

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			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	
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 1	
45. SHAPE			46. SEAMS	
47. HEADWALLS or ENDWALLS		Culvert Length 375	Culvert Fill Depth 70	
49.			50. SUMMARY 6	
CHANNEL				
51. ALIGNMENT	5 (SEE CODING GUIDE)	1	52. PROTECTION N NONE	
53. WATERWAY ADEQUACY		1	54. SUMMARY 8	
APPROACHES				
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	
GENERAL				
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	N	66. GENERAL APPRAISAL & OPERATIONAL STATUS 6 A
67. INSPECTED BY			68. REVIEWED BY	

SIGNED

PE Number

MJS
INITIALS

SIGNED

72336 MWB
PE Number INITIALS

DATE 10/27/2009

NNNNNNNN
SURVEY

DATE 2/2/2010

CULVERTS

GENERAL: CRACKS IN MOTAR WITH AREAS OF HEAVY EFFLORESCENCE.

LOCALIZED AREAS OF MISSING BRICK. SEE ATTACHED

DIVER REPORT DATED 10/27/09.

APPROACHES

PAVEMENT: CRACKS. MINOR ASPHALT PATCHES.

GENERAL

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

CONFINED SPACE ENTRY BY DIVER WITH LOW OXYGEN.

Inspection Report for:

Morgana Run Culvert under Interstate Route 77 below Cleveland, Ohio
(Three layer Brick and Reinforced Concrete Culvert)

KCI Personnel on site during inspection:

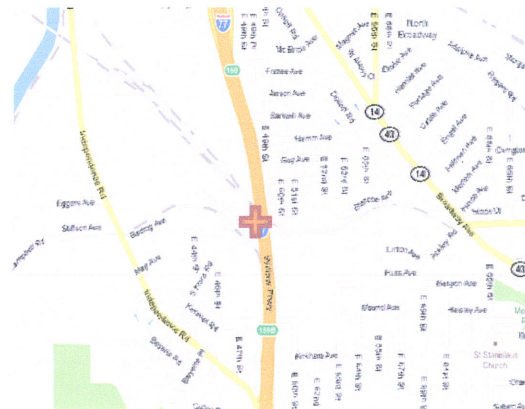
1. Mr. Travis M. Clower, P.E. (Entrant/ Inspector)
2. Mr. Mark A. Suchan, (Attendant)
3. Mr. John L. Clower (Supervisor)

ODOT Personnel on site during inspection:

1. Mr. Michael J. Sutak



General View of Brick Culvert



Location Map

Prepared for:

ODOT District 12
5500 Transportation Blvd
Garfield Heights, Ohio 44125



Prepared by:

KCI Associates of Ohio, P. A.
388 S. Main Street, Suite 401
Akron, Ohio 44311
Phone: (330) 564-9100



Travis M. Clower
12-10-09



DESCRIPTION

The Morgana Run Culvert, CUY-77-1318 (SFN 1806564) is located under Interstate 77 below Cleveland, Ohio. The teardrop-shaped, three layer brick culvert was constructed in 1914 and is connected on the west end to a reinforced concrete box culvert with tile floor. The area that was inspected is from a manhole at East 49th Street (on the east side of Interstate 77) to a manhole located on the Arcelor Mittal Steel property on the west side of Interstate 77.

INSPECTION OPERATIONS

KCI's three-person, OSHA certified, confined space team performed the culvert inspection on 10/27/09. This was a permit required confined space entry. A tripod, winch and harness were used for entry into the Arcelor Mittal Steel manhole on the west side of Interstate 77. Because the atmosphere contained less than 19.5% oxygen, the entrant carried his breathable air with him and wore a Superlite 27 helmet. The previous inspection report dated 10/25/06 was available for comparison. A visual inspection was performed on the entire internal structure between the two manholes mentioned above. The entrant entered the Arcelor Mittal Steel property manhole on the west side of Interstate 77. From there, he traveled east until reaching the 49th Street Manhole. At this point the inspector turned to reported findings and take photos on the return trip.

Hazards Encountered: *Difficult entrance, Permit Required Confined Space with less than 19.5% oxygen atmosphere*

Inspection Mode: *Walking*

Flow Direction / Velocity: *N/A*

Direction of Diver / Inspector: *Reported findings starting at the 49th Street Manhole on the return trip to the Arcelor Mittal Steel property manhole.*

Culvert Bottom: *Brick and Tile*

Scour Checked By: *N/A*

Equipment Used: *Superlite 27 helmet with hard wire communication to the surface, tripod, winch, gas monitor, harness, lights*

Elements Cleaned: *None*

Hydrographic Reference: *N/A*



OBSERVATIONS STARTING AT THE 49th STREET MANHOLE

GENERAL

- At 385 feet from the Arcelor Mittal Steel entry manhole is the 49th Street manhole. This six-sided concrete structure has ladder rungs mounted on one side and is located on the south wall of the culvert (see Photo 2).
- The culvert is a teardrop shape created with three layers of red brick. This shape is shown in Photos 5 and 8.
- A concrete diversion weir with dimensions 24 inches high and 19 inches thick is located directly below the 49th Street manhole.
- The 12-inch deep water on the east side of the weir wall makes a 90-degree bend and flows under the north wall. This is shown in Photos 3 and 4. There were only sporadic puddles on the west side.
- At 370 feet from the entry point, is a horizontal six inch beam located eight feet above the floor. Photos 5, 6 and 7 show the beam and the brick surrounding it. A similar beam is located 15 feet east of the weir wall at the same elevation.
- Facing west at 215 feet from the entry point, the brick culvert makes approximately a 35-degree bend northward (to the right).
- There is a 4-foot diameter brick incoming pipe on the south wall 160 feet from the entry point. Photo 9 shows this incoming pipe with a small amount of flow.
- There is a 4-inch diameter clay tile incoming pipe on the north wall at 160 feet from the entry point. It is located approximately 6 feet above the floor and is partially blocked with sludge and debris (see Photo 10).
- The culvert transitions from the red brick teardrop shape to a rectangle concrete and tile floor culvert section 45 feet from the entry point. This is shown in Photos 12, 13 and 15.



DEFECTS & DEFICIENCIES STARTING AT THE 49th STREET MANHOLE

- The concrete around the 49th Street manhole had up to ½-inch deep scaling.
- The ladder rungs at both manholes were intact but heavily corroded. Photo 2 shows the 49th Street ladder rungs and Photos 14 and 16 show the Arcelor Mittal Steel manhole ladder rungs.
- The diversion weir has a 1/16-inch wide through crack at the center. This is shown in Photo 3.
- The horizontal beam shown in Photos 5, 6 and 7 has heavy corrosion and is deflected approximately 2 inches in the center. The area where the beam penetrates the walls is patched with concrete. Both the beam condition and the surrounding concrete patchwork are similar to the conditions found during the 2006 inspection. The similar beam to the east of the weir wall does not appear to have the deflection.
- Photo 11 shows a 2-inch wide x 3-inch high hole in the first layer of brick located 5 feet off of the floor on the north wall at 150 feet east of the entry point. This small area was not noted in the previous inspection.
- Photos 5, 8, 12 and 13 show a ½-inch horizontal crack on both sides of the culvert with water infiltration and heavy efflorescence. This crack jumps mortar joints staying between 7 and 9 feet above the floor on both walls. The crack is not continuous around the culvert's 35-degree bend. There is very little infiltration in this area also.
- There is water infiltration in numerous places at the peak for the first 100 feet of the teardrop shaped culvert. Photo 12 shows this well.
- The transition between the two culvert types is not smooth at the west end. This is shown in Photo 13.
- The concrete culvert below the entry point had up to ¼-inch scaling with heavy efflorescence near the ladder rungs (Photos 14 – 16).
- The entry / exit manhole ladder rungs are offset, corroded and slippery. A tripod, winch and harness are necessary for safe extraction.
- No loose bricks or concrete debris was found on the floor.



COMPARISON TO PREVIOUS REPORTING AND SUMMARY

The culvert's condition has changed very little in the past three years. This inspector had the opportunity to do both the October 2006 and October 2009 inspections. The deficiencies noted above, such as the weir wall crack, beam deflection, horizontal mortar joint cracks and ladder rung corrosion remain consistent with the 2006 inspection. No significant changes to the structure have occurred in the past three years.





Aerial Photo by Google Maps

Photo 1 – Facing Down. Aerial view showing approximate location of Culvert.



Photo by T. Clower, 10/27/09

Photo 2 – Facing Southwest. 49th Street Manhole access.



Photo by T. Clower, 10/27/09

Photo 3 – Facing East. Weir Wall with 1/16-inch through crack.



Photo by T. Clower, 10/27/09

Photo 4 – Facing Northeast. Diversion Channel at the Weir Wall with water exiting beneath North Wall.



Photo by T. Clower, 10/27/09

*Photo 5 – Facing West at 370 feet from the Arcelor Mittal Steel entry point.
Steel Beam with approximate 2-inch deflection.*



Photo by J. Clower, 10/27/09

Photo 6 – Facing North. Area where the Steel Beam penetrates the brick wall.



Photo by T. Clower, 10/27/09

Photo 7 – Facing South. Area where the Steel Beam penetrates the brick wall.



Photo by T. Clower, 10/27/09

Photo 8 – Facing West at 365 feet from the Arcelor Mittal Steel entry point.
Horizontal Mortar Joint Cracks with infiltration and efflorescence.



Photo by T. Clower, 10/27/09

Photo 9 – Facing South at 160 feet from the Arcelor Mittal Steel entry point.
48-inch diameter brick incoming pipe.



Photo by T. Clower, 10/27/09

Photo 10 – Facing North at 160 feet from the Arcelor Mittal Steel entry point.
4-inch diameter incoming clay tile pipe.



Photo by T. Clower, 10/27/09

Photo 11 – Facing North at 150 feet from the Arcelor Mittal Steel entry point.
2-inch wide x 3-inch high hole in first layer of brick.



Photo by T. Clower, 10/27/09

Photo 12 – Facing West. Looking out the west end of the Brick Culvert.



Photo by T. Clower, 10/27/09

Photo 13 – Facing East. Transition from Concrete to Brick Culvert.



Photo by T. Clower, 10/27/09

Photo 14 – Facing Northwest. Arcelor Mittal Steel manhole (entry point) ladder rungs.



Photo by T. Clower, 10/27/09

Photo 15 – Facing West. Concrete and Tile Culvert.



Photo by T. Clower, 10/27/09

Photo 16 – Facing up at entry point. Note the offset in the ladder rungs.

CONFINED SPACE ENTRY PERMITDate and Time Issued: 10/27/09 14:30 hrsDate and Time Expires: 10/27/09 15:45hrsJob Site/ Space I.D.: Morgana Run Supervisor: John ClowerEquipment to be worked on: N/A Work Performed: Inspection

Checklist:

- All personnel trained in Confined Space Entry, CPR, and First Aid (yes)
- Communications: Line tended entrant with hard wire communications
- Method of Egress: Tripod, winch and harness
- Natural Ventilation: (yes) and/or Forced Ventilation ()
- Is Lock Out/Tag Out and/or Weather an Important Issue? (must have no rain)
- Is SCBA or Surface Supplied Air being used? (SCUBA tank with dive helmet)
- Monitor Atmosphere (Top, Middle, Bottom) every 20 minutes
 - Oxygen (19.4% too low) must be between 19.5 and 23.5% to breath
 - Explosive % (0%) must be < 10% LEL
 - Toxic PPM (0%) must be < 10 PPM H(2)S
 - 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 M. Clower
Travis M. Clower, P.E.

Attendant(s) Signature:

Mark A. Suchan
Mark A. Suchan

Supervisor Signature:

John L. Clower
John L. Clower



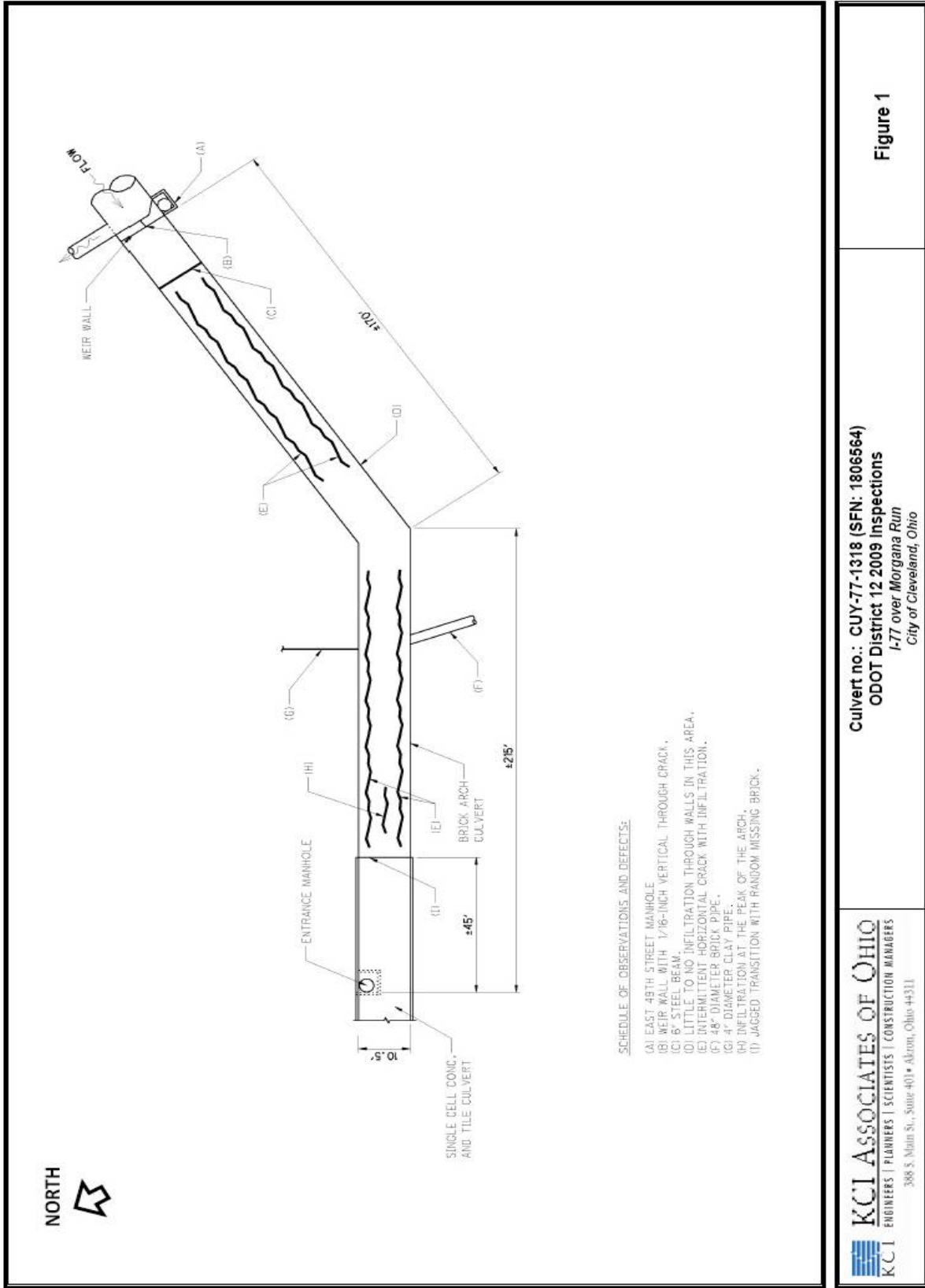


Figure 1

Culvert no.: CUY-77-1318 (SFN: 1806564)
 ODOT District 12 2009 Inspections
 I-77 over Morgana Run
 City of Cleveland, Ohio

KCI ASSOCIATES OF OHIO
 ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS
 388 S. Main St., Suite 401 • Akron, Ohio 44311

