Bridge Inspection Report

037B00074N
Inspector: Paul Davis
Entered by: PDAVIS
07/20/2022
Standard (24 months)

IDENTIFICATION

Structure Num (8):	037B00074N
NBI Number:	037B00074N
Structure Name:	Julian M. Carroll Bridge
Location (9):	500 FT E OF KY 420
Carries (7):	KY 676 (E-W CONN)
Type of Service (42A):	1 Highway
Feature Crossed (6):	KENTUCKY RIVER & KY 1263
Type of Service (42B):	6 Highway-waterway
Placecode (4):	Not Applicable
County (3):	Franklin (037)
State (1):	21 Kentucky
Admin Area:	Inventory
District:	District 5
Latitude (16):	38° 10' 17"
Longitude (17):	84° 52' 29"
Owner (22):	State Highway Agency
Maint. Resp. (21):	State Highway Agency
Year Built (27):	1979
Year Recon (106):	0
Border State (98A):	Not Applicable (P)
Border Number (99):	
% Responsibility (98B):	-1

Fair **Heath Index:** 79.35

SubStd: No **SubStd Reason:** Not Sub-Standa

Inspection Type	Freq (92)	Last Insp (93)	Next Insp
Routine	24	7/20/2022	7/20/2024
Element	24	7/20/2022	7/20/2024
Fracture Critical (A)		7/21/2016	1/1/1901
Underwater (B)	60	7/10/2018	7/10/2023
Special Insp (C)	12	7/20/2022	7/20/2023

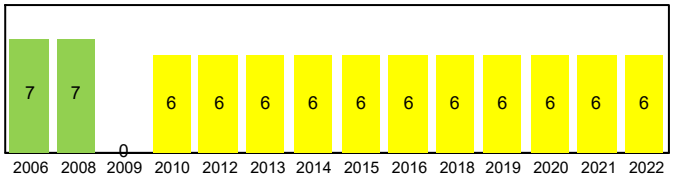
LOAD RATING AND POSTING

Posting Status(41):	P Posted for load
Posting (70):	0 >39.9% below
Signs Posted Cardinal:	Yes
Signs Posted Non-Cardinal:	Yes
Recmd Date:	3/31/2022
Posted Date:	5/4/2022

Required Postings (Tons.)		Field Postings (Tons.)	
Gross:		**Gross:**	
Truck Type 1:	21.00	**Truck Type 1**	21.00
Truck Type 2:	30.00	**Truck Type 2**	30.00
Truck Type 3:	37.00	**Truck Type 3**	37.00
Truck Type 4:	41.00	**Truck Type 4**	40.00
SUV 5:	38.00	**SUV 5:**	38.00
SUV 6:	40.00	**SUV 6:**	40.00
SUV 7:	40.00	**SUV 7:**	40.00
EV Single Axle:		**EV Gross:**	
EV Tadem Axle:			

DECK GEOMETRY

Deck Geometry (68):	9 Above Desirable Crit
Deck Area:	72,457.00 ft²
Deck Type (107):	2 Concrete Precast Panel
Wearing Surface (108A):	4 Low Slump Concrete
Membrane (108B):	9 Other
Deck Protection (108C):	None
Approach Roadway width (32):	80.00 ft.
Width Curb to Curb (51):	80.00 ft.
O. to O. Width (52):	86.30 ft.
Curb / Sidewalk Width L (50A):	0.00 ft.
Curb / Sidewalk Width R (50B):	0.00 ft.
Median (33):	3 Closed Med w/Barriers

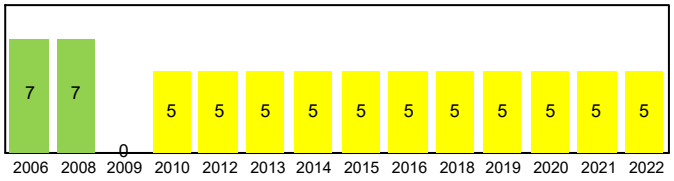


DECK CONDITION

Deck Rating (58):	6 Satisfactory
Bridge Rail (36A):	1 Meets Standards
Transition (36B):	1 Meets Standards
Approach Rail (36C):	1 Meets Standards
Approach Rail Ends (36D):	1 Meets Standards

SUPERSTRUCTURE GEOMETRY

# of Main Spans (45):	3
# of Approach Spans (46):	2
Main Material (43 A):	6 P/S Conc Continuous
Main Design (43 B):	21 Segmental Box Girder
Max Span Length (48):	323.20 ft.
Structure Length (49):	839.60 ft.
NBIS Length (37):	Long Enough
Temp Structure (103):	Not Applicable (P)
Skew (34):	16°
Structure Flared (35):	0 No flare
Parallel Structure (101):	No || bridge exists
Approach Alignment (72):	8 Equal Desirable Crit

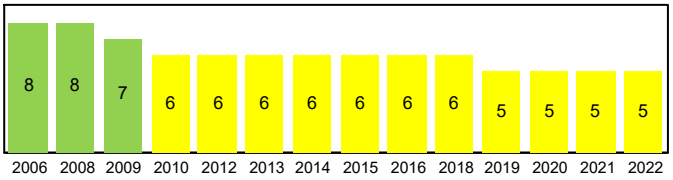


SUPERSTRUCTURE CONDITION

Superstructure Rating (59):	5 Fair
Structure Evaluation (67):	3 Intolerable - Correct

SUBSTRUCTURE GEOMETRY

Navigation Control (38):	Permit Required
Nav Vert Clearance (39):	
Nav Horiz Clearance (40):	
Pier Protection (111):	1 Not Required
Lift Bridge Vertical Clearance (116):	
Scour Rating (113):	5 Stable w/in footing
Waterway Adequacy (71):	9 Above Desirable



SUBSTRUCTURE CONDITION

Substructure Rating (60):	5 Fair
Channel Rating (61):	7 Minor Damage

KYTC FIELDS

Overlay:	Yes	**Scour Observed:**	Minor Scour
Overlay Type:	PCC	**Scour Risk :**	Low Risk
Overylay Thickness:	1.50 in.	**Scour Analysis/Assessment :**	Completed by Ogden
Overlay Year:	1987	**Scour POA :**	Not Required
Cross Section:	Yes	**Scour POA Date :**	
Cross Section Date:	07/10/2018	**Next Cross Section Due Date :**	07/20/2028

1ST NON-CARD ROUTE ON: EAST WEST CONNECTOR RD

ROADWAY LOCATION

Pos Prefix (5A):	1st Non-Card Route
Kind of Hwy (5B):	3 State Hwy
Route Num (5D):	00676
LRS Route (13A/B):	KY0676_000/00
Milepost (11):	1.59 mi
Suffix (5E):	0 N/A (NBI)
Lanes Under (28B):	4
Detour Length (19):	4.97 mi

ROADWAY CLASSIFICATION

Funct Class (26):	14 Urban Other Princ
Level Service (5C):	1 Mainline
NHS (104):	1 On the NHS
Defense Hwy (100):	0 Not a STRAHNET hwy
Toll Facility (20):	3 On free road
ADT (29):	17,909 Cars/Day
Pct Trucks (109):	4.00%
ADT Year (30):	2021

CLEARANCES

Vertical (10):	99.99 ft.
Min Vert Over (53):	99.99 ft.
Vert Ref (54A):	H Hwy beneath struct
Undrclearnce (54B):	22.50 ft.
Horizontal (47):	40.00 ft.
Min Lat Left (56):	0.00 ft.
Min Lat Right (55B):	2.00 ft.
Horiz Ref (55A):	H Hwy beneath struct
Underclearance (69):	3 Intolerable - Correct

ROUTE UNDER STRUCTURE: BIG EDDY RD

ROADWAY LOCATION

Pos Prefix (5A):	One Route Under
Kind of Hwy (5B):	3 State Hwy
Route Num (5D):	01263
LRS Route (13A/B):	
Milepost (11):	3.42 mi
Suffix (5E):	0 N/A (NBI)
Lanes Under (28B):	2
Detour Length (19):	0.00 mi

ROADWAY CLASSIFICATION

Funct Class (26):	09 Rural Local
Level Service (5C):	1 Mainline
NHS (104):	0 Not on NHS
Defense Hwy (100):	0 Not a STRAHNET hwy
Toll Facility (20):	3 On free road
ADT (29):	392 Cars/Day
Pct Trucks (109):	0.00%
ADT Year (30):	2021

CLEARANCES

Vertical (10):	22.50 ft.
Min Vert Over (53):	99.99 ft.
Vert Ref (54A):	H Hwy beneath struct
Undrclearnce (54B):	22.50 ft.
Horizontal (47):	24.00 ft.
Min Lat Left (56):	0.00 ft.
Min Lat Right (55B):	2.00 ft.
Horiz Ref (55A):	H Hwy beneath struct
Underclearance (69):	3 Intolerable - Correct

ROUTE ON STRUCTURE: EAST WEST CONNECTOR RD

ROADWAY LOCATION

Pos Prefix (5A):	Route On Structure
Kind of Hwy (5B):	3 State Hwy
Route Num (5D):	00676
LRS Route (13A/B):	KY0676_000/00
Milepost (11):	1.59 mi
Suffix (5E):	0 N/A (NBI)
Lanes On (28A):	4
Detour Length (19):	4.97 mi

ROADWAY CLASSIFICATION

Funct Class (26):	14 Urban Other Princ
Level Service (5C):	1 Mainline
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ADT (29):	17,909 Cars/Day
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Min Lat Right (55B):	2.00 ft.
Horiz Ref (55A):	H Hwy beneath struct
Underclearance (69):	3 Intolerable - Correct

STRUCTURE NOTES

-BRIDGE IS REQUIRED TO BE POSTED AT THE FOLLOWING WEIGHT LIMITS: TYPE 1 – 21 TONS, TYPE 2 – 30 TONS, TYPE 3 – 37 TONS, TYPE 4 – 40 TONS, SUV 5 – 38 TONS, SUV 6 – 40 TONS, SUV 7+ – 40TONS.
-Although this bridge is no longer substandard for weight, item 92CB has been changed to 12 months. The scope of the special inspection is to monitor the cracking of the box girders.
-See layout sheet in the Media Tab for bridge component numbering.
-In September 2020, Burgess & Niple performed an invasive investigation of the post tensioning system (PTS). Work is summarized here, and the full report is available on the Media Tab. Per ANSI, approximately 60 post tensioning ducts in each girder were checked for grout voids. PT strands were located with GPR, holes were drilled into the concrete, and the ducts were opened to investigate voids with a borescope. 65 locations were tested on the EB girder and 59 on the WB girder with a total of 21 voids discovered. Heavy corrosion was present on the PT tendons in some of the voids, indicating that air and moisture is entering the PTS. Majority of the voids were found in the parabolic tendon ducts in the webs of the girders over the piers. Remaining voids were found in bottom slab tendon ducts that anchored into the top slab. Grouting procedures for the top slab ducts were identica to the bottom slab ducts, and no significant issues were expected based upon the findings in the bottom slab ducts. Grout sampling and corrosion rate testing was performed at 5 locations. Chloride content, water-cement ration, and air void content were within modern limits. Fine gypsum particles that have a high sulphate content were found in the grout. Sulphur trioxide content ranged from 2.6 to 2.8%, close to the limit of 3.0%. Corrosion rate tests indicated a moderate corrosion rate. STR 03/22/2021
-In-depth inspections performed by American Engineers in October 2006, Stantec in July 2012 and 2016, by Palmer/AECOM in July 2018, and by B&N in July 2020.
-This bridge is permitted by the U.S. Coast Guard. Relevant permits and lighting plans are in the General Media Tab. A list of all Coast Guard permitted bridges in D5 is kept in the bridge file in the Miscellaneous Drawer. The USCG contact is Eric Washburn (314-269-2378). RJM 12/2012

INSPECTION NOTES

-BRIDGE IS POSTED AT THE FOLLOWING WEIGHT LIMITS AT BOTH APPROACHES: TYPE 1 – 21 TONS, TYPE 2 – 30 TONS, TYPE 3 – 31 TONS, TYPE 4 – 33 TONS, SUV 5 - 31 TONS, SUV 6 - 31 TONS, SUV 7+ - 32 TONS. PWD 7/21/22
-Substandard Inspection (12 months) - Interior portions of box beams were inspected by District 5 Bridge Inspectors on 7/20/22 and remaining elements were inspected by Paul Davis and Daniel Coulter on 7/21/22.
-Substandard Inspection included inspection of the interior of all segments of superstructure. Access was gained through the hatch at the West end of the eastbound bridge using an extension ladder.
-Exterior portions of segments could not be adequately inspected from ground level. Element notes and condition state quantities from previous inspections were carried over regarding portions of the bridge needing snooper access.
-River navigation lighting system appears to be intact.
3/31/22 Due to the load test, this bridge is no longer substandard. Keep at 12 month inspection to monitor web cracks. DGA

SCOUR NOTES

LOAD RATING NOTES

02/25/15 Posting memo for 40 tons gross due to the condition of the superstructure – ALI.
02/25/15 The load rating is set to design loads for Inventory and Operating Ratings by engineering judgment – ALI.
01/23/18 The load rating is controlled by Principal Stress between Segments 10 and 11 for Inventory, by Transverse Tensile Stress along the Center-Line of the Deck for KY Type 1 and Type 2 Trucks, and by Longitudinal Tensile Stress between Segments 116 and 117 for all other vehicles. Analysis by Stantec, note by MJE.
01/23/18 Posting memo for Truck Types 1-4 and SU5+ at 21, 30, 32, 34, and 33 Tons, respectively. -MJE
03/05/18 Updated load rating due to minor consultant error. The load rating is controlled by Principal Stress between Segments 10 and 11 for Inventory, by Longitudinal Tensile Stress along the Center-Line of the Deck for KY Type 1, Type 2, and EV2 Trucks, and by Longitudinal Tensile Stress between Segments 116 and 117 for all other vehicles. Analysis by Stantec, note by MJE.
03/05/18 Posting memo for Truck Types 1-4, SU5, SU6, and SU7+ at 21, 30, 31, 33, 31, 31, and 32 Tons, respectively. -MJE
3/9/22 Load tested by KTC on 11/2/2020, due to that- the controlling ratings are governed by the transverse tensile stress for Types 1-3, and SU4, and EVs, the Shear Stress for the other trucks. Structure may be posted at 21,30,37,41; 38,40,40 tons. Due to the cracking in the webs, keep on a yearly inspection schedule. DGA

COMPLIANCE NOTES

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
15	**Pre Concrete Top Flange**	**3**	**07/20/2022**	**67,330.00**	**sq.ft**	**66,748.00**	**441.00**	**141.00**	**0.00**

The top side of the top flange is not visible due to a low slump concrete wearing surface. The westbound overlay was placed in 1983 and the eastbound overlay was placed in 1987. The interior of the box girders shows delaminations and minor to moderate spalls in the top flange. These defects are normally located near the construction joint recess pockets. The joints between segments show evidence of minor seepage at a few locations. There are several previously marked delaminations found in the top flange near the piers. The deficiencies are typically less than 1 square foot in size, although there are spalls as large as 27 inches by 13 inches by 1/2 in deep and delaminations as large as 30 inches by 12 inches. There are longitudinal cracks on the top flange, some with minor efflorescence, and diagonal cracks in the flange fillets. There are spalls with exposed reinforcing steel scattered throughout the cantilevers of the top flange in addition to some cracks with rust staining.

510	Wearing Surfaces	3	07/20/2022	62,392.00	sq.ft	61,992.00	200.00	200.00	0.00

There is unsealed transverse cracking near the bridge ends with small to moderate spalls in the headers adjacent to the joints. The concrete wearing surface shows minor wear in the wheel paths with small popouts. A few moderately wide transverse cracks are scattered over the length of the bridge. The wearing surface of the Westbound Bridge has three spalls along the centerline construction joint. Span 1 has a 9 foot long x 8 inch wide delamination and a 3 foot x 6 inch spall along the centerline that is partially filled with asphalt. There is 3 inch deep spalling adjacent to the Abutment 1 joint in the eastbound bridge in the right lane and shoulder. Span 2 has a 10 inch by 6 inch spall and a 10 inch by 3 inch spall. Span 3 has a 4 foot by 6 inch spall with adjacent wide cracking near the joint and three small spalls on the inside shoulder.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
38	**Re Concrete Slab**	**3**	**07/20/2022**	**5,158.00**	**sq.ft**	**5,138.00**	**0.00**	**20.00**	**0.00**

Structural slabs are present at both ends of each girder, spanning between the front and back walls of the abutments. The slabs are 15 inch thick reinforced concrete. A low slump concrete wearing surface is present on each slab, preventing visual inspection of the top surface. There are spalls with exposed reinforcing steel on the underside of the slab at the west end of the westbound girder adjacent to the backwall of Abutment 1.

510	Wearing Surfaces	3	07/20/2022	4,780.00	sq.ft	4,297.00	480.00	3.00	0.00

The overlay on the structural slabs has minor wear in the wheel paths. Moderate longitudinal cracks are present on the overlay at both ends of the eastbound lanes, and there is moderate map cracking along the right lane line on the west end of the westbound lanes. There is 8 square feet of patching on the overlay at the west end of the eastbound lanes; the patches are cracking but appear to be sound. The overlay on the east end of the eastbound lanes has a 10 inch by 6 inch by 1/2 inch deep spall near the left lane line at the end of the bridge. Minor spalls are present adjacent to the joint headers.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
104	Pre Clsd Box Girder	3	07/20/2022	1,560.00	ft	214.00	1,076.00	270.00	0.00

For the interior of the box girders, the access hatch on the east end of the Eastbound Bridge has a broken hinge and both hinges are broken at the west end of the Westbound Bridge. The crack gauges installed in the webs in 2010 show no sign of growth during 2021 inspection. There are typically areas of corrosion from exposed form ties in the webs due to lack of cover. There are isolated areas of exposed reinforcing steel due to lack of cover in the webs. There is typically honeycombing of the concrete in the bottom flange fillets, as well as at random locations in the interior face of segment webs. There are delaminations and minor spalls in the top flange. These defects are normally located near the construction joint recess pockets. There are several previously marked delaminations found in the top flange near the piers. The largest top flange delamination is 24 inches x 24 inches in Westbound Segment 92; however most of the spalls and delaminations are less than 1 square foot in size. There are longitudinal cracks with occasional very minor efflorescence in the top flange in the flat portions and diagonal cracks in the top flange fillets. The webs of the interior box segments have cracks throughout that range in width from hairline to 0.030 inch. These cracks are more prevalent in segments with floor tendon anchors. Web cracking is generally inclined and has grown when compared to previously marked terminations. Longitudinal cracks are present along the fillets between the webs and top slabs at a few locations and there are a few small areas of minor map cracking. Cracking is present in the bottom slabs, most commonly extending diagonally from the post tensioning anchor blocks. The cracks have occasionally propagated into the fillets and webs. The web in Segment 1 of the westbound girder outside of the end diaphragm has spalling with exposed reinforcing steel. The bottom flange in Eastbound Segments 120 and 121 has a 6'-3" long and 1'-8" wide spall with exposed transverse reinforcing steel. The spall is encompassed in a delaminated area measuring 12'-2" x 3'-8". As previously reported, the east end of the westbound girder has shifted 1 inch to the south. This is evidenced by 1 inch lateral offset between the bridge and approach railings along both edges of the girder and a 1 inch shift of the girder relative to the bearings at Abutment 4. During the 2021 inspection, the exterior portion of girders was only visually inspected from ground level at the abutment slopes. Notes and affected condition state quantities have been carried over from the 2020 In-Depth Inspection. Cracks are visible in the webs in approximately 10 percent of the segments, though the masonry coating on the faces of the outboard webs may conceal cracking in some segments. Cracking, generally longitudinal, is present on the bottom slabs on approximately 60 percent of the segments, most commonly in positive moment regions. Cracks are generally hairline to 0.009 inches wide with a few isolated cracks as wide as 0.033 inches. Small areas of minor map cracking are present at a few locations. Minor areas of spalling, delaminations, and unsound patches are present at random locations throughout both girders. The most significant spalling is on the end segments below leaking joints.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
205	Re Conc Column	3	07/20/2022	24.00	each	12.00	5.00	7.00	0.00

Piers 2 and 3 each have four columns. No significant deficiencies were observed on the pier columns. Four columns support caps for structural slabs at both ends of each girder. These columns are located above the front abutment walls. Several of the abutment columns have delaminations and spalls. For Abutment 1 eastbound, Column 3 has a spall on the east face near the top (CS 2) and Column 4 has a delamination on the east face near the top (CS 3). For Abutment 1 westbound, Column 1 has multiple spalls (CS 3), Column 2 has a delamination on the north face near the bottom (CS 2), and Column 3 has a delamination on the east face near the top (CS 2). For Abutment 4 eastbound, all of the columns have spalls, the most significant being on the west face of Column 1 near the bottom, which has one severed column tie and minor section loss on the primary reinforcing steel (all CS 3). For Abutment 4 westbound, Column 1 has delaminations near the bottom (CS 2), Column 2 has a spall with exposed reinforcing steel on the west face (CS 3), and Column 3 has cracking near the top and delamination near the bottom (CS 2).

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
215	Re Conc Abutment	3	07/20/2022	180.00	ft	96.00	39.00	45.00	0.00

Vaulted abutments are present at both ends on each girder. The abutment quantity includes the primary abutments (front walls) and the backwalls that support the structural slabs at the ends of the bridge. The front walls of the abutments support elastomeric bearings for the girders as well as columns and caps for the structural slabs over the abutments. The side and back walls also support the structural slabs. The exterior face of the front wall for Abutment 1 eastbound has vertical and horizontal cracking over much of the length. The exterior face of the south side wall has a 3 foot by 3 foot spall with adjacent delamination and cracking. No significant deficiencies were observed on the backwall. The interior face of the front wall for Abutment 1 westbound has a 22 foot long by 5.5 foot tall area of spalling with exposed primary reinforcing steel. There is a 40 inch long by 28 inch high spall on the front face of the front wall that extends up to 16 inches back from the face of the wall. The exterior face also has minor cracking and spalling at both cheekwalls and there is a small spall on the exterior face at about the one-third point from the south side. The backwall has cracking with efflorescence. There are two sections of loss of fill material at the northeast corner, primarily below the wingwall. The full length of the backwall for Abutment 4 is undermined, exposing all nine of the steel piles that support the backwall. The erosion is deep enough at the southeast corner to allow for easy entry into the interior of the structure. The backwall between the eastbound and westbound abutments has two moderate and one wide vertical cracks. There is a vertical crack on the exterior face of the front wall for Abutment 4 eastbound. The backwall has a 4 foot by 16 inch by 1 inch spall and cracking with efflorescence. There is a vertical crack on the exterior face of the front wall for Abutment 4 westbound. The north side wall has vertical and diagonal cracking and a 1 square foot delamination. The backwall has a 7 foot by 1 foot by 2 inch spall and a 6 foot by 1 foot by 3 inch spall as well as horizontal and vertical cracking with efflorescence.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
225	Steel Pile	3	07/20/2022	9.00	(EA)	0.00	6.00	3.00	0.00

All of the piles that support the backwall of Abutment 4 are exposed. Surface corrosion is present on all of the piles, and minor laminating corrosion is present on a few of the piles.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
234	Re Conc Pier Cap	3	07/20/2022	252.00	ft	176.00	16.00	60.00	0.00

Caps are present at both the columns for the piers as well at the columns at the abutments that support the structural slabs over the abutments. The Abutment 1 eastbound cap has 14 feet of delamination and spalling within the structure, and the full length of the south cantilever has delamination and spalling. Abutment 1 cap has a 16 inch by 12 inch by 1 inch deep spall on the east face over westbound Column 3 and a 2 foot length of delamination on the underside between Columns 2 and 3. The west face of the Pier 2 cap has 6 vertical cracks with efflorescence. The north face of the cap for Pier 3 has map cracking on the top 2 feet of the cap. There are three vertical cracks on the east face and six vertical cracks on the west face of the Pier 3 cap, some with efflorescence. The Abutment 4 eastbound cap has 8 feet of delamination. There is a 24 inch by 18 inch spall with exposed reinforcing steel over the cheek wall. The Abutment 4 westbound cap has extensive delamination, cracking and spalling both within the structure and on the north cantilever.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
300	Strip Seal Exp Joint	3	07/20/2022	40.00	ft	0.00	39.00	1.00	0.00

A strip seal joint is present on the west end of the westbound girder. There is minor spalling to moderate spalling on the header adjacent to the joint. The full length of the gland is covered in loose debris. The curb plate is missing at the median railing.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
303	Assem Jnt With Seal	3	07/20/2022	120.00	ft	0.00	0.00	92.00	28.00

Modular expansion joints are located at both ends of the eastbound lanes and on the east end of the westbound lanes. The modular joints are comprised of steel and rubber components. A continuous layer of rubber encases steel plates and serves as the seal between components of the joint. These rubber layers/seals typically have minor deterioration and minor debris accumulation. There are damaged and missing sections of rubber on the steel plates in the driving lanes. Several bolts are missing from the steel plates. There are 16 feet of missing or damaged steel plates at Abutment 4 in the westbound lanes. There are 12 feet of missing, damaged, and loose steel plates at Abutment 1 in the eastbound lanes. The joint components deflect and rattle under even light passenger vehicle loads. At Abutment 4 in the eastbound lanes, there are two loose steel plates, one on each side of the center lane line.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
310	Elastomeric Bearing	3	07/20/2022	8.00	each	0.00	8.00	0.00	0.00

The elastomeric bearings at the abutments have minor deficiencies, including minor bulging, sagging, and splitting of the elastomer. The grout pads for the bearings have spalled in some locations. As noted for Element 104, the westbound girder has reportedly shifted 1 inch to the south relative to the bearings at Abutment 4.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
314	Pot Bearing	3	07/20/2022	8.00	each	8.00	0.00	0.00	0.00

No significant deficiencies were observed for the pot bearings at the piers. For the bearings that have bolted connections, light surface corrosion is developing on some of the nuts.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
515	Steel Protective Coating	3	07/20/2022	132.00	sq.ft	0.00	128.00	4.00	0.00

The paint on the pot bearings is chalking and fading but is substantially effective. Minor surface corrosion is developing on some of the nuts in the bolted connections, indicating limited effectiveness for a small portion of the paint.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
331	Re Conc Bridge Railing	3	07/20/2022	3,358.00	ft	2,819.00	378.00	161.00	0.00

As previously reported, the east approach span rail on the Westbound Bridge is offset 1 inch to the north. The masonry coating is failing throughout the Westbound Bridge north rail. There are cracks, delaminations, and/or spalls at approximately half of the construction joints. There is horizontal cracking in Span 1 westbound north rail near the bottom. There are spalls with exposed reinforcing steel at some of the construction joints. Away from the construction joints, there are four spalls, three of them with exposed reinforcing steel, at random locations in the concrete railings. The top of the south rail for the eastbound lanes has wide cracking and map cracking near Midspan 2.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
850	2nd Elem	3	07/20/2022	1.00	(EA)	0.00	0.00	1.00	0.00

Cracking and spalling with exposed reinforcing steel is present on some of the concrete end diaphragms for the girders.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
851	Transitions	3	07/20/2022	1.00	(EA)	0.00	0.00	0.00	1.00

There is a 1-3/4" transition at the right edge of the eastbound bridge over Abutment 1 expansion joint. There is a 1" vertical displacement in the right shoulder of the westbound bridge modular joint over Abutment 1. On the east end of the westbound lanes, approach settlement has progressed to over 2-inches in the left lane.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
852	Drains	3	07/20/2022	1.00	(EA)	0.00	1.00	0.00	0.00

Drains along the north rail are 100-percent blocked. Drains along the south rail are partially blocked. The average is up to 50-percent blocked (CS2).

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
853	Utilities	3	07/20/2022	1.00	(EA)	0.00	1.00	0.00	0.00

Navigation lights are attached to the north and south railings near Pier 2, Midspan 2, and Pier 3. No significant deficiencies were observed. Electrical conduits inside the girders are corroded and/or separated at several locations. Several interior lights were out at the time of the inspection.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
857	Embankment Erosion	3	07/20/2022	1.00	(EA)	0.00	0.00	1.00	0.00

There are two sections of loss of fill material at the northeast corner of Abutment 1. One is 5 1/2" tall, 3'-6" wide, and 3'-2" deep, the other section is 5 1/2" tall, 2'-0" wide, and 3'-2" deep. Erosion is present below the entire length of the backwall of Abutment 4, exposing all nine piles that support the backwall. The erosion is up to 23 inches deep at the south side wall of Abutment 4 eastbound. The erosion at that location is deep enough to provide access to the interior of the structure.

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	UNITS	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
859	Vegetation	3	07/20/2022	1.00	(EA)	0.00	0.00	1.00	0.00

There are trees and vegetation under the bridge that restrict proper inspection.

Work Candidates Report

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4FE7062-639B-092920-566751A860	Misc-Repair/Replace Utility	2020/07/28		2020	Under Review	Low	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "sribble" on 7/28/2020 - Repair damaged electrical conduits and replace burned out light bulbs Repair damaged hatches.
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4FE7062-639B-092920-D928ADDD77	Drain-Cln/Clr Dck Drain/Dwnspout	2020/07/28		2020	Under Review	Low	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "sribble" on 7/28/2020 - Clean deck drains as well as the drains inside the girders near the piers.
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4FE7062-639B-093020-1DE86B664C	Joints-Clean	2020/07/28		2020	Under Review	Medium	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "sribble" on 7/28/2020 - Clean debris from the strip seal joint.
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4FE7062-639B-092920-7795C02743	Substructure-Patch spalls	2020/07/28		2020	Under Review	Medium	KYTC Bridge Crew	Inspector Recommended

Notes : Generated by user "sribble" on 7/28/2020 - Patch spalls on the abutments and the caps and columns at the abutments.
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4225-PVPN-102016-49E797A074574	Drainage-Repair Washouts/Erosion	2016/07/21		2016	Under Review	Medium		Inspector Recommended

Notes : Generated by user "mrezaee" on 10/20/2016 - Backfill eroded areas at Abutments.
-I concur with this recommendation. CRK 2018
-Concur (DFS 07/24/19).
-Concur (STR 07/24/20).
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4225-PVPN-102016-F96FBC3D1CDA4	Joints-Replace	2016/07/21		2016	Under Review	Medium		Inspector Recommended

Notes : Generated by user "mrezaee" on 10/20/2016 - replace modular joints
-I concur with this recommendation. CRK 2018
-Concur (DFS 07/24/19).
-Concur (STR 07/24/20)
-Agree. PWD 7/29/21

BRIDGE ID	WORK ID	DESCRIPTION	DATE RECOMMENDED	DATE COMPLETED	TARGET YEAR	STATUS	PRIORITY	WORK ASSIGNE	SOURCE
037B00074N	4225-PVPN-102016-4105C82951FF4	Misc-Remove Vegetation	2016/07/21		2016	Under Review	Medium	KYTC Agronomy	Inspector Recommended

Notes : Generated by user "mrezaee" on 10/20/2016 - remove vegetation under and near bridge.
-I concur with this recommendation. CRK 2018
-Concur (DFS 07/24/19).
-Concur (STR 07/24/20).
-Agree. Vegetation is thick in Spans 1 and 3, restricting proper inspection. Cut at ground level. Spray to hinder future growth. PWD 7/29/21

037B00074N	4225-PVPN-102016-9906DE7552524	Deck-Place Overlay	2016/07/21	2016	Under Review	Medium	Inspector Recommended

Notes : Generated by user "mrezaee" on 10/20/2016 - place overlay on bridge.
-I concur with this recommendation. CRK 2018
-Concur (DFS 07/24/19).
-Concur (STR 07/24/20).
-Agree. PWD 7/29/21