

BRIDGE INSPECTION REPORT

2801655
Structure File NumberBRIDGE NUMBER **GEA 00422 0986 L**YEAR BUILT **1960**DIST **12** Bridge Type **322** TYPE SERVICE **1 5** **LA DUE RES. 0.71 MI E 44**

DECK	out/out 41.3 Deck Area 9,085 sqft		2 INTEGRAL CONCRETE (MONOLITHIC)	
1. FLOOR	1 REINF CONCRT (PRESTRSD, PRECAST)	1	2. WEARING SURFACE	Thk 2 Wear Date 1/1/1994 1
3. CURBS, SIDEWALKS AND WALKWAYS	Left N NONE / Right N NONE		4. MEDIAN	Lanes on 2
5. RAILING	C 32" DEFLECTOR-TYPE PARAPET (NJ)	1	6. DRAINAGE	0 OTHER-NATURAL(OFF THE BRIDGE ENDS) 1
7. EXPANSION JOINTS	3 COMPRESSION SEAL	3	8. SUMMARY	7
SUPERSTRUCTURE			4 ROLLED STEEL	
9. ALIGNMENT	Max Spans 60	1	10. BEAMS/GIRDERS/SLAB	2
11. DIAPHRAGMS or CROSSFRAMES		2	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	2 ROCKERS 3
25. ARCH			26. ARCH COLUMNS or HANGERS	
27. SPANDREL WALLS			28. PROTECTIVE COATING SYSTEM	Paint Date 1/1/1987 5 PAINT SYSTEM OZE 6
29. PINS/HANGERS/HINGES			30. FATIGUE PRONE CONNECTIONS	
31. LIVE LOAD RESPONSE		S	32. SUMMARY	6
SUBSTRUCTURE			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		1	36. PIER SEATS	5 CAPPED COLUMN Piers: ON PILING 1
37. BACKWALLS		1	38. WINGWALLS	1
39. FENDERS and DOLPHINS	Piers = 03 NN NN Spans = 4		40. SCOUR	2 1
41. SLOPE PROTECTION	3 RIP RAP (DUMPED ROCK)	1	42. SUMMARY	Dive Date 10/28/2009 7
CULVERTS				
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	
CHANNEL				
51. ALIGNMENT		1	52. PROTECTION	2 STONE 1
53. WATERWAY ADEQUACY	6 (SEE CODING GUIDE)	1	54. SUMMARY	8
APPROACHES				
55. PAVEMENT	2 BITUMINOUS	1	56. APPROACH SLABS	2
57. GUARDRAIL	1 STEEL BEAM	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

60048 YSS
PE Number INITIALS

DATE 6/17/2010

1 1 1 1 1 N N N
SURVEY

DATE 2/7/2011

DECK

FLOOR: A FEW TRANSVERSE CRACKS. FLOOR <1% DETERIORATED.
WS: CRACKS. WS <1% DETERIORATED.
RAILING: ONE SF SPALL OF INSIDE FACE OF RIGHT RAILING AT
EMBEDDED WOOD 2 BY 4 IN SPAN #2.
EXJTS: EVIDENCE OF WATER LEAKING DOWN FORWARD BACKWALL IN
BAY #3. THE EPOXY RESIN USED TO FILL THE VOID LEFT BY
THE REMOVAL OF PART OF THE FORWARD BACKWALL EXJT
ARMOR HAS CRACKED AND SOME OF THE RESIN HAS POPPED
OUT. THE DECK SIDE IS 1/2" LOWER THAN THE SLAB SIDE
AT THE FORWARD JOINT. SEE ATTACHED PHOTOS 5 & 6 DATED
11/3/09. GOUGES IN REAR EXJT BACKWALL ARMOR.

SUPERSTRUCTURE

BEAMS: RUSTED SECTION LOSS AT BOTH ABUTMENTS AND OF LOWER
FLANGE OF BEAM #6 AT PIER #1. SEE ATTACHED PHOTOS
1 - 4 DATED 8/30/06. POSSIBLE CRACK TO WEB OF BEAM 6
AT FORWARD ENDFRAME. SEE ATTACHED PHOTO 8 DATED
11/3/09.
XFRAMES: ENDFRAME RUSTING SECTION LOSS. TWO CRACKED ENDFRAME
WELDS AT FORWARD ABUTMENT, ONE AT BEAM #5 AND ONE
AT BEAM 6. SEE ATTACHED PHOTOS 7 & 8 DATED 11/3/09.
BEARINGS: RUSTED SECTION LOSS. FORWARD ABUTMENT ROCKERS #3,
#4 AND #5 ARE LOOSE.
PCS: PEELING PAINT. 5% RUST. PCS IS 5-10% DETERIORATED.

SUBSTRUCTURE

ABUTMENTS: CONCRETE PATCHES.
PIERS: TWO MINOR SPALLS. RUSTING SECTION LOSS OF STEEL AT
WATERLINE.
BACKWALLS: CRACKS. RUST STAINS.
SCOUR: SEE ATTACHED DIVE REPORT DATED 10/28/09. NO CHANGE IN
2010.

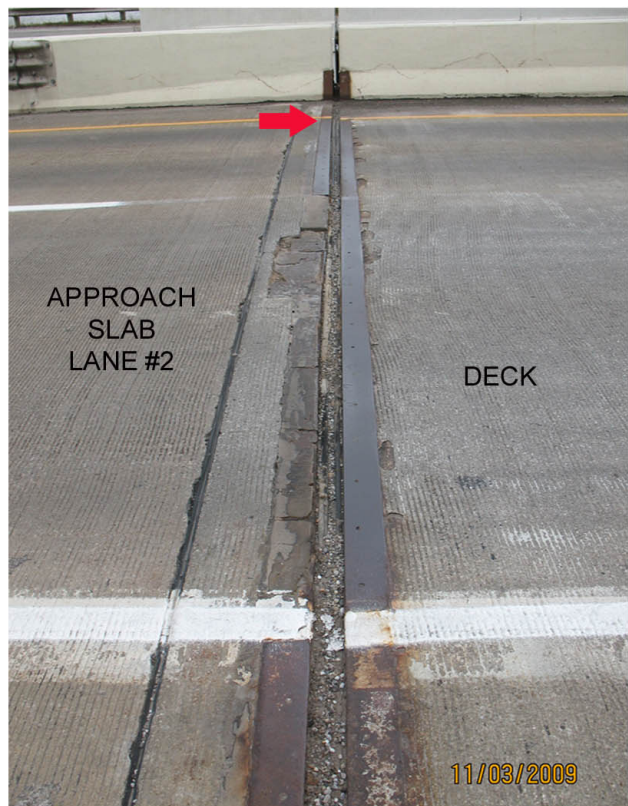
APPROACHES

APPROACH SLABS: FORWARD SLAB IS 1/2" HIGHER THAN DECK AND
REAR SLAB IS 1/8" HIGHER AT EXJTS. FULL
WIDTH CRACK IN REAR SLAB.

GENERAL

BOATED BY MS AND AH ON 06/17/10. DIVER INSPECTION ON
10/28/09.

GEA-422-0986L
SFN 2801655



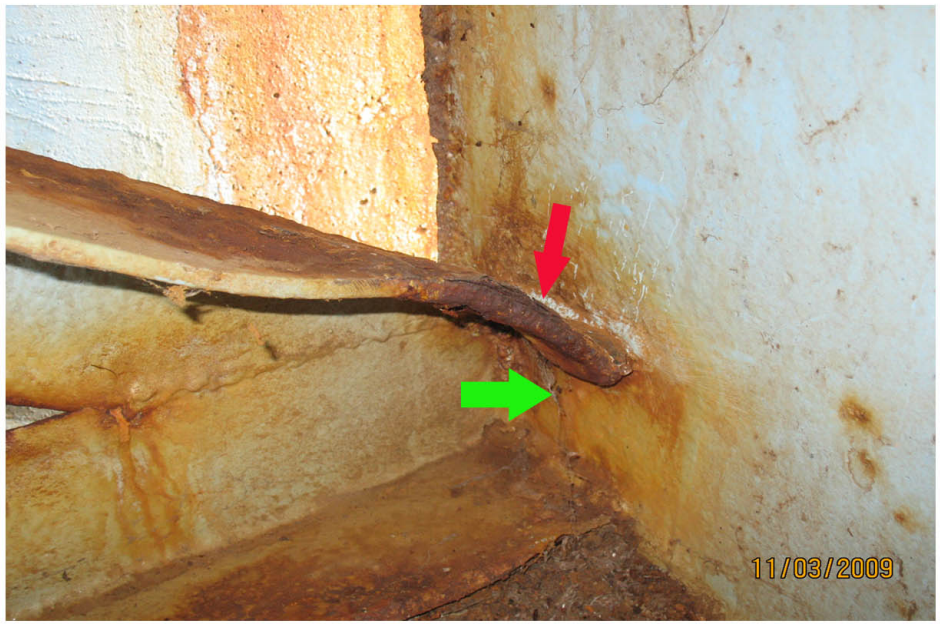
P5: EPOXY REPAIR TO START (E) EXJT IS CRACKED AND BREAKING UP.



P6: BRIDGE DECK IS A 1/2" LOWER THEN APPROACH SLAB. MEASUREMENT IS TAKEN BY ARROW IN P1 ABOVE.



P7: ARROW SHOWS CRAKED ENDFRAME WELD TO BEAM #2 AT START (E) ABUTMENT.



P8: RED ARROW SHOWS CRAKED ENDFRAME WELD TO BEAM OF SOUTH FASCIA BEAM AT START (E) ABUTMENT. GREEN ARROW SHOWS POSSIBLE CRACK IN WEB OF BEAM. NOTE BOW IN DIAGONAL ANGLE THIS WHOLE AREA FLEX'S WITH LIVE LOAD.



P1 rusting section loss of beam #1 at pier #3.psd



P2 close-up of P1.jpg



P3 close-up of P2.jpg



P4 close-up of P3.jpg

Underwater Inspection Report for:
State Route 422 (Westbound) over La Due Reservoir Geauga County, Ohio
(Four Span, Steel Beam Bridge)

KCI Personnel on site during inspection:

1. Mr. Travis M. Clower, P.E. (Primary Diver / Lead Inspector)
2. Mr. Mark A. Suchan, (Backup Diver / Inspector)
3. Mr. John L. Clower (Supervisor / Inspector)

ODOT Personnel on site during inspection:

1. Mrs. Andrea Persani



South Elevation View looking East



Location Map

Prepared for:

ODOT District 12
5500 Transportation Blvd
Garfield Heights, Ohio 44125



Prepared by:

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Travis M. Clower
12-10-09



DESCRIPTION

Bridge GEA-422-0986 L (SFN 2801655) carries two lanes of State Route 422 westbound over La Due Reservoir towards Bainbridge, Ohio in Geauga County. The structure, built in 1960, consists of a four-span, steel beam bridge carried by three reinforced concrete column piers and two reinforced concrete abutments. Each pier has three round concrete columns and one steel jacketed concrete drilled shaft. This is shown in Photos 1, 2, 5 and 6. Both abutments were more than six feet above the water level and not considered part of this inspection.

To be consistent with ODOT's Topside Inspection Report dated 11/13/08, Pier 1 is the east pier. Likewise this report numbers beams and columns starting at the south going north. When comparing reports, it is important to note that the 10/28/04 Underwater Inspection Report did not follow this numbering convention.

INSPECTION OPERATIONS

KCI's three-person dive team performed an underwater inspection on October 28, 2009. A visual inspection was performed from 1-foot above the waterline (splash zone) to the mud line. Where the diver's visibility was limited, tactile methods were used. Soundings were taken along all substructure units and up to 30 feet upstream and downstream of the bridge using a survey story pole.

The 10/28/04 Underwater Inspection Report established a Hydrographic Reference Location at the north end of Pier 2's cap. The water level for the 2009 inspection was 8.7 feet below the top of the cap. The water level during the 10/28/04 inspection was 5.8 feet below the top of the pier cap, a 2.9-foot difference.

Hazards Encountered:	<i>N/A</i>
Inspection Mode:	<i>Diving from a boat.</i>
Flow Direction / Velocity:	<i>N/A</i>
Direction of Diver / Inspector:	<i>Soundings were gathered first. Then the Piers were inspected in order.</i>
Bottom Composition:	<i>Flat mud and small stone bottom with riprap stone near the abutments.</i>
Scour Checked By:	<i>Soundings, probing and tactile methods.</i>
Equipment Used:	<i>Surface Supplied Diving with hardwire communications.</i>
Elements Cleaned:	<i>No significant cleaning required.</i>
Hydrographic Reference:	<i>North end, Pier 2, top of pier cap to the water = 8.7 feet .</i>



OBSERVATIONS

GENERAL

- The concrete surfaces had up to ¼-inch scaling. The concrete was sounded in numerous locations and found to be hard with no signs of delamination.
- The steel jacketed concrete drilled shafts had a 1/8-inch layer of surface corrosion (see Photo 8).
- Underwater visibility was less than 2 feet with no current.

CHANNEL

- The bottom composition is flat mud and small stone.
- Each abutment is surrounded with large diameter riprap stone (shown in Photos 5 and 6). This stone slopes downward toward the piers.

DEFECTS & DEFICIENCIES

PIER 1 (EAST PIER)

- The concrete surfaces had up to ¼-inch scaling.
- The steel jacketed concrete drilled shaft has a 1/8-inch layer of surface corrosion. Photo 8 is an underwater picture of this corrosion on Pier 1.

PIER 2

- The concrete surfaces had up to ¼-inch scaling.
- The steel jacketed concrete drilled shaft has a 1/8-inch layer of surface corrosion.

PIER 3 (WEST PIER)

- The concrete surfaces had up to ¼-inch scaling.
- The steel jacketed concrete drilled shaft has a 1/8-inch layer of surface corrosion.
- At 3 feet below the waterline on the east side of Column 1 are three small honeycombing areas 3 inches in diameter and 1-inch deep.



COMPARISION TO PREVIOUS REPORTING AND SUMMARY

Both the previous Underwater Inspection Report and the previous Topside Inspection Reports were available for comparison. The light concrete scaling on the columns and the surface corrosion of the steel jackets on the drilled shafts remains unchanged from the previous inspection. The only new defects that were mentioned in this report are three small areas of honeycombing on the east side of Pier 3, Column 1, three feet below the water surface. They are insignificant in size and have no reinforcing steel exposed. The spalled areas above the water on the south side of Pier 3's cap were present in the previous ODOT inspection and remain unchanged.

There was no undermining, no scour and no other significant defects found at the time of inspection.

RECOMMENDATIONS

Because of the satisfactory conditions found during the underwater inspection, there are no recommendations at this time.





Photo by T. Clower, 10/28/09

Photo 1 – Facing South. North Elevation of the Bridge.



Photo by T. Clower, 10/28/09

Photo 2 – Facing Northeast. South Elevation of the Bridge.



Photo by T. Clower, 10/28/09

Photo 3 – Facing North. View of La Due Reservoir from the Bridge.



Photo by T. Clower, 10/28/09

Photo 4 – Facing South. View of La Due Reservoir and Bridge GEA-422-0986 R.



Photo by T. Clower, 10/28/09

Photo 5 – Facing West. West Abutment with large Riprap Stone Shore Protection.



Photo by T. Clower, 10/28/09

Photo 6 – Facing Southeast. East Abutment with large Riprap Stone Shore Protection.



Photo by T. Clower, 10/28/09

Photo 7 – Facing North. South end of Pier 3 Cap with Spalls and exposed Rebar.
(9-inch high x 6-inch wide x 1-inch deep)

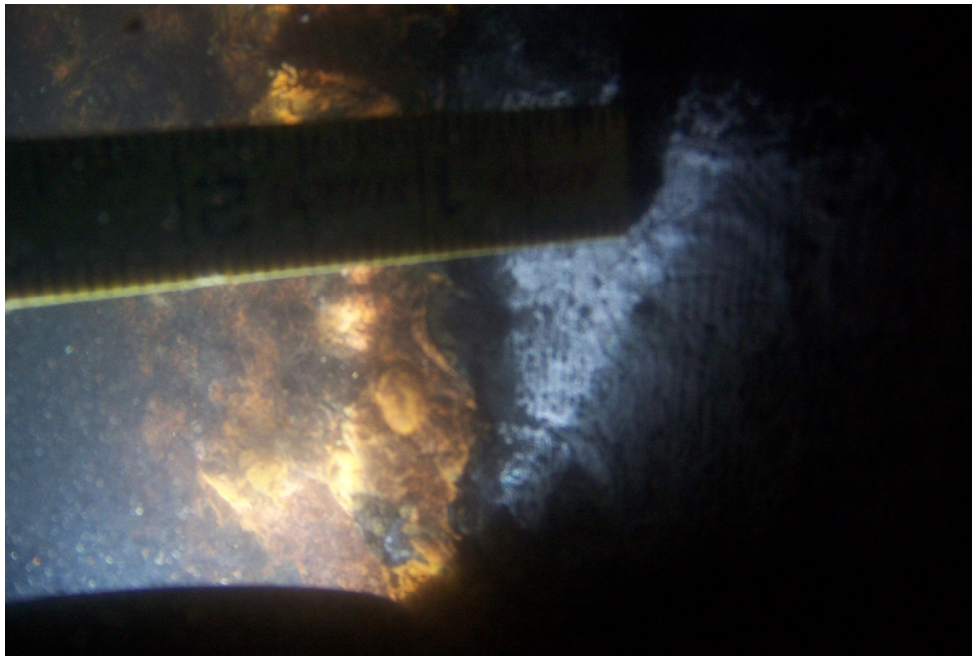


Photo by T. Clower, 10/28/09

Photo 8 – Facing North. South side of Pier 1 steel jacket on the drilled shaft at the mudline. Typical 1/8-inch thick corrosion of the steel.

