

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		E	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	3 1
41. SLOPE PROTECTION	3 RIP RAP (DUMPED ROCK)	1	42. SUMMARY	Dive Date 12/30/1899 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	1
57. GUARDRAIL	1 STEEL BEAM	1	58. RELIEF JOINTS	
59. EMBANKMENT		1	60. SUMMARY	Percent Legal = 150 7
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

KJB
INITIALS

SIGNED

70223 AWH
PE Number INITIALS

DATE 11/3/2009

1 1 1 1 1 N N N
SURVEY

DATE 3/12/2010

DECK

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

SUPERSTRUCTURE

BEAMS: RUSTED SECTION LOSS AT BOTH ABUTMENTS AND OF LOWER
FLANGE OF BEAM #1 AT PIER #3; SEE ATTACHED PHOTOS 1 - 4
DATED 8/30/06. POSSIBLE CRACK TO WEB AT START ENDFRAME OF

SOUTH FASCIA; SEE ATTACHED PHOTO 8 DATED 11/3/09.
XFRAMES: ENDFRAME RUSTING SECTION LOSS. TWO CRACKED ENDFRAME
WELD AT START ABUT, ONE AT BEAM #2 AND ONE AT SOUTH
FASCIA; SEE ATTACHED PHOTOS 7 & 8 DATED 11/3/09.
BEARINGS: RUSTED SECTION LOSS. START ABUTMENT ROCKERS #2,
#3, & #4 ARE LOOSE.
PCS: PEELING PAINT, 5% RUST, PCS IS 5-10% DETERIORATED.
LLR: BEAMS #2, #3, AND #4 MOVE UP & DOWN UNDER HEAVY LOADING

AT THE START ABUTMENT. ALSO SOUTH FASCIA AT ENDFRAME
FLEX'S WITH HEAVY LOAD.

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.

APPROACHES

APPROACH SLABS: START SLAB IS 1/2" HIGHER THAN DECK AND
FINISH IS <1/4" AT EXJTS. FULL WIDTH CRACK IN FINISH SLAB.

GENERAL

AP BOATED UNDER BRIDGE WITH DIVER INSPECTION ON 10/28/09.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
BRIDGE INSPECTION REPORT

BR-86 REV 02-95

2 8 0 1 6 5 5
1 Structure File Number 7

Bridge Number **GEA 00422 0986** L AUBURN TWP
CO ROUTE UNIT

Date Built **07/01/1960 - 1994**

District **12** Bridge Type **STEEL/BEAM/CONTINUOUS**

Type Service **1 15 LA DUE RES. 0.71 MI E 44**

GEA

DECK		Out/Out 41.3	1	THCK = 2.0		1
1. Floor	1-REINF CONCRT (PRESTRSD	8	1	2. Wearing Surface	2-INTEGRAL CONCRETE (MON	41
		N-NONE		W.S. Date = 01/01/1994		
3. Curbs, Sidewalks, Walkways	N-NONE	9		4. Median		42
5. Railing	C-32" DEFLECTOR-TYPE PAR	10	1	6. Drainage	0-OTHER-NATURAL(OFF THE	43
7. Expansion Joints	3-COMPRESSION SEAL	11	3	8. Summary		44
SUPERSTRUCTURE		MAX.SPAN=60	1			2
9. Alignment		12	1	10. Beams/Girders/Slab	1-ROLLED STEEL	45
11. Diaphragms or Crossframes	TOT.LGTH=220	13	2	12. Joists/Stringers		46
13. Floor Beams		14		14. Floor Beam Connections		47
15. Verticals		15		16. Diagonals		48
17. End Posts		16		18. Top Chord		49
19. Lower Chord		17		20. Lower Lateral Bracing		50
21. Top Lateral Bracing		18		22. Sway Bracing		51
23. Portals		19		24. Bearing Devices	2-ROCKERS N-NONE	52
25. Arch		20		26. Arch Columns or Hangers		53
27. Spandrel Walls		21		28. Protective Coating System	TYPE = 5-PAINT SYSTEM OZEU DATE = 01/01/1987	54
29. Pins/Hangers/Hinges		22		30. Fatigue Prone Connections		55
31. Live Load Response		23	E	32. Summary		56
SUBSTRUCTURE		2-CONCRETE	1	PIERS=3	SPANS = 4	1
33. Abutments	2-CONCRETE	24	1	34. Abutment Seats		57
35. Piers	TYPE = 2-CONCRETE	25	1	36. Pier Seats		58
37. Backwalls		26	1	38. Wingwalls	ABUTMENT:=CIP REI / CIP REI	59
39. Fenders and Dolphins		27		40. Scour	8-STABLE: EVAL SCOUR ABO	60
41. Slope Protection	3-RIP RAP (ROCK)	28	1	42. Summary		62
				DIVE DT=10/28/2009		
CULVERTS						
43. General		29		44. Alignment		63
45. Shape		30		46. Seams		64
47. Headwalls or Endwalls		31		48. Scour		65
49.		32		50. Summary		66
CHANNEL				2-STONE		1
51. Alignment		33	1	52. Protection		67
53. Waterway Adequacy		34	1	54. Summary		68
APPROACHES						
55. Pavement	2-BITUMINOUS	35	1	56. Approach Slabs		69
57. Guardrail	1-STEEL BEAM	36	1	58. Relief Joints		70
59. Embankment	BRDG.WIDTH=38.0	37	1	60. Summary		71
				PCT.LEGAL=150		
GENERAL				ROUTINE.RESP: 1-OHIO TRAN DEPT		
61. Navigation Lights		38		62. Warning Signs	MAINT.RESP: 1-OHIO TRAN DEPT	72
63. Sign Supports	MVC ON=9999 UND=0000	39		64. Utilities		73
65. Vertical Clearance		40	N	66. General Appraisal & Operational Status		74
				COND STAT		6 A

67. INSPECTED BY

68. REVIEWED BY

SIGNED

76 PE

K J B
78 INITIALS

SIGNED

7 0 2 2 3
81 PE

A W H
83 INITIALS

DOT 2852

DECK AREA 9,085

Date 1 1 0 3 0 9
86 91

1 1 1 1 1 N N N
92 69 Survey 99

Date 0 3 1 2 1 0
100 105

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
BRIDGE INSPECTION REPORT

BR-86 REV 02-95

2	8	0	1	6	5	5
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1 Structure File Number 7

Bridge Number **GEA 00422 0986 L**
 CO ROUTE UNIT

Date Built 07/01/1960 - 1994

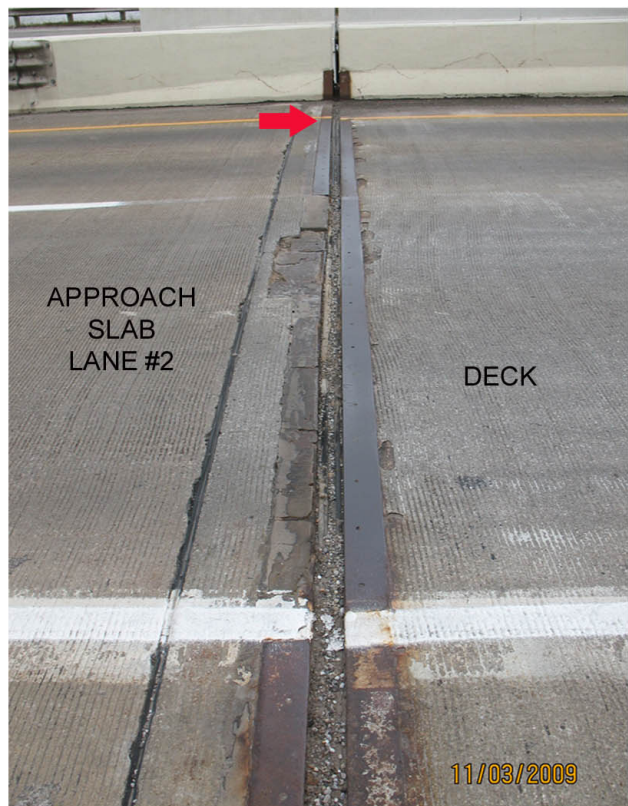
District **12** Bridge Type **STEEL/BEAM/CONTINUOUS**

Type Service **1 15**

LA DUE RES. 0.71 MI E 44

Deck FL: A FEW TRANSVERSE CRACKS. FLOOR <1% DETERIORATED.
 Deck WS: CRACKS. WS <1% DETERIORATED.
 Deck RAILING: ONE SF SPALL OF INSIDE FACE OF LEFT RAILING AT
 Deck EMBEDDED WOOD 2 BY 4 IN SPAN #2.
 Deck EXJTS: EVIDENCE OF WATER LEAKING DOWN START BACKWALL IN BAY
 Deck #3. THE EPOXY RESIN USED TO FILL THE VOID LEFT BY THE
 Deck REMOVAL OF PART OF THE START BACKWALL EXJT ARMOR HAS
 Deck CRACKED AND SOME OF THE RESIN HAS POPPED OUT OF THE LEFT
 Deck WHEEL TRACK OF LANE #2. THE DECK IS A 1/2" LOWER THEN THE
 Deck SLAB SIDE AT THE START (E) JOINT; SEE ATTACHED PHOTOS 5 &
 Deck 6 DATED 11/3/09. GOUGES IN FINISH EXJT BACKWALL ARMOR.
 Superstructure BEAMS: RUSTED SECTION LOSS AT BOTH ABUTMENTS AND OF LOWER
 Superstructure FLANGE OF BEAM #1 AT PIER #3; SEE ATTACHED PHOTOS 1 - 4
 Superstructure DATED 8/30/06. POSSIBLE CRACK TO WEB AT START ENDFRAME OF
 Superstructure SOUTH FASCIA; SEE ATTACHED PHOTO 8 DATED 11/3/09.
 Superstructure XFRAMES: ENDFRAME RUSTING SECTION LOSS. TWO CRACKED ENDFRAME
 Superstructure WELD AT START ABUT, ONE AT BEAM #2 AND ONE AT SOUTH
 Superstructure FASCIA; SEE ATTACHED PHOTOS 7 & 8 DATED 11/3/09.
 Superstructure BEARINGS: RUSTED SECTION LOSS. START ABUTMENT ROCKERS #2,
 Superstructure #3, & #4 ARE LOOSE.
 Superstructure PCS: PEELING PAINT, 5% RUST, PCS IS 5-10% DETERIORATED.
 Superstructure LLR: BEAMS #2, #3, AND #4 MOVE UP & DOWN UNDER HEAVY LOADING
 Superstructure AT THE START ABUTMENT. ALSO SOUTH FASCIA AT ENDFRAME
 Superstructure FLEX'S WITH HEAVY LOAD.
 Substructure ABUTMENTS: CONCRETE PATCHES.
 Substructure PIERS: TWO MINOR SPALLS. RUSTING SECTION LOSS OF STEEL AT
 Substructure WATERLINE.
 Substructure BACKWALLS: CRACKS. RUST STAINS.
 Substructure SCOUR: SEE ATTACHED DIVE REPORT DATED 10/28/09.
 Approaches APPROACH SLABS: START SLAB IS 1/2" HIGHER THAN DECK AND
 Approaches FINISH IS <1/4" AT EXJTS. FULL WIDTH CRACK IN FINISH SLAB.
 General AP BOATED UNDER BRIDGE WITH DIVER INSPECTION ON 10/28/09.

GEA-422-0986L
SFN 2801655



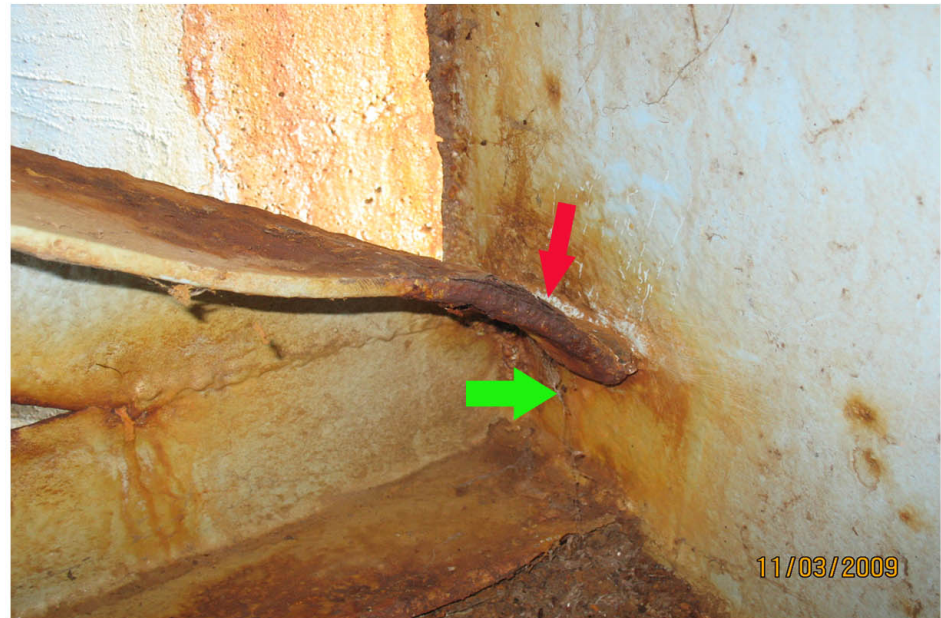
P5: EPOXY REPAIR TO START (E) EXJT IS CRACKED AND BREAKING UP.



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:

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

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)

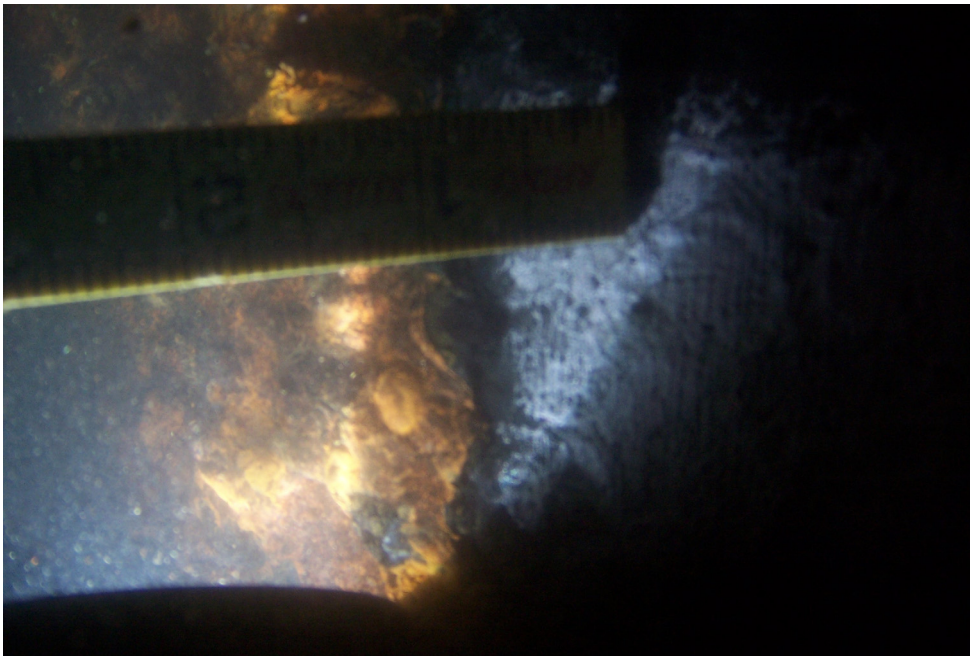


Photo by T. Clower, 10/28/09

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.

SOUNDING SHEET

(All measurements are in feet)

Bridge No.: GE A-422-0986 L Inspection Date: 10/28/2009
 Inspectors: JC, MS, TC Clearance Location: Pier 2, north, top of cap

