

BRIDGE INSPECTION REPORT

1806564  
Structure File Number

BRIDGE NUMBER CUY 00077 1318

YEAR BUILT 1914

DIST 12 Bridge Type 095 TYPE SERVICE 1 5 MORGANA RUN

<b>DECK</b> out/out 0 Deck Area 1,324 sqft			N NOT APPLICABLE (CULVERT UNDER FILL ETC)	
1. FLOOR	N NONE		2. WEARING SURFACE	Thk 0
Left N NONE / Right N NONE				
3. CURBS, SIDEWALKS AND WALKWAYS			4. MEDIAN Lanes on 6	
5. RAILING	N NONE		6. DRAINAGE N NONE	
7. EXPANSION JOINTS			8. SUMMARY	
<b>SUPERSTRUCTURE</b>			1 N/A (CULVERTS, TRUSSES, ETC.)	
9. ALIGNMENT	Max Spans 11		10. BEAMS/GIRDERS/SLAB	
11. DIAPHRAGMS or CROSSFRAMES			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 N NONE	
25. ARCH			26. ARCH COLUMNS or HANGERS	
27. SPANDREL WALLS			Paint Date 1/1/1949 28. PROTECTIVE COATING SYSTEM U UNKNOWN	
29. PINS/HANGERS/HINGES			30. FATIGUE PRONE CONNECTIONS	
31. LIVE LOAD RESPONSE			32. SUMMARY	
<b>SUBSTRUCTURE</b>			N NONE	
33. ABUTMENTS	N NONE		34. ABUTMENT SEATS Abutment: NOT ON PILING	
35. PIERS			36. PIER SEATS Piers: NOT ON PILING	
37. BACKWALLS			38. WINGWALLS	
39. FENDERS and DOLPHINS		Piers = NN NN NN Spans = 1	40. SCOUR	
41. SLOPE PROTECTION		N NONE-NATURAL PROTECTION(GRA)	42. SUMMARY Dive Date 12/30/1899	
<b>CULVERTS</b>				
43. GENERAL	6 PIPE-ELLIPTICAL	2	44. ALIGNMENT 1	
45. SHAPE			46. SEAMS	
47. HEADWALLS or ENDWALLS		Culvert Length 375	Culvert Fill Depth 70	
49.			50. SUMMARY 6	
<b>CHANNEL</b>				
51. ALIGNMENT		1	52. PROTECTION N NONE	
53. WATERWAY ADEQUACY		1	54. SUMMARY 8	
<b>APPROACHES</b>				
55. PAVEMENT	2 BITUMINOUS	2	56. APPROACH SLABS	
57. GUARDRAIL	7 CONC DFLCT PARAPET	1	58. RELIEF JOINTS	
59. EMBANKMENT		1	60. SUMMARY Percent Legal = 150 6	
<b>GENERAL</b>				
61. NAVIGATION LIGHTS			62. WARNING SIGNS Maint Resp 1 OHIO TRAN DEPT	
63. SIGN SUPPORTS		Signs on = N MVC on = 9999.9 Under C = 0	64. UTILITIES	
65. VERTICAL CLEARANCE		Under NC = 0	66. GENERAL APPRAISAL & OPERATIONAL STATUS 6 A	

67. INSPECTED BY \_\_\_\_\_ 68. REVIEWED BY \_\_\_\_\_  
 \_\_\_\_\_ SIGNED PE Number INITIALS KJB 60048 MJM  
 \_\_\_\_\_ SIGNED PE Number INITIALS

## CULVERTS

GENERAL: CRACKS IN MOTAR WITH AREAS OF HEAVY EFFLORESCENCE.  
LOCALIZED AREAS OF MISSING BRICK. SEE ATTACHED  
DIVER REPORT DATED 9/25/07.

## APPROACHES

PAVEMENT: CRACKS. MINOR ASPHALT PATCHES.

## GENERAL

DEPTH OF FILL OVER STRUCTURE >50' UNDER I-77.  
CULVERT WAS NOT ENTERED IN 2008 INSPECTION.

1806564

Structural File Number

CUY-0077-1318

Bridge Number

September 25, 2007

Inspection Date

**Underwater Inspection Report for:**

**Interstate Route 77 over Morgana Run**  
Cuyahoga County, Ohio  
(Brick and Reinforced Concrete Culvert)



*General Elevation View*

**Personnel on site during inspection:**

**ODOT**

Ms. Andrea Persanyi

**Contractor**

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

**Prepared for:**

ODOT District 12  
5500 Transportation Blvd  
Garfield Heights, Ohio 44125

**Prepared by:**



Marine Solutions, Inc.  
250 Gold Rush Drive, Suite 4  
Lexington, Kentucky 40503  
Phone: (859) 260-1055  
[awilkins@MSIdiving.com](mailto:awilkins@MSIdiving.com)

**1806564**

*Structural File Number*

**CUY-0077-1318**

*Bridge Number*

**September 25, 2007**

*Inspection Date*

## **Table of Contents**

<b>Section</b>	<b>Page No.</b>
1. Introduction.....	1
2. Description of Structure .....	1
3. Inspection Procedure.....	1
4. Observed Conditions .....	1
5. Conclusions.....	2

## **List of Appendixes**

### **Appendix**

- Appendix A Photographs
- Appendix B Figures
- Appendix C Confined Space Entry Permit

## 1. Introduction

Marine Solutions, Inc (MSI) conducted a routine underwater inspection of the CUY-00077-1318 Culvert over Morgana Run 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

Culvert Number CUY-00077-1318 (SFN 1806564) carries Interstate 77 over Morgana Run in the City of Cleveland, Cuyahoga County, Ohio. The total length of the culvert was unknown at the time of inspection. The culvert was built in 1914. The area inspected was between two manholes, one located at East 49<sup>th</sup> street and the other located on Mittal Steel Property. The distance between the manholes measures approximately 375 feet. The culvert is constructed out of concrete at the Mittal steel entry manhole and transitions to brick within 50 feet east of the ladder of the Mittal steel manhole. The remaining structure consists of a brick arch culvert with brick floor.

## 3. Inspection Procedure

The inspection was performed on September 25, 2007. A visual inspection was performed on the entire structure between the above mentioned manholes. The inspector entered the Mittal Steel manhole and traveled east towards the East 49<sup>th</sup> street manhole. Original plans were not available for review.

Inspection Mode: *Wading*  
Flow Direction / Velocity: *west/ < 1 knot*  
Direction of Diver / Inspector: *Entered Mittal Steel manhole, walked east to 49<sup>th</sup> Street manhole..*  
Channel Bottom: *Clay tile and brick.*  
Scour Checked By: *N/A*  
Equipment Used: *Superlite 37 Helmet with hardwire communication to surface, wet suit, gas meter, rope, digital camera, survey rod, lights*  
Elements Cleaned: *None*  
Hydrographic Reference: *N/A*

## 4. Observed Conditions

- There is a concrete diversion weir extending the width of the culvert directly below the East 49<sup>th</sup> street entry manhole. The weir measures approximately 19 inches wide by 2 feet tall.
- The water on the east side of the weir was 13 inches deep. Whereas the water in the culvert to the west was less than 2 inches deep.
- At 370 feet from the Mittal Steel entry manhole there is a horizontal 6 inch centering beam

located 8 feet above the floor. A similar beam is located approximately 15 feet east of the diversion weir at the same elevation.

- There is a 48 inch diameter brick inflow pipe located approximately 160 feet from the Mittal Steel entry manhole on the south wall.
- There is a 4 inch diameter clay tile inflow pipeline located approximately 160 feet from the Mittal Steel entry manhole on the north wall. The pipeline is approximately 50 percent blocked with debris and sludge.
- There are several areas of water penetration from the top of the culvert with areas of efflorescence.
- The concrete around the East 49th Street Manhole entry ladder had up to 2 inches of deep scaling. The ladder rungs were in poor condition.
- There is a vertical hairline crack in the center of the diversion weir.
- There is approximately 2 inches of deflection in the horizontal steel beam located near the diversion weir. There are several patches in the location of the horizontal steel beam.
- The brick walls have been patched in the areas where the beam is located.
- There is a horizontal crack between the mortar joints of the bricks. The crack moves up and down in elevation through the joints.
- There is an area (3 square feet) of missing brick on the south wall 240 feet from the Mittal Steel entry manhole.

## **5. Conclusions**

The condition of the culvert during the 2007 inspection was consistent with that of the 2006 inspection report. Both inspections noted prevalent horizontal cracking with infiltration and efflorescence.

Appendix A  
Photographs



Photo by D. Wilkins 09/25/07

Photo 1. Mittal Street manhole.



Photo by D. Wilkins 09/25/07

Photo 2. Culvert tile floor.





Photo by D. Wilkins 09/25/07

Photo 3. Mittal Street manhole entrance ladder.



Photo by D. Wilkins 09/25/07

Photo 4. Typical brick culvert wall.



Photo by D. Wilkins 09/25/07

Photo 5. Culvert brick roof.



Photo by D. Wilkins 09/25/07

Photo 6. Concrete weir.





Photo by D. Wilkins 09/25/07

Photo 7. Drain just upstream of concrete weir.



Photo by D. Wilkins 09/25/07

Photo 8. Horizontal steel beam.



Photo by D. Wilkins 09/25/07

Photo 9. 49<sup>th</sup> Street manhole entrance ladder.



Photo by D. Wilkins 09/25/07

Photo 10. Brick roof and horizontal beam.





Photo by D. Wilkins 09/25/07

Photo 11. Missing mortar between bricks.



Photo by D. Wilkins 09/25/07

Photo 12. Joint between brick and concrete portion of the culvert.

**1806564**

*Structural File Number*

**CUY-0077-1318**

*Bridge Number*

**September 25, 2007**

*Inspection Date*

**Underwater Inspection Report for:**

**Interstate Route 77 over Morgana Run**  
Cuyahoga County, Ohio  
(Brick and Reinforced Concrete Culvert)



*General Elevation View*

**Personnel on site during inspection:**

**ODOT**

Ms. Andrea Persanyi

**Contractor**

Mr. Don W. Wilkins (Primary Diver/ Supervisor)

Mr. Chris J. Kupper (Backup Diver/ Inspector)

Mr. James A. Ritchie (Backup Diver/ Inspector)

Mr. Brian B. Butler (Tender)

**Prepared for:**

ODOT District 12

5500 Transportation Blvd

Garfield Heights, Ohio 44125

**Prepared by:**



Marine Solutions, Inc.

250 Gold Rush Drive, Suite 4

Lexington, Kentucky 40503

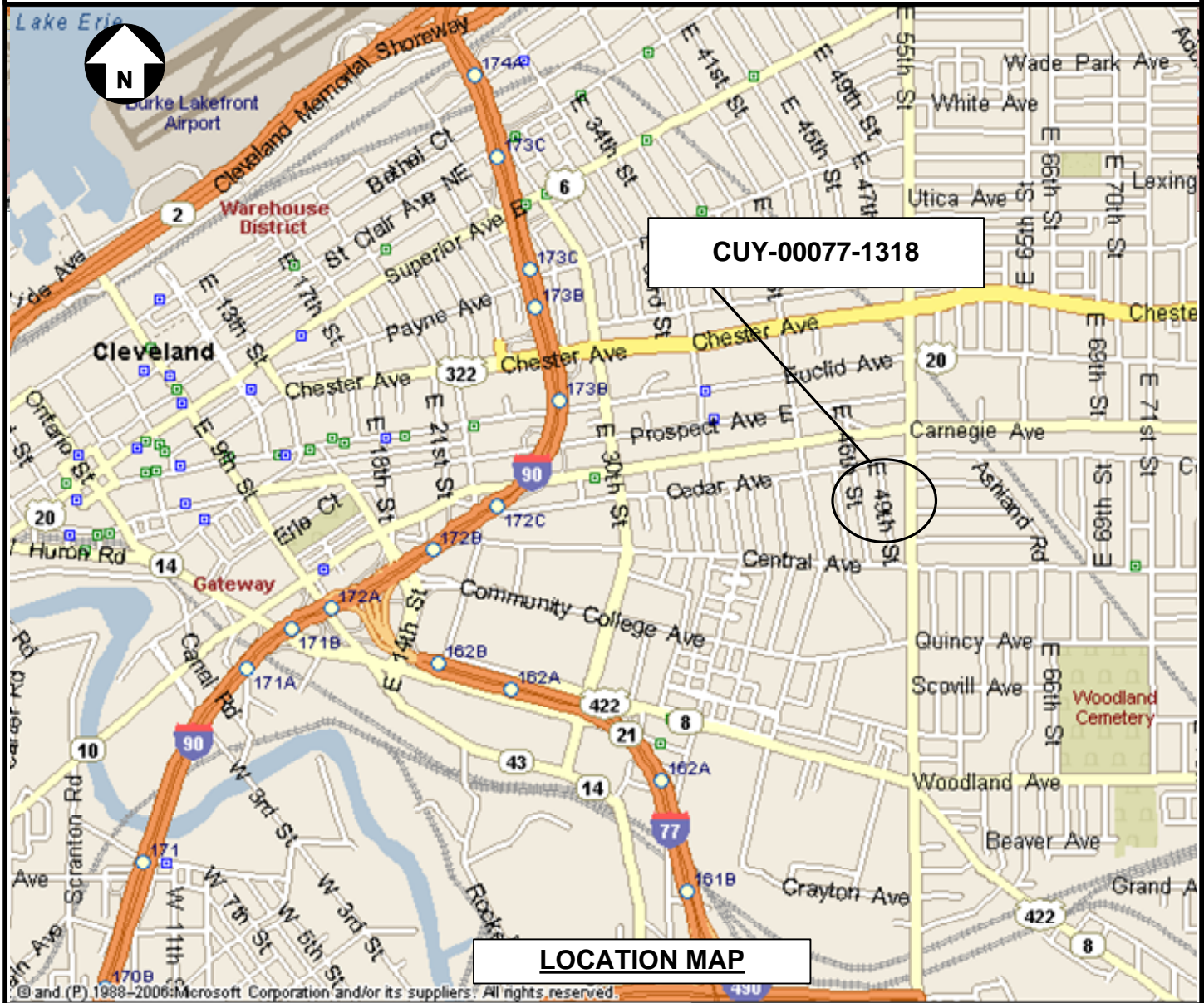
Phone: (859) 260-1055

[awilkins@MSIdiving.com](mailto:awilkins@MSIdiving.com)

Appendix B

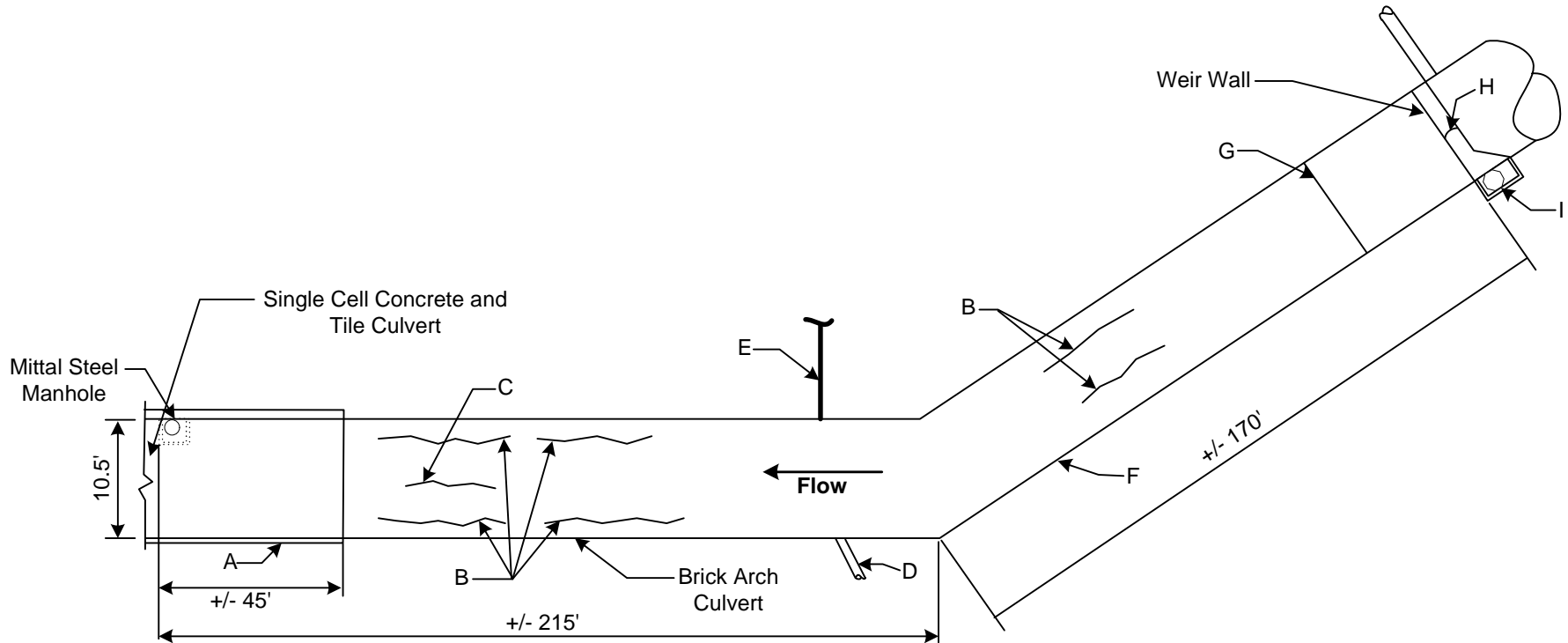
Figures





GRAPHIC SCALE: <b>Not To Scale</b>		PROJECT: ODOT District 12 2007 Underwater Bridge Inspections	
INSPECTION DATE: September 25, 2007		SHEET: <b>CUY-0077-1318</b> Cuyahoga County Ohio	PAGE NO.: <b>B-1</b>
DRAWN BY: DW	CKD. BY: ANW		FIG. NO.:
MSI JOB NO.: <b>MSI2007008</b>		Location Map	1
FILE NAME: CUY-0077-1318 Location Map			





**Legend:**

- A. Jagged Transition with isolated areas of missing brick.
- B. Horizontal cracking with water infiltration.
- C. Water infiltration near the peak of the arch.
- D. 48" diameter brick inflow pipeline.
- E. 4" diameter clay inflow pipeline.
- F. Area of missing brick ~3 sq.ft.
- G. 6" steel cambering beam.
- H. Weir wall with hairline vertical through crack.
- I. East 49<sup>th</sup> Street Manhole.



GRAPHIC SCALE:  
**Not to Scale**

INSPECTION DATE: **October 25, 2007**

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

FMSM JOB NO.: **MSI2007008**

FILE NAME: **CUY-0007701318 - Plan**

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

SHEET: **CUY-00077-1318  
I77 over Morgana Run  
City of Cleveland**

**Substructure Plan View**

PAGE NO.:  
**B-2**

FIG. NO.:  
**2**

## Appendix C

### Confined Space Entry Permit



# Confined Space Entry Permit

Permit space to be entered: CUY-00077-1318

Purpose of entry: Culvert Inspection

Date of entry: 09/25/2007 Duration of entry permit: 55 minutes

Authorized entrants: Don Wilkins and Andrew Richie

Attendants: Brian Butler

Entry supervisor: Chris Kupper Time: 8:40 am

Record hazards of the space to be entered.

Hazard	Yes	No	N/A
A. Lack of Oxygen	X		
B. Combustible Gases		X	
C. Combustible Vapors		X	
D. Combustible Dust		X	
E. Toxic Gases	X		
F. Toxic Vapors		X	
G. Chemical Contact	X		
H. Electrical Hazards		X	
I. Mechanical Exposure		X	
J. Temperature		X	
K. Engulfment	X		
L. Entrapment		X	
M. Others		X	

Check or list the measures used to isolate and/or eliminate or control permit space hazards before entry.

- |   |   |
|---|---|
| <u>        </u> A. Purge-Flush and Vent | <u>        </u> E. Blanking, Blocking, Bleeding |
| <u>        </u> B. Ventilation          | <u>        </u> F. External Barricades          |
| <u>        </u> C. Lockout/Tag Out      | <u>        </u> G. Confined Space ID Signs      |
| <u>        </u> D. Inerting             |   |

Comments: Continuous monitoring for O@, LEL, H2S, CO

**This Permit to be kept at Job Site.  
Return to Safety Office following job completion.**

Tests to be taken.	Permissible entry levels	Test #1	Test #2
A. Oxygen %	19.5 - 23.5	20.9 @ 8:35am	20.6 @ 9:10am
B. Explosive % L.E.L.	< 10%	0 @ 8:35am	0 @ 8:35am
C. Toxic PPM	<10 PPM	0 @ 8:35am	0 @ 8:35am
D.			
E.			

Name of Tester: Don Wilkins

Test Times: 8:35 am, 8:50am, 9:10 am

**Rescue and Emergency Services Available:**

*Fire Department - Phone 911*

**Equipment Supplied to Employee:**

Gas Test and Monitoring  X       Ventilating             Lighting  X

**Communication:**

Voice  X       Radio  X       Hand Signals  X       Other      

**Personal Protective Equipment**

Safety Harness	<u>      </u>	Face	<u>      </u>	Eye	<u>      </u>
Respiratory	<u>      </u>	Hand	<u> X </u>	Ear	<u>      </u>
Hard Hats	<u> X </u>	Foot	<u> X </u>	Clothing	<u> X </u>

**Barriers/Shields**

Pedestrian             Vehicle      

Other safety equipment: Drysuit

Additional permits:      

This Confined Space Entry Permit has been Cancelled:

By: Chris Kupper      Time: 9:20am

Date: 09/25/2007