

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

DECK 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	
SUPERSTRUCTURE			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			28. PROTECTIVE COATING SYSTEM Paint Date 1/1/1982 3 PAINT SYSTEM A	
29. PINS/HANGERS/HINGES			30. FATIGUE PRONE CONNECTIONS	
31. LIVE LOAD RESPONSE			32. SUMMARY	
SUBSTRUCTURE			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	
CULVERTS				
43. GENERAL	6 PIPE-ELLIPTICAL	2	44. ALIGNMENT	
45. SHAPE			46. SEAMS	
47. HEADWALLS or ENDWALLS Culvert Length 375			48. SCOUR Culvert Fill Depth 70	
49.			50. SUMMARY	
CHANNEL				
51. ALIGNMENT		1	52. PROTECTION X N/A	
53. WATERWAY ADEQUACY 5 (SEE CODING GUIDE)		1	54. SUMMARY	
APPROACHES				
55. PAVEMENT	2 BITUMINOUS	1	56. APPROACH SLABS	
57. GUARDRAIL	7 CONC DFLCT PARAPET	1	58. RELIEF JOINTS	
59. EMBANKMENT		1	60. SUMMARY Percent Legal = 150	
GENERAL				
61. NAVIGATION LIGHTS			62. WARNING SIGNS Maint Resp 4 CITY/LOCAL	
63. SIGN SUPPORTS Signs on = N MVC on = 9999.9 Under C = 0			64. UTILITIES	
65. VERTICAL CLEARANCE Under NC = 0		N	66. GENERAL APPRAISAL & OPERATIONAL STATUS	

67. INSPECTED BY _____ 68. REVIEWED BY _____
SIGNED _____ PE Number _____ INITIALS _____ SIGNED _____ PE Number _____ INITIALS _____

CULVERTS

GENERAL: CRACKS IN MOTAR WITH AREAS OF HEAVY EFFLORESCENCE.

LOCALIZED AREAS OF MISSING BRICK. SEE ATTACHED

DIVER REPORT DATED 10/25/06.

GENERAL

DEPTH OF FILL OVER STRUCTURE >50' UNDER I-77.

Inspection Report for:

Interstate Route 77 over Morgana Run, City of Cleveland
(Brick and Reinforced Concrete Culvert)

Contractor personnel on site during inspection:

1. Mr. Travis M. Clower, P.E. (Entrant / Inspector)
2. Mr. Mark A. Suchan (Attendant)
3. Mr. John L. Clower (Tender / Supervisor)

ODOT personnel on site during inspection:

1. Mr. Mike Sutak



General View of Culvert



Location Map

Prepared for:

ODOT District 12
5500 Transportation Blvd
Garfield Heights, Ohio 44125



Prepared by:

KCI Associates of Ohio
39 East Market Street, Suite 404
Akron, Ohio 44308
Phone: (330) 375-9455
dgonano@kci.com



DESCRIPTION

Culvert Number CUY-77-1318 (SFN 1806564) carries Interstate Route 77 over Morgana Run in Cleveland, Ohio. The culvert was built in 1914. The area that was inspected is from a manhole at East 49th Street west to the next manhole under Mittal Steel property. For reporting purposes and numbering conventions, ODOT's Bridge Component Nomenclature System will be used with the Direction of Survey as North.

INSPECTION OPERATIONS

The culvert inspection was performed on 10/25/06. The previous underwater inspection report dated 10/12/05 was available for comparison. A visual inspection was performed on the entire structure between the two manholes mentioned above. The entrant entered the Mittal Steel Manhole and traveled east. At the 49th Street Manhole the entrant turned back west reporting findings and taking photos on the return trip.

Hazards Encountered:	<i>Confined Space; Septic conditions; Slippery Ladder at Mittal Steel manhole</i>
Inspection Mode:	<i>Walking</i>
Flow Direction / Velocity:	<i>West / minimal flow</i>
Direction of Diver / Inspector:	<i>Entered Mittal Steel manhole, walked east to 49th Street manhole and began reporting inspection results on return trip west.</i>
Culvert Bottom:	<i>Brick; Tile</i>
Scour Checked By:	<i>N/A</i>
Equipment Used:	<i>Superlite Helmet with hardwire communication to surface, dry suit, digital camera, gas monitor, rope, tripod, winch, harness, lights</i>
Elements Cleaned:	<i>None</i>
Hydrographic Reference:	<i>N/A</i>

OBSERVATIONS (STARTING AT THE 49TH STREET MANHOLE)

- The access hole below the 49th Street manhole is a six-sided concrete structure located on the start (south) wall with ladder rungs mounted to one side (*See Photo 1*). This location was measured to be 385' from the Mittal Steel entry manhole.
- Traveling west is a 3 course, teardrop-shaped, red brick arched culvert with a curved brick floor. The change from concrete to brick is smooth. Areas of missing brick have been filled in with concrete.



- Directly below the 49th Street access point is a full width concrete diversion weir with dimensions of 19" thick x 24" high.
- The water on the east side of the weir was 13" deep. Whereas the water in the culvert to the west was less than 1/2" deep.
- At 370' from the Mittal Steel entry manhole is a horizontal 6" centering beam located 8' above the floor.
- A similar beam is located approximately 15' east of the diversion weir at the same elevation.
- Facing west at 215' from the Mittal Steel entry manhole the culvert makes approximately a 35-degree bend to the right. This view is shown in *Photo 8*.
- At 160' from the Mittal Steel entry manhole on the start (south) wall, is a 48" diameter brick pipe. The pipe, shown in *Photo 9*, is approximately 36" above the floor.
- At 160' from the Mittal Steel entry manhole on the finish (north) wall, is a 4" diameter clay tile pipe. The pipe, shown in *Photo 10*, is approximately 6' above the floor and 50% blocked by sludge and debris.
- The culvert transitions from the red brick teardrop shape to a rectangle concrete and tile culvert section at 45' from the Mittal Steel entry manhole.
- No loose bricks or concrete debris was found on the floor of the entire culvert.

DEFECTS & DEFICIENCIES (STARTING AT THE 49TH STREET MANHOLE)

- The concrete around the 49th Street Manhole entry ladder had up to 1/2" deep scaling. The ladder rungs were in poor condition.
- The diversion weir located below the 49th Street Manhole has a hairline vertical through crack at the center. *Photos 2 and 4* show this crack.
- The horizontal 6" centering beam located 370' from the Mittal Steel entry manhole has a 2" deflection (*See Photo 5*).
- The brick walls have been patched in the areas where the beam is located. *Photo #6* shows missing brick, patching and heavy efflorescence around the beam penetration on the finish (north) wall.
- A semi-continuous 1/2" horizontal crack is located in the mortar joint between brick at approximately 8' above the floor on the finish (north) wall. The horizontal crack jumps mortar joints as it extends west causing it to change elevation randomly from 7' to 9' above the floor. The crack is likely a construction joint related to where the culvert centering supports were changed or removed to finish the top of the teardrop shape. Water is actively seeping from these mortar joints and efflorescence is present. These conditions exist intermittently on both walls throughout the entire culvert (*See Photos 7, 11 and 12*).
- There is a 3 square feet area of missing brick on the start (south) wall at 240' from the Mittal Steel entry manhole.
- There is an area of infiltration at the peak of the arch leaking water into the culvert 85' from the Mittal Steel entry manhole.



- Unlike the east end of the brick section, the transition from brick to concrete at this west end is not smooth. *Photos 10, 11 and 12* show this jagged transition with random missing brick.
- The concrete culvert above the tile had up to ¼” scaling on the concrete walls.
- The entry / exit manhole ladder rungs are offset, corroded and slippery. A tripod, winch and harness are necessary for safe extraction.

COMPARISION TO PREVIOUS REPORTING

The condition of the culvert during the 2006 inspection was consistent with that of the 10/12/2005 inspection without much apparent change. Both inspections noted prevalent horizontal cracking with infiltration and efflorescence. Both inspections also noted the jagged transition areas between the brick, tear-drop shaped culvert and the concrete & tile culvert, with random missing brick. The hairline vertical through crack on the weir wall was not previously identified. Likewise, the incoming lateral pipes and 6-inch steel centering beam were not discussed.



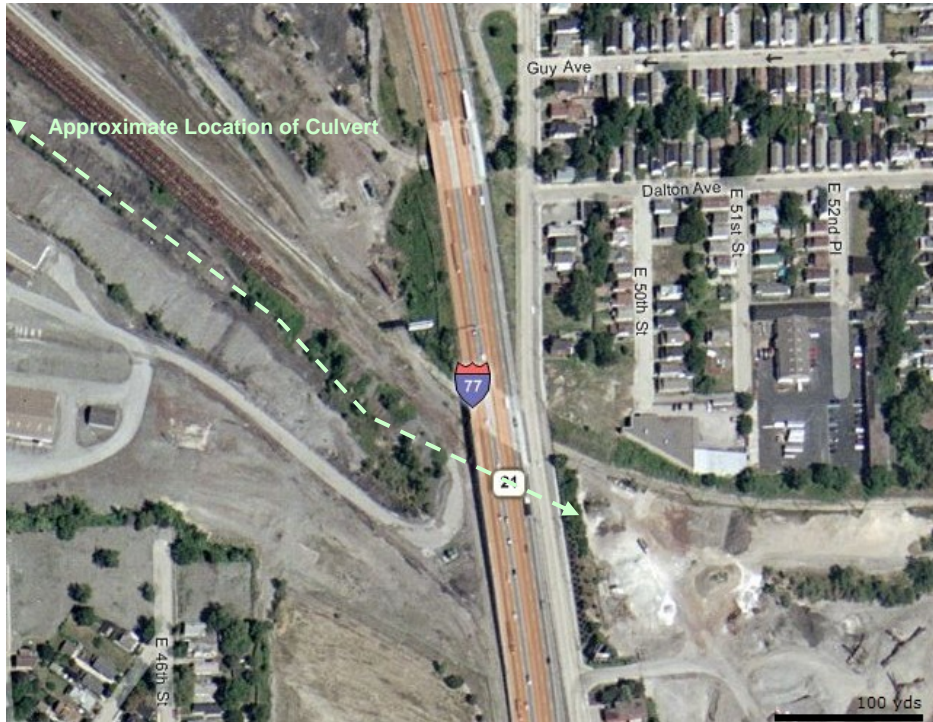


Photo by Microsoft Live Search, 11/16/2006

Aerial Photo A – Aerial photo of culvert location.



Photo by Microsoft Live Search, 11/16/06

Aerial Photo B – Aerial (Bird's Eye View) photo of culvert location, looking west.





Photo by T. Clower, 10/25/06

Photo 1 – Facing up and South. View of the 49th Street Manhole Ladder.



Photo by T. Clower, 10/25/06

Photo 2 – Facing East. Elevation view of the weir wall near 49th Street manhole.



Photo by T. Clower, 10/25/06

Photo 3 – Facing northeast. View of the diversion channel at weir wall, water exiting beneath Finish (north) wall.



Photo by T. Clower, 10/25/06

Photo 4 – Facing East. View of crack through weir wall.

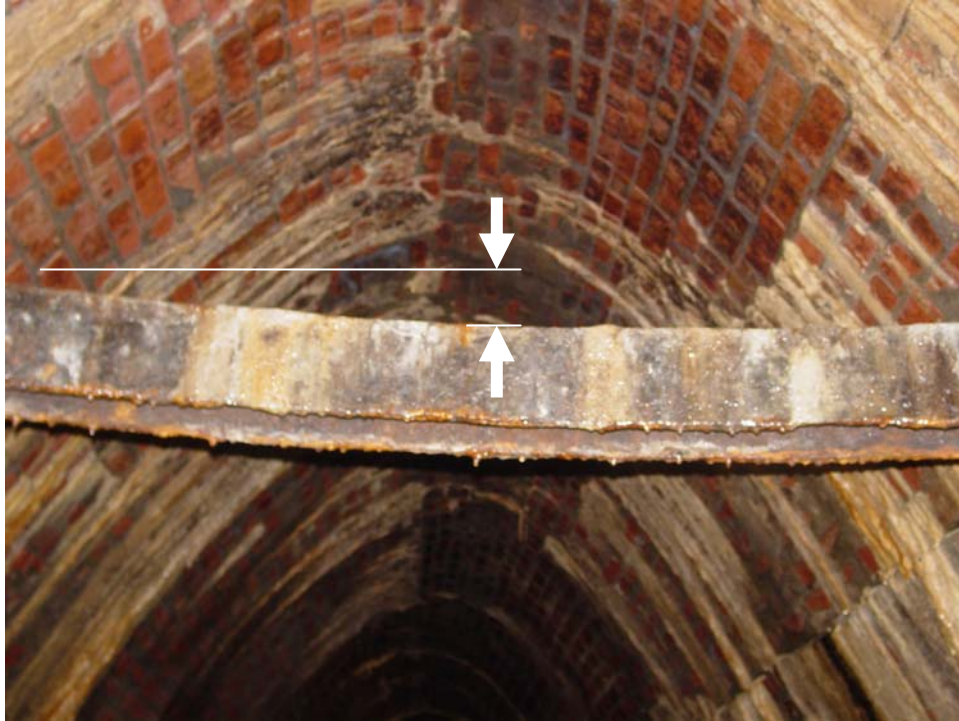


Photo by T. Clower, 10/25/06

Photo 5 – Facing West. View of 6” centering beam. Note bend or deflection (~2”).



Photo by T. Clower, 10/25/06

Photo 6 – Facing North. View of the beam/brick interface.



Photo by T. Clower, 10/25/06

Photo 7 – Facing West. Note water infiltration and heavy efflorescence along each wall.



Photo by T. Clower, 10/25/06

Photo 8 – Facing South. View of intersecting 48” diameter brick sewer.



Photo by T. Clower, 10/25/06

Photo 9 – Facing North. View of intersecting 4” diameter clay pipe drain. Note missing brick and concrete patching.



Photo by T. Clower, 10/25/06

Photo 10 – Facing Southeast. View of abutting brick and concrete culvert sections along Start (South) wall.



Photo 11 – Facing East. View of view of abutting brick and concrete culvert sections along Finish (North) wall.



Photo by T. Clower, 10/25/06

Photo 12 – Facing East. View of abutting brick and concrete culvert sections. Note line of water infiltration along horizontal cracks.



Photo by T. Clower, 10/25/06

Photo 13 – Facing East. View of concrete and tile culvert section and the Mittal Steel manhole entrance ladder. Note heavy water intrusion.

Structure File Number 1806564
Culvert Number CUY-77-1318

Inspection Date 10/25/06

CONFINED SPACE ENTRY PERMIT

Date and Time Issued: 10/25/06 10:00 hrs. Date and Time Expires: 10/25/06 11:30 hrs.

Job site/Space I.D.: Morgana Run Job Supervisor: John Clower

Equipment to be worked on: N/A Work to be performed: Inspection

Checklist:

- All personnel trained in Confined Space Entry, CPR and First Aid ()
- Communications: Hard wire communications
- Method of Egress: Walking with continuous rope to exit
- Natural Ventilation () and/or Mechanical Ventilation ()
- Is Lock Out/Tag Out and/or Weather an important issue here? (no rain)
- Is a SCBA or Surface Supplied Air being used? (Superlite 27 Helmet)
- Monitor Atmosphere (Top / Middle /Bottom) every 20 minutes
 - o Oxygen % (20.9) < 23.5% and > 19.5%
 - o Explosive % (0) < 10% Lower Flammable/Explosive Limit
 - o Toxic PPM (0) < 10 PPM H(2)S
 - o Times checked: continuous

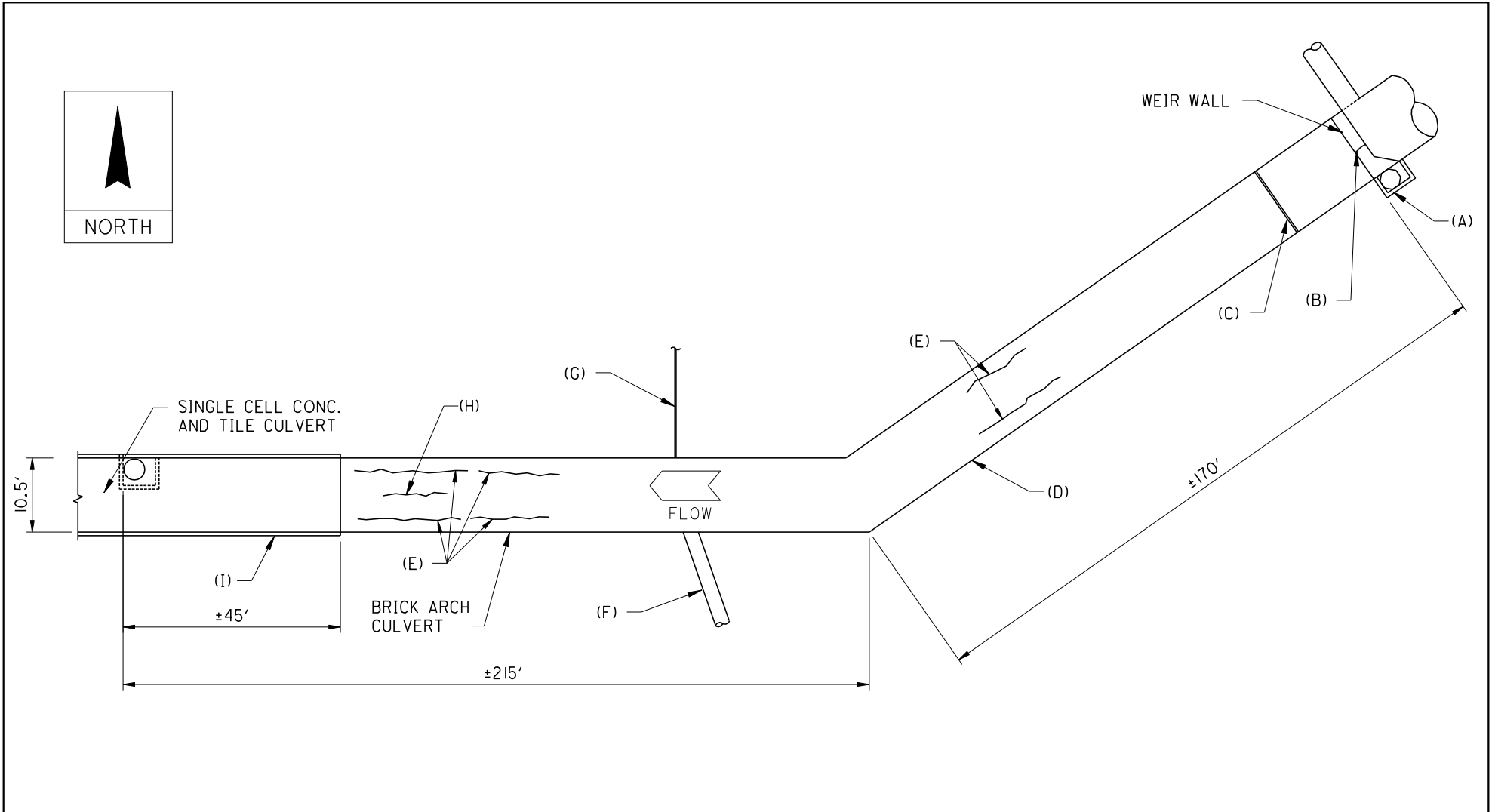
We have reviewed the work authorized by this permit and the information contained here-in. Instructions, safety and rescue procedures have been reviewed and understood.

Entrant(s) Signature: _____
Travis Clower, P.E.

Attendant(s) Signature: _____
Mark Suchan

Field Supervisor: _____
John Clower





SCHEDULE OF OBSERVATIONS AND DEFECTS:

- (A) EAST 49TH STREET MANHOLE
- (B) WEIR WALL WITH HAIRLINE VERTICAL THROUGH CRACK.
- (C) 6" STEEL CAMBERING BEAM.
- (D) 3 SQ. FT. AREA OF MISSING BRICK (FIRST LAYER).
- (E) INTERMITTENT HORIZONTAL CRACK WITH INFILTRATION.
- (F) 48" DIAMETER BRICK PIPE.
- (G) 4" DIAMETER CLAY PIPE.
- (H) INFILTRATION AT THE PEAK OF THE ARCH.
- (I) JAGGED TRANSITION WITH RANDOM MISSING BRICK.

KCI Associates of Ohio	
ODOT District 12 2006 Underwater Inspections	
Bridge No.: CUY-77-1318 (SFN: 1806564)	
I-77 OVER MORGANA RUN, CITY OF CLEVELAND	