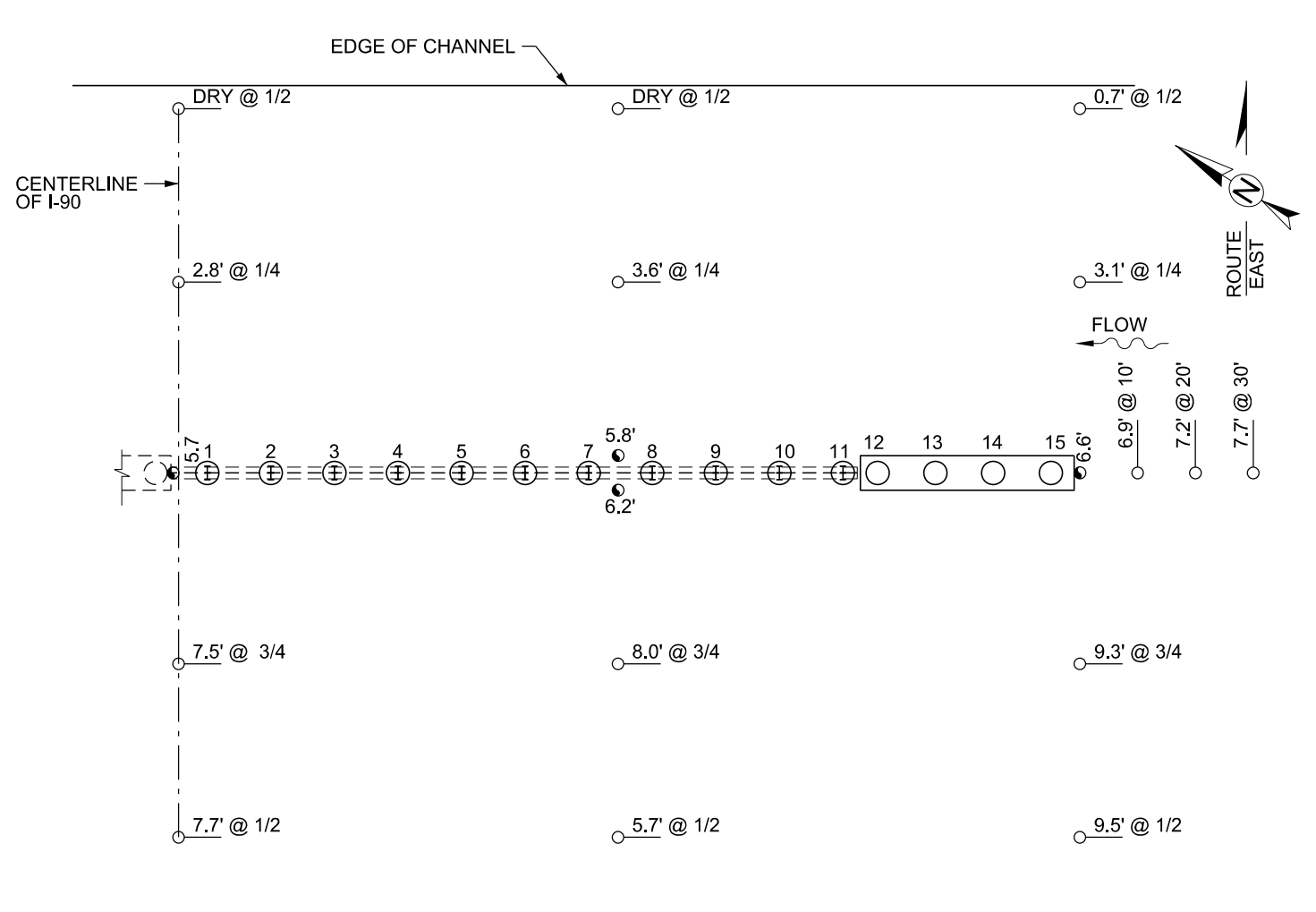
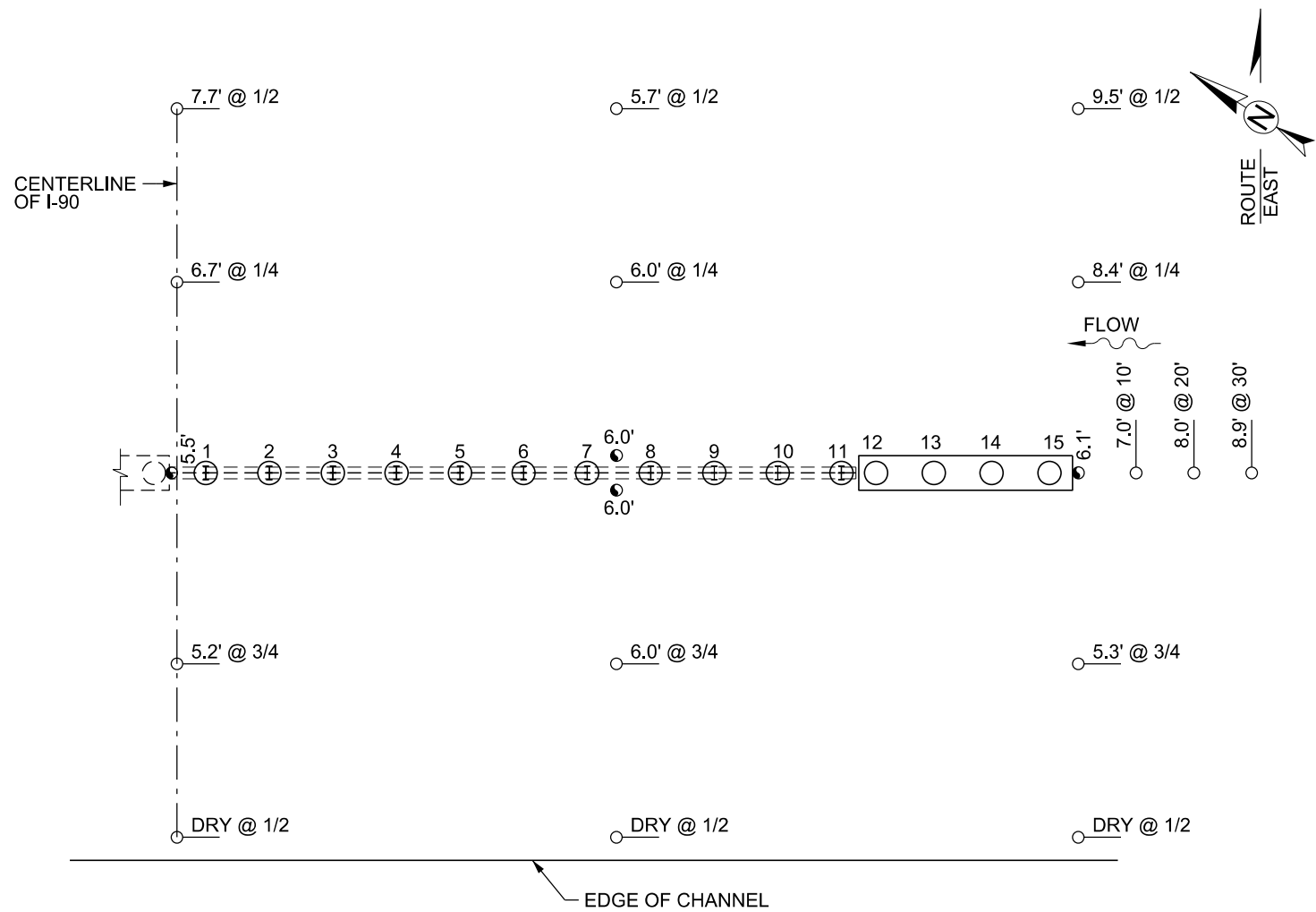
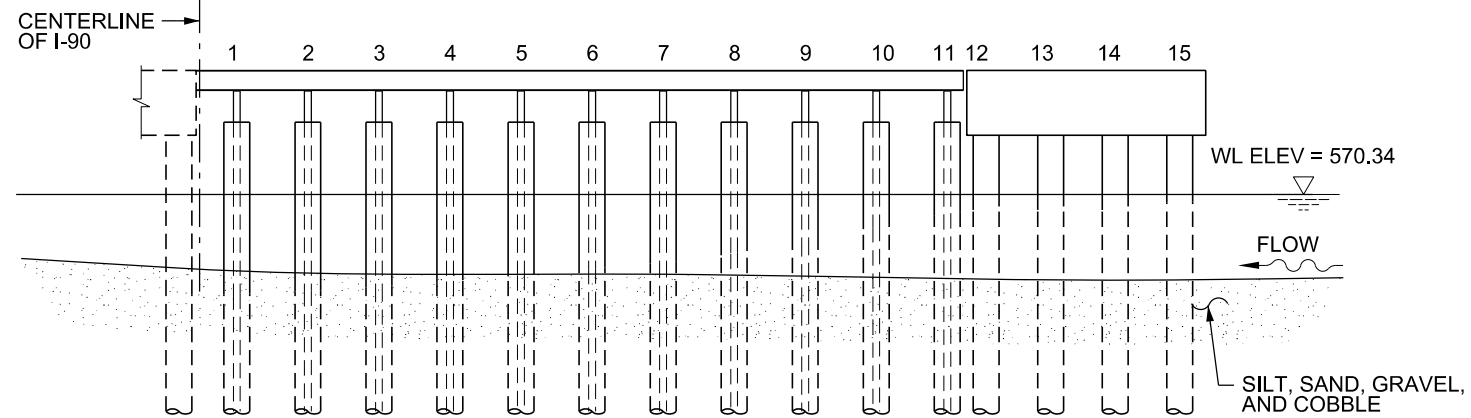
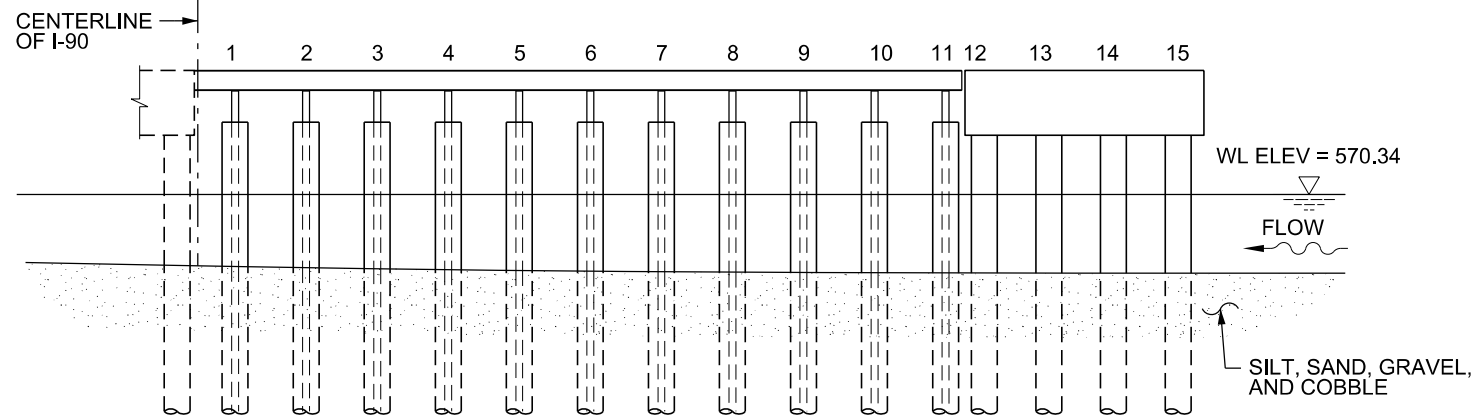


DATE  
DEC, 2012

200 East Campus View Blvd.  
Suite 200  
Columbus, Ohio 43235  
PH: 614.310.3048

**INFRASTRUCTURE  
ENGINEERS, INC.**

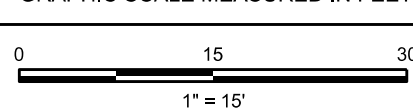
I-90 OVER C.E.I. OUTLET BRIDGE NO. CUY-00090-2043R	
PROFILE SHEET	PAGE A-1



**LEGEND:**

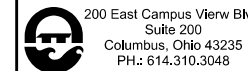
- 7.1' SOUNDING LOCATION AND DEPTH AT PIER
- 2.0' @ 20' SOUNDING LOCATION AND DEPTH AT OFFSET DISTANCE OR FRACTION OF SPAN

GRAPHIC SCALE MEASURED IN FEET



DATE

DEC, 2012



INFRASTRUCTURE ENGINEERS, INC.

I-90 OVER C.E.I. OUTLET  
BRIDGE NO. CUY-00090-2043R

BENTS 1 AND 2

OHIO DEPARTMENT OF TRANSPORTATION

**BRIDGE INSPECTION REPORT**

1	8	0	8	7	4	5
---	---	---	---	---	---	---

STRUCTURE FILE NUMBER

C	U	Y
CO		

0	0	9	0
ROUTE			

2	0	4	3	R
UNIT				

YEAR BUILT 1 9 3 8

DIST 1 2 BRIDGE TYPE \_\_\_\_\_ CO 3 2 2 TYPE OF SERVICE 1 5 C E I Outlet Channel \_\_\_\_\_

DECK

1. Floor		2. Wearing Surface	
3. Curbs, Sidewalks & Walkways		4. Median	
5. Railing		6. Drainage	
7. Expansion Joints		<b>8. SUMMARY</b>	

SUPERSTRUCTURE

9. Alignment of Members		10. Beams/Girders/Slab	
11. Diaphragms or Cross frames		12. Joists/Stringers	
13. Floorbeams		14. Floorbeam Connections	
15. Verticals		16. Diagonals	
17. End posts		18. Upper Chord	
19. Lower Chord		20. Gusset Plates	
21. Lateral Bracing		22. Sway Bracing	
23. Portals		24. Bearing Devices	
25. Arch		26. Arch Columns or Hangers	
27. Spandrel Walls		<b>28. Protective Coating System (PCS)</b>	
29. Pins/Hangers/Hinges		30. Fatigue Prone Detail (E & E')	
31. Live Load Response ( <i>E or S</i> )		<b>32. SUMMARY</b>	

SUBSTRUCTURE

33. Abutments		34. Abutment Seats	
35. Piers	2	36. Pier Seats	
37. Backwalls		38. Wingwalls	
39. Fenders and Dolphins		40. Scour ( <i>Insp Type - 1, 2, 3</i> )	3 1
41. Slope Protection	1	<b>42. SUMMARY</b>	6

CULVERT

43. General		44. Alignment	
45. Shape		46. Seams	
47. Headwall or Endwalls		48. Scour ( <i>Insp Type - 1,2,3</i> )	
49. Abutments		<b>50. SUMMARY</b>	

CHANNEL

51. Alignment	1	52. Protection	1
53. Hydraulic Opening	1	<b>54. SUMMARY</b>	7

APPROACHES

55. Pavement		56. Approach Slabs	
57. Guardrail		58. Relief Joint	
59. Embankment		<b>60. SUMMARY</b>	

GENERAL

61. Navigation Lights		62. Warning Signs	
63. Sign Supports		64. Utilities	
65. Vertical Clearance ( <i>1, 2-change, N</i> )		66. <b>General Appraisal &amp; Operational Status</b>	

67. Inspected By, First & Last Name

F	R	E	D	E	R	I	C	K				
M	E	E	K									

PE Number					

68. Reviewed By, First & Last Name

D	A	V	I	D							
R	E	S	E	R							

	7	3	8	7	8
PE Number					

Date 1 2 1 1 1 2

\_\_\_\_\_

Date \_\_\_\_\_

69. Survey (1, 0, N)